



## Defining the Location Hierarchy

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### Defining the Location Hierarchy

Cisco Spaces supports the following wireless networks:

- **Cisco Meraki**
- **Cisco Wireless Controller with or without Cisco CMX**
- **Cisco Catalyst 9800 Series Wireless Controller**



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**Note** For Cisco Wireless Controller without Cisco CMX and Cisco Catalyst 9800 Series Wireless Controller, you can ensure that appropriate data transfer happens between the Controller and Cisco Spaces using a Cisco Spaces: Connector.

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Based on your wireless network, choose the required instructions from the following:

### Defining the Location Hierarchy for Cisco Meraki

To import the Cisco Meraki locations, first you must add the Cisco Meraki Organization under the customer name. You can then import Meraki networks. When you import a Meraki network, its floors, and access points are also imported. You can group the access points and create zones at network or floor level. You can group the locations at customer name, or organization level. You can also rename the customer name.

A Meraki Network Location may contain one or more Meraki access points with Cisco Spaces-supported tags. When adding such a Meraki Network Location, only these tagged APs will be added to the Location Hierarchy. Currently, Cisco Spaces only supports the `Cisco-DNASpaces` tag.

If a Meraki Network Location with one or more Cisco Spaces-tagged APs is already added to the Cisco Spaces location hierarchy, then only these tagged APs will be added during the background network synchronization. Non-Cisco Spaces-tagged APs that exist in the location hierarchy for this network will be removed from their respective locations during the next background network synchronization.

However, if none of the APs in the Meraki network have Cisco Spaces-supported tags, then all the access points will be added to the Location Hierarchy. If such a Meraki Network Location having no tagged APs is

already added to the Cisco Spaces location hierarchy, then all the APs will be synchronized to the location hierarchy. There will be no change to the existing location hierarchy.

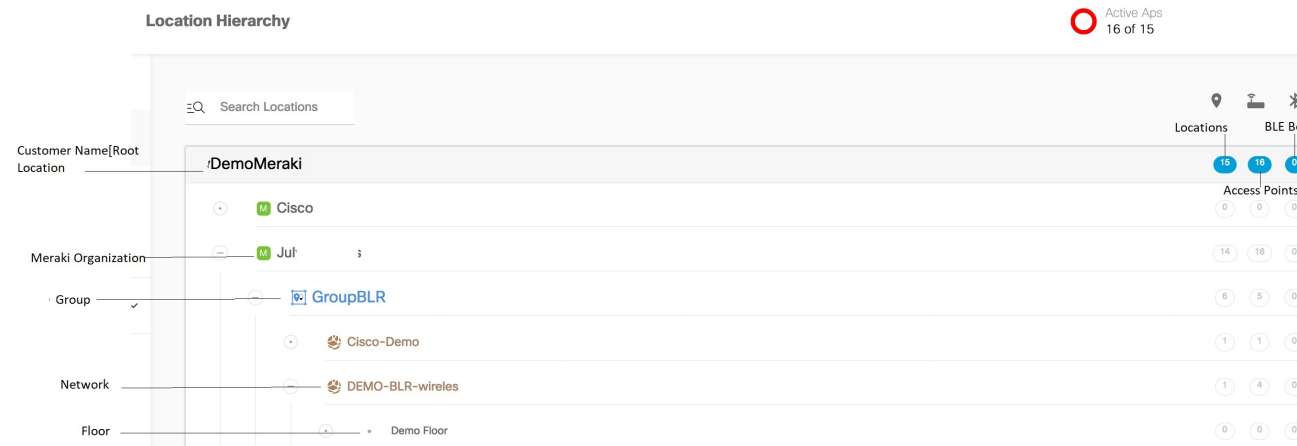
Before creating the location hierarchy, ensure that all the prerequisites are met. To know the prerequisites for creating the location hierarchy, see the [Prerequisites for Defining the Location Hierarchy](#).

The location hierarchy for Cisco Meraki network is as follows:

**Meraki > Organization > Network > Floor > Access Points.**

The Location Hierarchy for Cisco Meraki is shown in the following figure.

