

PIMG Integration Guide for Cisco Unity Connection Release 15

First Published: 2021-03-26

Last Modified: 2023-07-05

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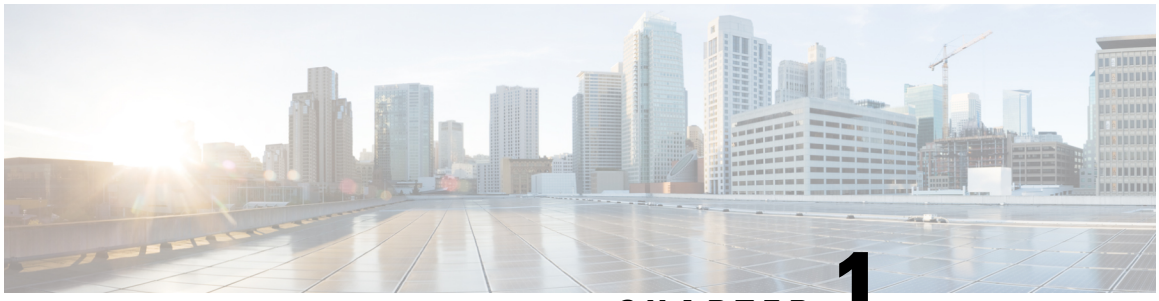
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CHAPTER 1

Introduction

- Introduction, on page 1

Introduction

Integration Description

Cisco\\\ Unity Connection supports PIMG integrations with the following phone systems.

Table 1: Supported Phone Systems for PIMG Integrations

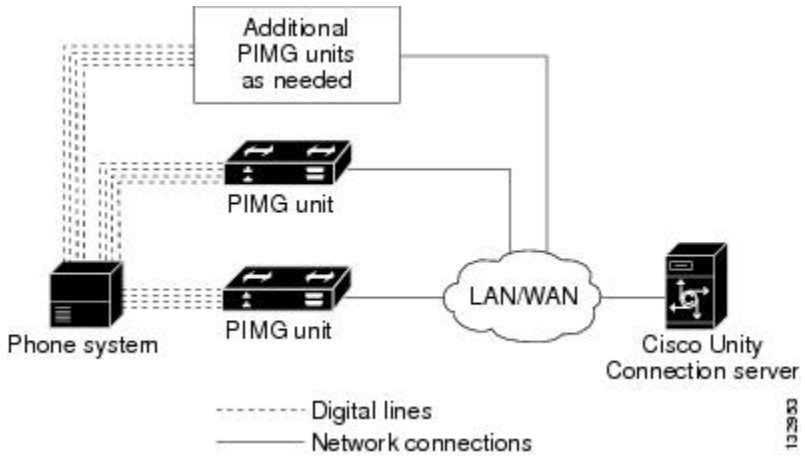
Phone System	Integration Type	Supported PIMG Units
Alcatel 4400	DTMF (analog)	Analog PIMG units (PIMG80LS or DMG1008LS)
Any phone system that provides a serial data link (SMDI, MCI, or MD-110 protocol) to the master PIMG unit	Serial (SMDI, MCI, or MD-110)	Analog PIMG units (PIMG80LS or DMG1008LS)
Avaya Definity G3	Digital	Digital PIMG units (PIMG80PBXDNI or DMG1008DNI)
Avaya Definity ProLogix	Digital	Digital PIMG units (PIMG80PBXDNI or DMG1008DNI)
Avaya S8300, Avaya S8500, and Avaya S8700	Digital	Digital PIMG units (PIMG80PBXDNI or DMG1008DNI)
Mitel SX-200	Digital	Digital Mitel PIMG units (PIMG80MTLPBXDNI or DMG1008MTLDNI)

Phone System	Integration Type	Supported PIMG Units
Mitel SX-2000	Digital	Digital Mitel PIMG units (PIMG80MTLPBXDNI or DMG1008MTLDNI)
NEC NEAX 2400	Digital	Digital PIMG units (PIMG80PBXDNI or DMG1008DNI)
Nortel Meridian 1 (includes Succession and SL 1)	Digital	Digital PIMG units (PIMG80PBXDNI or DMG1008DNI)
Rolm 9751 9005	Digital	Digital Rolm PIMG units (PIMB80RLMPBXDNI or DMG1008RLMDNI)
Rolm 9751 9006	Digital	Digital Rolm PIMG units (PIMB80RLMPBXDNI or DMG1008RLMDNI)
Siemens Hicom 150	DTMF (analog)	Analog PIMG units (PIMG80LS or DMG1008LS)
Siemens Hicom 300 E (European)	DTMF (analog)	Analog PIMG unit (PIMG80LS or DMG1008LS)
Siemens Hicom 300-series E (North American)	Digital	Digital PIMG units (PIMG80PBXDNI or DMG1008DNI)
Siemens Hipath 3550	DTMF (analog)	Analog PIMG units (PIMG80LS or DMG1008LS)
Siemens Hipath 4000	DTMF (analog)	Analog PIMG units (PIMG80LS or DMG1008LS)

Digital Integration with Digital PIMG Units

The phone system sends call information, MWI requests, and voice connections through the digital lines, which connect the phone system to the PIMG units (media gateways). The PIMG units communicate with the Unity Connection server through the LAN or WAN using Session Initiation Protocol (SIP). Figure 1-1 shows the required connections for a digital integration using digital PIMG units.

