



# CHAPTER 1

## Product Overview

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**Revised: 08 August 2017**

This chapter describes the Catalyst 4500 E-series switches and contains these sections:

- [Catalyst 4503-E Switch, page 1-2](#)
- [Catalyst 4506-E Switch, page 1-6](#)
- [Catalyst 4507R-E Switch, page 1-10](#)
- [Catalyst 4510R-E Switch, page 1-14](#)
- [Catalyst 4507R+E Switch, page 1-18](#)
- [Catalyst 4510R+E Switch, page 1-22](#)



**Note**

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The Catalyst 4500 series switches are described in a separate publication.

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**Tip**

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For additional information about the Cisco Catalyst 4500 E-series switches (including configuration examples and troubleshooting information), see the documents listed on this page:

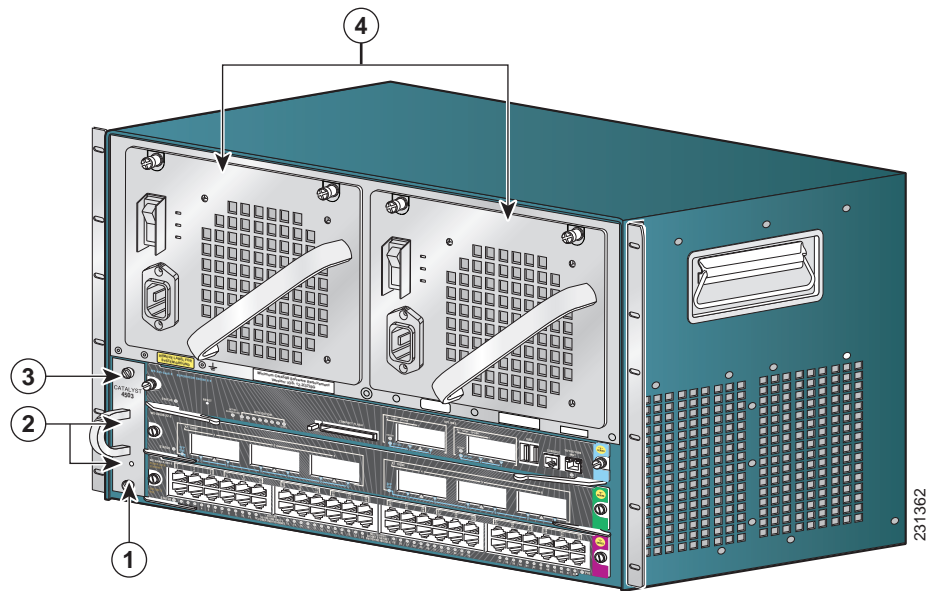
<http://www.cisco.com/en/US/products/hw/switches/ps4324/index.html>

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# Catalyst 4503-E Switch

The Catalyst 4503-E switch is a 3-slot horizontal chassis supporting redundant power supplies, a single supervisor engine, and slots for up to two modules. [Figure 1-1](#) shows a front view of the Catalyst 4503-E switch with the chassis major features identified.

*Figure 1-1 Catalyst 4503-E Switch Chassis (Front View)*



1	Fan tray assembly	3	Supervisor engine (slot 1)
2	Switching modules (slots 2 and 3)	4	Redundant power supplies

Table 1-1 describes the features of the Catalyst 4503-E switch chassis.

**Table 1-1 Catalyst 4503-E Switch Features**

Feature	Description
Chassis	Three horizontal slots. Slots are numbered from 1 (top) to 3 (bottom).
Supervisor engines	<ul style="list-style-type: none"> <li>• Supports the following supervisor engines:               <ul style="list-style-type: none"> <li>– Supervisor Engine 9-E</li> <li>– Supervisor Engine 8L-E</li> <li>– Supervisor Engine 8-E</li> <li>– Supervisor Engine 7L-E</li> <li>– Supervisor Engine 7-E</li> </ul> </li> </ul> <p><b>Note</b> Refer to your software release notes for the minimum software release versions required to support the supervisor engines.</p> <ul style="list-style-type: none"> <li>• Supervisor engines must be installed in slot 1.</li> <li>• Supervisor engine redundancy is not supported in this chassis.</li> </ul> <p><b>Note</b> Check your software release notes for any restrictions on the type of module that can be installed.</p>
Modules	<ul style="list-style-type: none"> <li>• Supports up to two Catalyst 4500 series modules.</li> <li>• Some Catalyst 4500 series modules may:               <ul style="list-style-type: none"> <li>– Not be supported</li> <li>– Require that you install a specific supervisor engine model</li> <li>– Have chassis slot restrictions</li> <li>– Require a specific software release level to operate</li> </ul> </li> </ul> <p><b>Note</b> Check your software release notes for specific support information.</p>
Backplane	48 Gbps full duplex per slot (96 Gbps)
Fan tray	<ul style="list-style-type: none"> <li>• The chassis supports one hot-swappable fan tray. One fan tray model is available:               <ul style="list-style-type: none"> <li>– WS-X4593-E</li> </ul> </li> <li>• The fan tray contains six individual fans. The individual fans are not field replaceable; you must replace the fan tray in the event of a fan failure.</li> <li>• Air is drawn in on the right side of the chassis and exhausted on the left side of the chassis.</li> <li>• Fan tray STATUS LED (located on the fan tray front panel)               <ul style="list-style-type: none"> <li>– Red—One or more individual fans have failed.</li> <li>– Green—Fan tray is operating normally.</li> </ul> </li> </ul>

Table 1-1 Catalyst 4503-E Switch Features (continued)

Feature	Description
Power supply	<ul style="list-style-type: none"> <li>• Supports one or two power supplies. The following power supplies are supported:               <ul style="list-style-type: none"> <li>– 1000 W AC-input power supply (PWR-C45-1000AC)</li> <li>– 1400 W AC-input power supply (PWR-C45-1400AC)</li> <li>– 1300 W AC-input power supply (PWR-C45-1300ACV)</li> <li>– 2800 W AC-input power supply (PWR-C45-2800ACV)</li> <li>– 4200 W AC-input power supply (PWR-C45-4200ACV)</li> <li>– 6000 W AC-input power supply (PWR-C45-6000ACV)</li> <li>– 9000 W AC-input power supply (PWR-C45-9000ACV)</li> <li>– 1400 W DC-input power supply, triple-input (PWR-C45-1400DC)</li> <li>– 1400 W DC-input power supply with integrated PEM (PWR-C45-1400DC-P)</li> <li>– External AC power shelf (WS-P4502-1PSU)</li> </ul> </li> <li>• All Catalyst 4500 series AC-input power supplies require single-phase source AC.</li> <li>• 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.</li> <li>• Single power supplies are installed in the left power supply bay. The second power supply is installed in the right power supply bay.</li> </ul> <p><b>Note</b> For proper operation of the power supply OUTPUT FAIL LED, systems with single power supplies must be configured with a minimum of one fan tray and one supervisor engine. Systems with dual power supplies must have a minimum configuration of one fan tray, one supervisor engine, and one additional module. Failure to meet these minimum configuration requirements can cause a false power supply output fail signal.</p>

Table 1-2 lists the environmental and physical specifications of the Catalyst 4503-E switch.

