Cisco Unified Communications Manager Express SCCP Integration Guide for Cisco Unity Connection Release 8.x

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This document provides instructions for setting up a Cisco Unified Communications Manager Express Skinny Call Control Protocol (SCCP) integration with Cisco Unity Connection.

This document does not apply to the configuration in which Cisco Unity Connection is installed as Cisco Unified Communications Manager Business Edition (CMBE)—on the same server with Cisco Unified Communications Manager.

Cisco Unity Connection can integrate with Cisco Unified CM Express in SRST mode. For details, see the *Integrating Cisco Unity Connection with Cisco Unified CME-as-SRST* application note at http://www.cisco.com/en/US/products/sw/voicesw/ps4625/products_installation_and_configuration_guides_list.html.

Integration Tasks

Before doing the following tasks to integrate Cisco Unity Connection with Cisco Unified Communications Manager Express by SCCP, confirm that Cisco Unity Connection is ready for the integration by completing the applicable tasks in the *Installation Guide for Cisco Unity Connection*.

The following task list describes the process for creating the integration.

Task List to Create the Integration

Use the following task list to set up a Cisco Unified CM Express SCCP integration.

1. Review the system and equipment requirements to confirm that all phone system and Cisco Unity Connection server requirements have been met. See the "Requirements" section on page 2.
2. Plan how the voice messaging ports will be used by Cisco Unity Connection. See the "Planning How the Voice Messaging Ports Will Be Used by Cisco Unity Connection" section on page 5.

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3. Program Cisco Unified Communications Manager Express. See the "Programming the Cisco Unified Communications Manager Express Phone System for Integrating with Cisco Unity Connection" section on page 9.
4. Create the integration. See the "Creating a New Integration with Cisco Unified Communications Manager Express" section on page 28.
5. Test the integration. See the "Testing the Integration" section on page 39.
6. If this integration is a second or subsequent integration, add the applicable new user templates for the new phone system. See the "Adding New User Templates for Multiple Integrations" section on page 42.

Requirements

Revised November 16, 2010

The Cisco Unified CM Express SCCP integration supports configurations of the following components:

Phone System

- A compatible version of Cisco Unified CM Express.

  For details on compatible versions of Cisco Unified CM Express, see the *SCCP Compatibility Matrix: Cisco Unity Connection, Cisco Unified Communications Manager, and Cisco Unified Communications Manager Express* at http://www.cisco.com/en/US/products/ps6509/products_device_support_tables_list.html.
- The following phones or combinations of phones for the Cisco Unified CM Express extensions:
  - Only SCCP phones.
  - Both SCCP phones and SIP phones.

  For a list of supported Cisco IP phone models, see the applicable compatibility information document at http://www.cisco.com/en/US/products/sw/voicesw/ps4625/products_device_support_tables_list.html.
- A compatible Cisco IOS software version. See the *Cisco Unified CME and Cisco IOS Software Version Compatibility Matrix* at http://www.cisco.com/en/US/products/sw/voicesw/ps4625/products_device_support_tables_list.html.
- Cisco Unified CM Express feature license.
- Cisco IP phone feature licenses, and Cisco licenses for other H.323-compliant devices or software (such as Cisco VirtualPhone and Microsoft NetMeeting clients) that will be connected to the network, as well as one license for each Cisco Unity Connection port.
- Analog phones connected to ATA. (For integration limitations with these phones, see the "Integration Description" section on page 3.)
- A LAN connection in each location where you will plug the applicable phone into the network.

Cisco Unity Connection Server

- The applicable version of Cisco Unity Connection. For details on compatible versions of Cisco Unity Connection, see the *SCCP Compatibility Matrix: Cisco Unity Connection, Cisco Unified Communications Manager, and Cisco Unified Communications Manager Express* at http://www.cisco.com/en/US/products/ps6509/products_device_support_tables_list.html.

- Cisco Unity Connection installed and ready for the integration, as described in the *Installation Guide for Cisco Unity Connection* at http://www.cisco.com/en/US/products/ps6509/prod_installation_guides_list.html.
- A license that enables the applicable number of voice messaging ports.

Centralized Voice Messaging

Cisco Unity Connection supports centralized voice messaging through the phone system, which supports various inter-phone system networking protocols including proprietary protocols such as Avaya DCS, Nortel MCDN, or Siemens CorNet, and standards-based protocols such as QSIG or DPNSS. Note that centralized voice messaging is a function of the phone system and its inter-phone system networking, not voicemail. Connection will support centralized voice messaging as long as the phone system and its inter-phone system networking are properly configured. For details, see the "Centralized Voice Messaging" section in the "Integrating Cisco Unity Connection with the Phone System" chapter of the *Design Guide for Cisco Unity Connection Release 8.x* at http://www.cisco.com/en/US/docs/voice_ip_comm/connection/8x/design/guide/8xcucdgx.html.

Integration Description

The Cisco Unified Communications Manager (CM) Express SCCP integration uses a LAN to connect Cisco Unity Connection and the phone system. The Cisco Unified Communications Manager Express router also provides connections to the PSTN. Figure 1 shows the connections for a system with a single Cisco Unified CM Express router.

Figure 1 Connections Between a Single Cisco Unified Communications Manager Express Router and Cisco Unity Connection

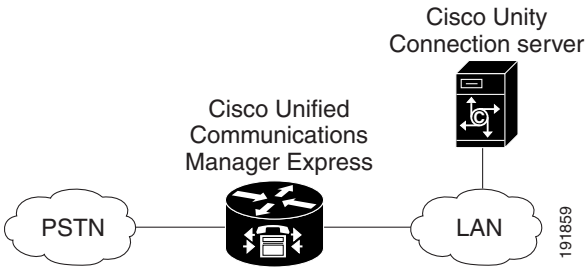
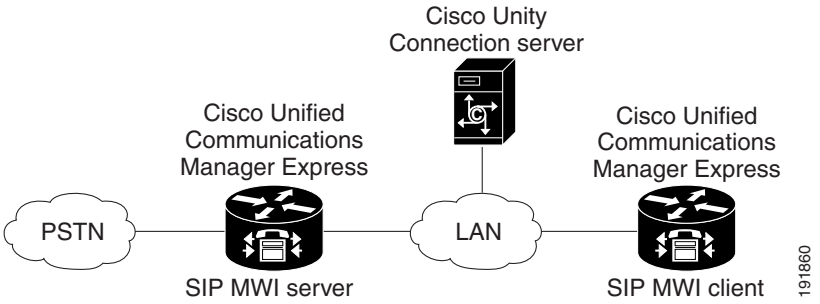


Figure 2 shows the connections for a system with multiple Cisco Unified CM Express router and a single Cisco Unity Connection server. One Cisco Unified CM Express router acts as the SIP MWI server, and the remaining Cisco Unified CM Express routers act as SIP MWI clients. Note that Cisco Unity Connection voice messaging ports register with only the SIP MWI server (the Cisco Unified CM Express router that is on the same LAN as the Cisco Unity Connection server), not with the SIP MWI clients.

Figure 2 Connections Between Multiple Cisco Unified Communications Manager Express Routers and a Single Cisco Unity Connection Server



For a list of supported versions of Cisco Unified CM Express that are qualified to integrate with Cisco Unity Connection by Skinny Call Control Protocol (SCCP), see the *SCCP Compatibility Matrix: Cisco Unity Connection, Cisco Unified Communications Manager, and Cisco Unified Communications Manager Express* at http://www.cisco.com/en/US/products/ps6509/products_device_support_tables_list.html.

This document does not apply to the configuration in which Cisco Unity Connection is installed as Cisco Unified Communications Manager Business Edition (CMBE)—on the same server with Cisco Unified CM.

Call Information

The phone system sends the following information with forwarded calls:

- The extension of the called party
- The extension of the calling party (for internal calls) or the phone number of the calling party (if it is an external call and the system uses caller ID)
- The reason for the forward (the extension is busy, does not answer, or is set to forward all calls)

Cisco Unity Connection uses this information to answer the call appropriately. For example, a call forwarded to Cisco Unity Connection is answered with the personal greeting of the user. If the phone system routes the call to Cisco Unity Connection without this information, Cisco Unity Connection answers with the opening greeting.

Integration Functionality

The Cisco Unified CM Express SCCP integration with Cisco Unity Connection provides the following features:

- Call forward to personal greeting
- Call forward to busy greeting

- Caller ID
- Easy message access (a user can retrieve messages without entering an ID; Cisco Unity Connection identifies a user based on the extension from which the call originated; a password may be required)
- Identified user messaging (Cisco Unity Connection automatically identifies a user who leaves a message during a forwarded internal call, based on the extension from which the call originated)
- Message waiting indication (MWI)

These integration features are not available to analog phones connected through FXS ports on the Cisco Unified CM Express phone system. Analog phones connected to ATA, however, support all integration features, except MWIs (MWI lamps will not light, though the stutter dial tone will sound).

Integrations with Multiple Phone Systems

When Cisco Unity Connection is installed as Cisco Unified Communications Manager Business Edition (CMBE)—on the same server with Cisco Unified Communications Manager—Cisco Unity Connection cannot be integrated with multiple phone systems at one time.

When Cisco Unity Connection is not installed as Cisco Unified CMBE, Cisco Unity Connection can be integrated with two or more phone systems at one time. For information on and instructions for integrating Cisco Unity Connection with multiple phone systems, see the *Multiple Phone System Integration Guide for Cisco Unity Connection Release 8.x* at http://www.cisco.com/en/US/products/ps6509/products_installation_and_configuration_guides_list.html.

Planning How the Voice Messaging Ports Will Be Used by Cisco Unity Connection

Before programming the phone system, you need to plan how the voice messaging ports will be used by Cisco Unity Connection. The following considerations will affect the programming for the phone system (for example, setting up the hunt group or call forwarding for the voice messaging ports):

- The number of voice messaging ports installed.

  For a Cisco Unity Connection cluster, each Cisco Unity Connection server must have enough ports to handle all voice messaging traffic in case the other server stops functioning. The Cisco Unified CM Express server must have enough ports created for all Cisco Unity Connection servers.
- The number of voice messaging ports that will answer calls.
- The number of voice messaging ports that will only dial out, for example, to send message notification, to set message waiting indicators (MWIs), and to make telephone record and playback (TRAP) connections.

The following table describes the voice messaging port settings in Cisco Unity Connection that can be set on Telephony Integrations > Port of Cisco Unity Connection Administration.

