Configure and Troubleshoot StackPower and XPS 2200 on Catalyst 9300 Switches

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Introduction

This document describes the configuration of Cisco StackPower and eXpandable Power System (XPS) 2200 and how to troubleshoot related issues.

Prerequisites

Requirements

There are no specific requirements for this document.

Background Information

StackPower is a feature that aggregates all the available power in a stack of switches and manages it as one common power pool for the entire stack. The Catalyst 9300 provides the ability to create a pool of power to use dedicated stack power cables. In the event of a power supply failure or more PoE power draw, the switch can utilize the power from the shared pool to support the extra load. Stack power can be deployed in

two modes: power-share and redundant mode. This helps achieve more granular control over power use.

StackPower offers a zero-footprint Redundant Power System (RPS) deployment. It supports a pay-as-you-grow architecture similar to the StackWise data stack and provides 1+N redundancy with inline power.

The primary function of the Stack Power circuitry is to maintain safe distribution of power from the Input Power supplies to all of the various loads StackPower supports a stack of four switches in a r topology, though multiple power stacks are possible within a single StackWise stack. For example, a StackWise data stack of eight switches can be configured into two StackPower stacks of four switches. Up to eight switches can be part of a power stack in star topology.

Components

The information in this document is based on C9300 Series switch

(C9300L variants do not support StackPower)

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, ensure that you understand the potential impact of any command.

This table lists the various Cisco StackPower and XPS cables:

Product ID	**Description**
CAB-SPWR-30CM	30cm StackPower Cable
CAB-SPWR-150CM	150cm StackPower Cable
CAB-XPS-58CM	58cm XPS StackPower Cable
CAB-XPS-150cm	150cm XPS StackPower Cable

Cisco **StackPower** and XPS cables are keyed and have colored bands on the ends to help you understand what the connector can plug into.

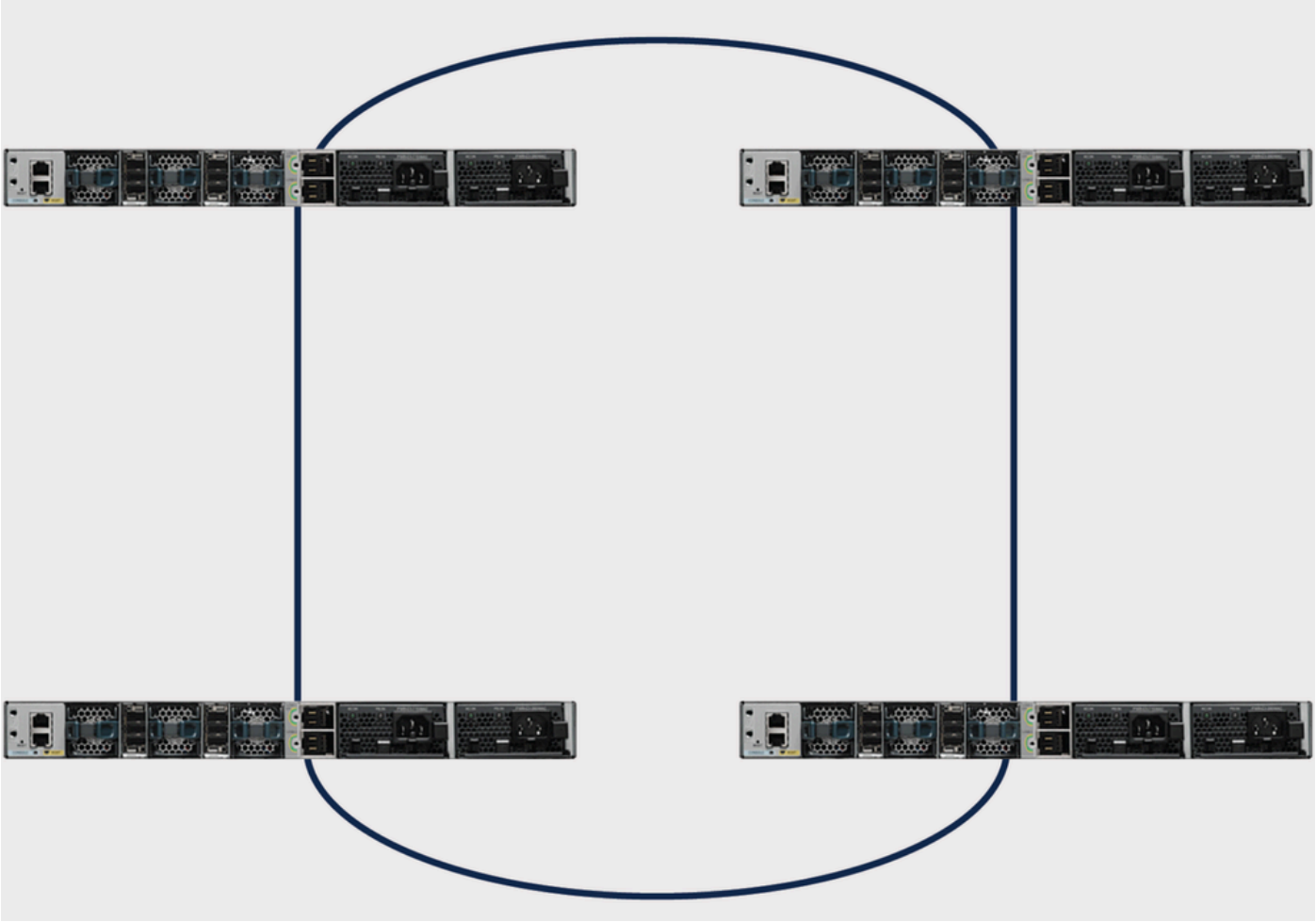
Tip: The cable end with the green band can connect only to a Cisco Catalyst 9300 Series Switch. The cable end with the yellow band can connect to a 9300 Series Switch or an XPS 2200.

