GOBIERNO DE PUERTO RICO
ADMINISTRACIÓN DE SERVICIOS GENERALES

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Gobernador

Carlos E. Vázquez Pesquera
Administrador

21 de junio de 2011

Sra. Monica Estela Hoyos Pacheco
Administradora Auxiliar
Área de Adquisiciones y Contratos
Administración de Servicios Generales

Edgardo A. Torres Concepción
Analista/Programador de Sistemas de Información
Oficina de Informática

ANALISIS DE LOS CAMBIOS PRESENTADOS POR SESCO TECHNOLOGY SOLUTIONS PARA EL CONTRATO 72-230 PARA EL RENGLÓN 20.

Conforme a la documentación provista en carpeta por el Sr. David Habibe, Presidente de **SESCO Technology Solutions**, y recibido en la agencia el **16 de junio de 2011** certifico que las especificaciones cambiadas correspondientes al **Renglón 20, Partida 3, 3B, 4, 4B, 5, 5B, 6, 7 y 7A** cumplen con el requisito de igualar o mejorar la oferta hecha originalmente.

En todos los cambios se cumplió con la necesidad de actualizar los modelos y precios del hardware ofrecido.

Para más información o aclarar alguna duda, se me puede contactar en el 787-759-7676 extensión 2000.

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RENGLON 20 - SWITCHES

Renglón, Partida	Especificación Técnica Vigente	Especificación Técnica Propuesta	Modelo Propuesto	Precio Propuesto
Partida 3	**Full Duplex**	**Full Duplex**	**CISCO CATALYST 2960S-24 SWITCH**	**$ 1,495.00**
	10/100/1000Base-TX	10/100/1000Base-TX		
	Data Collision/Frame Retiming	Data Collision/Frame Retiming		
	VLAN Support	VLAN Support		
	Web Interface to configure the switch	Web Interface to configure the switch		
	Managed Switch	Managed Switch		
	Automatically Adjust the speed connection on all 10/100/1000 ports.	Automatically Adjust the speed connection on all 10/100/1000 ports.		
	VLAN Support.	VLAN Support.		
	4 open uplink slots for Gigabit SFP's	4 open uplink slots for Gigabit SFP's		
	Managed switching with uplinks.	Managed switching with uplinks.		
	RMON, SNMP. Rack Mountable. SNMP M	RMON, SNMP. Rack Mountable. SNMP Manageable.		
	3 Year 8X5XNBD On site service	3 Year 8X5XNBD On site service		$ 500.00
	Stackable Functionality	Stackable Functionality		$ 750.00
	802.3AF - PoE+ Functionality	802.3AF - PoE+ Functionality		$ 1,500.00
Partida 3b	One port GBIC 1000-SX Gigabit module	One port GBIC 1000-SX Gigabit module E	CISCO SX GBIC (P/N GLC-SX-MM) - C2960S-STACK	CISCO SX GBIC (P/N GLC-SX-MM) - $375.00; C2960S-STACK - $1,125.00
Partida 4	**Full Duplex**	**Full Duplex**	**CISCO CATALYST 2960S-48 SWITCH**	**$ 2,695.00**
	10/100/1000Base-TX	10/100/1000Base-TX		
	Data Collision/Frame Retiming	Data Collision/Frame Retiming		
	VLAN Support	VLAN Support		
	Web Interface for configure the switch	Web Interface for configure the switch		

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RENGLON 20 - SWITCHES

Renglón, Partida	Especificación Técnica Vigente	Especificación Técnica Propuesta	Modelo Propuesto	Precio Propuesto
	Managed Switch	Managed Switch		
	Automatically Adjust the speed connection on all 10/100/1000 ports.	Automatically Adjust the speed connection on all 10/100/1000 ports.		
	VLAN Support.	VLAN Support.		
	4 open uplink slots for Gigabit SFP's	4 open uplink slots for Gigabit SFP's		
	Managed switching with uplinks.	Managed switching with uplinks.		
	RMON, SNMP.	RMON, SNMP.		
	Rack Mountable. SNMP Manageable.	Rack Mountable. SNMP Manageable.		
	3 Year 8X5XNBD On site service	3 Year 8X5XNBD On site service		$ 750.00
	Stackable Functionality	Stackable Functionality		$ 1,050.00
	802.3AF - PoE+ Functionality	802.3AF - PoE+ Functionality		$ 1,880.00
Partida 4b	One port GBIC 1000-SX Gigabit module	One port GBIC 1000-SX Gigabit module E	CISCO SX GBIC (P/N GLC-SX-MM) - C2960S-STACK	CISCO SX GBIC (P/N GLC-SX-MM) - $375.00; C2960S-STACK - $1,125.00
Partida 5	**Full Duplex**	**Full Duplex**	**CISCO CATALYST 2960-48 SWITCH**	**$ 2,500.00**
	10/100Base-TX PoE	10/100Base-TX PoE		
	Data Collision/Frame Retiming	Data Collision/Frame Retiming		
	VLAN Support	VLAN Support		
	Web Interface for configure the switch	Web Interface for configure the switch		
	Managed Switch	Managed Switch		
	Automatically Adjust the speed connection on all 10/100 ports.	Automatically Adjust the speed connection on all 10/100 ports.		
	VLAN Support.	VLAN Support.		

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Renglón, Partida	Especificación Técnica Vigente	Especificación Técnica Propuesta	Modelo Propuesto	Precio Propuesto
	4 Uplinks for Gigabit ethernet Uplink flexibility	4 Uplinks for Gigabit ethernet Uplink flexibility		
	Managed switching with uplinks.	Managed switching with uplinks.		
	RMON, SNMP. Rack mountable.	RMON, SNMP. Rack mountable.		
	3 Year 8X5XNBD On site service	3 Year 8X5XNBD On site service		$ 750.00
Partida 5b	One port GBIC 1000-SX Gigabit module	One port GBIC 1000-SX Gigabit module E	CISCO SX GBIC (P/N GLC-SX-MM) - C2960S-STACK	CISCO SX GBIC (P/N GLC-SX-MM) - $375.00; C2960S-STACK - $1,125.00
Partida 6	**Port Type: 10/100BASE-TX (RJ-45) - 24,**	**Port Type: 10/100BASE-TX (RJ-45) - 24,**	**CISCO CATALYST 4500 SWITCH (P/N WS-C45XX-E)**	**$ 4,895.00**
	Rack mountable	Rack mountable		
	Gigabit Ethernet Uplink	Gigabit Ethernet Uplink		
	3 Year 8X5XNBD On site service	3 Year 8X5XNBD On site service		$ 500.00
	Power suppply	Power suppply		$ 700.00
	Uplink Line Card	Uplink Line Card		$ 4,250.00
	48-port UTP Line Card	48-port UTP Line Card		$ 4,250.00
	Software Feature Set	Software Feature Set		$ 6,995.00
	SuperVisor engine	SuperVisor engine		$ 8,250.00
Partida 7	**Port Type: 10/100BASE-TX auto-sensing - 24**	**Port Type: 10/100/1000BASE-TX auto-sensing - 24**	**CISCO CATALYST 3560 SWITCH (P/N WS-C3560X-24T-L)**	**$ 2,130.00**
	Expansion Slots: GBIC Slots for GBIC modules – 2. SNMP Manageable/ RMON Support.	Expansion Slots: GBIC Slots for GBIC modules – 2. SNMP Manageable/ RMON Support.		
	VLAN Trunk Protocol (VTP) Version 2	VLAN Trunk Protocol (VTP) Version 2		

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Renglón, Partida	Especificación Técnica Vigente	Especificación Técnica Propuesta	Modelo Propuesto	Precio Propuesto
	Inter-Switch Link (ISL) or similar Technology and IEEE 802.1Q trunking , IEEE 802.1P Compliant.	Inter-Switch Link (ISL) or similar Technology and IEEE 802.1Q trunking , IEEE 802.1P Compliant.		
	Dynamic-access VLANS	Dynamic-access VLANS		
	Load sharing and redundancy over parallel trunks	Load sharing and redundancy over parallel trunks		
	TACACS+ (Terminal Access Controller Access Control System Plus) and RADIUS support.	TACACS+ (Terminal Access Controller Access Control System Plus) and RADIUS support.		
	3 Year 8X5XNBD On site service	3 Year 8X5XNBD On site service		$ 680.00
	802.3AF - PoE+ Functionality	802.3AF - PoE+ Functionality		$ 600.00
	Additional 24 10/100/1000 ports	Additional 24 10/100/1000 ports		$ 2,995.00
	Layer 3 Functionality	Layer 3 Functionality		$ 750.00
	Top of Rack Functionality (12 SFP port)	Top of Rack Functionality (12 SFP port)		$ 9,150.00
Partida 7a	GBIC Modules for item 7.	GBIC Modules for item 7.	CISCO SX GBIC (P/N GLC-SX-MM)-CISCO LH GBIC (P/N GLC-LH-SM)CISCO TWIN GIG MODULE (P/N CVR-X2-SFP)	CISCO SX GBIC (P/N GLC-SX-MM)-$375.00 CISCO LH GBIC (P/N GLC-LH-SM)-$695.00 CISCO TWIN GIG MODULE (P/N CVR-X2-SFP)-$195.00

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RENGLON 20 - SWITCHES

Renglón, Partida	Especificación Técnica Vigente	Especificación Técnica Propuesta	Modelo Propuesto	Precio Propuesto

Nota: Deberán entregar literatura técnica y disco compacto con la información provista de las tablas Excel.

