Cisco Catalyst 4948 10 Gigabit Ethernet Switch

10 Gigabit Ethernet Switching for High-Performance, Rack-Optimized Server Switching

Product Overview

The Cisco Catalyst® 4948 10 Gigabit Ethernet Switch is a wire-speed, low-latency, Layer 2 to 4, 1-rack-unit (1RU), fixed-configuration switch for rack-optimized server switching. Based on the proven Cisco® Catalyst 4500 Series hardware and software architecture, the Cisco Catalyst 4948 10 Gigabit Ethernet Switch offers exceptional performance, bandwidth, and reliability for low-density, multilayer aggregation of high-performance servers and workstations. High performance and scalability of intelligent network services is made possible with dedicated specialized resources known as ternary content addressable memory (TCAM). Ample TCAM resources (64,000 entries) enable high feature capacity, providing wire-speed routing and switching performance with concurrent provisioning of services such as quality of service (QoS) and security and helping ensure scalability for today's network requirements with ample room for future growth.

The Cisco Catalyst 4948 10 Gigabit Ethernet Switch offers 48 ports of wire-speed 10/100/1000BASE-T with 2 ports of wire-speed 10 Gigabit Ethernet (X2 optics). Exceptional reliability and serviceability are delivered with optional internal AC or DC 1+1 hot-swappable power supplies and a hot-swappable fan tray with redundant fans (Figures 1 and 2).

Figure 1.   Cisco Catalyst 4948 10 Gigabit Ethernet Switch

Figure 2.   Rear View of Cisco Catalyst 4948 10 Gigabit Ethernet Switch with Dual Redundant Power Supplies and Removable Fan Tray

Features and Benefits

Wire-Speed Performance in All Directions

The Cisco Catalyst 4948 10 Gigabit Ethernet Switch delivers wire-speed throughput with low latency for data-intensive applications using a 136-Gbps switching fabric with a forwarding rate of 102 million packets per second (mpps) in hardware for Layer 2 to 4 traffic. High-performance switching is maintained regardless of the number of route entries or Layer 3 and 4 services enabled. Hardware-based Cisco Express Forwarding routing architecture enables increased scalability and performance. X2 10 Gigabit Ethernet optics provide 20 Gigabit Ethernet wire-speed uplinks for outstanding throughput of traffic.

Power-Supply Redundancy for Nonstop Operation

The Cisco Catalyst 4948 10 Gigabit Ethernet Switch provides reliability for critical applications with 1+1 redundant, hot-swappable internal AC or DC power supplies. The 1+1 power supply design provides A-to-B failover when power supplies are connected to different circuits. AC and DC power supplies can be mixed in the same unit for outstanding deployment flexibility. The Cisco Catalyst 4948 10 Gigabit Ethernet Switch also has a hot-swappable fan tray with four redundant fans for additional serviceability and availability.

Comprehensive Management

The Cisco Catalyst 4948 10 Gigabit Ethernet Switch includes a single, dedicated 10/100 console port and a single, dedicated 10/100 management port for offline disaster recovery. Remote in-band management is available with the Simple Network Management Protocol (SNMP), Telnet client, Bootstrap Protocol (BOOTP), and Trivial File Transfer Protocol (TFTP). Support for local or remote out-of-band management is delivered through a terminal or modem attached to the console interface. The management port helps enable the Cisco Catalyst 4948 10 Gigabit Ethernet Switch to reload a new image from a TFTP server within seconds.

The Cisco Catalyst 4948 10 Gigabit Ethernet Switch delivers a comprehensive set of management tools to provide the visibility and control required for server switching. Managed with CiscoWorks solutions and embedded CiscoWorks CiscoView, the Cisco Catalyst 4948 10 Gigabit Ethernet Switch can be configured and managed to deliver device, VLAN, traffic, and policy management. These web-based management tools offer numerous services, including software deployment and quick isolation of error conditions.

Software Configuration Options

Table 1 describes the software configuration options for the Cisco Catalyst 4948 10 Gigabit Ethernet Switch.

