



Getting Started

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Prerequisites for Setting Up and Accessing Cisco Mobility Express

- You must not have other Cisco wireless controllers, neither appliance nor virtual, in the same network, during setup or during daily operation of a Cisco Mobility Express network.

The Cisco Mobility Express controller cannot interoperate or co-exist with other wireless controllers in the same network. Ensure that there no wireless controllers, other than the Cisco Mobility Express controller, in the network.

- Decide on the first access point (AP) to be set up. The first AP to be set up should be one that supports the Cisco Mobility Express wireless controller functionality. This is to ensure that this AP can act as the master AP, and the other APs can then connect to it. This will ensure that the pre-defined *CiscoAirProvision* Service Set Identifier (SSID) is advertised only by the master AP and not by other APs.
- Ensure that the AP is properly installed as per its *Hardware Installation Guide*.
- Cisco Mobility Express provides an internal DHCP server which can be optionally setup during the initial configuration wizard. However, if you want to use an external DHCP server instead, then ensure that a DHCP server is present and accessible in the network. The Mobility Express controller will use this DHCP server for IP address management of the access points and the wireless clients.

- The initial setup of the Cisco Mobility Express controller can be done only through the controller configuration wizard and over Wi-Fi.

You require a Wi-Fi-enabled laptop to connect to the pre-defined *CiscoAirProvision* SSID advertised by the master AP. You cannot access this SSID through a wired network.

- Your laptop should have a compatible browser. For a list of browsers compatible with the Cisco Mobility Express wireless controller web interface and the initial configuration wizard, see [Supported Browsers](#).
- If your network is using universal regulatory domain access points, then you will need prime the access point to the right regulatory domain, before the APs start serving clients. See the *Cisco Aironet Universal AP Priming and Cisco AirProvision User Guide*, at this URL: http://www.cisco.com/c/en/us/td/docs/wireless/access_point/ux-ap/guide/uxap-mobapp-g.html.

After these prerequisites are met, proceed to [Configuring the Switch Port, on page 2](#).



Note A CLI-based Initial Configuration Wizard is also available, but recommended only for advanced users. See [Using the CLI Initial Configuration Wizard](#).

Auto-provisioning the Master AP via Cisco Plug and Play

Using the Cisco Network Plug and Play (PnP) solution, you can provision the master AP automatically via a remote Cisco Application Policy Infrastructure Controller Enterprise Module (APIC-EM) server. PnP is activated only for the initial setup on Day 0 of the Cisco Mobility Express network deployment.

If there are multiple Cisco Mobility Express-capable APs on Day 0 in the Cisco Mobility Express network, they elect a master AP among themselves through VRRP. This elected master AP then receives its provisioning parameters from the APIC-EM server via PnP through one of the following ways:

- Via Cisco cloud redirect to APIC-EM
- Via DHCP option 43
- Via DNS discovery

For prerequisites and detailed instructions on automatically provisioning using Cisco PnP, see [Cisco Network Plug and Play](#).

Configuring the Switch Port

Connect the access points to the switch and power them up. Ensure the following while configuring the switch port:

- All access points, including the Master AP, in a Mobility Express network should be in the same L2 broadcast domain. Management traffic must not be tagged.
- The switch port to which the Master AP is connected can be a trunk port or an access port and must be configured to trunk Native VLAN for management traffic. Data traffic must be trunked with appropriate VLANs for local switching as well.

The following is a sample switch port configuration.

```
Interface GigabitEthernet1/0/37
description » Connected to Master AP «
switchport trunk native vlan 122
switchport trunk allowed vlan 10,20,122
switchport mode trunk
```

Starting the Initial Configuration Wizard

Step 1 Boot the AP that has controller capability.

It will be a few minutes before the *CiscoAirProvision* SSID starts broadcasting after initially powering up the AP. Once the *CiscoAirProvision* SSID starts broadcasting, the AP's status LED start cycling through green, red, and amber.

Step 2 Connect the Wi-Fi-enabled laptop to the *CiscoAirProvision* SSID advertised by the AP, using Wi-Fi. The password is **password**.

The laptop gets an IP address from the subnet 192.168.1.0/24.

Step 3 Open a supported web browser and enter the URL *mobilityexpress.cisco* to reach the initial configuration wizard. The wizard starts by asking you to create an admin account.

