



CHAPTER 8

Managing Device Configurations

The WLSE allows you to create templates, schedule and check on the status of configuration jobs, manage configuration archives, and automate configurations.

Following are the subtabs under Configure:

- **Templates**—See [Using IOS Templates, page 5-1](#), [Using WLSM Templates, page 6-1](#), or [Using Wizard Templates, page 7-1](#).
- **Archives**—See [Managing Configuration Archives, page 8-1](#).
- **Jobs**—See [Managing Jobs, page 8-7](#).
- **Auto Update**—See [Automating Configurations, page 8-38](#).
- **Device Specific**—See [Managing Device Specific Configurations, page 8-46](#)
- **Key Rotation**—See [Managing Key Rotation Configurations, page 8-51](#)

Managing Configuration Archives

As WLAN networks become larger, configuration management becomes more difficult. Each group of devices may have distinct configuration parameters that are difficult to track and maintain manually. The configuration archive feature allows you to easily restore or troubleshoot a failing device by applying the previously stored configuration. It also enables you to archive the last 4 distinct configurations for a device, which you can restore if needed.



Note

Your login determines whether you can use this option.

The topics covered in this section are:

- Viewing, editing, deleting, comparing, and exporting configuration archives—See [Viewing Archived Configurations, page 8-1](#).
- Scheduling a configuration archive job—[Scheduling an Archive Collection, page 8-3](#).
- Viewing the status of a configuration archive job—[Viewing Archive Status, page 8-3](#).

Viewing Archived Configurations

Use this option to view, edit, delete, compare, and export an archived configuration. You can also allow or disallow a configuration archive to be overwritten.

Before You Begin

Before you can view any archived configurations, you must have run an archive job. See [Scheduling an Archive Collection, page 8-3](#) for information on creating and running an archive job.

Procedure

Step 1 Select **Configure > Archives**.

Step 2 Search for a device or select the device for which you want to view a configuration archive from the device selector in the left pane.



Note The icons in the device selector indicate the current status of the access points, not the archive status.

For information on how to search or use the device selector, see [Using the Device Selector, page 1-12](#).

Step 3 Click the device group or device name and the following table appears:

Field	Description
Device Name	The name of the device.
Archive Name	The name of the archived configuration. Click the Archive Name to view the configuration. A window appears displaying the configuration file for the selected archive.
Date	The date the configuration was archived.
Type	The type of configuration archive.
Overwrite	Indicates if the configuration has been marked as Overwrite. Yes indicates that the configuration is available to be overwritten; No indicates it will not be overwritten.
Edit	Click the icon to edit the information. The Archive Details Window appears. See Editing the Archive, page 8-4 .

Step 4 By selecting the archives in this table you can do any of the following:

- Allow or disallow overwriting—See [Selecting Overwrite Settings, page 8-4](#).
- Delete an archived configuration—See [Applying an Archived Configuration to a Device, page 8-5](#).
- Apply an archived configuration to a device—See [Applying an Archived Configuration to a Device, page 8-5](#).
- Compare configurations—See [Comparing Configurations, page 8-5](#).
- Export a configuration to a file—See [Exporting a Configuration to a File, page 8-5](#)
- Export a configuration to a template—See [Exporting a Configuration to a Template, page 8-6](#)

Scheduling an Archive Collection

Procedure

- Step 1** Select **Configure > Archives**.
 - Step 2** Click **Schedule Archive Collection**. The window for creating an archive job appears. See [Archive Job Choices, page 8-27](#).
 - Step 3** After scheduling a job, click **View Archives** to return to the **Configure > Archives** window.
-

Viewing Archive Status

Procedure

- Step 1** Select **Configure > Archives**.
 - Step 2** Click **View Archive Status**. The window for creating and archive job appears. See [Viewing Archive Job Status, page 8-32](#).
 - Step 3** After viewing the archive status, click **View Archives** to return to the **Configure > Archives** window.
-

Editing the Archive

Procedure

Step 1 To edit the archive, complete the following:



Note None of the fields under Details are editable; they are informational only.

Field	Description
Archive Name	Enter a name for the archived configuration.
Overwrite	Select one of the following: Yes—Use this setting to indicate that the configuration archive is available to be overwritten. No—Use this setting to indicate that it will not be overwritten.
Description	Enter a description for the archived configuration.
Details	
Save Time	The date and time the configuration archive was saved.
Type	The type of configuration archive.
Device Name	The name of the device.

Step 2 Click **Save Changes**.

Selecting Overwrite Settings

Use this option to allow an archive to be overwritten or to disallow overwriting it.

Procedure

Step 1 Select a configuration archive configuration.

Step 2 Click one of the following:

- Overwrite—to allow the configuration archive to be overwritten.
- Do Not Overwrite—to make sure the configuration archive is not overwritten.

Deleting Archived Configurations

Use this option to delete an archived configuration from the database. You cannot retrieve a deleted configuration archive.

Procedure

- Step 1** Select a configuration from the table.
 - Step 2** Click **Delete**.
-

Applying an Archived Configuration to a Device

Use this option to apply an archived configuration to the device.

Procedure

- Step 1** Select a configuration from the table.
 - Step 2** Click **Apply to Device**.
A confirmation box displays asking if you are sure you want to apply the configuration.
 - Step 3** Click **Yes** to continue. The configuration is applied.
-

Comparing Configurations

Use this option to compare archived configurations.



Tip

You can compare archived configurations for devices that are in different groups by creating a new group, then putting the devices you want to compare into that group.

Procedure

- Step 1** Select any two archived configurations you want to compare from the table.
 - Step 2** Click **Compare**. A window opens with the selected configurations.
Differences between the configurations are shown in red; information that is one configuration but not the other are shown in orange.
-

Exporting a Configuration to a File

Use this option to export an archived configuration to a file.

Procedure

-
- Step 1** Select a configuration you want to from the table.
- Step 2** Click **Export to File**. You will be prompted for a location to export the configuration.
-

Exporting a Configuration to a Template

Use this option to export an archived configuration to a template.

Procedure

-
- Step 1** Select a configuration you want to from the table.
- Step 2** Click **Export to Template**. The configuration is exported to a template.
- Step 3** To view the exported template, select **Configure > Templates** and it is listed in the Existing Templates window.
-

Managing Jobs

There are two types of jobs you can manage in this window:

- Configuration Jobs—See [Managing Configuration Jobs, page 8-7](#).
- Archive Jobs—[Managing Archive Jobs, page 8-24](#).

Managing Configuration Jobs

This window allows you to view a list of configuration jobs. It also allows you to create, edit, undo, and perform other operations on configuration jobs.

The configuration job types include:

- Config Regular—Jobs created to apply template configurations to devices.
- Config Auto—Jobs created using the Auto Update option.
- Archive Regular—Jobs created using the Schedule Archive Collection option.

The topics covered in this section are:

- [How Do WLSE Configuration Jobs Work?, page 8-8](#)
- [In What Order are the Template Configurations Applied to the Devices?, page 8-8](#)
- [Recommendations For Running Configuration Jobs, page 8-9](#)
- [Creating a Configuration Job, page 8-18](#)
- [Viewing Configuration Job Status, page 8-18](#)
 - [Filtering a Configuration Job, page 8-22](#)
 - [Editing a Configuration Job, page 8-22](#)
 - [Running a Configuration Job Again, page 8-22](#)
 - [Deleting a Configuration Job, page 8-23](#)
 - [Copying a Configuration Job, page 8-23](#)
 - [Viewing the Job Run Details Tables, page 8-23](#)

Related Topics

- [Using IOS Templates, page 5-1](#)

How Do WLSE Configuration Jobs Work?

Access points use jobs created by the **Configure > Jobs** option to make configuration updates.

When the WLSE configures access points, it pushes raw IOS CLI commands to the access points over a telnet or SSH connection.

To update the configuration, therefore, the WLSE requires only the telnet or SSH user name and password access point credentials.

Related Topics

- [Recommendations For Running Configuration Jobs, page 8-9](#)
- [Creating a Configuration Job, page 8-18](#)

In What Order are the Template Configurations Applied to the Devices?

When you create a template using several categories (Association, Services > CDP, etc.) the commands associated with each category are applied sequentially to the device, but the order in which each category is applied is random.

For example, if you create an IOS template made up of two categories, Basic Security and SecurityManager > SSID 802.11 b/g/n, all the commands generated by the Basic Security category are applied in order. However, the commands associated with the Security Manager > SSID 802.11b/g/n might be applied before the commands generated for Basic Security.

Any custom values you configure, are applied to the device only after all the other template configurations have been applied. Any device specific values are applied to the device only after all other template configurations and custom values have been applied.

