



Q&A

Cisco Catalyst 2950 LRE Series Solution Question and Answers

Q. What solutions can Cisco® Long-Reach Ethernet (LRE) products deliver?

A. Along with Cisco LRE customer premises equipment (CPE) and POTS splitters, Cisco Catalyst® 2950 LRE Series Switches extend intelligent Ethernet to areas of the network where existing Category 1–3 wiring can be used. Many applications require intelligent networks, but the cost of rewiring with Category 5 cable can be prohibitive. Cisco LRE solutions extend networks without the cost of rewiring, are easy to deploy and manage, and provide all the features of Cisco Catalyst 2950 Series switches. With the Cisco Catalyst 2950 LRE Series LRE solution, applications in the enterprise sector (such as retail, education, and government), hospitality (broadband services to hotel guests), and service providers (high-speed Internet access with scalability to voice and video) can be enhanced by using existing wiring.

Q. What devices constitute the Cisco Catalyst 2950 LRE Series?

A. The Cisco Catalyst 2950 LRE Series consists of these products:

- Cisco Catalyst 2950ST 24 LRE and Catalyst 2950ST 8 LRE, switches: These stackable Cisco Catalyst 2950 LRE Series switches offer speeds of 5 to 15 Mbps at distances of up to 5000 ft (1524 m) and uplink connectivity using a variety of fixed and optional Small Form-Factor Pluggable (SFP) uplinks. These switches deliver intelligent services, such as availability, security, and quality of service (QoS), to the network edge using the simple Web interface provided in Cisco Cluster Management Suite (CMS) software. Cisco IOS® Enhanced Image software is installed to provide intelligent services.
- Cisco 575 and 585LRE CPE Devices: These CPE devices are endpoints for the Cisco LRE network, converting LRE to 10/100BASE-T Ethernet. Each CPE includes two RJ-11 inputs for telephone line input and telephone connectivity. The Cisco 575 LRE CPE Device includes one 10/100BASE-T Ethernet port. The Cisco 585 LRE CPE Device includes four 10/100BASE-T Ethernet ports and advanced QoS features.
- Cisco 48-Port LRE POTS Splitter: This one-rack-unit passive filter allows LRE and POTS basic telephone services to exist on the same wiring. Analog voice traffic and LRE traffic are split using frequency filters, and 48 ports are supported.

Table 1. Cisco Catalyst 2950 LRE Series Products

Product Name	Product Number	Product Description
Cisco Catalyst 2950 24 LRE Switch	WS-C2950ST-24-LRE	<ul style="list-style-type: none">• 24 LRE ports• Two 10/100/1000BASE-T RJ-45 fixed uplinks• Two SFP uplinks• 1-rack-unit stackable switch• Delivers intelligent services over existing phone wiring• Comes with Enhanced Image software• Very-high-bit-rate DSL (VDSL) Plan 998
Cisco Catalyst 2950 8 LRE Switch	WS-C2950ST-8-LRE	<ul style="list-style-type: none">• Eight LRE ports• Two 10/100/1000BASE-T RJ-45 fixed uplinks• Two SFP uplinks• 1-rack-unit stackable switch• Delivers intelligent services over existing phone wiring• Comes with Enhanced Image software• VDSL Plan 998

Cisco 575 LRE CPE Device	CISCO575-LRE	<ul style="list-style-type: none"> • Two RJ-11 ports • One 10/100BASE-T RJ-45 Ethernet port • Converts LRE to 10/100BASE-T Ethernet • VDSL Plan 998 • Not interoperable with Cisco Catalyst 2950 LRE 997 Switches
Cisco 585 LRE CPE Device	CISCO585-LRE	<ul style="list-style-type: none"> • Two RJ-11 ports • Four 10/100BASE-T RJ-45 Ethernet ports • Converts LRE to 10/100BASE-T Ethernet • Features advanced QoS • VDSL Plan 998 • Not interoperable with Cisco Catalyst 2950 LRE 997 Switch
Cisco LRE 48-Port LRE POTS Splitter	PS-1M-LRE-48	<ul style="list-style-type: none"> • 48 ports • Passive filters (no power required) • 1-rack-unit device • Allows LRE to coexist with basic phone service

Q. What is Enhanced Image software?

A. Enhanced Image software, installed on Cisco Catalyst 2950 LRE Series Switches, delivers intelligent services such as advanced QoS, rate limiting, security filters, and multicast management to the network edge.

