



Product Overview

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Chassis Overview

The Cisco Catalyst 9606R Switch is a six-slot chassis, with two redundant supervisor module slots, four module slots, four power supply modules and a fan tray.

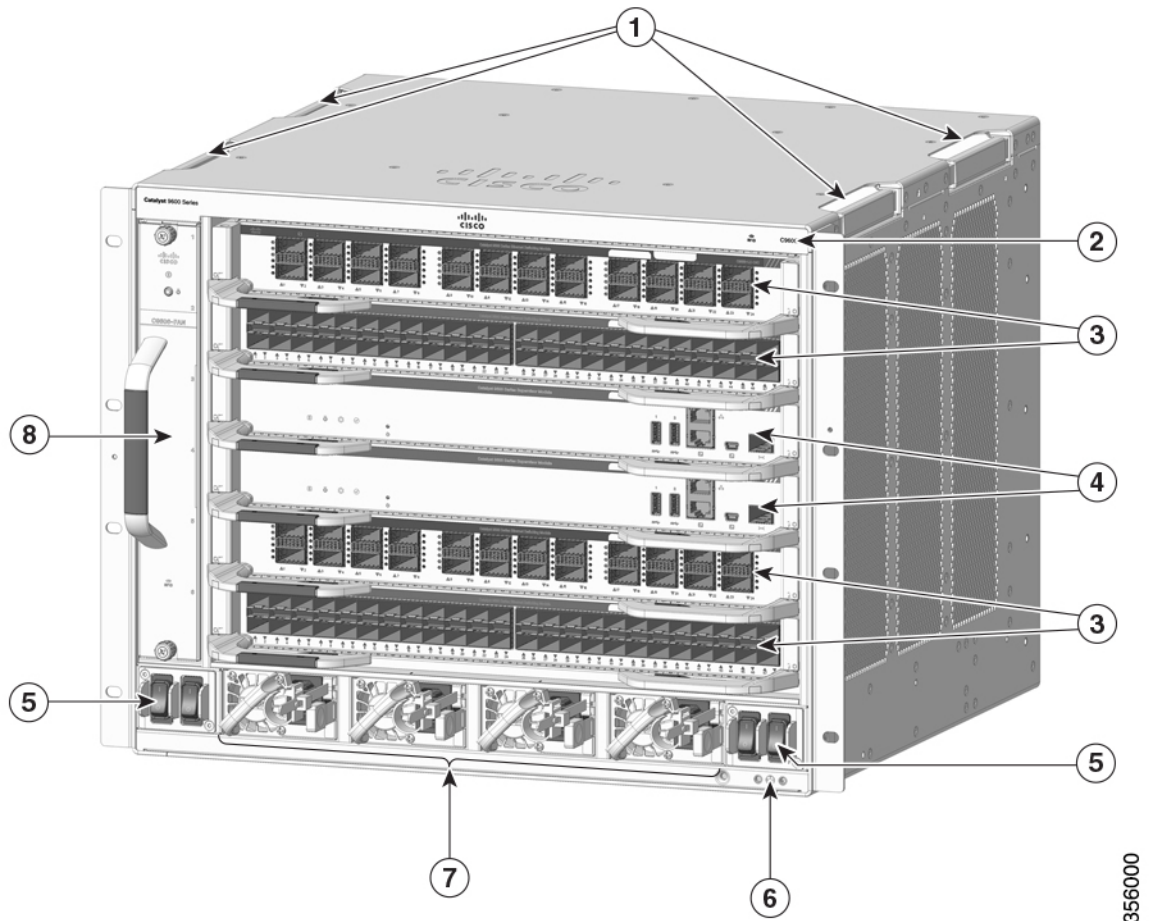
Table 1: Cisco Catalyst 9600R Switch Features

