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Cisco Catalyst 4500 Series Switch

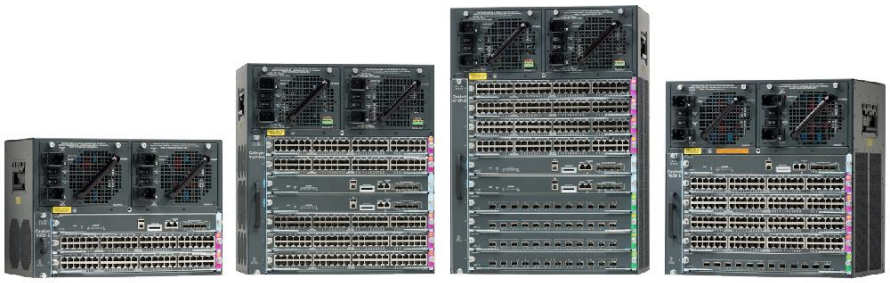
Overview

The Cisco® Catalyst® 4500 Series Switches enable Borderless Networks, providing high performance, mobile, and secure user experiences through Layer 2-4 switching investments. They enable security, mobility, application performance, video, and energy savings over an infrastructure that supports resiliency, virtualization, and automation. Cisco Catalyst 4500 Series Switches provide borderless performance, scalability, and services with reduced total cost of ownership (TCO) and superior investment protection.

The Cisco Catalyst 4500 (Figure 1) has a centralized forwarding architecture that enables collaboration, virtualization, and operational manageability through simplified operations. With forward and backward compatibility spanning multiple generations, the new Cisco Catalyst 4500E Series provides exceptional investment protection and deployment flexibility to meet the evolving needs of organizations of all sizes. The Cisco Catalyst 4500E Series platform has 10 Gigabit Ethernet (GE) uplinks and supports Power over Ethernet Plus (PoE+) and Universal PoE (UPOE), enabling customers to future proof their network.

E-Series chassis come in four different form factors: 3-slot (4503-E), 6-slot (4506-E), 7-slot (4507R+E), and 10-slot (4510R+E). 4503-E, 4506-E, 4507R+E, and 4510R+E chassis are extremely flexible and support either 24 or 48 Gbps per line-card slot. Integrated resiliency in the Cisco Catalyst 4500E Series includes 1 + 1 supervisor engine redundancy (10-slot and 7-slot chassis only), redundant fans, software-based fault tolerance, and 1 + 1 power supply redundancy. Integrated resiliency in both hardware and software minimizes network downtime, helping to ensure workforce productivity, profitability, and customer success.

Figure 1. Cisco Catalyst 4500E Series



The Cisco Catalyst 4500E Series extends control to the network edge with intelligent network services, including sophisticated quality of service (QoS), predictable performance, advanced security, comprehensive management, and integrated resiliency. Scalability of these intelligent network services is made possible with dedicated, specialized resources known as ternary content-addressable memory (TCAM). Ample TCAM resources (up to 384,000 entries) enable “high feature capacity”, which provides wire-speed routing and switching performance independent of provisioning of services such as QoS and security.

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Cisco Catalyst 4500E Series Chassis

The Cisco Catalyst 4500E Series offers four chassis options and four supervisor engine options (Table 1). It provides a common architecture that can scale up to 388 ports. The Cisco Catalyst redundant R+E chassis offer high availability by supporting 1 + 1 redundant supervisor engines with subsecond failover time and full-image In-Service Software Upgrades (ISSUs). Nonstop forwarding with stateful switchover (NSF/SSO) and ISSU help ensure continuous packet forwarding during supervisor engine switchover to help ensure high availability for collaboration applications and voice over IP (VoIP). Using the same line cards as the widely deployed Cisco Catalyst 4000 Series Switches and classic Cisco Catalyst 4500 Series Switches, the Cisco Catalyst 4500E Series furthers Cisco's commitment to affordable enterprise and branch-office scalability.