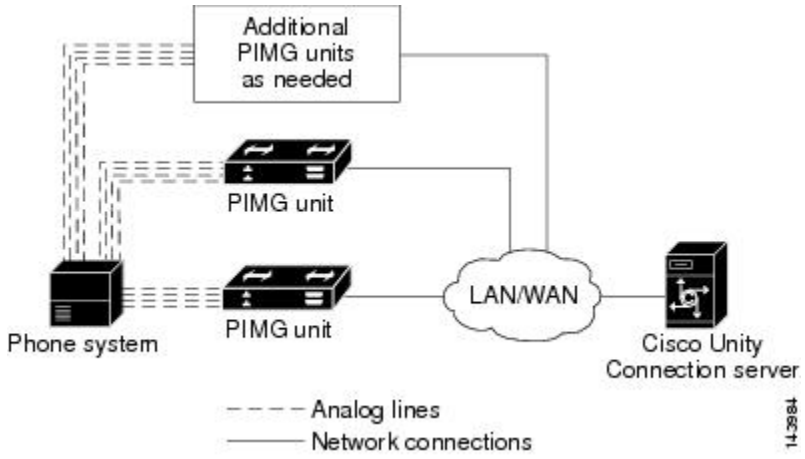
Figure 1: Figure 1-1 Connections for a Digital Integration by Using Digital PIMG Units



DTMF Integration with Analog PIMG Units

The phone system sends call information, MWI requests, and voice connections through the analog lines, which connect the phone system to the PIMG units (media gateways). The PIMG units communicate with the Unity Connection server through the LAN or WAN using Session Initiation Protocol (SIP). Figure 1-2 shows the required connections for a DTMF integration using analog PIMG units.

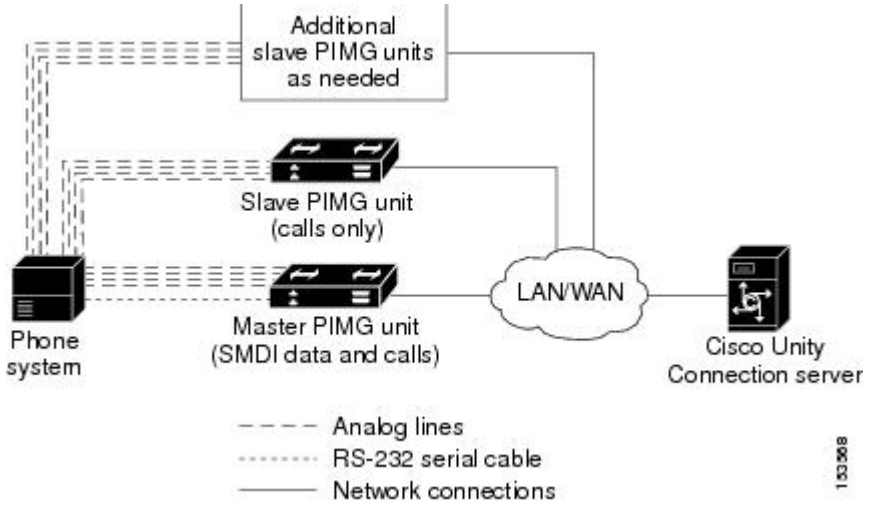
Figure 2: Figure 1-2 Connections for a DTMF Integration by Using Analog PIMG Units



Serial (SMDI, MCI, or MD-110) Integration with Analog PIMG Units

The phone system sends call information and MWI requests through the data link, which is an RS-232 serial cable that connects the phone system and the master PIMG unit (media gateway). Voice connections are sent through the analog lines between the phone system and the PIMG units. The PIMG units communicate with the Unity Connection server through the LAN or WAN using Session Initialization Protocol (SIP). Figure 1-3 shows the required connections for a serial integration using analog PIMG units.

Figure 3: Figure 1-3 Connections for a Serial (SMDI, MCI, or MD-110) Integration by Using Analog PIMG Units



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)

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

Note Serial integrations send requests to turn on and turn off MWIs through the data link.

