



Release Notes for the Catalyst 2928 Switch, Cisco IOS Release 12.2(55)EZ

November 5, 2010

Cisco IOS Release 12.2(55)EZ runs on the Catalyst 2928 switch. You can use the switch with a third-party system that provides authentication, authorization, and accounting services to provide both wired and wireless network access.

The Catalyst 2928 switches and the third-party system implement a stringed access control that binds a user name and password with the IP address, MAC address, VLAN ID, and port number.

These release notes include important information about Cisco IOS Release 12.2(55)EZ and any limitations, restrictions, and caveats that apply to this release. Verify that these release notes are correct for your switch:

- If you are installing a new switch, see the Cisco IOS release label on the rear panel of your switch.
- If your switch is on, use the **show version** privileged EXEC command. See the “[Finding the Software Version and Feature Set](#)” section on page 4.
- If you are upgrading to a new release, see the software upgrade filename for the software version. See the “[Deciding Which Files to Use](#)” section on page 4.

You can download the switch software from this site (registered Cisco.com users with a login password): http://www.cisco.com/web/CN/products/products_netsol/switches/products/ca2928/index.html

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System Requirements

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Supported Hardware

Table 1 *Catalyst 2928 Switch Supported Hardware*

Switch	Description
Catalyst 2928-24TC	24 10/100 BASE-TX Ethernet ports and 2 dual-purpose ports (2 10/100/1000BASE-T copper ports and 2 small form-factor pluggable [SFP] module slots)
Catalyst 2928-48TC	48 10/100 BASE-TX Ethernet ports and 2 dual-purpose ports (2 10/100/1000BASE-T copper ports and 2 SFP module slots)
Catalyst 2928-24LT	24 10/100 BASE-TX Ethernet ports, 8 of which are Power over Ethernet (PoE), and 2 dual-purpose ports (2 10/100/1000BASE-T copper ports and 2 SFP module slots)
SFP modules	GLC-T: 1000BASE-T SFP transceiver module for Category 5 copper wire GLC-SX-MM: 1000BASE-SX SFP transceiver module for MMF, 850-nm wavelength GLC-LH-SM: 1000BASE-LX/LH SFP transceiver module for MMF and SMF GLC-ZX-SM: 1000BASE-ZX SFP transceiver module for SMF GLC-BX-D: 1000BASE-BX10 SFP module for single-strand SMF GLC-BX-U: 1000BASE-BX10 SFP module for single-strand SMF GLC-GE-100FX: 100BASE-FX SFP module for Gigabit Ethernet ports GLC-FE-100FX: 100BASE-FX SFP module for 100-MB ports GLC-FE-100LX: 100BASE-FX SFP module for 100-MB ports GLC-FE-100BX-D: 100BASE-BX10-D SFP module for 100-MB ports GLC-FE-100BX-U: 100BASE-BX10-U SFP module for 100-MB ports 1000BASE-CWDM

Device Manager System Requirements

- [Hardware Requirements, page 3](#)
- [Software Requirements, page 3](#)

Hardware Requirements

Table 2 **Minimum Hardware Requirements**

Processor Speed	DRAM	Number of Colors	Resolution	Font Size
Intel Pentium II ¹	64 MB ²	256	1024 x 768	Small

1. We recommend Intel Pentium 4.
2. We recommend 256-MB DRAM.

Software Requirements

- Windows 2000, XP, Vista, and Windows Server 2003.
- Internet Explorer 5.5, 6.0, 7.0, Firefox 1.5, 2.0 or later.

The device manager verifies the browser version when starting a session, and it does not require a plug-in.

Cluster Compatibility

You cannot create and manage switch clusters through the device manager. To create and manage switch clusters, use the CLI.

When creating a switch cluster or adding a switch to a cluster, follow these guidelines:

- When you create a switch cluster, we recommend configuring the highest-end switch in your cluster as the command switch.
- The standby command switch must be the same type as the command switch. For example, if the command switch is a Catalyst 2928 switch, all standby command switches must be Catalyst 2928 switches.

For additional information about clustering, see the software configuration guide and the command reference.

Upgrading the Switch Software

- [Finding the Software Version and Feature Set, page 4](#)
- [Deciding Which Files to Use, page 4](#)
- [Upgrading a Switch by Using the Device Manager, page 5](#)
- [Upgrading a Switch by Using the CLI, page 5](#)
- [Recovering from a Software Failure, page 6](#)

Finding the Software Version and Feature Set

The Cisco IOS image is stored as a bin file in a directory that is named with the Cisco IOS release. A subdirectory contains the files needed for web management. The image is stored on the system board flash device (flash:).

