



Boot Commands

This module describes the commands used to boot or reset Cisco IOS XR software.

For more information about ROM Monitor (ROMMON) and boot tasks, see *ROM Monitor Configuration Guide for Cisco ASR 9000 Routers* or *Cisco ASR 9000 Series Aggregation Services Router Getting Started Guide*.

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config-register

To define the configuration register boot value, use the **config-register** command in the appropriate mode.

config-register {*value* | **boot-mode** {**exec-mode** | **rom-monitor**} | **console-baud** *baud-rate* | **console-break-key** {**disable** | **enable**} | **password-recovery** {**disable** | **enable**}} [**location** {*node-id* | **all**}]

Syntax Description	<p><i>value</i></p> <p>Hexadecimal or decimal value that represents the 16-bit configuration register value to be used the next time the router is reloaded. Range is from 0x0 to 0xFFFF (0 to 65535 in decimal).</p> <p>For information about common configuration register settings, see Table 1: Common Configuration Register Settings, on page 3.</p>	
	boot-mode	Specifies what to do when the system is rebooted.
	exec-mode	Specifies to load the Cisco IOS XR software and enter EXEC mode on next system reboot.
	rom-monitor	Specifies to enter ROM Monitor mode on next system reboot.
	console-baud <i>baud-rate</i>	Specifies the console baud rate.
	console-break-key { disable enable }	Specifies to disable or enable the console break key on the next system reboot.
	password-recovery { disable enable }	Specifies to enable or disable the password recovery mode on the next reboot.
	location { <i>node-id</i> all }	(Optional) Specifies the RSP node for which to define the configuration register boot value. The all keyword specifies all RSP nodes.
Command Default	By default, the configuration register value is 0x102 after a Turboboot.	
Command Modes	Administration EXEC EXEC mode	
Command History	Release	Modification
	Release 3.7.2	This command was introduced.
Usage Guidelines	To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.	

The *configuration register setting* is a 16-bit, user-configurable value that determines how the router switch processor (RSP) functions during initialization. The configuration register can cause the RSP to boot normally from the default configuration, or to enter ROMMON mode during a reload. Configuration register settings can also be used to perform tasks such as password recovery.

The **config-register** command is entered in administration EXEC mode, on the designated shelf controller (DSC) of the system. The DSC is the primary RSP of the owner secure domain router (owner SDR).

When you have two RPs (Primary RP0 and Standby RP1) and the config-registers of the two are different, you must manually set the config-register in RP1 equal to RP0 in order for RP1 to synchronize with the configurations on RP0.

Use the **show variables boot** command in the EXEC mode to see status of the config-register in both the RPs.

Use the **config-register:location** command in the Admin mode to change the config-register in either of the RPs.

When setting the configuration register value for the **config-register** command, note the following conditions:

- If both the primary and standby DSC are up and running when the configuration register value is set, the configuration register value applies to both the primary and standby DSC.
- By contrast, if only the primary DSC is up and running when the configuration register value is set and the standby DSC is introduced into the router at a later time, the router does *not* attempt to synchronize the configuration register value for the standby RSP to that of the active RSP; in this situation, the configuration register setting applied to the standby DSC is determined by the configuration register value set in ROMMON mode.

This table describes the most commonly used configuration register settings.

Table 1: Common Configuration Register Settings

Value	Description
0x0	RSP enters ROMMON mode (rommon B1>) on the next system boot.
0x2	RSP loads the Cisco IOS XR software and default configuration on the next system boot. After logging in, the user can access EXEC mode.
0x102	Router loads the Cisco IOS XR software with the console Break key disabled on the next system boot. Both 0x102 and 0x2102 specify the same functionality, as bit 13 in 0x2102 is not significant for Cisco IOS XR software.
0x40	Router enters the password recovery mode on the next system boot.

If you use the various keywords to set the configuration settings, note that the hexadecimal value is updated in an additive or subtractive manner to represent the keyword used. For example, if the current configuration setting is 0x102 and you use the **config-register** command with the **password-recovery enable** keywords, the value is updated to 0x142.

Task ID	Task ID	Operations
	root-lr	read, write

The following example shows how to set the configuration register on the DSC to 0x2. Setting the configuration registration to 0x2 causes the router to boot the Cisco IOS XR software and enter EXEC mode during a router reload.

```
RP/0/RSP0/CPU0:router(admin)# config-register boot-mode exec-mode
```

```
Sun May 31 12:10:36.037 PST Successfully set config-register to  
0x2 on node 0/RSP0/CPU0
```

Related Topics

[reload](#), on page 10

[show variables boot](#), on page 26

[show version](#)

mirror

To configure disk mirroring on a node, use the **mirror** command in global configuration mode. To disable disk mirroring, use the **no** form of this command.

mirror location [**preconfigure**] *node-id primary-device:secondary-device:*
no mirror location

Syntax Description		
location <i>node-id</i>		Specifies the node of the RP. It can be a node that is not yet installed if the preconfigure keyword is used. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.
preconfigure		(Optional) Enables you to specify a node that is not yet installed.
<i>primary-device :</i>		Specifies the primary boot device used to store installation packages and configuration files. Supported devices are: <ul style="list-style-type: none"> • disk0: • disk1: (if installed) • compactflash: (if installed)
<i>secondary-device :</i>		Storage device on the same RP as the <i>primary-device</i> , to where critical data is replicated. Supported devices are the same as for <i>primary-device :</i> , but <i>secondary-device :</i> must be different than the <i>primary-device :</i> .

Command Default None

Command Modes Global configuration

Command History

Command History	Release	Modification
	Release 3.7.2	This command was introduced.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **mirror** command replicates all critical data contained in the primary partition of the primary boot device, onto a second storage device on the same RSP. Therefore, if the primary boot device fails, applications continue to be serviced transparently by the secondary device, without having to switch control to a standby RSP.