On Apple clients, after connecting to the *CiscoAirProvision* SSID, the captive portal window may automatically open with the initial configuration wizard. You can use this window itself complete the initial configuration without opening a web browser.

Note After connecting to the *CiscoAirProvision* SSID, upon opening a web browser you should be automatically redirected to *mobilityexpress.cisco*. If you are not automatically redirected, then you can manually enter the URL *mobilityexpress.cisco* or go to *http://192.168.1.1*, both of which redirect to the initial configuration wizard.

What to do next

If the initial configuration wizard's admin account window is displayed, then proceed to [Checking if an AP has CAPWAP Lightweight AP Software or Cisco Mobility Express Software](#), on page 6.

Using the Initial Configuration Wizard

The initial configuration wizard helps you configure certain basic parameters on your Cisco Mobility Express wireless LAN controller, and thereby gets your Cisco Mobility Express network running.

Use the following sections as a reference for the data that you enter in the initial configuration wizard.

Initial Configuration Wizard Opening window

Figure 1: Cisco Mobility Express Initial Configuration Wizard Opening Window

The banner on this window shows the name of the AP model on which the Cisco Mobility Express wireless controller is being configured, for example, Cisco Aironet 1830 Series Mobility Express.

Create an admin account on the controller by specifying the following parameters and then click **Start**:

- Enter an administrative username. You can enter up to 24 ASCII characters.



Note Change the username and password on factory-shipped Cisco Mobility Express-capable APs. If you use the default credentials `cisco` (not case sensitive), SSH will be disabled on these APs.

- Enter a password. You can enter up to 24 ASCII characters.

When specifying a password, ensure the following:

- The password must contain characters from at least three of the following classes, lowercase letters, uppercase letters, digits, and special characters.
- No character in the password can be repeated more than three times consecutively.
- The new password must not be the same as the associated username or the username reversed.
- The password must not be `cisco`, `ocsic`, or any variant obtained by changing the capitalization of the letters in the word `Cisco`. In addition, you cannot substitute `!` for `i`, `0` for `o`, or `$` for `s`.

Step 1—Set Up Your Controller

Figure 2: Setting Up Your Controller

Specify the following basic parameters for setting up your controller:

- **System Name**—Enter the name that you want to assign to this controller.
- **Country**—Enter the country where this Cisco Mobility Express network is located.
- **Date and Time**—Specify the date. By default, your device's system time is applied here. You can manually edit the time, if required.
- **Timezone**—Select your time zone.
- **NTP Server**—To have the date and time set automatically using an Network Time Protocol (NTP) server, you can enter the IPv4 address or the FQDN name of the NTP server here.

By default three NTP servers are automatically created. The default FQDN names of the NTP servers are:

- `0.ciscome.pool.ntp.org`, with NTP Index value 1.
- `1.ciscome.pool.ntp.org`, with NTP Index value 2.
- `2.ciscome.pool.ntp.org`, with NTP Index value 3.

The IPv4 address or the FQDN name, which you specify here, will be applied to the server with NTP Index 1, thereby overwriting its default FQDN, `0.ciscome.pool.ntp.org`. For editing NTP server details, go to **Management > Time**.

- **Management IP Address**—Enter the IP address for managing the controller.
- **Subnet Mask**—Enter the subnet mask for the controller.

- **Default Gateway**—Enter the default gateway for the controller.
- **Enable DHCP Server (Management Network)**—This is optional. If you choose to enable the internal DHCP server, specify the following parameters:
 - **Network**
 - **Mask**
 - **Management VLAN ID**
 - **First IP**
 - **Last IP**
 - **Domain Name**
 - **Name Servers**

Step 2—Create Your Wireless Networks

You set up the following two networks here:

- **Employee Network**—A Wi-Fi network for employees and regular day-to-day users of the network. This provides more privileges than the guest network access.
- **Guest Network**—A Wi-Fi network for guest users.

