

CISCO CATALYST 4500

The Cisco Catalyst 4500 Series integrates resiliency for advanced control of converged networks.

Figure 1. Cisco Catalyst 4500 Series



OVERVIEW

The Cisco® Catalyst® 4500 Series offers non-blocking Layers 2 through 4 switching with integrated resiliency, further enhancing control of converged networks. Converged voice, video, and data networks with high availability enable business resiliency for enterprise, SMB and metropolitan (metro) Ethernet customers deploying Internet-based business applications.

The Cisco Catalyst 4500 Series includes four Cisco Catalyst chassis: the Cisco Catalyst 4510R (ten slots), the Cisco Catalyst 4507R (seven slots), Cisco Catalyst 4506 (six slots), and Cisco Catalyst 4503 (three slots). Integrated resiliency enhancements offered in the Cisco Catalyst 4500 Series include 1+1 supervisor engine redundancy (Cisco Catalyst 4507R/4510R), 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.

The Cisco Catalyst 4500 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. Offering compatibility with all Cisco Catalyst 4500 Series line cards and Supervisor Engines, the Cisco Catalyst 4500 Series reduces the cost of ownership by minimizing recurring operational expenses, improving return on investment (ROI).

CISCO CATALYST 4500 SERIES CHASSIS

The Cisco Catalyst 4500 Series offers four chassis options and four Supervisor Engine options. It provides a common architecture that can scale up to 384 ports. The Cisco Catalyst 4507R and 4510R offer high availability in supporting 1+1 redundant supervisor engines with sub-second failover time. Using the same line cards and Supervisor Engines as the widely deployed Cisco Catalyst 4000 Series, the Cisco Catalyst 4500 Series enhances

the Cisco commitment to affordable enterprise and branch scalability. It provides a cost-effective, flexible network solution that scales to meet today's high-performance needs with investment protection (Table 1).

Table 1. Cisco Catalyst 4500 Series Chassis Features

Feature	Cisco Catalyst 4503 Chassis	Cisco Catalyst 4506 Chassis	Cisco Catalyst 4507R Chassis	Cisco Catalyst 4510R Chassis
Total Number of Slots	3	6	7	10
Supervisor Engine Slots	1 ¹	1 ¹	2 ²	2 ²
Supervisor Engine Redundancy	No	No	Yes (Supervisor Engine II-Plus, IV, V)	Yes (Supervisor Engine V only)
Supervisor Engines Supported	Supervisor Engine II-Plus, II-Plus-TS, IV, V	Supervisor Engine II-Plus, IV, V	Supervisor Engine II-Plus, IV, V	Supervisor Engine V only
Line Card Slots	2	5	5 ²	8 ²
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
Number of Fan Tray Bays	1	1	1	1
Location of 19-inch Rack-Mount ³	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 1 and 2 are reserved for supervisor engines only in Cisco Catalyst 4507R and 4510R; slots 3 and higher are reserved for line cards.

3. Chassis can be mounted in racks and cabinets that meet ANSI/EIA-310-D and ETS 300 119-3.

Note: Supervisor engine slots do not support switching line card modules. Line card slots do not support supervisor engines.

CONFIGURATION ALTERNATIVES

The Cisco Catalyst 4500 Series offers a powerful and flexible network solution that can be built with four 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 4500 Series Supervisor Engine Support and Performance

Feature	Supervisor Engine II-Plus-TS (WS-X4013+TS)	Supervisor Engine II-Plus (WS-X4013+)	Supervisor Engine IV (WS-X4515)	Supervisor Engine V (WS-X4516)
Cisco Catalyst 4503 Chassis	Supported 64 Gbps, 48 Mpps	Supported, 28 Gbps, 21 Mpps	Supported, 28 Gbps, 21 Mpps	Supported, 28 Gbps, 21 Mpps
Cisco Catalyst 4506 Chassis	Not supported	Supported 64 Gbps, 48 Mpps	Supported 64 Gbps, 48 Mpps	Supported 64 Gbps, 48 Mpps
Cisco Catalyst 4507R Chassis	Not supported	Supported 64 Gbps, 48 Mpps	Supported 64 Gbps, 48 Mpps	Supported 68 Gbps, 51Mpps
Cisco Catalyst 4510R Chassis	Not supported	Not supported	Not supported	Supported 96 Gbps 72 Mpps