Q. Can Cisco Catalyst 2950 LRE Series Switches be upgraded to enable IP routing?

A. No. None of the Cisco Catalyst 2950 LRE Series Switches can be upgraded to enable IP routing. Cisco Catalyst 3550 Series Switches, however, can enable IP routing.

Q. Do Cisco Catalyst 2950 LRE Series Switches support Gigabit Ethernet connectivity?

A. Cisco Catalyst 2950 LRE Series Switches support Gigabit Ethernet connectivity through either fixed 10/100/1000-Mbps Ethernet ports or SFP ports. The following SFPs are supported: 1000BASE-SX, 1000BASE-LX, 1000BASE-ZX, and 1000BASE-T.

Q. What software features are available on Cisco Catalyst 2950 LRE Series Switches?

A. The Cisco Catalyst 2950 LRE Series shares the same software features as the Cisco Catalyst 2950 Series and delivers intelligent services to the edge of the network. Additions to the feature set include advanced QoS with an ability to map differentiated services code point (DSCP) to class of service (CoS) (or the converse); rate limiting based on a wide range of access control parameters such as source/destination IP address, source/destination MAC address, and Transmission Control Protocol/User Datagram Protocol (TCP/UDP) port number; and sophisticated security through filtering.

In addition to Layer 3 and 4 lookups, the Cisco Catalyst 2950 LRE Series offers new ease-of-use and deployment features such as Dynamic Trunking Protocol (DTP), Port Aggregation Protocol (PAgP), dynamic virtual LANs (VLANs), and VLAN Trunking Protocol (VTP) pruning. For a full range of software features that Cisco Catalyst 2950 LRE Series Switches support, refer to the Cisco Catalyst 2950 LRE Series Enhanced Image data sheet at <http://www.cisco.com/go/catalyst2950>.

All Cisco Catalyst 2950 Series Switches, including the Cisco Catalyst 2950 LRE Series, support traditional wiring closet and service provider features such as a Web management interface, Network Timing Protocol (NTP), port-based VLANs, fast EtherChannel and Gigabit EtherChannel technologies, 802.1Q VLAN tagging support, VTP, UplinkFast, Per VLAN Spanning Tree Plus (PVST+), TACACS+, and RADIUS.

Q. What security features are available on the Cisco Catalyst 2950 LRE Series?

- A.** The Cisco Catalyst 2950 LRE Series offers enhanced data security. The switches allow customers to secure network management traffic by encrypting passwords and configuration information; provide options for network security based on users, ports, and MAC addresses; and restrict access to sensitive areas of the network. The security enhancements are available without charge by downloading the latest software for the Cisco Catalyst 2950 LRE Series.

Private VLAN Edge isolates ports on a switch, helping to ensure that users cannot snoop on other users' traffic. Local Proxy Address Resolution Protocol (ARP) works in conjunction with the Private VLAN Edge to minimize broadcasts and maximize available bandwidth.

Port-based access control parameters (ACPs) restrict sensitive portions of the network by denying packets based on source and destination MAC addresses, IP addresses, or TCP/UDP ports. ACP lookups are conducted in hardware; therefore, forwarding performance is not compromised when implementing this type of security in the network. Port security provides another means to ensure that only authorized users are on the network by limiting access based on MAC addresses. For authentication of users with a RADIUS server, 802.1x provides port-level security.

With Cisco Catalyst 2950 LRE Series switches, network managers can implement high levels of console security. Multilevel access security on the switch console and the Web management interface prevents unauthorized users from accessing or altering switch configurations. TACACS+ and RADIUS authentication enables centralized access control of the switch and restricts unauthorized users from altering the configuration. Security components can be deployed through Cisco CMS software security wizards, which ease the deployment of security features that restrict user access to a server, a portion of the network, or access to the network.

Q. Do Cisco Catalyst 2950 LRE Series Switches support switch clustering?

- A.** Yes. Cisco Catalyst 2950 LRE Series Switches can be managed using the Web-based Cisco CMS software, which uses Cisco switch clustering technology. Cisco CMS allows network administrators to manage up to 16 interconnected Cisco Catalyst 2950, 3550, 3500 XL, 2900 XL, 2900 XL LRE, and 1900 Series switches through a single IP address. The switches can be in different locations and not physically located in the same wiring closet. Furthermore, the cluster software upgrade feature in Cisco CMS allows users to upgrade the Cisco IOS® Software automatically on a group of Cisco Catalyst 3550, 2950, 3500 XL, 2900 XL, 2900 XL LRE, and 1900 Series switches. In addition, Cisco CMS delivers voice and video templates, resource monitors, and other new tools that greatly simplify the deployment and prioritization of voice, video, and mission-critical data throughout the network in midsize enterprises.