Table 1. Cisco Catalyst 4500E Series Chassis Features

Feature	Cisco Catalyst WS-C4503-E Chassis	Cisco Catalyst WS C4506-E Chassis	Cisco Catalyst WS C4507R+E Chassis	Cisco Catalyst WS C4510R+E Chassis
Total number of slots	3	6	7	10
Line-card slots	2	5	5	8
Supervisor engine slots	1[1]	1[1]	2[2]	2[3]
Dedicated supervisor engine slot numbers	1	1	3 and 4	5 and 6
Supervisor engine redundancy	No	No	Yes	Yes Supervisor Engines V-10GE, 6-E, 7-E, and 8-E)
Supervisor engines supported	Supervisor Engines 8-E, 8L-E, 7-E, 7L-E, 6-E, and 6L-E	Supervisor Engines 8-E, 8L-E, 7-E, 7L-, 6-E, and 6L-E	Supervisor Engines 8-E, 8L-E, 7-E, 7L-E, 6-E, and 6L-E	Supervisor Engines 8-E, 7-E, and 6-E[4]
Maximum PoE per slot	1500W	1500W	1500W	1500W slots 1 and 2; 750W slots 3, 4, and 7-10
Bandwidth scalability per line-card slot	Up to 48 Gbps on all slots	Up to 48 Gbps on all slots	Up to 48 Gbps on all slots[5]	Up to 48 Gbps on all slots[5]
Number of power supply bays	2	2	2	2
AC input power	Yes	Yes	Yes	Yes
DC input power	Yes	Yes	Yes	Yes
Integrated PoE	Yes	Yes	Yes	Yes
Minimum number of power supplies	1	1	1	1
Power supplies supported	• 1000W AC • 1400W AC • 1300W ACV • 2800W ACV • 4200W ACV • 6000W ACV • 9000W ACV • 1400W DC (triple input) • 1400W-DC-P	• 1000W AC • 1400W AC • 1300W ACV • 2800W ACV • 4200W ACV • 6000W ACV • 9000W ACV • 1400W DC (triple input) • 1400W-DC-P	• 1000W AC • 1400W AC • 1300W ACV • 2800W ACV • 4200W ACV • 6000W ACV • 9000W ACV • 1400W DC (triple input) • 1400W-DC-P	• 1400W AC • 2800W ACV • 4200W ACV • 6000W ACV • 9000W ACV • 1400W DC (triple input) • 1400W-DC-P
Number of fan-tray bays	1	1	1	1
Location of 19-inch rack-mount	Front	Front	Front	Front
Location of 23-inch rack-mount	Front (option)	Front (option)	Front (option)	Front (option)

[1] Slot 1 is reserved for supervisor engine only; slots 2 and higher are reserved for line cards.

[2] Slots 3 and 4 are reserved for supervisor engines only in Cisco Catalyst 4507R+E; slots 1-2 and 5-7 are reserved for line cards.

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[3] Slots 5 and 6 are reserved for supervisor engines only in Cisco Catalyst 4510R+E; slots 1-4 and 7-10 are reserved for line cards.

[4] 6 Gbps only on slots 8-10.

[5] WS-C4507R+E and WS-C4510R+E chassis support up to 24 Gbps per line-card slot when used with Supervisor Engine 6-E.

Configuration Alternatives

The Cisco Catalyst 4500 Series offers a powerful and flexible network solution that can be built with eight supervisor engine alternatives. Each provides a high-performance, centralized, shared-memory switch fabric, protecting your line-card investment by supporting the addition of optional higher layer engines (Table 2).

Table 2. Cisco Catalyst 4500E Series Supervisor Engine Support

Feature	Cisco Catalyst 4500 Series Supervisor Engine 6L-E	Cisco Catalyst 4500 Series Supervisor Engine 6-E	Cisco Catalyst 4500 Series Supervisor Engine 8-E, 7-E	Cisco Catalyst 4500 Series Supervisor Engine 8L-E, 7L-E
Cisco Catalyst WS-C4503-E chassis	24 Gbps/slot	24 Gbps/slot	48 Gbps/slot	48 Gbps/slot
Cisco Catalyst WS-C4506-E chassis	24 Gbps/slot	24 Gbps/slot	48 Gbps/slot	48 Gbps/slot
Cisco Catalyst WS-C4507R+E chassis	24 Gbps/slot	24 Gbps/slot	48 Gbps/slot	48 Gbps/slot
Cisco Catalyst WS-C4510R+E chassis	Not supported	24 Gbps/slot (slot 1-7) 6 Gbps/slot (slot 8-10)	48 Gbps/slot	Not supported

The Cisco Catalyst 4500 Series has flexible interface types and port densities that allow you to mix and match network configurations to meet the specific needs of campus networks (Table 3).