For Config Regular and Config Auto Jobs, the following template order is maintained:

1. Security: Server Manager
2. Services: VLAN
3. Services: Filters - IP Filters
4. Services: Filters - MAC Address Filters
5. Security: Admin Access
6. Security: Local Radius Server - General Set-Up
7. Security: WEP Key Manager 802.11b/g/n
8. Security: WEP Key Manager 802.11a/n
9. Basic Security
10. Security: SSID Manager 802.11b/g/n
11. Security: SSID Manager 802.11a/n
12. Security: Advanced Security
13. Services: Telnet/SSH
14. Services: Hot Standby
15. Services: CDP-Cisco Discovery Protocol
16. Services: DNS - Domain Name Service
17. Services: Filters - EtherType Filters

18. Services: HTTP- Web Server
19. Voice Express
20. Services: QoS Policies
21. Services: QoS Policies 11b/g/n - Traffic Class Definition
22. Services: QoS Policies 11a/n - Traffic Class Definition
23. Stream - Packet Handling Radio 802.11a/n
24. Services: SNMP- Simple Network Management Protocol
25. Services: NTP- Network Time Protocol
26. Services: ARP Caching
27. Services: Spanning Tree Protocol
28. Basic Settings
29. Network Interfaces: Fast/Gigabit Ethernet Settings
30. Network Interfaces: Radio-802.11b/g/n
31. Network Interfaces: Radio-802.11a/n
32. Wireless Services: AP
33. Wireless Services: WDS - Wireless Domain Services - Settings
34. Association: Activity Timeout
35. Event Log: Configuration Options
36. Event Log: Notification Options
37. Custom Values: Custom IOS Commands
38. Device Specific: Device Specific Settings
39. System Config

Recommendations For Running Configuration Jobs

There are two interrelated questions you should consider when you use the WLSE configuration feature:

- How many devices should be included in the job?
- How much time should be allotted for the job?

How Many Devices?

Because the WLSE configuration feature is multi-threaded with up to 20 allotted threads, it can configure as many as twenty access points simultaneously. For example, a configuration job with 100 devices will begin by configuring twenty devices, one thread per device. When a device configuration completes, its thread will start on a new device immediately, even if the other configuration tasks are in progress. However, the maximum limit of devices can be configured in single job is 500.

How Much Time?

When calculating the amount of time it takes to configure an access point, the factors to consider are:

- How long does it take to download the template via TFTP or push IOS CLI commands to the access point?

TFTP download and IOS CLI command pushes are highly dependent on network performance. The WLSE has an internal configuration parameter that specifies a timeout value for configuration jobs. If the WLSE is unable to complete the job within the timeout period, it will declare the job as a failure. A timeout value that is set too low may cause the WLSE to prematurely abort configuration jobs or improperly report a device configuration failure. So if you have high latency issues or a congested network, increase the configuration timeout setting.

- How long does it take for the access point to reboot if required by the configuration change?

The amount of time to reboot and load new firmware is usually constant. However, if the access point uses DHCP to get an IP address or retrieve a configuration file when it comes up after a reboot, this time is also affected by network performance. This may cause issues with the configuration job timeout, so you may need to increase the timeout.

Here are some other factors that might influence configuration times:

- Configuration jobs sometimes fail due to configuration parameter dependencies on the access points. Consult the access point documentation to understand if there are any configuration dependencies if you have issues with configuration jobs failing.
- Large templates take longer to apply and are more prone to issues with parameter dependencies. If you are applying a large template and seeing configuration failures, it may be useful to break the template into multiple templates and run multiple configuration jobs.

For example, configuration tasks can be greatly simplified by using the WLSE device grouping feature. Suppose a WLSE administrator has created a group for the access points in Site A, sub-groups for Channels 1, 6, and 11, and moved the appropriate access points into the channel groups. Now, the administrator can create three separate templates to set the Channel IDs to Channels 1, 6, and 11. Then to set the access points to the correct channel, three configuration jobs can be created to map the correct template to the corresponding channel group.

Calculating the Estimated Change Window

Configuration jobs should be kept to a reasonable size. Typically, a job with 100 devices is a reasonably sized job, but that can vary. A configuration job should be able to complete within a change window. To calculate this window, use a formula similar to the one recommended for firmware:

$$T = (n / 10) * t + s$$

where:

- T is the total time for the change window
- n is the number of devices in the configuration job
- t is the estimated time to configure a single device
- s is the safety factor.

In this formula, T is often a constant defined by IT policies. For example, many campuses allow for a change window of no more than two hours. If you determine that it will take more than T to configure the access points, plan the upgrades in phases, each of which can be completed well within the change window. It is always a good idea to plan configuration changes conservatively. One conservative way to use this formula is to use the configuration timeout setting as your value for t.

Configuration Job Choices

When you create or edit a configuration job, the following choices appear in the left pane of the Jobs window:

**Caution**

Clicking on another Configure subtab before you have saved your entries in this window will cause the window to reset and you will lose all the information you entered.

1. **Job Name**—See [Naming the Configuration Job](#), page 8-11.
2. **Select Template**—See [Selecting a Template](#), page 8-12.
3. **Select Devices**—See [Selecting Devices](#), page 8-14.
4. **Schedule Job**—See [Scheduling a Configuration Job](#), page 8-15.
5. **Options**—See [Setting Configuration Job Options](#), page 8-15.
6. **Save**—See [Saving the Configuration Job](#), page 8-17.

Before you Begin

Before you schedule a job, make sure you have done the following:

- Ensure all devices of the same device type in the network or within the group of selected devices have the same firmware version. If not, schedule firmware jobs to upgrade the images.
- If device specific settings are configured on the WLSE, ensure that **Enable Device Specific for this Template** is enabled on the template. (See **Configure > Templates > IOS > Device Specific**.)
- Create templates based on device type or on a set of similar device types. For example, do not include a bridge AP with regular AP in the same group. Create different templates for each.
- Assign a template to a group of devices that share similar deployment characteristics, such as same device type and also similar operational characteristics such as data rates, SSID configuration, beacon intervals etc.
- Enable SSH across all devices in the network for secure configuration. Include these settings in the template.
- Ensure that the same template is associated with the AP when it is configured as a job or through the Auto-Config option.
- If DHCP is configured to obtain the configuration from the TFTP server, ensure the same template is associated with a specific AP.
- Ensure the template is complete, including proper SNMP, SSH (or Telnet) credentials, and that AAA configured correctly. Also ensure the native VLAN is configured correctly to maintain connectivity. If the AP configuration succeeds, the WLSE automatically updates the access credentials from those specified in the template.

Naming the Configuration Job**Procedure**

- Step 1** Click **Job Name**. The Job Name dialog box appears.
- Step 2** Complete the following:

**Note**

Clicking **Clear** removes all the current entries in the window and any entries you have made in other Job windows up until that point.

Table 8-1 Job Name

Field	Description
Job Name	Enter a name for the job. See Naming Guidelines, page B-1 .
Description	Enter a description of the job. See Naming Guidelines, page B-1 .

- Step 3** From the menu in the left pane, go to the next step, Select Template. For additional information, see [Selecting a Template, page 8-12](#).

Selecting a Template

Procedure

- Step 1** Click **Select Template**. The Select Template window appears.
- Step 2** Complete the following:



Note Clicking **Clear** removes all the current entries in the window and any entries you have made in other Job windows up until that point.

Table 8-2 Select Template

Field	Description
Configuration Template	From the list, select the template which you want to apply to the devices.
Name	Displays the name of the selected template.
Device Types	Displays the device types that are valid for the selected template.

Table 8-2 *Select Template (continued)*

Field	Description
Device Versions	<p>Displays the device versions for the device types listed in the Device Type field.</p> <p>Each device type's valid versions are displayed in sequence and grouped using parentheses.</p> <p>If the template is applicable to an access point with an 802.11g radio, it cannot be applied to an access point with an 802.11b radio.</p> <p>A template that is valid for a 1310 wireless bridge in AP mode cannot be applied to 1310 wireless bridge that is in bridge mode, and vice versa.</p> <p>If a 1310 wireless bridge is in workgroup bridge mode, the job will fail because the WLSE does not support configurations on workgroup bridges, which will be noted in the job run log.</p>
Description	Displays the template description.
Version Check Enabled	Indicates whether the version check is enabled.

Step 3 From the menu in the left pane, go to the next step, Select Devices. For additional information, see [Selecting Devices, page 8-14](#).

Selecting Devices

The maximum number of devices that can be configured in a single job is 500.

Procedure

Step 1 Click **Select Devices**. The Select window appears.



Note Clicking **Clear** removes all the current entries in the window and any entries you have made in other Job windows up until that point.

Step 2 From the device selector, click the folder from which you want to build a device list.

- Clicking the folder displays the folder's contents in the Available Devices list box.
- Repeat this step as many times as necessary to select devices from the folder in which they reside.

Step 3 From the Available Devices list, select folders or individual devices, then click >>. The devices appear in the Selected Devices list box.



Note If you select a folder, the template will be applied to all of the devices in that folder. If a device is subsequently added to the folder, the template is applied to that device.

Step 4 To remove devices, select them from the Selected Devices list, then click <<.

Step 5 From the menu in the left pane, go to the next step, Select Template. For additional information, see [Scheduling a Configuration Job, page 8-15](#).

Scheduling a Configuration Job

Procedure

Step 1 Click **Schedule Job**. The Schedule Job dialog box appears.

Step 2 Complete the following:



Note Clicking **Clear** removes all the current entries in the window and any entries you have made in other Job windows up until that point.

Table 8-3 *Schedule Job*

Field	Description
Run Now	Click to run the job. Note This option ignores any dates you have entered in Start Date and Start Time.
Start Date	From the lists, select the month, day, and year you want your job to run.
Start Time	From the list, select the hour and minutes of the day you want your job to run.
Repeat	
Enable	Check to run the job repeatedly.
Every	Indicate how often you want the job to repeat by entering a numerical value, then selecting an interval of time: Hours, Days, Months, or Years.

Step 3 From the menu in the left pane, go to the next step, Options. For additional information, see [Saving the Configuration Job](#), page 8-17.

Setting Configuration Job Options


Procedure

Step 1 Click **Options** in the left pane to complete creating a job. The Options dialog box appears in the right pane.

