Data Sheet

Cisco Catalyst 4500 Series

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

Overview

The Cisco Catalyst® 4500 Series offers nonblocking Layer2/3/4 switching with integrated resiliency, further enhancing control of converged networks. Converged voice/video/data networks with high availability enable business resiliency for ‘enterprise and metropolitan (metro) Ethernet customers deploying Internet-based business applications.

A next-generation Cisco Catalyst 4000 Family platform, the Cisco Catalyst 4500 Series includes three new Cisco Catalyst chassis: 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 only), integrated inline power for IP telephony, software-based fault tolerance, and 1 + 1 power supply redundancy. Integrated resiliency in both hardware and software minimizes network downtime, ensuring workforce productivity, profitability, and customer success.

As a key component of Cisco AVVID (Architecture for Voice, Video and Integrated Data), the Cisco Catalyst 4500 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 Cisco Catalyst 4000 Family line cards and supervisor engines, the Cisco Catalyst 4500 Series enables an extended window of deployment for the Cisco Catalyst 4000 Family in converged networks. This reduces the cost of ownership by minimizing recurring operational expenses, thus improving return on investment (ROI).

Cisco Catalyst 4500 Series Chassis

The Cisco Catalyst 4500 Series, with three chassis options and three supervisor engine options, provides a common architecture that scales to 240 ports of 10/100, 100BASE-FX Fast Ethernet, 1000BASE-LX, or 10/100/1000BASE-T Gigabit Ethernet. The Cisco Catalyst 4507R is the only Cisco Catalyst 4500 Series switch to support 1 + 1 redundant supervisor engines with sub-minute failover time.

Figure 1
Cisco Catalyst 4503, 4506, and 4507R Series

Using the same line cards and supervisor engines (Supervisor Engines II and III) as the widely deployed Cisco Catalyst 4000 Series, the Cisco Catalyst 4500 Series enhances the Cisco commitment to affordable enterprise and branch scalability, providing a cost-effective, flexible network solution that scales to meet today's high-performance needs with investment protection (refer to Table 1).

Table 1 Cisco Catalyst 4500 Series Chassis Features

Feature	Cisco Catalyst 4503 Chassis	Cisco Catalyst 4506 Chassis	Cisco Catalyst 4507R Chassis
Total number of slots	3	6	7
Supervisor engine slots	1[1]	1[1]	2[2]
Supervisor engine redundancy	No	No	Yes (Supervisor Engine IV only)
Supervisor engines supported	Supervisor II Supervisor III Supervisor IV	Supervisor II Supervisor III Supervisor IV	Supervisor IV
Line-card slots	2	5	5[2]
Number of power supply bays	2	2	2
AC input power	Yes	Yes	Yes
DC input power	Yes (future)	Yes (future)	Yes (future)
Integrated inline power (IP phone and wireless access point) support	Yes	Yes	Yes
Minimum number of power supplies	1	1	1
Number of fan-tray bays	1	1	1
Location of 19-inch rack-mount	Front	Front	Front
Location of 23-inch rack-mount	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 the Cisco Catalyst 4507R. Slots 3 and higher are reserved for line cards.

Note: Supervisor engine slots do not support switching line-card modules; line-card slots do not supportt supervisor engines.

Configuration Alternatives

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

Table 2 Cisco Catalyst 4500 Series Supervisor Engine Support and Performance

Feature	Supervisor Engine II (WS-X4013)	Supervisor Engine III (WS-X4014)	Supervisor Engine IV (WS-X4515)
Cisco Catalyst 4503 chassis	Supported 24-Gbps engine, 18 Mpps	Supported 28 Gbps, 21 Mpps	Supported 28 Gbps, 21 Mpps
Cisco Catalyst 4506 chassis	Supported 24 Gbps engine, 18 Mpps	Supported 64 Gbps, 48 Mpps	Supported 64 Gbps, 48 Mpps
Cisco Catalyst 4507R chassis	Not supported	Not supported	Supported 64 Gbps, 48 Mpps

Note: For a detailed list of Cisco Catalyst 4000 Family Supervisor Engine III and IV features, refer to the Cisco Catalyst 4000 Family Supervisor IV data sheet located on the Cisco Catalyst 4500 Series site:

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

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 any campus network (Table 3).

