

# External Portware Download

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This document describes the External Portware Download feature, first introduced for the Cisco AS5800 for Cisco IOS Release 11.3(5)AA. This feature supports upgrading the Cisco AS5800 modem firmware from an external flash memory device, such as a PCMCIA Flash card.

## Feature Overview

The External Portware Download feature modifies the existing **firmware** command. The previous version of the command was limited to upgrading dial shelf modem firmware from the bundled image. In order to upgrade the modem firmware, the entire dial shelf feature board images containing the new bundled modem firmware would have to be upgraded first.

The new command adds the capability of upgrading dial shelf modem firmware from an externally sourced file without first upgrading either the router shelf or dial shelf images. The **firmware** command now enables the user to copy non-bundled modem firmware out of Cisco AS5800 Flash memory down to the modems in the system shelf. The portware upgrade file can be previously copied to the router shelf from a variety of media or network sources, whenever new modem firmware becomes available. The external firmware upgrade file (portware) can be acquired from a variety of media or network sources, such as a TFTP server, Cisco Connection Online (CCO), or a floppy disk. The firmware is copied to a local Flash device, such as a PCMCIA Flash memory card in the Cisco AS5800.

This feature makes use of the conventions available in the Cisco IOS File System (IFS).

The External Portware Download feature consists of one new **config-modem-pool** subcommand that specifies the IFS path in the router for the Cisco AS5800 Flash memory device, containing the external firmware upgrade file.

The modified **firmware** command still retains the original capability of downloading firmware from an onboard bundled source, such as a Cisco IOS image.

## Benefits

The External Portware Download feature provides the following benefits:

- Dynamic upgrades of modem firmware without first upgrading router shelf or dial shelf bundled images
- The portware upgrade file can be acquired from a variety of media or network sources, whenever new modem firmware becomes available.
- Makes use of ISF device naming conventions to identify firmware in the Flash memory device

- User can select a shelf/slot/port-range of SIMM-based modem ports up to and including the entire complement of modem cards.
- The **firmware** command continues to support upgrades from bundled images.

## List of Terms

**ISF**—Cisco IOS File System

**modem range**—A range of ports in the modem pool defined by a starting shelf/slot/port number and an ending shelf/slot/port number.

**PCMCIA**—Personal Computer Memory Card International Association

**bundled image file**—A modem firmware file that is bundled with the router image.

**external portware**—A modem firmware file that is freestanding and not bundled with the router image.

## Restrictions

(none currently)

## Related Documentation

For more information on the Cisco AS5300, go to the Cisco Connection Online (CCO), <http://www.cisco.com> or the Cisco Documentation CD-ROM. The CCO path is:

**Cisco Connection Online: Cisco Product Documentation: Access Servers and Access Routers: Access Servers: Cisco AS5800: Cisco IOS 11.3 AA New Features: Cisco AS5800 New Dial and System Management Features.**

The path on the Cisco Documentation CD-ROM almost identical to that on CCO. You can also use the CCO search facility.

For additional software configuration information, see the following publications:

- *Cisco AS5800 Access Server Software ICG*
- *Dial Solutions Configuration Guide*
- *Dial Solutions Command Reference Guide*

## Platforms

This feature is supported on these platforms:

- Cisco AS5800

## Prerequisites

- Your Cisco AS5800 must be running Cisco IOS Release 11.3(6)AA or later.
- The **firmware** command does not include the capability of moving the firmware from point of origin to the Cisco AS5800 Flash memory device. It assumes that the user previously has copied the firmware from a TFTP server or other source to Flash memory in the Cisco AS5800.

## Supported MIBs and RFCs

None are applicable.

## How this Feature Works

The default firmware image is loaded on the modem card Flash memory during system boot-up. Normally, you do not need to change the firmware image; however, you can overwrite the default image with another firmware image using the **firmware** command. (If you specify a firmware image that does not exist, the information is stored so that, in the event that the modem card is updated with that firmware image, it will be loaded when the modem card image boots.)

In conjunction with the **pool-range** modem configuration subcommand, the **firmware** command allows you to separately upgrade modem firmware for individual or ranges of modems consisting of virtual groups of six modems or multiples thereof. (For more information, see the Command Reference section.)

