Configuring Cisco EnergyWise

Unless otherwise noted, the term *switch* refers to a standalone switch and to a switch stack.

The switch command reference has command syntax and usage information.

For more information about EnergyWise, go to
http://www.cisco.com/en/US/products/ps10195/tsd_products_support_series_home.html.

Managing Single Entities

Use Cisco EnergyWise to manage the energy usage of entities in an EnergyWise network.

EnergyWise Entity

An EnergyWise entity is a physical or logical device with EnergyWise enabled, such as a Catalyst switch, a power over Ethernet (PoE) port, or a PoE device.

EnergyWise uses a distributed model to *manage* energy usage.

- Switches are grouped in an EnergyWise domain and become domain entities. They receive messages from and send them to other domain entities.

- An entity in the EnergyWise domain responds to queries.

- An entity *participating* in EnergyWise controls the power usage of connected PoE devices, such as an IP phone, an IP camera, or a PoE-enabled device. For example, a Catalyst switch sends a power-off message to an IP phone.

On an EnergyWise-enabled entity

- The entity always participates in EnergyWise.

- PoE ports participate in EnergyWise.

- Non-PoE ports do not participate in EnergyWise.

EnergyWise Domain

An EnergyWise domain can be an EnergyWise network.

The domain is treated as one unit of power management.
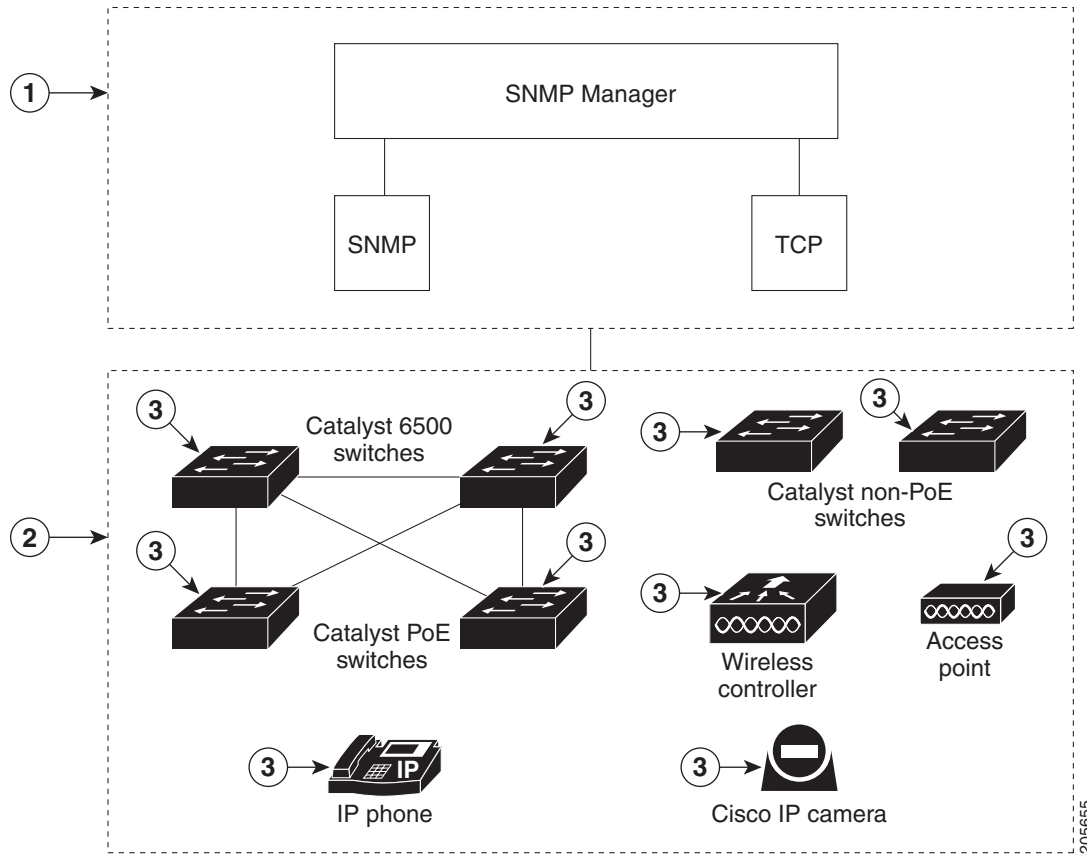
Entities have neighbor-to-neighbor relationships with other domain entities.

For more information, see the "Additional Information" section on page 4-18.

EnergyWise Network

An EnergyWise network has EnergyWise entities in a domain.

Figure 4-1   Typical Network

1	Entity managing power usage	**3**	Entities
2	Domain		

Single PoE Switch Scenario

Managing the power usage when

- A PoE entity powers on or off the connected entities.