In the **Employee Network** section, specify the following parameters:

- **Network Name**—Specify the SSID for your Employee network.
- **Security**—You can choose either **WPA2 Personal** that uses pre-shared key (PSK) authentication or **WPA2 Enterprise** (also called 802.1x), which requires a RADIUS server for authentication.
- **Pass Phrase**—If you have chosen WPA2 Personal security, specify the PSK here.
- **Authentication Server IP Address**—If you have chosen WPA2 Enterprise security, enter the IP address of the RADIUS server.
- **Shared Secret**—Enter the password for the RADIUS server.
- **VLAN**—Choose **Management VLAN** (VLAN 0) or create a **New VLAN** (with a VLAN ID ranging from 1 to 4094).
- **VLAN ID**—Specify the VLAN ID for the new VLAN here.
- **Enable DHCP Server (Employee Network)**—This is optional. If you choose to enable the internal DHCP server for assigning IP addresses on the **Employee Network**, specify the following parameters:
 - **Network**
 - **Mask**
 - **First IP**
 - **Last IP**
 - **Default Gateway**

- **Domain Name**
- **Name Servers**
- **Name Server IP1**
- **Name Server IP2**

Figure 3: Employee Network with WPA2 Enterprise Security Chosen

Figure 4: Employee Network with WPA2 Personal Security Chosen

In the **Guest Network** section, specify the following parameters:

- **Network Name**—Specify the SSID for your Guest network.
- **Security**—Choose **Web Consent**, which requires no authentication or **WPA2 Personal**, which uses PSK authentication.
- **Pass Phrase**—If you have chosen WPA2 Personal security, specify the PSK here.
- **VLAN**—Choose **Employee VLAN** to have the same VLAN as that defined for the Employee Network or create a **New VLAN** (with a VLAN ID ranging from 1 to 4094).
- **VLAN ID**—Specify the VLAN ID for the new VLAN.
- **DHCP Server Address**—This is optional.

Figure 5: Guest Network with Web Consent Security Chosen

Figure 6: Guest Network with WPA2 Personal Security Chosen

Step 3—Advanced Settings

Optimize the network's radio frequency signal coverage and quality by indicating the expected client density and traffic type in your network. To know the values that are set when low, typical, or high client density type is selected, see [RF Parameter Optimization Settings](#).



Note If you do not enable RF Parameter Optimization during the initial configuration wizard, then client density is set to **Typical** (the default value), and RF traffic type is set to **Data** (the default value). To change this at a later time, see [Optimizing RF Parameters](#).

Figure 7: RF Parameter Optimization

Once you apply these configuration settings, the access point reboots and the controller restarts. You can now proceed to [Logging in to Cisco Mobility Express](#), on page 9.

Checking if an AP has CAPWAP Lightweight AP Software or Cisco Mobility Express Software

Both the Cisco 1850 Series and 1830 Series APs can be ordered with a factory-shipped CAPWAP lightweight AP software or a Cisco Mobility Express controller software. However, you can convert a CAPWAP AP to

Cisco Mobility Express software, and vice-versa, on site. To determine if your AP has a Cisco Mobility Express image or CAPWAP Lightweight AP image, follow these steps:

- Step 1** Connect to the console port of the AP.
- Step 2** Log in to the AP using the username **Cisco** and password **Cisco**. Both are case-sensitive. This is the default factory-shipped username and password on all Cisco Aironet APs.
- Step 3** Enter the **sh version** command on the AP console.
- Step 4** Check the command output for the **AP Image Type** and **AP Configuration** fields. There are three possible scenarios, as shown in the following table:

What to do next

Fields and Their Values in the Output	What to do Next
AP Image Type: MOBILITY EXPRESS IMAGE AP Configuration: MOBILITY EXPRESS CAPABLE	No conversion is required.
AP Image Type: MOBILITY EXPRESS IMAGE AP Configuration: NOT MOBILITY EXPRESS CAPABLE	<p>This means that the AP has the Cisco Mobility Express software, but is running as a CAPWAP lightweight AP.</p> <p>This AP is currently not configured to run as Mobility Express controller, does not take part in the master AP election process either, and hence does not broadcast the the <i>CiscoAirProvision</i> SSID. This AP can, however, function as a subordinate AP in a Mobility Express network.</p> <p>To enable the Mobility Express controller functionality of this AP, run the command ap-type mobility-express tftp on the AP console. The AP will reboot, come back online, and take part in the master AP election process. If and when it is elected as master, it will broadcast the <i>CiscoAirProvision</i> SSID.</p>
The AP Image Type and AP Configuration fields are not present in the output	This means that the AP has a CAPWAP lightweight AP software and not Cisco Mobility Express software. Proceed to Converting from CAPWAP Lightweight AP to Cisco Mobility Express Software , on page 7.