Table 1.   Software Configuration Options for the Cisco Catalyst 4948 10 Gigabit Ethernet Switch

Software Image	Description
LAN Base Image	Basic Layer 2 image
IP Base Image	Standard Layer 3 image, including Routing Information Protocol Version 1 (RIPv1), RIPv2, static routes, and Enhanced Interior Gateway Routing Protocol (EIGRP) stub
Enterprise Services Image	Enhanced Layer 3 image, including Open Shortest Path First (OSPF), Intermediate System-to-Intermediate System (IS-IS), EIGRP, Border Gateway Protocol (BGP), AppleTalk, and Internetwork Packet Exchange (IPX) software routing; also includes all IP Base image features

Feature Comparison

Table 2 compares the features of the Cisco Catalyst 4948 Switch, Catalyst 4948 10 Gigabit Ethernet Switch, and Catalyst 4900M Switch.

Table 2.   Cisco Catalyst 4900 Series Switches Model Comparison

Feature and Description	Cisco® Catalyst 4948	Cisco Catalyst 4948 10 Gigabit Ethernet	Cisco Catalyst 4900M
Switching Capacity	96 Gbps	136 Gbps	320 Gbps
Throughput	72 mpps	102 mpps	• 250 mpps for IPv4 • 125 mpps for IPv6
IPv6 Support	In Software	In Software	In Hardware
Height	1RU	1RU	2RU
Modular Half-Card Slots	0	0	2
Maximum 10/100/1000 Ports	48	48	40
Maximum 10 Gigabit Ethernet Ports	0	2	24
Maximum Gigabit Ethernet (fiber) Ports	4	0	32 (Cisco TwinGig Converter Module)
Cisco TwinGig Converter Module Support	No	No	Yes (half-cards only)
Uplink Optic Type	4 Small Form-Factor Pluggable (SFP) optics	2 X2 (10 Gigabit Ethernet) optics	8 X2 (10 Gigabit Ethernet) optics
Multilayer Switching	IP Base and Enterprise Services options	IP Base and Enterprise Services options	IP Base and Enterprise Services options
Shared Buffer	16 MB	16 MB	16 MB
CPU	266 MHz	666 MHz	1.3 GHz
Synchronous Dynamic RAM (SDRAM)	256 MB	256 MB	512 MB
Active VLANs	4096	4096	4096
Multicast Entries	• 28,000 (Layer 3) • 16,000 (Layer 2)	• 28,000 (Layer 3) • 16,000 (Layer 2)	• 56,000 for IPv4 • 28,000 for IPv6
Per-VLAN Spanning Tree (PVST) and VLAN IDs	4096	4096	4096
Spanning Tree Protocol Instances	10000	10000	10000
Switched Virtual Interfaces (SVIs)	2000	2000	4000
Security and QoS Hardware Entries	32,000	32,000	128,000
MAC Addresses	32,000	55,000	55,000
Switched Port Analyzer (SPAN)	2 ingress and 4 egress	2 ingress and 4 egress	8 ingress and 8 egress
USB port	No	No	Yes
Compact Flash Memory Support	No	No	Yes
System Reset Button	No	No	Yes
Minimum Software Requirement	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(40)XO or later

Predictable Performance and Scalability

The Cisco Catalyst 4948 10 Gigabit Ethernet Switch is optimized for multimedia applications with its advanced multicast support. It supports Protocol Independent Multicast (PIM), Source-Specific Multicast (SSM), and Pragmatic General Multicast (PGM), providing end users with additional scalability to support multimedia applications. Also supported is Internet Engineering Task Force (IGMP) snooping in hardware, enhancing performance and reducing network traffic by allowing a switch to dynamically add and remove hosts from a multicast group.

Intelligent Network Services with QoS and Sophisticated Traffic Management

The Cisco Catalyst 4948 10 Gigabit Ethernet Switch offers superior per-port QoS features to help ensure that network traffic is classified, prioritized, and scheduled optimally to efficiently manage bandwidth-hungry multimedia, and time-sensitive and mission-critical applications. The Catalyst 4948 10 Gigabit Ethernet Switch can classify, police, and mark incoming packets, allowing the administrator to differentiate between traffic flows and enforce policies. Sharing, shaping, and strict-priority configurations determine scheduling of egress traffic. The Catalyst 4948 10 Gigabit Ethernet Switch also supports Dynamic Buffer Limiting (DBL), a congestion-avoidance feature. For details about the QoS features (including DBL) on the Cisco Catalyst 4948 10 Gigabit Ethernet Switch, refer to the Cisco Catalyst 4500 Series supervisor engine QoS overview at http://www.cisco.com/en/US/products/hw/switches/ps4324/prod_white_papers_list.html.

