



# Cisco Catalyst 4500 Switch Modules Datasheet



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## CONTENT

Overview .....	2
Appearance .....	2
CISCO Catalyst 4500 Series Line Cards Features .....	4
CISCO Catalyst 4500 NetFlow Service Card Features.....	4
CISCO Catalyst 4500 Series Supervisor Engine Features .....	5
CISCO Catalyst 4500 Switch Modules Product Specifications .....	7
CISCO Catalyst 4500 Switch Modules Basic Ordering Information.....	11
Sources .....	14

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## OVERVIEW

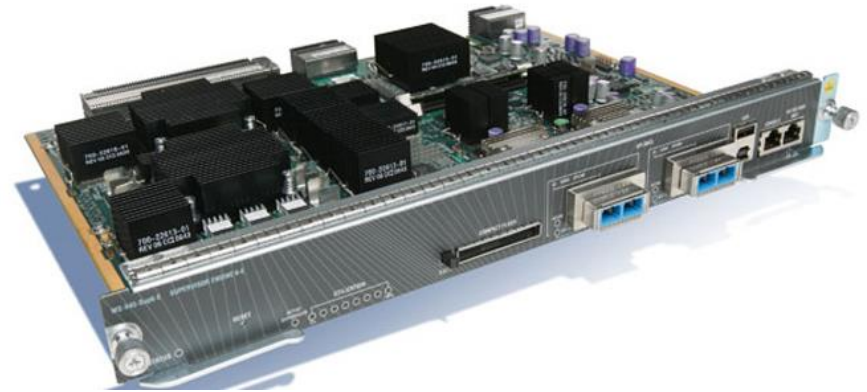
Cisco 4500 Switch Modules can extend the usefulness of your Cisco Catalyst 4500 Switches by installing the modules in your system. Here you can find Catalyst 4500 E-Series Supervisor Engine, Cisco 4500 Line Card, Catalyst 4500 GE Module, Catalyst 4500 NetFlow Services Card, etc.

## APPEARANCE

**Figure 1.** Cisco Catalyst 4500 Series Supervisor Engine V



**Figure 2.** Cisco Catalyst 4500 Supervisor Engine 6-E



**Figure 3.** Cisco Catalyst 4500E Supervisor Engine 7-E



**Figure 4.** Cisco Catalyst 4500E Supervisor Engine 8L-E



**Figure 5.** Cisco Catalyst 4500E Supervisor Engine 9-E



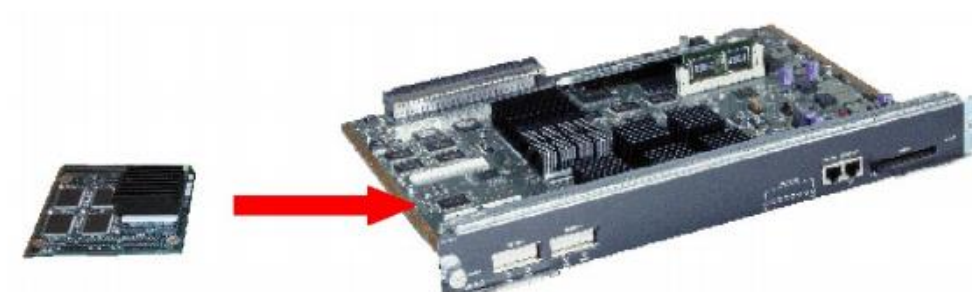
**Figure 6.** Cisco Catalyst 4500 Series Supervisor Engine V-10GE



**Figure 7.** Cisco Catalyst 4500 NetFlow Services Card



**Figure 8.** NetFlow Services Card and Supervisor Engine IV



NetFlow Services Card

Supervisor Engine IV

## CISCO CATALYST 4500 SERIES LINE CARDS FEATURES

Cisco® Catalyst® 4500 Series Switches enable borderless unified wired and wireless networks, providing high-performance, mobile, and secure user experiences through Layer 2-4 switching. Enabling security, mobility, application performance, video, and energy savings over your network infrastructure, the Cisco Catalyst 4500 Switch supports resiliency, virtualization, and automation, further improving the ease of network use. 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 Switch delivers predictable and scalable high performance, with advanced dynamic quality of service (QoS) capabilities and configuration flexibility for deploying borderless networks. Integrated resiliency features in both hardware and software maximize network availability, helping to ensure workforce productivity, profitability, and customer success. Its centralized, innovative, and flexible system design helps ensure smooth migration to wire-speed IPv6 and 10 Gigabit Ethernet (GE). The forward and backward compatibility between generations of the Cisco Catalyst 4500 Series extends deployment life, providing exceptional investment protection, while reducing the (TCO).

