



Cisco Unified Presence Fundamentals

Learn how to use Cisco Unified Presence Server and Client to streamline communication and improve business agility



Cisco Unified Presence Fundamentals

Brian Morgan, CCIE No. 4865

Shane Lisenbea

Michael C. Popovich III, CCIE No. 9599

Copyright© 2010 Cisco Systems, Inc.

Published by:

Cisco Press

800 East 96th Street

Indianapolis, IN 46240 USA

All rights reserved. No part of this book may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording, or by any information storage and retrieval system, without written permission from the publisher, except for the inclusion of brief quotations in a review.

Printed in the United States of America

First Printing June 2010

Library of Congress Cataloging-in-Publication Data:

Morgan, Brian (Brian Edward)

Cisco Unified Presence fundamentals / Brian Morgan, Shane Lisenbea, Michael Popovich III.
p. cm.

ISBN 978-1-58714-044-0 (pbk.)

1. Telecommunication—Message processing. 2. Internet telephony. 3. Multimedia communications.
I. Lisenbea, Shane, 1970– II. Popovich, Michael, 1973– III. Cisco Systems, Inc. IV. Title.

TK5102.5.M654 2010

006.7—dc22

2010019260

ISBN-13: 978-1-58714-044-0

ISBN-10: 1-58714-044-6

Warning and Disclaimer

This book is designed to provide information about Cisco Unified Presence. Every effort has been made to make this book as complete and as accurate as possible, but no warranty or fitness is implied.

The information is provided on an “as is” basis. The authors, Cisco Press, and Cisco Systems, Inc. shall have neither liability nor responsibility to any person or entity with respect to any loss or damages arising from the information contained in this book or from the use of the discs or programs that may accompany it.

The opinions expressed in this book belong to the author and are not necessarily those of Cisco Systems, Inc.

Trademark Acknowledgments

All terms mentioned in this book that are known to be trademarks or service marks have been appropriately capitalized. Cisco Press or Cisco Systems, Inc., cannot attest to the accuracy of this information. Use of a term in this book should not be regarded as affecting the validity of any trademark or service mark.

Introduction

Unified Communications and Collaboration is on the so-called “Hot List” in any forum wherein people are discussing communications and ways to better stay in touch. This book is aimed at explaining the concepts, ideas, and capabilities behind Presence, which is likely one of the least understood and most underestimated features in a Unified Communications solution. It has the power to end phone-tag before the game even begins. It has the power to ensure that you reach the right resource by the right means and on the first attempt.

Goals and Methods

The most important and somewhat obvious goal of this book is to explain not only the concepts behind Presence but also the technologies involved, their interdependencies, and how to troubleshoot them. It is understood that knowing a concept is not sufficient in and of itself. There must be comprehension and direction; a primer of sorts. With that in mind, some discussion of practical applications of Presence as a technology has also been addressed herein.

The book has been organized such that you might begin with little or no knowledge of Presence as a concept. The ideas behind it, installation and deployment of the technologies, and some possible applications are discussed to show some basic capabilities. It is largely up to you to decide how to best utilize these technologies within your organization; However, we assist in getting things moving in the right direction.

Who Should Read This Book?

This book is not designed to be a general networking topics book, although it can be used for that purpose. It is meant to be a reference before, during, and after the implementation of Cisco Unified Presence. It is both a guide and a reference resource. This book is intended to assist in understanding, installing, deploying, and troubleshooting numerous aspects of Cisco Unified Presence. In being so, it will be quite specific in those places where it is most important. With the installation out of the way, much of the level of specificity herein will disappear. This is due to the authors’ desire to avoid placing impediments to imagination. Unified Communications and Collaboration solutions are intended to be customized to fit a particular environment, solve business needs, and transform the way in which business is done. As you read this book, you can apply the information to your own environment and shape it into your own solution to meet your needs and that of your business.

How This Book Is Organized

As mentioned, this book is both a reference and a guide. It walks you through the installation process and detail interdependencies between various systems within a Cisco Unified Communications environment. So it might be of most benefit to read the book

cover-to-cover prior to stepping into an installation effort. You can likely learn things in the troubleshooting chapter that can save you some pain in the installation phase, for example. The outline of the book is as follows:

- **Chapter 1, “What Is Unified Communications?”**—This chapter provides a high-level tour of Unified Communications components. The purpose of doing so is to provide a base upon which a solid understanding of Presence and its uses can be built.
- **Chapter 2, “Cisco Unified Presence Overview”**—This chapter provides an introduction to Presence as a concept before getting deeper into Presence features and functionality. This provides a better understanding of the concepts discussed in the remainder of the book surrounding both the Presence Server and Presence clients.
- **Chapter 3, “Installing Cisco Unified Presence Server 7”**—This chapter provides a step-by-step guide to installing Cisco Unified Presence Server 7.x. It also discusses in detail the interdependencies between the Cisco Unified Presence Server and the Cisco Unified Communications Manager, as well as the configuration of those interdependencies.
- **Chapter 4, “Cisco Unified Presence Integration with Cisco Unified Communications Manager”**—This chapter provides a deeper view of the combined functional capabilities of Cisco Unified Presence and Cisco Unified Communications Manager. It covers LDAP integration and configuration along with user and phone feature association.
- **Chapter 5, “Cisco Unified Personal Communicator”**—This chapter covers the installation and configuration of the Cisco Unified Personal Communicator. Aside from simply installing the client, this chapter discusses the interdependencies between user, desk phone, and CUPC client as they relate to one another. The configuration includes not only the Cisco Unified Presence Server dependencies, but also those within the Cisco Unified Communications Manager.
- **Chapter 6, “Cisco Unified Presence Practical Applications”**—This chapter provides some general use cases for Presence as a feature. It looks into how Presence might be used by a varied user base with varied needs and provides some high-level case studies of features that different types of users might utilize.
- **Chapter 7, “Cisco Unified Presence Federation”**—This chapter discusses needs and configuration of both intradomain federation and intradomain federation with Cisco Unified Presence Server clusters. It also goes into the basics of interdomain federation with Microsoft OCS.
- **Chapter 8, “Leveraging Cisco Unified Presence in Vertical Markets”**—This chapter provides a use-case overview of how varying types of businesses might utilize the feature set provided by Cisco Unified Presence.
- **Chapter 9, “Troubleshooting Cisco Unified Presence”**—This chapter covers the troubleshooting aspect of Cisco Unified Presence. This includes troubleshooting the Cisco Unified Presence Server, Cisco Unified Personal Communicator, and Cisco Unified Communications Manager and the interdependencies between all these elements.

Cisco Unified Personal Communicator

Cisco Unified Personal Communicator (CUPC) is the client application that integrates into the Cisco Unified Presence Server (CUPS). This client runs on a Windows or Macintosh desktop environment and provides for several integrated communications features such as desk phone control, Instant Messaging (IM), Presence, softphone, communication escalation, and so on. This chapter covers the client installation, configuration, basic and advanced features, and client-side troubleshooting.

Figure 5-1 illustrates the communications in a basic CUP deployment with an IP phone and CUPC client.

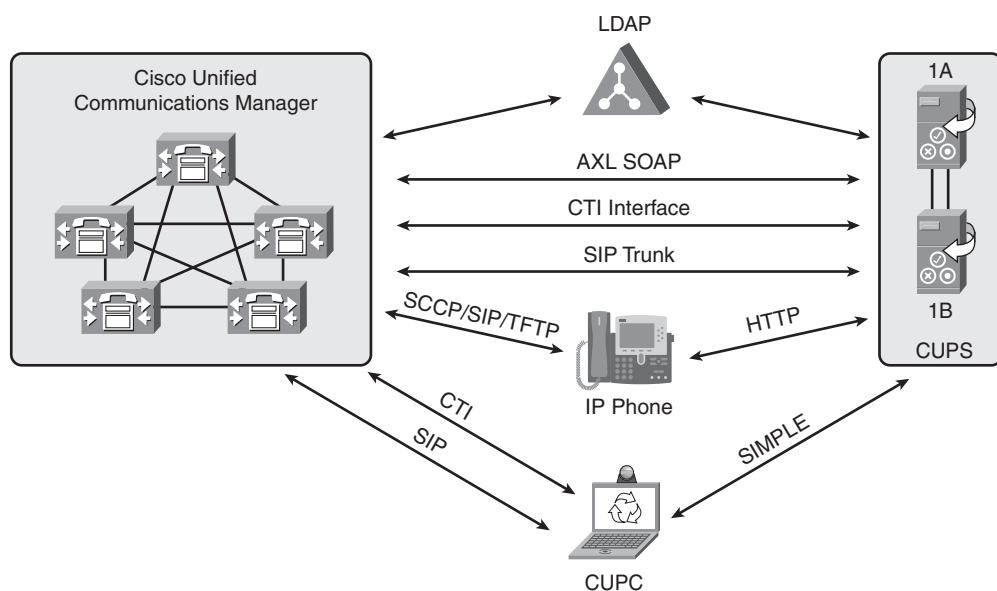


Figure 5-1 Communications of a Basic CUP Deployment

Note CUPS enables Presence information to be populated by many types of presentities; however, CUPC is the only software client supported directly by CUPS.

CUPC Configuration

The configuration of a user leveraging CUPC has several basic steps that need to be completed:

- Step 1.** Configure user in CUCM.
- Step 2.** Configure desk phone device in CUCM (optional).
- Step 3.** Configure the CUPC device in CUCM.
- Step 4.** Configure CUPS advanced end-user features:
 - Voicemail
 - Conferencing
 - Lightweight Directory Access Protocol (LDAP)
- Step 5.** Install CUPC software on the client machine.

The following sections describe these configuration steps in greater detail.

Configuring CUPC User in CUCM

It is strongly recommended having LDAP synchronization configured in any CUCM installation. This brief section covers the steps required to configure a user in CUCM *without* LDAP integration. This is because when LDAP synchronization is enabled, the ability to add/delete users in the CUCM user interface is removed. All users are added or removed via the LDAP management interface. Figure 5-2 illustrates the concepts for the following steps:

- Step 1.** In CUCM Administration, select **User Management > End User > Add New**.
- Step 2.** Fill in at least the required user information (User ID and Last Name).
- Step 3.** Device Associations can be left at the default.
- Step 4.** If this user will use extension mobility services, configure the required settings. Make sure to select the correct Presence group because this impacts what Presence visibility this user has.
- Step 5.** Leave directory number associates at the default setting unless you already have a desk phone and directory number configured for this user.

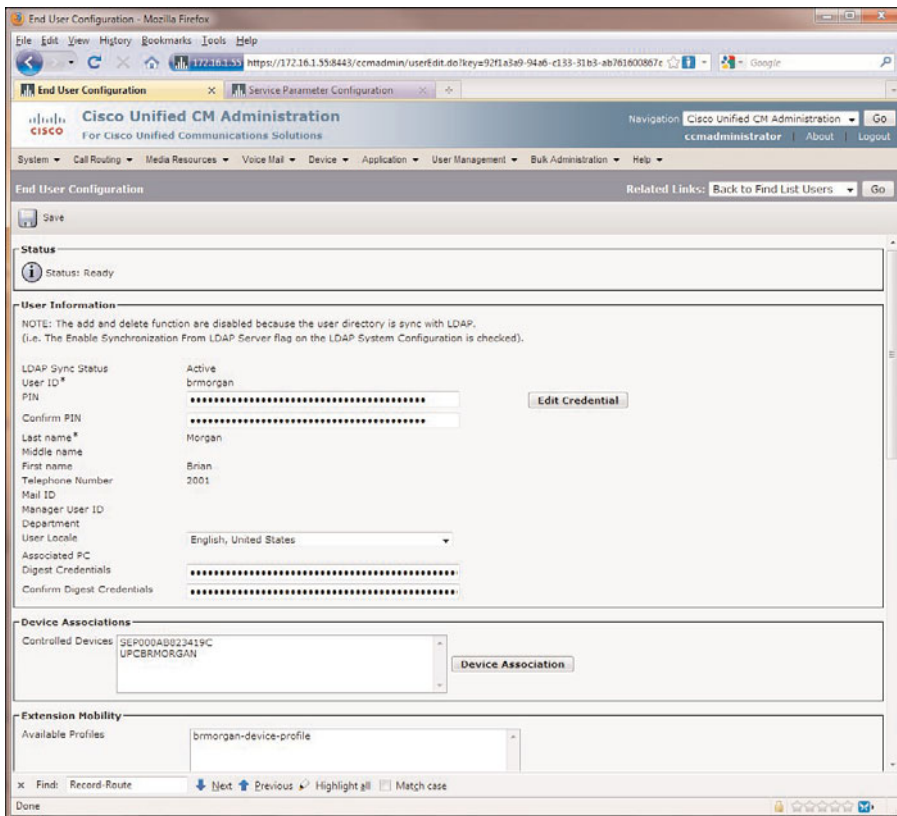


Figure 5-2 CUCM User Page

- Step 6.** The mobility section enables the user to configure single number reach access and mobile voice access (directory assistant IVR). Configure this section according to the end user's needs.
- Step 7.** Ensure that the user roles include **Standard CTI Enabled** and **Standard CTI Allow Control of All Devices**, as shown in Figure 5-3.
- Step 8.** Select the **Save** button.
- Step 9.** In CUCM Administration, select **System > Licensing > Capabilities Assignments**.
- Step 10.** Select the users recently added that will have Presence and CUPC capabilities.
- Step 11.** Click both check boxes to enable CUP and CUPC features for the users.