Before the **mirror** command can be used, the secondary storage device must be partitioned using the **format** command. If the primary boot device is not partitioned, once mirroring is enabled and all data on the primary boot device is replicated to the secondary device, the primary boot device is partitioned automatically. This guarantees that only critical data on the primary boot device is mirrored to the secondary device. Noncritical

data, such as logging data, should not be mirrored and should, therefore, be saved to the secondary partition on the storage device.

To temporarily suspend disk mirroring without changing the configuration, use the **mirror pause** command in EXEC mode.

Task ID

Task ID Operations

root-lr read,
 write

The following example shows how to configure disk mirroring from the primary boot device (disk0:) to the secondary storage device (disk1:):

```
RP/0/RSP0/CPU0:router(config)# mirror location 0/rp0/cpu0 disk0: disk1:
```

Related Topics

[format](#)

[mirror pause](#), on page 7

[mirror resume](#), on page 8

mirror pause

To temporarily pause disk mirroring on a node, use the **mirror pause** command in EXEC or administration EXEC mode.

mirror pause [**location** {*node-id* | **all**}]

Syntax Description	location { <i>node-id</i> all } (Optional) Specifies the node of the RSP. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation. The all keyword specifies all RSP nodes.
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Command Default	If no node is specified, disk mirroring is paused on the active RSP.
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Command Modes	EXEC Administration EXEC
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Command History	<table> <tr> <th>Release</th><th>Modification</th></tr> <tr> <td>Release 3.7.2</td><td>This command was introduced.</td></tr> </table>	Release	Modification	Release 3.7.2	This command was introduced.
Release	Modification				
Release 3.7.2	This command was introduced.				

Usage Guidelines	<p>To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.</p> <p>The mirror pause command temporarily pauses the mirroring of the primary boot device. This command is primarily useful during an installation operation to prevent significant performance degradation on single CPU boards. The mirror pause command does not change the configured state of mirroring, but rather causes the mirroring to be suspended until the mirror resume command is used.</p> <p>The mirror pause command has no affect if the mirror configuration command is not enabled.</p>
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Task ID	<table> <tr> <th>Task ID</th><th>Operations</th></tr> <tr> <td>root-lr</td><td>read, write</td></tr> </table>	Task ID	Operations	root-lr	read, write
Task ID	Operations				
root-lr	read, write				

The following example shows how to pause disk mirroring on the active RSP:

```
RP/0/RSP0/CPU0:router# mirror pause
```

Related Topics

- [mirror](#), on page 5
- [mirror resume](#), on page 8

mirror resume

To resume disk mirroring on a node after it has been temporarily stopped, use the **mirror resume** command in EXEC or administration EXEC mode.

mirror resume [**location** {*node-id* | **all**}]

Syntax Description	location { <i>node-id</i> all } (Optional) Specifies the node of the RSP. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation. The all keyword specifies all RSP nodes.
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Command Modes	EXEC Administration EXEC
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Command History	Release	Modification
	Release 3.7.2	This command was introduced.

Usage Guidelines	To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.
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The **mirror resume** command resumes the mirroring of the primary boot device after it has been temporarily paused with the **mirror pause** command.

The **mirror resume** command has no affect if the **mirror** configuration command is not enabled and the **mirror pause** command has not been used.

Task ID	Task ID	Operations
	root-lr	read, write

The following example shows how to resume disk mirroring on the active RSP:

```
RP/0/RSP0/CPU0:router# mirror resume
```

Related Topics

[mirror](#), on page 5

[mirror pause](#), on page 7

mirror verify

To verify disk synchronization for disk mirroring on a node, use the **mirror verify** command in EXEC or administration EXEC mode.

mirror verify [**location** *node-id*]

Syntax Description	location <i>node-id</i> (Optional) Specifies the node of the RSP. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.	
Command Default	If no node is specified, the verification is done on the active RSP.	
Command Modes	EXEC Administration EXEC	
Command History	Release	Modification
	Release 3.7.2	This command was introduced.
Usage Guidelines	<p>To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.</p> <p>The mirror verify command verifies the synchronization consistency between the primary and secondary media devices being used in mirroring. The command verifies that the full contents are identical between the mirrored devices and reports any inconsistencies found.</p>	
Task ID	Task ID	Operations
	root-lr	read, write

The following example shows how to verify the disk mirroring on the active RSP:

```
RP/0/RSP0/CPU0:router# mirror verify

Mirror Verify Information for 0/RSP0/CPU0.
=====
Primary device and secondary device are fully synchronized.
```

Related Topics

[mirror](#), on page 5

reload

reload

Syntax Description

This command has no keywords or arguments.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Releases	Modifications
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **reload** command to cause the RSP to reload the Cisco IOS XR software according to the configuration register setting (for example, 0x0 to enter ROMMON mode and 0x2 to reload the RSP to EXEC mode). If a standby RSP is in the ready redundancy state, the **reload** command also causes the router to fail over to the standby RSP. Use the **show redundancy** command in EXEC mode to display the status of the standby RSP.

When the **reload** command is used and a switchover occurs, the running (active) software configuration is automatically maintained during switchover.



Caution

If a standby RSP is not installed or is not in the ready state, then the router experiences a loss of service while the active RSP is reloading Cisco IOS XR software. To view the status of the standby RSP, issue the **show redundancy** command in EXEC mode.