Aprobado por:

Fecha de recibo

Firma del Jefe de la Agencia o su Representante Autorizado

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

The Cisco® Catalyst® 2960-S and 2960 Series Switches are the leading Layer 2 edge, providing improved ease of use, highly secure business operations, improved sustainability, and a borderless network experience. The Catalyst 2960-S Series Switches include new FlexStack switch stacking capability with 1 and 10 Gigabit connectivity, and Power over Ethernet Plus (PoE+) with the Cisco Catalyst 2960 Series Switches offering Fast Ethernet access connectivity and PoE capabilities. The Cisco Catalyst 2960-S and 2960 Series are fixed-configuration access switches designed for enterprise, midmarket, and branch office networks to provide lower total cost of ownership. The Cisco Catalyst 2960-S is shown in Figure 1, and the Cisco Catalyst 2960 Series Switches are shown in Figure 2.

What's new for the Cisco Catalyst 2960-S Series Switches with LAN Base Software:

- 10 and 1 Gigabit Ethernet uplink flexibility with Small Form-Factor Pluggable Plus (SFP+), providing business continuity and fast transition to 10 Gigabit Ethernet
- 24 or 48 ports of Gigabit Ethernet desktop connectivity
- Cisco FlexStack stacking module with 20 Gbps of throughput, allowing ease of operation with single configuration and simplified switch upgrade
- PoE+ with up to 30W per port that allows you to support the latest PoE+ capable devices
- Power supply options, with 740W or 370W fixed power supplies for PoE+ switches are available
- USB storage for file backup, distribution, and simplified operations
- A wide range of software features to provide ease of operation, highly secure business operations, sustainability, and a borderless network experience
- Limited lifetime hardware warranty, including next-business-day replacement with 90-day service and support

The Cisco Catalyst 2960 Series Switches with LAN Base Software offer the following:

- Dual-purpose uplinks for Gigabit Ethernet uplink flexibility, allowing use of either a copper or fiber uplink; each dual-purpose uplink port has one 10/100/1000 Ethernet port and one SFP-based Gigabit Ethernet port, with one port active at a time
- 24 or 48 ports of Fast Ethernet desktop connectivity
- PoE configurations with up to 15.4W per port
- 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

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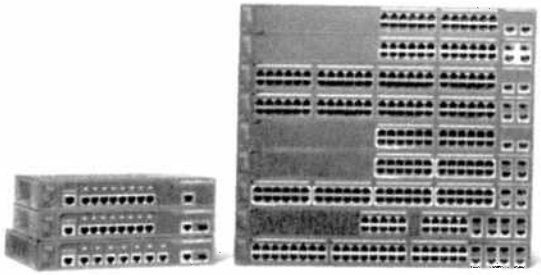
Figure 1. Cisco Catalyst 2960-S Series Switches

Figure 2. Cisco Catalyst 2960 Series Switches



Switch Configurations

Table 1 shows the configuration information for the Catalyst 2960-S Series Switches with LAN Base Software, and Table 2 shows the configuration information for the Catalyst 2960 Series Switches with LAN Base Software.

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

Cisco Catalyst 2960-S Switch Model	Description	Uplinks	Available PoE Power
10 Gigabit Uplinks with 10/100/1000 Ethernet Connectivity			
Cisco Catalyst 2960S-48FPD-L	48 Ethernet 10/100/1000 PoE+ ports	2 Ten Gigabit Ethernet SFP+ or 2 One Gigabit Ethernet SFP ports	740W
Cisco Catalyst 2960S-48LPD-L	48 Ethernet 10/100/1000 PoE+ ports	2 Ten Gigabit Ethernet SFP+ or 2 One Gigabit Ethernet SFP ports	370W
Cisco Catalyst 2960S-24PD-L	24 Ethernet 10/100/1000 PoE+ ports	2 Ten Gigabit Ethernet SFP+ or 2 One Gigabit Ethernet SFP ports	370W
Cisco Catalyst 2960S-48TD-L	48 Ethernet 10/100/1000 ports	2 Ten Gigabit Ethernet SFP+ or 2 One Gigabit Ethernet SFP ports	-
Cisco Catalyst 2960S-24TD-L	24 Ethernet 10/100/1000 ports	2 Ten Gigabit Ethernet SFP+ or 2 One Gigabit Ethernet SFP ports	-
1 Gigabit Uplinks with 10/100/100 Ethernet Connectivity			
Cisco Catalyst 2960S-48FPS-L	48 Ethernet 10/100/1000 PoE+ ports	4 One Gigabit Ethernet SFP ports	740W
Cisco Catalyst 2960S-48LPS-L	48 Ethernet 10/100/1000 PoE+ ports	4 One Gigabit Ethernet SFP ports	370W
Cisco Catalyst 2960S-24PS-L	24 Ethernet 10/100/1000 PoE+ ports	4 One Gigabit Ethernet SFP ports	370W
Cisco Catalyst 2960S-48TS-L	48 Ethernet 10/100/1000 ports	4 One Gigabit Ethernet SFP ports	-
Cisco Catalyst 2960S-24TS-L	24 Ethernet 10/100/1000 ports	4 One Gigabit Ethernet SFP ports	-
Cisco Catalyst 2960S-STACK	Hot-swappable FlexStack stacking module	-	-

All models available with optional Cisco FlexStack stacking module.
No DC power supplies are available.

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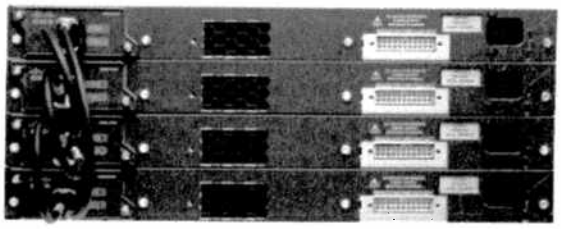
Table 2. Configurations of Cisco Catalyst 2960 Series Switches with LAN Base Software

Cisco Catalyst 2960 Switch Model	Description	Uplinks	Available PoE Power
1 Gigabit Uplinks with 10/100 Ethernet Connectivity			
Cisco Catalyst 2960-48PST-L	48 Ethernet 10/100 PoE ports	2 One Gigabit Ethernet SFP ports and 2 fixed Ethernet 10/100/1000 ports	370W
Cisco Catalyst 2960-24PC-L	24 Ethernet 10/100 PoE ports	2 dual-purpose ports (10/100/1000 or SFP)	370W
Cisco Catalyst 2960-24LT-L	24 Ethernet 10/100 ports	2 Ethernet 10/100/1000 ports	123W
Cisco Catalyst 2960-24TC-L	24 Ethernet 10/100 ports	2 dual-purpose ports	-
Cisco Catalyst 2960-48TC-L	48 Ethernet 10/100 ports	2 dual-purpose ports (10/100/1000 or SFP)	-
Cisco Catalyst 2960-24TT-L	24 Ethernet 10/100 ports	2 Ethernet 10/100/1000 ports	-
Cisco Catalyst 2960-48TT-L	48 Ethernet 10/100 ports	2 Ethernet 10/100/1000 ports	-
1 Gigabit Uplinks with 10/100/1000 Ethernet Connectivity			
Cisco Catalyst 2960G-24TC-L	24 Ethernet 10/100/1000 ports, 4 of which are dual-purpose (10/100/1000 or SFP)	4 dual-purpose ports (10/100/1000 or SFP)	
Cisco Catalyst 2960G-48-TC-L	48 Ethernet 10/100/1000 ports, 4 of which are dual-purpose (10/100/1000 or SFP)	4 dual-purpose ports (10/100/1000 or SFP)	
Compact Switches			
Cisco Catalyst 2960-8TC-L	8 Ethernet 10/100 ports; compact size with no fan	1 dual-purpose port (10/100/1000 or SFP)	
Cisco Catalyst 2960PD-8TT-L	8 Ethernet 10/100 ports; compact size with no fan	1 10/100/1000 PoE input port	
Cisco Catalyst 2960G-8TC-L	7 Ethernet 10/100/1000 ports; compact size with no fan	1 dual-purpose port (10/100/1000 or SFP)	

Cisco FlexStack Stacking

Cisco FlexStack stacking with a hot-swappable module and IOS software provides true stacking, all switches in a stack act as a single switch unit. The Cisco FlexStack provides a unified data plane, unified configuration, and single IP address management for a group of switches. The advantages of true stacking are lower total cost of ownership through simplified management and higher availability. Cisco FlexStack supports cross-stack features including Etherchannel, SPAN and FlexLink technology. A stack module can be added to any Catalyst 2960-S switch with LAN Base software to quickly upgrade the switch to make it stack capable, and the switch added to the stack will upgrade to the correct Cisco IOS® Software version and transparently become a stack member. Figure 3 shows the FlexStack stacking module for the Catalyst 2960-S.