- A PoE entity applies a network policy that powers on and powers off connected entities. The specified times are local times based on the PoE-entity time zone. For example, IP phones are powered on at 7:00 a.m. (0700) local time, and they are powered off at 7:00 p.m. (1900) local time.

  This is also known as the *recurrence scenario*.

Figure 4-2   Single PoE Switch Example
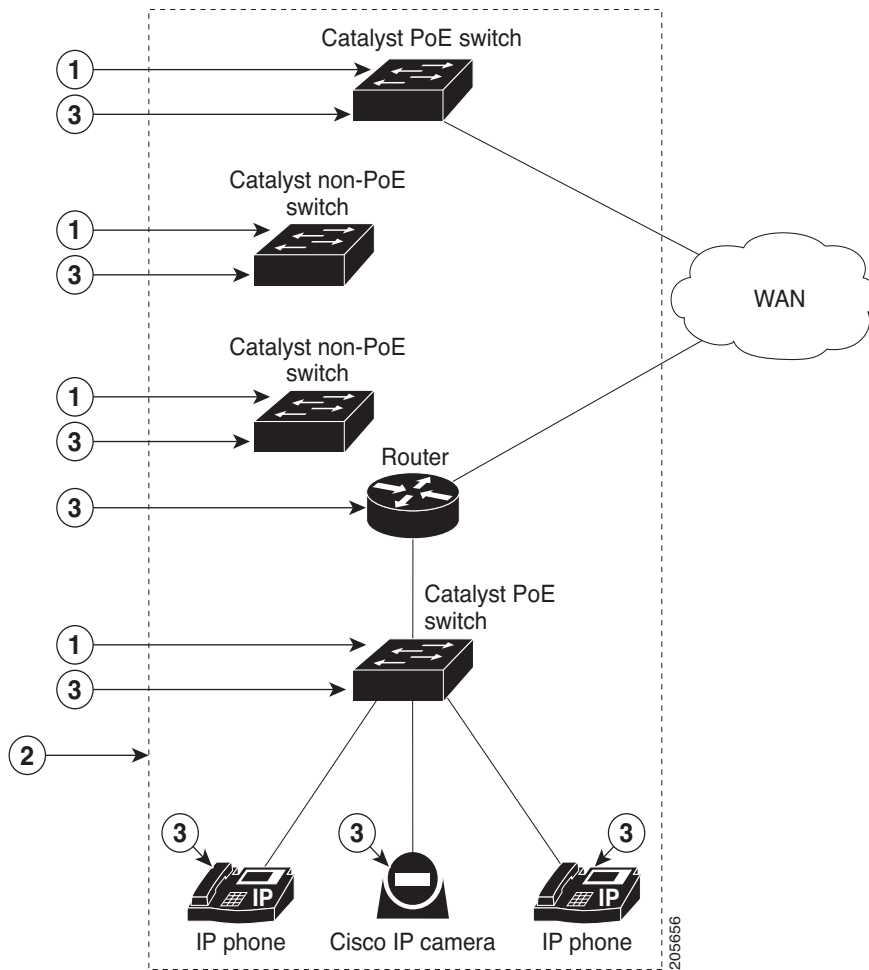
1	Entity managing power usage	**3**	Entities
2	Domain		

EnergyWise Power Level

The EnergyWise power level is for both a PoE port and a switch.

The range is from 0 to 10.

The default power level is 10.

A Catalyst switch does not support level 0.

A PoE port supports level 0 to level 10.

If the power level is 0, the port is powered off.

If the power level is from 1 to 10, the port is powered on. If the power level is 0, enter any value in this range to power on the PoE port or the switch.

When the power level changes, the port determines the action for the connected entities.

EnergyWise Importance

Set the EnergyWise importance value on a PoE port or a switch to rank domain entities.

The range is from 1 to 100.

The default importance value is 1.

EnergyWise Names, Roles, and Keywords

Set an EnergyWise-specific entity name to identify the domain entity.

- For a PoE port, the default is a short version of the port name; for example, Gi1.0.2 for Gigabit Ethernet 1/0/2.
- For a switch, the default is the hostname.

Set the role of the domain entity to differentiate it from other entities.

- For a PoE port, the default is *interface*.
- For a switch, the default is the model number.

Set at least one keyword describing an entity to differentiate it from other entities.

Configuration Guidelines

By default, EnergyWise is disabled.

When you add an entity to a domain, EnergyWise is enabled on the entity and its PoE ports.

Use the **energywise level 0** interface configuration command to power off a PoE port.

You cannot use the **energywise level 0** global configuration command to power off the entity.

If you schedule the entity to power on the PoE port at 7:00 a.m. (0700), the port powers on within 1 minute, between 7:00 a.m.(0700) and 7:01 a.m. (0701) local time.