| Feature | Description |
|--------------------|--|
| Product ID | Cisco Catalyst 9606R |
| Chassis | Has six horizontal slots. Slots are numbered 1 to 6 from top to bottom. |
| Supervisor modules | Supports two supervisor modules. The following is the supported model — Cisco Catalyst 9600 Series Supervisor 1 Module (C9600-SUP-1). For more information about installing a supervisor module, see the Cisco Catalyst 9600 Series Switch Supervisor Module Installation Note. |
| Line Cards | Supports upto four line cards. The following are the supported line cards: <ul style="list-style-type: none"> • Cisco Catalyst 9600 Series 48-Port 25GE/10GE/1GE¹ (C9600-LC-48YL — 48 ports that support SFP56 (48x1G/10G/25G ports) • Cisco Catalyst 9600 Series 24-Port 40GE/12-Port 100GE (C9600-LC-24C) — 24 ports that support QSFP28 (24x40G or 12x100G) For more information about installing a line card, see the Cisco Catalyst 9600 Series Switch Line Card Installation Note. |
| Fan tray assembly | Provides a single front and rear serviceable and hot-swappable fan tray with 9 fans. |

| Feature | Description |
|----------------|---|
| Power supplies | Has 4 power supply slots that supports upto 4 AC/DC power supply modules. |
| Backplane | Provides 6.4Tbps bandwidth per slot. |

¹ 1G is currently not supported.

Figure 1: Front view of a Cisco Catalyst 9606R

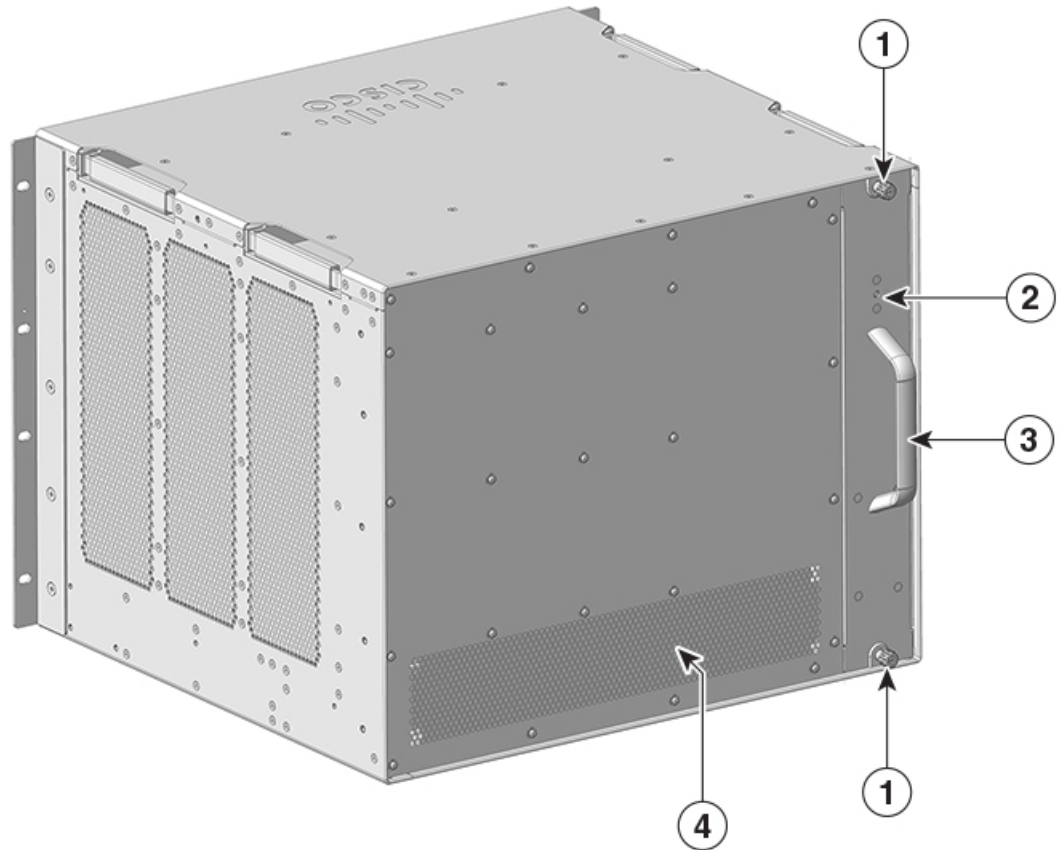


| | | | |
|---|-----------------------------------|---|--|
| 1 | Chassis handholds | 5 | Power switches |
| 2 | Chassis Radio Frequency ID (RFID) | 6 | System ground with ground lug screw holes on each side |
| 3 | Line card slots | 7 | Power Supply modules |
| 4 | Supervisor Module slots | 8 | Fan tray assembly |

