# New Cisco Catalyst 4948E-F Ethernet Switch for High-Performance Data Center Access

PB638058

Cisco is extending the widely deployed Cisco Catalyst® 4948E Ethernet Switch to offer back-to-front airflow with the Cisco Catalyst 4948E-F Switch. In addition to back-to-front airflow, the Cisco Catalyst 4948E-F offers forty-eight 10/100/1000-Gbps RJ45 downlink ports and four fiber uplink ports capable of Gigabit Ethernet and 10 Gigabit Ethernet. This switch is designed to simplify data center architecture and operations by offering enterprise-class hardware and software in a one-rack-unit (1RU) form factor optimized for smart top-of-rack (ToR) data center deployments (Figure 1).

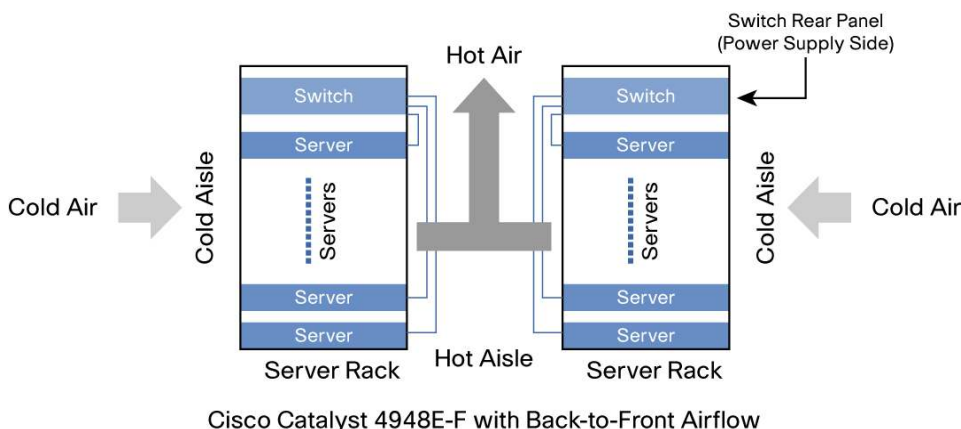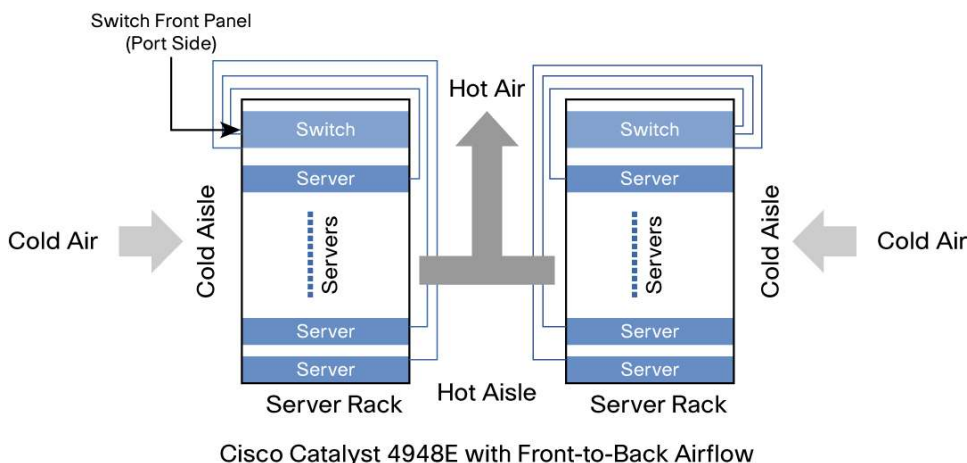**Figure 1.** Cisco Catalyst 4948E-F
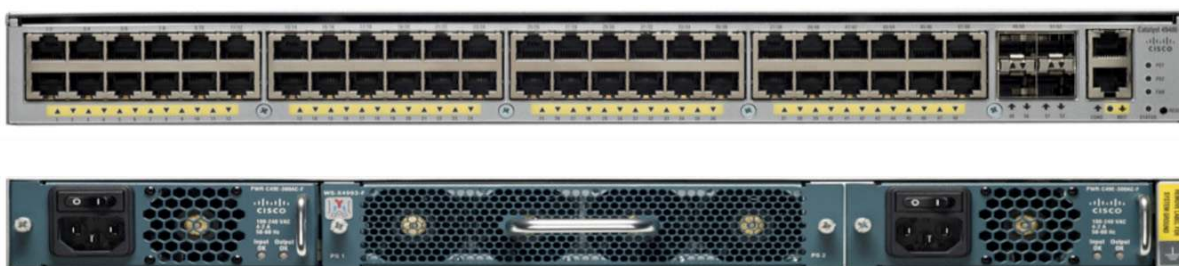
1 RU, 48x 10/100/1000 Server Links
4x 1 and 10 Gigabit Ethernet SFP and SFP+ Uplinks
176 Gbps Bandwidth

