



File System

This module describes additional enhancement to file system commands. File System commands are instructions that can be used to manage and manipulate files and directories within a file system.

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Secure File Transfer

Table 1: Feature History Table

Feature Name	Release Information	Feature Description
Secure File Transfer	Release 7.9.1	<p>Now, you can securely transfer router files to an archive server. It's made possible because the copy command now supports SFTP (Secure File Transfer Protocol) and SCP (Secure Copy Protocol using the underlying SSH protocol implementation). Secure transfer of files from the router maintains the integrity, confidentiality, and availability of network configurations.</p> <p>This feature modifies the copy command.</p>

You can duplicate files or data in the router from one location to another using the **copy** command. This functionality helps to create a copy of a file, folder, or data set and place it in a specific destination. You can use the copy functionality to back up files, move data between directories, create duplicates of the files for editing or distribution without modifying the original content. It also allows you to retain the original data while making a duplicate that you can further manipulate independently.

Starting with Cisco IOS XR Release 7.9.1, we've enhanced the functionality of the copy command to support secure file transfer from the router. Secure file transfer protects data during transit using the SFTP (Secure File Transfer Protocol) and SCP (Secure Copy Protocol) when sharing files within or across networks. The

SFTP and SCP functionalities in the copy feature use the SSH protocol implementation in the router to secure transfer the files to a remote server.

You can use the following options in the **copy** command for secure file transfer:

- **sftp**: You can transfer the files to a remote location using the **SFTP** file transfer protocol. SFTP is a secure file transfer protocol for transferring large files.
- **scp**: You can transfer the files to a remote location using the **SCP** file transfer protocol. SCP is a secure copy protocol to transfer files between servers.

Starting Cisco IOS XR Software Release 7.10.1, you can use public-key authentication while copying the running configuration. To know more about using public-key authentication with **copy** refer the *Auto-Save and Copy Router Configuration Using Public Key Authentication* in Configuration Management Commands chapter in General Administration Guide.

Prerequisites:

Enable the SSH Server in the router as follows:

```
Router# config
Router(config)# ssh server v2
Router(config)# ssh server vrf default
Router(config)# ssh server netconf vrf default
Router(config)# commit
```

Copy Files Using SCP

Step 1 Copy the running configuration file from the router to a remote server using SCP using the **copy** command.

```
Router# copy running-config scp://root:testpassword@192.0.4.2//var/opt/run_conf_scp.txt

Destination file name (control-c to cancel): [/var/opt/run_conf_scp.txt]?

.
215 lines built in 1 second
[OK]Connecting to 192.0.4.2...22
Password:

Transferred 3271 Bytes
3271 bytes copied in 0 sec (0)bytes/sec
```

Step 2 Verify if the copied files are available in the SCP server using the **ls** utility.

```
[root@scp_server ~]# ls -ltr /var/opt/run_conf_scp.txt
-rw-r--r-- 1 root root 3271 Mar 21 18:07 /var/opt/run_conf_scp.txt
```

Copy files Using SFTP

Step 1 Copy the running configuration file from the router to a remote server using SFTP using the **copy** command.

```
Router#copy running-config sftp://root:testpassword@192.0.2.1//var/opt/run_conf_sftp.txt
```

```

Destination file name (control-c to cancel): [/var/opt/run_conf_sftp.txt]?

.
215 lines built in 1 second
[OK]Connecting to 192.0.2.1...22
Password:
sftp> put /tmp/tmposymlink/nvgen-34606-_proc_34606_fd_75 /var/opt/run_conf_sftp.txt

/tmp/tmposymlink/nvgen-34606-_proc_34606_fd_75

Transferred 3271 Bytes
3271 bytes copied in 0 sec (3271000)bytes/sec
sftp> exit

```

Step 2 Verify if the copied files are available in the SFTP server using the **ls** utility

```

[root@sftp_server ~]# ls -ltr /var/opt/run_conf_sftp.txt
-rw-r--r-- 1 root root 3271 Mar 21 18:07 /var/opt/run_conf_sftp.txt

