



## Manage Device Configuration Files

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- [Set Up Device Configuration File Management, on page 1](#)
- [How Do I Find Out the Last Time Files Were Archived?, on page 4](#)
- [Back Up Device Configuration Files to the Archive, on page 5](#)
- [View the Device Configuration Files That Are Saved in the Archive, on page 6](#)
- [Label Important Configuration Files With Tags, on page 8](#)
- [Synchronize Running and Startup Device Configurations, on page 8](#)
- [Download Configuration Files, on page 9](#)
- [Compare or Delete Device Configuration Files, on page 9](#)
- [Deploy an External Configuration File to a Device, on page 10](#)
- [Overwrite a Startup Configuration with a Running Configuration, on page 11](#)
- [Roll Back a Device's Configuration To an Archived Version, on page 11](#)
- [Export Configuration Files to a Local File System, on page 13](#)
- [Delete Archived Device Configuration Files, on page 13](#)

## Set Up Device Configuration File Management

- [Make Sure Devices Are Configured Correctly, on page 1](#)
- [Control How Archiving is Triggered, on page 2](#)
- [Set Up Event-Triggered Archiving, on page 2](#)
- [Specify Items to be Excluded When Configuration Files Are Checked for Changes, on page 3](#)
- [Control the Timeouts for Configuration Archive Operations, on page 3](#)
- [Control When Device Configuration Files are Purged from the Database, on page 4](#)

## Make Sure Devices Are Configured Correctly

Before you start using the Configuration Archive features, make sure devices are configured according to the settings in [Configure Devices So They Can Be Modeled and Monitored](#).

## Control How Archiving is Triggered

By default, Cisco EPN Manager saves device configuration files to the archive when:

- A new device is added to Cisco EPN Manager
- When a device change notification is received
- Archive collection is not carried out in case of full or granular sync.



**Note** If there is an event occurrence, archive data is collected after the period of configured hold off timer.

Users with Administrator privileges can change these settings.

**Step 1** Choose **Administration > Settings > System Settings**, then choose **Inventory > Configuration Archive**.

**Step 2** Adjust the archiving settings depending on the following criteria.

Check this check box:	To archive files:
Archive configuration out-of-box?	When a new device is added (enabled by default)
Archive configuration on receiving configuration change events?	When a configuration change notification is sent (enabled by default); see <a href="#">Set Up Event-Triggered Archiving, on page 2</a>

**Step 3** To schedule regular archiving for groups of devices (or single devices):

- Choose **Inventory > Device Management > Configuration Archive Collection**.
- Under the **Devices** tab, select the devices or device groups that you want to archive on a regular basis.
- Click **Schedule Archive** and complete the schedule settings in the **Recurrence** area. If the operation will be performed on a large number of devices, schedule the archiving for a time that is least likely to impact production.
- Click the **Backup to Repository** button to transfer device configuration periodically to external repository. You can configure or create the repository using CLI commands and the supported repositories are FTP, SSH FTP (SFTP) and Network File System (NFS). You can also select to encrypt the exported files using GnuPG. You have to provide an encryption password if you choose to encrypt using GnuPG.

## Set Up Event-Triggered Archiving

By default, Cisco EPN Manager backs up a device's configuration file whenever it receives a change notification event. This function will work only if devices are configured properly; see [How Is Inventory Collected?](#). For example, for devices running Cisco IOS XR and Cisco IOS XE, the following setting must be configured:

```
logging server-IP
```

When Cisco EPN Manager receives a configuration change event, it waits 10 minutes (by default) before archiving in case more configuration change events are received. This prevents multiple collection processes

from running at the same time. To check or change this setting, choose **Administration > Settings > System Settings**, then choose **Inventory > Configuration Archive** and adjust the **Hold Off Timer**.



**Note** The **Hold Off Timer** may be set to a shorter period for certain events, called expedited events. For more information, see [Change the Behavior of Expedited Events](#).

To turn off event-triggered archiving, choose **Administration > Settings > System Settings**, then choose **Inventory > Configuration Archive** and uncheck the **Archive configuration on receiving configuration change events?** check box.

## Specify Items to be Excluded When Configuration Files Are Checked for Changes

Some lines in device configuration files should be excluded when Cisco EPN Manager compares different versions to identify changes. Cisco EPN Manager excludes some lines by default, such as clock settings for routers and switches. If you have Administrator privileges, you can check which lines are excluded, and add more lines to be excluded.