PoE and EnergyWise Interactions

Table 4-1   Does the Entity Participate in EnergyWise?

EnergyWise Entity	PoE Mode		
	auto	never	static
PoE port	Yes	No	Yes
Non-PoE port	No	No	No

If the PoE port mode is **never**, the port power is off, but EnergyWise is not disabled. You can

- Configure EnergyWise on the port.
- Configure the port power level. The level takes effect after you change the port mode to **auto** or **static**. You do not need to restart the switch.

If EnergyWise is disabled, the entity can use PoE to manage port power.

Manually Managing Power

Powering the Entity

Beginning in privileged EXEC mode:

	Command	Purpose
Step 1	**show energywise**	(Optional) Verify that EnergyWise is disabled.
Step 2	**configure terminal**	Enter global configuration mode.

Step 3	**energywise domain** *domain-name* **secret** [**0** | **7**] *password* [**protocol udp port** *udp-port-number* [**interface** *interface-id* | **ip** *ip-address*]]	Enable EnergyWise on the entity, assign the entity to a domain with the specified *domain-name*, and set the *password* for secure communication among the entities in the domain.
		
		• (Optional) **0**—Use an unencrypted password. This is the default.
		• (Optional) **7**—Use a hidden password.
		  If you do not enter **0** or **7**, the entity uses the default value of 0.
		• (Optional) **port** *udp-port-number*—Specify the UDP port that sends and receives queries.
		  The range is from 1 to 65000. The default is 43440.
		• (Optional) **interface** *interface-id*—Specify the port from which the EnergyWise messages are sent.
		• (Optional) **ip** *ip-address*—Specify the IP address from which the EnergyWise messages are sent.
		For the *domain-name* and *password*
		• You can enter alphanumeric characters and symbols such as #, (, %, !, or &.
		• Do not use an asterisk (*) or a blank space between the characters and symbols.
		By default, no domain and password are assigned.

Step 4	**end**	Return to privileged EXEC mode.
Step 5	**show energywise** **show energywise domain**	Verify your entries.
Step 6	**copy running-config startup-config**	(Optional) Save your entries in the configuration file.

Configuring Entity Attributes

Beginning in privileged EXEC mode:

	Command	**Purpose**
Step 1	**show energywise**	(Optional) Verify that EnergyWise is enabled.
Step 2	**configure terminal**	Enter global configuration mode.
Step 3	**energywise importance** *importance*	(Optional) Set the importance of the entity.
		The range is from 1 to 100.
		The default is 1.
Step 4	**energywise keywords** *word,word,...*	(Optional) Assign at least one keyword for the entity.
		When assigning multiple keywords, separate the keywords with commas, and do not use spaces between keywords.
		• You can enter alphanumeric characters and symbols such as #, (, %, !, or &.
		• Do not use an asterisk (*) or a blank space between the characters and symbols.
		By default, no keywords are defined.
Step 5	**energywise management** *udp-port-number*	(Optional) Specify the UDP port that sends and receives queries.
		The range is from 1 to 65000.
		The default is 43440.
Step 6	**energywise name** *name*	(Optional) Specify the EnergyWise-specific entity name.
		• You can enter alphanumeric characters and symbols such as #, (, %, !, or &.
		• Do not use an asterisk (*) or a blank space between the characters and symbols.
		The default is the hostname.
Step 7	**energywise neighbor** [*hostname*| *ip-address*] *udp-port-number*	(Optional) Assign a static neighbor.
		• (Optional) Hostname (*hostname*) or IP address (*ip-address*).
		• UDP port (*udp-port-number*) that sends and receives queries. The range is from 1 to 65000.
		By default, no static neighbors are assigned.
Step 8	**energywise role** *role*	(Optional) Specify the role of the entity in the EnergyWise domain. For example, lobby.b20.
		• You can enter alphanumeric characters and symbols such as #, (, %, !, or &.
		• Do not use an asterisk (*) or a blank space between the characters and symbols.
		The default is the model number.
Step 9	**end**	Return to privileged EXEC mode.

	Command	Purpose
Step 10	show energywise	Verify your entries.
	show energywise domain	
Step 11	copy running-config startup-config	(Optional) Save your entries in the configuration file.

Powering the PoE Port

Beginning in privileged EXEC mode:

	Command	Purpose
Step 1	configure terminal	Enter global configuration mode.
Step 2	interface *interface-id*	Specify the port or the range of ports to be configured, and enter interface configuration mode.
Step 3	energywise level 0	(Optional) Manually power off the port, or
	or	
	energywise level 10	Manually power on the port.
Step 4	end	Return to privileged EXEC mode.
Step 5	show energywise domain	Verify your entries.
	show energywise children	
Step 6	copy running-config startup-config	(Optional) Save your entries in the configuration file.
		Note The power level that you set in Step 3 is the default power level when the switch restarts.