Hot-aisle and cold-aisle deployment remains the widely adopted best practice for data center cabinet layouts today. Networking switches and computing servers mounted in a single cabinet need to maintain the separation of the inlet cold air and the exhaust hot air for efficient use of cooling resources. The Cisco Catalyst 4948E and 4948E-F switches provide the option of front-to-back airflow (Cisco Catalyst 4948E) and back-to-front airflow (Cisco Catalyst 4948E-F) in ToR switch deployments. Table 1 summarizes the deployment scenarios for the Cisco Catalyst 4948E and 4948E-F to help you decide which switch to use.

Table 1. Deployment Decision Factors and Switch Selection

Switch Choice	Decision Factors
Cisco Catalyst 4948E	• Server-to-switch cable patch panel facing the cold aisle • Network ports face the cold aisle • Upgrading from traditional front-connected ToR switches
Cisco Catalyst 4948E-F	• Cable patch panel facing the hot aisle • Network ports face the hot aisle • Server-to-switch connectivity is without the patch panel

Figures 2 and 3 show data center server-to-switch connectivity scenarios for the Cisco Catalyst 4948E and 4948E-F.

Figure 2. Cold-Aisle and Hot-Aisle Isolation Using Back-to-Front Airflow with Cisco Catalyst 4948E-F

Cisco Catalyst 4948E-F with Back-to-Front Airflow

Figure 3. Cold-Aisle and Hot-Aisle Isolation Using Front-to-Back Airflow with Cisco Catalyst 4948E

Cisco Catalyst 4948E with Front-to-Back Airflow

New Features

The Cisco Catalyst 4948E-F offers:

- Hardware and software feature parity with the Cisco Catalyst 4948E
- True back-to-front airflow

Table 2 summarizes the main features of the Cisco Catalyst 4900 Series Switches.

Table 2. Cisco Catalyst 4900 Series Features

Feature and Description	Cisco Catalyst 4948 Switch	Cisco Catalyst 4948 10 Gigabit Ethernet Switch	Cisco Catalyst 4900M Switch	Cisco Catalyst 4948E and 4948E-F Switches
Environmental				
Height	1RU	1RU	2RU	1RU
Dimensions (H x W x D)	1.71 x 17.3 x 16.1 in. (4.3 x 43.9 x 40.9 cm)	1.71 x 17.3 x 16.1 in. (4.3 x 43.9 x 40.9 cm)	3.5 x 17.2 x 17.9 in. (8.9 x 43.7 x 45.5 cm)	1.75 x 17.5 x 19.4 in. (4.4 x 44.4 x 49.3 cm)
Power redundancy	1+1 AC or DC	1+1 AC or DC	1+1 AC or DC	1+1 AC or DC
Unit weight	16.5 lb (7.48 kg)	16.5 lb (7.48 kg)	34.0 lb (15.4 kg)	19 lb (8.62 kg)
Hot-swappable fan	Yes	Yes	Yes	Yes
Average and maximum power consumption (in watts [W])	176W average 300W maximum	212W average 300W maximum	300W average 446W maximum	230W average 275W maximum