Features and Specifications at a Glance

Layer 2 Features

- Layer 2 hardware forwarding at 102 mpps
- Layer 2 switch ports and VLAN trunks
- IEEE 802. 1Q VLAN encapsulation
- Inter-Switch Link (ISL) VLAN encapsulation
- Dynamic Trunking Protocol (DTP)
- VLAN Trunking Protocol (VTP) and VTP domains
- Support for 4096 VLANs per switch
- PVST and PVST+
- Flexlink
- Spanning Tree PortFast and PortFast Guard
- Spanning Tree UplinkFast and BackboneFast
- IEEE 802.1s
- IEEE 802.1w
- IEEE 802.3ad
- Spanning Tree Root Guard
- Cisco Discovery Protocol Versions 1 and 2
- IGMPv1, v2, and v3 snooping
- Cisco EtherChannel technology, Cisco Fast EtherChannel technology, and Cisco Gigabit EtherChannel technology
- Port Aggregation Protocol (PAgP)
- Link Aggregation Control Protocol (LACP)
- Unidirectional link detection (UDLD) and aggressive UDLD

- IEEE 802.1 QinQ in hardware

- Layer 2 protocol tunneling

- Multilayer jumbo frames (up to 9216 bytes)

- Baby giants (up to 1600 bytes)

- Unidirectional Ethernet

- Storm control (formally known as broadcast and multicast suppression)

- Community private VLANs (PVLANs)

- Forced 10/100 autonegotiation

- Web Content Communication Protocol (WCCP) Version 2 Layer 2 redirect

- Private VLAN promiscuous trunk

- Layer 2 promiscuous trunk over trunk port (L2PT)

- Class-of-service (CoS) mutation

- E-OAM 802.3ah and CFM: 802.1ag

Layer 3 Features

- Jumbo frames on all ports (up to 9216 bytes)

- Hardware-based IP Cisco Express Forwarding routing at 102 mpps

- IP routing protocols: EIGRP, OSPF, RIP, and RIP2

- BGP4 and Multicast Border Gateway Protocol (MBGP)

- Nonstop Forwarding (NSF) awareness

- Hot Standby Router Protocol (HSRP) v1 and v2

- Software routing of Internetwork Packet Exchange (IPX) and AppleTalk

- IS-IS routing protocol

- IGMPv1, v2, and v3

- IGMP filtering on access and trunk ports

- IP Multicast routing protocols: PIM, SSM, and Distance Vector Multicast Routing Protocol (DVMRP)

- Auto rendezvous point (Auto-RP)

- Pragmatic General Multicast (PGM)

- Cisco Group Multicast Protocol server

- Full Internet Control Message Protocol (ICMP) support

- ICMP Router Discovery Protocol

- Policy-based routing (PBR)

- Virtual Route Forwarding lite (VRF-lite)

- VRF-aware IP services

- IPv6 (software switched)

- OSPF fast convergence

- OSPF and EIGRP fast-convergence protection

- EIGRP stub

- Virtual Router Redundancy Protocol (VRRP)

- IP unnumbered for SVI

- NSF (Non-Stop Forwarding) Awareness
- WCCPv2 (Web Cache Communications Protocol)
- Gateway Load Balancing Protocol (GLBP)

High-Availability Features

- 1+1 hot swappable AC or DC power supplies
- Hot-swappable field-replaceable fan tray with redundant fans
- HSRP v1 and v2
- VRRP
- Cisco IOS Embedded Event Manager (EEM)
- Cisco Generic Online Diagnostics (GOLD)
- Smart Call Home

Sophisticated QoS and Traffic Management

- Per-port QoS configuration
- Support for four queues per port
- Strict priority queuing
- IP differentiated services code point (DSCP)
- Classification and marking based on IP type of service (ToS) or DSCP
- Classification and marking based on full Layer 3 and 4 headers
- Input and output policing based on Layer 3 and 4 headers
- Support for 512 policers on ingress and 512 policers on egress
- Shaping and sharing output queue management
- DBL congestion-avoidance feature
- No performance penalty for granular QoS functions
- Per-port, per-VLAN QoS
- Match class of service (CoS) for non-IPv4 traffic