A valid pool range must exist (that is, the **pool-range** modem pool configuration subcommand must have been configured) for modem overwrites to occur. Modem pooling allows you to define, select, and use separate modem pools within a single access server or router to enable different dial-in services for different customers. In this case, the modem pool specifies which modems are loaded with the new firmware image.

The specified firmware image is loaded on every modem for every slot specified in the pool range. If the modem is busy, the firmware change is deferred until the modem is available. When the modem is available, the firmware change takes place immediately.

## Modem Operation at Bootup

When the Cisco 5800 router shelf boots up and parses its NVRAM, the modem cards will not be up. As a result, the overwrite firmware name is stored in the modem pool structures and no action will be taken. At boot-up time, the default firmware image is loaded first. If there is a firmware image specified by the **firmware** command, it is then loaded onto the modem card.

When a modem card becomes active, it sends a startup message to the router shelf. The router shelf then triggers a search in the various modem pools to see if any modem modules on the modem card have a specified firmware overwrite. If yes, the firmware overwrite request is relayed to the modem card, which will load the specified overwrite firmware image on the indicated modem modules.

As a result, the modem modules that are destined to run an overwrite firmware image will experience two firmware downloads at bootup time. The default modem firmware image is loaded first, followed by the overwrite modem firmware image.

## Configuration Tasks

Determine which form of the command you want to use: the bundled firmware form or the external portware form.

## Bundled Firmware

Upgrading the Cisco AS5800 modem firmware from bundled firmware is summarized as follows:

- 1 The download file from the bundled image is identified.

- 2 The **modem-pool** is created and its range specified.
- 3 The form of the **firmware** command is specified and the download is initiated.

## External Portware Firmware

Upgrading the Cisco AS5800 modem firmware from an external flash memory device is summarized as follows:

- 1 The download image is copied to the router Flash memory from a TFTP server, or, if the download is to be from the bundled image, the download file is identified.
- 2 The **modem-pool** is created and its range specified.
- 3 The form of the **firmware** command is specified and the download is initiated.

## Configure

The table below is an example procedure for upgrading modem firmware upgrade using the **firmware** command and other related commands. Begin in privileged EXEC mode.

Step	Command	Purpose
1	router# <b>show modem version</b>	Determine the firmware version currently running on the modem card. If the version needs to be upgraded, proceed.
2	5800# <b>show modem bundled-firmware</b>	If you wish to know the bundled firmware currently residing in the modems, determine the available bundled modem firmware images per slot.
3	5800# <b>copy tftp flash</b>	If you are using external portware to upgrade the modems, copy the portware from a TFTP server to Flash memory in the Cisco AS5800.
4	5800# <b>configure terminal</b> Enter configuration commands, one per line. End with CNTL/Z.	Enter global configuration mode. You are prompted how to enter the commands.
5	5800(config)# <b>modem-pool</b> <i>pool-name</i>	You are in global configuration mode as indicated by the prompt. Enter modem pool configuration mode and create a modem pool.
6	5800(config-modem-pool)# <b>pool-range</b> <i>shelfslot/port</i> <i>shelfslot/port</i>	Create the range (from, up to and including) of modems whose firmware you want to overwrite. A modem range must be coextensive with the boundaries of each virtual group of six modems on a modem card. These group boundaries apply regardless of the type of modem SIMMs used on the card. Thus, numbering range examples might include: <i>shelfslot/0 shelfslot/5</i> (port 0 to port 5 of the first group) or <i>shelfslot/0 shelfslot/11</i> (the first two groups) or <i>shelfslot/6 shelfslot/23</i> (the last three groups), etc. (You must type the slashes (/) as part of the command.)
7	5800(config-modem-pool)# <b>firmware</b> <i>file_specifier_string</i>	If you are downloading external portware, enter the string identifying the portware file copied to the Cisco AS5800 Flash memory, such as an (IFS) file system specifier, as in the example: <b>slot0:mica-firmware.2222.bin</b> . If you are downloading from the bundled image, enter the firmware version.
8	5800(config-modem-pool)# <b>ctrl-z</b> 5800 # Slot 8: Firmware being upgraded to slot0:portware.2222.ios for modems in modem-pool range <i>n n</i>  %SYS-5-CONFIG_I: Configured from console by console	Press <b>Return</b> to verify your command registers, then type <b>Ctrl-Z</b> to exit the modem-pool configuration mode and return to privileged EXEC mode.  The router prompt returns. A confirmation messages indicates the firmware file used as the download file and range <i>n n</i> of modems being downloaded to. (In this case, the external portware form of the command is used as an example.)  After the displaying the confirmation message, a “Configured from console” message is displayed. This is expected and does not indicate an error.
9	5800# <b>copy running-config startup-config</b>	Save your configuration when ready.

