Cisco Unified CME Telephony Service Provider 2.1 Setup Guide

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Introduction

Cisco Unified Communications Manager Express (Cisco Unified CME, formerly known as Cisco Unified CallManager Express) telephony service provider (TSP) 2.1 is a Windows driver-based telephony application programming interface (TAPI) you install and configure on your PC to handle Cisco Unified CME VoIP calls.

To enable a Cisco TAPI-based solution, your network must have the following components:

- A Windows PC with a TAPI-based application
- A Cisco Unified CME IP telephony system
- An IP phone username and password account on the Cisco Unified CME IP telephony system
- Access to Cisco Unified CME TSP 2.1 to install on your PC

Organization

The installation and configuration portion of this document contains the following sections:

- The "TSP Installation" section on page 3—Describes the installation process and options for loading Cisco Unified CME TSP 2.1
- The "Setup Wizard" section on page 8—Describes how to configure Cisco Unified CME TSP 2.1 using the Setup Wizard.
- The "Troubleshooting" section on page 26—Provides some common troubleshooting steps and problem reporting methods

Purpose

This document describes how to install and set up Cisco Unified CME TSP 2.1.

For more information on setting up Cisco Unified CME to enable TAPI services, see the Cisco Unified CME documentation available at www.cisco.com.

Audience

Cisco intends this document to be used by installers of TAPI-compatible Windows applications working in conjunction with Cisco Unified CME.

This document assumes that the installer possesses the required IP phone configuration information.

Related Documents

The following resources provide more information about TAPI specifications, creating an application to use TAPI, and TAPI administration:

- *Getting Started with Windows Telephony*
  http://www.microsoft.com/ntserver/techresources/commnet/tele/getstartedtele.asp
- *The Microsoft Windows Telephony Platform*
  http://www.microsoft.com/ntserver/techresources/commnet/tele/tapiwp.asp
- *Creating Next Generation Telephony Applications*
  http://www.microsoft.com/ntserver/techresources/commnet/tele/tapi21wp.asp
- *Windows Telephony Features with TAPI 2.1*
  http://www.microsoft.com/ntserver/techresources/commnet/tele/tapi21.asp
- *The Microsoft Telephony Application Programming Interface (TAPI) Programmer's Reference*
- *For the Telephony API, Press 1; For Unimodem, Press 2; or Stay on the Line*—A paper on TAPI by Hiroo Umeno a COMM and TAPI specialist at Microsoft
- *TAPI 2.1 Microsoft TAPI Client Management*
- *TAPI 2.1 Administration Tool*

Cisco Unified CME TSP 2.1 Components

Cisco Unified CME TSP 2.1 requires the following software:

- Cisco Unified Communications Manager Express:
  - Cisco Unified CME 3.3 with Cisco IOS release 12.4
  - Cisco Unified CME 4.0 with Cisco IOS release 12.4(4)XC or later
- Microsoft Windows 2000 or Windows XP
- A compatible TAPI application, like Microsoft Outlook, to utilize the TAPI driver

Note For more information about TAPI specifications, creating an application to use TAPI, or TAPI administration, see "Related Documents" section on page 2 and the *Cisco Unified CME TAPI Developers Guide* available at www.cisco.com.

Terminology

Table 1 defines some common terms denoting Cisco IP telephony components and entities.

Table 1   ***Terms***

Term	Meaning
Button	A physical button on an IP phone. A button can be configured as a line, as a speed dial hot key, or to provide access to features.
DCA	Dual Line Call Appearance—a button configuration that supports a two calls and directory numbers.
IP phone	Cisco telephones that use VoIP technology to provide business telephone service to users.
Line	An IP phone button configured with one or more directory numbers.
MCA	Monitored Call Appearance—a button configuration that monitors the state of another extension and provides idle and busy status.
Number	A directory number or a number you can dial to reach a telephone.
SCA	Single Call Appearance—a button configuration that supports a single call and directory number.
SD	Speed Dial—a button configuration that has a number associated with it. Pressing the button automatically dials that number.
TAPI	Windows Telephony Application Programming Interface.
TSP	Telephony service provider—TAPI driver for specific telephone systems.

TSP Installation

The Cisco Unified CME TSP 2.1 software allows you to control an associated IP phone or set up your PC to emulate an IP phone. The following sections describe how to download and install Cisco Unified CME TSP 2.1:

- Minimum System Requirements—This sections outlines the minimum system requirements to run Cisco Unified CME TSP 2.1.
- TSP Pre-Installation—This section provides a pre-installation overview including required network and phone configuration information.
- Installing Cisco Unified CME TSP 2.1—This section provides the steps necessary to install the Cisco Unified CME TSP 2.1 application files.

Minimum System Requirements

To use Cisco Unified CME TSP 2.1, your computer and network environment must meet the following minimum requirements:

- Pentium PC 600 MHz or higher
- 512 MB RAM or higher
- 10 MB available hard disk for TSP

- Microsoft Windows XP or Windows 2000
- Windows Socket version 2.0 or later
- USB version 1.1 or 2.0
- LAN, DSL, or higher network connection
- TCP/IP and UDP Protocol Support
- Audio Device such as headset or handset (if the TSP is configured as a softphone)

TSP Pre-Installation

You must address the following four pre-installation topics before you attempt to install Cisco Unified CME TSP 2.1:

- Required Network Information
- Acquiring Installation Files
- Required PC Access Rights
- Required Phone System Configuration Information

Required Network Information

To install and operate the TSP, you must have the following network connectivity and network configuration information:

- **IP connectivity to Cisco Unified CME**—The TSP must have access to Cisco Unified CME on your network. If you are planning to use the TSP from your office, you should be able to access the Cisco Unified CME router on the LAN.

  If you are dialing in to a Remote Access Server (RAS) or using a Virtual Private Network (VPN) connection via an ISP, you must connect to a Cisco Unified CME router using remote network access.

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  Note   If your network secures access via firewalls or other security components, ensure that you have access to the variety of TCP/IP ports necessary to accommodate VoIP services on your network.

- **Cisco Unified CME IP Address and Port**—You must have the IP address and TAPI port of the Cisco Unified CME router from your system administrator or service provider. By default, port 2000 is used for SCCP connections to the router.

- **IP phone Username and Password**—The TSP operates in one of two modes—control mode or emulation mode. In control mode, the TSP is associated with an IP phone. To connect to Cisco Unified CME, the IP phone must have a username and password configured.

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  Note   The password is case sensitive.

- **IP phone MAC Address**—In emulation or (softphone) mode, the TSP looks like a Cisco Unified 7960 IP phone to Cisco Unified CME. This IP phone needs to have a MAC address defined in the Cisco Unified CME configuration. Although referred to as a MAC Address, it is a unique device identifier. This MAC address is required by the Cisco Unified CME TAPI driver to register with the Cisco Unified CME Router.

- **IP phone Configuration**—The TSP controls or emulates an IP phone. This IP phone should be provisioned prior to setting up the TSP. You will need the telephone numbers, the number of buttons and the configuration of these mappings.

- **Audio Access Device**—If you are setting up the TSP to emulate an IP phone, then you should have the audio device available through which you will talk and listen to the caller. This can be an analog headset, a USB handset or a USB audio device such as a headset.

Acquiring Installation Files

To install Cisco Unified CME TSP 2.1, you must obtain the installation files:

- **Via access to download site**—The TSP installation files can be found at the Cisco.com software center. For the location on Cisco.com see the "Downloading the Installation Files" section on page 6 for the URL and executable file name.

- **Via a CD-ROM or email**—You can also install the software from a CD-ROM or from a file folder provided by your system administrator.

Required PC Access Rights

You must have local admin rights on your PC to install Cisco Unified CME TSP 2.1, as the installation process loads a number of system files on to your PC and updates the Windows registry.