If you use the **reload** command and there is no available standby node, you are prompted to continue with the reload:

```
RP/0/RSP0/CPU0:router# reload

Standby card not present or not Ready for failover. Proceed?[confirm]y
```

Task ID

Task Operations

root-lr execute

The following example shows how to reload the active RSP. If a standby RSP is in the ready state, then the router fails over to the standby RSP. If the standby RSP is not installed or is not in the ready state, then the router enters ROMMON mode and routing operations stop.

```
RP/0/RSP0/CPU0:router# reload
```

```
Updating Commit Database. Please wait...[OK]
Proceed with reload? [confirm] y

PCI0 device[7]: Vendor ID 0x10ee
PCI0 device[7]: Device ID 0x300e
PCI1 device[7]: Device ID 0x1100
PCI1 device[7]: Vendor ID 0x1013
PCI1 device[8]: Device ID 0x649
PCI1 device[8]: Vendor ID 0x1095
PCI1 device[9]: Device ID 0x5618
PCI1 device[9]: Vendor ID 0x14e4
PCI1 device[10]: Device ID 0x5618
PCI1 device[10]: Vendor ID 0x14e4
System Bootstrap, Version 1.15(20040120:002852) ,
Copyright (c) 1994-2004 by cisco Systems, Inc.
Board type is 0x100000 (1048576)
Enabling watchdog
Broadcom 5618 #0 Found on PCI
Broadcom 5618 #1 Found on PCI
No. of BCM 56xx switches found 2 .
BCM Switch #0 initialisation complete.
BCM Switch #1 initialisation complete
G4(7450-SMP-GT64260_A) platform with 2048 Mb of main memory

rommon B1 >
```

Related Topics

[reload \(administration EXEC\)](#), on page 12


[show redundancy](#)

[config-register](#), on page 2

reload (administration EXEC)

To reload a node or all nodes on a single chassis or multishelf system, use the **reload** command in the appropriate mode.

reload [**location** {*node-id* | **all**} | **rack** *rack-number*]

Syntax Description	location { <i>node-id</i> all }	(Optional) Specifies the node to reload. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation. The all keyword specifies all RP nodes.
	rack	Reloads all the nodes on a specified chassis.
	<i>rack-number</i>	Rack number of the line card chassis or fabric chassis.
Command Default	None	
Command Modes	Administration EXEC	
Command History	Release	Modification
	Release 3.7.2	This command was introduced.
Usage Guidelines	To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.	
		
Note	Before reloading nodes on the router, we recommend using the cfs check command to check the sanity of the configuration file system and attempt to recover from internal inconsistencies.	
To reload a specific node on the router, specify the reload command with the location <i>node-id</i> keyword and argument. The <i>node-id</i> is expressed in the <i>rack/slot/module</i> notation.		

Task ID	Task ID	Operations
	root-system	execute

The following example shows how to reload all nodes on the router:

```
RP/0/RSP0/CPU0:router(admin)# reload location all

Graceful reload of all nodes not supported
Assuming 'force'
Operation may result in file corruptions or loss of config. Proceed [Y/N]? y
```



Note To ensure the sanity of the configuration file system, enter the **cfs check** command on the router.

Related Topics

[cfs check](#)

[reload](#), on page 10

[show redundancy](#)

[config-register](#), on page 2

show epm trace boot

To display execution path monitoring traces, use the **show epm trace boot** command in administration EXEC mode.

show epm trace boot [**hexdump**] [**last** *n*] [**reverse**] [**stats**] [**tailf**] [**unique**][**verbose**] [**wrapping**][**file** *filename* **original**] [**location** {*node-id* | **all**}]

Syntax Description	hexdump	(Optional) Displays traces in hexadecimal format.
	last <i>n</i>	(Optional) Displays the last <i>n</i> number of traces only.
	reverse	(Optional) Displays the most recent traces first.
	stats	(Optional) Displays execution path statistics.
	tailf	(Optional) Displays new traces as they are added.
	unique	(Optional) Displays unique entries only, along with the count of the number of times this entry appears.
	verbose	(Optional) Displays additional internal debugging information.
	wrapping	(Optional) Displays wrapping entries.
	file <i>filename</i> original	(Optional) Specifies the filename of the file to display. You can specify up to four trace files.
	location { <i>node-id</i> all }	(Optional) Specifies the node of the RSP. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation. You can specify up to four nodes. The all keyword specifies all RSP nodes.

Command Default None

Command Modes Administration EXEC

Command History	Release	Modification
	Release 3.7.2	This command was introduced.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show epm trace boot** command provides a simple way of tracking and time-stamping critical events to clearly understand their temporal relationship to one another and the amount of time spent performing critical operations.