The Cisco Catalyst 4500E Series is a high-performance, next-generation extension to the Cisco Catalyst 4500 Series. The new E-Series is composed of the Cisco Catalyst 4500E Series supervisor engines, E-Series line cards, and E-Series chassis, which are designed for a high-performance, mobile, and secure user experience with superior backward and forward compatibility, delivering exceptional investment protection for organizations of all sizes.

### Cisco Catalyst 4500E Series and Classic Line Cards

The Cisco Catalyst 4500 Series offers two classes of line cards: classic and E-Series. Classic line cards provide 6 gigabits of switching capacity per slot. E-Series line cards provide increased switching capacity per slot. This increase in per-slot switching capacity with the E-Series line cards requires the Cisco Catalyst 4500E Series chassis and the Cisco Catalyst 4500E Series Supervisor. Two types of E-Series line cards are available based on the per-slot switching capacity. E-Series line cards numbered 47xx operate at 48 gigabits per slot, while E-Series line cards numbered 46xx operate at 24 gigabits per slot. Classic line cards may be deployed in both classic and E-Series chassis with either classic Cisco Catalyst 4500 Series supervisor engines or with the Cisco Catalyst 4500E Series Supervisor Engine. With the E-Series supervisor engine, the per-slot switching capacity for classic line cards remains at 6 gigabits per slot. However, because of the centralized switching architecture of the Cisco Catalyst 4500, the classic line cards will adopt all of the new E-Series supervisor engine features such as eight queues per port, dynamic QoS, and hardware-based IPv6 routing. For more feature details, refer to the E-Series supervisor engine data sheet. Classic line cards and E-Series line cards may be mixed and matched within a Cisco Catalyst 4500E Series chassis with no performance degradation: classic line cards will operate at 6 gigabits per slot, and E-Series line cards operate at either 48 gigabits per slot or 24 gigabits per slot based on whether they belong to the 47xx or 46xx family of line cards. Table 1 summarizes the chassis and supervisor support for both classic and E-Series line cards.

## CISCO CATALYST 4500 NETFLOW SERVICE CARD FEATURES

The initial software release of the NetFlow Services Card supports NetFlow versions 1 and 5 and will provide the following functionalities:

- NetFlow Statistics Collection and NetFlow Data Export (NDE)
  - Supported fields:
    - Source and destination IP address
    - IP Protocol • Layer 4 source and destination ports (for TCP/UDP or 0 otherwise)
    - Start and end timestamps
    - Packet counts and byte counts
- VLAN statistics collection
- CLI support for NetFlow and VLAN statistics
- SNMP support for VLAN statistics

Future software releases will support NetFlow version 8 which includes:

- NetFlow Aggregation Support (NFX)

