

PCMCIA Filesystem Compatibility Matrix and Filesystem Information

Document ID: 6145

Contents

Introduction

Before You Begin

- Conventions

- Prerequisites

- Components Used

PCMCIA Filesystem Compatibility Matrix

Working with the PCMCIA Filesystem

- Class A Filesystem

- Sample Outputs

- Class B Filesystem

- Class C Filesystem

Related Information

Introduction

This document explains the PCMCIA Filesystem Compatibility Matrix, describes the different filesystems that are available, and explains how to work on those filesystems.

The matrix shows filesystem compatibilities for PCMCIA Flash cards between various platforms. This can be useful when copying a software image on the PCMCIA Flash card of a router or switch (source) which is to be used for another router or switch (target) of a different platform.

The tables below describe which filesystems the various Cisco hardware platforms belong to. Platforms listed under the same filesystem class share the same filesystem structure.

Note: In order to boot a router or a switch from a Cisco IOS® software file located on a PCMCIA Flash card, the Flash card must have been formatted in the target platform. Using a PCMCIA card formatted in the source platform may work in some cases; however, there are a number of situations where the bootstrap version of the target router does not support the formatted card, even if the filesystems are compatible. Therefore, there is no guarantee that the information shown on this page works in all situations.

Before You Begin

Conventions

For more information on document conventions, see the Cisco Technical Tips Conventions.

Prerequisites

There are no specific prerequisites for this document.

Components Used

This document is not restricted to specific software and hardware versions.

The information presented in this document was created from devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If you are working in a live network, ensure that you understand the potential impact of any command before using it.

PCMCIA Filesystem Compatibility Matrix

Filesystem Class "A"
<ul style="list-style-type: none">• ATM Switch/Processor for LightStream 1010 and Catalyst 5000/5500• Multiservice Switch Route Processor for LightStream 1010• Catalyst 5000/5500 Route Switch Module (RSM)• Catalyst 8500 Switch Route Processor (SRP)• Cisco 6400 Universal Access Concentrator• Cisco 7000 Route Switch Processor (RSP)• Cisco 7500 Series Route Switch Processors (RSP 2, RSP 4, RSP 8)• Cisco 12000 Series Internet Router
Filesystem Class "B"
<ul style="list-style-type: none">• Cisco 1000 Series Routers• Cisco 1600 Series Routers ¹• Cisco 3600 Series Routers ²
Filesystem Class "C"
<ul style="list-style-type: none">• AS5800 Dial Shelf Controller• Catalyst 5000/5500 Supervisor III Module• Catalyst 6000/6500 Supervisor Engine I• Catalyst 6000/6500 Supervisor Engine II• Cisco 7000 Route Processor• Cisco 7100 Series Routers• Cisco uBR7100 Series Routers• Cisco 7200 Series Network Processing Engine• Cisco uBR7200 Series Routers• Cisco 7200VXR Series Network Services Engine 1• Cisco 7600 Series Internet Routersv• Cisco 10000 Series Routers (ESR)• Cisco uBR10000 Series Routers

¹ The 1600 Series Router has a single PC Card that contains Flash memory. The 1601–1604 run from Flash. If you remove the PC Card when the router is running, the router halts. The 1601R–1605R runs from RAM. If you remove the PC Card, the router does not load the Cisco IOS software image during the next bootup. In the 1600 series, you can't delete the running image file or any other file unless it is in a different partition.

² The 3600 traditionally uses a class B filesystem, but with the addition of crashinfo file support in Cisco IOS Software Version 12.2(4)T, the 3600 needs the ability to delete individual files. Consequently, the 3600 Series Router with Cisco IOS Software Version 12.2T and later utilizes commands from class B filesystems as well as commands from class C filesystems. In order to activate the class C filesystem commands on the 3600 with Cisco IOS Software Release 12.2T, you first need to use the **erase** command to completely remove all files from the Flash filesystem. Then, when the Flash is empty, run the **squeeze** command against it to create a squeeze log. At this point, the 3600 Flash system uses the **delete** and **squeeze** commands like a class C filesystem.

Working with the PCMCIA Filesystem

Flash disks are Flash memory–based devices that conform to the PC Card (formerly PCMCIA) standard, and that present an AT Attachment (ATA) interface to the system. This interface complies with the ANSI ATA Interface Document X3T13.1153 D Rev. 9 specification.