Table 3. Cisco Catalyst 4500 Series Port Densities

Cisco Catalyst 4500 Series Switching Modules	Number of Interfaces Supported per Line Card	Cisco Catalyst 4503-E	Cisco Catalyst 4506-E	Cisco Catalyst 4507R+E	Cisco Catalyst 4510R+E
Switched 10/100 Fast Ethernet (RJ-45)	48	96	240	240	384
Switched 10/100 Fast Ethernet (RJ+45) with IEEE 802.3af at Power over Ethernet (PoE/PoE+)	48	96	240	240	384
Switched 100 FX Fast Ethernet (MT-RJ)	48	96	240	240	384
Switched 1000BASE-X (fiber)	6, 18, or 48	100	244	244	388
Switched 10/100/1000BASE-T Gigabit Ethernet	48	96	240	240	384
Switched 10/100/1000BASE-T Gigabit Ethernet with IEEE 802.3af at PoE/PoE+	48	96	240	240	384
Switched 10/100/1000BASE-T Gigabit Ethernet with UPOE	48	96	240	240	384
Switched 10 Gigabit Ethernet	6 or 12	32	68	68	104

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Configuration Flexibility and Modular Superiority

You can mix and match Cisco Catalyst 4500 Series Line Cards to suit numerous LAN access, server connectivity, small and medium-sized business (SMB), or branch-office deployments. The Cisco Catalyst 4500 Series supports the line cards listed in Table 4 by part number.

Table 4. Cisco Catalyst 4500 Series Line Cards

Product Number	Description
Cisco Catalyst 4500E Series Line Cards	
WS-X4748-12X48U+E	Cisco Catalyst 4500E 48-Port UPOE w/ 12-Port MultiGigabit and 36-Port 10/100/1000
WS-X4748-UPOE+E	Cisco Catalyst 4500E Series 48-Port UPOE 10/100/1000 (RJ-45)
WS-X4748-RJ45V+E	Cisco Catalyst 4500E Series 48-Port 802.3at PoEP 10/100/1000 (RJ-45)
WS-X4748-RJ45-E	Cisco Catalyst 4500E Series 48-Port 10/100/1000 (RJ-45)
WS-X4712-SFP+E	Cisco Catalyst 4500E Series 12-port 10 Gigabit Ethernet (SFP+)
WS-X4748-SFP-E	Cisco Catalyst 4500E Series 48-Port GE (SFP)
WS-X4724-SFP-E	Cisco Catalyst 4500E Series 24-Port GE (SFP)
WS-X4712-SFP-E	Cisco Catalyst 4500E Series 12-Port GE (SFP)
WS-X4624-SFP-E	Cisco Catalyst 4500E Series 24-port GE (SFP)
WS-X4612-SFP-E	Cisco Catalyst 4500E Series 12-port GE (SFP)
WS-X4648-RJ45V-E	Cisco Catalyst 4500E Series 48-Port PoE 10/100/1000(RJ45)
WS-X4648-RJ45V+E	Cisco Catalyst 4500E Series 48-Port Premium PoE 10/100/1000(RJ45)
WS-X4606-X2-E	Cisco Catalyst 4500E Series 6-Port 10GE (X2)
WS-X4648-RJ45-E	Cisco Catalyst 4500E Series 48-Port Data 10/100/1000(RJ45)
Cisco Catalyst 4500 Classic 10/100 Line Cards	
WS-X4148-RJ	Cisco Catalyst 4500 10/100 Auto Module, 48-Port (RJ-45)
WS-X4248-RJ45V	Cisco Catalyst 4500 PoE 802.3af 10/100, 48-Port (RJ-45)
Cisco Catalyst 4500 Classic 10/100/1000 Line Cards	
WS-X4548-GB-RJ45	Cisco Catalyst 4500 Enhanced 48-Port 10/100/1000 Module (RJ-45)
WS-X4548-RJ45V+	Cisco Catalyst 4500 48-Port 802.3af PoE and 802.3at PoEP 10/100/1000 (RJ-45)
WS-X4548-GB-RJ45V	Cisco Catalyst 4500 PoE IEEE 802.3af 10/100/1000, 48 Ports (RJ-45)
Cisco Catalyst 4500 Classic 100 BASE-X FE Line Cards	
WS-X4148-FX-MT	Cisco Catalyst 4500 Series 48-Port 100BASE-FX Fast Ethernet Line Card (MT-RJ) for multimode fiber
WS-X4248-FE-SFP	Cisco Catalyst 4500 Fast Ethernet Switching Module, 48-Port 100BASE-X (SFP)
Cisco Catalyst 4500 Classic 1000 BASE-X GE Line Cards	
WS-X4506-GB-T	Cisco Catalyst 4500 6-Port 10/100/1000 RJ-45 PoE IEEE 802.3af and 1000BASE-X (SFP)
WS-X4418-GB	Cisco Catalyst 4500 Gigabit Ethernet Module, Server Switching 18 Ports (GBIC)
WS-X4448-GB-SFP	Cisco Catalyst 4500 Gigabit Ethernet Module, 48 Ports 1000X (SFP)

