Working with the Flash File System

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Information About the Flash File System

The flash file system is a single flash device on which you can store files. It also provides several commands to help you manage software bundles and configuration files. The default flash file system on the device is named flash:.

As viewed from the active device, or any stack member, flash: refers to the local flash device, which is the device attached to the same device on which the file system is being viewed. In a device stack, each of the flash devices from the various stack members can be viewed from the active device. The names of these flash file systems include the corresponding device member numbers. For example, flash-3:, as viewed from the active device, refers to the same file system as does flash: on stack member 3. Use the **show file systems** privileged EXEC command to list all file systems, including the flash file systems in the device stack.

Only one user at a time can manage the software bundles and configuration files for a device stack.

Displaying Available File Systems

To display the available file systems on your device, use the **show file systems** privileged EXEC command as shown in this example for a standalone device:

```
Device# 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:
```

This example shows a device stack. In this example, the active device is stack member 1; the file system on stack member 2 is displayed as flash-2:, the file system on stack member 3 is displayed as flash-3: and so on up to stack member 9, displayed as flash-9: for a 9-member stack. The example also shows the crashinfo directories and a USB flash drive plugged into the active device:

```
Device# show file systems
File Systems:
      Size(b)        Free(b)      Type   Flags   Prefixes
     145898496      5479424      disk     rw    crashinfo:crashinfo-1:
     248512512      85983232     disk     rw    crashinfo-2:stby-crashinfo:
     146014208      17301504     disk     rw    crashinfo-3:
     146014208            0      disk     rw    crashinfo-4:
     146014208       1572864     disk     rw    crashinfo-5:
     248512512      30932992     disk     rw    crashinfo-6:
     146014208       6291456     disk     rw    crashinfo-7:
     146276352      15728640     disk     rw    crashinfo-8:
     146276352      73400320     disk     rw    crashinfo-9:
*    741621760     481730560     disk     rw    flash:flash-1:
    1622147072    1360527360     disk     rw    flash-2:stby-flash:
     729546752     469762048     disk     rw    flash-3:
     729546752     469762048     disk     rw    flash-4:
     729546752     469762048     disk     rw    flash-5:
    1622147072    1340604416     disk     rw    flash-6:
     729546752     469762048     disk     rw    flash-7:
    1749549056    1487929344     disk     rw    flash-8:
    1749549056    1487929344     disk     rw    flash-9:
             0             0     disk     rw    unix:
             -             -     disk     rw    usbflash0:usbflash0-1:
             -             -     disk     rw    usbflash0-2: stby-usbflash0:
             -             -     disk     rw    usbflash0-3:
             -             -     disk     rw    usbflash0-4:
             -             -     disk     rw    usbflash0-5:
             -             -     disk     rw    usbflash0-6:
             -             -     disk     rw    usbflash0-7:
             -             -     disk     rw    usbflash0-8:
             -             -     disk     rw    usbflash0-9:
             0             0     disk     ro    webui:
             -             -   opaque     rw    system:
             -             -   opaque     rw    tmpsys:
       2097152       2055643    nvram     rw    stby-nvram:
             -             -    nvram     rw    stby-rcsf:
             -             -   opaque     rw    null:
             -             -   opaque     ro    tar:
             -             -  network     rw    tftp:
       2097152       2055643    nvram     rw    nvram:
             -             -   opaque     wo    syslog:
             -             -  network     rw    rcp:
             -             -  network     rw    http:
             -             -  network     rw    ftp:
             -             -  network     rw    scp:
             -             -  network     rw    https:
             -             -   opaque     ro    cns:
             -             -   opaque     rw    revrcsf:
```

Table 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. **disk**—The file system is for a flash memory device, USB flash, and crashinfo file. **network**—The file system for network devices; for example, an FTP server or and HTTP server. **nvram**—The file system is for a NVRAM device. **opaque**—The file system is a locally generated pseudo file system (for example, the system) or a download interface, such as brimux. **unknown**—The file system is an unknown type.
Flags	Permission for file system. **ro**—read-only. **rw**—read/write. **wo**—write-only.

Field	Value
Prefixes	Alias for file system. **crashinfo:**—Crashinfo file. **flash:**—Flash file system. **ftp:**—FTP server. **http:**—HTTP server. **https:**—Secure HTTP server. **nvram:**—NVRAM. **null:**—Null destination for copies. You can copy a remote file to null to find its size. **rcp:**—Remote Copy Protocol (RCP) server. **scp:**—Session Control Protocol (SCP) server. **system:**—Contains the system memory, including the running configuration. **tftp:**—TFTP network server. **usbflash0:**—USB flash memory. **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

You can specify the file system or directory that the system uses as the default file system by using the **cd** *filesystem:* privileged EXEC command. You can set the default file system to omit the *filesystem:* argument from related commands. For example, for all privileged EXEC commands that have the optional *filesystem:* argument, the system uses the file system specified by the **cd** command.

