

Cisco Catalyst 2950 Series Switches with Standard Image Software

Product Overview

The Cisco® Catalyst® 2950SX-48, 2950T-48, 2950SX-24, 2950-24, and 2950-12 switches, members of the Cisco Catalyst 2950 Series, are standalone, fixed-configuration, managed 10/100-Mbps switches providing basic workgroup connectivity for small to midsize networks. These wire-speed desktop switches come with Standard Image software features and offer Cisco IOS® Software functions for basic data, voice, and video services at the edge of the network. Embedded in all Cisco Catalyst 2950 Series switches is the Cisco Cluster Management Suite (CMS) software, which allows users to simultaneously configure and troubleshoot multiple Cisco Catalyst desktop switches using a standard Web browser. In addition, with the newly launched Cisco Express Setup, users now have the option to set up the switch through a Web browser, eliminating the need for more complex terminal emulation programs and knowledge of the command-line interface (CLI). Cisco Express Setup reduces the cost of deployment by enabling less-skilled personnel to set up switches quickly. This product line offers two distinct sets of software features and a range of configurations to allow small, midsize, and enterprise branch offices to select the right combination for the network edge. For networks that require additional security, advanced quality of service (QoS), and high availability, Enhanced Image software delivers intelligent services such as rate limiting and security filtering for deployment at the network edge.

The Cisco Catalyst 2950SX-48, 2950T-48, 2950SX-24, 2950-12 and 2950-24 switches (Figures 1–5) are available only with the Standard Image (SI) software for the Cisco Catalyst 2950 Series.

- Cisco Catalyst 2950SX-48 Switch—48 10/100-Mbps ports with two fixed 1000BASE-SX uplinks
- Cisco Catalyst 2950T-48 Switch—48 10/100-Mbps ports with two fixed 10/100/1000BASE-T uplinks
- Cisco Catalyst 2950SX-24 Switch—24 10/100-Mbps ports with two fixed 1000BASE-SX uplinks
- Cisco Catalyst 2950-24 Switch— 24 10/100-Mbps ports
- Cisco Catalyst 2950-12 Switch—12 10/100-Mbps ports



Figure 1
Cisco Catalyst 2950-12 Switch



Figure 2
Cisco Catalyst 2950-24 Switch



Figure 3
Cisco Catalyst 2950SX-24 Switch



Figure 4
Cisco Catalyst 2950T-48 Switch



Figure 5
Cisco Catalyst 2950SX-48 Switch





These switches provide customers with many connectivity and port-density options. The Cisco Catalyst 2950-12 and Cisco Catalyst 2950-24 switches provide 12 and 24 10/100-Mbps ports, respectively, for edge connectivity. Depending on port-density requirements, customers with gigabit fiber uplink connectivity needs can choose between the Cisco Catalyst 2950SX-24 Switch, which provides 24 10/100-Mbps ports and 2 integrated 1000BASE-SX ports, and the Cisco Catalyst 2950SX-48 Switch, which provides 48 10/100-Mbps ports and 2 integrated 1000BASE-SX ports.

With these integrated ports, customers get an extremely cost-effective solution for delivering gigabit speeds using fiber. These switches are ideal for education and government segments where fiber uplinks are required. For customers that do not need fiber connectivity, the Cisco Catalyst 2950T-48 Switch with 48 10/100-Mbps ports and two integrated 10/100/1000 BASE-T ports is a cost-effective alternative. The 10/100/1000 BASE-T ports can be used for server connectivity or for uplink connectivity to distribution or other switches. Dual ports also provide redundancy and increased availability, as well as provide a cost-effective means for cascading switches and managing them as a cluster. The Cisco Catalyst 2950 Series Intelligent Ethernet switches with Enhanced Image software are fixed-configuration models that bring intelligent services, such as advanced QoS, enhanced security, and high availability to the network edge while maintaining the simplicity of traditional LAN switching. Combining a Cisco Catalyst 2950 Series Intelligent Ethernet Switch with a Cisco Catalyst 3550 Series Switch enables IP routing from the edge to the core of the network. Refer to the Cisco Catalyst 2950 Series Enhanced Image Data Sheet for more information:

http://www.cisco.com/en/US/partner/products/hw/switches/ps628/products_data_sheet09186a00801a0c5b.html

Network Availability with Wire-Speed Performance in Connecting End Stations to the LAN

With a switching fabric of 13.6 Gbps and a maximum forwarding bandwidth of 13.6 Gbps, Cisco Catalyst 2950 Series switches deliver wire-speed performance on all ports in connecting end stations and users to the company LAN. Cisco Catalyst 2950 Series switches with basic services support performance-boosting features such as Cisco Fast EtherChannel[®] to provide high-performance bandwidth between Cisco Catalyst switches, routers, and servers.