Figure 3. Cisco FlexStack Module and Switches



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Power over Ethernet Plus PoE+

In addition to PoE 802.3af, the Cisco Catalyst 2960-S Series Switches support PoE+ (IEEE 802.3at standard), which provides up to 30W of power per port. The Cisco Catalyst 2960-S and 2960 Series Switches can provide a lower total cost of ownership for deployments that incorporate Cisco IP phones, Cisco Aironet® wireless LAN (WLAN) access points, or any IEEE 802.3af-compliant end device. PoE removes the need for wall power to each PoE-enabled device and eliminates the cost for additional electrical cabling and circuits that would otherwise be necessary in IP phone and WLAN deployments. Table 3 shows the power supply combinations required for different PoE needs.

Table 3. Switch PoE and PoE+ Power Capacity

Switch Model	Maximum Number of PoE+ (IEEE 802.3at) Ports	Maximum Number of PoE (IEEE 802.3af) Ports	Available PoE Power
10 Gigabit Uplinks with 10/100/1000 Ethernet Connectivity			
Cisco Catalyst 2960S-48FPD-L	24 ports up to 30W	48 ports up to 15.4W	740W
Cisco Catalyst 2960S-48LPD-L	12 ports up to 30W	24 ports up to 15.4W 48 ports up to 7.7W	370W
Cisco Catalyst 2960S-24PD-L	12 ports up to 30W	24 ports up to 15.4W	370W
1 Gigabit Uplinks with 10/100/1000 Ethernet Connectivity			
Cisco Catalyst 2960S-48FPS-L	24 ports up to 30W	48 ports up to 15.4W	740W
Cisco Catalyst 2960S-48LPS-L	12 ports up to 30W	24 ports up to 15.4W 48 ports up to 7.7W	370W
Cisco Catalyst 2960S-24PS-L	12 ports up to 30W	24 ports up to 15.4W	370W
Cisco Catalyst 2960-48PST-L	N/A	24 ports up to 15.4W	370W
Cisco Catalyst 2960-24PC-L	N/A	24 ports up to 15.4W	370W
Cisco Catalyst 2960-24LT-L	N/A	8 ports up to 15.4W	123W

* Intelligent power management allows flexible power allocation across all ports.

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

Borderless Networks, a Cisco architecture, deliver the new workspace experience, connecting anyone, anywhere, using any device, to any resource securely, reliably, and transparently. Cisco's 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, sustainability, EnergyWise and ease of operations for increased productivity and operational efficiency. When network access is intelligent, it knows the identity of the user, as well as where the user is on the network. It knows what is connecting to the network, to automatically provision the network for QoS and delivery. It becomes services-aware to optimize user experience. Only with intelligent access network, your enterprise can go borderless securely and transparently. Your business can save energy, simplify operations with better business efficiency, and have an optimized total cost of ownership.

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

- Sustainability
- EnergyWise
- 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 enterprise wide 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 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 savings, 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.

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Intelligent Power over Ethernet Management

The Cisco Catalyst 2960-S PoE models support the latest PoE+ devices including Cisco IP phones and Cisco Aironet WLAN access points providing up to 30W 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
- **Per port PoE power sensing** measures actual power being drawn, enabling more intelligent control of powered devices
- **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
- **The PoE MIB** provides proactive visibility into power usage and allows customers to set different power-level thresholds

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.
- **Cisco Smart Configuration** provides a single point of management for a group of switches and in addition adds the ability archive and backup configuration files to a file server or switch allowing seamless zero touch switch replacement.
- **Cisco Smart Troubleshooting** is an extensive array of debug diagnostic commands and system health checks within the switch, including Generic Online Diagnostics (GOLD) and Onboard Failure Logging (OBFL).

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Easy to Use Deployment and Control Features

- **Automatic QoS (AutoQoS)** simplifies QoS configuration in voice over IP (VoIP) networks by issuing interface and global switch commands to detect Cisco IP phones, classify traffic, and help enable egress queue configuration.
- **Stacking Master configuration management** and Cisco FlexStack stacking helps ensure that all switches are automatically upgraded when the master switch receives a new software version. Automatic software version checking and updating help ensure that all stack members have the same software version.
- **Dynamic Host Configuration Protocol (DHCP)** autoconfiguration of multiple switches through a boot server eases switch deployment.
- **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.
- **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.
- **Multicast VLAN Registration (MVR)** continuously sends multicast streams in a multicast VLAN while isolating the streams from subscriber VLANs for bandwidth and security reasons.
- **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.
- **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).

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- **Layer 2 traceroute** eases troubleshooting by identifying the physical path that a packet takes from source to destination.
- **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.

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

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- 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 Series Switches provide superior Layer 2 threat defense capabilities for mitigating man-in-the-middle attacks (such as MAC, IP, and ARP spoofing). TrustSec, a primary element of Borderless Security Architecture, helps enterprise customers secure their networks, data and resources with policy-based access control, identity 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:

- Threat defense
- Cisco TrustSec
- Other advanced security features

Threat Defense

Cisco Integrated Security Features is an industry-leading solution available on Cisco Catalyst Switches that proactively protects your critical network infrastructure. Delivering powerful, easy-to-use tools to effectively prevent the most common and potentially damaging Layer 2 security threats, Cisco Integrated Security Features provides robust security throughout the network. Cisco Integrated Security Features include Port Security, DHCP Snooping, Dynamic ARP Inspection, and IP Source guard.

- **Port Security** secures the access to an access or trunk port based on MAC address. It limits the number of learned MAC addresses to deny MAC address flooding.
- **DHCP Snooping** prevents malicious users from spoofing a DHCP server and sending out bogus addresses. This feature is used by other primary security features to prevent a number of other attacks such as ARP poisoning.
- **Dynamic ARP Inspection (DAI)** helps ensure user integrity by preventing malicious users from exploiting the insecure nature of the ARP protocol.
- **IP source guard** prevents a malicious user from spoofing or taking over another user's IP address by creating a binding table between the client's IP and MAC address, port, and VLAN.

Cisco TrustSec

TrustSec secures access to the network, enforces security policies, and delivers standard based security solutions such as 802.1X enabling secure collaboration and policy compliance. TrustSec capabilities reflect Cisco thought leadership, innovations, and commitment to customer success. These new capabilities include:

- **Flexible authentication** that supports multiple authentication mechanisms including 802.1X, MAC Authentication Bypass and web authentication using a single, consistent configuration.
- **Open mode** that creates a user friendly environment for 802.1X operations.

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- **Integration of device profiling technology and guest access** handling with Cisco switching to significantly improve security while reducing deployment and operational challenges.
- **RADIUS Change of Authorization and downloadable calls** for comprehensive policy management capabilities.
- **802.1X Supplicant with Network Edge Access Transport (NEAT)** enables extended secure access where compact switches in the conference rooms have the same level of security as switches inside the locked wiring closet.

Other Advanced Security Features

Other Advanced Security features include but are not limited to:

- **Private VLANs** restrict traffic between hosts in a common segment by segregating traffic at Layer 2, turning a broadcast segment into a nonbroadcast multiaccesslike segment.
- **Private VLAN Edge** provides security and isolation between switch ports, which helps ensure that users cannot snoop on other users' traffic.
- **Multidomain Authentication** allows an IP phone and a PC to authenticate on the same switch port while placing them on appropriate voice and data VLAN.
- **Port-based ACLs** for Layer 2 interfaces allow security policies to be applied on individual switch ports.
- **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 Protocol, Kerberos, and the cryptographic version of SNMPv3 require a special cryptographic software image because of U.S. export restrictions.
- Bidirectional data support on the **Switched Port Analyzer (SPAN)** port allows Cisco Intrusion Detection System (IDS) to take action when an intruder is detected.
- **TACACS+ and RADIUS authentication** facilitates 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.
- **Multilevel security on console access** prevents unauthorized users from altering the switch configuration.
- **Bridge protocol data unit (BPDU) Guard** shuts down Spanning Tree 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 VLAN Membership Policy Server client capability to provide flexibility in assigning ports to VLANs. Dynamic VLAN facilitates the fast assignment of IP addresses.

