

Cisco IOS File System

Description

The Cisco IOS File System (IFS) feature provides a single interface to all file systems the router uses:

- Flash memory file systems
- Network file systems (TFTP, rcp, and FTP)
- Any other endpoint for reading or writing data (such as NVRAM, the running configuration, ROM, raw system memory, system bundled microcode, Xmodem, Flash load helper log, modems, and BRI MUX interfaces).

Benefits

IFS provides the following benefits:

- File Viewing and Classification
- Platform-Independent Commands
- Minimal Prompting for Commands
- Directory Navigation and Creation

File Viewing and Classification

With IFS, all files can be viewed and classified (image, text file, and so forth), including files on remote servers. For example, you may want to determine the size and type of an image on a remote server before you copy it to ensure that it is a valid image. You can also view a configuration file on a remote server to verify that it is the correct configuration file before you load the file on the router.

Platform-Independent Commands

With IFS, the file system user interface is no longer platform specific. Commands have the same syntax, regardless of which platform is used. Thus, you can use the same commands for all of your routers.

However, not all commands are supported on all platforms and file systems. Because different types of file systems support different operations, certain commands are not available for all file systems. Platforms will support commands for the file systems they use.

Minimal Prompting for Commands

IFS minimizes the required prompting for many commands, such as the **copy** command. You can enter all of the required information in the command line, rather than having to provide information when the system prompts you for it. For example, if you want to copy a file to an FTP server, you can specify the specific location on the router of the source file, the specific location of the destination file on the FTP server, and the username and password to use when connecting to the FTP server, all on a single line. However, if you wish to have the router prompt you for the needed information, you can still enter the minimum form of the command.

Depending on the current configuration of the **file prompt** command and the type of command you entered, the router may prompt you for confirmation, even if you have provided all the information in the command. In these cases, the default value will be the value entered in the command. Press Return to confirm the values.

Directory Navigation and Creation

With IFS, you can move around to different directories and list the files in a directory. On newer platforms, you can create subdirectories in Flash memory or on a disk.

URLs

The new file system interface uses Uniform Resource Locators (URLs) to specify the location of a file. URLs are commonly used to specify files or locations on the World Wide Web. However, on Cisco routers, they can now be used to specify the location of files on the router or remote file servers.

On Cisco routers, use URLs in commands to specify the location of the file or directory. For example, if you want to copy a file from one location to another, use the **copy source-url destination-url** command.

The format of URLs used by the routers can vary from the format you may be used to using. There are also a variety of formats that can be used, based on the location of the file.

Network Files

When you want to specify a file on a network server, use one of the following forms:

ftp:[[//[username[:password]@]location]/directory]/filename

rcp:[[//[username@]location]/directory]/filename

tftp:[[//[location]/directory]/filename

The location can be an IP address or a host name. The username variable, if specified, overrides the username specified by the **ip rcmd remote-username** or **ip ftp username** commands. The password overrides the password specified by the **ip ftp password** command.

The file path (directory and filename) is specified relative to the directory used for file transfers. For example, on UNIX file servers, TFTP pathnames start in the /tftpboot directory, and rcp and FTP paths start in the home directory associated with the username.

The following example specifies the file `c7200-j-mz.112-current` on the TFTP server `myserver.cisco.com`. The file is located in the directory called `master`.

```
tftp://myserver.cisco.com/master/c7200-j-mz.112-current
```

The following example specifies the file `ship-config` on the server `enterprise.cisco.com`. The router uses the username `jeanluc` and the password `secret` to access this server via FTP.

```
ftp://jeanluc:secret@enterprise.cisco.com/ship-config
```

Local Files

For local files (files on the router), the syntax is basically the same as the syntax previously used on high-end platforms; however, you can now specify directories:

prefix:[directory/]filename

Use this form to specify a file located on the router. For example, use this form to specify a file in Flash memory or NVRAM.

The following example specifies the startup configuration in NVRAM:

```
nvram:startup-config
```

The following example specifies the file `backup-config` in the `configs` directory of Flash memory:

```
flash:configs/backup-config
```

When referring to a file system instead of a file, the form is

prefix:

This form specifies the file system itself, rather than a file in the file system. Use this form to perform commands on file systems themselves, such as listing the files in a file system or formatting the file system.

The following example specifies the first PCMCIA Flash memory card:

```
slot0:
```

URL Prefix

The URL prefix specifies the file system. File system prefixes are listed in Table 1. The list of available file systems differs by platform and operation. Refer to your product documentation or use the **show file systems** command to determine which prefixes are available on your platform.

Table 1 File System Prefixes

Prefix	File System
bootflash:	Boot Flash memory.
disk0:	Rotating media.
flash:	Flash memory. This prefix is available on all platforms. For platforms that do not have a device named <code>flash:</code> , the prefix flash: is aliased to slot0: . Therefore, you can use the prefix flash: to refer to the main Flash memory storage area on all platforms.
flh:	Flash load helper log files.
ftp:	File Transfer Protocol (FTP) network server.
null:	Null destination for copies. You can copy a remote file to null to determine its size.
nvram:	NVRAM.

Table 1 File System Prefixes

Prefix	File System
rcp:	Remote copy protocol (rcp) network server.
slavebootflash:	Internal Flash memory on a slave RSP card of a router configured for HSA.
slavenvram:	NVRAM on a slave RSP card of a router configured for HSA.
slaveslot0:	First PCMCIA card on a slave RSP card of a router configured for HSA.
slaveslot1:	Second PCMCIA card on a slave RSP card of a router configured for HSA.
slot0:	First PCMCIA Flash memory card.
slot1:	Second PCMCIA Flash memory card.
system:	Contains the system memory, including the running configuration.
tftp:	Trivial File Transfer Protocol (TFTP) network server.
xmodem:	Obtain the file from a network machine using the Xmodem protocol.
ymodem:	Obtain the file from a network machine using the Ymodem protocol.

Note MOP servers are no longer supported as file systems.

In all commands, the colon is required after the file system name. However, commands that did not require the colon previously will continue to be supported, although they will not be available in the context-sensitive help.

URL Prefix for Partitioned Devices

For partitioned devices, the prefix includes the partition number. The syntax for the prefix on a partitioned device is *device:partition-number:*.

For example, **flash:2:** refers to the second partition in Flash memory.

URL Component Lengths

Table 2 lists the maximum lengths of the different URL components.

Table 2 Maximum Lengths of URL Components

Component	Length (Number of Characters)
Prefix	31
Username	15
Password	15
Hostname	31

Table 2 Maximum Lengths of URL Components

Component	Length (Number of Characters)
Directory	63
Filename	63

Using URLs in Commands

Depending on which command you are using, different file systems are available. Some file systems can only serve as a source for files, not a destination. For example, you cannot copy to another machine using Xmodem. Other operations, such as **format** and **erase**, are only supported by certain file systems on certain platforms.