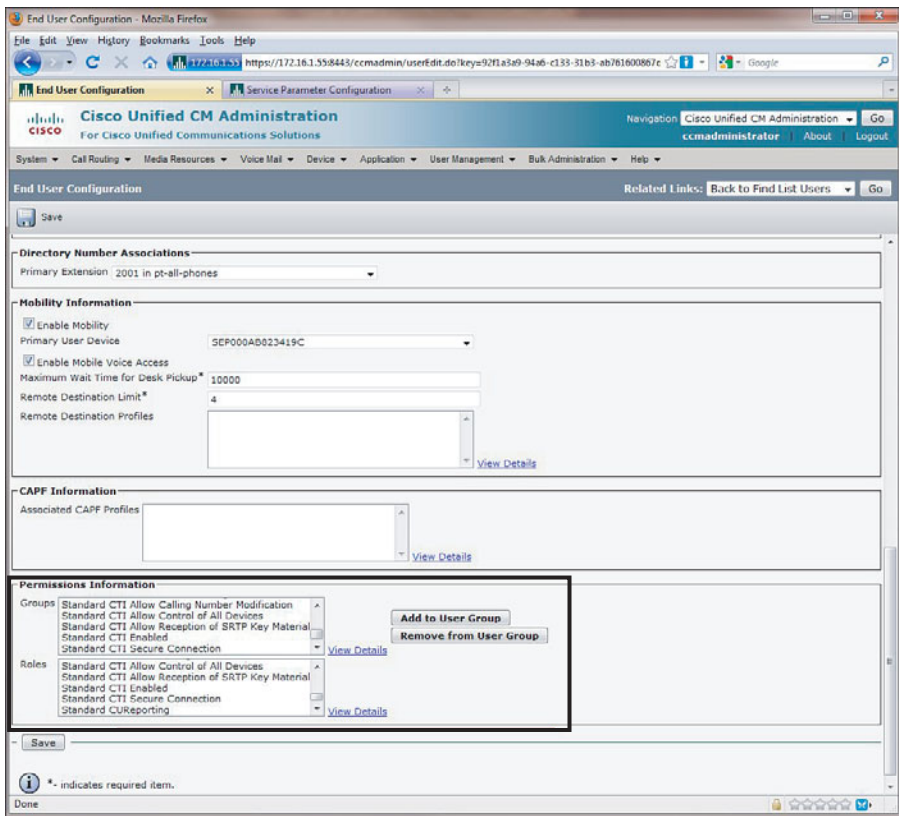


Figure 5-3 CUCM User Page Continued

Tip The user might not show up for several minutes on the CUP server. If it is taking too long, go to **Cisco Unified Serviceability > Tools > Control Center-Feature Services**, select the CUP server (publisher if in a cluster), and then start or restart Cisco UP Sync Agent.

When the user has been added to CUCM, it will be synchronized over to the CUP server. There is no need to add the user separately to the CUP server. LDAP synchronization is strongly recommended so most of these steps would not be necessary, and the rest can be done when doing the phone device provisioning in CUCM. For more information on CUCM synchronization with LDAP, refer to the “LDAP System Configuration” section in the *Cisco Unified Communications Manager Administration Guide* at <http://tinyurl.com/yaoy42m>.

Configuring IP Phone in CUCM

A common deployment model is for a single user to have both a desk phone and have CUPC act as a softphone during communications that take place away from the desk. CUPC offers a softphone capability that enables it to act as a phone device on a computer without the requirement of a desk phone, making the desk phone an optional device in a deployment. The use of a desk phone is optional and not required when deploying and configuring CUPC. This section covers the basic steps necessary in setting up an IP Phone to be used with CUPC. Figure 5-4 shows the addition of a physical desk phone.

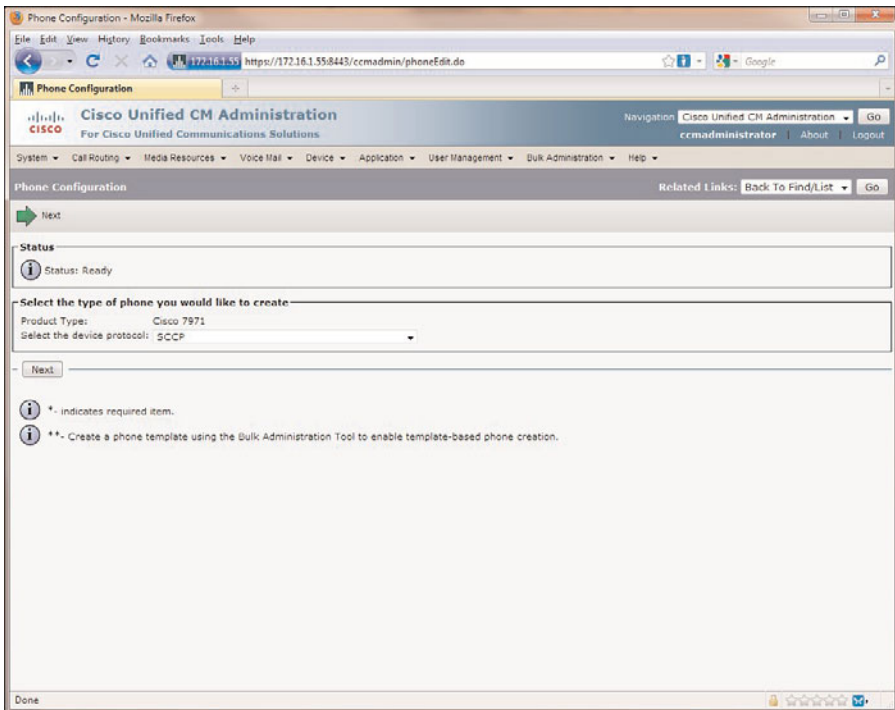


Figure 5-4 *Adding a Desk Phone in CUCM*

- Step 1.** In CUCM Administration, select **Device > Phone**.
- Step 2.** Click the **Add New** button.
- Step 3.** Select the device for the desk phone; then click the **Next** button. *Do not* select Cisco Unified Personal Communicator.
- Step 4.** Select the protocol for the phone to use.
- Step 5.** Make sure the Presence Group and SUBSCRIBE Calling Search Space are defined according to your Presence policy.

Note Presence authorization works with Presence Groups to allow or block Presence requests between groups. This enables greater granularity in offering Presence services to groups or departments.

The SUBSCRIBE calling search space determines how CUCM routes Presence requests that come from the phone. This setting enables you to apply a calling search space separate from the call-processing search space for Presence (SUBSCRIBE) requests for the phone.

Step 6. Make sure that Allow Control of Device from CTI is checked. Figure 5-5 illustrates the settings for Steps 5 and 6.

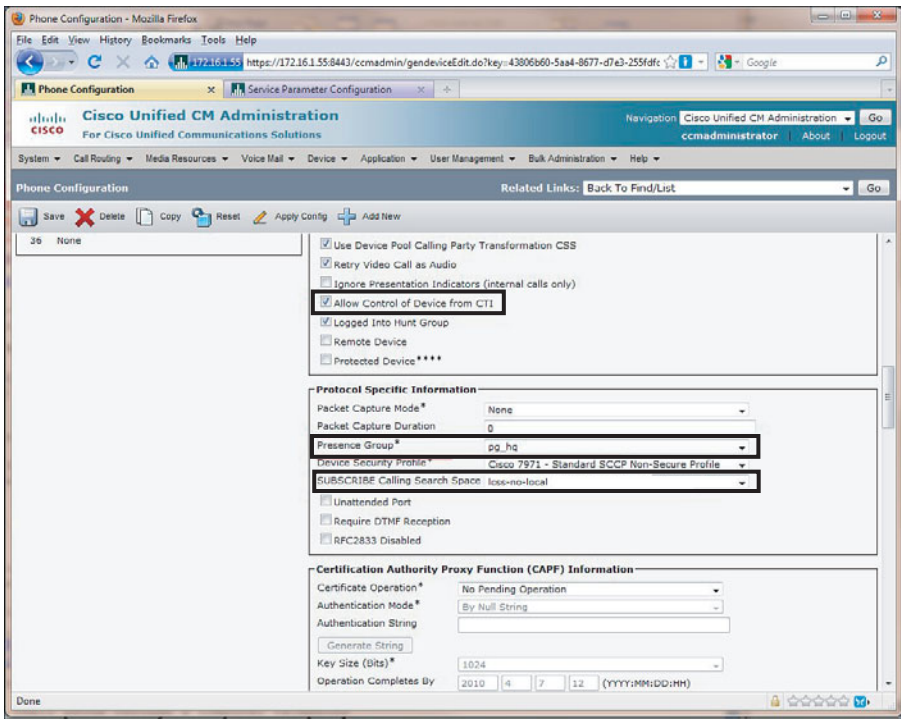


Figure 5-5 Adding a Desk Phone in CUCM Continued

Step 7. Configure all the remaining required settings for the phone and end-user requirements.

Step 8. Associate the user to the phone, as shown in Figure 5-6.

The phone now registers to CUCM with the proper settings and user association. Adding the phone allows users to have the option to control their phone through a computer telephony interface (CTI) with the CUPC client. This allows for the added software

features offered by the CUPC client and still has a desk phone for a more reliable voice experience.

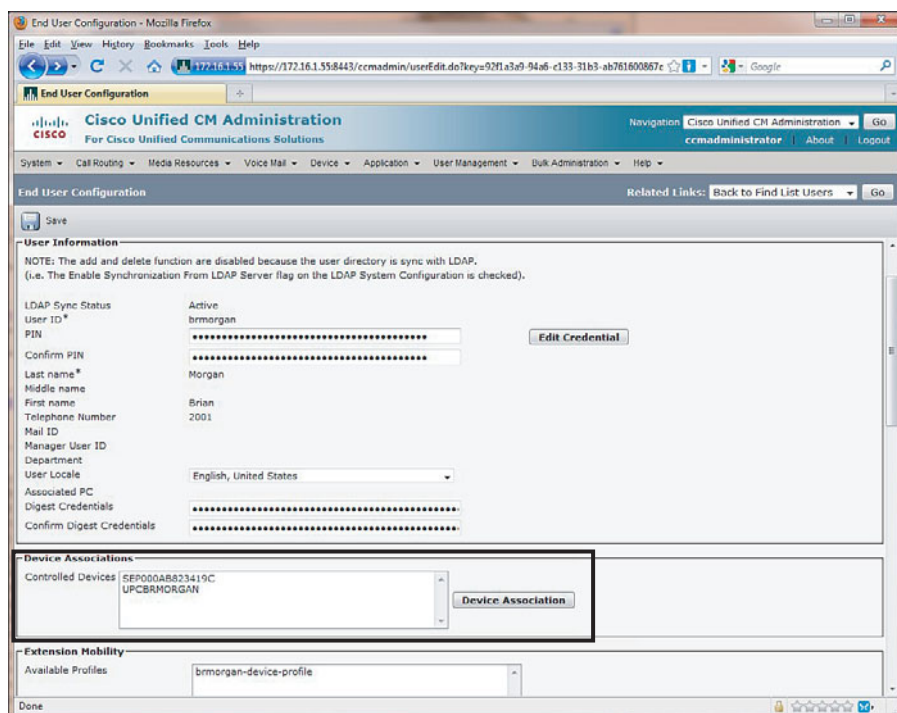


Figure 5-6 *Associating Phones with Users*

Configuring a CUPC Device in CUCM

The next step is to set up a CUPC device in CUCM associated to the appropriate user and potentially connected to a desk phone. The first step in planning for the CUPC device configuration is to understand the naming convention required in CUCM. These requirements follow:

- Derives from the username
- Starts with *UPC*
- Contains only uppercase letters or numerals
- Contains no more than 12 additional characters after *UPC*

Table 5-1 provides some examples that outline these requirements.

Table 5-1 Username Examples for CUPC in CUCM

CUCM Username	Associated Softphone Device Name
mpopovich	UPCMPOPOVICH
michael_popovich	UPCMICHAELPOPOV
michaelpopovich	UPCMICHAELPOPOV
mike.popovich	UPCMIKEPOPOVICH

When the naming convention has been decided, the CUPC device can now be added to CUCM:

- Step 1.** In CUCM Administration, select **Device > Phone**.
- Step 2.** Click the **Add New** button.
- Step 3.** Select the **Cisco Unified Personal Communicator**.
- Step 4.** The Device Name should be the CUPC name determined earlier, for example, UPCMPOPOVICH. This is shown in Figure 5-7.

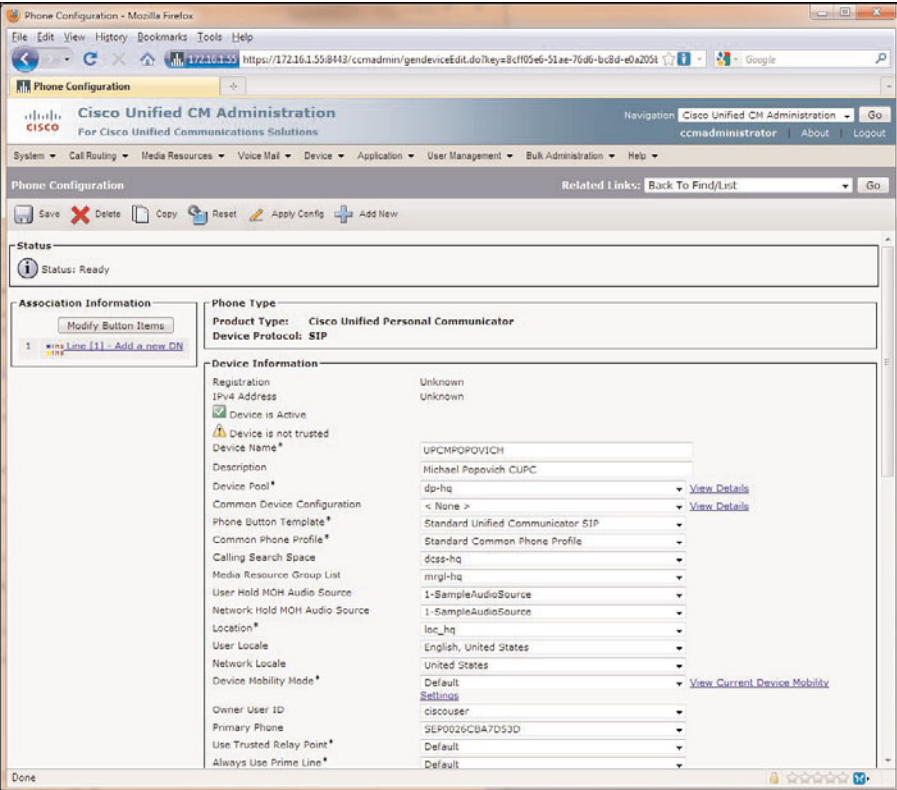


Figure 5-7 Adding a CUPC Endpoint in CUCM Continued

- Step 5.** Uncheck the box for Allow Control of Device from CTI.
- Step 6.** Specify the correct Presence Group and SUBSCRIBE Calling Search Space.
- Step 7.** Set the Owner User ID field to the appropriate user.
- Step 8.** Configure the rest of the settings according to system/user policy.
- Step 9.** Click the Save button.
- Step 10.** Click the Line[1] > Add a new DN link.
- Step 11.** Assign the directory number to the line. If a phone device is already configured, use the same DN as the phone. If this is a CUPC-only user, enter a new DN, as shown in Figure 5-8.