By default, the default file system is *flash:*.

You can display the current default file system as specified by the **cd** command by using the **pwd** privileged EXEC command.

Displaying 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 might 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 might want to verify its filename for use in another command. To display information about files on a file system, use one of the privileged EXEC commands listed in the following table.

Table 2: Commands for Displaying Information About Files

Command	Description
dir [/all] **[***filesystem:filename***]**	Displays a list of files on a file system.
show file systems	Displays more information about each of the files on a file system.
show file information *file-url*	Displays information about a specific file.
show file descriptors	Displays a list of open file descriptors. File descriptors are the internal representations of open files. You can use this command to see if another user has a file open.

For example, to display a list of all files in a file system, use the **dir** privileged EXEC command:

```
device# dir flash:
Directory of flash:/
7386  -rwx     2097152 Jan 23 2013 14:06:49 +00:00 nvram_config
7378  drwx        4096 Jan 23 2013 09:35:11 +00:00 mnt
7385  -rw-   221775876 Jan 23 2013 14:15:13 +00:00
cat3k_caa-universalk9.SSA.03.12.02.EZP.150-12.02.EZP.150-12.02.EZP.bin
7389  -rwx         556 Jan 21 2013 20:47:30 +00:00 vlan.dat
712413184 bytes total (445063168 bytes free)
device#
```

Changing Directories and Displaying the Working Directory (CLI)

Follow these steps to change directories and to display the working directory:

SUMMARY STEPS

1. **enable**
2. **dir** *filesystem:*
3. **cd** *directory_name*
4. **pwd**
5. **cd**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. Enter your password if prompted.

	Command or Action	Purpose
Step 2	**dir** *filesystem:* **Example:** `Device# dir flash:`	Displays the directories on the specified file system. For *filesystem:*, use flash: for the system board flash device. To access flash partitions of device members in a stack, use flash-*n* where *n* is the stack member number. For example, flash-4.
Step 3	**cd** *directory_name* **Example:** `Device# cd new_configs`	Navigates to the specified directory. The command example shows how to navigate to the directory named *new_configs*.
Step 4	**pwd** **Example:** `Device# pwd`	Displays the working directory.
Step 5	**cd** **Example:** `Device# cd`	Navigates to the default directory.

Creating Directories (CLI)

Beginning in privileged EXEC mode, follow these steps to create a directory:

SUMMARY STEPS

1. **dir** *filesystem:*
2. **mkdir** *directory_name*
3. **dir** *filesystem:*

DETAILED STEPS

	Command or Action	Purpose
Step 1	**dir** *filesystem:* **Example:** `Device# dir flash:`	Displays the directories on the specified file system. For *filesystem:*, use flash: for the system board flash device.
Step 2	**mkdir** *directory_name* **Example:** `Device# mkdir new_configs`	Creates a new directory. Directory names are case sensitive and are limited to 45 characters between the slashes (/); the name cannot contain control characters, spaces, slashes, quotes, semicolons, or colons.

	Command or Action	Purpose
Step 3	**dir** *filesystem:* **Example:** `Device# dir flash:`	Verifies your entry.

Removing Directories

To remove a directory with all its files and subdirectories, use the **delete /force /recursive** *filesystem:/file-url* privileged EXEC command.

Use the **/recursive** keyword to delete the named directory and all subdirectories and the files contained in it. Use the **/force** 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.

For *filesystem*, use **flash:** for the system board flash device. For *file-url*, enter the name of the directory to be deleted. All of the files in the directory and the directory are removed.

Caution When directories are deleted, their contents cannot be recovered.

Copying Files

To copy a file from a source to a destination, use the **copy** *source-url destination-url* privileged EXEC command. For the source and destination URLs, you can use **running-config** and **startup-config** keyword shortcuts. For example, the **copy running-config startup-config** 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 (**xmodem:**, **ymodem:**) as the source for the file from a network machine that uses the Xmodem or Ymodem protocol.