Table 1 Settings for the Voice Messaging Ports

Field	Considerations
Enabled	Check this check box to enable the port. The port is enabled during normal operation. Uncheck this check box to disable the port. When the port is disabled, calls to the port get a ringing tone but are not answered. Typically, the port is disabled only by the installer during testing.
Server	*(For a Cisco Unity Connection cluster only)* Select the name of the Cisco Unity Connection server that you want to handle this port. Assign an equal number of answering and dial-out voice messaging ports to the Cisco Unity Connection servers so that they equally share the voice messaging traffic.
Extension	Enter the extension for the port as assigned on the phone system.
Answer Calls	Check this check box to designate the port for answering calls. These calls can be incoming calls from unidentified callers or from users.
Perform Message Notification	Check this check box to designate the port for notifying users of messages. Assign Perform Message Notification to the least busy ports.
Send MWI Requests	Check this check box to designate the port for turning MWIs on and off. Assign Send MWI Requests to the least busy ports.
Allow TRAP Connections	Check this check box so that users can use the port for recording and playback through the phone in Cisco Unity Connection web applications. Assign Allow TRAP Connections to the least busy ports.
Outgoing Hunt Order	Enter the priority order in which Cisco Unity Connection will use the ports when dialing out (for example, if the Perform Message Notification, Send MWI Requests, or Allow TRAP Connections check box is checked). The highest numbers are used first. However, when multiple ports have the same Outgoing Hunt Order number, Cisco Unity Connection will use the port that has been idle the longest.

The Number Voice of Messaging Ports to Install

The number of voice messaging ports to install depends on numerous factors, including:

- The number of calls Cisco Unity Connection will answer when call traffic is at its peak.
- The expected length of each message that callers will record and that users will listen to.
- The number of users.
- The number of ports that will be set to dial out only.
- The number of calls made for message notification.
- The number of MWIs that will be activated when call traffic is at its peak.
- The number of TRAP connections needed when call traffic is at its peak. (TRAP connections are used by Cisco Unity Connection web applications to play back and record over the phone.)

- The number of calls that will use the automated attendant and call handlers when call traffic is at its peak.
- Whether a Cisco Unity Connection cluster is configured. For considerations, see the "Considerations for a Cisco Unity Connection Cluster" section on page 7.

It is best to install only the number of voice messaging ports that are needed so that system resources are not allocated to unused ports.

The Number of Voice Messaging Ports That Will Answer Calls

The calls that the voice messaging ports answer can be incoming calls from unidentified callers or from users. Typically, the voice messaging ports that answer calls are the busiest.

You can set voice messaging ports to both answer calls and to dial out (for example, to send message notifications). However, when the voice messaging ports perform more than one function and are very active (for example, answering many calls), the other functions may be delayed until the voice messaging port is free (for example, message notifications cannot be sent until there are fewer calls to answer). For best performance, dedicate certain voice messaging ports for only answering incoming calls, and dedicate other ports for only dialing out. Separating these port functions eliminates the possibility of a collision, in which an incoming call arrives on a port at the same time that Cisco Unity Connection takes the port off-hook to dial out.

If your system is configured for a Cisco Unity Connection cluster, see the "Considerations for a Cisco Unity Connection Cluster" section on page 7.

The Number of Voice Messaging Ports That Will Dial Out, and Not Answer Calls

Ports that will only dial out and will not answer calls can do one or more of the following:

- Notify users by phone, pager, or email of messages that have arrived.
- Turn MWIs on and off for user extensions.
- Make a TRAP connection so that users can use the phone as a recording and playback device in Cisco Unity Connection web applications.

Typically, these voice messaging ports are the least busy ports.

If your system is configured for a Cisco Unity Connection cluster, see the "Considerations for a Cisco Unity Connection Cluster" section on page 7.

Caution In programming the phone system, do not send calls to voice messaging ports in Cisco Unity Connection that cannot answer calls (voice messaging ports that are not set to Answer Calls). For example, if a voice messaging port is set only to Send MWI Requests, do not send calls to it.

Considerations for a Cisco Unity Connection Cluster

If your system is configured for a Cisco Unity Connection cluster, consider how the voice messaging ports will be used in different scenarios.

When Both Cisco Unity Connection Servers Are Functioning Normally

- The phone system is provisioned with twice the number SCCP ephone devices needed to handle the voice messaging traffic.
- A hunt group is configured on the phone system to send incoming calls first to the subscriber server, then to the publisher server if no answering ports are available on the subscriber server.
- Both Cisco Unity Connection servers are active and handle voice messaging traffic for the system.
- In Cisco Unity Connection Administration, the voice messaging ports that connect to the SCCP ephone devices are configured so that an equal number of voice messaging ports are assigned to each Cisco Unity Connection server. This guide directs you to assign the voice messaging ports to their specific server at the applicable time.
- The voice messaging ports on both Cisco Unity Connection servers are registered with the phone system.
- The number of voice messaging ports that are assigned to one Cisco Unity Connection server must be sufficient to handle all of the voice messaging traffic for the system (answering calls and dialing out) when the other Cisco Unity Connection server stops functioning.

  If both Cisco Unity Connection servers must be functioning to handle the voice messaging traffic, the system will not have sufficient capacity when one of the servers stops functioning.
- Each Cisco Unity Connection server is assigned half the total number of voice messaging ports.

  If all the voice messaging ports are assigned to one Cisco Unity Connection server, the other Cisco Unity Connection server will not be able to answer calls or to dial out.
- Each Cisco Unity Connection server must have voice messaging ports that will answer calls and that can dial out (for example, to set MWIs).

When Only One Cisco Unity Connection Server Is Functioning

- The SCCP ephone devices on the phone system are unregistered from the voice messaging ports on the Cisco Unity Connection server that stopped functioning.
- The hunt group on the phone system sends all calls to the functioning Cisco Unity Connection server.
- The functioning Cisco Unity Connection server receives all voice messaging traffic for the system.
- The number of voice messaging ports that are assigned to the functioning Cisco Unity Connection server must be sufficient to handle all of the voice messaging traffic for the system (answering calls and dialing out).
- The functioning Cisco Unity Connection server must have voice messaging ports that will answer calls and that can dial out (for example, to set MWIs).

  If the functioning Cisco Unity Connection server does not have voice messaging ports for answering calls, the system will not be able to answer incoming calls. Similarly, if the functioning Cisco Unity Connection server does not have voice messaging ports for dialing out, the system will not be able to dial out (for example, to set MWIs).

Programming the Cisco Unified Communications Manager Express Phone System for Integrating with Cisco Unity Connection

After the Cisco Unified Communications Manager Express router is installed, do the procedures in the applicable section depending on the Cisco Unity Connection configuration or on the number of Cisco Unified CM Express routers that you will integrate with Cisco Unity Connection:

- Cisco Unity Connection without a Connection cluster—see the "Programming a Cisco Unified Communications Manager Express Router to Integrate with Cisco Unity Connection (Without a Connection Cluster)" section on page 9.
- Cisco Unity Connection with a Connection cluster configured—see the "Programming a Cisco Unified Communications Manager Express Router to Integrate with Cisco Unity Connection with a Connection Cluster Configured" section on page 14.
- Multiple Cisco Unified Communications Manager Express routers—see the "Programming Multiple Cisco Unified Communications Manager Express Routers to Integrate with Cisco Unity Connection" section on page 19.

Programming a Cisco Unified Communications Manager Express Router to Integrate with Cisco Unity Connection (Without a Connection Cluster)

Note Do the procedures in this section only if you are integrating a single Cisco Unified CM Express router with Cisco Unity Connection server (without a Connection cluster). If Cisco Unity Connection is configured for a Connection cluster, see the "Programming a Cisco Unified Communications Manager Express Router to Integrate with Cisco Unity Connection with a Connection Cluster Configured" section on page 14. If you are integrating multiple Cisco Unified CM Express routers, see the "Programming Multiple Cisco Unified Communications Manager Express Routers to Integrate with Cisco Unity Connection" section on page 19.

To Configure the Message Button Access to Cisco Unity Connection (Without a Connection Cluster)

This procedure configures the Message button on Cisco IP phones to dial the Cisco Unity Connection pilot number when pressed.

Step 1 On the Cisco Unified CM Express router, go into the telephony-service configuration mode by entering the following command:

telephony-service

Step 2 Enter the following command:

voicemail <Cisco Unity Connection pilot number>

Step 3 To exit the telephony-service configuration mode, enter the following command:

exit

The following is an example of the configuration:

```
telephony-service
 voicemail 4001
```

To Configure the Router for Cisco Unity Connection (Without a Connection Cluster)

Step 1 Go into the ephone-dn configuration mode and configure the directory number tag for the Cisco IP phone lines by entering the applicable command:

- For ephone-dns that will be used by ports that are dedicated for leaving and retrieving voice messages, enter the following command:

  ephone-dn <DN tag> dual-line

- For ephone-dns that will be used only to dial out, enter the following command:

  ephone-dn <DN tag>

Step 2 To set the extension number for the voice messaging port, enter the following command:

number <Voice messaging port extension>

Note The voice message port extension must be the Cisco Unity Connection pilot number (configured by the "voicemail" command in the preceding procedure) for all ports dedicated for leaving and retrieving voice messages.

Step 3 To set the display name for the port (for example, "Voice Messaging System" or "Dial Out Only"), enter the following command:

name <Display name of voice messaging port>

Step 4 To set the device name for the port (for example, "CUC1-VI1" or "CUC1-Dialout1"), enter the following command:

description <Device name of voice messaging port>

Step 5 To reserve the second ephone-dn channel for supervised transfers, enter the following command:

huntstop channel

Step 6 To set the dial-peer preference for the extension, enter the following command:

preference <Preference order>

Step 7 Enter the applicable command:

- To disable huntstop, enter the following command:

  no huntstop

- To enable huntstop, enter the following command:

  huntstop

Step 8 Repeat Step 1 through Step 7 for all remaining ports.

Note The number of voice messaging ports set up to connect to Cisco Unity Connection must be the same as the number of directory number tags for the Cisco IP phone lines set up by the ephone-dn configuration mode.

Step 9 To exit the ephone-dn configuration mode, enter the following command:

exit

The following is an example of the configuration without a Cisco Unity Connection cluster:

```
ephone-dn 32 dual-line
 number 4001
 name "Voice Messaging System"
 description "CUC1-VI1"
 huntstop channel
 no huntstop
 preference 1
!
ephone-dn 33 dual-line
 number 4001
 name "Voice Messaging System"
 description "CUC1-VI2"
 huntstop channel
 no huntstop
 preference 2
!
ephone-dn 34 dual-line
 number 4001
 name "Voice Messaging System"
 description "CUC1-VI3"
 huntstop channel
 huntstop
 preference 3
!
ephone-dn 35
 number 5001
 name "Dial Out Only"
 description "CUC1-Dialout1"
```

In this example, there are four ephone-dns configured to provide four voice messaging ports. Three of the ephone-dns are configured with the same extension number to provide ports dedicated for leaving and retrieving voice messages. These three ephone-dns are also configured with two channels each (the second channel is reserved for supervised transfers). The fourth ephone-dn is provided for use as a dial-out port. The first three ephone-dns are configured with the same extension number (4001), using preferences 1, 2, and 3 to create a hunt group. If the first port is busy, the call goes to the second port, and so on. Port 4 is configured with the extension number 5001 and is used to dial out by Cisco Unity Connection (for example, to set MWIs). Separate ports are required for answering calls and dialing out in order to prevent call-collision problems between incoming calls placed by Cisco Unified CM Express to Cisco Unity Connection, and outgoing calls that Cisco Unity Connection places in the opposite direction.

