Release Notes for the Catalyst 2955, Catalyst 2950, and Catalyst 2940 Switches, Cisco IOS Release 12.1(22)EA9

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Cisco IOS Release 12.1(22)EA9 runs on Catalyst 2955, Catalyst 2950, and Catalyst 2940 switches.

Review the new software features, open caveats, and resolved caveats sections for information specific to your switch. The information in this document refers to all the switches, unless otherwise noted.

These release notes include important information about this release and any limitations, restrictions, and caveats that apply to it. To verify that these are the correct release notes 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 running, you can use the **show version** user EXEC command. See the "Finding the Software Version and Feature Set" section on page 7.
- If you are upgrading to a new release, see the software upgrade filename for the Cisco IOS version.

For the complete list of Catalyst 2955, Catalyst 2950, and Catalyst 2940 switch documentation, see the "Related Documentation" section on page 48.

You can download the switch software from this site:

http://www.cisco.com/kobayashi/sw-center/sw-lan.shtml

This Cisco IOS release is part of a special release of Cisco IOS software that is not released on the same 8-week maintenance cycle that is used for other platforms. As maintenance releases and future Cisco IOS releases become available, they will be posted to Cisco.com in the Cisco IOS software area.

CISCO SYSTEMS

Corporate Headquarters:
Cisco Systems, Inc., 170 West Tasman Drive, San Jose, CA 95134-1706 USA

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System Requirements

The system requirements for this release are described in these sections:

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Hardware Supported

The Catalyst 2950 switch is supported by either the standard software image (SI) or the enhanced software image (EI). The Catalyst 2950 Long-Reach Ethernet (LRE) and Catalyst 2955 switches are supported only by the EI. The Catalyst 2940 switch supports some of the features supported by a Catalyst 2950 switch.

The EI provides a richer set of features, including access control lists (ACLs), enhanced quality of service (QoS) features, and extended-range VLANs. The cryptographic SI and EI support the Secure Shell Version 2 (SSHv2) protocol.

For information about the software releases that support the switches listed in Table 1, see the "Catalyst 2950 Hardware and Software Compatibility Matrixes" section on page 23.

Table 1 and Table 2 list the hardware supported by this software release:

Table 1 Catalyst 2940, Catalyst 2950, and Catalyst 2955 Hardware Supported

Hardware	Software Image	Description
Catalyst 2940-8TT-S	–[1]	8 10/100 Ethernet ports and 1 10/100/1000 Ethernet port
Catalyst 2940-8TF-S	–[1]	8 10/100 Ethernet ports, 1 SFP[2] module slot, and 1 100BASE-FX port
Catalyst 2950-12	SI	12 fixed autosensing 10/100 Ethernet ports
Catalyst 2950-24	SI	24 fixed autosensing 10/100 Ethernet ports
Catalyst 2950C-24	EI	24 fixed autosensing 10/100 Ethernet ports and 2 100BASE-FX ports
Catalyst 2950G-12-EI	EI	12 fixed autosensing 10/100 Ethernet ports and 2 GBIC[3] module slots
Catalyst 2950G-24-EI	EI	24 fixed autosensing 10/100 Ethernet ports and 2 GBIC module slots
Catalyst 2950G-24-EI-DC	EI	24 fixed autosensing 10/100 Ethernet ports and 2 GBIC module slots with DC-input power
Catalyst 2950G-48-EI	EI	48 fixed autosensing 10/100 Ethernet ports and 2 GBIC module slots
Catalyst 2950ST-8 LRE	EI	8 LRE ports, 2 10/100/1000 Ethernet ports[4], and 2 SFP module slots
Catalyst 2950ST-24 LRE	EI	24 LRE ports, 2 10/100/1000 Ethernet ports[4], and 2 SFP module slots
Catalyst 2950ST-24 LRE 997	EI	24 LRE ports, 2 10/100/1000 Ethernet ports[4], and 2 SFP module slots with DC-input power
Catalyst 2950SX-24	SI	24 fixed autosensing 10/100 Ethernet ports and 2 1000BASE-SX ports
Catalyst 2950SX-48-SI	SI	48 fixed autosensing10/100 Ethernet ports and 2 1000BASE-SX ports
Catalyst 2950T-24	EI	24 fixed autosensing 10/100 Ethernet ports and 2 10/100/1000 Ethernet ports[5]
Catalyst 2950T-48-SI	SI	48 fixed autosensing 10/100 Ethernet ports and 2 10/100/1000 Ethernet ports
Catalyst 2955C-12	EI	12 fixed autosensing 10/100 ports and 2 MM[6] 100BASE-FX ports
Catalyst 2955S-12	EI	12 fixed autosensing 10/100 ports and 2 SM[7] 100BASE-LX ports
Catalyst 2955T-12	EI	12 fixed autosensing 10/100 ports and 2 10/100/1000 Ethernet ports[4]

[1] The Catalyst 2940 switch supports some of the features supported by a Catalyst 2950 switch.

[2] SFP = small form-factor pluggable

[3] GBIC = Gigabit Interface Converter

[4] The 10/100/1000 ports on a Catalyst 2950 LRE or Catalyst 2955T-12 switch operate at 10 or 100 Mbps in either full- or half-duplex mode and at 1000 Mbps only in full-duplex mode.

[5] The 10/100/1000 interfaces on the Catalyst 2950T-24 switch do not support the **half** keyword in the **duplex** command.

[6] MM = multimode

[7] SM = single mode

Table 2 Other Hardware Supported

Hardware	Software Image	Description
Cisco 575 LRE CPE[1]	–	1 fixed 10/100 port
Cisco 576 LRE CPE 997	–	1 fixed 10/100 port
Cisco 585 LRE CPE	–	4 fixed 10/100 ports

Table 2 Other Hardware Supported (continued)

Hardware	Software Image	Description
GBIC modules	–	- 1000BASE-SX GBIC - 1000BASE-LX/LH GBIC - 1000BASE-ZX GBIC - 1000BASE-T GBIC (model WS-5483) - CWDM[2] fiber-optic GBIC[3] - DWDM[4] fiber-optic GBIC - GigaStack GBIC
Redundant power system	–	- Cisco RPS 300 redundant power system - Cisco RPS 675 redundant power system
SFP devices	–	- 1000BASE-SX SFP module - 1000BASE-LX\LH SFP module - 1000BASE-ZX SFP module - 1000BASE-T SFP module - CWDM

[1] CPE = customer premises equipment

[2] CDWM = coarse wavelength-division multiplexing

[3] This feature is only supported when your switch is running the EI.

[4] DWDM = dense wavelength-division multiplexing

Hardware Not Supported

Table 3 lists the hardware that is not supported by this release.

Table 3 Hardware Not Supported

Hardware	Description
GBIC module	1000BASE-T GBIC (model WS-G4582)
Redundant power system	Cisco RPS 600 Redundant Power System

Device Manager System Requirements

These sections describes the hardware and software requirements for using the device manager:

- "Hardware Requirements" section on page 5
- "Software Requirements" section on page 5

Hardware Requirements

Table 4 lists the minimum hardware requirements for running the device manager.

Table 4 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

Table 5 lists the supported operating systems and browsers for using the device manager. The device manager verifies the browser version when starting a session to ensure that the browser is supported.

Note The device manager does not require a plug-in.

Table 5 Supported Operating Systems and Browsers

Operating System	Minimum Service Pack or Patch	Microsoft Internet Explorer[1]	Netscape Navigator
Windows 2000	None	5.5 or 6.0	7.1
Windows XP	None	5.5 or 6.0	7.1

[1] Service Pack 1 or higher is required for Internet Explorer 5.5.

Cluster Compatibility

You cannot create and manage switch clusters through the device manager. To create and manage switch clusters, use the command-line interface (CLI) or the Network Assistant application.

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.
- If you are managing the cluster through Network Assistant, the switch that has the latest software should be 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 3750 switch, all standby command switches must be Catalyst 3750 switches.

For additional information about clustering, see *Getting Started with Cisco Network Assistant* and *Release Notes for Cisco Network Assistant* (not orderable but available on Cisco.com), the software configuration guide, and the command reference.

Cisco Network Assistant Compatibility

Cisco IOS 12.1(11)EA9 and later are compatible with Cisco Network Assistant 5.0 and later. You can download Cisco Network Assistant from this URL:

http://www.cisco.com/pcgi-bin/tablebuild.pl/NetworkAssistant

For more information about Cisco Network Assistant, see the *Release Notes for Cisco Network Assistant* on Cisco.com.

Upgrading the Switch Software

Before downloading software, read this section for important information. This section describes these procedures for downloading software:

- "Finding the Software Version and Feature Set" section on page 7
- "Deciding Which Files to Download from Cisco.com" section on page 7
- "Archiving Software Images" section on page 8
- "Upgrading a Switch by Using the Device Manager or Network Assistant" section on page 8
- "Upgrading a Switch by Using the CLI" section on page 9
- "Recovering from Software Failure" section on page 13

For information about the software releases that support the switches, see the "Catalyst 2950 Hardware and Software Compatibility Matrixes" section on page 23.

Note The Catalyst 2950-12 and Catalyst 2950-24 switches cannot be upgraded to Cisco IOS Release 12.1(6)EA2, Cisco IOS Release 12.1(6)EA2a, or Cisco IOS Release 12.1(6)EA2b. They can be upgraded to Cisco IOS Release 12.1(6)EA2c or later.

When you upgrade a switch, the switch continues to operate while the new software is copied to flash memory. If flash memory has enough space, the new image is copied to the selected switch but does not replace the running image until you reboot the switch. If a failure occurs during the copy process, you can still reboot your switch by using the old image. If flash memory does not have enough space for two images, the new image is copied over the existing one. Features provided by the new software are not available until you reload the switch.

If a failure occurs while copying a new image to the switch, and the old image has already been deleted, see the "Recovering from Corrupted Software" section in the "Troubleshooting" chapter of the software configuration guide for this release.

For information about upgrading the LRE switch firmware, see the "Upgrading LRE Switch Firmware" section in the software configuration guide for this release.

Caution A bootloader upgrade occurs if you are upgrading Catalyst 2950 switches running Cisco IOS Release 12.1(9)EA1d or earlier to Cisco IOS Release 12.1(11)EA1 or later for both cryptographic and noncryptographic images.
When you first upgrade the switch from a Cisco IOS noncryptographic image to a cryptographic image, the bootloader automatically upgrades. The new bootloader upgrade can take up to 30 seconds. Do not

power cycle the switch the first time that you are upgrading the switch to a cryptographic Cisco IOS image. If a power failure occurs when you are copying this image to the switch, call Cisco Systems immediately.

Caution Do not power cycle the switch while you are copying an image to the switch. If a power failure occurs while you are copying the software image to the switch, and there are no other images on the switch, see the "Troubleshooting" chapter in the software configuration guide for detailed recovery procedures.

Finding the Software Version and Feature Set

The 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** user EXEC command to see the software version that is running on your switch. In the display, check the line that begins with `System image file is`. This line shows the directory name in flash memory where the image is stored. A couple of lines below the image name, you see `Running Enhanced Image` if you are running the EI or `Running Standard Image` if you are running the SI.

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 Download from Cisco.com

The upgrade procedures in these release notes describe how to perform the upgrade by using a combined tar file. This file contains both the Cisco IOS image file and the embedded device manager files. You must use the combined tar file to upgrade the switch through the device manager.

The tar file is an archive file from which you can extract files by using the **archive tar** command.

Note If you are upgrading a non-LRE Catalyst 2950 switch from a release earlier than Cisco IOS Release 12.1(6)EA2, use the **tar** command instead of the **archive tar** command.

Table 6 lists the software filenames for this release. These files are posted on Cisco.com.

Table 6 Catalyst 2955, 2950, and Catalyst 2940 Cisco IOS Software Files

Filename	Description
c2955-i6k2l2q4-tar.121-22.EA9.tar	Catalyst 2955 EI files. This includes the cryptographic Cisco IOS image and the device manager files.
c2955-i6q4l2-tar.121-22.EA9.tar	Catalyst 2955 EI files. This includes the Cisco IOS image and the device manager files.
c2950-i6k2l2q4-tar.121-22.EA9.tar	Catalyst 2950 SI[1] and EI files. This includes the cryptographic Cisco IOS image and the device manager files.
c2950-i6q4l2-tar.121-22.EA9.tar	Catalyst 2950 SI and EI files. This includes the Cisco IOS image and the device manager files.

Table 6 Catalyst 2955, 2950, and Catalyst 2940 Cisco IOS Software Files (continued)

Filename	Description
c2950lre-i6k2l2q4-tar.121-22.EA9.tar	Catalyst 2950 LRE EI files. This includes the cryptographic Cisco IOS image and the device manager files.
c2950lre-i6l2q4-tar.121-22.EA9.tar	Catalyst 2950 LRE EI files. This includes the Cisco IOS image and the device manager files.
c2940-i6k2l2q4-tar.121-22.EA9.tar	Catalyst 2940 files. This includes the cryptographic Cisco IOS image and the device manager files.
c2940-i6q4l2-tar.121-22.EA9.tar	Catalyst 2940 files. This includes the Cisco IOS image and the device manager files.

1. Switches that support only the SI cannot run the cryptographic image. For more information, see the SI-only switches listed in Table 1 and the "Cisco IOS Limitations and Restrictions" section on page 15.

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/partner/products/sw/iosswrel/ps5187/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 "Additional File Transfer Commands" section of the *Cisco IOS Configuration Fundamentals Command Reference, Release 12.1* at this URL:

http://www.cisco.com/en/US/products/sw/iosswrel/ps1831/products_command_reference_book09186a0080087e47.html

Upgrading a Switch by Using the Device Manager or Network Assistant

You can upgrade switch software by using the device manager or Network Assistant. From the feature bar, choose **Administration > Software Upgrade**. 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

To upgrade the switch software by using the CLI, see Table 6 to decide which software files that you need, and then follow these procedures in this order:

1. Download the tar files from Cisco.com, as described in the "Downloading the Software" section on page 9.
2. Copy the current startup configuration file, as described in the "Copying the Current Startup Configuration from the Switch to TFTP Server" section on page 9.
3. Use the CLI to extract the image and the device manager files from the tar file:
   - If your switch is a Catalyst 2950 LRE or Catalyst 2940 switch, see the "Using the CLI to Upgrade a Catalyst 2950 LRE or Catalyst 2940 Switch" section on page 10.
   - If your switch is a Catalyst 2955 or non-LRE Catalyst 2950, switch, see the "Using the CLI to Upgrade a Catalyst 2955 Switch or Non-LRE Catalyst 2950 Switch" section on page 11.

Downloading the Software

This procedure is for copying the combined tar file to a 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.