Figure 1. Shows a ring configuration to use both of the supplied 0.3-meter Cisco **StackPower** cables and one 1.5-meter cable. In this example, the switches are stacked in a vertical rack.



StackPower and StackWise cables properly installed

Figure 2. Ring topology



Cisco Expandable Power System 2200

The XPS 2200 expandable power system is required for star topology. The XPS 2200 is the next-generation redundant power system, to provide redundancy for up to eight Cisco Catalyst 9300 Series Switches as well as Cisco StackPower capability for up to eight 9300 Series switches.

The Cisco eXpandable Power System (XPS) 2200 is a standalone power system that you can connect to Catalyst switches. The XPS 2200 can provide backup power to connected devices that experience a power supply failure or, in a Catalyst switch power stack, it can supply additional power to the power stack budget. The XPS 2200 power ports and internal power supplies can operate in redundant power supply (RPS) mode or stack power (SP) mode.

XPS 2200 Power Supply Modes

The XPS has two power supplies that can also be in either RPS or SP mode.

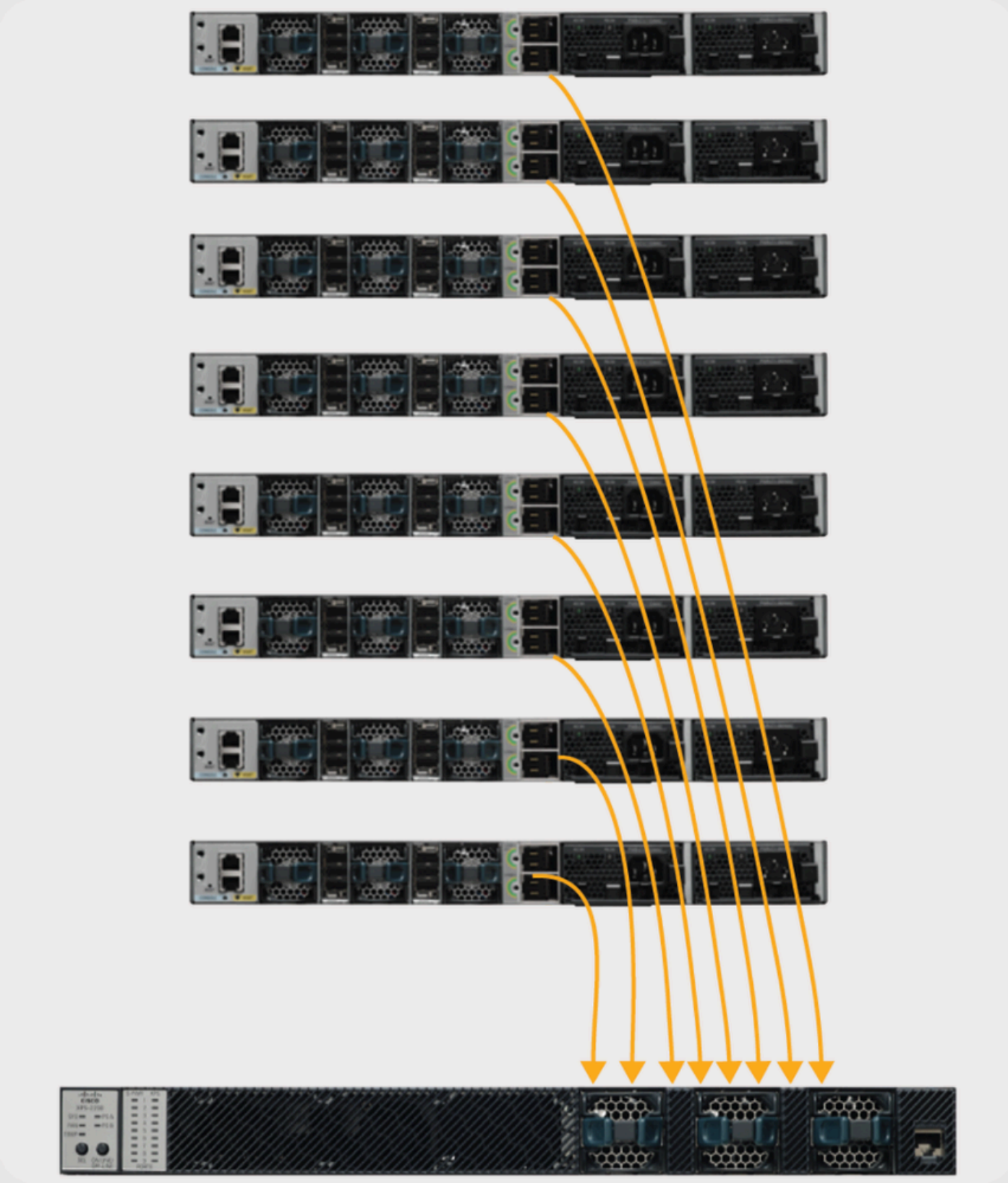
In SP mode, all SP ports on the XPS belong to the same power stack. When a power stack includes an XPS, the stack topology is a star topology and consists of up to nine member switches plus the XPS 2200. The XPS power supply or power supplies that are in SP mode are considered in the power budget. If both XPS power supplies are in RPS mode, the power stack consists only of the switches connected to XPS ports in SP mode, and the power budget is determined by the power supplies in these switches.

