



Warm Reload

The Warm Reload feature allows users to reload their routers without reading images from storage. That is, the Cisco IOS image reboots without ROM monitor mode (ROMMON) intervention by restoring the read-write data from a previously saved copy in the RAM and by starting execution without either copying the image from flash to RAM or self-decompression of the image. Thus, the overall availability of your system improves because the time to reboot your router is significantly reduced.

Feature History for Warm Reload

Release	Modification
12.3(2)T	This feature was introduced.
12.2(18)S	This feature was integrated into Cisco IOS Release 12.2(18)S.
12.2(27)SBC	This feature was introduced on a Cisco IOS Release 12.2 SB-based train. This feature became available for the Cisco 7304 router for both the NSE-100 and NPE-G100 processors for the first time.

Finding Support Information for Platforms and Cisco IOS Software Images

Use Cisco Feature Navigator to find information about platform support and Cisco IOS software image support. Access Cisco Feature Navigator at <http://www.cisco.com/go/fn>. You must have an account on Cisco.com. If you do not have an account or have forgotten your username or password, click **Cancel** at the login dialog box and follow the instructions that appear.

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Restrictions for Warm Reload

Additional Memory Consumption

Additional memory is consumed because a copy of the initialized variables must be stored for a warm reboot to function. However, to consume as little memory as possible, a copy of the initialized variables is kept in a compressed form, which is marked as “read-only” to prevent corruption.

Software Support Only

A warm reboot should be used only for forced software crashes. Hardware failure of any kind will result in a cold reboot.

Information About Warm Reload

To use the warm-reboot functionality, you should understand the following concepts:

- [Benefits of Warm Reload, page 2](#)
- [Warm Reload Functionality, page 2](#)

Benefits of Warm Reload

Quicker Router Reload

By eliminating the need to copy an image from flash to RAM and decompress it, the reload time of a router is reduced by 2 to four minutes. The time savings is greater on platforms that use the BOOTLDR images because the additional step of loading a BOOTLDR image and parsing the configuration file by the BOOTLDR image can be avoided.

Flash Card Removal

The router is not useless if a flash card is removed because it can still reboot as long as it is not forced into a cold reboot (such as a power failure).

Warm Reload Functionality

When encountering a crash, a Cisco IOS image transfers control to ROMMON, which copies the system image from the storage device (which is typically flash) to main memory, decompresses the system image, and transfers control back to Cisco IOS. Warm rebooting allows the image to return to the start of the text segment in memory and restart execution from that point, thereby, eliminating ROMMON intervention. A copy of the initialized variables is kept in memory and is used to overwrite the existing memory location where the initialized variables are stored. Thus, when the CPU returns to the start of the text segment and begins operating, the information is the same as if execution had begun after the binary had been read from flash and decompressed.

How to Use Warm Reload

This section contains the following procedures:

- [Configuring a Warm Reload, page 3](#)
- [Reloading Your System Without Overriding the Warm-Reload Functionality, page 4](#)

Configuring a Warm Reload

Use this task to configure your router for a warm reload in global configuration mode.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **warm-reboot** [**count** *number*] [**uptime** *minutes*]
4. **exit**
5. **show warm-reboot**

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Router> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> • Enter your password if prompted.
Step 2	configure terminal Example: Router# configure terminal	Enters global configuration mode.
Step 3	warm-reboot [count <i>number</i>] [uptime <i>minutes</i>] Example: Router(config)# warm-reboot count 10 uptime 10	Enables a router to warm-reboot. <ul style="list-style-type: none"> • count <i>number</i>—Maximum number of warm reboots allowed between any intervening cold reboot. Valid values range from 1 to 50. The default value is 5 times. • uptime <i>minutes</i>—Minimum number of minutes that must elapse between initial system configuration and an exception before a warm reboot is attempted. If the system crashes before the specified time elapses, a warm reboot is not attempted. Valid values range from 0 to 120. The default value is 5 minutes. <p>Note After a warm reboot is enabled, it will not become active until after the next cold reboot because a warm reboot requires a copy of the initialized memory.</p>

	Command or Action	Purpose
Step 4	<code>exit</code>	Exits global configuration mode and return to EXEC mode.
Step 5	<code>show warm-reboot</code>	(Optional) Displays statistics for attempted warm reboots.
	Example: Router# <code>show warm-reboot</code>	

Reloading Your System Without Overriding the Warm-Reload Functionality

If you issue the **reload** command after you have configured the **warm-reboot** global command, a cold reboot will occur. Thus, if you wish to reload your system, but do not want to override the warm-reboot functionality, you should specify the **warm** keyword with the **reload** command. Use this task to configure your router for a warm reboot while you reload your system.