**Figure 1: Location Hierarchy for Meraki**



If you do not have Meraki credentials you can import the locations using Meraki API keys. For more information on importing the locations from Meraki using the API keys, see [Importing Cisco Meraki Locations Using the API Keys, on page 4](#).

If you have the Meraki credentials, to import the Meraki locations to Cisco Spaces, perform the following steps:



**Note** After defining the location hierarchy, ensure that you define timezones for locations. The timezone defined affects the Cisco Spaces rules and reports.

## Adding a Cisco Meraki Organization

To create the location hierarchy in Cisco Spaces, first you must add the Cisco Meraki Organization of which you want to import the locations to the location hierarchy.



**Note** Cisco Spaces enables you to add multiple Cisco Meraki Organizations to the location hierarchy so that you can connect to the multiple Meraki organizations simultaneously.

To add a Cisco Meraki Organization to the location hierarchy, perform the following steps:

**Step 1** In the **Cisco Spaces** dashboard, choose **Location Hierarchy**.

- Step 2** In the **Location Hierarchy** window that appears, click **More Actions** for the customer name (root name).
- Step 3** Choose **Add a Wireless Network**.
- Step 4** From the **Wireless Network** drop-down list that appears, choose **Cisco Meraki**.
- Step 5** Enter the user name and password for your Meraki account, and click **Login**.
- Step 6** From the **Organization** drop-down list, choose the Cisco Meraki Organization from which you want to import the locations.
- Step 7** Click **Add**.
- The organization that is added gets listed in the location hierarchy.

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## Adding a Network to Cisco Meraki Organization

Cisco Spaces enables you to maintain the network, and floor structure followed for the location hierarchy in Cisco Meraki. After adding a Cisco Meraki Organization to the location hierarchy, you can import its networks, and the associated floors.

To import a network and its associated floors to the location hierarchy, perform the following steps:

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- Step 1** In the Cisco Spaces dashboard, click **Location Hierarchy**.
- Step 2** In the **Location Hierarchy** window, click the **More Actions** icon at the far right of the Cisco Meraki Organization for which you want to add the network.
- Step 3** Choose **Add Network**.
- Step 4** In the **Add Network** window, select the networks that you want to add to the location hierarchy.
- The **Add Network** window appears with all the available networks for that Cisco Meraki Organization.
- Step 5** Click **Add**.
- The networks added gets listed in the location hierarchy along with its associated floors.
- Note** In the Cisco Meraki application, ensure that the network name is not duplicated.

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## Creating Zones and Adding Access Points

You can group the access points of a network or floor using zones. You can create the zones at network or floor level.



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**Note** You cannot modify the access points for a floor.

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To create a zone for a network or floor, perform the following steps:

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- Step 1** In the Cisco Spaces dashboard, choose **Location Hierarchy**.
- Step 2** In the **Locations** window, click the **More Actions** at the far right of the network or floor under which you want to create the zone.

**Step 3** Choose **Add Zone**.

**Step 4** In the **Add Zone** window that appears, perform the following steps:

- a) In the **Zone Name** field, enter a name for the zone.
- b) In the **Select Access Points** area, check the check box for the access points that you want to add to the zone.
- c) Click **Add**.

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#### What to do next



**Tip** Before creating the zones, locate the access points that you want to include in the zone in the Cisco Meraki dashboard.



**Note** When you add an access point of a network or floor to a zone, that access point will not be available for that network or floor. The access points added to a zone will not be available for other zones.

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## Importing Cisco Meraki Locations Using the API Keys

Use the **Setup > Wireless Networks** window to import Cisco Meraki locations for the first time using the API keys.

To import Cisco Meraki locations using the API keys, perform the following steps:

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**Step 1** In the **Location Hierarchy** window, click the **More Actions** icon for the customer name (root name), and click **Connect Wireless Networks**.

**Step 2** In the **Connect your wireless network** window, click **Go to Setup**.

**Step 3** In the **Connect your wireless network** window, click **+Add New**.

**Step 4** Select Cisco Meraki as the wireless network.

The **Connect via Meraki API Key** wireless network is displayed.