Predictable Performance

- 136-Gbps switching fabric
- Layer 2 hardware forwarding at 102 mpps
- Layer 3 hardware-based IP Cisco Express Forwarding routing at 102 mpps
- Layer 4 TCP and User Datagram Protocol (UDP) hardware-based filtering at 102 mpps
- No performance penalty with advanced Layer 3 and 4 services enabled
- Software-based learning at a sustained rate of 3000 hosts per second
- Support for 55,000 unicast and 16000 multicast MAC addresses
- Support for 32,000 entries in routing table (shared between unicast and multicast)
- Scalability to 2000 virtual ports (SVIs)
- Bandwidth aggregation up to 40 Gbps using Cisco Gigabit Ethernet EtherChannel technology

- Hardware-based multicast management

- Hardware-based access control lists (ACLs), router ACLs (RACLs), and VLAN ACLs (VACLs)

Comprehensive management

- Manageable through Cisco Network Assistant (CNA)

- Single console port and single IP address to manage all system features

- Software configuration management, including local and remote storage

- Manageable through CiscoWorks Windows network-management software on a per-port and per-switch basis, providing a common management interface for Cisco routers, switches, and hubs

- SNMPv1, v2, and v3 instrumentation, delivering comprehensive in-band management

- Command-line interface (CLI) based management console to provide detailed out-of-band management

- Remote Monitoring (RMON) software agent to support four RMON groups (history, statistics, alarms, and events) for enhanced traffic management, monitoring, and analysis

- Support for all nine RMON groups through the use of a Cisco SwitchProbe analyzer (Switched Port Analyzer [SPAN])

- port, which permits traffic monitoring of a single port, a group of ports, or the entire switch from a single network analyzer or RMON probe

- Analysis support, including ingress port, egress port, and VLAN SPAN

- Layer 2 traceroute

- Remote SPAN (RSPAN)

- Cisco SmartPort macros

- SPAN ACL filtering

- Dynamic Host Configuration Protocol (DHCP) client autoconfiguration

- Enhanced SNMP MIB support

- HTTPS

- Time Domain Reflectometry (TDR)

- MAC address notification

- Onboard failure logging (OBFL)

- Network Mobility Service Protocol (NMSP)

Advanced Security

- TACACS+ and RADIUS, which help enable centralized control of the switch and restrict unauthorized users from altering the configuration

- Standard and extended ACLs on all ports

- IEEE 802. 1x user authentication (with VLAN assignment, voice VLAN, port security, guest VLAN, private guest VLAN, private VLAN, and RADIUS-supplied session timeout extensions)

- IEEE 802.1x accounting

- IEEE 802. 1x authentication failure

- IEEE 802. 1x private VLAN assignment

- IEEE 802. 1x private guest VLAN

- IEEE 802. 1x RADIUS-supplied timeout

- IEEE 802.1x Mac-Auth-Bypass

- IEEE 802.1x inaccessible authentication bypass
- Cisco Network Admission Control (NAC) Layer 2 IEEE 802.1x
- Cisco NAC Layer 2 IP
- Cisco NAC Layer 2 IP inaccessible authentication bypass
- Trusted boundary
- RACLs on all ports (no performance penalty)
- VACLs
- Port ACLs (PACLs)
- Private VLANs (PVLANs) on access and trunk ports
- VTPv3
- DHCP snooping
- DHCP Option 82
- DHCP Option 82 insertion
- DHCP Option 82 pass-through
- Port security
- Port security for PVLAN ports
- Sticky port security
- Secure Shell (SSH) Protocol Versions 1 and 2
- VLAN Management Policy Server (VMPS) client
- Unicast MAC filtering
- Unicast port flood blocking
- Dynamic Address Resolution Protocol (ARP) inspection
- IP Source Guard
- Community PVLANs
- Trunk port security
- IEEE 802.1x inaccessible authentication bypass
- MAC authentication bypass
- Control plane policing
- IEEE 802.1x unidirectional controlled port
- Voice VLAN sticky port security
- Secure Copy Protocol (SCP)
- Cisco EtherChannel trunk port security