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

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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:

- High availability and layer 2 networking
- QoS
- Location awareness and mobility

High Availability and Layer 2 Networking

The Cisco Catalyst 2960-S Series Switches provides Cisco FlexStack stacking and both the Cisco 2960-S and 2960 Series switches provide layer 2 networking to enable resilency and availability.

Other high-availability features include but are not limited to:

- **Cross-Stack EtherChannel** provides the ability to configure Cisco EtherChannel technology across different members of the Cisco FlexStack for high resiliency.
- **Flexlink** provides link redundancy with convergence time less than 100 ms.
- **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 offer the benefit of Layer 2 load balancing and distributed processing. Stacked units behave as a single spanning-tree node.
- **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.

Enhanced Quality of Service

The Cisco 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:

- **Cross-stack QoS** allows QoS to be configured across the entire Cisco 2960-S Flexstack.
- **802.1p class of service (CoS)** and differentiated services code point (DSCP) field classification are provided, using marking and reclassification on a per-packet basis by source and destination IP address, MAC address, or Layer 4 TCP/UDP port number.
- **Cisco control-plane and data-plane QoS ACLs** on all ports help ensure proper marking on a per-packet basis.
- **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.
- **Strict priority queuing** helps ensure that the highest-priority packets are serviced ahead of all other traffic.

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- **Trusted Boundary** provides the ability to trust the QoS priority settings if an IP phone is present and to disable the trust setting if the IP phone is removed, thereby preventing a malicious user.
- **Rate limiting** is provided based on source and destination IP address, source and destination MAC address, Layer 4 TCP/UDP information, or any combination of these fields, using QoS ACLs (IP ACLs or MAC ACLs), class maps, and policy maps.
- **Up to 64 aggregate or individual policers** are available per Fast Ethernet or GbE port.

Location Awareness and Mobility

In order to provide delivery of a best-in-class network experience to end users, it's critical for network access to be location aware. A wide variety of devices can appear on the network, both wired (switches, routers, IP phones, PCs, access points, controllers, video digital media players, and so on) and wireless (mobile devices, wireless tags, rogues, and so on). In many industries, locating assets is primarily a manual process and is time consuming and error prone. The inability to locate assets in real time and to help ensure their availability when and where they are needed limits reaction time and efficiency.

Location services answer business-critical questions about both mobile assets and the users of those assets regardless of whether those assets are connecting using wired or wireless, and hence directly improve their organization's profitability. Network Location Services also improve security and accelerate client troubleshooting by locating an asset, user, or device on the network.

- **Network visibility and control** provide centralized visibility into wired and wireless devices on the network and their location.
- **Location-assisted client troubleshooting** enables tracking of wired or wireless clients for quick problem resolution.
- **Asset tracking and improved security** provide centralized inventory of wired and wireless devices and asset management for improved business processes.
- **Location based policy** allows greater control and visibility. With EnergyWise, power policies can be set up (to reduce the power or shut down the power from a port) based on the location.
- **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.

Tables 4, 6, 7, and 8 provide hardware features, power specifications, management and standards support, and safety and compliance information for the Cisco Catalyst 2960-S and 2960 Series Switches with LAN Base Software.

Table 4. Cisco Catalyst 2960-S and 2960 Series Switches with LAN Base Software switch performance and scalability information

Performance and Scalability Numbers for All Switch Models		
	Catalyst 2960-S	**Catalyst 2960**
Forwarding bandwidth	88 Gbps	16 Gbps 32 Gbps (2960G)
Switching bandwidth*	176 Gbps	32Gbps 32 Gbps (2960G)
Flash memory	64 MB	32 MB
Memory DRAM	128 MB	64 MB

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Performance and Scalability Numbers for All Switch Models			
Max VLANs	255		255
VLAN IDs	4000		4000
Maximum transmission unit (MTU)	9198 bytes		Up to 9000 bytes
Jumbo frames	9216 bytes		9018 bytes (2960G only)
Forwarding Rate: 64-Byte Packet Cisco Catalyst 2960-S			
Cisco Catalyst 2960S-48FPD-L		101.2 mpps	
Cisco Catalyst 2960S-48LPD-L		101.2 mpps	
Cisco Catalyst 2960S-24PD-L		65.5 mpps	
Cisco Catalyst 2960S-48TD-L		101.2 mpps	
Cisco Catalyst 2960S-24TD-L		65.5 mpps	
Cisco Catalyst 2960S-48FPS-L		77.4 mpps	
Cisco Catalyst 2960S-48LPS-L		77.4 mpps	
Cisco Catalyst 2960S-24PS-L		41.7 mpps	
Cisco Catalyst 2960XS-48TS-L		77.4 mpps	
Cisco Catalyst 2960S-24TS-L		41.7 mpps	
Forwarding Rate: 64-Byte Packet Cisco Catalyst 2960			
Cisco Catalyst 2960PD-8TT-L		2.7 mpps	
Cisco Catalyst 2960-8TC-L		2.7 mpps	
Cisco Catalyst 2960-24TT-L		6.5 mpps	
Cisco Catalyst 2960-24TC-L		6.5 mpps	
Cisco Catalyst 2960-24LT-L		6.5 mpps	
Cisco Catalyst 2960-24PC-L		6.5 mpps	
Cisco Catalyst 2960-48TT-L		10.1 mpps	
Cisco Catalyst 2960-48TC-L		10.1 mpps	
Cisco Catalyst 2960-48PST-L		13.3 mpps	
Cisco Catalyst 2960G-8TC-L		11.9 mpps	
Cisco Catalyst 2960G-24TC-L		35.7 mpps	
Cisco Catalyst 2960G-48TC-L		39.0 mpps	
Resource: Cisco Catalyst 2960-S and 2960		**Default**	**QoS**	**Dual**
Unicast MAC addresses		8000	8000	8000
IPv4 IGMP groups		255	255	255
IPv4 MAC QoS access control entries (ACEs)		128	384	0
IPv4 MAC security ACEs		384	128	256

* Switching bandwidth is full-duplex capacity.

Table 5. Dimensions, weight, acoustic, MTBF and environmental range

Dimensions (H x W x D)		
Cisco Catalyst 2960-S	**Inches**	**Centimeters**
Cisco Catalyst 2960S-48FPD-L	1.75 x 17.5 x 15.2	4.5 x 44.5 x 38.6
Cisco Catalyst 2960S-48LPD-L		
Cisco Catalyst 2960S-24PD-L		

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Cisco Catalyst 2960S-48TD-L	1.75 x 17.5 x 11.8	4.5 x 44.5 x 30
Cisco Catalyst 2960S-24TD-L		
Cisco Catalyst 2960S-48FPS-L	1.75 x 17.5 x 15.2	4.5 x 44.5 x 38.6
Cisco Catalyst 2960S-48LPS-L		
Cisco Catalyst 2960S-24PS-L		
Cisco Catalyst 2960S-48TS-L	1.75 x 17.5 x 11.8	4.5 x 44.5 x 30
Cisco Catalyst 2960S-24TS-L		
Cisco Catalyst 2960	**Inches**	**Centimeters**
Cisco Catalyst 2960PD-8TT-L	1.73 x 10.6 x 6.2	4.4 x 27 x 15.7
Cisco Catalyst 2960-8TC-L	1.73 x 10.6 x 6.4	4.4 x 27 x 16.3
Cisco Catalyst 2960-24TT-L	1.73 x 17.7 x 9.52	4.4 x 45 x 23.6
Cisco Catalyst 2960-24TC-L		
Cisco Catalyst 2960-24LT-L		
Cisco Catalyst 2960-24PC-L	1.73 x 17.7 x 13	4.4 x 45 x 33.2
Cisco Catalyst 2960-48TT-L		
Cisco Catalyst 2960-48TC-L		
Cisco Catalyst 2960-48PST-L	1.73 x 17.7 x 13.07	4.4 x 45 x 23.6
Cisco Catalyst 2960G-8TC-L	1.73 x 10.6 x 8.1	4.4 x 27 x 20.5
Cisco Catalyst 2960G-24TC-L	1.73 x 17.7 x 12.9	4.4 x 45 x 32.8
Cisco Catalyst 2960G-48TC-L		
Weight		
Cisco Catalyst 2960-S	**Pounds**	**Kilograms**
Cisco Catalyst 2960S-48FPD-L	13	5.9
Cisco Catalyst 2960S-48LPD-L	12.5	5.7
Cisco Catalyst 2960S-24PD-L	12.5	5.7
Cisco Catalyst 2960S-48TD-L	9.5	4.3
Cisco Catalyst 2960S-24TD-L	9.5	4.3
Cisco Catalyst 2960S-48FPS-L	13	5.9
Cisco Catalyst 2960S-48LPS-L	12.5	5.7
Cisco Catalyst 2960S-24PS-L	12.5	5.7
Cisco Catalyst 2960S-48TS-L	10.5	4.8
Cisco Catalyst 2960S-24TS-L	10	4.5
Cisco Catalyst 2960	**Pounds**	**Kilograms**
Cisco Catalyst 2960PD-8TT-L	3	1.4
Cisco Catalyst 2960-8TC-L	3	1.4
Cisco Catalyst 2960-24TT-L	8	3.6
Cisco Catalyst 2960-24TC-L	8	3.6
Cisco Catalyst 2960-24LT-L	10	4.5
Cisco Catalyst 2960-24PC-L	12	5.4
Cisco Catalyst 2960-48TT-L	8	3.6
Cisco Catalyst 2960-48TC-L	8	3.6
Cisco Catalyst 2960-48PST-L	12	5.4
Cisco Catalyst 2960G-8TC-L	3	1.4
Cisco Catalyst 2960G-24TC-L	10	4.5
Cisco Catalyst 2960G-48TC-L	12	5.4