Rear View of a Cisco Catalyst 9606R

The figure shows a rear view of the chassis, with the major components identified:

Figure 2: Rear View of a Cisco Catalyst 9606R



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| | | | |
|---|---|---|---|
| 1 | Captive installation screws to remove the fan tray assembly. | 3 | Fan tray assembly handle |
| 2 | Blue beacon LED on the rear panel of the fan tray (always matches the blue beacon on the front panel of the fan tray) | 4 | Rear exhaust for the power supply modules |

Fan Tray Assembly

The fan tray assembly (C9606-FAN) in Cisco Catalyst 9600 Series Switches consists of a fan tray and a connector that is attached to the fan tray. It is responsible for cooling the entire chassis and interfacing with environmental monitors to trigger alarms when conditions exceed thresholds. The fan tray provides cooling

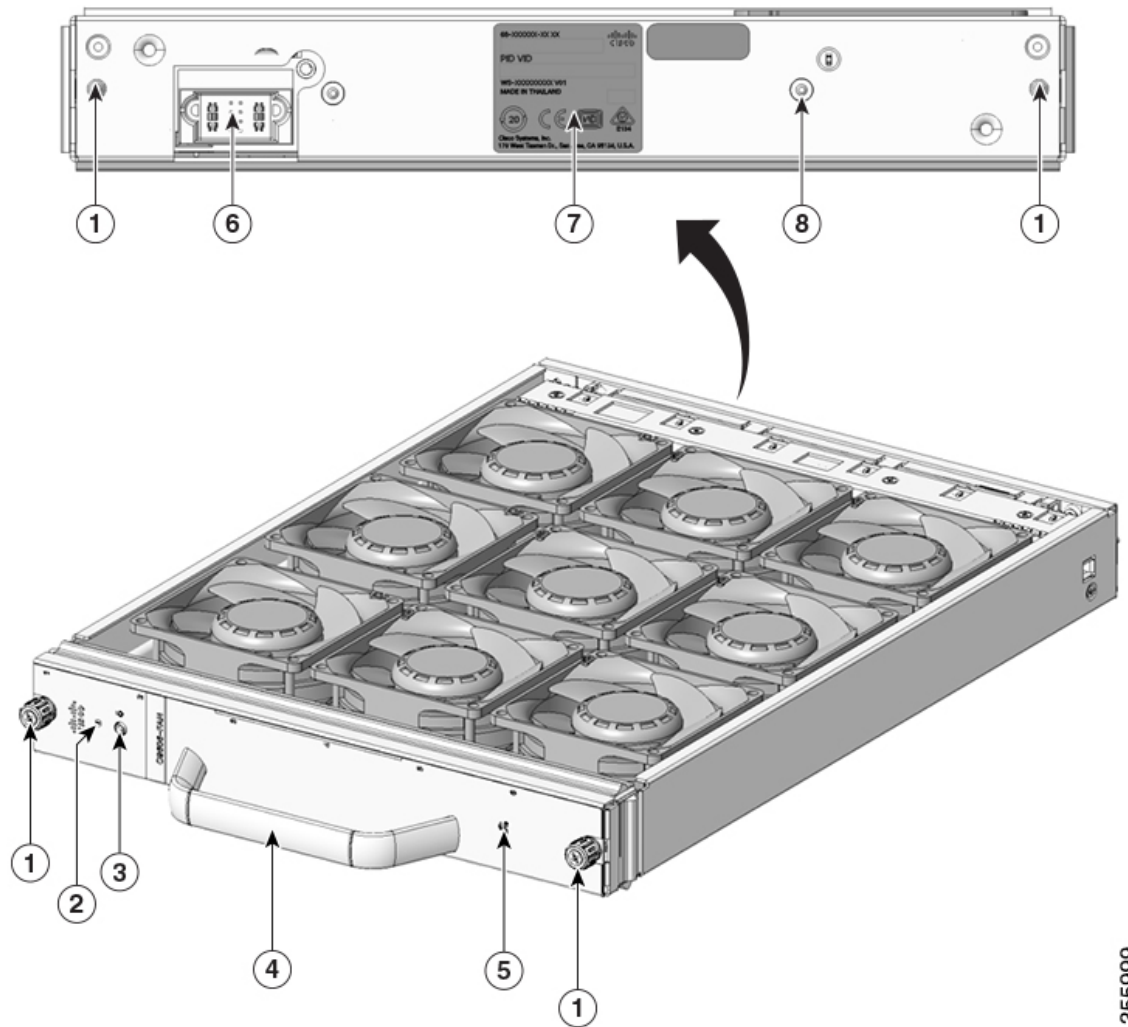
that is critical for the switch operation which could otherwise result in a switch being non-operational or causing permanent damage to the modules or components.