Management

- Enhanced Object Tracking (EOT)
- IP service-level agreement (SLA)
- CiscoWorks LAN Management Solution (LMS), including CiscoWorks Resource Manager Essentials
- CiscoWorks CiscoView
- Cisco Network Assistant (CNA)
- BGP4-MIB.my
- BRIDGE-MIB.my (RFC 1493)
- Static multicast MAC address in BRIDGE-MIB
- CISCO-BULK-FILE-MIB.my
- CISCO-CDP-MIB.my
- CISCO-CLASS-BASED-QOS-MIB.my
- CISCO-CONFIG-COPY-MIB.my
- CISCO-CONFIG-MAN-MIB.my
- CISCO-ENTITY-ASSET-MIB.my
- CISCO-ENTITY-EXT-MIB.my
- CISCO-ENTITY-FRU-CONTROL-MIB.my
- CISCO-ENTITY-SENSOR-MIB.my
- CISCO-ENTITY-VENDORTYPE-OID-MIB.my
- CISCO-ENVMON-MIB.my
- CISCO-FLASH-MIB.my
- CISCO-FTP-CLIENT-MIB.my
- CISCO-HSRP-MIB.my
- CISCO-IETF-IP-MIB.my
- CISCO-IETF-IP-FORWARD-MIB.my
- CISCO-IETF-ISIS-MIB.my
- CISCO-IF-EXTENSION-MIB.my
- CISCO-IGMP-FILTER-MIB.my
- CISCO-IMAGE-MIB.my
- CISCO-IPMROUTE-MIB.my
- CISCO-L2-TUNNEL-CONFIG-MIB.my
- CISCO-L2L3-INTERFACE-CONFIG-MIB.my
- CISCO-LAG-MIB.my
- CISCO-MEMORY-POOL-MIB.my
- CISCO-NDE-MIB.my
- CISCO-PAGP-MIB.my
- CISCO-PAE-MIB.my
- CISCO-PING-MIB.my
- CISCO-PORT-SECURITY-MIB.my

- CISCO-PORT-STORM-CONTROL-MIB.my
- CISCO-PRIVATE-VLAN-MIB.my
- CISCO-PROCESS-MIB.my
- CISCO-PRODUCTS-MIB.my
- CISCO-RF-MIB.my
- CISCO-RMON-CONFIG-MIB.my
- CISCO-RTTMON-MIB.my
- CISCO-STP-EXTENSIONS-MIB.my
- CISCO-SYSLOG-MIB.my
- CISCO-VLAN-IFTABLE-RELATIONSHIP-MIB.my
- CISCO-VLAN-MEMBERSHIP-MIB.my
- CISCO-VTP-MIB.my
- DOT3-MAU-MIB.my (RFC 3636)
- ENTITY-MIB.my
- ETHERLIKE-MIB.my
- EXPRESSION-MIB.my
- HC-RMON-MIB.my
- IEEE8021-PAE-MIB.my
- IEEE8023-LAG-MIB.my (802.3ad)
- IF-MIB.my
- IGMP-MIB.my
- IPMROUTE-MIB.my
- NOVELL-IPX-MIB.my
- NOVELL-RIPSAP-MIB.my
- OLD-CISCO-TS-MIB.my
- PIM-MIB.my
- RFC1213-MIB.my (MIB-II)
- RFC1243-MIB.my (APPLETALK MIB)
- RFC1253-MIB.my (OSPF-MIB)
- RMON-MIB.my (RFC 1757)
- RMON2-MIB.my (RFC 2021)
- SMON-MIB.my (Internet-Draft)
- SNMP-FRAMEWORK-MIB.my (RFC 2571)
- SNMP-MPD-MIB.my (RFC 2572)
- SNMP-NOTIFICATION-MIB.my (RFC 2573)
- SNMP-TARGET-MIB.my (RFC 2573)
- SNMP-USM-MIB.my (RFC 2574)
- SNMP-VACM-MIB.my (RFC 2575)
- SNMPv2-MIB.my

- TCP-MIB.my

- UDP-MIB.my

- RIP SNMP MIB

- LLDP MIB

Industry Standards

- Ethernet: IEEE 802.3 and 10BASE-T

- Fast Ethernet: IEEE 802.3u, 100BASE-TX, and 100BASE-FX

- Gigabit Ethernet: IEEE 802.3z and 802.3ab

- IEEE 802. 1D Spanning Tree Protocol

- IEEE 802.1w rapid reconfiguration of spanning tree

- IEEE 802. 1s multiple VLAN instances of spanning tree

- IEEE 802.3 ad LACP

- IEEE 802. 1p CoS prioritization

- IEEE 802.1Q VLAN

- IEEE 802. 1x user authentication

- X2 support

- RMON I and II standards

Indicators and Ports

- System status: Green (operational), or red (faulty)

- Console: RJ-45 socket

- Reset (switch recessed for protection)

- Uplinks: Link and active

- Image management port: 10/100BASE-TX (RJ-45 socket) data terminal equipment (DTE); green (good), orange (disabled), or off (not connected)

Supported X2 Optics

Table 3 lists the X2 optics supported by the Cisco Catalyst 4948 10 Gigabit Ethernet Switch.