The following sections provide hints for using URLs in commands:

- Determining File Systems Supporting a Command
- Using the Default File System
- Using Tab Completion
- Listing Files in a File System

Determining File Systems Supporting a Command

Use the context sensitive help to determine which file systems can be used for a particular command. In the following example, the context-sensitive help displays which file systems can be used as sources for the **copy** command. The output will vary based on the platform.

```
Router# copy ?
/erase      Erase destination file system.
bootflash:  Copy from bootflash: file system
flash:      Copy from flash: file system
ftp:        Copy from ftp: file system
null:       Copy from null: file system
nvram:      Copy from nvram: file system
rcp:        Copy from rcp: file system
system:     Copy from system: file system
tftp:       Copy from tftp: file system
```

Using the Default File System

For most commands, if no file system is specified, the file is assumed to be in the default directory, as specified by the **cd** command.

```
Router# pwd
slot0:
Router# dir
Directory of slot0:/

 1  -rw-   4720148   Aug 29 1997 17:49:36 hampton/nitro/c7200-j-mz
 2  -rw-   4767328   Oct 01 1997 18:42:53 c7200-js-mz
 5  -rw-     639    Oct 02 1997 12:09:32 foo
 7  -rw-     639    Oct 02 1997 12:37:13 the_time

20578304 bytes total (3104544 bytes free)
Router# cd nvram:
Router# dir
Directory of nvram:/
```

```
1  -rw-      2725      <no date>  startup-config
2  ----      0        <no date>  private-config
3  -rw-      2725      <no date>  underlying-config
```

```
129016 bytes total (126291 bytes free)
```

Using Tab Completion

You can use tab completion to reduce the number of characters you need to type for a command. Type the first few characters of the filename, and press the Tab key. If the characters are unique to a filename, the router will complete the filename for you. Continue entering the command as normal and press Return to execute the command.

In the following example, the router completes the filename `startup-config` because it is the only file in the `nvr` file system that starts with “s”:

```
Router# show file info nvrs<tab>
Router# show file info nvram:startup-config<Enter>
```

If you use tab completion without specifying any characters, the router uses the first file in the file system.

```
Router# show file info nvram:<tab>
Router# show file info nvram:private-config<Enter>
```

Listing Files in a File System

For many commands, you can get a listing of the files in a file system on the router by using the context-sensitive help. In the following example, the router lists the files in NVRAM:

```
Router# show file info nvram:?
nvram:private-config nvram:startup-config nvram:underlying-config
```

File System Management Tasks

This section describes the following basic tasks related to file system management. These tasks involve new or changed functionality related to IFS:

- General File System Management Tasks
- Flash Memory File System Management Tasks
- Remote File System Management Tasks
- NVRAM File System Management Tasks
- System File System Management Tasks

General File System Management Tasks

This section describes general tasks you can perform to use the different file systems.

List Available File Systems

Not all file systems are supported on every platform. To list the file systems available on your platform, complete the following task in EXEC mode:

Command	Purpose
show file systems	List the file systems available on your platform. This command also displays information about each file system.

Set the Default File System

You can specify the file system or directory that the system uses as the default file system. Setting the default file system allows you to omit an optional *filesystem:* argument from related commands. For all EXEC commands that have an optional *filesystem:* argument, the system uses the file system specified by the **cd** command when you omit the optional *filesystem:* argument. For example, the **dir** command contains an optional *filesystem:* argument and displays a list of files on the file system.

To specify a default file system, complete the following task in EXEC mode:

Command	Purpose
cd filesystem:	Set a default Flash memory device.

The following example sets the default file system to the Flash memory card inserted in slot 0:

```
cd slot0:
```

Display the Current Default File System

To display the current default file system, as specified by the **cd** command, complete the following task in EXEC mode:

Command	Purpose
pwd	Display the current file system.

The following example shows that the default file system is slot 0:

```
Router> pwd
slot0:
```

The following example uses the **cd** command to change the default file system to system and then uses the **pwd** command to verify that the default file system was changed:

```
Router> cd system:
Router> pwd
system:
```

Display Information about Files on a File System

You can view a list of the contents of a file system before manipulating its contents. For example, before copying a new configuration file to Flash memory, you may want to verify that the file system does not already contain a configuration file with the same name. Similarly, before copying a Flash configuration file to another location, you may want to verify its filename for use in another command.

To show display information about files on a file system, complete one of the following tasks in EXEC mode:

Command	Purpose
dir [/all] [filesystem:][filename]	Display a list of files on a file system.
show filesystem:	Display more information about each of the files on a file system.
show file information file-url	Display information about a specific file.
show file descriptors	Display a list of open file descriptors.

The following example compares the different commands used to display information about files for the PCMCIA card in the first slot. Notice that deleted files appear in the **dir /all** output but not in the **dir** output.

```

Router# dir slot0:
Directory of slot0:/

 1 -rw-    4720148   Aug 29 1997 17:49:36 hampton/nitro/c7200-j-mz
 2 -rw-    4767328   Oct 01 1997 18:42:53 c7200-js-mz
 5 -rw-      639    Oct 02 1997 12:09:32 foo
 7 -rw-      639    Oct 02 1997 12:37:13 the_time

20578304 bytes total (3104544 bytes free)
Router# dir /all slot0:
Directory of slot0:/

 1 -rw-    4720148   Aug 29 1997 17:49:36 hampton/nitro/c7200-j-mz
 2 -rw-    4767328   Oct 01 1997 18:42:53 c7200-js-mz
 3 -rw-    7982828   Oct 01 1997 18:48:14 [rsp-jsv-mz]
 4 -rw-      639    Oct 02 1997 12:09:17 [the_time]
 5 -rw-      639    Oct 02 1997 12:09:32 foo
 6 -rw-      639    Oct 02 1997 12:37:01 [the_time]
 7 -rw-      639    Oct 02 1997 12:37:13 the_time

20578304 bytes total (3104544 bytes free)
Router# show slot0:
-#- ED --type-- --crc--- -seek-- nlen -length- -----date/time----- name
 1  .. unknown 317FBA1B 4A0694 24 4720148 Aug 29 1997 17:49:36 hampton/nitz
 2  .. unknown 9237F3FF 92C574 11 4767328 Oct 01 1997 18:42:53 c7200-js-mz
 3  .D unknown 71AB01F1 10C94E0 10 7982828 Oct 01 1997 18:48:14 rsp-jsv-mz
 4  .D unknown 96DACD45 10C97E0 8 639 Oct 02 1997 12:09:17 the_time
 5  .. unknown 96DACD45 10C9AE0 3 639 Oct 02 1997 12:09:32 foo
 6  .D unknown 96DACD45 10C9DE0 8 639 Oct 02 1997 12:37:01 the_time
 7  .. unknown 96DACD45 10CA0E0 8 639 Oct 02 1997 12:37:13 the_time

3104544 bytes available (17473760 bytes used)

```

Display a File

To display the contents of any readable file, including a file on a remote file system, complete the following task in EXEC mode:

Command	Purpose
more [/ascii /binary /ebcdic] file-url	Display a file.

The following example displays the contents of a configuration file on a TFTP server:

```

Router# 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
!
...
end

```

Flash Memory File System Management Tasks

The methods used for erasing, deleting, and recovering files depend on the class of the Flash file system.

Flash Memory File System Types

Cisco platforms use one of three different Flash memory file system types. Some commands are supported on only one or two file system types. The command reference documentation notes commands that are not supported on all file system types.

Refer to Table 3 to determine which Flash memory file system type your platform uses.

Table 3 Flash Memory File System Types

Type	Platforms
Class A	Cisco 7000 family, C12000, LS1010
Class B	Cisco 1003, Cisco 1004, Cisco 1005, Cisco 2500 series, Cisco 3600 series, Cisco 4000 series, Cisco AS5200
Class C	Cisco MC3810, disk0 of SC3640

Class A Flash File Systems

On Class A Flash file systems, you can delete individual files using the **delete** command and later recover these files with the **undelete** command. The delete command marks the files as “deleted,” but the files still take up space in Flash memory. To permanently delete the files, use the **squeeze** command. The **squeeze** command removes all of the files marked “deleted” from the specified Flash memory device. These files can no longer be recovered. To erase all of the files on a Flash device, use the **format** command.