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Environmental Ranges				
	Cisco Catalyst 2960-S		Cisco Catalyst 2960	
	Fahrenheit	Centigrade	Fahrenheit	Centigrade
Operating temperature up to 5000 ft (1500 m)	0° to 113°F	-5° to 45°C	23° to 113°F	-5° to 45°C
Operating temperature up to 10,000 ft (3000 m)	23° to 104°F	-5° to 40°C	23° to 104°F	-5° to 40°C
Short-term exception at sea level*	23° to 31°F	-5° to 55°C	23° to 31°F	-5° to 55°C
Short-term exception up to 5000 feet (1500 m)*	23° to 122°F	-5° to 50°C	23° to 122°F	-5° to 50°C
Short-term exception up to 10,000 feet (3000 m)*	23° to 113°F	-5° to 45°C	23° to 113°F	-5° to 45°C
Short-term exception up to 13,000 feet (4000 m)*	23° to 104°F	-5° to +40°C	23° to 104°F	-5° to 40°C
Storage temperature up to 15,000 feet (4573 m)	-13° to 158°F	-25° to 70°C	-13° to 158°F	-25° to 70°C
	Feet	Meters		
Operating altitude	Up to 10,000	Up to 3000	Up to 10,000	Up to 3000
Storage altitude	Up to 13,000	Up to 4000	Up to 13,000	Up to 4000
Operating relative humidity	10% to 95% noncondensing		10% to 95% noncondensing	
Storage relative humidity	10% to 95% noncondensing		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)**
Cisco Catalyst 2960S-48FPD-L	42 dB	45 dB	5.2 B	5.5 B
Cisco Catalyst 2960S-48LPD-L				
Cisco Catalyst 2960S-24PD-L				
Cisco Catalyst 2960S-48TD-L	44 dB	47 dB	5.4 B	5.7 B
Cisco Catalyst 2960S-24TD-L				
Cisco Catalyst 2960S-48FPS-L	42 dB	45 dB	5.2 B	5.5 B
Cisco Catalyst 2960S-48LPS-L				
Cisco Catalyst 2960S-24PS-L				
Cisco Catalyst 2960S-48TS-L	44 dB	47 dB	5.4 B	5.7 B
Cisco Catalyst 2960S-24TS-L				

Mean time between failures (MTBF)

Cisco Catalyst 2960-S		Cisco Catalyst 2960	
Model	**MTBF in hours**	**Model**	**MTBF in hours**
Cisco Catalyst 2960S-48FPD-L	183,498	**Cisco Catalyst 2960PD-8TT-L**	737,065
Cisco Catalyst 2960S-48LPD-L	198,300	**Cisco Catalyst 2960-8TC-L**	615,549
Cisco Catalyst 2960S-24PD-L	237,016	**Cisco Catalyst 2960-24TT-L**	407,707
Cisco Catalyst 2960S-48TD-L	311,291	**Cisco Catalyst 2960-24TC-L**	339,743
Cisco Catalyst 2960S-24TD-L	332,958	**Cisco Catalyst 2960-24LT-L**	402,926
Cisco Catalyst 2960S-48FPS-L	189,242	**Cisco Catalyst 2960-24PC-L**	311,781
Cisco Catalyst 2960S-48LPS-L	205,052	**Cisco Catalyst 2960-48TT-L**	243,277
Cisco Catalyst 2960S-24PS-L	245,604	**Cisco Catalyst 2960-48TC-L**	336,409
Cisco Catalyst 2960S-48TS-L	328,058	**Cisco Catalyst 2960-48PST-L**	180,427
Cisco Catalyst 2960S-24TS-L	349,824	**Cisco Catalyst 2960G-8TC-L**	485,576
Cisco Catalyst 2960S-STACK	25,743,890	**Cisco Catalyst 2960G-24TC-L**	313,828
		Cisco Catalyst 2960G-48TC-L	221,432

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* Not more than the following in a 1-year period: 96 consecutive hours, or 360 hours total, or 15 occurrences.

Note: For Catalyst 2960G-8TC-L, reduce the high range temperature by 5°C.

Table 6. Connectors, LED indicators and Dimensions

Connectors and LED Indicators
Cisco Catalyst 2960-S with SFP+ based ports: • 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, -BX, -T,* -FX,* and coarse wavelength-division multiplexing (CWDM) SFP-based ports: LC fiber connectors (single/multimode fiber) • 10GBASE-LR, SR, LRM, CX1 SFP+ based ports * *The Cisco Catalyst 2960-S with SFP+ does not support the GLC-FE-100BX, GLC-FE-100FX, or GLC-FE-100LX.*
Cisco Catalyst 2960-S and 2960 with SFP-based ports: • 10BASE-T ports: RJ-45 connectors, 2-pair Category 3, 4, or 5 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, -BX, -T,* -FX,* and CWDM SFP-based ports: LC fiber connectors (single/multimode fiber) • 100BASE-LX, -BX, -FX SFP-based ports: LC fiber connectors (single/multimode fiber) * *GLC-T and GLC-GE-100FX are not supported on the Catalyst 2960-8TC-S, 2960-8TC-L, or 2960G-8TC-L switches.*
Cisco Catalyst 2960-S FlexStack stacking cables: • CAB-STK-E-0.5M FlexStack stacking cable with a 0.5 m length • CAB-STK-E-1M FlexStack stacking cable with a 1.0 m length • CAB-STK-E-3M FlexStack stacking cable with a 3.0 m length
Cisco Catalyst 2960-S console cables: • CAB-CONSOLE-RJ45 Console cable 6 ft with RJ-45 • CAB-CONSOLE-USB Console cable 6 ft with USB Type A and mini-B connectors

• Customers can provide power to a switch 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
• Cisco RPS connector:
  ◦ The Cisco RPS connector offers connection for an optional Cisco RPS 2300 that uses AC input and supplies DC output to the switch.
  ◦ The connector offers a 2300W redundant power system that supports up to 6 external network devices and provides power to 2 failed devices 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 2300 (model PWR-RPS2300) should be attached to the redundant-power-system receptacle
Note: The Cisco Catalyst 2960-8TC-L and 2960G-8TC-L do not have RPS ports.