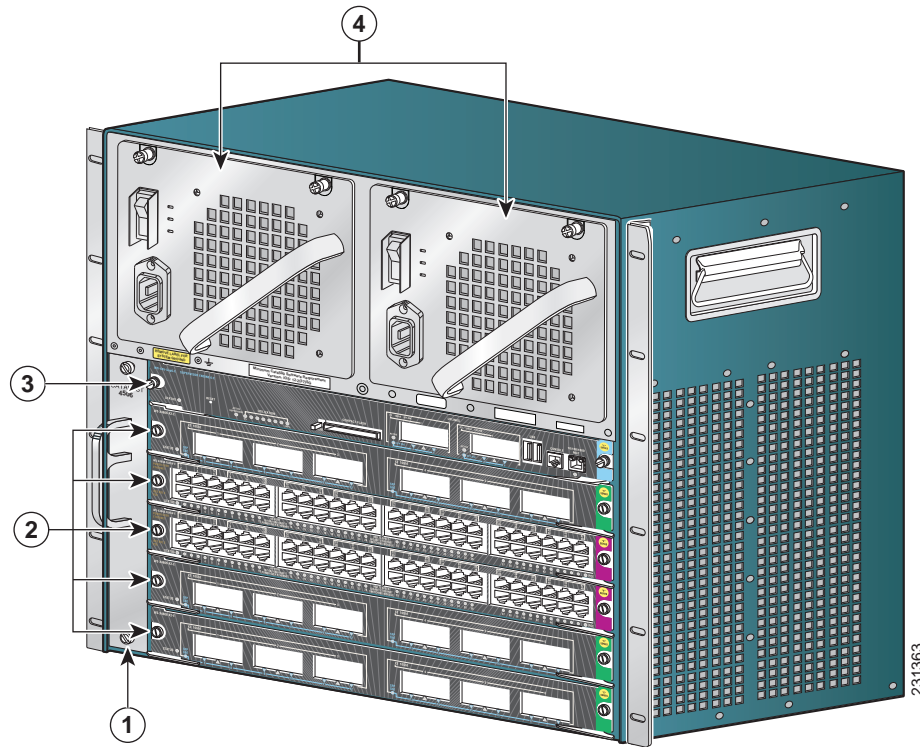
**Table 1-2** Catalyst 4503-E Switch Specifications

Item	Specification
Temperature, ambient	<ul style="list-style-type: none"> <li>Operating: 32° to 104°F (0° to 40°C)</li> <li>Nonoperating and storage: -40 to 167°F (-40 to 75°C)</li> </ul>
Humidity (RH), ambient (noncondensing)	<ul style="list-style-type: none"> <li>Operating: 10% to 90%</li> <li>Nonoperating and storage: 5% to 95%</li> </ul>
Altitude, operating and nonoperating	-196 to 6561 ft (-60 to 2000 m)
Sound pressure level	<ul style="list-style-type: none"> <li>One PS: 63.6 dBA at low speed and 62.3 dBA at full speed</li> <li>Two PS: 65 dBA at low speed and 65.4 dBA at full speed</li> </ul>
Dimensions (H x W x D) and rack units (RU)	<ul style="list-style-type: none"> <li>12.25 x 17.31 x 12.50 in. (31.12 x 43.97 x 31.70 cm)</li> <li>7 RU</li> </ul>
Weight	<ul style="list-style-type: none"> <li>32.25 lbs (14.63 kg) minimum weight</li> <li>75 lbs (34 kg) maximum weight</li> </ul>
Airflow	<ul style="list-style-type: none"> <li>Chassis fan tray: Right to left</li> <li>Power supply fan: Front to back</li> </ul>

# Catalyst 4506-E Switch

The Catalyst 4506-E switch is a 6-slot horizontal chassis supporting redundant power supplies, a single supervisor engine, and slots for up to five modules. [Figure 1-2](#) shows a front view of the Catalyst 4506-E switch with the chassis major features identified.

*Figure 1-2 Catalyst 4506-E Switch (Front View)*



1	Fan tray assembly	3	Supervisor engine (slot 1)
2	Switching modules (slots 2 to 6)	4	Power supplies

Table 1-3 describes the features of the Catalyst 4506-E switch chassis.

**Table 1-3 Catalyst 4506-E Switch Features**

Feature	Description
Chassis	Six horizontal slots. Slots are numbered from 1 (top) to 6 (bottom).
Supervisor engines	<ul style="list-style-type: none"> <li>• Supports the following supervisor engines:               <ul style="list-style-type: none"> <li>– Supervisor Engine 9-E</li> <li>– Supervisor Engine 8L-E</li> <li>– Supervisor Engine 8-E</li> <li>– Supervisor Engine 7L-E</li> <li>– Supervisor Engine 7-E</li> </ul> </li> </ul> <p><b>Note</b> Refer to your software release notes for the minimum software release versions required to support the supervisor engines.</p> <ul style="list-style-type: none"> <li>• Supervisor engines must be installed in slot 1.</li> <li>• Supervisor engine redundancy is not supported in this chassis.</li> </ul>
Modules	<ul style="list-style-type: none"> <li>• Supports up to five Catalyst 4500 series modules.</li> <li>• Some Catalyst 4500 series modules may:               <ul style="list-style-type: none"> <li>– Not be supported</li> <li>– Require that you install a specific supervisor engine</li> <li>– Have chassis slot restrictions</li> <li>– Require a specific software release level to operate</li> </ul> </li> <li>• Check your software release notes for specific support information.</li> </ul>
Backplane	48 Gbps full duplex per slot (240 Gbps)
Fan tray	<ul style="list-style-type: none"> <li>• The chassis supports a single hot-swappable fan tray. One fan tray model is available:               <ul style="list-style-type: none"> <li>– WS-X4596-E</li> </ul> </li> <li>• The fan tray contains four individual fans. The individual fans are not field replaceable; you must replace the fan tray in the event of a fan failure.</li> <li>• Air is drawn in on the right side of the chassis and exhausted on the left side of the chassis.</li> <li>• Fan tray STATUS LED (located on the fan tray front panel)               <ul style="list-style-type: none"> <li>– Red—One or more individual fans have failed.</li> <li>– Green—Fan tray is operating normally.</li> </ul> </li> </ul>

Table 1-3 Catalyst 4506-E Switch Features (continued)