```

Increasing Commit Limit

Table 2: Feature History Table

Feature Name	Release Information	Feature Description
Increasing Commit Limit	Release 24.2.1	<p>The maximum number of commits is increased in the router that allows you to configure complex topology changes without interruptions caused by the default blocking of commit changes during rebase or ASCII backup operations. You can prevent the commit operation from getting blocked by using the cfs check command, which increases the commit (pacount) count from 20 to 40, and the commit file diff size (configuration data) from 2 MB to 4 MB, and by using the clear configuration ascii inconsistency command, which performs an ASCII backup after 55 minutes.</p> <p>The feature modifies the following commands:</p> <ul style="list-style-type: none"> • cfs check • clear configuration ascii inconsistency

The Cisco IOS XR Routers use a two-stage configuration model. The first stage is target configuration, where you build the configurations using the necessary commands in the command line interface. The second stage is the commit, where the configuration made in the target stage is added to the router configuration using the **commit** command. After each commit, the router generates a file for the newly configured changes and adds it to its running configuration, making it an integral part of the running configuration.



Note This target configuration doesn't impact the router's running configuration.

The Cisco IOS XR routers perform rebase and ASCII backup operations to maintain the real time configuration in the backup copy. The rebase and ASCII backup operations block you from committing configurations to the router.



Note Starting with Release 24.3.1, the rebase operation no longer blocks the commit operation.

This allows you to configure complex topology changes without being interrupted by the default blocking of commit changes during the rebase operation. For more information, see the section [Concurrent Configuration Rebase during Commit, on page 6](#).

In rebase, the router automatically saves your changes to the backup binary configuration file after 20 commits, or 2 MB of configuration data. The router blocks the commit while saving the configuration to the backup file. The router takes a few seconds to complete the rebase operation, during which, if you terminate the CLI session, the router loses the target configurations in the blocked commit.

In ASCII backup, the router automatically saves a copy of its running configuration in the ASCII format. This backup process takes place if there has been a commit to the router configuration and when the ASCII backup timer completes a 55-minute window after the previous backup event. However, if there was no commit when the ASCII backup timer completes 55 minutes, the counter is reset without any backup. During the ASCII backup, the router blocks the configuration commits.

Starting with Release 24.2.1, we have made the following enhancements:

- You can use the **cfs check** command to increase the rebase limits in the router from 20 to 40 commits and the configuration data from 2 MB to 4 MB. When configuring the router, you can check the current commit count and configuration data size using the **show cfmgr commitdb** command. If the commit count is 20 or higher, or the configuration data size is 2 MB or above, the router initiates a rebase within 10 seconds. By using the **cfs check** command to increase the commit count to 40 and the configuration data to 4 MB, you can commit without delay.
- You can use the **clear configuration ascii inconsistency** command to perform an ASCII backup and reset the ASCII backup timer to zero. Once the backup is complete, the router will automatically initiate the next periodic ASCII backup operation only after 55 minutes from the time the **clear configuration ascii inconsistency** command is executed.

Guidelines and Restrictions for Increasing the Commit Limit

- The **clear configuration ascii inconsistency** command initiates an ASCII backup and resets the ASCII backup timer count to zero. Following this, the router will automatically initiate the next periodic ASCII backup operation only after 55 minutes from the time **clear configuration ascii inconsistency** command is executed. For example, if you execute a commit operation after executing a **clear configuration ascii**

inconsistency command, the router will perform an ASCII backup operation 55 minutes after the **clear configuration ascii inconsistency** command was executed, and merge the new commit into ASCII backup. Hence, before the next 55 minutes, you must execute the **clear configuration ascii inconsistency** command again to reset the ASCII backup timer to zero.

- When the router enters standby mode or reloads, the ASCII timer does not reset to zero, and the router performs an ASCII backup operation 55 minutes after the first commit operation before the standby mode or reload.
- Cisco does not recommend executing **clear configuration inconsistency** and **clear configuration ascii inconsistency** commands regularly after each commit, as it causes hard disk wear and tear. You should execute these commands only before a commit or sequence of commits that must be done within a specific timeframe and without being delayed by rebase and ASCII backup operations. As these commands perform disk input and output operations in the background, frequent execution of these commands causes frequent access to the hard disk, which increases the wear and tear on the hard disk.