The Cisco Catalyst 4500 Series has flexible interface types and port densities that allow network configurations to be mixed and matched 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	Cisco Catalyst 4506	Cisco Catalyst 4507R	Cisco Catalyst 4510R
Switched 10/100 Fast Ethernet (RJ-45)	24, 32 or 48	96	240	240	384 ¹
Switched 10/100 Fast Ethernet (RJ-45) with IEEE 802.3 af PoE	24, 48	96	240	240	384 ¹
Switched 10/100 Fast Ethernet (RJ-21) with or without IEEE 802.3af PoE	48	96	240	240	384 ¹
Switched 100 FX Fast Ethernet (MT-RJ)	4 ² , 24, or 48	96	240	240	384 ¹
Switched 100 LX-10 (MT-RJ) or 100 BX-D (LC) Fast Ethernet	48	96	240	240	384 ¹
Switched 1000 Gigabit Ethernet (fiber)	2, 6, 18, or 48	96	240	240	384 ¹
Switched 10/100/1000BASE-T	24 or 48	108*	240	240	384 ¹

Cisco Catalyst 4500 Series Switching Modules	Number of Interfaces Supported per Line Card	Cisco Catalyst 4503	Cisco Catalyst 4506	Cisco Catalyst 4507R	Cisco Catalyst 4510R
Gigabit Ethernet					
Switched 10/100/1000BASE-T Gigabit Ethernet with IEEE 802.3 af PoE	24, 48	108 ³	240	240	384 ¹

1. When using the Cisco Catalyst 4500 Supervisor Engine V, 336 ports are supported. The 4510R can support up to 384 ports with future Supervisor Engines. When Supervisor Engine V is used in the 4510R chassis, Slot 10 (Flex-slot) supports a sub-set of line cards: 2-port GBIC (WS-X4302-GB) and Access Gateway Module (WS-X4604-GWY). This is due to the switching capacity of the Supervisor Engine V, and not a limitation of the 4510R chassis. Future Supervisor Engines will allow Slot 10 to accommodate any and all line cards.
2. Four 100 Base FX, MMF interfaces are supported via the uplink module (WS-U4504-FX-MT) using the Cisco Catalyst 32-port, 10/100, RJ-45 (WS-X4232-RJ-XX) line card.
3. Supervisor II-Plus-TS required for 108 10/100/1000 ports.

CONFIGURATION FLEXIBILITY AND MODULAR SUPERIORITY

Cisco Catalyst 4500 Series modules can be mixed and matched to suit numerous wiring closet, data center, SMB or branch office deployments. Any Gigabit Ethernet port can be 1000BASE-SX, 1000BASE-LX/LH, 1000BASE-ZX, or coarse wavelength-division multiplexing (CWDM) by using flexible, hot-swappable gigabit-interface-converter (GBIC) modules. The Cisco Catalyst 4500 Series supports the following switching modules:

- WS-F4531—Cisco Catalyst 4500 NetFlow Services Daughter Card
- WS-X4148-FE-LX-MT—Cisco Catalyst 4500 Fast Ethernet Switching Module, 48-port 100BASE-LX10 single-mode fiber (SMF) (MT-RJ)
- WS-X4148-FE-BD-LC—Cisco Catalyst 4500 Fast Ethernet Switching Module, 48-port 100BASE-BX-D single-mode fiber (SMF) (LC)
- WS-X4124-FX-MT—Cisco Catalyst 4000 Fast Ethernet Switching Module, 24-port 100BASE-FX (MT-RJ)
- WS-X4148-FX-MT—Cisco Catalyst 4500 Fast Ethernet Switching Module, 48-port 100BASE-FX multimode fiber (MMF) (MT-RJ)
- WS-X4124-RJ45—Cisco Catalyst 4500 10/100 Module, 24 ports (RJ-45)
- WS-X4148-RJ—Cisco Catalyst 4500 10/100 Module, 48 ports (RJ-45)
- WS-X4148-RJ21—Cisco Catalyst 4500 10/100 Module, 48-port telco (4 x RJ-21)
- WS-X4248-RJ21V—Cisco Catalyst 4500 PoE 802.3af 10/100, 48-Ports(RJ21)
- WS-X4148-RJ45V—Cisco Catalyst 4500 Cisco Pre-standard PoE 10/100, 48 ports (RJ-45)
- WS-X4224-RJ45V—Cisco Catalyst 4500 PoE 803.3af 10/100, 24 ports (RJ-45)
- WS-X4248-RJ45V—Cisco Catalyst 4500 PoE 802.3af 10/100, 48-Ports(RJ45)
- WS-X4232-GB-RJ—Cisco Catalyst 4500 32-port 10/100 (RJ-45), 2-Gigabit Ethernet (GBIC) Module
- WS-X4232-RJ-XX—Cisco Catalyst 4500 32-port 10/100 (RJ-45), plus modular uplink slot
- WS-U4504-FX-MT—Cisco Catalyst 4500 Fast Ethernet Uplink Daughter Card for WS-X4232-RJ-XX, 4-port 100BASE-FX (MT-RJ)
- WS-X4302-GB—Cisco Catalyst 4500 Gigabit Ethernet Module, 2 ports (GBIC)
- WS-X4306-GB—Cisco Catalyst 4500 Gigabit Ethernet Module, 6 ports (GBIC)
- WS-X4506-GB-T—Cisco Catalyst 4500 Gigabit Ethernet Module, 6 ports 10/100/1000 802.3af PoE or 1000BASE-X (SFP)
- WS-X4418-GB—Cisco Catalyst 4500 Gigabit Ethernet Module, server switching 18 ports (GBIC)
- WS-X4448-GB-LX—Cisco Catalyst 4500 48-port 1000BASE-LX (SFPs included)