Follow these steps to download the software from Cisco.com to your management station:

Step 1 Download the files from one of these locations:

Go to this URL and log in to download the appropriate files:

http://www.cisco.com/kobayashi/sw-center/sw-lan.shtml

To download the files, click the link for your switch platform, and then follow the links on the page to select the correct tar image file.

Step 2 Use the CLI or web-based interface to perform a TFTP transfer of the file or files to the switch after you have downloaded them to your PC or workstation.

New features provided by the software are not available until you reload the software.

Copying the Current Startup Configuration from the Switch to TFTP Server

When you make changes to a switch configuration, your changes become part of the running configuration. When you enter the command to save those changes to the startup configuration, the switch copies the configuration to the config.text file in flash memory. To ensure that you can recreate the configuration if a switch fails, you might want to copy the config.text file from the switch to a TFTP server.

Beginning in privileged EXEC mode, follow these steps to copy a switch configuration file to the TFTP server.

Step 1 Copy the file in flash memory to the root directory of the TFTP server:

```
switch# copy flash:config.text tftp
```

Step 2 Enter the IP address of the device where the TFTP server resides:

```
Address or name of remote host []? ip_address
```

Step 3 Enter the name of the destination file (for example, **config.text**):

```
Destination filename [config.text]? yes/no
```

Step 4 Verify the copy by displaying the contents of the root directory on the TFTP server.

Using the CLI to Upgrade a Catalyst 2950 LRE or Catalyst 2940 Switch

Use this procedure for upgrading your Catalyst 2950 LRE or Catalyst 2940 switch by using the **archive download-sw** privileged EXEC command to automatically extract and download the Cisco IOS image and the device manager files to the switch. The **archive download-sw** command initiates this process:

- It verifies adequate space on the flash memory before downloading the new set of images.
- If there is insufficient space on the flash memory to hold both the old and the new images, it deletes the old set of images. The images are always stored in a subdirectory on the flash memory. The subdirectory name is the same as the image release name, for example, *flash:/c2940-i6q412-tar.121.22.EA5/*
- It replaces the old set of images with the new set of images. The set includes the Cisco IOS image and the device manager files and, on Catalyst 2950 LRE switches, the LRE firmware files. You do not have to manually delete the device manager directory from flash memory.
- After the new set of files is downloaded, it automatically sets the BOOT environment variable.
- If you enter the command with the **/reload** or the **/force-reload** option, it automatically reloads the switch after the upgrade.

For further information on this command, see the command reference for this release.

Follow these steps to upgrade the switch software by using a TFTP transfer:

Step 1 If your PC or workstation cannot act as a TFTP server, copy the file to a TFTP server to which you have access.

Step 2 Log into the switch by starting a Telnet session or by connecting to the switch console port through the RS-232 connector.

To start a Telnet session on your PC or workstation, enter this command:

```
server% telnet switch_ip_address
```

Enter the Telnet password if you are prompted to do so.

Step 3 Enter privileged EXEC mode:

```
switch> enable
switch#
```

Enter the password if you are prompted to do so.

Step 4 Ensure that you have IP connectivity to the TFTP server by using 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 5 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 using this privileged EXEC command:

```
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.

Note You must use the **/overwrite** option when upgrading a Catalyst 2940 switch.

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/c2940-i6l2-tar.121-22.EA9.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.

Your Telnet session ends when the switch reloads.

After the switch reboots, use Telnet to return to the switch, and enter the **show version** user EXEC command to verify the upgrade procedure. If you have a previously opened browser session to the upgraded switch, close the browser, and start it again to ensure that you are using the latest HTML files.

Using the CLI to Upgrade a Catalyst 2955 Switch or Non-LRE Catalyst 2950 Switch

Use this procedure for upgrading your Catalyst 2955 or non-LRE Catalyst 2950 switch by copying the tar file to the switch. You copy the Cisco IOS image and the device manager files to the switch from a TFTP server and then extract the files by entering the **archive tar** command, with these results:

- Changes the name of the current image file to the name of the new file that you are copying and replaces the old image file with the new one. Perform this step only if you have space available on your switch.
- Disables access to the device manager pages and deletes the existing device manager files before the software upgrade to avoid a conflict if users access the web pages during the software upgrade.
- Re-enables access to the device manager pages after the upgrade is complete.

Caution A bootloader upgrade occurs if you are upgrading Catalyst 2950 switches running Cisco IOS Release 12.1(9)EA1d or earlier to Cisco IOS Release 12.1(11)EA1 or later for both cryptographic and noncryptographic images.
When you first upgrade the switch from a Cisco IOS noncryptographic image to a cryptographic image, the bootloader automatically upgrades. The new bootloader upgrade can take up to 30 seconds. Do not power cycle the switch the first time that you are upgrading the switch to a cryptographic Cisco IOS image. If a power failure occurs when you are copying this image to the switch, call Cisco Systems immediately.

Before downloading the new image, use the **dir** user EXEC command to confirm that you have enough space on the flash. The new image and HTML files will be slightly larger than the size of the tar file.

If you do not have enough space on the flash for the tar file, delete any old unused Cisco IOS images. If that does not free up enough flash space, delete the HTML files.

Caution Do not delete the image that you are currently running on the switch. If the switch fails while downloading the new image, you will need to use this.Follow these steps to upgrade the switch software by using a TFTP transfer:

Step 1 If your PC or workstation cannot act as a TFTP server, copy the file to a TFTP server to which you have access.

Step 2 Log into the switch by starting a Telnet session or by connecting to the switch console port through the RS-232 connector.

To start a Telnet session on your PC or workstation, enter this command:

```
server% telnet switch_ip_address
```

Enter the Telnet password if you are prompted to do so.

Step 3 Enter privileged EXEC mode:

```
switch> enable
switch#
```

Enter the password if you are prompted to do so.

Step 4 Remove the switch HTML files:

```
switch# delete /r /f flash:html
```

where **/r** is for /recursive and **/f** is for /force. This command deletes all the switch HTML files and subdirectories.

Press **Enter** to confirm the deletion of each file. Do not press any other keys during this process.

Step 5 Enter this command to copy the new image and the device manager files to flash memory:

Caution In this step, the **archive tar** command copies the tar file that contains both the image and the device manager files. If you are upgrading from a release earlier than Cisco IOS Release 12.1(6)EA2, use the **tar** command instead of the **archive tar** command.

```
switch# archive tar /x tftp://server_ip_address/path/filename.tar flash:
Loading /path/filename.tar from server_ip_address (via VLAN1):!)
extracting info (110 bytes)
extracting c2950-i6q4l2-mz.121-13.EA1c.bin (2239579 bytes)!!!!!!!!!!!!!!!!!!!
html/ (directory)
extracting html/Detective.html.gz (1139 bytes)!
extracting html/ieGraph.html.gz (553 bytes)
extracting html/DrawGraph.html.gz (787 bytes)
extracting html/GraphFrame.html.gz (802 bytes)!
...
```

Depending on the TFTP server being used, you might need to enter only one slash (/) after the *server_ip_address* in the **archive tar** command.

Step 6 Display the name of the running (default) image file (BOOT path-list). This example shows the name in italic:

```
switch# show boot
BOOT path-list:    flash:current_image
Config file:       flash:config.text
Enable Break:      1
Manual Boot:       no
HELPER path-list:
NVRAM/Config file
buffer size: 32768
```

Step 7 Enter global configuration mode:

```
switch# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
```

Step 8 Enter the **boot** command with the name of the new image filename:

```
switch(config)# boot system flash:new_image
```

For example:

```
switch(config)# boot system flash:c2950-i6q4l2-mz.121-13.EA1c.bin
```

Note If the **show boot** command entered in Step 6 displays no image name, you do not need to enter this command; the switch automatically finds the correct file to use when it resets.

Step 9 Return to privileged EXEC mode:

```
switch(config)# end
```

Step 10 Reload the new software with this command:

```
switch# reload
System configuration has been modified. Save? [yes/no]:y
Proceed with reload? [confirm]
```

Step 11 Press **Return** to confirm the reload.

Your Telnet session ends when the switch reloads.

After the switch reboots, use Telnet to return to the switch, and enter the **show version** user EXEC command to verify the upgrade procedure. If you have a previously opened browser session to the upgraded switch, close the browser, and start it again to ensure that you are using the latest device manager files.

Recovering from Software Failure

If the software fails, you can reload the software. For detailed recovery procedures, see the “Troubleshooting” chapter in the software configuration guide for your switch.

Installation Notes

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

- The Express Setup program on Catalyst 2950 (including Catalyst 2950 LRE switches) and Catalyst 2940 switches. The Express Setup program is not supported on Catalyst 2955 switches.

  For more information about Express Setup, see the "Quick Setup" chapter in the Catalyst 2950 and Catalyst 2940 getting started guides.
- The CLI-based setup program.

  This procedure is described in the Catalyst 2955, Catalyst 2950, and Catalyst 2940 hardware installation guides.
- The DHCP-based autoconfiguration. See the software configuration guide for your switch.
- Manually assigning an IP address. See the software configuration guide for your switch.

New Features

These sections describe the new supported hardware and the new software features provided in this release:

- "New Hardware Features" section on page 14
- "New Software Features" section on page 14

New Hardware Features

For a complete list of supported hardware, see the "Hardware Supported" section on page 2.

New Software Features

These are the new software features in this release:

- Support for MAC authentication bypass to authorize clients based on the client MAC address (Catalyst 2940 switches)

Limitations and Restrictions

You should review this section before you begin working with the switches. 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.

Note These limitations and restrictions apply to all Catalyst 2955, Catalyst 2950, and Catalyst 2940 switches unless otherwise noted.

These sections describe the limitations and restrictions:

- "Cisco IOS Limitations and Restrictions" section on page 15
- "LRE Limitations and Restrictions" section on page 21
- "Device Manager Limitations and Restriction" section on page 23
- "Catalyst 2950 Hardware and Software Compatibility Matrixes" section on page 23

Cisco IOS Limitations and Restrictions

These limitations and restrictions apply to the Cisco IOS configuration:

- Root guard is inconsistent when configured on a port that is in the STP blocked state at the time of configuration. (CSCdp85954)
- Aging of dynamic addresses does not always occur exactly after the specified aging time elapses. It might take up to three times this time period before the entries are removed from the table. (CSCdr96565)
- Internal loopback in half-duplex mode causes input errors. We recommend that you configure the PHY to operate in full duplex before setting the internal loopback. (CSCds20365)
- If the switch gets configured from the dynamic IP pool, a duplicate or different IP address might be assigned.

  The workaround is to make sure that the DHCP server contains reserved addresses that are bound to each switch by the switch hardware address so that the switch does not get its IP address from the dynamic pool. (CSCds58369)
- A source-based distribution port group does not share the broadcast with all the group members. When the destination of the packets is a broadcast or unknown unicast or multicast, the packets are forwarded only on one port member of a port group, instead of being shared among all members of the port group. (CSCdt24814)
- When you enter the **show controllers ethernet-controller** *interface-id* or **show interfaces** *interface-id* **counters** privileged EXEC command, if a large number of erroneous frames are received on an interface, the receive-error counts might be smaller than the actual values, and the receive-unicast frame count might be larger than the actual frame count. (CSCdt27223)
- Two problems occur when a switch is in transparent mode:
  - If the switch is a leaf switch, any new VLANs added to it are not propagated upstream through VTP messages. As a result, the switch does not receive flooded traffic for that VLAN.
  - If the switch is connected to two VTP servers, it forwards their pruning messages. If the switch has a port on a VLAN that is not requested by other servers through their pruning messages, it does not receive flooded traffic for that VLAN.

  There is no workaround. (CSCdt48011)
- The receive count output for the **show controllers ethernet-controller** *interface-id* privileged EXEC command shows the incoming packets count before the ASIC makes a decision of whether to drop the packet or not. Therefore, for ports in the STP blocking states, even though the receive count shows incoming frames, the packet is not forwarded to the other port. (CSCdu83640)
- In some network topologies, when UplinkFast is enabled on all switches and BackboneFast is not enabled on all switches, a temporary loop might be caused when the STP root switch is changed.

  The workaround is to enable BackboneFast on all switches. (CSCdv02941)

- At times, the Window XP pop-up window might not appear while authenticating a client (supplicant) because the user information is already stored in Windows XP. However, the Extensible Authentication Protocol over LAN (EAPOL) response to the switch (authenticator) might have an empty user ID that causes the IEEE 802.1x port to be unauthenticated.

  The workaround is to manually re-initiate authentication by either logging off or detaching the link and then reconnecting it. (CSCdv19671)

- If two Catalyst 2950 switches are used in a network and if access ports are used to connect two different VLANs whose VLAN IDs are separated by the correct multiple of 64, it is possible to create a situation where the two switches use the same bridge ID in the same spanning-tree instances. This might cause a loss of connectivity in the VLAN as the spanning tree blocks the ports that should be forwarding.

  The workaround is to not cross-connect VLANs. For example, do not use an access port to connect VLAN 1 to VLAN 65 on either the same switch or from one switch to another switch. (CSCdv27247)

- A command switch might not show the Catalyst 1900, Catalyst 2820, and Catalyst 2900 XL 4-MB (models C2908-XL, C2916M-XL, C2924C-XL, and C2924-XL) switches as candidates even though their management VLAN is the same as the command switch. This occurs only when their management VLAN is not VLAN 1. (CSCdv34505)

- You can configure up to 256 Multicast VLAN Registration (MVR) groups by using the **mvr vlan group** interface configuration command, but only 255 groups are supported on a Catalyst 2950 switch at one time. If you statically add a 256th group, and 255 groups are already configured on the switch, it continues trying (and failing) to add the new group.

  The workaround is to set the mode to **dynamic** for Catalyst 2950 switches that are connected to IGMP-capable devices. The new group can join the multicast stream if another stream is dynamically removed from the group. (CSCdv45190)

- A Catalyst 2950 command switch can discover only the first Catalyst 3550 switch if the link between the Catalyst 3550 switches is an IEEE 802.1Q trunk and the native VLAN is not the same as the management VLAN of the Catalyst 2950 switch or if the link between the Catalyst 3550 switches is an Inter-Switch Link (ISL) trunk and the management VLAN is not VLAN 1.

  The workaround is to connect Catalyst 3550 switches by using the access link on the command switches management VLAN or to configure an IEEE 802.1Q trunk with a native VLAN that is the same as the management VLAN of the command switch. (CSCdv49871)

- There might be a link on the Fast Ethernet port of the Catalyst 2950 switch when it is forced to 10 Mbps and full-duplex mode and its link partner is forced to 100 Mbps and forced duplex mode. The LED on the Catalyst 2950 switch might display the link, and the error counters might increment.

  The workaround is to configure both sides of a link to the same speed or use autonegotiation. (CSCdv62271)

- The **ip http authentication enable** global configuration command is not saved to the configuration file because this is the default configuration. Therefore, this configuration is lost after a reboot.

  The workaround is to manually enter the command again after a reboot. (CSCdv67047)

- If a stack that has Catalyst 2955, Catalyst 2950, or Catalyst 2940 switches also has Catalyst 2900 XL *or* Catalyst 3500 XL switches, cross-stack UplinkFast (CSUF) does not function if the management VLAN on the Catalyst 2900 XL or Catalyst 3500 XL switches is changed to a VLAN other than VLAN 1 (the default).

  The workaround is to make sure that the management VLANs of all Catalyst 2900 XL or 3500 XL switches in the stack are set to VLAN 1. (CSCdv82224)

- If a port is configured as a secure port with the violation mode as restrict, the secure ports might process packets even after maximum limit of MAC addresses is reached, but those packets are not forwarded to other ports. (CSCdw02638)
- The *discarded frames* count of the **show controllers ethernet-controller** privileged EXEC command output and the *ignored* count of the **show controller ethernet** privileged EXEC command output can increment for these reasons:
  - The source and destination ports are the same.
  - The spanning-tree state of the ingress port is not in the forwarding state.
  - Traffic is filtered because of unicast or multicast storms are on the port.
  - Traffic is dropped because a VLAN has not been assigned by VLAN Query Protocol (VQP).

  Note This error occurs only on switches that can run Cisco IOS Release 12.0(5)WC2b or earlier.

  There is no workaround. (CSCdw48441)
- You can apply ACLs to a management VLAN or to any traffic that is going directly to the CPU, such as SNMP, Telnet, or web traffic. For information on creating ACLs for these interfaces, see the "Configuring IP Services" section of the *Cisco IOS IP and IP Routing Configuration Guide for Cisco IOS Release 12.1* and the *Cisco IOS IP and IP Routing Command Reference for Cisco IOS Release 12.1*.
- The SSH feature uses a large amount of switch memory, which limits the number of VLANs, trunk ports, and cluster members that you can configure on the switch. Before you download the cryptographic software image, your switch configuration must meet these conditions:
  - The number of trunk ports multiplied by the number of VLANs on the switch must be less than or equal to 128. These are examples of switch configurations that meet this condition:

    If the switch has 2 trunk ports, it can have up to 64 VLANs.

    If the switch has 32 VLANs, it can have up to 4 trunk ports.
  - If your switch is a cluster command switch, it can only support up to eight cluster members.

  If your switch has a saved configuration that does not meet the previous conditions and you upgrade the switch software to the cryptographic software image, the switch might run out of memory. If this happens, the switch does not operate properly. For example, it might continuously reload.

  If the switch runs out of memory, this message appears:

  ```
  %SYS-2-MALLOCFAIL: Memory allocation of (number_of_bytes) bytes failed ...
  ```

  The workaround is to check your switch configuration and ensure that it meets the previous conditions. (CSCdw66805)
- When you use the **policy-map** global configuration command to create a policy map, and you do not specify any action for a class map, the association between that class map and policy map is not saved when you exit **policy-map** configuration mode.

  The workaround is to specify an action in the policy map. (CSCdx75308)
- When a community string is assigned by the cluster command switch, you cannot get any dot1dBridge MIB objects by using a community string with a VLAN entity from a cluster member switch.

The workaround is to manually add the cluster community string with the VLAN entity on the member switches for all active VLANs shown in the **show spanning-tree summary** display. This is an example of such a change, where *cluster member 3* has spanning tree on *vlan 1-3*, and the cluster commander community string is *public@es3*.

```
Switch(config)# snmp community public@es3@1 RO
Switch(config)# snmp community public@es3@2 RO
Switch(config)# snmp community public@es3@3 RO
```

There is no workaround. (CSCdx95501)

- When the Internet Group Management Protocol (IGMP) Immediate Leave is configured, new ports are added to the group membership each time a join message is received, and ports are pruned (removed) each time a leave message is received.

  If the join and leave messages arrive at high rate, the CPU can become busy processing these messages. For example, the CPU usage is approximately 50 percent when 50 pairs of join and leave messages are received each second. Depending on the rate at which join and leave messages are received, the CPU usage can go very high, even up to 100 percent, as the switch continues processing these messages.

  The workaround is to only use the Immediate Leave processing feature on VLANs where a single host is connected to each port. (CSCdx95638)

- A switch does not use the default gateway address in the DHCP offer packet from the server during automatic-install process.

  The workaround is to manually assign an IP address to the switch. (CSCdy08716)

- In a Remote Switched Port Analyzer (RSPAN) session, if at least one switch is used as an intermediate or destination switch *and* if traffic for a port is monitored in both directions, traffic does not reach the destination switch.

  These are the workarounds:

  – Use a Catalyst 3550 or Catalyst 6000 switch as an intermediate or destination switch.

  – Monitor traffic in only one direction if a Catalyst 2950 switch is used as an intermediate or destination switch. (CSCdy38476)

- If you assign a nonexistent VLAN ID to a static-access EtherChannel by setting the ciscoVlanMembershipMIB:vmVlan object, the switch does not create the VLAN in the VLAN database. (CSCdy65850)

- When you configure a dynamic switch port by using the **switchport access vlan dynamic** interface configuration command, the port might allow unauthorized users to access network resources if the interface changes from access mode to trunk mode through Dynamic Trunking Protocol (DTP) negotiation.

  The workaround is to configure the port as a static access port. (CSCdz32556)

- The output from the **show stack** privileged EXEC command might show a large number of false interrupts.

  There is no workaround. The number of interrupts does not affect the switch functionality. (CSCdz34545)

- If you configure a static secure MAC address on an interface before enabling port security on the interface, the same MAC address is allowed on multiple interfaces. If the same MAC address is added on multiple ports before enabling port security and port security is later enabled on those ports, only the first MAC address can be added to the hardware database. If port security is first enabled on the interface, the same static MAC address is not allowed on multiple interfaces. (CSCdz74685)

- In Cisco IOS Release 12.1(13)EA1 or later, these are the default settings for a IP Phone connected to a switch:
  - The port trust state is to not trust the priority of frames arriving on the IP Phone port from connected devices.
  - The class of service (CoS) value of incoming traffic is overwritten and set to zero. (CSCdz76915)
- If you press and hold the spacebar while the output of any **show** user EXEC command is being displayed, the Telnet session is stopped, and you can no longer communicate with the management VLAN.

  These are the workarounds:
  - Enter the show commands from privileged EXEC mode, and use this command to set the terminal length to zero:

    ```
    switch# terminal length 0
    ```
  - Open a Telnet session directly from a PC or workstation to the switch.
  - Do not hold down the spacebar while scrolling through the output of a **show** user EXEC command. Instead, slowly press and release the spacebar. (CSCea12888)
- When you connect a switch to another switch through a trunk port and the number of VLANs on the first switch is lower than the number on the connected switch, interface errors are received on the management VLAN of the first switch.

  The workaround is to match the configured VLANs on each side of the trunk port. (CSCea23138)
- When you enable Port Fast on a static-access port and then change the port to dynamic, Port Fast remains enabled. However, if you change the port back to static, Port Fast is disabled.

  The workaround is to configure Port Fast globally by using the **spanning-tree portfast** global configuration command. (CSCea24969)
- When using the SPAN feature, the monitoring port receives copies of sent and received traffic for all monitored ports. If the monitoring port is oversubscribed, it will probably become congested. This might also affect how one or more of the monitored ports forwards traffic.
- When a 10/100 switch port is connected to a 10/00 port on a hub and another 10/100 port on the hub is connected to a 10/100 port on another switch, when one of the switches restarts, the link state might change from down to up, and these messages might appear:

  ```
  %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to down
  %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up
  ```

  Then the switch that restarted does not forward traffic until the spanning-tree state enters the forwarding state. This can occur on a switch running Cisco IOS Release 12.1(13)EA1 or later. (CSCea47230)
- On a Catalyst 2940 switch, when a 1000BASE-T SFP module is inserted in the SFP module slot, the output of the **show interface capabilities** privileged EXEC command incorrectly shows that the interface supports 10 Mbps, 100 Mbps, and 1000 Mbps. The SFP module supports only 1000 Mbps. (CSCeb31239)

- After a topology change in STP, some terminals connected to the management VLAN can transfer data because the affected switch ports start forwarding before they move to the forwarding state.

  Note If the terminal does not belong to management VLAN, this failure does not occur.

  The workaround is to place the ports in static-access mode for a single VLAN, if the topology supports this configuration. (CSCec13986)

- (Catalyst 2950 switches) If a policy map is applied to a switch, it might be only partially applied on these ingress ports; Fast Ethernet 0/8, Fast Ethernet 0/16, Fast Ethernet 0/24, Fast Ethernet 0/32, Fast Ethernet 0/40, or Fast Ethernet 0/48.

  This problem occurs when:

  - All eight ports of a port group are configured to trust Differentiated Services Code Point (DSCP). A port group can have Fast Ethernet ports 1 to 8, 9 to 16, and so on.
  - A policy map is applied.
  - A port group has 75 or more access control entries (ACEs).

  The workaround is to use fewer than 75 ACEs per port group when configuring the ports to trust DSCP. (CSCed11617)

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

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

- If a switch receives STP packets and non-STP packets that have a CoS value of 6 or 7 and all of these packets belong to the same management VLAN, a loop might occur.

  These are the workarounds:

  - Change the CoS value of the non-STP packets to a value other than 6 or 7.
  - If the CoS value of the non-STP packets must be 6 or 7, configure these packets to belong to a VLAN other than the management VLAN. (CSCed88622)

- This problem can affect switches running Cisco IOS Release 12.1(22)EA4. The EtherChannel between two switches flaps, and this message appears:

  ```
  ERROR interrupt: PCI Fatal Error on DMA CH0
  ```

  This problem occurs when there is an EtherChannel between two switches, traffic is sent between the switches, and the RSPAN or SPAN source port is configured to monitor sent traffic.

  The workaround is to stop the SPAN traffic, and then delete and recreate the VLAN. (CSCeh20389)

- CSCsd43109 (Catalyst 2950SX-48-SI, 2950G-24-EI, and 2950T-48-SI switches)

  When two Catalyst 2950SX-48-SI, 2950G-24-EI, or 2950T-48-SI switches are connected back to back, and both sides of the link change from 100 Mbps half duplex to 10 Mbps half duplex, only one side of the link becomes error disabled. This error message appears:

  ```
  Nov 22 19:03:10: %ETHCNTR-3-HALF_DUX_COLLISION_EXCEED_THRESHOLD: Half-duplex loopback
  detected, collision threshold exceeded on FastEthernet0/24.
  Nov 22 19:03:10: %PM-4-ERR_DISABLE: loopback error detected on Fa0/24, putting Fa0/24
  in err-disable state
  Nov 22 19:03:11: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/24,
  changed state to down
  Nov 22 19:03:12: %LINK-3-UPDOWN: Interface FastEthernet0/24, changed state to down
  ```

There is no workaround. (CSCsd43109)

- Certain combinations of features and switches create conflicts with the port security feature. In Table 7, *No* means that port security cannot be enabled on a port on the referenced switch if the referenced feature is also running on the same port. *Yes* means that both port security and the referenced feature can be enabled on the same port on a switch at the same time. A dash means not applicable.

Table 7 Port Security Incompatibility with Other Switch Features

Feature	Catalyst 2940	Catalyst 2950 and Catalyst 2955
DTP[1] port[2]	No	No
Trunk port	No	No
Dynamic-access port[3]	No	No
SPAN source port	Yes	Yes
SPAN destination port	No	No
EtherChannel	No	No
Protected port	Yes	Yes
IEEE 802.1x port	–	Yes[4]
Voice VLAN port[5]	Yes	Yes

[1] DTP = Dynamic Trunking Protocol

[2] A port configured with the **switchport mode dynamic** interface configuration command.

[3] A VLAN Query Protocol (VQP) port configured with the **switchport access vlan dynamic** interface configuration command.

[4] The switch must be running the enhanced software image (EI).

[5] You must set the maximum allowed secure addresses on the port to two plus the maximum number of secure addresses allowed on the access VLAN.

LRE Limitations and Restrictions

These limitations and restrictions apply only to Catalyst 2950 LRE switches:

- VLAN-tagged packets from multiple VLANs with the same source MAC address that are received on different Cisco 585 LRE CPE Ethernet ports create a single MAC address entry (ingress port entry). Any network designed with the assumption that MAC addresses are maintained per VLAN does not work.

  There is no workaround. The Ethernet port on the Cisco 585 LRE CPE does not support VLANs. All the ports are assumed to be in the same VLAN. (CSCdx03708)

- Maximum-sized ISL frames (frames between 1537 and 1544 bytes) are discarded by the CPE device on ingress interfaces. Some chips and switches on the CPE device support a maximum frame size of 1536 bytes, which causes any maximum-sized ISL frames coming into the CPE from an end device or from an LRE switch to be discarded.

  There is no workaround. You must ensure that the network does not send ISL tagged frames of sizes between 1537 and 1544 bytes to an LRE switch. (CSCdx25940)

- The system runs out of memory and fails after too many RMON buckets are requested.

  There is no workaround; only 1000 buckets per interface are supported. (CSCdy38390)

- The flow control autonegotiation settles in the incorrect outcome if you use a Cisco-made 1000BASE-T GBIC with any switch not listed in Table 1 of the Cisco Gigabit Ethernet Transceiver Modules Compatibility Matrix :

  http://www.cisco.com/en/US/products/hw/modules/ps5455/products_device_support_table09186a0080446625.html

  The workaround is to use the Cisco 1000BASE-T GBIC only with compatible switches. (CSCdy53369)
- The flash memory write operation is slower on LRE switches than on non-LRE switches. (CSCdy55897)
- The Cisco 585 LRE CPE has four Fast Ethernet ports. When the CPE is connected to an LRE switch, the default value for the maximum number of secure MAC addresses is 1. You can use the **show port-security** command to display the current maximum value.

  The workaround is to use the **switchport port-security maximum** *value* interface configuration command to change the default value. For interfaces connected to Cisco 575 LRE and Cisco 576 LRE 997 CPEs, the default value can be 1. For interfaces connected to Cisco 585 LRE CPEs, the value can be 5 because the CPE has four Fast Ethernet ports and one additional MAC address. (CSCdy73748)
- The Cisco 575 LRE or the Cisco 576 LRE 997 CPE does not support all of the Fast Ethernet statistics displayed by the **show controllers ethernet-controller longreachethernet** *interface-id* **cpe** command. The Cisco 585 LRE CPE supports all the LRE and CPE Fast Ethernet statistics.

  There is no workaround. These CPE Fast Ethernet statistics are supported by the Cisco 575 LRE CPE and the Cisco 576 LRE 997 CPE (CSCdy89348):