Network Security

Cisco Catalyst 2950 Series switches offer enhanced data security through a wide range of security features. These features allow customers to provide network security based on users or MAC addresses. The security enhancements are available free by downloading the latest software for the Cisco Catalyst 2950 Series switches.

Private VLAN Edge isolates ports on a switch, ensuring that traffic travels directly from the entry point to the aggregation device through a virtual path and cannot be directed to another port. In addition, for authentication of users with a TACACS+ or a RADIUS server, 802.1x provides port-level security. Simple Network Management Protocol Version 3 (SNMPv3) (non-crypto) monitors and controls network devices as well as manages configurations, performance, collection of statistics, and security.

With the Cisco Catalyst 2950SX-48, 2950T-48, 2950SX-24, 2950-24, and 2950-12 switches, network managers can make ports and consoles highly secure. MAC-address-based port-level security prevents unauthorized stations from accessing the switch. Multilevel access security on the switch console and the Web management interface prevents unauthorized users from accessing or altering switch configurations and can be implemented using an internal user database on each switch or a centrally administered TACACS+ or RADIUS server. Using 802.1x in conjunction with



a RADIUS server allows dynamic port-based user authentication. In addition, 802.1x can coexist with port security on a per-port basis. Security features can be deployed using Cisco CMS software security wizards, which ease the deployment of security features that restrict user access to a server or portion of the network or restrict the applications used in certain areas of the network.

Network Control

Cisco Catalyst 2950SX-48, 2950T-48, 2950SX-24, 2950-24, and 2950-12 switches deliver LAN-edge QoS, supporting two modes of reclassification. One mode—based on the IEEE 802.1p standard—honors the class-of-service (CoS) value at the ingress point and assigns the packet to the appropriate queue. In the second mode, packets can be reclassified based on a default CoS value assigned to the ingress port by the network administrator. In the case of frames that arrive without a CoS value (such as untagged frames), these Cisco Catalyst 2950 Series switches support classification based on a default CoS value per port assigned by the network administrator. After the frames have been classified or reclassified using one of the above modes, they are assigned to the appropriate queue at the egress. Cisco Catalyst 2950 Series switches support four egress queues, which allow the network administrator to be more discriminating and granular in assigning priorities for the various applications on the LAN. Strict Priority Scheduling configuration ensures that time-sensitive applications, such as voice, always follow an expedited path through the switch fabric. Weighted Round Robin (WRR) scheduling, another significant enhancement, ensures that lower-priority traffic receives attention without comprising the priority settings administered by a network manager. These features allow network administrators to prioritize mission-critical, time-sensitive traffic, such as voice (IP telephony traffic), enterprise resource planning (Oracle, SAP, etc.), and computer-assisted design and manufacturing, over less time-sensitive applications such as FTP or e-mail (Simple Mail Transfer Protocol).

Network Availability

To provide efficient use of resources for bandwidth-hungry applications like multicasts, Cisco Catalyst 2950 Series switches support Internet Group Management Protocol Version 3 (IGMPv3) snooping in hardware. Through the support and configuration of IGMP snooping through the Cisco CMS software, these Cisco Catalyst 2950 Series switches deliver outstanding performance and ease of use in administering and managing multicast applications on the LAN.

The IGMPv3 snooping feature allows the switch to “listen in” on the IGMP conversation between hosts and routers. When a switch hears an IGMP join request from a host for a given multicast group, the switch adds the host's port number to the group destination address list for that group. And when the switch hears an IGMP leave request, it removes the host's port from the content-addressable memory (CAM) table entry.

Multicast VLAN Registration (MVR) is designed for applications using wide-scale deployment of multicast traffic across an Ethernet ring-based service provider network (for example, the broadcast of multiple television channels over a service-provider network). MVR allows a subscriber on a port to subscribe and unsubscribe to a multicast stream on the networkwide multicast VLAN.