- WS-X4448-GB-SFP—Catalyst 4500 Gigabit Ethernet Module, 48-Ports 1000X (Optional SFPs)
- WS-X4424-GB-RJ45—Cisco Catalyst 4500 24-port 10/100/1000 Module (RJ-45)
- WS-X4448-GB-RJ45—Cisco Catalyst 4500 48-port 10/100/1000 Module (RJ-45)
- WS-X4548-GB-RJ45—Cisco Catalyst 4500 Enhanced 48-port 10/100/1000 Module (RJ-45)
- WS-X4524-GB-RJ45V—Cisco Catalyst 4500 PoE 802.3af 10/100/1000, 24 ports (RJ-45)
- WS-X4548-GB-RJ45V—Cisco Catalyst 4500 PoE 802.3af 10/100/1000, 48-Ports(RJ45)
- WS-G5483—Cisco 1000BASE-T GBIC
- WS-G5484—Cisco 1000BASE-SX Short-Wavelength GBIC (multimode only)
- WS-G5486—Cisco 1000BASE-LX/LH Long-Haul GBIC (single mode or multimode)
- WS-G5487—Cisco 1000BASE-ZX Extended-Reach GBIC (single mode)
- GLC-T—1000BASE-T SFP
- GLC-SC-MM—GE SFP, LC connector SX transceiver
- GLC-LH-SM—GE SFP, LC connector LX/LH transceiver
- GLC-ZX-SM—1000BASE-ZX SFP
- Cisco coarse wavelength-division multiplexing (CWDM) GBIC solution
- Cisco (CWDM) SFP solution

Table 4. Cisco Catalyst Supervisor Engine Software Minimum Requirements

Specification	Cisco Catalyst 4503 with Supervisor II-Plus-TS	Cisco Catalyst 4503, 4506, and 4507R with Supervisor Engine II-Plus	Cisco Catalyst 4503, 4506, and 4507R with Supervisor Engine IV	Cisco Catalyst 4503, 4506, 4507R, and 4510R with Supervisor Engine V
Minimum Software Requirement	Cisco IOS® Software Release 12.2(20)EWA or higher	Cisco IOS® Software Release 12.1(19)EW or higher	Cisco IOS Software Release 12.1(12c)EW or higher	Cisco IOS Software Release 12.2(18)EW

Table 5. Comparison Between Cisco Catalyst Chassis

Feature	Legacy Cisco Catalyst 4006	Cisco Catalyst 4503	Cisco Catalyst 4506	Cisco Catalyst 4507R	Cisco Catalyst 4510R
Power over Ethernet (PoE)	Yes—With external power shelf	Yes—Integrated	Yes—Integrated	Yes—Integrated	Yes—Integrated
PoE per Line Card Slot Maximum	400W	830W	830W	830W	830W
Power Supply Redundancy	2 + 1	1 + 1	1 + 1	1 + 1	1 + 1