Note If you are not logged in to the PC with the required access rights, the installation process may unexpectedly halt or even fail.

Required Phone System Configuration Information

The Cisco Unified CME TSP 2.1 Setup Wizard launches after the application files are copied to your PC. You must have the information summarized in Table 2 or Table 3—depending on whether you configure the TSP to operate in control mode or emulation mode—to initiate and complete the TSP configuration process.

Table 2   *TSP Controlling an IP Phone (Control Mode)*

Item	Description	Source
Cisco Unified CME router IP address	The network address of the Cisco Unified CME router	Service provider or system administrator
Cisco Unified CME TAPI port	The port number used to communicate with the Cisco Unified CME router. (This value is set to 2000 by default.)	Service provider or system administrator

Table 2   *TSP Controlling an IP Phone (Control Mode) (continued)*

Item	Description	Source
IP phone username	Username configured for the IP phone	Service provider or system administrator
IP phone user password	Password configured for the user on the IP phone	Service provider or system administrator
IP phone configuration	Directory numbers configured on the IP phone.	Can be automatically obtained
Button programming	The call appearances	Service provider or system administrator

Table 3   *TSP Emulating an IP Phone (Emulation Mode)*

Item	Description	Source
Cisco Unified CME router IP address	The network address of the Cisco Unified CME Router	Service provider or system administrator
IP phone MAC address	The MAC address configured for the IP phone	Service provider or system administrator
IP phone Configuration	Directory numbers configured on the IP phone	Can be automatically obtained
Button Programming	The call appearances	Service provider or system administrator

Installing Cisco Unified CME TSP 2.1

You can download and install Cisco Unified CME TSP 2.1 from the Web. The steps necessary to download and install the TSP are described in the following sections.

Downloading the Installation Files

Go to the following URL and download the **CiscoUnifiedCME_TSPSetup201.exe** installer that will install the Cisco Unified CME TSP 2.1 application files on your computer:

http://www.cisco.com/cgi-bin/tablebuild.pl/ip-iostsp

Note You must have a valid CCO log-in ID and password to access files in the Cisco Software Center. If you do not have CCO access, contact your Cisco Unified CME reseller or distributor.

Installing the Application Files

Perform the following steps to install the Cisco Unified CME TSP 2.1 application files:

Step 1 Double-click on the Cisco Unified CME TSP 2.1 installation file **CiscoUnifiedCME_TSPSetup201.exe** to launch the installation program.

Step 2 When the Cisco Unified CME TSP 2.1 installation window appears, review the license information and click **YES** to accept the terms and continue installation.

Step 3   When prompted, enter your name and company name and click **Next**.

Step 4   Review the installation information and click **Install**. The Cisco Unified CME TSP 2.1 files are copied to your PC and the Setup Wizard launches automatically.

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Note   Cisco recommends that you restart your PC after installing the TSP files to ensure the Windows registry updates and installation processes are correct.

Adding Cisco Unified CME TSP 2.1 to Windows

The Cisco Unified CME TSP 2.1 Setup Wizard automatically adds the TSP to Windows. Once the TSP has been installed on your PC, you can re-install the TSP from the Windows Control Panel if the TSP is accidentally uninstalled or is otherwise inaccessible.

Perform the following steps to add Cisco Unified CME TSP 2.1 to Windows:

Step 1   From the Windows Control Panel, choose **Phone and Modem Options** and click the **Advanced** tab.

Step 2   If Cisco Unified CME TSP 2.1 does not already appear in the list of available providers:

   a.   Click **Add**.

   b.   Select "Cisco Unified (SL) CME Telephony Service Provider" from the Telephony providers list.

   c.   Click **Add**.

Step 3   Click **OK** to close the **Phone and Modem Options** dialog box.

Removing Cisco Unified CME TSP 2.1 from Windows

Perform the following steps to remove Cisco Unified CME TSP 2.1 from Windows:

Step 1   From the Windows Control Panel, choose **Phone and Modem Options** and click the **Advanced** tab.

Step 2   Click on "Cisco Unified (SL) CME Telephony Service Provider" to highlight it.

Step 3   Click **Remove**.

Step 4   Click **OK** to close the **Phone and Modem Options** dialog box.

Re-Installing or Updating Cisco Unified CME TSP 2.1

If you re-install Cisco Unified CME TSP 2.1, the Installation Wizard detects the existing installation and gives you the following options:

• **Install a new instance of the TSP**—This option re-installs the TSP files on your PC.

• **Maintain or update the existing files**—This option allows you to modify, re-install, or remove the TSP application files.

Modify TSP Files

This option updates the Cisco Unified CME TSP 2.1 files on your system.

The Installation Wizard checks the current version of the TSP files on your PC against the version of the files you want to install and replaces any older files with the newer version.

Re-Install the TSP

This option uninstalls Cisco Unified CME TSP 2.1 and automatically re-installs an entirely new suite of application files, regardless of the current or install version.

Remove the TSP

This option uninstalls all of the Cisco Unified CME TSP 2.1 application files from your PC.

Setup Wizard

The Cisco Unified CME TSP 2.1 Setup Wizard allows you to specify operating parameters of the Cisco Unified CME TAPI driver to connect to Cisco Unified CME. The Setup Wizard also provides tools to validate the connection parameters and download the IP phone line configuration. The following sections describe how to launch and use the Cisco Unified CME TSP 2.1 Setup Wizard:

- Setup Wizard Overview
- Launching the Cisco Unified CME TSP 2.1 Setup Wizard
- Configuring Cisco Unified CME TSP 2.1

Setup Wizard Overview

Cisco Unified CME TSP 2.1 provides an easy-to-use, step-by-step guide to specify operating parameters for the Cisco Unified CME TAPI driver.

You can specify the following TSP parameters:

- **Mode of Operation**—The Setup Wizard allows you to specify whether the TSP operates in control mode where your PC controls the behavior and actions of an associated IP phone, or emulation mode, where you set up your PC to emulate an IP phone.

Note Cisco recommends that you configure the TSP to operate in control mode whenever possible. Emulation mode is only supported with Cisco Technology Developer Partner certified applications.

- **Use Preferences**—These options include connecting to the router at Windows startup, turning on the speaker when a call is made, and enabling logging to capture diagnostic trace information.
- **Account Information**—Specifies the IP address and the connection parameters the TSP requires to connect to Cisco Unified CME.
- **Verify Connections to Cisco Unified CME**—This allows you to verify the account information and connection status with Cisco Unified CME.

- **Call Appearances/Feature Buttons**—This feature allows you to define the lines (buttons) configured on the associated IP phone.

- **Audio Devices** (emulation mode only)—This selects the audio device for the ringer, playback (speaker), and recording (microphone).

- **Audio Tuning** (emulation mode only)—The tuning option sets the optimum levels for recording and playback devices.

- **Tone Files** (emulation mode only)—You can use this feature in emulation mode to customize Audio Device and Audio Tuning tones. (This feature is not yet supported.)

Launching the Cisco Unified CME TSP 2.1 Setup Wizard

You can launch the Cisco Unified CME TSP 2.1 Setup Wizard from the Windows Control Panel.

Figure 1   *Cisco Unified CME TSP 2.1 Setup Wizard*

Perform the following steps to launch the Cisco Unified CME TSP 2.1 Setup Wizard:

Step 1   Open the Windows Control Panel and select **Phone and Modem Options**. The Phone and Modem Options window appears.

Step 2   Click on the **Advanced** tab and highlight "Cisco Unified CME TSP 2.1."

Note   If the Cisco Unified CME TAPI driver is not displayed in the list, then click **Add** to insert it. If "Cisco Unified CME TSP 2.1" is not listed in the **Add Provider** dialog box, re-install the TSP according to the "Adding Cisco Unified CME TSP 2.1 to Windows" section on page 7.