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- Step 1** Choose **Administration > Settings > System Settings**, then choose **Inventory > Configuration Archive**.
  - Step 2** Click the **Advanced** tab.
  - Step 3** In the **Product Family** list, choose the devices or groups to which you want to apply the command exclusions.
  - Step 4** In the **Command Exclude List**, enter a comma-separated list of configuration commands you want to exclude for that selection. These are the parameters Cisco EPN Manager will ignore when checking devices for configuration changes.
  - Step 5** Click **Save**.
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## Control the Timeouts for Configuration Archive Operations

The Configuration Archive task uses the Device CLI Timeout value for each fetch activity. A single Configuration Archive task entails 1 to 5 files. Consequently, the overall job timeout value is determined using the following logic: **Overall job timeout = Number of files \* Device CLI Timeout**

To configure a CLI timeout value, choose **Inventory > Device Management > Network Devices**, click the edit device icon, select the **Telnet/SSH** option, and then enter a value in the **Timeout** field.



**Note** You must increase the Device CLI timeout value if the Configuration Archive task fails due to CLI timeout.

## Control How Often Alarms are Triggered

By default, Cisco EPN Manager saves device configuration files to the archive based on the configured settings. However, when these jobs fail, you can choose to generate an alarm notification.

When a Configuration Archive job fails, Cisco EPN Manager waits for 7 days or for more than 5 (by default) configuration files before triggering an alarm. The alarm has information about the cause for the trigger of the alarm and other related details associated with the configuration archives. To change the default settings for how often the alarms are generated, choose **Administration > Settings > System Settings**, then choose **Inventory > Configuration Archive**, and adjust the **Alarm Threshold** parameter for maximum number of configuration files (exceeding which an alarm is generated) and the number of days to wait before the alarm is triggered.

## Control When Device Configuration Files are Purged from the Database

Device configuration files cannot be automatically deleted from the database (you can manually delete the files); they can be periodically purged by Cisco EPN Manager based on your settings. Users with Administrator privileges can adjust when configuration files are purged as follows. If you do not want any configuration files purged, follow this procedure but leave both fields blank.



**Note** For a description of how to manually delete a configuration file, see [Delete Archived Device Configuration Files](#).

**Step 1** Choose **Administration > Settings > System Settings**, then choose **Inventory > Configuration Archive**.

**Step 2** Adjust the archiving settings depending on the following criteria.

Use this field:	To purge files when:
Max. configuration archive	The number of a device's configuration files exceeds this setting (5 by default).
Max. days retained	A configuration file's age exceeds this setting (7 days by default).

## How Do I Find Out the Last Time Files Were Archived?

**Step 1** To find out the most recent date when device running configuration files were backed up to the archive, choose **Inventory > Device Management > Configuration Archive** and click the **Devices** tab. The Latest Archive column lists the archiving time stamp for each device with the most recent archive listed first. The Created By column displays the archive trigger (for example, a syslog).

**Step 2** To view the contents of a device's most recently-archived running configuration file, click the time stamp hyperlink. The Running Configuration window displays the contents of the file.

**Step 3** To view the changes that were made between archives for a device, see [Compare or Delete Device Configuration Files, on page 9](#).

# Back Up Device Configuration Files to the Archive

- [What Is Backed Up to the Database?, on page 5](#)
- [Back Up \(Archive\) Configuration Files, on page 5](#)

## What Is Backed Up to the Database?

The configuration archive maintains copies of device configuration files, storing them in the database. Most configuration files are stored in readable format as received from the device and can be compared with earlier versions. Device configurations can be restored to earlier states using the files saved in the archive.

If the running and startup configurations on a device are the same, Cisco EPN Manager copies only the running configuration to the database. This is why in some cases, when you view the image repository, you will only see an archive for the running configuration.

If a configuration file has not changed since its last backup, Cisco EPN Manager does not archive the file. Cisco EPN Manager will report that the job was successful and the job result will display **Already Exists**.

Cisco EPN Manager collects and archives the following device configuration files.