Feature	Description
Power supply	<ul style="list-style-type: none"> <li>• Supports one or two power supplies. The following power supplies are supported:               <ul style="list-style-type: none"> <li>– 1000 W AC-input power supply (PWR-C45-1000AC)</li> <li>– 1400 W AC-input power supply (PWR-C45-1400AC)</li> <li>– 1300 W AC-input power supply (PWR-C45-1300ACV)</li> <li>– 2800 W AC-input power supply (PWR-C45-2800ACV)</li> <li>– 4200 W AC-input power supply (PWR-C45-4200ACV)</li> <li>– 6000 W AC-input power supply (PWR-C45-6000ACV)</li> <li>– 9000 W AC-input power supply (PWR-C45-9000ACV)</li> <li>– 1400 W DC-input power supply, triple-input (PWR-C45-1400DC)</li> <li>– 1400 W DC-input power supply with integrated PEM (PWR-C45-1400DC-P)</li> <li>– External AC power shelf (WS-P4502-1PSU)</li> </ul> </li> <li>• All Catalyst 4500 series AC-input power supplies require single-phase source AC.</li> <li>• 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.</li> <li>• Single power supplies are installed in the left power supply bay. The second power supply is installed in the right power supply bay.</li> </ul> <p><b>Note</b> For proper operation of the power supply OUTPUT FAIL LED, systems with single power supplies must be configured with a minimum of one fan tray and one supervisor engine. Systems with dual power supplies must have a minimum configuration of one fan tray, one supervisor engine, and one additional module. Failure to meet these minimum configuration requirements can cause a false power supply output fail signal.</p>

Table 1-4 lists the environmental and physical specifications of the Catalyst 4506-E switch.

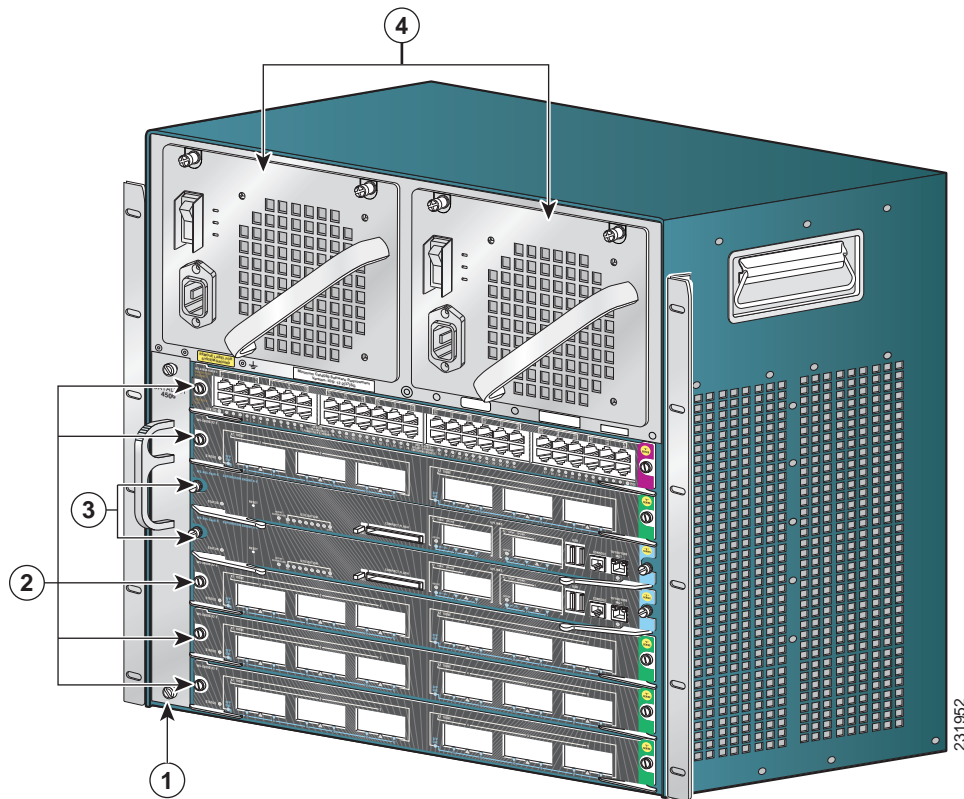
**Table 1-4 Catalyst 4506-E Switch Specifications**

Item	Specification
Temperature, ambient	<ul style="list-style-type: none"> <li>Operating: 32° to 104°F (0° to 40°C)</li> <li>Nonoperating and storage: -40° to 167°F (-40° to 75°C)</li> </ul>
Humidity (RH), ambient (noncondensing)	<ul style="list-style-type: none"> <li>Operating: 10% to 90%</li> <li>Nonoperating and storage: 5% to 95%</li> </ul>
Altitude, operating and nonoperating	-196 to 6561 ft (-60 to 2000 m)
Sound pressure level	<ul style="list-style-type: none"> <li>One PS: 60.8 dBA at low speed and 62.1 dBA at full speed</li> <li>Two PS: 65 dBA at low speed and 65.6 dBA at full speed</li> </ul>
Dimensions (H x W x D) and rack units (RU)	<ul style="list-style-type: none"> <li>17.38 x 17.31 x 12.50 in. (44.13 x 43.97 x 31.70 cm)</li> <li>10 RU</li> </ul>
Weight	<ul style="list-style-type: none"> <li>40.50 lbs (18.37 kg) minimum weight</li> <li>100 lbs (45.4 kg) maximum weight</li> </ul>
Airflow	<ul style="list-style-type: none"> <li>Chassis fan tray: Right to left</li> <li>Power supply fan: Front to back</li> </ul> <p><b>Note</b> We recommend that you maintain a minimum air space of 6 inches (16 cm) between walls and the chassis air vents and a minimum horizontal separation of 12 inches (30.5 cm) between two chassis to prevent overheating.</p>

# Catalyst 4507R-E Switch

The Catalyst 4507R-E switch is a 7-slot horizontal chassis supporting redundant power supplies, redundant supervisor engines, and slots for up to six modules. [Figure 1-3](#) shows a front view of the Catalyst 4507R-E switch with the chassis major features identified.

*Figure 1-3 Catalyst 4507R-E Switch (Front View)*



1	Fan tray	3	Supervisor engines (primary in slot 3 and secondary in slot 4)
2	Switching modules (slots 1, 2, 5, 6, 7)	4	Power supplies

[Table 1-5](#) describes the features of the Catalyst 4507R-E switch.