Integration Functionality

The PIMG integration provides the following integration 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 because Unity Connection identifies the user based on the extension from which the call originated; a password may be required)
- Identified user messaging (Unity Connection identifies the user who leaves a message during a forwarded internal call, based on the extension from which the call originated)

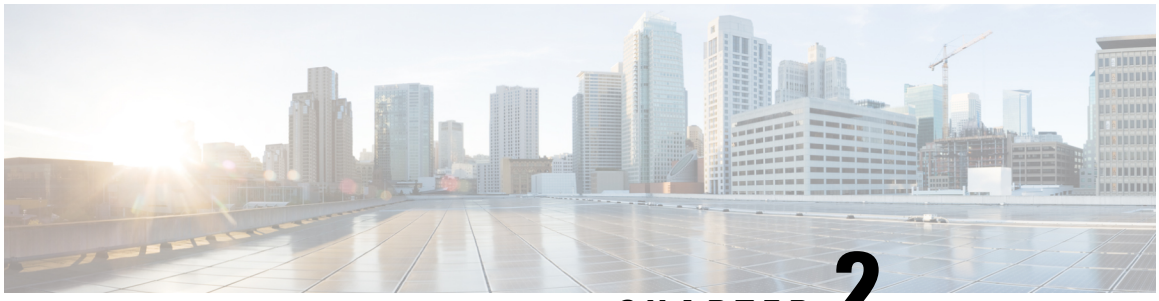
- Message waiting indication (MWI)

Integrations with Multiple Phone Systems

Unity Connection can be integrated with two or more phone systems at one time. For information on the maximum supported combinations and instructions for integrating Unity Connection with multiple phone systems, see the *Multiple Phone System Integration Guide for Cisco Unity Connection Release 15*at https://www.cisco.com/c/en/us/td/docs/voice_ip_comm/connection/15/integration/multiple/b_cuc15intmultiple.html.

Centralized Voice Messaging

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. Unity Connection supports 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 15* at https://www.cisco.com/c/en/us/td/docs/voice_ip_comm/connection/15/design/guide/b_15cucdg.html.



CHAPTER 2

Planning the Usage of Voice Messaging Ports

See the following sections in this chapter:

- Planning the Voice Messaging Ports, on page 7

Planning the Voice Messaging Ports

Planning the Port Setup

Before programming the phone system, you need to plan how the voice messaging ports are used by Cisco Unity Connection. The following considerations 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 Unity Connection cluster, each server must have enough ports to handle all voice messaging traffic in case the other server stops functioning.

- The number of voice messaging ports that answer calls.
- The number of voice messaging ports that only dial out, for example, to send message notification, to set message waiting indicators (MWIs), and to make telephone record and playback (TRAP) connections.

To configure settings for the voice messaging ports in Unity Connection, navigate to Cisco Unity Connection Administration, expand Telephony Integrations and select Ports. Select an applicable port and modify the settings on Port Basics page. For more information on configuring ports, see the "Configuring Ports" section of the "Telephony Integration" chapter of the *System Administration Guide for Cisco Unity Connection, Release 15*, available at https://www.cisco.com/c/en/us/td/docs/voice_ip_comm/connection/15/administration/guide/b_15cucsag.html.

Determining the Number of Voice Messaging Ports

The following tasks describe the process for determining the number of voice messaging ports for Cisco Unity Connection to install, answer call and dial out calls:

- For determining the number of voice messaging ports to Install, see Voice Messaging Ports to Install.

- For determining the number of voice messaging ports to Answer Calls, see Voice Messaging Ports to Answer Calls.
- For determining the number of voice messaging ports to Dial Out, see Voice Messaging Ports that Dial Out.

Voice Messaging Ports to Install

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

- The number of calls Unity Connection answers when call traffic is at its peak.
- The expected length of each message that callers record and users listen to.
- The number of users.
- The number of ports set to dial out only.
- The number of calls made for message notification.
- The number of MWIs 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 Unity Connection web applications to play back and record over the phone.)
- The number of calls that use the automated attendant and call handlers when call traffic is at its peak.
- Whether a Unity Connection cluster is configured. For considerations, see the Considerations for a Unity Connection Cluster.

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.

Voice Messaging Ports to 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 Unity Connection takes the port off-hook to dial out.

If your system is configured for a Unity Connection cluster, see the Considerations for a Unity Connection Cluster.

Voice Messaging Ports that Dial Out

Ports that only dial out and 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 Unity Connection so that users can use the phone as a recording and playback device in Unity Connection web applications.

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



Caution In programming the phone system, do not send calls to voice messaging ports in 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 Unity Connection Cluster

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

When Both Unity Connection Servers are Functioning

- The number of ports provisioned on the phone system is the same as the number of voice messaging ports on each Unity Connection server.
- The PIMG units are configured to send incoming calls first to the subscriber server, then to the publisher server if no answering ports are available on the subscriber server.
- The PIMG units are configured to balance the voice messaging traffic between the Unity Connection servers.
- Both Unity Connection servers are active and handle voice messaging traffic for the system.
- The number of voice messaging ports on each 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 Unity Connection server stops functioning.