Delete Files on a Flash Device

When you no longer need a file on a Flash memory device, you can delete it. When you delete a file, the router simply marks the file as deleted, but it does not erase the file. This feature allows you to recover a “deleted” file, as discussed in the following section. You may want to recover a “deleted” image or configuration file if the new image or configuration file becomes corrupted.

To delete a file from a specified Flash device, complete the following task from EXEC mode:

Command	Purpose
delete [<i>filesystem:</i>] <i>filename</i>	Delete a file from a Flash memory device.

If you omit the device, the router uses the default device specified by the **cd** command.

If you attempt to delete the file specified by the CONFIG_FILE or BOOTLDR environment variable, the system prompts you to confirm the deletion. Also, if you attempt to delete the last valid system image specified in the BOOT environment variable, the system prompts you to confirm the deletion.

The following example deletes the file myconfig from a Flash memory card inserted in slot 0:

```
delete slot0:myconfig
```

Recover Deleted Files on a Flash Device

You can undelete a deleted file. For example, you may want to revert to a previous configuration file because the current one is corrupt.

To undelete a deleted file on a Flash memory device, complete the following tasks in EXEC mode:

Step	Command	Purpose
1	dir /all [<i>filesystem:</i>]	Determine the index of the deleted file.
2	undelete index [<i>filesystem:</i>]	Undelete a deleted file on a Flash memory device.

You must undelete a file by its index because you can have multiple deleted files with the same name. For example, the “deleted” list could contain multiple configuration files with the name router-config. You undelete by index to indicate which of the many router-config files from the list to undelete. Use the **dir** command with the **/all** option to learn the index number of the file you want to undelete.

You cannot undelete a file if a valid (undeleted) one with the same name exists. Instead, first delete the existing file and then undelete the file you want. For example, if you had an undeleted version of the router-config file and you wanted to use a previous, deleted version instead, you cannot simply undelete the previous version by index. You must first delete the existing router-config file and then undelete the previous router-config file by index. You can undelete a file as long as the file has not been permanently erased with the **squeeze** command. You can delete and undelete a file up to 15 times.

The following example recovers the deleted file whose index number is 1 to the Flash memory card inserted in slot 0:

```
undelete 1 slot0:
```

Permanently Delete Files on a Flash Device

When a Flash memory device is full, you may need to rearrange the files so that the space used by the “deleted” files can be reclaimed. To determine whether a Flash memory device is full, use the **dir** command.

To permanently delete files on a Flash memory device, complete the following task from privileged EXEC mode:

Command	Purpose
<code>squeeze filesystem:</code>	Permanently delete all files marked “deleted” in Flash memory.

When you issue the **squeeze** command, the router copies all valid files to the beginning of Flash memory and erases all files marked “deleted.” At this point, you cannot recover “deleted” files, and you can now write to the reclaimed Flash memory space.

Note The squeeze operation can take as long as several minutes because it can involve erasing and rewriting almost an entire Flash memory space.

Verify Flash

To recompute and verify the checksum of a file in Flash memory on a Class A Flash file system, use the **verify** command.

Class A Flash File System Examples

In the following example, the image `c7200-js-mz` is deleted and undeleted. Note that the deleted file does not appear in the output for the first **dir** command, but it appears in the output for the **dir /all** command.

```
Router# delete slot1:
Delete filename []? c7200-js-mz
Delete slot1:c7200-js-mz? [confirm]
Router# dir slot1:
Directory of slot1:/

No such file

20578304 bytes total (15754684 bytes free)
Router# dir /all slot1:
Directory of slot1:/

  1  -rw-      4823492   Dec 17 1997 13:21:53  [c7200-js-mz]

20578304 bytes total (15754684 bytes free)
Router# undelete 1 slot1:
Router# dir slot1:
Directory of slot1:/

  1  -rw-      4823492   Dec 17 1997 13:21:53  c7200-js-mz

20578304 bytes total (15754684 bytes free)
```

In the following example, the image is deleted. In order to reclaim the space taken up by the deleted file, the **squeeze** command is issued.

```
Router# delete slot1:c7200-js-mz
Delete filename [c7200-js-mz]?
Delete slot1:c7200-js-mz? [confirm]
Router# squeeze slot1:
All deleted files will be removed. Continue? [confirm]
Squeeze operation may take a while. Continue? [confirm]
```

```
Erasing squeeze log
Squeeze of slot1: complete
Router# dir /all slot1:
Directory of slot1:/

No such file

20578304 bytes total (20578304 bytes free)
```

Class B Flash File Systems

On Class B Flash file systems, you can delete individual files with the **delete** command. The **delete** command marks the file as “deleted.” The file is still present in Flash memory and takes up space. To recover the file, use the **undelete** command. To reclaim any space in Flash memory, you must erase the entire Flash file system with the **erase** command.

Delete Files on a Flash Device

When you no longer need a file on a Flash memory device, you can delete it. When you delete a file, the router simply marks the file as deleted, but it does not erase the file. This feature allows you to recover a “deleted” file, as discussed in the following section. You may want to recover a “deleted” image or configuration file if the new image or configuration file becomes corrupted.

To delete a file from a specified Flash device, complete the following task from EXEC mode:

Command	Purpose
delete [<i>filesystem:</i>] <i>filename</i>	Delete a file from a Flash memory device.

If you omit the device, the router uses the default device specified by the **cd** command.

The following example deletes the file `myconfig` from a Flash memory card inserted in slot 0:

```
delete slot0:myconfig
```

Recover Deleted Files on a Flash Device

You can undelete a deleted file. For example, you may want to revert to a previous configuration file because the current one is corrupt.

To undelete a deleted file on a Flash memory device, complete the following tasks in EXEC mode:

Step	Command	Purpose
1	dir /all [<i>filesystem:</i>]	Determine the index of the deleted file.
2	undelete <i>index</i> [<i>filesystem:</i>]	Undelete a deleted file on a Flash memory device.

You must undelete a file by its index because you can have multiple deleted files with the same name. For example, the “deleted” list could contain multiple configuration files with the name `router-config`. You undelete by index to indicate which of the many `router-config` files from the list to undelete. Use the **dir** command with the **/all** option to learn the index number of the file you want to undelete.

You cannot undelete a file if a valid (undeleted) one with the same name exists. Instead, first delete the existing file and then undelete the file you want. For example, if you had an undeleted version of the `router-config` file and you wanted to use a previous, deleted version instead, you cannot simply undelete the previous version by index. You must first delete the existing `router-config` file and then

undelete the previous router-config file by index. You can undelete a file as long as the file system has not been permanently erased with the **erase** command. You can delete and undelete a file up to 15 times.

The following example recovers the deleted file whose index number is 1 to the Flash memory card inserted in slot 0:

```
undelete 1 slot0:
```

Erase Flash Memory

In order to reclaim any space taken up by files in Flash memory, you must erase the entire file system using the **erase flash:** or **erase bootflash:** commands. These commands reclaim all of the space in flash memory, erasing all files, deleted or not, in the process. Once erased, these files cannot be recovered. Before erasing Flash memory, save any files you wish to keep in another location (an FTP server, for example). Copy the files back to Flash memory after you have erased the device.

To erase a Flash device, complete the following task from EXEC mode:

Command	Purpose
erase filesystem:	Erase the Flash file system.