To Associate the Voice Messaging Port (Without a Connection Cluster)

To associate the actual voice messaging port (vm-device-id) to the phone number, associate the Cisco IP phone with the voice messaging port.

The vm-device-id name uses the following format:

<Cisco Unity Connection device name prefix><Port number>

The vm-device-id name must match the Cisco Unity Connection voice messaging port name that you will use to identify the port in Cisco Unity Connection Administration when you create the integration:

- The Cisco Unity Connection device name prefix part (for example, CUC1-VI) must match the Device Name Prefix field on the Telephony Integrations > Port Group > Port Group Basics page of Cisco Unity Connection Administration.

- The port number part (for example, “1”) must match the number part of the Cisco Unity Connection Administration voice messaging port name used to identify the port on the Telephony Integrations > Port > Port Basics page of Cisco Unity Connection Administration.

To associate a voice messaging port to the Cisco Unified CM Express router, do the following steps, beginning in ephone configuration mode.

Step 1 Go into the ephone configuration mode and register the Cisco IP phones by entering the following command:

ephone <DN tag>

Step 2 Define the voice messaging port name, by entering the following command:

vm-device-id <Cisco Unity Connection device name prefix><Port number>

For example, if the Cisco Unity Connection device name prefix is CUC1-VI, enter CUC1-VI1 for the first port, CUC1-VI2 for the second port, and so on.

Caution The vm-device-id name used by Cisco Unified CM Express must be the same as the voice messaging port name used by Cisco Unity Connection. Otherwise, the integration will not work.

Step 3 Assign buttons to the Cisco IP phone directory numbers created in the “To Configure the Router for Cisco Unity Connection (Without a Connection Cluster)” procedure on page 10 by entering the following command:

button <Button number>:<DN tag>

For example, you can use the values 1:1, 2:4, or 3:14. In this example, button 1 corresponds to directory number 1 (ephone-dn 1), button 2 corresponds to directory number 4, and button 3 corresponds to directory number 14. The buttons correspond to the phone lines on the Cisco IP phone.

Step 4 Repeat Step 1 through Step 3 for all remaining voice messaging port names.

Note The number of voice messaging port names configured with the vm-device-id command must be the same as the number of Cisco IP phones registered by the ephone configuration mode.

Step 5 To exit the ephone configuration mode, enter the following command:

exit

Following is an example of the configuration without a Cisco Unity Connection cluster. In this example, the vm-device-id command is used within the ephone configuration in place of the mac-address parameter that is used for configuring a regular Cisco IP phone.

```
ephone 5
 vm-device-id CUC1-VI1
 button 1:32
!
ephone 6
 vm-device-id CUC1-VI2
 button 1:33
!
ephone 7
 vm-device-id CUC1-VI3
```

```
 button 1:34
!
ephone 8
 vm-device-id CUC1-VI4
 button 1:35
```

To Configure a Directory Number for MWI Notification (Without a Connection Cluster)

MWI configuration on the Cisco Unified CM Express is performed by dedicating Cisco IP phone directory numbers (ephone-DNs) to process MWI status notification calls originating from Cisco Unity Connection. You must allocate a minimum of one MWI processing ephone-dn for each MWI ephone-dn voice messaging port. The MWI processing ephone-dn extensions are configured to match the MWI extensions configured on Cisco Unity Connection.

Step 1 Go into the ephone-dn configuration mode and configure the directory numbers for the Cisco IP phone lines by entering the following command:

ephone-dn <DN tag>

Step 2 Configure two valid directory numbers for the Cisco IP phone to be used for MWIs—the first number will turn MWIs on, and the second number will turn MWIs off—by entering the following command:

number <MWI on number> secondary <MWI off number>

Note The MWI on and off numbers must match the settings of the MWI On Extension and MWI Off Extension fields you enter in Cisco Unity Connection Administration when you create the integration on Cisco Unity Connection.

Step 3 Configure these two directory numbers to be used for setting MWIs by entering the following command:

mwi on-off

Step 4 To exit the ephone-dn configuration mode, enter the following command:

exit

Following is an example of the configuration.

```
ephone-dn 32
 number 8000 secondary 8001
 mwi on-off
```

In this example, Cisco Unity Connection calls extensions 8000 and 8001 to turn MWIs on and off. The DN triggers an MWI ON event when 8000 is called, and an MWI OFF event when 8001 is called.

For extensions associated with analog telephone adaptors (ATAs), the MWI is a lit function button on the ATA and a stutter dial tone on the connected analog phone.

Note After completing the procedures in this section, continue to the "Creating a New Integration with Cisco Unified Communications Manager Express" section on page 28.

Programming a Cisco Unified Communications Manager Express Router to Integrate with Cisco Unity Connection with a Connection Cluster Configured

Note Do the procedures in this section only if you are integrating a single Cisco Unified CM Express router with Cisco Unity Connection with a Connection cluster configured. If Cisco Unity Connection is not configured for a Connection cluster, see the "Programming a Cisco Unified Communications Manager Express Router to Integrate with Cisco Unity Connection (Without a Connection Cluster)" section on page 9. If you are integrating multiple Cisco Unified CM Express routers, see the "Programming Multiple Cisco Unified Communications Manager Express Routers to Integrate with Cisco Unity Connection" section on page 19.

To Configure the Message Button Access to Cisco Unity Connection (With a Connection Cluster Configured)

This procedure configures the Message button on Cisco IP phones to dial the Cisco Unity Connection pilot number when pressed.

Step 1 On the Cisco Unified CM Express router, go into the telephony-service configuration mode by entering the following command:

telephony-service

Step 2 Enter the following command:

voicemail <Cisco Unity Connection pilot number>

Step 3 To exit the telephony-service configuration mode, enter the following command:

exit

The following is an example of the configuration:

```
telephony-service
 voicemail 4001
```

To Configure the Router for Cisco Unity Connection (With a Connection Cluster Configured)

Step 1 Go into the ephone-dn configuration mode and configure the directory number tag for the Cisco IP phone lines by entering the applicable command:

- For ephone-dns that will be used by ports that are dedicated for leaving and retrieving voice messages, enter the following command:

  ephone-dn <DN tag> dual-line

- For ephone-dns that will be used only to dial out, enter the following command:

  ephone-dn <DN tag>

Step 2 To set the extension number for the voice messaging port, enter the following command:

number <Voice messaging port extension>

Note The voice message port extension must be the Cisco Unity Connection pilot number (configured by the "voicemail" command in the preceding procedure) for all ports dedicated for leaving and retrieving voice messages.

Step 3 To set the display name for the port (for example, "Voice Messaging System" or "Dial Out Only"), enter the following command:

name <Display name of voice messaging port>

Step 4 To set the device name for the port (for example, "CUC1-VI1" or "CUC1-Dialout1"), enter the following command:

description <Device name of voice messaging port>

Step 5 To reserve the second ephone-dn channel for supervised transfers, enter the following command:

huntstop channel

Step 6 To set the dial-peer preference for the extension, enter the following command:

preference <Preference order>

Note The preference order must route calls first to the subscriber server in the Connection cluster, then to the publisher server. See the example configuration below.

Step 7 Enter the applicable command:

- To disable huntstop, enter the following command:

  no huntstop

- To enable huntstop, enter the following command:

  huntstop

Step 8 Repeat Step 1 through Step 7 for all remaining ports.

Note The number of voice messaging ports set up to connect to Cisco Unity Connection must be the same as the number of directory number tags for the Cisco IP phone lines set up by the ephone-dn configuration mode. Further, the number of voice messaging ports must be the total of the ports on all Cisco Unity Connection servers in the Cisco Unity Connection cluster.

Step 9 To exit the ephone-dn configuration mode, enter the following command:

exit

The following is an example of the configuration with a Cisco Unity Connection cluster configured:

```
ephone-dn 32 dual-line
 number 4001
 name "Voice Messaging System"
 description "CUC1-VI1"
 huntstop channel
 no huntstop
 preference 4
!
ephone-dn 33 dual-line
 number 4001
```

```
 name "Voice Messaging System"
 description "CUC1-VI2"
 huntstop channel
 no huntstop
 preference 5
!
ephone-dn 34 dual-line
 number 4001
 name "Voice Messaging System"
 description "CUC1-VI3"
 huntstop channel
 huntstop
 preference 6
!
ephone-dn 35 dual-line
 number 4001
 name "Voice Messaging System"
 description "CUC2-VI1"
 huntstop channel
 no huntstop
 preference 1
!
ephone-dn 36 dual-line
 number 4001
 name "Voice Messaging System"
 description "CUC2-VI2"
 huntstop channel
 no huntstop
 preference 2
!
ephone-dn 37 dual-line
 number 4001
 name "Voice Messaging System"
 description "CUC2-VI3"
 huntstop channel
 no huntstop
 preference 3
!
ephone-dn 38
 number 5001
 name "Dial Out Only"
 description "CUC1-Dialout1"
!
ephone-dn 39
 number 5001
 name "Dial Out Only"
 description "CUC2-Dialout1"
```

In this example, there are two sets of ephone-dns:

- Four ephone-dns are configured for the publisher server in the Connection cluster (CUC1-VI1 through CUC1_VI3, and CUC1-Dialout1).
- Four ephone-dns are configured for the subscriber server in the Connection cluster (CUC2-VI1 through CUC2_VI3, and CUC2-Dialout1).

The hunt group routes calls first to the subscriber server in the Connection cluster. When all the answering ports on the subscriber server are busy, the hunt group routes calls to the publisher server. Only the last answering ephone-dn for the publisher server has enabled huntstop so that the hunt group will search through the answering ephone-dns on all Cisco Unity Connection servers. The ephone-dns that are used for dialing out are not included in the hunt group.

To Associate the Voice Messaging Port (With a Connection Cluster Configured)

To associate the actual voice messaging port (vm-device-id) to the phone number, associate the Cisco IP phone with the voice messaging port.

The vm-device-id name uses the following format:

<Cisco Unity Connection device name prefix><Port number>

The vm-device-id name must match the Cisco Unity Connection voice messaging port name that you will use to identify the port in Cisco Unity Connection Administration when you create the integration:

- The Cisco Unity Connection device name prefix part (for example, CUC1-VI) must match the Device Name Prefix field on the Telephony Integrations > Port Group > Port Group Basics page of Cisco Unity Connection Administration.
- The port number part (for example, “1”) must match the number part of the Cisco Unity Connection Administration voice messaging port name used to identify the port on the Telephony Integrations > Port > Port Basics page of Cisco Unity Connection Administration.

To associate a voice messaging port to the Cisco Unified CM Express router, do the following steps, beginning in ephone configuration mode.

Step 1 Go into the ephone configuration mode and register the Cisco IP phones by entering the following command:

ephone <DN tag>

Step 2 Define the voice messaging port name, by entering the following command:

vm-device-id <Cisco Unity Connection device name prefix><Port number>

For example, if the Cisco Unity Connection device name prefix is CUC1-VI, enter CUC1-VI1 for the first port, CUC1-VI2 for the second port, and so on.