**Step 5** Click **Connect** to connect Cisco Meraki with Cisco Spaces using the API key.

The **Connect via API key** pop-up window is displayed.

**Step 6** In the **API Key** field, enter the Cisco Meraki API key to fetch the network information and click **Connect**.

The network locations for that API key gets listed. The networks gets imported into Location Hierarchy.

**Step 7** Enter the **Post URL** and **Secret Key** parameters to configure Meraki scanning API.

**Step 8** Click **Import Networks** to import Cisco Meraki networks into Location Hierarchy.

The network locations gets listed in the **Locations Hierarchy** window. When you import a network, the floors and access points under it also imported.

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## Defining the Location Hierarchy for Cisco AireOS/ Cisco Catalyst

You can connect CiscoAireOS (Cisco Wireless Controller) and Cisco Catalyst (Cisco Catalyst 9800 Series Wireless Controller) to Cisco Spaces and import the location hierarchy using any of the following connectors: Cisco CMX, Cisco WLC Direct Connect, or Cisco Spaces: Connector.

### Defining the Location Hierarchy for Cisco AireOS/ Cisco Catalyst Wireless Controller with Cisco CMX

Before creating the location hierarchy, ensure that all the prerequisites are met. To know the prerequisites for creating the location hierarchy, see the [Prerequisites for Defining the Location Hierarchy](#).

Cisco Spaces supports only Cisco CMX 10.6 or later.



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**Note** The **CMX on Prem** option in **Add a Wireless** window will not function any more. When connecting Cisco Spaces to Cisco AireOS/ Catalyst with Cisco CMX, for importing the location to location hierarchy, you can import the locations using CMX Tethering. CMX Tethering can be done by uploading map to Map Services or by configuring Token in Cisco CMX. After importing maps, the map data will reflect in the Location Hierarchy automatically.

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The location hierarchy for Cisco AireOS Wireless Controller with a Cisco CMX installation is as following:

**Cisco CMX Node > Campus > Building(network) > Floor > CMX Zone (if defined)**



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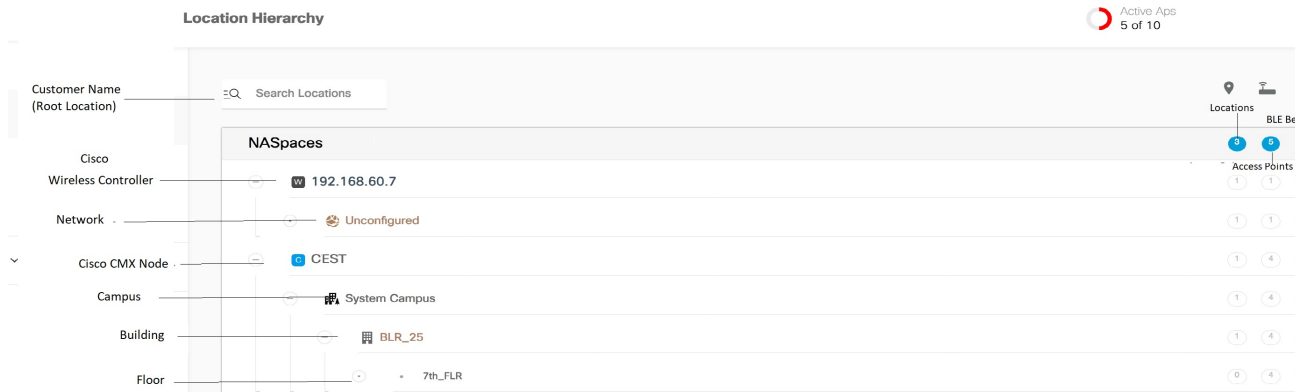
**Note**

- Due to the update in Map services, the location hierarchies imported newly after October 2020 will have only **Campus > Building > Floor > CMX Zone (if defined)** in the hierarchy. However, any updates made to the existing location hierarchy through map upload will maintain **CMX Node**
- For an existing location hierarchy, if you reimport the locations using Map Services, the overlapping APs (APs already existed in location hierarchy and is available in the map imported as well) will be moved to the map-based hierarchy. Therefore, the reports and proximity rules will be affected. . You also have to re-configure the proximity rules to display captive portals or to send notifications
- The **Cisco Spaces Dashboard** restricts the import of locations, under **Location Hierarchy > Add Wireless Networks**, using **CMX On-Prem** or **WLC Direct Connect > Import from Maps**.