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

** 1000Base-T not supported on Cisco Catalyst 2960-S switches.

Table 7. Management and Standards Support for Cisco Catalyst 2960-S and 2960 Series Switches with LAN Base Software

Description	Specification	
Management	• BRIDGE-MIB • CISCO-CABLE-DIAG-MIB • CISCO-CDP-MIB • CISCO-CLUSTER-MIB • CISCO-CONFIG-COPY-MIB	• CISCO-TC-MIB • CICSO-TCP-MIB • CISCO-UDLDP-MIB • CISCO-VLAN-IFTABLE • RELATIONSHIP-MIB

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Description	Specification	
	• CISCO-CONFIG-MAN-MIB • CISCO-DHCP-SNOOPING-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-POE-EXTENSIONS-MIB • CISCO-PORT-QOS-MIB • CISCO-PORT-SECURITY-MIB • CISCO-PORT-STORM-CONTROL-MIB • CISCO-PRODUCTS-MIB • CISCO-PROCESS-MIB • CISCO-RTTMON-MIB • CISCO-SMI-MIB • CISCO-STP-EXTENSIONS-MIB • CISCO-SYSLOG-MIB	• CISCO-VLAN-MEMBERSHIP-MIB • CISCO-VTP-MIB • ENTITY-MIB • ETHERLIKE-MIB • IEEE8021-PAE-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 • ePM MIB • CISCO-STACKWISE-MIB (2960-S)
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) • IEEE 802.3ad • IEEE 802.3af • IEEE 802.3ah (100BASE-X single/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-BX (SFP) • 100BASE-FX (SFP) • 100BASE-LX (SFP) • 1000BASE-BX (SFP) • 1000BASE-SX (SFP) • 1000BASE-LX/LH (SFP) • 1000BASE-ZX (SFP) • 1000BASE-CWDM SFP 1470 nm • 1000BASE-CWDM SFP 1490 nm • 1000BASE-CWDM SFP 1510 nm • 1000BASE-CWDM SFP 1530 nm • 1000BASE-CWDM SFP 1550 nm • 1000BASE-CWDM SFP 1570 nm • 1000BASE-CWDM SFP 1590 nm • 1000BASE-CWDM SFP 1610 nm • 10GBASE-LR (SFP+) • 10GBASE-SR (SFP+) • 10GBASE-LRM (SFP+) • 10GBASE-CX1 (SFP+) • RMON I and II standards • SNMP v1, v2c, and v3
RFC compliance	• RFC 768 - UDP • RFC 783 - TFTP • RFC 791 - IP • RFC 792 - ICMP • RFC 793 - TCP • RFC 826 - ARP • RFC 854 - Telnet	• RFC 1901 - SNMP v2C • RFC 1902-1907 - SNMP v2 • RFC 1981 - Maximum Transmission Unit (MTU) Path Discovery IPv6 • FRC 2068 - HTTP • RFC 2131 - DHCP • RFC 2138 - RADIUS

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Description	Specification	
	• RFC 951 - Bootstrap Protocol (BOOTP) • RFC 959 - FTP • RFC 1112 - IP Multicast and IGMP • RFC 1157 - SNMP v1 • RFC 1166 - IP Addresses • RFC 1256 - Internet Control Message Protocol (ICMP) Router Discovery • RFC 1305 - NTP • RFC 1492 - TACACS+ • RFC 1493 - Bridge MIB • RFC 1542 - BOOTP extensions • RFC 1643 - Ethernet Interface MIB • RFC 1757 - RMON	• RFC 2233 - IF MIB v3 • RFC 2373 - IPv6 Aggregatable Addrs • RFC 2460 - IPv6 • RFC 2461 - IPv6 Neighbor Discovery • RFC 2462 - IPv6 Autoconfiguration • RFC 2463 - ICMP IPv6 • 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

Table 8. Voltage and power information

AC/DC input voltage and current			
Cisco Catalyst 2960-S	**Voltage (Autoranging)**	**Current**	**Frequency**
Cisco Catalyst 2960S-48FPD-L	100 to 240 VAC	9 to 4 A	50 to 60Hz
Cisco Catalyst 2960S-48LPD-L		5 to 2 A	
Cisco Catalyst 2960S-24PD-L		5 to 2 A	
Cisco Catalyst 2960S-48TD-L		1 to 0.5 A	
Cisco Catalyst 2960S-24TD-L		1 to 0.5 A	
Cisco Catalyst 2960S-48FPS-L		9 to 4 A	
Cisco Catalyst 2960S-48LPS-L		5 to 2 A	
Cisco Catalyst 2960S-24PS-L		5 to 2 A	
Cisco Catalyst 2960S-48TS-L		1 to 0.5 A	
Cisco Catalyst 2960S-24TS-L		1 to 0.5 A	
Cisco Catalyst 2960	**Voltage (Autoranging)**	**Current**	**Frequency**
Cisco Catalyst 2960-8TC-L	100 to 240 VAC	0.5 to 0.25 A	50 to 60Hz
Cisco Catalyst 2960G-8TC-L		0.8 to 0.4 A	
Cisco Catalyst 2960-24LT-L		3.0 to 1.5 A	
Cisco Catalyst 2960-24PC-L		8.0 to 4.0 A	
Cisco Catalyst 2960-48PST-L		5.0 to 2.0 A	
Cisco Catalyst 2960-24TT-L and Catalyst 2960-24TC-L and Catalyst 2960-48TT-L and Catalyst 2960-48TC-L		1.3 to 0.8 A	
Cisco Catalyst 2960G-24TC-L and Catalyst 2960G-48TC-L		3.0 to 1.5 A	
Cisco Catalyst 2960PD-8TT-L	DC input 48 VDC (for AC use PWR-A= sold separately)	0.3 A	

Power Rating			
Cisco Catalyst 2960-S		**Cisco Catalyst 2960**	
Model	**Power Rating**	**Model**	**Power Rating**
Cisco Catalyst 2960S-48FPD-L	0.89 kVA	**Cisco Catalyst 2960PD-8TT-L**	11W
Cisco Catalyst 2960S-48LPD-L	0.48 kVA	**Cisco Catalyst 2960-8TC-L**	0.035 kVA
Cisco Catalyst 2960S-24PD-L	0.46 kVA	**Cisco Catalyst 2960-24TT-L**	0.05 kVA
Cisco Catalyst 2960S-48TD-L	0.09 kVA	**Cisco Catalyst 2960-48TT-L**	0.075 kVA

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Cisco Catalyst 2960S-24TD-L	0.09 kVA	**Cisco Catalyst 2960-24TC-L**	0.05 kVA
Cisco Catalyst 2960S-48FPS-L	0.89 kVA	**Cisco Catalyst 2960-24LT-L**	0.175 kVA
Cisco Catalyst 2960S-48LPS-L	0.48 kVA	**Cisco Catalyst 2960-24PC-L**	0.470 kVA
Cisco Catalyst 2960S-24PS-L	0.46 kVA	**Cisco Catalyst 2960-48PST-L**	0.5 kVA
Cisco Catalyst 2960S-48TS-L	0.13 kVA	**Cisco Catalyst 2960-48TC-L**	0.075 kVA
Cisco Catalyst 2960S-24TS-L	0.09 kVA	**Cisco Catalyst 2960G-8TC-L**	0.05 kVA
		Cisco Catalyst 2960G-24TC-L	0.075 kVA
		Cisco Catalyst 2960G-48TC-L	0.140 kVA

DC input voltages (RPS input)		
Cisco Catalyst 2960-S		
Cisco Catalyst 2960S-48FPD-L	12V at 4 A	-52 V at 15 A
Cisco Catalyst 2960S-48LPD-L	12V at 4 A	-52 V at 8 A
Cisco Catalyst 2960S-24PD-L	12V at 3 A	-52 V at 8 A
Cisco Catalyst 2960S-48TD-L	12V at 4 A	N/A
Cisco Catalyst 2960S-24TD-L	12V at 3 A	N/A
Cisco Catalyst 2960S-48FPS-L	12V at 4 A	-52 V at 15A
Cisco Catalyst 2960S-48LPS-L	12V at 4 A	-52 V at 8 A
Cisco Catalyst 2960S-24PS-L	12V at 3 A	-52 V at 8 A
Cisco Catalyst 2960S-48TS-L	12V at 4 A	N/A
Cisco Catalyst 2960S-24TS-L	12V at 4 A	N/A
Cisco Catalyst 2960		
Cisco Catalyst 2960-24TT-L	12V at 5 A	5 A
Cisco Catalyst 2960-48TT-L		
Cisco Catalyst 2960-24TC-L		
Cisco Catalyst 2960-24LT-L	12 V at 8.3 A	-48 V at 2.7 A
Cisco Catalyst 2960-24PC-L	12 V at 11.25 A	-48 V at 7.8 A
Cisco Catalyst 2960-48PST-L	12 V at 4 A	-48 V at 7.8 A
Cisco Catalyst 2960-48TC-L	12 V at 5 A	
Cisco Catalyst 2960G-24TC-L	12 V at 10.5 A	
Cisco Catalyst 2960G-48TC-L		

No RPS input for Cisco Catalyst 2960PD-8TT-L, Catalyst 2960-8TC-L, or Catalyst 2960G-8TC-L.

PoE and PoE+

- Maximum power supplied per port for PoE+ is 30W.
- Maximum power supplied per port for PoE is 15.4W.
- Total power dedicated to PoE or PoE+ is 370W or 740W.