You can use the **show version** privileged EXEC command to see the software version that is running on your switch. The second line of the display shows the version.

You can also use the **dir filesystem:** privileged EXEC command to see the directory names of other software images that you might have stored in flash memory.

Deciding Which Files to Use

The upgrade procedures in these release notes describe how to perform the upgrade by using a combined tar file. This file contains the Cisco IOS image file and the files needed for the embedded device manager. You must use the combined tar file to upgrade the switch through the device manager. To upgrade the switch through the command-line interface (CLI), use the tar file and the **archive download-sw** privileged EXEC command.

These are the Cisco IOS Software image files for the Catalyst 2928 switch:

c2928-lanlitek9-mz.122-55.EZ.bin	Catalyst 2928 cryptographic image file with Kerberos and SSH features. This is the executable file.
c2928-lanlitek9-tar.122-55.EZ.tar	Catalyst 2928 cryptographic image file with Kerberos and SSH features. This is the archive file that includes the image and additional device manager files.

Archiving Software Images

Before upgrading your switch software, make sure that you have archived copies of the current Cisco IOS release and the Cisco IOS release to which you are upgrading. You should keep these archived images until you have upgraded all devices in the network to the new Cisco IOS image and until you have verified that the new Cisco IOS image works properly in your network.

Cisco routinely removes old Cisco IOS versions from Cisco.com. See *Product Bulletin 2863* for more information:

http://www.cisco.com/en/US/prod/collateral/iosswrel/ps8802/ps6969/ps1835/prod_bulletin0900aecd80281c0e.html

You can copy the bin software image file on the flash memory to the appropriate TFTP directory on a host by using the **copy flash: tftp:** privileged EXEC command.



Note

Although you can copy any file on the flash memory to the TFTP server, it is time consuming to copy all of the HTML files in the tar file. We recommend that you download the tar file from Cisco.com and archive it on an internal host in your network.

You can also configure the switch as a TFTP server to copy files from one switch to another without using an external TFTP server by using the **tftp-server** global configuration command. For more information about the **tftp-server** command, see the “Basic File Transfer Services Commands” section of the *Cisco IOS Configuration Fundamentals Command Reference, Release 12.2*:

http://www.cisco.com/en/US/docs/ios/fundamentals/command/reference/cf_t1.html

Upgrading a Switch by Using the Device Manager

You can upgrade switch software by using the device manager. For detailed instructions, click **Help**.



Note

When using the device manager to upgrade your switch, do not use or close your browser session after the upgrade process begins. Wait until after the upgrade process completes.

Upgrading a Switch by Using the CLI

This procedure is for copying the combined tar file to the switch. You copy the file to the switch from a TFTP server and extract the files. You can download an image file and replace or keep the current image.

To download software, follow these steps:

-
- Step 1** Identify the file that you want to download.
 - Step 2** Download the software image file. If you have a SmartNet support contract, go to this URL, and log in to download the appropriate files:

http://www.cisco.com/web/CN/products/products_netsol/switches/products/ca2928/index.html

To download the image for a Catalyst 2928 switch, click **Catalyst 2928 software**.

- Step 3** Copy the image to the appropriate TFTP directory on the workstation, and make sure that the TFTP server is properly configured.

For more information, see Appendix B in the software configuration guide for this release.

- Step 4** Log into the switch through the console port or a Telnet session.

- Step 5** (Optional) Ensure that you have IP connectivity to the TFTP server by entering this privileged EXEC command:

```
Switch# ping tftp-server-address
```

For more information about assigning an IP address and default gateway to the switch, see the software configuration guide for this release.

- Step 6** Download the image file from the TFTP server to the switch. If you are installing the same version of software that is currently on the switch, overwrite the current image by entering this privileged EXEC command:

```
Switch# archive download-sw /overwrite /reload
tftp: [ [/location] /directory] /image-name.tar
```

The **/overwrite** option overwrites the software image in flash memory with the downloaded one.

The **/reload** option reloads the system after downloading the image unless the configuration has been changed and not saved.

For *//location*, specify the IP address of the TFTP server.