The following lists the features and functionalities of a Cisco Catalyst 9600 fan tray:

- Has nine individual fans (three rows of three each) and supports a minimum airflow of 720 cubic feet per minute (cfm) at 100 percent fan throttle.
- Has side-to-side airflow for balanced airflow across the inserted cards. When facing the front of the chassis, airflow direction is right to left.
- You can install and remove from the front and the rear.
- Has a built-in, front-facing, passive RFID tag that uses Ultra High Frequency (UHF) RFID technology and requires an RFID reader with compatible software.
- Provides N+1 redundancy with individual fans. Fan tray does not support redundancy; however with N+1 redundancy using individual fans, system ensures that there is no impact to the system performance even if one of the fans fails.
- Optimizes the fan-speed for temperature and pressure and maintains the minimum fan speeds and temperatures that the chassis requires, in ambient conditions.

The following figure shows C9606-FAN with the major components identified.

Figure 3: Fan Tray Assembly



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| | | | |
|---|--|---|---|
| 1 | Captive installation screws on the front and the rear of the fan tray. | 5 | Fan tray RFID |
| 2 | Fan status LED | 6 | Fan tray connector |
| 3 | Switch to turn on the Blue Beacon LED. | 7 | Fan tray serial number |
| 4 | Front fan tray handle. | 8 | Blue beacon LED on the rear of the fan tray |

High Availability

To ensure high availability, the system is designed to respond to fan failures by either minimising impact or by compensating and operating at a worst case scenario specification.

- If a single fan fails, the remaining fans in the row compensate with increased speed.

- If two or more fans fail, the entire fan tray operates at full speed after one minute. Further, the fan tray must be replaced. The individual fans are not field replaceable, you must replace the fan tray.
- If the temperature sensor fails or communication with the temperature sensor fails, the worst case operating temperature is assumed.
- If the pressure sensor fails or communication with the pressure sensor fails, the worst case operating pressure is assumed.

Thresholds, Alarms, and Abnormal Acoustic Conditions

Under normal operating conditions, when none of the temperature alarms have been triggered, hardware controls fan speed. If any of the system temperature alarms are triggered, software displays a syslog message indicating that the temperature is high and the fans are operating at higher speed. Refer to the *System Management* section of the software configuration guide for more information.

In case of a fan failure, you must replace the fan tray within 120 seconds or power down the system. If the temperature exceeds the shutdown threshold, software powers the system down.

When the fan tray operates at full speed, increased noise levels may be expected. The fan tray may operate at full speed in these circumstances:

- If two or more fans have failed
- If the STATUS LED remains red for more than one minute
- If there is a hardware failure
- If the software watchdog timer is triggered

Power Supply Module Overview

The switch chassis has four redundant power supply slots that operate with one to four power supply modules. The chassis supports field-replaceable AC-input and DC-input power supply modules.

The power supply modules generate 12Vdc output power and distributes it to the line cards and supervisor modules. The power supplies distribute power to all slots using an internal bus-bar based power distribution mechanism. All power supply modules have internal fans and support front-to-rear airflow.

