



# Power Management for the Cisco 12000 Series Router

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Some combinations of older power supplies and recent line cards in Cisco 12000 Series routers can result in a condition where the total power required to operate exceeds the total power available. The power management feature calculates the maximum possible power consumption of all chassis components and generates warning messages if the calculation indicates the possibility of an underpowered condition. Messages are also generated for events that affect power consumption. New show command output provides power consumption ratings of all supported line cards.

## Feature History for Power Management for the Cisco 12000 Series Router

Release	Date	Modification
12.0(31)S	04/29/05	This feature was introduced for the Cisco 12000 Series routers.
12.0(31)S	10/28/05	Bug fixes incorporated.
12.0(32)S	07/30/09	Updated the configuration CLI for the “additive” mode of the “power-mgr” command.

## Finding Support Information for Platforms and Cisco IOS Software Images

Use Cisco Feature Navigator to find information about platform support and Cisco IOS software image support. Access Cisco Feature Navigator at <http://www.cisco.com/go/fn>. You must have an account on Cisco.com. If you do not have an account or have forgotten your username or password, click **Cancel** at the login dialog box and follow the instructions that appear.

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# Restrictions for Power Management for the Cisco 12000 Series Router

The Power Management feature is not supported on the Cisco 12008 or 12010 routers.

## Information About Power Management for the Cisco 12000 Series Router

To configure the Power Management for the Cisco 12000 Series Router feature, you should understand the following concepts:

- [Power Manager Facility, page 2](#)
- [Power Zones, page 3](#)
- [Additive and Redundant Modes, page 3](#)

### Power Manager Facility

The introduction of high-wattage Cisco 12000 Series line cards has made theoretical chassis configurations possible in which the maximum power required for the router could exceed the maximum power available if older power supplies are installed. The Power Management for the Cisco 12000 Series Router feature permits the administrator to plan and monitor the power usage, as well as dynamically receive messages related to events that change the power usage. The power manager feature does not control the power supplied to any component, it only monitors, calculates, and generates messages.

The power management feature can display a table of all supported Cisco 12000 Series field replaceable units (FRUs) with their rated maximum power consumption in watts, as well as dynamic summaries and individual power consumption calculations for all installed chassis components. The calculations are based on the rated maximum wattages and the power manager configuration options. System messages are generated for events that change power consumption. The following power-related events create logged messages:

- Power supply insertion or removal
- Power supply power-up or power-down
- Line card OIR insertion or removal
- CLI line card power-up or power-down
- Environment monitor line card shutdown
- mode change to additive or redundant

The power manager feature continually audits power supply capacities and the power up or down states of all chassis components every 2.5 seconds, then recalculates the power usage according to the power manager configuration. The power manager configuration can specify power zones and specify additive or redundant calculation modes. The default is redundant mode. The power manager facility can be disabled.

## Power Zones

A power zone comprises the power supplies and other chassis components connected to the same power bus. The 16-slot DC-powered chassis with the original power supplies, has two independent power buses, and thus two power zones. Zone A corresponds to the upper card cage with its two power supplies, and Zone B corresponds to the lower card cage with its two power supplies. The 16-slot DC chassis with enhanced power supplies has one power zone. All other Cisco 12000 Series router chassis have one power zone.

## Additive and Redundant Modes

Additive Watts = Total\_Watts\_of\_Power\_Supplies\_in\_Zone

Redundant Watts = (Total\_Watts\_of\_Power\_Supplies\_in\_Zone) – (Redundant\_Power\_Supply\_Watts)

In additive mode, the total available power in a power zone is calculated by the power manager as the total capacity in watts of all operating power supplies in the zone. This value is recalculated when a change occurs in the status of a power supply in the zone.



### Note

Additive mode is provided for those installations where guaranteed system up-time is a lower priority than maximizing the number of line cards and chassis components installed.

In redundant mode the total available power reported for a zone is equivalent to the total capacity in watts of all operating power supplies in the zone minus the power ratings of operating redundant power supplies in the zone.

For example, a Cisco 12810 router with two 2,800 watt power supplies, and 1+1 power supply redundancy, would report 5,600 watts total available power in additive mode, and 2,800 watts total available power in redundant mode.

For chassis with two power zones, the power zones can be configured with the same or with differing modes.

[Table 2](#) lists how redundancy is defined for Cisco 12000 Series powershelves.

**Table 1** Cisco 12000 Series Router Power Supply Redundancy Scheme

Number of Power Supplies in Powershell <sup>1</sup>	Redundancy Type <sup>2</sup>
2	1 + 1
3	2 + 1
4 AC	2 + 2
4 (DC original power supplies)	1 + 1 in Zone A, 1 + 1 in Zone B
4 (DC enhanced power supplies)	2 + 2

1. Redundancy allocations are valid for original and upgraded models of the AC power supplies.
2. In the n + x redundancy formulation, n represents the number of power supplies required for the maximum power demands and x is the number of additional power supplies installed. For example, n + 1 redundancy includes one power supply more than the minimum number required to sustain the maximum power demand of the system.

If the total power load of chassis components and line cards in a zone is less than or equal to the total available power reported by the power manager in redundant mode, the router can continue to safely operate in the event of a power supply failure.

# Power Manager Error Messages

Some conditions may generate error messages even though the Power Manager feature is disabled. This is because the power manager is auditing the power system before the bootup procedure parses and executes the power manager disable command in the startup-config file.

## Error Message

```
%POWERMGR-0-ENQUEUE: Cannot enqueue event [chars] for device [dec]
```

**Explanation** Power Manager internal failure occurred; possibly low memory condition.

**Recommended Action** Copy the error message exactly as it appears on the console or in the system log. Research and attempt to resolve the error using the Output Interpreter <https://www.cisco.com/cgi-bin/Support/OutputInterpreter/home.pl>. Also perform a search of the Bug Toolkit <http://www.cisco.com/cgi-bin/Support/Bugtool/home.pl>. If you still require assistance, open a case with the Technical Assistance Center via the Internet <http://tools.cisco.com/ServiceRequestTool/create/launch.do>, or contact your Cisco technical support representative and provide the representative with the gathered information.

## Error Message

```
%POWERMGR-0-INITFAIL: Resource allocation error encountered during startup
```

**Explanation** Power Manager subsystem failed during startup; lack of resources

**Recommended Action** Copy the error message exactly as it appears on the console or in the system log. Research and attempt to resolve the error using the Output Interpreter <https://www.cisco.com/cgi-bin/Support/OutputInterpreter/home.pl>. Also perform a search of the Bug Toolkit <http://www.cisco.com/cgi-bin/Support/Bugtool/home.pl>. If you still require assistance, open a case with the Technical Assistance Center via the Internet <http://tools.cisco.com/ServiceRequestTool/create/launch.do>, or contact your Cisco technical support representative and provide the representative with the gathered information.

## Error Message

```
%POWERMGR-2-CANNOT_TALK: No alarmcard/busboard module available to communicate w/  
PEM[dec]
```

**Explanation** No alarmcard or busboard module was found available to talk to the PEMs. The results are unpredictable, as power availability cannot be determined. Some linecards may be left in an unpowered state as a result.

**Recommended Action** Copy the error message exactly as it appears on the console or in the system log. Research and attempt to resolve the error using the Output Interpreter <https://www.cisco.com/cgi-bin/Support/OutputInterpreter/home.pl>. Also perform a search of the Bug Toolkit <http://www.cisco.com/cgi-bin/Support/Bugtool/home.pl>. If you still require assistance, open a case

with the Technical Assistance Center via the Internet <http://tools.cisco.com/ServiceRequestTool/create/launch.do>, or contact your Cisco technical support representative and provide the representative with the gathered information.

