Cisco Catalyst 2960-S and 2960 Series Switches with LAN Lite Software

The Cisco® Catalyst® 2960-S and 2960 Series Switches are the leading Layer 2 edge switches, providing improved operational excellence, highly secure business operations, improved sustainability, and an enhanced workspace experience. They are fixed-configuration access switches designed for entry-level enterprise, midmarket, and branch office networks. Figure 1 shows the Cisco Catalyst 2960-S Series Switch model and Figure 2 shows the Cisco Catalyst 2960 Series Switch model with LAN Lite software.

The Cisco Catalyst 2960-S Series Switches with LAN Lite Software have the following capabilities:

- 24 and 48 ports of Gigabit Ethernet (GbE) 10/100/1000 desktop connectivity
- 1 GbE Small Form-Factor Pluggable (SFP) uplinks
- USB storage interface for file backup, distribution, and simplified operations
- Enhanced troubleshooting for problem solving, including link connectivity and cable diagnostics
- Single IP address management for up to 16 switches
- A wide range of software features to provide ease of operation, secure business operations, sustainability and borderless networking experience
- Limited lifetime hardware warranty, including next-business-day replacement with 90-day service and support

The Cisco Catalyst 2960 Series Switches with LAN Lite Software have the following capabilities:

- Fast Ethernet connectivity with Power over Ethernet (PoE) of up to 15.4W per port
- GbE for data connectivity
- Enhanced troubleshooting for problem solving, including link connectivity and cable diagnostics
- Single IP address management for up to 16 switches
- A wide range of software features to provide ease of operation, highly secure business operations, sustainability, and a borderless networking experience
- Limited lifetime hardware warranty

Figure 1. Cisco Catalyst 2960-S and 2960 Series Switches with LAN Lite Software

Figure 2. Cisco Catalyst 2960-S Series Switches with LAN Lite Software

Switch Configurations

Table 1 shows the configuration information for the Cisco Catalyst 2960-S and 2960 Series Switches with LAN Lite Software.

Table 1. Configurations of Cisco Catalyst 2960-S and 2960 Series Switches with LAN Lite Software

Switch Model	Description	Uplinks
Catalyst 2960-S Switches with 1 Gigabit Uplinks and 10/100/1000 Ethernet Connectivity		
Cisco Catalyst 2960S-48TS-S	48 Ethernet 10/100/1000	2 1 GbE ports
Cisco Catalyst 2960S-24TS-S	24 Ethernet 10/100/1000	2 1 GbE SFP ports
Catalyst 2960 Switches with 1 Gigabit Uplinks and 10/100 Ethernet Connectivity		
Cisco Catalyst 2960-48PST-S	48 Ethernet 10/100 PoE ports (370W capacity)	2 fixed 10/100/1000 ports and 2 SFP ports
Cisco Catalyst 2960-24PC-S	24 Ethernet 10/100 PoE ports (370W capacity)	2 dual-purpose ports (10/100/1000 or SFP)
Cisco Catalyst 2960-24LC-S	24 Ethernet 10/100 and 8 10/100 PoE ports (123W capacity)	2 dual-purpose ports (10/100/1000 or SFP)
Cisco Catalyst 2960-48TC-S	48 Ethernet 10/100	2 dual-purpose ports (10/100/1000 or SFP)
Cisco Catalyst 2960-48TT-S	48 Ethernet 10/100	2 fixed 10/100/1000 ports
Cisco Catalyst 2960-24TC-S	24 Ethernet 10/100	2 dual-purpose ports (10/100/1000 or SFP)
Cisco Catalyst 2960-24-S	24 Ethernet 10/100	None
Compact Switches		
Cisco Catalyst 2960-8TC-S	8 Ethernet 10/100 compact size with no fan	1 dual-purpose port (10/100/1000 or SFP)

Cisco Catalyst 2960-S and 2960 Series Switches Enable Cisco Borderless Network

The Cisco Borderless Network Architecture delivers the new workspace experience, connecting anyone, anywhere, using any device, to any resource securely, reliably, and transparently. The Cisco Borderless Networks architecture addresses primary IT and business challenges to help create a truly borderless experience by bringing interactions closer to the employee and customer.

Borderless experience is only possible with intelligent network elements designed and architected to meet the needs of a global workspace. Cisco Network Access is a primary component of this architecture, enabling various borderless network services such as mobility, security, EnergyWise, and ease of operations for increased productivity and operational efficiency.

Cisco Network Access for Borderless solution focuses on the following primary areas:

- Sustainability
- Ease of operations
- Borderless security
- Borderless experience

Sustainability

Cisco Catalyst switching solutions enable greener practices through measurable power efficiency, integrated services, and continuous innovations such as Cisco EnergyWise, an enterprisewide solution that monitors and conserves energy with customized policies. Together, Cisco EnergyWise technology and Cisco Catalyst switches reduce greenhouse gas (GhG) emissions and increase energy cost savings and sustainable business behavior. Sustainability features in the Cisco Catalyst 2960-S and 2960 Series Switches include the following features sets:

- Cisco EnergyWise technology
- Efficient switch operation
- Intelligent power management

Cisco EnergyWise Technology

Cisco EnergyWise is an innovative architecture, added to fixed configuration switches, promoting companywide sustainability by reducing energy consumption across an entire corporate infrastructure and affecting more than 50 percent of global greenhouse gas emissions created by worldwide building infrastructure, a much greater effect than the 2 percent generated by the IT industry. Cisco EnergyWise enables companies to measure the power consumption of network infrastructure and network-attached devices and manage power consumption with specific policies, reducing power consumption to realize increased cost savings, potentially affecting any powered device.