## Verify

To verify you have configured downloaded the firmware to the modems:

- After you typed the **firmware** command, check to see that the router prompt returns and you get a message similar to this example:

```
Slot 8: Firmware being upgraded to slot0:portware.2222.ios for modems in modem-pool x
```

- To verify a download has succeeded, use the **show modem version** command.

```
5800# > show modem version
Modem Range           Module  Firmware Rev
 1/6/00 1/6/05         0      2.2.2.2
 1/6/06 1/6/11         1      2.2.2.2
 1/6/12 1/6/17         2      2.2.2.2
 1/6/18 1/6/23         3      2.2.2.2
 1/6/24 1/6/29         4      2.2.2.2
 1/6/30 1/6/35         5      2.2.2.2
 1/6/36 1/6/41         6      2.2.2.2
 1/6/42 1/6/47         7      2.2.2.2
 1/6/48 1/6/53         8      2.2.2.2
 1/6/54 1/6/59         9      2.2.2.2
 1/6/60 1/6/65        10     2.2.2.2
 1/6/66 1/6/71        11     2.2.2.2
Modem board HW version info:

Modem Range:      1/6/00 1/6/05           Modem Module:  0
Manufacture Cookie Info:
EEPROM Type 0x0101, EEPROM Version 0x01, Board ID 0x06,
Board Hardware Version 1.0, Item Number 73-2522-2,
Board Revision 051, Serial Number 06298557,
PLD/ISP Version 255.255, Manufacture Date 17-Jul-1997.

Modem Range:      1/6/06 1/6/11           Modem Module:  1
Manufacture Cookie Info:
EEPROM Type 0x0101, EEPROM Version 0x01, Board ID 0x06,
Board Hardware Version 1.0, Item Number 73-2522-2,
Board Revision 051, Serial Number 06298553,
PLD/ISP Version 255.255, Manufacture Date 17-Jul-1997.

Modem Range:      1/6/12 1/6/17           Modem Module:  2
Manufacture Cookie Info:
EEPROM Type 0x0101, EEPROM Version 0x01, Board ID 0x06,
Board Hardware Version 1.0, Item Number 73-2522-2,
Board Revision 051, Serial Number 06298017,
PLD/ISP Version 255.255, Manufacture Date 17-Jul-1997.

Modem Range:      1/6/18 1/6/23           Modem Module:  3
Manufacture Cookie Info:
EEPROM Type 0x0101, EEPROM Version 0x01, Board ID 0x06,
Board Hardware Version 1.0, Item Number 73-2522-2,
Board Revision 051, Serial Number 06298019,
PLD/ISP Version 255.255, Manufacture Date 17-Jul-1997.

Modem Range:      1/6/24 1/6/29           Modem Module:  4
Manufacture Cookie Info:
EEPROM Type 0x0101, EEPROM Version 0x01, Board ID 0x06,
Board Hardware Version 1.0, Item Number 73-2522-2,
Board Revision 051, Serial Number 06298200,
PLD/ISP Version 255.255, Manufacture Date 17-Jul-1997.
Modem Range:      1/6/30 1/6/35           Modem Module:  5
Manufacture Cookie Info:
EEPROM Type 0x0101, EEPROM Version 0x01, Board ID 0x06,
Board Hardware Version 1.0, Item Number 73-2522-2,
Board Revision 051, Serial Number 06298590,
PLD/ISP Version 255.255, Manufacture Date 17-Jul-1997.

Modem Range:      1/6/36 1/6/41           Modem Module:  6
Manufacture Cookie Info:
EEPROM Type 0x0101, EEPROM Version 0x01, Board ID 0x06,
Board Hardware Version 1.0, Item Number 73-2522-2,
Board Revision 051, Serial Number 06298446,
```

```

PLD/ISP Version 255.255, Manufacture Date 17-Jul-1997.

Modem Range:      1/6/42 1/6/47          Modem Module:  7
Manufacture Cookie Info:
  EEPROM Type 0x0101, EEPROM Version 0x01, Board ID 0x06,
  Board Hardware Version 1.0, Item Number 73-2522-2,
  Board Revision 051, Serial Number 06298593,
  PLD/ISP Version 255.255, Manufacture Date 17-Jul-1997.

Modem Range:      1/6/48 1/6/53          Modem Module:  8
Manufacture Cookie Info:
  EEPROM Type 0x0101, EEPROM Version 0x01, Board ID 0x06,
  Board Hardware Version 1.0, Item Number 73-2522-2,
  Board Revision 051, Serial Number 06298233,
  PLD/ISP Version 255.255, Manufacture Date 17-Jul-1997.

Modem Range:      1/6/54 1/6/59          Modem Module:  9
Manufacture Cookie Info:
  EEPROM Type 0x0101, EEPROM Version 0x01, Board ID 0x06,
  Board Hardware Version 1.0, Item Number 73-2522-2,
  Board Revision 051, Serial Number 06298309,
  PLD/ISP Version 255.255, Manufacture Date 17-Jul-1997.

Modem Range:      1/6/60 1/6/65          Modem Module: 10
Manufacture Cookie Info:
  EEPROM Type 0x0101, EEPROM Version 0x01, Board ID 0x06,
  Board Hardware Version 1.0, Item Number 73-2522-2,
  Board Revision 051, Serial Number 06297954,
  PLD/ISP Version 255.255, Manufacture Date 17-Jul-1997.

Modem Range:      1/6/66 1/6/71          Modem Module: 11
Manufacture Cookie Info:
  EEPROM Type 0x0101, EEPROM Version 0x01, Board ID 0x06,
  Board Hardware Version 1.0, Item Number 73-2522-2,
  Board Revision 051, Serial Number 06298008,
  PLD/ISP Version 255.255, Manufacture Date 17-Jul-1997.