Feature	Legacy Cisco Catalyst 4006	Cisco Catalyst 4503	Cisco Catalyst 4506	Cisco Catalyst 4507R	Cisco Catalyst 4510R
Supervisor Engine Redundancy	No	No	No	Yes	Yes
Supported Line Cards	All Cisco Catalyst 4000 line cards	All Cisco Catalyst 4000 line cards	All Cisco Catalyst 4000 line cards	All Cisco Catalyst 4000 line cards	All Cisco Catalyst 4000 line cards
Supervisor Engines Supported	Supervisor Engines II-Plus, IV and V	Supervisor Engines II-Plus, Supervisor Engine II-Plus-TS, IV and V	Supervisor Engines II-Plus, IV and V	Supervisor Engines II-Plus, IV and V	Supervisor Engines V only
Internal Power Supplies Supported	400-watt AC	1000-watt AC 1400-watt AC 1300-watt ACV 2800-watt ACV 1400-watt DC	1000-watt AC 1400-watt AC 1300-watt ACV 2800-watt ACV 1400-watt DC	1000-watt AC 1400-watt AC 1300-watt ACV 2800-watt ACV 1400-watt DC	1400-watt AC ¹ 2800-watt ACV ¹ 1400-watt DC

1. The 1400W AC and 2800W AC power supplies are required to support a fully loaded Catalyst 4510R. The 1000W AC and 1300W AC power supplies can be deployed in the 4510R; however, power management is required.

Standard Network Protocols

<ul style="list-style-type: none"> • Ethernet <ul style="list-style-type: none"> – IEEE 802.3, 10BASE-T • Fast Ethernet <ul style="list-style-type: none"> – IEEE 802.3u, 100BASE-TX – IEEE 802.3, 100BASE-FX • Gigabit Ethernet <ul style="list-style-type: none"> – IEEE 802.3z – IEEE 802.3x – IEEE 802.3ab • 1000BASE-X (GBIC) <ul style="list-style-type: none"> – 1000BASE-SX – 1000BASE-LX/LH – 1000BASE-ZX 	<ul style="list-style-type: none"> • Virtual LAN (VLAN) trunking/tagging <ul style="list-style-type: none"> – IEEE 802.1Q – IEEE 802.3ad • Spanning-Tree Protocol <ul style="list-style-type: none"> – IEEE 802.1D – IEEE 802.1w – IEEE 802.1s • Security <ul style="list-style-type: none"> – IEEE 802.1x • Power over Ethernet (PoE) <ul style="list-style-type: none"> – IEEE 802.3af
---	---

NETWORK MANAGEMENT

- Support provided by Cisco Works Resource Manager Essentials (a component of LAN Management Solution [LMS])
 - Builds and maintains an up-to-date hardware and software inventory
 - Maintains an active archive and simplifies deployment of configuration changes to multiple devices
 - Simplifies and accelerates software image analysis and automates deployment
 - Records and displays comprehensive reports of software, hardware, and configuration changes
 - Highlights critical devices and their ability to respond
 - Isolates network error conditions and suggests probable causes

- Support provided by Cisco Works Resource Manager Essentials (a component of LMS)
 - Network topology discovery and display services
 - VLAN provisioning and logical display representation
 - Traffic monitoring and performance assessment
 - End station tracking with search utilities
 - CiscoView graphical device management
 - Network topology integrity checking
 - Cisco Discovery Protocol
 - Cisco Virtual Trunking Protocol (VTP)
 - Simple Network Management Protocol (SNMP) Version 1 (RFCs 1155-1157)
 - SNMP Version 2c
 - Cisco Workgroup Management Information Base (MIB)
 - Ethernet MIB (RFC 1643)
 - Ethernet Repeater MIB (RFC 1516)
 - SNMP MIB II (RFC 1213)
 - Remote Monitoring (RMON) (RFC 1757)
 - RMON II (RFC 2021)
 - Interface table (RFC 1573)
 - Bridge MIB (RFC 1493)
 - Switched Port Analyzer (SPAN)
 - Enhanced Switched Port Analyzer (ESpan)
 - Port snooping and connection steering

- Standard Cisco IOS Software security capabilities: passwords and Terminal Access Controller Access Control System (TACACS+)
- Telnet, Trivial File Transfer Protocol (TFTP), and Bootstrap Protocol (BOOTP) for management access

