



Route Processor Redundancy and Fast Software Upgrade on Cisco 7500 Series Routers

Feature History

12.0(16)ST	This feature was introduced.
12.0(22)S	This feature was integrated into Cisco IOS Release 12.0(22)S.

This feature module describes Route Processor Redundancy (RPR) and Fast Software Upgrade (FSU) on Cisco 7500 series routers in Cisco IOS Release 12.0(22)S. It includes information on the benefits of the new features, supported platforms, related documents, configuration examples, and a command reference.

This document includes the following sections:

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Feature Overview

Route Processor Redundancy (RPR) provides an alternative to the High System Availability (HSA) feature currently available on Cisco 7500 series routers. HSA enables a system to reset and use a standby Route Switch Processor (RSP) in the event of a failure of the active RSP.

Using RPR, you can reduce unplanned downtime. RPR enables a quicker switchover between an active and standby RSP in the event of a fatal error on the active RSP. When you configure RPR, the standby RSP loads a Cisco IOS image on bootup and initializes itself in standby mode. In the event of a fatal error on the active RSP, the system switches to the standby RSP, which reinitializes itself as the active RSP, reloads all of the line cards, and restarts the system.

Using Fast Software Upgrade (FSU), you can reduce planned downtime. With FSU, you can configure the system to switch over to a standby RSP that is preloaded with an upgraded Cisco IOS software image. FSU reduces outage time during a software upgrade by transferring functions to the standby RSP that has the upgraded Cisco IOS software pre-installed. The only downtime with a Fast Software Upgrade is the time required for the standby RSP to take control during the switchover. You can also use FSU to downgrade a system to an older version of Cisco OS or have a backup system loaded for downgrading to a previous image immediately after an upgrade.

Switchover Times

Whenever an RPR switchover occurs, the RSP will not completely be booted up and configured in its new state for approximately 15 minutes. For HSA, the complete time to achieve the new state is roughly 20 minutes. The actual time of the any High Availability switchover is dependant upon configuration and various other factors, and will take at least 5 minutes and 30 seconds in the best possible switchover scenario.

The following table provides some rough estimates regarding the time required to switch a new packet and total switchover time for various High Availability features:

Feature	Time to Immediately Switch a Packet on New RSP After Failover	Expected Overall Time to Have New RSP in New High Availability State After Failover	Notes
High System Availability (HSA)	10 minutes	20 minutes	System default.
RPR	5 minutes	15 minutes	VIPs and legacy interface processors supported.
RPR+	30 seconds	11 minutes	VIPs supported. ¹
Stateful Switchover	7 seconds	7 minutes	

1. Legacy interface processors default to RPR. A message similar to the following is displayed during switchover:
 %HA-2-NO_Quiesce: Slot 11 did not quiesce, it will be disabled and then reloaded.

Benefits

- RPR reduces the amount of unplanned downtime of a Cisco 7500 series router by enabling a faster startup time of a standby RSP.
- FSU reduces outage time during a software upgrade by transferring functions to the standby RSP that has an upgraded Cisco IOS software pre-installed.

Restrictions

- To configure RPR, a router must have either two RSP8s or any combination of RSP2s and RSP4s.
- RSP1s do not support RPR or HSA.
- RPR is only supported on routers which support dual RSPs. Only the Cisco 7507 and Cisco 7513 support dual RSPs.

Related Features and Technologies

Single Line Card Reload

Related Documents

- [Cisco IOS Release 12.0 Configuration Fundamentals Configuration Guide](#)
- [Cisco IOS Release 12.0 Configuration Fundamentals Command Reference](#)
- [Cisco 7500 Single Line Card Reload](#)

Supported Platforms

Cisco 7500 series

Platform Support Through Feature Navigator

Cisco IOS software is packaged in feature sets that support specific platforms. To get updated information regarding platform support for this feature, access Feature Navigator. Feature Navigator dynamically updates the list of supported platforms as new platform support is added for the feature.

Feature Navigator is a web-based tool that enables you to quickly determine which Cisco IOS software images support a specific set of features and which features are supported in a specific Cisco IOS image.