EnergyWise encompasses a highly intelligent network-based approach to communicate messages that measure and control energy between network devices and endpoints. The network discovers Cisco EnergyWise-manageable devices, monitors their power consumption, and takes action based on business rules to reduce power consumption. EnergyWise uses a unique domain-naming system to query and summarize information from large sets of devices, making it simpler than traditional network management capabilities. Cisco EnergyWise's management interfaces allow facilities and network management applications to communicate with endpoints and each other using the network as a unifying fabric. The management interface uses standard Simple Network Management Protocol (SNMP) or TCP to integrate Cisco and third-party management systems.

Efficient Switch Operation

Cisco Catalyst 2960-S and 2960 Series Switches, designed and engineered by Cisco, provide optimum power saving, low power operations for industry best-in-class power management, and power consumption capabilities. The Catalyst 2960-S ports are capable of reduced power modes so that ports not in use can move into a lower power utilization state.

Intelligent Power over Ethernet Management

The Cisco Catalyst 2960 Series PoE models support the latest PoE devices including Cisco IP phones and Cisco Aironet WLAN access points providing up to 15.4W of power per port, as well as any IEEE 802.3af-compliant end device.

- **Per port power consumption** command allows customers to specify maximum power setting on an individual port.
- **Cisco Discovery Protocol Version 2** allows switches to negotiate a more granular power setting when connecting to a Cisco powered device such as IP phones or access points than what is provided by IEEE classification.
- **PoE MIB** provides proactive visibility into power usage and allows customers to set different power-level thresholds.
- **IEEE 802.3af and Cisco prestandard PoE** support comes with automatic discovery to detect a Cisco prestandard or IEEE 802.3af endpoint and provide the necessary power without any user configuration. Per-port PoE power sensing measures the actual power being drawn, enabling more intelligent control of powered devices.

Table 2 lists the PoE capacity of the Cisco Catalyst 2960 Series Switches.

Table 2. Switch PoE Power Capacity

Switch Model	Maximum Number of PoE Ports*	Available PoE Power
Cisco Catalyst 2960-48PST-S	24 ports up to 15.4W 48 ports up to 7.7W	370W
Cisco Catalyst 2960-24PC-S	24 ports up to 15.4W	370W
Cisco Catalyst 2960-24LC-S	8 ports up to 15.4W	123W

*Intelligent power allows flexible power allocation across all ports.

Ease of Operations

The Cisco Catalyst 2960-S and 2960 Series Switches help reduce the operating costs through:

- Cisco Catalyst Smart Operations
- Easy to use deployment and control features
- Advanced, intelligent network management tools

Cisco Catalyst Smart Operations

Cisco Catalyst Smart Operations is a comprehensive set of capabilities that simplify LAN deployment, configuration, and troubleshooting. Cisco Catalyst Smart Operations enable zero-touch installation and replacement of switches, fast upgrade, as well as ease of troubleshooting with reduced operational cost.

Cisco Catalyst Smart Operations is a set of features that includes Smart Install, Auto Smartports, Smart Configuration, and Smart Troubleshooting to enhance operational excellence:

- **Cisco Smart Install** is a transparent plug-and-play technology to configure the Cisco IOS Software image and switch configuration without user intervention. Smart Install utilizes dynamic IP address allocation and the assistance of other switches to facilitate installation providing transparent network plug and play.
- **Cisco Auto Smartports** provide automatic configuration as devices connect to the switch port, allowing auto detection and plug and play of the device onto the network.

Easy to Use Deployment and Control Features

- **Auto-negotiation** on all ports automatically selects half- or full-duplex transmission mode to optimize bandwidth.
- **Dynamic Trunking Protocol (DTP)** facilitates 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.
- **Automatic media-dependent interface crossover (MDIX)** automatically adjusts transmit and receive pairs if an incorrect cable type (crossover or straight-through) is installed.
- **Unidirectional Link Detection Protocol (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.
- **Dynamic Host Configuration Protocol (DHCP)** autoconfiguration of multiple switches through a boot server eases switch deployment.
- **Switching Database Manager (SDM)** templates for access, routing, and VLAN deployment allow the administrator to easily maximize memory allocation to the desired features based on deployment-specific requirements.
- **Local Proxy Address Resolution Protocol (ARP)** works in conjunction with Private VLAN Edge to minimize broadcasts and maximize available bandwidth.
- **Internet Group Management Protocol (IGMP)** Snooping for IPv4 and IPv6 MLD v1 and v2 Snooping provide fast client joins and leaves of multicast streams and limit bandwidth-intensive video traffic to only the requestors.
- **Per-port broadcast, multicast, and unicast storm control** prevents faulty end stations from degrading overall systems performance.
- **Voice VLAN** simplifies telephony installations by keeping voice traffic on a separate VLAN for easier administration and troubleshooting.
- **Cisco VLAN Trunking Protocol (VTP)** supports dynamic VLANs and dynamic trunk configuration across all switches.
- **Switch Port Analyzer (SPAN)** allows administrators to 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).
- **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 timestamp to all intranet switches.
- **Cisco Emergency Responder (CER)** enhances emergency calling from Cisco Unified CallManager. It helps assure that Cisco Unified CallManager sends emergency calls to the appropriate Public Safety Answering Point (PSAP) for the caller's location.