Device/Device OS	What is Backed Up
Cisco IOS and Cisco IOS XE	Latest startup, running, and VLAN configuration.
Cisco IOS XR	<ul style="list-style-type: none"> <li>• Latest running configuration; includes active packages. Devices must be managed with system user because copy command is not available in command-line interface (CLI) for non-system users.</li> <li>• Database configuration (binary file)</li> </ul> <p><b>Note</b> For Cisco NCS 4000 devices, the database is backed up as a .tgz file to a file system on your local machine.</p>
Cisco NCS	<p>Database configuration (binary file)</p> <p><b>Note</b> For Cisco NCS 2000 devices, the database is backed up as a binary file. Because it is not a text file, you cannot compare versions, but you can identify them by their file time stamp in the configuration archive.</p>

## Back Up (Archive) Configuration Files

When a configuration file is backed up, Cisco EPN Manager fetches a copy of the configuration file from the device and copies (backs it up) to the configuration archive (database). Before saving a copy to the archive, Cisco EPN Manager compares the fetched file with the last version in the archive (of the same type—running with running, startup with startup). Cisco EPN Manager archives the file only if the two files are different. If the number of archived versions exceeds the maximum (5, by default), the oldest archive is purged.

For devices that support both running and startup configurations, Cisco EPN Manager identifies *out-of-sync* (unsynchronized) devices during the backup process by comparing the latest version of the startup configuration with the latest version of the running configuration file. For more information on out-of-sync devices, see [Synchronize Running and Startup Device Configurations, on page 8](#).

The following table describes the supported backup methods and how they are triggered. To check or adjust the default settings, see [Control How Archiving is Triggered, on page 2](#).

When you archive a Cisco NCS 2000 database, if you receive an error message saying the database or flash is busy, it is likely caused by one of the following:

- You are performing the archive operation in parallel with other Configuration Archive or Image Management operations. You should retry the operation after a short period of time.
- Multiple users are performing the same operation at the same time. You should retry the operation after a short period of time.
- The device has a software download alarm that has not been cleared. You should clear the alarm.

**Table 1: Backup Method**

Backup Method	Description	Notes
On-demand manual backup	Choose <b>Inventory &gt; Device Management &gt; Configuration Archive</b> , choose devices, and click <b>Schedule Archive Collection</b> (run the job immediately or at a later time).	N/A
Regular scheduled backups	Choose <b>Inventory &gt; Device Management &gt; Configuration Archive</b> , choose devices, and click <b>Schedule Archive Collection</b> . In the scheduler, specify a <b>Recurrence</b> .	N/A
New device backups	Cisco EPN Manager automatically performs backup for new devices.	Enabled by default
Event-triggered backups (device change notifications)	Cisco EPN Manager automatically performs backup when it receives a syslog from a managed device.	Enabled by default

## View the Device Configuration Files That Are Saved in the Archive

- [View All Archived Files, on page 6](#)
- [View Archived Files for a Specific Device, on page 7](#)

### View All Archived Files

To view the configuration files that are saved in the database, choose **Inventory > Device Management > Configuration Archive**. Click the Archives or Devices tabs depending on where you want to start:

- **Archives** tab—A list of configuration files that have been archived, with the most recent archives listed first. The Out of Band column indicates whether the change was made by an application other than Cisco EPN Manager. Use the Groups list on the left to view archives by device types and families. From here you can:
  - [Roll Back a Device's Configuration To an Archived Version, on page 11](#)
  - [Overwrite a Startup Configuration with a Running Configuration, on page 11](#)

- [Label Important Configuration Files With Tags, on page 8](#)
- **Devices** tab—A flat list of devices with their archived configurations. From here you can:
  - Schedule backups to the archive (see [Back Up Device Configuration Files to the Archive, on page 5](#)).
  - View the archived file for a specific device by clicking the device name hyperlink (see [View Archived Files for a Specific Device, on page 7](#)).

By default, Cisco EPN Manager saves up to 5 versions of a file, and deletes any files that are older than 7 days; device configuration files cannot be manually deleted from the database. (To check the current purging settings, see [Control When Device Configuration Files are Purged from the Database, on page 4](#).)

## View Archived Files for a Specific Device



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**Note** If you only see a running configuration file and not a startup file, that is because the two files are the same. Cisco EPN Manager only backs up the startup configuration when it is different from the running configuration.