For */directory/image-name.tar*, specify the directory (optional) and the image to download. Directory and image names are case sensitive.

This example shows how to download an image from a TFTP server at 198.30.20.19 and to overwrite the image on the switch:

```
Switch# archive download-sw /overwrite tftp://198.30.20.19/c2928-lanlite-tar.122-55.EZ.tar
```

You can also download the image file from the TFTP server to the switch and keep the current image by replacing the **/overwrite** option with the **/leave-old-sw** option.

Recovering from a Software Failure

For recovery procedures, see the “Troubleshooting” chapter in the software configuration guide for this release.

Installation Notes

You can assign IP information to your switch by using these methods:

- The Express Setup program, as described in the switch getting started guide.
- The CLI-based setup program, as described in the switch hardware installation guide.
- The DHCP-based autoconfiguration, as described in the switch software configuration guide.
- Manually assigning an IP address, as described in the switch software configuration guide.

New Software Features

This is the first software release for the Catalyst 2928 switch. For a detailed list of features for this software release, see the “Overview” chapter of the Catalyst 2928 Switch Software Configuration Guide.

Limitations and Restrictions

You should review this section before you begin working with the switch. These are known limitations that will not be fixed, and there is not always a workaround. Some features might not work as documented, and some features could be affected by recent changes to the switch hardware or software.

Cisco IOS Limitations

- [“Configuration” section on page 7](#)
- [“Ethernet” section on page 8](#)
- [“IP Telephony” section on page 8](#)
- [“Smart Install” section on page 8](#)
- [“SPAN” section on page 9](#)
- [“Trunking” section on page 9](#)
- [“VLAN” section on page 10](#)

Configuration

- A static IP address might be removed when the previously acquired DHCP IP address lease expires. This problem occurs under these conditions:

- When the switch is booted up without a configuration (no config.text file in flash memory).
- When the switch is connected to a DHCP server that is configured to give an address to it (the dynamic IP address is assigned to VLAN 1).
- When an IP address is configured on VLAN 1 before the dynamic address lease assigned to VLAN 1 expires.

The workaround is to reconfigure the static IP address. (CSCea71176 and CSCdz11708)

- When connected to some third-party devices that send early preambles, a switch port operating at 100 Mb/s full duplex or 100 Mb/s half duplex might bounce the line protocol up and down. The problem is observed only when the switch is receiving frames.

The workaround is to configure the port for 10 Mb/s and half duplex or to connect a hub or a nonaffected device to the switch. (CSCed39091)

- When port security is enabled on an interface in restricted mode and the **switchport block unicast interface** command has been entered on that interface, MAC addresses are incorrectly forwarded when they should be blocked

The workaround is to enter the **no switchport block unicast** interface configuration command on that specific interface. (CSCee93822)

- A traceback error occurs if a crypto key is generated after an SSL client session.

There is no workaround. This is a cosmetic error and does not affect the functionality of the switch. (CSCef59331)

- When the **logging event-spanning-tree** interface configuration command is configured and logging to the console is enabled, a topology change might generate a large number of logging messages, causing high CPU utilization. CPU utilization can increase with the number of spanning-tree instances and the number of interfaces configured with the **logging event-spanning-tree** interface configuration command. This condition adversely affects how the switch operates and could cause problems such as STP convergence delay.

High CPU utilization can also occur with other conditions, such as when debug messages are logged at a high rate to the console.

Use one of these workarounds:

- Disable logging to the console.
- Rate-limit logging messages to the console.

Remove the **logging event spanning-tree** interface configuration command from the interfaces. (CSCsg91027)

- The far-end fault optional facility is not supported on the GLC-GE-100FX SFP module.

The workaround is to configure aggressive UDLD. (CSCsh70244).

- When you enter the **boot host retry timeout** global configuration command to specify the amount of time that the client should keep trying to download the configuration and you do not enter a timeout value, the default value is zero, which should mean that the client keeps trying indefinitely. However, the client does not keep trying to download the configuration.

The workaround is to always enter a non zero value for the timeout value when you enter the **boot host retry timeout timeout-value** command. (CSCsk65142)

- If you configure a large number of input interface VLANs in a class map, a traceback message similar to this might appear:

```
01:01:32: %BIT-4-OUTOFRANGE: bit 1321 is not in the expected range of 0 to 1024
```

There is no impact to switch functionality.