Task ID	Task ID	Operations
	basic	read
	services	

The following example shows sample output from the **show epm trace boot** command:

```
RP/0/RSP0/CPU0:router(admin)# show epm trace boot
```

```
Mon Jun 1 03:16:36.946 PST
22 wrapping entries (1024 possible, 0 filtered, 22 total)
Oct 8 07:54:49.610 epm/boot 0/RSP0/CPU0 t1 @ 00:00:06 - [init] process-start
Oct 8 07:55:25.710 epm/boot 0/RSP0/CPU0 t1 @ 00:00:42 - [insthelper] process-start
Oct 8 07:57:08.992 epm/boot 0/RSP0/CPU0 t1 @ 00:02:25 - [sysmgr] process-start
Oct 8 07:57:09.785 epm/boot 0/RSP0/CPU0 t7 @ 00:02:26 - [sysmgr] start-level: start
Oct 8 07:57:10.722 epm/boot 0/RSP0/CPU0 t1 @ 00:02:27 - [sw_dwnld_svr] process-start
Oct 8 07:57:12.482 epm/boot 0/RSP0/CPU0 t11 @ 00:02:29 - [sysmgr] start-level: admin
Oct 8 07:57:13.385 epm/boot 0/RSP0/CPU0 t1 @ 00:02:30 - [instdir] process-start
Oct 8 07:57:19.638 epm/boot 0/RSP0/CPU0 t1 @ 00:02:36 - [instdir_lr] process-start
Oct 8 07:58:07.045 epm/boot 0/RSP0/CPU0 t9 @ 00:03:23 - [sysmgr] admin-plane-up
Oct 8 07:58:52.057 epm/boot 0/RSP0/CPU0 t4 @ 00:04:08 - [cfgmgr-rp] admin-config-start
Oct 8 07:58:59.973 epm/boot 0/RSP0/CPU0 t4 @ 00:04:16 - [cfgmgr-rp] admin-config-done
Oct 8 07:59:00.079 epm/boot 0/RSP0/CPU0 t9 @ 00:04:16 - [sysmgr] start-level: infra
Oct 8 07:59:00.615 epm/boot 0/RSP0/CPU0 t1 @ 00:04:17 - [devc-conaux] exec-available
Oct 8 07:59:02.288 epm/boot 0/RSP0/CPU0 t4 @ 00:04:18 - [cfgmgr-rp] admin-plane-mount-done
Oct 8 07:59:08.157 epm/boot 0/RSP0/CPU0 t6 @ 00:04:24 - [instdir] ready-for-requests
Oct 8 07:59:15.999 epm/boot 0/RSP0/CPU0 t6 @ 00:04:32 - [sysmgr] start-level: active
Oct 8 07:59:32.300 epm/boot 0/RSP0/CPU0 t13 @ 00:04:48 - [sysmgr] start-level: final
Oct 8 07:59:38.143 epm/boot 0/RSP0/CPU0 t9 @ 00:04:54 - [sysmgr] lr-plane-up
Oct 8 07:59:38.189 epm/boot 0/RSP0/CPU0 t4 @ 00:04:54 - [cfgmgr-rp] lr-config-start
Oct 8 07:59:49.898 epm/boot 0/RSP0/CPU0 t4 @ 00:05:06 - [cfgmgr-rp] lr-config-done
Oct 8 07:59:50.259 epm/boot 0/RSP0/CPU0 t4 @ 00:05:06 - [cfgmgr-rp]
bulk-interface-config-start
Oct 8 07:59:50.351 epm/boot 0/RSP0/CPU0 t7 @ 00:05:06 - [cfgmgr-rp] node-config-done
```

In this sample output, the time stamp following the @ sign is the elapsed time in the format hh:mm:ss since the execution phase started (for example, since node start, in the case of a boot).

show mirror

To display disk mirroring information, use the **show mirror** command in EXEC or administration EXEC mode.

show mirror [**location** {*node-id* | **all**}]

Syntax Description	location { <i>node-id</i> all } (Optional) Specifies the node of the RSP for which to display the mirroring information. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation. The all keyword specifies all RSP nodes.				
Command Default	No default behavior or values				
Command Modes	EXEC Administration EXEC				
Command History	<table> <tr> <th>Release</th><th>Modification</th></tr> <tr> <td>Release 3.7.2</td><td>This command was introduced.</td></tr> </table>	Release	Modification	Release 3.7.2	This command was introduced.
Release	Modification				
Release 3.7.2	This command was introduced.				
Usage Guidelines	To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.				
Task ID	<table> <tr> <th>Task ID</th><th>Operations</th></tr> <tr> <td>filesystem</td><td>read</td></tr> </table>	Task ID	Operations	filesystem	read
Task ID	Operations				
filesystem	read				

The following is sample output from the **show mirror** command:

```
RP/0/RSP0/CPU0:router# show mirror
```

```
Mirror Information for 0/RSP0/CPU0.
=====
Mirroring Enabled
  Configured Primary:      disk0:
  Configured Secondary:    disk1:

Current Mirroring State:   Syncing Files
  Current Physical Primary: disk1:
  Current Physical Secondary: disk0:

Mirroring Logical Device:  disk0:

Physical Device    State    Flags
-----
disk0:             Available  Enabled Formatted
disk1:             Available  Enabled Formatted
compactflash:      Not Present
```



```

disk0a:      Available      Formatted
disk1a:      Available      Formatted
compactflasha: Not Present

Mirroring Rommon Variable
BOOT_DEV_SEQ_CONF = disk0::disk1:
BOOT_DEV_SEQ_OPER = disk1:
MIRROR_ENABLE = Y

```

Table 2: show mirror Field Descriptions

Field	Description
Mirroring Enabled	Indicates whether mirroring is enabled or disabled.
Configured Primary	If mirroring is enabled, the configured primary disk for mirroring.
Configured Secondary	If mirroring is enabled, the configured secondary disk for mirroring.
Current Mirroring State	Current status of mirroring. Possible values are as follows: Syncing files—Files are being synchronized between the primary and secondary disks. Not Configured—Mirroring is not configured. Mirroring Paused—In this state, no mirroring is being done to the secondary device and the disk redundancy has been removed. The values of the BOOT_DEV_SEQ_OPER and MIRROR_ENABLE variables reflect this. Redundant—The primary and secondary disks are totally in synchronization. Any read or write failure on the primary device results in disk redundancy switchover such that all operations are performed on the secondary device.
Current Physical Primary	Current primary disk.
Current Physical Secondary	Current secondary disk.
Mirroring Logical Device	Device name used by the mirroring process to intercept all application requests to that named device before passing them through to one of the mirrored physical devices.
Physical Device	Physical disk in router.
State	Status of the disk. Possible values are as follows: Available—Disk exists in router and is available. Not present—Disk does not exist in router. Partitioning of disks is available only after the disk has been formatted with the partition keyword.
Flags	Enabled—Disk mirroring has been enabled on this device and the device is part of the mirroring process. Repaired—During the boot, some minor inconsistencies were discovered on the disk and were repaired to make the file system consistent. Formatted—Disk was formatted before mirroring was enabled.