Caution The vm-device-id name used by Cisco Unified CM Express must be the same as the voice messaging port name used by Cisco Unity Connection. Otherwise, the integration will not work.

Step 3 Assign buttons to the Cisco IP phone directory numbers created in the “To Configure the Router for Cisco Unity Connection (With a Connection Cluster Configured)” procedure on page 14 by entering the following command:

button <Button number>:<DN tag>

For example, you can use the values 1:1, 2:4, or 3:14. In this example, button 1 corresponds to directory number 1 (ephone-dn 1), button 2 corresponds to directory number 4, and button 3 corresponds to directory number 14. The buttons correspond to the phone lines on the Cisco IP phone.

Step 4 Repeat Step 1 through Step 3 for all remaining voice messaging port names.

Note The number of voice messaging port names configured with the vm-device-id command must be the same as the number of Cisco IP phones registered by the ephone configuration mode.

Step 5 To exit the ephone configuration mode, enter the following command:

exit

The following is an example of the configuration with a Cisco Unity Connection cluster configured. In this example, the vm-device-id command is used within the ephone configuration in place of the mac-address parameter that is used for configuring a regular Cisco IP phone.

```
ephone 5
 vm-device-id CUC1-VI1
 button 1:32
!
ephone 6
 vm-device-id CUC1-VI2
 button 1:33
!
ephone 7
 vm-device-id CUC1-VI3
 button 1:34
!
ephone 8
 vm-device-id CUC1-VI4
 button 1:38
!
ephone 9
 vm-device-id CUC2-VI1
 button 1:35
!
ephone 10
 vm-device-id CUC2-VI2
 button 1:36
!
ephone 11
 vm-device-id CUC2-VI3
 button 1:37
!
ephone 12
 vm-device-id CUC2-VI4
 button 1:39
```

To Configure a Directory Number for MWI Notification (With a Connection Cluster Configured)

MWI configuration on the Cisco Unified CM Express is performed by dedicating Cisco IP phone directory numbers (ephone-DNs) to process MWI status notification calls originating from Cisco Unity Connection. You must allocate a minimum of one MWI processing ephone-dn for each MWI ephone-dn voice messaging port. The MWI processing ephone-dn extensions are configured to match the MWI extensions configured on Cisco Unity Connection.

Step 1 Go into the ephone-dn configuration mode and configure the directory numbers for the Cisco IP phone lines by entering the following command:

ephone-dn <DN tag>

Step 2 Configure two valid directory numbers for the Cisco IP phone to be used for MWIs—the first number will turn MWIs on, and the second number will turn MWIs off—by entering the following command:

number <MWI on number> secondary <MWI off number>

Note The MWI on and off numbers must match the settings of the MWI On Extension and MWI Off Extension fields you enter in Cisco Unity Connection Administration when you create the integration on Cisco Unity Connection.

Step 3 Configure these two directory numbers to be used for setting MWIs by entering the following command:

mwi on-off

Step 4 To exit the ephone-dn configuration mode, enter the following command:

exit

Following is an example of the configuration.

```
ephone-dn 32
 number 8000 secondary 8001
 mwi on-off
```

In this example, Cisco Unity Connection calls extensions 8000 and 8001 to turn MWIs on and off. The DN triggers an MWI ON event when 8000 is called, and an MWI OFF event when 8001 is called.

For extensions associated with analog telephone adaptors (ATAs), the MWI is a lit function button on the ATA and a stutter dial tone on the connected analog phone.

Note After completing the procedures in this section, continue to the "Creating a New Integration with Cisco Unified Communications Manager Express" section on page 28.

Programming Multiple Cisco Unified Communications Manager Express Routers to Integrate with Cisco Unity Connection

Cisco Unity Connection can be used by multiple Cisco Unified CM Express routers. This configuration requires that one Cisco Unified CM Express router be on the same LAN as Cisco Unity Connection, and that this Cisco Unified CM Express router register all Cisco Unity Connection voice messaging ports. This Cisco Unified CM Express router (the SIP MWI server) is a proxy server that relays SIP MWI messages between Cisco Unity Connection and all other Cisco Unified CM Express routers (the SIP MWI clients). Note that Cisco Unity Connection voice messaging ports register with only the SIP MWI server (the Cisco Unified CM Express router that is on the same LAN as Cisco Unity Connection), not with the SIP MWI clients.

Note Do the procedures in this section only if you are integrating multiple Cisco Unified CM Express routers. If Cisco Unity Connection Cisco Unity Connection is not configured for a Connection cluster, see the "Programming a Cisco Unified Communications Manager Express Router to Integrate with Cisco Unity Connection (Without a Connection Cluster)" section on page 9. If Cisco Unity Connection Cisco Unity Connection is configured for a Connection cluster, see the "Programming a Cisco Unified Communications Manager Express Router to Integrate with Cisco Unity Connection with a Connection Cluster Configured" section on page 14.

To Configure the Message Button Access to Cisco Unity Connection (Multiple Cisco Unified CM Express Routers)

Step 1 On the Cisco Unified CM Express router, go into the telephony-service configuration mode by entering the following command:

telephony-service

Step 2 Enter the following command:

voicemail <Cisco Unity Connection pilot number>

Step 3 To exit the telephony-service configuration mode, enter the following command:

exit

The following is an example of the configuration:

```
telephony-service
 voicemail 4001
```

To Configure the Router for Cisco Unity Connection (Multiple Cisco Unified CM Express Routers)

Step 1 Go into the ephone-dn configuration mode and configure the directory number tag for the Cisco IP phone lines by entering the applicable command:

- For ephone-dns that will be used by ports that are dedicated for leaving and retrieving voice messages, enter the following command:

  ephone-dn <DN tag> dual-line

- For ephone-dns that will be used only to dial out, enter the following command:

  ephone-dn <DN tag>

Step 2 To set the extension number for the voice messaging port, enter the following command:

number <Voice messaging port extension>

Note The voice message port extension must be the Cisco Unity Connection pilot number (configured by the "voicemail" command in the preceding procedure) for all ports dedicated for leaving and retrieving voice messages.

Step 3 To set the display name for the port (for example, "Voice Messaging System" or "Dial Out Only"), enter the following command:

name <Display name of voice messaging port>

Step 4 To set the device name for the port (for example, "CUC1-VI1" or "CUC1-Dialout1"), enter the following command:

description <Device name of voice messaging port>

Step 5 To reserve the second ephone-dn channel for supervised transfers, enter the following command:

huntstop channel

Step 6 To set the dial-peer preference for the extension, enter the following command:

preference <Preference order>

Note The preference order must route calls first to the subscriber server in the Connection cluster, then to the publisher server. See the example configuration below.

Step 7 Enter the applicable command:

- To disable huntstop, enter the following command:

  no huntstop

- To enable huntstop, enter the following command:

huntstop

Step 8 Repeat Step 1 through Step 7 for all remaining ports.

Note The number of voice messaging ports set up to connect to Cisco Unity Connection must be the same as the number of directory number tags for the Cisco IP phone lines set up by the ephone-dn configuration mode.

For a Cisco Unity Connection cluster, the number of voice messaging ports must be the total of the ports on all Cisco Unity Connection servers in the Cisco Unity Connection cluster.

Step 9 To exit the ephone-dn configuration mode, enter the following command:

exit

The following is an example of the configuration without a Cisco Unity Connection cluster:

```
ephone-dn 32 dual-line
 number 4001
 name "Voice Messaging System"
 description "CUC1-VI1"
 huntstop channel
 no huntstop
 preference 1
!
ephone-dn 33 dual-line
 number 4001
 name "Voice Messaging System"
 description "CUC1-VI2"
 huntstop channel
 no huntstop
 preference 2
!
ephone-dn 34 dual-line
 number 4001
 name "Voice Messaging System"
 description "CUC1-VI3"
 huntstop channel
 huntstop
 preference 3
!
ephone-dn 35
 number 5001
 name "Dial Out Only"
 description "CUC1-Dialout1"
```

In this example, there are four ephone-dns configured to provide four voice messaging ports. Three of the ephone-dns are configured with the same extension number to provide ports dedicated for leaving and retrieving voice messages. These three ephone-dns are also configured with two channels each (the second channel is reserved for supervised transfers). The fourth ephone-dn is provided for use as a dial-out port. The first three ephone-dns are configured with the same extension number (4001), using preferences 1, 2, and 3 to create a hunt group. If the first port is busy, the call goes to the second port, and so on. Port 4 is configured with the extension number 5001 and is used to dial out by Cisco Unity Connection (for example, to set MWIs). Separate ports are required for answering calls and dialing out in order to prevent call-collision problems between incoming calls placed by Cisco Unified CM Express to Cisco Unity Connection, and outgoing calls that Cisco Unity Connection places in the opposite direction.

The following is an example of the configuration with a Cisco Unity Connection cluster configured:

```
ephone-dn 32 dual-line
 number 4001
 name "Voice Messaging System"
 description "CUC1-VI1"
 huntstop channel
 no huntstop
 preference 4
!
ephone-dn 33 dual-line
 number 4001
 name "Voice Messaging System"
 description "CUC1-VI2"
 huntstop channel
 no huntstop
 preference 5
!
ephone-dn 34 dual-line
 number 4001
 name "Voice Messaging System"
 description "CUC1-VI3"
 huntstop channel
 huntstop
 preference 6
!
ephone-dn 35 dual-line
 number 4001
 name "Voice Messaging System"
 description "CUC2-VI1"
 huntstop channel
 no huntstop
 preference 1
!
ephone-dn 36 dual-line
 number 4001
 name "Voice Messaging System"
 description "CUC2-VI2"
 huntstop channel
 no huntstop
 preference 2
!
ephone-dn 37 dual-line
 number 4001
 name "Voice Messaging System"
 description "CUC2-VI3"
 huntstop channel
 no huntstop
 preference 3
!
ephone-dn 38
 number 5001
 name "Dial Out Only"
 description "CUC1-Dialout1"
!
ephone-dn 39
 number 5001
 name "Dial Out Only"
 description "CUC2-Dialout1"
```

In this example, there are two sets of ephone-dns:

- Four ephone-dns are configured for the publisher server in the Connection cluster (CUC1-VI1 through CUC1_VI3, and CUC1-Dialout1).

- Four ephone-dns are configured for the subscriber server in the Connection cluster (CUC2-VI1 through CUC2-VI3, and CUC2-Dialout1).

The hunt group routes calls first to the subscriber server in the Connection cluster. When all the answering ports on the subscriber server are busy, the hunt group routes calls to the publisher server. Only the last answering ephone-dn for the publisher server has enabled huntstop so that the hunt group will search through the answering ephone-dns on all Cisco Unity Connection servers. The ephone-dns that are used to dial out are not included in the hunt group.

To Associate the Voice Messaging Port (Multiple Cisco Unified CM Express Routers)

To associate the actual voice messaging port (vm-device-id) to the phone number, associate the Cisco IP phone with the voice messaging port.