SUMMARY STEPS

1. **enable**
2. **reload** `[[warm] text | [warm] in [hh:]mm [text] | [warm] at hh:mm [month day | day month] [text] | [warm] cancel]`
3. **show reload**

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Router> <code>enable</code>	Enables privileged EXEC mode. <ul style="list-style-type: none"> • Enter your password if prompted.
Step 2	reload <code>[[warm] text [warm] in [hh:]mm [text] [warm] at hh:mm [month day day month] [text] [warm] cancel]</code> Example: Router# <code>reload warm at 10:30</code>	Reloads the operating system. You must issue the warm keyword if you do not want to override the warm reboot functionality when you reload the router.
Step 3	show reload Example: Router# <code>show reload</code>	Displays the reload status on the router.

Configuration Examples for Cisco IOS Warm Reload

This section contains the following configuration example:

- [Warm Reload Configuration: Example, page 5](#)

Warm Reload Configuration: Example

The following example shows how to enable and verify a warm reboot:

```
Router#(config) warm-reboot count 10 uptime 10
Router#(config) exit
!
Router# show warm-reboot

Warm Reboot is enabled

Statistics:
10 warm reboots have taken place since the last cold reboot
XXX KB taken up by warm reboot storage
```

Additional References

The following sections provide references related to the Warm Reload feature.

Related Documents

Related Topic	Document Title
Additional information on rebooting your router	The chapter “Rebooting” in the section “File Management” in the <i>Cisco IOS Configuration Fundamentals and Network Management Configuration Guide</i>
Additional booting commands	<i>Cisco IOS Configuration Fundamentals and Network Management Command Reference</i> , Release 12.3 T

Standards

Standards	Title
None	—

MIBs

MIBs	MIBs Link
None	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
None	—

Technical Assistance

Description	Link
Technical Assistance Center (TAC) home page, containing 30,000 pages of searchable technical content, including links to products, technologies, solutions, technical tips, and tools. Registered Cisco.com users can log in from this page to access even more content.	http://www.cisco.com/public/support/tac/home.shtml

Command Reference

This section documents new and modified commands. All other commands used with this feature are documented in the Cisco IOS Release 12.3 T command reference publications.

- [reload](#)
- [show warm-reboot](#)
- [warm-reboot](#)

reload

To reload the operating system, use the **reload** command in EXEC mode.

```
reload [[warm] [/verify | /noverify] text | [warm] [/verify | /noverify] in [hh:mm] [text] | [warm]
[/verify | /noverify] at [hh:mm] [month day | day month] [text] | [warm] [/verify | /noverify]
cancel]
```

Syntax Description

<i>text</i>	(Optional) Reason for the reload, 1 to 255 characters long.
in [<i>hh:mm</i>]	(Optional) Schedule a reload of the software to take effect in the specified minutes or hours and minutes. The reload must take place within approximately 24 days.
at [<i>hh:mm</i>]	(Optional) Schedule a reload of the software to take place at the specified time (using a 24-hour clock). If you specify the month and day, the reload is scheduled to take place at the specified time and date. If you do not specify the month and day, the reload takes place at the specified time on the current day (if the specified time is later than the current time), or on the next day (if the specified time is earlier than the current time). Specifying 00:00 schedules the reload for midnight. The reload must take place within approximately 24 days.
<i>month</i>	(Optional) Name of the month, any number of characters in a unique string.
<i>day</i>	(Optional) Number of the day in the range from 1 to 31.
cancel	(Optional) Cancel a scheduled reload.
warm	(Optional) Schedule a warm-reboot.
/verify	(Optional) Verify the signature of the file that is going to be loaded onto the operating system.
/noverify	(Optional) Do not verify the signature of the file that is going to be loaded onto the operating system.
Note	This keyword is often issued if the file verify auto command is enabled, which automatically verifies the signature of all images that are copied.