Step 3 Highlight "Cisco Unified CME TSP 2.1" and click **Configure** to launch the Cisco Unified CME TSP 2.1 Setup Wizard.

Configuring Cisco Unified CME TSP 2.1

This section describes the configuration options for Cisco Unified CME TSP 2.1. Launch the Setup Wizard and click **Next** to step through the configuration choices for Cisco Unified CME TSP 2.1.

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Note If you are already familiar with the categories and options in the Setup Wizard, you can also click on a specific option to jump to that configuration screen instead of using the **Next** button.

Specifying the TSP Operation Mode

The Mode of Operation window allows you to specify the TSP operation mode. Cisco Unified CME TSP 2.1 can operate on one of two modes—control mode or emulation mode. The CME TSP Versions section displays the current and supported versions of Cisco Unified CME TSP, SCCP Protocol, and Setup Wizard.

*Figure 2   Mode of Operation Window (Default)*
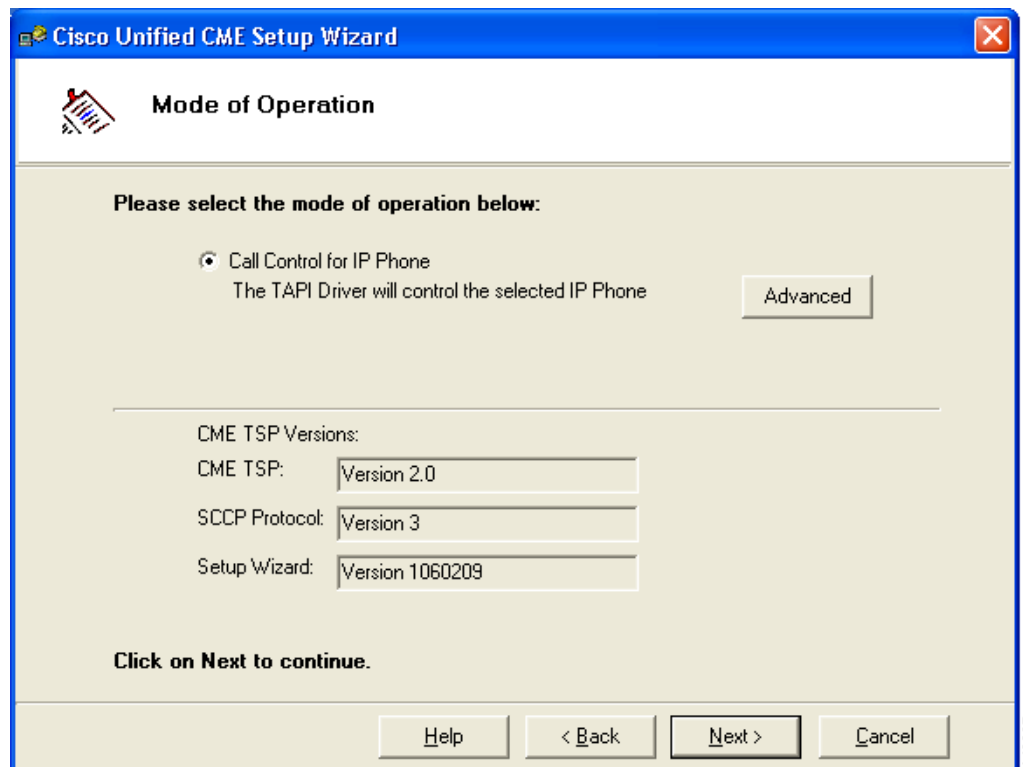
Perform the following steps to specify the TSP operation mode:

Step 1 Launch the Cisco Unified CME TSP 2.1 Setup Wizard and turn on the **Mode of Operation** option or click **Next** until you reach the Mode of Operation window.

Step 2 Do one of the following:

- To configure the TSP to operate in control mode, select the **Call Control for IP Phone** option. (Cisco recommends this option.)

- If you have a Cisco Technology Developer Partner Certified call control application installed and want to configure the TSP to operate in emulation mode, click **Advanced** to display the Mode of Operation dialog box, select either the **Call Control for IP Phone** (control mode) or **Call Control for Softphone Application with Media** (emulation mode) option to specify the TSP operation mode, and click **OK**. Control mode lets you remotely control an associated IP phone and emulation mode enables the media-handling capability of the TSP on your PC.

Figure 3   Mode of Operation Dialog Box

Note The **Call Control for Softphone Application with Media** option is supported only with Cisco Technology Developer Partner Certified application installations. The TSP application does not include a media-handling component. If you select this option without a media-handling softphone type of application already installed on your system, the TSP will not operate n and your installation will not be supported by the Cisco Technical Assistance Center (TAC).

Figure 4   *Mode of Operation Window (Following "Advanced" Configuration)*
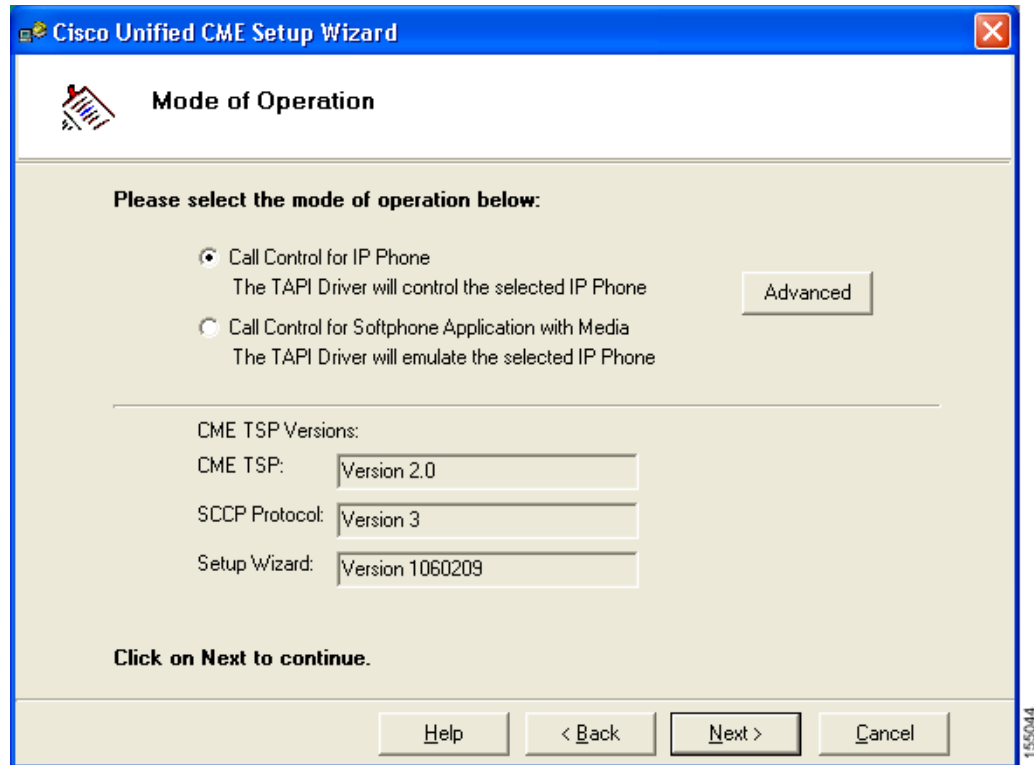
Step 3   Click **Next**.

Specifying User Preferences

The User Preferences window allows you to automatically connect to Cisco Unified CME when Windows launches, turn on the IP phone speaker when answering or initiating a call, and start a trace and specify the location of the trace log file.

