



Using CompactFlash Memory

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The Cisco Connected Grid Router 2010 uses Advanced Capability CF external memory to store the system image, configuration files, and some software data files. CF supports true integrated development environment mode and multi-word direct memory access mode.

This document explains how to manage directories and files on the CF in the following sections:

- [Requirements and Restrictions, page 75](#)
- [Online Insertion and Removal, page 76](#)
- [Formatting CompactFlash Memory as a Class C File System, page 76](#)
- [File Operations on CompactFlash Memory Cards, page 77](#)
- [Directory Operations on a CompactFlash Memory Card, page 81](#)

Requirements and Restrictions

CompactFlash Support

- Only Advanced Capability CF purchased from Cisco operate in the Cisco CGR 2010 router.
- Legacy CF will not operate in Cisco CGR 2010 router. When legacy CF is inserted, the following error message appears:

```
WARNING: Unsupported compact flash detected. Use of this card during normal operation
can impact and severely degrade performance of the system. Please use supported
compact flash cards only.
```

Formatting CompactFlash

- Only Class C file systems are supported on Cisco PCMCIA CompactFlash (CF).
- We recommend that you format new CF to initialize a new flash file system. Proper formatting lets the ROM monitor recognize and boot the flash memory. The CF can be formatted on a router, and files can be copied to or from any PC that is equipped with a CF memory reader. If you use a PC to format the CF, use the Microsoft File Allocation Table (FAT32) file system.



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CompactFlash Slots and Files

- Cisco CGR 2010 routers have two types of external CF slots
 - 2— PCMCIA
 - 2— USB
- CF in slot0 can store the system image, configuration, and data files. The CF must be present in this slot for the router to boot and perform normal file operations.



Note Use `flash1` in the command syntax to access CF in slot 1. Use `flash0` in the command syntax to access CF in slot 0.

Table 1 Compact Flash Slot Numbering and Naming

Slot Number	PCMCIA CF Filenames	USB CF Filenames	Size
Slot0 ¹	<code>flash0</code>	<code>usbflash0</code>	256MB
Slot1	<code>flash1</code>	<code>usbflash1</code>	0
Total	-	-	4GB

1. Slot 0 is the default CF slot. CF in slot0 can store system image, configuration, and data files. CF must be present in this slot for the router to boot and perform normal file operations.

Online Insertion and Removal

Online insertion and removal (OIR) is a feature that allows you to replace CompactFlash memory cards without turning off the router and without affecting the operation of other interfaces. OIR of CF memory cards provides uninterrupted operation to network users, maintains routing information, and ensures session preservation.



Caution

The external CF memory card should not be removed if the flash memory busy “CF” LED on the router is blinking, because this indicates that the software is accessing the CF memory card. Removing the CF memory card may disrupt the network, because some software features use the CF memory card to store tables and other important data.

For instructions on inserting, removing, and replacing the external CF memory card, see the router’s *Hardware Installation Guide*.

Formatting CompactFlash Memory as a Class C File System

Use the **format flash:** command in privileged EXEC mode to:

- Format CF memory cards with a Class C flash file system
- Remove the files from a CF memory card previously formatted with a Class C flash file system



Note Use `flash1` in the command syntax to access CF in slot 1. Use `flash0` in the command syntax to access CF in slot 0.

Formatting CompactFlash Memory as a Class C Flash File System: Example

```

Router# format flash:
Format operation may take a while. Continue? [confirm]
Format operation will destroy all data in "flash:". Continue? [confirm]
Enter volume ID (up to 64 chars)[default flash]:
Current Low End File System flash card in flash will be formatted into DOS
File System flash card! Continue? [confirm]
Format:Drive communication & 1st Sector Write OK...
Writing Monlib sectors .....
Monlib write complete
Format:All system sectors written. OK...
Format:Total sectors in formatted partition:250592
Format:Total bytes in formatted partition:128303104
Format:Operation completed successfully.
Format of flash complete

```

File Operations on CompactFlash Memory Cards

This section describes the following file operations for external CF memory cards:

- [Copying Files, page 77](#)
- [Displaying Files, page 78](#)
- [Displaying File Content, page 78](#)
- [Displaying Geometry and Format Information, page 79](#)
- [Deleting Files, page 80](#)
- [Renaming Files, page 80](#)

Copying Files

To copy files, enter the **copy** command in privileged EXEC mode. To indicate a file that is stored in a CF memory card, precede the filename with **flash**.



Note Use **flash1** in the command syntax to access CF in slot 1. Use **flash0** in the command syntax to access CF in slot 0.

Examples: Copying Files

In the following example, the file my-config1 on the CF memory card is copied into the startup-config file in the system memory:

```

Router# copy flash:my-config1 startup-config

Destination filename [startup-config]?
[OK]
517 bytes copied in 4.188 secs (129 bytes/sec)

```

In the following example, the file my-config2 on the CF memory card is copied into the running-config file in the system memory:

```

Router# copy flash:my-config2 running-config

Destination filename [running-config]?
709 bytes copied in 0.72 secs

```

Displaying Files

To display a list of files in CF memory, enter the **dir flash:** command in privileged EXEC mode.