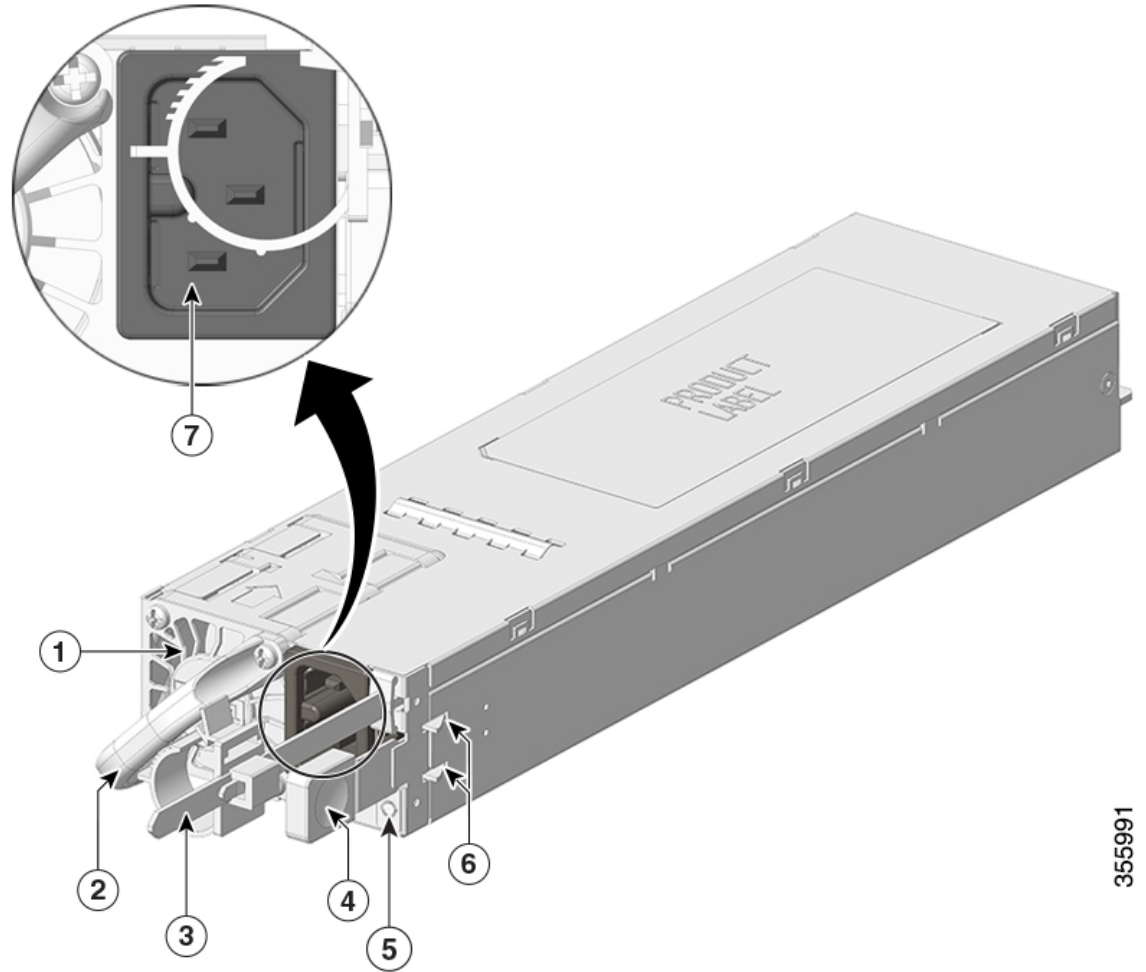
The following are the supported power supply modules:

Table 2: Power Supply Modules Supported on Cisco Catalyst 9600 Series Switches

| Part Number | Description |
|---------------------|--|
| C9600-PWR-2KWAC (=) | Cisco Catalyst 9600 Series 2000W AC Power Supply |
| C9600-PWR-2KWDC (=) | Cisco Catalyst 9600 Series 2000W DC Power Supply |

