APPENDIX B

Working with the Cisco IOS File System, Configuration Files, and Software Images

This appendix describes how to manipulate the Cisco ME 3400E Ethernet Access switch flash file system, how to copy configuration files, and how to archive (upload and download) software images to a switch.

Note For complete syntax and usage information for the commands used in this chapter, see the switch command reference *Cisco IOS Configuration Fundamentals Command Reference, Release 12.2*

This appendix consists of these sections:

Working with the Flash File System

flash:

Displaying Available File Systems

show file systems privileged EXEC command as shown in this example.

```
Switch# show file systems
File Systems:
     Size(b)     Free(b)      Type  Flags   Prefixes
*   15998976     5135872     flash     rw   flash:
           -           -    opaque     rw   bs:
           -           -    opaque     rw   vb:
      524288      520138     nvram     rw   nvram:
           -           -   network     rw   tftp:
           -           -    opaque     rw   null:
           -           -    opaque     rw   system:
           -           -    opaque     ro   xmodem:
           -           -    opaque     ro   ymodem:
```

Table B-1 show file systems Field Descriptions

Field	Value
Size(b)	Amount of memory in the file system in bytes.
Free(b)	Amount of free memory in the file system in bytes.
Type	Type of file system. **flash**—The file system is for a flash memory device. **nvram**—The file system is for a NVRAM device. **opaque** *pseudo* *system* **unknown**
	Permission for file system. —read-only. —read/write.\ —write-only.
Prefixes	Alias for file system. **flash:**—Flash file system. **nvram:**—NVRAM. **null:**—Null destination for copies. You can copy a remote file to null to find its size. **rcp:** **system:** **tftp:** **xmodem:**—Obtain the file from a network machine by using the Xmodem protocol. **ymodem:**—Obtain the file from a network machine by using the Ymodem protocol.

Setting the Default File System

Displaying Information about Files on a File System

Table B-2 Commands for Displaying Information About Files

Command	Description
[**/all**] [ ][ ]	Display a list of files on a file system.
	Display more information about each of the files on a file system.
file-url	

Changing Directories and Displaying the Working Directory

		Purpose
Step 1		
Step 2	**cd new_configs**	*new_configs*
Step 3		

Creating and Removing Directories

dir :	**: flash:**
mkdir old_configs	Directory names are limited to 45 characters between the slashes (/); the name cannot contain control characters, spaces, deletes, slashes, quotes, semicolons, or colons.
	Verify your entry.

Use the keyword to delete the named directory and all subdirectories and the files contained in it. Use the keyword to suppress the prompting that confirms a deletion of each file in the directory. You are prompted only once at the beginning of this deletion process. Use the and keywords for deleting old software images that were installed by using the **download-sw**

flash:

Caution

Copying Files

command. For the source and destination URLs, you can use and keyword shortcuts. For example, the command saves the currently running configuration file to the NVRAM section of flash memory to be used as the configuration during system initialization.

You can also copy from special file systems (,) as the source for the file from a network machine that uses the Xmodem or Ymodem protocol.

Network file system URLs include , , and and have these syntaxes:

- FTP— [[[ ]@ / /

  rcp: // @ / /

  tftp: // / /

In addition, the Secure Copy Protocol (SCP) provides a secure and authenticated method for copying switch configurations or switch image files. SCP relies on Secure Shell (SSH), an application and a protocol that provides a secure replacement for the Berkeley r-tools. See the "Configuring the Switch for Secure Copy Protocol" section on page 8-41.

For more information on how to configure and verify SCP, see the "Secure Copy Protocol" chapter of the *Cisco IOS New Features, Cisco IOS Release 12.2,* at this URL:
http://cisco.com/en/US/products/sw/iosswrel/ps1839/products_feature_guide09186a0080087b18.html

Local writable file systems include flash:.

Some invalid combinations of source and destination exist. Specifically, you cannot copy these combinations:

From a running configuration to a running configuration

From a startup configuration to a startup configuration

From a device to the same device (for example, the command is invalid)

For specific examples of using the command with configuration files, see the "Working with Configuration Files" section on page B-8.

To copy software images either by downloading a new version or by uploading the existing one, use the or the privileged EXEC command. For more information, see the "Working with Software Images" section on page B-23.

When you no longer need a file on a flash memory device, you can permanently delete it. To delete a file or directory from a specified flash device, use the [ ] [ ] [ ] privileged EXEC command.

Use the keyword for deleting a directory and all subdirectories and the files contained in it. Use the keyword to suppress the prompting that confirms a deletion of each file in the directory. You are prompted only once at the beginning of this deletion process. Use the and keywords for deleting old software images that were installed by using the command but are no longer needed.