```

## Tips

Error messages result if the following circumstances exist:

- If you issue a firmware command on a modem pool that has no pool range already specified, an error message will result.
- If you issue a firmware command on a modem pool that is neither constrained nor constraint-capable, an error message will result.
- If the firmware specified is not part of the firmware list, a message is printed to the console. The firmware name is stored in the modem pool structures until that modem card is updated with the specified firmware image. The firmware upgrade then occurs when that modem card is rebooted.
- If any modem module has an active call on it, the firmware upgrade request is queued and deferred until the modem module becomes free.
- To deactivate a modem command, type **no** before the command, if applicable:

```
5800# (config)# no modem-pool test
```

## Configuration Examples

### Example 1: External Portware

The following example creates a modem pool called **denver**, assigns a pool range to **denver** beginning from dial shelf 6, slot 5, ports 0 and extending through dial shelf 6, slot 5, port 5 (a 6 modem boundary), and downloads from the ISF-specified path in the router shelf's Flash memory where the external portware file containing firmware version 2.2.2.2 resides:

```
router# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
router(config)# modem-pool denver
router(config-modem-pool)# pool-range 6/5/0-6/5/5
router(config-modem-pool)# firmware slot0:portware.2222.ios
Slot 5: Firmware being upgraded to slot0:portware.2222.ios for modems in modem-pool
denver
router(config-modem-pool)# end
router#
```

The string, **slot0:portware.2222.ios**, identifies ISF file specifier path of the external portware file that has previously be loaded in an Cisco AS5800 Flash memory device. Slot 0 is the location of the memory device. The file name is **portware.2222.ios**. The user has previously copied this file to Flash memory using the **copy tftp flash** command.