PHYSICAL SPECIFICATIONS

Table 6. Physical Specifications of Cisco Catalyst 4500 Series Chassis

Specification	Cisco Catalyst 4503	Cisco Catalyst 4506	Cisco Catalyst 4507R	Cisco Catalyst 4510R
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)	7 RU	10 RU	11 RU	14 RU
Chassis Weight (w/fan tray)	31.25 lbs./14.18 kg.	40.50 lbs./18.37 kg.	44.25 lbs./20.07 kg.	51.50 lb/23.36 kg.
Mounting	19- and 23-inch rack compatible (19-inch rack and cable guide hardware included)	19- and 23-inch rack compatible (19-inch rack and cable guide hardware included)	19- and 23-inch rack compatible (19-inch rack and cable guide hardware included)	19- and 23-inch rack compatible (19-inch rack and cable guide hardware included)

POWER SUPPLY INDICATORS AND INTERFACES

- Fan cooling: Integrated in hot-insertion/hot-extraction unit
- Good: Green (good)
- Fail: Red (faulty)
- SNMP MIB supported

Table 7. Cisco Catalyst 4500 Series Power Supply Specifications

Power Supply	1000W AC	1400W AC	1300W AC	2800W AC	1400W DC	2500W AC—Power Shelf P/S
Integrated Power over Ethernet (PoE)	No (Data only)	No (Data Only)	Yes (Up to 800W)	Yes (Up to 1400W)	Up to 7500W (minus the power consumed for data) when connected directly to a DC power plant or 2 External AC Power Shelves	2500W per power supply; 5000W per shelf (minus the power consumed for data)
IEEE 802.3af Compliant PoE	No	No	Yes	Yes	Yes	Yes
Input Current (rated)	12A @ 100 VAC, 5A @ 240 VAC	16A @ 100 VAC, 7A @ 240 VAC	16A @ 100 VAC, 7A @ 240 VAC	16A @ 200 VAC	31A @ -60 VDC (Data only)	15A @ 200 VAC

Power Supply	1000W AC	1400W AC	1300W AC	2800W AC	1400W DC	2500W AC—Power Shelf P/S
					180A @ -48 VDC (PoE)	
Output Current (data)	12V @ 83.4A 3.3V @ 12.2A	12V @ 113.4A 3.3V @ 12.2A	12V @ 84.7A 3.3V @ 12.5A	12V @ 113.3A 3.3V @ 12.1A	12V @ 120A 3.3V @ 10A	-52 VDC @ 50A (total output per supply)
Output Current (PoE)	N/A	N/A	-50V @ 16.7A	-50V @ 28A	140A @ -48/-60 VDC	-52 VDC @ 50A (total output per supply)
Output Power Redundant Mode (Data)	1000W + 40W	1360W + 40W	1000W + 40W	1360W + 40W	1360W + 40W	Up to 1400W (via DC supply)
Output Power Redundant Mode (PoE)	N/A	N/A	800W max. per power supply	1400W max. per power supply	Up to 7500W (minus the power consumed for data)	2500W per supply (minus the power consumed for data)
Output Power Combined Mode (Data)	1667W	2473W	1667W	2473W	N/A	N/A
Output Power Combined Mode (PoE)	N/A	N/A	1333W	2333W	N/A	N/A
Heat Dissipation ¹	943 BTU/Hr.	1048 BTU/Hr.	1568 BTU/Hr.	2387 BTU/Hr.	Data only: 1591 BTU/Hr. Data and voice: 2905 BTU/Hr.	1210 BTU/Hr. per power supply
Holdup Time	20 ms	20 ms	20 ms	20 ms	4 ms	20 ms
Number of 802.3af Class 2 PDs Supported with One Power Supply (1+1)	N/A	N/A	102	179	384 ²	384 ²
Number of 802.3af	N/A	N/A	46	80	384 ²	384 ²

Power Supply	1000W AC	1400W AC	1300W AC	2800W AC	1400W DC	2500W AC—Power Shelf P/S
Class 0 & 3 PDs Supported with One Power Supply (1+1)						
Cisco Phones with Integrated (PoE) ³	None	N/A	126	222	384 ²	384 ²
Hot Swappable	Yes	Yes	Yes	Yes	Yes	Yes

1. Note that calculations for heat dissipation is based on one power supply operating at maximum output power.
2. Measured when two AC power shelves are strapped together and contain 3x2500W AC power supplies.
3. Measured when using Cisco pre-standard PoE line cards (WS-X4148-RJ45V).