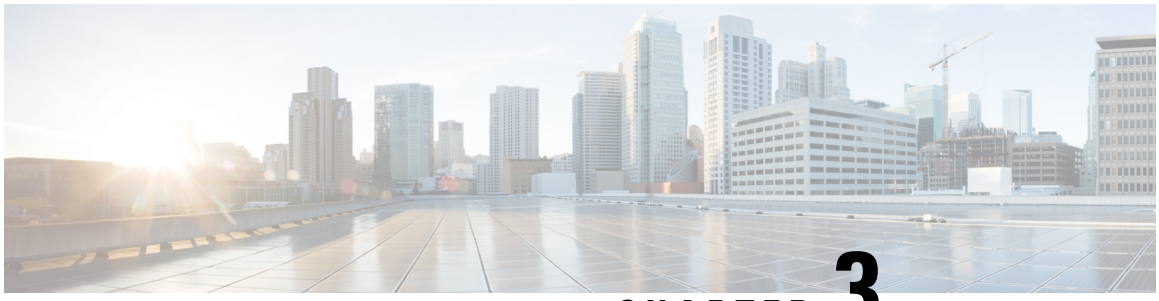
If both Unity Connection servers must be functioning to handle the voice messaging traffic, the system do not have sufficient capacity when one of the servers stops functioning.

- Each Unity Connection server must have voice messaging ports that answer calls and that can dial out (for example, to set MWIs).

When Only One Unity Connection Server is Functioning

- PIMG units send all calls to the functioning Unity Connection server.
- The functioning Unity Connection server receives all voice messaging traffic for the system.
- The number of voice messaging ports that are assigned to the functioning Unity Connection server must be sufficient to handle all of the voice messaging traffic for the system (answering calls and dialing out).
- The functioning Unity Connection server must have voice messaging ports that answer calls and that can dial out (for example, to set MWIs).

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



CHAPTER 3

Setting Up an Alcatel 4400 Analog PIMG Integration

For detailed instructions for setting up an Alcatel 4400 analog PIMG integration with Cisco Unity Connection, see the following sections in this chapter:

- Setting Up Alcatel 4400 Analog PIMG Integration, on page 11

Setting Up Alcatel 4400 Analog PIMG Integration

Task List for Alcatel 4400 PIMG Integration

Before doing the following tasks to integrate Unity Connection with the Alcatel 4400 phone system using PIMG units (media gateways), confirm that the Unity Connection server is ready for the integration after completing the server installation, following the tasks in the "Installing Cisco Unity Connection" chapter of the *Install, Upgrade, and Maintenance Guide for Cisco Unity Connection Release 15*, available at https://www.cisco.com/c/en/us/td/docs/voice_ip_comm/connection/15/install_upgrade/guide/b_15cuciumg.html.

1. Review the system and equipment requirements to confirm that all phone system and Unity Connection server requirements have been met. See the Requirements section.
2. Plan how the voice messaging ports are used by Unity Connection. See the Planning the Usage of Voice Messaging Ports, on page 7 chapter.
3. If you have a legacy voice messaging system, clear the MWIs for subscribers who are migrating to Unity Connection. See the Clearing MWIs from a Legacy Voice Messaging System section.
4. Program the Alcatel 4400 phone system and extensions. See the Programming Alcatel 4400 Phone System for Integration section.
5. Set up the PIMG units.
6. Create the integration. See the Configuring Unity Connection for Integration with the Alcatel 4400 Phone System, on page 29 section.
7. Test the integration. See the Testing the Integration, on page 381 chapter.
8. 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, on page 387 chapter.

Requirements

This integration supports configurations of the following components:

Phone System

- Alcatel 4400.
- Software version 3.1 or later.
- The following features are enabled:
  - VPS (option 21; the value must equal the number of voice messaging ports in the hunt group for Cisco Unity Connection)
  - CLIonVPS_SL (option 121; the value must equal the number of voice messaging ports in the hunt group for Unity Connection)
- One or more of the applicable PIMG units. For details, see the Introduction, on page 1 chapter.
- The voice messaging ports in the phone system connected by analog lines to the ports on the PIMG units.

You should connect the voice messaging ports on the phone system to the ports on the PIMG units in a planned manner to simplify troubleshooting. For example, the first phone system voice messaging port connects to the first port on the first PIMG unit, the second phone system voice messaging port connects to the second port on the first PIMG unit, and so on.

- The PIMG units connected to the same LAN or WAN that Unity Connection is connected to.
- If the PIMG units connect to a WAN, the requirements for the WAN network connections are:
  - For G.729a codec formatting, a minimum of 32.76 Kbps guaranteed bandwidth for each voice messaging port.
  - For G.711 codec formatting, a minimum of 91.56 Kbps guaranteed bandwidth for each voice messaging port.
  - No network devices that implement network address translation (NAT).
  - A maximum 200 ms one-way network latency.