Per VLAN Spanning Tree Plus (PVST+) allows users to implement redundant uplinks while also distributing traffic loads across multiple links. This is not possible with standard Spanning Tree Protocol implementations. Cisco UplinkFast technology ensures immediate transfer to the secondary uplink, much better than the traditional 30- to 60-second convergence time. This is yet another enhancement of the Spanning Tree Protocol implementation. An



additional feature that enhances performance is voice VLAN. This feature allows network administrators to assign voice traffic to a VLAN dedicated to IP telephony, thereby simplifying phone installations and providing easier network traffic administration and troubleshooting.

Network Management

Cisco Cluster Management Suite (CMS) is Web software that is embedded in Cisco Catalyst 3750, 3550, 2970, 2950, 2940, 3500 XL, 2900 XL, and 2900 LRE XL series switches. Through Cisco switch-clustering technology, users access Cisco CMS software with any standard Web browser to manage up to 16 of these switches at once, regardless of their geographic proximity with the option of using a single IP address for the entire cluster if desired. Cisco CMS software supports standards-based connectivity options such as Ethernet, Fast Ethernet, Fast EtherChannel, Gigabit Ethernet, and Gigabit EtherChannel connectivity. Because Cisco switch-clustering technology is not limited to a single stack of switches, Cisco CMS software expands the traditional cluster domain beyond a single wiring closet and saves time and effort for network administrators.

Cisco Catalyst 2950 Series switches can be configured either as command or member switches in a Cisco switch cluster. Cisco CMS also allows the network administrator to designate a standby or redundant command switch, which takes the commander duties should the primary command switch fail. Other key features include the ability to configure multiple ports and switches simultaneously, as well as perform software updates across the entire cluster at once, and clone configurations to other clustered switches for rapid network deployment. Bandwidth graphs and link reports provide useful diagnostic information, and the topology map gives network administrators a quick view of network status.

In addition to CMS, Cisco Catalyst 2950 Series switches provide extensive management tools using SNMP network management platforms such as CiscoWorks.

Cisco Catalyst 2950 Series switches deliver a comprehensive set of management tools to provide the required visibility and control in the network. Managed with CiscoWorks, Cisco Catalyst family switches can be configured and managed to deliver end-to-end device, VLAN, traffic, and policy management. Coupled with CiscoWorks, Cisco Resource Manager Essentials, a Web-based management tool, offers automated inventory collection, software deployment, easy tracking of network changes, views into device availability, and quick isolation of error conditions.

Cisco Express Setup is a new feature that simplifies initial configuration of a switch. Users now have the option to set up the switch using a Web browser, eliminating the need for more complex terminal emulation programs and knowledge of CLI. Cisco Express Setup reduces the cost of deployment by enabling less-skilled personnel to set up switches quickly and simply.



Product Features and Benefits

Feature	Benefit
Availability	
Superior redundancy for fault backup	<ul style="list-style-type: none">• IEEE 802.1D Spanning Tree Protocol support for redundant backbone connections and loop-free networks simplifies network configuration and improves fault tolerance.• Support for Cisco Spanning Tree Protocol enhancements such as UplinkFast, BackboneFast, and PortFast technologies ensures quick failover recovery and enhances overall network stability and availability.• Support for an optional 675W redundant Cisco AC power system provides a backup power source for as many as four units or six units, respectively, for improved fault tolerance and network uptime.• Unidirectional link detection (UDLD) and aggressive UDLD detect and disable unidirectional links on fiber-optic interfaces caused by incorrect fiber-optic wiring or port faults.
Integrated Cisco IOS Software features for bandwidth optimization	<ul style="list-style-type: none">• Bandwidth aggregation through Cisco EtherChannel technology enhances fault tolerance and offers higher-speed aggregated bandwidth between switches to routers and individual servers. Port Aggregation Protocol (PagP) is available to simplify configuration.• VLAN1 minimization allows VLAN1 to be disabled on any individual VLAN trunk link.• Per-port broadcast, multicast, and unicast storm control prevents faulty end stations from degrading overall system performance.• Per VLAN Spanning Tree Plus (PVST+) allows for Layer 2 load sharing on redundant links to efficiently use the extra capacity inherent in a redundant design.• VLAN Trunking Protocol (VTP) pruning limits bandwidth consumption on VTP trunks by flooding broadcast traffic only on trunk links required to reach the destination devices. Dynamic Trunking Protocol (DTP) enables dynamic trunk configuration across all ports in the switch.• IGMPv3 snooping provides for fast client joins and leaves of multicast streams and limits bandwidth-intensive video traffic to the requestors. MVR, IGMP filtering, and fast-join and immediate leave are available as enhancements.