Notes for Table 7:

1. Output power is per power supply, unless otherwise stated.
2. Heat dissipation numbers represent the power conversion losses of the power supply in operation.
3. The number of power devices (PD's) supported will depend on customer configuration.

FAN TRAYS

Each Cisco Catalyst 4500 Series chassis 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 (via LED, CLI, and SNMP) that a fan has failed and the tray needs to be replaced.

FABRIC REDUNDANCY MODULES (CISCO CATALYST 4507R AND 4510R ONLY)

The Cisco Catalyst 4500 redundancy scheme uses removable fabric redundancy modules on the passive backplane to switch traffic to the active supervisor. There is one fabric redundancy module per line cards. Fabric redundancy modules and redundant clocks ship standard with every Cisco Catalyst 4507R and 4510R chassis. Spare fabric redundancy modules and clock modules are available for serviceability.

ENVIRONMENTAL CONDITIONS

- Operating temperature: 32° to 104°F (0° to 40°C)
- Storage temperature: -40° to 167°F (-40° to 75°C)
- Relative humidity: 10 to 90%, noncondensing
- Operating altitude: -60 to 2000 m

REGULATORY STANDARDS COMPLIANCE

Table 8. Regulatory Standards Compliance of Cisco Catalyst 4500 Series

Specification	Standard
Regulatory Compliance	<ul style="list-style-type: none"> • CE marking
Safety	<ul style="list-style-type: none"> • UL 60950 • CAN/CSA-C22.2 No. 60950 • EN 60950 • IEC 60950 • TS 001 • AS/NZS 3260
EMC	<ul style="list-style-type: none"> • 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 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	<ul style="list-style-type: none"> • GR-63-Core Network Equipment Building Standards (NEBS) Level 3 • GR-1089-Core Level 3 • ETS 300 019 Storage Class 1.1 • ETS 300 019 Transportation Class 2.3 (pending) • ETS 300 019 Stationary Use Class 3.1 • ETS 300 386
Telecom (E1)	<ul style="list-style-type: none"> • CTR 12/13 • CTR 4 • ACA TS016

Specification	Standard
Telecom (T1)	<ul style="list-style-type: none"> • FCC Part 68 • Canada CS-03 • JATE Green Book

ORDERING INFORMATION

Table 9. Cisco Catalyst 4500 Series Common Equipment Ordering Information

Product Number	Description
WS-C4503	Cisco Catalyst 4500 (3-slot chassis), fan, no power supply
WS-C4506	Cisco Catalyst 4500 (6-slot chassis), fan, no power supply
WS-C4507R	Cisco Catalyst 4500 (7-slot chassis), fan, no power supply, redundant supervisor capable
WS-C4510R	Cisco Catalyst 4500 (10-slot chassis), fan, no power supply; redundant supervisor capable
PWR-C45-1000AC	Cisco Catalyst 4500 1000-watt AC power supply (Data only)
PWR-C45-1400AC	Cisco Catalyst 4500 1400-watt AC power supply (Data only)
PWR-C45-1300ACV	Cisco Catalyst 4500 1300-watt AC power supply (with integrated PoE)
PWR-C45-2800ACV	Cisco Catalyst 4500 2800-watt AC power supply (with integrated PoE)
PWR-C45-1400DC-P	Cisco Catalyst 4500 1400W DC power supply with Integrated PEM
WS-P4502-1PSU	Catalyst 4500 Aux. Power Shelf (2 slot), incl. 1 PWR-4502
PWR-4502	Catalyst 4500 Aux. Power Shelf Redundant Power Supply
WS-X4013+	Cisco Catalyst 4500 Series Supervisor Engine II-Plus
WS-X4013+TS	Cisco Catalyst 4503 Series Supervisor Engine II-Plus-TS. 12 10/100/1000 PoE (RJ-45) and 8 1000-X SFP ports included on Supervisor faceplate.
WS-X4515	Cisco Catalyst 4500 Series Supervisor Engine IV
WS-X4515/2	Cisco Catalyst 4507R Series Redundant Supervisor Engine IV
WS-X4516	Cisco Catalyst 4500 Series Supervisor Engine V
WS-X4516/2	Cisco Catalyst 4507R Series Redundant Supervisor Engine V
S4KL3-12218EW ¹	Cisco IOS Software: Basic Layer 3 software image (RIP, static routes, IPX, AppleTalk)
S4KL3K91-12218EW	Cisco IOS Software: Basic Layer 3 software image, (RIP, static routes, IPX, AppleTalk, 3DES)
S4KL3E-12218EW	Cisco IOS Software: Enhanced Layer 3 software image, (OSPF, EIGRP, and IS-IS)
S4KL3EK91-12218EW	Cisco IOS Software: Enhanced Layer 3 software image, (OSPF, EIGRP, and IS-IS, 3DES)
MEM-C4K-FLD64M	Cat 4500 IOS-based Supervisor, Compact Flash memory, 64-MB option