Directory Number Configuration - Mozilla Firefox

File Edit View History Bookmarks Tools Help

172.16.1.53 https://172.16.1.55:8443/ccmadmin/directoryNumberEdit.do?devicekey=8cf05e6-51ae-76d6- Google

Directory Number Configuration

Cisco Unified CM Administration
For Cisco Unified Communications Solutions

Navigation: Cisco Unified CM Administration Go
ccmadministrator About Logout

System Call Routing Media Resources Voice Mail Device Application User Management Bulk Administration Help

Directory Number Configuration Related Links: Configure Device (UPC/POPOVICH) Go

Save

Status
Status: Ready

Directory Number Information

Directory Number* 2006
Route Partition pt-all-phones
Description Michael Popovich
Alerting Name Michael Popovich
ASCII Alerting Name Michael Popovich
☒ Active

Directory Number Settings

Voice Mail Profile UnityCxn (Choose <None> to use system default)
Calling Search Space lcs-no-restrictions
Presence Group* pg_hq
User Hold MOH Audio Source 1-SampleAudioSource
Network Hold MOH Audio Source 1-SampleAudioSource

AAR Settings

Voice Mail	AAR Destination Mask	AAR Group
AAR <input type="checkbox"/> or		< None >

☒ Retain this destination in the call forwarding history

Call Forward and Call Pickup Settings

Voice Mail	Destination	Calling Search Space
Calling Search Space Activation Policy		Use System Default
Forward All <input type="checkbox"/> or		< None >
Secondary Calling Search Space for Forward All		< None >
Forward Busy Internal <input checked="" type="checkbox"/> or		< None >

Done

Figure 5-8 Adding a DN to a CUPC Endpoint

- Step 12.** Uncheck the box for Allow Control of Device from CTI.
- Step 13.** Configure the rest of the settings according to system policy.
- Step 14.** Click Save.

When saved, a new screen comes up that shows what devices are associated to the DN. This field should at least have the CUCP device associated with it. If it is a shared DN with a phone device, two devices should be listed: the CUCP and the phone device. This is shown in Figure 5-9.

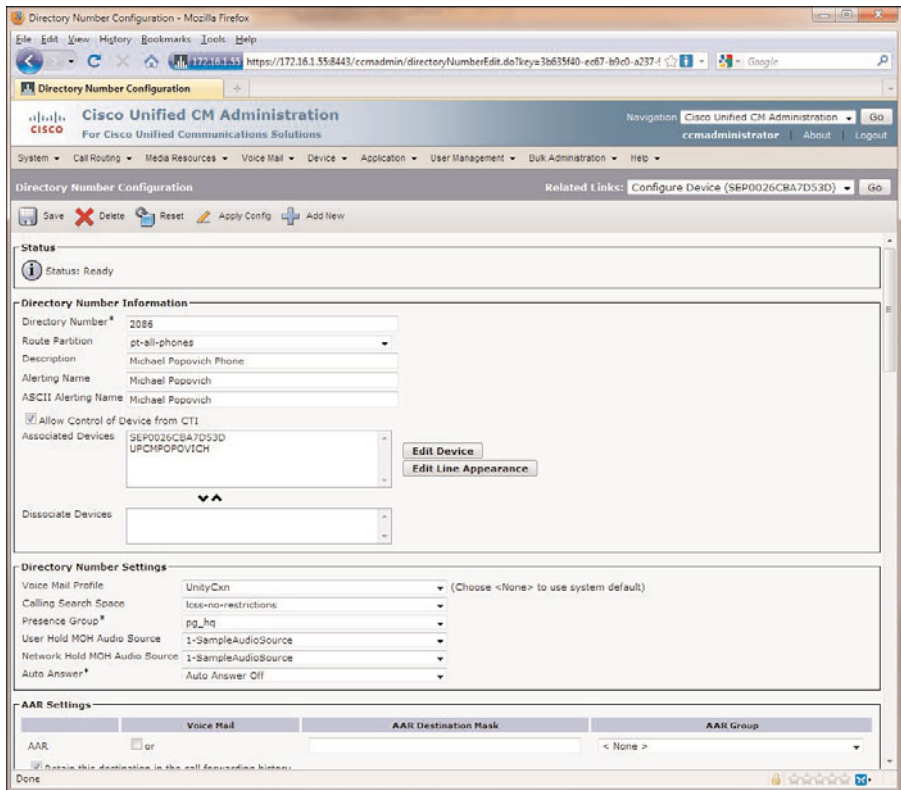


Figure 5-9 *Adding a DN to a CUPC Endpoint Continued*

Now that the CUPC device is set up in CUCM and the users are configured, the client can be installed, and there will be Presence, desk phone connectivity (CTI), and soft-phone functionality. These are the basic services that CUPC has available, and in the next section, the advanced features of CUPC will be configured. It is recommended to have these features configured before installing the client.

Configuring Advanced Features for CUPC

The advanced features available to the CUPC client consist of Unity voicemail, MeetingPlace conferencing, video, and LDAP integration. The following sections describe the configuration of these advanced features in greater detail.

Voice mail Configuration for CUPC

CUPC has the capability to access Unity voicemail directly through the client interface. This is useful to the end user by providing a visual interface to the Unity voicemail system, enabling the user to prioritize voicemails by name, timestamp, duration, and so on without having to listen to the messages first.

Two primary prerequisites must be completed before integrating CUPS to Unity:

- Implement a supported version of Unity or Unity Connection, which are the only two supported messaging platforms for CUPS integration.
- Complete the integration of CUCM and Unity/Unity Connection, and make sure all voice ports are working properly.

The sections that follow discuss how to satisfy these prerequisites in more detail.

Cisco Unity Connection

The following steps describe the Cisco Unity Connection (CUC) provisioning steps for CUPC users. Use Figure 5-10 with the following steps.

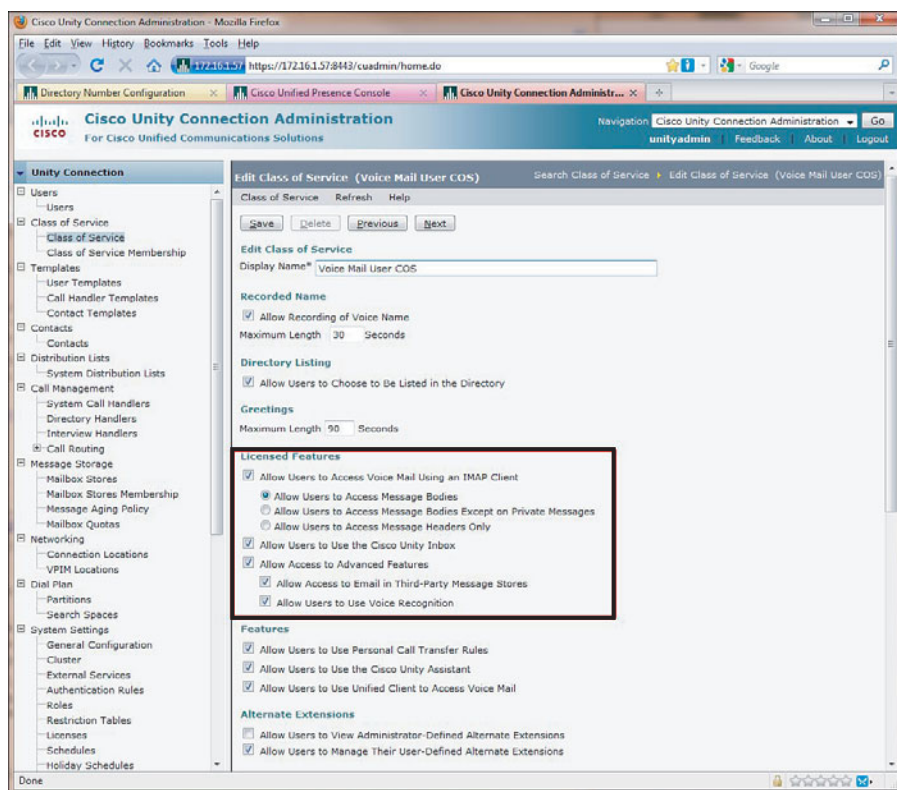


Figure 5-10 Enabling IMAP in Unity Connection

- Step 1.** Configure a class of service in CUC with IMAP enabled:
- Select **Class of Service** in the left navigation pane.
 - Select or add the desired class of service in the list.
 - Check the **Allow Users to Use Unified Client to Access Voice Mail** box. This allows access to port 7993 and TLS for the CUPC client support.
 - For IMAP client support as well, check the **Allow Users to Access VoiceMail Using an IMAP Client** box and select the **Allow Users to Access Message Bodies** button.
 - Click **Save**.
- Step 2.** Create a CUC user account and voicemail box for each CUPC user.
- Step 3.** Make sure the web application password is set for the user.

Note Secure messaging is optional, and a set of features offered in Unity Connection enables several security features that provide control for access and distribution to messages. Several caveats need to be understood before enabling these features. You can find detailed information on these caveats at <http://tinyurl.com/y9uuu2q>.

Use Figure 5-11 with the following steps to enable secure messaging:

- Step 1.** Enable secure messaging:
- Select **Class of Service** using the navigation panel; then click the Class of Service the CUPC users are a part of.
 - Under the Message Options section of the Class of Service; select the type of secure messaging next to the **Require Secure Messaging** option:
 - **Always:** Messages will always be marked secure.
 - **Never:** Messages will never be marked secure. (Users can still mark messages as private, and they will be secure.)
 - **Ask:** Users will be prompted from the Special Delivery Options menu to select if the message is marked secure or not.
 - **Private:** Messages are marked secure only when the user makes them a private message. This is the system default.

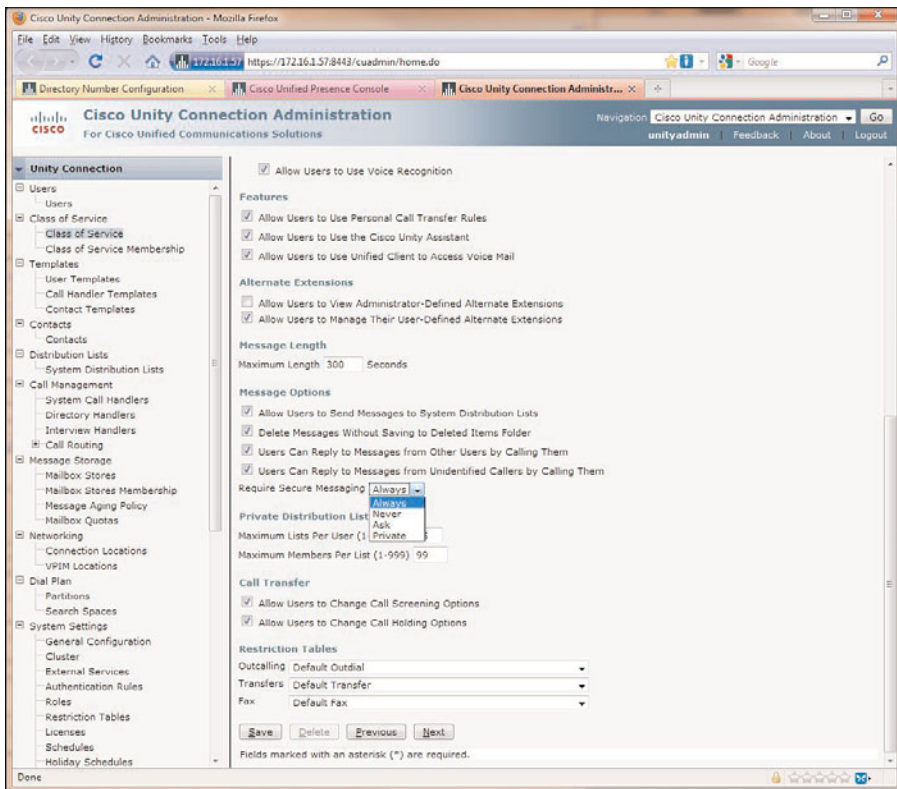


Figure 5-11 *Enabling Secure Messaging in Unity Connection*

- Step 2.** Configure unidentified caller message security settings, as shown in Figure 5-12:
- Select **Users** in the navigation panel.
 - Select the desired user.
 - Select **Edit > Message Settings**.
 - Check **Mark Secure** in the Unidentified Callers Message Security section.

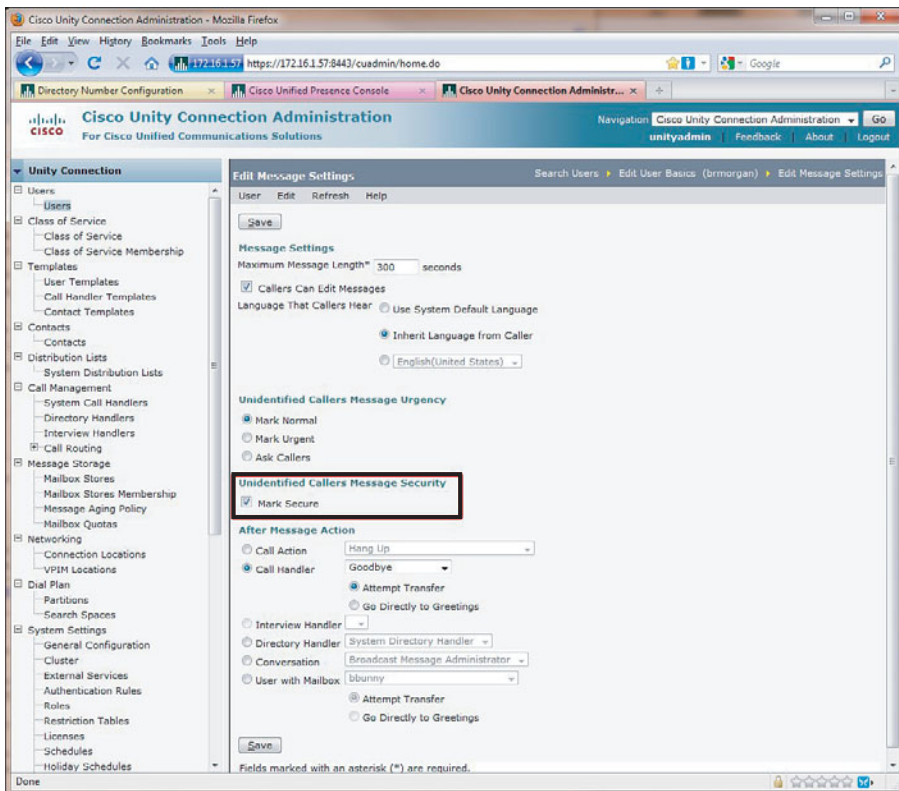


Figure 5-12 *Enabling Secure Messaging in Unity Connection Continued*

Cisco Unity

The next steps cover the configuration requirements for Unity as the message platform for the CUPC user:

- Step 1.** Configure the Microsoft Exchange server to use IMAP by enabling the IMAP Connector. Refer to Chapter 9, “Troubleshooting Cisco Unified Presence,” for step-by-step guidance.
- Step 2.** Configure the port and encryption type. Ensure that SSL is the only encryption type being used and not TCP. This setting is manually done in Exchange 2003 but on Exchange 2007, SSL is the default.
- Step 3.** Configure the user in Unity.
- Step 4.** Create the exchange mailbox for the users. This step might not be necessary, depending on whether the user was added in Unity or AD first. If users were imported from AD into Unity, the mailbox should already be there as a result of the import process. For purposes of brevity, it is assumed that this is the case.

