Device Mobility

Device Mobility Overview

Device mobility allows devices to assume settings based on their location. Your system uses the device IP subnets to determine the exact location of the device. By enabling device mobility within a cluster, you allow mobile users to roam from one site to another and acquire the site-specific settings. Your system then uses these dynamically allocated settings for functions such as call routing, codec selection, and media resource selection.

Device Mobility Prerequisites

- The phone must have a dynamic IP address to use device mobility. If a phone with a static IP address roams, Unified Communications Manager uses the configuration settings from its home location.

- The Device Mobility feature requires you to set up device pools with site-specific settings. This chapter describes only the device pool settings that relate to device mobility. For more detailed information on configuring device pools, see the "*Configure Device Pools*" chapter in the System Configuration Guide for Cisco Unified Communications Manager.

- Cisco Database Layer Monitor service must be running on the same node as the Cisco CallManager service.

- Cisco TFTP service must be running on at least one node in the cluster.

- Cisco Unified Communications Manager Locale Installer (if you want to use non-English phone locales or country-specific tones).

- Any phone that runs either SCCP or SIP.

Device Mobility Configuration Task Flow

Before you begin

- Review Device Mobility Prerequisites, on page 1.

Procedure

	Command or Action	Purpose
Step 1	To Enable Device Mobility, on page 3, perform one or both of the following subtasks: • Enable Device Mobility Clusterwide, on page 3 • Enable Device Mobility for Individual Devices, on page 4	Perform these procedures as needed for your configuration. You can configure Device Mobility to be enabled across your cluster, for individual devices, or a combination of enabled and disabled for devices.
Step 2	Configure a Physical Location, on page 4	Configure the geographic location so that your system can determine which network resources to assign to a device. If a user moves away from the home location, the system ensures that the device uses local media resources and the correct bandwidth for the call.
Step 3	Configure a Device Mobility Group, on page 5	Configure the device mobility group to define a logical group of sites with similar dialing patterns (for example, US_dmg and EUR_dmg). Depending on the network size and scope, your device mobility groups can represent countries, regions, states, provinces, or cities. For example, an enterprise with a worldwide network can choose device mobility groups that represent individual countries, whereas an enterprise with a national or regional network can define device mobility groups that represent states, provinces, or cities.
Step 4	Configure Device Mobility Information, on page 5	Configure device mobility information such as the subnets and device pools that are used for device mobility. When a phone registers, your system compares the IP address of the device to the subnets that are configured device mobility in the **Device Mobility Info Configuration** window. The best match uses the largest number of bits in the IP subnet mask (longest match rule). For example, the IP address 9.9.8.2 matches the subnet 9.9.8.0/24 rather than the subnet 9.9.0.0/16.

	Command or Action	Purpose
Step 5	Configure a Device Pool for Device Mobility, on page 6	Unified Communications Manager assigns a device pool to an IP phone based on the device's IP subnet. The following steps describe the behavior: • The IP phone tries to register to Unified Communications Manager by sending its IP address in the registration message. • Unified Communications Manager derives the device's IP subnet and matches it with the subnet configured as part of the device mobility information. • If the subnet matches, Unified Communications Manager provides the device with a new configuration based on the device pool configuration.
Step 6	(Optional) View Roaming Device Pool Parameters, on page 8	Follow this procedure if you want to view and verify the current device mobility settings for a device.

Enable Device Mobility

Perform these procedures as needed for your configuration. You can configure Device Mobility to be enabled across your cluster, for individual devices, or a combination of enabled and disabled for devices.

Procedure

	Command or Action	Purpose
Step 1	Enable Device Mobility Clusterwide, on page 3	Activate a service parameter if you want to enable device mobility on all devices in the cluster.
Step 2	Enable Device Mobility for Individual Devices, on page 4	Follow this procedure if you want to enable device mobility for an individual device or if you want to specify a different value for individual devices.

Enable Device Mobility Clusterwide

Use the following procedure to configure a service parameter that sets the default device mobility setting to **On** for all phones clusterwide except where there is an overriding configuration in that phone's **Phone Configuration**.

Procedure

Step 1	From Cisco Unified CM Administration, choose **System** > **Service Parameters**.
Step 2	From the **Server** drop-down list, choose the node that is running the Cisco CallManager service.
Step 3	From the **Service** drop-down list, choose **Cisco CallManager Service**.
Step 4	Under **Clusterwide Parameters (Device - Phone)**, set the **Device Mobility Mode** service parameter to **On**.
Step 5	Click **Save**.