Unity Connection Server

- Unity Connection installed following the tasks in the "Installing Cisco Unity Connection" chapter of the *Install, Upgrade, and Maintenance Guide for Cisco Unity Connection Release 15*, available at https://www.cisco.com/c/en/us/td/docs/voice_ip_comm/connection/15/install_upgrade/guide/b_15cuciumg.html.
- A license that enables the applicable number of voice messaging ports.

Clearing MWIs from a Legacy Voice Messaging System

If users do not have existing voicemail on a legacy voice messaging system, skip this section and continue with the next section.

If users have existing voicemail on a legacy voice messaging system, do the following procedure.

Step 1 Have all users who are migrating to Unity Connection delete or listen to their voice messages on the legacy voice messaging system.

Step 2 Confirm that all MWIs for the subscribers migrating to Unity Connection are turned off.

Programming Alcatel 4400 Phone System for Integration

The following programming instructions are provided as an example only. The specific programming for your phone system may vary depending on its configuration.

Caution In programming the phone system, do not send calls to voice messaging ports in 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.

-

Programming through the Command Line Interface (CLI)

Step 1 On the Alcatel 4400 console, sign in to the configuration interface.

Step 2 In the Generic Configuration Software window, go to **Categories** > **Phone Facilities Category**.

Step 3 Select the category that you use and select **Edit**.

Step 4 Under Local Services, confirm the following settings and select **OK**.

Table 2: Settings for Phone Facility

Field	Setting
Consult Message	1
Switch Off Message LED	1

Step 5 In the Generic Configuration Software window, go to **Translator** > **1** > **Prefix Plan** and select **Create**.

Step 6 In the Prefix Plan dialog box, enter the following settings to turn MWIs on, and select **OK**.

Table 3: Settings for Turning MWIs On

Field	Setting
Number	<the code that turns MWIs on>
Prefix Meaning	Local Features
Local Features	Consult Message

Step 7 In the Prefix Plan dialog box, enter the following settings to turn MWIs off, and select **OK**.

Table 4: Settings for Turning MWIs Off

Field	Setting
Number	<the code that turns MWIs off>
Prefix Meaning	Local Features
Local Features	Switch Off Message LED

Step 8 In the Prefix Plan dialog box, select **Close**.

Step 9 In the Generic Configuration Software window, go to **Users** and select **Create**.

Step 10 In the Users dialog box, enter the following settings for the first voice messaging port and all other settings required for the configuration of the phone system.

Table 5: Settings for the Voice Messaging Port

Field	Setting
Directory Number	<the extension number of the voice messaging port>
Set Type	4620 (VPS + CLIP)

Step 11 In the Users dialog box, select **OK**.

Step 12 Repeat Step Step 1 and Step Step 2 for all remaining voice messaging ports.

Step 13 In the Generic Configuration Software window, go to **Groups** > **1** > **Hunting Group**, and select **Create**.

Step 14 In the Hunting Group dialog box, enter the following settings.

Table 6: Settings for the Hunt Group

Field	Setting
Directory Number	<the pilot number of the hunting group for the voice messaging ports>
Type of Hunting Group	RSVP Hunting Group
Search Type	Sequential

Step 15 Scroll down to the Dir. No Allocated to the Group field (in the middle of the dialog box), and select the magnifying glass icon.

Step 16 In the Set of Dir. No Allocated to the Group dialog box, enter the extension number of the first voice messaging port in the hunting group and select **Add**.

In programming the phone system, do not send calls to voice messaging ports in 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.

Step 17 Repeat Step 16 for all remaining voice messaging ports that you want to include in the hunting group, and select **OK**.

Step 18 In the Hunting Groups dialog box, select **OK**.

Step 19 Program each phone to forward calls to the pilot number assigned to the voice messaging ports, based on one of the Unity Connection call transfer types shown in Table 3-6.

Table 7: Call Transfer Types

Transfer Types	Usage
Release transfer (blind transfer)	Program the phone to forward calls to the pilot number when: • The extension is busy • The call is not answered
Supervised transfer	Program the user station to forward calls to the pilot number only when the call is not answered (on the phone system, the number of rings before forwarding must be more than the number of rings to supervise the call). Confirm that call forwarding is disabled when the extension is busy.

Setting Up the Analog PIMG Units for a DTMF Integration

Do the following procedures to set up the analog PIMG units connected to the Alcatel 4400 phone system for a DTMF integration.

These procedures require that the following tasks have already been completed:

- The phone system is connected to the PIMG units using analog lines.
- The PIMG units are ready to be connected to the LAN or WAN.
- The PIMG units are connected to a power source.