Figure 5   User Preferences Window
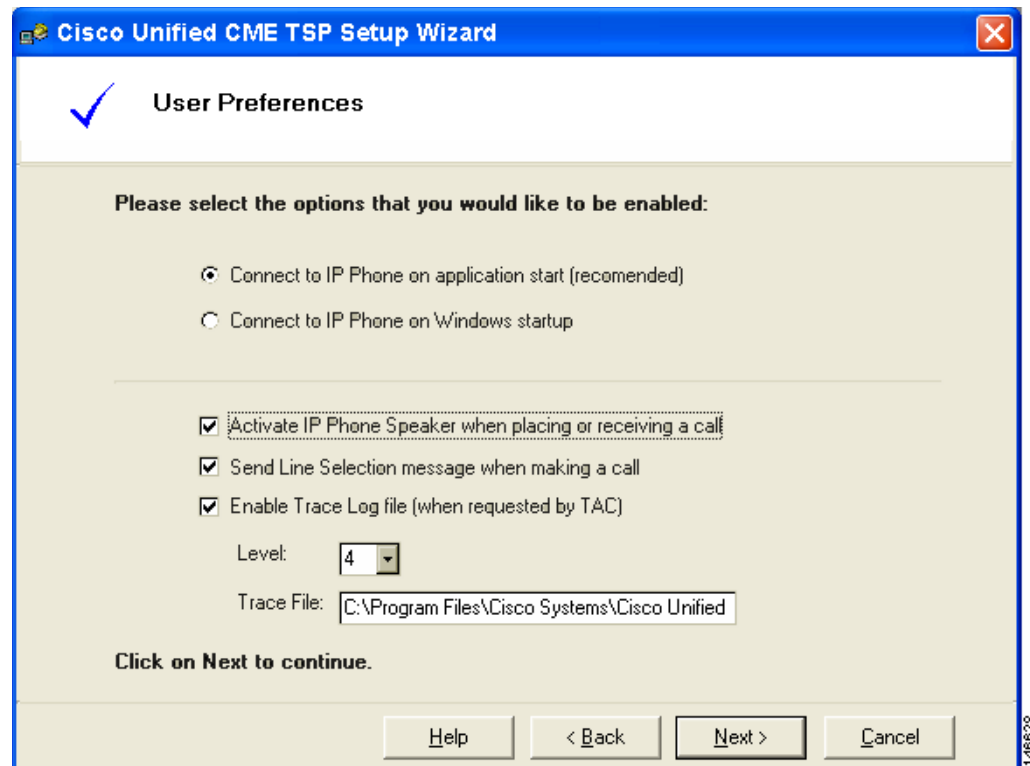
- **Connect to IP Phone on application start**—Select this option for Cisco Unified CME TSP 2.1 to register with Cisco Unified CME when the TAPI application starts. Cisco recommends this option for startup operation.
- **Connect to IP Phone on Windows startup**— Select this option for Cisco Unified CME TSP 2.1 to automatically start and register with Cisco Unified CME when Windows launches.

> **Note**   The **Connect to IP Phone on Windows startup** option is useful for MS-Outlook type applications that open and close a TAPI session every time a call is made. Unless such applications are in use, Cisco recommends that you leave the option disabled.

- **Activate IP Phone Speaker when placing or receiving a call**—If the handset is on-hook, then the speaker on the IP phone is only turned on when a new call is made or when a call is answered.
- **Send Line Selection message when making a call**—This allows an application to select a specific line appearance when making a call. Otherwise the default line is selected.

> **Note**   On single line phones, this option needs to be turned off.

- **Enable Trace Log file**—The trace log file can help technical support isolate problems you may be experiencing. Normally, this option should remain disabled. If you are experiencing problems, however, your system administrator or other technical support person may ask you to turn on tracing and email them the trace file.

Perform the following steps to enable or disable user preferences:

Step 1 Launch the Cisco Unified CME TSP 2.1 Setup Wizard and turn on the **User Preferences** option or click **Next** until you reach the User Preferences window.

Step 2 Select one of the startup options to specify IP phone connection behavior—either **Connect to IP Phone on application start** or **Connect to IP Phone on Windows startup**.

Step 3 Enable or disable these options (A check mark indicates that the option is enabled):

- **Activate IP Phone Speaker when placing or receiving a call**
- **Send Line Selection message when making a call**
- **Enable Trace Log file**

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> **Note** When you enable tracing, you should also specify the filename and the network path where the resulting trace log file is written.

Step 4 Click **Next**.

Specifying Cisco Unified CME Account Information

The Account Information window allows you to enter the Cisco Unified CME account information necessary to establish connection between the TSP and Cisco Unified CME.

Figure 6   Account Information Window (Control Mode)

The account information you enter specifies Cisco Unified CME's network location, access parameters, and type of IP phone the TAPI driver uses during system operation. The information you specify is different for each of the two TSP operational modes—control mode and emulation mode. In control mode, you specify the IP phone username and password. In emulation mode, you specify your PC's MAC address or an IP phone's device ID.

The following information is required to connect the TSP to Cisco Unified CME.

- **PC Device ID/MAC Address**—The MAC address or virtual MAC address (VMAC) of your PC or the device ID of the associated IP phone. If the TSP is operating in control mode, the Setup Wizard automatically populates this field.

- **Cisco Unified CME IP Address**—The IP address of the Cisco Unified CME router

- **TCP/IP Port for SCCP**—The TCP/IP port number used to communicate with the Cisco Unified CME router. By default, port 2000 is used for SCCP connections to the router.

- **IP Phone User Name (control mode only)**—An IP phone controlled by the TSP must be configured with a username and password. The TSP registers with Cisco Unified CME using this username and password. The username is uniquely associated with an IP phone.

- **IP Phone Password** and **Verify Password (control mode only)**—The password configured for the IP phone username.

- **Region/Service Provider**—The geographical location of your service provider. (This setting helps ensure that the TSP passes appropriate local and long-distance phone number formats to Windows.)

Perform the following steps to specify Cisco Unified CME account parameters:

Step 1 Launch the Cisco Unified CME TSP 2.1 Setup Wizard and turn on the **Account Information** option or click **Next** until you reach the Account Information window.

Step 2 If the TSP is operating in control mode, the TSP automatically populates the **PC Device ID/MAC Address** field with the associated IP phone's device ID. If the TSP is operating in emulation mode, enter your PC's MAC address or virtual MAC address (VMAC) in this field.

> **Note** If you enter an incorrect MAC address or device ID and automatic registration is configured on Cisco Unified CME, Cisco Unified CME automatically creates a record with that MAC address or device ID. If you initiate an erroneous entry when automatic registration is configured, you must access the appropriate Cisco Unified CME administration screens to delete it.

Step 3 Enter the Cisco Unified CME IP address in the **CME IP Address** field.

Step 4 If you select control mode:

 a. Enter the Cisco Unified CME router port number listening for IP phone and softphone traffic in the **TCP/IP Port for SCCP** field. This value is set to 2000 by default.

 b. Enter a valid Cisco Unified CME username in the **IP Phone User Name** field. The username is case-sensitive and must exactly match the Cisco Unified CME setting.

 c. Enter the password associated with the username you specified in step b in both the **IP Phone Password** and **Verify Password** fields The password is case-sensitive and must exactly match the Cisco Unified CME setting.

Step 5 Select your geographical location from the **Region/Service Provider** menu.

Step 6 Click **Next**.

Verifying Connection to Cisco Unified CME

The Connections to CME window allows you to verify the account parameters entered in the Account Information window, verify network connectivity to Cisco Unified CME, and download the IP phone button configuration from Cisco Unified CME. The features in the Connections to CME window are optional and designed to provide an additional convenient method to load IP phone configuration

information. If you are unable to connect and download IP phone configuration information, you can still manually configure the TSP. You can still define and customize the IP phone settings using the basic and advanced portions of the Call Appearance/Feature Button window.