  ```
  1 Transmit receive 0 bytes
  0 Bytes
  0 Unicast frames
  0 Broadcast frames
  0 Pause frames
  0 Alignment errors
  0 One collision frames
  0 Multiple collisions
  0 Undersize frames
  0 Late collisions
  0 Oversize frames
  0 Excess collisions
  0 FCS errors
  0 Deferred frames
  ```
- When the *entPhysicalTable* object is retrieved, the copper physical entry is not included.

  There is no workaround. (CSCdz06748)
- When an IEEE 802.1x protocol-enabled client attempts to connect to a Catalyst 2950 LRE switch through a Cisco 585 LRE CPE with IEEE 802.1x configured on a port, the client cannot be authenticated. This problem does not affect the Cisco 575 LRE CPE or the Cisco 576 LRE 997 CPE. The **show dot1x interface** *interface* configuration command displays the port state as unauthorized. (CSCdz22965)
- When a Fast Ethernet port on a Cisco 585 LRE CPE is in half-duplex mode and the rate at which the port receives packets is higher than rate at which it can forward packets, the *Pause Frames* counter for the CPE port increments.

  There is no workaround. (CSCea41362)

- On a Catalyst 2950 LRE switch running Cisco IOS Release 12.1(11)YJ4 or later, a Cisco 575 LRE CPE or a Cisco 576 LRE 997 CPE that does not have an LRE link but is connected to a remote device through the Ethernet link might see repeated flaps on the Ethernet link. This does not occur on a Cisco 585 LRE CPE. (CSCeb01097)
- When a Cisco Catalyst 2950 LRE running Cisco IOS 12.1(14)EA1 or Cisco IOS 12.1(11)YJ is connected to Cisco 575 LRE CPE, the Fast Ethernet link on the CPE port fails to activate if you change the CPE speed setting from 10 to 100 Mbps while the CPE duplex mode is set to half or full.

  The workaround is to reset the CPE port by using the **cpe shutdown** followed by the **no cpe shutdown** interface configuration command. This activates the Fast Ethernet link on the CPE port. (CSCeb35007)
- When you shut down the 100BASE-FX port on the Catalyst 2950 switch, the upstream switch does not detect loss of link, and the line protocol stays up.

  Configure UDLD aggressive mode (using the **udld port aggressive** interface configuration command) on both the Catalyst switch and neighboring device, and change the error- disable recovery options by using the **errdisable recovery cause udld** and **errdisable recovery interval 60** global configuration commands. (CSCee57059)
- On a Catalyst 2950 LRE switch running Cisco IOS Release 12.1(20)EA1 or later, the **flowcontrol** interface configuration commands only take effect when the LRE link comes up after being shut down.

  If the switch configuration is saved and the switch restarts, this does not affect the switch. However, if the flow control configuration for an LRE port is changed and the switch is not rebooted, the commands do not take effect unless you shut down and bring up the LRE link.

  The workaround is to enter the **shutdown** and **no shutdown** interface configuration commands on an interface after entering a **flowcontrol** interface configuration command, such as the **flowcontrol receive** or the **flowcontrol send** command. (CSCef26565)

Device Manager Limitations and Restriction

These device manager limitations and restrictions:

- This release supports the same switch cluster compatibilities supported in Cisco IOS Release 12.1(22)EA1. However, you cannot create and manage switch clusters through the device manager. To create and manage switch clusters, use the CLI or the Cisco Network Assistant application. For information about Network Assistant, see the "New Features" section on page 14.
- When you are prompted to accept the security certificate and you click *No*, you see only 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)

Catalyst 2950 Hardware and Software Compatibility Matrixes

Some Catalyst 2950 switches are not supported by certain software releases.

Table 8 lists the Catalyst 2950-12, 2950-24, 2950C-24, and 2950T-24 switches and the software releases supporting them. The serial numbers are on the switch rear panel. In this table, *Yes* means that the switch is supported by the software release; *No* means that the switch is not supported by the release.

The Catalyst 2950G-12-EI, 2950G-24-EI, 2950G-24-EI-DC, and 2950G-48-EI switches are supported by Cisco IOS Release 12.1(6)EA2 or later.

The Catalyst 2950SX-24 switches are supported by Cisco IOS Release 12.1(9)EA1d or later.

The Catalyst 2955 switches are supported by Cisco IOS Release 12.1(12c)EA1 or later.

The Catalyst 2950ST-8 LRE and 2950ST-24 LRE switches are supported by Cisco IOS Release 12.1(11)YJ or later.

The Catalyst 2950ST-24 LRE 997 switches are supported by Cisco IOS Release 12.1(11)YJ4 or later.

Table 8 Catalyst 2950-12, 2950-24, 2950C-24, and 2950T-24 Switches

Hardware	Serial Number	Cisco IOS Release 12.0(5)WC2b or Earlier	Cisco IOS Release 12.1(6)EA2, 12.1(6)EA2a, and 12.1(6)EA2b	Cisco IOS Release 12.1(6)EA2c	Cisco IOS Release 12.1(9)EA1 or Later
Catalyst 2950-12	Any serial number beginning with FAA or FAB	Yes	No	Yes	Yes
	Lower than FOC0616W1H6 or FHK0616W34M	Yes	No	Yes	Yes
	FOC0616W1H6, FHK0616W34M, or higher	No	No	Yes	Yes
Catalyst 2950-24	Any serial number beginning with FAA or FAB	Yes	No	Yes	Yes
	Lower than FOC0616Z1ZM or FHK0617Y0N3	Yes	No	Yes	Yes
	FOC0616Z1ZM, FHK0617Y0N3, or higher	No	No	Yes	Yes
Catalyst 2950C-24	Any serial number beginning with FAA or FAB	Yes	Yes	Yes	Yes
	Lower than FOC0616TOJH or FHK0617W0YA	Yes	Yes	Yes	Yes
	FOC0616TOJH, FHK0617W0YA, or higher	No	No	Yes	Yes

Table 8 Catalyst 2950-12, 2950-24, 2950C-24, and 2950T-24 Switches (continued)

Hardware	Serial Number	Cisco IOS Release 12.0(5)WC2b or Earlier	Cisco IOS Release 12.1(6)EA2, 12.1(6)EA2a, and 12.1(6)EA2b	Cisco IOS Release 12.1(6)EA2c	Cisco IOS Release 12.1(9)EA1 or Later
Catalyst 2950T-24	Any serial number beginning with FAA or FAB	Yes	Yes	Yes	Yes
	Lower than FOC0617X11P or FHK0617Y1M2	Yes	Yes	Yes	Yes
	FOC0617X11P, FHK0617Y1M2, or higher	No	No	Yes	Yes

The Cisco LRE CPE devices are not supported by certain Catalyst 2950 LRE switches. In Table 9, *Yes* means that the CPE is supported by the switch; *No* means that the CPE is not supported by the switch.

Table 9 LRE Switch and CPE Compatibility Matrix

LRE Devices	Catalyst 2950ST-8 LRE switch	Catalyst 2950ST-24 LRE switch	Catalyst 2950ST-24 LRE 997 switch
Cisco 575 LRE CPE	Yes	Yes	No
Cisco 576 LRE 997 CPE	No	No	Yes
Cisco 585 LRE CPE	Yes	Yes	No

Important Notes

Note These important notes apply to all Catalyst 2955, Catalyst 2950, and Catalyst 2940 switches unless otherwise noted.

This section describes important informations related to this release:

- "Cisco IOS Notes" section on page 26
- "Device Manager Notes" section on page 27

Cisco IOS Notes

These are the important Cisco IOS configuration notes related to this release:

- In Cisco IOS Release 12.1(14)EA1, the implementation for IEEE 802.1x changed from the previous release. Some global configuration commands became interface configuration commands, and new commands were added.

  If you have IEEE 802.1x configured on the switch and you upgrade to Cisco IOS Release 12.1(14)EA1 or later, the configuration file does not contain the new commands, and IEEE 802.1x does not operate. After the upgrade is complete, make sure to globally enable IEEE 802.1x by using the **dot1x system-auth-control** global configuration command. For more information, see the software configuration guide for this release.
- When you enable port security on an interface that is also configured with a voice VLAN, you must set the maximum allowed secure addresses on the port to 2 plus the maximum number of secure addresses allowed on the access VLAN. When the port is connected to a Cisco IP Phone, the telephone requires up to two MAC addresses. The IP address of the phone is learned on the voice VLAN, and it might or might not be learned on the access VLAN. Connecting a PC to the Cisco IP phone requires additional MAC addresses.
- IGMP filtering controls only group specific query and membership reports, including join and leave reports. It does not control general IGMP queries.
- The **management** interface configuration command is not supported in Cisco IOS Release 12.1(6)EA2 or later. To shut down the current management VLAN interface and to enable the new management VLAN interface, use the **shutdown** and **no shutdown** interface configuration commands. See the *Catalyst 2950 and Catalyst 2955 Switch Command Reference* for information about using the **shutdown** interface configuration command.
- When an IEEE 802.1x-authenticated client is disconnected from an IP phone, hub, or switch and does not send an EAPOL-Logoff message, the switch interface does not change to the unauthorized state. If this happens, it can take up to 60 minutes for the interface to change to the unauthorized state when the re-authentication time is the default value (3600 seconds).

  The workaround is to change the number of seconds between re-authentication attempts by using the **dot1x timeout re-authperiod** *seconds* global configuration command. (CSCdz38483)
- The guest VLAN might not assign a DHCP address to some clients. This is a problem with the IEEE 802.1x client, not with the switch.

  The workaround is to either release and renew the IP address or to change the default timers. These examples show typical interface timer changes:

  ```
  dot1x timeout quiet-period 3
  ```

  ```
  dot1x timeout tx-period 5
  ```
- The **transmit-interface** *type number* interface configuration command is not supported.
- 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.

Device Manager Notes

These notes apply to the device manager:

- 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.

  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. • **enable**—Enable password, the default method of HTTP server user authentication. • **local**—Local user database, as defined on the Cisco router or access server. • **tacacs**—TACACS server.
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), 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. • **enable**—Enable password, the default method of HTTP server user authentication. • **local**—Local user database, as defined on the Cisco router or access server. • **tacacs**—TACACS server.
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

This section describes the open caveats that might cause possible unexpected activity in this software release. Unless otherwise noted, these severity 3 Cisco IOS configuration caveats apply to the Catalyst 2955, 2950, and 2940 switches

- CSCeg09032

  Open Shortest Path First (OSPF) routes might not appear in the routing table after a topology change if Incremental SPF (iSPF) is enabled.

  The workaround is to disable iSPF.

- CSCsb93563

  When a Cisco IP phone is connected to the switch, the port VLAN ID (PVID) and the voice VLAN ID (VVID) both learn its MAC address. However, after dynamic MAC addresses are deleted, only VVID relearns the IP phone MAC address. MAC addresses are deleted manually or automatically for a topology change or when port security or an IEEE 802.1x feature is enabled or disabled.

  There is no workaround.

- CSCsg74716

  On a Catalyst 2940 running Cisco IOS Release 12.2(22)EA7 or later, when you enter the **dot1x max-reauth-req 1** interface configuration command on an IEEE 802.1x-enabled port, the IEEE authentication process can consume up to 99 percent of the CPU usage.

  The workaround is to enter the **no dot1x max-reauth-req** interface configuration command to remove the configuration from the interface.

- CSCsg87605

  On a Catalyst 2950 switch cluster with clustering and an HSRP standby management address configured on the switches in the cluster, a copy of user IP and UDP traffic with the UDP Dest Port equal to 1985 is sent to the MAC address of the default gateway configured on the switch. The source and destination IP address of the user traffic is not changed.

  You can use one of two workarounds:

  - Disable clustering by entering the **no cluster run** command on a switch, or remove the standby IP commands by entering the **no standby** *ip address* interface configuration command.
  - Configure an IP access list that permits only the traffic sent by the switch management IP address and the HSRP address by entering this command sequence:

    ```
    Switch (config)# interface vlan vlan-id
    Switch (config-if)# ip address x.x.x.x 255.255.255.0
    Switch (config-if)# ip access-group 101 out
    switch (config-if)# standby Y ip y.y.y.y
    switch (config-if)# exit
    switch (config)# access-list 101 permit ip host x.x.x.x any
    switch (config)# access-list 101 permit ip host y.y.y.y any
    ```

Resolved Caveats

Note All resolved caveats listed in these sections apply to the Catalyst 2955, Catalyst 2950, and Catalyst 2940 switches unless otherwise noted.

These are the Cisco IOS caveats resolved in Cisco IOS Release 12.1(22)EA9:

- CSCeg09032 (Catalyst 2950 switches)

  Open Shortest Path First (OSPF) routes now appear in the routing table after a topology change when incremental SPF (iSPF) is enabled.

- CSCsb93563 (Catalyst 2950 switches)

  When a Cisco IP phone is connected to the switch, the port VLAN ID (PVID) and the voice VLAN ID (VVID) have learned its MAC address, and the dynamic MAC addresses stored on the switch are deleted, both the PVID and VVID relearn the MAC address of the IP phone.

- CSCse09254 (Catalyst 2950 and 2940 switches)

  The class of service (CoS) value in a Layer 2 802.1Q frame header for locally generated traffic is no longer always 2.

- CSCse22683 (Catalyst 2950 switches)

  If all of the switch interfaces are configured for port security and storm control, the switch no longer fails at startup.

Documentation Updates

These are the updates to the product documentation:

- "Updates for All Software Configuration Guides" section on page 30
- "Updates to the Catalyst 2940 Software Configuration Guide" section on page 31
- "Updates to All Command References" section on page 33
- "Updates to the Catalyst 2940 Command Reference" section on page 33
- "Updates to the System Message Guides" section on page 38
- "Updates to the Regulatory Compliance and Safety Information" section on page 38
- "Updates for the Catalyst 2950 Hardware Installation Guide" section on page 40
- "Updates for the Catalyst 2940 Hardware Installation Guide" section on page 40

Updates for All Software Configuration Guides

Although the IEEE 802.1x inaccessible authentication bypass feature is mentioned in the *Catalyst 2940 Switch Software Configuration Guid*e and the *Catalyst 2950 Switch Software Configuration Guide*, Catalyst 2950 and 2940 switches do not support this feature.

This information about DHCP-based autoconfiguration with a saved file feature was added to the software configuration guides for the Catalyst 2955 and 2950 and Catalyst 2940 switches.

- This was added to the "Overview" chapter:

  Ease of Use and Deployment Features

  DHCP-base autoconfiguration automatically configures a switch at startup with IP address

- This was added to the "Assigning the Switch IP Address and Default Gateway" chapter:

  Understanding DHCP-Based Autoconfiguration with a Saved Configuration File

  DHCP-based autoconfiguration with a saved configuration file works exactly the same as DHCP-based autoconfiguration except that you can now enable an autoconfiguration on a switch that already contains a basic configuration file in its memory.

  Configuring DHCP-Based Autoconfiguration with a Saved Configuration File

  Beginning in privileged EXEC mode, follow these steps to configure DHCP-based autoconfiguration with a saved configuration file:

	Command	Purpose
Step 1	**configure terminal**	Enter global configuration mode.
Step 2	**boot host dhcp**	Enable autoconfiguration with a saved configuration file.
Step 3	**boot host retry timeout** *timeout-value*	Set the amount of time between system retries.
Step 4	**banner config-save ^C** *warning-message* **^C**	Create warning message.
Step 5	**end**	Return to privileged EXEC mode.
Step 6	**show boot**	Verify the configuration.

This example shows how to configure an interface with a backup interface and to verify the configuration:

```
Switch# configure terminal
Switch(conf)# boot host dhcp
Switch(conf)# boot host retry timeout 420
Switch(conf)# banner config-save ^C Caution - Downloading running configuration file
^C
Switch(conf)#
Switch(conf)# show boot
```

The **boot buffersize** global configuration command is not supported.

Updates to the Catalyst 2940 Software Configuration Guide

Correction to the the "Configuring VLANs" Chapter

The "Configuring VLANs" chapter of the Catalyst 2940 software configuration guide states that the switches support 64 spanning-tree instances. Previous versions of the software configuration guide stated that the switches only support 10 spanning-tree instances.

Updates to the Configuring IEEE 802.1x Port-Based Authentication" Chapter

These sections were added to the "Configuring IEEE 802.1x Port-Based Authentication" chapter :

- "Using IEEE 802.1x Authentication with MAC Authentication Bypass" section on page 31
- "Configuring MAC Authentication Bypass" section on page 32

Using IEEE 802.1x Authentication with MAC Authentication Bypass

You can configure the switch to authorize clients based on the client MAC address by using the MAC authentication bypass feature. For example, you can enable this feature on IEEE 802.1x ports connected to devices such as printers.

If IEEE 802.1x authentication times out while waiting for an EAPOL response from the client, the switch tries to authorize the client by using MAC authentication bypass.

When the MAC authentication bypass feature is enabled on an IEEE 802.1x port, the switch uses the MAC address as the client identity. The authentication server has a database of client MAC addresses that are allowed network access. After detecting a client on an IEEE 802.1x port, the switch waits for an Ethernet packet from the client. The switch sends the authentication server a RADIUS-access/request frame with a username and password based on the MAC address. If authorization succeeds, the switch grants the client access to the network. If authorization fails, the switch assigns the port to the guest VLAN if one is configured.

If an EAPOL packet is detected on the interface during the lifetime of the link, the switch determines that the device connected to that interface is an IEEE 802.1x-capable supplicant and uses IEEE 802.1x authentication (not MAC authentication bypass) to authorize the interface. EAPOL history is cleared if the interface link status goes down.

If the switch already authorized a port by using MAC authentication bypass and detects an IEEE 802.1x supplicant, the switch does not unauthorize the client connected to the port. When re-authentication occurs, the switch uses IEEE 802.1x authentication as the preferred re-authentication process if the previous session ended because the Termination-Action RADIUS attribute value is DEFAULT.

Clients that were authorized with MAC authentication bypass can be re-authenticated. The re-authentication process is the same as that for clients that were authenticated with IEEE 802.1x authentication. During re-authentication, the port remains in the previously assigned VLAN. If re-authentication is successful, the switch keeps the port in the same VLAN. If re-authentication fails, the switch assigns the port to the guest VLAN, if one is configured.

If re-authentication is based on the Session-Timeout RADIUS attribute (Attribute[27]) and the Termination-Action RADIUS attribute (Attribute [29]) and if the Termination-Action RADIUS attribute (Attribute [29]) action is *Initialize,* (the attribute value is *DEFAULT*), the MAC authentication bypass session ends, and connectivity is lost during re-authentication. If MAC authentication bypass is enabled and the IEEE 802.1x authentication times out, the switch uses the MAC authentication bypass feature to initiate re-authorization. For more information about these AV pairs, see RFC 3580, "IEEE 802.1X Remote Authentication Dial In User Service (RADIUS) Usage Guidelines."

MAC authentication bypass interacts with the features:

- IEEE 802.1x authentication—You can enable MAC authentication bypass only if IEEE 802.1x authentication is enabled on the port.
- Guest VLAN—If a client has an invalid MAC address identity, the switch assigns the client to a guest VLAN if one is configured.
- Restricted VLAN—This feature is not supported when the client connected to an IEEE 802.lx port is authenticated with MAC authentication bypass.
- Port security—See the "Using IEEE 802.1x with Port Security" section of the "Configuring IEEE 802.1x Port-Based Authentication" chapter in the software configuration guide.
- Voice VLAN—See the "Using IEEE 802.1x with Voice VLAN Ports" section of the "Configuring IEEE 802.1x Port-Based Authentication" chapter in the software configuration guide.
- VLAN Membership Policy Server (VMPS)—IEEE802.1x and VMPS are mutually exclusive.
- Private VLAN—You can assign a client to a private VLAN.
- Network admission control (NAC) Layer 2 IP validation—This feature takes effect after an IEEE 802.1x port is authenticated with MAC authentication bypass, including hosts in the exception list.

Configuring MAC Authentication Bypass

These are the MAC authentication bypass configuration guidelines:

- Unless otherwise stated, the MAC authentication bypass guidelines are the same as the IEEE 802.1x authentication guidelines in the "Configuring IEEE 802.1x Port-Based Authentication" chapter in the software configuration guide.
- If you disable MAC authentication bypass from a port after the port has been authorized with its MAC address, the port state is not affected.
- If the port is in the unauthorized state and the client MAC address is not the authentication-server database, the port remains in the unauthorized state. However, if the client MAC address is added to the database, the switch can use MAC authentication bypass to re-authorize the port.
- If the port is in the authorized state, the port remains in this state until re-authorization occurs.

Beginning in privileged EXEC mode, follow these steps to enable MAC authentication bypass. This procedure is optional.

	Command	Purpose
Step 1	**configure terminal**	Enter global configuration mode.
Step 2	**interface** *interface-id*	Specify the port to be configured, and enter interface configuration mode.
Step 3	**dot1x port-control auto**	Enable IEEE 802.1x authentication on the port.
Step 4	**dot1x mac-auth-bypass** [**eap**]	Enable MAC authentication bypass. (Optional) Use the **eap** keyword to configure the switch to use EAP for authorization.
Step 5	**end**	Return to privileged EXEC mode.
Step 6	**show dot1x interface** *interface-id*	Verify your entries.
Step 7	**copy running-config startup-config**	(Optional) Save your entries in the configuration file.

To disable MAC authentication bypass, use the **no dot1x mac-auth-bypass** interface configuration command.

This example shows how to enable MAC authentication bypass:

```
Switch(config-if)# dot1x mac-auth-bypass
```

Updates to All Command References

This correction was added to all of the command references:

In the **udld** global configuration command, the default setting for the **message time** parameter is incorrect:

> The message timer is set at 60 seconds.

This is the correct information:

> The message timer is set at 15 seconds.

Updates to the Catalyst 2940 Command Reference

These commands were added or updated in the Catalyst 2940 command reference:

- "dot1x mac-auth-bypass" section on page 34
- "show dot1x" section on page 35

dot1x mac-auth-bypass

Use the **dot1x mac-auth-bypass** interface configuration command to enable the MAC authentication bypass feature. Use the **no** form of this command to disable MAC authentication bypass feature.

dot1x mac-auth-bypass

no dot1x mac-auth-bypass

Syntax Description

This command has no arguments or keywords.

Defaults

MAC authentication bypass is disabled.

Command Modes

Interface configuration

Command History

Release	Modification
12.1(22)EA9	This command was introduced.

Usage Guidelines

Unless otherwise stated, the MAC authentication bypass usage guidelines are the same as the IEEE 802.1x authentication guidelines.

If you disable MAC authentication bypass from a port after the port has been authenticated with its MAC address, the port state is not affected.

If the port is in the unauthorized state and the client MAC address is not the authentication-server database, the port remains in the unauthorized state. However, if the client MAC address is added to the database, the switch can use MAC authentication bypass to re-authorize the port.

If the port is in the authorized state, the port remains in this state until re-authorization occurs.

Clients that were authorized with MAC authentication bypass can be re-authenticated.

For more information about how MAC authentication bypass and IEEE 802.lx authentication interact, see the “Understanding IEEE 802.1x Authentication with MAC Authentication Bypass” section and the “IEEE 802.1x Authentication Configuration Guidelines” section in the “Configuring IEEE 802.1x Port-Based Authentication” chapter of the software configuration guide.

Examples

This example shows how to enable MAC authentication bypass:

```
Switch(config-if)# dot1x mac-auth-bypass
```

You can verify your settings by entering the **show dot1x** [**interface** *interface-id*] privileged EXEC command.

Related Commands

Command	Description
show dot1x [**interface** *interface-id*]	Displays IEEE 802.1x status for the specified port.

show dot1x

Use the **show dot1x** privileged EXEC command to display IEEE 802.1x statistics, administrative status, and operational status for the switch or for the specified interface.

> **show dot1x** [**all**] | [**interface** *interface-id*] | [**statistics** [**interface** *interface-id*]] [**|** {**begin** | **exclude** | **include**} *expression*]

Syntax Description

all	(Optional) Display the IEEE 802.1x status for all interfaces.
interface *interface-id*	(Optional) Display the IEEE 802.1x status for the specified interface.
statistics [**interface** *interface-id*]	(Optional) Display IEEE 802.1x statistics for the switch or the specified interface.
| begin	(Optional) Display begins with the line that matches the *expression*.
| exclude	(Optional) Display excludes lines that match the *expression*.
| include	(Optional) Display includes lines that match the specified *expression*.
expression	Expression in the output to use as a reference point.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.1(22)EA9	Support for MAC authentication bypass status was added.

Usage Guidelines

If you do not specify an interface, global parameters and a summary appear. If you specify an interface, details for that interface appear.

If you specify the **statistics** keyword without the **interface** *interface-id* option, statistics appear for all interfaces. If you specify the **statistics** keyword with the **interface** *interface-id* option, statistics appear for the specified interface.

Expressions are case sensitive. For example, if you enter **| exclude output**, the lines that contain *output* do not appear, but the lines that contain *Output* appear.

Examples

These are examples of output from the **show dot1x** and the **show dot1x all** privileged EXEC commands:

```
Switch# show dot1x
Sysauthcontrol                    = Enabled
Supplicant Allowed In Guest Vlan  = Disabled
Dot1x Protocol Version            = 1
Dot1x Oper Controlled Directions  = Both
Dot1x Admin Controlled Directions = Both

Switch# show dot1x all
Dot1x Info for interface FastEthernet 0/3
----------------------------------------------------
Supplicant MAC 00d0.b71b.35de
   AuthSM State      = CONNECTING
   BendSM State      = IDLE
```

```
PortStatus        = UNAUTHORIZED
MaxReq            = 2
HostMode          = Single
Port Control      = Auto
QuietPeriod       = 60 Seconds
Re-authentication = Disabled
ReAuthPeriod      = 3600 Seconds
ServerTimeout     = 30 Seconds
SuppTimeout       = 30 Seconds
TxPeriod          = 30 Seconds
Guest-Vlan        = 0

Dot1x Info for interface FastEthernet 0/7
----------------------------------------------------
PortStatus        = UNAUTHORIZED
MaxReq            = 2
HostMode          = Multi
Port Control      = Auto
QuietPeriod       = 60 Seconds
Re-authentication = Disabled
ReAuthPeriod      = 3600 Seconds
ServerTimeout     = 30 Seconds
SuppTimeout       = 30 Seconds
TxPeriod          = 30 Seconds
Guest-Vlan        = 0
```

This is an example of output from the show dot1x all privileged EXEC command when a restricted VLAN is configured:

```
Switch# show dot1x all
Dot1x Info for interface GigabitEthernet0/1
----------------------------------------------------
Supplicant MAC 0002.b3eb.0df6
AuthSM State          = AUTHENTICATED(AUTH-FAIL-VLAN)
BendSM State          = IDLE
Posture               = N/A
PortStatus            = AUTHORIZED(AUTH-FAIL-VLAN)
MaxReq                = 2
MaxAuthReq            = 2
HostMode              = Single
PortControl           = Auto
ControlDirection      = Both
QuietPeriod           = 10 Seconds
Re-authentication     = Disabled
ReAuthPeriod          = 3600 Seconds
ServerTimeout         = 30 Seconds
SuppTimeout           = 30 Seconds
TxPeriod              = 10 Seconds
Guest-Vlan            = 3
AuthFail-Vlan         = 4
AuthFail-Max-Attempts = 3
```

This is an example of output from the **show dot1x interface fastethernet0/3** privileged EXEC command. In this example, MAC authentication bypass is enabled:

```
Switch# show dot1x interface fastethernet0/3
Supplicant MAC 00d0.b71b.35de
   AuthSM State      = AUTHENTICATED (AUTH-FAIL-VLAN)
   BendSM State      = IDLE
ReAuthPeriod = 4000 Seconds { (From Authentication Server) | (Locally Configured) }
ReAuthAction = { Terminate | Reauthenticate }
TimeToNextReauth = 1453 Seconds
PortStatus        = AUTHORIZED
MaxReq            = 2
```

```
HostMode           = Single (AUTH-FAIL-VLAN)
Port Control       = Auto
QuietPeriod        = 60 Seconds
Re-authentication = Disabled
ReAuthPeriod       = 3600 Seconds
ServerTimeout      = 30 Seconds
SuppTimeout        = 30 Seconds
TxPeriod           = 30 Seconds
Guest-Vlan         = 0
Mac-Auth-Bypass = Enabled
```

This is an example of output from the **show dot1x statistics interface fastethernet0/3** command. Table 10 describes the fields in the display.