Converting from CAPWAP Lightweight AP to Cisco Mobility Express Software

Follow this procedure to convert the AP software to Cisco Mobility Express configuration-capable software.

note



Note The following procedure shows a conversion from the 8.1.122.0 Lightweight AP release on an 1850 series AP, and hence uses the corresponding software file. Ensure that you use the appropriate software file depending on the release you are converting from and the AP model.

Before you begin

- Your AP is either a Cisco 1850 Series or a 1830 Series AP with Lightweight AP software Release 15.3.3-JBB5, for Cisco Wireless Controller Software Release 8.1.122.0, or a newer software.
- A TFTP server and a DHCP server should be configured and accessible.
- Ensure that there are no Cisco WLCs, physical or virtual, in the network while you are performing this upgrade. The AP must not interface with any other wireless controller while you are performing this upgrade.

-
- Step 1** Download the *AIR-AP1850-K9-8.1.122.0.tar* software file from Cisco.com to the TFTP server. On the Download Software page, for a given release, this .TAR file is labeled, '*Software to be used for conversion from Lightweight Access Points only*'.
- Step 2** Connect to the console port of the AP.
- Step 3** Log in to the AP using the username **Cisco** and password **Cisco**. Both are case-sensitive. This is the default factory-shipped username and password on all Cisco Aironet APs.
- Step 4** To convert the AP from CAPWAP lightweight AP software to Cisco Mobility Express software, use the **ap-type mobility-express tftp://<tftp server ip-address>/<filename of TAR file with path from root on the TFTP server>** command. The software file is downloaded to the AP, and is written to the AP's flash memory. The AP reboots with a Mobility Express-capable configuration and starts broadcasting the *CiscoAirProvison* SSID.
-

What to do next

For an alternative to the above conversion process, using the .ZIP file, see [Alternative Method for CAPWAP to Mobility Express Conversion](#).

To convert an AP from Mobility Express type to CAPWAP type, see [Converting an AP from Mobility Express to CAPWAP Type](#).

Preparing APs to Associate with the Master AP

Follow this procedure to enable a new AP to associate itself with the Cisco Mobility Express wireless controller on the master AP, and thereby enabling it to join the Cisco Mobility Express network.

Before you begin

- A master AP with Cisco Mobility Express wireless controller should be up and running.
- If the AP that has to be prepared to associate with the master AP is a universal regulatory domain AP, then it should be primed using the Cisco AirProvision mobile application. For more information, see the *Cisco Aironet Universal AP Priming and Cisco AirProvision User Guide* at:

http://www.cisco.com/c/en/us/td/docs/wireless/access_point/ux-ap/guide/uxap-mobapp-g.html

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- Step 1** Download the latest Cisco Mobility Express bundle from Cisco.com to the TFTP server. This pack is either in .zip format (for Windows) or .tar format (Linux or Mac OSX) and contains the software images for all the supported APs.
- Step 2** Unzip the software pack to a folder on the TFTP server.
- Step 3** Provide the path to the folder in the **Management > Software Update > File Path** field.
- Step 4** Perform a software update. .
-