Erase a File System Example

The following example erases all files in the second partition in Flash memory:

```
Router# erase flash:2

System flash directory, partition 2:
File Length Name/status
  1 1711088 dirt/gate/c1600-i-mz
[1711152 bytes used, 15066064 available, 16777216 total]

Erase flash device, partition 2? [confirm]
Are you sure? [yes/no]: yes
Erasing device... eeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeee ...erased
```

Verify Flash

To recompute and verify the checksum of a file in Flash memory on a Class B Flash file system, use the **verify** command.

Class C Flash File Systems

On Class C Flash memory file systems, you can delete individual files with the **delete** command. Files cannot be reclaimed once they have been deleted. Instead, the Flash file system space is reclaimed dynamically. To erase all of the files in Flash, use the **format** command.

Delete Files on a Flash Device

When you no longer need a file on a Flash memory device, you can delete it. When you delete a file on a Class C file system, the file is deleted permanently. The router reclaims the space dynamically.

To delete a file from a specified Flash device, complete the following task in EXEC mode:

Command	Purpose
<code>delete [filesystem:]filename</code>	Delete a file from a Flash memory device.

If you omit the device, the router uses the default device specified by the **cd** command.

If you attempt to delete the file specified by the `CONFIG_FILE` or `BOOTLDR` environment variable, the system prompts you to confirm the deletion. Also, if you attempt to delete the last valid system image specified in the `BOOT` environment variable, the system prompts you to confirm the deletion.

The following example permanently deletes the `myconfig` file from a Flash memory card inserted in slot 0:

```
delete slot0:myconfig
```

Format Flash

To format a Class C Flash file system, complete the following task in EXEC mode:

Command	Purpose
<code>format filesystem</code>	Format Flash.

If you format a Flash device, all of the files are erased and cannot be recovered.

Create and Remove Directories

On Class C Flash file systems, you can create a new directory with the **mkdir** command. To remove a directory from a Flash file system, use the **rmdir** command.

On Class C Flash file systems, you can rename a file using the **rename** command.

Check and Verify Flash

On Class C Flash file systems, you can check a file system for damage and repair any problems using the **fsck** command.

Remote File System Management Tasks

On remote file systems (file systems on FTP, rcp, or TFTP servers) you can perform the following tasks:

- View the contents of a file with the **more** command.
- Copy files to or from the router using the **copy** command.
- Show information about a file using the **show file information** command.

Note You cannot delete files on remote systems.

NVRAM File System Management Tasks

On most platforms, NVRAM contains the startup configuration. On Class A Flash file system platforms, the CONFIG_FILE environment variable specifies the location of the startup configuration. However, the file URL nvram:startup-config always specifies the startup configuration, regardless of the CONFIG_FILE environment variable.

You can view the startup-config (with the **more nvram:startup-config** command), replace the startup config with a new configuration file (with the **copy source-url nvram:startup-config** command), save the startup configuration to another location (with the **copy nvram:startup-config destination-url** command), and erase the contents of NVRAM (with the **erase nvram:** command). The **erase nvram:** command also deletes the startup configuration if another location is specified by the CONFIG_FILE variable.

This example displays the startup configuration:

```

nnm3640-2# more nvram:startup-config
Using 2279 out of 129016 bytes
!
! Last configuration change at 10:57:25 PST Wed Apr 22 1998
! NVRAM config last updated at 10:57:27 PST Wed Apr 22 1998
!
version 11.3
service timestamps log datetime localtime
service linenumbers
service udp-small-servers
service pt-vty-logging
...
end

```

The following example displays the contents of the NVRAM file system on a Class A Flash file system platform. The file named startup-config is the current startup configuration file, in physical NVRAM or in Flash memory. If the file is located in a Flash memory file system, this entry is a symbolic link to the actual file. The file named underlying-config is always the NVRAM version of the configuration.

```

Router# dir nvram:
Directory of nvram:/

   1  -rw-          2703          <no date>  startup-config
   2  ----           5          <no date>  private-config
   3  -rw-          2703          <no date>  underlying-config

129016 bytes total (126313 bytes free)

```

System File System Management Tasks

The system file system contains the system memory and the current running configuration. You can view the current configuration (with the **more system:running-config** command), save the current configuration to some other location (with the **copy system:running-config destination-url** command), or add configuration commands to the current configuration (with the **copy source-url system:running-config** command).

The following example changes to the system file system, views the contents of the file system, and displays the running configuration:

```

nnm3640-2# cd system:
nnm3640-2# dir
Directory of system:/

  2  dr-x          0          <no date>  memory

```

```

1 -rw-          0          <no date>  running-config

No space information available
nm3640-2# more system:running-config
!
! No configuration change since last restart
!
version 11.3
service timestamps log datetime localtime
service linenummer
service udp-small-servers
service pt-vty-logging
!
...
end

```

On some platforms, the system file system contains microcode in its ucode directory.

```

Router# dir system:/ucode
Directory of system:/ucode/

 21 -r--          22900          <no date>  aip20-13
 18 -r--          32724          <no date>  eip20-3
 25 -r--          123130         <no date>  feip20-6
 19 -r--          25610          <no date>  fip20-1
 22 -r--           7742          <no date>  fsip20-7
 23 -r--          17130          <no date>  hip20-1
 24 -r--          36450          <no date>  mip22-2
 29 -r--          154752         <no date>  posip20-0
 28 -r--          704688         <no date>  rsp220-0
 20 -r--           33529         <no date>  trip20-1
 26 -r--          939130         <no date>  vip22-20
 27 -r--          1107862        <no date>  vip222-20

No space information available

```

Command Reference

Any command that specifies a file or file system has been changed by this feature. This document does not describe all of the changed commands.

This section describes the following modified commands:

- **cd**
- **delete**
- **dir**
- **erase**
- **file prompt**
- **format**
- **fsck**
- **kerberos srvtab remote**
- **mkdir**
- **more**
- **pwd**

- **rename**
- **rmdir**
- **show file descriptors**
- **show file information**
- **show file systems**
- **squeeze**
- **tftp-server**
- **undelete**
- **verify**

cd

To change the default directory or file system, use the **cd** EXEC command.

```
cd [filesystem:]
```

Syntax Description

filesystem: (Optional) URL of the directory or file system followed by a colon.

Default

The initial default file system is **flash:**. For platforms that do not have a physical device named **flash:**, the keyword **flash:** is aliased to the default Flash device.

If you do not specify a directory on a file system, the default is the root directory on that file system.

Command Mode

EXEC

Usage Guidelines

This command first appeared in Cisco IOS Release 11.0.

For all EXEC commands that have an optional *filesystem* argument, the system uses the file system specified by the **cd** command when you omit the optional *filesystem* argument. For example, the **dir** command, which displays a list of files on a file system, contain an optional *filesystem* argument. When you omit this argument, the system lists the files on the file system specified by the **cd** command.

Example

The following example sets the default file system to the Flash memory card inserted in the slot 0:

```
Router# pwd  
bootflash:/  
Router# cd slot0:  
Router# pwd  
slot0:/
```

Related Commands

You can use the master indexes or search online to find documentation of related commands.

```
copy  
delete  
dir  
pwd  
show (Flash file system)  
undelete
```

delete

To delete a file on a Flash memory device, use the **delete** EXEC command.

delete *flash-url*

Syntax Description

flash-url URL of the file to be deleted.

Command Mode

EXEC

Usage Guidelines

This command first appeared in Cisco IOS Release 11.0.

When you delete a file, the software simply marks the file as deleted, but it does not erase the file. This feature allows you to later recover a “deleted” file using the **undelete** command. You can delete and undelete a file up to 15 times. To permanently delete all files marked “deleted” on a Flash memory device, use the **squeeze** command.