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- Step 1** Choose **Inventory** > **Device Management** > **Configuration Archive**, then click the **Devices** tab.
- Step 2** Click a device name hyperlink. Cisco EPN Manager lists archived files according to their timestamps.
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## View the Raw Content of an Archived Configuration File

Use this procedure to view the startup, running, and (if supported) VLAN, database, and admin configuration files that have been saved to the configuration archive. You can choose versions according to timestamps and then compare them with other versions.



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**Note** For Cisco NCS 2000 and Cisco NCS 4000 devices, the database is backed up as a binary file. Because it is not a text file, you cannot view it or compare it with other versions, instead, you can export the file directly.

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To view the contents of a running configuration file stored in the configuration archive:

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- Step 1** Choose **Inventory** > **Device Management** > **Configuration Archive**, then click the **Devices** tab.
- Step 2** Click a device name hyperlink. Cisco EPN Manager lists archived files according to their timestamps.
- Step 3** Expand a timestamp to view the files that were archived at that time. You will see the details for Running Configuration, Startup Configuration, Admin Configuration, VLAN Configuration, and Database Configuration. Click the Details hyperlink under these categories, to see more information.
- Note** If you only see a running configuration file and not a startup file, that is because the two files are the same. Cisco EPN Manager only backs up the startup configuration when it is different from the running configuration.

- Step 4** Click a file under Configuration Type to view its raw data. The Raw Configuration tab lists the file contents, top to bottom.
- Step 5** To compare it with another file, click any of the hyperlinks under the Compare With column. The choices depend on the device type and number of configuration files that have been backed up to the archive. Color codes indicate what was updated, deleted, or added.

## Label Important Configuration Files With Tags

Assigning tags to configuration files is a clear method for identifying important configurations and convey critical information. The tag is displayed with the list of files on the Configuration Archive page. Tags can also be edited and deleted using the following procedure.

- Step 1** Choose **Inventory > Device Management > Configuration Archive**.
- Step 2** Under the **Archives** tab, locate the configuration file you want to label, and click **Edit Tag**.
- Step 3** Enter your content in the Edit Tag dialog box (or edit or delete existing tags) and click **Save**.

## Synchronize Running and Startup Device Configurations

Devices that have startup configuration files and running configuration files may become out-of-sync (unsynchronized). A device is considered out-of-sync if its startup file (which is loaded when a device is restarted) is different from its running configuration. Unless a modified running configuration is also saved as the startup configuration, if the device is restarted, the modifications in the running configuration will be lost. The overwrite operation synchronizes the files by overwriting the device's startup configuration with its current running configuration.



**Note** This device configuration file synchronize operation is different from the Sync operation, which performs *an immediate inventory collection for a device*. That Sync operation is described in [Collect a Device's Inventory Now \(Sync\)](#).

- Step 1** Identify the devices that are out-of-sync:
- Choose **Inventory > Device Management > Configuration Archive**.
  - Under the **Devices** tab, check the **Startup/Running Mismatch** field .
  - If any devices list **Yes**, make note of the devices.
- Step 2** To synchronize the devices:
- Under the **Devices** tab, select the out-of-sync devices, and click **Schedule Archive Overwrite**. (See [Overwrite a Startup Configuration with a Running Configuration, on page 11](#) for more information about the overwrite operation.)
- Step 3** To check the job details, choose **Administration > Job Dashboard** to view details about the overwrite jobs.



# Download Configuration Files

You can download the Startup and Running configuration files of up to a maximum of 1000 devices at a time, to your local system.

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**Step 1** Choose **Inventory > Device Management > Configuration Archive**.

**Step 2** In the **Export Latest Archives** drop-down list, select one of the following options to download the configuration files:

- a. **Sanitized**—The device credential password will be masked in the downloaded file.
- b. **Unsanitized**—The device credential password is visible in the downloaded file.

The Unsanitized option appears based on the user permission set in Role Based Access Control (RBAC).

This option downloads all supported configuration in the device as a csv file. To download only the Startup or the Running configuration in the device, use the alternate steps given below:

- Click the device for which you want to download configuration files in the **Inventory > Device Management > Configuration Archive** page or Click the device for which you want to download configuration files in the **Inventory > Device Management > Network Devices** page and click **Configuration Archive** tab.
- Use the expand icon to display the required configuration details in the archive.
- Click **Details**.
- Select **Sanitized** or **Unsanitized** in the **Export** drop-down list.