#### Error Message

```
%POWERMGR-2-INVALID_COND: Internal programatic error or invalid condition detected ([chars]:[dec])
```

**Explanation** A disallowed condition internal to the Power Manager has been detected.

**Recommended Action** Copy the error message exactly as it appears on the console or in the system log. Research and attempt to resolve the error using the Output Interpreter <https://www.cisco.com/cgi-bin/Support/OutputInterpreter/home.pl>. Also perform a search of the Bug Toolkit <http://www.cisco.com/cgi-bin/Support/Bugtool/home.pl>. If you still require assistance, open a case with the Technical Assistance Center via the Internet <http://tools.cisco.com/ServiceRequestTool/create/launch.do>, or contact your Cisco technical support representative and provide the representative with the gathered information.

#### Error Message

```
%POWERMGR-2-OVERBUDGET: Power consumption has exceeded supply by [dec]W; results unpredictable
```

**Explanation** The power calculated in use by the chassis exceeds that available by the powershell. This condition could result in an outage of the chassis if action is not immediately taken.

**Recommended Action** Remove some linecards to reduce power consumption, or install a higher capacity powershell.

#### Error Message

```
%POWERMGR-2-TIMEOUT: Timed out waiting for response from power-up of slot [dec]
```

**Explanation** Power Manager internal failure occurred.

**Recommended Action** Copy the error message exactly as it appears on the console or in the system log. Research and attempt to resolve the error using the Output Interpreter <https://www.cisco.com/cgi-bin/Support/OutputInterpreter/home.pl>. Also perform a search of the Bug Toolkit <http://www.cisco.com/cgi-bin/Support/Bugtool/home.pl>. If you still require assistance, open a case with the Technical Assistance Center via the Internet <http://tools.cisco.com/ServiceRequestTool/create/launch.do>, or contact your Cisco technical support representative and provide the representative with the gathered information.

**Error Message**

S%POWERMGR-3-EVENT\_ERROR: Spurious QUEUE\_EVENT, dequeuing NULL pointer

**Explanation** Power Manager main event loop encountered internal error.

**Recommended Action** Copy the error message exactly as it appears on the console or in the system log. Research and attempt to resolve the error using the Output Interpreter <https://www.cisco.com/cgi-bin/Support/OutputInterpreter/home.pl>. Also perform a search of the Bug Toolkit <http://www.cisco.com/cgi-bin/Support/Bugtool/home.pl>. If you still require assistance, open a case with the Technical Assistance Center via the Internet <http://tools.cisco.com/ServiceRequestTool/create/launch.do>, or contact your Cisco technical support representative and provide the representative with the gathered information.

**Error Message**

%POWERMGR-3-UNKNOWN\_PEM: Unable to determine characteristics of PEM[dec]; skipping

**Explanation** The characteristics of the power supply installed in the specified slot could not be determined. This supply is being skipped, and discovery of the rest of the powershell will continue. If no supplies can be found, a failsafe type will be used to allow the chassis to come up to a point at which debugging of the problem is possible.

**Recommended Action** Copy the error message exactly as it appears on the console or in the system log. Research and attempt to resolve the error using the Output Interpreter <https://www.cisco.com/cgi-bin/Support/OutputInterpreter/home.pl>. Also perform a search of the Bug Toolkit <http://www.cisco.com/cgi-bin/Support/Bugtool/home.pl>. If you still require assistance, open a case with the Technical Assistance Center via the Internet <http://tools.cisco.com/ServiceRequestTool/create/launch.do>, or contact your Cisco technical support representative and provide the representative with the gathered information.

**Error Message**

%POWERMGR-3-UNKNOWN\_PEMS: Unable to detect installed power supplies; using failsafe assumptions

**Explanation** The installed power supplies (i.e., PEMs) could not be detected. To allow the chassis to come up, a set of conservative assumptions have been used for calculating power availability and consumption. Some linecards may be left in an unpowered state as a result.

**Recommended Action** Copy the error message exactly as it appears on the console or in the system log. Research and attempt to resolve the error using the Output Interpreter <https://www.cisco.com/cgi-bin/Support/OutputInterpreter/home.pl>. Also perform a search of the Bug Toolkit <http://www.cisco.com/cgi-bin/Support/Bugtool/home.pl>. If you still require assistance, open a case with the Technical Assistance Center via the Internet <http://tools.cisco.com/ServiceRequestTool/create/launch.do>, or contact your Cisco technical support representative and provide the representative with the gathered information.

**Error Message**

%POWERMGR-3-UNKNOWN\_SHELF: Unable to determine powershelf type; using failsafe assumptions

**Explanation** The powershelf type (AC or DC) could not be determined during bootup. To allow the chassis to come up, a set of conservative assumptions have been used for calculating power availability and consumption. Some linecards may be left in an unpowered state as a result.

**Recommended Action** Copy the error message exactly as it appears on the console or in the system log. Research and attempt to resolve the error using the Output Interpreter <https://www.cisco.com/cgi-bin/Support/OutputInterpreter/home.pl>. Also perform a search of the Bug Toolkit <http://www.cisco.com/cgi-bin/Support/Bugtool/home.pl>. If you still require assistance, open a case with the Technical Assistance Center via the Internet <http://tools.cisco.com/ServiceRequestTool/create/launch.do>, or contact your Cisco technical support representative and provide the representative with the gathered information.

**Error Message**

%POWERMGR-4-UNPOWERED:PEM[dec] inserted but unpowered

**Explanation** The power supply specified has been installed in the chassis but is unpowered, most likely because of an unconnected power cord.

**Recommended Action** Check the power cord and if installed correctly, remove and reinstall the PEM. If the error persists, contact customer support.

**Error Message**

%POWERMGR-4-PEM\_DOWN: PEM[dec] has powered down

**Explanation** The power supply specified has powered down.

**Recommended Action** This message is informational. No action is required.

**Error Message**

%POWERMGR-5-INVALID\_EVENT: Unexpected event [dec]/[dec]; ignoring

**Explanation** Power Manager received an event that was not expected.

**Recommended Action** Copy the error message exactly as it appears on the console or in the system log. Research and attempt to resolve the error using the Output Interpreter <https://www.cisco.com/cgi-bin/Support/OutputInterpreter/home.pl>. Also perform a search of the Bug Toolkit <http://www.cisco.com/cgi-bin/Support/Bugtool/home.pl>. If you still require assistance, open a case with the Technical Assistance Center via the Internet <http://tools.cisco.com/ServiceRequestTool/create/launch.do>, or contact your Cisco technical support representative and provide the representative with the gathered information.

**Error Message**

%POWERMGR-5-REMOVED: PEM[dec] removed

**Explanation** The power supply specified has been removed from the chassis.

**Recommended Action** This message is informational. No action is required.

**Error Message**

%POWERMGR-6-BUDGET\_OK: Chassis power consumption is back within limits

**Explanation** The power calculated in use by the chassis has returned to a value within the power supplied by the powershell.