```
Switch# show dot1x statistics interface fastethernet0/3
PortStatistics Parameters for Dot1x
--------------------------------------------
TxReqId = 15    TxReq = 0       TxTotal = 15
RxStart = 4     RxLogoff = 0    RxRespId = 1    RxResp = 1
RxInvalid = 0   RxLenErr = 0    RxTotal= 6
RxVersion = 1   LastRxSrcMac 00d0.b71b.35de
```

Table 10 show dot1x statistics Field Descriptions

Field	Description
TxReqId	Number of Extensible Authentication Protocol (EAP)-request/identity frames that have been sent.
TxReq	Number of EAP-request frames (other than request/identity frames) that have been sent.
TxTotal	Number of Extensible Authentication Protocol over LAN (EAPOL) frames of any type that have been sent.
RxStart	Number of valid EAPOL-start frames that have been received.
RxLogoff	Number of EAPOL-logoff frames that have been received.
RxRespId	Number of EAP-response/identity frames that have been received.
RxResp	Number of valid EAP-response frames (other than response/identity frames) that have been received.
RxInvalid	Number of EAPOL frames that have been received and have an unrecognized frame type.
RxLenErr	Number of EAPOL frames that have been received in which the packet body length field is invalid.
RxTotal	Number of valid EAPOL frames of any type that have been received.
RxVersion	Received packets in the IEEE 802.1x Version 1 format.
LastRxSrcMac	Source MAC address carried in the most recently received EAPOL frame.

Related Commands

Command	Description
dot1x control-direction	Resets the configurable IEEE 802.1x parameters to their default values.

Updates to the System Message Guides

These messages were added to the system message guides:

Error Message `DOT1X-5-ERR_INVALID_AAA_MANDATORY_AV: Received unknown mandatory AV: [chars]=[chars]`

Explanation During authentication, authorization, and accounting (AAA) authorization, the switch received an unexpected mandatory Attribute-Value (AV) pair. The first [chars] is the AV pair name, and the second [chars] is the type of packet.

Recommended Action Check the RADIUS server configuration and ensure that the switch does not send the AV pair to the RADIUS server as part of the user profile information.

Error Message `SPANTREE-7-PORTDEL_SUCCESS: [chars] deleted from Vlan [dec]`

Explanation The interface has been deleted from specified VLAN. [chars] is the interface, and [dec] is the VLAN ID.

Recommended Action No action is required.

Updates to the Regulatory Compliance and Safety Information

This information was added to the *Regulatory Compliance and Safety Information* for the Catalyst 2950 and 2940 switches:

Statement 361—VoIP and Emergency Calling Services do not Function if Power Fails

Warning **Voice over IP (VoIP) service and the emergency calling service do not function if power fails or is disrupted. After power is restored, you might have to reset or reconfigure equipment to regain access to VoIP and the emergency calling service. In the USA, this emergency number is 911. You need to be aware of the emergency number in your country.** Statement 361

Waarschuwing **Voice over IP (VoIP)-service en de service voor noodoproepen werken niet indien er een stroomstoring is. Nadat de stroomtoevoer is hersteld, dient u wellicht de configuratie van uw apparatuur opnieuw in te stellen om opnieuw toegang te krijgen tot VoIP en de noodoproepen. In de VS is het nummer voor noodoproepen 911. U dient u zelf op de hoogte te stellen van het nummer voor noodoproepen in uw land.**

Varoitus **Voice over IP (VoIP) -palvelu ja hätäpuhelupalvelu eivät toimi, jos virta katkeaa tai sen syötössä esiintyy häiriöitä. Kun virransyöttö on taas normaali, sinun täytyy mahdollisesti asettaa tai määrittää laitteisto uudelleen, jotta voisit jälleen käyttää VoIP-palvelua ja hätäpuhelupalvelua. Yhdysvalloissa hätänumero on 911. Selvitä, mikä on omassa kotimaassasi käytössä oleva hätänumero.**

Attention **Le service Voice over IP (VoIP) et le service d’appels d’urgence ne fonctionnent pas en cas de panne de courant. Une fois que le courant est rétabli, vous devrez peut-être réinitialiser ou reconfigurer le système pour accéder de nouveau au service VoIP et à celui des appels d’urgence. Aux États-Unis, le numéro des services d’urgence est le 911. Vous devez connaître le numéro d’appel d'urgence en vigueur dans votre pays.**

Avvertenza **Il servizio Voice over IP (VoIP) e il servizio per le chiamate di emergenza non funzionano in caso di interruzione dell'alimentazione. Ristabilita l'alimentazione, potrebbe essere necessario reimpostare o riconfigurare l'attrezzatura per ottenere nuovamente l'accesso al servizio VoIP e al servizio per le chiamate di emergenza. Negli Stati Uniti, il numero di emergenza è 911. Si consiglia di individuare il numero di emergenza del proprio Paese.**

Advarsel **Tjenesten Voice over IP (VoIP) og nødanropstjenesten fungerer ikke ved strømbrudd. Etter at strømmen har kommet tilbake, må du kanskje nullstille eller konfigurere utstyret på nytt for å få tilgang til VoIP og nødanropstjenesten. I USA er dette nødnummeret 911. Du må vite hva nødnummeret er i ditt land.**

Aviso **O serviço Voice over IP (VoIP) e o serviço de chamadas de emergência não funcionam se houver um corte de energia. Depois do fornecimento de energia ser restabelecido, poderá ser necessário reiniciar ou reconfigurar o equipamento para voltar a utilizar os serviços VoIP ou chamadas de emergência. Nos EUA, o número de emergência é o 911. É importante que saiba qual o número de emergência no seu país.**

¡Advertencia! **El servicio de voz sobre IP (VoIP) y el de llamadas de emergencia no funcionan si se interrumpe el suministro de energía. Tras recuperar el suministro es posible que deba que restablecer o volver a configurar el equipo para tener acceso a los servicios de VoIP y de llamadas de emergencia. En Estados Unidos el número de emergencia es el 911. Asegúrese de obtener el número de emergencia en su país.**

Varning! **Tjänsten Voice over IP (VoIP) och larmnummertjänsten fungerar inte vid strömavbrott. Efter att strömmen kommit tillbaka måste du kanske återställa eller konfigurera om utrustningen för att få tillgång till VoIP och larmnummertjänsten. I USA är det här larmnumret 911. Du bör ta reda på det larmnummer som gäller i ditt land.**

Figyelem **Az IP csatornán történő hangátvitel (VoIP) és a segélyhívó szolgáltatás nem működik, ha az áramellátás megszűnik vagy megszakad. Az áramellátás helyreállítását követően előfordulhat, hogy alaphelyzetbe kell állítani vagy újra kell konfigurálni a berendezést, hogy újra hozzáférhessen a VoIP és a segélyhívó szolgáltatáshoz. Az Egyesült Államokban a segélyhívó szám 911. Tisztában kell lennie a saját országának segélyhívó számával.**

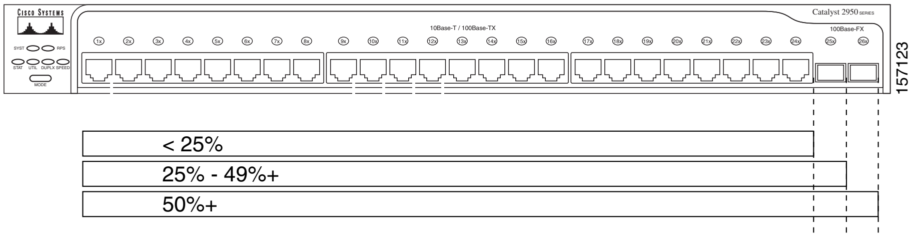
Предупреждение **Служба передачи голоса по IP (VoIP) и служба экстренных вызовов не будут работать, если произошел сбой питания. После восстановления питания, возможно, потребуется перенастроить оборудование, чтобы возобновить доступ к службе VoIP и службе экстренных вызовов. В США телефон службы экстренных вызовов 911. Вам необходимо знать телефон этой службы в своей стране.**

警告 電源障害や停電の場合、ボイス オーバー アイピー (VoIP) サービスと緊急呼出しサービスは機能しません。電源の回復後、VoIP と緊急呼出しサービスにアクセスするには機器をリセットまたは再設定する必要があります。米国内の緊急呼出し番号は 911 です。お住まいの地域の緊急呼出し番号をあらかじめ調べておいてください。

Updates for the Catalyst 2950 Hardware Installation Guide

The hardware installation guide shows has an incorrect bandwidth-utilization illustration for a Catalyst 2950-24, 2950C-24, 2950SX-24, and 2950T-24 2950-12 switch. Figure 1 is the correct illustration.

Figure 1 Bandwidth Utilization on Catalyst 2950-24, 2950C-24, 2950SX-24, and 2950T-24 Switches



If all LEDs on a Catalyst 2950-24, 2950C-24, 2950SX-24, and 2950T-24 2950-12 switch are green (no amber showing), the switch is using 50 percent or more of the total bandwidth. If the far-right LED is off, the switch is using more than 25 but less than 50 percent of the total bandwidth, and so on. If only the far-left LED is green, the switch is using less than 0.0488 percent of the total bandwidth.

Updates for the Catalyst 2940 Hardware Installation Guide

These are the updates for the Catalyst 2940 hardware installation guide:

- This update to the "Installation" chapter describes the installation procedure for 19-inch rack-mounting.

Warning **To prevent bodily injury when mounting or servicing this unit in a rack, you must take special precautions to ensure that the system remains stable. The following guidelines are provided to ensure your safety:**

This unit should be mounted at the bottom of the rack if it is the only unit in the rack.

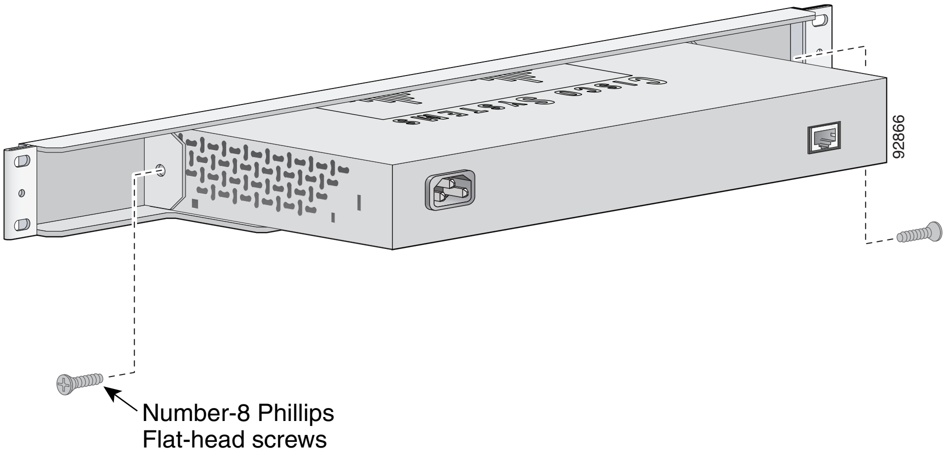
When mounting this unit in a partially filled rack, load the rack from the bottom to the top with the

heaviest component at the bottom of the rack.

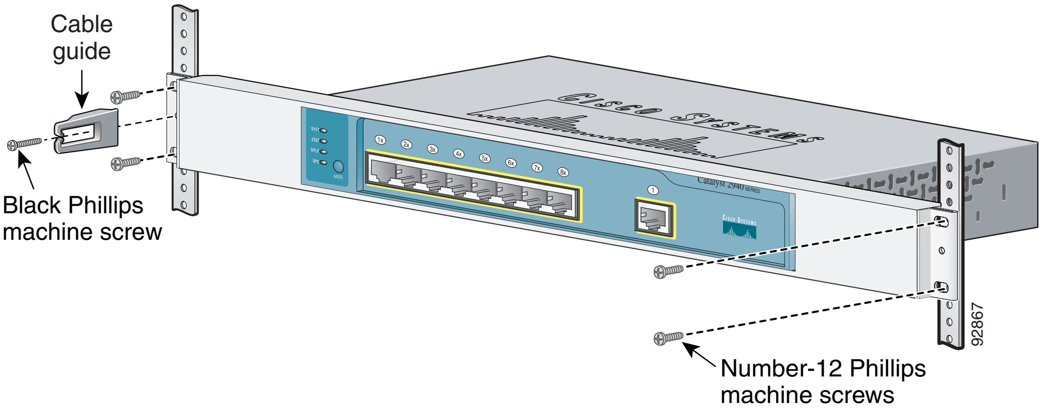
If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack.
Statement 1006

Follow these steps:

Step 1 Position the switch in the center of the mounting bracket.



Step 2 Insert a number-8 Phillips flat-head screw through the bracket into one side of the switch. Tighten the screw with a screwdriver. Repeat on the opposite side.



Step 3 Align the switch bracket assembly in the rack. Insert the number-12 Phillips machine screws through the bracket into the rack. Tighten the screws with a screwdriver. Repeat on the opposite side.

Step 4 Use the black Phillips machine screw to attach the cable guide to either bracket.

Statement 1006—Chassis Warning for Rack-Mounting and Servicing

Warning

To prevent bodily injury when mounting or servicing this unit in a rack, you must take special precautions to ensure that the system remains stable. The following guidelines are provided to ensure your safety:

- **This unit should be mounted at the bottom of the rack if it is the only unit in the rack.**
- **When mounting this unit in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.**
- **If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack.**

Waarschuwing

Om lichamelijk letsel te voorkomen wanneer u dit toestel in een rek monteert of het daar een servicebeurt geeft, moet u speciale voorzorgsmaatregelen nemen om ervoor te zorgen dat het toestel stabiel blijft. De onderstaande richtlijnen worden verstrekt om uw veiligheid te verzekeren:

- **Dit toestel dient onderaan in het rek gemonteerd te worden als het toestel het enige in het rek is.**
- **Wanneer u dit toestel in een gedeeltelijk gevuld rek monteert, dient u het rek van onderen naar boven te laden met het zwaarste onderdeel onderaan in het rek.**
- **Als het rek voorzien is van stabiliseringshulpmiddelen, dient u de stabilisatoren te monteren voordat u het toestel in het rek monteert of het daar een servicebeurt geeft.**

Varoitus

Kun laite asetetaan telineeseen tai huolletaan sen ollessa telineessä, on noudatettava erityisiä varotoimia järjestelmän vakavuuden säilyttämiseksi, jotta vältytään loukkaantumiselta. Noudata seuraavia turvallisuusohjeita:

- **Jos telineessä ei ole muita laitteita, aseta laite telineen alaosaan.**
- **Jos laite asetetaan osaksi täytettyyn telineeseen, aloita kuormittaminen sen alaosasta kaikkein raskaimmalla esineellä ja siirry sitten sen yläosaan.**
- **Jos telinettä varten on vakaimet, asenna ne ennen laitteen asettamista telineeseen tai sen huoltamista siinä.**

Attention

Pour éviter toute blessure corporelle pendant les opérations de montage ou de réparation de cette unité en casier, il convient de prendre des précautions spéciales afin de maintenir la stabilité du système. Les directives ci-dessous sont destinées à assurer la protection du personnelþ:

- **Si cette unité constitue la seule unité montée en casier, elle doit être placée dans le bas.**
- **Si cette unité est montée dans un casier partiellement rempli, charger le casier de bas en haut en plaçant l'élément le plus lourd dans le bas.**
- **Si le casier est équipé de dispositifs stabilisateurs, installer les stabilisateurs avant de monter ou de réparer l'unité en casier.**

Warnung **Zur Vermeidung von Körperverletzung beim Anbringen oder Warten dieser Einheit in einem Gestell müssen Sie besondere Vorkehrungen treffen, um sicherzustellen, daß das System stabil bleibt. Die folgenden Richtlinien sollen zur Gewährleistung Ihrer Sicherheit dienen:**

- **Wenn diese Einheit die einzige im Gestell ist, sollte sie unten im Gestell angebracht werden.**
- **Bei Anbringung dieser Einheit in einem zum Teil gefüllten Gestell ist das Gestell von unten nach oben zu laden, wobei das schwerste Bauteil unten im Gestell anzubringen ist.**
- **Wird das Gestell mit Stabilisierungszubehör geliefert, sind zuerst die Stabilisatoren zu installieren, bevor Sie die Einheit im Gestell anbringen oder sie warten.**

Avvertenza **Per evitare infortuni fisici durante il montaggio o la manutenzione di questa unità in un supporto, occorre osservare speciali precauzioni per garantire che il sistema rimanga stabile. Le seguenti direttive vengono fornite per garantire la sicurezza personale:**

- **Questa unità deve venire montata sul fondo del supporto, se si tratta dell'unica unità da montare nel supporto.**
- **Quando questa unità viene montata in un supporto parzialmente pieno, caricare il supporto dal basso all'alto, con il componente più pesante sistemato sul fondo del supporto.**
- **Se il supporto è dotato di dispositivi stabilizzanti, installare tali dispositivi prima di montare o di procedere alla manutenzione dell'unità nel supporto.**

Advarsel **Unngå fysiske skader under montering eller reparasjonsarbeid på denne enheten når den befinner seg i et kabinett. Vær nøye med at systemet er stabilt. Følgende retningslinjer er gitt for å verne om sikkerheten:**