## CISCO CATALYST 4500 SERIES SUPERVISOR ENGINE FEATURES

<b>Cisco Catalyst 4500E Supervisor Engine 7-E Performance and Scalability Features</b>	
Feature and Description	Supervisor Engine 7-E
Centralized switching capacity	848 Gbps
Per-slot switching capacity	48 Gbps
Throughput	<ul style="list-style-type: none"> <li>● 250 Mpps for IPv4</li> <li>● 125 Mpps for IPv6</li> <li>● 250 Mpps for L2 Bridging</li> </ul>
IPv4 routing entries	256,000
IPv6 routing entries	128,000
Multicast routes	16,000 (available with Cisco IOS XE 3.1.0 SG) 32,000 (Available with Cisco IOS XE 3.2.0 SG or later)
CPU	Dual core; 1.5 GHz
CPU queues	64
Synchronous dynamic RAM (SDRAM)	2 GB upgradable to 4 GB
Nonvolatile RAM (NVRAM)	1 GB
Security and QoS hardware entries	128,000
Cisco Network Admission Control (NAC) and Dynamic Host Configuration Protocol (DHCP) snooping entries	12,000
MAC addresses	55,000
Active VLANs	4,094
Address Resolution Protocol (ARP) entries	47,000
Spanning Tree Protocol instances	10,000
Switched virtual interfaces (SVIs)	4,094
Switched Port Analyzer (SPAN)	Maximum of 8 sessions: ingress or egress
<b>Cisco Catalyst 4500 Supervisor Engine 6-E Performance and Scalability Features</b>	
Feature and Description	Supervisor Engine 6-E
Centralized switching capacity	320 Gbps



Per-slot switching capacity	24 Gbps
Throughput	250 Mpps for IPv4 125 Mpps for IPv6 250 Mpps for L2 Bridging
IPv4 Routing entries	256,000
IPv6 Routing entries	128,000
Multicast routes	32,000
CPU	1.3 GHz
CPU queues	64
Synchronous Dynamic RAM (SDRAM)	512 MB upgradable to 1 GB
Nonvolatile RAM (NVRAM)	No through Boot flash (64 MB)
Security and QoS hardware entries	128,000
Cisco Network Admission Control (NAC) and Dynamic Host Configuration Protocol (DHCP) Snooping entries	12,000
MAC addresses	55,000
Active VLANs	4096
Spanning Tree Protocol instances	10,000
Switched virtual interfaces (SVIs)	4096
Switched Port Analyzer (SPAN)	Maximum of 8 sessions: ingress and or egress
<b>Cisco Catalyst 4500E Supervisor Engine 8-E Performance and Scalability Features</b>	
Features	Performance and Scalability
Centralized Wired Switching Capacity	Up to 928 Gbps
Wireless Termination Capacity	Up to 20 Gbps (software Roadmap)
Per-slot Switching Capacity	48 Gbps
Throughput	<ul style="list-style-type: none"> <li>● 250 Mpps for IPv4</li> <li>● 125 Mpps for IPv6</li> </ul>
IPv4 Routing Entries	256,000
IPv6 Routing Entries	128,000
Multicast Routes	32,000
CPU	Quad core; 2.0 GHz
CPU Queues	64
Synchronous Dynamic RAM (SDRAM)	4 GB

Nonvolatile RAM (NVRAM)	2 GB
Security and QoS Hardware Entries	128,000
Dynamic Host Configuration Protocol (DHCP) Snooping Entries	12,000
MAC Addresses	55,000
Active VLANs	4094
Address Resolution Protocol (ARP) Entries	47,000
Spanning Tree Protocol Instances	10,000
Switched Virtual Interfaces (SVIs)	4094
Switched Port Analyzer (SPAN)	Maximum of 8 bi-directional sessions

## CISCO 4500 SWITCH MODULES PRODUCT SPECIFICATIONS

### Cisco Catalyst 4500 Series Line Cards Specifications

Feature	Description
Standards	<ul style="list-style-type: none"> <li>● Gigabit Ethernet: IEEE 802.3z, IEEE 802.3x, IEEE 802.3ab, IEEE 803.3at, IEEE 802.3af, IEEE 802.3az</li> <li>● 1000BASE-X (GBIC), 1000BASE-SX, 1000BASE-LX/LH, 1000BASE-ZX, CWDM</li> </ul>
EtherChannel Technology	<ul style="list-style-type: none"> <li>● Gigabit EtherChannel: All 1000 Mbps ports</li> <li>● 10 Gigabit EtherChannel: All 10Gbps ports</li> <li>● IEEE 802.3ad (Link Aggregation Control Protocol): All 1000 Mbps ports</li> <li>● Port Aggregation Protocol (PagP): Yes</li> <li>● Number of ports per tuple: 8</li> <li>● EtherChannel and IEEE 802.3ad technology across line cards: Yes</li> </ul>
Physical Dimensions	<ul style="list-style-type: none"> <li>● Occupies one slot in the Cisco Catalyst 4500 Series platform</li> <li>● Dimensions (H x W x D): 1.2 x 14.25 x 10.75 in. (3.0 x 36.2 x 27.3 cm)</li> </ul>