Table 9. Power Specifications for Cisco Catalyst 2960-S and 2960 Series Switches with LAN Base Software

Description	C2960-S Specifications				
Models	**C2960S-48FPD-L**	**C2960S-48LPD-L**	**C2960S-24PD-L**	**C2960S-48TD-L**	**C2960S-24TD-L**
100 Percent Throughput					
Measured Power Consumption	81W	71W	55W	55W	39W
5 Percent Throughput					
Measured Power Consumption	80W	70W	54W	53W	38W
5 Percent Throughput (with 50 Percent PoE Loads)					

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Measured Power Consumption	Switch Power: 464W PoE Power: 386W	Switch Power: 266W PoE Power: 195W	Switch Power: 249W PoE Power: 195W	-	-
100 Percent Throughput (with Maximum Possible PoE Loads)					
Measured Power Consumption	Switch Power: 870W PoE Power: 744W	Switch Power: 466W PoE Power: 375W	Switch Power: 451W PoE Power: 375W	-	-

Description	C2960-S Specifications				
Models	**C2960S-48FPS-L**	**C2960S-48LPS-L**	**C2960S-24PS-L**	**C2960S-48TS-L**	**C2960S-24TS-L**
100 Percent Throughput					
Measured Power Consumption	79W	71W	55W	52W	40W
5 Percent Throughput					
Measured Power Consumption	78W	70W	54W	50W	39W
5 Percent Throughput (with 50 Percent PoE Loads)					
Measured Power Consumption	Switch Power: 464W PoE Power: 386W	Switch Power: 266W PoE Power: 195W	Switch Power: 249W PoE Power: 195W	-	-
100 Percent Throughput (with Maximum Possible PoE Loads)					
Measured Power Consumption	Switch Power: 870W PoE Power: 744W	Switch Power: 466W PoE Power: 375W	Switch Power: 449W PoE Power: 375W	-	-

Description	C2960 Specifications				
Models	**C2960-48PST-L**	**C2960-24PC-L**	**C2960-24LT-L**	**C2960-48TC-L**	**C2960-24TC-L**
100 Percent Throughput					
Measured Power Consumption	67W	45W	36W	39W	27W
5 Percent Throughput					
Measured Power Consumption	63W	43W	34W	36W	24W
5 Percent Throughput (with 50 Percent PoE Loads)					
Measured Power Consumption	Switch Power: 262W PoE Power: 187W	Switch Power: 237W PoE Power: 185W	Switch Power: 98W PoE Power: 62W	-	-
100 Percent Throughput (with Maximum Possible PoE Loads)					
Measured Power Consumption	Switch Power: 460W PoE Power: 339W	Switch Power: 433W PoE Power: 357W	Switch Power: 162W PoE Power: 119W	-	-

Description	C2960 Specifications				
Models	**C2960-48TT-L**	**C2960-24TT-L**	**C2960G-48TC-L**	**C2960G-24TC-L**	**C2960-24T-L**
100 Percent Throughput					
Measured Power Consumption	42W	28W	123W	72W	22W
5 Percent Throughput					
Measured Power Consumption	38W	26W	114W	65W	21W
5 Percent Throughput (with 50 Percent PoE Loads)					
Measured Power Consumption	-	-	-	-	-

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100 Percent Throughput (with Maximum Possible PoE Loads)					
Measured Power Consumption	-	-	-	-	-

Description	Compact Switch Specifications		
Models	**C2960-8TC-L**	**C2960PD-8TT-L**	**C2960G-8TC-L**
100 Percent Throughput			
Measured Power Consumption	12W	11W	22W
5 Percent Throughput			
Measured Power Consumption	11W	N/A	20W
5 Percent Throughput (with 50 Percent PoE Loads)			
Measured Power Consumption	-	-	-
100 Percent Throughput (with Maximum Possible PoE Loads)			
Measured Power Consumption	-	-	-

Note: Disclaimer: All power consumption numbers were measured under controlled laboratory conditions and are provided as an estimate.

The wattage rating on the power supply does not represent actual power draw. It indicates the maximum power draw possible by the power supply. This rating can be used for facility capacity planning. For PoE switches, cooling requirements are smaller than the actual power consumption as a significant portion of PoE loads are dissipated in the endpoints.

Non-PoE Power Consumption

100 Percent Throughput Switch Power Consumption

The numbers indicate the power consumed by a typical switch under normal conditions. Normal conditions signify a temperature of 25 degrees Celsius, atmospheric pressure in the range of 860 to 1060 mbar, and relative humidity from 30 to 75 percent. Typically such power draws are only seen when encountering a 100 percent traffic load made up entirely of 64-byte packets on the switch and the uplinks.

5 Percent Throughput Switch Power Consumption

The numbers indicate the power consumed by a typical switch under normal conditions. Normal conditions signify a temperature of 25 degrees Celsius, atmospheric pressure in the range of 860 to 1060 mbar, and relative humidity from 30 to 75 percent. The numbers below indicate a 5 percent traffic load on the switch and its uplinks.

PoE Power Consumption

100 Percent Throughput Switch Power Consumption (No PoE Loads)

The numbers indicate the power consumed by a typical switch under normal conditions. Normal conditions signify a temperature of 25 degrees Celsius, atmospheric pressure in the range of 860 to 1060 mbar, and relative humidity from 30 to 75 percent. Typically such power draws are only seen when encountering a 100 percent traffic load made up entirely of 64-byte packets with no PoE loads on the switch and uplinks.

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Measured 5 Percent Throughput Switch Power Consumption (No PoE Loads)

The numbers indicate the power consumed by a typical switch under normal conditions. Normal conditions signify a temperature of 25 degrees Celsius, atmospheric pressure in the range of 860 to 1060 mbar and relative humidity from 30 to 75 percent. The numbers below indicate a 5 percent traffic load on the switch and its uplinks.

100 Percent Throughput Switch Power Consumption (with Maximum PoE Loads)

The numbers indicate the power consumed by a typical system (the switch and the corresponding PoE loads) under normal conditions. Normal conditions signify a temperature of 25 degrees Celsius, atmospheric pressure in the range of 860 to 1060 mbar and relative humidity from 30 to 75 percent. Typically this power draw is realized when a switch is running 100 percent traffic load of 64 byte sized packets on all its ports and uplinks and also drawing 100 percent PoE load.

5 Percent Throughput Switch Power Consumption (with 50 Percent PoE Loads)

The numbers indicate the power consumed by a typical system (the switch and the corresponding PoE loads) under normal conditions. Normal conditions signify a temperature of 25 degrees Celsius, atmospheric pressure in the range of 860 to 1060 mbar and relative humidity from 30 to 75 percent. The numbers below indicate a 5 percent traffic load and 50 percent PoE load on the switch and its uplinks.

Table 10. 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
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 11). 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 Center (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.

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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 11. 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 end user continues to own or use the product, provided that: fan and power supply warranty is limited to five (5) years.	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 part for next business day delivery, where available. Otherwise, a replacement will be shipped within ten (10) working days after the 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 Cisco 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 Base Software

Customers with Cisco Catalyst LAN Base 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 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

Minimize operating costs and reduce power consumption with 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 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 10 lists the technical services available for the Cisco Catalyst 2960-S and 2960 Series Switches.

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Table 12. 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 available[1] • Ongoing operating system software updates within the licensed feature set[2] • 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 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 upgrades[2] • Next-business-day advance hardware replacement as available, 24x7x4 option available[1]
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 available[1] • Ongoing operating system software updates[2]
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.

Ordering Information

Tables 13, 14, and 15 give ordering information for the Cisco Catalyst 2960-S and 2960 Series Switches with LAN Base Software.

Table 13. Ordering Information for Cisco Catalyst 2960-S Series Switches with LAN Base Software

Part Numbers	Description
10 Gigabit Uplinks with 10/100/1000 Ethernet Connectivity	
WS-C2960S-48FPD-L	• 48 Ethernet 10/100/1000 PoE+ ports • 740W PoE capacity • 2 10 Gigabit Ethernet or 2 1 Gigabit Ethernet SFP+ uplink ports • Optional Cisco FlexStack stacking support • LAN Base image

[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.

