

Cisco Catalyst 2948G-GE-TX Gigabit Ethernet Switch

Product Overview

The Cisco® Catalyst® 2948G-GE-TX Gigabit Ethernet Switch is a fixed-configuration switch that provides Gigabit Ethernet connectivity for small and medium-sized networks (Figure 1). The Cisco Catalyst 2948G-GE-TX switch enhances network performance and productivity with the highest 10/100/1000-Mbps port density in a 1 rack unit (RU) form factor in the networking industry. The Cisco Catalyst 2948G-GE-TX is also an affordable solution for delivering gigabit-speed connectivity to the desktop over Category 5 copper cabling.

The Cisco Catalyst 2948G-GE-TX has autosensing 48 10/100/1000BASE-T ports and 4 small form-factor pluggable (SFP) ports, providing a total of 52 Gigabit Ethernet ports. The 4 SFP ports are wire-speed, and the 48 10/100/1000BASE-T ports can burst to Gigabit Ethernet line rate and share 12 Gbps of capacity (or 6 Gbps full-duplex) into the switching fabric. All ports can use Cisco Gigabit EtherChannel® or IEEE 802.3ad for high-speed interconnection applications. All ports use the standard IEEE 802.3x flow control (PAUSE frame)

mechanism to control Gigabit Ethernet host traffic. The Cisco Catalyst 2948G-GE-TX uses the same feature-rich Cisco Catalyst OS software as the Cisco Catalyst 2948G, the Cisco Catalyst 2980G-A, and Cisco Catalyst 4000 Series switches.

Gigabit Ethernet

Today's knowledge workers are placing higher demands on their networks. They need to run multiple, concurrent applications, and to do this productively, they require higher bandwidth from the network. For example, a worker joins a team conference call using IP videoconferencing, sends a 10-MB spreadsheet to meeting participants, broadcasts the latest marketing video for the team to evaluate, and queries the customer relationship management (CRM) database for the latest real-time feedback. Meanwhile, the multigigabyte system backup starts in the background and the latest virus updates are pushed to the client. Bandwidth enhancement beyond 100 Mbps—enabled by Gigabit Ethernet—provides for a smoothly operating network that can evolve.

Cisco makes the transition to Gigabit Ethernet faster and easier with a full suite of Gigabit Ethernet products including the Catalyst 3750 Series switches and the Catalyst 2970 Series switches. The Catalyst 3750 Series switches are an innovative product line that improves LAN operating efficiency by combining

Figure 1
Cisco Catalyst
2948G-GE-TX Switch





industry-leading ease of use and the highest resiliency available for stackable switches. This product series represents the next generation in desktop switches, and features StackWise technology, a 32-Gbps stack interconnect that allows customers to build a unified, highly resilient switching system—one switch at a time. The Catalyst 2970 Series switches are affordable Gigabit Ethernet switches that deliver wire-speed intelligent services for small and medium businesses and enterprise branch offices. Featuring a complete set of intelligent services, the Catalyst 2970 Series switches can enhance network performance and increase productivity. At speeds of 1000 Mbps, Gigabit Ethernet provides the bandwidth that networks need to meet new and evolving network demands, alleviate bottlenecks, and boost performance while increasing the return on existing infrastructure investments.

Table 1 lists features and benefits of the Cisco Catalyst 2948G-GE-TX Gigabit Ethernet Switch.

