



Cisco IOS Resilient Configuration

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The Cisco IOS Resilient Configuration feature enables a router to secure and maintain a working copy of the running image and configuration so that those files can withstand malicious attempts to erase the contents of persistent storage (NVRAM and flash).

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Finding Feature Information

Your software release may not support all the features documented in this module. For the latest caveats and feature information, see [Bug Search Tool](#) and the release notes for your platform and software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the feature information table at the end of this module.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to www.cisco.com/go/cfn. An account on Cisco.com is not required.

Restrictions for Cisco IOS Resilient Configuration

- This feature is available only on platforms that support a Personal Computer Memory Card International Association (PCMCIA) Advanced Technology Attachment (ATA) disk. There must be enough space on the storage device to accommodate at least one Cisco IOS image (two for upgrades) and a copy of the running configuration. IOS File System (IFS) support for secure file systems is also needed by the software.
- It may be possible to force removal of secured files using an older version of Cisco IOS software that does not contain file system support for hidden files.
- This feature can be disabled only by using a console connection to the router. With the exception of the upgrade scenario, feature activation does not require console access.



Americas Headquarters:
Cisco Systems, Inc., 170 West Tasman Drive, San Jose, CA 95134-1706 USA

- You cannot secure a bootset with an image loaded from the network. The running image must be loaded from persistent storage to be secured as primary.
- Secured files will not appear on the output of a **dir** command issued from an executive shell because the IFS prevents secure files in a directory from being listed. ROM monitor (ROMMON) mode does not have any such restriction and can be used to list and boot secured files. The running image and running configuration archives will not be visible in the Cisco IOS **dir** command output. Instead, use the **show secure bootset** command to verify archive existence.

Information About Cisco IOS Resilient Configuration

- [Feature Design of Cisco IOS Resilient Configuration, page 2](#)

Feature Design of Cisco IOS Resilient Configuration

A great challenge of network operators is the total downtime experienced after a router has been compromised and its operating software and configuration data erased from its persistent storage. The operator must retrieve an archived copy (if any) of the configuration and a working image to restore the router. Recovery must then be performed for each affected router, adding to the total network downtime.

The Cisco IOS Resilient Configuration feature is intended to speed up the recovery process. The feature maintains a secure working copy of the router image and the startup configuration at all times. These secure files cannot be removed by the user. This set of image and router running configuration is referred to as the primary bootset.

The following factors were considered in the design of Cisco IOS Resilient Configuration:

- The configuration file in the primary bootset is a copy of the running configuration that was in the router when the feature was first enabled.
- The feature secures the smallest working set of files to preserve persistent storage space. No extra space is required to secure the primary Cisco IOS image file.
- The feature automatically detects image or configuration version mismatch.
- Only local storage is used for securing files, eliminating scalability maintenance challenges from storing multiple images and configurations on TFTP servers.
- The feature can be disabled only through a console session.

How to Use Cisco IOS Resilient Configuration

- [Archiving a Router Configuration, page 2](#)
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Archiving a Router Configuration

This task describes how to save a primary bootset to a secure archive in persistent storage.

SUMMARY STEPS

1. enable
2. configure terminal
3. secure boot-image
4. secure boot-config
5. end
6. show secure bootset

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 | secure boot-image Example: Router(config)# secure boot-image | Enables Cisco IOS image resilience. |
| Step 4 | secure boot-config Example: Router(config)# secure boot-config | Stores a secure copy of the primary bootset in persistent storage. |
| Step 5 | end Example: Router(config)# end | Exits to privileged EXEC mode. |

| Command or Action | Purpose |
|---|--|
| Step 6 <code>show secure bootset</code> Example: Router# <code>show secure bootset</code> | (Optional) Displays the status of configuration resilience and the primary bootset filename. |

Example

The following example displays sample output from the **show secure bootset** command:

```
Router# show secure bootset
IOS resilience router id JMX0704L5GH
IOS image resilience version 12.3 activated at 08:16:51 UTC Sun Jun 16 2002
Secure archive slot0:c3745-js2-mz type is image (elf) [ ]
  file size is 25469248 bytes, run size is 25634900 bytes
  Runnable image, entry point 0x80008000, run from ram
IOS configuration resilience version 12.3 activated at 08:17:02 UTC Sun Jun 16 2002
Secure archive slot0:.runcfg-20020616-081702.ar type is config
configuration archive size 1059 bytes
```

Restoring an Archived Router Configuration

This task describes how to restore a primary bootset from a secure archive after the router has been tampered with (by an NVRAM erase or a disk format).