Table 5 lists the minimum software requirements for the Cisco Catalyst 4500 supervisor engines.

Table 5. Cisco Catalyst Supervisor Engine Software Minimum Requirements

Chassis	Supervisor Engine	Minimum Software Requirement
Cisco WS-C4503-E and WS-C4506-E	Supervisor Engine 6-E	Cisco IOS® Software Release 12.2(40)SG
	Supervisor Engine 6L-E	Cisco IOS Software Release 12.2(52)SG
	Supervisor Engine 7-E	Cisco IOS XE Software Release 3.0(1)SG
	Supervisor Engine 7L-E	Cisco IOS XE Software Release 3.2.0XO
	Supervisor Engine 8-E	Cisco IOS XE Software Release 3.3.0XO
	Supervisor Engine 8L-E	Cisco IOS XE Software Release 3.8.1E

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Chassis	Supervisor Engine	Minimum Software Requirement
Cisco WS-C4507R+E	Supervisor Engine 6-E Supervisor Engine 6L-E Supervisor Engine 7-E Supervisor Engine 7L-E Supervisor Engine 8-E Supervisor Engine 8L-E	Cisco IOS Software Release 12.2(54)SG Cisco IOS Software Release 12.2(54)SG Cisco IOS XE Software Release 3.0(1)SG Cisco IOS XE Software Release 3.2.0XO Cisco IOS XE Software Release 3.3.0XO Cisco IOS XE Software Release 3.8.1E
Cisco WS-C4510R+E	Supervisor Engine 6-E Supervisor Engine 7-E Supervisor Engine 8-E	Cisco IOS Software Release 12.2(54)SG Cisco IOS XE Software Release 3.0(1)SG Cisco IOS XE Software Release 3.3.0XO

Managing the Cisco Catalyst 4500E Series Switch

Network management applications are instrumental in lowering operating expenditures (OpEx) while improving network availability by simplifying and automating many of the day-to-day tasks associated with managing an end-to-end network. The Cisco Catalyst 4500 Series Switches offer both a superior CLI for detailed configuration and Cisco Prime™ infrastructure for unified wired plus wireless management. Prime infrastructure provides day 0 and ongoing provisioning, ongoing monitoring and maintenance, configuration templates, and device and user 360-degree views and serves as the FNF collector for user traffic views using the Prime Assurance Manager module.

For detailed information about Cisco Prime infrastructure, go to http://www.cisco.com/en/US/products/ps12239/index.html.

Unified Access One Management

Cisco Prime Infrastructure combines the wireless functionality of Cisco Prime Network Control System (NCS) and the wired functionality of Cisco Prime LAN Management Solution (LMS) with rich application performance monitoring and troubleshooting capabilities of Cisco Prime Assurance Manager.

This single solution can enable IT organizations to consolidate tools and converge workflows, reducing operational overhead and increasing productivity. It provides a new operational model based on lifecycle processes aligned with the way network operators do their jobs.