Table 1 Product Features and Benefits

Feature	Benefit
Ease of use and deployment	<ul style="list-style-type: none">• Dynamic Host Configuration Protocol (DHCP) autoconfiguration of multiple switches through a boot server eases switch deployment.• Autosensing on each non-SFP port detects the speed of the attached device and automatically configures the port for 10-, 100-, or 1000-Mbps operation, easing switch deployment in mixed 10, 100, and 1000BASE-T environments.• Autonegotiating on all ports automatically selects half- or full-duplex transmission mode to optimize bandwidth.• Dynamic Trunking Protocol (DTP) enables dynamic trunk configuration across all switch ports.• Port Aggregation Protocol (PAgP) automates the creation of Cisco Fast EtherChannel groups or Gigabit EtherChannel groups to link to another switch, router, or server.• Link Aggregation Control Protocol (LACP) allows the creation of Ethernet channeling with devices that conform to IEEE 802.3ad. This feature is similar to Cisco EtherChannel technology and PAgP.• DHCP Relay allows a DHCP relay agent to broadcast DHCP requests to the network DHCP server.• IEEE 802.3z-compliant 1000BASE-SX, 1000BASE-LX/LH, 1000BASE-ZX, 1000BASE-T and coarse wavelength division multiplexing (CWDM) physical interface support through a field-replaceable SFP module provides unprecedented flexibility in switch deployment.• To help ensure that the switch can be quickly connected to the network and can pass traffic with minimal user intervention, there is a default configuration stored in Flash.



Table 1 Product Features and Benefits (Continued)

Feature	Benefit
Availability/Scalability	
Superior redundancy for fault backup	<ul style="list-style-type: none"> • Cisco UplinkFast and BackboneFast technologies help to ensure quick failover recovery, enhancing overall network stability and reliability. • IEEE 802.1w Rapid Spanning Tree Protocol provides rapid spanning-tree convergence (independent of spanning-tree timers) and benefit of distributed processing. • Per-VLAN Rapid Spanning Tree Plus (PVRST+) allows rapid spanning-tree reconvergence on a per-VLAN spanning-tree basis, without requiring the implementation of spanning-tree instances. • Unidirectional link detection (UDLD) and aggressive UDLD allow unidirectional links caused by incorrect fiber-optic wiring or port faults to be detected and disabled on fiber-optic interfaces. • Switch port autorecovery (errdisable) automatically attempts to re-enable a link that is disabled due to a network error. • Cisco Redundant Power System (RPS) 675 support provides superior power-source redundancy for up to six Cisco networking devices, resulting in improved fault tolerance and network uptime. • Bandwidth aggregation up to 8 Gbps through Gigabit EtherChannel technology and up to 800 Mbps through Fast EtherChannel technology enhances fault tolerance and offers higher-speed aggregated bandwidth between switches and to routers and individual servers.
Integrated Cisco Catalyst OS Software features for bandwidth optimization	<ul style="list-style-type: none"> • IEEE 802.1d Spanning Tree Protocol support for redundant backbone connections and loop-free networks simplifies network configuration and improves fault tolerance. • PVST+ allows for Layer 2 load sharing on redundant links to efficiently use the extra capacity inherent in a redundant design. • IEEE 802.1s Multiple Spanning Tree Protocol allows multiple VLANs to share a spanning-tree instance, enabling Layer 2 load sharing on redundant links. • Local Proxy Address Resolution Protocol (ARP) works in conjunction with Private VLAN to minimize broadcasts and maximize available bandwidth. • VLAN1 minimization allows VLAN1 to be disabled on any individual VLAN trunk link. • VLAN Trunking Protocol (VTP) pruning limits bandwidth consumption on VTP trunks by flooding broadcast traffic only on trunk links required to reach the destination devices.
Quality of Service (QoS)/Control	
QoS and rate limiting	<ul style="list-style-type: none"> • 802.1p class of service (CoS) field classification is provided, using marking and reclassification on a per-packet basis. • Two egress queues per port applied at a system level enable differentiated management of up to two traffic types.