**Remember** Before you upload this config file to your WLC, you must add a keyword, **config** at the beginning of each line.

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# Compare or Delete Device Configuration Files

The comparison feature displays two configuration files side by side with additions, deletions, and excluded values indicated by different colors. You can use this feature to view the differences between startup and running configuration files for out-of-sync devices, or to find out if similar devices are configured differently. You can then delete the configuration archives from the database.

Cisco EPN Manager excludes a small set of commands by default, such as the NTP clock rate (which constantly changes on a managed network element but is not considered a configuration change). You can change the excluded commands list as described in [Specify Items to be Excluded When Configuration Files Are Checked for Changes, on page 3](#).



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**Note** File comparisons are not supported on the Cisco NCS 2000 devices because the files are saved in binary format. Only text-based files can be compared.

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**Step 1** Choose **Inventory > Device Management > Configuration Archive**.

- Step 2** To delete the device configuration archive, under the Devices tab, locate the device with the configuration you want to delete and click the X delete button.
- Step 3** To compare device configuration archives:
- Under the Devices tab, locate the device with the configuration you want to compare and click its device name hyperlink.
  - Expand a time stamp to view the files that were archived at that time.
  - Launch a comparison window by clicking any of the hyperlinks under the Compare With column. The choices depend on the device type and number of configuration files that have been backed up to the archive. Color codes indicate what was updated, deleted, or added.

In the Configuration Comparison window, you can peruse the configuration by looking at the raw files or by looking at certain portions of the files (configlets). Use the color codes at the bottom window to find what was updated, deleted, or added.

## Deploy an External Configuration File to a Device

The Schedule Deploy operation updates a device's configuration file with an external file. The difference between Rollback and Schedule deploy is that the Rollback uses an existing file from the archive, while Schedule Deploy uses an external file.

Depending on the type of device, you can specify the following settings for the deploy job:

- Overwrite the current startup configuration with the new version and optionally reboot the device after the deploy.
- Merge the new file with the current running configuration and optionally archive the file as the new startup configuration.
- Schedule the deploy of database configuration files in .tgz format.



**Note** Once the configuration archive deploy is performed from EPNM, you must manually synchronize the device.

Make sure you have the location of the file on your local machine.

- Step 1** Open the device's Device Details page, from which you will execute the deploy operation.
- Choose **Inventory > Device Management > Network Devices**.
  - Click the device name hyperlink to open the Device Details page.
- Step 2** Open the device's Configuration Archive page by clicking the Configuration Archive tab. For Cisco NCS 2000 and Cisco ONS devices, this choice is displayed on the right when you click the **Chassis View** tab.
- Step 3** Click **Schedule Deploy** to open the deploy job dialog box.
- Step 4** Choose the file you want to deploy by clicking **Browse**, navigating to the file's location, and choosing the file.
- Note** To deploy database configuration files to Cisco for NCS 4000 devices, you must upload the files in .tgz format.

- Step 5** Configure the job parameters, depending on the type of file you are deploying:
- Startup configuration—Choose **Overwrite Startup Configuration**. If you want to reboot the device after the deploy operation, check the **Reboot** check box.
  - Running configuration—Choose **Merge with Running Configuration**. If you want to also save the file on the device as the startup configuration, check the **Save to Startup** check box.
  - Database configuration—Choose **Deploy Database Configuration** and select a database file (in .tgz format for Cisco NCS 4000 devices and .cfg format for Cisco NCS2000 devices).
  - Admin configuration—Choose **Merge with Admin Configuration** and enter the **Device VM Admin Password**.
- Step 6** Schedule the deploy job to run immediately or at a future time, and click **Submit**.
- Step 7** Choose **Administration > Job Dashboard** to view details about the image activation job.
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## Overwrite a Startup Configuration with a Running Configuration

The overwrite operation copies a device's running configuration to its startup configuration. If you make changes to a device's running configuration without overwriting its startup configuration, when the device restarts, your changes will be lost.



**Note** Do not use the **Schedule Archive Overwrite** button in the Devices tab (shown when you choose **Inventory > Device Management > Configuration Archive**) because it only allows you to select a device but not select a configuration file.