If you omit the option, the switch uses the default device specified by the command. For , you specify the path (directory) and the name of the file to be deleted.

When you attempt to delete any files, the system prompts you to confirm the deletion.

When files are deleted, their contents cannot be recovered.

This example shows how to delete the file from the default flash memory device:

```
delete myconfig
```

Creating, Displaying, and Extracting tar Files

Note

Creating a tar File

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directory] tar-filename.tar

rcp: // @ / / .tar

tftp: // / / .tar

.tar

flash:/

saved.tar

```
archive tar /create tftp:172.20.10.30/saved.tar flash:/new-configs
```

Displaying the Contents of a tar File

archive tar /table

- flash:
- ftp: // : @ / / .tar

```
archive tar /table flash:image-name

image-name/ (directory)
image-name/html/ (directory)
image-name/html/foo.html (0 bytes)
image-name/image-name.bin (4527884 bytes)
image-name/info (346 bytes)
info (110 bytes)
```

Extracting a tar File

dir/file

source-url

-
- *username password location directory tar-filename*
- *username location directory tar-filename*
- *location directory tar-filename*

tar-filename

file-url dir/file t
dir/file

This command extracts just the directory into the root directory on the local flash file system. The remaining files in the file are ignored.

```
archive tar /xtract tftp://172.20.10.30/saved.tar flash:/new-configs
```

| |] privileged EXEC command:.

This example shows how to display the contents of a configuration file on a TFTP server:

```
more tftp://serverA/hampton/savedconfig
!
! Saved configuration on server
!
version 11.3
service timestamps log datetime localtime
service linenumber
service udp-small-servers
service pt-vty-logging
!
<output truncated>
```

Working with Configuration Files

Gateway."

You can copy ( ) configuration files from a TFTP, FTP, or RCP server to the running configuration or startup configuration of the switch. You might want to perform this for one of these reasons:

- To restore a backed-up configuration file.
- To use the configuration file for another switch. For example, you might add another switch to your network and want it to have a configuration similar to the original switch. By copying the file to the new switch, you can change the relevant parts rather than recreating the whole file.
- To load the same configuration commands on all the switches in your network so that all the switches have similar configurations.

You can copy ( ) configuration files from the switch to a file server by using TFTP, FTP, or RCP. You might perform this task to back up a current configuration file to a server before changing its contents so that you can later restore the original configuration file from the server.

The protocol you use depends on which type of server you are using. The FTP and RCP transport mechanisms provide faster performance and more reliable delivery of data than TFTP. These improvements are possible because FTP and RCP are built on and use the TCP/IP stack, which is connection-oriented.

These sections contain this configuration information:

Guidelines for Creating and Using Configuration Files

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Note {**ftp: | rcp: | tftp:**} privileged EXEC command loads the configuration files on the switch as if you were entering the commands at the command line. The switch does not erase the existing running configuration before adding the commands. If a command in the copied configuration file replaces a command in the existing configuration file, the existing command is erased. For example, if the copied configuration file contains a different IP address in a particular command than the existing configuration, the IP address in the copied configuration is used. However, some commands in the existing configuration might not be replaced or negated. In this case, the resulting configuration file is a mixture of the existing configuration file and the copied configuration file, with the copied configuration file having precedence.

To restore a configuration file to an exact copy of a file stored on a server, copy the configuration file directly to the startup configuration (by using the { } privileged EXEC command), and reload the switch.

Configuration File Types and Location

Creating a Configuration File By Using a Text Editor

Step 1

Step 2

Step 3

Step 4

Step 5

Copying Configuration Files By Using TFTP

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Preparing to Download or Upload a Configuration File By Using TFTP

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Note

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Downloading the Configuration File By Using TFTP

Step 1

Step 2

Step 3

Step 4

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tokyo-confg

```
copy tftp://172.16.2.155/tokyo-confg system:running-config
Configure using tokyo-confg from 172.16.2.155? [confirm] y
Booting tokyo-confg from 172.16.2.155:!!! [OK - 874/16000 bytes]
```

```
Switch#
Write file tokyo-confg on host 172.16.2.155? [confirm] y
#
Writing tokyo-confg!!! [OK]
```

username@switchname.domain *username*
switchname *domain*

directory of a user on the server, specify that user's name as the remote username.

For more information, see the documentation for your FTP server.