Cisco Prime Infrastructure provides:

- Converged wired and wireless management of access, branch, and wide area networks
- Comprehensive network lifecycle management, including user access visibility, inventory, configuration management, plug and play, radio frequency planning, and best practices reporting
- End-to-end application and service assurance visibility to quickly isolate and troubleshoot performance issues, using technologies such as flexible NetFlow, Network-Based Application Recognition (NBAR), and Medianet Performance Agent
- Prime 360 Experience providing a relational, multidimensional view of users, applications, and network to simplify the diagnostics and remediation of network and service affecting issues

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Cisco Prime Infrastructure is built with scalability and extensibility in mind. It has the ability to manage global enterprise networks with thousands of network devices and hundreds of thousands of access devices, or smaller commercial networks with the same level of control and resiliency. It also provides powerful REST-based APIs enabling IT and service organizations to gather and distribute network information for operations, capacity planning, automation, and business intelligence.

Physical Specifications

Table 6 lists physical specifications.

Table 6. Physical Specifications of Cisco Catalyst 4500 Series Chassis

Specification	WS-C4503-E	WS-C4506-E	WS-C4507R+E	WS-C4510R+E
Dimensions (H x W x D)	12.25 x 17.31 x 12.50 in. (31.12 x 43.97 x 31.70 cm)	17.38 x 17.31 x 12.50 in. (44.13 x 43.97 x 31.70 cm)	19.19 x 17.31 x 12.50 in. (48.74 x 43.97 x 31.70 cm)	24.35 x 17.31 x 12.50 in. (61.84 x 43.97 x 31.70 cm)
Rack units (RU)	7RU	10RU	11RU	14RU
Chassis weight (with fan tray)	32.25 lb (14.63 kg)	40.50 lb (18.37 kg)	44.50 lb (20.19 kg)	54.50 lb (24.73 kg)
Mounting	19- and 23-in. rack compatible (19-in. rack and cable guide hardware included)	19- and 23-in. rack compatible (19-in. rack and cable guide hardware included)	19- and 23-in. rack compatible (19-in. rack and cable guide hardware included)	19- and 23-in. rack compatible (19-in. rack and cable guide hardware included)

Power Supply Indicators and Interfaces

- Output Fail LED (per unit): RED
- Input OK LED(per input): Green
- Fan OK LED(per input): Green

Tables 7 and 8 describe power supply specification.

Table 7. Cisco Catalyst 4500E Series Power Supply Specifications (Data Only)

Power Supply	1000W AC	1400W AC	1400W DC Triple Input
Integrated PoE	No (data only)	No (data only)	No (data only)
Input current (rated)	12A at 100 VAC, 5A at 240 VAC	16A at 100 VAC, 7A at 240 VAC	Two -48 VDC at 15A; One -48 VDC at 12.5A
Output current (data)	• 12V at 83.4A • 3.3V at 12.2A	• 12V at 113.4A • 3.3V at 12.2A	• 12V at 1360W • 3.3V at 40W
Output power redundant mode (data)	1000W + 40W	1360W + 40W	1400W + 40W
Output power combined mode (data)	1667W	2473W	-
Heat dissipation	943 BTU per hour	1048 BTU per hour	1048 BTU per hour
Holdup time	20 ms	20 ms	8 ms
Hot-swappable	Yes	Yes	Yes

Table 8. Cisco Catalyst 4500E Series Power Supply Specifications (Data and PoE)

Power Supply	1300W AC	2800W AC	4200W AC	6000 AC	9000 AC	1400W DC with Power Entry Module (PEM)
Integrated PoE	Yes (up to 800W)	Yes (up to 1400W)	Yes (up to 3855W)	Yes (up to 4800W)	Yes (up to 7500W)	Up to 7500W (minus the power consumed for data) when connected directly to a DC power plant or 2 external AC power shelves