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The location hierarchy for Cisco AireOS/Catalyst Wireless Controller with Cisco CMX is shown in the following figure.

Figure 2: Location Hierarchy with Cisco CMX



**Note** After defining the location hierarchy, ensure that you define timezones for locations. The timezone defined affects the Cisco Spaces rules and reports.

## Connecting Cisco Spaces to Cisco Wireless Controller or Cisco Catalyst 9800 Series Wireless Controller Using CMX Tethering

If you are having Cisco CMX 10.6 or later, you can use the CMX tethering feature to connect Cisco Spaces to the controller, import locations and to configure the location updates for notifications and reports.

Cisco Spaces Network Sync Server supports AP synchronization for CMX Tethering. For CMX Tethering, the changes made to APs in Cisco Prime get updated in Cisco Spaces location hierarchy. To synchronize the AP changes, do any of the following:

- In Cisco CMX, click **SYSTEM**. In the dashboard that appears, choose **Settings > Controllers and Maps Setup > Import**. In the window that appears, provide Cisco Prime Username, Password and IP Address. Then click **Import Controllers and Maps** to get latest map changes. Click **Save**.
- Download updated map from Cisco Prime Infrastructure and upload it to Cisco CMX.
- Download updated map from Cisco Prime and upload it to Map Services in Cisco Spaces.

You can do CMX Tethering in the following ways:

### CMX Tethering by Configuring Token in Cisco CMX

To configure CMX Tethering through token, perform the following steps:

- Step 1** In the Cisco Spaces dashboard, choose **Setup > Wireless Networks**.
- Step 2** In the **Connect your wireless network** window, click **Add New**.
- Step 3** Click **Select** for **Cisco AireOS/Catalyst**.
- Step 4** Click **Select** for **Connect Via CMX Tethering**.  
The prerequisites for using this option are displayed.
- Step 5** Click **Continue Setup**.

The **Connect Via CMX Tethering** widget appears in the **Connect your wireless network** window.

**Step 6** Expand the widget **Connect Via CMX Tethering** .

**Step 7** Click **Create New Token** displayed at Step 2.

**Step 8** In the **Create a new token** window, enter a name and description for the Cisco CMX Tethering.

**Step 9** Click **Save**.

**Step 10** Click **View Tokens** displayed at Step 2.

The Cisco CMX Tethering instance added gets listed.

**Step 11** To generate a token for connecting the Cisco Spaces dashboard with Cisco CMX, in the **CMX Tethering Tokens** window, click the **Key** icon for the Cisco CMX Tethering instance for which you want to generate a token.

**Step 12** Click **Copy**.

**Step 13** Log into Cisco CMX.

**Step 14** Choose **Manage > Cloud Apps**.

**Step 15** In the **Cloud Applications** window that appears, click **Enable** in the **Actions** column for **Cisco Spaces**.

**Step 16** In the window that appears, configure the token copied from Cisco Spaces dashboard.

When you configure CMX tethering using a token, the location map for the particular CMX node appears in the **Map Service** window and the locations appear automatically under **Location Hierarchy** of the Cisco Spaces dashboard.

- Note**
- If you delete a location from the **Location Hierarchy**, it will also be removed from **Map Service**.
  - To enable the **Cisco Spaces** service in Cisco CMX, you must have a Cisco Spaces account.
  - For Cisco CMX, you cannot add campus, building, and other child locations using **More Actions** in the location hierarchy. You must update the locations in **Setup > Map Service**. However, you cannot add zones (AP Zones). You can group or delete the locations from the location hierarchy. When you delete a location from the location hierarchy, that location gets removed from the **Map Service** also. For more information, see [Managing the Location Hierarchy for Cisco Wireless Controller with Cisco CMX](#).
  - If you want the location updates in Cisco Prime Infrastructure to get automatically synchronized in Cisco Spaces, you must click the **Map Sync** button in Cisco CMX.