If you attempt to delete the configuration file or image specified by the CONFIG_FILE or BOOTLDR environment variable, the system prompts you to confirm the deletion. Also, if you attempt to delete the last valid system image specified in the BOOT environment variable, the system prompts you to confirm the deletion.

Example

The following example deletes the file named test from the Flash card inserted in slot 0:

```
Router# delete slot0:test  
Delete slot0:test? [confirm]
```

Related Commands

You can use the master indexes or search online to find documentation of related commands.

cd
dir
show bootvar
squeeze
undelete

dir

To display a list of files on a file system, use the **dir** EXEC command.

dir [/all] [filesystem: |file-url]

Syntax Description

/all	(Optional) Lists deleted files, undeleted files, and files with errors.
<i>filesystem:</i>	(Optional) File system or directory containing the file(s) to list followed by a colon.
<i>file-url</i>	(Optional) Name of the file(s) to display on a specified device. The files can be of any type. You can use wildcards in the filename. A wildcard character (*) matches all patterns. Strings after a wildcard are ignored.

Default

The default file system is specified by the **cd** command. When you omit the **/all** keyword, the Cisco IOS software displays only undeleted files.

Command Mode

EXEC

Usage Guidelines

This command first appeared in Cisco IOS Release 11.0.

Use the **show (Flash file system)** command to display more detail about the files in a particular file system.

Sample Displays

The following is sample output from the **dir** command:

```
Router# dir slot0:
Directory of slot0:/

 1 -rw-      4720148   Aug 29 1997 17:49:36 hampton/nitro/c7200-j-mz
 2 -rw-      4767328   Oct 01 1997 18:42:53 c7200-js-mz
 5 -rw-         639   Oct 02 1997 12:09:32 foo
 7 -rw-         639   Oct 02 1997 12:37:13 the_time

20578304 bytes total (3104544 bytes free)
Router# dir /all slot0:
Directory of slot0:/

 1 -rw-      4720148   Aug 29 1997 17:49:36 hampton/nitro/c7200-j-mz
 2 -rw-      4767328   Oct 01 1997 18:42:53 c7200-js-mz
 3 -rw-      7982828   Oct 01 1997 18:48:14 [rsp-jsv-mz]
 4 -rw-         639   Oct 02 1997 12:09:17 [the_time]
 5 -rw-         639   Oct 02 1997 12:09:32 foo
 6 -rw-         639   Oct 02 1997 12:37:01 [the_time]
 7 -rw-         639   Oct 02 1997 12:37:13 the_time
```

Table 4 described the fields shown in this output.

Table 4 Dir Field Descriptions

Field	Description
1	Index number of the file.
-rw-	Permissions. The file can be any or all of the following: <ul style="list-style-type: none">• d—directory• r—readable• w—writable• x—executable
4720148	Size of the file.
Aug 29 1997 17:49:36	Last modification date.
hampton/nitro/c7200-j-mz	Filename. Deleted files are indicated by square brackets around the filename.

Related Commands

You can use the master indexes or search online to find documentation of related commands.

cd
delete
undelete

erase

To erase a file system, use the **erase EXEC** command. The **erase nvram:** command replaces the **write erase** command and the **erase startup-config** command.

erase filesystem:

Syntax Description

filesystem: File system name followed by a colon.

Command Mode

EXEC

Usage Guidelines

This command first appeared in Cisco IOS Release 11.0.

When a file system is erased, none of the files in the file system can be recovered.

The **erase** command can be used on Class B Flash file systems only. To reclaim space on Flash file systems after deleting files using the **delete** command, you must use the **erase** command. This command erases all of the files in the Flash file system.

Class A Flash file systems cannot be erased. You can delete individual files using the **delete** command and then reclaim the space using the **squeeze** command. You can also use the **format** command to format the Flash file system.

On Class C Flash file systems, space is dynamically reclaimed when you use the **delete** command. You can also use the **format** command to format the Flash file system.

The **erase nvram:** command erases NVRAM. On Class A file system platforms, if the CONFIG_FILE variable specifies a file in Flash memory, the specified file will be marked “deleted.”

Examples

The following example erases the NVRAM, including the startup configuration located there:

```
erase nvram:
```

The following example erases all of partition 2 in internal Flash memory:

```
Router# erase flash:2

System flash directory, partition 2:
File Length Name/status
  1  1711088 dirt/images/c3600-i-mz
[1711152 bytes used, 15066064 available, 16777216 total]

Erase flash device, partition 2? [confirm]
Are you sure? [yes/no]: yes
Erasing device... eeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeee ..erased
```

The following example erases Flash memory when Flash is partitioned, but no partition is specified in the command:

```
Router# erase flash:

System flash partition information:
Partition  Size      Used    Free    Bank-Size  State      Copy-Mode
   1         4096K   2048K   2048K   2048K      Read Only  RXBOOT-FLH
   2         4096K   2048K   2048K   2048K      Read/Write Direct

[Type ?<no> for partition directory; ? for full directory; q to abort]
Which partition? [default = 2]
```

The system will prompt only if there are two or more read/write partitions. If the partition entered is not valid or is the read-only partition, the process terminates. You can enter a partition number, a question mark (?) for a directory display of all partitions, or a question mark and a number (?*number*) for directory display of a particular partition. The default is the first read/write partition.

```
System flash directory, partition 2:
File Length Name/status
  1  3459720 master/igs-bfpx.100-4.3
[3459784 bytes used, 734520 available, 4194304 total]

Erase flash device, partition 2? [confirm] <Return>
```

Related Commands

You can use the master indexes or search online to find documentation of related commands.

```
boot config
delete
more nvram:startup-config
show bootvar
undelete
```

file prompt

To specify the level of prompting, use the **file prompt** global configuration command.

```
file prompt {alert | noisy | quiet}
```

Syntax Description

alert	Prompts only for destructive file operations. This is the default.
noisy	Confirms all file operation parameters.
quiet	Seldom prompts for file operations.

Default

alert

Command Mode

Global configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 11.0.

Use this command to change the amount of confirmation needed for different file operations.

This command affects only prompts for confirmation of operations. The router will always prompt for missing information.

Example

The following example configures confirmation prompting for all file operations:

```
file prompt noisy
```

format

To format a Class A or Class C Flash file system, use the **format** EXEC command.

format *filesystem1* (Class C Flash file systems)

format [**spare** *spare-number*].*filesystem1* [[*filesystem2*][*monlib-filename*]] (Class A Flash file system)



Caution The following formatting procedure erases all information in the Flash memory. To prevent the loss of important data, proceed carefully.

Syntax Description

spare	(Optional) Reserves spare sectors as specified by the <i>spare-number</i> argument when formatting Flash memory.
<i>spare-number</i>	(Optional) Number of the spare sectors to reserve on formatted Flash memory. Valid values are 0 to 16. The default value is zero.
<i>filesystem1</i>	Flash memory to format.
<i>filesystem2</i>	(Optional) File system containing the monlib file to use for formatting <i>filesystem1</i> .
<i>monlib-filename</i>	(Optional) Name of the ROM monitor library file (monlib file) to use for formatting <i>filesystem1</i> . The default monlib file is the one bundled with the system software. When used with HSA and you do not specify the <i>monlib-filename</i> , the system takes ROM monitor library file from the slave image bundle. If you specify the <i>monlib-filename</i> , the system assumes that the files reside on the slave devices.

Default

The default monlib file is the one bundled with the system software.