Advanced, Intelligent Network Management Tools

The Cisco Catalyst 2960-S and 2960 Series Switches offer both a superior CLI for detailed configuration and Cisco Network Assistant software, a PC-based tool for quick configuration based on preset templates. In addition, CiscoWorks LAN Management Solution (LMS) supports the Cisco Catalyst 2960-S and 2960 Series Switches for networkwide management.

Cisco Network Assistant

A PC-based network management application designed for small and medium-sized business (SMB) networks with up to 250 users, Cisco Network Assistant offers centralized network management and configuration capabilities. Cisco Network Assistant uses Cisco Smartports technology to simplify both initial deployment and ongoing maintenance. This application also features an intuitive GUI where users can easily apply common services across Cisco switches, routers, and access points, such as:

- Configuration management
- Troubleshooting advice
- Inventory reports
- Event notification
- Network security settings
- Password synchronization
- Drag-and-drop Cisco IOS Software upgrades
- Secure wireless

For detailed information about Cisco Network Assistant, visit http://www.cisco.com/go/cna.

CiscoWorks LAN Management Solution

CiscoWorks LAN Management Solution (LMS) is a comprehensive network lifecycle management solution. It provides an extensive library of easy-to-use features to automate the initial and day-to-day management of your Cisco network infrastructure. CiscoWorks LMS uniquely uses Cisco hardware and software platform knowledge and operational experience into a powerful set of workflow driven configuration, monitoring, troubleshooting, reporting, and administrative tools. Including:

- Support for new Cisco hardware platforms the day they ship
- Support for new technologies and services from initial deployment to day-to-day administration and management, such as EnergyWise, Identity, Cisco Auto Smartports, Cisco Smart Install, and much more
- Configuration management tools built from Cisco experience and Cisco Validated Design recommendations
- Monitoring and troubleshooting capabilities that incorporates Cisco hardware best practices and diagnostics features
- Automation in managing hardware inventories, security vulnerabilities (PSIRTS) and platform end-of-life and support cycles

For detailed information about CiscoWorks LMS, go to:
http://www.cisco.com/en/US/products/sw/cscowork/ps2425/index.html.

Borderless Security

The Cisco Catalyst 2960-S and 2960 LAN Lite Series Switches provide basic TrustSec, a primary element of Borderless Security Architecture, that helps enterprise customers secure their networks, data and resources with policy-based access control, identity-aware and role-aware networking, pervasive integrity, and confidentiality. The borderless security is enabled by the following feature sets in the Cisco Catalyst 2960-S and 2960 Series Switches:

- Basic Cisco TrustSec
- Other security features

Cisco TrustSec

- The Cisco TrustSec solution provides authentication, access control, and security policy administration to secure network connectivity and resources. On the Cisco Catalyst 2960-S and 2960 Series with LAN Lite, the TrustSec solution prevents unauthorized access and helps ensure that users get only their designated privileges. It provides the ability to dynamically administer granular levels of network access.

Other Security Features

Other Advanced Security features include but are not limited to:

- **MAC Auth Bypass (MAB)** for voice allows third-party IP phones without an 802.1X supplicant to get authenticated using their MAC address.
- **Port security** can be used to limit access on an Ethernet port based on the MAC address of the device to which it is connected. It also can be used to limit the total number of devices plugged into a switch port, thereby protecting the switch from a MAC flooding attack as well as reducing the risks posed by rogue wireless access points or hubs.
- **The MAC Address Notification** feature can be used to monitor the network and track users by sending an alert to a management station so that network administrators know when and where users enter the network.
- **Secure Shell (SSH) Protocol v2** and Simple Network Management Protocol (SNMP) v3 provide network security by encrypting administrator traffic during Telnet and SNMP sessions. SSH v2 and the cryptographic version of SNMP v3 require a special cryptographic software image because of U.S. export restrictions.

Borderless Experience

Borderless network enables enterprise mobility and business-grade video services. Industry's first unified network (wired and wireless) location services enable tracking of mobile assets and the users of those assets for both wired and wireless devices. The true borderless experience is enabled by the following feature sets in the Cisco Catalyst 2960-S and 2960 Series Switches:

- Layer 2 Networking
- QoS

Layer 2 Networking

The Cisco 2960-S and 2960 Series Switches provide Layer 2 networking to enable availability.

Features include but are not limited to:

- **IEEE 802.1s/w Rapid Spanning Tree Protocol (RSTP) and Multiple Spanning Tree Protocol (MSTP)** provide rapid spanning-tree convergence independent of spanning-tree timers and also offers the benefit of Layer 2 load balancing and distributed processing.
- **Per-VLAN Rapid Spanning Tree (PVRST+)** allows rapid spanning-tree reconvergence on a per-VLAN spanning-tree basis, without requiring the implementation of spanning-tree instances.
- **Switch-port autorecovery (Errdisable)** automatically attempts to reactivate a link that is disabled because of a network error.
- **Up to 64 VLANs** and up to 64 spanning-tree instances per switch are supported.

Quality of Service

The Cisco Catalyst 2960-S and 2960 Series Switches offers intelligent services that keep everything flowing smoothly. Industry-leading mechanisms for marking, classification, and scheduling deliver superior performance for data, voice, and video traffic, all at wire speed.