These sections contain this configuration information:

- Preparing to Download or Upload a Configuration File By Using FTP, page B-13
- Downloading a Configuration File By Using FTP, page B-13
- Uploading a Configuration File By Using FTP, page B-14

Before you begin downloading or uploading a configuration file by using FTP, do these tasks:

Ensure that the switch has a route to the FTP server. The switch and the FTP server must be in the same subnetwork if you do not have a router to route traffic between subnets. Check connectivity to the FTP server by using the command.

If you are accessing the switch through the console or a Telnet session and you do not have a valid username, make sure that the current FTP username is the one that you want to use for the FTP download. You can enter the privileged EXEC command to view the valid username. If you do not want to use this username, create a new FTP username by using the global configuration command during all copy operations. The new username is stored in NVRAM. If you are accessing the switch through a Telnet session and you have a valid username, this username is used, and you do not need to set the FTP username. Include the username in the command if you want to specify a username for only that copy operation.

When you upload a configuration file to the FTP server, it must be properly configured to accept the write request from the user on the switch.

For more information, see the documentation for your FTP server.

Beginning in privileged EXEC mode, follow these steps to download a configuration file by using FTP:

	Verify that the FTP server is properly configured by referring to the "Preparing to Download or Upload a Configuration File By Using FTP" section on page B-13.
	Log into the switch through the console port or a Telnet session.
	Enter global configuration mode on the switch. This step is required only if you override the default remote username or password (see Steps 4, 5, and 6).
	(Optional) Change the default remote username.
	(Optional) Change the default password.
Step 6	
Step 7	

```
copy ftp://netadmin1:mypass@172.16.101.101/host1-confg system:running-config

Loading 1112 byte file host1-confg:![OK]
Switch#
%SYS-5-CONFIG: Configured from host1-config by ftp from 172.16.101.101
```

```
Switch#
Switch(config)#
Switch(config)#
Switch(config)#
Switch#
Address of remote host [255.255.255.255]?
Name of configuration file[rtr2-confg]?
Configure using host2-confg from 172.16.101.101?[confirm]
Connected to 172.16.101.101
Loading 1112 byte file host2-confg:![OK]
[OK]
Switch#
%SYS-5-CONFIG_NV:Non-volatile store configured from host2-config by ftp from
172.16.101.101
```



```
Switch#
Write file switch2-confg on host 172.16.101.101?[confirm]
Building configuration...[OK]
Connected to 172.16.101.101
Switch#
```

```
Switch#
Switch(config)#
Switch(config)#
Switch(config)#
Switch#
Remote host[]?
Name of configuration file to write [switch2-confg]?
Write file switch2-confg on host 172.16.101.101?[confirm]
![OK]
```

Preparing to Download or Upload a Configuration File By Using RCP

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```
hostname Switch1
ip rcmd remote-username User0
```

```
Switch1.company.com Switch1
```


```
Switch#
Configure using host1-confg from 172.16.101.101? [confirm]
Connected to 172.16.101.101
Loading 1112 byte file host1-confg:![OK]
Switch#
%SYS-5-CONFIG: Configured from host1-config by rcp from 172.16.101.101
```

```
Switch#
Switch(config)#
Switch(config)#
Switch#
Address of remote host [255.255.255.255]?
Name of configuration file[rtr2-confg]?
Configure using host2-confg from 172.16.101.101?[confirm]
Connected to 172.16.101.101
Loading 1112 byte file host2-confg:![OK]
[OK]
Switch#
%SYS-5-CONFIG_NV:Non-volatile store configured from host2-config by rcp from
172.16.101.101
```


```
Switch#
Write file switch-confg on host 172.16.101.101?[confirm]
Building configuration...[OK]
Connected to 172.16.101.101
Switch#
```

```
Switch#
Switch(config)#
Switch(config)#
Switch#
Remote host[]?
Name of configuration file to write [switch2-confg]?
Write file switch2-confg on host 172.16.101.101?[confirm]
![OK]
```

Clearing the Startup Configuration File

Caution

Deleting a Stored Configuration File

Caution

Replacing and Rolling Back Configurations

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Understanding Configuration Replacement and Rollback

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Archiving a Configuration

Replacing a Configuration

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Rolling Back a Configuration

Configuration Replacement and Rollback Guidelines

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Configuring the Configuration Archive

	Command	Purpose
Step 1		
Step 2		
Step 3		
Step 4	*number*	*number*—
	minutes	*minutes*—
Step 8		

Performing a Configuration Replacement or Rollback Operation

	Command	Purpose
Step 1		Note
Step 2		
Step 3		
Step 4		
Step 5		Note
Step 6		Note
Step 7		

Working with Software Images

Note

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Note

Image Location on the Switch

tar File Format of Images on a Server or Cisco.com

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```
image_feature: LAYER_2|MIN_DRAM_MEG=64
image_family: family
stacking_number: 1.11
board_ids: 0x00000029
info_end:
```