Fields that are not mentioned in the following procedures must keep their default values. For the default values of all fields, see the manufacturer documentation for the PIMG units.

Downloading the PIMG Firmware Update Files for Analog PIMG Units

http://software.cisco.com/download/navigator.html?mdfid=280082558&i=rm.

Note To access the software download page, you must be signed in to Cisco.com as a registered user.

This procedure describes the steps when using Internet Explorer as your web browser. If you are using a different web browser, the steps may differ.

1. In the tree control on the Downloads Home page, expand Unified Communications> **Unified Communications Applications** > **Messaging** > **Cisco Unity** and select **Cisco Unity Telephony Integration**.
2. On the Log In page, enter your username and password and select **Log In**.
3. On the Select a Release page, under Latest Releases, select the most recent release.
4. In the right column, select the version of the firmware for analog PIMG units.
5. On the Download Image page, select **Download**.
6. On the Supporting Document(s) page, select **Agree**.
7. In the File Download dialog box, select **Save**.
8. In the Save As dialog box, browse to the Windows workstation that have access the PIMG units, browse to a directory where you want to save the file, and select **Save**.
9. In the Download Complete dialog box, select **Open**. The window for extracting the PIMG firmware update files appears and select **Extract**.
10. In the Extract dialog box, browse to the directory where you want the extracted files and select **Extract**.
11. Close the window for the extracting application.

On a Windows workstation that have access to the PIMG units, go to the following link:

Setting Up the Analog PIMG Units (Firmware Version 6.x)

Step 1 On the Windows workstation, add a temporary route to enable access to the PIMG units.

a) On the Windows Start menu, select **Run**.
b) Enter **cmd**, and press **Enter**. The Command Prompt window appears.
c) At the command prompt, enter **route add 10.12.13.74 <IP Address of Workstation>**, and press **Enter**.

For example, if the IP address of the workstation is 198.1.3.25, enter “route add 10.12.13.74<space>198.1.3.25” in the Command Prompt window.

d) Close the Command Prompt window.

Step 2 Connect a PIMG unit to the network.

Step 3 In the web browser, go to **http://10.12.13.74**.

Step 4 To sign in, enter the following case-sensitive settings.

Table 8: Sign-in Settings

Field	Settings
Username	Enter **admin**.
Password	Enter **IpodAdmin**.

Step 5 Select **OK**.

Step 6 On the System menu, select **Upgrade**.

Step 7 On the Upgrade page, select **Browse**.

Step 8 In the Choose File dialog box, browse to the directory on the Windows workstation that has the extracted PIMG firmware update files.

Step 9 Select **Ls_<xx** > **.app** (where <xx> is multiple digits), and select **Open**.

Step 10 On the Upgrade page, select **Install File**.

Step 11 After the file is installed, a message prompting you to restart the PIMG unit appears. Select **Cancel**.

Do not restart the PIMG unit until you are instructed to do so later in this procedure, even if the file installation fails. Restarting the PIMG unit at this step may prevent the PIMG unit from functioning correctly.

Step 12 Repeat Step 6 through Step 11 for the file **Run_<xx** > **.dsp**.

Step 13 On the System menu, select **Upgrade**.

Step 14 On the Upgrade page, under Import, select **Browse**.

Step 15 In the Choose File dialog box, browse to the file **Ls_<xx** > **.fsh**.

Step 16 Select **Ls_<xx** > **.fsh**, and select **Open**.

Step 17 On the Upgrade page, select **Install File**.

Step 18 After the file is installed, a message prompting you to restart the PIMG unit appears. Select **OK**.

Step 19 In the web browser, go to **http://10.12.13.74**.

Step 20 To sign in, enter the following case-sensitive settings.

Table 9: Sign-in Settings

Field	Settings
Username	Enter **admin**.
Password	Enter **IpodAdmin**.

Step 21 Select **OK**.

Step 22 If your Unity Connection system must have an RTP port range of 16384 to 32767, do the following substeps. Otherwise, continue to Step 23.

You must set the RTP port range for the PIMG units if your system uses an RTP port range of 16384 to 32767. Otherwise, Unity Connection cannot answer calls and callers hear ringing or silence.