Following are some of the QoS features supported in the Cisco 2960-S and 2960 Series Switches:

- **802.1p class of service (CoS)** classification provides differentiated services when best-effort traffic delivery is insufficient.
- **Four egress queues per port** help enable differentiated management of different traffic types across the stack.
- **Shaped Round Robin (SRR)** scheduling helps ensure differential prioritization of packet flows by intelligently servicing the ingress queues and egress queues.
- **Weighted Tail Drop (WTD)** provides congestion avoidance at the ingress and egress queues before a disruption occurs.

Tables 3, 4, 5, 6 and 7 provide hardware features, power specifications, management and standards, and safety and compliance information for the Cisco Catalyst 2960-S and 2960 Series Switches with LAN Lite Software.

Table 3. Hardware Features for Cisco Catalyst 2960-S and 2960 Series Switches with LAN Lite Software

Performance and Scalability Numbers for All Switch Models	
Forwarding bandwidth	16 Gbps (2960), 50 Gbps (2960-S)
Flash memory	32 MB (2960), 64 MB (2960-S)
Memory DRAM	64 MB (2960), 128 MB (2960-S)
Max VLANs	64
VLAN IDs	4000
Maximum transmission unit (MTU)	Up to 9198 bytes
Jumbo frames	9016 bytes (2960), 9216 bytes (2960-S)
Forwarding Rate	
2960S-48TS-S	74.4 mpps
2960S-24TS-S	38.7 mpps
2960-8TC-S	2.7 mpps

2960-24-S	3.6 mpps
2960-24TC-S	6.5 mpps
2960-24PC-S	6.5 mpps
2960-24LC-S	6.5 mpps
2960-48TT-S	10.1 mpps
2960-48TC-S	10.1 mpps
2960-48PST-S	13.3 mpps

Resource	Default	QoS	Dual
Unicast MAC addresses	**8000**	**8000**	**8000**
IPv4 IGMP groups	**256**	**256**	**256**
IPv4 MAC QoS access control entries (ACEs)	**128**	**384**	**0**
IPv4 MAC security ACEs	**384**	**128**	**256**

Connectors and Cabling and Indicators

- 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 SFP-based ports: LC fiber connectors (single- and multimode fiber)
- 100Base-FX: LC fiber connectors (single- and multimode fiber)

- Customers can provide power to a switch only by using the internal power supply. The connector is located at the back of the switch. These switches do not have a redundant-power-supply port.
- The internal power supply is an auto-ranging 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.

- Per-port status: Link integrity, disabled, activity, speed, and full duplex
- System status: System, link status, link duplex, PoE, and link speed

- Per-port status: Link integrity, disabled, activity, speed, and full duplex
- System status: System, link status, link duplex, PoE, and link speed

Dimensions (H x W x D)

Model	Inches	Centimeters
2960S-48TS-S	**1.75 x 17.7 x 11.8**	**4.5 x 45 x 30**
2960S-24TS-S	**1.75 x 17.7 x 11.8**	**4.5 x 45 x 30**
2960-8TC-S	**1.73 x 10.6 x 6.4**	**4.4 x 27 x 16.3**
2960-24-S	**1.73 x 17.7 x 9.52**	**4.4 x 45 x 24.2**
2960-24TC-S	**1.73 x 17.7 x 9.52**	**4.4 x 45 x 24.2**
2960-24PC-S	**1.73 x 17.7 x 13**	**4.4 x 45 x 33.02**
2960-24LC-S	**1.73 x 17.7 x 13**	**4.4 x 45 x 33.02**
2960-48TT-S	**1.73 x 17.7 x 9.52**	**4.4 x 45 x 24.2**
2960-48TC-S	**1.73 x 17.7 x 9.52**	**4.4 x 45 x 24.2**
2960-48PST-S	**1.73 x 17.7 x 13**	**4.4 x 45 x 33.02**

Weight

Model	Pounds	Kilograms
2960S-48TS-S	**10.5**	**4.8**
2960S-24TS-S	**10**	**4.5**
2960-8TC-S	**3**	**1.4**
2960-24-S	**8**	**3.6**
2960-24TC-S	**8**	**3.6**

2960-24PC-S	12	5.4
2960-24LC-S	10	4.5
2960-48TT-S	8	3.6
2960-48TC-S	8	3.6
2960-48PST-S	12	5.4

Environmental ranges		
	Fahrenheit	Centigrade
Operating temperature up to 5000 ft (1500 m)	23º to 113ºF	-5º to 45ºC
Operating temperature up to 10,000 ft (3000 m)	23º to 104ºF	-5º to 40ºC
Short-term exception at sea level*	23º to 31ºF	-5º to +55ºC
Short-term exception up to 5,000 feet (1500 m)*	23º to 122ºF	-5º to +50ºC
Short-term exception up to 10,000 feet (3000 m)*	23º to 113ºF	-5º to +45ºC
Storage temperature	Same as above	Same as above
	Feet	Meters
Operating altitude	Up to 10,000	Up to 3000
Storage altitude	Up to 13,000	Up to 4000
Operating relative humidity	10% to 95% noncondensing	
Storage relative humidity	10% to 95% noncondensing	

Acoustic noise

Measured per ISO 7779 and declared per ISO 9296.

Bystander positions operating mode at 25°C ambient.