Table 1-5 Catalyst 4507R-E Switch Features

Feature	Description
Chassis	Seven horizontal slots. Slots are numbered from 1 (top) to 7 (bottom).
Supervisor engines	<ul style="list-style-type: none"> <li>Supports the following supervisor engines: <ul style="list-style-type: none"> <li>Supervisor Engine 8L-E<sup>1</sup></li> <li>Supervisor Engine 8-E<sup>1</sup></li> <li>Supervisor Engine 7L-E</li> <li>Supervisor Engine 7-E</li> </ul> </li> </ul> <p><b>Note</b> Refer to your software release notes for the minimum software release versions required to support the supervisor engines.</p> <ul style="list-style-type: none"> <li>Supervisor engines must be installed in slot 3 and in slot 4.</li> <li>Supervisor engine redundancy is supported in this chassis.</li> </ul> <p><b>Note</b> The Catalyst 4507R-E switch supports 1+1 supervisor-engine redundancy for integrated resiliency. Redundant supervisor engines help minimize network downtime. With the support of stateful switchover (SSO), the secondary supervisor engine serves as a backup to immediately take over after a primary supervisor failure. During the switchover, Layer 2 links are maintained transparently without the need to renegotiate sessions.</p>
Modules	<ul style="list-style-type: none"> <li>Supports up to five Catalyst 4500 series modules.</li> <li>Some Catalyst 4500 series modules may: <ul style="list-style-type: none"> <li>Not be supported</li> <li>Require that you install a specific supervisor engine</li> <li>Have chassis slot restrictions</li> <li>Require a specific software release level to operate</li> </ul> </li> <li>Check your software release notes for specific support information.</li> </ul>
Backplane	24 Gbps full duplex per slot (240 Gbps).
Fan tray	<ul style="list-style-type: none"> <li>The chassis supports a single hot-swappable fan tray. One fan tray model is available: <ul style="list-style-type: none"> <li>WS-X4597-E</li> </ul> </li> </ul> <p><b>Note</b> The Catalyst 4507R-E switch and the Catalyst 4507R+E switch use the same fan tray.</p> <ul style="list-style-type: none"> <li>The fan tray contains eight individual fans. The individual fans are not field replaceable; you must replace the fan tray in the event of a fan failure.</li> <li>Air is drawn in on the right side of the chassis and exhausted on the left side of the chassis.</li> <li>Fan tray STATUS LED (located on the fan tray front panel) <ul style="list-style-type: none"> <li>Red—One or more individual fans have failed.</li> <li>Green—Fan tray is operating normally.</li> </ul> </li> </ul>

Table 1-5 Catalyst 4507R-E Switch Features (continued)

Feature	Description
Power supply	<ul style="list-style-type: none"> <li>• Supports one or two power supplies. The following power supplies are supported:               <ul style="list-style-type: none"> <li>– 1000 W AC-input power supply (PWR-C45-1000AC)</li> <li>– 1400 W AC-input power supply (PWR-C45-1400AC)</li> <li>– 1300 W AC-input power supply (PWR-C45-1300ACV)</li> <li>– 2800 W AC-input power supply (PWR-C45-2800ACV)</li> <li>– 4200 W AC-input power supply (PWR-C45-4200ACV)</li> <li>– 6000 W AC-input power supply (PWR-C45-6000ACV)</li> <li>– 9000 W AC-input power supply (PWR-C45-9000ACV)</li> <li>– 1400 W DC-input power supply, triple-input (PWR-C45-1400DC)</li> <li>– 1400 W DC-input power supply with integrated PEM (PWR-C45-1400DC-P)</li> <li>– External AC power shelf (WS-P4502-1PSU)</li> </ul> </li> <li>• All Catalyst 4500 series AC-input power supplies require single-phase source AC.</li> <li>• 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.</li> <li>• Single power supplies are installed in the left power supply bay. The second power supply is installed in the right power supply bay.</li> </ul> <p><b>Note</b> For proper operation of the power supply OUTPUT FAIL LED, systems with single power supplies must be configured with a minimum of one fan tray and one supervisor engine. Systems with dual power supplies must have a minimum configuration of one fan tray, one supervisor engine, and one additional module. Failure to meet these minimum configuration requirements can cause a false power supply output fail signal.</p>

1. To support Supervisor Engine 8-E and 8L-E, the Cisco Catalyst 4507R-E Switch chassis must have hardware revision 2.0 or higher. Note that the hardware revision is with reference to the chassis and not the supervisor engine.

Table 1-6 lists the environmental and physical specifications of the Catalyst 4507R-E switch.

Table 1-6 Catalyst 4507R-E Switch Specifications

Item	Specification
Temperature, ambient	<ul style="list-style-type: none"> <li>• Operating: 32° to 104°F (0° to 40°C)</li> <li>• Nonoperating and storage: –40° to 167°F (–40° to 75°C)</li> </ul>
Humidity (RH), ambient (noncondensing)	<ul style="list-style-type: none"> <li>• Operating: 10% to 90%</li> <li>• Nonoperating and storage: 5% to 95%</li> </ul>
Altitude, operating and nonoperating	–196 to 6561 ft (–60 to 2000 m)

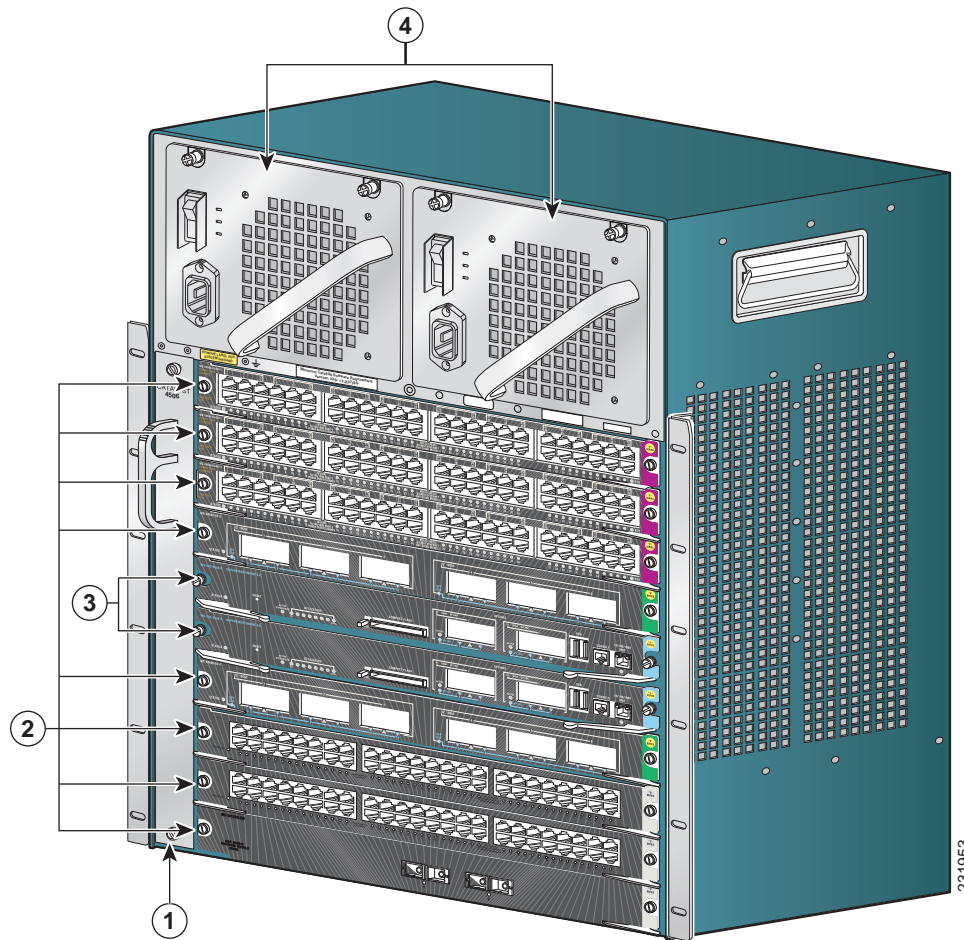
Table 1-6 Catalyst 4507R-E Switch Specifications (continued)

