Extend and Connect

Extend and Connect Overview

The Extend and Connect feature allows administrators to deploy Unified Communications Manager (UC) Computer Telephony Integration (CTI) applications that interoperate with any endpoint. With Extend and Connect, users can access UC applications from any location using any device.

The Extend and Connect feature for Unified Communications Manager provides the following UC features:

- Receive incoming enterprise calls

- Make Call

- Disconnect

- Hold and Retrieve

- Redirect and Forward

- Call Forward All

- Call Forward Busy

- Call Forward No Answer

- Do Not Disturb

- Play Dual Tone Multi Frequency (DTMF) (out-of-band and in-band)

- Consult Transfer, Conference

- Add, edit, and delete remote destinations

- Set remote destination as Active or Inactive

- Persistent Connection

- Play Whisper Announcement

Extend and Connect Prerequisites

- Cisco Jabber, Release 9.1(1) or later

- Cisco Unified Workspace License (CUWL) Standard, CUWL Professional, or Cisco User Connect License (UCL) - Enhanced

Extend and Connect Configuration Task Flow

This section describes the procedures that you must complete to provision Unified Communications Manager users with Extend and Connect capabilities. For information about provisioning Cisco Jabber for Windows users with Extend and Connect, see the Cisco Jabber for Windows Installation and Configuration Guide.

Before you begin

Procedure

	Command or Action	Purpose
Step 1	Configure User Account, on page 2	Enable mobility for users so that they can use CTI remote devices. CTI devices are off-cluster phones that work with Cisco UC applications.
Step 2	Add User Permissions, on page 3	Add access control group permissions.
Step 3	Create CTI Remote Devices, on page 4	Configure off-cluster phones that users can use with Cisco UC applications.
Step 4	Add Directory Number to a Device, on page 4	Associate a directory number with the CTI remote device.
Step 5	Add Remote Destination, on page 5	Add a numerical address or directory URI that represents the other phones that the user owns.
Step 6	Verify Remote Destination, on page 6	Verify if the remote destination is successfully added for a user.
Step 7	Associate User with Device, on page 6	Associate an end user account to the CTI remote device.

Configure User Account

Use the following procedure to configure a new or existing user in Unified Communications Manager, you must enable user mobility so that they can use CTI remote devices. If you do not enable mobility for users, you cannot assign those users as owners of CTI remote devices.

Procedure

Step 1	From Cisco Unified CM Administration, choose **User Management** > **End User**.
Step 2	Perform either of the following:

- Click **Add New**, to configure a new user.
- Apply the filters using the **Find User Where** field and click **Find** to retrieve a list of users.

Note You may add the new end user account through LDAP integration or local configuration.

Step 3	Locate the **Mobility Information** section.
Step 4	Check the **Enable Mobility** check box.
Step 5	Click **Save**.

Add User Permissions

After the end user is active in Unified Communications Manager, add access control group permissions.

Procedure

Step 1	From Cisco Unified CM Administration, choose **User Management** > **End User**.
Step 2	Specify the appropriate filters in the **Find User Where** field, and then select **Find** to retrieve a list of users.
Step 3	Select the user from the list.
Step 4	Locate the **Permissions Information** section.
Step 5	Click **Add to Access Control Group**.

The **Find and List Access Control Groups** window appears.

Step 6	Click **Find**.

The Access Control Group list for Standard Users appears.

Step 7	Check the check boxes next to the following permissions:

- Standard CCM End-Users

- Standard CTI Enabled

Step 8	Click **Add Selected**.
Step 9	Click **Save**.

Create CTI Remote Devices

Use the following procedure to create a CTI remote device is a device type that represents off-cluster phones that users can use with Cisco UC applications. The device type is configured with one or more lines (directory numbers) and one or more remote destinations.

Unified Communications Manager provides Extend and Connect capabilities to control calls on devices such as public switched telephone network (PSTN) phones and private branch exchange (PBX) devices.

Procedure

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

Step 2   Click **Add New**.

Step 3   Select **CTI Remote Device** from the **Phone Type** drop-down list and then click **Next**.

Step 4   Select the appropriate user ID from the **Owner User ID** drop-down list.

> **Note**   Only users for whom you enable mobility are available from the **Owner User ID** drop-down list.

Unified Communications Manager populates the **Device Name** field with the user ID and a CTRID prefix, for example, *CTRIDusername*.

Step 5   Edit the default value in the **Device Name** field, if appropriate.

Step 6   Enter a meaningful description in the **Description** field.

> **Note**   Cisco Jabber displays device descriptions to users. If Cisco Jabber users have multiple devices of the same model, the descriptions from Unified Communications Manager help users tell the difference between them.

Step 7   Ensure that you select an appropriate option from the **Rerouting Calling Search Space** drop-down list in the **Protocol Specific Information** section.