	Sound Pressure		Sound Power	
Model	LpA (Typical*)	LpAD (Maximum*)	LwA (Typical)	LwAD (Maximum)
2960S-48TS-S 2960S-24TS-S	44 dB	47 dB	5.4 B	5.7 B
2960-24-S	40 dB	-	-	-
2960-24TC-S	40 dB	-	-	-
2960-24PC-S	48 dB	-	-	-
2960-24LC-S	48 dB	-	-	-
2960-48TT-S	40 dB	-	-	-
2960-48TC-S	40 dB	-	-	-
2960-48PST-S	48 dB	-	-	-

*Typical: Noise emission for a typical configuration and PoE load up to 185W

*Maximum: Statistical maximum to account for production variations

Mean time between failures (MTBF)	
2960S-48TS-S	357,740 hours
2960S-24TS-S	335,014 hours
2960-8TC-S	615,549 hours
2960-24-S	429,847 hours
2960-24TC-S	403,745 hours
2960-24PC-S	242,818 hours
2960-24LC-S	311,007 hours

2960-48TT-S	**339,743 hours**
2960-48TC-S	**336,983 hours**
2960-48PST-S	**181,979 hours**

*Not more than the following in a 1-year period. 96 consecutive hours, or 360 hours total, or 15 occurences.
Note: Compact switch 2960-8TC-S (no fan) has 0 dB sound pressure.

Table 4. Power Specifications for Cisco Catalyst 2960-S and 2960 Series Switches with LAN Lite Software

Description	C2960-S and C2960 Specifications				
Models	C2960S-48TS-S	C2960S-24TS-S	C2960-8TC-S	C2960-24TC-S	C2960-24PC-S
100 Percent Throughput					
Measured Power Consumption	53W	36W	12W	22W	27W
5 Percent Throughput					
Measured Power Consumption	50W	36W	11W	21W	24W
5 Percent Throughput (with 50 Percent PoE Loads)					
Measured Power Consumption	-	-	-	-	Switch Power: 237W PoE Power: 185W
100 Percent Throughput (with Maximum Possible PoE Loads)					
Measured Power Consumption	-	-	-	-	Switch Power: 433W PoE Power: 357W

Description	C2960 Specifications			
Models	C2960-24LC-S	C2960-48TT-S	C2960-48TC-S	C2960-48PST-S
100 Percent Throughput				
Measured Power Consumption	79W	71W	55W	52W
5 Percent Throughput				
Measured Power Consumption	78W	70W	54W	50W
5 Percent Throughput (with 50 Percent PoE Loads)				
Measured Power Consumption	Switch Power: 98W PoE Power: 62W	-	-	Switch Power: 460W PoE Power: 339W
100 Percent Throughput (with Maximum Possible PoE Loads)				
Measured Power Consumption	Switch Power: 162W PoE Power: 119W	-	-	Switch Power: 262W PoE Power: 187W

Table 5. Voltage and Power Rating for Cisco Catalyst 2960-S and 2960 Series Switches with LAN Lite Software

Voltages and Power Rating			
Model	Voltage (Autoranging)	Current	Frequency
2960S-48TS-S	100 to 240 VAC	1 to 0.5 A	50 to 60 Hz
2960S-24TS-S	100 to 240 VAC	1 to 0.5 A	50 to 60 Hz
2960-8TC-S	100 to 240 VAC	0.5 to 0.3 A	50 to 60 Hz
2960-24-S	100 to 240 VAC	1.3 to 0.8 A	50 to 60 Hz
2960-24TC-S	100 to 240 VAC	1.3 to 0.8 A	50 to 60 Hz
2960-24PC-S	100 to 240 VAC	8.0 to 4.0 A	50 to 60 Hz

Voltages and Power Rating			
2960-24LC-S	100 to 240 VAC	3.0 to 1.5 A	50 to 60 Hz
2960-48TT-S	100 to 240 VAC	1.3 to 0.8A	50 to 60 Hz
2960-48TC-S	100 to 240 VAC	1.3 to 0.8A	50 to 60 Hz
2960-48PST-S	100 to 240 VAC	5.0 to 2.0 A	50 to 60 Hz

Model	Power Rating
2960S-48TS-S	0.13 kVA
2960S-24TS-S	0.08 kVA
2960-8TC-S	0.035 kVA
2960-24-S	0.05 kVA
2960-24TC-S	0.05 kVA
2960-24PC-S	0.47 kVA
2960-24LC-S	0.175 kVA
2960-48TT-S	0.075 kVA
2960-48TC-S	0.075 kVA
2960-48PST-S	0.5 kVA

- Maximum power supplied per port for PoE is 15.4W
- Total power dedicated to PoE is 370W

Table 6. Management and Standards Support for Cisco Catalyst 2960-S and 2960 Series Switches with LAN Lite Software