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Power Supply	1300W AC	2800W AC	4200W AC	6000 AC	9000 AC	1400W DC with Power Entry Module (PEM)
Input current (rated)	• 16A at 100 VAC • 7A at 240 VAC	• 16A at 200 VAC	• Two 12A at 100 VAC Or • Two 12A at 200 VAC	• Two 12A at 100 VAC Or • Two 16A at 200 VAC	• Three 12A at 100 VAC Or • Three 16A at 200 VAC	• 31A at -60 VDC (data only) • 180A at -48 VDC (PoE)
Output current (data)	• 12V at 84.7A • 3.3V at 12.5A	• 12V at 113.3A • 3.3V at 12.5A	• 12V at 115.3A • 3.3V at 12.5A	• 12V at 186.9A • 3.3V at 12.5A	• 12V at 163.3A • 3.3V at 12.5A	• 12V at 120A • 3.3V at 12.5A
Output current (PoE)	-50V at 16.7A	-50V at 28A	-50V at 77.1A (200V) -50V at 38A (100V)	-50V at 100.0A (200V) -50V at 38.5A (120V)	-50V at 150.0A (200V) -50V at 50.0A (120V)	140A at -48/-60 VDC
Output power redundant mode (data)	1000W + 40W	1360W + 40W	1383W + 40W	2200W + 40W	1960W + 40W	1360W + 40W
Output power redundant mode (PoE)	800W maximum per power supply	1400W maximum per power supply	• 3700W (220V) • 1850W (110V)	• 4800W (220V) • 1850W (110V)	• 7500W (220V) • 2500W (110V)	Up to 7500W (minus the power consumed for data)
Output power combined mode (data)	1667W	2473W	2766W	4400W	3920W	-
Output power combined mode (PoE)	1333W	2333W	6700W (220V) 3360W (110V)	8700W (220V) 3360W (110V)	14,400W (220V) 4150W (110V)	3800W (100V)
Heat dissipation	1568 BTU/hr	2387 BTU/hr	3580 BTU/hr	2720 BTU/hr	3010 BTU/hr	Data only: 1591 BTUs per hour Data and voice: 2905 BTUs per hour
Holdup time	20 ms	20 ms	20 ms	20 ms	20 ms	4 ms
Hot swappable	Yes	Yes	Yes	Yes	Yes	Yes

Additional notes for Tables 7 and 8:

- Output power is per power supply unless otherwise stated.
- Heat-dissipation numbers represent the power-conversion losses of the power supply in operation.
- The number of power devices supported depends on customer configuration.

Fan Trays

Each Cisco Catalyst 4500E Series uses a single fan tray for cooling. All fan trays are composed of independent fans. If one fan fails, the system will continue to operate without a significant degradation in cooling. The system will detect and notify the user (through LED, CLI, and Simple Network Management Protocol [SNMP]) that a fan has failed and the tray needs to be replaced.

Environmental Conditions

The Cisco Catalyst 4500 and 4500E Series require the following conditions:

- Operating temperature: 32 to 104ºF (0 to 40ºC)
- Storage temperature: -40 to 167ºF (-40 to 75ºC)
- Relative humidity: 10 to 90 percent, noncondensing
- Operating altitude: -60 to 3000 meters (m)

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Regulatory Standards Compliance

Table 9 lists the regulatory standards compliance of the Cisco Catalyst 4500 and 4500E Series.

Table 9. Regulatory Standards Compliance

Specification	Standard
Regulatory compliance	CE Marking
Safety	• UL 60950 • CAN/CSA-C22.2 No. 60950 • EN 60950 • IEC 60950 • TS 001 • AS/NZS 3260
EMC	• FCC Part 15 (CFR 47) Class A • ICES-003 Class A • EN55022 Class A • CISPR22 Class A • AS/NZS 3548 Class A • VCCI Class A • EN 50121-4 • EN 55022 • EN 55024 • EN 61000-6-1 • EN 50082-1 • EN 61000-3-2 • EN 61000-3-3 • ETS 300 386
Industry EMC, safety, and environmental standards	• NEBS Level 3 • ETS 300 019 Storage Class 1.1 • ETS 300 019 Transportation Class 2.3 • ETS 300 019 Stationary Use Class 3.1 • ETS 300 386
Telecom (E1)	• CTR 12/13 • CTR 4 • ACA TS016
Telecom (T1)	• FCC Part 68 • Canada CS-03 • JATE Green Book
ROHS compliance	ROHS5

Power and MTBF Information

Table 10 gives power and mean-time-between-failures (MTBF) information for different chassis.

Table 10. Power and MTBF Information

Part Number	Maximum Rated Power (W)	Rated MTBF (Hours)
WS-C4503-E	60	1,064,279
WS-C4506-E	120	710,119
WS-C4507R+E	135	248,630
WS-C4510R+E	200	179,714

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Note: All power numbers shown in Table 10 are maximum values recommended for facility power and cooling capacity planning. These figures are not indicative of the actual power draw during operation. Typical power draw is about 20 percent lower than the maximum value shown.