Note The default RTP port range for PIMG units is 49000 to 50000. Some Unity Connection configurations require a different RTP port range.

a) On the Configuration menu, select **Import/Export**.
b) On the Import/Export page, under Export Files, select **Export All Settings**.

c) In the File Download dialog box, select **Save**.
d) In the Save As dialog box, browse to the Windows workstation that has access to the PIMG units, browse to a directory where you want to save the file, and select **Save**.
e) In the Download Complete dialog box, select **Open**. Notepad opens the file Config.ini that you saved.
f) Locate the line with the following parameter:

```
gwRTPStartPort
```

g) Change the value of the parameter to **16384** so that the line reads as follows:

```
gwRTPStartPort = 16384
```

h) Locate the line with the following parameter:

```
gwRTPEndPort
```

i) Change the value of the parameter to **32767** so that the line reads as follows:

```
gwRTPEndPort = 32767
```

j) Save the file, and exit Notepad.
k) On the Configuration menu of the PIMG unit, select **Import/Export**.
l) On the Import/Export page, under Browse for Import Settings, select **Browse**.
m) In the Choose File dialog box, browse to the file Config.ini that you saved.
n) Select **Config.ini**, and select **Open**.
o) On the Import/Export page, select **Import File**.
p) When prompted to restart the PIMG unit, select **OK**.
q) When the PIMG unit has restarted, in the web browser, go to **http://10.12.13.74**.
r) To sign in, enter the following case-sensitive settings.

Table 10: Sign-in Settings

Field	Setting
Username	Enter **admin**.
Password	Enter **IpodAdmin**.

s) Select **OK**.

Step 23 On the System menu, select **Password**.

Step 24 On the Change Password page, enter the following settings.

Table 11: Change Password Page Settings

Field	Settings
Old Password	Enter **IpodAdmin**. (This setting is case sensitive.)

Field	Settings
New Password	Enter your new password. (This setting is case sensitive.)
Confirm Password	Enter your new password. (This setting is case sensitive.)

Step 25 Select **Change**.

Step 26 On the Configuration menu, select **Mgmt Protocols**.

Step 27 On the Management Protocols page, enter the following settings.

Table 12: Management Protocols Page Settings

Field	Settings
E-mail Alarms Enabled	Select **No**.
SNMP Traps Enabled	Select **No**.

Step 28 Select **Submit**.

Step 29 On the Configuration menu, select **Routing Table**.

Step 30 On the Routing Table page, under Router Configuration, select **VoIP Host Groups**.

Step 31 Under VoIP Host Groups, enter the following settings for the first VoIP Host Group.

Table 13: First VoIP Host Group Settings

Field	Settings
Name	Accept the default or enter another descriptive name of the VoIP host group.
Load-Balanced	*(Unity Connection without a cluster)* Select **False**. *(Unity Connection with a cluster configured)* Select **False**.
Fault-Tolerant	*(Unity Connection without a cluster)* Select **False**. *(Unity Connection with a cluster configured)* Select **True**.

Step 32 For Unity Connection without a cluster, under Under Host List, enter the host name or IP address of the Unity Connection server and the server port in the format <host name or IP address>:5060.

For Unity Connection with a cluster configured, under Host List, confirm that field contains the host name or IP address of the publisher server (the first Unity Connection server that you installed) and the server port in the format <host name or IP address>:5060.

Step 33 For Unity Connection without a cluster, continue to Step 36. For Unity Connection with a cluster configured, under Host List, enter the host name or IP address of the subscriber server (the second Unity Connection server that you installed) and the server port in the format <host name or IP address>:5060.

Step 34 Select **Add Host**.

Step 35 In the second field, enter the host name or IP address of the publisher server and the server port in the format <host name or IP address>:5060.

Do not add a third host under Host List or a second host group under VoIP Host Groups. Otherwise, the Unity Connection cluster may not function correctly.

Step 36 Select **Submit**.

Step 37 Under Router Configuration, select **TDM Trunk Groups**.

Step 38 Under TDM Trunk Groups, select **Add Trunk Group**.

Step 39 Under TDM Trunk Groups, enter the following settings for the first TDM trunk group.

Table 14: First TDM Trunk Group Settings (Inbound Calls)

Field	Settings
Name	Enter **Inbound_PBX_Calls** or another unique name. This TDM trunk group handles all incoming calls from the phone system.
Selection Direction	Select **Ascending**.
Selection Mode	Select **Linear**.
Port/Channel Content	Enter the numbers of the PIMG ports that handle inbound calls. For example, enter "*" for all PIMG ports, or enter "1-6" for the first six PIMG ports.

Step 40 Under TDM Trunk Groups, select **Add Trunk Group**.

Step 41 Enter the following settings for the second TDM trunk group.

Table 15: Second TDM Trunk Group Settings (MWIs)

Field	Settings
Name	Enter **MWIs** or another unique name. This TDM trunk group handles outbound MWI calls (where applicable).
Selection Direction	Select **Ascending**.
Selection Mode	Select **Cyclic**.
Port/Channel Content	Enter the numbers of the PIMG ports that dial out MWIs. For example, enter "*" for all PIMG ports, or enter "7,8" for the last two PIMG ports.

Step 42 Under TDM Trunk Groups, select **Add Trunk Group**.

Step 43 Enter the following settings for the third TDM trunk group.

Table 16: Third TDM Trunk Group Settings (Outbound Calls)

Field	Settings
Name	Enter **Outbound_PBX_Calls** or another unique name. This TDM trunk group handles all outbound calls from Unity Connection.