Table 1 Product Features and Benefits (Continued)

Feature	Benefit
Security	
Network-wide security features	<ul style="list-style-type: none">• IEEE 802.1x allows dynamic, port-based security, providing user authentication.• IEEE 802.1x with VLAN assignment allows a dynamic VLAN assignment for a specific user regardless of where the user is connected.• Secure Shell (SSH) Protocol, Kerberos, and Simple Network Management Protocol Version 3 (SNMPv3) provide network security by encrypting administrator traffic during Telnet and SNMP sessions. SSH, Kerberos, and the cryptographic version of SNMPv3 require a special cryptographic software image due to U.S. export restrictions.• Private VLAN provides security and isolation between switch ports or groups of switch ports called communities, which helps ensure that users cannot snoop on other users' traffic.• Bidirectional data support on the Switched Port Analyzer (SPAN) port allows Cisco Secure Intrusion Detection System (IDS) to take action when an intruder is detected.• TACACS+ and RADIUS authentication enables centralized control of the switch and restricts unauthorized users from altering the configuration.• MAC address notification allows administrators to be notified of users added to or removed from the network.• Port security secures the access to an access or trunk port based on MAC address.• After a specific timeframe, the aging feature removes the MAC address from the switch to allow another device to connect to the same port.• Multilevel security on console access prevents unauthorized users from altering the switch configuration.• The user-selectable address-learning mode simplifies configuration and enhances security.• Bridge Protocol Data Unit (BPDU) guard shuts down Spanning-Tree Protocol PortFast-enabled interfaces when BPDUs are received to avoid accidental topology loops.• Spanning Tree Root Guard (STRG) prevents edge devices not in the network administrator's control from becoming Spanning Tree Protocol root nodes.• IGMP filtering provides multicast authentication by filtering out nonsubscribers and limits the number of concurrent multicast streams available per port.• Dynamic VLAN assignment is supported through implementation of the VLAN Membership Policy Server (VMPS) client to provide flexibility in assigning ports to VLANs. Dynamic VLAN enables the fast assignment of IP addresses.



Table 1 Product Features and Benefits (Continued)

Feature	Benefit
Manageability	
Superior manageability	<ul style="list-style-type: none"> • Cisco Catalyst OS CLI support provides a common user interface and command set with Cisco routers and Cisco Catalyst desktop switches. • Cisco Service Assurance Agent support facilitates service-level management throughout the LAN. • VLAN trunks can be created from any port, using either standards-based 802.1Q tagging or the Cisco Inter-Switch Link (ISL) VLAN architecture. • Up to 2000 VLANs per switch and up to 1500 spanning-tree instances per switch are supported. • 4000 VLAN IDs are supported. • Cisco VTP supports dynamic VLANs and dynamic trunk configuration across all switches. • Remote Switch Port Analyzer (RSPAN) allows administrators to remotely monitor ports in a Layer 2 switch network from any other switch in the same network. • For enhanced traffic management, monitoring, and analysis, the Embedded Remote Monitoring (RMON) software agent supports four RMON groups (history, statistics, alarms, and events). • Layer 2 traceroute eases troubleshooting by identifying the physical path that a packet takes from source to destination. • All nine RMON groups are supported through a SPAN port, which permits traffic monitoring of a single port, a group of ports, or the entire stack from a single network analyzer or RMON probe. • Domain Name Systems (DNSs) provide IP address resolution with user-defined device names. • Trivial File Transfer Protocol (TFTP) reduces the cost of administering software upgrades by downloading from a centralized location. • Network Timing Protocol (NTP) provides an accurate and consistent time stamp to all intranet switches. • Includes LEDs for link status per port as well as switch-level status LEDs for system, power, and redundant power supply.
CiscoWorks support	<ul style="list-style-type: none"> • CiscoWorks network management software provides management capabilities on a per-port and per-switch basis, providing a common management interface for Cisco routers, switches, and hubs. Stacking is supported. • SNMP v1, v2c, and v3, and Telnet interface support, deliver comprehensive in-band management, and a CLI-based management console provides detailed out-of-band management. • Cisco Discovery Protocol Versions 1 and 2 enable a CiscoWorks network management station for automatic switch discovery. • The CiscoWorks 2000 LAN Management Solution provides support.



Table 2 shows the Cisco Catalyst 2948 G-GE-TX Gigabit Ethernet Switch hardware requirements.