Figure 7   Connections to CME Window
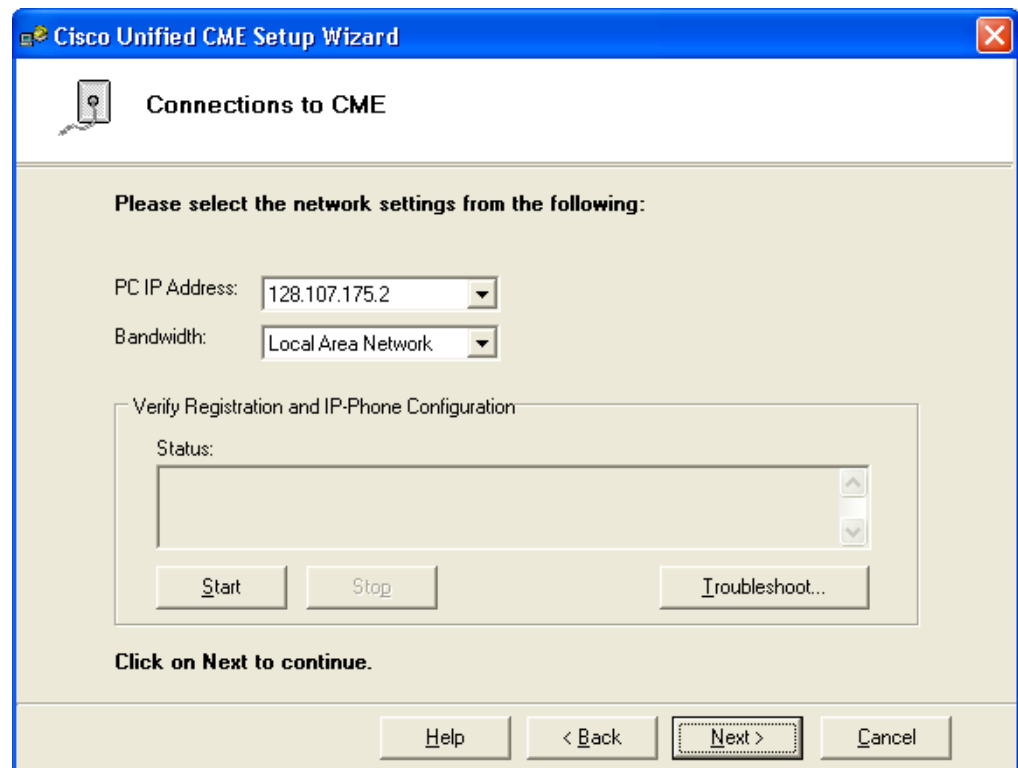
- **PC IP Address**—This is the IP address of the PC on which the TAPI driver is installed. If your PC features multiple network connections, this setting allows you to specify the network over which the PC connects to Cisco Unified CME.

- **Bandwidth**—The bandwidth parameter determines whether the TSP uses the G.711 codec or a lower bandwidth codec. For the Local Area Network, DSL, and Cable Modem selections, the TSP uses the G.711 codec. For all other selections, the TSP uses the G.729 codec.

Note   The **Bandwidth** parameter is only valid when in emulation mode.

Perform the following steps to verify Cisco Unified CME account parameters and connectivity:

Step 1   Enter the IP address of the PC where the TAPI driver is installed in the **PC IP Address** field.

Step 2   Select the appropriate network connection type from the **Bandwidth** drop-down list.

Step 3   Click **Start**. The Cisco Unified CME TSP 2.1 Setup Wizard pings the Cisco Unified CME IP address via the PC IP address you specified in step 1.

- If the PC IP address does not respond, the TSP displays the following message:

   Error: Host "xxx.xxx.xxx.xxx" is not responding

- If the PC IP address responds, the TSP displays the following message:

Found Router "xxx.xxx.xxx.xxx"

- If the MAC address or username and password are incorrect, or if another application already has a TAPI session established with the specified IP phone, the TSP displays the following message:

Error: Cannot register user. Invalid IP address, User Name or Password

- If the TSP is able to successfully connect to Cisco Unified CME, the TSP displays the following message:

Success: Registered user with "xxx.xxx.xxx.xxx"

> **Note** If the TSP is able to successfully connect to Cisco Unified CME, the output is also followed by a list of downloaded configuration entries.

**Step 4** Click **Next**.

> **Note** In emulation mode, if you enter a MAC address or device ID that does not exist on the Cisco Unified CME router and Cisco Unified CME is configured to use automatic registration, Cisco Unified CME automatically creates a new record based on your input. The new record, however, does not feature any configuration. In this situation, the Setup Wizard prompts you with a warning indicating that no numbers are configured for this entry.

Defining Phone Button Types and Labels

The Call Appearance/Feature Buttons window allows you view and map the buttons corresponding to your particular IP phone with the Cisco Unified CME TAPI driver.

Figure 8   Call Appearance/Feature Buttons Window (Default View)
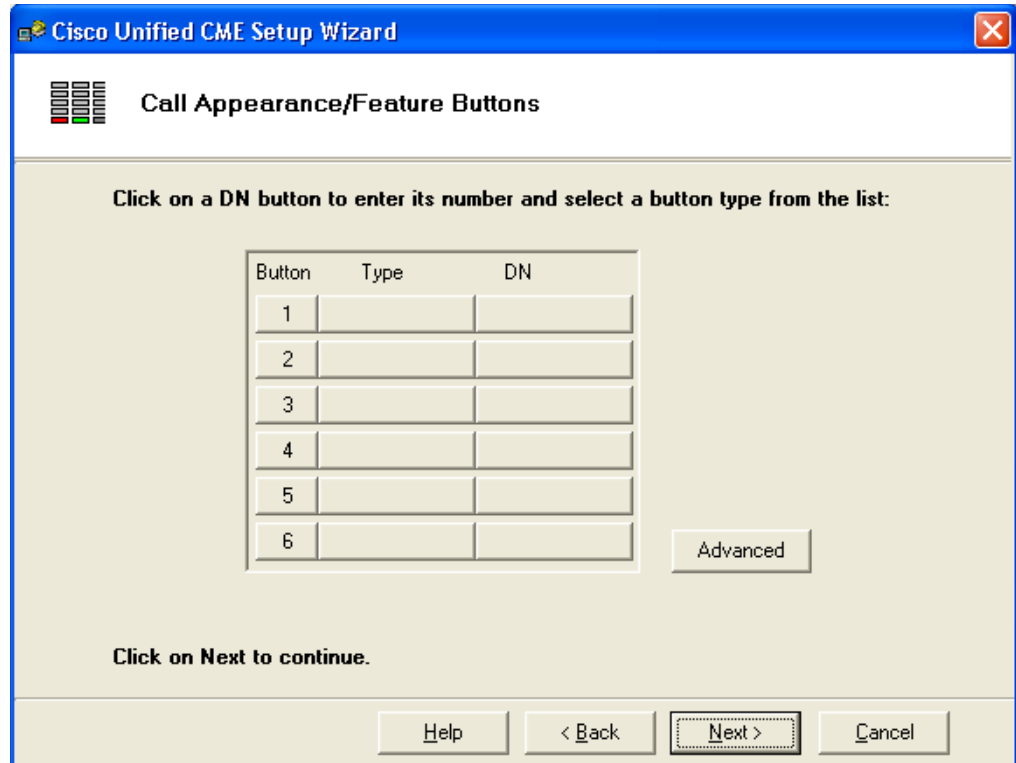
You can configure a Type and dialed number (DN) combination in the Call Appearance/Feature Buttons window for each physical button on an IP phone. To change a button type, click on the Type identifier in the appropriate column and select the button type from the associated drop-down menu. To change a button label, click on the DN identifier in the appropriate column and enter a number or select the button label from the associated drop-down menu.