Table 8-4 *IOS Template Job*

Field	Description
Email Settings	
Upon completion, email to	Enter a comma-separated list of email addresses to be notified when the job completes.

Table 8-4 IOS Template Job

Field	Description
Email only if job fails	Select this checkbox if you want recipients to be notified only if the job fails.
Update device credentials in WLSE	Select this check box to update the device credentials with the credentials defined in this template.
Apply Template to Running Configuration Click See detail to see for additional information about this option.	Select this checkbox if you want to apply the template to the running configuration, then specify the method: Telnet or SSH.
Copy Running Configuration to Startup Configuration (Write NVRAM on Success)	Select this checkbox if you want this template, after the job has succeeded, to be used by the access point in the event of a reload.
Apply Template To Startup Configuration Click See detail to see for additional information about this option.	<p> Caution This option is recommended for advanced users only. Use it when you are sure that the new template is a complete configuration which can replace the existing configuration on the device(s), and when you are sure that the device(s) can be safely rebooted.</p> <p>Select this checkbox to overwrite the existing configuration on the device with the selected configuration template, then specify the method: Telnet or SCP.</p> <p>Click See detail to see for additional information about using the SCP method.</p>



Tip If email notification is not working, you may need to configure the mailroute by selecting **Admin > Appliance > Configure Mailroute**.

Step 2 From the menu in the left pane, go to the next step, Save. For additional information, see [Saving the Configuration Job, page 8-17](#).

Saving the Configuration Job

When you run a configuration job, the jobs are validated to make sure that the configuration template you selected is applicable to the devices you selected.

If the job encounters validation problems, a window displays the found errors or warnings.

- **Warnings**—They are issued when there are version mismatches and are not critical. You can still force the template on the devices despite the warnings. Warnings are caused by one of the following reasons:
 - The selected device is running a software version that is not currently supported.
 - The selected device version does not match the device versions supported by the selected template.
- **Errors**—They are issued based on device type mismatches and are critical. You cannot force a configuration template on a device with job errors; you must correct the problem.

Procedure

Step 1 Click **Save** in the left pane to complete creating a job. The Save dialog box appears in the right pane with the job details.



Note If a warning message appears saying that WLSE server is ahead of or behind your local time, see [Understanding Time Discrepancy Problems in Job Scheduling, page 1-11](#).

Step 2 Click **Save**. A window displays comments to indicate whether the job has passed the validation tests.

Creating a Configuration Job

Using this option, you can create a configuration job.

If you are creating a job that includes device specific settings, make sure that you enabled them under **Configure > Templates > IOS > Device Specific**.

**Note**

Your login determines whether you can use this option.

Procedure

-
- Step 1** Select **Configure > Jobs**.
- Step 2** Click **Config Job**. The Jobs Window appears.
- Step 3** Select the numbered choices in the left pane to create a job. For a description, see [Configuration Job Choices](#), page 8-10.
-

Viewing Configuration Job Status

This window allows you to view job status. It also allows you to filter a job, edit a job, and view details about the job.

Device data is polled every 15 minutes by default, and the duration that job data is retained is 30 days. To change either default, see [Managing Polling Parameters](#), page 4-69.

The topics covered in this section are:

- [Creating a Configuration Job](#), page 8-18
- [Viewing the Configuration Job](#), page 8-18
- [Filtering a Configuration Job](#), page 8-22
- [Editing a Configuration Job](#), page 8-22
- [Running a Configuration Job Again](#), page 8-22
- [Deleting a Configuration Job](#), page 8-23
- [Copying a Configuration Job](#), page 8-23
- [Viewing the Job Run Details Tables](#), page 8-23

**Note**

Your login determines whether you can use this option.

Related Topics

- [Using IOS Templates](#), page 5-1

Viewing the Configuration Job

Procedure

-
- Step 1** Select the status of the job you want to view from the Job State list.

Step 2 Select the type of job you want to view from the Job Type list.

If you select Config Auto, the User field always displays WLSE as the user.

Step 3 Click **Apply**. The window refreshes and the jobs are displayed.

The tables vary depending on the type of Job State and Job Type you selected: [Scheduled and Unscheduled](#), [Running](#), or [All](#).

- Scheduled and Unscheduled

Field	Description
Job Name	The job name.
Recurring	Whether the job recurs.
Next Schedule	For scheduled jobs, this indicates the next time the job will run. For completed jobs, this is last time the job ran.
Last Run Status	The status of the last run. Note Jobs that cause an access point to reboot are listed as Unverified.
User	The user who created the job. Note If you upgrade from a previous release to Release 2.9, and have scheduled a recurring job, the user will appear as WLSE after the upgrade.

- Running

Field	Description
Job Name	The job name.
Recurring	Whether the job recurs.
Job Start Time	The time the job started.
Percent Complete	The percent of the job that has completed running.
Next Schedule	The next time the job is scheduled to run.
User	The user who created the job. Note If you upgrade from a previous release to Release 2.9, and have scheduled a recurring job, the user will appear as WLSE after the upgrade.

- All

Field	Description
Job Name	The job name.
Recurring	Whether the job recurs.
Job State	The state of the job (Completed, Scheduled, etc.)
Next Schedule	For scheduled jobs, this indicates the next time the job will run. For completed jobs, this is last time the job ran.
Last Run Status	The status of the job the last time it ran. For more information, see Understanding Job Status Information, page 8-21 .
As Of	The time the WLSE polled information from the device. For more information, see Understanding WLSE Time Displays, page 1-10
User	The user who created the job. Note If you upgrade from a previous release to Release 2.9, and have scheduled a recurring job, the user will appear as WLSE after the upgrade.

Step 4 To sort table data, click on the column heading by which you want to sort the data:

- A triangle indicates ascending order.
- An upside-down triangle indicates descending order.

- No triangle indicates that the data is not sorted.

Step 5 Do any of the following:



Note If the option is not available for the job type, the buttons are grayed.

- Filter the job—See [Filtering a Configuration Job](#), page 8-22.
- Edit the job—See [Editing a Configuration Job](#), page 8-22.
- Run the job again—See [Running a Configuration Job Again](#), page 8-22.
- Delete the job—See [Deleting a Configuration Job](#), page 8-23.
- Copy a job—See [Copying a Configuration Job](#), page 8-23.
- View the run details—See [Viewing the Job Run Details Tables](#), page 8-23.
- Refresh the screen—Click **Refresh**.

Understanding Job Status Information

Table 8-5 on page 8-21 describes the status of the job.

Table 8-5 Job Status

Status	Meaning
Success	The configuration job for all devices was successful..
Failed	The configuration job for all devices failed. Rerun the job by clicking Job Run Details , then click one of the options to rerun the job. See Viewing Job Run Details , page 8-36.
Partial Success	The configuration job failed for some of the devices, not all. Rerun the job by clicking Job Run Details , then click one of the options to rerun the job. See Viewing Job Run Details , page 8-36.
Success (no backup)	The configuration update succeeded but a backup could not be performed.
Aborted	This job status can be caused by one of the following: <ul style="list-style-type: none"> • An unexpected failure occurred and the configuration job did not complete. Select the job, and click Run Again. • A user stopped the configuration job before it completed.
Not verified	The job status cannot be verified, whether the job completed or not. For example, if the configuration job caused a device to reboot, the WLSE may not be able to verify whether the job succeeded.

Table 8-5 Job Status (continued)

Status	Meaning
Running	The job is running.
Not run	The job does not have any devices on which to run the job.
Waiting	The job has just entered the queue to run.

Filtering a Configuration Job

Use this option to filter jobs from the displayed list. Filtering this way allows you to display a limited set of jobs, making it easier to search for a particular job if you know the name.

Procedure

-
- Step 1** Click **Filter Job**. The Filter Job dialog box appears.
 - Step 2** Enter the name, or part of the a name, on which to filter. Use % as a wildcard to filter jobs. For example, entering %name% will filter all the jobs that contain “name.”
 - Step 3** Click **Apply filter**. The Job window refreshes and the matching jobs are displayed on the Jobs list.



Note The filter is applied only until the page is refreshed.

Editing a Configuration Job

Use this option to edit jobs from the displayed list of jobs.

Procedure

-
- Step 1** Select the job from the list which you would like to edit.
 - Step 2** Click **Edit Job**. The Job Name dialog box appears.
 - Step 3** Select the choices in the Template Menu to create a configuration template. For a description, see [Configuration Job Choices, page 8-10](#).
-

Running a Configuration Job Again

Use this option to run jobs again from the displayed list of jobs.



Note This option works only for Run Now jobs.

Procedure

-
- Step 1** Select the job or jobs from the list which you would like to re-run.
- Step 2** Click **Run Again**. A confirmation box appears verifying the job was run.
-

Deleting a Configuration Job

Use this option to delete jobs from the displayed list of jobs. Jobs that are scheduled, unscheduled, completed and did not start can be deleted. Jobs that are running cannot be deleted.

Procedure

-
- Step 1** Select the job from the list which you would like to delete.
- Step 2** Click **Delete Job**.
-

Copying a Configuration Job

Use this option to copy unscheduled jobs from the displayed list of jobs, which can be run later on demand.