Table 2 Hardware

Description	Specification
Performance	<ul style="list-style-type: none"> • 20 Gbps maximum forwarding bandwidth at Layer 2 switching fabric • Forwarding rate of 29.76 Mpps for 64-byte packets • 64 MB DRAM and 16 MB Flash memory • Configurable up to 16,000 MAC addresses • Configurable maximum transmission unit (MTU) of up to 1522 bytes for bridging on Gigabit Ethernet ports
Connectors and Cabling	<ul style="list-style-type: none"> • 10BASE-T ports: RJ-45 connectors, 2-pair Category 3, 4, or 5 unshielded twisted-pair (UTP) cabling • 100BASE-TX ports: RJ-45 connectors, 2-pair Category 5 UTP cabling • 1000BASE-T ports: RJ-45 connectors, 4-pair Category 5 UTP cabling • 1000BASE-T SFP-based ports: RJ-45 connectors, 4-pair Category 5 UTP cabling • 1000BASE-SX, -LX/LH, -ZX, and CWDM SFP-based ports: LC fiber connectors (single-mode, or multimode fiber) • 10/100 management port: RJ-45 connector • Management console port: RJ-45-to-DB9 cable for PC connections
Power Connectors	<p>Customers can provide power to a switch by using either the internal power supply or the Cisco RPS 675. The connectors are located at the back of the switch.</p> <p>Internal Power Supply Connector</p> <ul style="list-style-type: none"> • The internal power supply is an autoranging unit. • The internal power supply supports input voltages between 100 and 240 VAC. • Use the supplied AC power cord to connect the AC power connector to an AC power outlet. <p>Cisco RPS Connector</p> <ul style="list-style-type: none"> • The connector offers connection for an optional Cisco RPS 675 that uses AC input and supplies DC output to the switch. • The connector offers a 675W RPS that supports up to six external network devices and provides power to one failed device at a time. • The connector automatically senses when the internal power supply of a connected device fails and provides power to the failed device, preventing loss of network traffic. • Only the Cisco RPS 675 (model PWR675-AC-RPS-N1=) should be attached to the redundant power supply receptacle.
Indicators	<ul style="list-style-type: none"> • Per-port link status LED • System-status LEDs: system, power, and RPS
Dimensions (H x W x D)	<ul style="list-style-type: none"> • 1.73 x 17.5 x 17 in. (4.39 x 44.5 x 43.1 cm)
Weight	<ul style="list-style-type: none"> • 13 lb (5.9 kg)
Environmental Ranges	<ul style="list-style-type: none"> • Operating temperature: 32 to 113 F (0 to 45 C) • Storage temperature: -13 to 158 F (-25 to 70 C) • Operating relative humidity: 10 to 85 percent (noncondensing) • Operating altitude: Up to 10,000 ft (3049 m) • Storage altitude: Up to 15,000 ft (4573 m)



Table 2 Hardware (Continued)

Description	Specification
Acoustic Noise	<ul style="list-style-type: none">• International Organization for Standardization (ISO) 7779: bystander position operating to an ambient temperature of 30 C• 42 decibels (dB)
Mean Time Between Failure (MTBF)	<ul style="list-style-type: none">• 146,280 hours

Table 3 shows the power specifications for the Cisco Catalyst 2948G-GE-TX Gigabit Ethernet Switch.

Table 3 Power Specifications

Description	Specification
Power Consumption	130W (maximum), 445 BTUs per hour
AC Input Voltage and Frequency	100–240 VAC (autoranging), 50–60 Hz
DC Input Voltages	RPS input: +12V at 13A

Table 4 shows the management and standards support for the Cisco Catalyst 2948 G-GE-TX Gigabit Ethernet Switch.