There is no workaround. (CSCtg32101)

Ethernet

- Traffic on EtherChannel ports is not perfectly load-balanced. Egress traffic on EtherChannel ports are distributed to member ports on load balance configuration and traffic characteristics like MAC or IP address. More than one traffic stream may map to same member ports based on hashing results calculated by the ASIC.

If this happens, uneven traffic distribution will happen on EtherChannel ports.

Changing the load balance distribution method or changing the number of ports in the EtherChannel can resolve this problem. Use any of these workarounds to improve EtherChannel load balancing:

- for random source-ip and dest-ip traffic, configure load balance method as **src-dst-ip**
- for incrementing source-ip traffic, configure load balance method as **src-ip**
- for incrementing dest-ip traffic, configure load balance method as **dst-ip**
- Configure the number of ports in the EtherChannel so that the number is equal to a power of 2 (i.e. 2, 4, or 8)

For example, with load balance configured as **dst-ip** with 150 distinct incrementing destination IP addresses, and the number of ports in the EtherChannel set to either 2, 4, or 8, load distribution is optimal. (CSCeh81991)

IP Telephony

- Some access point devices are incorrectly discovered as IEEE 802.3af Class 1 devices. These access points should be discovered as Cisco prestandard devices. The **show power inline** user EXEC command shows the access point as an IEEE Class 1 device. The workaround is to power the access point by using an AC wall adaptor. (CSCin69533)
- After you change the access VLAN on a port that has IEEE 802.1x enabled, the IP phone address is removed. Because learning is restricted on IEEE 802.1x-capable ports, it takes approximately 30 seconds before the address is relearned. No workaround is necessary. (CSCea85312)
- The Cisco 7905 IP Phone is error disabled when the phone is connected to wall power.

The workaround is to enable PoE and to configure the switch to recover from the PoE error-disabled state. (CSCsf32300)

Smart Install

- When upgrading switches in a stack, the director cannot send the correct image and configuration to the stack if all switches in the stack do not start at the same time. A switch in the stack could then receive an incorrect image or configuration.

The workaround is to use an on-demand upgrade to upgrade switches in a stack by entering the **vstack download config** and **vstack download image** commands. (CSCta64962)

- When you upgrade a Smart Install director to Cisco IOS Release 12.2(55)SE but do not upgrade the director configuration, the director cannot upgrade client switches.

When you upgrade the director to Cisco IOS Release 12.2(55)SE, the workaround is to also modify the configuration to include all built-in, custom, and default groups. You should also configure the tar image name instead of the image-list file name in the stored images. (CSCte07949)

- Backing up a Smart Install configuration could fail if the backup repository is a Windows server and the backup file already exists in the server.

The workaround is to use the TFTP utility of another server instead of a Windows server or to manually delete the existing backup file before backing up again. (CSCte53737)

- In a Smart Install network with the backup feature enabled (the default), the director sends the backup configuration file to the client during zero-touch replacement. However, when the client is a switch in a stack, the client receives the seed file from the director instead of receiving the backup configuration file.

The workaround, if you need to configure a switch in a stack with the backup configuration, is to use the **vstack download config** privileged EXEC command so that the director performs an on-demand upgrade on the client.

- When the backup configuration is stored in a remote repository, enter the location of the repository.
- When the backup file is stored in the director flash memory, you must manually set the permissions for the file before you enter the **vstack download config** command. (CSCtf18775)

SPAN

- Cisco Discovery Protocol (CDP), VLAN Trunking Protocol (VTP), and Port Aggregation Protocol (PAgP) packets received from a SPAN source are not sent to the destination interfaces of a local SPAN session. The workaround is to use the **monitor session session_number destination {interface interface-id encapsulation replicate}** global configuration command for local SPAN. (CSCed24036)

Trunking

- The switch treats frames received with mixed encapsulation (IEEE 802.1Q and Inter-Switch Link [ISL]) as frames with FCS errors, increments the error counters, and the port LED blinks amber. This happens when an ISL-unaware device receives an ISL-encapsulated packet and forwards the frame to an IEEE 802.1Q trunk interface. There is no workaround. (CSCdz33708)
- IP traffic with IP options set is sometimes leaked on a trunk port. For example, a trunk port is a member of an IP multicast group in VLAN X but is not a member in VLAN Y. If VLAN Y is the output interface for the multicast route entry assigned to the multicast group and an interface in VLAN Y belongs to the same multicast group, the IP-option traffic received on an input VLAN interface other than one in VLAN Y is sent on the trunk port in VLAN Y because the trunk port is forwarding in VLAN Y, even though the port has no group membership in VLAN Y. There is no workaround. (CSCdz42909).
- For trunk ports or access ports configured with IEEE 802.1Q tagging, inconsistent statistics might appear in the **show interfaces counters** privileged EXEC command output. Valid IEEE 802.1Q frames of 64 to 66 bytes are correctly forwarded even though the port LED blinks amber, and the frames are not counted on the interface statistics. There is no workaround. (CSCec35100).