To access Feature Navigator, you must have an account on Cisco.com. If you have forgotten or lost your account information, send a blank e-mail to cco-locksmith@cisco.com. An automatic check will verify that your e-mail address is registered with Cisco.com. If the check is successful, account details with a new random password will be e-mailed to you. Qualified users can establish an account on Cisco.com by following the directions at <http://www.cisco.com/register>.

Feature Navigator is updated when major Cisco IOS software releases and technology releases occur. As of May 2001, Feature Navigator supports M, T, E, S, and ST releases. You can access Feature Navigator at the following URL:

<http://www.cisco.com/go/fn>

Supported Standards, MIBs, and RFCs

Standards

No new or modified standards are supported by this feature.

MIBs

No new or modified MIBs are supported by this feature.

To obtain lists of MIBs supported by platform and Cisco IOS release and to download MIB modules, go to the Cisco MIB website on Cisco.com at:

<http://www.cisco.com/public/sw-center/netmgmt/cmtk/mibs.shtml>.

RFCs

None

Prerequisites

RPR requires a Cisco 7500 series router loaded with two RSP8s or a combination of RSP2s and RSP4s.

Configuration Tasks

See the following sections for the configuration tasks required to run the RPR and FSU features.

- [Copying an Image onto an RSP, page 4](#) (required)
- [Setting the Config-Register Boot Variable, page 5](#) (optional)
- [Configuring RPR, page 6](#) (required)
- [Performing a Fast Software Upgrade, page 8](#) (optional)
- [Verifying RPR, page 10](#) (optional)

Copying an Image onto an RSP

Use TFTP to copy a high availability Cisco IOS image onto the active and standby RSPs:

Command	Purpose
<p>Step 1 Router# copy tftp slotslot-number:</p> <p>Address or name of remote host []? <i>ip-address</i></p> <p>Name of file to copy []? <i>imagename</i><Return> writing filename!!</p> <p>Destination file name? [<i>imagename1</i>] <Return> Accessing file 'imagename' on ip-address.. found ! 903500 bytes available for writing without erasure.</p> <p>Loading imagename from ip-address (via Ethernet1/0): ! [OK - 3320245/4194176 bytes] Verifying via checksum...</p> <p>Flash verification successful. Length = 3320245, checksum = 0xA83D</p>	<p>Uses TFTP to copy a high availability Cisco IOS image onto the Flash memory card of the active RSP.¹</p> <ul style="list-style-type: none"> • <i>slotslot-number</i>—Specifies the Flash memory card of the active RSP. <p>The router prompts you for the IP address of the TFTP server.</p> <ul style="list-style-type: none"> • <i>ip-address</i>—Specifies the IP address of the TFTP server that contains the new image. <p>The router prompts you for the name of the image file you are copying to the Flash memory card.</p> <ul style="list-style-type: none"> • <i>imagename</i>—Indicates the name of the image to be loaded onto the Flash memory card. <p>The router prompts you to enter the name under which you want the file to appear at the destination.</p> <ul style="list-style-type: none"> • <i>imagename1</i>—Indicates the name of the image as it appears at the destination. <p>If you want the Flash memory card erased, enter y.</p>

<p>Step 2 Router# copy tftp slaveslots<i>slot-number</i>:</p> <p>Address or name of remote host []? <i>ip-address</i></p> <p>Name of file to copy []? <i>imagename</i><Return> writing filename!!</p> <p>Destination file name? [<i>imagename1</i>] <Return> Accessing file 'imagename' on ip-address.. found ! 903500 bytes available for writing without erasure. Loading imagename from ip-address (via Ethernet1/0): !</p> <p>[OK - 3320245/4194176 bytes] Verifying via checksum...</p> <p>Flash verification successful. Length = 3320245, checksum = 0xA83D</p>	<p>Uses TFTP to copy a high availability Cisco IOS image onto the Flash memory card of the standby RSP.</p> <ul style="list-style-type: none"> • <i>slaveslots</i><i>slot-number</i>—Specifies the Flash memory card of the standby RSP. <p>The router prompts you for the IP address of the TFTP server.</p> <ul style="list-style-type: none"> • <i>ip-address</i>—Specifies the IP address of the TFTP server that contains the new image. <p>The router prompts you for the name of the image file you are copying to the Flash memory card.</p> <ul style="list-style-type: none"> • <i>imagename</i>—Indicates the name of the image to be loaded onto the Flash memory card. <p>The router prompts you to enter the name under which you want the file to appear at the destination.</p> <ul style="list-style-type: none"> • <i>imagename1</i>—Indicates the name of the image as it appears at the destination.
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1. Before you copy a file to Flash memory, be sure there is ample space available in Flash memory. Compare the size of the file you are copying to the amount of available Flash memory shown. If the space available is less than the space required by the file you will copy, the copy process will continue, but the entire file will not be copied into Flash memory.