If there is a power supply role mismatch, for example, if an XPS port is configured for RPS and both power supplies are in SP mode, the XPS detects the mismatch, and an error message is sent.

Expandable Power System 2200 Restrictions

- When the Expandable Power System (XPS) power suppliesis used in the RPS mode for back up switch power supplies, the smallest power supply in the XPS must be greater than the largest power supply in a switch connected to an XPS port in RPS mode.
- In RPS mode, each XPS power supply can back up one and only one switch power supply, regardless of the size.
- If you remove a power supply from the power stack (from a switch or the XPS), be sure that when removed, it does not deplete available power enough to cause load shed.
- Cisco Catalyst 9300L Series Switches do not support Stack Power and XPS 2200.

Figure 3. Shows a star topology configuration. In this example, the switches are stacked in a vertical rack



The Cisco Catalyst 9300 Series Switches come with multiple power-supply options, and you can use any of them on any switch in a stack, in any combination.

This table lists the various Power-supply options for the Cisco Catalyst 9300 Series Switches:

Product ID	Description
PWR-C1-350WAC	350W AC power supply
PWR-C1-715WAC	715W AC power supply
PWR-C1-1100WAC	1100W AC power supply
PWR-C1-715WDC	715W DC Power supply
PWR-C1-350WAC-P	350W AC power supply (Platinum rated)
PWR-C1-715WAC-P	715W DC Power supply (Platinum rated)
PWR-C1-1100WAC-P	1100W AC power supply (Platinum rated)

The Cisco Catalyst 9300 Series Switches provide two slots for redundant power supplies, but only one supply is needed to run a single switch unless full PoE+ is deployed on a 48-port switch. In that case, the power requirement is greater than 1700W, which is more than the 1100W provided by the largest available power supply. If the switch is deployed within a Cisco StackPower stack, a second power supply is not needed if the stack has extra power to meet the requirements of this switch, though the power-supply slot must be covered to maintain proper airflow.

You can mix the power-supply types either in a standalone switch or in a stack. That is, you can combine a 350W AC power supply (the default for a data-only switch) with a 715W or 1100W AC power supply (the default in a full PoE switch) or with a 715W DC power supply.

Addition of a New Switch to a StackPower

Cisco StackPower technology reserves enough power to bring up the MCU of any Cisco Catalyst 9300 Series Switch. It adds resiliency to the stack. To add a new members to an operational Power Stack (Ring or Star) can be accomplished without service interruption to the current operational Power Stack. It is also possible to “merge” two operational Rings (example: two rings of two merged into a single ring of four) without service interruption to either ring. In all cases (to ensure there is no service interruption) care must be taken to ensure that the ring is broken at only point at a time.

StackPower Operational Modes

Cisco StackPower has two modes of operation: Shared and Redundant.

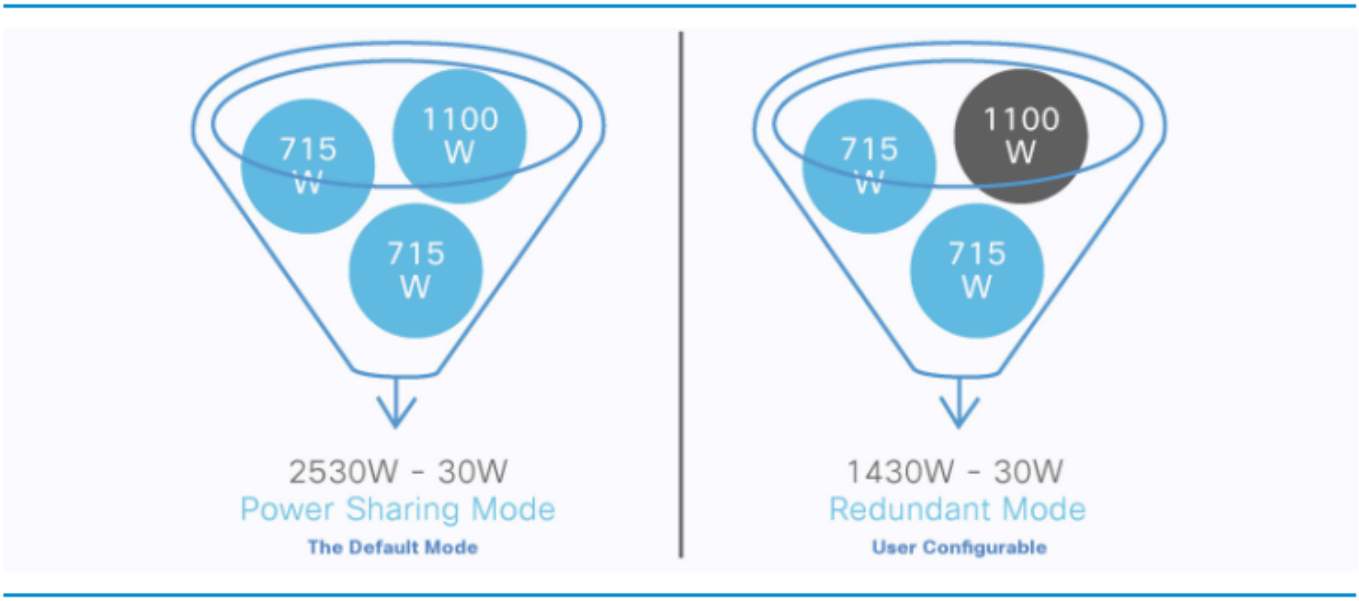
In **sharing mode**, the default, all input power is available for use anywhere in the stack. The total available power is used for power allocation decisions. If a power supply fails, then the available power that remains from the budget is utilized and there is no impact on either the system components or the PoE devices. If there is not enough power in the budget then the PoE devices could be shut down, followed by the switches based on the priority. By default, load shedding order is as follows:

- Low priority ports
- High priority ports
- Switches

Power priority is configurable. By default, all ports in the system are considered low priority.

In **redundant mode**, power from the largest power supply is subtracted from the power budget. This reduces the total available power, but it allows backup power to be available in the event of a power supply failure.

Figure 4. Shows Sharing and Redundant StackPower Operational Modes

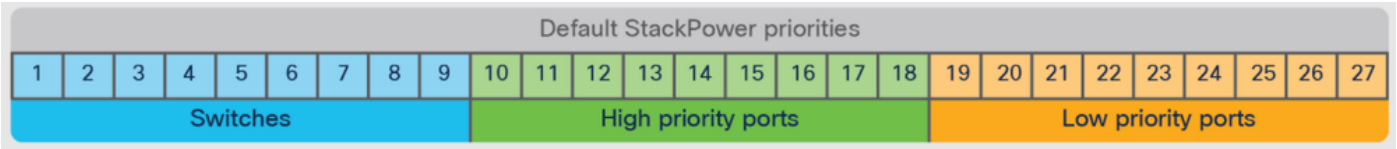


Tip: StackPower also reserves 30W in case a new switch is added to the stack.

Intelligent Load Management

Cisco StackPower has a priority scheme that covers up to eight switches in a data stack and all of the ports of the entire stack. Priorities are set by default upon stack creation, but are configurable and impact the priority in which a switch or powered device receives power. The priority determines the order in which powered devices and switches are powered down in the case of a power shortage. Intelligent load management allows for the graceful load shed. The switch has three configurable priorities - the system (or switch) priority, priority of high-priority Power over Ethernet (PoE) ports, and the priority of low-priority PoE ports.

Figure 5. Shows the default Cisco StackPower priorities



Tip: The default priority ranges, if none are configured, are 1 to 9 for switches, 10 to 18 for high-priority ports, and 19 to 27 for low-priority ports.

Configure Cisco StackPower

Define the StackPower mode and other values of a user-defined stack with the command **stack-power stack <NAME>**

<#root>

```
Catalyst-9300(config)#
```

stack-power stack MyPowerStack

```
Catalyst-9300(config-stackpower)#
```

?

```
Power stack configuration mode:
  default   Set a command to its defaults
  exit      Exit from power stack configuration
  mode      Power stack mode
  no        Negate a command or set its defaults
```

Specify the desired switch to configure priority values with the **stack-power switch <number> command**.

<#root>

```
Catalyst-9300#
```

configure terminal

```
Enter configuration commands, one per line. End with CNTL/Z
Catalyst-9300(config)#
```

stack-power switch 3

```
Catalyst-9300(config-switch-stackpower)#
```

power-priority switch 3

```
Catalyst-9300(config-switch-stackpower)#
```

power-priority high 10

```
Catalyst-9300(config-switch-stackpower)#
```

power-priority low 20

```
Catalyst-9300(config)#
```

end

Tip: You can configure the priority values of each switch in the power stack and all high- and low-priority ports on that switch to set the order in which switches and ports are shut down when power is lost and load shedding must occur. Priority values are from 1 to 27; switches and ports with the highest values are shut down first

Configure an interface as either high or low priority with the command **power inline port priority <high/low>**.

```
<#root>

Catalyst-9300(config)#

interface GigabitEthernet1/0/1


Catalyst-9300(config-if)#

power inline port priority ?


high high priority port

low  low priority port
```

Tip: On any switch, the switch priority value must be lower than the port priority values, and the high-priority value must be set lower than the low-priority value. We recommend that you configure a different priority value for each switch and for its high- and low-priority ports. This configuration limits the number of devices shut down at one time in case of a loss of power. If you try to configure the same priority value on different switches in a power stack, the configuration is allowed, but a log message is displayed.

Verify StackPower Configuration

Use this section in order to confirm that your configuration works properly.