Table 3.   X2 Optics Supported by Cisco Catalyst 4948 10 Gigabit Ethernet Switch

Type	Maximum Distance over Specified Medium
LR	10 km on single-mode fiber (SMF) (G.652)
CX4	Up to 15m on IBX4 cable
LX4	300m on multimode fiber (MMF)
SR	26 to 300m on MMF (depends on MMF type)
ER	40 km on SMF
LRM	220m on MMF
ZR	1550 nm on SMF
DWDM	1530.33 nm to 1560.61 nm X2 (100-GHz ITU grid)

Power Supply

The Cisco Catalyst 4948 10 Gigabit Ethernet Switch offers a choice of 300-watt (W) AC or DC power supplies. The switch can operate with one power supply present. When two power supplies are installed, the switch shares the power load between the two supplies (Table 4).

Table 4.   AC and DC Power Supply Specifications

Specification	300W AC	300W DC
Input Current	4A at 100V	8A @ -40.5 to -75VDC
2A at 240V	8A at –48 to –60V	–
Output Current	25A at 12 VDC	25A @ 12 VDC
Weight	Weight: 2.0 kg	Weight: 2.0 kg
Heat Dissipation	1023 BTU/hr	1023 BTU/hr
Average Power use	212 Watts	212 Watts

Switch Dimensions

- Width: 17.290 in. (43.9166 cm)
- Depth: 16.14 in. (40.9956 cm)
- Height: 1.712 in. (4.445 cm)
- Weight: 16.5 lb (7.48 kg) with one power supply

Software Requirements

The Cisco Catalyst 4948 10 Gigabit Ethernet Switch is supported only in Cisco IOS Software and is not supported in the Cisco Catalyst Operating System Software. The minimum software version is Cisco IOS Software Release 12.2(25)EWA or later.

For the latest software release information and recommendations, please reference the product bulletin at http://www.cisco.com/en/US/products/ps6021/prod_bulletins_list.html.

Environmental 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 2000m

Regulatory Standards Compliance

Table 5 summarizes the regulatory standards compliance of the Cisco Catalyst 4948 10 Gigabit Ethernet Switch.

Table 5.   Regulatory Standards Compliance of Cisco Catalyst 4948 10 Gigabit Ethernet Switch

Specification	Description
Regulatory Compliance	Products bear CE Marking, indicating compliance with the 89/336/EEC and 73/23/EEC directives, which include the safety and EMC standards listed here.
Safety	• UL 60950-1 • CAN/CSA-C22.2 No. 60950-1 • EN 60950-1 • IEC 60950-1 • AS/NZS 60950 • IEC 60825-1 • IEC 60825-2 • EN 60825-1 • EN 60825-2 • 21 CFR 1040
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 • EN55024 • ETS300 386 • EN50082-1 • EN61000-3-2 • EN61000-3-3

Table 6 lists the industry EMC, safety, and environmental standards for the Cisco Catalyst 4948 10 Gigabit Ethernet Switch.

Table 6.   Industry EMC, Safety, and Environmental Standards

Specification	Description
Network Equipment Building Standards (NEBS)	• GR-63-Core NEBS Level 3 • GR-1089-Core NEBS Level 3
ETSI	• ETS 300 019 Storage Class 1.1 • ETS 300 019 Transportation Class 2.3 • ETS 300 019 Stationary Use Class 3.1

New Cisco IOS Software Packaging for the Cisco Catalyst 4900 Series

Cisco provides a new Cisco IOS Software package for the Cisco Catalyst 4900 Series, creating a new foundation for features and functions and offering consistency across all Cisco Catalyst switches. The new Cisco IOS Software release is designated Release 12.2SG.