Ordering Information

Table 11 lists the ordering information for chassis, power supplies, supervisor engines, and memory that are commonly used with the Cisco Catalyst 4500 Series.

Table 11. Ordering Information

Product Number	Description
WS-C4503-E	Cisco Catalyst E-Series 4503 switch (3-slot chassis), fan, no power supply
WS-C4506-E	Cisco Catalyst E-Series 4506 switch (6-slot chassis), fan, no power supply
WS-C4507R+E	Cisco Catalyst E-Series 4507R+E switch (7-slot chassis), fan, no power supply, redundant supervisor capable
WS-C4510R+E	Cisco Catalyst E-Series 4510R+E switch (10-slot chassis), fan, no power supply; redundant supervisor capable
PWR-C45-1000AC	Cisco Catalyst 4500 Series 1000W AC power supply (data only)
PWR-C45-1400AC	Cisco Catalyst 4500 Series 1400W AC power supply (data only)
PWR-C45-1300ACV	Cisco Catalyst 4500 Series 1300W AC power supply (with integrated PoE)
PWR-C45-2800ACV	Cisco Catalyst 4500 Series 2800W AC power supply (with integrated PoE)
PWR-C45-4200ACV	Cisco Catalyst 4500 Series 4200W AC power supply (with integrated PoE)
PWR-C45-6000ACV	Cisco Catalyst 4500 Series 6000W AC power supply (with integrated PoE)
PWR-C45-9000ACV	Cisco Catalyst 4500 Series 9000W AC power supply (with integrated PoE)
PWR-C45-1400DC-P	Cisco Catalyst 4500 Series 1400W DC power supply with integrated power entry module (PEM)
PWR-C45-1400DC	Cisco Catalyst 4500 Series triple input 1400W DC power supply (data only)
WS-X4516-10GE	Cisco Catalyst 4500 Series Supervisor Engine V-10GE
WS-X45-Sup6-E	Cisco Catalyst 4500 Series Supervisor Engine 6-E
WS-X45-Sup6L-E	Cisco Catalyst 4500 Series Supervisor Engine 6L-E
WS-X45-Sup7-E	Cisco Catalyst 4500 Series Supervisor Engine 7-E
WS-X45-Sup7L-E	Cisco Catalyst 4500 Series Supervisor Engine 7L-E
WS-X45-Sup8-E	Cisco Catalyst 4500 Series Supervisor Engine 8-E
WS-X45-Sup8L-E	Cisco Catalyst 4500 Series Supervisor Engine 8L-E
MEM-C4K-FLD64M	Compact Flash memory, 64-MB option
MEM-C4K-FLD128M	Compact Flash memory, 128-MB option

Licensing for Cisco Catalyst 4500E Series

The three feature sets available with Cisco Catalyst 4500E Series Switches are:

- Cisco IOS XE Software LAN Base: This feature set on the bundles provides Layer 2 features for access.
- Cisco IOS XE Software IP Base: This feature set is upgradable with a software activation license (SAL). It includes all Layer 2 features and some basic Layer 3 features. ISSU and SSO are supported in this package.
- Cisco IOS XE Software Enterprise Services: This feature set is upgradable with a SAL; it supports full Layer 3 protocols and advanced features such as complete routing scalability, Border Gateway Protocol (BGP), Virtual Route Forwarding (VRF), Policy-Based Routing (PBR), and so on.

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These features can be enabled using the software-licensing mechanism. For details about software licensing, refer to http://www.cisco.com/go/sa.

Cisco ONE Software

Cisco ONE Software for Access Switching is available for the Cisco Catalyst 4500E Series Switches.

Cisco ONE Software is a new way for customers to purchase and use our infrastructure software. It offers a simplified consumption model, centered on common customer scenarios in the data center, WANs, and LANs.

Cisco ONE Software and services provide customers with four primary benefits:

- Software suites that address typical customer use scenarios at an attractive price
- Investment protection of their software purchase through software services-enabled license portability
- Access to ongoing innovation and new technology with Cisco Software Support Service (SWSS)
- Flexible licensing models to smoothly distribute customer's software spend over time

For ordering information for Cisco ONE Software for the Cisco Catalyst 4500E Series Switches, go to http://www.cisco.com/c/en/us/products/software/one-access/switching-part-numbers.html.