- **Denne enheten bør monteres nederst i kabinettet hvis dette er den eneste enheten i kabinettet.**
- **Ved montering av denne enheten i et kabinett som er delvis fylt, skal kabinettet lastes fra bunnen og opp med den tyngste komponenten nederst i kabinettet.**
- **Hvis kabinettet er utstyrt med stabiliseringsutstyr, skal stabilisatorene installeres før montering eller utføring av reparasjonsarbeid på enheten i kabinettet.**

Aviso **Para se prevenir contra danos corporais ao montar ou reparar esta unidade numa estante, deverá tomar precauções especiais para se certificar de que o sistema possui um suporte estável. As seguintes directrizes ajudá-lo-ão a efectuar o seu trabalho com segurança:**

- **Esta unidade deverá ser montada na parte inferior da estante, caso seja esta a única unidade a ser montada.**
- **Ao montar esta unidade numa estante parcialmente ocupada, coloque os itens mais pesados na parte inferior da estante, arrumando-os de baixo para cima.**
- **Se a estante possuir um dispositivo de estabilização, instale-o antes de montar ou reparar a unidade.**

¡Advertencia! **Para evitar lesiones durante el montaje de este equipo sobre un bastidor, o posteriormente durante su mantenimiento, se debe poner mucho cuidado en que el sistema quede bien estable. Para garantizar su seguridad, proceda según las siguientes instrucciones:**

- **Colocar el equipo en la parte inferior del bastidor, cuando sea la única unidad en el mismo.**
- **Cuando este equipo se vaya a instalar en un bastidor parcialmente ocupado, comenzar la instalación desde la parte inferior hacia la superior colocando el equipo más pesado en la parte inferior.**
- **Si el bastidor dispone de dispositivos estabilizadores, instalar éstos antes de montar o proceder al mantenimiento del equipo instalado en el bastidor.**

Varning!

För att undvika kroppsskada när du installerar eller utför underhållsarbete på denna enhet på en ställning måste du vidta särskilda försiktighetsåtgärder för att försäkra dig om att systemet står stadigt. Följande riktlinjer ges för att trygga din säkerhet:

- **Om denna enhet är den enda enheten på ställningen skall den installeras längst ned på ställningen.**
- **Om denna enhet installeras på en delvis fylld ställning skall ställningen fyllas nedifrån och upp, med de tyngsta enheterna längst ned på ställningen.**
- **Om ställningen är försedd med stabiliseringsdon skall dessa monteras fast innan enheten installeras eller underhålls på ställningen.**

Figyelem

A készülék rackbe történő beszerelése és karbantartása során bekövetkező sérülések elkerülése végett speciális óvintézkedésekkel meg kell őrizni a rendszer stabilitását. A személyes biztonsága érdekében tartsa be a következő szabályokat:

- **Ha a rackben csak ez az egy készülék található, a rack aljába kell beszerelni.**
- **Ha nincs teljesen tele az a rack, amelybe beszerelik a készüléket, alulról fölfelé haladva töltse fel a racket úgy, hogy a legnehezebb készülék kerüljön a rack aljába.**
- **Ha stabilizáló eszközök is tartoznak a rackhez, szerelje fel a stabilizátorokat, mielőtt beszerelné az egységet a rackbe, vagy karbantartást végezne rajta.**

Предупреждение

Во избежание травм при монтаже и обслуживании устройства в стойке следует принять особые меры предосторожности, чтобы убедиться в устойчивости оборудования.
Для обеспечения безопасности работ необходимо соблюдать следующие правила.

- Если в стойке находится одно устройство, оно должно быть установлено в нижней части.
- При монтаже устройств в частично заполненную стойку устанавливайте оборудование снизу вверх, размещая наиболее тяжелые устройства в нижней части.
- Если стойка снабжена приспособлениями для стабилизации, их необходимо установить до начала монтажа или обслуживания оборудования.

警告

为避免在机架中安装或维修该部件时使身体受伤，您必须采取特殊的预防措施确保系统固定。以下是确保安全的原则：

- 如果此部件是机架中唯一的部件，应将其安装在机架的底部。
- 如果在部分装满的机架中安装此部件，请按从下往上的顺序安装各个部件，并且最重的组件应安装在机架的底部。
- 如果机架配有固定装置，请先装好固定装置，然后再在机架中安装或维修部件。

警告

この装置をラックに設置したり保守作業を行ったりするときは、人身事故を防ぐため、システムが安定しているかどうかを十分に確認する必要があります。次の注意事項に従ってください。

- ラックにこの装置を単独で設置する場合は、ラックの一番下に設置します。
- ラックに別の装置がすでに設置されている場合は、最も重量のある装置を一番下にして、重い順に下から上へ設置します。
- ラックに安定器具が付属している場合は、その安定器具を取り付けてから、装置をラックに設置するか、またはラック内の装置の保守作業を行ってください。

주의

이 장치를 랙에 장착하거나 서비스할 때 신체 부상을 방지하려면, 시스템이 안정된 상태를 유지하도록 특별히 주의해야 합니다. 사용자의 안전을 위해 다음 지침 사항을 준수하십시오.

- 이 장치가 랙에 장착되는 유일한 것일 경우, 랙의 맨 아래 부분에 장착되어야 합니다.
- 부분적으로 차 있는 랙에 이 장치를 장착할 경우, 가장 무거운 장치를 랙의 맨 아래 부분부터 차례로 장착하십시오.
- 안정기가 랙과 함께 제공되는 경우, 이 안정기를 설치한 후 이 장치를 랙에 장착하거나 서비스하십시오

Aviso **Para evitar lesões corporais ao montar ou dar manutenção a esta unidade em um rack, é necessário tomar todas as precauções para garantir a estabilidade do sistema. As seguintes orientações são fornecidas para garantir a sua segurança:**

- **Se esta for a única unidade, ela deverá ser montada na parte inferior do rack.**
- **Ao montar esta unidade em um rack parcialmente preenchido, carregue-o de baixo para cima com o componente mais pesado em sua parte inferior.**
- **Se o rack contiver dispositivos estabilizadores, instale-os antes de montar ou dar manutenção à unidade existente.**

Advarsel **For at forhindre legemesbeskadigelse ved montering eller service af denne enhed i et rack, skal du sikre at systemet står stabilt. Følgende retningslinjer er også for din sikkerheds skyld:**

- **Enheden skal monteres i bunden af dit rack, hvis det er den eneste enhed i racket.**
- **Ved montering af denne enhed i et delvist fyldt rack, skal enhederne installeres fra bunden og opad med den tungeste enhed nederst.**
- **Hvis racket leveres med stabiliseringsenheder, skal disse installeres for enheden monteres eller serviceres i racket.**

تحذير

لتجنب حدوث أي إصابات عند تركيب هذه الوحدة، يجب اتباع بعض الاحتياطات لضمان عمل النظام بشكل سليم.
يتم ذكر الإرشادات التالية لضمان الأمان.
يجب تركيب هذه الوحدة في الجزء السفلي من الدولاب المتضمن قضبان إذا كانت هذه الوحدة هي الوحدة الوحيدة في الدولاب الذي يحتوي على قضبان.
عند تركيب هذه الوحدة في دولاب شبه ممتلئ، قم برفع الدولاب من الجزء السفلي لأعلى بحيث يكون الجزء الأثقل وزناً أسفل الدولاب.
إذا كان الدولاب المتضمن قضباناً يحتوي على أجهزة حفظ التوازن، قم بتثبيت هذه الأجهزة قبل تركيب الوحدة في الدولاب.

Upozorenje **Kako ne bi došlo do tjelesnih ozljeda kod postavljanja ili servisiranja uređaja na polici, potrebno je poduzeti mjere predostrožnosti kako bi sustav uvijek bio stabilan. Sigurnost se može osigurati poštivanjem sljedećih smjernica:**
- **Ovaj uređaj treba ugraditi na dno police, ukoliko je to jedini uređaj na polici.**
- **Kod ugradnje uređaja u policu na kojoj se već nalaze drugi uređaji, policu treba opremati počevši od dna, te tako da se na dno stave najteži dijelovi.**
- **Ukoliko su na polici ugrađeni stabilizatori, njih montirajte prije ugradnje ili servisiranja uređaja na polici.**

Upozornění **Abyste předešli poranění osob při montáži nebo opravě zařízení v montážním rámu, musíte dodržovat zvláštní preventivní opatření pro zajištění udržení stability systému. Pro zajištění bezpečnosti obsluhy jsou určeny následující zásady:**
- **Pokud je toto zařízení jedinou jednotkou v montážním rámu, musí být namontováno na nejnižší místo rámu.**
- **Pokud je toto zařízení montováno do částečně obsazeného montážního rámu, obsazujte montážní rám ve směru zdola nahoru tak, aby byla nejtěžší součást nejníže.**
- **Pokud je montážní rám vybaven stabilizačními zařízeními, nainstalujte stabilizátory ještě před montáží nebo opravou zařízení v montážním rámu.**

Για να αποφύγετε τον τραυματισμό κατά την τοποθέτηση ή τη συντήρηση αυτής της συσκευής σε αρθρωτό σύστημα, πρέπει να λάβετε ειδικές προφυλάξεις για να διασφαλίσετε τη σταθερότητα του συστήματος. Οι παρακάτω οδηγίες παρέχονται για να εξασφαλίσουν την ασφάλειά σας:

- Αυτή η συσκευή πρέπει να τοποθετείται στο κάτω μέρος του αρθρωτού συστήματος αν είναι η μοναδική συσκευή σε αυτό.
- Όταν τοποθετείτε αυτήν τη συσκευή σε εν μέρει γεμάτο αρθρωτό σύστημα, τοποθετήστε συσκευές στο αρθρωτό σύστημα από κάτω προς τα επάνω, με τη βαρύτερη συσκευή στο κάτω μέρος του συστήματος.
- Εάν το αρθρωτό σύστημα διαθέτει διατάξεις σταθεροποίησης, τοποθετήστε τους σταθεροποιητές πριν τοποθετήσετε ή συντηρήσετε τη συσκευή στο αρθρωτό σύστημα.

אזהרה

כדי למנוע פציעה בעת הרכבת יחידה זו במעמד או טיפול בה, עליך לנקוט אמצעי זהירות מיוחדים כדי להבטיח את יציבות המערכת. הקווים המנחים הבאים ניתנים על מנת להבטיח את ביטחונך:

- אם יחידה זו היא יחידה בודדת במעמד, יש להרכיב את היחידה בחלקו התחתון של המעמד.
- בעת הרכבת יחידה זו במעמד המלא בחלקו, טען את המעמד החל בחלק התחתון וכלפי מעלה כאשר הרכיב הכבד ביותר נמצא בחלקו התחתון של המעמד.
- אם המעמד מסופק עם התקני ייצוב, התקן את המייצבים לפני הרכבה היחידה במעמד או טיפול בה.

Opomena

За да се не повредите кога го монтирате или го сервисирате уредот на полица, мора да бидете особено претпазливи за да ја обезбедите стабилноста на системот. Следите напатствија се дадени за да ја осигураат Вашата безбедност:

- Уредот треба да се монтира најдолу на полицата ако е единствен уред на полицата.
- Кога го монтирате уредот на делумно пополнета полица, полнете ја полицата од дното кон врвот со најтешката компонента на дното на полицата.
- Ако полицата има стабилизаторски делови, наместете ги стабилизаторите пред да го монтирате или сервисирате уредот на полицата.

Ostrzeżenie **Aby zapobiec urazom podczas montażu lub serwisowania tego urządzenia w stojaku, należy zastosować szczególne środki ostrożności w celu zapewnienia stabilności układu. Poniżej przedstawiono wskazówki, których przestrzeganie zapewni bezpieczeństwo:**

- **Jeśli urządzenie to jest jedynym urządzeniem w stojaku, powinno być zamontowane na dole.**
- **W przypadku montażu urządzenia w częściowo zapełnionym stojaku należy instalować kolejne urządzenia od najniższego do najwyższego, przy czym element najcięższy powinien być zamontowany najniżej w stojaku.**
- **Jeśli stojak jest wyposażony w elementy stabilizujące, należy zamontować stabilizatory przed przystąpieniem do montażu lub serwisowania urządzeń w stojaku.**

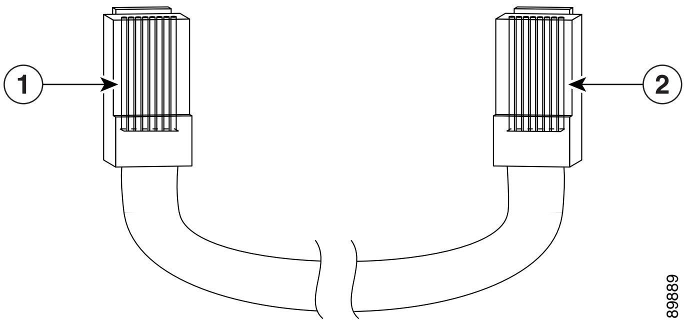
Upozornenie **Aby ste predišli poraneniu osôb pri montáži alebo oprave zariadenia v montážnom ráme, musíte dodržiavať zvláštne preventívne opatrenia na zaistenie udržania stability systému. Na zaistenie bezpečnosti obsluhy sú určené nasledujúce zásady:**

- **Pokiaľ je toto zariadenie jedinou jednotkou v montážnom ráme, musí byť namontované na najnižšie miesto v ráme.**
- **Pokiaľ je toto zariadenie montované do čiastočne obsadeného montážneho rámu, obsadzujte montážny rám v smere zdola nahor tak, aby bola najťažšia súčasť najnižšie.**
- **Pokiaľ je montážny rám vybavený stabilizačnými zariadeniami, nainštalujte stabilizátory ešte pred montážou alebo opravou zariadenia v montážnom ráme.**

- The “Connectors and Cables” appendix incorrectly refers to a *crossover* cable as a *rollover* cable. This is the correct information:

  You can identify a crossover cable by comparing the two modular cable ends. Hold the cable ends side-by-side, with the tab at the back, right plug, as shown in Figure 2.

Figure 2 Identifying a Crossover Cable



1	Pin 1
2	Pin 9

On a crossover cable, the wire connected to the pin on the outside of the left plug should be the same color as the wire connected to the pin on the outside of the right plug.

Related Documentation

You can find complete information about these Catalyst switches on Cisco.com.

Catalyst 2955 switch:

http://www.cisco.com/en/US/products/ps6738/tsd_products_support_series_home.html

Catalyst 2950 switch:

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

Catalyst 2950 LRE switch:

http://www.cisco.com/en/US/products/hw/switches/ps4916/tsd_products_support_series_home.html

Catalyst 2950 switch:

http://www.cisco.com/en/US/products/hw/switches/ps5213/tsd_products_support_series_home.html

You can order printed copies of documents with a DOC-xxxxxx= number from the Cisco.com sites and from the telephone numbers listed in the "Obtaining Documentation" section on page 49.

- *Catalyst 2955, 2950, and 2940 Switch System Message Guide* (not orderable but available on Cisco.com)

These publications provide more information about the Catalyst 2955 and Catalyst 2950 switches:

- *Catalyst 2950 and Catalyst 2955 Switch Software Configuration Guide* (not orderable but available on Cisco.com)
- *Catalyst 2950 and Catalyst 2955 Switch Command Reference*(not orderable but available on Cisco.com)
- Device manager online help (available on the switch)
- *Catalyst 2950 Switch Hardware Installation Guide* (not orderable but available on Cisco.com)
- *Catalyst 2950 Switch Getting Started Guide (*order number DOC-1786521=)
- *Regulatory Compliance and Safety Information for the Catalyst 2950 Switch* (order number DOC-7816625=)
- *Catalyst 2955 Hardware Installation Guide* (order number DOC-7814944=)

These publications provide more information about the Catalyst 2940 switches:

- *Catalyst 2940 Switch Software Configuration Guide* (not orderable but available on Cisco.com)
- *Catalyst 2940 Switch Command Reference* (not orderable but available on Cisco.com))
- Device manager online help (available on the switch)
- *Catalyst 2940 Switch Hardware Installation Guide* (not orderable but available on Cisco.com)
- *Catalyst 2940 Switch Getting Started Guide (*order number DOC-7816576=)
- *Regulatory Compliance and Safety Information for the Catalyst 2940 Switch* (order number DOC-7816656=)

For other information about related products, see these documents:

- *Getting Started with Cisco Network Assistant* (not orderable but available on Cisco.com)
- *Release Notes for Cisco Network Assistant* (not orderable but available on Cisco.com)