Field	Description
BOOT_DEV_SEQ_CONF=	<p>ROM Monitor environmental variable for the boot disk sequence. This variable is set when mirroring is enabled through the mirror configuration command. The devices in this ROMMON variable declare the primary and the secondary devices of the mirroring process. The first device is the primary device and the second device is the secondary device in the mirroring process.</p> <p>Note This variable is also shared by the disk backup feature. This variable can also be set or unset using the system boot-sequence command of the disk backup feature. But the use of system boot-sequence and system backup commands is blocked, if mirroring is enabled.</p>
BOOT_DEV_SEQ_OPER=	<p>ROM Monitor environmental variable that reflects the state of the disk redundancy status. When mirroring is enabled and the state is redundant, this variable is set to the primary device followed by the secondary device. When mirroring is not in the redundancy state, then this variable is updated to contain only the primary device.</p>
MIRROR_ENABLE	<p>ROM Monitor environmental variable whose value reflects the mirroring status. If it is set to Y, then mirroring is enabled. If it is set to P, then mirroring is paused. If empty, mirroring is not enabled.</p>

Related Topics

[mirror](#), on page 5

[mirror verify](#), on page 9

show reboot

To display reboot information for a node, use the **show reboot** command in EXEC or administration EXEC mode.

show reboot {**history** | [**reverse**] | {**first** | **last**} {**crashinfo** | **syslog** | **trace**} | **graceful**} **location** *node-id*

Syntax Description	first	(Optional) Displays information about the first ungraceful reboot.
	last	(Optional) Displays information about the last ungraceful reboot.
	crashinfo	Displays crash information for an ungraceful reboot.
	syslog	Displays the syslogs related to an ungraceful reboot.
	trace	Displays trace information for an ungraceful reboot.
	graceful	Displays information about the last graceful reboot.
	history	Displays the reboot history of a specific node.
	reverse	(Optional) Displays the reboot history information in reverse chronological order.
Note Starting from Cisco IOS XR Release 24.3.1, the reverse keyword is deprecated and will not be supported in future releases.		
	location <i>node-id</i>	Specifies which node to reload. The <i>node-id</i> argument is expressed in the <i>rack/slot/module</i> notation.
Command Default	None	
Command Modes	EXEC	
	Administration EXEC	
Command History	Release	Modification
	Release 3.7.2	This command was introduced.
	Release 24.3.1	The reverse keyword is deprecated and will not be supported in future releases. Hence the show reboot history reverse location command is also not supported.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **history** keyword for the **show reboot** command displays all reboot causes stored for previous node resets.

Crash information (**crashinfo**), syslog, and kernel dumper ltrace (**trace**) can be displayed for the first or last reboot if it is an ungraceful reboot.

Task ID**Task ID Operations**

system	read
--------	------

This example shows sample output from the **show reboot** command with the **history** keyword:

The following example shows sample output from the **show reboot** command with the **first crashinfo** keywords:

```
RP/0/RSP0/CPU0:router# show reboot first crashinfo location 0/rp0/cpu0

Crashinfo Timestamp: Thu Jul 19 20:32:57 2007

20070719 20:32:57

Crash Reason: Cause code 0x21000010 Cause: Missed deadline,
client: sc-reddrv-main, timeout: 5 Process: wd-critical-mon
Traceback: fc1941a0 fc194290 48200738 482013cc 48201c04 fc1d4fb0 Timezone UTC0

Exception at 0xfc1944c8 signal 5 c=1 f=3

Active process(s):
pkg/bin/wd-critical-mon Thread ID 1 on cpu 0
pkg/bin/l3test Thread ID 0 on cpu 1

REGISTER INFO
r0      r1      r2      r3
R0      01000000 4817e8c0 4820e208 000000de
r4      r5      r6      r7
R4      fc1b4856 7fffffff 4817e738 fc1b4856
r8      r9      r10     r11
R8      00000000 602cf522 00000000 00000000
r12     r13     r14     r15
R12     602cf51c 4820e1a0 00000000 00000000
r16     r17     r18     r19
R16     00000000 00000000 00000000 00000000
r20     r21     r22     r23
R20     00000000 00000000 48200000 48200000
r24     r25     r26     r27
R24     48200000 48200000 48200000 48200000
r28     r29     r30     r31
R28     00000028 00000001 21000010 6029b000
cnt     lr      msr      pc
R32     00000000 fc194290 0002d932 fc1944c8
cnd     xer
R36     44000094 20000006
```

SUPERVISOR REGISTERS

Memory Management Registers

Instruction BAT Registers

Index #	Value
IBAT0U #	0x1ffe
IBAT0L #	0x12
IBAT1U #	0
IBAT1L #	0
IBAT2U #	0x30000ffe
IBAT2L #	0xf0000032
IBAT3U #	0xfffc0003
IBAT3L #	0x40011

Data BAT Registers

Index #	Value
DBAT0U #	0x1ffe
DBAT0L #	0x12
DBAT1U #	0
DBAT1L #	0x10000012
DBAT2U #	0x30000ffe
DBAT2L #	0xf000006a
DBAT3U #	0xfffc0003
DBAT3L #	0x40011

Segment Registers

Index #	SR-Value
0 #	0
1 #	0
2 #	0
3 #	0
4 #	0
5 #	0
6 #	0
7 #	0
8 #	0
9 #	0
10 #	0
11 #	0
12 #	0
13 #	0
14 #	0
15 #	0

Exception Handling Registers

Data Addr Reg #	DSISR
0x602cf440 #	0x42000000
SPRG0 # SPRG1 # SPRG2 # SPRG3	
0x1 # 0x21000010 # 0x6029b000 #	0
SaveNRestore SRR0 # SaveNRestore SRR1	
0xfc1944c4 # 0x2d932	

Miscellaneous Registers

Processor Id Reg #	
HID0 #	0x8410c0bc
HID1 #	0x9001ac80
MSSCR0 #	0x88000
MSSSR0 #	0

STACK TRACE

```
#0 0xfc194290
#1 0x48200738
#2 0x482013cc
#3 0x48201c04
```

```
#4 0xfc1d4fb0
```

Related Topics

[reload](#), on page 10

show system backup

To display the system backup details and history, use the **show system backup** command in EXEC or administration EXEC mode.