The following steps are necessary only if secure messaging is implemented with Cisco Unity:

- Step 1.** Enable secure messaging through the Cisco Unity System Admin Page, as shown in Figure 5-13:
 - a. Select **Subscribers > Subscribers > Features**.
 - b. Select the desired option in the **Message Security When Sending a Message** list.
 - c. Select **Save**.
- Step 2.** Configure unidentified caller message security settings, as shown in Figure 5-14.:
 - a. Select **System > Configuration > Message Security Settings**.
 - b. Select an option from the list on how messages should be secured from unidentified callers.
 - c. Select **Save**.

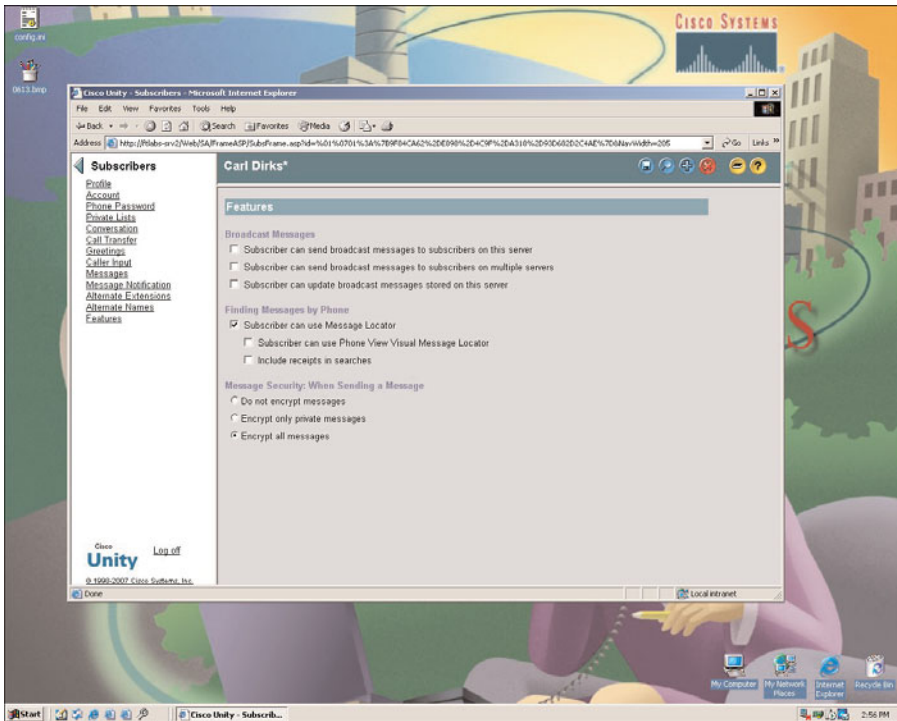


Figure 5-13 *Enabling Secure Messaging in Unity*

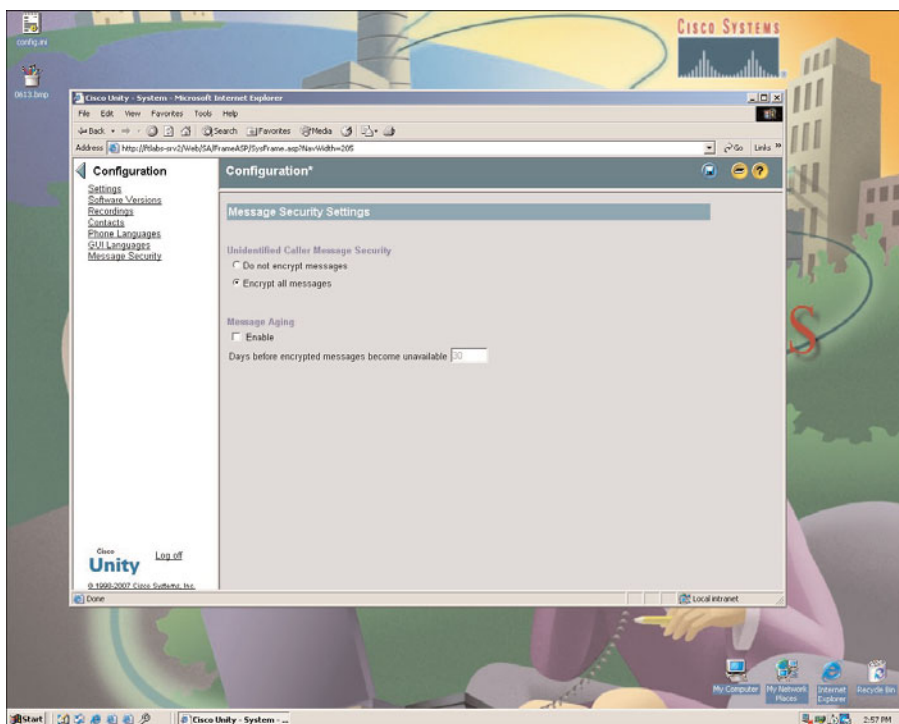


Figure 5-14 *Enabling Secure Messaging in Unity Continued*

Configuring Voicemail Servers in CUPS

Voicemail servers are defined in CUPS to allow for required interactions between CUPS and the specified voicemail server. Voice message web service (VMWS) is the service on a Cisco Unity or CUC server that enables deleted voicemails to be moved to their correct location in the mail store and also provides encryption service for secure messaging environments. The IP address of the voicemail server and the peer Microsoft Exchange server (if using Unity) is needed prior to the following steps:

- Step 1.** Navigate to **Application > Cisco Unified Personal Communicator > Voicemail Server** in the CUPS administration page, as shown in Figure 5-15.
- Step 2.** Click **Add New**.
- Step 3.** Select **Unity** or **Unity Connection** in the server type menu.
- Step 4.** Define the voicemail server name.
- Step 5.** Define the FQDN hostname or IP address.
- Step 6.** For Cisco Unity Servers, define **443** for Web Service Port. For Cisco Unity Connection Servers, define **143** for the Port.

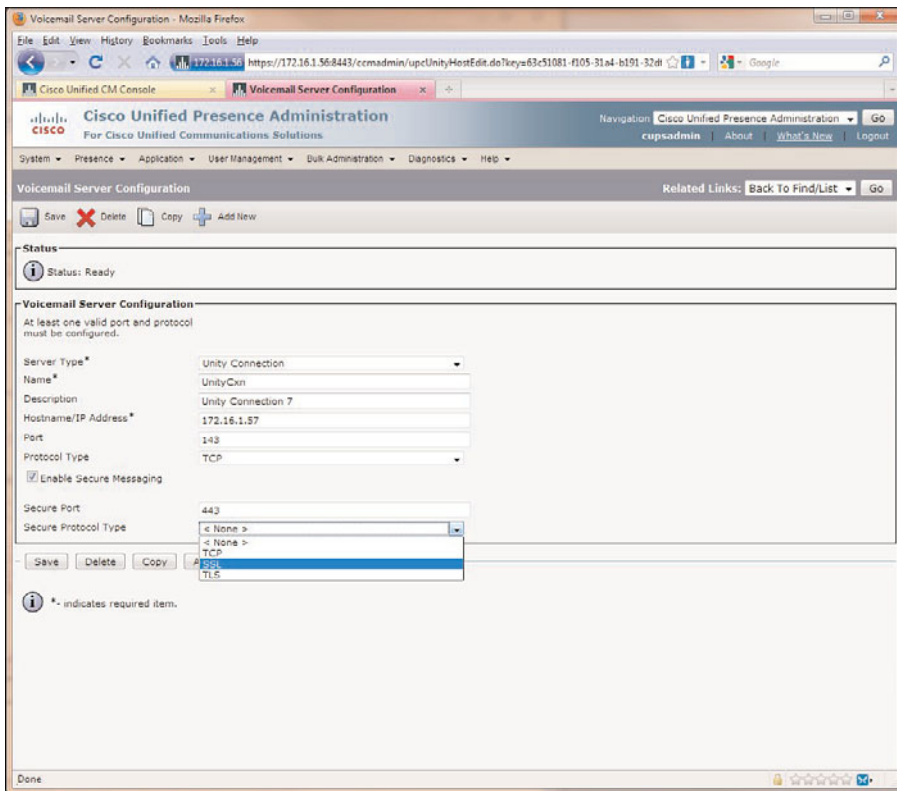


Figure 5-15 *Configuring the CUPC Voice Mail Server in CUPS*

- Step 7.** For Cisco Unity Servers, select **HTTPS** for Web Service Protocol. For Cisco Unity Connection Servers, select TCP, UDP, TLS, or SSL. The default is UDP.
- Step 8.** If enabling Secure Messaging (optional), define the Secure Port and Secure Protocol Type. For Cisco Unity Servers, choose HTTP or HTTPS for Protocol Type. For Cisco Unity Connection Servers, choose TCP, SSL, or TLS as the Protocol Type.
- Step 9.** Click Save.

Configuring Mailstore Server in CUPS

Defining a mailstore in CUPS is required for the CUPC client to access the voicemail messages on the voicemail server. Figure 5-16 shows the CUPS Mailstore page. The FQDN hostname or IP address of the mailstore server is necessary to complete the following tasks.

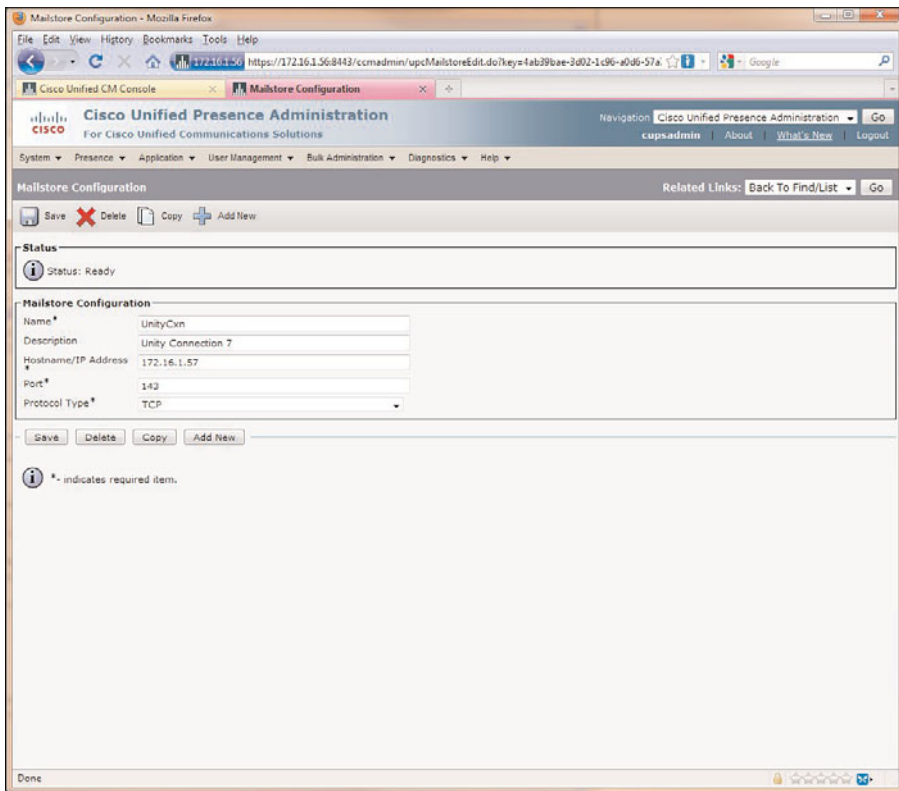


Figure 5-16 *Configuring the CUPC Mailstore in CUPS*

- Step 1.** Navigate to **Application > Cisco Unified Personal Communicator > Mailstore** in the CUPS administration site.
- Step 2.** Click **Add New**.
- Step 3.** Define the mailstore server name.
- Step 4.** Define the FQDN hostname or IP address.
- Step 5.** Define the IMAP port number for CUPC to use in connecting to the mailstore server.

Unity Connection options follow:

- TCP: port 143
- SSL: port 993
- TLS: port 143 or 7993

Unity with Exchange options are the same as Unity Connection except TLS is supported only on port 143.

- Step 6.** Click **Save**.

Configuring Voicemail Profiles in CUPS

The voicemail profile is required in CUPS to enable the CUPC client to access the correct voicemail resources for the end user. The following steps are necessary to configure the voicemail profile:

- Step 1.** Navigate to **Application > Cisco Unified Personal Communicator > Voicemail Profile** in the CUPS administration page, as shown in Figure 5-17.
- Step 2.** Click **Add New**.
- Step 3.** Define the profile name.
- Step 4.** Select the Voice Message Pilot number for the correct voicemail server of the CUPC end user.