Table 3 Cisco Catalyst 4500 Series Port Densities

Cisco Catalyst 4000 Switching Modules	Number of Interfaces Supported per Line Card	Cisco Catalyst 4503	Cisco Catalyst 4506	Cisco Catalyst 4507R
Switched 10/100 Fast Ethernet (RJ-45)	32 or 48	96	240	240
Switched 10/100 Fast Ethernet (RJ-21)	48	96	240	240
Switched 100 Fast Ethernet (MT-RJ)	4, 24, or 48	96	240	240
Switched 1000 Gigabit Ethernet (fiber)	2, 6, 18, or 48	96	240	240
Switched 10/100/1000BASE-T Gigabit Ethernet	12 (1000BASE-T only), 24 or 48	96	240	240

Configuration Flexibility and Modular Superiority

The Cisco Catalyst 4503, 4506, and 4507R offer the same comprehensive, scalable suite of 10/100/1000-Mbps Ethernet switch modules as the Cisco Catalyst 4003 and 4006. A variety of Cisco Catalyst 4000 Family modules are available, which can be mixed and matched to suit a wide range of wiring-closet, data-center, 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-X4148-FX-MT—Cisco Catalyst 4000 Fast Ethernet Switching Module, 48-port 100BASE-FX multimode fiber (MMF) (MT-RJ)
- WS-X4148-RJ—Cisco Catalyst 4000 10/100 Module, 48 ports (RJ-45)
- WS-X4148-RJ21—Cisco Catalyst 4000 10/100 Module, 48-port telco (4 x RJ-21)
- WS-X4148-RJ45V—Cisco Catalyst 4000 Inline Power 10/100, 48 ports (RJ-45) for IP phones and wireless access points
- WS-X4232-GB-RJ—Cisco Catalyst 4000 32-Port 10/100 (RJ-45), 2-Gigabit Ethernet (GBIC) Module
- WS-X4232-L3[1]—Cisco Catalyst 4000 Layer 3 32-Port 10/100 (RJ-45), 2-Gigabit Ethernet (GBIC) Module
- WS-X4232-RJ-XX—Cisco Catalyst 4000 Layer 3 Services 32-port 10/100 (RJ-45), plus modular uplink slot
- WS-X4424-GB-RJ45—Cisco Catalyst 4000 24-Port 10/100/1000 Module (RJ-45)
- WS-X4306-GB—Cisco Catalyst 4000 Gigabit Ethernet Module, 6 ports (GBIC)
- WS-X4412-2GB-T—Cisco Catalyst 4000 Gigabit Ethernet Module, 12-port 1000BASE-T (RJ-45) + 2-port [1000BASE-X (GBIC)
- WS-X4418-GB—Cisco Catalyst 4000 Gigabit Ethernet Module, server switching, 18 ports (GBIC)
- WS-X4448-GB-LX—Cisco Catalyst 4000 48-port 1000BASE-LX (small form-factor pluggable [SFP])
- WS-X4448-GB-RJ45—Cisco Catalyst 4000 48-port 10/100/1000 Module (RJ-45)
- WS-U4504-FX-MT—Cisco Catalyst 4000 Fast Ethernet Uplink Daughter Card, 4-port 100BASE-FX (MT-RJ)
- WS-X4604-GWY[1]—Cisco Catalyst 4000 Access Gateway Module with IP/firewall software
- WS-X4095-PEM—Cisco Catalyst 4006 DC Power Entry Module
- WS-X4124-FX-MT—Cisco Catalyst 4000 Fast Ethernet Switching Module, 24-port [100BASE-FX (MT-RJ)
- WS-X4019[1]—Cisco Catalyst 4000 Backplane Channel Module
- WS-G5483[1]—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)
- Cisco CWDM GBIC solution

1. Supported with Supervisor Engine II with Cisco Catalyst Operating System (CatOS) Version 7.4(1) and up at FCS

Software Requirements

Table 4 gives requirements for the Cisco Catalyst Supervisor Engine Software, and Table 5 gives the differences between the Cisco Catalyst 4000 and 4500 Series switches.