Command Modes

EXEC

Command History

Release	Modification
10.0	The command was introduced.
12.3(2)T	The warm keyword was added.
12.2(18)S	The /verify and /noverify keywords were added.
12.2(27)SBC	This feature was introduced on a Cisco IOS Release 12.2 SB-based train. This feature became available for the Cisco 7304 router for the first time.

Usage Guidelines

The **reload** command halts the system. If the system is set to restart on error, it reboots itself. Use the **reload** command after configuration information is entered into a file and saved to the startup configuration.

You cannot reload from a virtual terminal if the system is not set up for automatic booting. This prevents the system from dropping to the ROM monitor and thereby taking the system out of the remote user's control.

If you modify your configuration file, the system prompts you to save the configuration. During a save operation, the system asks you if you want to proceed with the save if the CONFIG_FILE variable points to a startup configuration file that no longer exists. If you say "yes" in this situation, the system goes to setup mode upon reload.

When you schedule a reload to occur at a later time, it must take place within approximately 24 days.

The **at** keyword can be used only if the system clock has been set on the router (either through NTP, the hardware calendar, or manually). The time is relative to the configured time zone on the router. To schedule reloads across several routers to occur simultaneously, the time on each router must be synchronized with NTP.

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

The warm Keyword

If you issue the **reload** command after you have configured the **warm-reboot** global command, a cold reboot will occur. Thus, if you wish to reload your system, but do not want to override the warm reboot functionality, you should specify the **warm** keyword with the **reload** command. The **warm** keyword configures the router for warm reboot, which allows a Cisco IOS image to reload without ROMMON intervention. That is, read-write data is saved in RAM during cold startup and restored during a warm reboot. Warm reboot allows the router to reboot quicker than conventional rebooting (where control is transferred to ROMMON and back to the image) because nothing is copied from flash to RAM.

The /verify and /noverify Keywords

If the **/verify** keyword is specified, the integrity of the image will be verified before it is reloaded onto a router. If verification fails, the image reload will not occur. Image verification is important because it assures the user that the image is protected from accidental corruption, which can occur at any time during transit, starting from the moment the files are generated by Cisco until they reach the user.

The **/noverify** keyword overrides any global automatic image verification that may be enabled via the **file verify auto** command.

Examples

The following example immediately reloads the software on the router:

```
Router# reload
```

The following example reloads the software on the router in 10 minutes:

```
Router# reload in 10
```

```
Router# Reload scheduled for 11:57:08 PDT Fri Apr 21 1996 (in 10 minutes)
Proceed with reload? [confirm]
Router#
```

The following example reloads the software on the router at 1:00 p.m. today:

```
Router# reload at 13:00
```

```
Router# Reload scheduled for 13:00:00 PDT Fri Apr 21 1996 (in 1 hour and 2 minutes)
Proceed with reload? [confirm]
Router#
```

The following example reloads the software on the router on April 20 at 2:00 a.m.:

```
Router# reload at 02:00 apr 20
```

```
Router# Reload scheduled for 02:00:00 PDT Sat Apr 20 1996 (in 38 hours and 9 minutes)
Proceed with reload? [confirm]
Router#
```

The following example cancels a pending reload:

```
Router# reload cancel

%Reload cancelled.
```

The following example shows how to configure the router for warm reboot at 4:00 today:

```
Router# reload warm at 4:00
```

The following example shows how to specify image verification via the **/verify** keyword before reloading an image onto the router:

```
Router# reload /verify

Verifying file bootflash:c7200-kboot-mz.121-8a.E
%ERROR:Signature not found in file bootflash:c7200-kboot-mz.121-8a.E.
Signature not present. Proceed with verify? [confirm]
Verifying file disk0:c7200-js-mz
.....Done!
Embedded Hash MD5 :CFA258948C4ECE52085DCF428A426DCD
Computed Hash MD5 :CFA258948C4ECE52085DCF428A426DCD
CCO Hash MD5 :44A7B9BDDD9638128C35528466318183
Signature Verified

Proceed with reload? [confirm]n
Router#
```