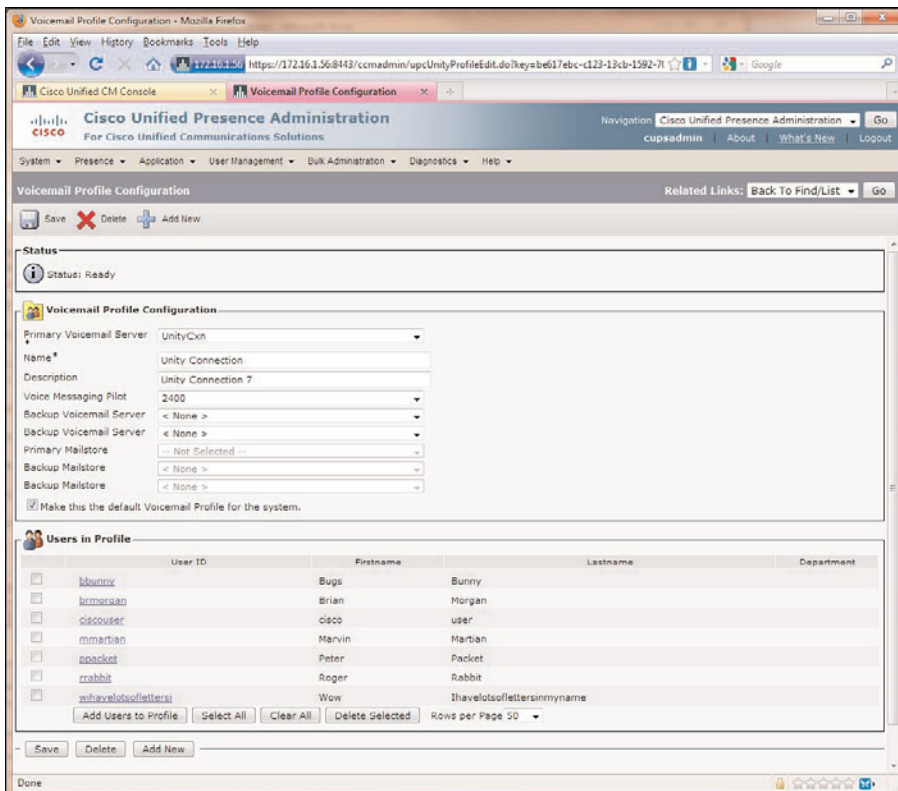


Figure 5-17 Configuring the CUPC Voicemail Profile in CUPS

Note Voicemail and mailstore server failover is not supported in CUPS 7.0(4).

When the voicemail profile configuration is complete, CUPC end users are now ready to log in and access the voicemail services through the desktop client.

Conferencing Configuration for CUPC

One of the major benefits of using the CUPS and the CUPC client is that application integrations allow for consolidated user functionality into other applications, such as video and conferencing. These integrations are at the touch of a button and easy to use from an end-user perspective. Initiating a conversation through an IM window and then escalating that conversation to an audio or video call at the touch of a button and then further enhancing that conversation into a collaboration conference is compelling for end users and has a dramatic effect on their productivity. This functionality begins to bring the true value of CUPS and the CUPC client to the user.

CUPC can be configured to support ad-hoc web conference sessions with the following products:

- Cisco Unified MeetingPlace
- Cisco Unified MeetingPlace Express
- Cisco Unified MeetingPlace VT
- Cisco Webex Meeting Center

MeetingPlace Express and Meeting Place Express VT

MeetingPlace Express and MeetingPlace Express VT can both provide web and audio conferencing functionality to CUPC. MeetingPlace Express VT provides video conferencing resources to provide the capability for CUPC to escalate a point-to-point video call to a multipoint video call.

Several things need to be completed before integrating the MeetingPlace Express (VT) platform into the CUPS solution:

1. Install a release of MeetingPlace Express (VT) supported by the CUPC client. The release notes for the CUPC client will specify the specific supported software versions. You can find current CUPC 7.x release notes at <http://tinyurl.com/y9dephh>.
2. Configure CUCM to integrate with MeetingPlace Express (VT).
3. Determine the number of web, audio, and video ports required for the solution. A good rule of thumb for the average user population is 1:40 (ports:client) for web and video and 1:20 for audio.

The next steps cover the necessary configuration to integrate MeetingPlace Express (VT) with CUPC:

Step 1. Configure the MeetingPlace Express (VT) conferencing capabilities:

a. Install the following licenses:

- adhocsystemsoftware
- webconf
- maxadhoc
- maxweb

b. Configure MeetingPlace Express (VT) for adhoc conferencing. You can find detailed documentation for this feature at http://docwiki.cisco.com/wiki/Cisco_Unified_MeetingPlace_Express_Release_2.x.

c. Configure MeetingPlace Express for the reservationless feature to support full web meetings initiated by MeetingPlace Express and the web meetings initiated by CUPC. You can find specific details on configuring user profiles, call control, and such on MeetingPlace Express at http://docwiki.cisco.com/wiki/Cisco_Unified_MeetingPlace_Express_Release_2.x.

Step 2. Enable Secure Sockets Layer (SSL) encryption. This is optional; however, if it is not completed, passwords sent between CUPC and MeetingPlace Express will be sent in clear text, creating a potential security vulnerability.

Step 3. Configure a user profile for each CUPC user that is going to initiate web conferences from the CUPC client.

Note This is not required for *all* CUPC users and is needed only for the users that will initiate the web conferences.

Step 4. Ensure that the Presenter add-in is installed on each CUPC user's computer. This can be done remotely by downloading the install package from Cisco Connection Online, or the user can download it by navigating to the MeetingPlace Express server's main page using a web browser.

Step 5. Configure the voice network so that inbound calls from the PSTN to the CUPC user support RFC2388. This allows an inbound call from MeetingPlace Express to the CUPC user to use the CUPC key pad for DTMF instead of key press markup language (KPML). This is required only for DTMF support on inbound calls to CUPC, which supports both KPML and DTMF for outbound calls. This will be done on the CUCM configuration page for the SIP Trunk configured to CUPS (see Figure 5-18).

When these configurations are made, CUPS configuration will take place to define a conferencing server and profile. Those steps come later in this chapter, after the MeetingPlace and Webex configurations are covered.

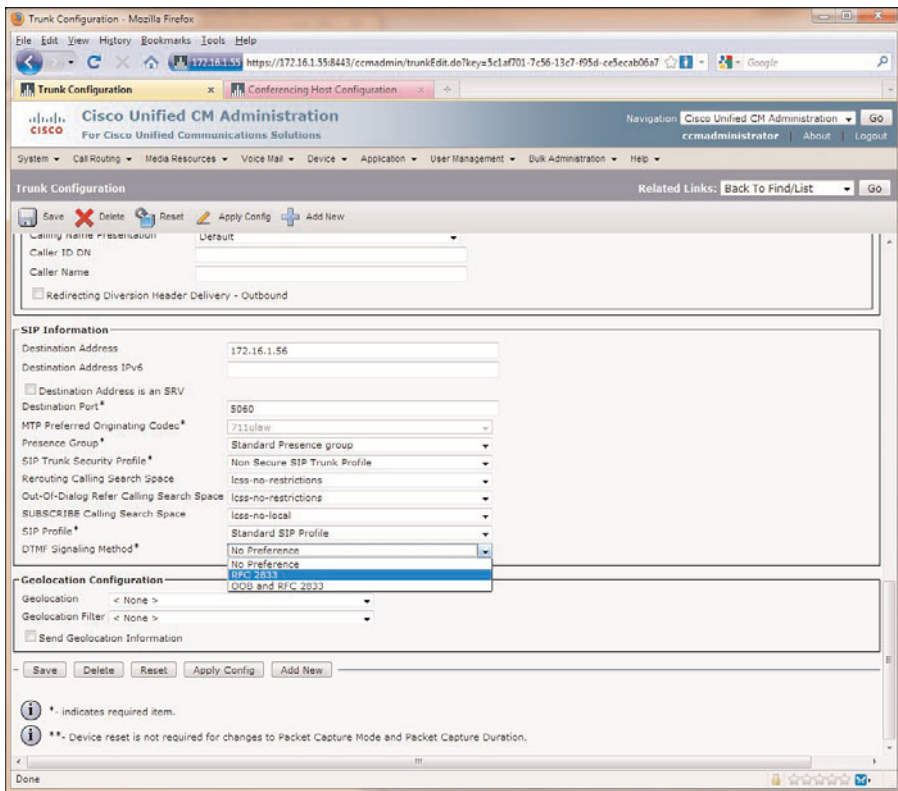


Figure 5-18 *Configuring RFC 2388 DTMF Support*

Configuring MeetingPlace

The following steps configure MeetingPlace to support the CUPC client:

- Step 1.** Install the web and audio conferencing user licenses.
- Step 2.** Enable SSL encryption. This is optional; however, if not completed, passwords sent between CUPC and MeetingPlace Express will be sent in clear text, creating a potential security vulnerability.
- Step 3.** Configure user authentication on the web conference server. The following methods are supported:
 - MeetingPlace
 - LDAP
 - HTTP Basic
 - LDAP, then MeetingPlace
- Step 4.** Configure user profiles for each CUPC user on the MeetingPlace server.

When these configurations are made, CUPS configuration takes place to define a conferencing server and profile. Those steps come later in this chapter, after the Webex configurations are covered.

Configuring WebEx Meeting Center

Integration for CUPC into WebEx Meeting Center is a new integration available with CUPS version 7.0(3) and CUPC version 7.0(2). The WebEx Meeting Center conferencing server must be installed prior to configuration. You can find documentation on how to set up this server on the provisioned WebEx site that is being integrated. Create a user profile on the WebEx Meeting Center for each CUPC user that needs access to initiate web conferencing meetings.

The previous three integration options outline the steps required to provision a CUPC user to have access to the conferencing features that the client provides. This provisioning, so far, has only taken place on the conferencing servers. The next section covers the steps to define these conferencing servers and the conferencing profiles in the CUPS for the CUPC client to leverage these resources.

Configuring Conference Servers in CUPS

This section covers the configuration of the conferencing server in CUPS so that the CUPC client can access the available resources. The configuration steps are done through the CUPS administration web pages.

Before beginning the configuration, you must complete the following prerequisite tasks:

- Get the IP address and the port number of the conferencing server.
- Integrating to a WebEx Meeting Center solution requires the Site ID and the Partner ID assigned to your WebEx site. If you do not know these IDs, you can get them from your WebEx administrator.

The following configuration steps are necessary to complete the integration:

- Step 1.** Go to **Application > Cisco Unified Personal Communicator > Conferencing Server** in the CUPS administration page, as shown in Figure 5-19.
- Step 2.** Click **Add New**.
- Step 3.** Define the Name of the conference server.
- Step 4.** Define an optional description of the conference server.
- Step 5.** Enter the IP address or a hostname of the conference server. The hostname needs to be a Full Qualified Domain Name (FQDN) that can be resolved by the DNS server used by CUPS.
- Step 6.** Define the port that the conference server is configured for. The options are for 80 (HTTP) or 443 (HTTPS).

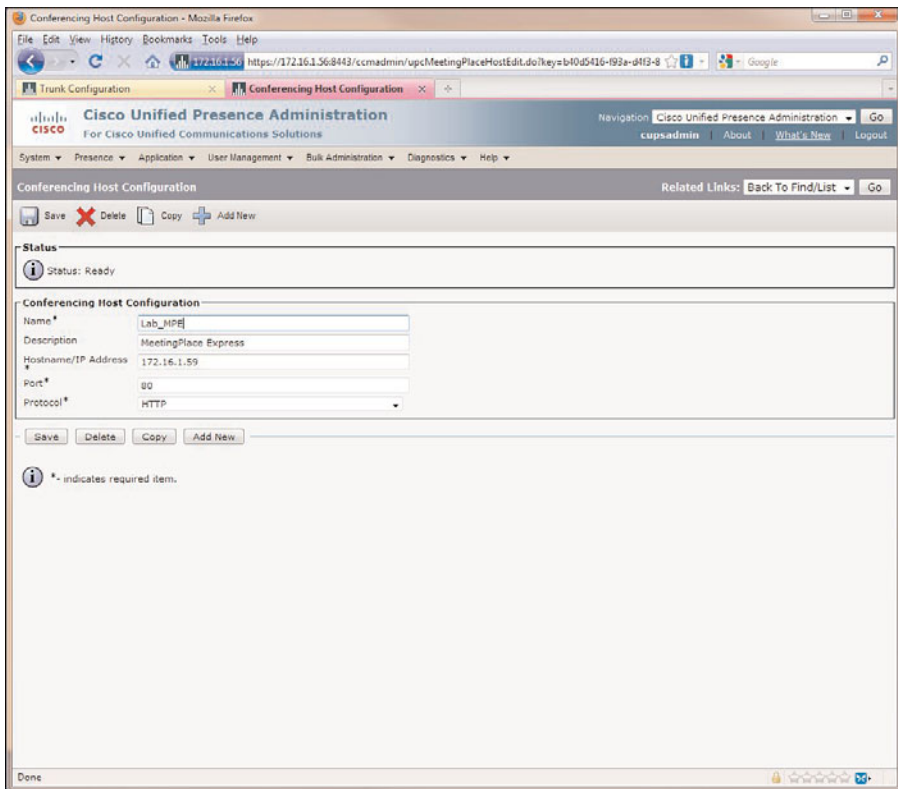


Figure 5-19 *Configuring the CUPC Conferencing Server in CUPS*

- Step 7.** Select the protocol used when CUPS communicates with the conferencing server. The current supported protocols are HTTP and HTTPS.
- Step 8.** Select the conferencing server being integrated.
- Step 9.** If WebEx were selected, enter the Site ID and the Partner ID for the WebEx site being integrated.

Configuring Conferencing Profiles in CUPS

This section covers the final step for CUPC users accessing conferencing resources on the network. Prior to this section, the steps covered addressed the conferencing server provisioning of the CUPC user and configuring the conference server in CUPS. There can be more than one conference server defined in CUPS as required by end-user feature/functionality, migration from one platform to another, increased capacity requirements, and so on. Conference profiles enable the capability to have different CUPC end users configured for different conferencing server resources. The following steps are needed to configure conferencing profiles and assign CUPC users:

Step 1. Navigate to **Application > Cisco Unified Personal Communicator > Conferencing Profile** in the CUPS administration page, as shown in Figure 5-20.

Conferencing Profile Configuration

Status: Add successful

Conferencing Profile Configuration

Name*: conf_profile_mpe_test
 Description: MeetingPlace Express Conferencing Profile
 Primary Conferencing Server: Lab_MPE
 Backup Conferencing Server: < None >
 Backup Conferencing Server: < None >
☒ Make this the default Conferencing Profile for the system.

Users in Profile

	User ID	Firstname	Lastname	Department
<input type="checkbox"/>	blunmy	Bugs	Bunny	
<input type="checkbox"/>	brmorgan	Brian	Morgan	
<input type="checkbox"/>	ciscouser	cisco	user	
<input type="checkbox"/>	mmartian	Marvin	Martian	
<input type="checkbox"/>	ppacket	Peter	Packet	
<input type="checkbox"/>	rrabbit	Roger	Rabbit	
<input type="checkbox"/>	wihavelotsofletters	Wow	Ihevelotsoflettersinmyname	

Add Users to Profile Select All Clear All Delete Selected Rows per Page 50

Save Delete Add New

* indicates required item.