Setting the Config-Register Boot Variable

Though it is not required, we recommend that you modify the software configuration register boot field so that the system boots the same image that the **hw-module slot slot-number image file-spec** command specifies in the “Configuring RPR” section.

	Command	Purpose
Step 1	Router# show version	Obtains the current configuration register setting.
Step 2	Router# configure terminal	Enters configuration mode, selecting the terminal option.

	Command	Purpose
Step 3	Router(config)# boot system flash slot <i>slot-number</i> : [<i>imagename</i>]	Specifies the filename of an image stored in Flash memory. <ul style="list-style-type: none"> <i>imagename</i>—It is recommended that you set the boot variable so that the system boots the same image specified by the hw-module slot slot-number image file-spec command. See Step 2 of the “Configuring RPR” section on page 6. <i>slot-number</i>—Specifies the active RSP slot where the Flash memory card is located. Valid numbers are slot 2 or slot 3 for a Cisco 7507 router and slot 6 or slot 7 for a Cisco 7513 router.
Step 4	Router(config)# config-register <i>value</i>	Modifies the existing configuration register setting to reflect the way in which you want to load a system image. <i>value</i> —0x0 to 0xFFFFFFFF
Step 5	Router# Ctrl-Z	Exits configuration mode
Step 6	Router# reload	Reboots the router to make your changes take effect.

Configuring RPR

To configure RPR, enter the commands as shown below:

	Command	Purpose
Step 1	Router# configure terminal	Enters configuration mode.
Step 2	Router(config)# hw-module slot slot-number image file-spec	Verifies that the specified image is compatible with RPR and exists on the standby RSP. If a high availability image is found, the running configuration is updated. <ul style="list-style-type: none"> <i>slot-number</i>—Specifies the standby RSP slot where the Flash memory card is located. Valid numbers are slot 2 or slot 3 for a Cisco 7507 router or slot 6 or slot 7 for a Cisco 7513 router. <i>file-spec</i>—Indicates the flash device and the name of the image on the standby RSP.

	Command	Purpose
Step 3	Router(config)# hw-module slot slot-number image file-spec	Verifies that the specified image is compatible with RPR and exists on the active RSP. If a high availability image is found, the running configuration is updated. <ul style="list-style-type: none"> • <i>slot-number</i>—Specifies the active RSP slot where the Flash memory card is located. Valid numbers are slot 2 or slot 3 for a Cisco 7507 router or slot 6 or slot 7 for a Cisco 7513 router. • <i>file-spec</i>—Indicates the Flash device and the name of the image on the active RSP.
Step 4	Router(config)# redundancy	Enters redundancy mode.
Step 5	Router(config-r)# mode rpr	Sets the redundancy mode to RPR on both the active and standby RSPs. HSA is the default redundancy mode.
Step 6	Router(config-r)# end	Exits redundancy mode.
Step 7	Router(config)# hw-module sec-cpu reset	Resets and reloads the standby RSP with the specified Cisco IOS image and executes the image. <p>Note If you do not specify a Cisco IOS image in Step 2, this command loads and executes the bundled default IOS standby image. The system then operates in HSA mode.</p>
Step 8	Router(config-r)# end	Exits configuration mode.