Item	Specification
Sound pressure level	<ul style="list-style-type: none"> <li>• One PS: 63.6 dBA at low speed and 68.3 dBA at full speed</li> <li>• Two PS: 65.4 dBA at low speed and 68.4 dBA at full speed</li> </ul>
Dimensions (H x W x D) and rack units (RU)	<ul style="list-style-type: none"> <li>• 19.19 x 17.31 x 12.50 in. (48.74 x 43.97 x 31.70 cm)</li> <li>• 11 RU</li> </ul>
Weight	<ul style="list-style-type: none"> <li>• 44.5 lbs (20.19 kg) minimum weight</li> <li>• 100 lbs (45.4 kg) maximum weight</li> </ul>
Airflow	<p>Chassis fan tray: Right to left</p> <p>Power supply fan: Front to back</p> <p><b>Note</b> We recommend that you maintain a minimum air space of 6 inches (16 cm) between walls and the chassis air vents and a minimum horizontal separation of 12 inches (30.5 cm) between two chassis to prevent overheating.</p>

# Catalyst 4510R-E Switch

The Catalyst 4510R-E switch is a 10-slot horizontal chassis supporting redundant power supplies, redundant supervisor engines, and slots for up to nine modules. [Figure 1-4](#) shows a front view of the Catalyst 4510R-E switch with the chassis major features identified.

*Figure 1-4 Catalyst 4510R-E Switch Chassis (Front View)*



1	Fan tray assembly	3	Supervisor engines (primary in slot 5 and secondary in slot 6)
2	Switching modules (slots 1–4 and 7–10)	4	Power supplies

[Table 1-7](#) describes the features of the Catalyst 4510R-E switch.

Table 1-7 Catalyst 4510R-E Switch Features

Feature	Description
Chassis	Ten horizontal slots. Slots are numbered from 1 (top) to 10 (bottom).
Supervisor engines	<ul style="list-style-type: none"> <li>• Supports the following supervisor engines: <ul style="list-style-type: none"> <li>– Supervisor Engine 8-E</li> <li>– Supervisor Engine 7-E</li> </ul> </li> </ul> <p><b>Note</b> Refer to your software release notes for the minimum software release versions required to support the supervisor engines.</p> <ul style="list-style-type: none"> <li>• Supervisor engines must be installed in slot 5 or in slot 6.</li> <li>• Supervisor engine redundancy is supported in this chassis.</li> </ul> <p><b>Note</b> The Catalyst 4510R-E switch supports 1+1 supervisor-engine redundancy for integrated resiliency. With the support of stateful switchover (SSO), the secondary supervisor engine serves as a backup to immediately take over after a primary supervisor failure. During the switchover, Layer 2 links are maintained transparently without the need to renegotiate sessions.</p>
Modules	<ul style="list-style-type: none"> <li>• Supports up to eight Catalyst 4500 series modules.</li> <li>• Some Catalyst 4500 series modules may: <ul style="list-style-type: none"> <li>– Not be supported</li> <li>– Require that you install a specific supervisor engine</li> <li>– Have chassis slot restrictions</li> <li>– Require a specific software release level to operate</li> </ul> </li> <li>• Check your software release notes for specific support information.</li> </ul>
Backplane	24 Gbps full duplex per slot on five slots, plus 12 Gbps full duplex per slot on three slots (276 Gbps) with Supervisor Engine 6-E
Fan tray	<ul style="list-style-type: none"> <li>• The chassis supports one hot-swappable fan tray. One fan tray model is available: <ul style="list-style-type: none"> <li>– WS-X4582-E (located on the fan tray front panel)</li> </ul> </li> </ul> <p><b>Note</b> The Catalyst 4510R-E and the Catalyst 4510R+E switches use the same fan tray.</p> <ul style="list-style-type: none"> <li>• The fan tray contains ten individual fans. The individual fans are not field replaceable; you must replace the fan tray in the event of a fan failure.</li> <li>• Air is drawn in on the right side of the chassis and exhausted on the left side of the chassis.</li> <li>• Fan tray STATUS LED (located on the fan tray front panel) <ul style="list-style-type: none"> <li>– Red—One or more individual fans have failed.</li> <li>– Green—Fan tray is operating normally.</li> </ul> </li> </ul>

Table 1-7 Catalyst 4510R-E Switch Features (continued)

Feature	Description
Power supply	<ul style="list-style-type: none"> <li>• Supports one or two power supplies. The following power supplies are supported:               <ul style="list-style-type: none"> <li>– 1000 W AC-input power supply (PWR-C45-1000AC)</li> <li>– 1400 W AC-input power supply (PWR-C45-1400AC)</li> <li>– 1300 W AC-input power supply (PWR-C45-1300ACV)</li> <li>– 2800 W AC-input power supply (PWR-C45-2800ACV)</li> <li>– 4200 W AC-input power supply (PWR-C45-4200ACV)</li> <li>– 6000 W AC-input power supply (PWR-C45-6000ACV)</li> <li>– 9000 W AC-input power supply (PWR-C45-9000ACV)</li> <li>– 1400 W DC-input power supply, triple-input (PWR-C45-1400DC)</li> <li>– 1400 W DC-input power supply with integrated PEM (PWR-C45-1400DC-P)</li> <li>– External AC power shelf (WS-P4502-1PSU)</li> </ul> </li> <li>• All Catalyst 4500 series AC-input power supplies require single-phase source AC.</li> <li>• 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.</li> <li>• Single power supplies are installed in the left power supply bay. The second power supply is installed in the right power supply bay.</li> </ul> <p><b>Note</b> For proper operation of the power supply OUTPUT FAIL LED, systems with single power supplies must be configured with a minimum of one fan tray and one supervisor engine. Systems with dual power supplies must have a minimum configuration of one fan tray, one supervisor engine, and one additional module. Failure to meet these minimum configuration requirements can cause a false power supply output fail signal.</p>

Table 1-8 lists the environmental and physical specifications of the Catalyst 4510R-E switch.

