

# **Manage Device Configuration Files**

- Set Up Device Configuration File Management, page 1
- How Do I Find Out the Last Time Files Were Archived?, page 5
- Back Up Device Configuration Files to the Archive, page 5
- View the Device Configuration Files That Are Saved in the Archive, page 7
- View a Device's Running Configuration File (Raw Content), page 9
- Label Important Configuration Files With Tags, page 9
- Synchronize Running and Startup Device Configurations, page 9
- Download Configuration Files, page 10
- Compare Device Configuration Files, page 11
- Deploy an External Configuration File to a Device, page 11
- Overwrite a Startup Configuration with a Running Configuration, page 12
- Roll Back a Device's Configuration To an Archived Version, page 13
- Export Configuration Files to a Local File System, page 14
- Check the Network Audit for Configuration Archive Operations, page 14

## **Set Up Device Configuration File Management**

- Make Sure Devices Are Configured Correctly, on page 2
- 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 How Often the Archive Summary Is Updated, on page 4
- Control How Many Files Can Be Archived In Parallel, on page 4

- Control Whether Configuration File Content Is Masked During Exports, on page 4
- 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

Users with Administrator privileges can change those 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 after inventory sync?	When a change is detected after inventory collection (disabled by default)
Archive configuration on receiving configuration change events?	When a configuration change notification is sent (enabled by default); see Set Up Event-Triggered Archiving, on page 2

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

- a) Choose Inventory > Device Management > Configuration Archive.
- b) Under the Devices tab, select the devices or device groups that you want to archive on a regular basis.
- c) 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.

### 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 Often 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.

**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.

#### **Control the Timeouts for Configuration Archive Operations**

By default, Configuration Archive operations such as archiving, rolling back, and fetching configurations from devices will time out if a device does not respond for 6 minutes (360s). To adjust this setting, choose Administration > Settings > System Settings, then choose Inventory > Configuration Archive and change the setting in the Timeout field.

#### **Control How Often the Archive Summary Is Updated**

When you choose **Inventory** > **Device Management** > **Configuration Archive**, Cisco EPN Manager lists the configuration archives that it has collected. This summary data is updated whenever a new archive is collected. It is also updated by default at least every 30 minutes according to a summary refresh timer. You can change the time setting by choosing Administration > Settings > System Settings, then choose Inventory > Configuration Archive and adjust the **Summary refresh hold-off time**.

### **Control How Many Files Can Be Archived In Parallel**

Cisco EPN Manager uses 10 thread pools for copying configuration files to the archive. A larger number may be helpful when archiving of changes involving more than 1,000 devices; however, making the number too large can negatively impact system performance. To change this number, choose Administration > Settings > System Settings, then choose Inventory > Configuration Archive and adjust the Thread Pool Timer.

### **Control Whether Configuration File Content Is Masked During Exports**

Cisco EPN Manager supports exporting startup and running configuration files to a local file system. By default, the contents of these files are masked when they are exported. To export configuration files, see Export Configuration Files to a Local File System, on page 14. If you want to change the mask setting, choose Administration > Settings > System Settings, then choose Inventory > Configuration Archive and adjust the Mask security content while exporting option.

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

Device configuration files cannot be manually deleted from the database; they can only be purged by Cisco EPN Manager. 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.

**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 purge files when:
Max configuration archives	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 choose
	<b>Inventory &gt; Device Management &gt; Configuration Archive</b> and click the <b>Devices</b> 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 Device Configuration Files, on page 11.

## **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 6

#### 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**.

Device/Device OS	What is Backed Up	
Cisco IOS and Cisco IOS XE	Latest startup, running, and VLAN configuration.	
Cisco IOS XR	• 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.	
	• Database configuration (binary file)	
	Note	For Cisco NCS 4000 devices, the database is backed up as a .tgz file to a file system on your local machine.

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

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Device/Device OS	What	What is Backed Up	
Cisco NCS	Database configuration (binary file)		
	Note	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.	

### **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 a 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 9.

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 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.

Backup Method	Description	Notes	
On-demand manual backup	Choose <b>Inventory &gt; Configuration Archive</b> , choose devices, and click <b>Schedule Archive</b> (run the job immediately or at a later time).	N/A	
Regular scheduled backupsChoose Inventory > Configuration Archive, choose devices, and click Schedule Archive. In the scheduler, specify a Recurrence.		N/A	
Inventory collection backups			
New device backups	Cisco EPN Manager automatically performs backup for new devices.	Enabled by default	

#### Table 1: Backup Method

Backup Method	Description	Notes
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 7
- View Archived Files for a Specific Device, on page 8

### **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 13
  - Overwrite a Startup Configuration with a Running Configuration, on page 12
  - Label Important Configuration Files With Tags, on page 9
- Devices tab—A flat list of devices with their archived configurations. From her 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 8).