Network file system URLs include ftp:, rcp:, tftp:, scp:, http:, and https: and have these syntaxes:

- FTP—ftp:[[//username [:password]@location]/directory]/filename
- RCP—rcp:[[//username@location]/directory]/filename
- TFTP—tftp:[[//location]/directory]/filename
- SCP—scp:[[//username [:password]@location]/directory]/filename
- HTTP—http:[[//username [:password]@location]/directory]/filename
- HTTPS—https:[[//username [:password]@location]/directory]/filename

Note The password must not contain the special character '@'. If the character '@' is used, the copy fails to parse the IP address of the server.

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 **copy flash: flash:** command is invalid)

Copying Files from One Device in a Stack to Another Device in the Same Stack

To copy a file from one device in a stack to another device in the same stack, use the **flash-X:** notation, where **X** is the device number.

To view all devicees in a stack, use the **show switch** command in privileged EXEC mode, as in the following example of a 9-member device stack:

```
Device# show switch
Switch/Stack Mac Address : 0006.f6b9.b580 - Local Mac Address Mac persistency wait time:
Indefinite
                                             H/W   Current
Switch#   Role    Mac Address     Priority Version  State
-----------------------------------------------------------
*1       Active   0006.f6b9.b580     15     P3B     Ready
 2       Standby  0006.f6ba.0c80     14     P3B     Ready
 3       Member   0006.f6ba.3300     7      P3B     Ready
 4       Member   0006.f6b9.df80     6      P3B     Ready
 5       Member   0006.f6ba.3880     13     P1A     Ready
 6       Member   1ce6.c7b6.ef00     4      PP      Ready
 7       Member   2037.06ce.2580     3      P2A     Ready
 8       Member   2037.0653.7e00     2      P5A     Ready
 9       Member   2037.0653.9280     1      P5B     Ready
```

To view all file systems available to copy on a specific device, use the **copy** command as in the following example of a 5-member stack:

```
Device# copy flash: ?
  crashinfo-1:     Copy to crashinfo-1: file system
  crashinfo-2:     Copy to crashinfo-2: file system
  crashinfo-3:     Copy to crashinfo-3: file system
  crashinfo-4:     Copy to crashinfo-4: file system
  crashinfo-5:     Copy to crashinfo-5: file system
  crashinfo:       Copy to crashinfo: file system
  flash-1:         Copy to flash-1: file system
  flash-2:         Copy to flash-2: file system
  flash-3:         Copy to flash-3: file system
  flash-4:         Copy to flash-4: file system
  flash-5:         Copy to flash-5: file system
  flash:           Copy to flash: file system
  ftp:             Copy to ftp: file system
  http:            Copy to http: file system
  https:           Copy to https: file system
  null:            Copy to null: file system
  nvram:           Copy to nvram: file system
  rcp:             Copy to rcp: file system
  revrcsf:         Copy to revrcsf: file system
  running-config   Update (merge with) current system configuration
  scp:             Copy to scp: file system
```

```
  startup-config   Copy to startup configuration
  stby-crashinfo:  Copy to stby-crashinfo: file system
  stby-flash:      Copy to stby-flash: file system
  stby-nvram:      Copy to stby-nvram: file system
  stby-rcsf:       Copy to stby-rcsf: file system
  stby-usbflash0:  Copy to stby-usbflash0: file system
  syslog:          Copy to syslog: file system
  system:          Copy to system: file system
  tftp:            Copy to tftp: file system
  tmpsys:          Copy to tmpsys: file system
  usbflash0-1:     Copy to usbflash0-1: file system
  usbflash0-2:     Copy to usbflash0-2: file system
  usbflash0-3:     Copy to usbflash0-3: file system
  usbflash0-4:     Copy to usbflash0-4: file system
  usbflash0-5:     Copy to usbflash0-5: file system
  usbflash0:       Copy to usbflash0: file system

Device#
```

This example shows how to copy a config file stored in the flash partition of device 2 to the flash partition of device 4. It assumes that device 2 and device 4 are in the same stack.

```
Device# copy flash-2:config.txt flash-4:config.txt
```

Deleting Files

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 **delete** [**/force**] [**/recursive**] [*filesystem:*]*/file-url* privileged EXEC command.

Use the **/recursive** keyword for deleting a directory and all subdirectories and the files contained in it. Use the **/force** 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 **/force** and **/recursive** keywords for deleting old software images that were installed by using the **archive download-sw** command but are no longer needed.

If you omit the *filesystem:* option, the device uses the default device specified by the **cd** command. For *file-url*, 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.

Caution When files are deleted, their contents cannot be recovered.