Feature	Benefit
Security	
Networkwide security features	<ul style="list-style-type: none">• A private VLAN edge provides security and isolation between ports on a switch, ensuring that voice traffic travels directly from its entry point to the aggregation device through a virtual path and cannot be directed to a different port.• Support for the 802.1x standard allows users to be authenticated regardless of which LAN ports they are accessing, and it provides unique benefits to customers who have a large base of mobile (wireless) users accessing the network.• 802.1x with voice VLAN permits an IP phone access to the voice VLAN regardless of the authorized or unauthorized state of the port.• 802.1x with Port Security authenticates the port and manages network access for all MAC addresses, including that of the client.• Port Security secures the access to a port based on the MAC address of a user's device. The aging feature removes the MAC address from the switch after a specific time to allow another device to connect to the same port.• MAC Address Notification allows administrators to be notified of new users added or removed from the network.• Multilevel security on console access prevents unauthorized users from altering the switch configuration.• Trusted Boundary provides the ability to trust the QoS priority settings if an IP phone is present and disable the trust setting in the event that the IP phone is removed, thereby preventing a rogue user from overriding prioritization policies in the network.• TACACS+ and RADIUS authentication enables centralized control of the switch and restricts unauthorized users from altering the configuration.• SNMPv3 (non-crypto) monitors and controls network devices, manages configurations, statistics collection, performance, and security.• Cisco CMS software security wizards ease the deployment of security features for restricting user access to a server, a portion of the network, or access to the network.
Quality of Service	
Layer 2 QoS	<ul style="list-style-type: none">• Support for reclassifying frames is based either on 802.1p class-of-service (CoS) value or default CoS value per port assigned by network manager.• Four queues per egress port are supported in hardware.• The Weighted Round Robin (WRR) scheduling algorithm ensures that low-priority queues are not starved.• Strict priority queue configuration via Strict Priority Scheduling ensures that time-sensitive applications such as voice always follow an expedited path through the switch fabric.



Feature	Benefit
Management	
Superior manageability	<ul style="list-style-type: none">• SNMP and Telnet interface support delivers comprehensive in-band management, and a CLI management console provides detailed out-of-band management.• An embedded Remote Monitoring (RMON) software agent supports four RMON groups (history, statistics, alarms, and events) for enhanced traffic management, monitoring, and analysis.• A Switched Port Analyzer (SPAN) port can mirror traffic from one or many ports to another port for monitoring all nine RMON groups with an RMON probe or network analyzer.• 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 switches within the intranet.• Layer 2 traceroute eases troubleshooting by identifying the physical path that a packet takes from the source device to a destination device.• Multifunction LEDs per port for port status, half-duplex/full-duplex, 10BASE-T/100BASE-TX/1000BASE-T indication, as well as switch-level status LEDs for system, redundant power supply, and bandwidth utilization provide a comprehensive and convenient visual management system.• Crash information support enables a switch to generate a crash file for improved troubleshooting.• Show-interface-capabilities provide information about the configuration capabilities of any interface.• Response Time Monitoring (RTTMON) MIB allows users to monitor network performance between a Cisco Catalyst switch and a remote device.



Feature	Benefit
Cisco Cluster Management Suite	<ul style="list-style-type: none">• Cisco Cluster Management Suite (CMS) software allows the user to manage up to 16 interconnected Cisco Catalyst 3750, 2970, 2950, 2940, 3500XL, 2900XL, and 2900 LRE XL series switches without the limitation of being located in the same wiring closet, and with the option of using a single IP address for the entire cluster if desired. Full backward compatibility ensures that any combination of the above switches can be managed with a Cisco Catalyst 2950 Series Switch.• Cisco AVVID (Architecture for Voice, Video and Integrated Data) wizards use just a few user inputs to automatically configure the switch to optimally handle different types of traffic: voice, video, multicast, and high-priority data.• One-click software upgrades can be performed across the entire cluster simultaneously, and configuration cloning enables rapid deployment of networks.• Cisco CMS Guide Mode helps users configure powerful advanced features by providing step-by-step instructions.• Cisco CMS provides enhanced online help for context-sensitive assistance.• Easy-to-use graphical interface provides both a topology map and front-panel view of the cluster.• Cisco CMS Client Install improves the launch time of Cisco CMS by installing the software files on the management station.• Multidevice- and multiport-configuration capabilities allow network administrators to save time by configuring features across multiple switches and ports simultaneously.• Cisco CMS allows the launch of the Web-based management for a Cisco Aironet[®] Wireless Access Point simply by clicking its icon in the topology map.• User-personalized interface allows users to modify polling intervals, table views, and other settings within Cisco CMS and retain these settings the next time they use Cisco CMS.• Alarm notification provides automated e-mail notification of network errors and alarm thresholds.• A Cisco CMS plug-in enables configuration of the management station with the correct run-time software.
Support for CiscoWorks	<ul style="list-style-type: none">• Manageability is enabled through CiscoWorks network management software on a per-port and per-switch basis, providing a common management interface for Cisco routers, switches, and hubs.• SNMPv1, v2, and v3 (non-crypto) and Telnet interface support delivers comprehensive in-band management, and a command-line-interface (CLI) management console provides detailed out-of-band management.• Cisco Discovery Protocol (CDP) versions 1 and 2 enable a CiscoWorks network management station to automatically discover the switch in a network topology.• Support is provided by the CiscoWorks LAN Management Solution.