Prior Cisco IOS Software images for the Catalyst 4900 Series, formally known as Basic Layer 3 (Standard Multilayer Image [SMI]) and Enhanced Layer 3 (Enhanced Multilayer Image [EMI]) images, now are called IP Base and Enterprise Services images, respectively. Unless otherwise specified, all currently shipping Cisco Catalyst 4900 software features based on Cisco IOS Software are supported in the IP Base image; however, note the following points regarding the IP Base image:

- The IP Base image does not support the following routing-related features: BGP, EIGRP, OSPF, IS-IS, IPX, AppleTalk, VRF-lite, and PBR).

- The IP Base image supports EIGRP stub for Layer 3 routing on all Cisco Catalyst 4900 Series supervisor engines. For more information on EIGRP stub functions, go to http://www.cisco.com/en/US/tech/tk365/technologies_white_paper0900aecd8023df6f.shtml.

The Enterprise Services image supports all Cisco Catalyst 4900 Series software features based on Cisco IOS Software, including enhanced routing. Table 1 earlier in this document provides a more detailed description of the feature differences between the IP Base and Enterprise Services images.

LAN Base Image

Starting with Cisco IOS Release 12.2(52)SG LAN Base Software image will be the default IOS option for the Catalyst 4948. IP Base and Enterprise Services image are available as optional upgrades. The LAN Base image is supported on the Catalyst 4948 and 4948-10GE. It is primarily focused on customers Layer 2 requirements and therefore many of the IP Base features have been removed. If at a later date some of the features are required LAN Base is fully upgradable to IP Base or Enterprise Services.

Table 7. IOS Feature Comparison–LAN Bas

	LAN Base	IP Base
Datacenter Grade HW	Yes	Yes
Basic L2	Yes	Yes
SPAN	2 sessions	8 sessions
Location Services	No	Yes
SmartCallHome	No	Yes
HSRP and VRRP	No	Yes
GLBP	No	Yes
L2PT and Q-in-Q	No	Yes
Auto QoS	Yes*	Yes
EIGRP Stub	No	Yes
PIM SM/DM	No	Yes
MLD Snooping	Yes*	Yes
Flex Link	Yes*	Yes
PVST+ & RPVST+	Yes*	Yes
EEM	No	Yes
Smartports	Yes*	Yes

* Support added in 12.2(53)SG

Ordering Information

Table 8 provides ordering information for the Cisco Catalyst 4948 10 Gigabit Ethernet Switch.

Table 8. Ordering Information

Part Number	Description
WS-C4948-10GE-S	Cisco Catalyst 4948-10GE, IP Base Image (RIP, static routes,), one AC power supply, fan tray
WS-C4948-10GE-E	Cisco Catalyst 4948-10GE, Enterprise Services Image (OSPF, EIGRP, IS-IS, BGP, IPX, AppleTalk), one AC power supply, fan tray
WS-C4948-10GE	Cisco Catalyst 4948-10GE, optional software image, optional power supplies, fan tray
WS-C4948-10GEBDL	Cisco Catalyst 4948-10GE, 10 switch multi-pack bundle shipped in 1 box, volume service option
S49LB-12252SG(=)	Cisco IOS Software for Cisco Catalyst 4900 Series Switches (LAN Base image)
S49LBK9-12252SG(=)	Cisco IOS Software for Cisco Catalyst 4900 Series Switches (LAN Base image with Triple Data Encryption Standard [3DES])