Increasing the Rebase Limits

You can increase the rebase limits as follows:

1. Use the **cfs check** command to increase the commit count to 40 and the configuration data to 4 MB.

```
Router# cfs check
Creating any missing directories in Configuration File system...OK
Initializing Configuration Version Manager...OK
Syncing commit database with running configuration...OK
```

2. Verify if the **cfs check** command is executed using the **show configuration history** command.

```
Router# show configuration history last 5
Sno.  Event      Info                               Time Stamp
~~~~  ~~~~~      ~~~~                               ~~~~~
1      cfs check  completed                          Wed Jan 10 11:42:21 2024
2      commit    id 1000000001                       Wed Jan 10 11:39:26 2024
3      startup   configuration applied                 Wed Jan 10 11:39:02 2024
```

Perform ASCII Backup and Rest ASCII Backup Timer

You can perform ASCII backup and rest ASCII backup timer as follows:

1. Use the **clear configuration ascii inconsistency** command to perform ASCII backup at that instance and reset the ASCII backup timer count to zero.

```
Router# clear configuration ascii inconsistency
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!! It is recommended to run this command only when all nodes in router      !!!!
!!!! are in IOS-XR RUN state. To determine node state, run following command: !!!!
!!!! 'show platform'.                                                         !!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
Proceed with the command?[confirm] y
Ascii configuration backup is in progress...
Configuration ascii backup complete
```

2. Verify if the **clear configuration ascii inconsistency** command is executed using the **show configuration history** command.

```
Router# show configuration history last 5
Sno.  Event      Info                               Time Stam
```

```

~~~~~  ~~~~~  ~~~~~  ~~~~~~
1      backup  Periodic ASCII backup  Wed Jan 10 11:48:20 2024
2      cfs check completed          Wed Jan 10 11:42:21 2024
3      commit  id 1000000001         Wed Jan 10 11:39:26 2024
4      startup configuration applied  Wed Jan 10 11:39:02 2024
    
```

Concurrent Configuration Rebase during Commit

Table 3: Feature History Table

Feature Name	Release Information	Feature Description
Concurrent Configuration Rebase during Commit	Release 24.3.1	The router performs the commit and rebase operations simultaneously, ensuring that the commit operation remains unblocked during the rebase operation. This removes the need to use the cfs check command to increase the commit count and the commit file diff size.

Cisco IOS XR routers use a two-stage configuration model. In the first stage, configurations are built using necessary commands in the command line interface, and in the second stage, the configurations are committed to the router.

During rebase and ASCII backup operations, the router blocks configuration commits. However, the "Concurrent Configuration Rebase during Commit" feature allows the router to perform commit and rebase operations simultaneously, ensuring that the commit operation remains unblocked during the rebase operation.

The Cisco IOS XR routers perform rebase and ASCII backup operations to maintain the real time configuration in the backup copy.

Before Release 24.3.1,

- The rebase and ASCII backup operations block you from committing configurations to the router.
- You can increase the maximum number of commits and reset the ASCII backup timer to allow the router to configure complex topology changes without interruptions caused by the default blocking of commit changes during rebase or ASCII backup operations. For more information, see the section [Increasing Commit Limit, on page 3](#).

From Release 24.3.1,

- The router performs the commit and rebase operations simultaneously, ensuring that the commit operation remains unblocked during the rebase operation. This removes the need to use the **cfs check** command to increase the commit count and the commit file diff size.
- However, the ASCII backup operations still block the commit operation. You can reset the ASCII backup timer using the clear configuration ascii inconsistency command. This allows the router to perform an ASCII backup after 55 minutes and perform commit operations without being blocked by ASCII backup operations. For more information on ASCII backup, see the section [Increasing Commit Limit, on page 3](#).