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## CMX Tethering by Uploading the Location Map to Map Services

The configurations done in the external applications that are not part of Cisco Spaces, and the menu path and names specified for the tabs, windows, options, and so on in this documentation are subject to change.

You can export the maps from Cisco Prime Infrastructure or Catalyst Center. Maps exported from Cisco Prime Infrastructure or Catalyst Center, and imported into Cisco Spaces using **Map Service** will appear automatically under **Location Hierarchy**.

To import the locations to the location hierarchy by exporting the maps from Cisco Prime Infrastructure, perform the following steps:

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**Step 1** Log into Cisco Prime Infrastructure .

**Step 2** In the **Settings/Getting Started** window, click the circle icon near the top left of the window (near the Cisco logo).

**Step 3** In the window that appears, click **Maps** on the left pane.

**Step 4** In the **Wireless Maps** area, click **Site Maps (Deprecated)**.

**Note** You can add new locations using the **Site Maps (New)** option.

**Step 5** Click the drop-down list near **Go**, and choose **Export Maps**.

**Step 6** Click **Go**.

**Step 7** From the tree view of location maps, select the parent location (CMX node) that you want to export, and click **Export**.

**Note** Ensure that the **Include Map Information** check box is checked.

Save the location map on your computer.

**Note** You must download the map in the zip format and upload it in the Cisco Spaces in the same format.

**Step 8** In the Cisco Spaces dashboard, choose **Setup > Map Service**.

**Step 9** Click **Upload** at the top left of the window, and select the location map downloaded from Cisco Prime Infrastructure.

The location map gets uploaded to the **Map Service**.

**Note** You can add a CMX Zone in **Setup > Map Service** using the square icon (below the Expand Collapse icon) displayed in the map.

**Step 10** In the Cisco Spaces dashboard, choose **Location Hierarchy**.

- The campuses and its associated buildings and floors that are available in the location map imported to **Map Service** are displayed.
- Maps exported from Cisco Prime Infrastructure and imported into Cisco Spaces using **Map Service** now appears automatically under **Location Hierarchy**.
- If you delete a location from **Location Hierarchy**, it will also be removed from **Map Service**.

**Note**

- For Cisco CMX, you cannot add campus, building, and other child locations using **More Actions** in the location hierarchy. You must update the locations in **Setup > Map Service**. However, you cannot add zones (AP Zones). You can group or delete the locations from the location hierarchy. When you delete a location from the location hierarchy, that location gets removed from the **Map Service** also. For more information, see [Managing the Location Hierarchy for Cisco Wireless Controller with Cisco CMX](#).
- If you want the location updates in Cisco Prime to get synchronized in Cisco Spaces, you must upload the latest map to **Map Service**.

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## Defining the Location Hierarchy for Cisco Catalyst 9800 Series Wireless Controllers or Cisco Wireless Controller (without Cisco CMX)

You can connect a Cisco AireOS Wireless Controller (without CMX) or Cisco Catalyst 9800 Series Wireless Controller to Cisco Spaces using any of the following connectors:

- Cisco WLC Direct Connect
- Cisco Spaces: Connector



For more information on features supported by these connectors, see [Features Supported by Various Connectors](#).

When you have connected the controller to Cisco Spaces using **Cisco WLC Direct Connect** or **Cisco Spaces Connector**, you can import the locations to the location hierarchy using any of the following methods:

- **Access Point Prefix:** If you are using this option, you can add only networks, groups, and zones in the location hierarchy.

For more information on connecting the Cisco Wireless Controller to Cisco Spaces, and importing the location hierarchy to the Cisco Spaces dashboard, see [Importing the Locations using Access Point Prefix, on page 9](#). Alternatively, you can also refer to the configurations steps for **Connect WLC/Catalyst 9800 Directly in Setup > Wireless Networks** of Cisco Spaces dashboard.