Table 4 Management and Standards Support

Description	Specification
Management	BRIDGE-MIB CISCO-CDP-MIB CISCO-CLUSTER-MIB CISCO-CONF-MAN-MIB CISCO-ENTITY-FRU-CONTROL-MIB CISCO-ENVMON-MIB CISCO-FLASH-MIB CISCO-FTP-CLIENT-MIB CISCO-IGMP-FILTER-MIB CISCO-IMAGE-MIB CISCO-MAC-NOTIFICATION-MIB CISCO-MEMORY-POOL-MIB CISCO-PAGP-MIB CISCO-PING-MIB CISCO-PROCESS-MIB CISCO-RTTMON-MIB CISCO-STP-EXTENSIONS-MIB CISCO-SYSLOG-MIB CISCO-TCP-MIB CISCO-VLAN-IFTABLE-RELATIONSHIP-MIB CISCO-VLAN-MEMBERSHIP-MIB CISCO-VTP-MIB ENTITY-MIB ETHERLIKE-MIB IF-MIB IGMP-MIB OLD-CISCO-CHASSIS-MIB OLD-CISCO-FLASH-MIB OLD-CISCO-INTERFACES-MIB OLD-CISCO-IP-MIB OLD-CISCO-SYS-MIB OLD-CISCO-TCP-MIB OLD-CISCO-TS-MIB RFC1213-MIB RFC1253-MIB RMON-MIB RMON2-MIB SNMP-FRAMEWORK-MIB SNMP-MPD-MIB SNMP-NOTIFICATION-MIB SNMP-TARGET-MIB SNMPv2-MIB TCP-MIB UDP-MIB



Table 4 Management and Standards Support (Continued)

Description	Specification
Standards	<ul style="list-style-type: none"> IEEE 802.1s IEEE 802.1w IEEE 802.1x IEEE 802.3ad IEEE 802.3x full duplex on 10BASE-T, 100BASE-TX, and 1000BASE-T ports IEEE 802.1D Spanning Tree Protocol IEEE 802.1p class of service (CoS) prioritization IEEE 802.1Q VLAN IEEE 802.3 10BASE-T specification IEEE 802.3u 100BASE-TX specification IEEE 802.3ab 1000BASE-T specification IEEE 802.3z 1000BASE-X specification 1000BASE-X (SFP) 1000BASE-SX 1000BASE-LX/LH 1000BASE-ZX RMON I and II standards SNMPv1, SNMPv2c, SNMPv3

Table 5 shows the Cisco Catalyst 2948G-GE-TX Gigabit Ethernet Switch safety, compliance and warranty specifications.

Table 5 Safety and Compliance and Warranty

Description	Specification
Safety Certifications	<ul style="list-style-type: none"> • UL to UL 60950, Third Edition • C-UL to CAN/CSA C22.2 No. 60950-00, Third Edition • TUV/GS to EN 60950:2000 • CB to IEC 60950 with all country deviations • NOM to NOM-019-SCFI • CE Marking
Electromagnetic Emissions Certifications	<ul style="list-style-type: none"> • FCC Part 15 Class A • EN 55022: 1998 (CISPR22) • EN 55024: 1998 (CISPR24) • VCCI Class A • AS/NZS 3548 Class A • CE • CNS 13438 Class A • MIC
Telco	<ul style="list-style-type: none"> • CLEI code
Warranty	<ul style="list-style-type: none"> • Limited lifetime hardware warranty



Service and Support

Cisco is committed to minimizing total cost of ownership (TCO). Cisco offers a portfolio of Technical Support Services to help ensure that Cisco products operate efficiently, remain highly available, and benefit from the most up-to-date system software. The services and support programs described in Table 6 are available as part of the Cisco Desktop Switching Service and Support solution, and are available directly from Cisco and through resellers.