The vm-device-id name uses the following format:

<Cisco Unity Connection device name prefix><Port number>

The vm-device-id name must match the Cisco Unity Connection voice messaging port name you will use to identify the port in Cisco Unity Connection Administration when you create the integration:

- The Cisco Unity Connection device name prefix part (for example, CUC1-VI) must match the Device Name Prefix field on the Telephony Integrations > Port Group page.
- The port number part (for example, "1") must match the number part of the Cisco Unity Connection voice messaging port name used to identify the port on the Telephony Integrations > Port page.

To associate a voicemail device with the Cisco Unified CM Express router, do the following steps, beginning in ephone configuration mode.

Step 1 Go into the ephone configuration mode and register the Cisco IP phones by entering the following command:

ephone <DN tag>

Step 2 Define the voice messaging port name, by entering the following command:

vm-device-id <Cisco Unity Connection device name prefix><Port number>

For example, if the Cisco Unity Connection device name prefix is CUC1-VI, enter CUC1-VI1 for the first port, CUC1-VI2 for the second port, and so on.

Caution The vm-device-id name used by Cisco Unified CM Express must be the same as the voice messaging port name used by Cisco Unity Connection. Otherwise, the integration will not work.

Step 3 Assign buttons to the Cisco IP phone directory numbers created in the "To Configure the Router for Cisco Unity Connection (Multiple Cisco Unified CM Express Routers)" procedure on page 20 by entering the following command:

button <Button number>:<DN tag>

For example, you can use the values 1:1, 2:4, or 3:14. In this example, button 1 corresponds to directory number 1 (ephone-dn 1), button 2 corresponds to directory number 4, and button 3 corresponds to directory number 14. The buttons correspond to the phone lines on the Cisco IP phone.

Step 4 Repeat Step 1 through Step 3 for all remaining voice messaging port names.

Note The number of voice messaging port names configured with the vm-device-id command must be the same as the number of Cisco IP phones registered by the ephone configuration mode.

Step 5 To exit the ephone configuration mode, enter the following command:

exit

Following is an example of the configuration without a Cisco Unity Connection cluster. In this example, the vm-device-id command is used within the ephone configuration in place of the mac-address parameter that is used for configuring a regular Cisco IP phone.

```
ephone 5
 vm-device-id CUC1-VI1
 button 1:32
!
ephone 6
 vm-device-id CUC1-VI2
 button 1:33
!
ephone 7
 vm-device-id CUC1-VI3
 button 1:34
!
ephone 8
 vm-device-id CUC1-VI4
 button 1:35
```

The following is an example of the configuration with a Cisco Unity Connection cluster configured:

```
ephone 5
 vm-device-id CUC1-VI1
 button 1:32
!
ephone 6
 vm-device-id CUC1-VI2
 button 1:33
!
ephone 7
 vm-device-id CUC1-VI3
 button 1:34
!
ephone 8
 vm-device-id CUC1-VI4
 button 1:38
!
ephone 9
 vm-device-id CUC2-VI1
 button 1:35
!
ephone 10
 vm-device-id CUC2-VI2
 button 1:36
!
ephone 11
 vm-device-id CUC2-VI3
 button 1:37
!
ephone 12
 vm-device-id CUC2-VI4
```

```
button 1:39
```

Do the following procedure.

To Configure the SIP MWI Server (Multiple Cisco Unified CM Express Routers)

Step 1 Go into the SIP user-agent configuration mode by entering the following command:

sip-ua

Step 2 Configure the IP address (or DNS name) and port for the SIP MWI server by entering the following command:

mwi-server {ipv4:<MWI server IP address> | dns:<MWI server host-name>} [expires <Seconds>] [port <Port number>] [transport {tcp | udp}] [unsolicited]

The SIP MWI server must be in the same LAN as Cisco Unity Connection. This IP address is used in conjunction with the "mwi sip" command in ephone-dn configuration mode to subscribe individual ephone-dn extension numbers to the MWI server notification list. The SIP MWI client runs TCP by default.

This command uses the following keywords:

- **ipv4:**—Sets the IP address of the SIP MWI server.
- **dns:**—Sets the DNS name of the SIP MWI server.
- **expires**—*(optional)* Subscription expiration time, in seconds. The range is 1 to 999999. The default is 3600.
- **transport tcp**—The default setting.
- **transport udp**—Allows you to integrate with the SIP MWI client.
- **port**—Used to specify the TCP port for the SIP MWI server. The default SIP port number is 5060.
- **unsolicited**—Allows sending SIP NOTIFY for MWIs without the need to send a SUBSCRIBE from the Cisco Unified CM Express router.

Step 3 To exit the SIP user-agent configuration mode, enter the following command:

exit

Step 4 Go into the telephony-service configuration mode by entering the following command:

telephony-service

Step 5 If you want to keep the default registration with an extension number, continue to Step 6. If you want to register with an E.164 10-digit number, enter the following command:

mwi reg-e164

Step 6 To exit the telephony-service configuration mode, enter the following command:

exit

Step 7 Continue to the next procedure.

To Configure MWIs for Each Directory Number (Multiple Cisco Unified CM Express Routers)

Step 1 Go into the ephone-dn configuration mode and configure the directory numbers for the Cisco IP phone lines by entering the following command:

ephone-dn <DN tag>

Step 2 Configure a valid directory number for the Cisco IP phone that receives the MWI notification by entering the following command:

number <Directory number>

Step 3 Configure the device name of MWI for the directory number that receives MWI notification by entering the following command:

name MWI

Step 4 Subscribe the extension in a Cisco Unified CM Express to receive MWIs from a SIP MWI server by entering the following command:

mwi sip

This command integrates the Cisco Unified CM Express with the MWI service based on SIP protocol.

Note The "mwi sip-server" command under telephony-service configuration mode or the "mwi-server" command under SIP user-agent configuration mode must be set before enabling the "mwi sip" command in ephone configuration mode.

Step 5 To exit the ephone-dn configuration mode, enter the following command:

exit

To Configure a Directory Number for MWI Notification (Multiple Cisco Unified CM Express Routers)

MWI configuration on the Cisco Unified CM Express is performed by dedicating Cisco IP phone directory numbers (ephone-DNs) to process MWI status notification calls originating from Cisco Unity Connection. You must allocate a minimum of one MWI processing ephone-dn for each MWI ephone-dn voice messaging port. The MWI processing ephone-dn extensions are configured to match the MWI extensions configured on Cisco Unity Connection.

Step 1 Go into the ephone-dn configuration mode and configure the directory numbers for the Cisco IP phone lines by entering the following command:

ephone-dn <DN tag>

Step 2 Configure two valid directory numbers for the Cisco IP phone to be used for MWIs—the first number will turn MWIs on, and the second number will turn MWIs off—by entering the following command:

number <MWI on number> secondary <MWI off number>

Note The MWI on and off numbers must match the settings of the MWI On Extension and MWI Off Extension fields you enter in Cisco Unity Connection Administration when you create the integration on Cisco Unity Connection.

Step 3 Configure these two directory numbers to be used for setting MWIs by entering the following command:

mwi on-off

Step 4 To exit the ephone-dn configuration mode, enter the following command:

exit

Following is an example of the configuration.

```
ephone-dn 32
 number 8000 secondary 8001
 mwi on-off
```

In this example, Cisco Unity Connection calls extensions 8000 and 8001 to turn MWIs on and off. The DN triggers an MWI ON event when 8000 is called, and an MWI OFF event when 8001 is called.

To Configure MWI Relay (Multiple Cisco Unified CM Express Routers)

MWI relay is required when Cisco Unity Connection is integrated with multiple Cisco Unified CM Express routers. The Cisco Unified CM Express routers use the SIP subscriber and notifier mechanism for MWI relay. The Cisco Unified CM Express router that is the SIP MWI relay server acts as the SIP notifier. The other Cisco Unified CM Express routers (the SIP MWI clients) act as the SIP subscribers.

Step 1 Go into the telephony-service configuration mode by entering the following command:

telephony-service

Step 2 Enable the Cisco Unified CM Express router to relay MWI information to Cisco IP phones on other Cisco Unified CM Express routers by entering the following command:

mwi relay

Step 3 To exit the telephony-service configuration mode, enter the following command:

exit

Step 4 Go into the SIP user-agent configuration mode by entering the following command:

sip-ua

Step 5 Configure the IP address (or DNS name) and port for the SIP MWI server by entering the following command:

mwi-server {ipv4:<MWI server IP address> | dns:<MWI server host-name} [expires <Seconds>] [port <Port number>] [transport {tcp | udp}] [unsolicited]

The SIP MWI server must be in the same LAN as Cisco Unity Connection. This IP address is used in conjunction with the "mwi sip" command in ephone-dn configuration mode to subscribe individual ephone-dn extension numbers to the MWI server notification list. The SIP MWI client runs TCP by default.

This command uses the following keywords:

- **ipv4:**—Sets the IP address of the SIP MWI server.
- **dns:**—Sets the DNS name of the SIP MWI server.
- **expires**—*(optional)* Subscription expiration time, in seconds. The range is 1 to 999999. The default is 3600.
- **transport tcp**—The default setting.
- **transport udp**—Allows you to integrate with the SIP MWI client.
- **port**—Used to specify the TCP port for the SIP MWI server. The default SIP port number is 5060.
- **unsolicited**—Allows sending SIP NOTIFY for MWIs without the need to send a SUBSCRIBE from the Cisco Unified CM Express router.

Step 6 To exit the SIP user-agent configuration mode, enter the following command:

exit

Step 7 Go into the telephony-service configuration mode by entering the following command:

telephony-service

Step 8 If you want to keep the default registration with an extension number, continue to Step 9. If you want to register with an E.164 10-digit number, enter the following command:

mwi reg-e164

Step 9 To exit the telephony-service configuration mode, enter the following command:

exit

To Enable DTMF Relay (Multiple Cisco Unified CM Express Routers)

In certain situations, DTMF digits are not recognized when processed through VoIP dial-peer gateways. To avoid this problem, certain gateways must be configured to enable DTMF relay. The DTMF relay feature is available in Cisco IOS software version 12.0(5) and later.

Cisco IOS software-based gateways that use H.245 out-of-band signaling (but not the Cisco Unified CM Express routers with which Cisco Unity Connection is integrated) must be configured to enable DTMF relay.

The Catalyst 6000 T1/PRI and FXS gateways enable DTMF relay by default and do not need additional configuration to enable this feature.

Step 1 On a VoIP dial-peer that points to a Cisco Unified CM Express router integrated with Cisco Unity Connection (the dial-peer must have a session target of the Cisco Unified CM Express router, not Cisco Unity Connection), enter the following command:

dtmf-relay h245-signal

Step 2 Create a destination pattern that matches the Cisco Unified CM Express voicemail port numbers. For example, if the system has voicemail ports 1001 through 1016, enter the dial-peer destination pattern **10xx**.

Step 3 Repeat Step 1 and Step 2 for all remaining VoIP dial-peers that point to Cisco Unified CM Express routers integrated with Cisco Unity Connection.