VLAN

- If the number of VLANs times the number of trunk ports exceeds the recommended limit of 13,000, the switch can fail.

The workaround is to reduce the number of VLANs or trunks. (CSCeb31087)

- When line rate traffic is passing through a dynamic port, and you enter the **switchport access vlan dynamic** interface configuration command for a range of ports, the VLANs might not be assigned correctly. One or more VLANs with a null ID appears in the MAC address table instead.

The workaround is to enter the **switchport access vlan dynamic** interface configuration command separately on each port. (CSCsi26392)

Device Manager Limitations

- When you are prompted to accept the security certificate and you click *No*, you only see a blank screen, and the device manager does not launch.

The workaround is to click *Yes* when you are prompted to accept the certificate. (CSCef45718)

Important Notes

- [Cisco IOS Notes, page 10](#)
- [Device Manager Notes, page 10](#)

Cisco IOS Notes

- If the switch requests information from the Cisco Secure Access Control Server (ACS) and the message exchange times out because the server does not respond, a message similar to this appears:

```
00:02:57: %RADIUS-4-RADIUS_DEAD: RADIUS server 172.20.246.206:1645,1646 is not responding.
```

If this message appears, check that there is network connectivity between the switch and the ACS. You should also check that the switch has been properly configured as an AAA client on the ACS.

- For user accounting, the switch can update an authentication, authorization and accounting (AAA) RADIUS server with per port aggregated user send and receive byte counters, as well as send and receive packet counters. However, the switch reports the statistics per port, not per user. If multiple users are connected through the same port, the switch reports the same counter statistics for each user.

Device Manager Notes

- When you launch Express Setup, you are prompted for the switch password. Enter the default password, *cisco*. The switch ignores text in the username field. Before you complete and exit Express Setup, you must change the password from the default password, *cisco*.
- You cannot create and manage switch clusters through the device manager. To create and manage switch clusters, use the CLI.

- When the switch is running a localized version of the device manager, the switch displays settings and status only in English letters. Input entries on the switch can only be in English letters.
- For device manager sessions on Internet Explorer, popup messages in simplified Chinese can appear as garbled text. These messages appear properly if your operating system is Chinese.
- We recommend this browser setting to speed up the time needed to display the device manager from Microsoft Internet Explorer.

From Microsoft Internet Explorer:

1. Choose **Tools > Internet Options**.
 2. Click **Settings** in the “Temporary Internet files” area.
 3. From the Settings window, choose **Automatically**.
 4. Click **OK**.
 5. Click **OK** to exit the Internet Options window.
- The HTTP server interface must be enabled to display the device manager. By default, the HTTP server is enabled on the switch. Use the **show running-config** privileged EXEC command to see if the HTTP server is enabled or disabled.

If you are *not* using the default method of authentication (the enable password), you need to configure the HTTP server interface with the method of authentication used on the switch

Beginning in privileged EXEC mode, follow these steps to configure the HTTP server interface:

	Command	Purpose
Step 1	configure terminal	Enter global configuration mode.
Step 2	ip http authentication {aaa enable local}	Configure the HTTP server interface for the type of authentication that you want to use. <ul style="list-style-type: none"> • aaa—Enable the authentication, authorization, and accounting feature. You must enter the aaa new-model interface configuration command for the aaa keyword to appear. • enable—Enable password, which is the default method of HTTP server user authentication, is used. • local—Local user database, as defined on the Cisco router or access server, is used.
Step 3	end	Return to privileged EXEC mode.
Step 4	show running-config	Verify your entries.

- The device manager uses the HTTP protocol (the default is port 80) and the default method of authentication (the enable password) to communicate with the switch through any of its Ethernet ports and to allow switch management from a standard web browser.