The **Rerouting Calling Search Space** drop-down list defines the calling search space for rerouting and ensures that users can send and receive calls from the CTI remote device.
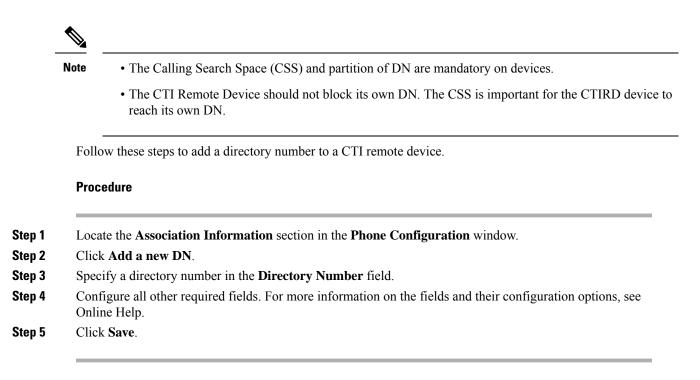
Step 8   Configure the remaining fields in the **Phone Configuration** window. For more information on the fields and their configuration options, see Online Help.

Step 9   Click **Save**.

The fields to associate directory numbers and add remote destinations are displayed in the **Phone Configuration** window.

Add Directory Number to a Device

A directory number (DN) is a numerical address that is configured as a line on the CTI remote device. A DN typically represents the primary work number of a user (for example, 2000 or +1 408 200 2000).

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> **Note**
> - The Calling Search Space (CSS) and partition of DN are mandatory on devices.
> - The CTI Remote Device should not block its own DN. The CSS is important for the CTIRD device to reach its own DN.

Follow these steps to add a directory number to a CTI remote device.

Procedure

Step 1 Locate the **Association Information** section in the **Phone Configuration** window.

Step 2 Click **Add a new DN**.

Step 3 Specify a directory number in the **Directory Number** field.

Step 4 Configure all other required fields. For more information on the fields and their configuration options, see Online Help.

Step 5 Click **Save**.

Add Remote Destination

Use the following procedure to add a remote destination is a numerical address or directory URI that represents the other phones that the user owns (for example, a home office line or other PBX phone). A remote destination may be any off-cluster device. Unified Communications Manager automatically applies application dial rules to all remote destination numbers for CTI remote devices. By default, four remote destinations are supported per device. You can set the maximum number to 10 remote destinations per device in **End User Configuration** window.

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> **Note** You can determine which remote destination the Jabber client has set as Active by opening the **Phone Configuration** window from the Cisco Unified Communications Manager Administration interface.

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> **Note** Unified Communications Manager users can add remote destinations through the Cisco Jabber interface. For more information, see the Cisco Jabber for Windows Installation and Configuration Guide.
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> - Unified Communications Manager automatically verifies whether it can route calls to remote destinations that Cisco Jabber users add through the client interface.
> - Unified Communications Manager does not verify whether it can route calls to remote destinations that you add through the Cisco Unified Communications Manager Administration interface.

Procedure

Step 1	From Cisco Unified CM Administration, choose **Device** > **Phone**.
Step 2	Specify the appropriate filters in the **Find Phone Where** field to and then click **Find** to retrieve a list of phones.
Step 3	Select the CTI remote device from the list.
Step 4	Locate the **Associated Remote Destinations** section.
Step 5	Click **Add a New Remote Destination**.
Step 6	Enter the destination number in the **Destination Number** field.
	To use the remote destination with Cisco Jabber clients, you must configure the destination name as *JabberRD*.
Step 7	Configure the remaining fields in the **Remote Destination Information** window. For more information on the fields and their configuration options, see Online Help.
Step 8	Click **Save**.

Verify Remote Destination

Perform these steps to verify if the remote destination is successfully added for a user.

Procedure

Step 1	From Cisco Unified CM Administration, choose **Device** > **Phone**.
Step 2	Specify the appropriate filters in the **Find Phone Where** field to and then click **Find** to retrieve a list of phones.
Step 3	Select the CTI remote device from the list.
Step 4	Locate the **Associated Remote Destinations** section and verify that the remote destination is available.
Step 5	Click **Apply Config**.
	Note The Device Information section on the **Phone Configuration** window indicates when a remote destination is active or controlled by Cisco Jabber.

Associate User with Device

Procedure

Step 1	From Cisco Unified CM Administration, choose **User Management** > **End User**.
Step 2	Specify the appropriate filters in the **Find User Where** field to and then click **Find** to retrieve a list of users.
Step 3	Select the user from the list.
Step 4	Locate the **Device Information** section.

Step 5	Click **Device Association**.
Step 6	Find and select the CTI remote device.
Step 7	To complete the association, click **Save Selected/Changes**.
Step 8	From **Related Links** drop-down list, choose **Back to User**, and then click **Go**.
	The **End User Configuration** window appears, and the associated device that you chose appears in the **Controlled Devices** pane.

CTI Remote Device (CTIRD) Call Flows

Unified Communications Manager supports the separate calling party number and billing number feature when users are added as CTI Remote Device. Each CTI Remote Device is configured with the user directory number (DN) (for example, 2000) and a remote destination that represents any off-cluster device (for example, a PBX phone with the number +1 408 111 1111).