Note Use **flash1** in the command syntax to access CF in slot 1. Use **flash0** in the command syntax to access CF in slot 0.

```
Router# dir flash:

Directory of flash:/
 1580  -rw-      6462268   Mar 06 2004 06:14:02  c29xx-i-mz.3600ata
    3   -rw-      6458388   Mar 01 2004 00:01:24  c29xx-i-mz
63930368 bytes total (51007488 bytes free)
```

Displaying CF Platform Support Status and Errors

To display the platform support status of the CF memory, enter the **show platform cf** command in privileged EXEC mode.

```
Router# show platform cf

Platform Support status of Compact Flash:
=====
CF flash0: Compact Flash plugged in is Unsupported
CF flash1: Compact Flash not plugged in.
```

Router

To display platform error status, enter the **show platform error** command in privileged EXEC mode.

```
Router# show platform error
Interface GigabitEthernet0/0:
-----
Unknown Protocol Drops   : 6

Interface GigabitEthernet0/1:
-----
Lost Carrier              : 1

CF Error Status:
-----
Compact Flash 0 Unsupported (HT)
```

Router#

Displaying File Content

To display the content of a file that is stored in flash memory, enter the **more flash:** command in privileged EXEC mode:



Note Use **flash1** in the command syntax to access CF in slot 1. Use **flash0** in the command syntax to access CF in slot 0.

```
Router# more flash:cgr2010-universalk9-mz.SPA.151-1.T
```

```

00000000: 7F454C46 01020100 00000000 00000000 .ELF ....
00000010: 00020061 00000001 80008000 00000034 ...a ....4
00000020: 00000054 20000001 00340020 00010028 ...T ...4. ... (
00000030: 00050008 00000001 0000011C 80008000 ....
00000040: 80008000 00628A44 00650EEC 00000007 .... .b.D .e.l ....
00000050: 0000011C 0000001B 00000001 00000006 ....
00000060: 80008000 0000011C 00004000 00000000 .... ..@. ....
00000070: 00000000 00000008 00000000 00000021 .... ..!
00000080: 00000001 00000002 8000C000 0000411C .... ..@. ..A.
00000090: 00000700 00000000 00000000 00000004 ....
000000A0: 00000000 00000029 00000001 00000003 .... ..) ....
000000B0: 8000C700 0000481C 00000380 00000000 ..G. ..H. ....
000000C0: 00000000 00000004 00000000 0000002F .... .. /
000000D0: 00000001 10000003 8000CA80 00004B9C .... ..J. ..K.
000000E0: 00000020 00000000 00000000 00000008 ... ..
000000F0: 00000000 0000002F 00000001 10000003 .... .. /
00000100: 8000CAA0 00004BBC 00623FA4 00000000 ..J ..K< .b?$ ....
00000110: 00000000 00000008 00000000 3C1C8001 .... ..<... <...
00000120: 679C4A80 3C018001 AC3DC70C 3C018001 g.J. <... ,=G. <...
00000130: AC3FC710 3C018001 AC24C714 3C018001 ,?G. <... ,&G. <...
00000140: AC25C718 3C018001 AC26C71C 3C018001 ,%G. <... ,&G. <...
00000150: AC27C720 3C018001 AC30C724 3C018001 ,'G <... ,0G$ <...
00000160: AC31C728 3C018001 AC32C72C 3C018001 ,1G( <... ,2G, <...
--More-- q

```

Displaying Geometry and Format Information

To display the geometry and format information of a CF flash file system, enter the **show flash: filesystems** command in privileged EXEC mode.



Note Use **flash1** in the command syntax to access CF in slot 1. Use **flash0** in the command syntax to access CF in slot 0.

```

Router# show flash0 filesystems
***** ATA Flash Card Geometry/Format Info *****

```

```

ATA CARD GEOMETRY
  Manufacturer Name
  Model Number          SMART CF    fs:8000
  Serial Number         2009101509D809B20000
  Firmware Revision     20060729
  Number of Heads       16
  Number of Cylinders   1986
  Sectors per Cylinder  63
  Sector Size           512
  Total Sectors         2001888

```

```

ATA PARTITION 1 INFO
  Start Sector          63
  Number of Sectors     2001825
  Size in Bytes         1024934400
  File System Type      FAT16
  Number of FAT Sectors 245
  Sectors Per Cluster   32
  Number of Clusters    62540
  Number of Data Sectors 2001280
  Base FAT Sector       1
  Base Root Sector      491

```

```

Base Data Sector      523

ATA MONLIB INFO
Image Monlib size    121788
Disk Monlib Size     NA
Disk Space Available NA
Name                 NA
End Sector           NA
Start sector         NA
Updated By           NA
Version              NA

Router#

```

Deleting Files

To delete a file from a CF memory card, enter the **delete flash:** command.



Note Use **flash1** in the command syntax to access CF in slot 1. Use **flash0** in the command syntax to access CF in slot 0.