Cisco Limited Lifetime Hardware Warranty

The Cisco Limited Lifetime Hardware Warranty (LLW) includes 10-day advance hardware replacement for as long as the original end user owns the product. Table 12 describes the warranty.

Your formal warranty statement, including the warranty applicable to Cisco software, appears in the Cisco information packet that accompanies your Cisco product. We encourage you to review carefully the warranty statement shipped with your specific product before use.

For additional information about warranty terms, visit http://www.cisco.com/go/warranty.

Table 12. Limited Lifetime Hardware Warranty

	Cisco Limited Lifetime Hardware Warranty[1]
Warranty duration	As long as the original end user continues to own or use the product.
End-of-life policy	In the event of discontinuance of product manufacture, Cisco warranty support is limited to 5 years from the announcement of discontinuance.
Hardware replacement	Cisco or its service center will use commercially reasonable efforts to ship a replacement part within 10 business days after receipt of the return materials authorization (RMA) request and confirmation that a replacement part is appropriate response. Actual delivery times may vary depending on customer location.
Effective date	Hardware warranty commences from the date of shipment to the customer (and in case of resale by a Cisco reseller, not more than 90 days after original shipment by Cisco).
Cisco Technical Assistance Center (TAC) support	None
Cisco.com access	Warranty allows guest access only to Cisco.com.

[1] Cisco reserves the right to refund the purchase price as its exclusive warranty remedy.

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Cisco and Partner Services for Expanding the Borderless Network

Encourage Borderless Networks innovation, optimize operational efficiencies, establish business flexibility, and gain competitive advantage using intelligent, personalized services from Cisco and our partners. Through a discovery process that begins with understanding your business objectives, we help you integrate the next-generation Cisco Catalyst 4500-E Series Switches into your architecture and incorporate network services onto that platform. Sharing knowledge and leading practices, we support your success every step of the way as you deploy, absorb, manage, and scale new technology.

For additional information about Cisco services, visit http://www.cisco.com/go/services.

Adding a Cisco technical services contract to your device coverage provides benefits not available with warranty, including access to the Cisco TAC, a variety of hardware replacement options to meet critical business needs, updates for licensed Cisco IOS Software, and registered access to the extensive Cisco.com knowledge base and support tools. Choose from a flexible suite of support services designed to meet your business needs and help you maintain high-quality network performance while controlling operating costs. Table 13 shows the Cisco technical services available for Cisco Catalyst 4500-E Series Switches.

For information about Cisco Technical Services, visit http://www.cisco.com/go/ts.

Table 13. Cisco Technical Services for Cisco Catalyst 4500-E Series Switches

Technical Services
Cisco Smart Net Total Care™ Service • Twenty-four-hour global access to the Cisco TAC • Unrestricted access to the extensive Cisco.com resources, communities, and tools • Next-business-day, 8 x 5 x 4, 24 x 7 x 4, and 24 x 7 x 2 advance hardware replacement[2] and onsite parts replacement and installation available • Ongoing operating system software updates within the licensed feature set[1] • Proactive diagnostics and real-time alerts on Smart Call Home-enabled devices
Cisco Smart Foundation Service • Next-business-day (NBD) advance hardware replacement as available • Business hours access to SMB TAC (access levels vary by region) • Access to Cisco.com SMB knowledge base • Online technical resources through Smart Foundation Portal • Operating system software bug fixes and patches
Cisco Focused Technical Support Services Three levels of premium, high-touch services are available: • Cisco High-Touch Operations Management Service • Cisco High-Touch Technical Support Service • Cisco High-Touch Engineering Service Valid Cisco Smart Net Total Care or SP Base contracts on all network equipment are required.

Notes:

[1] Cisco operating system updates include the following: maintenance releases, minor updates, and major updates within the licensed feature set.

[2] Advance hardware replacement is available in various service-level combinations. For example, 8 x 5 x NBD indicates that shipment will be initiated during the standard 8-hour business day, 5 days a week (the generally accepted business days within the relevant region), with next-business-day (NBD) delivery. Where NBD is not available, same-day shipping is provided. Restrictions apply; review the appropriate service descriptions for details.

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Printed in USA C78-436089-23 03/17

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