The Flash disk is more flexible than linear Flash memory because the Flash disk has controller circuitry that allows it to emulate a hard disk and that automatically maps out bad blocks and performs automatic block erasure. Further, the Flash disk provides the capability to allocate noncontiguous sectors, which eliminates the need for the **squeeze** command (previously required with linear Flash memory cards).

Unlike Flash memory modules installed directly on the mainboard of the router, multiple PCMCIA Flash devices do not coalesce into one contiguous block of memory. It is therefore important to note that when loading large files into PCMCIA Flash, such files cannot span across more than one device.

The Flash Disk provides increased Flash–based memory space – 48 to 128 MB – for storage of system configuration files, Cisco IOS software images, and other types of system–related files.

Flash memory ATA disks and Flash memory cards use similar commands. The primary syntax change is that `disk0:` or `disk1:` refers to Flash memory ATA disks, while `slot0:` or `slot1:` refers to Flash memory cards. Generally, use the syntax `slot0:` for Flash memory cards less than 20 MB, and use `disk0:` for Flash disk greater than 20 MB. Keep in mind that there are 32 MB linear PCMCIA Flash cards where you use `slot0:`.

To see which Flash cards are used in your router, use the **show version** command and look at the bottom portion of the output.

```
7200# show version
IOS (tm) 7200 Software (C7200-JS-M), Version 12.0(22), RELEASE SOFTWARE (fc1)
Copyright (c) 1986-2002 by cisco Systems, Inc.
Compiled Mon 01-Apr-02 19:44 by srani
Image text-base: 0x60008900, data-base: 0x610E0000

ROM: System Bootstrap, Version 12.1(20000914:181332) [bwhatley-npe200 102],
DEVELOPMENT SOFTWARE
BOOTFLASH: 7200 Software (C7200-BOOT-M), Version 12.0(5), RELEASE SOFTWARE (fc1)

cisco 7206 (NPE150) processor with 43008K/6144K bytes of memory.
R4700 processor, Implementation 33, Revision 1.0 (512KB Level 2 Cache)
Last reset from power-on
Bridging software.

X.25 software, Version 3.0.0.
SuperLAT software (copyright 1990 by Meridian Technology Corp).
TN3270 Emulation software.
1 FastEthernet/IEEE 802.3 interface(s)
125K bytes of non-volatile configuration memory.
```

1024K bytes of packet SRAM memory.

46976K bytes of ATA PCMCIA card at slot 0 (Sector size 512 bytes).

!-- This indicates an ATA PCMCIA flash disk

20480K bytes of Flash PCMCIA card at slot 1 (Sector size 128K).

!-- This indicates a Linear PCMCIA flash card

4096K bytes of Flash internal SIMM (Sector size 256K).

Configuration register is 0x2102

The **show file system** command also displays the file systems supported by the router.

Router-3725# show file system

File Systems:

	Size(b)	Free(b)	Type	Flags	Prefixes
	-	-	opaque	rw	archive:
	-	-	opaque	rw	system:
	57336	51389	nvr	rw	nvr
	-	-	opaque	rw	null:
	-	-	network	rw	tftp:
	-	-	opaque	ro	xmodem:
	-	-	opaque	ro	ymodem:
*	63881216	22765568	disk	rw	flash:#
	31932416	31932416	disk	rw	slot0:#
	-	-	opaque	wo	syslog:
	-	-	network	rw	rcp:
	-	-	network	rw	pram:
	-	-	network	rw	ftp:
	-	-	network	rw	http:
	-	-	network	rw	scp:
	-	-	opaque	ro	tar:
	-	-	network	rw	https:
	-	-	opaque	ro	cns:

Router-7204# show file system

File Systems:

	Size(b)	Free(b)	Type	Flags	Prefixes
	-	-	opaque	rw	system:
	-	-	opaque	rw	null:
	-	-	network	rw	tftp:
	129016	124443	nvr	rw	nvr
	-	-	disk	rw	disk0:
	-	-	disk	rw	disk1:
*	20578304	2088580	flash	rw	slot0: flash:
	-	-	flash	rw	slot1:
	3407872	1307684	flash	rw	bootflash:
	-	-	network	rw	rcp:
	-	-	network	rw	pram:
	-	-	network	rw	ftp:

Router-7206VXR#show file system

File Systems:

	Size(b)	Free(b)	Type	Flags	Prefixes
	-	-	opaque	rw	archive:
	-	-	opaque	rw	system:
	-	-	opaque	rw	null:
	-	-	network	rw	tftp:

129016	126237	nvr	rw	nvr
-	-	opaque	wo	syslog:
* 128135168	50855936	disk	rw	disk0:#
-	-	disk	rw	disk1:
-	-	flash	rw	slot0: flash:
-	-	flash	rw	slot1:
3407873	1	flash	rw	bootflash:
-	-	network	rw	rcp:
-	-	network	rw	pram:
-	-	network	rw	http:
-	-	network	rw	ftp:
-	-	opaque	ro	cns:

Class A Filesystem

The Filesystem Class A table above describes which filesystems the various Cisco hardware platforms belong to. Platforms listed under the same filesystem class share the same filesystem structure. The methods used for erasing, deleting, and recovering files depend on the class of the filesystem. Class A filesystems support the following file management commands:

- **delete** – "Marks" files as deleted, but the files still occupy space in Flash memory. Use the **undelete** command to recover these files later.
- **squeeze** – Permanently removes all of the files marked "deleted" or "error" from the specified Flash memory device. These files can no longer be recovered. The squeeze operation can take as long as several minutes if it needs to erase and rewrite most of the Flash memory space on a PCMCIA card.
- **format** – Erases all of the files on a Flash device, and prepares the Flash device to be used by the platform.
- **verify** – Recomputes and verifies the checksum of a file in Flash memory. Assumes the file was written to the Flash device correctly. If the file was corrupted when it was originally written to the device, the **verify** command will never flag an error. The **verify** command is only useful for PCMCIA Flash cards because they have the ability to store checksums on files. The ATA Flash disks don't have the ability to store checksums so the **verify** command traditionally was not supported. However, in Cisco IOS software version 12.2T and later, the **verify** command has been updated with an MD5 option so it is now possible to get an MD5 hash on images stored in an ATA Flash disk and compare that hash to what is listed in the Download Software area (registered customers only) .

Note: To use the troubleshooting tools described in this document, you must be a registered user and you must be logged in.

Sample Outputs

In the sample outputs below, the Cisco IOS software file names may vary depending on the type of platform used.

Note: Before using the commands below, use the **dir{device:}** command to display a list of files on a Flash memory. Also, the **show{device:}** command is available for PCMCIA Flash cards and will show you files marked as deleted, but that have not been squeezed yet.

- **delete** – "Marks" files as deleted, but the files still occupy space in Flash memory. Verify that you have enough space in the Flash memory card by using the **dir{device:}** command or the **show{device:}** command. If there is not enough room, then you must delete and **squeeze** some files to make enough space.

```
C7513#delete slot0:rsp-jsv-mz.112-26.bin
```

```
Delete filename [rsp-jsv-mz.112-26.bin]? y
```

```
Delete slot0:rsp-jsv-mz.112-26.bin? [confirm]y
```

- **undelete** – To recover a file marked "deleted" on a Class A Flash filesystem. For Class A Flash filesystems, when you delete a file, the Cisco IOS software simply marks the file as deleted, but it does not erase the file on linear PCMCIA flash cards.

This command allows you to recover a "deleted" file on a specified Flash memory device as long as the file is on a linear PCMCIA flash card. You must undelete a file by its index as listed in the output of the **show{device:}** command.

```
C7513#undelete 1 slot0:
```

In this example, the file with the index of 1 will be undeleted from slot0. The index number was obtained from the output of the **show{device:}** command as seen below. The first field (-#-) is the index field:

```
C7513#show slot0:
```

```
--#- ED --type-- --crc--- -seek-- nlen -length- -----date/time----- name
1   .D image    9CAA2A55  83C50C   19  8504460 Jan 13 2000 20:03:02 rsp-pv-mz.120-10
7879412 bytes available (8504588 bytes used)
```

- **squeeze** – To permanently delete Flash files by squeezing a Class A Flash filesystem on linear PCMCIA Flash cards. This command is not used on ATA PCMCIA Flash disks. 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" or "error". At this point, you cannot recover "deleted" files and you can write to the reclaimed Flash memory space.