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Part Numbers	Description
WS-C2960S-48LPD-L	• 48 Ethernet 10/100/1000 PoE+ ports • 370W PoE capacity • 2 10 Gigabit Ethernet or 2 1 Gigabit Ethernet SFP+ uplink ports • Optional Cisco FlexStack stacking support • LAN Base image
WS-C2960S-24PD-L	• 24 Ethernet 10/100/1000 PoE+ ports • 370W PoE capacity • 2 10 Gigabit Ethernet or 2 1 Gigabit Ethernet SFP+ uplink ports • Optional Cisco FlexStack stacking support • LAN Base image
WS-C2960S-48TD-L	• 48 Ethernet 10/100/1000 ports • 2 10 Gigabit Ethernet or 2 1 Gigabit Ethernet SFP+ uplink ports • Optional Cisco FlexStack stacking support • LAN Base image
WS-C2960S-24TD-L	• 24 Ethernet 10/100/1000 ports • 2 10 Gigabit Ethernet or 2 1 Gigabit Ethernet SFP+ uplink ports • Optional Cisco FlexStack stacking support • LAN Base image
1 Gigabit Uplinks with 10/100/1000 Ethernet Connectivity	
WS-C2960S-48FPS-L	• 48 Ethernet 10/100/1000 PoE+ ports • 740W PoE capacity • 2 1 Gigabit Ethernet SFP uplink ports • Optional Cisco FlexStack stacking support • LAN Base image
WS-C2960S-48LPS-L	• 48 Ethernet 10/100/1000 PoE+ ports • 370W PoE capacity • 2 1 Gigabit Ethernet SFP uplink ports • Optional Cisco FlexStack stacking support • LAN Base image
WS-C2960S-24PS-L	• 24 Ethernet 10/100/1000 PoE+ ports • 370W PoE capacity • 2 1 Gigabit Ethernet SFP uplink ports • Optional Cisco FlexStack stacking support • LAN Base image
WS-C2960S-48TS-L	• 48 Ethernet 10/100/1000 ports • 2 1 Gigabit Ethernet SFP uplink ports • Optional Cisco FlexStack stacking support • LAN Base image
WS-C2960S-STACK	FlexStack hot-swappable stacking module

Table 14. Ordering Information for Cisco Catalyst 2960 Series Switches with LAN Base Software

Part Numbers	Description
WS-C2960PD-8TT-L	• 8 Ethernet 10/100 ports and 1 10/100/1000 PoE input port • Power adaptor (PWR-A=) and power cord sold separately • Compact size with no fan; magnet included • LAN Base image
WS-C2960-8TC-L	• 8 Ethernet 10/100 ports • 1 dual-purpose uplink (dual-purpose uplink port has 1 10/100/1000 Ethernet port,1 SFP-based Gigabit Ethernet port, 1 port active) • Compact size with no fan; magnet included • LAN Base image

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Part Numbers	Description
WS-C2960-24TT-L	• 24 Ethernet 10/100 ports and 2 10/100/1000 TX uplinks • 1 RU fixed-configuration • LAN Base image
WS-C2960-48TT-L	• 48 Ethernet 10/100 ports and 2 10/100/1000 TX uplinks • 1 RU fixed-configuration • LAN Base image
WS-C2960-24LT-L	• 24 Ethernet 10/100 ports with 8 PoE ports and 2 10/100/1000 TX uplinks • 1 RU fixed-configuration • LAN Base image
WS-C2960-24PC-L	• 24 Ethernet 10/100 PoE ports and 2 dual-purpose uplinks • 1 RU fixed-configuration • LAN Base image
WS-C2960-48PST-L	• 48 Ethernet 10/100 PoE ports and 2 10/100/1000 uplinks and 2 SFP uplinks • 1 RU fixed-configuration • LAN Base image
WS-C2960-48TC-L	• 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) • 1 RU fixed-configuration • LAN Base image
WS-C2960G-8TC-L	• 7 Ethernet 10/100/1000 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) • Compact size with no fan; magnet included • LAN Base image
WS-C2960G-24TC-L	• 20 Ethernet 10/100/1000 ports and 4 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) • 1 RU fixed-configuration • LAN Base image
WS-C2960G-48TC-L	• 44 Ethernet 10/100/1000 ports and 4 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) • 1 RU fixed-configuration • LAN Base image

Table 15. Ordering Information for Cisco Catalyst 2960-S and 2960 Series Switches with LAN Base Software Accessories

Part Numbers	Description
CAB-STK-E-0.5M	FlexStack stacking cable with a 0.5 m length
CAB-STK-E-1M	FlexStack stacking cable with a 1.0 m length
CAB-STK-E-3M	FlexStack stacking cable with a 3.0 m length
CAB-CONSOLE-RJ45	Console cable 6 ft with RJ45
CAB-CONSOLE-USB	Console cable 6 ft with USB Type A and mini-B connectors
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

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Part Numbers	Description
CAB-ACC	Power cord (China) 10A, IEC 320, C13 (APN=CS-PWR-CH)
CAB-3P-JPN	CABASY,POWER CORD, JAPAN 3P, PSE, 12A @125VAC
CAB-L620P-C13-JPN	Power cord (Japan) 250VAC, 15A, NEMA L6-20 to C13, JAPAN
CAB-IND-10A	Power cord (India)
PWR-RPS2300	Cisco Redundant Power System 2300 and blower, no power supply
BLNK-RPS2300=	Spare bay insert for Cisco Redundant Power System 2300 for Cisco Catalyst 2960 and Catalyst 2960-S switches
CAB-RPS2300-E=	Spare RPS2300 cable for Cisco Catalyst 2960-48PST-L, 2960-24PC-L and 2960-24LT-L switches and Catalyst 2960-S switches
CAB-RPS2300=	Spare RPS2300 cable for Cisco Catalyst 2960 except as noted with CAB-RPS2300-E above
BLWR-RPS2300=	Spare 45 CFM blower for Cisco Redundant Power System 2300
C3K-PWR-750WAC=	Catalyst 2960 and Catalyst 2960-S RPS 2300 750W AC power supply spare
PWR-A=	Power adapter for Cisco Catalyst 2960PD-8TT-L compact switch
CBLGRD-C2960-8TC=	Cable guard for Cisco Catalyst 2960-8TC compact switch
CBLGRD-C2960G-8TC=	Cable guard for Cisco Catalyst 2960G-8TC compact switch
RCKMNT-19-CMPCT=	Rack mount for Cisco Catalyst 2960-8TC and Catalyst 2960G-8TC compact switches
RCKMNT-1RU=	Spare rack-mount kit for Cisco Catalyst 2960 and 2960-S Series for 19- and 24-inch racks
RCKMNT-REC-1RU=	1 RU recessed rack-mount kit for Cisco Catalyst 2960 and 2960-S Series
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-ZX-SM=	1000BASE-ZX SFP transceiver module for SMF, 1550-nm wavelength
GLC-T=	1000BASE-T SFP transceiver module for Category 5 copper wire Not supported on the Cisco Catalyst 2960-8TC and Catalyst 2960G-8TC compact switches
GLC-BX-D=	1000BASE-BX10 SFP transceiver module for single strand SMF, 1490-nm TX/1310-nm RX wavelength
GLC-BX-U=	1000BASE-BX10 SFP transceiver module for single strand SMF, 1310-nm TX/1490-nm RX wavelength
GLC-GE-100FX=	100BASE-FX SFP module for Gigabit Ethernet ports, 1310-nm wavelength, 2 km over MMF Not supported on the Cisco Catalyst 2960-8TC and Catalyst 2960G-8TC compact switches
GLC-FE-100FX=	100BASE-FX SFP module for 100-Mb ports, 1310-nm wavelength, 2 km over MMF
GLC-FE-100LX=	100BASE-LX10 SFP module for 100-Mb ports, 1310-nm wavelength, 10 km over SMF
GLC-FE-100BX-D=	100BASE-BX10-D SFP module for 100-Mb ports, 1550-nm TX/1310-nm RX wavelength, 10 km over single-strand SMF
GLC-FE-100BX-U=	100BASE-BX10-U SFP module for 100-Mb ports, 1310-nm TX/1550-nm RX wavelength, 10 km over single-strand SMF
CWDM-SFP-1470=	Cisco CWDM SFP 1470 nm; Gigabit Ethernet and 1G/2G Fibre Channel (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 (blue)
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)
CAB-SM-LCSC-1M	1m fiber single-mode LC-to-SC connectors
CAB-SM-LCSC-5M	5m fiber single-mode LC-to-SC connectors

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Part Numbers	Description
SFP-10G-LR=	10GBASE-LR SFP+ module
SFP-10G-SR=	10GBASE-SR SFP+ module
SFP-10G-LRM=	10GBASE-LRM SFP module
SFP-10G-CX1=	10GBASE-CX1 SFP module
SFP-H10GB-CU1M=	10GBASE-CU SFP+ Cable 1 Meter
SFP-H10GB-CU3M=	10GBASE-CU SFP+ Cable 3 Meter
SFP-H10GB-CU5M=	10GBASE-CU SFP+ Cable 5 Meter

For the latest SFP compatibility information with C2960 model switches, please consult the tables available here: http://www.cisco.com/en/US/products/hw/modules/ps5455/products_device_support_tables_list.html.

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Printed in USA

C78-341562-12 06/11

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