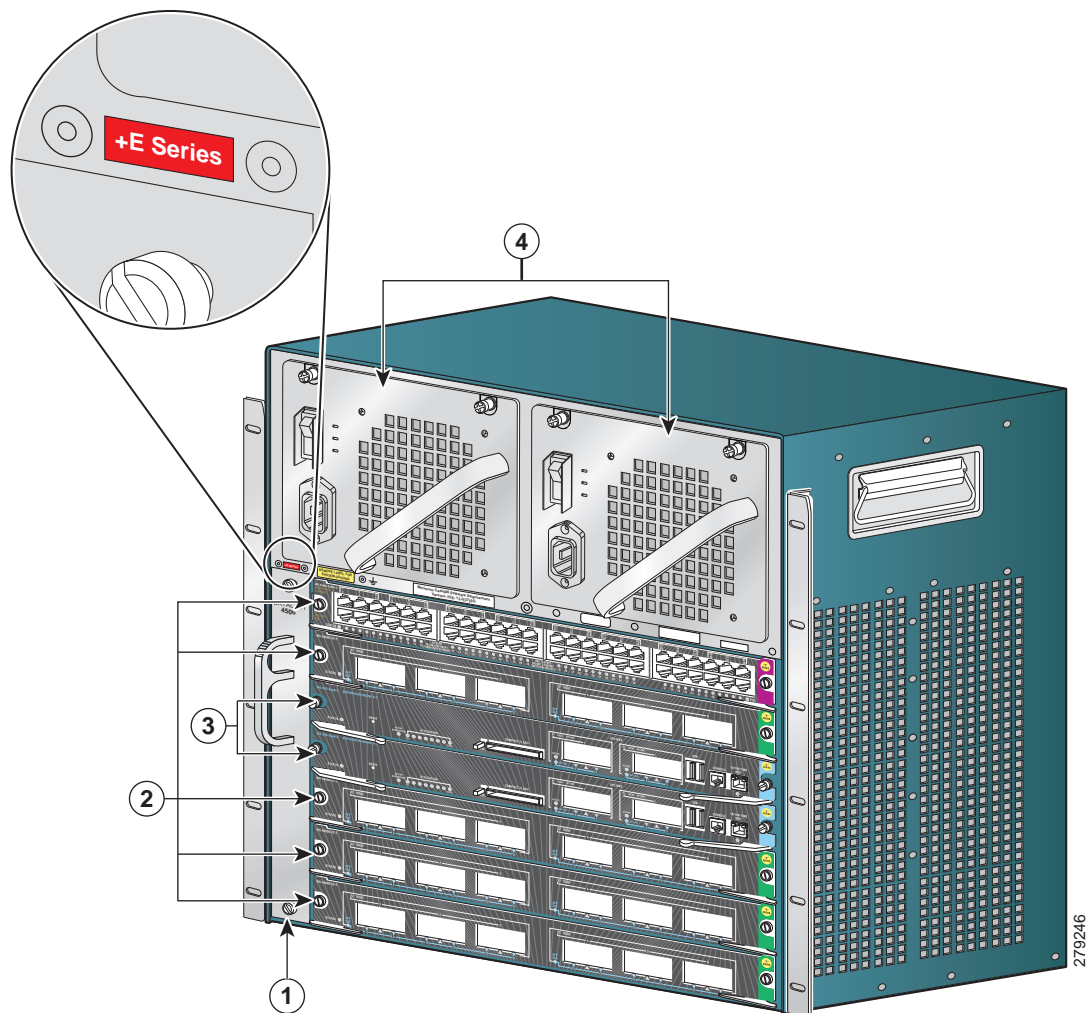
**Table 1-8 Catalyst 4510R-E Switch Specifications**

Item	Specification
Temperature, ambient	<ul style="list-style-type: none"> <li>Operating: 32° to 104°F (0° to 40°C)</li> <li>Nonoperating and storage: -40° to 167°F (-40° to 75°C)</li> </ul>
Humidity (RH), ambient (noncondensing)	<ul style="list-style-type: none"> <li>Operating: 10% to 90%</li> <li>Nonoperating and storage: 5% to 95%</li> </ul>
Altitude, operating	-196 to 6561 ft (-60 to 2000 m)
Sound pressure level	<ul style="list-style-type: none"> <li>One PS—63.6 dBA at low speed and 68.3 dBA at full speed</li> <li>Two PS—65.4 dBA at low speed and 68.4 dBA at full speed</li> </ul>
Dimensions (H x W x D) and rack units (RU)	<ul style="list-style-type: none"> <li>24.35 x 17.31 x 12.50 in. (61.84 x 43.97 x 31.70 cm)</li> <li>14 RU</li> </ul>
Weight	<ul style="list-style-type: none"> <li>54.5 lbs (24.77 kg) minimum</li> <li>108 lbs (45.4 kg) maximum</li> </ul>
Airflow	<ul style="list-style-type: none"> <li>Chassis fan tray: Right to left</li> <li>Power supply fan: Front to back</li> </ul> <p><b>Note</b> We recommend that you maintain a minimum air space of 6 inches (16 cm) between walls and the chassis air vents and a minimum horizontal separation of 12 inches (30.5 cm) between two chassis to prevent overheating.</p>

# Catalyst 4507R+E Switch

The Catalyst 4507R+E switch is a 7-slot horizontal chassis supporting redundant power supplies, redundant supervisor engines, and slots for up to five modules. [Figure 1-5](#) shows a front view of the Catalyst 4507R+E switch with the chassis major features identified.

*Figure 1-5 Catalyst 4507R+E Switch Chassis*



<b>1</b>	Fan tray	<b>3</b>	Supervisor engines (primary in slot 3 and secondary in slot 4)
<b>2</b>	Switching modules (slots 1, 2, 5, 6, 7)	<b>4</b>	Power supplies

[Table 1-9](#) describes the features of the Catalyst 4507R+E switch.

Table 1-9 Catalyst 4507R+E Switch Features

Feature	Description
Chassis	Seven horizontal slots. Slots are numbered from 1 (top) to 7 (bottom).
Supervisor engines	<ul style="list-style-type: none"> <li>• Supports the following supervisor engines: <ul style="list-style-type: none"> <li>– Supervisor Engine 9-E</li> <li>– Supervisor Engine 8L-E</li> <li>– Supervisor Engine 8-E</li> <li>– Supervisor Engine 7L-E</li> <li>– Supervisor Engine 7-E</li> </ul> </li> </ul> <p><b>Note</b> Refer to your software release notes for the minimum software release versions required to support the supervisor engines.</p> <ul style="list-style-type: none"> <li>• Supervisor engines must be installed in slot 3 or in slot 4.</li> <li>• Supervisor engine redundancy is supported in this chassis.</li> </ul> <p><b>Note</b> The Catalyst 4507R+E switch supports 1+1 supervisor-engine redundancy. With the support of stateful switchover (SSO), the secondary supervisor engine serves as a backup to immediately take over after a primary supervisor failure. During the switchover, Layer 2 links are maintained transparently without the need to renegotiate sessions.</p>
Modules	<ul style="list-style-type: none"> <li>• Supports up to five Catalyst 4500 series modules.</li> <li>• Some Catalyst 4500 series modules may: <ul style="list-style-type: none"> <li>– Not be supported</li> <li>– Require that you install a specific supervisor engine</li> <li>– Have chassis slot restrictions</li> <li>– Require a specific software release level to operate</li> </ul> </li> <li>• Check your software release notes for specific support information.</li> </ul>
Backplane	48 Gbps full duplex per slot
Fan tray	<ul style="list-style-type: none"> <li>• The chassis supports a single hot-swappable fan tray. One fan tray model is available: <ul style="list-style-type: none"> <li>– WS-X4597+E</li> </ul> </li> <li>• The fan tray contains eight individual fans. The individual fans are not field replaceable; you must replace the fan tray in the event of a fan failure.</li> <li>• Air is drawn in on the right side of the chassis and exhausted on the left side of the chassis.</li> <li>• Fan tray STATUS LED (located on the fan tray front panel) <ul style="list-style-type: none"> <li>– Red—One or more individual fans have failed.</li> <li>– Green—Fan tray is operating normally.</li> </ul> </li> </ul>