Note: The **squeeze** command is available starting from Cisco IOS software release 11.1. If your Cisco IOS software release is earlier than 11.1, then you need to erase the entire Flash using the **format** command and then copy the image which was in the router earlier.

```
C7513#squeeze slot0:
```

```
All deleted files will be removed. Continue? [confirm]y
```

```
Squeeze operation may take a while. Continue? [confirm]y
```

```
Squeezing...
```

```
Squeeze of slot0 complete
```

- **format** – To format a Class A Flash filesystem. In some cases, you might need to insert a new PCMCIA Flash memory card and load images or back up configuration files onto it. Before you can use a new Flash memory card, you must format it. To be sure that a platform is able to boot from a linear PCMCIA Flash card, you should format it on the platform in question; however, the ability to boot from an ATA Flash disk is often times dependent on the platform.

```
C7513#format slot0:
```

```
Format operation may take a while. Continue? [confirm]y
```

```
Format operation will destroy all data in "slot0:". Continue? [confirm]y
```

```
Formatting sector 160.....
```

```
Format of slot0: complete
```

Class B Filesystem

The Filesystem Class B table above describes which filesystems the various Cisco hardware platforms belong to. Platforms listed under the same filesystem class share the same filesystem structure. The methods used for erasing, partitioning, deleting, and recovering files depend on the class of the filesystem. Class B filesystems support the following file management commands:

- **delete** – "Marks" files as deleted, but the files still occupy space in Flash memory.
- **erase** – Erases all of the files on a Flash device.
- **partition** – To separate Flash memory into partitions on Class B filesystem platforms. Use the **no** form of this command to undo partitioning and to restore Flash memory to one partition.

In the sample outputs, the Cisco IOS software file names may vary depending upon the type of platform used.

Note: Before using the commands below, use the **dir{device:}** command or the **show{device:}** command to display a list of files on a Flash memory.

- **Delete**– "Marks" files as deleted, but the files still occupy space in Flash memory. Verify that you have enough space in the Flash memory card by using the **dir{device:}** command. If there is not enough room, then you must erase the Flash to recover the space. The only way to recover a deleted file is to erase the Flash and download the file again from a Trivial File Transfer Protocol (TFTP) or File Transfer Protocol (FTP) server.

```
3640#delete slot1:c3640-i-mz.113-11c.bin
Delete filename [c3640-i-mz.113-11c.bin]? y
Delete slot1:c3640-i-mz.113-11c.bin? [confirm]y
```

Note: To reclaim space on Class B Flash filesystems after deleting files using the **delete** command, you must use the **erase** command. Remember: the **erase** command erases all of the files in the Flash filesystem.

- **erase** – This command erases all of the files in the Flash filesystem; none of the files in the filesystem can be recovered.

The following example shows the erase command on the 3640 router. The erase command is used to erase the files in slot1.

```
3640#erase slot1:
Erasing the slot1 filesystem will remove all files! Continue? [confirm]y
Erasing device... eeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeee ...erased
Erase of slot1 complete
```

- **partition** – To separate Flash memory into partitions on Class B filesystem platforms, use the **partition** global configuration command. Use the **no** form of this command to undo partitioning and to restore Flash memory to one partition.

Note: Before you use the **partition** command, you need to erase a particular Flash memory.

For Cisco 1600 series and Cisco 3600 series:

partition *flash-filesystem: [number-of-partitions][partition-size]*

no partition *flash-filesystem:*

All other Class B platforms:

partition *flash partitions [size1 size2]*

no partition flash

The following example divides the Flash memory card in slot 0 into three partitions: two 8 MB and one 4 MB in size on the Cisco 3600:

```
3640# configure terminal

Enter configuration commands, one per line. End with CNTL/Z.

3640(config)# partition slot0: 3 8 8 4
```