Description	Specification	
Management	• BRIDGE-MIB • CISCO-CABLE-DIAG-MIB • CISCO-CDP-MIB • CISCO-CLUSTER-MI • CISCO-CONFIG-COPY-MIB • CISCO-CONFIG-MAN-MIB • CISCO-ENTITY-VENDORTYPE-OID-MIB • CISCO-ENVMON-MIB • CISCO-ERR-DISABLE-MIB • CISCO-FLASH-MIB • CISCO-FTP-CLIENT-MIB • CISCO-IGMP-FILTER-MIB • CISCO-IMAGE-MIB • CISCO-IP-STAT-MIB • CISCO-LAG-MIB • CISCO-MAC-NOTIFICATION-MIB • CISCO-MEMORY-POOL-MIB • CISCO-PAGP-MIB • CISCO-PING-MIB • CISCO-PORT-QOS-MIB • CISCO-PORT-SECURITY-MIB • CISCO-PORT-STORM-CONTROL-MIB • CISCO-POWER-ETHERNET-EXT-MIB • CISCO-PRODUCTS-MIB • CISCO-PROCESS-MIB • CISCO-RTTMON-MIB • CISCO-SMI-MIB • CISCO-STP-EXTENSIONS-MIB • CISCO-SYSLOG-MIB • Cisco-UDLDP-MIB	• CISCO-TC-MIB • CICSO-TCP-MIB • CISCO-VLAN-IFTABLE-RELATIONSHIP-MIB • CISCO-VLAN-IFTABLE-MEMBERSHIP-MIB • CISCO-VTP-MIB • ENTITY-MIB • ETHERLIKE-MIB • IEEE8023-LAG-MIB • IF-MIB • INET-ADDRESS-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 • RMON-MIB • RMON2-MIB • SNMP-FRAMEWORK-MIB • SNMP-MPD-MIB • SNMP-NOTIFICATION-MIB • SNMP-TARGET-MIB • SNMPv2-MIB • TCP-MIB • UDP-MIB

Description	Specification	
Standards	• IEEE 802.1D Spanning Tree Protocol • IEEE 802.1p CoS Prioritization • IEEE 802.1Q VLAN • IEEE 802.1s • IEEE 802.1w • IEEE 802.1X • IEEE 802.1ab (LLDP without MED*) • IEEE 802.3ad • IEEE 802.3ah (100BASE-X single- and multimode fiber only) • IEEE 802.3x full duplex on 10BASE-T, 100BASE-TX, and 1000BASE-T ports • IEEE 802.3 10BASE-T specification • IEEE 802.3u 100BASE-TX specification • IEEE 802.3ab 1000BASE-T specification • IEEE 802.3z 1000BASE-X specification	• 100BASE-FX (SFP) • 1000BASE-SX (SFP) • 1000BASE-LX/LH (SFP) • Remote Monitoring (RMON) I and II standards • SNMPv1, v2c, and v3
RFC compliance	• RFC 768 - UDP • RFC 783 - TFTP • RFC 791 - IP • RFC 792 - ICMP • RFC 793 - TCP • RFC 826 - Address Resolution Protocol (ARP) • RFC 854 - Telnet • RFC 951 - Bootstrap Protocol (BOOTP) • RFC 959 - FTP • RFC 1112 - IP Multicast and IGMP • RFC 1157 - SNMP v1 • RFC 1166 - IP addresses • RFC 1305 - NTP • RFC 1492 - TACACS+ • RFC 1493 - Bridge MIB • RFC 1542 - BOOTP extensions • RFC 1643 - Ethernet Interface MIB • RFC 1757 - RMON	• RFC 1901 - SNMP v2C • RFC 1902-1907 - SNMP v2 • FRC 2068 - HTTP • RFC 2131 - DHCP • RFC 2138 - RADIUS • RFC 2233 - IF MIB • RFC 2273-2275 - SNMP v3 • RFC 2474 - Differentiated Services (DiffServ) Precedence • RFC 2597 - Assured Forwarding • RFC 2598 - Expedited Forwarding • RFC 2571 - SNMP Management • RFC 3046 - DHCP Relay Agent Information Option • RFC 3376 - IGMP v3 • RFC 3580 - 802.1X RADIUS

*Version with MED will be available starting in release IOS12.2.(55)

Table 7. Safety and Compliance

Description	Specification
Safety certifications	• UL 60950-1, Second Edition • CAN/CSA 22.2 No. 60950-1, Second Edition • TUV/GS to EN 60950-1, Second Edition • CB to IEC 60950-1 Second Edition with all country deviations • CE Marking • NOM (through partners and distributors)
Electromagnetic emissions certifications	• FCC Part 15 Class A • EN 55022 Class A (CISPR22) • EN 55024 (CISPR24) • AS/NZS CISPR22 Class A • CE • CNS13438 Class A • MIC • GOST • China EMC Certifications

Description	Specification
Environmental	Reduction of Hazardous Substances (ROHS) 5
Telco	Common Language Equipment Identifier (CLEI) code
Warranty	Limited lifetime warranty

Cisco Limited Lifetime Hardware Warranty

Cisco Catalyst 2960-S and 2960 Series Switches come with a limited lifetime warranty (Table 8). The warranty for the Catalyst 2960-S has the same terms as our standard limited lifetime warranty plus the addition of next business day delivery of replacement hardware where available and 90 days of 8x5 Cisco Technical Assistance (TAC) support. Your formal warranty statement, including the warranty applicable to Cisco software, appears in the Cisco information packet that accompanies your Cisco product. We encourage you to review carefully the warranty statement shipped with your specific product before use.

Cisco reserves the right to refund the purchase price as its exclusive warranty remedy.

For further information on warranty terms, visit http://www.cisco.com/go/warranty.