Procedure

-
- Step 1** Select the job from the list which you would like to copy.
- Step 2** Click **Copy Job**. A dialog box appears.
- Step 3** Enter a name for the job, then click **OK**. The screen refreshes and the job is listed.
-

Viewing the Job Run Details Tables

The Job Runs Details the following tables display:

Table 8-6 **Job Runs**

Field	Description
Job StartTime	The time the job started.
Job End Time	The time the job ended.
Job Status	The status of the job. For more information, see Understanding Job Status Information , page 8-21.
Percent Complete	The percent of the job that has completed.

Select any of the jobs, in the Job Runs table, then you can click the following options:

- **Show Run Details**—The information for the selected job is displayed in [Table 8-7](#).

- **Job Run Log**—A window displays the job log information.
- **Refresh**—The screen refreshes.

Table 8-7 **Job Run Details**

Field	Description
Device Name	The name of the device.
Start Time	The time the job started.
End Time	The time the job ended.
Status	The status of the job. For more information, see Understanding Job Status Information , page 8-21.

You can click the following options:

- **Select All**—Selects all the jobs listed.
- **DeSelect All**—Deselects all the jobs listed.



Note If you have multiple screens, you must Select All or DeSelect All one screen at a time.

- **Rerun for All Failed Devices**—Re-runs all failed jobs.
- **Rerun for All Selected Devices**—Re-runs all selected jobs.

Managing Archive Jobs

This window allows you to view a list of archive jobs. It also allows you to create, edit, and perform other operations on archive jobs.

The topics covered in this section are:

- [How Do Configuration Archive Jobs Work?](#), page 8-25
- [Recommendations For Using Configuration Archives](#), page 8-26
- [Creating an Archive Job](#), page 8-32
- [Viewing Archive Job Status](#), page 8-32
 - [Filtering an Archive Job](#), page 8-34
 - [Editing an Archive Job](#), page 8-35
 - [Running an Archive Job Again](#), page 8-36
 - [Deleting an Archive Job](#), page 8-36
 - [Copying an Archive Job](#), page 8-36
 - [Viewing the Job Run Details Table](#), page 8-37.

How Do Configuration Archive Jobs Work?

The **Configure > Archive** feature allows you to set up a job that will archive an access point configuration. When a configuration archive job runs, the WLSE uses TFTP to download the configuration from the access point. If the configuration is identical to the previous archived configuration, the new configuration is not saved. If the new configuration is different from the previous archive, a new archived configuration is saved as a file on the WLSE.

The feature can archive a maximum four different configurations. By default, archived configurations can be overwritten after the maximum number of configurations has been reached. You can, however, mark an archived configuration as protected, so that it cannot be overwritten. If the maximum numbers of configurations are archived and all of the files are protected against overwrites, the WLSE will not create a new configuration archive.

Using this option, you can also:

- View existing archived configurations.
- Compare any two archived configurations within a WLSE device group.
- Export archived configurations to a file or to a WLSE configuration template.

Related Topics

- [Recommendations For Using Configuration Archives, page 8-26](#)
- [Scheduling an Archive Collection, page 8-3](#)

Recommendations For Using Configuration Archives

There are several issues to consider when using the Configuration Archive feature:

- Q.** When should archive jobs be run?
- A.** Configurations are downloaded from access points to the WLSE using TFTP, which means that configuration archival is potentially sensitive to network congestion and oversubscription. Therefore, due to the potential sensitivity to network conditions and because configuration archival is a low-priority background task that can be affected by higher priority processes, archive jobs should be run during off-hours.
- Q.** How many devices should I include in an archive job?
- A.** The number of devices assigned to a configuration archive job will vary depending on network congestion and WLSE performance factors. Some WLSE users have successfully archived hundreds of configurations in a single job, while others have had difficulty with less than one hundred. Arriving at a good number for an archive job may be a trial-and-error process. For example, you could start with twenty-five devices. If that is successful, try fifty. Keep adding more devices until configurations are no longer archived satisfactorily.
- Q.** How often should I archive configurations?
- A.** The recommended frequency of configuration archival varies with deployment and operational requirements and WLSE performance capabilities. Typically, device configurations do not change much after a network becomes stable. Therefore, after archiving the initial baseline configurations, you might need to run configuration archive jobs as monthly recurring jobs or only after known changes have been made to network configurations.
- Q.** What should be protected from overwrites?
- A.** After archiving baseline configurations for the network devices, you should protect these official configurations. For additional protection, export the archive to a file and to a configuration template. A configuration template can be used if a roll-back is required.
- Q.** How can I take advantage of the WLSE grouping feature?
- A.** The WLSE grouping feature is especially useful when configuring configuration archive jobs. Each configuration archive job should operate on a logical grouping of devices. For example, it might make sense to archive configurations per campus or per building. See [Recommendations For Running Configuration Jobs, page 8-9](#), for details on organizing the managed WLAN with the WLSE grouping feature.
- Q.** How can I use the compare feature effectively?
- A.** The configuration archive compare feature allows you to compare any archived file with any other archived file within a device group. The comparison feature is really most relevant for examining the difference between two configuration archives from access points of the same type or access points that are deployed identically to other access points.
- Q.** What should I do when some configuration archives fail?
- A.** Because WLSE configuration archive jobs download configurations using TFTP, some devices might fail during the archive job. The job run log files typically contain information about why the configuration archival for a device might have failed. Typically, rerunning an archive job for any devices that have failed is all that is necessary.

If the entire configuration archive job fails, verify that the WLSE is configured with the correct device credentials. If the WLSE has the correct credentials, there are probably network issues to resolve.

Related Topics

- [Managing Archive Jobs, page 8-24](#)

Archive Job Choices

When you create or edit an archive job, the following choices appear in the left pane of the Jobs window:

1. **Job Name**—See [Naming the Archive Job, page 8-28](#).
2. **Select Devices**—See [Selecting Devices, page 8-28](#).
3. **Schedule Job**—See [Scheduling an Archive Job, page 8-30](#).
4. **Finish**—See [Finishing the Archive Job, page 8-30](#).

**Note**

All these steps, except Schedule Job, must be completed, but do not have to be done in order.

Related Topics

[Recommendations For Using Configuration Archives, page 8-26](#)

Naming the Archive Job

Procedure

Step 1 Click **Job Name**. The Job Name dialog box appears.

Step 2 Complete the following:



Note Clicking **Clear** removes all the current entries in the window and any entries you have made in other Job windows up until that point.

Table 8-8 Job Name

Field	Description
Job Name	Enter a name for the job. See Naming Guidelines, page B-1 .
Description	Enter a description of the job. See Naming Guidelines, page B-1 .

Step 3 From the menu in the left pane, go to the next step, Select Devices. For additional information, see [Selecting Devices, page 8-14](#).

Selecting Devices

The maximum number of devices that can configured in single job is 500.

Procedure

Step 1 Click **Select Devices**. The Select window appears.



Note Clicking **Clear** removes all the current entries in the window and any entries you have made in other Job windows up until that point.

- Step 2** From the device selector, click the folder from which you want to build a device list.
- Clicking the folder displays the folder's contents in the Available Devices list box.
 - Repeat this step as many times as necessary to select devices from the folder in which they reside.



Note The icons in the device selector indicate the current status of the access points, not the archive status.

- Step 3** From the Available Devices list, select folders or individual devices, then click >>. The devices appear in the Selected Devices list box.



Note If you select a folder, the template will be applied to all of the devices in that folder. If a device is subsequently added to the folder, the template is applied to that device.

- Step 4** To remove devices, select them from the Selected Devices list, then click <<.

- Step 5** From the menu in the left pane, go to the next step, Schedule Job. For additional information, see [Scheduling a Configuration Job, page 8-15](#).
-

Scheduling an Archive Job

Procedure

Step 1 Click **Schedule Job**. The Schedule Job dialog box appears.

Step 2 Complete the following:



Note Clicking **Clear** removes all the current entries in the window and any entries you have made in other Job windows up until that point.

Table 8-9 **Schedule Job**

Field	Description
Run Now	Click to run the job. Note This option ignores any dates you have entered in Start Date and Start Time.
Start Date	From the lists, select the month, day, and year you want your job to run.
Start Time	From the list, select the hour and minutes of the day you want your job to run.
Repeat	
Enable	Check to run the job repeatedly.
Every	Indicate how often you want the job to repeat by entering a numerical value, then selecting an interval of time: Hours, Days, Months, or Years.

Step 3 From the menu in the left pane, go to the next step, Finish. For additional information, see [Finishing the Archive Job, page 8-30](#).

Finishing the Archive Job

Procedure

Step 1 Click **Finish** in the left pane to complete creating a job. The Finish dialog box appears in the right pane.

Step 2 Complete the following:

Field	Description
On completion, email to	Enter a comma-separated list of email addresses to be notified when the job completes.
Email only if job fails	Select this checkbox if you want recipients to be notified only if the job fails.
Configuration Type	Select the type of configuration.

**Tip**

If email notification is not working, you may need to configure the mailroute by selecting **Admin > Appliance > Configure Mailroute**.

Step 3 Click **Save**. A confirmation window appears with the job summary.

Creating an Archive Job

Using this option, you can create an archive job.

**Note**

Your login determines whether you can use this option.

Procedure

-
- Step 1** Select **Configure > Jobs**.
- Step 2** Click **Archive Job**. The Jobs Window appears.
- Step 3** Select the numbered choices in the left pane to create a job. For a description, see [Archive Job Choices, page 8-27](#).
-

Related Topics

[Recommendations For Using Configuration Archives, page 8-26](#)

Viewing Archive Job Status

This window allows you to view job status. It also allows you to filter a job, edit a job, and view details about the job.