Configuring PoE-Port Attributes

Beginning in privileged EXEC mode:

	Command	Purpose
Step 1	configure terminal	Enter global configuration mode.
Step 2	interface *interface-id*	Specify the port or the range of ports to be configured, and enter interface configuration mode.
Step 3	energywise importance *importance*	(Optional) Set the importance of the port.
		The range is from 1 to 100.
		The default is 1.

	Command	Purpose
Step 4	**energywise keywords** *word,word,...*	(Optional) Assign at least one keyword for the port.
		When assigning multiple keywords, separate the keywords with commas, and do not use spaces between keywords.
		• You can enter alphanumeric characters and symbols such as #, (, %, !, or &.
		• Do not use an asterisk (*) or a blank space between the characters and symbols.
		By default, no keywords are defined.
Step 5	**energywise name** *name*	(Optional) Specify the EnergyWise-specific port name.
		• You can enter alphanumeric characters and symbols such as #, (, %, !, or &.
		• Do not use an asterisk (*) or a blank space between the characters and symbols.
		The default is a short version of the port name; for example, Gi1.0.2 for Gigabit Ethernet 1/0/2.
Step 6	**energywise role** *role*	(Optional) Specify the role of the port in the domain. For example, lobbyport.
		• You can enter alphanumeric characters and symbols such as #, (, %, !, or &.
		• Do not use an asterisk (*) or a blank space between the characters and symbols.
		By default, the role is *interface*.
Step 7	**end**	Return to privileged EXEC mode.
Step 8	**show energywise domain** **show energywise children**	Verify your entries.
Step 9	**copy running-config startup-config**	(Optional) Save your entries in the configuration file.

Automatically Managing Power (Recurrence)

Beginning in privileged EXEC mode:

	Command	Purpose
Step 1	**show energywise**	(Optional) Verify that EnergyWise is enabled.
Step 2	**configure terminal**	Enter global configuration mode.

	Command	Purpose

Step 3	**energywise domain** *domain-name* **secret** [**0**	**7**] *password* [**protocol udp port** *udp-port-number* [**interface** *interface-id*	**ip** *ip-address*]]	Enable EnergyWise on the entity, assign the entity to a domain with the specified *domain-name*, and set the *password* for secure communication among the entities in the domain.
				
				• (Optional) **0**—Use an unencrypted password. This is the default.
				
				• (Optional) **7**—Use a hidden password.
				
				  If you do not enter **0** or **7**, the entity uses the default value of 0.
				
				• (Optional) **port** *udp-port-number*—Specify the UDP port that sends and receives queries.
				
				  The range is from 1 to 65000.
				
				  The default is 43440.
				
				• (Optional) **interface** *interface-id*—Specify the port that sends EnergyWise messages.
				
				• (Optional) **ip** *ip-address*—Specify the IP address of the port that sends EnergyWise messages.
				
				For the *domain-name* and *password*,
				
				• You can enter alphanumeric characters and symbols such as #, (, %, !, or &.
				
				• Do not use an asterisk (*) or a blank space between the characters and symbols.
				
				By default, no domain and password are assigned.

Step 4	**interface** *interface-id*	Specify the port or a range of ports to be configured, and enter interface configuration mode.
Step 5	**energywise level 10 recurrence importance** *importance* **at** *minute hour day_of_month month day_of_week*	(Optional) Schedule the power-on recurrence. • **importance** *importance*—Set the importance of the port in the domain. The range is from 1 to 100. The default is 1. • *minute*—The range is from 0 to 59. Use ***** for the wildcard. • *hour*—The range is from 0 to 23. Use ***** for the wildcard. • *day_of_month*—The range is from 1 to 31. Use * for the wildcard. • *month*—The range is from 1 (January) to 12 (December). Use ***** for the wildcard. • *day_of_week*—The range is from 0 (Sunday) to 6 (Saturday). Use * for the wildcard. **Note** The specified time is the local time based on the PoE-entity time zone.

	Command	Purpose
Step 6	**energywise level 0 recurrence importance** *importance* **at** *minute hour day_of_month month day_of_week*	(Optional) Schedule the power-off recurrence. • **importance** *importance*—Set the importance of the port in the domain. The range is from 1 to 100. The default is 1. • *minute*—The range is from 0 to 59. Use ***** for the wildcard. • *hour*—The range is from 0 to 23. Use ***** for the wildcard. • *day_of_month*—The range is from 1 to 31. Use ***** for the wildcard. • *month*—The range is from 1 (January) to 12 (December). Use ***** for the wildcard. • *day_of_week*—The range is from 0 (Sunday) to 6 (Saturday). Use ***** for the wildcard. **Note** The specified time is the local time based on the PoE-entity time zone.
Step 7	**end**	Return to privileged EXEC mode.
Step 8	**show energywise recurrence**	Verify your entries.
Step 9	**copy running-config startup-config**	(Optional) Save your entries in the configuration file.