show system backup [*target-device*] [**details** | **diff**] [**verify**] **location** {*node-id* | **all**}

Syntax Description	<div> <div><i>target-device</i></div> <div>(Optional) Displays the backup details and history for the specified device. The supported devices are: <ul style="list-style-type: none"> • disk0: • disk1: (if installed) • compactflash: (if installed) </div> </div> <div> <div>details</div> <div>(Optional) Lists the software packages and configurations stored on the specified backup device.</div> </div> <div> <div>diff</div> <div>(Optional) Displays the differences between the software packages and configuration files on the backup device with the packages and configuration files on the current boot device.</div> </div> <div> <div>verify</div> <div>(Optional) Verifies the software packages and configuration files stored on the specified backup device.</div> </div> <div> <div>location {<i>node-id</i> all}</div> <div>(Optional) Specifies the node of the RP for which to display information. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation. The all keyword specifies all RSP nodes.</div> </div>				
Command Default	Enter the show system backup command without keywords or arguments to display the date, time, and status of the last backup for the current designated shelf controller (DSC). This command also displays the configured primary and secondary boot devices.				
Command Modes	EXEC Administration EXEC				
Command History	<table> <tr> <th>Release</th><th>Modification</th></tr> <tr> <td>Release 3.7.2</td><td>This command was introduced.</td></tr> </table>	Release	Modification	Release 3.7.2	This command was introduced.
Release	Modification				
Release 3.7.2	This command was introduced.				
Usage Guidelines	<p>To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.</p> <p>Use the show system backup command to display details of the current system backup on a local storage device. The command displays information about the backup performed for the active RP to which you are logged in, including the date, time, and status of the last backup.</p> <ul style="list-style-type: none"> • Use the <i>target-device</i> argument to display backup information for a specified device on a RSP node. 				

- Use the **details** keyword to list information about the software packages and configuration files stored on the backup device.
- Use the **diff** keyword to display the differences between the software and configurations on the backup device and the software and configurations on the currently active boot disk.
- Use the **location** *node-id* keyword and argument to display information for a backup on a specific node. Use the **location all** keywords to display information for backups on all nodes in the system.

Various Command Modes

- The **show system backup** command can be entered in either EXEC mode or administration EXEC mode.

Task ID	Task ID	Operations
	root-lr	execute

In the following example, the **show system backup** command displays the status of the last system backup:

```
RP/0/RSP0/CPU0:router# admin
RP/0/RSP0/CPU0:router(admin)# show system backup

System Backup information for node0_0_CPU0 on disk1:
=====
Last Backup Successful
Backup started at Sat Jun 24 12:22:10 2006
  ended at Sat Jun 24 12:42:11 2006
Verify started at Sat Jun 24 12:42:12 2006
  ended at Sat Jun 24 12:48:47 2006
BOOT_DEV_SEQ_CONF=disk0;;disk1:
BOOT_DEV_SEQ_OPER=disk0;;disk1:
```

In the following example, the **show system backup** command is entered with the **details** keyword to display additional information about the configuration and software package files stored on the backup device. Because this command is entered in administration EXEC mode, the backup information for both the administration and SDR configurations is displayed.

```
RP/0/RSP0/CPU0:router(admin)# show system backup details

System Backup information for node0_0_CPU0 on disk1:
=====
Last Backup Successful
Backup started at Sat Jun 24 12:22:10 2006
  ended at Sat Jun 24 12:42:11 2006
Verify started at Sat Jun 24 12:42:12 2006
  ended at Sat Jun 24 12:48:47 2006
BOOT_DEV_SEQ_CONF=disk0;;disk1:
BOOT_DEV_SEQ_OPER=disk0;;disk1:
Admin configuration last commit record on disk1:
  Device          Commitid    Time Stamp
  disk1:          2000000010 23:07:59 UTC Fri Jun 09 2006

SDR configuration last commit record on disk1:
```



```

Device          Commitid    Time Stamp
disk1:          1000000030  11:56:43 UTC Thu Jun 22 2006

Active software packages on disk1:
371_372_Image_upgrade3.pdf
comp-asr9k-mini.vm-3.7.2
comp-asr9k-mini.pie-3.7.2
asr9k-diags-p.pie-3.7.2
asr9k-fpd.pie-3.7.2
asr9k-mcast-p.pie-3.7.2
asr9k-mgbl-p.pie-3.7.2
asr9k-mpls-p.pie-3.7.2
asr9k-k9sec-p.pie-3.7.2 [this item is only in the 3DES tar file]
No Inactive software packages on disk1:

```

Table 3: show system backup Field Descriptions

Field	Description
BOOT_DEV_SEQ_CONF=	ROM Monitor environmental variable for the boot disk sequence. This variable is defined by the system boot-sequence command. The first disk is the primary device; the second disk is the backup (secondary) device. The value listed in the secondary device is also used as the default backup target device for the system backup command.
BOOT_DEV_SEQ_OPER=	ROM Monitor environmental variable for the boot disks currently in use by the system.