Verify that the power stack is properly identified by the switch and that StackPower ports are connected with the command **show stack-power detail**. This command also shows topology information, and can be used to verify the stack is cabled as expected.

```
<#root>

Catalyst-9300#

show stack-power detail


Power Stack          Stack  Stack   Total  Rsvd   Alloc  Unused Num Num
Name                 Mode   Topolgy Pwr(W) Pwr(W) Pwr(W) Pwr(W) SW  PS
-------------------- ------ ------- ------ ------ ------ ------ --- -
Powerstack-1         SP-PS  Ring    5115   35     1180   3900   4   5

Power stack name: Powerstack-1

<<---- StackPower Name


Stack mode: Power sharing
```

<<---- StackPower Operational Mode

Stack topology: Ring
Switch 1:
Power budget: 1200
Power allocated: 240
Low port priority value: 20
High port priority value: 11
Switch priority value: 2
Port 1 status: Connected
Port 2 status: Connected
Neighbor on port 1: Switch 4 - dcf7.199a.5e80
Neighbor on port 2: Switch 2 - 046c.9d1f.3400

Switch 2:
Power budget: 1230
Power allocated: 240
Low port priority value: 19
High port priority value: 10
Switch priority value: 1

<<---- Priority StackPower values

Port 1 status: Connected
Port 2 status: Connected
Neighbor on port 1: Switch 1 - 046c.9d1f.3b80

<<---- StackPower neighbors

Neighbor on port 2: Switch 3 - 046c.9d1f.6c00

Switch 3:
Power budget: 1230
Power allocated: 240
Low port priority value: 21
High port priority value: 12
Switch priority value: 3
Port 1 status: Connected

<<---- StackPower ports status

Port 2 status: Connected
Neighbor on port 1: Switch 2 - 046c.9d1f.3400
Neighbor on port 2: Switch 4 - dcf7.199a.5e80

Switch 4:
Power budget: 1420
Power allocated: 460
Low port priority value: 22
High port priority value: 13
Switch priority value: 4
Port 1 status: Connected
Port 2 status: Connected

```
Neighbor on port 1: Switch 3 - 046c.9d1f.6c00
Neighbor on port 2: Switch 1 - 046c.9d1f.3b80
```

This table lists the various commands that can be used to verify StackPower:

Command	**Purpose**
Catalyst-9300#**show stack-power ?** budgeting Show Stack-Power budget table detail Show Stack-Power stack details load-shedding Show Stack-Power Load-Shedding table neighbors Show Stack-Power stack neighbor table | Output modifiers <cr> <cr>	Verify the StackPower budget table, stack details, Load-Shedding table and the stack neighbor table
Catalyst-9300#**show stack-power budgeting ?** stack-name Show budget table for a given power stack switch Show budget table for a given switch | Output modifiers <cr> <cr>	Verify the stack-power budgeting for a given power stack <*stack-name*> or a given switch <*switch number*>
Catalyst-9300#**show stack-power detail ?** stack-name Show Stack-Power details for a given power stack switch Show Stack-Power details for a switch | Output modifiers <cr> <cr>	Verify the StackPower details for a given power stack <*stack-name*> or a given switch <*switch number*>
Catalyst-9300#**show stack-power load-shedding ?**	Verify the StackPower Load-Shedding priority order

order Show Load-Shedding priority order for a power stack switch Show Load-Shedding table for a switch | Output modifiers <cr> <cr>	for a given power stack <*stack-name*> or a given switch <*switch number*>
Catalyst-9300#**show stack-power neighbors ?** stack-name Show neighbor table for a given power stack switch Show neighbor table for a switch | Output modifiers <cr> <cr>	Verify the StackPower neighbor table for a given power stack <*stack-name*> or a given switch <*switch number*>
Catalyst-9300#**stack-power switch 1 port 1 ?** disable Disable power stack port enable Enable power stack port	Manually enable and disable StackPower ports

Use the command **show environment power all** in order to view the status of the power supplies for each switch within the stack. This output shows a 4-member stack. Power supplies are not present in banks 1A, 1B, and 4B.

<#root>

```
Catalyst-9300#
show environment power all

SW    PID                 Serial#      Status           Sys Pwr   PoE Pwr   Watts
--    ------------------  ----------   --------------   -------   -------   ----


1A    Not Present
1B    Not Present
2A    PWR-C1-1100WAC      LIT21212WAR  OK               Good      Good      1100
2B    PWR-C1-715WAC       LIT211549FX  OK               Good      Good      715
3A    PWR-C1-1100WAC      LIT21212NFY  OK               Good      Good      1100
3B    PWR-C1-1100WAC      DTN2145V53F  OK               Good      Good      1100
4A    PWR-C1-1100WAC-P    ART2216FDQJ  OK               Good      Good      1100
4B    Not Present
```

Tip: Power-supply slots are named left to right; that is, power-supply slot A is on the left and power-supply slot B is on the right (closest to the edge of the switch).

Configure StackPower Auto-Off Feature

The StackPower auto-off feature allows power supplies to be soft-shutdown/disabled to increase efficiency within a power stack configuration. This is done via:

- Dynamically scaling active power supply unit(s) in a stack based on power allocation for peak efficiency.
- When a stack is lightly loaded, power supplies can be disabled only keeping power supplies to fulfill the total allocated power.
- If load increases on the stack, then power supplies can be automatically re-enabled as needed.

Command History

Release	Modification
Cisco IOS XE 17.15.2	This command was introduced.
Cisco IOS XE 17.16.1	This command was introduced.