Performing a Fast Software Upgrade

To perform a Fast Software Upgrade, follow the steps below:

Command	Purpose
<p>Step 1</p> <pre>Router# copy tftp slotslot-number: Address or name of remote host []? ip-address Name of file to copy []? imagename<Return> writing filename!! Destination file name? [imagename1] <Return> Accessing file 'imagename1' on ip-address.. found ! 903500 bytes available for writing without erasure. Loading imagename from ip-address (via Ethernet1/0): ! [OK - 3320245/4194176 bytes] Verifying via checksum... Flash verification successful. Length = 3320245, checksum = 0xA83D</pre>	<p>Uses TFTP to copy a high availability Cisco IOS image onto the Flash memory card of the active RSP.¹</p> <ul style="list-style-type: none"> slotslot-number—Specifies the Flash memory card of the active RSP. <p>The router prompts you for the IP address of the TFTP server.</p> <ul style="list-style-type: none"> ip-address—Specifies the IP address of the TFTP server that contains the new image. <p>The router prompts you for the name of the image file you are copying to the Flash memory card.</p> <ul style="list-style-type: none"> imagename—Indicates the name of the image to be loaded onto the Flash memory card. <p>The router prompts you to enter the name under which you want the file to appear at the destination.</p> <ul style="list-style-type: none"> imagename1—Indicates the name of the image as it appears at the destination.
<p>Step 2</p> <pre>Router# copy tftp slaveslotslot-number: Address or name of remote host []? ip-address Name of file to copy []? imagename<Return> writing filename!! Destination file name? [imagename1] <Return> Accessing file 'imagename1' on ip-address.. found ! 903500 bytes available for writing without erasure. Loading imagename from ip-address (via Ethernet1/0): ! [OK - 3320245/4194176 bytes] Verifying via checksum... Flash verification successful. Length = 3320245, checksum = 0xA83D</pre>	<p>Uses TFTP to copy a high availability Cisco IOS image onto the Flash card of the standby RSP.</p> <ul style="list-style-type: none"> slaveslotslot-number—Specifies the Flash memory card of the standby RSP. <p>The router prompts you for the IP address of the TFTP server.</p> <ul style="list-style-type: none"> ip-address—Specifies the IP address of the TFTP server that contains the new image <p>The router prompts you for the name of the image file you are copying to the Flash memory card.</p> <ul style="list-style-type: none"> imagename—Indicates the name of the image to be loaded onto the Flash memory card. <p>The router prompts you to enter the name under which you want the file to appear at the destination.</p> <ul style="list-style-type: none"> imagename1—Indicates the name of the image as it appears at the destination.

Step 3	Router# configure terminal	Enters configuration mode.
Step 4	Router(config)# hw-module slot slot-number image file-spec	Verifies that the specified image is compatible with RPR and exists on the standby RSP. If a high availability image is found, the running configuration is updated. <ul style="list-style-type: none"> • <i>slot-number</i>—Specifies the standby RSP slot where the Flash memory card is located. Valid numbers are slot 2 or slot 3 for a Cisco 7507 router or slot 6 or slot 7 for a Cisco 7513 router. • <i>file-spec</i>—Indicates the Flash device and the name of the image on the standby RSP.
Step 5	Router(config)# hw-module slot slot-number image file-spec	Verifies that the specified image is compatible with RPR and exists on the active RSP. If a high availability image is found the running configuration is updated. <ul style="list-style-type: none"> • <i>slot-number</i>—Specifies the active RSP slot where the Flash memory card is located. Valid numbers are slot 2 or slot 3 for a Cisco 7507 router or slot 6 or slot 7 for a Cisco 7513 router. • <i>file-spec</i>—Indicates the Flash device and the name of the image of the active RSP.
Step 6	Router(config)# hw-module sec-cpu reset	Resets and reloads the standby RSP with the specified Cisco IOS image and executes the image. <p>Note If you do not specify a Cisco IOS image in Step 2, this command loads and executes the bundled default IOS standby image. The system then operates in HSA mode.</p>
Step 7	Router(config)# slave auto-sync config	(Optional) Turns on automatic synchronization of configuration files. Use this command to ensure that the active and standby RSPs contain the same configuration files.
Step 8	Router(config)# end	Exits configuration mode.
Step 9	Router# copy running-config startup-config	Saves the configuration changes to your startup configuration in NVRAM so the router boots with the configuration you have entered.
Step 10	Router# redundancy force-switchover	Forces a switchover to the standby RSP.