Creating a New Integration with Cisco Unified Communications Manager Express

Revised November 16, 2010

After ensuring that Cisco Unified Communications Manager Express and Cisco Unity Connection are ready for the integration, do the following procedure to set up the integration and to enter the port settings.

To Create an Integration

Step 1 Sign in to Cisco Unity Connection Administration.

Step 2 In Cisco Unity Connection Administration, expand **Telephony Integrations**, then select **Phone System**.

Step 3 On the Search Phone Systems page, under Display Name, select the name of the default phone system.

Step 4 On the Phone System Basics page, in the Phone System Name field, enter the descriptive name that you want for the phone system.

Step 5 If you want to use this phone system as the default for TRaP connections so that administrators and users without voicemail boxes can record and playback through the phone in Cisco Unity Connection web applications, check the **Default TRAP Switch** check box. If you want to use another phone system as the default for TRaP connections, uncheck this check box.

Step 6 Select **Save**.

Step 7 On the Phone System Basics page, in the Related Links drop-down box, select **Add Port Group** and select **Go**.

Step 8 On the New Port Group page, enter the following settings to configure the answering port group and select **Save**.

Table 2 Settings for the New Port Group Page (Answering Port Group)

Field	Setting
Phone System	Select the name of the phone system that you entered in Step 4.
Create From	Select **Port Group Template** and select **SCCP** in the drop-down box.
Display Name	Enter a descriptive name for the port group. You can accept the default name or enter the name that you want. For example, enter "CUC1-VI."
Device Name Prefix	Enter the prefix that Cisco Unified CM Express uses in the vm-device-id name before the port number. This prefix must match the prefix used for the answering ephone-dns by Cisco Unified CM Express. For a Cisco Unity Connection cluster, this prefix must match the prefix used for the answering ephone-dns that will connect to the publisher server.
MWI On Extension	(This field is not used by the answering port group.) Enter the MWI on directory number that you specified in the ephone-dn configuration mode of the Cisco Unified CM Express router.
MWI Off Extension	(This field is not used by the answering port group.) Enter the MWI off directory number that you specified in the ephone-dn configuration mode of the Cisco Unified CM Express router.
IPv4 Address or Host Name *(Cisco Unity Connection 8.5 and later)*	Enter the IP address (or host name) of the Cisco Unified CM Express router that you are integrating with Cisco Unity Connection.
IPv6 Address or Host Name *(Cisco Unity Connection 8.5 and later)*	Do not enter a value in this field. IPv6 is not supported for Cisco Unified CM Express integrations.
IP Address or Host Name *(Cisco Unity Connection 8.0)*	Enter the IP address (or host name) of the Cisco Unified CM Express router that you are integrating with Cisco Unity Connection.
Port	Enter the TCP port of the Cisco Unified CM Express router that you are integrating with Cisco Unity Connection. We recommend that you use the default setting.
TLS Port	Enter the TLS port of the Cisco Unified CM Express router that you are integrating with Cisco Unity Connection. We recommend that you use the default setting.

Step 9 On the Port Group Basics page, on the Edit menu, select **Servers**.

Step 10 On the Edit Servers page, under Cisco Unified Communications Manager Servers, in the Server Type column, select **Cisco Unified Communications Manager Express** and select **Save**.

Step 11 On the Edit menu, select **Port Group Basics**.

Step 12 On the Port Group Basics page, in the Related Links drop-down box, select **Add Ports** and select **Go**.

Step 13 On the New Port page, enter the following settings and select **Save**.

Table 3 Settings for the New Port Page (Answering Ports)

Field	Setting
Enabled	Check this check box.
Number of Ports	Enter the number of answering voice messaging ports that you want to create in this port group. For a Cisco Unity Connection cluster, enter half of the total number of answering voice messaging ports that will be used by all servers in the Cisco Unity Connection cluster. Later, you will create a second answering port group for the remaining answering voice messaging ports.
Phone System	Select the name of the phone system that you entered in Step 4.
Port Group	Select the name of the port group that you added in Step 8.
Server	Select the name of the Cisco Unity Connection server. For a Cisco Unity Connection cluster, select the name of the publisher Cisco Unity Connection server in the Cisco Unity Connection cluster.
Security Mode	Select **Non-secure**. (Cisco Unified Communications Manager authentication and encryption are not available for Cisco Unified CM Express.)

Step 14 On the Search Ports page, select the display name of the first voice messaging port that you created for this answering port group.

Note By default, the display names for the voice messaging ports are composed of the port group display name followed by incrementing numbers.

Step 15 On the Port Basics page, set the voice messaging port settings as applicable. The fields in the following table are the ones that you can change.

Table 4 Settings for the Answering Voice Messaging Ports

Field	Considerations
Enabled	Check this check box to enable the port. The port is enabled during normal operation. Uncheck this check box to disable the port. When the port is disabled, calls to the port get a ringing tone but are not answered. Typically, the port is disabled only by the installer during testing.
Server	Select the name of the Cisco Unity Connection server. For a Cisco Unity Connection cluster, select the name of the publisher Cisco Unity Connection server in the Cisco Unity Connection cluster.

Table 4 Settings for the Answering Voice Messaging Ports (continued)

Field	Considerations
Answer Calls	Check this check box to designate the port for answering calls. These calls can be incoming calls from unidentified callers or from users.
Perform Message Notification	Uncheck this check box.
Send MWI Requests	Uncheck this check box.
Allow TRAP Connections	Uncheck this check box.
Outgoing Hunt Order	(This field is not used by the answering port group.) Enter the priority order in which Cisco Unity Connection will use the ports when dialing out (for example, if the Perform Message Notification, Send MWI Requests, or Allow TRAP Connections check box is checked). The highest numbers are used first. However, when multiple ports have the same Outgoing Hunt Order number, Cisco Unity Connection will use the port that has been idle the longest.
Security Mode	Select **Non-secure**. **Note** (Cisco Unified Communications Manager authentication and encryption are not available for Cisco Unified CM Express.)

Step 16 Select **Save**.

Step 17 Select **Next**.

Step 18 Repeat Step 15 through Step 17 for all remaining answering voice messaging ports for the answering port group.

Step 19 Expand **Telephony Integration**, then select **Port Group**.

Step 20 On the Search Port Groups page, select **Add New**. to add a dial-out port group.

Step 21 On the New Port Group page, enter the following settings to configure the dial-out port group and select **Save**.

Table 5 Settings for the New Port Group Page (Dial-out Port Group)

Field	Setting
Phone System	Select the name of the phone system that you entered in Step 4.
Create From	Select **Port Group Template** and select **SCCP** in the drop-down box.
Display Name	Enter a descriptive name for the port group. You can accept the default name or enter the name that you want. For example, enter “CUC1-Dialout.”
Device Name Prefix	Enter the prefix that Cisco Unified CM Express uses in the vm-device-id name before the port number. This prefix must match the prefix used for the dial-out ephone-dns by Cisco Unified CM Express. For a Cisco Unity Connection cluster, this prefix must match the prefix used for the dial-out ephone-dns that will connect to the publisher server.
MWI On Extension	Enter the MWI on directory number that you specified in the ephone-dn configuration mode of the Cisco Unified CM Express router.
MWI Off Extension	Enter the MWI off directory number that you specified in the ephone-dn configuration mode of the Cisco Unified CM Express router.

Table 5 Settings for the New Port Group Page (Dial-out Port Group) (continued)

Field	Setting
IPv4 Address or Host Name *(Cisco Unity Connection 8.5 and later)*	Enter the IP address (or host name) of the Cisco Unified CM Express router that you are integrating with Cisco Unity Connection.
IPv6 Address or Host Name *(Cisco Unity Connection 8.5 and later)*	Do not enter a value in this field. IPv6 is not supported for Cisco Unified CM Express integrations.
IP Address or Host Name *(Cisco Unity Connection 8.0)*	Enter the IP address (or host name) of the Cisco Unified CM Express router that you are integrating with Cisco Unity Connection.
Port	Enter the TCP port of the Cisco Unified CM Express router that you are integrating with Cisco Unity Connection. We recommend that you use the default setting.
TLS Port	Enter the TLS port of the Cisco Unified CM Express router that you are integrating with Cisco Unity Connection. We recommend that you use the default setting.

Step 22 On the Port Group Basics page, on the Edit menu, select **Servers**.

Step 23 On the Edit Servers page, under Cisco Unified Communications Manager Servers, in the Server Type column, select **Cisco Unified Communications Manager Express** and select **Save**.

Step 24 On the Edit menu, select **Port Group Basics**.

Step 25 On the Port Group Basics page, in the Related Links drop-down box, select **Add Ports** and select **Go**.

Step 26 On the New Port page, enter the following settings and select **Save**.

Table 6 Settings for the New Port Page (Dial-out Ports)

Field	Setting
Enabled	Check this check box.
Number of Ports	Enter the number of dial-out voice messaging ports that you want to create in this port group. For a Cisco Unity Connection cluster, enter half of the total number of dial-out voice messaging ports that will be used by all servers in the Cisco Unity Connection cluster. Later, you will create a second dial-out port group for the remaining dial-out voice messaging ports.
Phone System	Select the name of the phone system that you entered in Step 4.
Port Group	Select the name of the port group that you added in Step 21.
Server	Select the name of the Cisco Unity Connection server. For a Cisco Unity Connection cluster, select the name of the publisher Cisco Unity Connection server in the Cisco Unity Connection cluster.
Security Mode	Select **Non-secure**. (Cisco Unified Communications Manager authentication and encryption are not available for Cisco Unified CM Express.)

Step 27 On the Search Ports page, select the display name of the first voice messaging port that you created for this dial-out port group.

Note By default, the display names for the voice messaging ports are composed of the port group display name followed by incrementing numbers.

Step 28 On the Port Basics page, set the voice messaging port settings as applicable. The fields in the following table are the ones that you can change.

Table 7 Settings for the Dial-out Voice Messaging Ports

Field	Considerations
Enabled	Check this check box to enable the port. The port is enabled during normal operation. Uncheck this check box to disable the port. When the port is disabled, calls to the port get a ringing tone but are not answered. Typically, the port is disabled only by the installer during testing.
Server	Select the name of the Cisco Unity Connection server. For a Cisco Unity Connection cluster, select the name of the publisher Cisco Unity Connection server in the Cisco Unity Connection cluster.
Answer Calls	Uncheck this check box.
Perform Message Notification	Check this check box to designate the port for notifying users of messages. Assign Perform Message Notification to the least busy ports.
Send MWI Requests	Check this check box to designate the port for turning MWIs on and off. Assign Send MWI Requests to the least busy ports.
Allow TRAP Connections	Check this check box so that users can use the port for recording and playback through the phone in Cisco Unity Connection web applications. Assign Allow TRAP Connections to the least busy ports.
Outgoing Hunt Order	Enter the priority order in which Cisco Unity Connection will use the ports when dialing out (for example, if the Perform Message Notification, Send MWI Requests, or Allow TRAP Connections check box is checked). The highest numbers are used first. However, when multiple ports have the same Outgoing Hunt Order number, Cisco Unity Connection will use the port that has been idle the longest.
Security Mode	Select **Non-secure**. **Note** (Cisco Unified Communications Manager authentication and encryption are not available for Cisco Unified CM Express.)