**Recommended Action** This message is informational. No action is required.

**Error Message**

%POWERMGR-6-INSERTED: PEM[dec] inserted, supplying [dec] watts

**Explanation** The power supply specified has been installed in the chassis and is now active.

**Recommended Action** This message is informational. No action is required.

**Error Message**

%POWERMGR-6-PEM\_UP: PEM[dec] powered up successfully, supplying [dec] watts

**Explanation** The power supply specified has successfully powered up.

**Recommended Action** This message is informational. No action is required.

## How to Configure the Power Management Feature

The power management feature has only three configurable states, additive mode, redundant mode, and disable. The disable option is included for those who wish to suppress power manager messages.

### Changing the Power Manager Calculation Mode

In the following configuration, one of two power zones in a 16-slot DC chassis is configured to calculate power status in additive mode.



## SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **power-mgr {additive | disable}**
4. **show gsr power-mgr [detail | table | layout]**

## DETAILED STEPS

	Command or Action	Purpose
Step 1	<b>enable</b>  <b>Example:</b> Router> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>
Step 2	<b>configure terminal</b>  <b>Example:</b> Router# configure terminal	Enters global configuration mode.
Step 3	<b>power-mgr {additive   disable}</b>  <b>Example:</b> Router(config)# power-mgr additive	Specifies that for power management calculation, the power zones power availability calculations are additive. Use the <b>no</b> form of the command to restore the redundant mode default.
Step 4	<b>exit</b>  <b>Example:</b> Router(config)# exit	Exits global configuration to privileged EXEC mode.
Step 5	<b>show gsr power-mgr [detail   table   layout]</b>  <b>Example:</b> Router# show gsr power-mgr	Displays a summary of the system power calculations and the current calculation mode (additive or redundant).

## Examples

The following example disables the power manager:

```
router(config)# power-mgr disable
```

The following example enables the power manager:

```
router(config)# no power-mgr disable
```

The following example configures power zones as additive in a 16-slot Cisco 12000 Series router:

```
router(config)# power-mgr additive
router(config)# exit
router# show gsr power-mgr
```

```
Power management summary
-----
Powershell type: Intelligent DC Power Supplies
Operating phase: RUNNING_PHASE
```

```

|Z|      Operating mode: ADDITIVE |Z|      Operating mode: ADDITIVE
|O|      Total supply power: 4800 W |O|      Total supply power: 4800 W
|N|      Route processors: 120 W |N|      Route processors: 0 W
|E|      Linecards: 2108 W |E|      Linecards: 378 W
|A|      Chassis components: 213 W |B|      Chassis components: 404 W
          Total inuse power: 2441 W          Total inuse power: 782 W
          Remaining: 2359 W                  Remaining: 4018 W
    
```

```

PEM1 present in ZoneA, supplying 2400 watts; uptime 1d02h31m
PEM2 present in ZoneA, supplying 2400 watts; uptime 1d00h10m
PEM3 present in ZoneB, supplying 2400 watts; uptime 1d00h10m
PEM4 present in ZoneB, supplying 2400 watts; uptime 1d00h09m
    
```

The following example returns power zones to the default redundant mode in a 16-slot Cisco 12000 Series router:

```

router(config)# no power-mgr additive
router(config)# exit
router# show gsr power-mgr
    
```

```

Power management summary
-----
Powershell type: Intelligent DC Power Supplies
Operating phase: RUNNING_PHASE
    
```

```

|Z|      Operating mode: REDUNDANT |Z|      Operating mode: REDUNDANT
|O|      Total supply power: 2400 W |O|      Total supply power: 2400 W
|N|      Route processors: 120 W |N|      Route processors: 0 W
|E|      Linecards: 2108 W |E|      Linecards: 378 W
|A|      Chassis components: 213 W |B|      Chassis components: 404 W
          Total inuse power: 2441 W          Total inuse power: 782 W
          Remaining: - 41 W                  Remaining: 1618 W
    
```

```

PEM1 present in ZoneA, supplying 2400 watts; uptime 1d02h33m
PEM2 present in ZoneA, supplying 2400 watts; uptime 1d00h13m
PEM3 present in ZoneB, supplying 2400 watts; uptime 1d00h13m
PEM4 present in ZoneB, supplying 2400 watts; uptime 1d00h12m
    
```

The following example displays a power management summary for the system and by slot:

```

router# show gsr power-mgr detail
    
```

```

Power management summary
-----
Powershell type: Intelligent DC Power Supplies
Operating phase: RUNNING_PHASE
    
```

```

          Operating mode: REDUNDANT
          Total supply power: 1100 W
          Route processors: 76 W
          Linecards: 508 W
          Chassis components: 602 W
          Total inuse power: 1186 W
          Remaining: - 86 W
    
```

```

PEM1 absent
PEM2 present, supplying 1100 watts; uptime 0d03h36m
    
```

```

Slot  Cardtype      Watts  Status
----  -
** 0   OC12-4-POS        0  unpowered
    1   OC3-4-POS-X       90  powered
    2   GE-4             106  powered
    
```

5	GSRP	38	powered
6	OC3-POS-16	100	powered
7	OC12-ATM-4	122	powered
8	OC3-4-POS-X	90	powered
9	GSRP	38	powered
16	CSC10	19	powered
17	CSC10	19	powered
18	SFC10	64	powered
19	SFC10	64	powered
20	SFC10	64	powered
21	SFC10	64	powered
22	SFC10	64	powered
24	ALARM10	33	powered
25	ALARM10	33	powered
29	BLOWER16	178	powered

The following example displays a table listing the maximum power consumption ratings of all Cisco 12000 Series field replaceable units (FRUs).

```
router# show gsr power-mgr table
```

```
Power Manager device data:
```

FRU	Description	Watts
---	-----	----
GRP=	Route Processor	38
GRP-B=	Route Processor	38
PRP-1=	Performance Route Processor	60
PRP-2=	Performance Route Processor	60
LC-40C3/POS-SM=	4 Port Packet Over SONET OC-3c/STM-1	80
LC-40C3/POS-MM=	4 Port Packet Over SONET OC-3c/STM-1	80
40C3/POS-LR-SC=	4 Port Packet Over SONET OC-3c/STM-1	80
LC-10C12/POS-SM=	1 Port Packet Over SONET OC-12c/STM-4c	80
LC-10C12/POS-MM=	1 Port Packet Over SONET OC-12c/STM-4c	80
40C12/POS-IR-SC-B=	4 Port Packet Over SONET OC-12c/STM-4	100
40C12/POS-MM-SC-B=	4 Port Packet Over SONET OC-12c/STM-4	100
OC48E/POS-SR-SC-B=	1 Port Packet Over SONET OC-48c/STM-16	78
OC48E/POS-SR-FC-B=	1 Port Packet Over SONET OC-48c/STM-16	78
OC48E/POS-LR-SC-B=	1 Port Packet Over SONET OC-48c/STM-16	78
OC48E/POS-LR-FC-B=	1 Port Packet Over SONET OC-48c/STM-16	78
80C3/POS-SM=	8 Port Packet Over SONET OC-3c/STM-1	100
80C3/POS-MM=	8 Port Packet Over SONET OC-3c/STM-1	100
160C3/POS-SM=	16 Port Packet Over SONET OC-3c/STM-1	100
160C3/POS-MM=	16 Port Packet Over SONET OC-3c/STM-1	100
40C48/POS-SR-SC=	4 Port Packet Over SONET OC-48c/STM-16	212
40C48/POS-SR-FC=	4 Port Packet Over SONET OC-48c/STM-16	212
40C48/POS-LR-SC=	4 Port Packet Over SONET OC-48c/STM-16	212
40C48/POS-LR-FC=	4 Port Packet Over SONET OC-48c/STM-16	212
OC192/POS-VSR=	1 Port Packet Over SONET OC-192c/STM-64	174
OC192/POS-SR2-SC=	1 Port Packet Over SONET OC-192c/STM-64	174
OC192/POS-SR-SC=	1 Port Packet Over SONET OC-192c/STM-64	174
OC192/POS-IR-SC=	1 Port Packet Over SONET OC-192c/STM-64	174
OC192/POS-LR-SC=	1 Port Packet Over SONET OC-192c/STM-64	174
OC48X/POS-LR-SC=	1 Port ISE Packet Over SONET OC-48c/STM-16	140
OC48X/POS-IR-SC=	1 Port ISE Packet Over SONET OC-48c/STM-16	140
OC48X/POS-SR-SC=	1 Port ISE Packet Over SONET OC-48c/STM-16	140
40C12X/POS-M-SC-B=	4 Port ISE Packet Over SONET OC-12c/STM-4	140
40C12X/POS-I-SC-B=	4 Port ISE Packet Over SONET OC-12c/STM-4	140
160C3X/POS-M-MJ-B=	16 Port ISE Packet Over SONET OC-3c/STM-1	140
160C3X/POS-IR-LC-B=	16 Port ISE Packet Over SONET OC-3c/STM-1	140
80C3X/POS-MM-MJ-B=	8 Port ISE Packet Over SONET OC-3c/STM-1	105
80C3X/POS-IR-LC-B=	8 Port ISE Packet Over SONET OC-3c/STM-1	105
40C3X/POS-MM-MJ-B=	4 Port ISE Packet Over SONET OC-3c/STM-1	90