1. Before you copy a file to Flash memory, be sure there is ample space available in Flash memory. Compare the size of the file you are copying to the amount of available Flash memory shown. If the space available is less than the space required by the file you will copy, the copy process will continue, but the entire file will not be copied into Flash memory.

Verifying RPR

Use the **show redundancy** command to verify that RPR is enabled:

```
Router# show redundancy
Operating mode is rpr
redundancy mode rpr
hw-module slot 2 image slot0:rsp-pv-mz
hw-module slot 3 image slot0:rsp-pv-mz
```

Troubleshooting Tips

Use the commands in the table below to troubleshoot the RPR and FSU features on the Cisco 7500 series routers:

Command	Purpose
Router# show diag	Use this command to display hardware information for the router.
Router# show redundancy	Use this command to display the redundancy mode of the RSP. This command also displays information about the number of switchovers, system uptime, RSP uptime, and reasons for any switchovers.
Router# show version	Use this command to display image information for each RSP.

Configuration Examples

This section provides the following configuration example:

- [Configuring RPR Example, page 10](#)
- [Performing a Fast Software Upgrade Example, page 11](#)

Configuring RPR Example

In the following example, the active RSP is in slot 2 and the standby RSP is installed in slot 3 of a Cisco 7507 router.

```
Router# copy tftp slot0:rsp-pv-mz
Router# copy tftp slaveslot0:rsp-pv-mz
Router# configure terminal
Router(config)# hw-module slot 2 image slot0:rsp-pv-mz
Router(config)# hw-module slot 3 image slot0:rsp-pv-mz
Router(config)# redundancy
Router(config-r)# mode rpr
Router(config-r)# exit
Router(config)# hw-module sec-cpu reset
Router(config-r)# end
Router# show running-config
version 12.0
service timestamps debug uptime
```

```

service timestamps log uptime
no service password-encryption
service single-slot-reload-enable
!
hostname Router1
!
boot system rcp://path/to/image/rsp-boot-mz
boot system tftp://path/to/image/rsp-boot-mz
boot bootldr bootflash:rsp-boot-mz
enable password password
!
redundancy
mode rpr !--indicates Redundancy mode has been configured for RPR
!
hw-module slot 2 image slot0:rsp-pv-mz
hw-module slot 3 image slot0:rsp-pv-mz
ip subnet-zero
ip rcmd remote-username router1
ip cef distributed
ip host iphost 192.168.0.1
mpls traffic-eng auto-bw timers
!
!
controller T3 6/0/0
clock source line
!
!
interface Ethernet0/0/0
ip address 10.0.0.1 255.255.0.0
no ip directed-broadcast
ip route-cache distributed
no keepalive
.
.
.
exec-timeout 0 0
history size 40
transport preferred none
transport input none
line aux 0
line vty 0 4
login
!end

```

Performing a Fast Software Upgrade Example

The following example show a Fast Software Upgrade performed on a Cisco 7507 router with an active RSP in slot 2 and a standby RSP installed in slot 3.

```

Router# copy tftp slot0:rsp-pv-mz
Router# copy tftp slaveslot0:rsp-pv-mz
Router# configure terminal
Router(config)# hw-module slot 2 image slot0:rsp-pv-mz
Router(config)# hw-module slot 3 image slot0:rsp-pv-mz
Router(config)# hw-module sec-cpu reset
Router(config)# end
Router# copy running-config startup-config
Router# redundancy force-switchover

```

Command Reference

This section documents new commands. All other commands used with this feature are documented in the Cisco IOS Release 12.2 command reference publications.

- [hw-module sec-cpu reset](#)
- [hw-module slot image](#)
- [mode \(redundancy\)](#)
- [redundancy](#)
- [redundancy force-switchover](#)
- [show redundancy](#)

hw-module sec-cpu reset

To reset and reload the standby RSP with the specified Cisco IOS image and execute the image, use the **hw-module sec-cpu reset** command in configuration mode.

hw-module sec-cpu reset

Syntax Description This command has no arguments or keywords.

Defaults No default behavior or values.

Command Modes Configuration

Command History	Release	Modification
	12.0(16)ST	This command was introduced.
	12.0(22)S	This command was integrated into Cisco IOS Release 12.0(22)S.