Step 29 Select **Save**.

Step 30 Select **Next**.

Step 31 Repeat Step 28 through Step 30 for all remaining dial-out voice messaging ports in the dial-out port group.

Step 32 For Cisco Unity Connection without a Cisco Unity Connection cluster, skip to Step 58. For a Cisco Unity Connection cluster, in Cisco Unity Connection Administration, expand **Telephony Integrations**, then select **Port Group**.

Step 33 On the Search Port Groups page, select **Add New**.

Step 34 On the New Port Group page, enter the following settings to configure the answering port group for the subscriber server and select **Save**.

Table 8 Settings for the New Port Group Page (Answering Port Group)

Field	Setting
Phone System	Select the name of the phone system that you entered in Step 4.
Create From	Select **Port Group Template** and select **SCCP** in the drop-down box.
Display Name	Enter a descriptive name for the port group. You can accept the default name or enter the name that you want. For example, enter "CUC2-VI."
Device Name Prefix	Enter the prefix that Cisco Unified CM Express uses in the vm-device-id name before the port number. This prefix must match the prefix used for the answering ephone-dns for the subscriber server by Cisco Unified CM Express.
MWI On Extension	(This field is not used by the answering port group.) Enter the MWI on directory number that you specified in the ephone-dn configuration mode of the Cisco Unified CM Express router.
MWI Off Extension	(This field is not used by the answering port group.) Enter the MWI off directory number that you specified in the ephone-dn configuration mode of the Cisco Unified CM Express router.
IPv4 Address or Host Name *(Cisco Unity Connection 8.5 and later)*	Enter the IP address (or host name) of the Cisco Unified CM Express router that you are integrating with Cisco Unity Connection.
IPv6 Address or Host Name *(Cisco Unity Connection 8.5 and later)*	Do not enter a value in this field. IPv6 is not supported for Cisco Unified CM Express integrations.
IP Address or Host Name *(Cisco Unity Connection 8.0)*	Enter the IP address (or host name) of the Cisco Unified CM Express router that you are integrating with Cisco Unity Connection.
Port	Enter the TCP port of the Cisco Unified CM Express router that you are integrating with Cisco Unity Connection. We recommend that you use the default setting.
TLS Port	Enter the TLS port of the Cisco Unified CM Express router that you are integrating with Cisco Unity Connection. We recommend that you use the default setting.

Step 35 On the Port Group Basics page, on the Edit menu, select **Servers**.

Step 36 On the Edit Servers page, under Cisco Unified Communications Manager Servers, in the Server Type column, select **Cisco Unified Communications Manager Express** and select **Save**.

Step 37 On the Edit menu, select **Port Group Basics**.

Step 38 On the Port Group Basics page, in the Related Links drop-down box, select **Add Ports** and select **Go**.

Step 39 On the New Port page, enter the following settings and select **Save**.

Table 9 Settings for the New Port Page (Answering Ports)

Field	Setting
Enabled	Check this check box.
Number of Ports	Enter the answering voice messaging ports that will be used by the subscriber server in the Cisco Unity Connection cluster.
Phone System	Select the name of the phone system that you entered in Step 4.
Port Group	Select the name of the port group that you added in Step 34.
Server	Select the name of the subscriber Cisco Unity Connection server in the Cisco Unity Connection cluster.
Security Mode	Select **Non-secure**. (Cisco Unified Communications Manager authentication and encryption are not available for Cisco Unified CM Express.)

Step 40 On the Search Ports page, select the display name of the first voice messaging port that you created for this answering port group.

Note By default, the display names for the voice messaging ports are composed of the port group display name followed by incrementing numbers.

Step 41 On the Port Basics page, set the voice messaging port settings as applicable. The fields in the following table are the ones that you can change.

Table 10 Settings for the Answering Voice Messaging Ports

Field	Considerations
Enabled	Check this check box to enable the port. The port is enabled during normal operation. Uncheck this check box to disable the port. When the port is disabled, calls to the port get a ringing tone but are not answered. Typically, the port is disabled only by the installer during testing.
Server	Select the name of the subscriber Cisco Unity Connection server in the Cisco Unity Connection cluster.
Answer Calls	Check this check box to designate the port for answering calls. These calls can be incoming calls from unidentified callers or from users.
Perform Message Notification	Uncheck this check box.
Send MWI Requests	Uncheck this check box.
Allow TRAP Connections	Uncheck this check box.
Outgoing Hunt Order	(This field is not used by the answering port group.) Enter the priority order in which Cisco Unity Connection will use the ports when dialing out (for example, if the Perform Message Notification, Send MWI Requests, or Allow TRAP Connections check box is checked). The highest numbers are used first. However, when multiple ports have the same Outgoing Hunt Order number, Cisco Unity Connection will use the port that has been idle the longest.

Table 10 Settings for the Answering Voice Messaging Ports (continued)

Field	Considerations
Security Mode	Select **Non-secure**. **Note** (Cisco Unified Communications Manager authentication and encryption are not available for Cisco Unified CM Express.)

Step 42 Select **Save**.

Step 43 Select **Next**.

Step 44 Repeat Step 41 through Step 43 for all remaining answering voice messaging ports for the answering port group.

Step 45 Expand **Telephony Integration**, then select **Port Group**.

Step 46 On the Search Port Groups page, select **Add New**. to add a dial-out port group for the subscriber Cisco Unity Connection server in the Connection cluster.

Step 47 On the New Port Group page, enter the following settings to configure the dial-out port group and select **Save**.

Table 11 Settings for the New Port Group Page (Dial-out Port Group)

Field	Setting
Phone System	Select the name of the phone system that you entered in Step 4.
Create From	Select **Port Group Template** and select **SCCP** in the drop-down box.
Display Name	Enter a descriptive name for the port group. You can accept the default name or enter the name that you want. For example, enter “CUC2-Dialout.”
Device Name Prefix	Enter the prefix that Cisco Unified CM Express uses in the vm-device-id name before the port number. This prefix must match the prefix used for the dial-out ephone-dns for the subscriber server by Cisco Unified CM Express.
MWI On Extension	Enter the MWI on directory number that you specified in the ephone-dn configuration mode of the Cisco Unified CM Express router.
MWI Off Extension	Enter the MWI off directory number that you specified in the ephone-dn configuration mode of the Cisco Unified CM Express router.
IPv4 Address or Host Name *(Cisco Unity Connection 8.5 and later)*	Enter the IP address (or host name) of the Cisco Unified CM Express router that you are integrating with Cisco Unity Connection.
IPv6 Address or Host Name *(Cisco Unity Connection 8.5 and later)*	Do not enter a value in this field. IPv6 is not supported for Cisco Unified CM Express integrations.
IP Address or Host Name *(Cisco Unity Connection 8.0)*	Enter the IP address (or host name) of the Cisco Unified CM Express router that you are integrating with Cisco Unity Connection.
Port	Enter the TCP port of the Cisco Unified CM Express router that you are integrating with Cisco Unity Connection. We recommend that you use the default setting.

Table 11 Settings for the New Port Group Page (Dial-out Port Group) (continued)

Field	Setting
TLS Port	Enter the TLS port of the Cisco Unified CM Express router that you are integrating with Cisco Unity Connection. We recommend that you use the default setting.

Step 48 On the Port Group Basics page, on the Edit menu, select **Servers**.

Step 49 On the Edit Servers page, under Cisco Unified Communications Manager Servers, in the Server Type column, select **Cisco Unified Communications Manager Express** and select **Save**.

Step 50 On the Edit menu, select **Port Group Basics**.

Step 51 On the Port Group Basics page, in the Related Links drop-down box, select **Add Ports** and select **Go**.

Step 52 On the New Port page, enter the following settings and select **Save**.

Table 12 Settings for the New Port Page (Dial-out Ports)

Field	Setting
Enabled	Check this check box.
Number of Ports	Enter the dial-out voice messaging ports that will be used by the subscriber server in the Cisco Unity Connection cluster.
Phone System	Select the name of the phone system that you entered in Step 4.
Port Group	Select the name of the port group that you added in Step 47.
Server	Select the name of the subscriber Cisco Unity Connection server in the Cisco Unity Connection cluster.
Security Mode	Select **Non-secure**. (Cisco Unified Communications Manager authentication and encryption are not available for Cisco Unified CM Express.)

Step 53 On the Search Ports page, select the display name of the first voice messaging port that you created for this dial-out port group.

Note By default, the display names for the voice messaging ports are composed of the port group display name followed by incrementing numbers.

Step 54 On the Port Basics page, set the voice messaging port settings as applicable. The fields in the following table are the ones that you can change.

Table 13 Settings for the Dial-out Voice Messaging Ports

Field	Considerations
Enabled	Check this check box to enable the port. The port is enabled during normal operation. Uncheck this check box to disable the port. When the port is disabled, calls to the port get a ringing tone but are not answered. Typically, the port is disabled only by the installer during testing.
Server	Select the name of the subscriber server in the Cisco Unity Connection cluster.

Table 13 Settings for the Dial-out Voice Messaging Ports (continued)

Field	Considerations
Answer Calls	Uncheck this check box.
Perform Message Notification	Check this check box to designate the port for notifying users of messages. Assign Perform Message Notification to the least busy ports.
Send MWI Requests	Check this check box to designate the port for turning MWIs on and off. Assign Send MWI Requests to the least busy ports.
Allow TRAP Connections	Check this check box so that users can use the port for recording and playback through the phone in Cisco Unity Connection web applications. Assign Allow TRAP Connections to the least busy ports.
Outgoing Hunt Order	Enter the priority order in which Cisco Unity Connection will use the ports when dialing out (for example, if the Perform Message Notification, Send MWI Requests, or Allow TRAP Connections check box is checked). The highest numbers are used first. However, when multiple ports have the same Outgoing Hunt Order number, Cisco Unity Connection will use the port that has been idle the longest.
Security Mode	Select **Non-secure**. **Note** (Cisco Unified Communications Manager authentication and encryption are not available for Cisco Unified CM Express.)

Step 55 Select **Save**.

Step 56 Select **Next**.

Step 57 Repeat Step 54 through Step 56 for all remaining dial-out voice messaging ports in the dial-out port group.

Step 58 If another phone system integration exists, in Cisco Unity Connection Administration, expand **Telephony Integrations**, then select **Trunk**. Otherwise, skip to Step 62.

Step 59 On the Search Phone System Trunks page, on the Phone System Trunk menu, select **New Phone System Trunk**.

Step 60 On the New Phone System Trunk page, enter the following settings for the phone system trunk and select **Save**.

Table 14 Settings for the Phone System Trunk

Field	Setting
From Phone System	Select the display name of the phone system that you are creating a trunk for.
To Phone System	Select the display name of the previously existing phone system that the trunk will connect to.
Trunk Access Code	Enter the extra digits that Cisco Unity Connection must dial to transfer calls through the gateway to extensions on the previously existing phone system.