Environmental Conditions	<ul style="list-style-type: none"> <li>● Operating temperature: 32° to 104°F (0° to 40°C)</li> <li>● Storage temperature: -40° to 167°F (-40° to 75°C)</li> <li>● Relative humidity: 10 to 90%, noncondensing</li> <li>● Operating altitude: -60 to 3000m</li> </ul>
Safety Conditions	Fiber optic lasers: Class 1 laser products
Safety Certifications	<ul style="list-style-type: none"> <li>● UL 1950</li> <li>● EN 60950</li> <li>● CSA-C22.2 no 950</li> <li>● IEC 950</li> <li>● IEC 60950-1, 2nd Ed. EN 60950-1, 2nd Ed. UL 60950-1, 2nd Ed. CAN/CSA-C22.2 No. 60950-1 2nd Ed.11</li> </ul>
Electromagnetic Emissions Certifications	<ul style="list-style-type: none"> <li>● FCC 15J Class A</li> <li>● VCCI Class A</li> <li>● CE Marking</li> <li>● EN 55022 Class A</li> <li>● EN 55024 Class A</li> <li>● CISPR 22 Class A</li> <li>● AS/NZ 3548</li> <li>● NEBS Level 3 (GR-1089-CORE, GR-63-CORE)</li> <li>● ETSI ETS-300386-2</li> <li>● EN 50121-4</li> </ul>
ROHS Compliance	ROHS5

#### Port Information for Line Cards

Line Card	Port Speed	Port Type	Wire Rate	Cisco Catalyst 4500 Series Min/Max Ports
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	Number of Ports				4503-E	4506-E/ 4507R-E/ 4507R+E	4510R-E/ 4510R+E
<b>E-Series 10 Gigabit Ethernet Line Cards</b>							
WS-X4712-SFP+E5	12	10GBASE-R	SFP+ or SFP	2.5-to-1 with SFP+  1:1 with SFP	12/246	12/605	12/965
<a href="#"><u>WS-X4606-X2-E</u></a>	6	10GBASE-X	X2 or SFP with TwinGig Converter Module	2.5-to-1 with X2  1:1 with SFP	6/125  12/245	6/305  12/605	6/305  12/605
<b>E-Series 10/100/1000/Multigigabit Line Cards</b>							
WS-X4748-12X48U+E	48	12 Multigigabit 100/1000/2.5G/5G/10GBASE-T ports and 36 10/100/1000 ports	RJ-45 UPOE IEEE 802.3at, IEEE 802.3af, Cisco prestandard	1:1 for speeds up to 1000Mbps on all ports  Multigigabit ports for 10G speeds: Mode1: 10-to-1  Mode27: 5-to-1  Mode37: 2.5-to-1	48/966	48/2405,6	48/3845,6,8
<a href="#"><u>WS-X4748-UPOE+E</u></a>	48	10/100/1000	RJ-45 UPOE IEEE 802.3at, IEEE 802.3af, Cisco prestandard	1:1	48/966	48/2406	48/3846,9
<a href="#"><u>WS-X4748-RJ45V+E</u></a>	48	10/100/1000	RJ-45 PoE IEEE 802.3at, IEEE 802.3af, Cisco prestandard	1:1	48/966	48/2406	48/3846,9

<a href="#"><u>WS-X4748-RJ45-E</u></a>	48	10/100/1000	RJ-45	1:1	48/966	48/2406	48/3846,9
<a href="#"><u>WS-X4648-RJ45V+E</u></a>	48	10/100/1000	RJ-45 PoE IEEE 802.3at, IEEE 802.3af, Cisco prestandard	2-to-1	48/966	48/2406	48/3846,9
WS-X4648-RJ45V-E	48	10/100/1000	RJ-45 PoE IEEE 802.3af, Cisco prestandard	2-to-1	48/966	48/2406	48/3846,9
<a href="#"><u>WS-X4648-RJ45-E</u></a>	48	10/100/1000	RJ-45	2-to-1	48/966	48/2406	48/3846,9