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- Step 1** Choose **Inventory > Device Management > Network Devices**.
- Step 2** Click the device name hyperlink to open the device's details page, then click the Configuration Archive tab. For Cisco NCS 2000 and Cisco ONS devices, this choice is displayed on the right when you click the **Chassis View** tab.
- Step 3** Click **Schedule Archive Overwrite** and set the job to run immediately or at a future time, then click **Submit**.
- Step 4** Choose **Administration > Job Dashboard** to view the image activation job.
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## Roll Back a Device's Configuration To an Archived Version

The rollback operation copies files in the archive to devices, making the new files the current configuration. You can roll back running, startup, and VLAN configurations. By default, the operation is performed by merging the files. If you are rolling back a running configuration, you have the option to perform it using overwrite rather than merge. To roll back a configuration file to a previous version.

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- Step 1** Choose **Inventory > Device Management > Configuration Archive**.

**Step 2** Click the **Archives** tab and check the device that has the configuration file you want to roll back, and click **Schedule Archive Rollback**.

**Step 3** Choose the file types that you want to roll back. In the Schedule Configuration Rollback dialog box:

- a) Expand the **Rollback Options** area.
- b) From the **Files to Rollback** drop-down list, choose the file type. Choosing **All** applies the operation to startup, running, and VLAN configuration files.

**Note** For Cisco IOS XR 64-bit devices, if you select **Admin Configuration**, enter the **Device VM Admin Password**.

**Step 4** Click the specific configuration file version that you want to roll back to.

**Step 5** Click **Schedule Archive Rollback** and complete the following:

**Table 2: Roll Back Device Configuration**

Area	Option	Description
Rollback	Files to rollback	Select Database Configuration, Running Configuration, or Admin Configuration.
	Reboot	(Startup only) After rolling back the startup configuration, reboot the device so the startup configuration becomes the running configuration.
	Save to startup	(Running only) After rolling back the running configuration, save it to the startup configuration.
	Archive before rollback	Back-up the selected file(s) before beginning the rollback operation.
	Overwrite configurations	Overwrite (rather than merge) the old running configuration with the new one.
	Continue rollback on archive failure	(If Archive before rollback is selected) Continue the rollback even if the selected files are not successfully backed up to the database.
	VRF Name	Select the applicable VRF name from the drop-down list. The VRF name is validated on submission.
Rollback	Rollback Database Configuration	Begin the rollback operation for database configuration files.
Schedule	(see web GUI)	Specify whether to perform the rollback immediately or at a later scheduled time.

**Step 6** Click **Submit**.

# Export Configuration Files to a Local File System

You can export running configuration files and startup configuration files.



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**Note** For Cisco NCS 2000 devices, you can export database configurations as binary files to a file system on your local machine. With Cisco NCS 4000 devices, you can export database configurations as .tgz files. When you export it, your browser will prompt you to save or open the file.

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- Step 1** Choose **Inventory > Device Management > Configuration Archive**.
- Step 2** Under the Devices tab, locate the device with the archive you want to export, and click its device name hyperlink.
- Step 3** Locate the configuration version you want to export and expand it.
- Step 4** Under the Configuration Type column, click the hyperlink for the file you want to export (**Running Configuration** or, if supported, **Startup Configuration**, or **Database Configuration**).
- Step 5** In the file viewer page, click **Export** and save the file to your local machine.
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## Delete Archived Device Configuration Files

Provided you are a user who has the device configuration rollback privilege, you can complete one of the following procedures to manually delete archived device configuration files from the database.

### (Method 1)

1. Choose **Inventory > Device Management > Configuration Archive**.  
The **Configuration Archive** page opens with the **Devices** tab selected.
2. From the **Name** column, click the link for the device whose configuration files you want to delete.  
Its **Archive Details** page opens.
3. Click the radio button for the configuration files you want to delete and then click the **X (Delete)** icon.
4. Click **Yes** to confirm deletion of the configuration files.

### (Method 2)

1. Choose **Inventory > Device Management > Configuration Archive**.  
The **Configuration Archive** page opens with the **Devices** tab selected.
2. Click the **Archives** tab.
3. Check the check box for the configuration files you want to delete and then click the **X (Delete)** icon.
4. Click **Yes** to confirm deletion of the configuration files.