If you change the HTTP port, you must include the new port number when you enter the IP address in the browser **Location** or **Address** field (for example, `http://10.1.126.45:184` where 184 is the new HTTP port number). You should write down the port number through which you are connected. Use care when changing the switch IP information.

If you are *not* using the default method of authentication (the enable password), you need to configure the HTTP server interface with the method of authentication used on the switch.

Beginning in privileged EXEC mode, follow these steps to configure the HTTP server interface:

	Command	Purpose
Step 1	configure terminal	Enter global configuration mode.
Step 2	ip http authentication {enable local tacacs}	Configure the HTTP server interface for the type of authentication that you want to use. <ul style="list-style-type: none"> • enable—Enable password, which is the default method of HTTP server user authentication, is used. • local—Local user database, as defined on the Cisco router or access server, is used. • tacacs—TACACS server is used.
Step 3	end	Return to privileged EXEC mode.
Step 4	show running-config	Verify your entries.

- If you use Internet Explorer Version 5.5 and select a URL with a nonstandard port at the end of the address (for example, *www.cisco.com:84*), you must enter *http://* as the URL prefix. Otherwise, you cannot launch the device manager.

Open Caveats

- CSCte99366

In a Smart Install network, when the director is connected between the client and the DHCP server and the server has options configured for image and configuration, the client does not receive the image and configuration files sent by the DHCP server during an automatic upgrade. Instead, the files are overwritten by the director, and the client receives the image and configuration that the director sends.

Use one of these workarounds:

- If client needs to upgrade using an image and configuration file configured in the DHCP server options, you should remove the client from the Smart Install network during the upgrade.
- In a network using Smart Install, you should not configure options for image and configuration in the DHCP server. For clients to upgrade using Smart Install, you should configure product-id-specific image and configuration files in the director.

- CSCtg98656

If the director in the Smart Install network is located between an access point and the DHCP server, the access point tries to use the Smart Install feature to upgrade even though access points are not supported devices. The upgrade fails because the director does not have an image and configuration file for the access point.

There is no workaround.

- CSCth35152

When a Smart Install director is upgrading a client switch that is not Smart Install-capable (that is, not running Cisco IOS Release 12.2(52)SE or later), the director must enter the password configured on the client switch. If the client switch does not have a configured password, there are unexpected results depending on the software release running on the client:

- When you select the NONE option in the director CLI, the upgrade should be allowed and is successful on client switches running Cisco IOS Release 12.2(25)SE through 12.2(46)SE, but fails on clients running Cisco IOS Release 12.2(50)SE through 12.2(50)SEx.
- When you enter any password in the director CLI, the upgrade should not be allowed, but it is successful on client switches running Cisco IOS Release 12.2(25)SE through 12.2(46)SE, but fails on clients running Cisco IOS Release 12.2(50)SE through 12.2(50)SEx.

There is no workaround.

- CSCtj52727

A user might be unable to browse the internet after several logon attempts.

Use one of these workarounds:

- Perform these steps in the order listed:
Close all browser sessions.
Release and renew the IP configuration on the PC.
Restart the browser.
- Perform these steps in the order listed:
Close all browser sessions.
Disable the interface that is connected to the Catalyst 2928 switch.
Wait 2 minutes.
Re-enable the interface that is connected to the Catalyst 2928 switch.
Restart the browser.
- Perform these steps in the order listed:
Close all browser sessions.
Enter the **clear ip dhcp snooping binding user ip address** command
Disable and re-enable the interface that is connected to the Catalyst 2928 switch.
Restart the browser.
- Reboot the PC.

Related Documentation

These documents provide complete information about the switch and are available from this Cisco.com site:

http://www.cisco.com/web/CN/products/products_netsol/switches/products/ca2928/index.html

- *Release Notes for the Catalyst 2928 Switch*
- *Catalyst 2928 Switch Software Configuration Guide*
- *Catalyst 2928 Switch Command Reference*

- *Catalyst 2928 Switch System Message Guide*
- *Catalyst 2928 Switch Getting Started Guide*
- *Catalyst 2928 Switch Hardware Installation Guide*
- *Regulatory Compliance and Safety Information for the Catalyst 2928 Switch*
- *Cisco Small Form-Factor Pluggable Modules Installation Notes*

Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, submitting a service request, and gathering additional information, see the monthly *What's New in Cisco Product Documentation*, which also lists all new and revised Cisco technical documentation:

<http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html>

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