Table B-3 info File Description

Preparing to Download or Upload an Image File By Using TFTP

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Note

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Downloading an Image File By Using TFTP

	Command	Purpose
Step 1		
Step 2		
Step 3		• • • •
Step 4		• • • •

Note

Caution

Uploading an Image File By Using TFTP

	Command	Purpose
Step 1		
Step 2		
Step 3		• •

Caution

Copying Image Files By Using FTP

Note

Preparing to Download or Upload an Image File By Using FTP

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Downloading an Image File By Using FTP

	Command	Purpose
Step 1		
Step 2		
Step 3		
Step 4		
Step 5		
Step 6		

	Command	Purpose
Step 7		• • • • •
Step 8		• • • • •

Note

Caution

Uploading an Image File By Using FTP

	Command	Purpose
Step 1		
Step 2		
Step 3		
Step 4		
Step 5		
Step 6		
Step 7		• • •

Caution

Copying Image Files By Using RCP

Note

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Preparing to Download or Upload an Image File By Using RCP

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in the home directory of a user on the server, specify that user's name as the remote username.

Before you begin downloading or uploading an image file by using RCP, do these tasks:

Ensure that the workstation acting as the RCP server supports the remote shell (rsh).

Ensure that the switch has a route to the RCP server. The switch and the server must be in the same subnetwork if you do not have a router to route traffic between subnets. Check connectivity to the RCP server by using the command.

If you are accessing the switch through the console or a Telnet session and you do not have a valid username, make sure that the current RCP username is the one that you want to use for the RCP download. You can enter the privileged EXEC command to view the valid username. If you do not want to use this username, create a new RCP username by using the global configuration command to be used during all archive operations. The new username is stored in NVRAM. If you are accessing the switch through a Telnet session and you have a valid username, this username is used, and there is no need to set the RCP username. Include the username in the or privileged EXEC command if you want to specify a username only for that operation.

When you upload an image to the RCP to the server, it must be properly configured to accept the RCP write request from the user on the switch. For UNIX systems, you must add an entry to the .rhosts file for the remote user on the RCP server. For example, suppose the switch contains these configuration lines:

If the switch IP address translates to , the .rhosts file for User0 on the RCP server should contain this line:

For more information, see the documentation for your RCP server.

You can download a new image file and replace or keep the current image.

Beginning in privileged EXEC mode, follow Steps 1 through 6 to download a new image from an RCP server and overwrite the existing image. To keep the current image, go to Step 6.

	Verify that the RCP server is properly configured by referring to the "Preparing to Download or Upload an Image File By Using RCP" section on page B-32.
	Log into the switch through the console port or a Telnet session.

	Enter global configuration mode. This step is required only if you override the default remote username (see Steps 4 and 5).
	(Optional) Specify the remote username.
	Return to privileged EXEC mode.
[[[[ ]]]]	Download the image file from the RCP server to the switch, and overwrite the current image. The option overwrites the software image in flash memory with the downloaded image. The option reloads the system after downloading the image unless the configuration has been changed and not been saved. For pecify the username. For the RCP copy request to execute successfully, an account must be defined on the network server for the remote username. For more information, see the "Preparing to Download or Upload an Image File By Using RCP" section on page B-32. For , specify the IP address of the RCP server. For , specify the directory (optional) and the image to download. Directory and image names are case sensitive.
[[[[ ]]]]	Download the image file from the RCP server to the switch, and keep the current image. The option keeps the old software version after a download. The option reloads the system after downloading the image unless the configuration has been changed and not been saved. For pecify the username. For the RCP copy request to execute, an account must be defined on the network server for the remote username. For more information, see the "Preparing to Download or Upload an Image File By Using RCP" section on page B-32. For , specify the IP address of the RCP server. **For / / .tar**

The download algorithm verifies that the image is appropriate for the switch model and that enough DRAM is present, or it aborts the process and reports an error. If you specify the option, the download algorithm removes the existing image on the flash device whether or not it is the same as the new one, downloads the new image, and then reloads the software.

/overwrite

/leave-old-sw

/leave-old-sw

delete /force /recursive :/

flash:

configure terminal	
ip rcmd remote-username	

end	
archive upload-sw **rcp: // @ / /** **.tar**	**//** **@** **/ / .tar** **.tar**

archive upload-sw