Cisco Catalyst 4928 10 Gigabit Ethernet Switch

High-Performance Space-Constrained Branch-Office Switching with Enterprise-Grade Features

Product Overview

The Cisco® Catalyst® 4928 10 Gigabit Ethernet Switch (4928-10GE) is a wire-speed, Layer 2 to 4, 1-rack-unit (1RU) switch designed for space-constrained LAN distribution and core applications. Based on the proven Cisco Catalyst 4500 Series hardware and software architecture, this switch offers exceptional performance, bandwidth, and reliability for medium-density, multilayer aggregation of high-performance LAN access switches. High performance and scalability of intelligent network services are 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, helping ensure scalability for today's network requirements with ample room for future growth.

The Cisco Catalyst 4928 10 Gigabit Ethernet Switch offers 28 wire-speed 1000BASE-X Small Form-Factor pluggable (SFP) ports and 2 wire-speed 10 Gigabit Ethernet (X2 optics) ports. 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 (Figure 1).

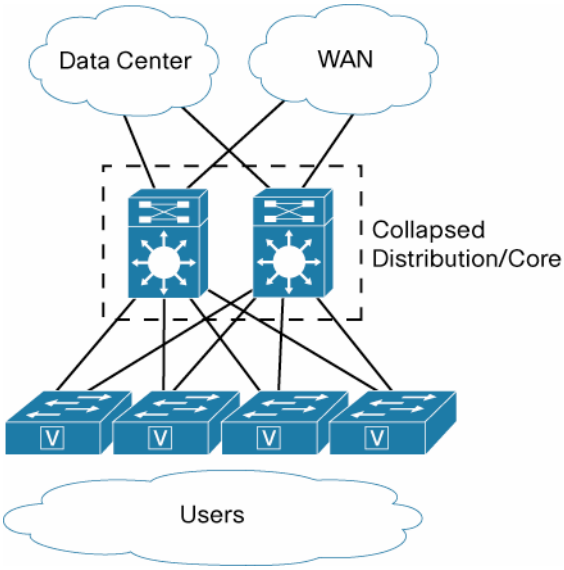
Figure 1. Cisco Catalyst 4928 10 Gigabit Ethernet Switch with Hot-Swappable Fan Tray and Power Supplies

Applications

The Cisco Catalyst 4928 10 Gigabit Ethernet Switch offers flexible and highly available aggregation solutions for nonstop unified network services. Enterprise-grade features such as dynamic routing, dual hot-swappable power supplies, and redundant field-replaceable fans enhance switch availability.

The switch is well-suited for space- and power-constrained deployments because of its compact 1RU form factor, economical power needs, and efficient cooling. Ideally suited to support secure converged applications such as Cisco TelePresence and Cisco Unified Communications, the switch delivers high-performance intelligent switching with its robust feature set.

Figure 2. Branch Office Network Design



The 28-port downlink density is ideally suited for branch-office locations where a collapsed distribution core is the most common network architecture (Figure 2). The downlink ports provide both an aggregation point for all access switches and connectivity and policy services for traffic flows. The uplink ports connect the LAN to the external networks, including remote data centers and branch offices. The SFP downlink ports are compatible with many different optics types, allowing network architects to mix and match to meet specific network requirements.

Key Features and Benefits

Wire-Speed Performance in All Directions

The Cisco Catalyst 4928 10 Gigabit Ethernet Switch delivers wire-speed throughput with low latency for data-intensive applications using a 96-Gbps switching fabric with a forwarding rate of 72 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 maximum traffic throughput.

Power-Supply Redundancy for Nonstop Operations

The Cisco Catalyst 4928 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. You can mix AC and DC power supplies in the same unit for maximum deployment flexibility. The switch also has a hot-swappable fan tray with four redundant fans for additional serviceability and availability.

Comprehensive Management

The Cisco Catalyst 4928 10 Gigabit Ethernet Switch includes a single, dedicated 10/100 console port and a single, dedicated 10/100 management port for offline disaster recovery and remote out-of-band management. Remote in-band management is available with the Simple Network Management Protocol (SNMP), Telnet Client, Bootstrap Protocol (BOOTP), and Trivial File Transfer Protocol (TFTP).

The management port has two operating modes designed to increase operational efficiency and availability. When the system is in Remote Monitoring (RMON) mode, the management port operates in a disaster-recovery mode. In this state the operator can reload new Cisco IOS® Software images from a TFTP server. During normal system

operation the management port operates as a standard out-of-band management port. Network administrators can use standard command-line interface (CLI) commands to monitor and configure the switch without interrupting the data flow.