Note The **dir flash:** command does not display deleted files and files with errors.

Renaming Files

To rename a file on a CF memory card, enter the **rename** command in privileged EXEC mode.



Note Use **flash1** in the command syntax to access CF in slot 1. Use **flash0** in the command syntax to access CF in slot 0.

```

Router# dir flash:

Directory of flash:/

   3  -rw-     6458388  Mar 01 2009 00:00:58 cgr2010-universalk9-mz.tmp
 1580 -rw-     6462268  Mar 06 2009 06:14:02 cgr2010-universalk9-mz.3600ata

63930368 bytes total (51007488 bytes free)

Router# rename flash:cgr2010-universalk9-mz.SPA.151-1.T.tmp flash:cgr2010-universalk9-mz

Destination filename [cgr2010-universalk9-mz]?

Router# dir flash:

Directory of flash:/

 1580 -rw-     6462268  Mar 06 2009 06:14:02 cgr2010-universalk9-mz.3600ata
   3  -rw-     6458388  Mar 01 2009 00:01:24 cgr2010-universalk9-mz

63930368 bytes total (51007488 bytes free)

```

Directory Operations on a CompactFlash Memory Card

The following sections describe directory operations for external CF memory cards on Cisco routers:

- [Entering a Directory and Determining Which Directory You Are In](#), page 81
- [Creating a New Directory](#), page 81
- [Removing a Directory](#), page 82

Entering a Directory and Determining Which Directory You Are In

To enter a directory of a CF memory card, enter the **cd** command in privileged EXEC mode. The **cd** command specifies or changes the default directory or file system. If you enter **cd** only, without specifying a file system, the router enters the default home directory, which is *flash0*. If you enter **cd flash1** or **cd usbflash1**, the router enters the *flash1* directory.

```
Router# cd
```

To determine which directory you are in, enter the **pwd** command in privileged EXEC mode. The CLI displays which directory or file system is specified as the default by the **cd** command.

```
Router# pwd
```

To display a list of files in the directory that you are in, enter the **dir** command in privileged EXEC mode. The command-line interface will display the files in the file system that was specified as the default by the **cd** command.

```
Router# dir flash:
```

```
Directory of flash:/
```

```
 1580  -rw-      6462268   Mar 06 2009 06:14:02 cgr2010-universalk9-mz.3600ata
      3  -rw-      6458388   Mar 01 2009 00:01:24 cgr2010-universalk9-mz
```

```
63930368 bytes total (51007488 bytes free)
```

Entering a Directory: Example

To enter the /config directory:

```
Router# cd config
```

To verify that you are in the /config directory:

```
Router# pwd
```

```
flash:/config/
```

```
Router# dir
```

```
Directory of flash:/config/
```

```
  380  -rw-      6462268   Mar 08 2004 06:14:02 myconfig1
  203  -rw-      6458388   Mar 03 2004 00:01:24 myconfig2
```

```
63930368 bytes total (51007488 bytes free)
```

Creating a New Directory

To create a directory in flash memory, enter the **mkdir flash:** command in privileged EXEC mode.



Note Use **flash1** in the command syntax to access CF in slot 1. Use **flash0** in the command syntax to access CF in slot 0.

Creating a New Directory: Example

In the following example, a new directory named “config” is created; then a new subdirectory named “test-config” is created within the “config” directory.

```
Router# dir flash:

Directory of flash:/

 1580  -rw-      6462268   Mar 06 2009 06:14:02  cgr2010-universalk9-mz.3600ata
      3  -rw-      6458388   Mar 01 2009 00:01:24  cgr2010-universalk9-mz

63930368 bytes total (51007488 bytes free)

Router# mkdir flash:/config

Create directory filename [config]?
Created dir flash:/config

Router# mkdir flash:/config/test-config

Create directory filename [/config/test-config]?
Created dir flash:/config/test-config

Router# dir flash:

Directory of flash:/

      3  -rw-      6458388   Mar 01 2009 00:01:24  cgr2010-universalk9-mz
 1580  drw-           0   Mar 01 2004 23:48:36  config

63930368 bytes total (51007488 bytes free)
```

Removing a Directory

To remove a directory in flash memory, enter the **rmdir flash:** command in privileged EXEC mode. Before you can remove a directory, you must remove all files and subdirectories from the directory.



Note Use **flash1** in the command syntax to access CF in slot 1. Use **flash0** in the command syntax to access CF in slot 0.

Example: Removing a Directory

In the following example, the subdirectory test-config is removed.

```
Router# dir

Directory of flash:/config/

 1581  drw-           0   Mar 01 2004 23:50:08  test-config

128094208 bytes total (121626624 bytes free)
```



```
Router# rmdir flash:/config/test-config

Remove directory filename [/config/test-config]?
Delete flash:/config/test-config? [confirm]
Removed dir flash:/config/test-config
Router# dir

Directory of flash:/config/

No files in directory

128094208 bytes total (121630720 bytes free)
```