The topics covered in this section are:

- [Viewing the Archive Job, page 8-32](#)
- [Filtering an Archive Job, page 8-34](#)
- [Editing an Archive Job, page 8-35](#)
- [Running an Archive Job Again, page 8-36](#)
- [Deleting an Archive Job, page 8-36](#)
- [Copying an Archive Job, page 8-36](#)
- [Viewing the Job Run Details Table, page 8-37](#)

**Note**

Your login determines whether you can use this option.

Viewing the Archive Job

Procedure

-
- Step 1** Select the status of the job you want to view from the Job State list.
- Step 2** Select Archive Regular from the Job Type list.
- Step 3** Click **Apply**. The window refreshes and the jobs are displayed.

The tables vary depending on the type of Job State and Job Type you selected: • [Scheduled and Unscheduled](#), • [Running](#), or • [All](#).

- Scheduled and Unscheduled

Field	Description
Job Name	The job name.
Recurring	Whether the job recurs.
Next Schedule	For scheduled jobs, this indicates the next time the job will run. For completed jobs, this is last time the job ran.
Last Run Status	The status of the last run.
User	The user who created the job. Note If you upgrade from a previous release to Release 2.9, and have scheduled a recurring job, the user will appear as WLSE after the upgrade.

- Running

Field	Description
Job Name	The job name.
Recurring	Whether the job recurs.
Job Start Time	The time the job started.
Percent Complete	The percent of the job that has completed running.
Next Schedule	The next time the job is scheduled to run.
User	The user who created the job. Note If you upgrade from a previous release to Release 2.9, and have scheduled a recurring job, the user will appear as WLSE after the upgrade.

- All

Field	Description
Job Name	The job name.
Recurring	Whether the job recurs.
Job State	The state of the job.
Next Schedule	For scheduled jobs, this indicates the next time the job will run. For completed jobs, this is last time the job ran.
Last Run Status	The status of the job the last time it ran.

Field	Description
As Of	The time the WLSE polled information from the device. For more information, see Understanding WLSE Time Displays, page 1-10
User	The user who created the job. Note If you upgrade from a previous release to Release 2.9, and have scheduled a recurring job, the user will appear as WLSE after the upgrade.

Step 4 To sort table data, click on the column heading by which you want to sort the data:

- A triangle indicates ascending order.
- An upside-down triangle indicates descending order.
- No triangle indicates that the data is not sorted.

Step 5 You can do the following:



Note If the option is not available for the job type, the buttons are grayed.

- Filter the job—See [Filtering an Archive Job, page 8-34](#).
- Edit the job—See [Editing an Archive Job, page 8-35](#).
- Delete the job—See [Deleting an Archive Job, page 8-36](#).
- Run the job again—See [Running an Archive Job Again, page 8-36](#).
- Copy a job—See [Copying an Archive Job, page 8-36](#).
- View the run details—See [Viewing Job Run Details, page 8-36](#).
- Refresh the screen—Click **Refresh**.

Filtering an Archive Job

Use this option to filter jobs from the displayed list. Filtering this way allows you to display a limited set of jobs, making it easier to search for a particular job if you know the name.

Procedure

- Step 1** Click **Filter Job**. The Filter Job dialog box appears.
- Step 2** Enter the name, or part of the a name, on which to filter. Use % as a wildcard to filter jobs. For example, entering %name% will filter all the jobs that contain “name.”
- Step 3** Click **Apply filter**. The Job window refreshes and the matching jobs are displayed on the Jobs list.



Note The filter is only applied until the page is refreshed.

Editing an Archive Job

Use this option to edit jobs from the displayed list of jobs.

Procedure

- Step 1** Select the job from the list which you would like to edit.
 - Step 2** Click **Edit Job**. The Job Name dialog box appears.
 - Step 3** Select the choices in the Archive Job Menu to edit the job. For a description, see [Archive Job Choices, page 8-27](#).
-

Running an Archive Job Again

Use this option to run jobs again from the displayed list of jobs.



Note This option works only for Run Now jobs.

Procedure

- Step 1** Select the job or jobs from the list which you would like to re-run.
- Step 2** Click **Run Again**. A confirmation box appears verifying the job was run.

Deleting an Archive Job

Use this option to delete jobs from the displayed list of jobs. Jobs that are scheduled, unscheduled, completed and did not start can be deleted. Jobs that are running cannot be deleted.

Procedure

- Step 1** Select the job from the list which you would like to delete.
- Step 2** Click **Delete Job**.

Copying an Archive Job

Use this option to copy unscheduled jobs from the displayed list of jobs, which can be run later on demand.

Procedure

- Step 1** Select the job from the list which you would like to copy.
- Step 2** Click **Copy Job**. A dialog box appears.
- Step 3** Enter a name for the job, then click **OK**. The screen refreshes and the job is listed.

Viewing Job Run Details

Use this option to view details about a job.

Procedure

- Step 1** From the table displayed in **Configure > Jobs** window, select a job for which you would like to see details, then click **Job Run Detail**.
- Step 2** The details window appears with the Job Runs table:

Field	Description
Select Run	Used to select a job for which you want to see more details.
Job Start Time	The time the job started.
Job End Time	The time the job ended.
Job Status	The status of the job.
Percent Complete	The percent of the job that completed.

Step 3 Do any of the following:

- To view details for a particular job run, select the job, then click **Show Run Details**. The Job Run details table displays the information. See [Viewing the Job Run Details Table, page 8-37](#).
- To view the job run log, click **Job Run Log**. A window displays all the details for the selected job number.
- To refresh the table, click **Refresh**.

Viewing the Job Run Details Table

The Job Runs Details table displays the following information:

Field	Description
Device Name	The name of the device.
Start Time	The time the job started.
End Time	The time the job ended.
Status	The status of the job.

- To sort table data, click on the column heading by which you want to sort the data:
 - A triangle indicates ascending order.
 - An upside-down triangle indicates descending order.
 - No triangle indicates that the data is not sorted.

Automating Configurations

This window allows you to automatically upload configuration templates to access points and bridges. Use this feature to:

- Apply startup templates through the DHCP server to newly installed devices with manufacturer-default configurations.
- Apply a common template to devices the first time they are discovered, auto managed, and the WLSE has their inventory information.

The topics covered in this section are:

- [Creating a Startup Configuration Template, page 8-38](#)
- [Assigning a Startup Configuration, page 8-40](#)
- [Assigning an Auto-Managed Configuration, page 8-42](#)

Creating a Startup Configuration Template

The startup configuration is used to bootstrap a device to allow the WLSE to discover it.



Caution

The startup configuration template is placed in tftpboot directory and anyone who knows the file name can access it. This template should contain only minimal feature settings.

To create a startup template select **Configure > Templates**. (To configure the access point manually without using a startup configuration, see [Getting Started with Device Management, page 4-1](#).)



Caution

Do not use the Reload command in a startup configuration.

Use the following table to guide you in creating a startup configuration template for IOS devices:

(See [In What Order are the Template Configurations Applied to the Devices?](#), page 8-8 for information about the order in which the template choices are applied.)

Tasks	Template Choice	Notes
Enable Cisco Discovery Protocol (CDP)	Select Services > CDP .	CDP is required for the WLSE to discover devices on the network.
Enable Telnet	Select Services > Telnet/SSH .	Select Enable for Telnet.

Tasks	Template Choice	Notes
Enable SSH	Select Services > Telnet/SSH .	<p>Do the following:</p> <ol style="list-style-type: none"> 1. Select Enabled for Secure Shell. 2. Enter the system name, where the system name is the host name of the IOS access point. For a factory- default IOS access points, this name is by default set to ap. 3. Enter the domain name. For example, cisco.com. <p>Note For any version earlier than 12.2(11)JA, you will have to manage the access points, then create and upload a template that enables SSH on those access points.</p>
Enable SNMP	Select Services > SNMP .	<p>SNMP is required for the WLSE to discover and manage the device.</p> <p>Select Enabled for Simple Network Management Protocol (SNMP).</p>
Create a Read community string	Select Services > SNMP .	<p>Do the following:</p> <ol style="list-style-type: none"> 1. Enter a community string in the SNMP Community field. 2. Select Read-Only. <p>Note The read community string must be specified under Devices > Discover > Device Credentials > SNMP Communities.</p>
Create a Write community string	Select Services > SNMP .	<p>Do the following:</p> <ol style="list-style-type: none"> 1. Enter a community string in the SNMP Community field. 2. Select Write-Only. <p>Note The write community string must be specified under Admin > Device Credentials.</p>

**Note**

Access points come with a factory default username, password, and SSID. If you do not want the defaults, apply a custom template to remove them.

Assigning a Startup Configuration

The startup configuration is used for newly-installed devices that have a manufacturer-default configuration. After the devices are powered on and receive an IP address from a DHCP server, the startup configuration will be automatically uploaded to the devices.

**Tip**

After the access point is powered on and the startup configuration is applied, you may want to prevent the startup configuration from being uploaded to devices again if for some reason the access points reboot.

For access points with Version 12.2(13)JA or later: Prevent the initial configuration from being uploaded to devices after a reboot by using the IOS config command **no boot upgrade**. Enter this command in the Custom Value template.