- **Importing from Maps:** This radio button is disabled now. Importing the locations through maps must be done now through **Setup > Map Service**. Using maps, you can import the locations in the same hierarchical structure as in Cisco Prime Infrastructure, Campus-Building-Floor. You must export the location map from Cisco Prime Infrastructure and upload the map to the **Map Service** option in the Cisco Spaces dashboard to view the locations in the location hierarchy. After importing maps to Cisco Spaces, the map data will reflect in the Location Hierarchy automatically. For more information on importing the locations using Map Services, see [Importing Locations to the Location Hierarchy Using Map Services, on page 11](#).

**Note**

- You can import APs as per the license limit when adding locations using the **Access Point Prefix** option (**Connect WLC/Catalyst 9800 Directly** or **Connect via Spaces Connector**).
- If the license limit was reached, APs over and above the license limit that were available under the controller were not synchronized with **Location Hierarchy**. Now, priority is given to the APs with a common prefix over the APs present under the **Unconfigured** location. Those APs that are present under the **Unconfigured** location are removed during the synchronization process, making way for the synchronization of the APs with a common prefix, under the controller.
- If you were using Cisco Spaces earlier with Cisco CMX, and if you are moving to use Cisco Spaces directly with Cisco Wireless Controller, the Reports and proximity rules will be affected. The Reports will be shown based on the new location configurations. You also have to re-configure the proximity rules to display captive portals or to send notifications
- For an existing location hierarchy, if you reimport the locations using Map Services, the overlapping APs (APs already existed in location hierarchy and is available in the newly imported map as well) will be moved to the map-based hierarchy. Therefore, the reports and proximity rules will be affected. You also have to re-configure the proximity rules to display captive portals or to send notifications.

### Importing the Locations using Access Point Prefix

- Step 1** To import the locations to the Cisco Spaces, click the three-line menu icon at the top-left of the Cisco Spaces dashboard.
- Step 2** Choose **Location Hierarchy**.
- Step 3** In the **Location Hierarchy** window, click **More Actions** at the far right of the customer name(root name).
- Step 4** Click **Add a Wireless Network**.
- Step 5** From the **Wireless Network** drop-down list, choose **WLC Direct Connect**.

**Step 6** Click the **Access Point Prefix** radio button.

The imported Cisco Wireless Controllers get listed.

**Note** The Cisco Wireless Controllers get listed only if you configure the Cisco Wireless Controller for importing them to Cisco Spaces.

**Step 7** Select the Cisco Wireless Controller, and click **Next**.

This Cisco Wireless Controller will act as the primary Cisco Wireless Controller.

**Step 8** Select another Cisco Wireless Controller as the secondary controller, and click **Next**.

**Note** This feature helps you manage Cisco Spaces with a secondary Cisco Wireless Controller with the same APs if the primary controller is down.

The secondary controller is optional. You can move to the next screen without selecting a secondary controller by clicking the **Skip** button.

**Step 9** Select the networks that you want to add.

**Note** Cisco Spaces will automatically group the APs based on the prefix of their names, and creates networks. The APs that are not grouped under a network will be listed under the name “Unconfigured”.

**Note** If you are not selecting a network, the APs in that network will be added to the location hierarchy under the name “Unconfigured”.

**Step 10** Click **Done**.

The APs of the primary and secondary controllers selected will get listed in the location hierarchy.

**Step 11** In the location hierarchy, click the **More Actions** icon at the far right of the network, and click **Add Zone**.

**Step 12** In the window that appears, enter a name for the zone, and select the APs to be included in the zone.

**Step 13** Similarly, create all the required zones.

**Step 14** If you have created the location hierarchy earlier using the Cisco CMX, delete that location hierarchy, and re-configure the rules such as captive portal rules, engagement rules and location personas rules.