Q. What kind of network management is available on Cisco Catalyst 2950 LRE Series Switches?

- A.** In addition to Cisco CMS, Cisco Catalyst 2950 LRE Series Switches provide extensive management tools using Simple Network Management Protocol (SNMP) platforms such as CiscoWorks. Cisco Catalyst 2950 LRE Series Switches deliver management tools to provide the required visibility and control in the network. Managed with CiscoWorks, Cisco Catalyst 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.

PRODUCT POSITIONING

Q. How are Cisco Catalyst 2950 LRE Series Switches positioned in the marketplace?

- A.** Cisco Systems is the only company with the breadth of technology that allows customers to extend intelligent services across any combination of wired and wireless infrastructures. Cisco Catalyst 2950 LRE Series Switches enable enterprises and service providers to extend intelligent Ethernet services over existing phone lines and other wiring at distances of up to 5000 feet. With LRE technology, enterprises can deploy productivity-enhancing applications across entire networks while avoiding the costs of rewiring. Also, service providers now have a cost-effective solution for delivering metro Ethernet services using existing copper wires.

PRODUCT TRANSITIONS

Q. How is the Cisco Catalyst 2950 LRE Series positioned in the marketplace with respect to Cisco Catalyst 2900 XL LRE Series Switches?

- A.** The Cisco Catalyst 2950 LRE Series includes hardware configurations that support SFP-based Gigabit Ethernet connectivity and stacking. The Cisco Catalyst 2950 LRE Series also delivers a wide range of intelligent services to the edge of a network at prices lower than Cisco Catalyst 2900 XL LRE Series configurations. Customers who previously purchased fixed-configuration Cisco Catalyst 2900 XL LRE Series Switches now have superior alternatives with the Cisco Catalyst 2950 LRE Series.

Q. Are the new Cisco Catalyst 2950 LRE Series Switches compatible with other Cisco Catalyst switches?

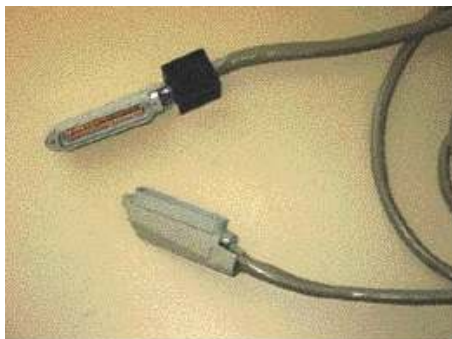
- A.** Cisco Catalyst 2950 Series Switches are fully compatible with the Cisco Catalyst 2950, 3550, 3500 XL, and 2900 XL switches. Committed to protecting customer investments in desktop switches, Cisco has ensured that all desktop switching platforms—Cisco Catalyst 2950, 3550, 3500 XL, 2900 XL, 2900 XL LRE, and 1900 Series—can be used together and managed using the Cisco CMS software already embedded and supported in these switches.

TECHNICAL QUESTIONS

Q. What additional cabling and accessories do I need to interconnect a Cisco Catalyst 2950 LRE Series solution, especially for testing or demonstrations?

- A.** Cisco Catalyst 2900 XL LRE Series and 2950 LRE Series switches use an RJ-21 connector (Figure 1). An RJ-21 cable is used to connect the LRE switch to a block 66 or a breakout box. RJ-21 cables can be purchased wherever telephone cable and electrical supplies are sold. In the United States, you can find them at Graybar (<http://www.graybar.com>) under part number 25-3-PP-5-GY-ADI.

Figure 1. RJ-21 Cable



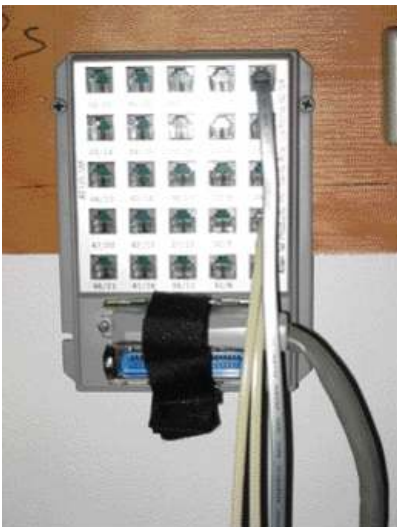
At the other end of the RJ-21 cable, you will need to attach a POTS splitter, a block 66 (Figure 2), or a breakout box (Figure 3). The block 66 is a standard punch block used in telecommunications applications. The RJ-21 cable connects to the side of the block, and the 24 pairs it contains are terminated on vampire clips. The block 66 is used to cross-connect pairs (loops).