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**



**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 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.		

#### 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 time stamps and then compare them with other versions.

To quickly view a device's currently-running configuration, perform a **show run** from the Device 360 view. See View a Device's Running Configuration File (Raw Content), on page 9.



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.

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

#### **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 time stamp 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.

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.

# **View a Device's Running Configuration File (Raw Content)**

To view a device's running configuration, execute a CLI **sh run** command from the Device 360 view **Actions** menu.

#### **Step 1** Open the device's Device 360 view.

- · Click the "i" icon next to an IP address in almost any device table
- From the network topology, click a device in an expanded group, then click View

Step 2	Choose Actions > Show Command.
Step 3	In the Run Show Commands dialog box, choose <b>sh run</b> from the drop-down list, then click <b>Run</b> .

## 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** Locate the configuration file you want to label, and click **Edit Tag** at the top of the table.
- **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.



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:

- a) Choose Inventory > Device Management > Configuration Archive.
- b) Under the Devices tab, check the Startup/Running Mismatch field.
- c) If any devices list Yes, make note of the devices.

#### **Step 2** To synchronize the devices:

- a) Click the Archives tab.
- b) Select the out-of-sync devices, and click **Overwrite**. (See Overwrite a Startup Configuration with a Running Configuration, on page 12 for more information about the overwrite operation.)

**Step 3** To check the job details, choose **Administration > Job Dashboard** to view details about the overwrite job.

## **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.

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

Step 2

From the **Export** drop-down list, select one of the following options to download the configuration files:

- 1 Sanitized—The device credential password will be masked in the downloaded file.
- 2 Unsanitized—The device credential password will be visible in the downloaded file.

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

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

You can also download the configuration files by doing the following:

- 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 from the archive.
- · Click Details.
- Select Sanitized or Unsanitized from the Export drop-down list.

# **Compare 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.

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.



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.

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

**Step 2** Under the Devices tab, locate the device with the configuration you want to compare and click its device name hyperlink.

- **Step 3** Expand a time stamp to view the files that were archived at that time.
- **Step 4** 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.

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.		
	a) Choose Inventory > Device Management > Network Devices.		
	b) 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 <b>Chassis View</b> tab.		
Step 3	Click Schedule Deploy to open the deploy job dialog box.		
Step 4	Choose the file you want to deploy by clicking <b>Browse</b> , navigating to the file's location, and choosing the file. <b>Note</b> 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 <b>Deploy Database Configuration</b> 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.		
Step 6	Schedule the deploy job to run immediately or at a future time, and click <b>Submit</b> .		
Sten 7	Choose Administration > Job Dashboard to view details about the image activation job		

## **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 Overwrite button in the Archives 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.

#### **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 Overwrite and set the job to run immediately or at a future time, then click Submit.
- **Step 4** Choose Administration > Job Dashboard to view details about the image activation job.

## **Roll Back a Device's Configuration To an Archived Version**

The rollback operation copies files from 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.

- **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 **Rollback**.
- **Step 3** Choose the file types 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.
- **Step 4** Click the specific configuration file version that you want to roll back to.
- **Step 5** Click **Schedule Rollback** and complete the following:

Table 2: Roll	<b>Back Device</b>	Configuration
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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 running configuration	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.

Area	Option	Description
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, startup configuration files. By default, the contents of device running config files are masked when they are exported (see Control Whether Configuration File Content Is Masked During Exports, on page 4).

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.

Step 1	Choose Inventory >	<b>Device Management</b>	: > 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.

## **Check the Network Audit for Configuration Archive Operations**

To get historical information about device software image changes, check the Network Audit.

Step 1

Choose **Inventory > Network Audit**. To filter the results to show only image management operations, enter **archive** in the Audit Component field.

🏠 / ... / Device Management / Network Audit 🔺

				Show Quick
Device Name	IP Address	Audit Time	Audit Component	Audit Description
prime-asr903	209.165.200.224	2015-Jan-23 17:12:21 PST	IFM Software Image Management	Image Distribution
prime-asr90	209.165.201.1	2015-Jan-23 17:11:29 PST	IFM Software Image Management	Image Distribution
prime-asr	209.165.202.128	2015-Jan-23 17:11:29 PST	IFM Software Image Management	Image Distribution

**Step 2** Expand an event drawer to get details about a device change. For example, if you expand the drawer highlighted in the Network Audit Event—Configuration Archive figure, given in step 1, you can see that the device's running configuration file was successfully backed up to the archive at that time.

Archive configuration	Success	
Fetch DATABASE configuration	Unsupported operation	
Fetch VLAN configuration	Unsupported operation	
Fetch running configuration	Success	
Fetch startup configuration	Success	
Syslog Message	<189>308716: *Jan 27 01:25:41.622:	
	<pre>%SYS-5-CONFIG_I: Configured from console by vty0</pre>	
	(10.127.101.52)	

For more information on the Network Audit feature, see Audit Configuration Archive and Software Management Changes (Network Audit).

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