The Cisco Catalyst 4928 10 Gigabit Ethernet Switch delivers a comprehensive set of management tools to provide the visibility and control required for LAN switching. With CiscoWorks solutions and embedded CiscoWorks CiscoView, you can configure the switch to manage devices, VLANs, traffic, and policies. These web-based management tools offer numerous services, including software deployment and quick isolation of error conditions.

Feature Availability

Table 1 lists software configuration options, Table 2 compares models for fiber aggregation, and Table 3 lists the features and benefits of the Cisco Catalyst 4929 10 Gigabit Ethernet Switch.

Table 1. Software Configuration Options for the Cisco Catalyst 4928 10 Gigabit Ethernet Switch

Software Image	Description
IP Base Image	Standard Layer 3 image, including Routing Information Protocol Version 1 (RIPv1), RIPv2, static routes, and Enhanced IGRP (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), and all IP Base image features

Table 2. Cisco Catalyst 4900 Series Switch Model Comparison for Fiber Aggregation

Feature and Description	Cisco Catalyst 4928 10 Gigabit Ethernet Switch	Cisco Catalyst 4900M Switch
Switch Capacity	96 Gbps	320 Gbps
Throughput	71 mpps	250 mpps for IPv4 125 mpps for IPv6
IPv6 Support	In software	In hardware
Height	1RU	2RU
Modular Half-Card Slots	0	2
Maximum Number of 10 Gigabit Ethernet Ports	2	24
Maximum Number of Gigabit Ethernet (Fiber) Ports	28	32 (Cisco TwinGig Converter Module)
Uplink Optics Type	4 SFP 2 X2 (10 Gigabit Ethernet) optics	8 X2 (10 Gigabit Ethernet) optics
Multilayer switching	IP Base and Enterprise Service options	IP Base and Enterprise Service options
Shared Buffer	16 MB	16 MB
CPU	666 MHz	1.3 GHz
Synchronous Dynamic RAM (SDRAM)	256 MB	512 MB
Active VLANs	2,048	4,096
Multicast Entries	28,000 (Layer 3) 16,000 (Layer 2)	56,000 for IPv4 28,000 for IPv6
Per-VLAN Spanning Tree (PVST) and VLAN IDs	4,096	4,096
Spanning Tree Protocol	10000	10000
Switched Virtual Interfaces (SVIs)	2,000	4,000
Security and QoS Hardware Entries	32,000	128,000
MAC Addresses	55,000	55,000
Switched Port Analyzer (SPAN)	2 ingress and 4 egress	8 ingress and 8 egress
USB Port	No	Yes
Compact Flash Memory Support	No	Yes

Feature and Description	Cisco Catalyst 4928 10 Gigabit Ethernet Switch	Cisco Catalyst 4900M Switch
System Reset Button	No	Yes
Minimum Software Requirement	Cisco IOS Software Release 12.2(46)SG or later	Cisco IOS Software Release 12.2(40)XO or later

Table 3. Features and Benefits

Feature	Benefit
Outstanding Scalability	
16-MB shared buffer	Large buffers for high-bandwidth video distribution and large file transfers
96-Gbps and 71-mpps wire-speed performance with low latency	Delay-sensitive traffic forwarding without interruption
Wire-speed uplinks	Elimination of oversubscription bottlenecks between downlinks and uplinks across the switch
Configuration Flexibility	
SFP optics support	Wide range of cost-effective optics types for diverse deployment options
Dual AC or DC power	High availability for nonstop operation

Supported X2 Optics

Table 4 lists the Cisco Catalyst 4928 10 Gigabit Ethernet Switch X2 optics support.

Table 4. X2 Optics Support of Cisco Catalyst 4928 10 Gigabit Ethernet Switch

Type	Maximum Distance over Specified Medium
Long reach (LR)	10 km on sigle-mode fiber (SMF) (G.652)
CX4	Up to 15m on IBX4 cable
LX4	300m on multimode fiber (MMF)
Short reach (SR)	26 to 300m on MMF (depends on MMF type)
Extended reach (ER)	40 km on SMF
Long reach LRM	220m on MMF

Power Supply

The Cisco Catalyst 4928 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 5 lists the specifications of the power supplies.

Table 5. AC and DC Power Supply Specifications

Specification	300 WAC	300 WDC
Input Current	4A at 100V or 2A at 240V	8A at -40 to -72 VDC
Output Current	8A at –40 to –60 VDC	8A at -40 to -72 VDC
Output Current	25A at 12 VDC	25A at 12 VDC
Weight	2.0 kg	2.0 kg
Heat Dissipation	1023 BTU/hr	1023 BTU/hr

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

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 percent, noncondensing
- Operating altitude: –60 to 2000m

Product Specifications

Table 6 lists Cisco Catalyst 4929 10 Gigabit Ethernet Switch product specifications.