Usage Guidelines Before using this command, you must use the **hw-module slot image** configuration command to specify a high availability Cisco IOS image to run on the standby RSP. After the high availability image is loaded in the active RSP, use the **hw-module sec-cpu reset** command to reset and reload the standby RSP with the specified Cisco IOS image and execute the image. To load the standby RSP with the bundled micro-IOS contained in the active RSP image, use the **no** form of the **hw-module slot image** command followed by the **hw-module sec-cpu reset** command.

Examples The following example shows a Cisco 7513 router with the standby RSP loaded in slot 7. The standby RSP is reset and reloaded with the rsp-pv-mz high availability Cisco IOS image. Both RSPs have slot 0 Flash memory cards:

```
Router(config)# hw-module slot 7 image slot0:rsp-pv-mz
Router(config)# hw-module sec-cpu reset
Router(config)# end
```

Related Commands	Command	Description
	hw-module slot image	Specifies a high availability Cisco IOS image to run on a standby RSP.

hw-module slot image

To specify a high availability Cisco IOS image to run on a standby RSP, use the **hw-module slot image** command in configuration mode. To remove a high availability Cisco IOS image from the running configuration, use the **no** form of this command.

hw-module slot *slot-number* **image** *file-spec*

no hw-module slot *slot-number* **image** *file-spec*

Syntax Description

<i>slot-number</i>	Specifies the RSP slot.
<i>file-spec</i>	Specifies the Flash memory card to load the image into and the name of the image.

Defaults

No default behavior or values.

Command Modes

Configuration

Command History

Release	Modification
12.0(16)ST	This command was introduced.
12.0(22)S	This command was integrated into Cisco IOS Release 12.0(22)S.

Usage Guidelines

Use the **hw-module slot image** command to specify a high availability Cisco IOS image to run on a standby RSP.

Examples

The following example shows a Cisco 7513 router with the active RSP loaded in slot 6 and the standby RSP loaded in slot 7. The `rsp-pv-mz` high availability Cisco IOS image is specified to run on the standby RSP. Both RSPs have slot 0 Flash memory cards:

```
Router(config)# hw-module slot 6 image slot0:rsp-pv-mz
Router(config)# hw-module slot 7 image slot0:rsp-pv-mz
```

Related Commands

Command	Description
hw-module sec-cpu reset	Resets and reloads the standby RSP with the specified Cisco IOS image and executes the image.
redundancy	Enters redundancy configuration mode.
mode (redundancy)	Configures the high availability mode.

mode (redundancy)

To configure the high availability mode, use the **mode** command in redundancy configuration mode. To use the default redundancy mode, use the **no** form of this command.

```
mode {hsa | rpr}
```

```
no mode {hsa | rpr}
```

Syntax Description

hsa	Selects High System Availability redundancy mode.
rpr	Selects RPR redundancy mode.

Defaults

High System Availability redundancy mode

Command Modes

Redundancy configuration

Command History

Release	Modification
12.0(16)ST	This command was introduced.
12.0(22)S	This command was integrated into Cisco IOS Release 12.0(22)S.

Usage Guidelines

The mode selected by the **mode** command in redundancy configuration mode must be fully supported by the image that has been set into both the active and standby RSPs. A high availability image must be installed into the RSPs before RPR can be configured. Use the [hw-module slot image](#) command to specify a high availability image to run on the standby RSP.

If the mode cannot be set on both RSPs, HSA is the default mode. HSA is the redundancy mode of a Cisco 7500 series router that has only one RSP installed.

Examples

The following example enters redundancy configuration mode and sets RPR as the redundancy mode for a Cisco 7500 series router.

```
Router(config)# redundancy
Router(config-r)# mode rpr
Router(config-r)# end
```

Related Commands

Command	Description
hw-module sec-cpu reset	Resets and reloads the standby RSP with the specified Cisco IOS image and executes the image.
hw-module slot image	Specifies a high availability Cisco IOS image to run on a standby RSP.
redundancy	Enters redundancy configuration mode.

redundancy

To enter redundancy configuration mode, use the **redundancy** command in configuration mode.

redundancy

Syntax Description This command has no arguments or keywords.

Defaults No default behaviors or values.