Feature and Description	Cisco Catalyst 4948 Switch	Cisco Catalyst 4948 10 Gigabit Ethernet Switch	Cisco Catalyst 4900M Switch	Cisco Catalyst 4948E and 4948E-F Switches
Airflow	Side to back	Side to back	Side to back	Front to back (Cisco Catalyst 4948E) Back to front (Cisco Catalyst 4948E-F)
Rack-mounting options	Front and rear mount	Front and rear mount High-performance rear mount	Four-post rack-side rail mount High-performance mount	Front and rear mount High-performance rear mount
Uplink optic types	Four Small Form-Factor Pluggable (SFP) optics	Two X2 (10 Gigabit Ethernet) optics	Eight X2 (10 Gigabit Ethernet) optics	SFP and SFP+
Cisco® TwinGig Converter Module support	No	No	Yes (WS-X4908-10GE only)	No
Cisco OneX Converter Module support (X2 to SFP+)	No	No	Yes	No
Optics	LH, SX, ZX, and CWDM	LR, CX4, LX4, SR, ER, LRM, ZR, and DWDM	X2: LR, CX4, LX4, SR, ER, LRM, ZR, and DWDM SFP+: SR	CWDM, DWDM, SR, LR, LRM, and CX4
Modular half-card slots	0	0	2	0
Ports				
Maximum 10/100/1000-Gbps ports	48	48	40	48
Maximum Gigabit Ethernet (fiber) ports	4	0	32 (Cisco TwinGig Converter Module)	4
Maximum 10 Gigabit Ethernet (10GBASE-T) ports	0	0	16	0
Maximum 10 Gigabit Ethernet (fiber) ports	0	2 (X2)	24 (X2)*	4 (SFP+)
Performance and Scalability				
Switching capacity	96 Gbps	136 Gbps	320 Gbps	176 Gbps
Throughput	72 million packets per second (mpps)	102 mpps	250 mpps for IPv4 125 mpps for IPv6	131 mpps for IPv4 110 mpps for IPv6
Routes supported	32,000	32,000	256,000	57,000
MAC addresses	32,000	55,000	55,000	55,000
Per-VLAN Spanning Tree (PVST) Protocol and VLAN IDs	4094	4094	4094	4094
Spanning Tree Protocol instances	4094	4094	4094	4094
Switched virtual interfaces (SVIs)	2000	2000	4094	4094
Active VLANs	4094	4094	4094	4094
Multicast routes	28,000	28,000	28,000	28,000
Security and quality-of-service (QoS) hardware entries	32,000	32,000	128,000	32,000
Switched Port Analyzer (SPAN)	2 ingress and 4 egress	2 ingress and 4 egress	8 ingress and 8 egress	8 ingress and 8 egress
Shared buffer	16 MB	16 MB	17.5 MB	17.5 MB
CPU	266 MHz	666 MHz	1.3 GHz	1 GHz
Synchronous dynamic RAM (SDRAM)	256 MB	256 MB	512 MB	1 GB
Multilayer switching	LAN Base, IP Base, and Enterprise Services options	LAN Base, IP Base, and Enterprise Services options	LAN Base, IP Base, and Enterprise Services options	LAN Base, IP Base, and Enterprise Services options
IPv6 support	Software switched	Software switched	Hardware switched	Hardware switched
USB port	No	No	Yes	No
Compact flash memory support	No	No	Yes	No

Feature and Description	Cisco Catalyst 4948 Switch	Cisco Catalyst 4948 10 Gigabit Ethernet Switch	Cisco Catalyst 4900M Switch	Cisco Catalyst 4948E and 4948E-F Switches
System reset button	No	No	Yes	Yes
Minimum software requirements	Cisco IOS® Software Release 12.2(20)EWA or later	Cisco IOS Software Release 12.2(25)EWA or later	Cisco IOS Software Release 12.2(46)SG or later	Cisco IOS Software Release 12.2(54)SG or later (Cisco Catalyst 4948E) Cisco IOS Software Release 12.2(54)WO or later (Cisco Catalyst 4948E-F)

* X2 can be converted to SFP+ using the Cisco OneX Converter Module.

Cisco IOS Software

Cisco IOS Software is a proven network OS that offers best-in-class availability, manageability, and scalability.

The Cisco Catalyst 4948E and 4948E-F support three levels of Cisco IOS Software. The basic level is LAN Base, developed for deployments that require data center-class hardware along with Layer 2 switching but not advanced features such as routing and Cisco IOS Embedded Event Manager (EEM). The next level of software is IP Base; this level supports static routes, Routing Information Protocol (RIP) Versions and 2, and Enhanced Interior Gateway Routing Protocol Stub (EIGRP-Stub) for limited routing. The top level of software is Enterprise Services; this level adds support for advanced routing protocols such as Border Gateway Protocol (BGP), Open Shortest Path First (OSPF), Intermediate System-to-Intermediate System (IS-IS) Protocol, and EIGRP. For a detailed list of supported software features, please refer to the software release notes at http://www.cisco.com/en/US/docs/switches/lan/catalyst4500/release/note/OL_23985.html.