Related Commands

Command	Description
copy system:running-config nvram:startup-config	Copies any file from a source to a destination.
file verify auto	Enables automatic image verification.
show reload	Displays the reload status on the router.

show warm-reboot

To display the statistics for attempted warm reboots, use the **show warm-reboot** command in privileged EXEC mode.

show warm-reboot

Syntax Description This command has no arguments or keywords.

Command Modes Privileged EXEC

Command History	Release	Modification
	12.3(2)T	This command was introduced.
	12.2(18)S	This feature was integrated into Cisco IOS Release 12.2(18)S.
	12.2(27)SBC	This feature was introduced on a Cisco IOS Release 12.2 SB-based train. This feature became available for the Cisco 7304 router for the first time.

Usage Guidelines Use the **show warm-reboot** command to see if warm rebooting is enabled, and, if so, how many warm reboots have occurred and how much space in kilobytes (KB) is consumed by warm-reboot storage, which is the RAM area used to store the data segment that enables warm reloading to function.

Examples The following example is sample output from the **show warm-reboot** command:

```
Router# show warm-reboot

Warm Reboot is enabled

Statistics:
10 warm reboots have taken place since the last cold reboot
XXX KB taken up by warm reboot storage
```

Related Commands	Command	Description
	warm-reboot	Enables a router to warm-reboot.

warm-reboot

To enable a router to warm-reboot, use the **warm-reboot** command in global configuration mode. To disable warm rebooting, use the **no** form of this command.

warm-reboot [*count number*] [*uptime minutes*]

no warm-reboot *count number uptime minutes*

Syntax Description

count <i>number</i>	(Optional) Maximum number of warm reboots allowed between any intervening cold reboot. Valid values range from 1 to 50. The default value is 5 times.
uptime <i>minutes</i>	(Optional) Minimum number of minutes that must elapse between initial system configuration and an exception before a warm reboot is attempted. If the system crashes before the specified time elapses, a warm reboot is not attempted. Valid values range from 0 to 120. The default value is 5 minutes.

Defaults

Warm rebooting is disabled.

If warm rebooting is enabled, the default value for the **count** *number* option is 5 times, and the default value for the **uptime** *minutes* option is 5 minutes.

Command Modes

Global configuration

Command History

Release	Modification
12.3(2)T	This command was introduced.
12.2(18)S	This feature was integrated into Cisco IOS Release 12.2(18)S.
12.2(27)SBC	This feature was introduced on a Cisco IOS Release 12.2 SB-based train. This feature became available for the Cisco 7304 router for the first time.

Usage Guidelines

Use the **warm-reboot** command to enable the router to reload a Cisco IOS image without ROM monitor mode (ROMMON) intervention, in which the image restores read-write data from a previously saved copy in the RAM and starts execution from that point. Unlike a cold reboot, this process does not involve a flash to RAM copy or self-decompression of the image.



Note

After a warm reboot is enabled, it will not become active until after the next cold reboot because a warm reboot requires a copy of the initialized memory.



Note

If the system crashes before the image completes the warm reboot process, a cold reboot is initiated.

Examples

The following example shows how to enable a warm reboot on the router:

```
Router#(config) warm-reboot count 10 uptime 10
```

Related Commands

Command	Description
show warm-reboot	Displays the statistics for attempted warm reboots.

Glossary

cold reboot—Process of reloading a Cisco IOS image in which the ROMMON copies the configured image from a storage device, such as flash, into main memory. Thereafter, the image is decompressed and execution is started.

warm reboot—Process of reloading a Cisco IOS image without ROMMON intervention in which the image restores read-write data from a previously saved copy in the RAM and starts execution. Unlike a cold reboot, this process does not involve a flash to RAM copy or self-decompression of the image.

**Note**

Refer to [Internetworking Terms and Acronyms](#) for terms not included in this glossary.

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