Command Mode

EXEC

Usage Guidelines

This command first appeared in Cisco IOS Release 11.0.

Use this command to format Class A or C Flash memory file systems.

In some cases, you might need to insert a new PCMCIA Flash memory card and load images or backup configuration files onto it. Before you can use a new Flash memory card, you must format it.

Flash memory cards have sectors that can fail. You can reserve certain Flash memory sectors as “spares” for use when other sectors fail. Use the **format** command to specify between 0 and 16 sectors as spares. If you reserve a small number of spare sectors for emergencies, you do not waste space because you can use most of the Flash memory card. If you specify zero spare sectors and some sectors fail, you must reformat the Flash memory card and thereby erase all existing data.

The monlib file is the ROM monitor library. The ROM monitor uses the monlib file to access files in the Flash file system. The Cisco IOS system software contains a monlib file.

In the command syntax, *filesystem1* is the device to format and *filesystem2* contains the monlib file to use. When you omit the `[[filesystem2][monlib-filename]]` argument, the system formats *filesystem1* using the monlib that is bundled with the system software. When you omit *filesystem2* from the `[[filesystem2][monlib-filename]]` argument, the system formats *filesystem1* using the named monlib file from the device specified by the **cd** command. When you omit *monlib-filename* from the `[[filesystem2][monlib-filename]]` argument, the system formats *filesystem1* using *filesystem2*'s monlib file. When you specify the whole `[[filesystem2:][monlib-filename]]` argument, the system formats *filesystem1* using the specified monlib file from the specified device. Note that you can specify *filesystem1*'s own monlib file in this argument. When the system cannot find a monlib file, the system terminates the formatting process.



Caution You can read from or write to Flash memory cards formatted for Cisco 7000 series Route Processor (RP) cards in your Cisco 7200 series and Cisco 7500 series, but you cannot boot the Cisco 7200 series and Cisco 7500 series from a Flash memory card that is formatted for the Cisco 7000 series. Similarly, you can read from or write to Flash memory cards formatted for the Cisco 7200 series and Cisco 7500 series in your Cisco 7000 series, but you cannot boot the Cisco 7000 series from a Flash memory card that is formatted for the Cisco 7200 series and Cisco 7500 series.

Example

The following example formats a Flash memory card inserted in slot 0:

```
Router# format slot0:
Running config file on this device, proceed? [confirm]y
All sectors will be erased, proceed? [confirm]y
Enter volume id (up to 31 characters): <Return>
Formatting sector 1 (erasing)
Format device slot0 completed
```

When the console returns to the EXEC prompt, the new Flash memory card is successfully formatted and ready for use.

Related Commands

You can use the master indexes or search online to find documentation of related commands.

copy
delete
dir
show (Flash file system)
squeeze
undelete

fsck

To check a Class C Flash file system for damage and repair any problems, use the **fsck** EXEC command.

```
fsck [/nocrc] filesystem
```

Syntax Description

/nocrc	(Optional) Skips CRC checks.
<i>filesystem</i>	File system to check.

Command Mode

EXEC

Usage Guidelines

This command first appeared in Cisco IOS Release 11.3 AA.

This command is only valid on Class C Flash file systems.

Example

The following example checks the flash: file system:

```
Router# fsck flash:  
Fsk operation may take a while. Continue? [confirm]  
flashfs[4]: 0 files, 2 directories  
flashfs[4]: 0 orphaned files, 0 orphaned directories  
flashfs[4]: Total bytes: 8128000  
flashfs[4]: Bytes used: 1024  
flashfs[4]: Bytes available: 8126976  
flashfs[4]: flashfs fsck took 23 seconds.  
Fsk of flash: complete
```

kerberos srvtab remote

To retrieve a krb5 SRVTAB file from the specified host, use the **kerberos srvtab remote** global configuration command.

```
kerberos srvtab remote file-url
```

Syntax Description

file-url TFTP URL of the SRVTAB file on the specified host.

Command Mode

Global configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 11.2.

When you use the **kerberos srvtab remote** command to copy the SRVTAB file from the remote host (generally the KDC), it parses the information in this file and stores it in the router's running configuration in the **kerberos srvtab entry** format. The key for each SRVTAB entry is encrypted with the private Data Encryption Standard (DES) key if one is defined on the router. To ensure that the SRVTAB is available (that is, that it does not need to be acquired from the KDC) when you reboot the router, use the **copy system:running-config nvram:startup-config** configuration command to save the router's running configuration.

Example

The following example copies the SRVTAB file (scooter.cisco.com-new-srvtab) residing on bucket.cisco.com to the router:

```
kerberos srvtab remote tftp://bucket.cisco.com/scooter.cisco.com-new-srvtab
```

Related Commands

kerberos srvtab entry
key config-key

mkdir

To create a new directory in a Class C Flash file system, use the **mkdir** EXEC command.

```
mkdir [directory]
```

Syntax Description

directory (Optional) Name of the directory to create.

Command Mode

EXEC

Usage Guidelines

This command first appeared in Cisco IOS Release 11.3 AA.

This command is only valid on Class C Flash file systems.

If you do not specify the directory name in the command line, the router prompts you for it.

Examples

The following example creates a directory called *newdir*:

```
Router# mkdir newdir
Mkdir file name [newdir]?
Created dir flash:newdir
Router# dir
Directory of flash:

  2  drwx          0   Mar 13 1993 13:16:21  newdir

8128000 bytes total (8126976 bytes free)
```

Related Commands

You can use the master indexes or search online to find documentation of related commands.

dir
rmdir

more

To display a file, use the **more** EXEC command. The **more nvram:startup-config** command replaces the **show startup-config** command and the **show configuration** command. The **more system:running-config** command replaces the **show running-config** command and the **write terminal** command.

```
more [/ascii | /binary | /ebcdic] file-url
```

Syntax Description

/ascii	(Optional) Displays a binary file in ASCII format.
/binary	(Optional) Displays a file in hex/text format.
/ebcdic	(Optional) Displays a binary file in EBCDIC format.
<i>file-url</i>	URL of the file to display.

Command Mode

EXEC

Usage Guidelines

This command first appeared in Cisco IOS Release 11.3 AA.

You can use this command to display configuration files:

- The **more nvram:startup-config** command displays the startup configuration file contained in NVRAM or specified by the CONFIG_FILE environment variable. The Cisco IOS software informs you whether the displayed configuration is a complete configuration or a distilled version. A distilled configuration is one that does not contain access lists.
- The **more system:running-config** command displays the running configuration.

These commands show the version number of the software used when you last changed the configuration file.

You can also display files on remote systems using the **more** command.

Sample Displays

The following partial sample output displays the configuration file named startup-config in NVRAM:

```
Router# more nvram:startup-config
!  
! No configuration change since last restart  
! NVRAM config last updated at 02:03:26 PDT Thu Oct 2 1997  
!  
version 11.3  
service timestamps debug uptime  
service timestamps log uptime  
service password-encryption  
service udp-small-servers  
service tcp-small-servers  
...
```

```
end
```

The following is partial sample output from the **more nvram:startup-config** command when the configuration file has been compressed:

```
rose# more nvram:startup-config

Using 21542 out of 65536 bytes, uncompressed size = 142085 bytes
!
version 11.3
service compress-config
!
hostname rose
!
...
```

The following partial sample output displays the running configuration:

```
Router2# more system:running-config
Building configuration...

Current configuration:
!
version 11.2
no service udp-small-servers
no service tcp-small-servers
!
hostname Router2
!
...
!
end
```

Related Commands

You can use the master indexes or search online to find documentation of related commands.

boot config
configure terminal
copy system:running-config nvram:startup-config
service compress-config
show bootvar

pwd

To show the current setting of the **cd** command, use the **pwd** EXEC command.

pwd

Syntax Description

This command has no arguments or keywords.