Examples

Setting Up the Domain

```
Switch# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)# energywise domain cisco secret cisco protocol udp port 43440 ip 2.2.4.30
Switch(config)# energywise importance 50
Switch(config)# energywise keywords lab1,devlab
Switch(config)# energywise name LabSwitch
Switch(config)# energywise neighbor TG3560G-21 43440
Switch(config)# energywise role role.labaccess
Switch(config)# end
Switch# show energywise domain
Name     : TG3560G-41
Domain   : cisco
Protocol : udp
IP       : 2.2.2.21

Port     : 43440
Switch# show energywise neighbors
Capability Codes: R - Router, T - Trans Bridge, B - Source Route Bridge
                  S - Switch, H - Host, I - IGMP, r - Repeater, P - Phone
Id    Neighbor Name              Ip:Port                  Prot   Capability
--    -------------              -------                  ----   ----------
1    TG3560G-21                 2.2.2.21:43440           udp    S I
2    TG3560G-31                 2.2.4.31:43440           static S I
3    TG3560G-22                 2.2.2.22:43440           cdp    S I
```

Manually Managing Power

To power on the lab IP phones now:

```
Switch# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)# energywise domain cisco secret cisco protocol udp port 43440 ip 2.2.4.44
Switch(config)# interface gigabitethernet1/0/3
Switch(config-if)# energywise importance 65
Switch(config-if)# energywise name labphone.5
Switch(config-if)# energywise role role.labphone
Switch(config-if)# end
```

Automatically Managing Power

The lab IP phones automatically power on at 8:00 a.m. (0800) local time and power off at 8:00 p.m.(2000) local time.

```
Switch# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)# energywise domain cisco secret cisco protocol udp port 43440 ip 2.2.4.30
Switch(config)# interface gigabitethernet1/0/3
Switch(config-if)# energywise level 10 recurrence importance 90 at 0 8 * * *
Switch(config-if)# energywise level 0 recurrence importance 90 at 0 20 * * *
Switch(config-if)# energywise importance 50
Switch(config-if)# energywise name labInterface.3
Switch(config-if)# energywise role role.labphone
Switch(config-if)# end

Switch# show energywise recurrences
Id     Addr        Class Action Lvl Cron
--     ----        ----- ------ --- ----
1      Gi1/0/3     QUERY SET     10  minutes: 0 hour: 8 day: * month: * weekday: *
2      Gi1/0/3     QUERY SET      0  minutes: 0 hour: 20 day: * month: * weekday: *

Switch# show running-config
<output truncated>
interface GigabitEthernet1/0/3
 energywise level 10 recurrence at 0 8 * * *
 energywise level 0 recurrence at 0 20 * * *
 energywise importance 50
 energywise role role.lobbyaccess
 energywise name lobbyInterface.3
end
<output truncated>
```
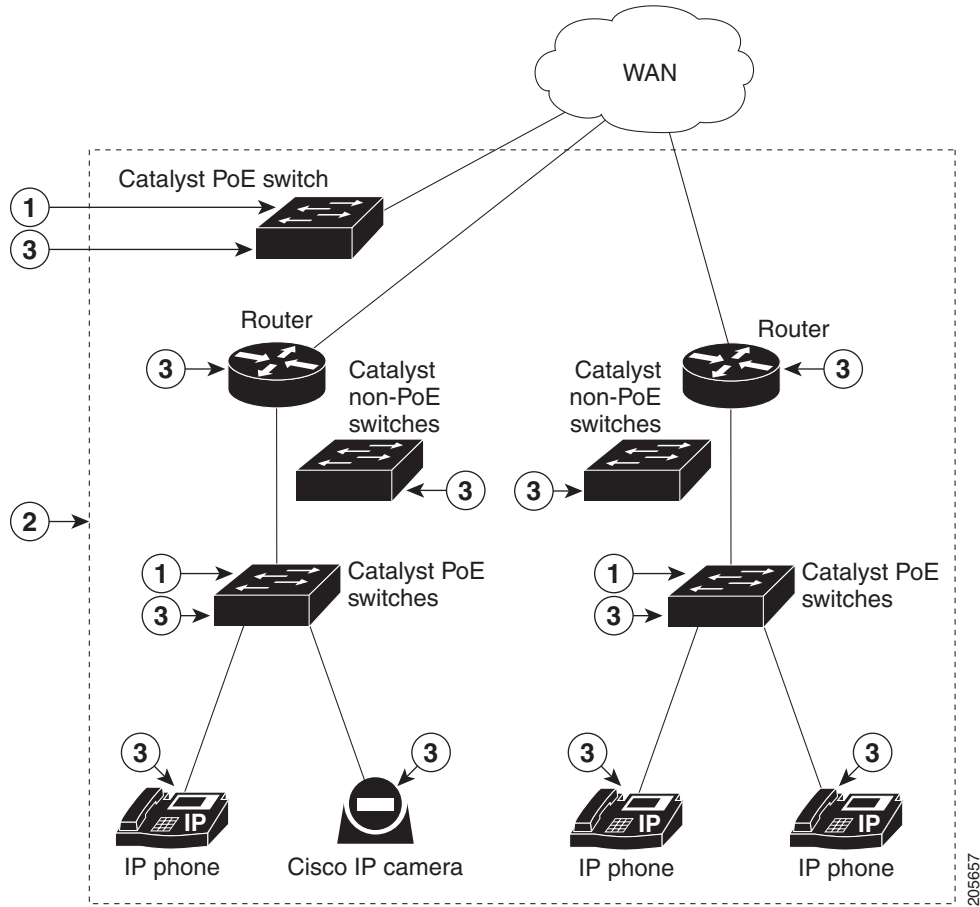
Managing Multiple Entities