Enter into configuration mode for the stack-power group, and enable the **auto-off** feature.

```
Switch(config)#stack-power stack Powerstack-1
Switch(config-stackpower)#auto-off
```

Verify auto-off is enabled.

<#root>

```
Switch#show stack-power det
   Power Stack                 Stack   Stack    Total   Rsvd    Alloc   Sw_Avail Num  Num
   Name                       Mode    Topolgy  Pwr(W)  Pwr(W)  Pwr(W)   Pwr(W)  SW   PS
   --------------------       ------  -------  ------  ------  ------  ------  ----- -----
   Powerstack-1                SP-PS   Ring     1100    30      486     584      2    1

Power stack name: Powerstack-1
   Stack mode: Power sharing
   Stack topology: Ring
   Stack total input power: 1100
   Power Supply auto-off: Enable

<<------Auto-off is enabled.

    Switch 1:
```

```
        Power budget: 513
        Power allocated: 243
        Low port priority value: 22
        High port priority value: 13
        Switch priority value: 4
        Port 1 status: Connected
        Port 2 status: Connected
        Neighbor on port 1: Switch 4 - 046c.9d1f.b780
        Neighbor on port 2: Switch 4 - 046c.9d1f.b780
        Auto-off: FEP B auto offlined, capacity: 1100
```

<<------ PSU is auto-offlined.

```
    Switch 4:
        Power budget: 557
        Power allocated: 243
        Low port priority value: 21
        High port priority value: 12
        Switch priority value: 3
        Port 1 status: Connected
        Port 2 status: Connected
        Neighbor on port 1: Switch 1 - cc98.9115.0980
        Neighbor on port 2: Switch 1 - cc98.9115.0980
        Auto-off: FEP A auto offlined, capacity: 1100
```

<<------ PSU is auto-offlined.

```
        Auto-off: FEP B auto offlined, capacity: 1100
```

<<------ PSU is auto-offlined.

<#root>

Switch#show stack-power budgeting

Power Stack Name	Stack Mode	Stack Topolgy	Total Pwr(W)	Rsvd Pwr(W)	Alloc Pwr(W)	Sw_Avail Pwr(W)	Num SW	Num PS
Powerstack-1	SP-PS	Ring	1100	30	486	584	2	1

<<----- One 1100 Watt PSU active, allocation of 486 watts for the two switches in the power stack.

SW	Power Stack Name	PS-A (W)	PS-B (W)	Power Budgt(W)	Alloc Power(W)	Poe_Avail Pwr(W)	Consumd Pwr Sys/PoE(W)
1	Powerstack-1	1100	0	513	243.0	270.0	89.1/0.0
4	Powerstack-1	0	0	557	243.0	314.0	79.9/0.0
Totals:					486.0	584.0	169.0/0.0

Verify power supplies have been disabled.

<#root>

```
Switch#show env all
Sensor List: Environmental Monitoring
 Sensor          Location       State            Reading       Range(min-max)
 PS1 Vout        1              GOOD             55938 mV      na
 PS1 Vin         1              GOOD             211500 mV     90 - 264
 PS1 CURin       1              GOOD             939 mA        na
 PS1 Curout      1              GOOD             3016 mA       na
 PS1 POWin       1              GOOD             198000 mW     na
 PS1 POWout      1              GOOD             169000 mW     na
 PS1 FAN         1              GOOD             2668 rpm      na
 PS2 Vout        1              PRESENT          0 mV          na
 PS2 Vin         1              PRESENT          0 mV          90 - 264
 PS2 CURin       1              PRESENT          0 mA          na
 PS2 CURout      1              PRESENT          0 mA          na
 PS2 POWin       1              PRESENT          0 mW          na
 PS2 POWout      1              PRESENT          0 mW          na
 PS2 FAN         1              PRESENT          0 rpm         na
 SYSTEM INLET    1              GREEN            27 Celsius    0 - 56
 SYSTEM OUTLET   1              GREEN            39 Celsius    0 - 125
 SYSTEM HOTSPOT  1              GREEN            54 Celsius    0 - 125

Switch   FAN     Speed   State   Airflow direction
-------------------------------------------------
  1      1     5440     OK     Front to Back
  1      2     5440     OK     Front to Back
  1      3     5440     OK     Front to Back

SW  PID              Serial#     Status         Sys Pwr  PoE Pwr  Watts
-- ------------------ ---------- --------------- ------- ------- -----
1A  PWR-C1-1100WAC-P   ART2335P2G5  OK           Good     Good     1100
1B  PWR-C1-1100WAC-P   QCS24053J29  Disabled     Bad      Bad      1100

<<-----PSU has been disabled.


-------------------------------------------------

Sensor List: Environmental Monitoring
 Sensor          Location       State            Reading       Range(min-max)
 PS1 Vout        4              PRESENT          0 mV          na
 PS1 Vin         4              PRESENT          0 mV          90 - 264
 PS1 CURin       4              PRESENT          0 mA          na
 PS1 Curout      4              PRESENT          0 mA          na
 PS1 POWin       4              PRESENT          0 mW          na
 PS1 POWout      4              PRESENT          0 mW          na
 PS1 FAN         4              PRESENT          0 rpm         na
 PS2 Vout        4              PRESENT          0 mV          na
 PS2 Vin         4              PRESENT          0 mV          90 - 264
 PS2 CURin       4              PRESENT          0 mA          na
 PS2 CURout      4              PRESENT          0 mA          na
 PS2 POWin       4              PRESENT          0 mW          na
 PS2 POWout      4              PRESENT          0 mW          na
 PS2 FAN         4              PRESENT          0 rpm         na
 SYSTEM INLET    4              GREEN            27 Celsius    0 - 56
 SYSTEM OUTLET   4              GREEN            35 Celsius    0 - 125
 SYSTEM HOTSPOT  4              GREEN            45 Celsius    0 - 125

Switch   FAN     Speed   State   Airflow direction
```

```
-------------------------------------------------
  4       1     5440      OK     Front to Back
  4       2     5440      OK     Front to Back
  4       3     5440      OK     Front to Back

SW  PID                 Serial#     Status           Sys Pwr  PoE Pwr  Watts
--  ------------------  ----------  ---------------  -------  -------  -----
4A  PWR-C1-1100WAC-P    ART2312P1NK  Disabled        Bad      Bad      1100

<<-----PSU has been disabled.

4B  PWR-C1-1100WAC-P    DCC2438DKP2  Disabled        Bad      Bad      1100

<<-----PSU has been disabled.


-------------------------------------------------
```