40C3X/POS-IR-LC-B=	4 Port ISE Packet Over SONET OC-3c/STM-1	90
40C3X/POS-LR-LC-B=	4 Port ISE Packet Over SONET OC-3c/STM-1	90
40C48E/POS-SR-SC=	4 Port ES Packet Over SONET OC-48c/STM-16	212
40C48E/POS-SR-FC=	4 Port ES Packet Over SONET OC-48c/STM-16	212
40C48E/POS-LR-SC=	4 Port ES Packet Over SONET OC-48c/STM-16	212
40C48E/POS-LR-FC=	4 Port ES Packet Over SONET OC-48c/STM-16	212
OC192E/POS-VSR=	1 Port ES Packet Over SONET OC-192c/STM-64	178
OC192E/POS-SR2-SC=	1 Port ES Packet Over SONET OC-192c/STM-64	178
OC192E/POS-SR-SC=	1 Port ES Packet Over SONET OC-192c/STM-64	178
OC192E/POS-IR-SC=	1 Port ES Packet Over SONET OC-192c/STM-64	178
OC192E/POS-LR-SC=	1 Port ES Packet Over SONET OC-192c/STM-64	178
2OC192E/POS-VSR=	2 Port ES Packet Over SONET OC-192c/STM-64	171
2OC192E/POS-SR2-SC=	2 Port ES Packet Over SONET OC-192c/STM-64	171
2OC192E/POS-SR-SC=	2 Port ES Packet Over SONET OC-192c/STM-64	171
2OC192E/POS-IR-SC=	2 Port ES Packet Over SONET OC-192c/STM-64	171
2OC192E/POS-LR-SC=	2 Port ES Packet Over SONET OC-192c/STM-64	171
8OC-48/POS-SFP	8 Port ES Packet Over SONET OC-48c/STM-16	165
LC-OC12-DS3=	1 port SONET OC12 channelized to DS3	80
CHOC12/STS3-IR-SC=	1 port SONET OC12 channelized to STS-3c/STM-1	80
6CT3-SMB=	6 Port Channelized T3	77
4CHOC12/DS3-IR-SC-B=	4 port ISE OC12 channelized STS-3c/STM-1 or DS3/E3	140
CHOC48/DS3-IR-SC=	1 port ISE OC48 channelized STS-12c/STM-4, STS-...	140
CHOC48/DS3-SR-SC=	1 port ISE OC48 channelized STS-12c/STM-4, STS-...	140
2CHOC3/STM1-IR-SC=	2 Ports OC3 Channelized to DS1/E1	80
CHOC12/STM4-IR-SC=	1 Port ISE OC12 Channelized to DS1/E1	94
CHOC12/DS1-IR-SC=	1 Port ISE OC12 Channelized to DS1/E1	94
6DS3-SMB-B=	6 Port Packet over DS3	80
12DS3-SMB-B=	12 Port Packet over DS3	80
6E3-SMB=	6 Port Packet over E3	80
12E3-SMB=	12 Port Packet over E3	80
LC-1OC12/ATM-SM=	1 port ATM Over SONET OC12c/STM-4c	62
LC-1OC12/ATM-MM=	1 port ATM Over SONET OC12c/STM-4c	62
4OC3/ATM-IR-SC=	4 port ATM Over SONET OC-3c/STM-1	70
4OC3/ATM-MM-SC=	4 port ATM Over SONET OC-3c/STM-1	70
4OC12/ATM-IR-SC=	4 port ATM Over SONET OC12c/STM-4c	122
4OC12/ATM-MM-SC=	4 port ATM Over SONET OC12c/STM-4c	122
8OC03/ATM/TS-IR-B=	8 port ATM Over SONET OC-3c/STM-1 Version B	95
8OC03/ATM/TS-MM-B=	8 port ATM Over SONET OC-3c/STM-1 Version B	95
8OC03/ATM/TS-IR=	8 port ATM Over SONET OC-3c/STM-1	95
8OC03/ATM/TS-MM=	8 port ATM Over SONET OC-3c/STM-1	95
4OC12X/ATM-IR-SC=	4 Port ISE ATM Over SONET OC-12/STM-4	140
4OC12X/ATM-MM-SC=	4 Port ISE ATM Over SONET OC-12/STM-4	140
4OC3X/ATM-IR-SC=	4 Port ISE ATM Over SONET OC-3/STM-1	140
4OC3X/ATM-MM-SC=	4 Port ISE ATM Over SONET OC-3/STM-1	140
GE-GBIC-SC-B=	1 Port Gigabit Ethernet	65
8FE-FX-SC-B=	8 Port Fast Ethernet	77
8FE-TX-RJ45-B=	8 Port Fast Ethernet	77
3GE-GBIC-SC=	3 Port Gigabit Ethernet	71
10X1GE-SFP-LC=	10 Port Gigabit Ethernet	191
EPA-GE/FE-BBRD	Modular Gigabit/FastEthernet	198
EPA-3GE-SX/LH-LC	Modular Gigabit/FastEthernet	198
EPA-24FE-TX	Modular Gigabit/FastEthernet	198
10GE-SX/LH-LC-B=	10 Port Gigabit Ethernet Version B	191
1X10GE-LR-SC=	1 Port 10GigEthernet Plus	196
1x10GE-ER-SC=	1 Port 10GigEthernet Plus	196
4GE-SFP-LC=	4 Port ISE Gigabit Ethernet	106
OC12/SRP-IR-SC-B=	1 Port SONET based SRP OC-12c/STM-4	80
OC12/SRP-MM-SC-B=	1 Port SONET based SRP OC-12c/STM-4	80
OC12/SRP-LR-SC-B=	1 Port SONET based SRP OC-12c/STM-4	80