Table 6. Product Specifications

Features	Specifications
Layer 2 Features	• Layer 2 hardware forwarding at 72 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 2048 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 • Internet Group Management Protocol Version 1 (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 • Layer 2 Tunneling Protocol (L2TP) • Multilayer Jumbo Frames (up to 9216 bytes) • Baby Giants (up to 1600 bytes) • Unidirectional Ethernet • Storm control (formally known as broadcast and multicast suppression) • Forced 10/100 autonegotiation • Web Cache Communications 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

Features	Specifications
Layer 3 Features	• Jumbo Frames on all ports (up to 9216 bytes) • Hardware-based IP Cisco Express Forwarding routing at 72 mpps • IP routing protocols: EIGRP, OSPF, RIP, and RIPv2 • 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: Protocol Independent Multicast (PIM), Source Specific Multicast (SSM), and Distance Vector Multicast Routing Protocol (DVMRP) • Autorendezvous 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) • IPv6 (software switched) • OSPF fast convergence • EIGRP stub • Virtual Router Redundancy Protocol (VRRP) • IP unnumbered for SVI • NSF Awareness • WCCPv2 • 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
Dynamic Buffer Limiting (DBL) Congestion-Avoidance Feature	• No performance penalty for granular QoS functions • Per-port, per-VLAN QoS • Match CoS for non-IPv4 traffic
Predictable Performance	• 96-Gbps switching fabric • Layer 2 hardware forwarding at 72 mpps • Layer 3 hardware-based IP Cisco Express Forwarding routing at 72 mpps • Layer 4 TCP and User Datagram Protocol (UDP) hardware-based filtering at 72 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 16,000 multicast MAC addresses • Support for 32,000 entries in routing table (shared between unicast and multicast) • Scalability to 2000 virtual ports (VLAN port instances) • Bandwidth aggregation up to 40 Gbps using Cisco Gigabit Ethernet EtherChannel technology

Features	Specifications
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 • 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 • CLI-based management console to provide detailed out-of-band management • 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 (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 • MAC address notification • Onboard failure logging (OBFL) • Network Mobility Service Protocol (NMSP)
Advanced Security	• TACACS+ and RADIUS, which 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 • IEEE 802.1x Cisco Network Admission Control (NAC) Layer 2 • 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 • 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

Features	Specifications
	• 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 (RME) • CiscoWorks CiscoView • Cisco Network Assistant • 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

Features	Specifications
	• 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
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)

Regulatory Standards Compliance

Table 7 summarizes Cisco Catalyst 4928 10 Gigabit Ethernet switch compliance with regulatory standards.

Table 7. Cisco Catalyst 4928 10 Gigabit Ethernet Switch Regulatory Standards Compliance

Specification	Standard
Regulatory Compliance	CE marking
Safety	• UL 60950 • CAN/CSA-C22.2 No. 60950 • EN 60950 • IEC 60950

Specification	Standard
	• AS/NZS 60950
EMC	• KN22 Class A • FCC Part 15 (CFR 47) Class A • ICES-003 Class A • EN55022 Class A • CISPR22 Class A • AS/NZS CISPR22 Class A • VCCI Class A • EN 55022 • EN 55024 • EN 61000-6-1 • EN 50082-1 • EN 61000-3-2 • EN 61000-3-3 • CISPR24
Industry EMC, Safety, and Environmental Standards	• SR-3580 Network Equipment Building Standards (NEBS) level 3 (GR-63-CORE, issue 3, and GR-1089-CORE, issue 4) • Telecommunications Carrier Group (TCG) Checklist • ATT TP76200 level 3 and TCG Checklist • ETS 300 019-1-1, Class 1.2 Storage • ETS 300 019-1-2, Class 2.3 Transportation • ETS 300 019-1-3, Class 3.2 Stationary Use

Cisco IOS Software Packaging for the Cisco Catalyst 4928 10 Gigabit Ethernet Switch

Cisco provides a Cisco IOS Software package for the Cisco Catalyst 4928 10 Gigabit Ethernet Switch, creating a foundation for features and functions and offering consistency across all Cisco Catalyst switches. The Cisco IOS Software release is designated Release 12.2SG:

- The IP Base image does not support the following routing-related features: BGP, EIGRP, OSPF, and VRF-lite).
- The IP Base image supports EIGRP stub, RIPv1 and v2, and Static Routes for Layer 3 routing on all Cisco Catalyst 4900 Series Switches.
- 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.