Table 4 Cisco Catalyst Supervisor Engine Software Requirements Specification

Specification	Cisco Catalyst 4503 and 4506 with Supervisor Engine II	Cisco Catalyst 4503 and 4506 with Supervisor Engine III	Cisco Catalyst 4503 and 4506 and 4507R with Supervisor Engine IV
Minimum software requirement	Cisco CatOS Software Version 7.4(1) or higher	Cisco IOS® Software Version 12.1(12c)EW or higher	Cisco IOS Software Version 12.1(12c)EW or higher

Table 5 Key Differences Between Cisco Catalyst 4000 and 4500 Series

Feature	Cisco Catalyst 4003	Cisco Catalyst 4006	Cisco Catalyst 4503	Cisco Catalyst 4506	Cisco Catalyst 4507R
Inline power	No	Yes—With external power shelf	Yes—Integrated	Yes—Integrated	Yes—Integrated
Power supply redundancy	1 + 1	2 + 1	1 + 1	1 + 1	1 + 1
Supervisor engine redundancy	No	No	No	No	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 switching line cards[1]
Supervisor engines supported	Supervisor Engine I	Supervisor Engines II, III, and IV	Supervisor Engines II, III, and IV	Supervisor Engines II, III, and IV	Supervisor Engine IV
Power supplies supported	400-watt AC 400-watt DC	400-watt AC 400-watt DC	1000-watt AC 2800-watt ACV	1000-watt AC 2800-watt ACV	1000-watt AC 2800-watt ACV

1. WS-X4604-GWY will be supported in a future software release. WS-X4019 is not needed with Supervisor Engine IV.

Standard Network Protocols

- Ethernet
  - IEEE 802.3, 10BASE-T
- Fast Ethernet
  - IEEE 802.3u, 100BASE-TX
  - IEEE 802.3, 100BASE-FX

- Gigabit Ethernet
  - IEEE 802.3z
  - IEEE 802.3x
  - IEEE 802.3ab
- 1000BASE-X (GBIC)
  - 1000BASE-SX
  - 1000BASE-LX/LH
  - 1000BASE-ZX
- Virtual LAN (VLAN) trunking/tagging
  - IEEE 802.1Q
- Spanning-Tree Protocol
  - IEEE 802.1D
  - IEEE 802.1w
  - IEEE 802.1s
- Security
  - IEEE 802.1x

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 speeds 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 LAN Management Solution (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) agent 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)
- Remote Monitoring II (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
- Text-based command-line interface (CLI) based on the familiar Cisco Catalyst 5000 Series interface (Supervisor Engine II only)
- Standard Cisco IOS security capabilities: passwords and TACACS+
- Telnet, Trivial File Transfer Protocol (TFTP), BOOTP for management access

Physical Specifications

Table 6 gives the physical specifications of the Cisco Catalyst 4500 Series chassis, and Table 7 gives Cisco Catalyst 4500 power supply specifications.

Table 6 Physical Specifications of Cisco Catalyst 4500 Series Chassis

Specification	Cisco Catalyst 4503	Cisco Catalyst 4506	Cisco Catalyst 4507R
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)
Rack units	7 rack units high	10 rack units high	11 rack units high
Minimum weight:	52 lb	56 lb	57 lb
Maximum weight:	75 lb	100 lb	107 lb
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)

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 Power Supply Specifications

Power Supply (per power supply)	1000-Watt AC	2800-Watt ACV
Integrated voice (48V inline power)	No (data only)	Yes (up to 1400 watts)
Input current	• 13.2A maximum @ 100VAC • 6.6A maximum @ 200VAC	• 17.6A maximum @ 200VAC
AC Input Power Requirements	• 100–240V~ • 50/60 Hz • 12–5A	• 220–240V~ • 50/60 Hz • 16A
Output current (data)	12V@ 84.7A maximum	12V@ 115.3A maximum
Output current (voice)	n/a	48V@ 29.1A Maximum
KVA rating	1.32 KVA	3.52 KVA
Output power (data)	1000W + 40W (fan)	1360W + 40W (fan)
Output power (voice)	n/a	1400W per power supply
Heat dissipation	943 BTU/hr	2387 BTU/hr
Holdup time	20 ms	20 ms
Cisco phones supported with integrated inline power	None	Up to 240[1]

1. 240 phones are supported in power supply combined mode. Refer to the Cisco Catalyst 4500 IP Telephony white paper at the following URL for details on phone support.