OC12/SRP-XR-SC-B=	1 Port SONET based SRP OC-12c/STM-4	80
OC48/SRP-LR-SC=	1 Port SONET based SRP OC-48c/STM-16	100
OC48/SRP-SR-SC=	1 Port SONET based SRP OC-48c/STM-16	100
OC192/SRP-VSR=	1 Port SONET based SRP OC-192c/STM-64	215
OC192/SRP-SR2-SC=	1 Port SONET based SRP OC-192c/STM-64	215
OC192/SRP-SR-SC=	1 Port SONET based SRP OC-192c/STM-64	215
OC192/SRP-IR-SC=	1 Port SONET based SRP OC-192c/STM-64	215
4OC12X/SRP-IR-LC=	4 Ports SONET based SRP ISE OC-12c/STM-4	140
4OC12X/SRP-XR-LC=	4 Ports SONET based SRP ISE OC-12c/STM-4	140
2OC12X/SRP-IR-LC=	2 Ports SONET based SRP ISE OC-12c/STM-4	140
2OC12X/SRP-XR-LC=	2 Ports SONET based SRP ISE OC-12c/STM-4	140
12000-SIP-600=	ISE 10G SPA Interface Card	256
12000-SIP-400=	ISE 2.5G SPA Interface Card	180
GSR16/80-CSC=	Clock Scheduler Card 16XOC48	43
GSR16/80-SFC=	Switch Fabric Card 16XOC48	35
GSR16/320-CSC=	Clock Scheduler Card 16XOC192	106
GSR16/320-SFC=	Switch Fabric Card 16XOC192	93
GSR10-CSC=	Clock Scheduler Card(10) OC-192	19
GSR10-SFC=	Switch Fabric Card(10) OC-192	64
GSR6-CSC=	Clock Scheduler Card(6) OC-192	56
GSR6-SFC=	Switch Fabric Card(6) OC-192	45
GSR04-FABRIC=	Clock Scheduler Card for 12404	143
12810-CSC=	Clock Scheduler Card(10) OC-768	54
12810-SFC=	Switch Fabric Card(10) OC-768	107
12816-CSC=	Clock Scheduler Card(16) OC-768	177
12816-SFC=	Switch Fabric Card(16) OC-768	151
12010-CSC=	Advanced Clock Scheduler Card(10)	19
12010-SFC=	Advanced Switch Fabric Card(10)	64
12006-CSC=	Advanced Clock Scheduler Card(6)	56
12006-SFC=	Advanced Switch Fabric Card(6)	45
12004-SF=	Advanced Clock+Switch Fabric(4)	143
12016-CSC=	Advanced Clock Scheduler Card(16)	106
12016-SFC=	Advanced Switch Fabric Card(16)	93
12810E-CSC=	Clock Scheduler Card(10) OC-768E	55
12816E-CSC=	Clock Scheduler Card(16) OC-768E	176
GSR16-BLOWER=	Blower Module(16)	178
12000/10/16-BLWER	Blower Module(16)	178
GSR10-ALRM=	Alarm Module(10)	33
GSR6-ALRM=	Alarm Module(6)	26
GSR16-ALRM=	Alarm Module(16)	35
GSR4-BLOWER=	Alarm Board(404)	115
GSR6-BLOWER=	Blower Module(6)	178
12000/6-BLOWER=	Blower Module(6)	178

The following example displays the types of Cisco 12000 Series powershelves, as well as the PEM (power supplies) numbering and the PEM positions within the shelves:

Router# **show gsr power-mgr layout**

GSR PEM layout (front view):

GSR16:3-AC		AC POWER 1 (PEM1)		AC POWER 2 (PEM2)		AC POWER 3 (PEM3)		
GSR16:4-AC		PS A2 (PEM1)		PS A1 (PEM2)				
		PS B2 (PEM3)		PS B1 (PEM4)				
GSR16:4-DC		DC POWER B1 (PEM3)		DC POWER B2 (PEM4)		DC POWER A2 (PEM2)		DC POWER A1 (PEM1)
GSR10:AC & DC		POWER_A (PEM1)		POWER_B (PEM2)				
GSR6:AC & DC		POWER_A (PEM1)		POWER_B (PEM2)				
GSR404:AC & DC		no label (PEM2)		no label (PEM1)				

## Additional References

The following sections provide references related to Power Management for the Cisco 12000 Series Router.

## Related Documents

Related Topic	Document Title
Installing and troubleshooting Cisco 1200 power supplies	<i>Cisco 12016, Cisco 12416, and Cisco 12816 Router Power System Procedures Guide</i> <i>Cisco 12010, Cisco 12410, and Cisco 12810 Router Power System Procedures Guide</i>
Installing and troubleshooting Cisco 12000 line cards	<i>Cisco 12000 Line Card Installation and Configuration Notes</i>

## Standards

Standards	Title
None	—

## MIBs

MIBs	MIBs Link
No new or modified MIBs are supported by this feature, and support for existing MIBs has not been modified by this feature.	To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at the following URL: <a href="http://www.cisco.com/go/mibs">http://www.cisco.com/go/mibs</a>

## RFCs

RFCs	Title
None	—

## Technical Assistance

Description	Link
Technical Assistance Center (TAC) home page, containing 30,000 pages of searchable technical content, including links to products, technologies, solutions, technical tips, and tools. Registered Cisco.com users can log in from this page to access even more content.	<a href="http://www.cisco.com/public/support/tac/home.shtml">http://www.cisco.com/public/support/tac/home.shtml</a>

# Command Reference

This section documents new commands.

- **power-mgr**
- **show gsr power-mgr**



## power-mgr

To specify redundant or additive power calculation method, use the **power-mgr** command in global configuration mode. To enable or reset default power modes, use the **no** form of this command.

**power-mgr** { **additive** | **disable** }

**no power-mgr** { **additive** | **disable** }

Syntax Description	additive	disable
	Sets power calculations to additive mode. Default is redundant mode.	Disables the power management feature. Default is enabled.

**Command Default** Redundant is the default mode.

**Command Modes** Global configuration

Command History	Release	Modification
	12.0(31)S	This command was introduced on the Cisco 12000 Series routers.
	12.0(32)S	Updated the CLI for the “additive” mode of the command.

**Usage Guidelines** The power management facility dynamically calculates the power consumption of all chassis components and the total power available from the power supplies. The following events create logged messages:

- Power supply insertion or removal
- Power supply power-up or power-down
- Line card OIR insertion or removal
- CLI line card power-up or power-down
- Environment monitor line card shutdown
- mode change to additive or redundant

When an event occurs, the power consumption statistics are recalculated. The power manager facility does not affect the power level supplied to any component, it only monitors, calculates and collects power statistics and issues warnings. The total power reported depends on whether the router is configured in additive or in redundant mode. The default is redundant mode.

### Power Zones

A power zone comprises a set of power supplies and the loads connected to them. The 16-slot DC-powered chassis with the original (not enhanced) power supplies, have a Zone A, corresponding to the upper card cage and its power supplies, and a Zone B, corresponding to the lower card and its power supplies. All other chassis have one power zone.

### Additive Mode

In additive mode, the total power available (power budget) is calculated as the total capacity in watts of all operating power supplies in the zone.

### Redundant Mode

In redundant mode the total available power reported for a zone is equivalent to the total capacity in watts of all operating power supplies in the zone minus the power ratings of operating redundant power supplies. Redundant mode is the default setting. [Table 2](#) lists how redundant power supplies are allocated for different Cisco 12000 Series powershelves.