Figure 5-20 Configuring the CUPC Conferencing Profile in CUPS

- Step 2.** Click Add New.
- Step 3.** In the name section, define the name of the conferencing profile.
- Step 4.** Select the Primary Conferencing Server as defined in the system.
- Step 5.** You can add up to two backup conferencing servers defined in the system.
- Step 6.** Check the Make This the Default Conferencing Profile for the System box if this is the default system.
- Step 7.** Click the Add Users to Profile.
- Step 8.** Select the users for this voicemail profile.
- Step 9.** Click Add Selected.

Step 10. Click **Save**.

Note Conferencing server failover is not supported in CUPS 7.0(4).

This section completes the required tasks necessary to configure full conferencing features for CUPC users. This feature will allow for ad-hoc web conferencing leveraging Meeting Express, Meeting Place Express VT, MeetingPlace, and WebEx Meeting Center. Conferencing can be a conversation escalated to a point-to-point web sharing portal or a full-service web conference with the ability to invite other users to the conference via a click to add, e-mail, or IM.

Configuring Video for CUPC

Video is relatively simple for a CUPC deployment. The main thing to note here is that video with CUPC is supported only when the client is in softphone mode. To configure video for CUPC, complete the following tasks:

- Step 1.** Configure the CUPC client for softphone use if it is not the user's primary device.
- Step 2.** Confirm that video use is enabled for the CUPC device in CUCM. This is done within the Region settings of CUCM and assigned to the device through the device pool.
- Step 3.** Distribute supported video cameras for the CUPC users.
- Step 4.** If three or more parties are required in a video call, the media resource group defined for those users must have a conference bridge configured with video resources available. The supported options are MeetingPlace Express VT, MeetingPlace with video, and Cisco Unified Videoconferencing solution that leverages the 3500 series Multipoint Control Units (MCU).

Note Steps 1 through 3 are the only ones necessary for point-to-point video.

Configure LDAP for CUPC

This section covers LDAP integration for the purposes of user lookup in the CUPC client. This enables CUPC users to search for and add contacts from a defined LDAP directory. The section does *not* cover LDAP directory integration for purposes of user provisioning and authentication with CUCM. Detailed LDAP integration for those purposes can be found in the "Configuring CUPC Users in CUCM" section of this chapter. Cisco strongly recommends having CUCM integrated to LDAP for user provisioning and authentication and configuring CUPC for LDAP integration on CUPS for user lookup functionality.

The first thing to understand before configuring LDAP servers in CUPS is the rules for how contacts are displayed in CUPC. This is important to understand because there will be attributes that need to be mapped for displaying names, and these rules determine how names are displayed:

- If a user edits a contact name retrieved from LDAP in CUPC, display that name. This is the Nickname attribute in CUPS.
- If the LDAP user field DisplayName is configured, display that name.
- If the LDAP user field Nickname is configured, display that name with the last name.
- If none of the preceding are configured, display the LDAP user field of the FirstName and LastName. If there is no last name, display only the first name. If there is no first name, display only the last name.
- If no LDAP user fields are configured, display the LDAP UserID or the CUPS user ID.
- If a non-LDAP contact is added, the user can define the Display As name, first name, and last name.

The first thing you need to do is to configure an LDAP attribute map for the supported LDAP server and the CUPC client attributes. Several attribute mappings available enable you to manipulate information between the LDAP server and the CUPC client, but only one is required at the start to provide the functionality of adding users retrieved in an LDAP search to the CUPC client contact list. The following are the steps necessary to accomplish that task:

- Step 1.** Navigate to **Application > Cisco Unified Personal Communicator > Settings** in the CUPS administration page, as shown in Figure 5-21.
- Step 2.** Select the type of LDAP server you want to configure in the drop-down menu.
- Step 3.** Define the UserID field under the UPC User Fields to one of the following:
 Microsoft Active Directory - sAMAccountName
 Sun ONE - uid
- Step 4.** Click **Save**.

After you correctly set the attributes, you can configure the LDAP server. The steps necessary to configure an LDAP server in CUPS are as follows:

- Step 1.** Navigate to **Application > Cisco Unified Personal Communicator > LDAP Server**, as shown in Figure 5-22.
- Step 2.** Click **Add New**.
- Step 3.** Define the name of the LDAP server.
- Step 4.** Define the FQDN hostname or the IP address.
- Step 5.** Define the port number used by the LDAP server; 389 is the default.

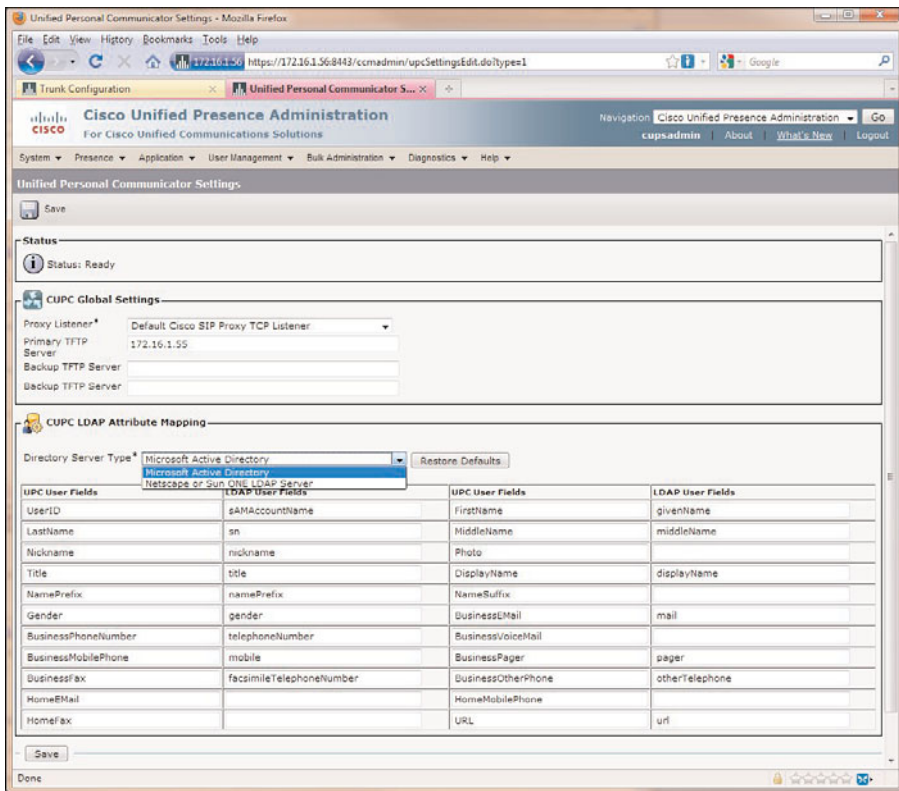


Figure 5-21 *Configuring the User ID Format in CUPS*

- Step 6.** Select the protocol to use. The default is TCP.
- Step 7.** Click Save.

Note More than one LDAP server can be defined in the CUPS system for purposes of failover. If this is done, all the defined LDAP servers must be of the same type.

The final required configuration is the LDAP Profile. The required steps to configure an LDAP profile in CUPS follows:

- Step 1.** Navigate to **Application > Cisco Unified Personal Communicator > LDAP Profile** in the CUPS administration page, as shown in Figure 5-23.
- Step 2.** Click **Add New**.
- Step 3.** Define the name of the profile.
- Step 4.** It is optional but recommended to define the Bind Distinguished Name field using an administrator-level account. Anonymous bind is available if wanted.

The syntax can vary depending on the LDAP server used. Table 5-2 provides a guide to the syntax for Microsoft Active Directory and Sun ONE.

- Step 5.** Define the LDAP bind password.
- Step 6.** Define the search context to be used for LDAP user searches by the CUPC client. A single OU search context is supported. For example (Microsoft AD):
CN=users,DC=cisco,DC=com
- Step 7.** Check to perform a recursive search of the directory.
- Step 8.** Select the primary LDAP server.
- Step 9.** Select any backup LDAP servers.
- Step 10.** Click **Add Users to Profile**.
- Step 11.** Select the users for this voicemail profile.
- Step 12.** Click **Add Selected**.
- Step 13.** Click **Save**.

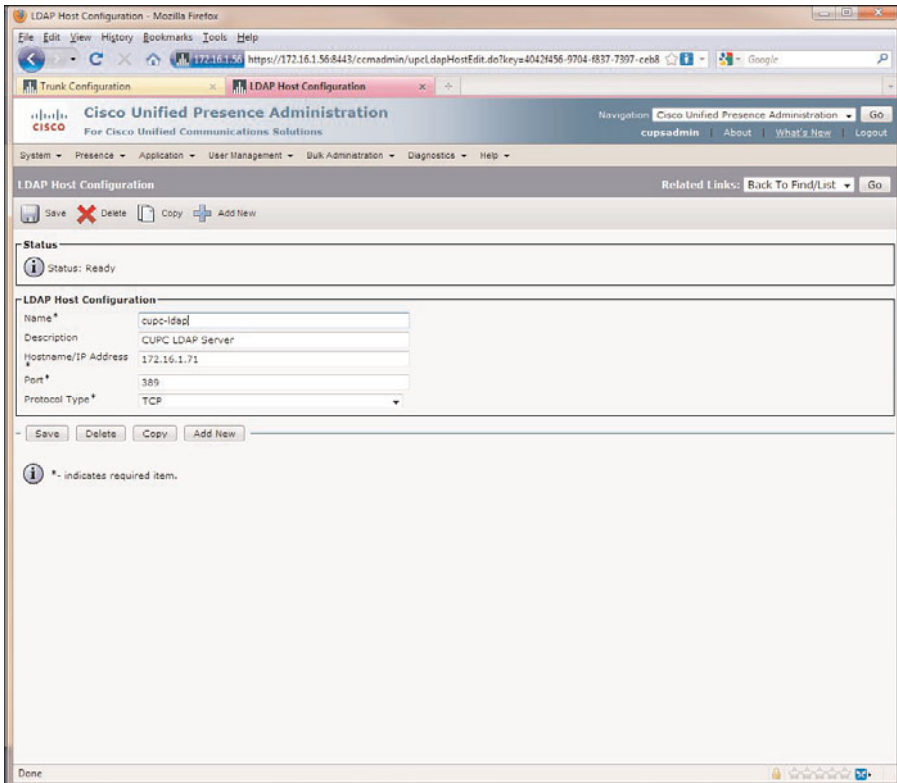


Figure 5-22 Configuring the CUPC LDAP Server in CUPS

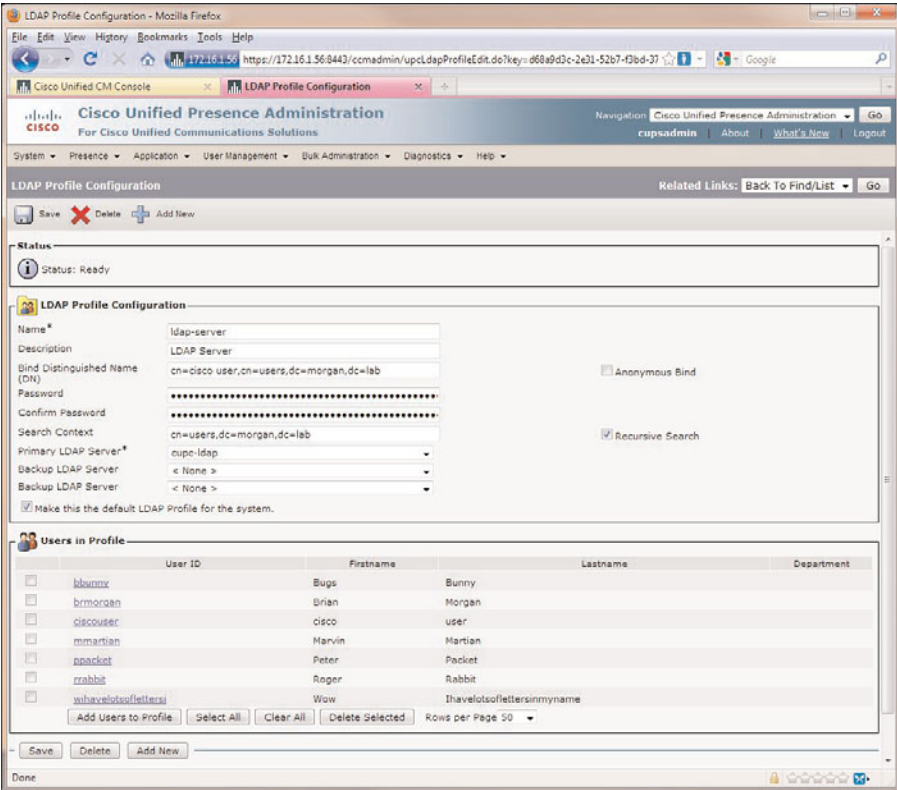


Figure 5-23 *Configuring the CUPC LDAP Profile in CUPS*

Table 5-2 *Supported LDAP Directory Types and Naming Syntax*

LDAP Server Type	Distinguished Name Syntax
Microsoft Active Directory	CN=Michael Popovich, CN=Users, DC=Contoso, DC=com
Sun ONE	cn=Michael Popovich, ou=Operations, o=Example Corp, st=CA, c=US

Upon completion of these steps, the CUPC users can search for contacts in the client and leverage the defined LDAP directory. When the search is completed on the client, the user has the option to IM, place an audio and video call to LDAP-defined contact numbers, initiate a web conference, and add the LDAP contact to the CUPC contact list.

CUPC Troubleshooting

The next few sections cover basic troubleshooting relative to the CUPC client. Some steps can be done by the end user and takes place on the client machine, and others are done by a system administrator or more experienced network administrator to narrow down possible root causes to an issue.

Basic CUPC Troubleshooting

If there is any service issues after a user has logged in, there are two basic things an end user can do to immediately confirm an issue and give administrators a good idea of what the problem is and how to resolve it follow:

- Look at the server health of the CUPC services. This is accomplished by navigating to **Help > Show Server Health** in the menu of the CUPC client (see Figure 5-24). There is an overall health status of all the available CUPC services that can be configured. Next to each process or service is a status indicator telling the user if the status is good with a green check or bad with a red octagon with an X in the middle. The end user can quickly tell an administrator what the initial problem might be. In the figure, there seems to be a couple of issues that need to be resolved.
- If the first option is not enough to adequately determine the potential problem, the end user can generate a more detailed dump of information that can be sent to the administrator. This is done by navigating to **Help > Create Problem Report** in the menu of the CUPC client, as shown in Figure 5-25. This starts a wizard in which the end users can quickly fill out the required information describing what they were attempting to do and what they were doing at the time of the problem. The tool then generates a log report and gathers necessary files that will be compiled into a zip file. This zip file will automatically be saved on the desktop. That file can be e-mailed to the administrator or appended to a Cisco TAC case for a more detailed review. One suggestion would be to enable detailed logging on the client and have the user log off and log back in to the client.