Use the **show slot0** command to check the partitions. You can see from the example below that there are three partitions: two with 8 MB and one with 4 MB. The first partition is loaded with a Cisco IOS software image after the partitions are created.

```
3640#show slot0:

PCMCIA Slot0 flash directory, partition 1:

File Length Name/status

  1  2779832  c3640-i-mz.113-11c.bin

[2779896 bytes used, 5608712 available, 8388608 total]

8192K bytes of processor board PCMCIA Slot0 flash (Read/Write)

PCMCIA Slot0 flash directory, partition 2:

No files in PCMCIA Slot0 flash

[0 bytes used, 8388608 available, 8388608 total]

8192K bytes of processor board PCMCIA Slot0 flash (Read/Write)

PCMCIA Slot0 flash directory, partition 3:

No files in PCMCIA Slot0 flash

[0 bytes used, 3932160 available, 3932160 total]

4096K bytes of processor board PCMCIA Slot0 flash (Read/Write)
```

To remove the partition, use the **no partition** command:

```
3640# configure terminal

3640(config)#no partition flash 3 8 8 4

3640(config)#
```

Class C Filesystem

The Filesystem Class C table above describes which filesystems the various Cisco hardware platforms belong to. Platforms listed under the same filesystem class share the same filesystem structure. The methods used for erasing, deleting, and recovering files depend on the class of the filesystem. Class C filesystems support the following file management commands:

- **delete** – "Marks" files as deleted, but the files still occupy space in Flash memory. Use the **undelete** command to recover these files later.
- **squeeze**– Permanently removes all of the files marked "deleted" or "error" from the specified Flash memory device. These files can no longer be recovered. The squeeze operation can take as long as several minutes if it needs to erase and rewrite most of the Flash memory space on a PCMCIA card.
- **format** – Erases all of the files on a Flash device.
- **mkdir** – To create a new directory in a Class C Flash filesystem.
- **rmdir** – To remove an existing directory in a Class C Flash filesystem.
- **rename** – To rename a file in a Class C Flash filesystem.

Sample Outputs

In the sample outputs below, the Cisco IOS software file names may vary depending upon the type of platform used.

Note: Before using the commands below, use the **dir{device:}** command or **show{device:}** command to display a list of files on a Flash filesystem.

- **Delete**– "Marks" files as deleted, but the files still occupy space in Flash memory. Verify that you have enough space in the Flash memory card by using the **dir{device:}** command. If there is not enough room, then you must delete and squeeze some files to make enough space.

```
7206#delete slot1:
Delete filename []? c7200-js-mz.120-22.bin
Delete slot1:c7200-js-mz.120-22.bin? [confirm]
```

After deleting the file above, you can squeeze the filesystem using the **squeeze** command.

```
7206#squeeze slot1:
All deleted files will be removed. Continue? [confirm]
Squeeze operation may take a while. Continue? [confirm]
Squeeze of slot1 complete
```

Note: The **squeeze** command is available starting from Cisco IOS software release 11.1. If your Cisco IOS software release is earlier than 11.1, you need to erase the entire Flash using the **format** command and then copy the image which was in the router before.

- **Format** – To format a Class C Flash filesystem. In some cases, you might need to insert a new PCMCIA Flash memory card and load images or back up configuration files onto it. Before you can use a new Flash memory card, you must format it.

Example 1: Using a Flash Disk

```
7206#format disk0:
```

```
Format operation may take a while. Continue? [confirm]
Format operation will destroy all data in "disk0:". 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: 93792
Format: Total bytes in formatted partition: 48021504
Format: Operation completed successfully.

Format of disk0: complete
7206#
```

Example 2: Using a Linear Flash Card

```
7206#format slot1:
Format operation may take a while. Continue? [confirm]
Format operation will destroy all data in "slot1:". Continue? [confirm]
Enter volume ID (up to 64 chars)[default slot1]:
Formatting sector 1
Format of slot1 complete
7206#
```

Related Information

- [Using the Cisco IOS File System](#)
- [How to Choose a Cisco IOS Software Release](#)
- [Technical Support & Documentation – Cisco Systems](#)

[Contacts & Feedback](#) | [Help](#) | [Site Map](#)

© 2009 – 2010 Cisco Systems, Inc. All rights reserved. [Terms & Conditions](#) | [Privacy Statement](#) | [Cookie Policy](#) | [Trademarks of Cisco Systems, Inc.](#)

Updated: Feb 17, 2009

Document ID: 6145