Table 8. Limited Lifetime Warranty Terms

	Cisco Limited Lifetime Hardware Warranty	Cisco Enhanced Limited Lifetime Hardware Warranty
Device covered	Applies to Cisco Catalyst 2960 Series Switches sold on or after May 1, 2009	Applies to Cisco Catalyst 2960-S Series Switches
Warranty duration	As long as the original customer owns the product.	As long as the original end user continues to own or use the product, provided that: fan and power supply warranty is limited to five (5) years.
End-of-life policy	In the event of discontinuance of product manufacture, Cisco warranty support is limited to five (5) years from the announcement of discontinuance.	In the event of discontinuance of product manufacture, Cisco warranty support is limited to five (5) years from the announcement of discontinuance.
Hardware replacement	Cisco or its service center will use commercially reasonable efforts to ship a replacement part within ten (10) working days after receipt of the RMA request. Actual delivery times may vary depending on customer location.	Cisco or its service center will use commercially reasonable efforts to ship a Catalyst 2960-S replacement for next business day delivery, where available. Otherwise, a replacement will be shipped within ten (10) working days after receipt of the RMA request. Actual delivery times may vary depending on customer location.
Effective date	Hardware warranty commences from the date of shipment to customer (and in case of resale by a Cisco reseller, not more than ninety [90] days after original shipment by Cisco).	Hardware warranty commences from the date of shipment to customer (and in case of resale by a Cisco reseller, not more than ninety [90] days after original shipment by Cisco).
TAC support	Not included.	Cisco will provide, during customer's local business hours, 8 hours per day, 5 days per week basic configuration, diagnosis, and troubleshooting of device-level problems for up to 90 days from the date of shipment of the originally purchased Catalyst 2960-S product. This support does not include solution or network-level support beyond the specific device under consideration.
Cisco.com Access	Warranty allows guest access only to Cisco.com	Warranty allows guest access only to Cisco.com

Software Update Policy for Cisco Catalyst 2960-S and 2960 Series Switches with LAN Lite Software

Customers with Cisco Catalyst LAN Lite software licenses will be provided with maintenance updates and bug fixes designed to maintain the compliance of the software with published specifications, release notes, and industry standards compliance as long as the original end user continues to own or use the product or for up to one year from the end-of-sale date for this product, whichever occurs earlier. Customers with licenses for our premium software images, Enterprise Services or IP Services, require a service support contract such as Cisco SMARTnet® Service to download updates.

This policy supersedes any previous warranty or software statement and is subject to change without notice.

Cisco and Partner Services for the Catalyst 2960 Switches

Minimize operating costs and reduce power consumption for the Cisco Catalyst 2960 switch using intelligent, personalized services from Cisco and our partners. Through a discovery process that begins with understanding your business objectives, we help you integrate the Cisco Catalyst switch into your architecture and incorporate network services onto it. Sharing knowledge and leading practices, we support your success every step of the way as you deploy, absorb, manage, and scale new technology. Choose from a flexible suite of support services designed to meet your business needs and help you maintain high-quality network performance while controlling operational costs. Table 9 lists the technical services available for the Cisco Catalyst 2960-S and 2960 Series Switches.

Table 9. Technical Services Available for Cisco Catalyst 2960-S and 2960 Series Switches

Technical Services
Cisco SMARTnet® Service • Around-the-clock, global access to the Cisco TAC • Unrestricted access to the extensive Cisco.com knowledge base and tools • Next-business-day, 8x5x4, 24x7x4, or 24x7x2 advance hardware replacement and onsite parts replacement and installation available1 • Ongoing operating system software updates within the licensed feature set2 • Proactive diagnostics and real-time alerts on Smart Call Home enabled devices
Cisco Smart Foundation Service • Next-business-day advance hardware replacement as available • Access to SMB TAC during business hours (access levels vary by region) • Access to Cisco.com SMB knowledge base • Online technical resources through the Smart Foundation Portal • Operating system software bug fixes and patches
Cisco Smart Care Service • Network-level coverage for the needs of small and medium-sized businesses • Proactive health checks and periodic assessments of Cisco network foundation, voice, and security technologies • Technical support for eligible Cisco hardware and software through Smart Care Portal • Cisco operating system and application software updates and upgrades2 • Next-business-day advance hardware replacement as available, 24x7x4 option available1
Cisco SP Base Service • Around-the-clock, global access to the Cisco TAC • Registered access to Cisco.com • Next business day, 8x5x4, 24x7x4, and 24x7x2 advance hardware replacement. Return to factory option available1 • Ongoing operating system software updates2
Cisco Focused Technical Support Services Three levels of premium, high-touch services are available: • Cisco High-Touch Operations Management Service • Cisco High-Touch Technical Support Service • Cisco High-Touch Engineering Service Valid Cisco SMARTnet or SP Base contracts are required on all network equipment.

Footnotes:
1. Advance hardware replacement is available in various service-level combinations. For example, 8x5xNBD indicates that shipment will be initiated during the standard 8-hour business day, 5 days a week (the generally accepted business days within the relevant region), with next-business-day (NBD) delivery. Where NBD is not available, same day shipping is provided. Restrictions apply; please review the appropriate service descriptions for details.
2. Cisco operating system updates include the following: maintenance releases, minor updates, and major updates within the licensed feature set.

Ordering Information

Table 10 has ordering information for the Cisco Catalyst 2960-S and 2960 Series Switches with LAN Lite Software.