Step 61 Repeat Step 59 and Step 60 for all remaining phone system trunks that you want to create.

Step 62 In the Related Links drop-down list, select **Check Telephony Configuration** and select **Go** to confirm the phone system integration settings.

If the test is not successful, the Task Execution Results displays one or more messages with troubleshooting steps. After correcting the problems, test the connection again.

Step 63 In the Task Execution Results window, select **Close**.

Testing the Integration

To test whether Cisco Unity Connection and the phone system are integrated correctly, do the following procedures in the order listed.

If any of the steps indicate a failure, see the following documentation as applicable:

- The installation guide for the phone system.
- *Troubleshooting Guide for Cisco Unity Connection Release 8.x* at http://www.cisco.com/en/US/docs/voice_ip_comm/connection/8x/troubleshooting/guide/8xcuctsgx.html.
- The setup information earlier in this guide.

To Set Up the Test Configuration

Step 1 Set up two test extensions (Phone 1 and Phone 2) on the same phone system that Cisco Unity Connection is connected to.

Step 2 Set Phone 1 to forward calls to the Cisco Unity Connection pilot number when calls are not answered.

Caution The phone system must forward calls to the Cisco Unity Connection pilot number in no fewer than four rings. Otherwise, the test may fail.

Step 3 In Cisco Unity Connection Administration, expand **Users**, then select **Users**.

Step 4 On the Search Users page, select the display name of a user to use for testing. The extension for this user must be the extension for Phone 1.

Step 5 On the Edit User Basics page, uncheck the **Set for Self-enrollment at Next Login** check box.

Step 6 In the Voice Name field, record a recorded name for the test user.

Step 7 Select **Save**.

Step 8 On the Edit menu, select **Message Waiting Indicators**.

Step 9 On the Message Waiting Indicators page, select the message waiting indicator. If no message waiting indication is in the table, select **Add New**.

Step 10 On the Edit Message Waiting Indicator page, enter the following settings.

Table 15 Settings for the Edit MWI Page

Field	Setting
Enabled	Check this check box to enable MWIs for the test user.
Display Name	Accept the default or enter a different name.
Inherit User's Extension	Check this check box to enable MWIs on Phone 1.

Step 11 Select **Save**.

Step 12 On the Edit menu, select **Transfer Rules**.

Step 13 On the Transfer Rules page, select the active transfer rule.

Step 14 On the Edit Transfer Rule page, under Transfer Action, select **Extension** and enter the extension of Phone 1.

Step 15 In the Transfer Type field, select **Release to Switch**.

Step 16 Select **Save**.

Step 17 Minimize the Cisco Unity Connection Administration window.

Do not close the Cisco Unity Connection Administration window because you will use it again in a later procedure.

Step 18 Sign in to the Real-Time Monitoring Tool (RTMT).

Step 19 On the Unity Connection menu, select **Port Monitor**. The Port Monitor tool appears in the right pane.

Step 20 In the right pane, select **Start Polling**. The Port Monitor will display which port is handling the calls that you will make.

To Test an External Call with Release Transfer

Step 1 From Phone 2, enter the access code necessary to get an outside line, then enter the number outside callers use to dial directly to Cisco Unity Connection.

Step 2 In the Port Monitor, note which port handles this call.

Step 3 When you hear the opening greeting, enter the extension for Phone 1. Hearing the opening greeting means that the port is configured correctly.

Step 4 Confirm that Phone 1 rings and that you hear a ringback tone on Phone 2. Hearing a ringback tone means that Cisco Unity Connection correctly released the call and transferred it to Phone 1.

Step 5 Leaving Phone 1 unanswered, confirm that the state of the port handling the call changes to “Idle.” This state means that release transfer is successful.

Step 6 Confirm that, after the number of rings that the phone system is set to wait, the call is forwarded to Cisco Unity Connection and that you hear the greeting for the test user. Hearing the greeting means that the phone system forwarded the unanswered call and the call-forward information to Cisco Unity Connection, which correctly interpreted the information.

Step 7 On the Port Monitor, note which port handles this call.

Step 8 Leave a message for the test user and hang up Phone 2.

Step 9 In the Port Monitor, confirm that the state of the port handling the call changes to “Idle.” This state means that the port was successfully released when the call ended.

Step 10 Confirm that the MWI on Phone 1 is activated. The activated MWI means that the phone system and Cisco Unity Connection are successfully integrated for turning on MWIs.

To Test Listening to Messages

Step 1 From Phone 1, enter the internal pilot number for Cisco Unity Connection.

Step 2 When asked for your password, enter the password for the test user. Hearing the request for your password means that the phone system sent the necessary call information to Cisco Unity Connection, which correctly interpreted the information.

Step 3 Confirm that you hear the recorded name for the test user (if you did not record a name for the test user, you will hear the extension number for Phone 1). Hearing the recorded name means that Cisco Unity Connection correctly identified the user by the extension.

Step 4 Listen to the message.

Step 5 After listening to the message, delete the message.

Step 6 Confirm that the MWI on Phone 1 is deactivated. The deactivated MWI means that the phone system and Cisco Unity Connection are successfully integrated for turning off MWIs.

Step 7 Hang up Phone 1.

Step 8 On the Port Monitor, confirm that the state of the port handling the call changes to "Idle." This state means that the port was successfully released when the call ended.

To Set Up Supervised Transfer on Cisco Unity Connection

Step 1 In Cisco Unity Connection Administration, on the Edit Transfer Rule page for the test user, in the Transfer Type field, select **Supervise Transfer**.

Step 2 In the Rings to Wait For field, enter **3**.

Step 3 Select **Save**.

Step 4 Minimize the Cisco Unity Connection Administration window.

Do not close the Cisco Unity Connection Administration window because you will use it again in a later procedure.

To Test Supervised Transfer

Step 1 From Phone 2, enter the access code necessary to get an outside line, then enter the number outside callers use to dial directly to Cisco Unity Connection.

Step 2 On the Port Monitor, note which port handles this call.

Step 3 When you hear the opening greeting, enter the extension for Phone 1. Hearing the opening greeting means that the port is configured correctly.

Step 4 Confirm that Phone 1 rings and that you do not hear a ringback tone on Phone 2. Instead, you should hear the indication your phone system uses to mean that the call is on hold (for example, music).

Step 5 Leaving Phone 1 unanswered, confirm that the state of the port handling the call remains "Busy." This state and hearing an indication that you are on hold mean that Cisco Unity Connection is supervising the transfer.

Step 6 Confirm that, after three rings, you hear the greeting for the test user. Hearing the greeting means that Cisco Unity Connection successfully recalled the supervised-transfer call.

Step 7 During the greeting, hang up Phone 2.

Step 8 On the Port Monitor, confirm that the state of the port handling the call changes to "Idle." This state means that the port was successfully released when the call ended.

Step 9 Select **Stop Polling**.

Step 10 Sign out of RTMT.

Adding New User Templates for Multiple Integrations

When you create the first phone system integration, this first phone system is automatically selected in the default user template. The users that you add after creating this phone system integration will be assigned to this phone system by default.

However, for each additional phone system integration that you create, you must add the applicable new user templates that will assign users to the new phone system. You must add the new templates before you add new users who will be assigned to the new phone system.

For details on adding new user templates, or on selecting a user template when adding a new user, see the "Adding, Modifying, or Deleting a User Template in Cisco Unity Connection 8.x" and the "Preparing to Add User Accounts in Cisco Unity Connection 8.x" chapters of the *User Moves, Adds, and Changes Guide for Cisco Unity Connection Release 8.x*. The guide is available at http://www.cisco.com/en/US/docs/voice_ip_comm/connection/8x/user_mac/guide/8xcucmacx.html.

Appendix: Documentation and Technical Assistance

Documentation Conventions

The *Cisco Unified Communications Manager Express SCCP Integration Guide for Cisco Unity Connection Release 8.x* uses the following conventions.

Table 16 Cisco Unified Communications Manager Express SCCP Integration Guide for Cisco Unity Connection Release 8.x Conventions

Convention	Description
boldfaced text	Boldfaced text is used for: • Key and button names. (Example: Select **OK.**) • Information that you enter. (Example: Enter **Administrator** in the User Name box.)
< > (angle brackets)	Angle brackets are used around parameters for which you supply a value. (Example: In the Command Prompt window, enter **ping <IP address>**.)
- (hyphen)	Hyphens separate keys that must be pressed simultaneously. (Example: Press **Ctrl-Alt-Delete.)**

Table 16 Cisco Unified Communications Manager Express SCCP Integration Guide for Cisco Unity Connection Release 8.x Conventions

Convention	Description
> (right angle bracket)	A right angle bracket is used to separate selections that you make: • On menus. (Example: On the Windows Start menu, select **Programs > Cisco Unified Serviceability > Real-Time Monitoring Tool**.) • In the navigation bar of Cisco Unity Connection Administration. (Example: In Cisco Unity Connection Administration, expand **System Settings > Advanced**.)
[x] (square brackets)	Square brackets enclose an optional element (keyword or argument). (Example: [reg-e164])
[x | y] (vertical line)	Square brackets enclosing keywords or arguments separated by a vertical line indicate an optional choice. (Example: [transport tcp | transport udp])
{x | y} (braces)	Braces enclosing keywords or arguments separated by a vertical line indicate a required choice. (Example: {tcp | udp})

The *Cisco Unified Communications Manager Express SCCP Integration Guide for Cisco Unity Connection Release 8.x* also uses the following conventions:

Note Means *reader take note*. Notes contain helpful suggestions or references to material not covered in the document.

Caution Means *reader be careful*. In this situation, you might do something that could result in equipment damage or loss of data.

Cisco Unity Connection Documentation

For descriptions and URLs of Cisco Unity Connection documentation on Cisco.com, see the *Documentation Guide for Cisco Unity Connection*. The document is shipped with Cisco Unity Connection and is available at http://www.cisco.com/en/US/products/ps6509/products_documentation_roadmaps_list.html.

Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, submitting a service request, and gathering additional information, see the monthly *What's New in Cisco Product Documentation*, which also lists all new and revised Cisco technical documentation, at:

http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html

Subscribe to the *What's New in Cisco Product Documentation* as a Really Simple Syndication (RSS) feed and set content to be delivered directly to your desktop using a reader application. The RSS feeds are a free service and Cisco currently supports RSS Version 2.0.

Cisco Product Security Overview

This product contains cryptographic features and is subject to United States and local country laws governing import, export, transfer and use. Delivery of Cisco cryptographic products does not imply third-party authority to import, export, distribute or use encryption. Importers, exporters, distributors and users are responsible for compliance with U.S. and local country laws. By using this product you agree to comply with applicable laws and regulations. If you are unable to comply with U.S. and local laws, return this product immediately.

Further information regarding U.S. export regulations can be found at http://www.access.gpo.gov/bis/ear/ear_data.html.