Before You Begin

1. Create a template for the startup configuration. See [Creating a Startup Configuration Template, page 8-38](#).
2. Make sure that the AP SNMP strings are setup correctly by selecting **Devices > Discover > Device Credentials > SNMP Communities**.
3. If you are configuring
 - A DHCP server, go to step 5.
 - A router as a DHCP server, go to step 4.
4. To configure a router as a DHCP server, enter the following commands:

```
ip dhcp pool (name)
network (network address) (subnet mask)
bootfile (startup file)
next-server (WLSE IP address)
default-router (default router)
domain-name (domain name)
dns-server (DNS IP address)
```

In this example, use the **next-server** command instead of option 66 or option 150.

5. To configure a DHCP server, do the following:
 - a. Return the WLSE's address. This is done by entering the <IP address of the WLSE> in the **Boot Server Host Name** field (option number 066) on the DHCP server.
 - b. Return the name of the initial template file in the DHCP reply message. This is done by entering <startup file name> in the **BootfileName** field (option number 067) on the DHCP server.

For example, if you had a WLSE with the IP address 10.10.11.12) and an associated startup template with Bootfile Name "newap1200.ini", you would do the following:

- a. On the DHCP server, select **Scope > Scope Options**.
- b. Set Scope option 066 (TFTP boot server name or IP address) with **10.10.11.12** (the WLSE's IP address).
- c. Set Scope option 067 (Bootfile Name) with **newap1200.ini** (the new Bootfile Name associated with the startup template file.)

Related Topics

- [Creating a Startup Configuration Template, page 8-38](#)
- [Assigning an Auto-Managed Configuration, page 8-42](#)

Procedure

Step 1 Select **Configure > Auto Update > Startup Configuration**. The Startup Configuration Template dialog box appears.

Step 2 Complete the following:

Field	Description
Startup Templates	Lists the startup templates that have been created.
Bootfile Name	Enter the configuration file name that appears on the DHCP server.
Description	Enter a description for the configuration.
Configuration Template	From the list select the startup template to assign to the configuration file. Click Details to see the device types and device versions for which the template is valid.
Copy Running Configuration to Startup Configuration (Save Configuration to NVRAM)	Select the checkbox to save the auto-managed configuration to NVRAM.

Step 3 Click **Save** to save the template. Click **Delete** to delete the template.

Step 4 Modify the periodic discovery or run an immediate discovery to get the APs discovered by selecting **Devices > Discover > Discovery Wizard**.

Assigning an Auto-Managed Configuration

Use this option to automatically apply a configuration template to devices the first time they are discovered, auto managed, and the WLSE has their inventory information.

The following topics are covered in this section:

- Assigning an Auto-Managed Configuration Template—See [Assigning Auto-Managed Configuration Templates, page 8-42](#)
- Emailing the Configuration Job Results—See [Using Auto-Managed Options, page 8-45](#)

Assigning Auto-Managed Configuration Templates

When a template is to be applied, the WLSE tries to find a template based on the selected matching criteria. The template with the first matching criteria is applied to the device. The order in which the WLSE searches for matches is as follows:

- MAC Address
- Serial Number
- Device Type + Device Version + Subnet
- Device Type + Device Version
- Device Type + Subnet
- Device Type
- Device Version + Subnet
- Device Version
- Subnet

Before you Begin

Make sure that for IOS APs, the Telnet/SSH credentials are entered correctly in the WLSE by selecting **Devices > Device Credentials > Telnet/SSH User /Password**.

Procedure

- Step 1** Select **Configure > Auto Update > Auto-Managed Configuration > Assign Templates**. The Auto-Managed Configuration Templates dialog box appears with the names of the groups for which you can apply an automated template.
- Step 2** Complete the following:

Table 8-10 Auto-Managed Configuration Templates

Field	Description
Auto-Managed Templates	Lists the auto-managed templates that have already been created.
Enable	Select the checkbox to automatically apply a configuration template to the devices, after they are auto managed, that matches the criteria below.
Name	Enter a name for the auto-managed configuration.

Table 8-10 Auto-Managed Configuration Templates (continued)


Field	Description
Description	Enter a description for the configuration.
Configuration Template	From the list select the template to assign to the configuration file. Click Details to see the device types and device versions for which the template is valid.
Matching Criteria	
MAC Address	<ol style="list-style-type: none"> 1. Select the checkbox to enable the MAC address matching. 2. Enter a MAC address, or select an existing one from the list, then click >> to add it to the list of valid MAC addresses for that template  Note The existing MAC addresses list is populated by enabling filtering for auto managed devices under Devices > Discover > Discover > Advanced Options. 3. To remove a MAC address from the list, select it, then click Remove.
Serial Number	<ol style="list-style-type: none"> 1. Select the checkbox to enable the serial number matching. 2. Enter the device serial number (top assembly serial number), then click >> to add it to the list of valid serial numbers for that template. 3. To remove a serial number from the list, select it, then click Remove.

Table 8-10 Auto-Managed Configuration Templates (continued)

Field	Description
Device Types	<ol style="list-style-type: none"> 1. Select the checkbox to enable the device type matching. 2. Enter the device type, or select an existing one from the list, then click >> to add it to the list of valid devices for that template. Note the following: <ul style="list-style-type: none"> – AP350—Auto-managed templates for AP 350s are applied to 350 bridges; you cannot assign a different template for bridges based on device type alone. If the bridges are running a different software version than the AP350s, use a different template for bridges and set the appropriate version numbers. – AP1210—For 1210 access points with dual radios (11a and 11g), use device type 1210. For 1210 access points with a single radio (11g) use device type AP1210-SR. 3. To remove devices from the list, select it, then click Remove.
Device Versions	<ol style="list-style-type: none"> 1. Select the checkbox to enable the device version matching. 2. Enter the version numbers if they are not in the list, or from the list, select the version number, then click >> to add it to the list of valid versions for that template. 3. To remove a version number, select it from the list, then click Remove.
Subnet	<ol style="list-style-type: none"> 1. Select the checkbox to enable subnet matching. 2. Enter the subnet if it is not in the list, or from the list, select the subnet then click >> to add it to the list of valid subnets for that template. 3. To remove a subnet, select it from the list, then click Remove.
Update device credentials in WLSE	<p>Select this check box to update the device credentials with the credentials defined in this template.</p> <p>Click See detail to see for additional information about this option.</p>

Table 8-10 Auto-Managed Configuration Templates (continued)

Field	Description
Copy Running Configuration to Startup Configuration (Save Configuration to NVRAM).	Select the checkbox to save the auto-managed configuration to NVRAM. Click See detail to see for additional information about this option.
Apply Template to Startup Configuration	Select this checkbox to overwrite the existing configuration on the device with the selected configuration template. Click See detail to see for additional information about this option.

Step 3 Click **Save** to save the template.

Step 4 To delete a template, select it from the Auto-Managed Templates listbox, then click **Delete**.

Using Auto-Managed Options

This option allows you to email the results of your auto-managed configuration job.

Procedure

-
- Step 1** Select **Configure > Auto Update > Auto-Managed Configuration > Auto-Managed Options**. The Auto-Managed Configuration Options dialog box appears.
- Step 2** Select the protocol to use: SSH or Telnet. Click **See detail** to see for additional information about using the SSH option.
- Step 3** Select the checkbox to enable email notification, then enter the email addresses.
- Step 4** Enter the email address for the recipients of the notification.



Tip If email notification is not working, you may need to configure the mailroute by selecting **Admin > Appliance > Configure Mailroute**.

Step 5 Click **Save**.

Managing Device Specific Configurations

This window enables you to import, export, and view specific access point settings, such as channel, power, and hostname. You can create a configuration template with these settings and apply them to access points in your network. For information on creating templates with device specific settings, see [Configuring Device Specific Settings, page 5-104](#).

**Note**

Device specific settings are applied after custom configurations.

Using this option, you can:

- Import settings from the desktop—See [Importing Device Specific Configurations, page 8-46](#).
- Export settings to the desktop—See [Exporting Device Specific Configurations, page 8-48](#).
- View current configuration—See [Viewing Device Specific Configurations, page 8-49](#).
- View a report about devices set up with device specific configurations—See [Validating a Device Specific Configuration, page 8-50](#).

Importing Device Specific Configurations

This option allows you to import device settings from a local CSV file on your desktop. (See [About the Device Specific CSV File, page 8-47](#).) The WLSE checks each setting in the file. Invalid settings are discarded and reported in a pop-up window.

You cannot edit the file with the settings using the WLSE. If you need to change the settings, export the file, and use a text editor. When you are finished, re-import the file with the edited settings to the WLSE.

**Note**

When a new access point is installed in the network, its settings and identity number must be imported to the WLSE. Otherwise, it will not receive the specific settings when a periodic configuration job is run.

To ensure that access points are receiving the specific settings, create a periodic configuration job. See **Configure > Jobs > Create Config Job**.

**Tip**

To create device-specific settings for a large group of access points, instead of typing the MAC addresses manually for each device, you can export the Group Identity Report in a CSV format under **Reports > Current**, and obtain all the MAC addresses for that group of access points.

Procedure

Step 1 Select **Configure > Device Specific > Import**. The Import dialog box appears.

**Note**

Click **Learn about the Device Specific Import File** for specific information, or see [About the Device Specific CSV File, page 8-47](#).

Step 2 Complete the following:

Table 8-11 Import Device Specific Settings

Field	Description
File Location	Click Browse to locate and select the CSV file containing the specific access point settings.
Remove current entries before importing	Select to remove all the existing settings from the WLSE before importing. If you do not select this option, existing settings remain in the file, matching settings are unchanged, and new settings are added.

Step 3 Click **Import**. The settings are imported.