5 WS-X4712-SFP+E and WS-X4748-12X48U+E are not supported on 4507R-E and 4510R-E chassis.

6 E-Series line cards require E-Series chassis.

7 In Mode2, ports 13-24 are inactive, in Mode3, ports 13-48 are inactive.

8 Requires Supervisor Engine 8-E/7-E to support greater than 240 ports on 4510R+E chassis.

9 Requires Supervisor Engine 8-E/7-E to support greater than 240 ports on 4510R+E and 4510R-E chassis.

#### E-Series Gigabit Ethernet SFP Line Cards

<a href="#"><u>WS-X4748-SFP-E</u></a>	48	1GbE/100Mbps	Pluggables	1:1	48/96	48/240	48/384
<a href="#"><u>WS-X4724-SFP-E</u></a>	24	1GbE/100Mbps	Pluggables	1:1	24/48	24/120	24/192
<a href="#"><u>WS-X4712-SFP-E</u></a>	12	1GbE/100Mbps	Pluggables	1:1	12/24	12/60	12/96
<a href="#"><u>WS-X4624-SFP-E</u></a>	24	1000	Pluggables	1:1	24/48	24/120	24/168
<a href="#"><u>WS-X4612-SFP-E</u></a>	12	1000	Pluggables	1:1	12/28	12/64	12/100
WS-X4640-CSFP-E	40 with SFP  80 with CSFP	1000	Pluggables	2:1 with SFP  4:1 with CSFP	40/160	40/400	Not supported

#### Classic 10/100/1000 Line Cards

<a href="#"><u>WS-X4548-RJ45V+</u></a>	48	10/100/1000	RJ-45 PoE IEEE 802.3at, IEEE 802.3af, Cisco prestandard	8-to-110	48/96	48/240	48/384
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<a href="#"><u>WS-X4548-GB-RJ45V</u></a>	48	10/100/1000	RJ-45 PoE IEEE 802.3af and Cisco prestandard	8-to-1	48/96	48/240	48/384
<a href="#"><u>WS-X4524-GB-RJ45V</u></a>	24	10/100/1000	RJ-45 PoE IEEE 802.3af and Cisco prestandard	4-to-1	24/48	24/120	24/168
<a href="#"><u>WS-X4548-GB-RJ45</u></a>	48	10/100/1000	RJ-45	8-to-1	48/96	48/240	48/384
<b>Classic Gigabit Ethernet Fiber (GBIC or SFP) Line Cards</b>							
<a href="#"><u>WS-X4306-GB</u></a>	6	1000BASE-X	GBIC	Yes	6/12	6/30	6/42
<a href="#"><u>WS-X4418-GB</u></a>	18	1000BASE-X	GBIC	2 ports full 16 ports 4-to-1	18/36	18/90	18/126
WS-X4448-GB-LX	48	1000BASE-LX	48 SFPs (included)	8-to-1	48/96	48/240	48/384
<a href="#"><u>WS-X4448-GB-SFP</u></a>	48	1000BASE-X	SFP	8-to-1	48/96	48/240	48/384
<a href="#"><u>WS-X4506-GB-T</u></a>	6 + 6	10/100/1000	1000BASE-X (SFP) RJ-45 PoE IEEE 802.3af and Cisco prestandard	Yes	6/12	6/30	6/42
<b>Classic Fast Ethernet Fiber Line Cards</b>							
<a href="#"><u>WS-X4248-FE-SFP</u></a>	48	100BASE-X	SFP	Yes	48/96	48/240	48/384
WS-X4248-FX-MT	48	100BASE-FX	MT-RJ	Yes	48/96	48/240	48/384
<b>Classic 10/100 Ethernet Line Cards</b>							
<a href="#"><u>WS-X4148-RJ</u></a>	48	10/100	RJ-45	Yes	48/96	48/240	48/384
<a href="#"><u>WS-X4248-RJ45V</u></a>	48	10/100	RJ-45 PoE IEEE 802.3af and Cisco prestandard	Yes	48/96	48/240	48/384