Related Topics

[system backup](#), on page 30

[system boot-sequence](#), on page 34

show variables boot

To display the configuration register setting and boot file setting for the route switch processors (RSPs) in the system, use the **show variables boot** command in administration

EXEC

mode.

show variables boot [**location** {**all***node-id*}]

Syntax Description	location { <i>node-id</i> all } (Optional) Specifies the node to reload. The <i>node-id</i> argument is expressed in the <i>rack/slot/module</i> notation. Use the all keyword to indicate all nodes.	
Command Default	No default behavior or values	
Command Modes	Administration EXEC	
Command History	Release	Modification
	Release 3.7.2	This command was introduced.
Usage Guidelines	To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.	
	Use the show variables boot command to display system boot variables for the router. This command displays the configuration register setting and boot file setting for the RSPs in the system. Use the location <i>node-id</i> keyword and argument to display the configuration register setting for a specific card.	
	The configuration register setting is set with the config-register command. The boot variable is set in ROM Monitor mode. For more information about ROM Monitor mode, see <i>ROM Monitor Configuration Guide for Cisco ASR 9000 Routers</i> .	
Task ID	Task ID	Operations
	root-lr	read

This example shows sample output from the **show variables boot** command:

```
RP/0/RSP0/CPU0:router# show variables boot
```

```
Mon Jun  1 05:21:56.791 PST
BOOT variable = disk0:asr9k-os-mbi-3.9.0.11I/mbiasr9k-rp.vm,1;
CONFREG variable = 0x102
```

Related Topics

[show variables system](#), on page 28

[show version](#)

[config-register](#), on page 2

show variables system

To display internal system environmental variables set on the router, use the **show variables system** command in

EXEC

mode.

show variables system

Syntax Description	This command has no keywords or arguments.	
Command Default	None	
Command Modes	EXEC	
Command History	Release	Modification
	Release 3.7.2	This command was introduced.
Usage Guidelines	To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.	
	Use the show variables system command to display system environmental variables for the router.	
	To display the configuration register setting, use the show variables boot command in administration EXEC mode.	
Task ID	Task ID	Operations
	basic-services	read

This example illustrates sample output from the **show variables system** command. The output is meant to be interpreted by Cisco personnel.

```
RP/0/RSP0/CPU0:router# show variables system
```

```
TERM=vt220
GDB_PDEBUG=-P1
TERM=vt100
DIR_PREFIX=.
LOADPATH=/pkg
LD_LIBRARY_PATH=/pkg/lib
PATH=/pkg/bin
BFM_CONFIG_PATH=/pkg/bfm/config
BGP_PATH=/pkg/bgp
CONFIGS_PATH=/pkg/configs
CRAFT_PATH=/pkg/cwi
CTF_PATH=/pkg/ctf
DM_RULES_PATH=/pkg/dm/rules
ETC_PATH=/pkg/etc
```

```
FPD_PATH=/pkg/fpd
IM_RULES_PATH=/pkg/rules
INIT_STARTUP_PATH=/pkg/init.d
INSTHELPER_PATH=/pkg/other
MAN_PATH=/pkg/man
MIB_LIBRARY_PATH=/pkg/lib/mib
MIB_PATH=/pkg/mib
NETIO_SCRIPT_PATH=/pkg/script
PARSER_PATH=/pkg/parser
PARTITIONS_PATH=/pkg/partitions
QOS_PATH=/pkg/qos
SCHEMA_PATH=/pkg/schema
STARTUP_PATH=/pkg/startup
TCL_LIBRARY=/pkg/lib/tcl
UCODE_PATH=/pkg/gsr/ucode
UCODE_ROOT_PATH=/pkg/ucode
VCM_RULES_PATH=/pkg/vcmrules
JOB_ID=0
INSTANCE_ID=1
SYSMGR_TUPLE=
SYSMGR_NODE=node0_RSP0_CPU0
EXIT_STATUS=0
SYSMGR_RESTART_REASON=0
AAA_USER=labuser
EXEC_PID=18280619
TASKID_MAP_SIZE=72
HOME=/disk0:/usr
TMPDIR=/disk0:/var/tmp
PWD=/disk0:/usr
```

Related Topics

[show variables boot](#), on page 26

[show version](#)

[config-register](#), on page 2

system backup

To back up the system software and configurations to a backup disk, use the **system backup** command in EXEC or administration EXEC mode.

system backup [*target-device*] [**format**] [**synchronous** | **asynchronous**] [**location** {*node-id* | **all**}]

Syntax Description	
<i>target-device</i>	<p>(Optional) Specifies the storage device used for the system backup. If a target device is not specified, then the secondary device defined with the system boot-sequence command is used. If a target device is not specified with either command, then the system backup command returns an error.</p> <ul style="list-style-type: none"> • The target device cannot be the current boot device. • The target device must be large enough to store the current software set and configuration. • The supported storage devices are: <ul style="list-style-type: none"> • disk0: • disk1: (if installed) • compactflash: (if installed)
format	<p>(Optional) Formats a target disk that already contains a system backup. By default, the system backup command formats the target disk if that target disk does not contain a previous system backup. If the target disk already contains a backup, then the disk is not formatted again. The format keyword forces a format of the target device even if it contains a previous system backup.</p>
synchronous	<p>(Optional) Performs the command in synchronous mode. This mode allows the installation process to finish before the prompt is returned. This is the default mode.</p>
asynchronous	<p>(Optional) Performs the command in asynchronous mode. In asynchronous mode, the command runs in the background, and the EXEC prompt is returned as soon as possible.</p>

location { <i>node-id</i> all }	<p>(Optional) Specifies an alternative node location for the backup target disk, such as the standby DSC.</p> <p>By default, the backup files are copied to the target device in the current DSC. Use the location <i>node-id</i> keyword and argument to specify an alternative node for the backup files, such as the standby DSC.</p> <p>The <i>node-id</i> argument is expressed in the <i>rack / slot / module</i> notation.</p> <p>Use the all keyword to back up the software and configuration files to all RSPs in the system. Each RP must contain a disk in the specified target device location, such as disk1:.</p>
---	--

Command Default	<p>The operation is performed in synchronous mode.</p> <p>The backup files are copied to the secondary device defined with the system boot-sequence command.</p> <p>The backup files are copied to the target device on the current designated shelf controller (DSC).</p>	
Command Modes	<p>EXEC</p> <p>Administration EXEC</p>	
Command History	Release	Modification
	Release 3.7.2	This command was introduced.
Usage Guidelines	<p>To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.</p>	



Note The **system backup** command does not make any changes to bootflash content.