If the Cisco Unified CME connection is successful according to the steps in the "Verifying Connection to Cisco Unified CME" section on page 16, the Setup Wizard automatically downloads the DN configuration from Cisco Unified CME. The Type information, however, is not automatically configured and you must specify button type information in all cases.

The Cisco Unified CME TAPI driver supports the following button types:

Dual Ln	Dual Line Call Appearance button
Single	Single Call Appearance button
Monitor	Monitored Call Appearance button (This option is not yet supported.)
Park	Park Slot Monitoring button (This option is not yet supported.)
Shared	Shared Call Appearance button (This option is not yet supported.)
Feature	Feature button (This option is not yet supported.)

Note The TAPI driver only displays the Dual Line Call Appearance (Dual Ln) and Single Call Appearance (Single) buttons configured on the IP phone. Other button names and definitions are not supported, nor are they required to successfully configure the TSP.

The TAPI driver supports a total of 64 buttons. An IP phone associated with the TAPI driver features up to 34 buttons.

Perform the following steps to specify button types and DN combinations:

Step 1 Click on the Type identifier for the button you want to define and select the appropriate button type from the associated drop-down list. The button type is set to Dual Line Call Appearance by default.

Note The TAPI driver only displays the Dual Line Call Appearance (Dual Ln) and Single Call Appearance (Single) buttons configured on the IP phone. Other button names and definitions are not supported, nor are they required to successfully configure the TSP.

Step 2 Click on the DN identifier for the button you want to define and select the appropriate button label from the associated drop-down list.

Note If you select the Call Appearance button, you must also enter a number defining that button.

Step 3 If your IP phone requires a more robust set of buttons than those displayed on the basic Call Appearance/Feature Buttons window:

a. Click **Advanced**. A similar window appears featuring up to 60 configurable buttons and additional options to specify the Line Preference and Ringing Tone.

**Figure 9** *Call Appearance/Feature Buttons Window ("Advanced" View)*
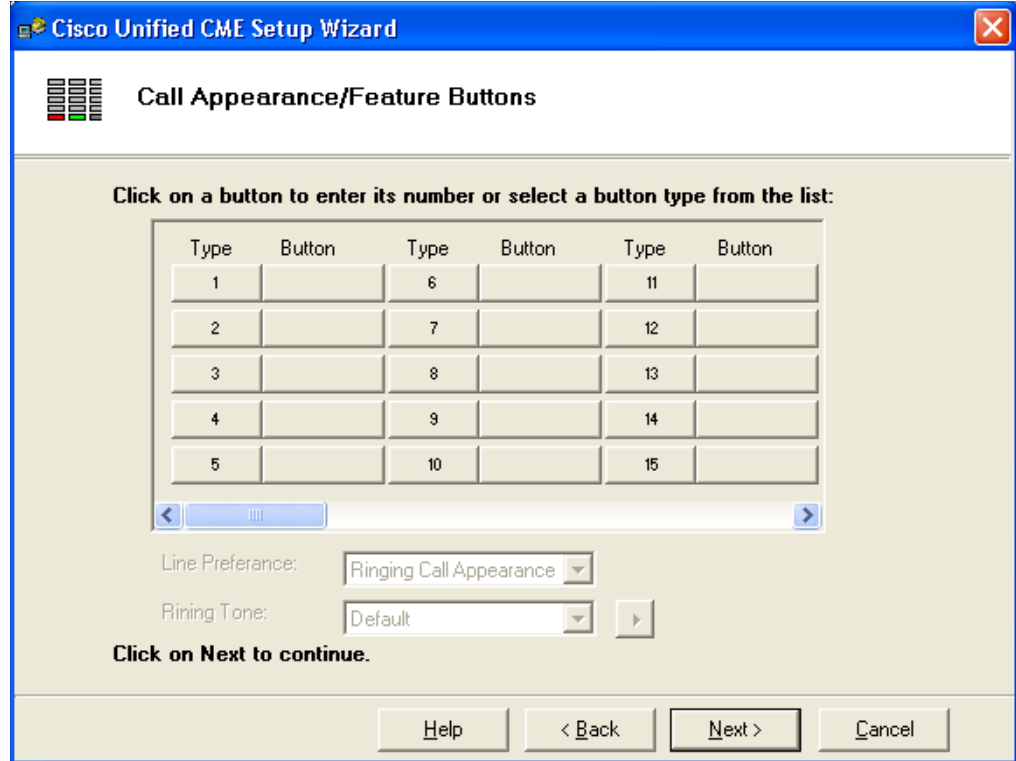
b. Configure the buttons corresponding to your IP phone just as in Step 1 and Step 2, above.

Step 4 When you have set the button types and labels, click **Next**.

Specifying Audio Devices

The Audio Devices window allows you to specify the alerting, playback, and recording audio devices when you use a PC with a softphone-type of application to emulate an IP phone in emulation mode. If you customize the settings in this window, you must ensure that the device source exists and is properly configured, or you may encounter problems with your audio device settings.

Figure 10   Audio Devices Window
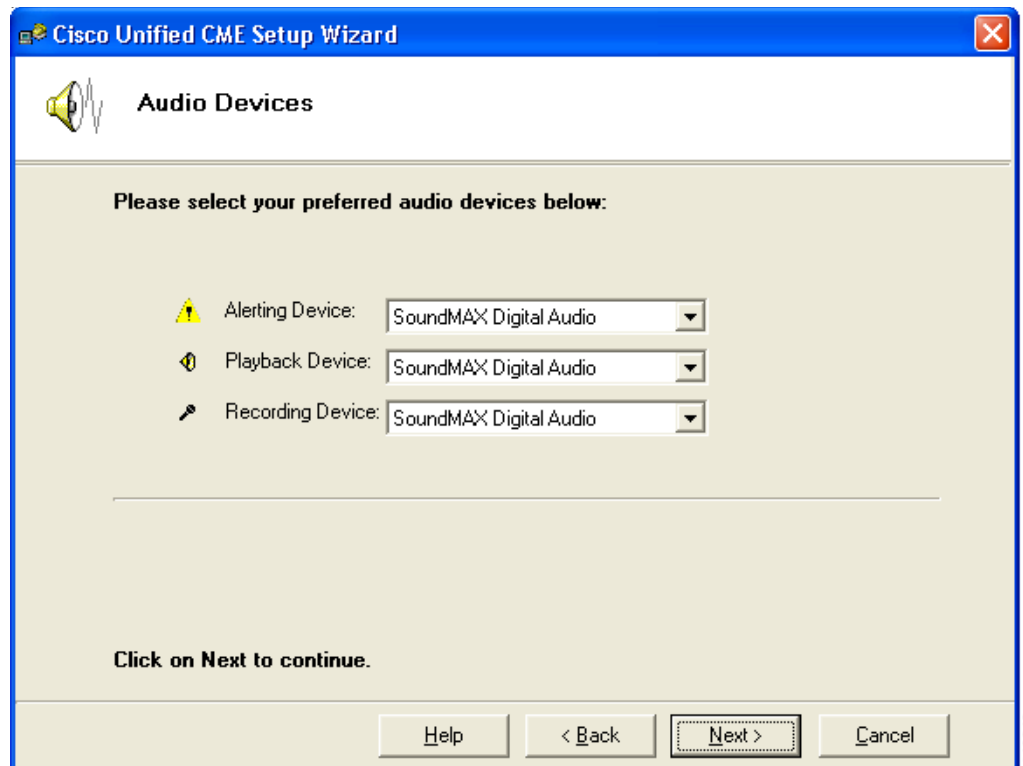
- **Alerting Device**—This audio device plays ring tones.
- **Playback Device**—The playback audio device produces call status tones (such as dial tone or busy tone) as well as incoming speech during a call.
- **Recording Device**—The recording audio device transmits speech to the other party on the call.