Part Number	Description
S49IPB-12252SG(=)	Cisco IOS Software for Cisco Catalyst 4900 Series Switches (IP Base image)
S49IPBK9-12252SG(=)	Cisco IOS Software for Cisco Catalyst 4900 Series Switches (IP Base image with Triple Data Encryption Standard [3DES])
S49ES-12252SG(=)	Cisco IOS Software for Cisco Catalyst 4900 Series Switches (Enterprise Services image with BGP support)
S49ESK9-12252SG(=)	Cisco IOS Software for Cisco Catalyst 4900 Series Switches (Enterprise Services image with 3DES and BGP support)
WS-C4900-SW-LIC	Catalyst 4948 IP Base Upgrade License for LAN Base IOS
PWR-C49-300AC(=)	Cisco Catalyst 4900 300W AC power supply
PWR-C49-300AC/2	Cisco Catalyst 4900 300W AC power supply, redundant
PWR-C49-300DC(=)	Cisco Catalyst 4900 300W DC power supply
PWR-C49-300DC/2	Cisco Catalyst 4900 300W DC power supply, redundant
WS-X4991=	Cisco Catalyst 4900 fan tray (spare)
C4948-ACC-KIT=	Spare rack-mount and cable guide
C4948-BKT-KIT=	C4900 front- and rear-mount brackets
C4948-REAR-BKT(=)	C49xx high performance rear mount brackets
Power Cable Options	
CAB-US515-C15-US	AC power cord, 110V North America
CAB-N5K6A-NA	AC power cord, 220V North America
CAB-AS3112-C15-AU	AC power cord (Australia)
CAB-CEE77-C15-EU	AC power cord (Europe)
CAB-C2316-C15-IT	AC power cord CD12 (Italy)
CAB-IR2073-C15-AR	AC power cord (Argentina)
CAB-BS546-C15-SA	AC power cord (South Africa)
CAB-BS1363-C15-UK	AC power cord (United Kingdom)
CAB-7KACSXX	AC power cord (Switzerland)
X2 Options	
X2-10GB-LR	10GB long-reach (LR) module
X2-10GB-CX4	10GB CX4 module
X2-10GB-LX4	10GB LX4 module
X2-10GB-SR	10GB short-reach (SR) module
X2-10GB-ER	10GB extended-reach (ER) module
X2-10GB-ZR	10GB ZR module
DWDM-X2	10GB DWDM X2 module with DOM support

Warranty

The Cisco Catalyst 4948 10 Gigabit Ethernet Switch has a 1-year limited hardware warranty. It includes hardware replacement with a 10-day turnaround from receipt of a return materials authorization (RMA).

Cisco Technical Support Services

Cisco Technical Support Services helps ensure that your Cisco products operate efficiently, remain highly available, and benefit from current system software to help you effectively manage your network service while controlling operating costs.

Cisco Technical Support Services (Tables 9 and 10) provides 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 include the following:

- Latest software updates

- Rapid replacement of hardware with next-day, 4-hour, or 2-hour dispatch options

- Ongoing technical support through Cisco Technical Assistance Center (TAC)

- Registered access to http://www.cisco.com

Table 9.   Cisco Technical Support Services: Components

Feature	Benefits
Software Support	Software support offers maintenance and minor and major updates for licensed feature sets. Downloading new maintenance releases, patches, or updates of Cisco IOS Software helps enhance and extend the useful life of Cisco devices. Through major software updates, organizations can extend the life of equipment and maximize application technology investments by: • Adding new functions that, in many cases, require no additional hardware investment • Increasing the performance of current functions • Enhancing network or application availability, reliability, and stability
Cisco TAC Support	With more than 1000 highly trained customer support engineers, 390 CCIE® experts, and access to 13,000 research and development engineers, Cisco TAC complements your in-house staff with a high level of knowledge in data, voice, and video 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 website provides 24-hour 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.
Smart Call Home	Cisco Smart Call Home is a proactive, connected service capability of Cisco SMARTnet Service that is available at no additional cost on Cisco Catalyst 4500 Series Switches. Smart Call Home devices can continuously monitor their own health using GOLD diagnostics technology and automatically notify you of potential issues using secure transmissions. If a serious problem arises, Smart Call Home automatically detects it and generates a Cisco Technical Assistance Center (TAC) service request that is routed to the right team for a particular problem.

Table 10.   Technical Support Services: Competitive Differentiators

Feature	Benefits
Worldwide Virtual Lab	This extensive lab of Cisco equipment and Cisco IOS Software releases provides an invaluable engineering resource and knowledge base for training, product information, and recreation and testing of selected network problems to help decrease time to resolution.
Cisco TAC Training • Boot camps • Tech calls • Tech forums	Cisco is committed to providing customers the latest in technology support. Cisco TAC training programs help customers avoid opening cases. These programs also 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 customers and Cisco TAC support engineers to work together more effectively.
Global logistics	With 10,000 onsite field engineers and a US$2.3 billion investment in inventory, Cisco delivers award-winning, worldwide hardware replacement support from 650 depots, covering 120 countries.
Cisco IOS Software	Cisco IOS Software employs 100 discrete technologies with more than 2000 features. Each year, 400 new features are added. 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 voice-over-IP (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_category_home.html.

For additional information about the Cisco Catalyst 4500 Series, visit http://www.cisco.com/go/catalyst4500. For additional information about 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

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