For devices that are already registered, you must restart the **Cisco CallManager** service for this new setting to be enabled.

What to do next

If you want to configure device mobility settings for an individual device, go to Enable Device Mobility for Individual Devices, on page 4.

Otherwise, you can begin configuring the system for device mobility. Go to Configure a Physical Location, on page 4.

Enable Device Mobility for Individual Devices

Use this procedure to enable device mobility for an individual device. This configuration overrides the setting of the **Device Mobility Mode** clusterwide service parameter.

Procedure

Step 1	From Cisco Unified CM Administration, choose **Device** > **Phone**.
Step 2	Click **Find** and select the device that you want to configure.
Step 3	From the **Device Mobility Mode** drop-down list, choose one of the following:

  - **On**—Device mobility is enabled for this device.
  - **Off**—Device mobility is disabled for this device.
  - **Default**—The device uses the setting of the **Device Mobility Mode** clusterwide service parameter. This is the default setting.

Step 4	Click **Save**.

Configure a Physical Location

Use this procedure to configure a physical location that you will assign to a device pool. Device Mobility uses the location of the device registration to assign an appropriate device pool.

Procedure

Step 1   From Cisco Unified CM Administration, choose **System** > **Physical Location**.

Step 2   Click **Add New**.

Step 3   Enter a **Name** for the location.

Step 4   Enter a **Description** for the location.

Step 5   Click **Save**.

Configure a Device Mobility Group

Use the following procedure to configure device mobility group is a logical grouping of sites with similar dialing patterns. For example, a company with a worldwide network may want to set up device mobility groups that represent individual countries.

Procedure

Step 1   From Cisco Unified CM Administration, choose **System** > **Device Mobility** > **Device Mobility Group**.

Step 2   Click **Add New**.

Step 3   Enter a **Name** for the device mobility group.

Step 4   Enter a **Description** for the device mobility group.

Step 5   Click **Save**.

Configure Device Mobility Information

Use this procedure to configure Device Mobility Info, representing the IP subnets to which roaming devices can register and the corresponding device pools that the system can assign to roaming devices.

Procedure

Step 1   From Cisco Unified CM Administration, choose **System** > **Device Mobility** > **Device Mobility Info**.

Step 2   Click **Add New**.

Step 3   Enter a **Name** for the Device Mobibility Info.

Step 4   Enter the IP subnet details for roaming device registrations.

- If you are using IPv4 addresses for your mobile devices, complete the IPv4 subnet details.
- If you are using IPv6 addresses for your mobile devices, complete the IPv6 subnet details.

Step 5   Select the device pools that you want the system to assign for roaming devices that register to one of these subnets. Use the arrows to move the appropriate device pools from the **Selected Device Pools** list box to the **Available Device Pools**s list box.

Step 6   Click **Save**.

For more information on the fields and their configuration options, see Online Help.

Configure a Device Pool for Device Mobility

Use this procedure to set up a device pool with parameters that you configured for device mobility.

Procedure

Step 1 From Cisco Unified CM Administration, choose **System** > **Device Pool**.

Step 2 Do either of the following:

- Click **Find** and select an existing device pool.
- Click **Add New** to create a new device pool.

Step 3 Under **Roaming Sensitive Settings**, assign the parameters that you set up in the previous device mobility tasks:

- **Physical Location**—From the drop-down list, select the physical location that you set up for this device pool. Device mobility uses this location to assign a device pool for a roaming device.
- **Device Mobility Group**—From the drop-down list, select the device mobility group that you set up for this device pool.

Step 4 Under **Device Mobility Related Information**, configure the following device mobility-related fields. For more information on the fields and their configuration options, see Online Help.

- **Device Mobility Calling Search Space**—Select the CSS to be used by a roaming device that uses this device pool.
- **AAR Calling Search Space**—Select the calling search space for the device to use when automated alternate routing (AAR) is performed.
- **AAR Group**—If AAR is configured, select the AAR Group for this device.
- **Calling Party Transformation CSS**—Select the calling party transformation CSS for roaming devices that use this device pool.

Note
- The **Calling Party Transformation CSS** overrides the device level configuration for roaming devices, even if the **Use Device Pool Calling Party Transformation CSS** check box is unchecked in the **Phone Configuration** window.

- **The Called Party Transformation CSS** setting is applied to the gateway rather than to the roaming device.

Step 5 Configure any remaining fields in the **Device Pool Configuration** window. For more information on the fields and their configuration options, see the system Online Help.