AC Power Supply Module

Figure 4: Cisco Catalyst 9600 Series 2000W AC Power Supply



| | | | |
|---|---------------------|---|----------------------|
| 1 | PSU fan | 5 | Status LED |
| 2 | Release handle | 6 | Retainer clips |
| 3 | Power cord retainer | 7 | Power cord connector |
| 4 | Release latch | - | - |

The following are the features supported by a Cisco Catalyst 9600 Series AC power supply module:

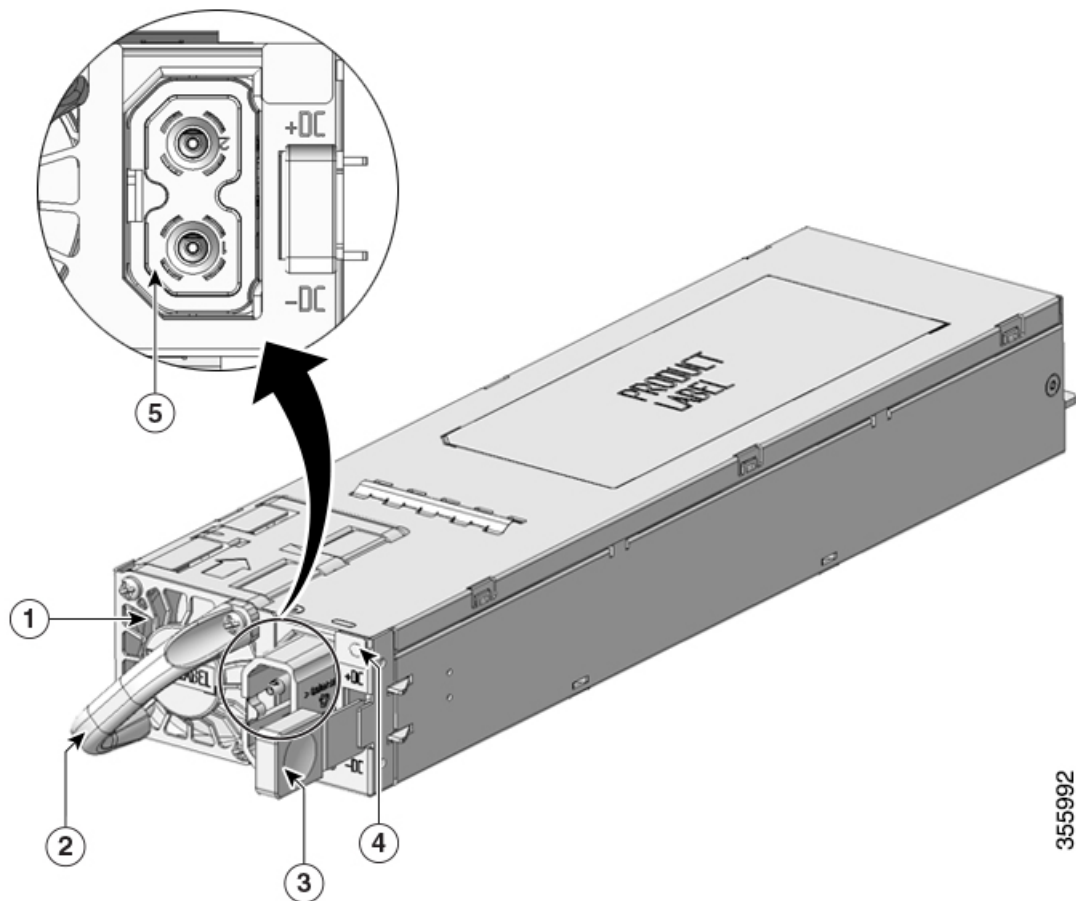
- Self-cooling, with a minimum airflow of 17 cubic feet per minute (CFM) at 100 percent load.
- Supports only single-phase source AC. Source AC can be out of phase between multiple power supplies or multiple AC-power plugs on the same power supply because all AC power supply inputs are isolated.
- Has a release latch and cord-retention mechanism on the front panel of the module, to avoid accidental removal of the module or the attached power cord.