Warning: The auto-off feature does **not** take into account redundancy. If the total power needed to allocate the proper amount within the power-stack only needs one PSU, then only one PSU is be active. If this PSU were to go down, the full stack goes through a reload.

Configure Cisco Expandable Power System 2200

Define the XPS name and other values of a user-defined stack

<#root>

```
Catalyst-9300(config)#

power xps ?


  <1-16>  Switch Number

Catalyst-9300(config)#

power xps 1 name ?        <<---- In a stacked system, the switch-number entered must be the switch numbe


  WORD          Name of the XPS
  serialnumber  Use the XPS serial number as the name   <<---- Use the serial number of the XPS 2200 as

Catalyst-9300(config)#

power xps 1 name MY_XPS ?  <<---- Enter a name for the XPS 2200 system. The name can have up to 20 chara


  <cr>  <cr>

Catalyst-9300(config)#

power xps 1 port 1 name ?   <<---- Enter a name for the XPS 2200 switch 1 stackpower port 1


  WORD          Name of port
  hostname      Use the connected switch's hostname as the port name
```

```
  serialnumber  Use the connected switch's serial number as the port name
```

Specify the desired switch and stackpower port to configure the XPS mode, priority and role values

<#root>

```
Catalyst-9300#
power xps 1 port 1 ?        <<---- Switch 1 StackPower port 1

  mode      Set the mode of the XPS port
  priority  Set the priority of the XPS port
  role      Set the role of the XPS port

Catalyst-9300#
power xps 1 port 1 mode ?

  disable   Set XPS port mode to disable
<<---- Disable (shut down) the XPS port.

  enable    Set XPS port mode to enable
<<---- Enable the XPS port. This is the default


Catalyst-9300#
power xps 1 port 1 priority ?

  <1-9>     XPS port priority
<<---- Set the RPS priority of the port. The range is 1 to 9, The 1 is the highest priority. The default


Catalyst-9300#
power xps 1 port 1 role ?

  auto      Set XPS port role to auto Stack Power
<<---- The port mode is determined by the switch connected to the port. This is the default.

  rps       Set XPS port role to RPS
<<---- The XPS acts as a back up if the switch power supply fails. At least one RPS power supply must be
```

Specify the desired switch to configure the XPS power supply mode

```
<#root>
Catalyst-9300#
power xps 1 supply ?    <<---- Select the power supply to configure. Power supply A is on the left (labe

  A  XPS power supply A

  B  XPS power supply B
Catalyst-9300#
power xps 1 supply A mode ?

  rps  RPS
<<---- Set the power supply mode to RPS, to back up connected switches. This is the default setting for

  sp   Stack Power
<<---- Set the power supply mode to stack power (SP), to participate in the power stack. This is the def

Catalyst-9300#
power xps 1 supply A
 (
on|off
)
<<---- Sets the XPS power supply to be on or off. The default is for both power supplies to be on.
```

Verify Cisco XPS 2200 Configuration

Use this section in order to confirm that your configuration works properly.

This table lists the various commands that can be used to verify the Cisco XPS 2200:

Command	Purpose
show environment xps system	Verifies the configured name of the system and ports.
show environment xps port	Verifies the XPS configuration of the port.
show environment xps power	Displays the status of the XPS power supplies

Troubleshoot

This section provides information you can use in order to troubleshoot your configuration.

Problem - Invalid Ring: The C9300 supports a StackPower stack of four. A common problem occurs when a data stack of greater than four is physically cabled for a single StackPower ring. The system generates a syslog that complains of invalid topology.

```
%PLATFORM_STACKPOWER-3-INVALID_TOPOLOGY: Invalid power stack topology observed by switch 1. More than f
```

Solution: Configure power stacks with a maximum of four members if a ring topology is used. If the data stack contains greater than four members, cable two or more StackPower rings. The single data stack supports multiple power stacks.

Problem - Cable Connectivity Problems: If a switch loses connectivity with the cable connected to its StackPower ports, the system views this as a reinsertion and generates a syslog.

```
%PLATFORM_STACKPOWER-6-CABLE_EVENT: Switch 4 stack power cable 2 inserted
```

Solution: The syslog states which switch and port disconnects. Physically inspect this cable and reseat the connection. If the problem persists, contact the Technical Assistance Center (TAC).