Feature	Benefit
Ease of use and deployment	<ul style="list-style-type: none">• Cisco Express Setup:<ul style="list-style-type: none">– Simplifies initial configuration of a switch via a Web browser, eliminating the need for more complex terminal emulation programs and CLI knowledge.– Reduces the cost of deployment by enabling less-skilled personnel to set up switches quickly and simply.• Auto-configuration eases deployment of switches in the network by automatically configuring multiple switches across a network using a bootp server.• Autosensing on each port detects the speed of the attached device and automatically configures the port for 10- or 100-Mbps operation, easing the deployment of the switch in mixed-speed environments.• Auto-negotiating on all ports automatically selects half- or full-duplex transmission mode to optimize bandwidth.• Link Aggregation Control Protocol (LACP) allows the creation of Ethernet channeling with devices that conform to IEEE 802.3ad. This is similar to Cisco EtherChannel and PagP.• Cisco Discovery Protocol versions 1 and 2 enable a CiscoWorks network management station to automatically discover the switch in a network topology.• Cisco VTP supports dynamic VLANs and dynamic trunk configuration across all switches.• Support for dynamic VLAN assignment through implementation of VLAN Membership Policy Server (VMPS) client functions provides flexibility in assigning ports to VLANs.• Voice VLAN simplifies telephony installations by keeping voice traffic on a separate VLAN for easier network administration and troubleshooting.• The default configuration stored in Flash memory ensures that the switch can be quickly connected to the network and can pass traffic with minimal user intervention.



Product Specifications

Feature	Description
Performance	<ul style="list-style-type: none"> • 13.6-Gbps switching fabric • Cisco Catalyst 2950-12: 2.4-Gbps maximum forwarding bandwidth • Cisco Catalyst 2950-24: 4.8-Gbps maximum forwarding bandwidth • Cisco Catalyst 2950SX-24: 8.8-Gbps maximum forwarding bandwidth • Cisco Catalyst 2950T-48: 13.6-Gbps maximum forwarding bandwidth • Cisco Catalyst 2950SX-48: 13.6-Gbps maximum forwarding bandwidth • (Forwarding rates based on 64-byte packets) • Cisco Catalyst 2950-12: 1.8-Mpps wire-speed forwarding rate • Cisco Catalyst 2950-24: 3.6-Mpps wire-speed forwarding rate • Cisco Catalyst 2950SX-24: 6.6-Mpps wire-speed forwarding rate • Cisco Catalyst 2950T-48: 10.1-Mpps wire-speed forwarding rate • Cisco Catalyst 2950SX-48: 10.1-Mpps wire-speed forwarding rate • 8 MB packet buffer memory architecture shared by all ports • 16 MB DRAM and 8 MB Flash memory • Configurable up to 8000 MAC addresses