**Table 2 Cisco 12000 Series Router Power Supply Redundancy Scheme**

Number of Power Supplies in Powershell <sup>1</sup>	Redundancy Type <sup>2</sup>
2	1 + 1
3	1 + 2
4 AC	2 + 2
4 (DC original power supplies)	1 + 1 in Zone A, 1 + 1 in Zone B
4 (DC enhanced power supplies)	2 + 2

1. Redundancy allocations are valid for original or upgraded models of the AC power supplies.
2. Left of the plus sign "+" is the number of redundant power supply units, the right side is the number of units the redundant unit(s) protect.

If the total power load of chassis components and line cards in a zone is less than or equal to the total available power reported by the power manager in redundant mode, the router can continue to safely operate in the event of a power supply failure (two power supply failures in the case of 16-slot chassis with 4 AC PEMs or 4 enhanced DC PEMs).

For chassis with two power zones, power zones can be configured with the same or with differing modes.

### Examples

The following example disables the power manager:

```
router(config)# power-mgr disable
```

The following example enables the power manager:

```
router(config)# no power-mgr disable
```

The following example configures power zones as additive in a 16-slot Cisco 12000 Series router:

```
router(config)# power-mgr additive
router(config)# exit
router# show gsr power-mgr
```

```
Power management summary
-----
Powershell type: Intelligent DC Power Supplies
Operating phase: RUNNING_PHASE
```

Z	Operating mode: ADDITIVE	Z	Operating mode: ADDITIVE
O	Total supply power: 4800 W	O	Total supply power: 4800 W
N	Route processors: 120 W	N	Route processors: 0 W
E	Linecards: 2108 W	E	Linecards: 378 W
A	Chassis components: 213 W	B	Chassis components: 404 W
	Total inuse power: 2441 W		Total inuse power: 782 W

Remaining: 2359 W

Remaining: 4018 W

```

PEM1 present in ZoneA, supplying 2400 watts; uptime 1d02h31m
PEM2 present in ZoneA, supplying 2400 watts; uptime 1d00h10m
PEM3 present in ZoneB, supplying 2400 watts; uptime 1d00h10m
PEM4 present in Zone2B, supplying 2400 watts; uptime 1d00h09m

```

The following example returns power zones to the default redundant mode in a 16-slot Cisco 12000 Series router:

```

router(config)# no power-mgr additive
router(config)# exit
router# show gsr power-mgr

```

Power management summary

```

-----
Powershell type: Intelligent DC Power Supplies
Operating phase: RUNNING_PHASE

```

Z	Operating mode: REDUNDANT	Z	Operating mode: REDUNDANT
O	Total supply power: 2400 W	O	Total supply power: 2400 W
N	Route processors: 120 W	N	Route processors: 0 W
E	Linecards: 2108 W	E	Linecards: 378 W
A	Chassis components: 213 W	B	Chassis components: 404 W
	Total inuse power: 2441 W		Total inuse power: 782 W
	Remaining: - 41 W		Remaining: 1618 W

```

PEM1 present in ZoneA, supplying 2400 watts; uptime 1d02h33m
PEM2 present in ZoneA, supplying 2400 watts; uptime 1d00h13m
PEM3 present in ZoneB, supplying 2400 watts; uptime 1d00h13m
PEM4 present in Zone2B, supplying 2400 watts; uptime 1d00h12m

```

## Related Commands

Command	Description
<b>show gsr power-mgr</b>	Displays power consumption information for the Cisco 12000 Series routers.

# show gsr power-mgr

To display the power consumption of all Cisco 12000 Series line cards or the power consumption of the shelf and available remaining power, use the **show gsr power-mgr** command in privileged exec mode.

**show gsr power-mgr [detail | table | layout]**

Syntax Description	Option	Description
	<b>detail</b>	Displays power management summary and the current power consumption for all the slots.
	<b>table</b>	Displays maximum power consumption ratings for all supported field replaceable units (FRUs).
	<b>layout</b>	Displays the placement of power supplies within various Cisco 12000 powershelves.

**Command Default** There is no default for this command

**Command Modes** Privileged EXEC

Command History	Release	Modification
	12.0(31)S	This command was introduced.

**Usage Guidelines** The power consumption values of the field replaceable units (FRUs) represents the maximum power consumption possible of the FRU, and not the actual power being consumed.

**Examples** The following example displays a summary of total power consumption and total power available:

```
router# show gsr power-mgr

Power management summary
-----
Powershelf type: Intelligent AC Power Supplies
Operating phase: RUNNING_PHASE

      Operating mode: REDUNDANT
Total supply power: 2800 W
  Route processors:  120 W
        Linecards:   402 W
Chassis components: 887 W
Total inuse power: 1409 W
      Remaining:    1391 W
```

**Table 3** *show power-mgr Field Descriptions*

Field	Description
Powershell type	The power subsystem in which the power supply modules (PEMs) are installed.
Operating phase	
Operating mode	Redundant or Additive. The current power calculation mode.
Total supply power	Maximum power available for the zone.
Route processors	Power consumed by two route processors. Dual route processors are calculated regardless of operating mode.
Linecards	Total possible power that consumed by all linecards in the zone.
Chassis components	Total maximum power consumed by chassis components other than line cards (for example, clock scheduling cards and switching fabric).
Total inuse power	Sum of values for route processors, line cards, and chassis components.
Remaining	Difference between Total supply power and Total inuse power.

The following example displays a summary of power consumption, and consumption by slot.

```

router# show gsr power-mgr detail

Power management summary
-----
Powershell type: Intelligent DC Power Supplies
Operating phase: RUNNING_PHASE

      Operating mode: REDUNDANT
Total supply power: 1100 W
      Route processors: 76 W
          Linecards: 508 W
Chassis components: 602 W
      Total inuse power: 1186 W
          Remaining: - 86 W

PEM1 absent
PEM2 present, supplying 1100 watts; uptime 0d03h36m

Slot   Cardtype           Watts   Status
----   -
** 0   OC12-4-POS          0      unpowered
    1   OC3-4-POS-X         90     powered
    2   GE-4                106    powered
    5   GSRP                38     powered
    6   OC3-POS-16         100    powered
    7   OC12-ATM-4         122    powered
    8   OC3-4-POS-X         90     powered
    9   GSRP                38     powered
   16   CSC10              19     powered
   17   CSC10              19     powered
   18   SFC10              64     powered
   19   SFC10              64     powered

```

```

20  SFC10                64  powered
21  SFC10                64  powered
22  SFC10                64  powered
24  ALARM10             33  powered
25  ALARM10             33  powered
29  BLOWER16           178  powered

```

**Table 4** show power-mgr detail Field Descriptions

Field	Description
Powershell type	The power subsystem in which the power supply modules (PEMs) are installed.
Operating phase	
Operating mode	Redundant or Additive. The current power calculation mode.
Total supply power	Maximum power available for the zone.
Route processors	Power consumed by two route processors. Power for two route processors is indicated regardless of operating mode.
Linecards	Total possible power consumption of all installed linecards in the zone.
Chassis components	Maximum possible power consumption by chassis components other than line cards (for example, clock scheduling cards and switching fabric).
Total inuse power	Sum of power consumption values for route processors, line cards, and chassis components.
Remaining	Difference between Total supply power and Total inuse power.
PEM1-PEM4	Operation status of each PEM in the zone.
Slot	The line card slot.
Cardtype	Description of line card.
Watts	Total possible power consumption of the line card in watts.
Status	Powered or Unpowered. The line card can be powered but not configured.