- *1000BASE-T Gigabit Interface Converter Installation Notes* (not orderable but is available on Cisco.com)

- *Catalyst GigaStack Gigabit Interface Converter Hardware Installation Guide* (order number DOC-786460=)
- *Cisco LRE CPE Hardware Installation Guide* (order number DOC-7811469=)
- *CWDM Passive Optical System Installation Note* (not orderable but is available on Cisco.com)
- *Installation Notes for the Catalyst Family Small-Form-Factor Pluggable Modules* (order number DOC-7815160=)
- *Installation and Warranty Notes for the Cisco LRE 48 POTS Splitter* (order number DOC-7812250=)
- *Network Admission Control Software Configuration Guide* (not orderable but is available on Cisco.com)
- These compatibility matrix documents are available from this Cisco.com site:

http://www.cisco.com/en/US/products/hw/modules/ps5455/products_device_support_tables_list.html

  - *Cisco Gigabit Ethernet Transceiver Modules Compatibility Matrix* (not orderable but available on Cisco.com)
  - *Cisco 100-Megabit Ethernet SFP Modules Compatibility Matrix* (not orderable but available on Cisco.com)
  - *Cisco Small Form-Factor Pluggable Modules Compatibility Matrix* (not orderable but available on Cisco.com)
  - *Compatibility Matrix for 1000BASE-T Small Form-Factor Pluggable Modules* (not orderable but available on Cisco.com)

Obtaining Documentation

Cisco documentation and additional literature are available on Cisco.com. This section explains the product documentation resources that Cisco offers.

Cisco.com

You can access the most current Cisco documentation at this URL:

http://www.cisco.com/techsupport

You can access the Cisco website at this URL:

http://www.cisco.com

You can access international Cisco websites at this URL:

http://www.cisco.com/public/countries_languages.shtml

Product Documentation DVD

The Product Documentation DVD is a library of technical product documentation on a portable medium. The DVD enables you to access installation, configuration, and command guides for Cisco hardware and software products. The Product Documentation DVD is created and released regularly. DVDs are available singly or by subscription. Registered Cisco.com users can order a Product Documentation DVD (product number DOC-DOCDVD= or DOC-DOCDVD=SUB) from Cisco Marketplace at the Product Documentation Store at this URL:

http://www.cisco.com/go/marketplace/docstore

Ordering Documentation

You must be a registered Cisco.com user to access Cisco Marketplace. Registered users may order Cisco documentation at the Product Documentation Store at this URL:

http://www.cisco.com/go/marketplace/docstore

If you do not have a user ID or password, you can register at this URL:

http://tools.cisco.com/RPF/register/register.do

Documentation Feedback

You can provide feedback about Cisco technical documentation on the Cisco Support site area by entering your comments in the feedback form available in every online document.

Cisco Product Security Overview

Cisco provides a free online Security Vulnerability Policy portal at this URL:

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

From this site, you will find information about how to do the following:

- Report security vulnerabilities in Cisco products
- Obtain assistance with security incidents that involve Cisco products
- Register to receive security information from Cisco

A current list of security advisories, security notices, and security responses for Cisco products is available at this URL:

http://www.cisco.com/go/psirt

To see security advisories, security notices, and security responses as they are updated in real time, you can subscribe to the Product Security Incident Response Team Really Simple Syndication (PSIRT RSS) feed. Information about how to subscribe to the PSIRT RSS feed is found at this URL:

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

Reporting Security Problems in Cisco Products

Cisco is committed to delivering secure products. We test our products internally before we release them, and we strive to correct all vulnerabilities quickly. If you think that you have identified a vulnerability in a Cisco product, contact PSIRT:

- For emergencies only—security-alert@cisco.com

  An emergency is either a condition in which a system is under active attack or a condition for which a severe and urgent security vulnerability should be reported. All other conditions are considered nonemergencies.

- For nonemergencies—psirt@cisco.com

In an emergency, you can also reach PSIRT by telephone:

- 1 877 228-7302
- 1 408 525-6532

Tip We encourage you to use Pretty Good Privacy (PGP) or a compatible product (for example, GnuPG) to encrypt any sensitive information that you send to Cisco. PSIRT can work with information that has been encrypted with PGP versions 2.*x* through 9.*x*.

Never use a revoked encryption key or an expired encryption key. The correct public key to use in your correspondence with PSIRT is the one linked in the Contact Summary section of the Security Vulnerability Policy page at this URL:

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

The link on this page has the current PGP key ID in use.

If you do not have or use PGP, contact PSIRT to find other means of encrypting the data before sending any sensitive material.

Product Alerts and Field Notices

Modifications to or updates about Cisco products are announced in Cisco Product Alerts and Cisco Field Notices. You can receive these announcements by using the Product Alert Tool on Cisco.com. This tool enables you to create a profile and choose those products for which you want to receive information.

To access the Product Alert Tool, you must be a registered Cisco.com user. Registered users can access the tool at this URL:

http://tools.cisco.com/Support/PAT/do/ViewMyProfiles.do?local=en

To register as a Cisco.com user, go to this URL:

http://tools.cisco.com/RPF/register/register.do

Obtaining Technical Assistance

Cisco Technical Support provides 24-hour-a-day award-winning technical assistance. The Cisco Support website on Cisco.com features extensive online support resources. In addition, if you have a valid Cisco service contract, Cisco Technical Assistance Center (TAC) engineers provide telephone support. If you do not have a valid Cisco service contract, contact your reseller.

Cisco Support Website

The Cisco Support website provides online documents and tools for troubleshooting and resolving technical issues with Cisco products and technologies. The website is available 24 hours a day at this URL:

http://www.cisco.com/en/US/support/index.html

Access to all tools on the Cisco Support website requires a Cisco.com user ID and password. If you have a valid service contract but do not have a user ID or password, you can register at this URL:

http://tools.cisco.com/RPF/register/register.do

Note Before you submit a request for service online or by phone, use the **Cisco Product Identification Tool** to locate your product serial number. You can access this tool from the Cisco Support website by clicking the **Get Tools & Resources** link, clicking the **All Tools (A-Z)** tab, and then choosing **Cisco Product Identification Tool** from the alphabetical list. This tool offers three search options: by product ID or model name; by tree view; or, for certain products, by copying and pasting **show** command output. Search results show an illustration of your product with the serial number label location highlighted. Locate the serial number label on your product and record the information before placing a service call.

Tip **Displaying and Searching on Cisco.com**

If you suspect that the browser is not refreshing a web page, force the browser to update the web page by holding down the Ctrl key while pressing **F5**.

To find technical information, narrow your search to look in technical documentation, not the entire Cisco.com website. After using the Search box on the Cisco.com home page, click the **Advanced Search** link next to the Search box on the resulting page and then click the **Technical Support & Documentation** radio button.

To provide feedback about the Cisco.com website or a particular technical document, click **Contacts & Feedback** at the top of any Cisco.com web page.

Submitting a Service Request

Using the online TAC Service Request Tool is the fastest way to open S3 and S4 service requests. (S3 and S4 service requests are those in which your network is minimally impaired or for which you require product information.) After you describe your situation, the TAC Service Request Tool provides recommended solutions. If your issue is not resolved using the recommended resources, your service request is assigned to a Cisco engineer. The TAC Service Request Tool is located at this URL:

http://www.cisco.com/techsupport/servicerequest

For S1 or S2 service requests, or if you do not have Internet access, contact the Cisco TAC by telephone. (S1 or S2 service requests are those in which your production network is down or severely degraded.) Cisco engineers are assigned immediately to S1 and S2 service requests to help keep your business operations running smoothly.

To open a service request by telephone, use one of the following numbers:

Asia-Pacific: +61 2 8446 7411
Australia: 1 800 805 227
EMEA: +32 2 704 55 55
USA: 1 800 553 2447

For a complete list of Cisco TAC contacts, go to this URL:

http://www.cisco.com/techsupport/contacts

Definitions of Service Request Severity

To ensure that all service requests are reported in a standard format, Cisco has established severity definitions.

Severity 1 (S1)—An existing network is "down" or there is a critical impact to your business operations. You and Cisco will commit all necessary resources around the clock to resolve the situation.

Severity 2 (S2)—Operation of an existing network is severely degraded, or significant aspects of your business operations are negatively affected by inadequate performance of Cisco products. You and Cisco will commit full-time resources during normal business hours to resolve the situation.

Severity 3 (S3)—Operational performance of the network is impaired while most business operations remain functional. You and Cisco will commit resources during normal business hours to restore service to satisfactory levels.

Severity 4 (S4)—You require information or assistance with Cisco product capabilities, installation, or configuration. There is little or no effect on your business operations.

Obtaining Additional Publications and Information

Information about Cisco products, technologies, and network solutions is available from various online and printed sources.

- The Cisco Online Subscription Center is the website where you can sign up for a variety of Cisco e-mail newsletters and other communications. Create a profile and then select the subscriptions that you would like to receive. To visit the Cisco Online Subscription Center, go to this URL:

  http://www.cisco.com/offer/subscribe

- The *Cisco Product Quick Reference Guide* is a handy, compact reference tool that includes brief product overviews, key features, sample part numbers, and abbreviated technical specifications for many Cisco products that are sold through channel partners. It is updated twice a year and includes the latest Cisco channel product offerings. To order and find out more about the *Cisco Product Quick Reference Guide*, go to this URL:

  http://www.cisco.com/go/guide

- Cisco Marketplace provides a variety of Cisco books, reference guides, documentation, and logo merchandise. Visit Cisco Marketplace, the company store, at this URL:

  http://www.cisco.com/go/marketplace/

- Cisco Press publishes a wide range of general networking, training, and certification titles. Both new and experienced users will benefit from these publications. For current Cisco Press titles and other information, go to Cisco Press at this URL:

  http://www.ciscopress.com

- *Internet Protocol Journal* is a quarterly journal published by Cisco for engineering professionals involved in designing, developing, and operating public and private internets and intranets. You can access the *Internet Protocol Journal* at this URL:

  http://www.cisco.com/ipj

- Networking products offered by Cisco, as well as customer support services, can be obtained at this URL:

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

- Networking Professionals Connection is an interactive website where networking professionals share questions, suggestions, and information about networking products and technologies with Cisco experts and other networking professionals. Join a discussion at this URL:

  http://www.cisco.com/discuss/networking

- "What's New in Cisco Documentation" is an online publication that provides information about the latest documentation releases for Cisco products. Updated monthly, this online publication is organized by product category to direct you quickly to the documentation for your products. You can view the latest release of "What's New in Cisco Documentation" at this URL:

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

- World-class networking training is available from Cisco. You can view current offerings at this URL:

  http://www.cisco.com/en/US/learning/index.html

This document is to be used in conjunction with the documents listed in the "Related Documentation" section.

Any Internet Protocol (IP) addresses used in this document are not intended to be actual addresses. Any examples, command display output, and figures included in the document are shown for illustrative purposes only. Any use of actual IP addresses in illustrative content is unintentional and coincidental.