### Example 2: Bundled Firmware

This sequence identifies and downloads bundled image file, **2.2.2.2**, to all the modems in modem pool **x**, which is created and whose range is specified.

```
router# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
router(config)# modem-pool x
router(config-modem-pool)# pool-range 6/5/0-6/5/5
router(config-modem-pool)# firmware 2.2.2.2
Slot 5: Firmware being upgraded to 2.2.2.2 for modems in modem-pool x
router(config-modem-pool)# end
router#
```

## Command Reference

This section is a command reference for the **firmware** command. The new command is modified to allow for downloading external portware files in addition to bundled image files. Therefore, there are two forms of the command: one for downloading a file from the bundled image, the other for downloading an external portware file.

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**Note** This section documents new or modified commands. All other commands used with this feature are documented in the Cisco IOS Release 11.3 or 12.0 command reference documents.

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## firmware

To download a bundled firmware image or an external portware image to modem-pool range, use the **firmware** modem pool configuration command. To download the default bundled firmware image, use the **no** form of the command.

```
firmware {file-specifier-string | version}
no firmware {version-file}
```

### Syntax Description

<i>file-specifier-string</i>	(For external portware) The string that ISF-specifies the external portware file that has previously be loaded in an Cisco AS5800 Flash memory device. For example: slot0:mica-firmware.2222.bin
<i>version</i>	(For bundled firmware) The string describing the bundled firmware image you want to download. This version name is usually a number, for example: 2.2.3.1.

### Default

The firmware version bundled with the current Cisco IOS software image is downloaded to the modem-pool range.

### Command Mode

Modem pool configuration

```
config-modem-pool
```

### Usage Guidelines

This command first appeared in Cisco IOS Release 11.3(2)AA. The command was changed in Cisco IOS Release 11.3(6)AA to include external portware.

A valid pool range must exist (that is, the **pool-range** modem pool configuration command must have been configured). Modem pooling allows service providers to define, select, and use separate pools of modems within a single access server or router to enable different dial-in services for different customers. In this case, the modem pool specifies which modems are loaded with the new firmware image.

For all access servers with internal MICA modems, the modem pool commands operate only on 6-modem boundaries. (Modems are grouped together using ranges based on 6-port boundaries.)

The specified firmware image is loaded on every modem specified in the pool-range. If the modem is busy, the firmware change is deferred until the modem is available. When the modem is available, the firmware change takes place immediately.

To determine what firmware image is currently running on the modem card, use the **show modem version EXEC** command.

To determine a list of valid firmware images, use the **show modem bundled-firmware EXEC** command. If you specify a firmware image that does not exist, the information is stored so that if the modem card is updated at a later date with a modem card image that contains that firmware image it will be loaded when the modem card image boots.

At boot-up time, the default firmware image is loaded first. If there is a firmware image specified by the **firmware** command, it is loaded on the modem card following the loading of the default firmware image.

## Examples

### Example 1: External Portware

The following example creates a modem pool called **denver**, assigns a pool range to **denver** beginning from dial shelf 6, slot 5, ports 0 and extending through dial shelf 6, slot 5, port 5 (a 6 modem boundary), and downloads from the ISF-specified path in the router shelf's Flash memory where the external portware file containing firmware version 2.2.2.2 resides:

```
router# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
router(config)# modem-pool denver
router(config-modem-pool)# pool-range 6/5/0-6/5/5
router(config-modem-pool)# firmware slot0:portware.2222.ios
Slot 5: Firmware being upgraded to slot0:portware.2222.ios for modems in modem-pool
denver
router(config-modem-pool)# end
router#
```

### Example 2: Bundled Firmware

This sequence identifies and downloads bundled image file, **2.2.2.2**, to all the modems in modem pool x, which is created and whose range is specified.

```
router# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
router(config)# modem-pool x
router(config-modem-pool)# pool-range 6/5/0-6/5/5
router(config-modem-pool)# firmware 2.2.2.2
Slot 5: Firmware being upgraded to 2.2.2.2 for modems in modem-pool x
router(config-modem-pool)# end
router#
```

## Related Commands

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

- copy modem**
- copy system:/ucode/filename modem**
- copy tftp flash**
- dir system:/ucode**
- modem-pool**
- pool-range**
- show modem**
- show modem bundled-firmware**
- show modem-pool**
- show modem version**