Ordering Information

Table 3 provides ordering information for the Cisco Catalyst 4948E and 4948E-F switches.

Table 3.   Ordering Information

Description	Part Number	
Hardware		
	Front to Back Cooling	**Back to Front Cooling**
48x 10/100/1000(RJ45)+4x 10GbE(SFP+), no p/s	WS-C4948E	WS-C4948E-F
48x 10/100/1000(RJ45)+4x10GbE(SFP+), IP Base IOS, AC p/s	WS-C4948E-S	WS-C4948E-F-S
48x 10/100/1000(RJ45)+4x10GbE(SFP+), Ent Ser IOS, AC p/s	WS-C4948E-E	WS-C4948E-F-E
Green Bundle 10x WS-C4948E	WS-C4948E-BDL	WS-C4948E-F-BDL
Catalyst 4948E 300WAC power supply (spare)	PWR-C49E-300AC-R(=)	PWR-C49E-300AC-F(=)
Catalyst 4948E 300WAC redundant power supply	PWR-C49E-300AC-R/2	PWR-C49E-300AC-F/2
Catalyst 4948E 300WDC power supply (spare)	PWR-C49-300DC(=)	Not Available at this time
Catalyst 4948E 300WDC redundant power supply (spare)	PWR-C49-300DC/2	Not Available at this time
Software		
Cisco IOS Software for Cisco Catalyst 4948E Series Switches (LAN Base image)	S49ELB-12254SG(=)	S49ELB-12254WO(=)
Cisco IOS Software for Cisco Catalyst 4948E Series Switches (LAN Base image with Triple Data Encryption)	S49ELBK9-12254SG(=)	S49ELBK9-12254WO(=)
Cisco IOS Software for Cisco Catalyst 4948E Series Switches (IP Base image)	S49EIPB-12254SG(=)	S49EIPB-12254WO (=)
Cisco IOS Software for Cisco Catalyst 4948E Series Switches (IP Base image with Triple Data Encryption)	S49EIPBK9-12254SG(=)	S49EIPBK9-12254WO (=)
Cisco IOS Software for Cisco Catalyst 4948E Series Switches (Enterprise Services image with BGP support)	S49EES-12254SG(=)	S49EES-12254WO(=)

Description	Part Number	
Cisco IOS Software for Cisco Catalyst 4948E Series Switches (Enterprise Services image with 3DES and BGP support)	S49EESK9-12254SG(=)	S49EESK9-12254WO(=)
Catalyst 4948 IP Base Upgrade License for LAN Base IOS	WS-C4900-SW-LIC	WS-C4900-SW-LIC
Accessories		
Cisco Catalyst 4948E spare fan tray rear exhaust	WS-X4993(=)	WS-X4993-F(=)
Power Cables		
AC Power cord, 110V North America, Japan	CAB-US515-C15-US(=)	
AC Power cord, 220V North America	CAB-N5K6A-NA(=)	
AC Power cord (Australia, New Zealand)	CAB-AS3112-C15-AU(=)	
AC Power cord (Europe)	CAB-CEE77-C15-EU(=)	
AC Power cord CD12 (Italy)	CAB-C2316-C15-IT(=)	
AC Power cord (Argentina)	CAB-IR2073-C15-AR(=)	
AC Power cord (South Africa, India)	CAB-SABS-C15-IND(=)	
AC Power cord (United Kingdom)	CAB-BS1363-C15-UK(=)	
AC Power cord (Switzerland)	CAB-9K10A-SW(=)	

Cisco Services

Cisco Services makes networks, applications, and the people who use them work better together.

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The unique Cisco Lifecycle approach to services defines the requisite activities at each phase of the network lifecycle to help ensure service excellence. With a collaborative delivery methodology that joins the forces of Cisco, our skilled network of partners, and our customers, we achieve the best results.

For More Information

For more information about the Cisco Catalyst 4948E and 4948E-F, visit http://www.cisco.com/go/4900.

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