The following example displays the maximum power consumption ratings of supported Cisco 12000 Series line cards.

```

router# show gsr power-mgr table
Power Manager device data:

```

```

FRU                Description                Watts
---                -
GRP=               Route Processor                38
GRP-B=            Route Processor                38
PRP-1=            Performance Route Processor    60
PRP-2=            Performance Route Processor    60
LC-40C3/POS-SM=   4 Port Packet Over SONET OC-3c/STM-1  80
LC-40C3/POS-MM=   4 Port Packet Over SONET OC-3c/STM-1  80
40C3/POS-LR-SC=   4 Port Packet Over SONET OC-3c/STM-1  80
LC-10C12/POS-SM=  1 Port Packet Over SONET OC-12c/STM-4c  80
LC-10C12/POS-MM=  1 Port Packet Over SONET OC-12c/STM-4c  80
40C12/POS-IR-SC-B= 4 Port Packet Over SONET OC-12c/STM-4  100

```

40C12/POS-MM-SC-B=	4 Port Packet Over SONET OC-12c/STM-4	100
OC48E/POS-SR-SC-B=	1 Port Packet Over SONET OC-48c/STM-16	78
OC48E/POS-SR-FC-B=	1 Port Packet Over SONET OC-48c/STM-16	78
OC48E/POS-LR-SC-B=	1 Port Packet Over SONET OC-48c/STM-16	78
OC48E/POS-LR-FC-B=	1 Port Packet Over SONET OC-48c/STM-16	78
80C3/POS-SM=	8 Port Packet Over SONET OC-3c/STM-1	100
80C3/POS-MM=	8 Port Packet Over SONET OC-3c/STM-1	100
160C3/POS-SM=	16 Port Packet Over SONET OC-3c/STM-1	100
160C3/POS-MM=	16 Port Packet Over SONET OC-3c/STM-1	100
40C48/POS-SR-SC=	4 Port Packet Over SONET OC-48c/STM-16	212
40C48/POS-SR-FC=	4 Port Packet Over SONET OC-48c/STM-16	212
40C48/POS-LR-SC=	4 Port Packet Over SONET OC-48c/STM-16	212
40C48/POS-LR-FC=	4 Port Packet Over SONET OC-48c/STM-16	212
OC192/POS-VSR=	1 Port Packet Over SONET OC-192c/STM-64	174
OC192/POS-SR2-SC=	1 Port Packet Over SONET OC-192c/STM-64	174
OC192/POS-SR-SC=	1 Port Packet Over SONET OC-192c/STM-64	174
OC192/POS-IR-SC=	1 Port Packet Over SONET OC-192c/STM-64	174
OC192/POS-LR-SC=	1 Port Packet Over SONET OC-192c/STM-64	174
OC48X/POS-LR-SC=	1 Port ISE Packet Over SONET OC-48c/STM-16	140
OC48X/POS-IR-SC=	1 Port ISE Packet Over SONET OC-48c/STM-16	140
OC48X/POS-SR-SC=	1 Port ISE Packet Over SONET OC-48c/STM-16	140
40C12X/POS-M-SC-B=	4 Port ISE Packet Over SONET OC-12c/STM-4	140
40C12X/POS-I-SC-B=	4 Port ISE Packet Over SONET OC-12c/STM-4	140
160C3X/POS-M-MJ-B=	16 Port ISE Packet Over SONET OC-3c/STM-1	140
160C3X/POS-IR-LC-B=	16 Port ISE Packet Over SONET OC-3c/STM-1	140
80C3X/POS-MM-MJ-B=	8 Port ISE Packet Over SONET OC-3c/STM-1	105
80C3X/POS-IR-LC-B=	8 Port ISE Packet Over SONET OC-3c/STM-1	105
40C3X/POS-MM-MJ-B=	4 Port ISE Packet Over SONET OC-3c/STM-1	90
40C3X/POS-IR-LC-B=	4 Port ISE Packet Over SONET OC-3c/STM-1	90
40C3X/POS-LR-LC-B=	4 Port ISE Packet Over SONET OC-3c/STM-1	90
40C48E/POS-SR-SC=	4 Port ES Packet Over SONET OC-48c/STM-16	212
40C48E/POS-SR-FC=	4 Port ES Packet Over SONET OC-48c/STM-16	212
40C48E/POS-LR-SC=	4 Port ES Packet Over SONET OC-48c/STM-16	212
40C48E/POS-LR-FC=	4 Port ES Packet Over SONET OC-48c/STM-16	212
OC192E/POS-VSR=	1 Port ES Packet Over SONET OC-192c/STM-64	178
OC192E/POS-SR2-SC=	1 Port ES Packet Over SONET OC-192c/STM-64	178
OC192E/POS-SR-SC=	1 Port ES Packet Over SONET OC-192c/STM-64	178
OC192E/POS-IR-SC=	1 Port ES Packet Over SONET OC-192c/STM-64	178
OC192E/POS-LR-SC=	1 Port ES Packet Over SONET OC-192c/STM-64	178
2OC192E/POS-VSR=	2 Port ES Packet Over SONET OC-192c/STM-64	171
2OC192E/POS-SR2-SC=	2 Port ES Packet Over SONET OC-192c/STM-64	171
2OC192E/POS-SR-SC=	2 Port ES Packet Over SONET OC-192c/STM-64	171
2OC192E/POS-IR-SC=	2 Port ES Packet Over SONET OC-192c/STM-64	171
2OC192E/POS-LR-SC=	2 Port ES Packet Over SONET OC-192c/STM-64	171
80C-48/POS-SFP	8 Port ES Packet Over SONET OC-48c/STM-16	165
LC-OC12-DS3=	1 port SONET OC12 channelized to DS3	80
CHOC12/STS3-IR-SC=	1 port SONET OC12 channelized to STS-3c/STM-1	80
6CT3-SMB=	6 Port Channelized T3	77
4CHOC12/DS3-IR-SC-B=	4 port ISE OC12 channelized STS-3c/STM-1 or DS3/E3	140
CHOC48/DS3-IR-SC=	1 port ISE OC48 channelized STS-12c/STM-4, STS-...	140
CHOC48/DS3-SR-SC=	1 port ISE OC48 channelized STS-12c/STM-4, STS-...	140
2CHOC3/STM1-IR-SC=	2 Ports OC3 Channelized to DS1/E1	80
CHOC12/STM4-IR-SC=	1 Port ISE OC12 Channelized to DS1/E1	94
CHOC12/DS1-IR-SC=	1 Port ISE OC12 Channelized to DS1/E1	94
6DS3-SMB-B=	6 Port Packet over DS3	80
12DS3-SMB-B=	12 Port Packet over DS3	80
6E3-SMB=	6 Port Packet over E3	80
12E3-SMB=	12 Port Packet over E3	80
LC-10C12/ATM-SM=	1 port ATM Over SONET OC12c/STM-4c	62
LC-10C12/ATM-MM=	1 port ATM Over SONET OC12c/STM-4c	62
4OC3/ATM-IR-SC=	4 port ATM Over SONET OC-3c/STM-1	70
4OC3/ATM-MM-SC=	4 port ATM Over SONET OC-3c/STM-1	70
4OC12/ATM-IR-SC=	4 port ATM Over SONET OC12c/STM-4c	122
4OC12/ATM-MM-SC=	4 port ATM Over SONET OC12c/STM-4c	122