Feature	Description/Part Numbers
Management	<ul style="list-style-type: none"> • BRIDGE-MIB • CISCO-2900-MIB • CISCO-BULK-FILE-MIB • CISCO-CDP-MIB • CISCO-CLASS-BASED-QOS-MIB • CISCO-CLUSTER-MIB • CISCO-CONFIG-COPY-MIB • CISCO-CONFIG-MAN-MIB • CISCO-ENVMON-MIB • CISCO-FLASH-MIB • CISCO-FTP-CLIENT-MIB • CISCO-IMAGE-MIB • CISCO-IPMROUTE-MIB • CISCO-MAC-NOTIFICATION-MIB • CISCO-MEMORY-POOL-MIB • CISCO-PAGP-MIB • CISCO-PING-MIB • CISCO-PROCESS-MIB • CISCO-PRODUCTS-MIB • CISCO-RTTMON-MIB • CISCO-SMI • CISCO-STACKMAKER-MIB • CISCO-STP-EXTENSIONS-MIB • CISCO-SYSLOG-MIB • CISCO-TC • CISCO-TCP-MIB • CISCO-VLAN-MEMBERSHIP-MIB • CISCO-VTP-MIB • ENTITY-MIB • IANAifType-MIB • IF-MIB (RFC 1573) • OLD-CISCO-CHASSIS-MIB • OLD-CISCO-CPU-MIB • OLD-CISCO-INTERFACES-MIB • OLD-CISCO-IP-MIB • OLD-CISCO-MEMORY-MIB • OLD-CISCO-SYSTEM-MIB • OLD-CISCO-TCP-MIB • OLD-CISCO-TS-MIB • RFC1213-MIB (MIB-II) • RFC1398-MIB (ETHERNET-MIB) • RMON-MIB (RFC 1757) • RS-232-MIB • SNMPv2-MIB • SNMPv2-SMI • SNMPv2-TC • TCP-MIB • UDP-MIB



Feature	Description/Part Numbers
Standards	<ul style="list-style-type: none"> • IEEE 802.1x support • IEEE 802.3x full duplex on 10BASE-T and 100BASE-TX ports • IEEE 802.1D Spanning-Tree Protocol • IEEE 802.1p class-of-service (CoS) prioritization • IEEE 802.1Q VLAN • IEEE 802.3 10BASE-T specification • IEEE 802.3u 100BASE-TX specification • IEEE 802.3ad • IEEE 802.3z 1000BASE-X specification
Connectors and cabling	<ul style="list-style-type: none"> • 10BASE-T ports: RJ-45 connectors, two-pair Category 3, 4, or 5 unshielded twisted-pair (UTP) cabling • 100BASE-TX ports: RJ-45 connectors; two-pair Category 5 UTP cabling • 1000BASE-SX ports: MT-RJ connectors, up to 1800 feet (550 meters) cable distance for 50/125 or up to 900 ft (275 m) cable distance for 62.5/125 micron multimode fiber-optic cabling • Management console port: 8-pin RJ-45 connector, RJ-45-to-DB9 adapter cable for PC connections; for terminal connections, use RJ-45-to-DB25 female data-terminal-equipment (DTE) adapter (can be ordered separately, Cisco part number ACS-DSBUASYN=)
MT-RJ patch cables for Cisco Catalyst 2950SX-24 Switch	<p><i>Type of cable, Cisco part number:</i></p> <ul style="list-style-type: none"> • 1-meter MT-RJ-to-SC multimode cable, CAB-MTRJ-SC-MM-1M • 3-meter MT-RJ-to-SC multimode cable, CAB-MTRJ-SC-MM-3M • 5-meter MT-RJ-to-SC multimode cable, CAB-MTRJ-SC-MM-5M • 1-meter MT-RJ-to-ST multimode cable, CAB-MTRJ-ST-MM-1M • 3-meter MT-RJ-to-ST multimode cable, CAB-MTRJ-ST-MM-3M • 5-meter MT-RJ-to-ST multimode cable, CAB-MTRJ-ST-MM-5M
Power connectors	<p>Customers can provide power to a switch by using the internal power supply, the Cisco RPS 675 Redundant Power System. The connectors are located at the back of the switch.</p> <p><i>Internal power supply connector:</i></p> <ul style="list-style-type: none"> • 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. <p><i>Cisco RPS 675 connector:</i></p> <ul style="list-style-type: none"> • The connector offers connection for an optional Cisco RPS 675 that uses AC input and supplies DC output to the switch. • The connector offers a 675W redundant power system that supports six external network devices and provides power to one failed device at a time. • The connector automatically senses when the internal power supply of a connected device fails and provides power to the failed device, preventing loss of network traffic. • Attach only the Cisco RPS 675 (Model PWR675-AC-RPS-NI=) to the redundant power supply receptacle with this connector.
Indicators	<ul style="list-style-type: none"> • Per-port status LEDs: link integrity, disabled, activity, speed, and full-duplex indications • System status LEDs: system, RPS, and bandwidth-utilization indications
Dimensions and weight (H x W x D)	<ul style="list-style-type: none"> • 1.72 x 17.5 x 9.52 in. (4.36 x 44.45 x 24.18 cm) (Cisco Catalyst 2950SX-24, 2950-24, 2950-12) • 1.72 x 17.5 x 13 in. (4.36 x 44.45 x 33.02 cm) (Cisco Catalyst 2950SX-48, 2950T-48) • 1 RU high (1.72 in./4.36 cm) • 6.5 lb (3.0 kg) (Cisco Catalyst 2950SX-24, 2950-24, 2950-12) • 10.6 lb (4.8 kg) (Cisco Catalyst 2950SX-48, 2950T-48)