Problem - Unbalanced Power Supplies: If a stack member contains an unbalanced number of power supplies, the system generates a syslog.

```
%PLATFORM_STACKPOWER-4-UNBALANCED_PS: Switch 1's power stack has unbalanced power supplies
```

Solution: Install an equal number of power supplies in each chassis within the power stack. Mixed-wattage power supplies in an individual chassis is supported.

Problem - StackPower Conflict: If a stackpower contains more than 4 members, the system generates a syslog.

```
%PLATFORM_STACKPOWER-4-PRIO_CONFLICT: Switch 4's power stack has conflicting power priorities. Device p
```

Solution: Up to four switches can be part of a power stack in a ring topology, and up to eight switches can share power in a star topology that uses an XPS 2200.

Problem - StackPower Redundancy Loss: When a power sources in a StackPower (redundant mode) are either no longer present in the stack or has a function problem, the system generates a syslog.

```
%PLATFORM_STACKPOWER-4-REDUNDANCY_LOSS:Switch 3's power stack lost redundancy and is now operating in p
```

Solution: Verify the stackpower cable and the power source to validate/discard a hardware problem with the PSU.

Problem - StackPower Cable A Current: It could indicate a hardware failure.

```
%PLATFORM_STACKPOWER-4-CABLE_A_CURRENT_IN: Switch 1 stack power cable 1 inward current is over the limi
```

Solution: Contact TAC to troubleshoot further.

Problem - StackPower Ports Remain Unconnected With a Cable Connected: Ensure StackPower ports are not in a shut state when you connect the stack power cables. If a cable connects into a shut port, the other end remains in **NoConn** state. In this scenario, an eight member data stack cable was not properly set and encountered problems that resulted in several ports in the shut state. After the stack cable was properly installed, the StackPower topology did not resolve as expected.

```
<#root>

C9300-Stack#

show stack-power neighbors


Power Stack            Stack    Stack     Total   Rsvd     Alloc   Sw_Avail Num    Num
Name                   Mode     Topolgy   Pwr(W)  Pwr(W)   Pwr(W)  Pwr(W)   SW     PS
--------------------   ------   -------   ------  ------   ------  ------   -----  ----

Powerstack-1           SP-PS    Stndaln   2200    0        243     1957     1      2
Powerstack-1-2         SP-PS    Ring      2200    30       243     1927     1      2
Powerstack-12          SP-PS    Ring      4400    30       486     3884     2      4
Powerstack-14          SP-PS    Ring      4400    30       486     3884     2      4
Powerstack-1-1         SP-PS    Stndaln   2200    0        243     1957     1      2

    Power Stack              Port 1   Port 1            Port 2  Port 2
SW  Name                     Status   Neighbor SW:MAC   Status  Neighbor SW:MAC
--  --------------------     ------   ----------------  ------  ----------------
1   Powerstack-1             Shut     -                 Shut    -
2   Powerstack-1-2           Conn     1:7018.a76c.8a00  NoConn  -
3   Powerstack-12            NoConn   -                 Conn    4:7018.a733.9b00
4   Powerstack-12            Conn     3:7018.a733.8f00  NoConn  -
5   Powerstack-12            Conn     6:7018.a76c.b100  NoConn  -
6   Powerstack-14            Shut     -                 Conn    7:7018.a76d.1680
7   Powerstack-14            Conn     6:7018.a76c.b100  Shut -
8   Powerstack-1-1           NoConn   -                 NoConn -
```

Solution: Faults and error conditions can cause power stack ports to shut and needs to be manually re-enabled either by command line or through a reload of the system.

Considerations

- Only four switches per stack in a ring topology.
- Low values are preferred to high values with regards to switch and port priority.
- Switch priority value must be lower than the port priority values.
- High-priority value must be set lower than the low priority value.
- Only disconnect and reconnect StackPower cables when necessary - unnecessary reinsertion reduce the life of the cable.
- A new switch can join an established power stack without service interruption - StackPower cables are hot-insertable.
- Contact TAC if problems persist.

StackPower Caveats

Cisco Bug ID Number	Description
Cisco bug ID CSCvi89146	%PLATFORM_STACKPOWER-4-REDUNDANCY_LOSS: Switch 4's power stack lost redundancy
Cisco bug ID CSCvo44552	Show Stack-power budget misses some switches when change to standalone mode.
Cisco bug ID CSCvw99523	Dynamic power budget negotiation take too long in Ring stack-power on C9300
Cisco bug ID CSCve28864	Stack-power is budgeted wrong upon stack-power cable OIR, SSO and slot reload
Cisco bug ID CSCvo44552	Show Stack-power budget misses some switches when change to standalone mode
Cisco bug ID CSCvi36291	Incorrect budget allocated for StackPower
Cisco bug ID CSCvh00427	The StackPower mode "non-strict" does not share power correctly.
Cisco bug ID CSCvk44346	Power high priority not observed in Strict mode on 9300

Related Information

Understanding Cisco StackPower White paper

Cisco Catalyst 9300 Series Switches Hardware Installation Guide

Technical Support & Documentation - Cisco Systems