Table 1-9 Catalyst 4507R+E Switch Features (continued)

Feature	Description
Power supply	<ul style="list-style-type: none"> <li>• Supports one or two power supplies. The following power supplies are supported:               <ul style="list-style-type: none"> <li>– 1000 W AC-input power supply (PWR-C45-1000AC)</li> <li>– 1400 W AC-input power supply (PWR-C45-1400AC)</li> <li>– 1300 W AC-input power supply (PWR-C45-1300ACV)</li> <li>– 2800 W AC-input power supply (PWR-C45-2800ACV)</li> <li>– 4200 W AC-input power supply (PWR-C45-4200ACV)</li> <li>– 6000 W AC-input power supply (PWR-C45-6000ACV)</li> <li>– 9000 W AC-input power supply (PWR-C45-9000ACV)</li> <li>– 1400 W DC-input power supply, triple-input (PWR-C45-1400DC)</li> <li>– 1400 W DC-input power supply with integrated PEM (PWR-C45-1400DC-P)</li> <li>– External AC power shelf (WS-P4502-1PSU)</li> </ul> </li> <li>• All Catalyst 4500 series AC-input power supplies require single-phase source AC.</li> <li>• 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.</li> <li>• Single power supplies are installed in the left power supply bay. The second power supply is installed in the right power supply bay.</li> </ul> <p><b>Note</b> For proper operation of the power supply OUTPUT FAIL LED, systems with single power supplies must be configured with a minimum of one fan tray and one supervisor engine. Systems with dual power supplies must have a minimum configuration of one fan tray, one supervisor engine, and one additional module. Failure to meet these minimum configuration requirements can cause a false power supply output fail signal.</p>

Table 1-10 lists the environmental and physical specifications of the Catalyst 4507R+E switch.

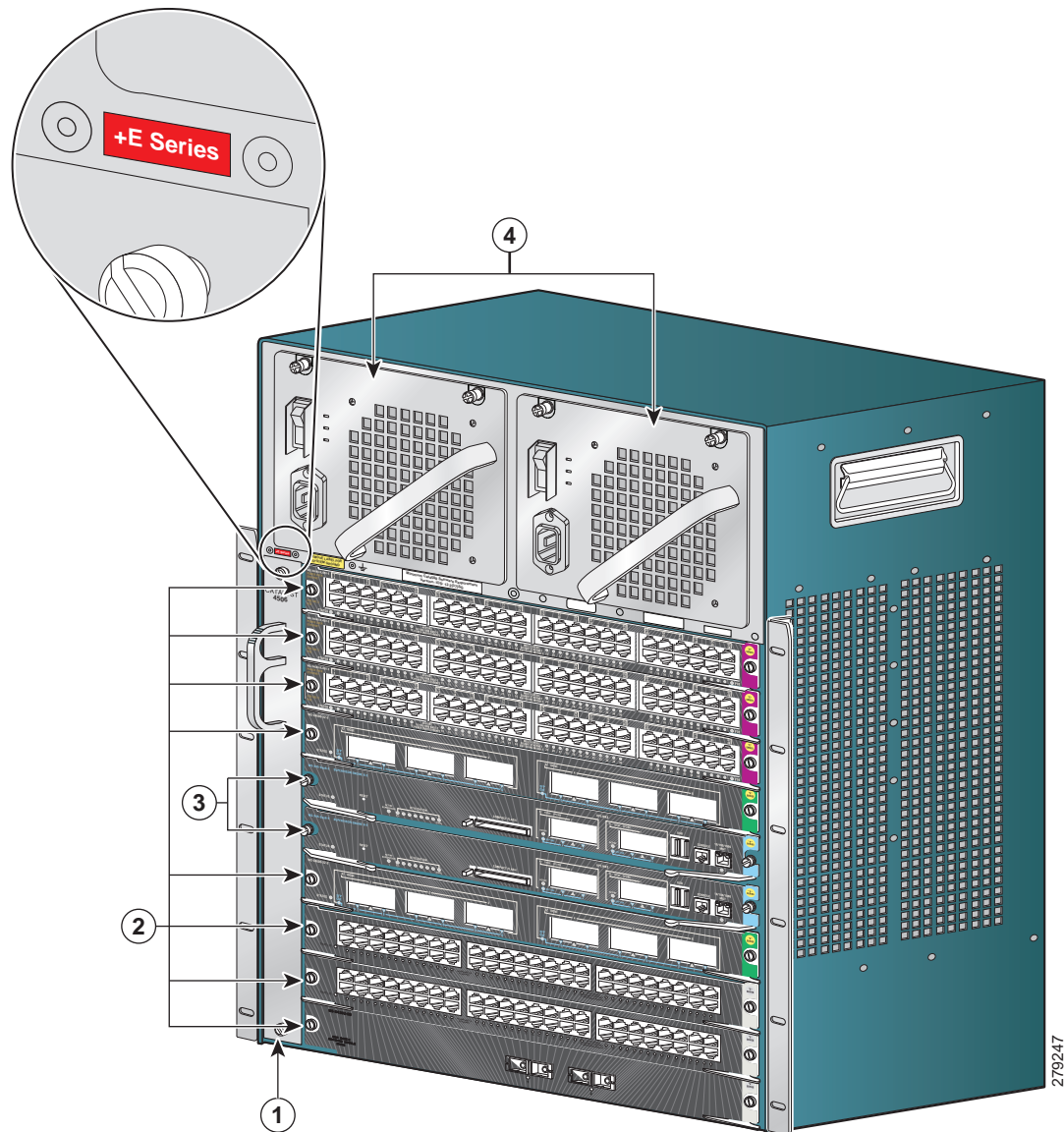
**Table 1-10** Catalyst 4507R+E Switch Specifications