- Supports redundant and combined configuration modes. A single (non-redundant) or a dual (redundant) power supply configuration, can support the following loads:

| Input Voltage (VAC) | Output Power in Watts |
|---------------------|-----------------------|
| 220VAC | 2000W |
| 110VAC | 1050W |

DC Power Supply Module

Figure 5: Cisco Catalyst 9600 Series 2000W DC Power Supply



| | | | |
|---|----------------|---|----------------------|
| 1 | PSU fan | 4 | LED |
| 2 | Release handle | 5 | Power cord connector |
| 3 | Release latch | - | - |

The following are the features supported by a Cisco Catalyst 9600 Series DC power supply module:

- Self-cooling, with a minimum airflow of 9.5 cubic feet per minute (CFM) at 100 percent load.
- Has a release latch mechanism on the side of the module, to avoid accidental removal of the module.
- Has DC-input reversal protection such that the unit will survive this condition up to the full input voltage rating.
- Supports redundant and combined configuration modes. A single (non-redundant) or a dual (redundant) power supply configuration, can support the following loads:

| Input Voltage (VDC) | Output Power |
|--|--------------|
| -40 to -72VDC (with extended range to -75VDC) Voltage differential between inputs is unlimited. | 2000W |

Power Supply Modes

Cisco Catalyst 9600 Series Switches offer redundant and combined configuration modes for power supplies. In both the modes, the power supplies will share the load equally.

The number of power supply modules installed and the system load determine the power-level that the system expects to draw from each power supply module and consequently, the power supply mode that will be suitable. For system power budgeting estimates and to determine power supply requirements, use the [Cisco Power Calculator](#).

To configure a power supply mode, enter the **power redundancy-mode** command in global configuration mode. If you do not configure a mode, the default mode applies.

Combined Mode

This is the default power supply mode.

The system operates with one to four power supply modules. The power available to the system is the sum of power outputs of all the power supply modules in the chassis multiplied by the share ratio. All available power supply modules are active and sharing power, and can operate at up to 100 percent capacity. Additional power supply units operate at 97 percent capacity. In combined mode, you can use a combination of AC and DC power supplies provided the AC input voltage is 220V and that the power supplies are of equal wattage. However, you cannot combine two AC power supplies of 110V input and 220V input.

Total combined mode power = $P + (N-1) * P * (\text{share ratio})$

where P = Power output of one of the power supply units and N is the number of power supply modules used.



Warning

In case of failure in the combined mode, each operational power supply increases its output. If the output power does not meet system requirements, then all the operational power supply modules may be overloaded and go into overcurrent shutdown. All system power is then lost.

The following table provides details about the power output in combined mode:

| Input voltage | One Power Supply | Two Power Supplies | Three Power Supplies | Four Power Supplies |
|---------------|------------------|--------------------|----------------------|---------------------|
| 110V | 1050W | 2040W | 3030W | 4020W |
| 220V | 2000W | 3940W | 5880W | 7820W |

Redundant (N+1) Mode

In a redundant configuration, a given power supply module can either be active, or in standby mode. In N+1 redundant mode, N is the number of active power supply modules and +1 is the power supply module configured as the standby module.

You can configure redundancy mode in the software. When the switch is configured with N+1 redundancy, software ensures that there is a standby power supply available and there is sufficient power available with the active power supply modules (N). All the power supplies including active and standby will share the load equally. However, with a standby power supply installed, system ensures that the additional output power available with a standby is always reserved for use in case of a failure. If the power supply mode is set to redundant mode and the total active output power is not sufficient to meet the power requirements, the switch will not enter the redundant mode.

You can use a combination of AC and DC power supplies provided the AC input voltage is 220V and the power supplies must be of equal wattage. However, you cannot combine two AC power supplies of 110V input and 220V input.

The following table provides details about the power output in N+1 redundant mode:

| Input voltage | Two Power Supplies | Three Power Supplies | Four Power Supplies |
|---------------|--------------------|----------------------|---------------------|
| 110V | 1050W | 2040W | 3030W |
| 220V | 2000W | 3940W | 5880W |

For detailed software configuration information, see the required version of the *Software Configuration Guide*. In the guide, go to *Contents* → *System Management* → *Environmental Monitoring and Power Management*.