Table 10. Ordering Information for Cisco Catalyst 2960 Series Switches with LAN Lite Software

Part Numbers	Description
Cisco Catalyst 2960S-48TS-S	• 48 Ethernet 10/100/1000 • 2 One Gigabit Ethernet SFP uplink ports • LAN Lite software
Cisco Catalyst 2960S-24TS-S	• 24 Ethernet 10/100/1000 • 2 One Gigabit Ethernet SFP uplink ports • LAN Lite software
WS-C2960-8TC-S	• 8 Ethernet 10/100 ports and 1 dual-purpose uplink (dual-purpose uplink port has 1 10/100/1000 Ethernet port and 1 SFP-based Gigabit Ethernet port, 1 port active) • LAN Lite software • Compact size with no fan; mounting magnet included
WS-C2960-24-S	• 24 Ethernet 10/100 ports • LAN Lite software
WS-C2960-24TC-S	• 24 Ethernet 10/100 ports and 2 dual-purpose uplinks (each dual-purpose uplink port has 1 10/100/1000 Ethernet port and 1 SFP-based Gigabit Ethernet port, 1 port active) • LAN Lite software
WS-2960-24PC-S	• 24 Ethernet 10/100 ports and 2 dual-purpose uplinks (each dual-purpose uplink port has 1 10/100/1000 Ethernet port and 1 SFP-based Gigabit Ethernet port, 1 port active) • LAN Lite software • 24 PoE ports
WS-2960-24LC-S	• 24 Ethernet 10/100 ports and 2 dual-purpose uplinks (each dual-purpose uplink port has 1 10/100/1000 Ethernet port and 1 SFP-based Gigabit Ethernet port, 1 port active)] • LAN Lite software • 8 PoE ports
WS-C2960-48TT-S	• 48 Ethernet 10/100 ports and 2 10/100/1000 TX uplinks • LAN Lite software
WS-C2960-48TC-S	• 48 Ethernet 10/100 ports and 2 dual-purpose uplinks (each dual-purpose uplink port has 1 10/100/1000 Ethernet port and 1 SFP-based Gigabit Ethernet port, 1 port active) • LAN Lite software
WS-2960-48PST-S	• 48 Ethernet 10/100 ports and 2 10/100/1000 uplinks and 2 SFP uplinks • LAN Lite software • 48 PoE ports
Spare Rack-Mount Kits for the Cisco Catalyst 2960 Series Switches with LAN Lite Software	
RCKMNT-1RU=	• Spare rack-mount kit for the Cisco Catalyst 2960 and 2960-S Series
RCKMNT-REC-1RU=	• 1 RU recessed rack-mount kit for the Cisco Catalyst 2960 and 2960-S Series
Power Cords	
CAB-16AWG-AC	AC Power cord, 16AWG
CAB-ACE	AC Power Cord (Europe), C13, CEE 7, 1.5M
CAB-L620P-C13-US	Power Cord, 250VAC, 15A, NEMA L6-20 to C13, US
CAB-ACI	AC Power Cord (Italy), C13, CEI 23-16, 2.5m
CAB-ACU	AC Power Cord (UK), C13, BS 1363, 2.5m
CAB-ACA	AC Power Cord (China/Australia), C13, AS 3112, 2.5m
CAB-ACS	AC Power Cord (Switzerland), C13, IEC 60884-1, 2.5m
CAB-ACR	AC Power Cord (Argentina), C13, EL 219 (IRAM 2073), 2.5m
CAB-ACC	CORD,PWR,CHINA,10A,IEC 320,C13(APN=CS-PWR-CH)

Part Numbers	Description
CAB-3P-JPN	CABASY,POWER CORD,JAPAN 3P, PSE, 12A @125VAC
CAB-L620P-C13-JPN	Power Cord, 250VAC, 15A, NEMA L6-20 to C13, JAPAN
CAB-IND-10A	Power cable for India
CAB-AC15A-90L-US	15A AC Pwr Cord, left-angle (United States)
CAB-ACE-RA	Power Cord Europe, Right Angle
CAB-ACI-RA	Power Cord-Italian, Right Angle
CAB-ACU-RA	Power Cord UK, Right Angle
CAB-ACC-RA	Power Cord China, Right Angle
CAB-ACA-RA	Power Cord, Australian, Right Angle
CAB-ACS-RA	Power Cord for Switzerland, Right Angle
CAB-ACR-RA	Power Cord, Argentina, Right Angle
CAB-JPN-RA	Power Cord, Japan, Right Angle
Optical Transceivers for the Cisco Catalyst 2960 Series Switches with LAN Lite Software	
GLC-LH-SM=	1000BASE-LX/LH SFP transceiver module for MMF and SMF, 1300-nm wavelength
GLC-SX-MM=	1000BASE-SX SFP transceiver module for MMF, 850-nm wavelength
GLC-T=	1000BASE-T SFP transceiver module for Category 5 copper wire
GLC-GE-100FX=	100BASE-FX SFP module for Gigabit Ethernet ports, 1310-nm wavelength, 2 km over MMF
GLC-FE-100FX=	100BASE-FX SFP module for 100-Mb ports, 1310-nm wavelength, 2 km over MMF
CAB-SM-LCSC-1M	1m fiber single-mode LC-to-SC connectors
CAB-SM-LCSC-5M	5m fiber single-mode LC-to-SC connectors

For latest information on transceivers, please go to: http://www.cisco.com/en/US/products/hw/modules/ps5455/products_device_support_tables_list.html.

For more information about Cisco products, contact:

- United States and Canada: (toll free) 800 553-NETS (6387)
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- Australia: 612 9935 4107
- Other: 408 526-7209
- World Wide Web URL: http://www.cisco.com

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