Output power is per power supply, but total output power from two supplies is not twice the output of one power supply. See the specifications.

Heat dissipation numbers represent the power conversion losses of the power supply in operation.

Fan Trays

Each Cisco Catalyst 4500 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 only)

The Cisco Catalyst 4507R 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 card, for a total of five modules per chassis. All five fabric redundancy modules ship standard with every Cisco Catalyst 4507R chassis. The Cisco Catalyst 4507R also ships standard with redundant clocks. Spare fabric redundancy modules and clock modules are available for serviceability.

Environmental Conditions

- Operating temperature: 32º to 104ºF (0º to 40ºC)
- Storage temperature: –40º to 167ºF (–40º to 75ºC)
- Relative humidity: 10 to 90%, noncondensing
- Operating altitude: –60 to 4000 m

Regulatory Standards Compliance

Table 8 gives information regarding compliance of the Cisco Catalyst 4500 Series to regulatory standards.

Table 8 Regulatory Standards Compliance of Cisco Catalyst 4500 Series

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 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	• 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)	• CTR 12/13 • CTR 4 • ACA TS016
Telecom (T1)	• FCC Part 68 • Canada CS-03 • JATE Green Book

Ordering Information

Table 9 lists Cisco Catalyst 4500 common equipment ordering information details.

Table 9 Cisco Catalyst 4500 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
PWR-C45-1000AC	Cisco Catalyst 4500 1000-watt AC power supply (data only)
PWR-C45-2800ACV	Cisco Catalyst 4500 2800-watt AC power supply (with integrated voice)
WS-X4013	Cisco Catalyst 4000 Family Supervisor Engine II
WS-X4014	Cisco Catalyst 4000 Family Supervisor Engine III
WS-X4515	Cisco Catalyst 4000 Family Supervisor Engine IV
WS-X4515/2	Cisco Catalyst 4507R Series Redundant Supervisor Engine IV
S4KL3-12112EW	Cisco IOS Software for the Cisco Catalyst 4000 Family Supervisor Engines III and IV; basic Layer 3 software image (Routing Information Protocol [RIP], static routes, IPX, AppleTalk)
S4KL3E-12112EW	Cisco IOS Software for the Cisco Catalyst 4000 Family Supervisor Engines III and IV; enhanced Layer 3 software image, including Open Shortest (OSPF), Interior Gateway Routing Protocol (IGRP), and Enhanced IGRP (EIGRP)
MEM-C4K-FLD64M	Cisco Catalyst 4000 Family compact Flash memory for Supervisor III or IV, 64-MB option
MEM-C4K-FLD128M	Cisco Catalyst 4000 Family compact Flash memory for Supervisor III or IV, 128-MB option

Licensing

Use of RMON on the Cisco Catalyst 4500 Series switches requires the purchase of the RMON agent license. Use of Border Gateway Protocol Version 4 (BGP4) on the Supervisor Engine III or IV requires an InterDomain Routing license. Only one RMON agent license or InterDomain Routing license is required per chassis.

Product Number	Description
WS-C4503-EMS-LIC(=)	Cisco Catalyst 4503 RMON Agent License
WS-C4506-EMS-LIC(=)	Cisco Catalyst 4506 RMON Agent License
WS-C4507R-EMS-LIC(=)	Cisco Catalyst 4507R RMON Agent License
FR-IRC4(=)	Cisco Catalyst 4000 Supervisor III and IV 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).

Service and Support

Cisco Systems is committed to maximizing the total cost your network investment. Cisco offers a portfolio of Technical Support Services to ensure that your Cisco products operate efficiently, remain highly available, and benefit from the most up-to-date system software. The Technical Support Services includes Cisco Smartnet Support and Software Application Services. For more information visit the Technical Assistance Center website:

http://www.cisco.com/tac/.

For more information on TIS, visit:

For more information on Cisco SMARTnet support, visit:

http://www.cisco.com/warp/public/cc/serv/mkt/sup/ent/snet/.

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