Step 6 Click **Save**.

Device Pool Fields for Device Mobility

The following table contains the settings in the **Device Pool Configuration** window that are relevant to setting up device mobility.

Field	Description
Roaming Sensitive Settings	
Physical Location	From the drop-down list, choose the physical location for this device pool. The system uses physical location with the Device Mobility feature to identify the parameters that relate to a specific geographical location.
Device Mobility Group	From the drop-down list, choose the device mobility group.
Device Mobility Related Information	
Device Mobility Calling Search Space	From the drop-down list, choose the calling search space to be used as the device calling search space when the device is roaming and in same device mobility group.
AAR Calling Search Space	From the drop-down list, choose the calling search space for the device to use when automated alternate routing (AAR) is performed. The AAR calling search space is the collection of route partitions that are searched to determine how to route a collected (originating) number that is otherwise blocked due to insufficient bandwidth.
AAR Group	From the drop-down list, choose the AAR group for this device. The AAR group provides the prefix digits that are used to route calls that are otherwise blocked due to insufficient bandwidth. An AAR group setting of **None** specifies that no rerouting of blocked calls is attempted.

Field	Description
Calling Party Transformation CSS	This setting allows you to localize the calling party number on the device. Ensure that the Calling Party Transformation CSS that you choose contains the calling party transformation pattern that you want to assign to this device pool. **Note** Before the call occurs, the device must apply the transformation by using digit analysis. If you choose **None** and you check the **Use Device Pool Calling Party Transformation CSS** check box in the device configuration window, the transformation does not match and is not applied. Ensure that you configure the calling party transformation pattern in a partition that is not used for routing.
Called Party Transformation CSS	This setting allows you to localize the called party number on the device. Make sure that the Called Party Transformation CSS that you choose contains the called party transformation pattern that you want to assign to this device pool. **Note** If you choose **None**, the transformation does not match and is not applied. Ensure that you configure the called party transformation pattern in a partition that is not used for routing.

View Roaming Device Pool Parameters

Use the following procedure to view and verify the current device mobility settings for a device.

Procedure

Step 1   From Cisco Unified CM Administration, choose **Device** > **Phone**.

Step 2   Enter search criteria and click **Find** to find the device with device mobility mode enabled.

Step 3   Click **View Current Device Mobility Settings** next to the **Device Mobility Mode** field.

The roaming device pool settings appear. If the device is not roaming, the home location settings appear.

Device Mobility Interactions and Restrictions

Device Mobility Interactions

Table 1: Device Mobility Interactions

Feature	Interaction
Calling Party Normalization	Calling party normalization enhances the dialing capabilities of some phones and improves call-back functionality when a call is routed to multiple geographical locations; that is, the feature ensures that the called party can return a call without the need to modify the directory number in the call log directories on the phone. Additionally, calling party normalization allows you to globalize and localize phone numbers, so the appropriate calling number presentation is displayed on the phone.
Roaming	When a device is roaming in the same device mobility group, Unified Communications Manager uses the device mobility CSS to reach the local gateway. If a user sets call forward all (CFA) at the phone, the CFA CSS is set to None, and the CFA CSS activation policy is set to With Activating Device/Line CSS, then the following behaviors will occur, depending on the device location: • The Device CSS and Line CSS are used as the CFA CSS when the device is in its home location. • If the device is roaming within the same device mobility group, the device mobility CSS from the roaming device pool and the line CSS are used as the CFA CSS. • If the device is roaming within a different device mobility group, the Device CSS and Line CSS are used as the CFA CSS.

Device Mobility Restrictions

Table 2: Device Mobility Restrictions

Restriction	Description
IP Address	The device mobility feature depends on the IPv4 address or IPv6 address of the device that registers with Unified Communications Manager. • The phone must have a dynamic IPv4 address or IPv6 address to use the device mobility. • If the device is assigned an IP address by using network address translation (NAT) or port address translation (PAT), the IP address that is provided during registration may not match the actual IP address of the device. • If the Cisco IP phone supports IPv4-Only Stack or IPv6-Only Stack, then the phone gets re-associated either with IPv4 or IPv6 Device Mobility Information, based on the IP addressing mode preference defined. For example, when a phone is defined with IPv6 preference but has no matching Device Mobility Information (IPv6 subnet and mask size), then it is associated with IPv4. When you add matching IPv6 Device Mobility Information, then the phone gets re-associated with IPv6 Device Mobility Information.