What to do next

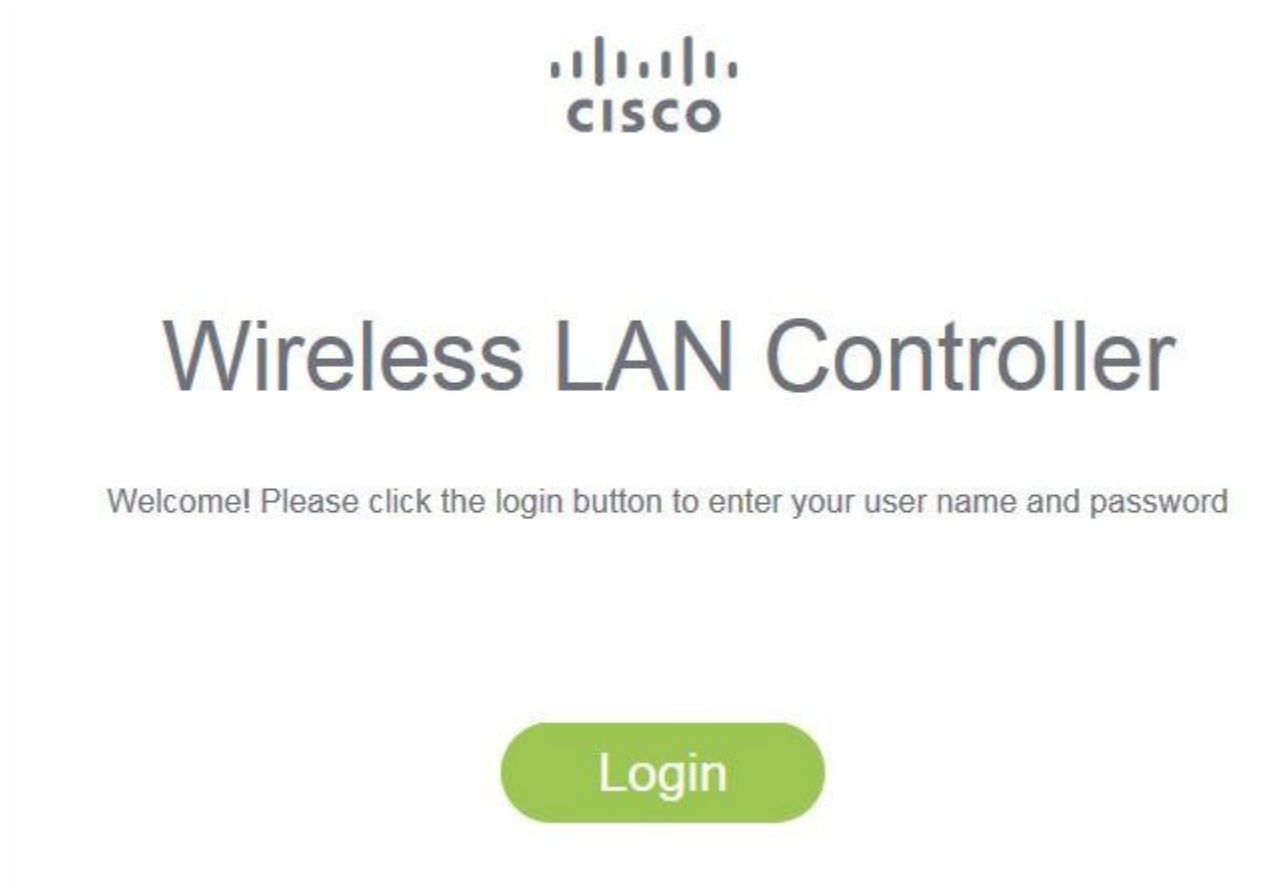
[Managing Associated Access Points](#)

Logging in to Cisco Mobility Express

- Step 1** Open a browser and enter **https://<ip address>** in your browser's address bar to access the Cisco Mobility Express **Wireless LAN Controller** login page. This IP address is the one you have specified for managing the Cisco Mobility Wireless Express controller.

The Cisco Mobility Express controller uses a self-signed certificate for HTTPS. Therefore, all browsers will display a warning and ask you whether you wish to proceed with an exception or not when the certificate is presented to the browser. Accept the warning in order to access the Mobility Express **Wireless LAN Controller** login page.

Figure 8: Cisco Mobility Express Wireless LAN Controller Web Interface Login



Step 2 Click **Login**.

Step 3 Enter admin user credentials to log in.