Product Number	Description
MEM-C4K-FLD128M	Cat 4500 IOS-based Supervisor, Compact Flash memory, 128-MB option

1. Enhanced Layer 3 software (S4KL3E-12218EW and S4KL3EK91-12218EW is available for the IV, and V only.

LICENSING

Use of Border Gateway Protocol Version 4 (BGP4) on the Supervisor Engine IV/V requires an InterDomain Routing license. Only one InterDomain Routing license is required per chassis.

Table 10. Licensing on the Cisco Catalyst 4500 Series

Product Number	Description
FR-IRC4(=)	Cisco Catalyst 4500 Supervisor Engine IV/V InterDomain Routing feature license

WARRANTY

The warranty for the Cisco Catalyst 4500 Series is 90 days; it includes hardware replacement with a 10-day turnaround from return to manufacturer authorization (RMA).

CISCO TECHNICAL SUPPORT SERVICES—EXTENDING NETWORK INTELLIGENCE THAT PROTECTS YOUR NETWORK INVESTMENT. NOW.

Cisco[®] Technical Support Services help to ensure that your Cisco products operate efficiently, remain highly available, and benefit from current system software to assist you in effectively managing your network service while controlling operational costs.

Cisco Technical Support Services provide significant benefits that go beyond what is offered under the Cisco warranty policy. Services available under a Cisco SMARTnet service contract that are not covered under a warranty are:

- Latest software updates
- Rapid replacement of hardware in next day, four-hour, or two-hour dispatch options
- Ongoing technical support through Cisco Technical Assistance Center (TAC)
- Registered access to Cisco.com

Table 11. Technical Support Services—Components

Service Feature Overview	Benefit/Advantage
Software Support	<p>Offers maintenance and minor and major updates for licensed feature set. Downloading new maintenance releases, patches, or updates of Cisco IOS Software helps to enhance and extend the useful life of Cisco devices. Through major software updates it is possible to extend the life of equipment and maximize application technology investments by:</p> <ul style="list-style-type: none"> • Increasing the performance of current functionality • Adding new functionality that, in many cases, requires no additional hardware investment • Enhancing network and/or application availability, reliability, and stability

Service Feature Overview	Benefit/Advantage
TAC Support	With more than 1000 highly-trained customer support engineers, 390 CCIEs, and access to 13,000 R&D engineers, Cisco TAC complements your in-house staff with a high level of knowledge in voice, video, and data communications networking technology. Its sophisticated call routing system quickly routes calls to the correct technology personnel. The Cisco TAC is available 24 hours a day, 365 days a year.
Cisco.com	This award-winning Web site provides 24x7 access to an extensive collection of online product and technology information, interactive network management and troubleshooting tools, and knowledge transfer resources that can help customers reduce costs by increasing staff self-sufficiency and productivity.
Advance Hardware Replacement	Advance Replacement and onsite field engineer options supply fast access to replacement hardware and field resources for installing hardware, minimizing the risk of potential network downtime.

Table 12. Technical Support Services—Competitive Differentiators

Feature	Benefit/Advantage
Worldwide Virtual Lab	This extensive lab of Cisco equipment and Cisco IOS software versions provides an invaluable engineering resource and knowledge base for training, product information, and recreation and testing of selected network issues to help decrease time-to-resolution.
TAC Training <ul style="list-style-type: none"> • Boot Camps • Tech Calls • Tech Forums 	Cisco is committed to providing customers the latest in technology support. These TAC training programs assist customers in case avoidance as well as provide knowledge transfer of Cisco networking expertise.
Cisco Live	A powerful suite of Internet-enabled tools with firewall-friendly features; these secure, encrypted Java applets can turn a simple phone call into an interactive collaboration session, allowing a customer and Cisco TAC support engineer to work together more effectively.
Global Logistics	Delivers award-winning, worldwide hardware replacement support with 650 depots, covering 120 countries, at a \$2.3 billion investment in inventory, leveraging 10,000 onsite field engineers.
Cisco IOS Software	Employs 100 discrete technologies with over 2000 features. 400 new features are added each year. Cisco IOS software is installed in more than 10 million devices and is running on more than 10,000 networks worldwide. It operates on the world's largest IPv6 and VoIP networks and in all major service provider networks worldwide.