When the user and administrator have determined a specific problem, more troubleshooting will most likely be required. The following sections cover some initial troubleshooting steps for the various CUPC services, such as authentication, voicemail, conferencing, LDAP, and so on. Many of these topics are covered in more depth in Chapter 9. For more detailed information on using the diagnostic tools available for CUPC, go to <http://tinyurl.com/ydhhfo9>.

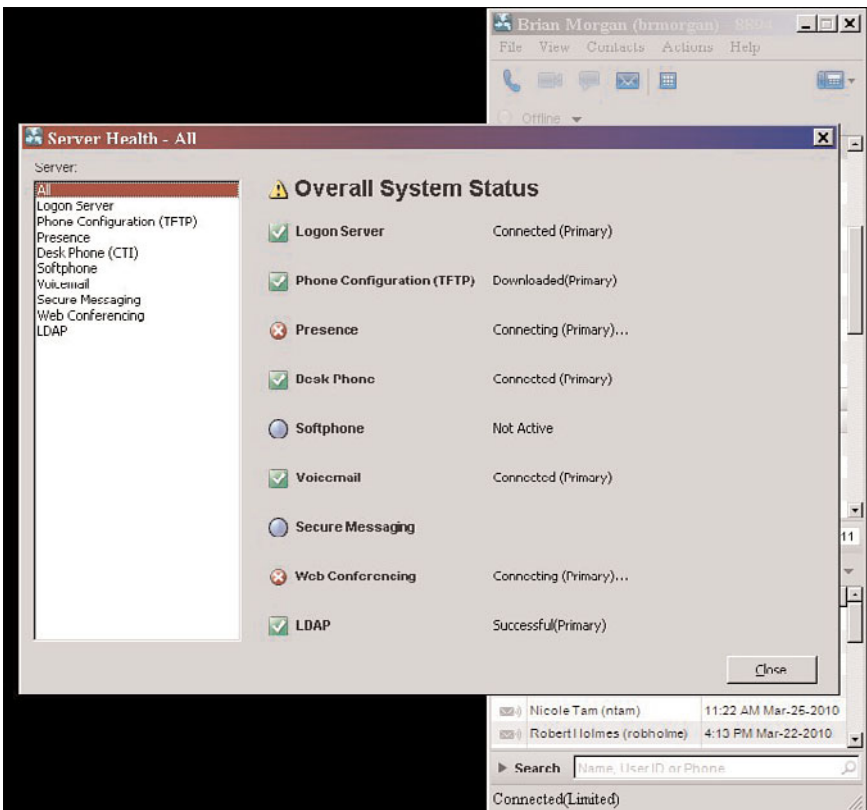


Figure 5-24 CUPS Show Server Health Tool

CUPS and CUCM Integration Troubleshooting

There could be issues with an end user not being able to log in to CUPS. This can be because of several issues and the following are some ideas on where to look:

- Make sure the end user has network connectivity to the voice network. This can be through the enterprise network or VPN, but connectivity must first be confirmed. Pinging the IP address of the CUPS server is the easiest way to accomplish this.
- LDAP integration with CUCM is the Cisco recommended way for deploying CUCM. CUPS authenticates users through CUCM, and if a user cannot authenticate using CUPS, verify LDAP is functional between CUCM and your LDAP server. This can be done by having the user authenticate to the CUCM end-user pages. If that is not allowed, an administrator can authenticate to CUCM admin pages using an LDAP account to verify connectivity.

- If this is a new user, it is possible that the user has not synched over to the CUPS cluster. Usually, the administrator would have verified this already because most deployments have some manual configuration of the CUPC user for voicemail and conferencing profiles. Deployments assign default profiles for all services, and when a user is synched and automatically assigned to a CUPS node, the user should be functional. If this is the case, make sure the Sync Agent and Proxy Service is running. If those services are not running, restart them manually and confirm the user is assigned on the cluster.

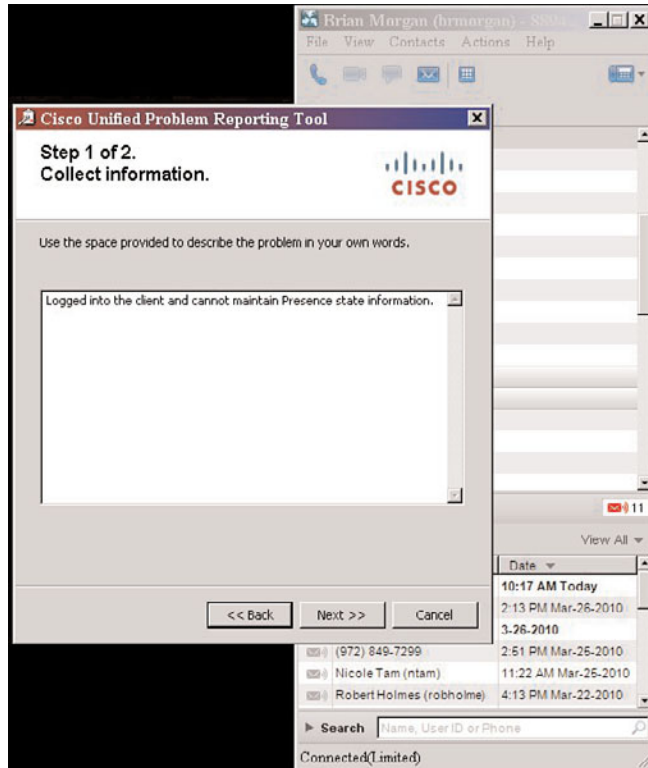


Figure 5-25 CUPC Create Problem Report Tool

VoiceMail Troubleshooting

Most common voicemail issues from the CUPC client stem from a user not being able to log on, or voicemail messages are not downloading or don't appear in the recent pane. Here are some things to look at to address voicemail issues on CUPC:

- Make sure users enter their credentials correctly in the CUPC client. This is found under **File > Preferences > Account**. If the user can log in to CUPC but does not see any voicemail messages, this is most likely not configured correctly. Show Server Health will also reveal this issue.

- If voicemail messages are not downloading but authentication is working, there are a few things to consider:
 - Check the server configuration to make sure that IMAP is enabled on the mail-store and that the voicemail profile is accurate for the CUPC user.
 - (Cisco Unity Connection) If messages are still not being received and the credentials have been checked, make sure that port 7993 is configured on the server and that the CUPC client is listening on port 7993. If there are any firewalls between the client and server, make sure that traffic on port 7993 is allowed to pass through.
 - Clear the voicemail cache on the end-user machine. This is accomplished by deleting all the files in the following directories:
 - For Windows XP:** *drive:\Documents and Settings\UserID\Local Settings\Application Data\Cisco\Unified Personal Communicator\VoiceMail*
 - For Windows Vista:** *drive:\Users\UserID\AppData\Local\Cisco\Unified Personal Communicator\VoiceMail*
 - For Mac OS:** *home/Library/Caches/Cisco/UnifiedPersonalCommunicator/VoiceMail*
- If voicemails do not display in the recent pane of the CUPC client and server health shows that the server fails due to authentication failure, have the user re-enter their credentials in the CUPC client. If the client tried to reconnect but can't, it is most likely that the voicemail account is either locked or the password has expired.

Conferencing Troubleshooting

This section covers the basic troubleshooting steps focused on conferencing and covers MeetingPlace Express and MeetingPlace:

- If the user complains that the conferencing button is dimmed on the CUPC client, that is most likely due to the conferencing resources not being configured for the system, the conference profile has not been defined for the user, or the Web Conferencing Server credentials on the CUPC client are incorrect. Check the CUPS server and make sure that a conferencing server has been configured and that the correct conference profile has been identified for the CUPC client. When that is confirmed, make sure the CUPC user has configured the correct user information in the Web Conference Server setting of the client.
- If the user complains that he cannot escalate a call to a web conference when he clicks **Start Web Conference**, check the CUCM server and make sure that the directory lookup dial rules are configured correctly. This issue can occur when the CUPC client cannot match a calling party number with the correct person from LDAP via the CUCM server. Details on configuring directory lookup dial rules can be found at <http://tinyurl.com/yd5pyd6>.

Note Advanced troubleshooting information for MeetingPlace express can be found at <http://tinyurl.com/ychwbnw> and for MeetingPlace at <http://tinyurl.com/ya3s2os>.

LDAP Troubleshooting

The following provide solutions to some common LDAP problems. For instance, if there are no results when a user does a query in the Search pane, there can be several reasons for this; here are some things to look at to resolve the issue:

- If anonymous bind is configured in CUPS for the LDAP server, uncheck that check box and configure the Bind Distinguished Name information.
- Check client connectivity to the LDAP server by having the user ping the IP address of the LDAP server or telnet to the LDAP port on the server. (The default is port 389.)
- If using bind credentials in the LDAP server configuration on CUPS, double-check that those credentials are correct.
- Verify the correct search space is defined in the LDAP server configuration on CUPS.

For more detailed LDAP troubleshooting information, go to <http://tinyurl.com/yadqb4v>.

Summary

The CUPC client is a feature-rich client that offers a lot of productivity enhancements to the end user. It is flexible for both the stationary and mobile workspace users with desk-phone CTI control and softphone. The collaboration features provided by the client cover Instant Messaging, audio/video calls, web conferencing—all at the click of a button. The idea of escalating a conversation as needed gives the end user the ability to get more done in a single interaction than has ever been provided before. The click-to-action functionality of CUPC gives the power of advanced collaboration features to end users with little to no knowledge of how to initiate them. This is especially evident with video and web conferencing because these two collaborative mediums have historically had low adoption rates because of complex scheduling and setup.

Index

A

- activating CUPS, 70–71
- active/standby redundant
 - high-availability deployment (CUP server), 40
- ad-hoc conferencing
 - MeetingPlace Express, CUPC support, configuring, 158–159, 161
 - troubleshooting, 172–173
 - WebEx Meeting Center, CUPC support, configuring, 161
- adding nodes to CUPS cluster, 90–91, 93
- advanced CUPC features, voicemail, configuring, 149–150, 152, 154–158
- application server, adding for CUCM installation, 46
- authentication (LDAP)
 - configuring, 112
 - as CUCM/CUPS integration requirement, 108
- AXL (Administrative XML Layer) API, 45

- AXL group, adding for CUCM installation, 48, 50

- AXP (Application Extension Platform), 11–12

B

- balanced nonredundant
 - high-availability deployment (CUP server), 39–40
- balanced redundant high-availability deployment (CUP server), 38–39
- Bell, Alexander Graham, 2
- BLF (Busy Lamp Field), 7
- BLF support (CUCM), 24

C

- call center agents, as typical Presence users, 185–186
- call control, 3, 177
 - IP-based, 5
 - CUCM, 7–8
 - endpoint network access, 8–9
 - ISRs, 9–11

- Mobile Connect, 181
- Mobile Voice Access, 181
 - for stationary users, 181–182
- call handlers, 11
- CIPC (Cisco IP Communicator), 16–17
- Cisco ASA (Adaptive Security Appliance), TLS Proxy feature, 191, 193
- Cisco AXP (Application Extension Platform), 11–12
- Cisco Unified Communications
 - Answer File Generator, unattended
 - Presence server installation, 94–99
- Cisco Unified MeetingPlace, 12
- Cisco Unity, configuring as CUPC message platform, 152, 154
- Cisco Unity Inbox Web Tool, 178
- Cisco UWL (User Workspace License), 18–19
- city and county government
 - productivity, enhancing with CUPS, 211
- CLI, CUP domain, configuring, 195–197
- clients (UC)
 - CIPC, 16–17
 - Cisco UWL, 18–19
 - CUCIMOC, 17
 - CUMC, 17
 - CUPC, 18
 - CUVA, 18
- cloud services, 13
- clusters
 - CUP, 27–28
 - nodes, adding, 90–91, 93
- Collaboration, 179–180
 - Cisco Unified MeetingPlace, 12
 - for stationary users, 182–183

- commands, show network eth0, 195–197
- comparing Presence Sources and Presence Consumers, 177
- conference servers, CUPS, configuring, 161
- conferencing, troubleshooting, 172–173
- conferencing profiles, CUPS, configuring, 162, 164
- configuring
 - CTI gateway, 85, 88
 - CUCM
 - CUPC devices*, 145, 147–148
 - IP phones*, 143, 145
 - CUCM/CUPS integration
 - CTI gateway settings*, 118, 121–123
 - device associations*, 129, 132–134
 - LDAP profile*, 128, 130–131
 - preconfiguration checks*, 114–115
 - Presence service parameter*, 122, 124
 - SIP trunks*, 125–126, 128
 - CUP domain from CLI, 195–197
 - CUPC, 140, 142
 - LDAP*, 164–165, 167–168
 - MeetingPlace support*, 158–159, 161
 - Proxy Listener*, 135–136
 - Service Parameter*, 135–136
 - TFTP server connection*, 134–135
 - video*, 164
 - voicemail*, 149–150, 152, 154–158
 - WebEx Meeting Center support*, 161

- CUPS
 - conference servers*, 161
 - conferencing profiles*, 162, 164
 - redundancy*, 93–94
- Federation, 188–189
 - DNS*, 194–195
 - email federation*, 189–191
 - on Microsoft OCS*, 197, 200–202
 - TLS peer subject creation*, 191, 193
- IPPM, 83–85
- LDAP, 109
 - authentication*, 112
 - connectivity*, 113
 - synchronization*, 110–111
- proxy domain, 82–83
- connectivity**
 - CUCM/CUPS, troubleshooting, 228–229
 - CUPS/CUCM, troubleshooting, 99, 101
 - LDAP/CUPS, configuring, 113
- CTI (Computer Telephony Interface) gateway**
 - configuring, 85, 88
 - CUCM/CUPS integration, configuring, 118, 121–123
- CUAD (Cisco Unified Application Designer)**, 12
- CUAE (Cisco Unified Application Environment)**, 12
- CUAS (Cisco Unified Application Server)**, 12
- CUC (Cisco Unity Connection)**
 - provisioning, 149
 - secure messaging, enabling, 150, 152
- CUCIMOC (Cisco UC Integration for Microsoft Office Communicator)**, 17
- CUCM, 7–8, 21**
 - CUP federated deployment, 35–37
 - CUP multicluster deployment, 33–34
 - CUP single-cluster deployment, 32–33
- CUPC**
 - configuring*, 140, 142
 - devices, configuring*, 145, 147–148
- CUPS dependencies, troubleshooting, 226, 228–229
- CUPS synchronization, 72–73
- installation tasks
 - application server, adding*, 46
 - AXL group, adding*, 48, 50
 - CUPS service activation*, 70–71
 - CUPS software installation*, 51, 53, 55, 57, 59, 62, 64, 66, 68
 - CUPS software licensing*, 69–70
 - Presence Gateway, adding*, 74–79, 81
- IP phones, configuring, 143, 145
- Presence capabilities, 23
 - phone directories*, 25
 - speed dials*, 24
- CUCM/CUPS integration**
 - CTI gateway settings, configuring, 118, 121–123
 - device associations, 129, 132–134
 - LDAP configuration, 109–113
 - LDAP profile, 128, 130–131
 - LDAP requirements
 - authentication*, 108
 - directory access*, 108
 - provisioning*, 107