About the Device Specific CSV File

The file used to import specific settings is an ASCII CSV (comma-separated values) file. Create and edit the CSV file with a text editor.

The following are ignored:

- Fields that are not in the first row of the CSV file.
- Empty values in the CSV file (,,).

Following is a sample:

```
000ff7507295, sjc14-ap27.cisco.com, SJ, ECS, 36, 95, 10, mW, 6, 95, 50, 50, mW, snmp-server community public RW
000b46faff02, sjc14-ap36.cisco.com, SJ, ECS, 44, 92, 10, mW, 11, 92, 20, 20, dBm, snmp-server community public RW; snmp-server community private RO
```

The CSV file can contain the following information:

Table 8-12 Device Specific CSV File

CSV Column	Description	CLI Command Generated
identity	The access point's Ethernet MAC address. Note This is the only required field; all others are optional.	Not applicable.
hostname	The name configured as the hostname on the access point.	hostname <i>value from CSV column</i>
syslocation	The location configured on the access point.	snmp-server location <i>value from CSV column</i>
syscontact	The name configured as the contact on the access point.	snmp-server contact <i>value from CSV column</i>
radioa_channel	The channel configuration for radio A.	interface dot11radio 1 channel <i>value from CSV column</i>
radioa_beacon	The beacon interval for radio A.	interface dot11radio 0 beacon period <i>value from CSV column</i>

Table 8-12 Device Specific CSV File (continued)

CSV Column	Description	CLI Command Generated
radioa_power	The power configuration for radio A.	Interface dot11radio 1 power local <i>value from CSV column</i>
powera_unit	The unit for radio A power.	Not applicable.
radiobg_channel	The channel configuration for radios B and G.	Interface dot11radio 0 channel <i>value from CSV column</i>
radiobg_beacon	The beacon interval for radios B and G.	interface dot11radio 0 beacon period <i>value from CSV column</i>
radiob_power_cck	The CCK power configuration for radios B and G.	Interface dot11radio 0 power local <i>value from CSV column</i>
radiobg_power_ofdm	The OFDM power configuration for radios G.	Interface dot11radio 0 power local ofdm <i>value from CSV column</i>
powerbg_unit	The power unit for radios B and G.	Not applicable.
ap_cli command	The custom CLI command for a particular access point. For multi-line commands, separate each command with a semicolon(;). The maximum length of this field is restricted to 255 characters.	An example of a sample CLI entry in the CSV file is as follows: Interface dot11radio 0;ssid tsunami;authentication open

Exporting Device Specific Configurations

This option allows you to export device settings to a local CSV file on your desktop.

Procedure

-
- Step 1** Select **Configure > Device Specific > Export**. The Export dialog box appears.
- Step 2** Click **Download CSV file to desktop**.
-

Viewing Device Specific Configurations

This option allows you to view the current device settings.

Procedure

- Step 1** Select **Configure > Device Specific > View**. The following settings are displayed:

Table 8-13 Viewing Device Specific Settings

Field	Description
Identity	The access point's Ethernet MAC address. This address is found at the back of the access point.
Host Name	The configured hostname on the access point, which is not the same as the DNS name. If you have configured the access point with a static IP and DNS is not configured, then this setting is recommended.
Location	The location of the access point.
Contact	A contact name.
Channel A/N	The access point's A radio. (Applicable only if the access point has an A radio).
Beacon A/N (ms)	The beacon interval in milliseconds.
Power A/N	The channel's power setting.
Power A/N unit	The channel power unit: either mW or dBm
Channel B/G/N	The access point's B/G/N radio.
Beacon B/G/N (ms)	The beacon interval in milliseconds.
CCK Power B/G/N	The CCKM power configuration for radios B, G, and N.
OFDM Power G/N	The OFDM power configuration for radios G and N.
Power B/G/N unit	The channel power unit: either mW or dBm.
CLI Command	CLI command specific to the access point.
Last Modified	The last time the access point settings were modified.

To delete

- All the entries in the table, click **Show All** at the bottom of the table, then select the checkbox in the table heading and click **Delete**.
- All the entries on a page, select the checkbox in the table heading and click **Delete**.
- A single entry, select the checkbox next to the row you want to remove, then click **Delete**.

Validating a Device Specific Configuration

This option allows you view a report about:

- Devices for which specific settings have been set up and which are currently managed
- Devices for which specific settings have been set up but are currently not managed.

Procedure

Step 1 Select **Configure > Device Specific > Validation**.

Step 2 From the **Select Validation** drop down list select one of the following:

Managed or Unmanaged.

Depending upon which you select, the following tables are displayed:

- Managed—See [Viewing a Device Specific Report for Managed Devices](#).
- Unmanage—See [Viewing a Device Specific Report for Unmanaged Devices](#).

Table 8-14 *Viewing a Device Specific Report for Managed Devices*

Field	Description
Identity	The access point's Ethernet MAC address. This address is found at the back of the access point.
IP Address	The IP address of the access point.
Host Name	The configured hostname on the access point, which is not the same as the DNS name. If you have configured the access point with a static IP and DNS is not configured, then this setting is recommended.

Table 8-15 *Viewing a Device Specific Report for Unmanaged Devices*

Field	Description
Identity	The access point's Ethernet MAC address. This address is found at the back of the access point.
IP Address	The IP address of the access point.
Host Name	The configured hostname on the access point, which is not the same as the DNS name. If you have configured the access point with a static IP and DNS is not configured, then this setting is recommended.
State	Indicates the current state of the access point.

Managing Key Rotation Configurations

This window enables you to configure WPA Pre-shared Key (WPA-PSK) rotation in access points.

Using this option, you can:

- Manage WPA-PSK key rotation—See [Managing WPA-PSK Keys, page 8-51](#).
- Manage WPS-PSK key rotation jobs—See [Managing WPA_PSK Jobs, page 8-52](#).

Managing WPA-PSK Keys

This option allows you to:

- Add, delete, and modify WPA-PSK keys
- Import from, and export to CSV

Procedure

- Step 1** Select **Configure > Key Rotation > WPA-PSK**.
- Step 2** To add a WPA-PSK key, enter the following information

Table 8-16 WPA-PSK Key Settings

Field	Description
SSID	Enter the SSID to map the access point to the key.
KeyType	Specify the type of the key. Select either ASCII or HEX .
KeyValue	If you use hexadecimal, you must enter 64 hexadecimal characters (unencrypted key) to complete the 256-bit key. If you use ASCII, you must enter a minimum of 8 letters, numbers, or symbols, and the access point expands the key for you. Up to 63 ASCII characters are allowed.



Note You can add only one key per SSID.

- Step 3** To delete a key, select a key in the list of WPA-PSK keys and click **Delete**.
- Step 4** To modify a WPA-PSK key, select a key in the list of WPA-PSK keys, modify the values in the SSID, KeyType, and KeyValue fields, and then click **Modify**.
- Step 5** To import WPA-PSK keys from a CSV file:
- Click **Import from CSV**.
 - Click **Browse**.

The CSV file consists of a header describing the fields in the file followed by one or more entries. Each entry represents a WPA-PSK key and consists of three values separated by commas. The following is an example of a CSV file:

```
ssid, isKeyAsciiorHexa, keyValue
ssid1, 0, 1234567890
ssid2, 1, 12345678901234567890123456789012345678901234567890123456789012345678901234
```

To learn more about the format of the CSV file, click **Learn about WPA-PSK File**.

- c. Select the file to import.
- d. Click **OK**.

If the CSV file contains a key that has the same SSID as a key in the list, WLSE replaces the key in the list with the corresponding key in the file.

Step 6 To export the WPA-PSK keys in the list to a CSV file:

- a. Click **Export to CSV**.
- b. In the window that comes up, click **Download CSV file to desktop**.
- c. Click **Save**.
- d. Specify the name of the file to export and click **Save**.

Managing WPA_PSK Jobs

The Configure > Key Rotation > Jobs page provides the following options:

- **Create Job**—Use this option to create a key rotation job.
- **Filter Job**—Use this option to filter jobs based on name from the displayed list.
- **Edit Job**—Use this option to edit jobs from the displayed list of jobs.
- **Run Again**—Use this option to run jobs again from the displayed list of jobs.
- **Delete Job**—Use this option to delete jobs from the displayed list of jobs.
- **Copy Job**—Use this option to copy unscheduled jobs from the displayed list of jobs, which can be run later on demand.
- **Job Run Detail**—Use this option to display job details.
- **Refresh**—Use this option to refresh the screen to reflect the current job status.

Creating WPA_PSK Jobs

Use the following procedure to create key rotation jobs that apply the WPA-PSK keys to managed devices in the WLSE.

Procedure

Step 1 Select **Configure > Key Rotation > Jobs**.

Step 2 Enter a name for the job and click **Create Job**.



Note Job names must be unique. Do not use the same job name for firmware jobs and other jobs (such as configuration and radio management jobs).

For other guidelines on job names, see [Appendix B, “Naming Guidelines.”](#)

- Step 3** The window refreshes with the Job Creation menu in the left pane and the Job Name dialog box in the right pane.
- Step 4** Select the numbered choices in the left pane to create and run or schedule the running of a Key Rotation job.

When you create or edit a configuration job, the following choices appear in the left pane of the Jobs window:

**Caution**

Clicking on another Configure subtab before you have saved your entries in this window will cause the window to reset and you will lose all the information you entered.