Multiple PoE Switch Scenario

Figure 4-3   *Multiple PoE Switches Example*

1	Entity managing power usage	**3**	Entities
2	Domain		

EnergyWise Query

- Collect power usage information.
- Summarize power information from entities.
- Set parameters.

Use these attributes to filter results:

- Importance.
- Entity name.
- One or more keywords for a port or for a group of ports.

Use EnergyWise importance values to select entities in a query. For example, an office phone is less important than an emergency phone that should never be in sleep mode.

Query results show entities, such as PoE ports, with importance values less than or equal to the specified value in the query.

The entity sending a query to all domain entities receives the results.

Using Queries to Manage Power in the Domain

Beginning in privileged EXEC mode:

	Command	Purpose

Step 1	**energywise query importance** *importance* {**keywords** *word,word,...* | **name** *name*} **collect** {**delta** | **usage**}
	
	 or
	
	 energywise query importance *importance* {**keywords** *word,word,...* | **name** *name*} **sum** {**delta** | **usage**}
		(Optional) Run a query to display power information for the domain entities and PoE ports.
		
		 • **importance** *importance*—Filter the results based on the importance value. Only entities with values less than or equal to the specified value appear. The *importance* range is from 1 to 100.
		
		 • (Optional) **keywords** *word,word,...*—Filter the results based on one or more of the specified keywords.
		
		 • (Optional) **name** *name* —Filter the results based on the name. For the wildcard, use * or *name** with the asterisk at the end of the name phrase.
		
		 • **collect** {**delta** | **usage**}—Display the delta or usage values for the entities and PoE ports.
		   – **delta**—Display only the differences between the current and available power usage.
		   – **usage**—Display only the current power usage.
		
		 • **sum** {**delta** | **usage**}—Display the sum of the delta or usage values for the entities and PoE ports.
		   – **delta**—Display only the sum of the differences between the current and available power usage.
		   – **usage**—Display the sum of the current power usage.
		
		 Note In the results with the **sum** keyword, the *Responded* total is not accurate. The Queried total is accurate and is the total number of entities that respond to the query.
		
		 Repeat this step to run another query.

	Command	Purpose
Step 2	**energywise query importance** *importance* {**keywords** *word,word,…* | **name** *name*} **set level** *level*	(Optional) Run a query to power on or power off the domain entities or PoE ports. ⚠ **Caution** Use this query with care because it affects the entity on which you enter the command *and* other domain entities that match the query criteria. • **importance** *importance*—Filter the results based on the importance value. Only entities with values less than or equal to the specified value appear. The *importance* range is from 1 to 100. • (Optional) **keywords** *word,word,…*—Filter the results based on one or more of the specified keywords. • (Optional) **name** *name* —Filter the results based on the name. For the wildcard, use * or *name** with the asterisk at the end of the name phrase. • **set level** *level*—Set the power level of the entities or PoE ports. The range is from 0 to 10. Repeat this step to run another query.

Examples

In these examples, Switch 1 and Switch 2 are in the same domain. The entity called *shipping.1* is a PoE port on Switch 1, and the entity called *shipping.2* is a PoE port on Switch 2.

Querying with the Name Attribute

To show the power usage of the domain entities with names beginning with *shipping* and with importance values less than or equal to 80, run this query on Switch 1:

```
Switch# energywise query importance 80 name shipping.* collect usage
EnergyWise query, timeout is 3 seconds:

Host            Name           Usage
----            ----           -----
192.168.20.1    shipping.1     6.3 (W)
192.168.20.2    shipping.2     8.5 (W)

Queried:  2    Responded:  2    Time:  0.4 seconds
```

The first row (*shipping.1*) is from Switch 1. The second row (*shipping.2*) is from Switch 2, a neighbor of Switch 1.