Feature	Description/Part Numbers
Environmental ranges	<ul style="list-style-type: none">• Operating temperature: 32 to 113 F (0 to 45 C)• Storage temperature: -13 to 158 F (-25 to 70 C)• Operating relative humidity: 10–85% (non-condensing)• Operating altitude: Up to 10,000 ft (3000 m)• Storage altitude: Up to 15,000 ft (4500 m)
Power requirements	<ul style="list-style-type: none">• Power consumption: 30W (maximum), 102 BTUs per hour (Cisco Catalyst 2950SX-24, 2950-24, 2950-12)• Power consumption: 45W (maximum), 154 BTUs per hour (Cisco Catalyst 2950T-48, 2950SX-48)• AC input voltage: 100 to 127, 200 to 240 VAC (auto-ranging)• AC input frequency: 47 to 63 Hz• DC input voltages for Cisco RPS 675 and Cisco RPS 300: +12V at 4.5A
Acoustic noise Predicted mean time between failure	<p><i>ISO 7770, bystander position, operating to an ambient temperature of 86 F (30 C):</i></p> <ul style="list-style-type: none">• WS-C2950-24, WS-C2950-12, WS-C2950SX-24: 46 dBa• WS-C2950T-48-SI, WS-C2950SX-48-SI: 48 dBa• 268,292 hours (Cisco Catalyst 2950-24)• 318,440 hours (Cisco Catalyst 2950-12)• 403,214 hours (Cisco Catalyst 2950SX-24)• 268,876 hours (Cisco Catalyst 2950T-48-SI)• 274,916 hours (Cisco Catalyst 2950SX-48-SI)
Regulatory Agency Approvals	
Safety certifications	<ul style="list-style-type: none">• UL 60950/CSA 22.2 No. 950• IEC 60950/EN 60950• AS/NZS 3260, TS001• CE Marking
Electromagnetic emissions certifications	<ul style="list-style-type: none">• FCC Part 15 Class A• EN 55022: 1998 (CISPR 22) Class A• EN 55022: 1998 (CISPR 22)• VCCI Class A• AS/NZS 3548 Class A• CE Marking• CNS 13438 Class A• CLEI Code• MIC
Warranty	<ul style="list-style-type: none">• Lifetime limited warranty



Service and Support

The services and support programs described here are available as part of the Cisco Desktop Switching Service and Support solution and are available directly from Cisco Systems® and through resellers.

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

Ordering Information

Model Numbers	Configuration
WS-C2950-12	<ul style="list-style-type: none"> • 12 10/100-Mbps ports • 1-RU standalone, fixed-configuration, managed 10/100-Mbps switch • Standard Image (SI) Software
WS-C2950-24	<ul style="list-style-type: none"> • 24 10/100-Mbps ports • 1-RU standalone, fixed-configuration, managed 10/100-Mbps switch • Standard Image (SI) Software
WS-C2950SX-24	<ul style="list-style-type: none"> • 24 10/100-Mbps ports with two fixed 1000BASE-SX uplinks • 1-RU standalone, fixed-configuration, managed 10/100-Mbps switch • Standard Image (SI) Software
WS-C2950T-48-SI	<ul style="list-style-type: none"> • 48 10/100-Mbps ports with two fixed 10/100/1000BASE-T uplinks • 1-RU standalone, fixed-configuration, managed 10/100-Mbps switch • Standard Image (SI) Software
WS-C2950SX-48-SI	<ul style="list-style-type: none"> • 48 10/100-Mbps ports with two fixed 1000BASE-SX uplinks • 1-RU standalone, fixed-configuration, managed 10/100-Mbps switch • Standard Image (SI) Software

For More Information

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