Target Device for the Backup

Use the **system boot-sequence** command with the *target-device* argument to specify the local storage device for backup software and configuration files. The *target-device* argument is optional and applies only to the current backup operation.

- If a target storage device is not specified, then the files are backed up to the secondary storage device defined with the **system boot-sequence** command.
- If a target device is not specified with either the **system backup** command or the **system boot-sequence** command, then the backup operation is not allowed.

The *target-device* can be any local storage device except the current boot device, and must be large enough to store the current software set and configuration. Supported storage devices are:

- **disk0:**
- **disk1:** (if installed)

- **compactflash:** (if installed)

Location Node of the Target Device

By default, the backup is created on the specified target device of the active DSC where the command is executed.

- To specify an alternate node for the system backup, such as the standby DSC, use the **system backup** command with the **location node-id** keyword and argument.
- To perform the backup on all installed route switch processors (RSPs), use the **system backup** command with the **location all** keywords in EXEC mode.



Note Each RSP impacted by the **system backup** command must contain the specified target device. For example, if the **system backup** command is executed for disk1: on all RSPs in the system, then a flash disk must be installed in disk1: of each RSP.

Various Command Modes

- Use the **system backup** command in administration EXEC mode to back up the administration plane configuration.
- Use the **system backup** command in the EXEC mode of an SDR to back up the software and configurations for a specific SDR.

Commit and Installation Operations Not Allowed During Backup

- Configuration changes are not allowed during the backup process. Any attempts to commit configuration changes are rejected until the backup operation is complete.
- The backup process cannot be performed during an installation operation. If an installation operation is performed while a backup is in process, the backup operation terminates.

Displaying the Current Backup Information

Enter the **show system backup** command to display information about the current backup files. If no backup exists, an error message is displayed.

Task ID	Task ID	Operations
	root-lr	read, write

The following example shows how to back up the software and configuration files on a router.

- The **system backup** command is run in administration EXEC mode, which backs up both the administration and SDR configurations.
- The target device is defined as disk1:.

- The disk is formatted because this is the first backup on the device.

```
RP/0/RSP0/CPU0:router# admin
RP/0/RSP0/CPU0:router(admin)# system backup disk1:

Info: node0_0_CPU0: formatting target device
Info: node0_0_CPU0: copying admin configuration
Info: node0_0_CPU0: copying SDR configuration
Info: node0_0_CPU0: copying installed software
Info: node0_0_CPU0: backup complete.
Info: node0_0_CPU0: verifying admin configuration
Info: node0_0_CPU0: verifying installed software
Info: node0_0_CPU0: verify complete.
Info: node0_0_CPU0: command succeeded.
```

Related Topics

[show system backup](#), on page 23
[system boot-sequence](#), on page 34

system boot-sequence

To define the order of local storage devices used to boot a router, use the **system boot-sequence** command in EXEC or administration EXEC mode.

system boot-sequence {*primary-device* [*secondary-device*] | **disable**} [**location** {*node-id* | **all**}]

Syntax Description

<i>primary-device</i>	Default device where software packages are installed and run. This device is also the default location for router configurations. The value of the <i>primary-device</i> argument is normally disk0 .
<i>secondary-device</i>	(Optional) Secondary (backup) boot device, used by the system backup command to back up system software and configurations. Supported storage devices are: <ul style="list-style-type: none"> • disk0: • disk1: (if installed) • compactflash: (if installed) <p>Note The value of the <i>secondary-device</i> argument must be different from the value of the <i>primary-device</i> argument.</p>
disable	Temporarily disables the automatic recovery mechanism.
location { <i>node-id</i> all }	(Optional) Specifies the node of the RSP for which to define the boot sequence. The <i>node-id</i> argument is expressed in the <i>rack/slot/module</i> notation. The all keyword specifies all RSP nodes.

Command Default

The primary device is **disk0**. The (optional) secondary boot device is not defined.

Command Modes

EXEC

Administration EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **system boot-sequence** command to define the local storage devices used to boot a router. You can define two devices with this command.

- The value of the *primary-device* argument defines the default device where software packages are installed and run. This device is also the default location for router configurations.

- The value of the *secondary-device* argument defines the device used by the **system backup** command to back up system software and configurations. This field is optional.
- The secondary device can also be temporarily defined when the **system backup** command is executed with the *target-device* argument. Use the **system boot-sequence** command with the *secondary-device* argument to permanently define the secondary (backup) device.



Note The primary and secondary device definitions remain in effect until the **system boot-sequence** command is entered again.

General Guidelines

- The value of the *secondary-device* argument must be different from the value of the *primary-device* argument.
- We recommend disk0: as the primary boot device in the boot sequence, and disk1: as the secondary boot device.
- The boot device specified with the **system boot-sequence** command must be installed in the card or the command is rejected.

Command Mode Options

- Use the **system boot-sequence** command in administration EXEC mode to define the boot sequence for the system.
- Use the **system boot-sequence** command in EXEC mode to define the boot sequence for a specific SDR.

Location Node

- Use the **location** *node-id* keyword and argument to define the boot sequence for a specific route switch processor (RSP).
- Use the **location all** keywords to define the boot sequence for all RSPs in the router.

Disabling Automatic Recovery

Use the **system boot-sequence** command with the **disable** keyword to disable the automatic recovery.

Displaying the Current Boot Sequence Settings

Enter the **show system backup** command to display the currently configured boot sequence devices.

Task ID	Task ID	Operations
	root-lr	read, write

The following example shows how to define the primary and secondary boot device for the active RSP (DSC). In this example, the default location for software and configurations is disk0:. The location for backups of software and configurations is disk1:.

```
RP/0/RSP0/CPU0:router# admin
RP/0/RSP0/CPU0:router(admin)# system boot-sequence disk0: disk1:

Info:  node0_0_CPU0: command succeeded.
```

Related Topics

[show system backup](#), on page 23

[system backup](#), on page 30