1. **Job Name**—See [Naming the Key Rotation Job, page 8-53](#).
2. **Select Devices**—See [Selecting Devices, page 8-54](#).
3. **Options**—See [Setting Key Rotation Job Options, page 8-54](#).
4. **Save**—See [Saving the Key Rotation Job, page 8-56](#).

Naming the Key Rotation Job

Procedure

- Step 1** Click **Job Name**. The Job Name dialog box appears.
- Step 2** Complete the following:



Note Clicking **Clear** removes all the current entries in the window and any entries you have made in other Job windows up until that point.

Table 8-17 Job Name

Field	Description
Job Name	Enter a name for the job. See Naming Guidelines, page B-1 .
Description	Enter a description of the job. See Naming Guidelines, page B-1 .

- Step 3** From the menu in the left pane, go to the next step, Select Template. For additional information, see [Selecting Devices, page 8-54](#).

Selecting Devices

The maximum number of devices that you can select for a single job is 500.

Procedure

Step 1 Click **Select Devices**. The Select window appears.



Note Clicking **Clear** removes all the current entries in the window and any entries you have made in other Job windows up until that point.

Step 2 From the device selector, click the folder from which you want to build a device list.

- Clicking the folder displays the folder's contents in the Available Devices list box.
- Repeat this step as many times as necessary to select devices from the folder in which they reside.

Step 3 From the Available Devices list, select folders or individual devices, then click >>. The devices appear in the Selected Devices list box.



Note If you select a folder, the SSID will be applied to all of the devices in that folder. If a device is subsequently added to the folder, the SSID is applied to that device.

Step 4 To remove devices, select them from the Selected Devices list, then click <<.

Step 5 From the menu in the left pane, go to the next step, Select Options. For additional information, see [Setting Key Rotation Job Options, page 8-54](#).

Setting Key Rotation Job Options

Procedure

Step 1 Click **Options** in the left pane to complete creating a job. The Options dialog box appears in the right pane.

Table 8-18 IOS Template Job

Field	Description
Email Settings	
Upon completion, email to	Enter a comma-separated list of email addresses to be notified when the job completes.
Email only if job fails	Select this checkbox if you want recipients to be notified only if the job fails.
Protocol	Select whether to use Telnet or SSH when running the job.

Table 8-18 IOS Template Job

Field	Description
Run Now	Select this option to run the job now after you save the job. Note This option ignores any dates you have entered in Start Date and Start Time.
Date	From the lists, select the month, day, and year you want your job to run.
Time	From the list, select the hour and minutes of the day you want your job to run.
Enable every	Indicate how often you want the job to repeat by entering a numerical value, then selecting an interval of time: Hours, Days, Weeks, or Months.



Tip If email notification is not working, you may need to configure the mailroute by selecting **Admin > Appliance > Configure Mailroute.**

Step 2 From the menu in the left pane, go to the next step, Save. For additional information, see [Saving the Key Rotation Job, page 8-56](#).

Saving the Key Rotation Job

Procedure

Step 1 Click **Save** in the left pane to complete creating a job. The Save dialog box appears in the right pane with the job details.



Note If a warning message appears saying that WLSE server is ahead of or behind your local time, see [Understanding Time Discrepancy Problems in Job Scheduling, page 1-11](#).

Step 2 Click **Save**. A window displays comments to indicate whether the job has passed the validation tests.

Based on the job settings, the WLSE generates the following configuration for every SSID entry and applies the configuration to the appropriate device:

```
dot11 ssid ssid-name
wpa-psk KeyType 0 KeyValue
```

Viewing WPA-PSK Job Status

This window allows you to view job status. It also allows you to filter a job, edit a job, and view details about the job.

The topics covered in this section are:

- [Viewing WPA-PSK Jobs, page 8-56](#)
- [Filtering a WPA-PSK Job, page 8-58](#)
- [Editing a WPA-PSK Job, page 8-59](#)
- [Running a WPA-PSK Job Again, page 8-60](#)
- [Deleting a WPA-PSK Job, page 8-60](#)
- [Copying a WPA-PSK Job, page 8-60](#)
- [Viewing WPA-PSK Job Run Details, page 8-60](#)



Note Your login determines whether you can use this option.

Viewing WPA-PSK Jobs

Procedure

Step 1 Select the status of the job you want to view from the Job State list.

Step 2 Click **Apply**. The window refreshes and the jobs are displayed.

- Scheduled and Unscheduled

Field	Description
Job Name	The job name.
Recurring	Whether the job recurs.
Next Schedule	For scheduled jobs, this indicates the next time the job will run. For completed jobs, this is last time the job ran.
Last Run Status	The status of the last run.
User	The user who created the job. Note If you upgrade from a previous release to Release 2.9, and have scheduled a recurring job, the user will appear as WLSE after the upgrade.

- Running

Field	Description
Job Name	The job name.
Recurring	Whether the job recurs.
Job Start Time	The time the job started.
Percent Complete	The percent of the job that has completed running.
Next Schedule	The next time the job is scheduled to run.
User	The user who created the job. Note If you upgrade from a previous release to Release 2.9, and have scheduled a recurring job, the user will appear as WLSE after the upgrade.

- All

Field	Description
Job Name	The job name.
Recurring	Whether the job recurs.
Job State	The state of the job.
Next Schedule	For scheduled jobs, this indicates the next time the job will run. For completed jobs, this is last time the job ran.
Last Run Status	The status of the job the last time it ran.

Field	Description
As Of	The time the WLSE polled information from the device. For more information, see Understanding WLSE Time Displays, page 1-10
User	The user who created the job. Note If you upgrade from a previous release to Release 2.9, and have scheduled a recurring job, the user will appear as WLSE after the upgrade.

Step 3 To sort table data, click on the column heading by which you want to sort the data:

- A triangle indicates ascending order.
- An upside-down triangle indicates descending order.
- No triangle indicates that the data is not sorted.

Step 4 You can do the following:



Note If the option is not available for the job type, the buttons are grayed.

- Filter the job—See [Filtering a WPA-PSK Job, page 8-58](#).
- Edit the job—See [Editing a WPA-PSK Job, page 8-59](#).
- Delete the job—See [Deleting a WPA-PSK Job, page 8-60](#).
- Run the job again—See [Running a WPA-PSK Job Again, page 8-60](#).
- Copy a job—See [Copying a WPA-PSK Job, page 8-60](#).
- View the run details—See [Viewing WPA-PSK Job Run Details, page 8-60](#).
- Refresh the screen—Click **Refresh**.

Filtering a WPA-PSK Job

Use this option to filter jobs from the displayed list. Filtering this way allows you to display a limited set of jobs, making it easier to search for a particular job if you know the name.

Procedure

- Step 1** Click **Filter Job**. The Filter Job dialog box appears.
- Step 2** Enter the name, or part of the a name, on which to filter. Use % as a wildcard to filter jobs. For example, entering %name% will filter all the jobs that contain “name.”
- Step 3** Click **Apply filter**. The Job window refreshes and the matching jobs are displayed on the Jobs list.



Note The filter is only applied until the page is refreshed.

Editing a WPA-PSK Job

Use this option to edit jobs from the displayed list of jobs.

Procedure

- Step 1** Select the job from the list which you would like to edit.
 - Step 2** Click **Edit Job**. The Job Name dialog box appears.
 - Step 3** Edit the job. For a description, see [Creating WPA_PSK Jobs, page 8-52](#).
-

Running a WPA-PSK Job Again

Use this option to run jobs again from the displayed list of jobs.



Note This option works only for Run Now jobs.

Procedure

- Step 1** Select the job or jobs from the list which you would like to re-run.
- Step 2** Click **Run Again**. A confirmation box appears verifying the job was run.

Deleting a WPA-PSK Job

Use this option to delete jobs from the displayed list of jobs. Jobs that are scheduled, unscheduled, completed and did not start can be deleted. Jobs that are running cannot be deleted.

Procedure

- Step 1** Select the job from the list which you would like to delete.
- Step 2** Click **Delete Job**.

Copying a WPA-PSK Job

Use this option to copy unscheduled jobs from the displayed list of jobs, which can be run later on demand.

Procedure

- Step 1** Select the job from the list which you would like to copy.
- Step 2** Click **Copy Job**. A dialog box appears.
- Step 3** Enter a name for the job, then click **OK**. The screen refreshes and the job is listed.

Viewing WPA-PSK Job Run Details

Use this option to view details about a job.

Procedure

- Step 1** From the table displayed in **Configure > Key Rotation > Jobs** window, select a job for which you would like to see details, then click **Job Run Detail**.
- Step 2** The details window appears with the Job Runs table:

Field	Description
Select Run	Used to select a job for which you want to see more details.
Job Start Time	The time the job started.
Job End Time	The time the job ended.
Job Status	The status of the job.
Percent Complete	The percent of the job that completed.

Step 3 Do any of the following:

- To view details for a particular job run, select the job, then click **Show Run Details**. The Job Run details table displays the information. See [Viewing the Job Run Details Table, page 8-37](#).
- To view the job run log, click **Job Run Log**. A window displays all the details for the selected job number.
- To refresh the table, click **Refresh**.

Viewing the Job Run Details Table

The Job Runs Details table displays the following information:

Field	Description
Device Name	The name of the device.
Start Time	The time the job started.
End Time	The time the job ended.
Status	The status of the job.

- To sort table data, click on the column heading by which you want to sort the data:
 - A triangle indicates ascending order.
 - An upside-down triangle indicates descending order.
 - No triangle indicates that the data is not sorted.