Querying with Keywords

To show the power usage of IP phones with different names, different roles, and importance values less than or equal to 80, but all with the *Admin* keyword, run this query on Switch 1:

```
Switch# energywise query importance 80 keyword Admin collect usage
EnergyWise query, timeout is 3 seconds:

Host            Name          Usage
----            ----          -----
192.168.40.2    shipping.1     6.3 (W)
192.168.50.2    orders.1      10.3 (W)


Queried:  2    Responded:  2    Time:  0.5 seconds
```

Switch 1 reports two phones are connected to Switch 2, a neighbor of Switch 1.

Querying to Set Power Levels

Run these queries on Switch 1 to

- Set the power level of the *shipping.2* entity to 0:

```
Switch# energywise query importance 80 name shipping.2 set level 0
```

- Manually set the power level of the *shipping.1* entity and the *shipping.2* entity to 0:

```
Switch# energywise query importance 90 name shipping.* set level 0
```

- Set the power level of entities with the keyword *Admin* to 10:

```
Switch# energywise query importance 60 keyword Admin set level 10
EnergyWise query, timeout is 3 seconds:
!!!!
Success rate is (2/2) setting entities

Queried:  2    Responded:  2    Time:  0.15 seconds
```

Verify the power levels:

```
Switch# energywise query importance 85 keyword Admin collect usage
EnergyWise query, timeout is 3 seconds:

Host            Name          Usage
----            ----          -----
192.168.40.2    shipping.1     0.0 (W)
192.168.50.2    orders.1       0.0 (W)


Queried:  2    Responded:  2    Time:  0.9 seconds
```

You can also use the **show energywise usage** privileged EXEC command on Switch 1 and Switch 2 to verify the power levels.

Troubleshooting EnergyWise

Using CLI Commands

Table 4-2   EnergyWise Commands

Command	Purpose
clear energywise neighbors privileged EXEC	Delete the EnergyWise neighbor tables on the entity. It immediately discovers the neighbors and recreates the table.
no energywise interface configuration	Disable EnergyWise on the PoE port.
no energywise domain global configuration	Disable EnergyWise on the entity.

Table 4-3   show Privileged EXEC Commands

Command	Purpose
show energywise	Display the settings and status for the entity.
show energywise children	Display the status of the entity and the PoE ports in the domain.
show energywise domain	Display the domain to which the entity belongs.
show energywise events	Display the last ten events (messages) sent to other entities in the domain.
show energywise neighbors	Display the neighbor tables for the domains to which the entity belongs.
show energywise recurrences	Display the EnergyWise settings and status for recurrence.
show energywise statistics	Display the counters for events and errors.
show energywise usage	Display the current power usage on the entity.
show energywise version	Display the current EnergyWise version.
show power inline	Display the PoE status.
show cdp neighbors	Display the neighbors discovered by CDP.

For more information about the commands, see the command reference for this release.

Verifying the Power Usage

- This example shows that the Cisco 7960 IP Phone uses 6.3 watts and that the Cisco 7970G IP Phone uses 10.3 watts.

```
Switch# show energywise usage children
Interface   Name            Usage       Caliber
---------   ----            -----       -------
            Switch          144.0 (W)   max
Gi1/0/1     Gi1.0.1           6.3 (W)   trusted
Gi1/0/2     Gi1.0.2          10.3 (W)   trusted
```
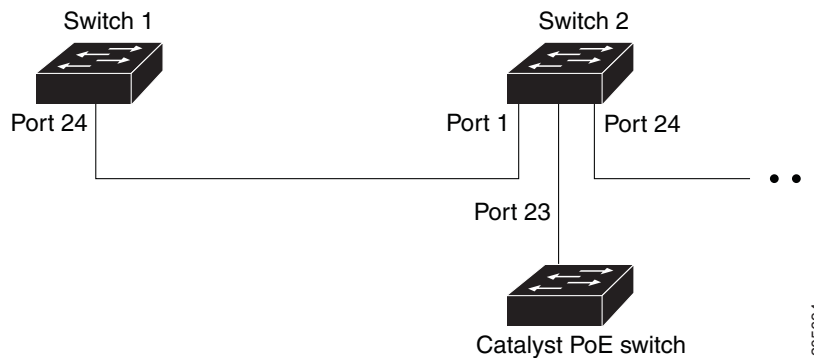
Additional Information

- Managing Power in a LAN, page 4-18
- Managing Power with IP Routing, page 4-18

Managing Power in a LAN

Multiple switches connected in the same LAN and in the same EnergyWise domain.