Table 6 Service and Support

Service and Support	Features	Benefits
Advanced Services		
Cisco Total Implementation Solutions (TIS), available direct from Cisco; Cisco Packaged TIS, available through resellers	<ul style="list-style-type: none"> • Project management • Site survey, configuration, and deployment • Installation, test, and cutover • Training • Major moves, adds, and changes • Design review and product staging 	<ul style="list-style-type: none"> • Supplements existing staff • Ensures functions meet client needs • Mitigates risk
Cisco SMARTnet® and SMARTnet Onsite, available direct from Cisco; Cisco Packaged SMARTnet, available through resellers	<ul style="list-style-type: none"> • 24-hour access to software updates • Web access to technical repositories • Telephone support through the Cisco Technical Assistance Center (TAC) • Advance replacement of hardware parts 	<ul style="list-style-type: none"> • Enables proactive or expedited issue resolution • Lowers TCO by taking advantage of Cisco expertise and knowledge • Minimizes network downtime

Ordering Information

Part Number	Description
WS-C2948G-GE-TX	<ul style="list-style-type: none"> • 48 Ethernet 10/100/1000BASE-T ports and 4 SFP-based Gigabit Ethernet ports • 1 rack-unit (RU) switch • Cisco Catalyst OS software (minimum 8.2(1)GLX release)
PWR675-AC-RPS-N1=	Cisco RPS 675 with one connector cable
CAB-RPS-1614=	1.2-meter cable for Cisco RPS 675 to external device connection
RCKMNT-1RU=	Spare rack mount kit
RCKMNT-REC-1RU=	Recessed spare rack mount kit
GLC-LH-SM=	Gigabit Ethernet SFP, LC connector, LH transceiver
GLC-SX-MM=	Gigabit Ethernet SFP, LC connector, SX transceiver
GLC-ZX-SM=	Gigabit Ethernet SFP, LC connector, ZX transceiver
GLC-T=	Gigabit Ethernet SFP, RJ-45 connector, 10/100/1000BASE-T transceiver
CWDM-SFP-1470= *	Cisco CWDM SFP 1470 nm; Gigabit Ethernet and 1G/2G FC (gray)
CWDM-SFP-1490= *	Cisco CWDM SFP 1490 nm; Gigabit Ethernet and 1G/2G FC (violet)
CWDM-SFP-1510= *	Cisco CWDM SFP 1510 nm; Gigabit Ethernet and 1G/2G FC (glue)

Part Number	Description
CWDM-SFP-1530= *	Cisco CWDM SFP 1530 nm; Gigabit Ethernet and 1G/2G FC (green)
CWDM-SFP-1550= *	Cisco CWDM SFP 1550 nm; Gigabit Ethernet and 1G/2G FC (yellow)
CWDM-SFP-1570= *	Cisco CWDM SFP 1570 nm; Gigabit Ethernet and 1G/2G FC (orange)
CWDM-SFP-1590= *	Cisco CWDM SFP 1590 nm; Gigabit Ethernet and 1G/2G FC (red)
CWDM-SFP-1610= *	Cisco CWDM SFP 1610 nm; Gigabit Ethernet and 1G/2G FC (brown)
CSS5-CABLX-LCSC=	CSS11500 10-meter fiber single- mode LX LC-to-SC connectors
CSS5-CABSX-LC=	CSS11500 10-meter fiber multimode SX LC connectors
CSS5-CABSX-LCSC=	CSS11500 10-meter fiber multimode SX LC-to-SC connectors
CAB-SM-LCSC-1M	1-meter fiber single-mode LC-to-SC connectors
CAB-SM-LCSC-5M	5-meter fiber single-mode LC-to-SC connectors

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Corporate Headquarters
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
www.cisco.com
Tel: 408 526-4000
800 553-NETS (6387)
Fax: 408 526-4100

European Headquarters
Cisco Systems International BV
Haarlerbergpark
Haarlerbergweg 13-19
1101 CH Amsterdam
The Netherlands
www-europe.cisco.com
Tel: 31 0 20 357 1000
Fax: 31 0 20 357 1100

Americas Headquarters
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
www.cisco.com
Tel: 408 526-7660
Fax: 408 527-0883

Asia Pacific Headquarters
Cisco Systems, Inc.
Capital Tower
168 Robinson Road
#22-01 to #29-01
Singapore 068912
www.cisco.com
Tel: +65 6317 7777
Fax: +65 6317 7799

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