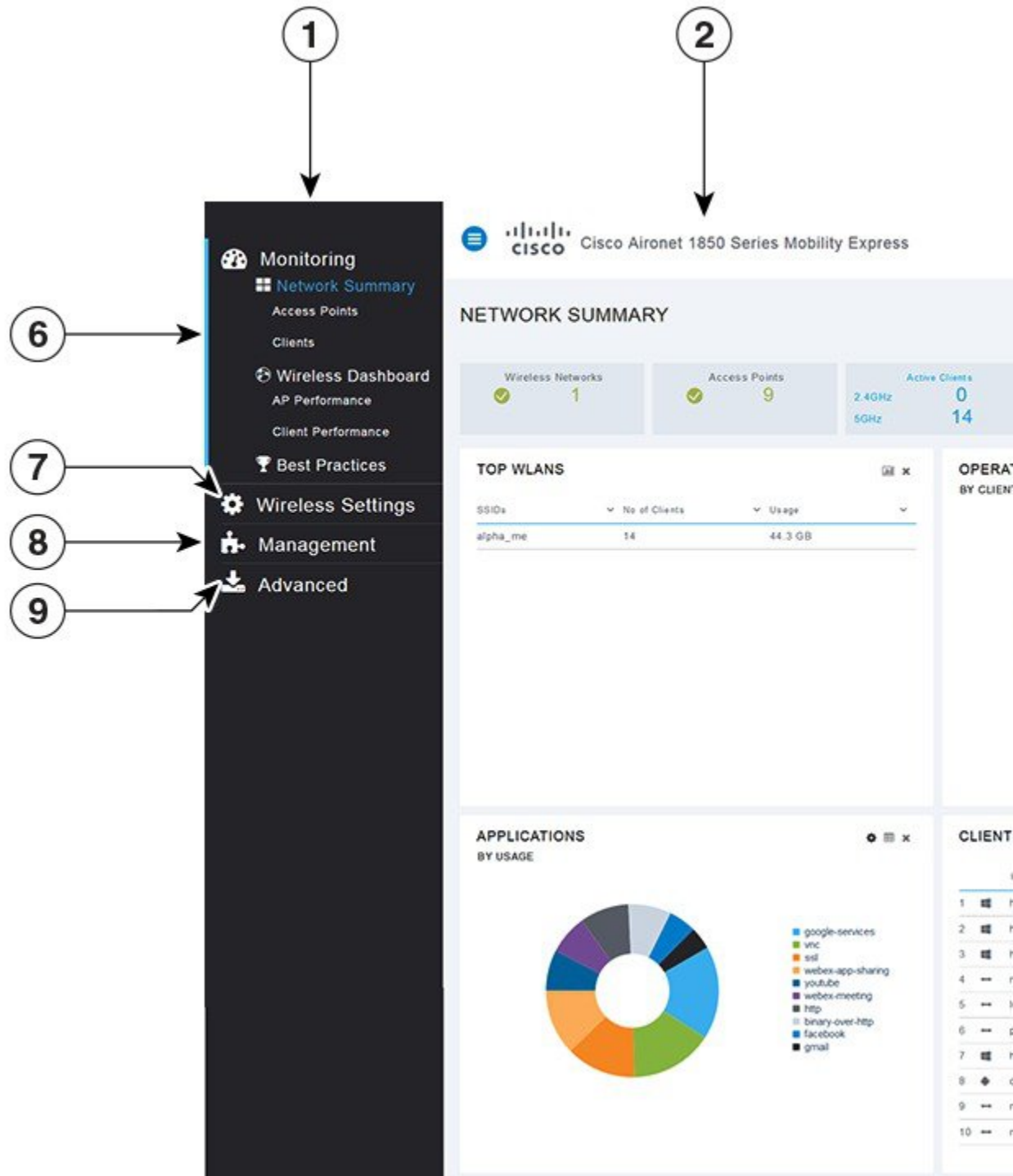
What to do next

After you log in, the default landing page is the **Network Summary** window. For more information, see [About the Cisco Mobility Express Monitoring Service](#).

Understanding the Mobility Express Controller Web Interface

The following figure illustrates the opening page and the general layout of the Mobility Express controller web interface.

Figure 9: Mobility Express Controller Web Interface



No.	Web Interface Section or Feature
1	The side pane of the web interface. This is main navigational pane using which you can navigate to the various sub-sections in the web interface.
2	The title of the web interface. It indicates the AP model of the master AP (on which the integrated controller functionality is currently operating)
3	Search for an AP or client using its MAC address.
4	Click to save the current controller configuration to the NVRAM. For more information, see Saving Controller Configuration .
5	Click to view the current system information or to log off the controller web interface.
6	The Mobility Express Network Monitoring section. For more information, see About the Cisco Mobility Express Monitoring Service .
7	The Wireless Settings section, where you can administer associated APs, manage WLANs, WLAN user accounts, and guest user accounts. For more information, see Specifying Wireless Settings .
8	The Management section, where you can set management access parameters, manage admin accounts, network time, and perform software updates.
9	The Advanced section, where you can set SNMP settings, sys log settings, and perform a reset to factory default.