Figure 2. Block 66



The breakout box is generally used when testing or demonstrating LRE. It terminates the RJ-21 cable and “splits” the 24 pairs into 24 RJ-11 Connections (standard U.S. telephone jack). The Graybar part number for this item is AT125-SM.

Figure 3. Breakout Box



SOFTWARE UPDATES

Q. For which fixed-configuration and stackable Cisco Catalyst series can I obtain a “no additional cost” Cisco IOS software update?

A. Cisco offers ongoing Cisco IOS Software updates for certain fixed-configuration and stackable Cisco Catalyst switches at no additional cost. For the life of the product, updates within the Cisco IOS Software package purchased (LAN Base, IP Base, IP Services, etc.) will be made available to customers. The Cisco Catalyst series that apply are as follows:

- Cisco Catalyst Express 500 Series Switches
- Cisco Catalyst 2900 XL Series Switches
- Cisco Catalyst 2940 Series Switches
- Cisco Catalyst 2948G-GE-TX Series Switch
- Cisco Catalyst 2950 Series Switches
- Cisco Catalyst 2950 LRE Series Switches
- Cisco Catalyst 2955 Series Switches
- Cisco Catalyst 2960 Series Switches
- Cisco Catalyst 2970 Series Switches
- Cisco Catalyst 3500 XL Series Switches
- Cisco Catalyst 3550 Series Switches
- Cisco Catalyst 3560 Series Switches
- Cisco Catalyst 3750 Series Switches
- Cisco ME 2400 Series Switches
- Cisco ME 3400 Series Switches

Note that **upgrades** are different from **updates**. For example, an upgrade from the IP Base Package to IP Services Package provides significant new function; therefore, this upgrade requires the purchase of a software license upgrade. Updates are incremental software features and bug fixes that are released within a licensed Cisco IOS Software package.

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

Q. How do I get a “no additional cost” Cisco IOS Software update for my fixed-configuration or stackable Cisco Catalyst switch?

A. Customers that own a software license for any of the eligible fixed-configuration or stackable Cisco Catalyst series may obtain a software update at Cisco.com.

Visit <http://tools.cisco.com/support/downloads/pub/MDFTree.x?butype=switches>, or from <http://www.cisco.com>, click on “Downloads” and select “Switch Software”. Downloading software requires a Cisco.com username and password. If you do not have a Cisco.com username, you can obtain one by clicking on “Register” at the top of any Cisco.com Webpage (<http://tools.cisco.com/RPF/register/register.do>).

WARRANTY AND SERVICE

The hardware warranty available on Cisco Catalyst 3750, 3560, 3550, 3500 XL, 2970, 2960, 2950/LRE, 2940, 2900 XL, and Express 500 Series switches is the Limited Lifetime Hardware Warranty. This warranty automatically comes with the purchase of eligible Cisco Catalyst products, free of charge. It offers free advanced replacement of products within 10 business days. For more information about the Limited Lifetime Hardware Warranty, visit:

http://www.cisco.com/en/US/products/prod_warranties_item09186a00800e6e6e.html.

TECHNICAL SUPPORT SERVICES

Technical support service is available through Cisco SMARTnet[®] and SMARTnet Onsite support. Cisco SMARTnet service augments the resources of your operations staff by providing them with access to expertise, both online and on the telephone, and numerous hardware advance replacement options. The Cisco SMARTnet Onsite service complements the hardware advance replacement feature by adding the services of a field engineer, services that can be critical for locations where internal staff are unable to perform part replacement activities. For more information about the Cisco SMARTnet service, visit

http://www.cisco.com/en/US/products/svcs/ps3034/ps2827/ps2978/serv_group_home.html.

PRODUCT AND CONTACT INFORMATION

- Q.** Where can I find technical and product specifications and other information about Cisco Catalyst 2950 LRE Series switches?
- A.** For data sheets, product specifications, and more, visit <http://www.cisco.com/go/lre>.



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