FOR MORE INFORMATION

To learn more about how you can take advantage of Cisco Technical Support Services, talk to your Cisco representative or visit Cisco Technical Support Services at:

http://www.cisco.com/en/US/products/svcs/ps3034/ps2827/serv_group_home.html

For additional information on the Cisco Catalyst 4500 Series, visit:

<http://www.cisco.com/go/catalyst4500>

For additional information on Cisco products, contact:

United States and Canada: 800 553-NETS (6387)

Europe: 32 2 778 4242

Australia: 612 9935 4107

Other: 408 526-7209

<http://www.cisco.com>



Corporate Headquarters

Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
www.cisco.com
Tel: 408 526-4000
800 553-NETS (6387)
Fax: 408 526-4100

European Headquarters

Cisco Systems International
BV
Haarlerbergpark
Haarlerbergweg 13-19
1101 CH Amsterdam
The Netherlands
www-europe.cisco.com
Tel: 31 0 20 357 1000
Fax: 31 0 20 357 1100

Americas Headquarters

Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
www.cisco.com
Tel: 408 526-7660
Fax: 408 527-0883

Asia Pacific Headquarters

Cisco Systems, Inc.
168 Robinson Road
#28-01 Capital Tower
Singapore 068912
www.cisco.com
Tel: +65 6317 7777
Fax: +65 6317 7799

Cisco Systems has more than 200 offices in the following countries and regions. Addresses, phone numbers, and fax numbers are listed on **the Cisco Web site at www.cisco.com/go/offices.**

Argentina • Australia • Austria • Belgium • Brazil • Bulgaria • Canada • Chile • China PRC • Colombia • Costa Rica • Croatia • Cyprus
Czech Republic • Denmark • Dubai, UAE • Finland • France • Germany • Greece • Hong Kong SAR • Hungary • India • Indonesia • Ireland
Israel • Italy • Japan • Korea • Luxembourg • Malaysia • Mexico • The Netherlands • New Zealand • Norway • Peru • Philippines • Poland
Portugal • Puerto Rico • Romania • Russia • Saudi Arabia • Scotland • Singapore • Slovakia • Slovenia • South Africa • Spain • Sweden
Switzerland • Taiwan • Thailand • Turkey • Ukraine • United Kingdom • United States • Venezuela • Vietnam • Zimbabwe

Copyright © 2004 Cisco Systems, Inc. All rights reserved. CCIP, CCSP, the Cisco *Powered* Network mark, Cisco Unity, Follow Me Browsing, FormShare, and StackWise are trademarks of Cisco Systems, Inc.; Changing the Way We Work, Live, Play, and Learn, and iQuick Study are service marks of Cisco Systems, Inc.; and Aironet, ASIST, BPX, Catalyst, CCDA, CCDP, CCIE, CCNA, CCNP, Cisco, the Cisco Certified Internetwork Expert logo, Cisco IOS, the Cisco IOS logo, Cisco Press, Cisco Systems, Cisco Systems Capital, the Cisco Systems logo, Empowering the Internet Generation, Enterprise/Solver, EtherChannel, EtherSwitch, Fast Step, GigaStack, Internet Quotient, IOS, IP/TV, iQ Expertise, the iQ logo, iQ Net Readiness Scorecard, LightStream, Linksys, MGX, MICA, the Networkers logo, Networking Academy, Network Registrar, *Packet*, PIX, Post-Routing, Pre-Routing, RateMUX, Registrar, ScriptShare, SlideCast, SMARTnet, StrataView Plus, Stratm, SwitchProbe, TeleRouter, The Fastest Way to Increase Your Internet Quotient, TransPath, and VCO are registered trademarks of Cisco Systems, Inc. and/or its affiliates in the United States and certain other countries.

All other trademarks mentioned in this document or Web site are the property of their respective owners. The use of the word partner does not imply a partnership relationship between Cisco and any other company. (0402R) 204108.7_ETMG_KW_10.04