Note

To restore an archived primary bootset, Cisco IOS image resilience must have been enabled and a primary bootset previously archived in persistent storage.

SUMMARY STEPS

1. **reload**
2. **dir** [*filesystem* :]
3. **boot** [*partition-number* :][*filename*]
4. **no**
5. **enable**
6. **configure terminal**
7. **secure boot-config** [*restore filename*]
8. **end**
9. **copy filename running-config**

DETAILED STEPS

| Command or Action | Purpose |
|---|--|
| <p>Step 1 <code>reload</code></p> <p>Example:</p> <pre>Router# reload</pre> | <p>(Optional) Enters ROM monitor mode, if necessary.</p> |
| <p>Step 2 <code>dir [filesystem :]</code></p> <p>Example:</p> <pre>rommon 1 > dir slot0:</pre> | <p>Lists the contents of the device that contains the secure bootset file.</p> <ul style="list-style-type: none"> The device name can be found in the output of the show secure bootset command. |
| <p>Step 3 <code>boot [partition-number :][filename]</code></p> <p>Example:</p> <pre>rommon 2 > boot slot0:c3745-js2-mz</pre> | <p>Boots up the router using the secure bootset image.</p> |
| <p>Step 4 <code>no</code></p> <p>Example:</p> <pre>--- System Configuration Dialog ---</pre> <p>Example:</p> <pre>Would you like to enter the initial configuration dialog? [yes/no]: no</pre> | <p>(Optional) Declines to enter an interactive configuration session in setup mode.</p> <ul style="list-style-type: none"> If the NVRAM was erased, the router enters setup mode and prompts the user to initiate an interactive configuration session. |
| <p>Step 5 <code>enable</code></p> <p>Example:</p> <pre>Router> enable</pre> | <p>Enables privileged EXEC mode.</p> <ul style="list-style-type: none"> Enter your password if prompted. |
| <p>Step 6 <code>configure terminal</code></p> <p>Example:</p> <pre>Router# configure terminal</pre> | <p>Enters global configuration mode.</p> |

| Command or Action | Purpose |
|---|---|
| Step 7 <code>secure boot-config [restore filename]</code> Example: <pre>Router(config)# secure boot-config restore slot0:rescue-cfg</pre> | Restores the secure configuration to the supplied filename. |
| Step 8 <code>end</code> Example: <pre>Router(config)# end</pre> | Exits to privileged EXEC mode. |
| Step 9 <code>copy filename running-config</code> Example: <pre>Router# copy slot0:rescue-cfg running-config</pre> | Copies the restored configuration to the running configuration. |

Additional References

The following sections provide references related to Cisco IOS Resilient Configuration.

Related Documents

| Related Topic | Document Title |
|--------------------|---|
| Cisco IOS commands | Cisco IOS Master Command List, All Releases |

Technical Assistance

| Description | Link |
|---|---|
| The Cisco Support and Documentation website provides online resources to download documentation, software, and tools. Use these resources to install and configure the software and to troubleshoot and resolve technical issues with Cisco products and technologies. Access to most tools on the Cisco Support and Documentation website requires a Cisco.com user ID and password. | http://www.cisco.com/cisco/web/support/index.html |

Feature Information for Cisco IOS Resilient Configuration

The following table provides release information about the feature or features described in this module. This table lists only the software release that introduced support for a given feature in a given software release train. Unless noted otherwise, subsequent releases of that software release train also support that feature.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to www.cisco.com/go/cfn. An account on Cisco.com is not required.

Table 1 Feature Information for Cisco IOS Resilient Configuration

| Feature Name | Releases | Feature Information |
|-----------------------------------|---------------------------|--|
| Cisco IOS Resilient Configuration | Cisco IOS XE Release 3.9S | <p>The Cisco IOS Resilient Configuration feature enables a router to secure and maintain a working copy of the running image and configuration so that those files can withstand malicious attempts to erase the contents of persistent storage (NVRAM and flash).</p> <p>The following commands were introduced or modified: secure boot-config, secure boot-image, show secure bootset.</p> |

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