Note
- Cisco recommends that you specify the PC speaker for the Alerting Device and set the audio level for the incoming ring tones.
- The Playback and Recording devices should be good quality headsets or handsets for call-handling applications.

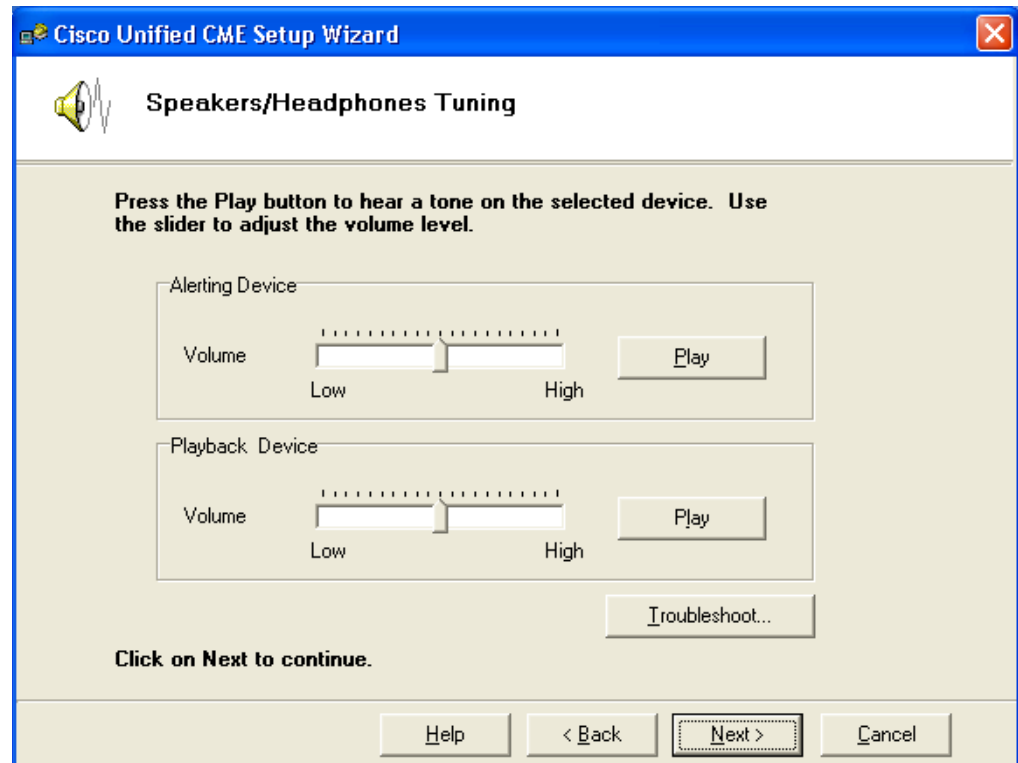Perform the following steps to specify the audio devices:

Step 1   Select audio devices from the **Alerting Device**, **Playback Device**, or **Recording Device** drop-down menus, as appropriate.

Step 2   When you have specified the alerting, playback, and recording audio devices, click **Next**.

Setting Volume Levels

The Speakers/Headphones Tuning window allows you to set the audio level for the alerting and playback devices when you use your PC to emulate an IP phone in emulation mode.

*Figure 11   Speakers/Headphones Tuning Window*

Perform the following steps to set the audio level for the alerting or playback device:

Step 1   Click **Play** to hear a sample device tone.

Step 2   Use the **Volume** slider to set the volume level.

Step 3   When both the Alerting Device and Playback Device volume levels are set, click **Next**.

Setting the Microphone Level

The Microphone Tuning window allows you to set the sensitivity level for the microphone when you use your PC to emulate an IP phone in emulation mode.

Figure 12   Microphone Tuning Window
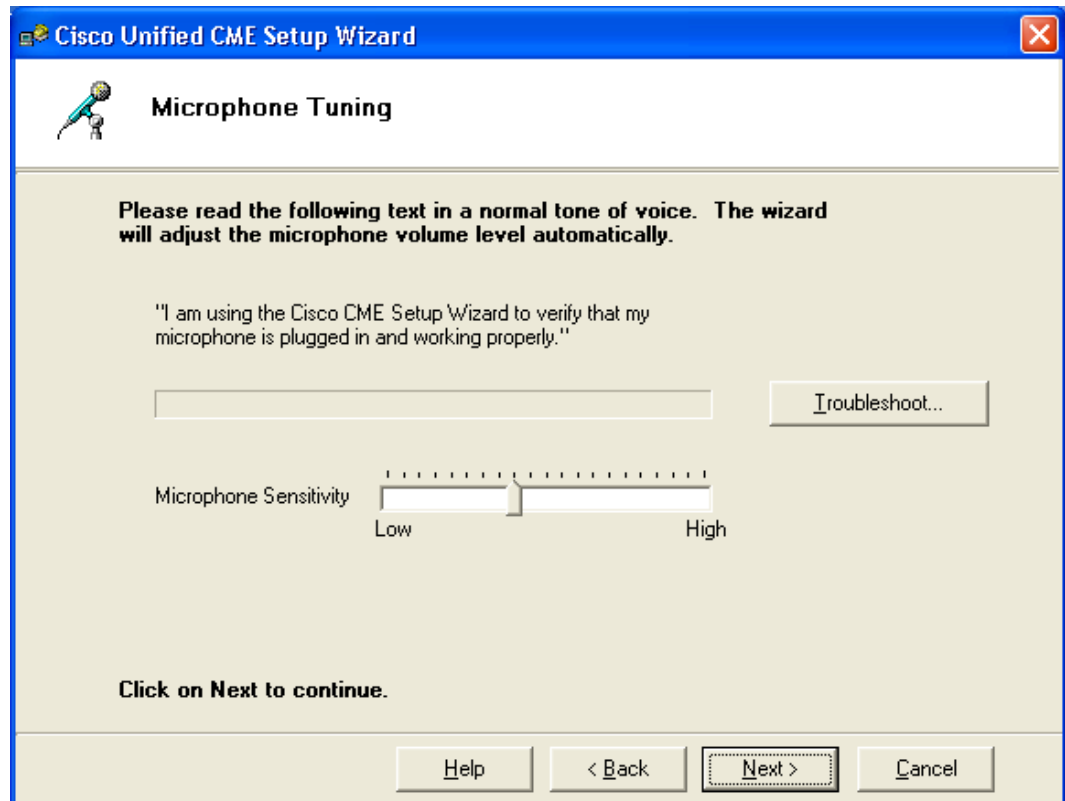
Perform the following steps to set the microphone level:

Step 1   Speak into the microphone. The level displayed on the Microphone Sensitivity bar automatically adjusts to the most appropriate level.

Step 2   When the level is set, click **Next**.

Finalizing Installation and Configuration

The Saving Configuration Changes window allows you to complete the Cisco Unified CME TSP 2.1 configuration process or go back and verify all of your settings to ensure proper configuration before you exit the Setup Wizard.