8OC03/ATM/TS-IR-B=	8 port ATM Over SONET OC-3c/STM-1 Version B	95
8OC03/ATM/TS-MM-B=	8 port ATM Over SONET OC-3c/STM-1 Version B	95
8OC03/ATM/TS-IR=	8 port ATM Over SONET OC-3c/STM-1	95
8OC03/ATM/TS-MM=	8 port ATM Over SONET OC-3c/STM-1	95
4OC12X/ATM-IR-SC=	4 Port ISE ATM Over SONET OC-12/STM-4	140
4OC12X/ATM-MM-SC=	4 Port ISE ATM Over SONET OC-12/STM-4	140
4OC3X/ATM-IR-SC=	4 Port ISE ATM Over SONET OC-3/STM-1	140
4OC3X/ATM-MM-SC=	4 Port ISE ATM Over SONET OC-3/STM-1	140
GE-GBIC-SC-B=	1 Port Gigabit Ethernet	65
8FE-FX-SC-B=	8 Port Fast Ethernet	77
8FE-TX-RJ45-B=	8 Port Fast Ethernet	77
3GE-GBIC-SC=	3 Port Gigabit Ethernet	71
10X1GE-SFP-LC=	10 Port Gigabit Ethernet	191
EPA-GE/FE-BBRD	Modular Gigabit/FastEthernet	198
EPA-3GE-SX/LH-LC	Modular Gigabit/FastEthernet	198
EPA-24FE-TX	Modular Gigabit/FastEthernet	198
10GE-SX/LH-LC-B=	10 Port Gigabit Ethernet Version B	191
1X10GE-LR-SC=	1 Port 10GigEthernet Plus	196
1x10GE-ER-SC=	1 Port 10GigEthernet Plus	196
4GE-SFP-LC=	4 Port ISE Gigabit Ethernet	106
OC12/SRP-IR-SC-B=	1 Port SONET based SRP OC-12c/STM-4	80
OC12/SRP-MM-SC-B=	1 Port SONET based SRP OC-12c/STM-4	80
OC12/SRP-LR-SC-B=	1 Port SONET based SRP OC-12c/STM-4	80
OC12/SRP-XR-SC-B=	1 Port SONET based SRP OC-12c/STM-4	80
OC48/SRP-LR-SC=	1 Port SONET based SRP OC-48c/STM-16	100
OC48/SRP-SR-SC=	1 Port SONET based SRP OC-48c/STM-16	100
OC192/SRP-VSR=	1 Port SONET based SRP OC-192c/STM-64	215
OC192/SRP-SR2-SC=	1 Port SONET based SRP OC-192c/STM-64	215
OC192/SRP-SR-SC=	1 Port SONET based SRP OC-192c/STM-64	215
OC192/SRP-IR-SC=	1 Port SONET based SRP OC-192c/STM-64	215
4OC12X/SRP-IR-LC=	4 Ports SONET based SRP ISE OC-12c/STM-4	140
4OC12X/SRP-XR-LC=	4 Ports SONET based SRP ISE OC-12c/STM-4	140
2OC12X/SRP-IR-LC=	2 Ports SONET based SRP ISE OC-12c/STM-4	140
2OC12X/SRP-XR-LC=	2 Ports SONET based SRP ISE OC-12c/STM-4	140
12000-SIP-600=	ISE 10G SPA Interface Card	256
12000-SIP-400=	ISE 2.5G SPA Interface Card	180
GSR16/80-CSC=	Clock Scheduler Card 16XOC48	43
GSR16/80-SFC=	Switch Fabric Card 16XOC48	35
GSR16/320-CSC=	Clock Scheduler Card 16XOC192	106
GSR16/320-SFC=	Switch Fabric Card 16XOC192	93
GSR10-CSC=	Clock Scheduler Card(10) OC-192	19
GSR10-SFC=	Switch Fabric Card(10) OC-192	64
GSR6-CSC=	Clock Scheduler Card(6) OC-192	56
GSR6-SFC=	Switch Fabric Card(6) OC-192	45
GSR04-FABRIC=	Clock Scheduler Card for 12404	143
12810-CSC=	Clock Scheduler Card(10) OC-768	54
12810-SFC=	Switch Fabric Card(10) OC-768	107
12816-CSC=	Clock Scheduler Card(16) OC-768	177
12816-SFC=	Switch Fabric Card(16) OC-768	151
12010-CSC=	Advanced Clock Scheduler Card(10)	19
12010-SFC=	Advanced Switch Fabric Card(10)	64
12006-CSC=	Advanced Clock Scheduler Card(6)	56
12006-SFC=	Advanced Switch Fabric Card(6)	45
12004-SF=	Advanced Clock+Switch Fabric(4)	143
12016-CSC=	Advanced Clock Scheduler Card(16)	106
12016-SFC=	Advanced Switch Fabric Card(16)	93
12810E-CSC=	Clock Scheduler Card(10) OC-768E	55
12816E-CSC=	Clock Scheduler Card(16) OC-768E	176
GSR16-BLOWER=	Blower Module(16)	178
12000/10/16-BLWER	Blower Module(16)	178
GSR10-ALRM=	Alarm Module(10)	33



GSR6-ALRM=	Alarm Module(6)	26
GSR16-ALRM=	Alarm Module(16)	35
GSR4-BLOWER=	Alarm Board(404)	115
GSR6-BLOWER=	Blower Module(6)	178
12000/6-BLOWER=	Blower Module(6)	178

**Table 5** *show power-mgr table Field Descriptions*

Field	Description
FRU	Part number of the Field Replaceable Unit (FRU).
Description	Description of FRU.
Watts	Total possible power consumption of the FRU in watts.

The following example displays the labels of Cisco 12000 series router power supplies as they appear on the physical AC and DC power shelves:

```
Router#show gsr power-mgr layout
GSR PEM layout (front view):
```

```

GSR16:3-AC  +-----+-----+-----+
|           |           |           |
|   AC      |   AC      |   AC      |
| POWER 1   | POWER 2   | POWER 3   |
| (PEM1)    | (PEM2)    | (PEM3)    |
|           |           |           |
+-----+-----+-----+

GSR16:4-AC  +-----+-----+
|           |           |           |
|   PS A2   |   PS A1   |           |
| (PEM1)    | (PEM2)    |           |
|           |           |           |
|   PS B2   |   PS B1   |           |
| (PEM3)    | (PEM4)    |           |
|           |           |           |
+-----+-----+

GSR16:4-DC  +-----+-----+-----+-----+
| DC POWER B1 | DC POWER B2 | DC POWER A2 | DC POWER A1 |
| (PEM3)      | (PEM4)      | (PEM2)      | (PEM1)      |
|           |           |           |           |
+-----+-----+-----+-----+

GSR10:AC & DC +-----+-----+
|           |           |           |           |
|   POWER_A |   POWER_B |           |           |
| (PEM1)    | (PEM2)    |           |           |
|           |           |           |           |
+-----+-----+

GSR6:AC & DC  +-----+-----+
|           |           |           |           |
|   POWER_A |   POWER_B |           |           |
| (PEM1)    | (PEM2)    |           |           |
|           |           |           |           |
+-----+-----+

GSR404:AC & DC +-----+-----+
|           |           |           |           |
|           | no label | (PEM2)    |           |
|           |           |           |           |
+-----+-----+
|           |           |           |           |
|           | no label | (PEM1)    |           |
|           |           |           |           |
+-----+-----+

```

**Related Commands**

Command	Description
power-mgr	Configures the power manager calculation method.

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