Command Modes Configuration

Command History	Release	Modification
	12.0(16)ST	This command was introduced.
	12.0(22)S	This command was integrated into Cisco IOS Release 12.0(22)S.

Usage Guidelines Use this command to enter redundancy configuration mode.

Examples In the following example, the router is entered into redundancy configuration mode.

```
Router(config)# redundancy
Router(config-r)#
```

Related Commands	Command	Description
	hw-module sec-cpu reset	Resets and reloads the standby RSP with the specified Cisco IOS image and executes the image.
	hw-module slot image	Specifies a high availability Cisco IOS image to run on a standby RSP.
	mode (redundancy)	Configures the high availability mode.

redundancy force-switchover

To switch control of a router from the active to the standby RSP, use the **redundancy force-switchover** command in privileged EXEC mode.

redundancy force-switchover

Syntax Description This command has no arguments or keywords.

Defaults No default behavior or values.

Command Modes Privileged EXEC

Command History	Release	Modification
	12.0(16)ST	This command was introduced.
	12.0(22)S	This command was integrated into Cisco IOS Release 12.0(22)S.

Usage Guidelines Use the **redundancy force-switchover** command to switch control of a Cisco 7500 series router from the active RSP to the standby RSP. Both the active and standby RSPs must have a high availability Cisco IOS image installed and must be configured for RPR redundancy mode before the **redundancy force-switchover** command can be used.

Examples The following example shows a switchover from the active RSP to the standby RSP on a Cisco 7513 router with RPR configured:

```
Router# configure terminal
Router(config)# hw-module slot 7 image slot0:rsp-pv-mz
Router(config)# hw-module slot 6 image slot0:rsp-pv-mz
Router(config)# hw-module sec-cpu reset
Router(config)# slave auto-sync config
Router(config)# end
Router# copy running-config startup-config
Router# redundancy force-switchover
```

Related Commands	Command	Description
	hw-module sec-cpu reset	Resets and reloads the standby RSP with the specified Cisco IOS image and executes the image.
	hw-module slot image mode (redundancy)	Specifies a high availability Cisco IOS image to run on a standby RSP.
	mode (redundancy)	Configures the high availability mode.
	redundancy	Enters redundancy configuration mode.

show redundancy

To display the current redundancy mode, use the **show redundancy** command in EXEC mode.

show redundancy

Syntax Description This command has no arguments or keywords.

Defaults No default behavior or values.

Command Modes EXEC

Command History	Release	Modification
	11.2 GS	This command was introduced.
	12.0(16)ST	This command was modified to display information on RPR.
	12.0(22)S	This command was integrated into Cisco IOS Release 12.0(22)S.

Usage Guidelines Use this command to display the redundancy mode of a Cisco 7500 series router. The default redundancy mode is High System Availability. Use the **redundancy** configuration command to enter redundancy configuration mode. Use the **mode rpr** command in redundancy configuration mode to configure RPR as the high availability mode. HSA is the default high availability mode.

The following example shows output for the **show redundancy** command for a router with RPR configured:

```
Router# show redundancy
redundancy mode rpr
hw-module slot 2 image slot0:rsp-pv-mz
hw-module slot 3 image slot0:rsp-pv-mz
```

Related Commands	Command	Description
	hw-module sec-cpu reset	Resets and reloads the standby RSP with the specified Cisco IOS image and executes the image.
	hw-module slot image	Specifies a high availability Cisco IOS image to run on a standby RSP.
	mode (redundancy)	Configures the high availability mode.
	redundancy	Enters redundancy configuration mode.

Glossary

Active RSP—The RSP that controls and runs the routing protocols, and presents the system management interface.

FSU—Fast Software Upgrade. A mechanism to upgrade the Cisco IOS software images on RSPs and line cards without reinitializing the entire system.

HSA—High System Availability. HSA enables a system to reset and use a standby RSP in the event of a failure of the active RSP.

RPR—Route Processor Redundancy. An alternative to HSA that reduces unplanned downtime.

RSP—Route Switch Processor. The Route Processor on the Cisco 7500 series router.

Standby RSP—The RSP that waits ready to take over the functions of the active RSP in the event of unplanned or planned downtime.