- Note**
- After defining the location hierarchy, ensure that you define timezones for locations. The timezone defined affects the Cisco Spaces rules and reports.
  - When adding the APs in the Cisco Wireless Controller, follow proper naming conventions (with appropriate prefix) to ease auto-network creation in Cisco Spaces.
  - In the Cisco Wireless Controller, if new APs are added to the Cisco Wireless Controller, those APs get automatically imported during the next Cisco Wireless Controller synchronization. If an imported AP is deleted from the Cisco Wireless Controller, the changes will be reflected in Cisco Spaces only after 48 hours.
  - For Cisco Wireless Controller, Cisco Spaces enables you to group access points with different prefixes under a single network. After importing the networks to the location hierarchy, click the network to add the APs of multiple prefixes. In the location hierarchy, when you click a network location, a new **Access Points Prefix Used** option will be available in the **Location Info** tab to add APs of multiple prefixes to that network. After adding the prefix, the APs under the unconfigured network with the specified prefix will be moved under this network. The **Access Points Prefix Used** option will be available only for network locations. However, the **Access Points Prefix Used** option will not be available for the Unconfigured network.

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### What to do next

You can change the primary controller, and add more secondary controllers. You can also add APs of multiple prefixes to a single network. For more information, see the [Managing the Location Hierarchy for Cisco Wireless Controller or Cisco Catalyst 9800 Series Controller\(with WLC Direct Connect or Cisco Spaces: Connector\)](#).

### Importing Locations to the Location Hierarchy Using Map Services

If a Cisco Wireless Controller or Cisco Catalyst 9800 Series Wireless Controller is connected to Cisco Spaces through **WLC Direct Connect** or **Cisco Spaces Connector**, you can import the locations to the location hierarchy using the Map Services. If you are using this option, you can import the locations in the same hierarchical structure, Campus- Building-floor .



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- Note** You can export the maps from Cisco Prime Infrastructure or Catalyst Center. Maps exported from Cisco Prime Infrastructure or Catalyst Center and imported into Cisco Spaces using **Map Service** appears automatically under **Location Hierarchy**.
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To import the locations to the location hierarchy by exporting the maps from Cisco Prime, perform the following steps:

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- Step 1** Log into Cisco Prime Infrastructure.
- Step 2** In the **Settings /Getting Started** window, click the circle icon near the top-left of the window (near the Cisco logo).
- Step 3** In the window that appears, click **Maps** on the left pane.
- Step 4** In the **Wireless Maps** area, click **Site Maps (Deprecated)**.

- Note** You can add new locations using the **Site Maps (New)** option.

**Step 5** Click the drop-down list near **Go**, and choose **Export Maps**.

**Step 6** Click **Go**.

**Step 7** From the tree view of location maps, select the parent location (CMX node) that you want to export, and click **Export**.

**Note** Ensure that the **Include Map Information** check box is checked.

**Step 8** Save the location map on your computer.

**Note** You must download the map in the gzip format and upload it in the Cisco Spaces in the same format.

**Step 9** In the Cisco Spaces dashboard, choose **Setup > Map Service**.

**Step 10** Click **Upload** at the top left of the window, and select the location map downloaded from Cisco Prime Infrastructure. The location map gets uploaded to the **Map Service**.

**Step 11** In the Cisco Spaces dashboard, choose **Location Hierarchy**.

- The campuses and its associated buildings and floors that are available in the location map imported to **Map Service** are displayed.
- Maps exported from Cisco Prime Infrastructure and imported into Cisco Spaces using **Map Service** now appears automatically under **Location Hierarchy**.
- If you delete a location from **Location Hierarchy**, it will also be removed from **Map Service**.

**Note** After defining the location hierarchy, ensure that you define timezones for locations. The timezone defined affects the Cisco Spaces rules and reports.

- If the locations are imported using **Map Service**, you cannot add campus, building, and other child locations using **More Actions** in the location hierarchy. You must update the locations in **Setup > Map Service**. However, you cannot add zones (AP Zones). You can group or delete the locations from the location hierarchy. When you delete a location from the location hierarchy, that location gets removed from the **Map Service** also. For more information, see [Managing the Location Hierarchy for Cisco Wireless Controller with Cisco CMX](#).
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