## CISCO 4500 SWITCH MODULES BASIC ORDERING INFORMATION

### Cisco Catalyst 4500 Series Supervisor Engine

<a href="#"><u>WS-X4516-10GE</u></a>	Cisco Catalyst 4500 Series Supervisor Engine V-10GE
<a href="#"><u>WS-X45-SUP6-E</u></a>	Cisco Catalyst 4500 Series Supervisor Engine 6-E
<a href="#"><u>WS-X45-SUP6L-E</u></a>	Cisco Catalyst 4500 Series Supervisor Engine 6L-E
<a href="#"><u>WS-X45-SUP7-E</u></a>	Cisco Catalyst 4500 Series Supervisor Engine 7-E
<a href="#"><u>WS-X45-SUP7L-E</u></a>	Cisco Catalyst 4500 Series Supervisor Engine 7L-E
<a href="#"><u>WS-X45-SUP8-E</u></a>	Cisco Catalyst 4500 Series Supervisor Engine 8-E
<a href="#"><u>WS-X45-SUP8L-E=</u></a>	Cisco Catalyst 4500 Series Supervisor Engine 8L-E
<b>Cisco 4500 Line Card</b>	
Part Number ( " = " Indicates " Spare ")	Product Name
WS-X4748-12X48U+E (=)	Cisco Catalyst 4500E Series 48-Port UPOE w/ 12p multigigabit and 36p 10/100/1000 (RJ-45)
WS-X4748-UPOE+E (=)	Cisco Catalyst 4500E Series 48-Port UPOE 10/100/1000 (RJ-45)
WS-UPOE-12VPSPL(=)	Cisco Catalyst 4500E Series UPOE Power Splitter
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-X4640-CSFP-E (=)	Cisco Catalyst 4500E Series 40 SFP/80 C-SFP Port 1000BaseX (SFPs Optional)
WS-X4648-RJ45-E (=)	Cisco Catalyst 4500E Series 48-Port 10/100/1000 (RJ-45)
WS-X4648-RJ45V-E (=)	Cisco Catalyst 4500E Series 48-Port 802.3af PoE 10/100/1000 (RJ-45)
WS-X4648-RJ45V+E (=)	Cisco Catalyst 4500E Series 48-Port 802.3af PoE and PoEP - 10/100/1000 (RJ-45)
WS-X4606-X2-E (=)	Cisco Catalyst 4500E Series 6-Port 10 Gigabit Ethernet (X2)
WS-X4548-GB-RJ45V(=)	Cisco Catalyst 4500 PoE IEEE 802.3af 10/100/1000, 48 Ports (RJ-45)
WS-X4548-RJ45V+(=)	Cisco Catalyst 4500 PoE IEEE 802.3af and PoEP-Ready 10/100/1000, 48 Ports (RJ-45)

WS-X4548-GB-RJ45(=)	Cisco Catalyst 4500 Enhanced 48-Port 10/100/1000 Module (RJ-45)
WS-X4506-GB-T(=)	Cisco Catalyst 4500 6-Port 10/100/1000 RJ-45 PoE IEEE 802.3af and 1000BASE-X (SFP)
WS-X4306-GB(=)	Cisco Catalyst 4500 Gigabit Ethernet Module, 6 Ports (GBIC)
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-Port 1000X (SFP)
WS-X4248-FE-SFP (=)	Cisco Catalyst 4500 Fast Ethernet Switching Module, 48-Port 100BASE-X (SFP)
WS-X4148-RJ(=)	Cisco Catalyst 4500 10/100 Module, 48 Ports (RJ-45)
WS-X4148-FX-MT(=)	Cisco Catalyst 4500 Series 48-Port 100BASE-FX Fast Ethernet Line Card (MT-RJ) for multimode fiber
WS-X4248-RJ45V(=)	Cisco Catalyst 4500 PoE IEEE 802.3af 10/100, 48 Ports (RJ-45)
<b>Catalyst 4500 NetFlow Services Card</b>	
WS-F4531(=)	Catalyst 4500 NetFlow Services Card (Sup IV/V)

## SOURCES

<https://www.cisco.com/c/en/us/products/switches/catalyst-4500-series-switches/index.html>