- preconfiguration checks, 114–115
- Presence service parameter, configuring, 122, 124
- SIP trunks, configuring, 125–126, 128
- troubleshooting, 170–171
- CUMC (Cisco Unified Mobile Communicator)), 17**
- CUME (Cisco Unified Media Engine), 12**
- CUP**
 - components, 22
 - deployment models
 - clusters*, 27–28
 - platform scalability*, 30
 - redundancy*, 29–30
 - federated deployment, 35–37
 - federation capabilities, 205
 - multicenter deployment, 33–34
 - single-center deployment, 32–33
 - users, 25
- CUP domain, configuring from CLI, 195–197**
- CUP Servers**
 - DNS, configuring, 194–195
 - email federation, configuring, 189–191
 - Federation, configuring, 188–189
 - multicenter scalability, 37–41
 - Publish Trunk service parameter, 26
- CUPC (Cisco Unified Personal Communicator)), 18**
 - ad-hoc conferencing
 - MeetingPlace support*, configuring, 158–159, 161
 - WebEx Meeting Center support*, configuring, 161
 - configuring, 140, 142
 - devices, configuring in CUCM, 145, 147–148
 - failed TFTP downloads, troubleshooting, 250–251
 - LDAP, configuring, 164–165, 167–168
 - leveraging with CUPS, 206–207
 - Proxy Listener, configuring, 135–136
 - Service Parameter, configuring, 135–136
 - softphones, creating for users, 131–134
 - TFTP server connection, configuring, 134–135
 - troubleshooting, 169
 - user device associations, troubleshooting, 244–245
 - user group membership, troubleshooting, 246, 248–249
 - user names, troubleshooting, 241, 243
 - video, configuring, 164
 - voicemail
 - configuring*, 149–150, 152, 154–158
 - troubleshooting*, 171–172, 251–252, 257
- CUPC Show Server Health tool, 169**
- CUPS (Cisco Unified Presence Server), 204**
 - conference servers, configuring, 161
 - conferencing profiles, configuring, 162, 164
 - CUCM connectivity, troubleshooting, 99, 101
 - CUCM dependencies, troubleshooting, 226, 228–229

CUCM synchronization, 72–73
 CUPC, leveraging, 206–207
 installing, 45
 supported server platforms,
 44–45
 leveraging in vertical markets
 city and county
 government, 211
 emergency services, 210–211
 healthcare, 207–209
 retail, 212–213
 mailstore servers, configuring,
 155–156
 nodes, adding to cluster,
 90–91, 93
 Presence objects, 187
 redundancy, configuring, 93–94
 service activation, 70–71
 software installation, 51, 53, 55, 57,
 59, 62, 64, 66, 68
 software licensing, 69–70
 System Troubleshooter, 101,
 103–104, 106
 troubleshooting tools
 MOC Troubleshooter page,
 221–222
 RTMT, 225–226
 System Status page,
 216–218
 System Troubleshooter page,
 218–220
 users, troubleshooting, 229–230,
 232–234, 236–237, 239–240
 voicemail profiles, configuring,
 157–158
 voicemail servers, configuring,
 154–155
 CUA (Cisco Unified Video
 Advantage), 18

CUWL (Cisco Unified Workplace
 Licensing), 177

D

defining UC, industry definition, 1–2
 dependencies (CUPS/CUCM), 99, 101
 troubleshooting, 226, 228–229
 deploying CUCM
 CUP federated deployment,
 35–37
 CUP multicluster deployment,
 33–34
 CUP single-cluster deployment,
 32–33
 deployment models (CUP)
 clusters, 27–28
 platform scalability, 30
 redundancy, 29–30
 Derived Presence, 176, 187
 desk phones, adding in CUCM,
 143, 145
 device associations, CUCM/CUPS
 integration, configuring, 129,
 132–134
 devices, CUPC, configuring in
 CUCM, 145, 147–148
 Diagnostics tab (CUPS
 Administration page)
 MOC Troubleshooter page, 221–222
 System Status page, 216–218
 System Troubleshooter page,
 218–220
 directory access (LDAP), as
 CUCM/CUPS integration
 requirement, 108
 DNS, configuring, 194–195
 doctor communications, enhancing
 productivity with CUPS, 209

E

Edison, Thomas, 2
 email federation, configuring,
 189–191
 emergency services, CUPS,
 leveraging, 210–211
 endpoints, 8–9
 executives, as typical Presence
 users, 183–184

F

failed TFTP downloads,
 troubleshooting, 250–251
 Federated Presence, Microsoft OCS
 configuration, 197, 200–202
 Federation
 configuring, 188–189
 DNS, configuring on CUP Server,
 194–195
 email federation, configuring,
 189–191
 IM networks, 187
 TLS peer subject creation, 191, 193
 federation capabilities (CUP), 205

G

Gray, Elisha, 2

H

healthcare industry, CUPS,
 leveraging, 207
 doctor communications, 209
 nurse communications, 208
 high availability, 29
 history of telephony, 2–3

I

IM
 federated networks, 187
 Jabber, 180
 industry definition of UC, 1–2
 installing
 CUCM
 application server, adding, 46
 AXL group, adding, 48, 50
 CUPS service activation, 70–71
 CUPS software installation, 51,
 53, 55, 57, 59, 62, 64, 66, 68
 CUPS software licensing, 69–70
 Presence Gateway, adding,
 74–79, 81
 CUPS, 45
 supported server platforms,
 44–45
 Presence server, unattended
 installation, 94–99
 Integrated Messaging, 178–179
 interdomain federation capabilities
 (CUP), 205
 interenterprise federation capabilities
 (CUP), 205
 International Phonetic Alphabet, 2
 IP phones, configuring in CUCM,
 143, 145
 IPICS (Cisco IP Interoperability
 and Collaboration System), 210
 IPPM (IP Phone Messenger),
 configuring, 83–85
 IPT (IP Telephony)
 call control, 5
 CUCM, 7–8
 endpoint network access, 8–9
 ISRs, 6, 9–11

ISRs (Integrated Services Routers),
6, 9-11

J

Jabber, 180

L

LDAP

authentication, configuring, 112
configuring, 109

*for CUPC, 164-165,
167-168*

connectivity, configuring, 113

CUCM/CUPS integration
requirements

*authentication, 108
directory access, 108
provisioning, 107*

synchronization, configuring,
110-111

troubleshooting, 173

LDAP profile, CUCM/CUPS
integration, configuring, 128,
130-131

LDAP synchronization,
troubleshooting, 232-234,
236-237, 239-240

leveraging CUPC with CUPS,
206-207

leveraging CUPS in vertical markets

city and county government, 211
emergency services, 210-211
healthcare, 207

*doctor communications, 209
nurse communications, 208*

retail, 212-213

licensing CUPS, 69-70

log files, 222-223

M

mailstore servers, configuring in
CUPS, 155-156

MeetingPlace, CUPC support,
configuring, 158-159, 161

messaging for stationary users, 182

Microsoft OCS, federation,
configuring, 197, 200-202

Mobile Connect, 181

mobile users, 183

mobility, 13, 180-181

MOC Troubleshooter page (CUPS
Diagnostics tab), 221-222

multicenter deployment (CUCM),
33-37

multinode scalability (CUP server), 37

active/standby redundant
high-availability deployment, 40

balanced nonredundant high-
availability deployment,
39-40

balanced redundant high-availability
deployment, 38-39

nonhigh-availability deployment, 41

N

nodes, adding to CUPS cluster,
90-91, 93

nonhigh-availability deployment
(CUP server), 41

nurse communications, enhancing
productivity with CUPS, 208

Nyquist, Harry, 2

Nyquist-Shannon theorem, 2

P

PBX architecture, 3

- ISRs, 6, 9–11
- signaling, 4–5

phone directories (CUCM), 25

platform scalability (CUP), 30

plug-ins (RTMT), 223

Post-Installation Wizard, 66, 68

preconfiguration checks,
CUCM/CUPS integration, 114–115

preinstallation tasks (CUPS), 44–45

Presence, 14–15, 21, 179, 187

- CUCM, 23
 - phone directories*, 25
 - speed dials*, 24
- CUP
 - components*, 22
 - deployment models*, 27–30
 - users*, 25
- CUP server, Publish Trunk service parameter, 26
- Derived Presence, 187
- user scenarios
 - call center agents*, 185–186
 - executives*, 183–184
 - mobile users*, 183
 - stationary users*, 181–183
 - teleworkers*, 184

Presence Engine log files, 223

Presence Gateway, adding, 74–79, 81

Presence server

- CTI gateway, configuring, 85, 88
- IPPM, configuring, 83–85
- proxy domain, configuring, 82–83

Presence service parameter,
CUCM/CUPS integration,
configuring, 122, 124

provisioning (LDAP), as CUCM/CUPS
integration requirement, 107

proxy domain, configuring, 82–83

Proxy Listener, configuring for
CUPC, 135–136

public sector, enhancing productivity
with CUPS

- city and county government, 211
- emergency services, 210–211

Publish Trunk service parameter
(CUP server), 26

R

redundancy

- CUP, 29–30
- CUPS, configuring, 93–94

retail, CUPS, leveraging, 212–213

RTMT (Real Time Monitoring Tool),
225–226

plug-ins, 223

S

scalability

- CUP, 30
- CUP server, multinode scalability,
37–41

secure messaging, CUC, configuring,
150, 152

Service Parameter, configuring for
CUPC, 135–136

show network eth0 command,
195–197

single-cluster deployment (CUCM),
32–33

SIP Proxy log files, 223

SIP trunks, CUCM/CUPS
integration, configuring,
125–126, 128

SNR (Single Number Reach), 15, 180
 softphones, creating for CUPC users, 131–134
 SONA, 6
 SRST, 11
 stationary users, 181
 call control, 181–182
 collaboration, 182–183
 messaging, 182
 Sync Agent log files, 222
 synchronization
 CUCM/CUPS, 72–73
 LDAP
 configuring, 110–111
 troubleshooting, 232–234, 236–237, 239–240
 System Status page (CUPS Diagnostics tab), 216–218
 System Troubleshooter (CUPS), 218–220
 users, troubleshooting, 229–240
 System Troubleshooting, 101, 103–104, 106

T

telephony. *See also* IPT
 call control, 3
 history of, 2–3
 PBX architecture, 3
 signaling, 4–5
 teleworkers, as typical Presence users, 184
 TFTP, failed downloads, troubleshooting, 250–251
 TFTP server connection, configuring for CUPC, 134–135
 TLS peer subject creation, 191, 193

trace files, 222–223
 troubleshooting
 conferencing, 172–173
 CUCM/CUPS dependencies, 226, 228–229
 CUCM/CUPS integration, 170–171
 CUCP
 failed TFTP downloads, 250–251
 voicemail access, 251–252, 257
 CUPC, 169
 user device associations, 244–245
 user group membership, 246, 248–249
 user names, 241, 243
 CUPS/CUCM connectivity, 99, 101
 CUPS users, 229–230, 232–234, 236–237, 239–240
 LDAP, 173
 with System Troubleshooter, 101, 103–104, 106
 voicemail, 171–172
 troubleshooting tools
 MOC Troubleshooter page, 221–222
 RTMT, 225–226
 System Status page, 216–218
 System Troubleshooter page, 218–220
 trace files, 222–223

U

UC, industry definition of, 1–2
 UC applications, Cisco Unified MeetingPlace, 12
 UC components
 call control, 177
 Collaboration, 179–180

- mobility, 180–181
- Presence, 179
- voice messaging, 177–178
 - Integrated Messaging*, 178–179
 - Unified Messaging*, 178
- UC solutions**
 - applications
 - Cisco AXP*, 11–12
 - mobility*, 13
 - voice messaging*, 13–14
 - clients, 16
 - CIPC*, 16–17
 - Cisco UWL*, 18–19
 - CUCIMOC*, 17
 - CUMC*, 17
 - CUPC*, 18
 - CUVA*, 18
 - user experience, 15–16
- unattended Presence server**
 - installation, 94–99
- Unified Messaging**, 178
- user device associations (CUPC)**,
 - troubleshooting, 244–245
- user group membership (CUPC)**,
 - troubleshooting, 246, 248–249
- user names (CUPC)**, troubleshooting,
 - 241, 243
- user scenarios**
 - call center agents, 185–186
 - executives, 183–184
 - mobile users, 183
 - stationary users, 181
 - call control*, 181–182
 - collaboration*, 182–183
 - messaging*, 182
 - teleworkers, 184
- users (CUCM)**, configuring without
 - LDAP integration, 140, 142

- users (CUPS)**, troubleshooting,
 - 229–240

V

- verifying TLS Peer Subject**
 - creation, 191
- video**, configuring for CUPC, 164
- video conferencing**, 180
- Visual Voice Mail**, 177
- voice messaging**, 13–14, 177–178
 - Integrated Messaging*, 178–179
 - Unified Messaging*, 178
- voicemail**
 - configuring in CUPC, 149–150, 152
 - Cisco Unity configuration*, 152, 154
 - CUPS mailstore servers*, 155–156
 - CUPS voicemail profiles*, 157–158
 - CUPS voicemail servers*, 154–155
 - troubleshooting, 171–172, 251–252, 257
- voicemail profiles**, configuring in
 - CUPS, 157–158

W

- WebEx Connect**, 180
- WebEx Meeting Center**, CUPC
 - support, configuring, 161

X

- XCP (Jabber eXtensible**
 - Communications**
 - Platform)**, 180