Command Mode

EXEC

Usage Guidelines

This command first appeared in Cisco IOS Release 11.0.

Use the **pwd** command to show what directory or file system is specified as the default by the **cd** command. For all EXEC commands that have an optional *filesystem* argument, the system uses the file system specified by the **cd** command when you omit the optional *filesystem* argument.

For example, the **dir** command contains an optional *filesystem* argument and displays a list of files on a particular file system. When you omit this *filesystem* argument, the system shows a list of the files on the file system specified by the **cd** command.

Examples

The following example shows that the present working file system specified by the **cd** command is slot 0:

```
Router> pwd
slot0:/
```

The following example uses the **cd** command to change the present file system to slot 1 and then uses the **pwd** command to display that present working file system:

```
Router> cd slot1:
Router> pwd
slot1:/
```

Related Commands

You can use the master indexes or search online to find documentation of related commands.

cd
dir

rename

To rename a file in a Class C Flash file system, use the rename EXEC command.

```
rename url1 url2
```

Syntax Description

url1 Original path name.

url2 New path name.

Command Mode

EXEC

Usage Guidelines

This command first appeared in Cisco IOS Release 11.3 AA.

This command is only valid on Class C Flash file systems.

Examples

In the following example, the file named Karen.1 is renamed test:

```
Router# dir
Directory of disk0:/Karen.dir/

 0  -rw-          0  Jan 21 1998 09:51:29  Karen.1
 0  -rw-          0  Jan 21 1998 09:51:29  Karen.2
 0  -rw-          0  Jan 21 1998 09:51:29  Karen.3
 0  -rw-          0  Jan 21 1998 09:51:31  Karen.4
243 -rw-         165  Jan 21 1998 09:53:17  Karen.cur

340492288 bytes total (328400896 bytes free)
Router# rename disk0:Karen.dir/Karen.1 disk0:Karen.dir/test
Router# dir
Directory of disk0:/Karen.dir/

 0  -rw-          0  Jan 21 1998 09:51:29  Karen.2
 0  -rw-          0  Jan 21 1998 09:51:29  Karen.3
 0  -rw-          0  Jan 21 1998 09:51:31  Karen.4
243 -rw-         165  Jan 21 1998 09:53:17  Karen.cur
 0  -rw-          0  Apr 24 1998 09:49:19  test

340492288 bytes total (328384512 bytes free)
```

rmdir

To remove an existing directory in a Class C Flash file system, use the **rmdir** EXEC command.

```
rmdir [directory]
```

Syntax Description

directory (Optional) Directory to delete.

Command Mode

EXEC

Usage Guidelines

This command first appeared in Cisco IOS Release 11.3 AA.

This command is only valid on Class C Flash file systems.

If you do not specify the directory in the command line, the router prompts you for it.

Examples

The following example deletes the directory named newdir:

```
Router# dir
Directory of flash:

 2  drwx          0  Mar 13 1993 13:16:21  newdir

8128000 bytes total (8126976 bytes free)
Router# rmdir newdir
Rmdir file name [newdir]?
Delete flash:newdir? [confirm]
Removed dir flash:newdir
Router# dir
Directory of flash:

No files in directory

8128000 bytes total (8126976 bytes free)
```

Related Commands

You can use the master indexes or search online to find documentation of related commands.

dir
mkdir

show file descriptors

To display a list of open file descriptors, use the **show file descriptors** EXEC command.

show file descriptors

Syntax Description

This command has no arguments or keywords.

Command Mode

EXEC

Usage Guidelines

This command first appeared in Cisco IOS Release 11.3 AA.

File descriptors are the internal representations of open files. You can use this command to see if another user has a file open.

Sample Display

The following is sample output from the **show file descriptors** command:

```
Router# show file descriptors

File Descriptors:

  FD  Position  Open  PID  Path
  --  -
  0   187392    0001   2   tftp://dirt/hampton/c4000-i-m.a
  1   184320    030A   2   flash:c4000-i-m.a
```

Table 5 describes the fields show in this display.

Table 5 Show File Descriptors Field Descriptions

Field	Description
FD	File descriptor. The file descriptor is a small integer used to specify the file once it has been opened.
Position	Byte offset from the start of the file.
Open	Flags supplied when opening the file.
PID	Process ID of the process that opened the file.
Path	Location of the file.

show file information

To display information about a file, use the **show file information** EXEC command.

show file information *file-url*

Syntax Description

file-url URL of the file to display.

Command Mode

EXEC

Usage Guidelines

This command first appeared in Cisco IOS Release 11.3 AA.

Sample Display

The following is sample output from the **show file information** command:

```
Router# show file information tftp://dirt/hampton/c2500-j-1.a
tftp://dirt/hampton/c2500-j-1.a:
  type is image (a.out) [relocatable, run from flash]
  file size is 8624596 bytes, run size is 9044940 bytes [8512316+112248+420344]
  Foreign image

Router# show file information slot0:c7200-js-mz
slot0:c7200-js-mz:
  type is image (elf) []
  file size is 4770316 bytes, run size is 4935324 bytes
  Runnable image, entry point 0x80008000, run from ram

Router1# show file information nvram:startup-config
nvram:startup-config:
  type is ascii text
```

Table 6 describes the possible file types.

Table 6 **Possible File Types**

Field	Description
image (a.out)	Runnable image in a.out format.
image (elf)	Runnable image in elf format.
ascii text	Configuration file or other text file.
coff	Runnable image in coff format.
ebcdic	Text generated on an IBM mainframe.
lzw compression	Lzw compressed file.
tar	Text archive file used by the CIP.

show file systems

To list available file systems, use the **show file systems** EXEC command.

show file systems

Syntax Description

This command has no arguments or keywords.

Command Mode

EXEC

Usage Guidelines

This command first appeared in Cisco IOS Release 11.3 AA.

Use this command to learn the names of the file systems your router supports.

Sample Display

The following is sample output from the **show file systems** command:

```
Router# show file systems

File Systems:

      Size(b)      Free(b)      Type  Flags  Prefixes
      -           -           opaque  rw    null:
      -           -           opaque  rw    system:
      -           -           opaque  ro    xmodem:
      -           -           opaque  ro    ymodem:
      -           -           network  rw    tftp:
      -           -           network  rw    rcp:
      -           -           network  rw    ftp:
* 4194304      4190616      flash   rw    flash:
      131066      129185      nvram   rw    nvram:
      -           -           opaque  wo    lex:
```

Table 7 describes the fields shown in this display.

Table 7 Show File Systems Field Descriptions

Type	Description
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. See Table 8.
Flags	Permissions for file system. See Table 9.
Prefixes	Prefix for file system.

Table 8 Possible File System Types

Type	Description
disk	The file system is for a rotating medium.
flash	The file system is for a Flash memory device.
network	The file system is a network file system (TFTP, rcp, FTP, etc.)
nvrnram	The file system is for an NVRAM device.
opaque	The file system is a locally generated “pseudo” file system (e.g., the “system”) or a download interface, such as brimux.
rom	The file system is for a ROM or EPROM device.
tty	The file system is for a collection of terminal devices.
unknown	The file system is of unknown type.