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

```
Device# delete myconfig
```

Creating, Displaying and Extracting Files (CLI)

You can create a file and write files into it, list the files in a file, and extract the files from a file as described in the next sections.

Beginning in privileged EXEC mode, follow these steps to create a file, display the contents, and extract it:

SUMMARY STEPS

1. **archive tar /create** *destination-url* **flash:** */file-url*
2. **archive tar /table** *source-url*
3. **archive tar /xtract** *source-url* **flash:**/*file-url* [*dir/file...*]
4. **more** [/**ascii** | /**binary** | /**ebcdic**] /*file-url*

DETAILED STEPS

	Command or Action	Purpose
Step 1	**archive tar /create** *destination-url* **flash:** */file-url* **Example:** `device# archive tar /create tftp:172.20.10.30/saved. flash:/new-configs`	Creates a file and adds files to it. For destination-url, specify the destination URL alias for the local or network file system and the name of the file to create: • Local flash file system syntax: **flash:** • FTP syntax: **ftp**:[[//*username*[:*password*]@*location*]/*directory*]/*-filename*. • RCP syntax: **rcp**:[[//*username@location*]/*directory*]/*-filename*. • TFTP syntax: **tftp**:[[//*location*]/*directory*]/*-filename*. For **flash:***/file-url*, specify the location on the local flash file system in which the new file is created. You can also specify an optional list of files or directories within the source directory to add to the new file. If none are specified, all files and directories at this level are written to the newly created file.
Step 2	**archive tar /table** *source-url* **Example:** `device# archive tar /table flash: /new_configs`	Displays the contents of a file. For *source-url*, specify the source URL alias for the local or network file system. The *-filename.* is the file to display. These options are supported: • Local flash file system syntax: **flash:** • FTP syntax: **ftp**:[[//*username*[:*password*]@*location*]/*directory*]/*-filename*. • RCP syntax: **rcp**:[[//*username@location*]/*directory*]/*-filename*. • TFTP syntax: **tftp**:[[//*location*]/*directory*]/*-filename*.

	Command or Action	Purpose
		You can also limit the file displays by specifying a list of files or directories after the file. Only those files appear. If none are specified, all files and directories appear.
Step 3	**archive tar /xtract** *source-url* **flash:**/*file-url* [*dir/file...*] **Example:** `device# archive tar /xtract tftp:/172.20.10.30/saved. flash:/new-configs`	Extracts a file into a directory on the flash file system. For *source-url*, specify the source URL alias for the local file system. The *-filename.* is the file from which to extract files. These options are supported: • Local flash file system syntax: **flash:** • FTP syntax: **ftp**:[[//*username*[:*password*]@*location*]/*directory*]/*-filename.* • RCP syntax: **rcp**:[[//*username@location*]/*directory*]/*-filename*. • TFTP syntax: **tftp**:[[//*location*]/*directory*]/*-filename*. For **flash:**/*file-url* [*dir/file...*], specify the location on the local flash file system from which the file is extracted. Use the *dir/file...* option to specify a list of files or directories within the file to be extracted. If none are specified, all files and directories are extracted.
Step 4	**more** [/**ascii** | /**binary** | /**ebcdic**] /*file-url* **Example:** `device# more flash:/new-configs`	Displays the contents of any readable file, including a file on a remote file system.

Additional References

Related Documents

Related Topic	Document Title
Commands for managing flash: file systems	*Cisco IOS Configuration Fundamentals Command Reference*

Error Message Decoder

Description	Link
To help you research and resolve system error messages in this release, use the Error Message Decoder tool.	https://www.cisco.com/cgi-bin/Support/Errordecoder/index.cgi

Standards

Standards	Title
No new or modified standards are supported by this feature, and support for existing standards has not been modified by this feature.	--

MIBs

MIBs	MIBs Link
No new or modified MIBs are supported by this feature, and support for existing MIBs has not been modified by this feature.	To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at the following URL: http://www.cisco.com/go/mibs

RFCs

RFCs	Title
No new or modified RFCs are supported by this feature, and support for existing RFCs has not been modified by this feature.	--

Technical Assistance

Description	Link
The Cisco Support website provides extensive online resources, including documentation and tools for troubleshooting and resolving technical issues with Cisco products and technologies. To receive security and technical information about your products, you can subscribe to various services, such as the Product Alert Tool (accessed from Field Notices), the Cisco Technical Services Newsletter, and Really Simple Syndication (RSS) Feeds. Access to most tools on the Cisco Support website requires a Cisco.com user ID and password.	http://www.cisco.com/cisco/web/support/index.html