Figure 13   Saving Configuration Changes Window
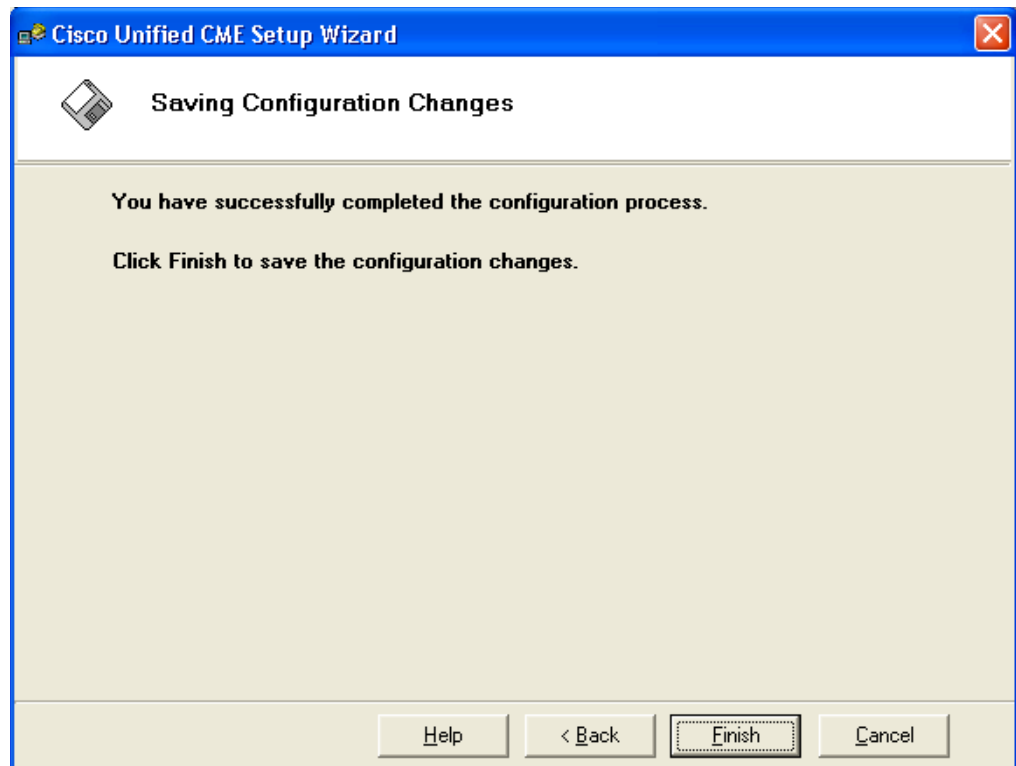
To finalize the Cisco Unified CME TSP 2.1 configuration process, click **Finish** and restart your computer to activate the new configuration or changes to the configuration you implement during your Setup Wizard session. If you want to go back and double-check your configuration, use the **Back** button to review your settings to ensure proper configuration.

Troubleshooting

This section contains procedures and troubleshooting information designed to help diagnose potential problems installing and configuring Cisco Unified CME TSP 2.1.

Cisco Unified CME TSP 2.1 Option Missing

Problem Description

Cisco Unified CME TSP 2.1 does not appear in the Phone and Modem Options control panel window or in the list of TAPI drivers.

Possible Causes

- The TSP has not been added to the Windows system
- The TSP was incorrectly installed
- The TSP was removed from the Phone and Modem Options control panel window
- One or more Cisco Unified CME TSP 2.1 files have been deleted

Corrective Action

Ensure that you have performed the steps in the "Adding Cisco Unified CME TSP 2.1 to Windows" section on page 7.

The TSP Returns a "Host Not Responding" Message

Problem Description

After you click **Start** in the Connections to CME window to verify Cisco Unified CME connection, the "Host Not Responding" error message appears. The Setup Wizard tries to ping the Cisco Unified CME IP address to verify network connectivity.

Possible Causes

- You may have entered an invalid IP address for Cisco Unified CME
- You cannot access Cisco Unified CME from your PC due to network security constraints
- Cisco Unified CME is not running

Corrective Action

Step 1   Verify that the Cisco Unified CME IP address is correct in the Setup Wizard Account Information window. If necessary, re-enter the information and verify connectivity using the Setup Wizard Connections to CME window.

Step 2   If you still cannot ping Cisco Unified CME, contact your Cisco Unified CME system administrator or service provider to verify network address and connectivity.

TSP Cannot Register User with Cisco Unified CME

Problem Description

The TSP can "see" and ping Cisco Unified CME, but cannot register.

Possible Causes

- You may have entered an invalid username and password
- Another TSP is running and using the same IP phone
- The IP phone has not been configured with a username and password

Corrective Action

Step 1   Verify that the Cisco Unified CME IP address is correct in the Setup Wizard Account Information window. If necessary, re-enter the information and verify connectivity using the Setup Wizard Connections to CME window.

Step 2   If the Setup Wizard still displays an error, contact your Cisco Unified CME system administrator or service provider to verify network address and connectivity.

Secondary Dialing Feature Not Functioning

Problem Description

When you try to transfer a call, the IP phone gets dial tone, but the TAPI application does not show the new call in dialing state.

Possible Causes

The most probable cause for this problem is having incorrectly specified the line or call appearance type in the Call Appearance/Feature Button window. If a Dual Line Call Appearance button is configured in the Setup Wizard as a Single Call Appearance, you cannot initiate the second call.

Note   The TAPI driver only displays the Dual Line Call Appearance (Dual Ln) and Single Call Appearance (Single) buttons configured on the IP phone. Other button names and definitions are not supported, nor are they required to successfully configure the TSP.

Corrective Action

Change the button Type to Dual Line Call Appearance according to the "Specifying the TSP Operation Mode" section on page 10.

The TAPI Driver Cannot Interact with the IP Phone

Problem Description

The buttons on the IP phone can be configured as Single Call Appearances or Dual Line Call Appearances. You must manually configure the Type information using the Setup Wizard. Otherwise, the TAPI driver cannot correctly interact with the IP phone.

Possible Causes

The IP phone and the Cisco Unified CME TAPI driver configurations do not match.

Corrective Action

Step 1 From the Windows Control Panel, choose **Phone and Modem Options** and click on the **Advanced** tab.

Step 2 Select "Cisco Unified CME Telephony Service Provider" and click **Configure**.

Step 3 Configure the Type information for the buttons on your IP phone according to the "Defining Phone Button Types and Labels" section on page 19.

Cannot Hear Ring Tones or Calling/Called Party Speech

Problem Description

The ringing function is too low or silent, you cannot hear the caller, or the other party cannot hear you.

Possible Causes

- The intended audio device may not have been selected or the volume level is set too low
- The audio device may have been disconnected after the last configuration
- The audio device may feature a mute or external volume control setting that is affecting behavior
- The Windows volume control or settings in the TSP Speakers/Headphones Tuning window may be set too low

Corrective Action

Ensure that the audio device you are using is connected to your PC and verify that the volume settings on the device are set correctly.

If you are still experiencing problems:

Step 1 From the Windows Control Panel, choose **Phone and Modem Options** and click on the **Advanced** tab.

Step 2 Select "Cisco Unified CME Telephony Service Provider" and click **Configure**. The Cisco Unified CME Setup Wizard launches.

Step 3 Verify your audio device specifications and settings according to the "Specifying Audio Devices" section on page 22, "Setting Volume Levels" section on page 23, and "Setting the Microphone Level" section on page 24.

If you still have problems, try to verify the device specifications and volume settings for these audio devices using the appropriate Windows Sounds and Audio Devices control panel.

Incorrect TSP Operating Mode

Problem Description

The TSP is set up to control an associated IP phone, but you want your PC to emulate an IP phone, or your PC is currently set up to emulate an IP phone, but you want calls to terminate at an IP phone— not your PC.

Possible Causes

The TSP has likely been set to a different mode of operation. The TSP supports two modes of operation—control mode and emulation mode. In control mode, the TSP is associated with an IP phone and controls the calls on that device. In emulation mode, you configure your PC to respond and behave like an IP phone.

Corrective Action

Step 1 From the Windows Control Panel, choose **Phone and Modem Options** and click on the **Advanced** tab.

Step 2 Select "Cisco Unified CME Telephony Service Provider" and click **Configure**. The Cisco Unified CME Setup Wizard launches.

Step 3 Click **Mode of Operation** and ensure you have selected the appropriate mode according to the "Specifying the TSP Operation Mode" section on page 10.