When a call is initiated from the PSTN network to a CTIRD line, Unified Communications Manager looks for FROM and PAID header information. The FROM header contains the external presentation name and number and PAID contains the identity of the user (that is a user's DN or DDI).

If FROM and PAID headers have different numbers and **Enable External Presentation Name and Number** check box is checked in its SIP profile and **Display External Presentation Name and Number** service parameter value set to *True*, then Unified Communications Manager displays the FROM header information on the called device. In the same way, if any one option is disabled,Unified Communications Manager displays PAID header information on the called device.

Similarly, in the outgoing call scenario a user calls from Remote Destination (CTIRD line) configured with **External Presentation Name** and **External Presentation Number** on Directory Number configuration page to a PSTN network through a SIP trunk with **Enable External Presentation Name and Number** configured in its SIP profile. Then, Unified Communications Manager send the External Presentation Information configured on the Directory Number Configuration page in the FROM header of the outgoing SIP message to display on the called device.

If **Enable External Presentation Name and Number** check box is unchecked, then Unified Communications Manager sends the directory number information in the FROM and PAID to display on the called device and configured External Presentation Information in the X-Cisco-Presentation header.

If you check the **Anonymous External Presentation** check box, the configured External Presentation Name and Number are removed from the respective fields and external presentation displayed as anonymous on the called device.

For more details on Configuring External Presentation Information, see the *Configure Directory Number* chapter in the System Configuration Guide for Cisco Unified Communications Manager.

Extend and Connect Interactions

Table 1: Extend and Connect Interactions

Feature	Interaction
Directory URI Dialing	Configure a Directory URI as the DN, remote destination, or both for the CTI remote device.
Unified Mobility	Extend and Support does not support moving active calls between a Cisco Unified IP Phone and a remote destination.
	If you want the capabilities of both Unified Mobility and Extend and Connect, you can configure the same remote destination on the Remote Device Profile and CTI Remote Device types when the Owner ID of both device types is the same. This configuration allows Cisco Mobility features to be used concurrently with Extend and Connect. The ability to configure the same remote destination on both device types is supported using Cisco Unified Communications Manager Release 10.0(1) or later.
	Do not configure remote destinations that are used with the Cisco Extend and Connect feature on Cisco Dual-mode for iPhone, Cisco Dual-mode for Android, and Carrier-integrated Mobile device types. Do not use prefixes to differentiate the same remote destination address. For example, 91-4085555555 and +1-4085555555 are treated as the same number.
Hunt List	The Extend and Connect feature allows users to receive hunt calls on remote destination phones under the following conditions: • The user has a Cisco Unified IP Phone. • The Cisco Unified IP Phone is available to answer hunt calls (logged-in/HLog). • Cisco Jabber is running in Extend and Connect mode.
CallerID Information	• The incoming caller ID information (name and number) is displayed on the Jabber client. • This information may also be displayed on the device, depending on your carrier and trunk configuration. • Outbound Dial Via Office calls to the remote destination display *Voice Connect* as the name and the trunk DID as the number. • Configure the trunk DID in the Unified CM Trunk Pattern, Route Pattern, or Cisco Gateway. This configuration may also be assigned by the carrier. The number field may display as blank if the trunk DID is not configured. • Outbound calls to the desired party display the CTI Remote Device Display Name and Directory Number (DN) as configured in Unified Communications Manager. • Remote destination numbers are never displayed to the called party.

Extend and Connect Restrictions

Table 2: Extend and Connect Restrictions

Restriction	Description
Maximum number of remote destinations	You can configure up to ten remote destinations for each CTI remote device. **Note** By default, four remote destinations are supported per device. You can set the maximum number to 10 remote destinations per device.
Off-cluster devices	• Remote destination numbers must represent off-cluster devices. • Remote destinations can be off-cluster URIs.
Directory numbers	You cannot configure directory numbers as remote destination numbers.
Cisco Jabber	Before you save the remote destinations that are configured using Cisco Jabber, verify if the remote destinations can be routed by the configured dial plan.
Application dial rules	Application Dial Rules are applied to all remote destinations that are configured on the CTI remote device through the Cisco Unified Communications Manager Administration interface and Cisco Jabber. **Note** Advise end users which number formats the Application Dial Rules are configured to support (for example, nn-nnn-nnnn, E.164, both).
Remote destination number	Each remote destination number must be unique within the cluster. **Note** Two or more users cannot use the same remote destination numbers.
Remote destination validation	• Remote destination numbers are validated using the CTI remote device reroute calling search space. • Remote destinations that are configured using the Cisco Unified Communications Manager Administration interface and AXL interface are not validated.
Consult transfer limitation	When a consult transfer is initiated from a CTI Remote Device to an internal IP phone or another extend and connect enabled device, no ringback is heard on the remote destination associated to the CTI Remote device which is initiating the transfer.
Call Forward Unregistered	Extend and Connect does not support Call Forward Unregistered Internal or Call Forward Unregistered External.
Route Next Hop By Calling Party Number	Extend and Connect does not support Translation Patterns when the "Route Next Hop By Calling Party Number" option is enabled.