Figure 4-4   *EnergyWise with LANs*

The domain configuration includes

- UDP default port (43440)
- Gigabit Ethernet port 1/0/23 on Switch 2 with a connected Catalyst PoE switch.

On Switch 1, configure the domain:

```
Switch(config): energywise domain cisco secret 0 cisco protocol udp port 43440 interface
gigabitethernet1/0/23
```
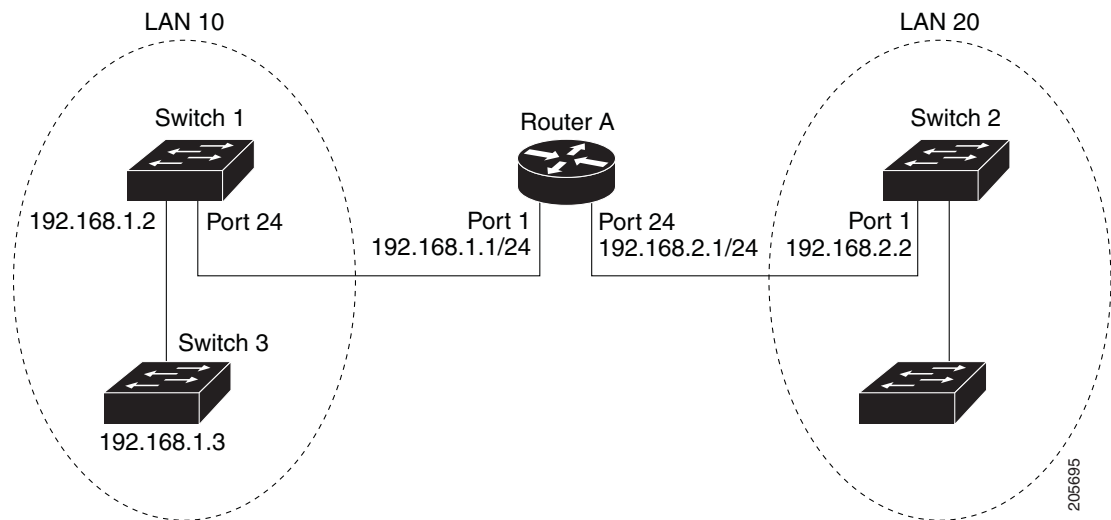
On Switch 1, verify that the EnergyWise protocols discovered the neighbors:

```
Switch# show energywise neighbors
Capability Codes: R - Router, T - Trans Bridge, B - Source Route Bridge
                  S - Switch, H - Host, I - IGMP, r - Repeater, P - Phone
Id   Neighbor Name           Ip:Port                  Prot   Capability
--   -------------           -------                  ----   ----------
4    Switch-2                192.168.20.2:43440       udp    S I
```

Managing Power with IP Routing

Switch 1 and Switch 2 are in a *disjointed domain*. Neighbors might not be discovered automatically.

Figure 4-5   *EnergyWise with IP Routing*

On Switch 1, to prevent a disjointed domain, manually assign Switch 2 as a static neighbor or the reverse.

```
Switch(config)# energywise neighbor 192.168.2.2 43440
```

Switch 1 discovers Switch 3 as a neighbor because they are in the same LAN.

On Switch 1, verify neighbor discovery.

```
Switch# show energywise neighbors
Capability Codes: R-Router, T-Trans Bridge, B-Source Route Bridge
                  S-Switch, H-Host, I-IGMP, r-Repeater, P-Phone

Id    Neighbor Name        Ip:Port              Prot    Capability
--    -------------        -------              ----    ----------
6     Switch-2             192.168.2.2:43440    static  S I
9     Switch-3             192.168.1.3:43440    cdp     S I
```

Switch 1 uses both static and dynamic protocols to detect neighbors.

Verify that switches are in the same domain:

```
Switch# energywise query name * collect usage
EnergyWise query, timeout is 3 seconds:
Host            Name            Usage
----            ----            -----
192.168.1.2     Switch-1        96.0 (W)
192.168.40.2    shipping.1      6.3 (W)
192.168.40.2    guest.1         10.3 (W)
192.168.50.2    shipping.2      8.5 (W)
192.168.50.2    lobby.1         10.3 (W)

Queried:  72    Responded:  72     Time:  0.65 second
```

In a routed network, a switch port assigned to a VLAN can be connected to a router interface. The IP address of the VLAN SVI is 192.168.1.2, and the IP address of the router interface is 192.168.1.1.

Configure the domain:

```
Switch(config)# energywise domain cisco secret 0 cisco protocol udp port 43440 ip
192.168.1.2
```

> **Note** To prevent a disjointed domain, you can also configure a helper address on Router A and specify that the router use UDP to forward broadcast packets with the
>
> **ip helper-address** *address* interface configuration command.
>
> **ip forward-protocol udp** [*port*] global configuration command.