Ordering Information

To place an order, visit the Cisco Ordering Home Page and refer to Table 8.

Table 8. Ordering Information

Product Name	Part Number
Cisco Catalyst 4928 10 Gigabit Ethernet Switch	WS-C4928-10GE
Cisco Catalyst 4900 series 300W AC power supply	PWR-C49-300AC(=)
Cisco Catalyst 4900 series 300W AC power supply, redundant	PWR-C49-300AC/2
Cisco Catalyst 4900 series 300W DC power supply	PWR-C49-300DC(=)
Cisco Catalyst 4900 series 300W DC power supply, redundant	PWR-C49-300DC/2
Accessories	
Spare rack mount and cable guide	C4948-ACC-KIT=
C4900 front and rear-mount brackets	C4948-BKT-KIT=

Product Name	Part Number
Transceiver Modules	
1000BASE-T SFP	GLC-T
GE SFP, LC connector SX transceiver	GLC-SX-MM
GE SFP, LC connector LX/LH transceiver	GLC-LH-SM
1000BASE-BX SFP, 1490NM	GLC-BX-D
1000BASE-BX SFP, 1310NM	GLC-BX-U
1000BASE-ZX SFP	GLC-ZX-SM
CWDM 1470 NM SFP Gigabit Ethernet and 1G/2G FC	CWDM-SFP-1470=
CWDM 1490 NM SFP Gigabit Ethernet and 1G/2G FC	CWDM-SFP-1490=
CWDM 1510 NM SFP Gigabit Ethernet and 1G/2G FC	CWDM-SFP-1510=
CWDM 1530 NM SFP Gigabit Ethernet and 1G/2G FC	CWDM-SFP-1530=
CWDM 1550 NM SFP Gigabit Ethernet and 1G/2G FC	CWDM-SFP-1550=
CWDM 1570 NM SFP Gigabit Ethernet and 1G/2G FC	CWDM-SFP-1570=
CWDM 1590 NM SFP Gigabit Ethernet and 1G/2G FC	CWDM-SFP-1590=
CWDM 1610 NM SFP Gigabit Ethernet and 1G/2G FC	CWDM-SFP-1610=
10GBASE-CX4 X2 Module	X2-10GB-CX4
10GBASE-ER X2 Module	X2-10GB-ER
10GBASE-SR X2 Module	X2-10GB-SR
10GBASE-LX4 X2 Module	X2-10GB-LX4
10GBASE-LR X2 Module	X2-10GB-LR
Power Cables	
AS-3112 to IEC-C15 8ft Aus	CAB-AS3112-C15-AU
BS-1363 to IEC-C15 8ft UK	CAB-BS1363-C15-UK
BS 546 to IEC-C15 6ft South Africa, India	CAB-BS546-C15-SA
C13 to C14 power cord	CAB-C13-C14-JMPR
CEI 23-16 to IEC-C15 8ft Italy	CAB-C2316-C15-IT
CEE 7/7 to IEC-C15 8ft Europe	CAB-CEE77-C15-EU
IRSM 2073 to IEC-C15 8ft Argen	CAB-IR2073-C15-AR
NEMA 6-20 to IEC-C15 US	CAB-N5K6A-NA
NEMA 5-15 to IEC-C15 8ft US	CAB-US515-C15-US
Software	
Cisco Cat4900 IOS Enterprise Services W/O Crypto	S49ES-12246SG
Cisco Cat4900 IOS Enterprise Services SSH	S49ESK9-12246SG
Cisco Cat4900 IOS IP Base W/O Crypto	S49IPB-12246SG
Cisco Cat4900 IOS IP Base SSH	S49ipbK9-12246SG

Warranty

The Cisco Catalyst 4928 has a one-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 8 and 9) 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, four-hour, or two-hour dispatch options
- Ongoing technical support through Cisco Technical Assistance Center (TAC)
- Registered access to http://www.cisco.com

Table 9. 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 local Cisco representative or visit http://www.cisco.com/en/US/products/svcs/ps3034/ps2827/serv_category_home.html.

For additional information about the Cisco Catalyst 4900 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

Americas Headquarters
Cisco Systems, Inc.
San Jose, CA

Asia Pacific Headquarters
Cisco Systems (USA) Pte. Ltd.
Singapore

Europe Headquarters
Cisco Systems International BV
Amsterdam, The Netherlands

Cisco has more than 200 offices worldwide. Addresses, phone numbers, and fax numbers are listed on the Cisco Website at www.cisco.com/go/offices.

Printed in USA C78-494757-03 06/09