Item	Specification
Temperature, ambient	<ul style="list-style-type: none"> <li>Operating: 32° to 104°F (0° to 40°C)</li> <li>Nonoperating and storage: -40° to 167°F (-40° to 75°C)</li> </ul>
Humidity (RH), ambient (noncondensing)	<ul style="list-style-type: none"> <li>Operating: 10% to 90%</li> <li>Nonoperating and storage: 5% to 95%</li> </ul>
Altitude, operating and nonoperating	-196 to 6561 ft (-60 to 2000 m)
Sound pressure level	<ul style="list-style-type: none"> <li>One PS: 63.6 dBA at low speed and 68.3 dBA at full speed</li> <li>Two PS: 65.4 dBA at low speed and 68.4 dBA at full speed</li> </ul>
Dimensions (H x W x D) and rack units (RU)	<ul style="list-style-type: none"> <li>19.19 x 17.31 x 12.50 in. (48.74 x 43.97 x 31.70 cm)</li> <li>11 RU</li> </ul>
Weight	<ul style="list-style-type: none"> <li>44.50 lb (20.19 kg)</li> </ul>
Airflow	<ul style="list-style-type: none"> <li>Chassis fan tray: Right to left</li> <li>Power supply fan: Front to back</li> </ul> <p><b>Note</b> We recommend that you maintain a minimum air space of 6 inches (16 cm) between walls and the chassis air vents and a minimum horizontal separation of 12 inches (30.5 cm) between two chassis to prevent overheating.</p>

# Catalyst 4510R+E Switch

The Catalyst 4510R+E switch is a 10-slot horizontal chassis supporting redundant power supplies, redundant supervisor engines, and slots for up to nine modules. [Figure 1-6](#) shows a front view of the Catalyst 4510R+E switch with the chassis major features identified.

*Figure 1-6 Catalyst 4510R+E Switch Chassis (Front View)*



1	Fan tray	3	Supervisor engines (primary in slot 5 and secondary in slot 6)
2	Switching modules (slots 1–4, 7–10)	4	Power supplies

Table 1-11 describes the features of the Catalyst 4510R+E switch.

**Table 1-11** Catalyst 4510R+E Switch Features

Feature	Description
Chassis	Ten horizontal slots. Slots are numbered from 1 (top) to 10 (bottom).
Supervisor engines	<ul style="list-style-type: none"> <li>• Supports the following supervisor engines:               <ul style="list-style-type: none"> <li>– Supervisor Engine 9-E</li> <li>– Supervisor Engine 8-E</li> <li>– Supervisor Engine 7-E</li> </ul> </li> </ul> <p><b>Note</b> Refer to your software release notes for the minimum software release versions required to support the supervisor engines.</p> <ul style="list-style-type: none"> <li>• Supervisor engines must be installed in slot 5 or in slot 6.</li> <li>• Supervisor engine redundancy is supported in this chassis.</li> </ul> <p><b>Note</b> The Catalyst 4510R+E switch supports 1+1 supervisor engine redundancy for integrated resiliency. With the support of stateful switchover (SSO), the secondary supervisor engine serves as a backup to immediately take over after a primary supervisor failure. During the switchover, Layer 2 links are maintained transparently without the need to renegotiate sessions.</p>
Modules	<ul style="list-style-type: none"> <li>• Supports up to eight Catalyst 4500 series modules.</li> <li>• Some Catalyst 4500 series modules may:               <ul style="list-style-type: none"> <li>– Not be supported</li> <li>– Require that you install a specific supervisor engine</li> <li>– Have chassis slot restrictions</li> <li>– Require a specific software release level to operate</li> </ul> </li> <li>• Check your software release notes for specific information.</li> </ul>
Backplane	48 Gbps full duplex per slot
Fan tray	<ul style="list-style-type: none"> <li>• The chassis supports a single hot-swappable fan tray. One fan tray model is available:               <ul style="list-style-type: none"> <li>– WS-X4582+E</li> </ul> </li> <li>• The fan tray contains ten individual fans. The individual fans are not field replaceable; you must replace the fan tray in the event of a fan failure.</li> <li>• Air is drawn in on the right side of the chassis and exhausted on the left side of the chassis.</li> <li>• Fan tray STATUS LED (located on the fan tray front panel)               <ul style="list-style-type: none"> <li>– Red—One or more individual fans have failed.</li> <li>– Green—Fan tray is operating normally.</li> </ul> </li> </ul>

Table 1-11 Catalyst 4510R+E Switch Features (continued)

Feature	Description
Power supply	<ul style="list-style-type: none"> <li>• Supports one or two power supplies. The following power supplies are supported:               <ul style="list-style-type: none"> <li>– 1000 W AC-input power supply (PWR-C45-1000AC)</li> <li>– 1400 W AC-input power supply (PWR-C45-1400AC)</li> <li>– 1300 W AC-input power supply (PWR-C45-1300ACV)</li> <li>– 2800 W AC-input power supply (PWR-C45-2800ACV)</li> <li>– 4200 W AC-input power supply (PWR-C45-4200ACV)</li> <li>– 6000 W AC-input power supply (PWR-C45-6000ACV)</li> <li>– 9000 W AC-input power supply (PWR-C45-9000ACV)</li> <li>– 1400 W DC-input power supply, triple-input (PWR-C45-1400DC)</li> <li>– 1400 W DC-input power supply with integrated PEM (PWR-C45-1400DC-P)</li> <li>– External AC power shelf (WS-P4502-1PSU)</li> </ul> </li> <li>• All Catalyst 4500 series AC-input power supplies require single-phase source AC.</li> <li>• 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.</li> <li>• Single power supplies are installed in the left power supply bay. The second power supply is installed in the right power supply bay.</li> </ul> <p><b>Note</b> For proper operation of the power supply OUTPUT FAIL LED, systems with single power supplies must be configured with a minimum of one fan tray and one supervisor engine. Systems with dual power supplies must have a minimum configuration of one fan tray, one supervisor engine, and one additional module. Failure to meet these minimum configuration requirements can cause a false power supply output fail signal.</p>

Table 1-12 lists the environmental and physical specifications of the Catalyst 4510R+E switch.

**Table 1-12** Catalyst 4510R+E Switch Specifications

Item	Specification
Temperature, ambient	<ul style="list-style-type: none"> <li>Operating: 32° to 104°F (0° to 40°C)</li> <li>Nonoperating and storage: -40° to 167°F (-40° to 75°C)</li> </ul>
Humidity (RH), ambient (noncondensing)	<ul style="list-style-type: none"> <li>Operating: 10% to 90%</li> <li>Nonoperating and storage: 5% to 95%</li> </ul>
Altitude, operating and nonoperating	-196 to 6561 ft (-60 to 2000 m)
Sound pressure level	<ul style="list-style-type: none"> <li>One PS: 63.6 dBA at low speed and 68.3 dBA at full speed</li> <li>Two PS: 65.4 dBA at low speed and 68.4 dBA at full speed</li> </ul>
Dimensions (H x W x D) and rack units (RU)	<ul style="list-style-type: none"> <li>24.35 x 17.31 x 12.50 in. (61.84 x 43.97 x 31.70 cm)</li> <li>14 RU</li> </ul>
Weight	<ul style="list-style-type: none"> <li>54.50 lb (24.73 kg)</li> </ul>
Airflow	<ul style="list-style-type: none"> <li>Chassis fan tray: Right to left</li> <li>Power supply fan: Front to back</li> </ul> <p><b>Note</b> We recommend that you maintain a minimum air space of 6 inches (16 cm) between walls and the chassis air vents and a minimum horizontal separation of 12 inches (30.5 cm) between two chassis to prevent overheating.</p>