Table 9 Possible File System Flags

Flag	Description
ro	The file system is Read Only.
rw	The file system is Write Only.
wo	The file system is Read/Write.

squeeze

To permanently delete Flash files by squeezing a Class A Flash file system, use the **squeeze** EXEC command.

squeeze *filesystem*:

Syntax Description

filesystem: Flash file system followed by a colon.

Command Mode

EXEC

Usage Guidelines

This command first appeared in Cisco IOS Release 11.1.

When Flash memory is full, you might need to rearrange the files so that the space used by the files marked “deleted” can be reclaimed. When you issue the **squeeze** command, the router copies all valid files to the beginning of Flash memory and erases all files marked “deleted.” At this point, you cannot recover “deleted” files and you can write to the reclaimed Flash memory space.

In addition to removing deleted files, the squeeze command removes any files that the system has marked as error. An error file is created when a file write fails (for example, the device is full). To remove error files, you must use the **squeeze** command.

Note The squeeze operation might take as long as several minutes because it can involve erasing and rewriting almost an entire Flash memory space.

Example

The following example instructs the router to permanently erase the files marked “deleted” from the Flash memory card inserted in slot 1:

```
squeeze slot1:
```

Related Commands

You can use the master indexes or search online to find documentation of related commands.

delete
dir
undelete

tftp-server

To configure a router or a Flash memory device on the router as a TFTP server, use the **tftp-server** global configuration command. This command replaces the **tftp-server system** command. To remove a previously defined filename, use the **no** form of this command with the appropriate filename.

```
tftp-server {file-url | rom} [alias alt-filename] [access-list-number]  
no tftp-server {file-url | rom}
```

Syntax Description

<i>file-url</i>	Location of the file that the TFTP server uses in answering TFTP read requests.
rom	Specifies TFTP service of a file in ROM.
alias	(Optional) Specifies an alternate name for the file that the TFTP server uses in answering TFTP read requests.
<i>alt-filename</i>	(Optional) Alternate name of the file that the TFTP server uses in answering TFTP read requests. A client of the TFTP server can use this alternate name in its read requests.
<i>access-list-number</i>	(Optional) Basic IP access list number. Valid values are 0 to 99.

Default

Disabled

Command Mode

Global configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 11.0.

You can specify multiple filenames by repeating the **tftp-server** command. The system sends a copy of the system image contained in ROM or one of the system images contained in Flash memory to any client that issues a TFTP read request with this filename. On systems that contain a complete image in ROM, the system sends the ROM image if the requested filename is not found in Flash memory.

Images that run from ROM cannot be loaded over the network. Therefore, it does not make sense to use TFTP to offer the ROMs on these images.

On the Cisco 7000 family, the system sends a copy of the file contained on one of the Flash memory devices to any client that issues a TFTP read request with its filename.

Examples

In the following example, the system uses TFTP to send a copy of the version-10.3 file located in Flash memory in response to a TFTP read request for that file. The requesting host is checked against access list 22.

```
tftp-server flash:version-10.3 22
```

In the following example, the system uses TFTP to send a copy of the ROM image gs3-k.101 in response to a TFTP read request for the gs3-k.101 file:

```
tftp-server rom alias gs3-k.101
```

In the following example, the system uses TFTP to send a copy of the version-11.0 file in response to a TFTP read request for that file. The file is located on the Flash memory card inserted in slot 0.

```
tftp-server slot0:version-11.0
```

The following example enables a router to operate as a TFTP server. The source file c3640-i-mz is in the second partition of internal Flash memory:

```
tftp-server flash:2:dirt/gate/c3640-i-mz
```

Related Commands

access-list

undelete

To recover a file marked “deleted” on a Class A or Class B Flash file system, use the **undelete** EXEC command.

```
undelete index [filesystem:]
```

Syntax Description

<i>index</i>	Number that indexes the file in the dir command output.
<i>filesystem:</i>	(Optional) File system containing the file to undelete.

Default

The default file system is the one specified by the **cd** command.

Command Mode

EXEC

Usage Guidelines

This command first appeared in Cisco IOS Release 11.0.

For Class A and B Flash file systems, when you delete a file, the Cisco IOS software simply marks the file as deleted, but it does not erase the file. This command allows you to recover a “deleted” file on a specified Flash memory device. You must undelete a file by its index because you could have multiple deleted files with the same name. For example, the “deleted” list could contain multiple configuration files with the name router-config. You undelete by index to indicate which of the many router-config files from the list to undelete. Use the **dir** command to learn the index number of the file you want to undelete.

You cannot undelete a file if a valid (undeleted) one with the same name exists. Instead, you first delete the existing file and then undelete the file you want. For example, if you had an undeleted version of the router-config file and you wanted to use a previous, deleted version instead, you could not simply undelete the previous version by index. You would first delete the existing router-config file and then undelete the previous router-config file by index. You can delete and undelete a file up to 15 times.

On Class A Flash file systems, if you try to recover the configuration file pointed to by the CONFIG_FILE environment variable, the system prompts you to confirm recovery of the file. This prompt reminds you that the CONFIG_FILE environment variable points to an undeleted file. To permanently delete all files marked “deleted” on a Flash memory device, use the **squeeze** command.

On Class B Flash file systems, you must use the **erase** command to recover any space taken up by deleted files.

Example

The following example recovers the deleted file whose index number is 1 to the Flash memory card inserted in slot 0:

```
undelete 1 slot0:
```

Related Commands

You can use the master indexes or search online to find documentation of related commands.

delete

dir

squeeze

verify

To verify the checksum of a file on a Flash memory file system, use the **verify EXEC** command. This command replaces the **copy verify** and **copy verify flash** commands.

```
verify file-url
```

Syntax Description

file-url URL of the file to verify.

Default

The current working device is the default device.

Command Mode

EXEC

Usage Guidelines

This command first appeared in Cisco IOS Release 11.0.

Use the **verify** command to verify the checksum of a file before using it.

Each software image that is distributed on disk uses a single checksum for the entire image. This checksum is displayed only when the image is copied into Flash memory; it is not displayed when the image file is copied from one disk to another.

The README file, which is included with the image on the disk, lists the name, file size, and checksum of the image. Review the contents of the README file before loading or duplicating the new image so that you can verify the checksum when you copy it into Flash memory or onto a server.

To display the contents of Flash memory, use the **show flash** command. The Flash contents listing does not include the checksum of individual files. To recompute and verify the image checksum after the image has been copied into Flash memory, use the **verify** command.

Examples

The following example verifies the file names c7200-js-mz on the Flash memory card inserted in slot 0:

```
Router# dir slot0:
Directory of slot0:/

   1  -rw-     4720148   Aug 29 1997 17:49:36  hampton/nitro/c7200-j-mz
   2  -rw-     4767328   Oct 01 1997 18:42:53  c7200-js-mz
   5  -rw-         639   Oct 02 1997 12:09:32  foo
   7  -rw-         639   Oct 02 1997 12:37:13  the_time

20578304 bytes total (3104544 bytes free)
tw3-7200-1# verify slot0:
Verify filename []? c7200-js-mz
Verified slot0:
```

The following example also verifies the file named c7200-js-mz on the Flash memory card inserted in slot 0:

```
Router# verify slot0:?  
slot0:c7200-js-mz slot0:foo slot0:hampton/nitro/c7200-j-mz slot0:the_time  
  
Router# verify slot0:c7200-js-mz  
Verified slot0:c7200-js-mz
```

Related Commands

You can use the master indexes or search online to find documentation of related commands.

- cd**
- copy**
- dir**
- pwd**
- show (Flash file system)**