Field	Settings
Selection Direction	Select **Descending**.
Selection Mode	Select **Linear**.
Port/Channel Content	Enter ***** for all channels in all ports. Enter the numbers of the PIMG ports that handle outbound (dialout) calls. For example, enter "*" for all PIMG ports, or enter "7,8" for the last two PIMG ports.

Step 44 Select **Submit**.

Step 45 Under Router Configuration, select **Inbound VoIP Rules**.

Step 46 Under Inbound VoIP Rules, uncheck the **Enabled** check box for the default rule.

Step 47 Select **Add Rule**.

Step 48 Under Inbound VoIP Rules, enter the following settings for the first new inbound VoIP rule.

Table 17: First New Inbound VoIP Rule Settings (MWIs)

Field	Settings
Enable	Check this check box.
Rule Label	Enter **MWI_Calls** or another name. This inbound VoIP rule handles all MWI calls from Unity Connection.
Request Type	Select **Message**.
Originating VoIP Host Address	Enter *****.

Step 49 Under Inbound VoIP Request Matching, enter the following settings.

The rule that you created in Step 48 must be selected. Otherwise, any changes you make apply to another rule.

Table 18: Inbound VoIP Request Matching Settings

Field	Settings
Calling Number	Enter *****.
Calling Name	Enter *****.
Called Number	Enter *****.
Called Name	Enter *****.
Redirect Number	Enter *****.
Redirect Name	Enter *****.

Step 50 Under Outbound Routes, enter the following settings.

The rule that you created in Step 48 must be selected. Otherwise, any changes you make apply to another rule.

Table 19: Outbound Routes Settings

Field	Settings
Device Selection	
Outbound Destination	Select **TDM**.
Trunk Group	Select the name of the TDM trunk group that you created for MWIs in Step 41. For example, select "MWIs."
CPID Manipulation	
Calling Number	Enter **S**.
Calling Name	Enter **S**.
Called Number	Enter **D**.
Called Name	Enter **D**.
Redirect Number	Enter **R**.
Redirect Name	Enter **R**.
Select Primary/Alternate Route	
Primary	Select **Primary**.

Step 51 Under Inbound VoIP Rules, select **Add Rule**.

Step 52 Under Inbound VoIP Rules, enter the following settings for the second new inbound VoIP rule.

Table 20: Second New Inbound VoIP Rule Settings (Outbound Calls)

Field	Settings
Enable	Check this check box.
Rule Label	Enter **Outbound_UC_Calls** or another name. This inbound VoIP rule handles all outbound calls from Unity Connection.
Request Type	Select **Call**.
Originating VoIP Host Address	Enter *****.

Step 53 Under Inbound VoIP Request Matching, enter the following settings.

The rule that you created in Step 52 must be selected. Otherwise, any changes you make apply to another rule.

Table 21: Inbound VoIP Request Matching Settings

Field	Settings
Calling Number	Enter *.
Calling Name	Enter *.
Called Number	Enter *.
Called Name	Enter *.
Redirect Number	Enter *.
Redirect Name	Enter *.

Step 54 Under Outbound Routes, enter the following settings.

The rule that you created in Step 52 must be selected. Otherwise, any changes you make apply to another rule.

Table 22: Outbound Routes Settings

Field	Settings
Device Selection	
Outbound Destination	Select **TDM**.
Trunk Group	Select the name of the TDM trunk group that you created for outbound calls in Step 43. For example, select "Outbound_PBX_Calls."
CPID Manipulation	
Calling Number	Enter **S**.
Calling Name	Enter **S**.
Called Number	Enter **D**.
Called Name	Enter **D**.
Redirect Number	Enter **R**.
Redirect Name	Enter **R**.
Select Primary/Alternate Route	
Primary	Select **Primary**.

Step 55 Select **Submit**.

Step 56 Under Router Configuration, select **Inbound TDM Rules**.

Step 57 Under Inbound TDM Rules, enter the following settings for the first inbound TDM rule.

Table 23: First Inbound TDM Rule Settings

Field	Settings
Enable	Check this check box.
Rule Label	Enter **Inbound_Rule_1** or another name. This inbound TDM rule handles all incoming calls from the phone system.
Request Type	Select **Call**.
Trunk Group	Select the name of the TDM trunk group that you created for incoming calls from the phone system in Step 39. For example, select "Inbound_PBX_Calls."

Step 58 Under Inbound TDM Request Matching, enter the following settings.

The rule that you created in Step 57 must be selected. Otherwise, any changes you make apply to another rule.

Table 24: Inbound TDM Request Matching Settings

Field	Settings
Calling Number	Enter the applicable matching rule used. For example, enter "*" for all.
Calling Name	Enter the applicable matching rule used. For example, enter "*" for all.
Called Number	Enter the applicable matching rule used. For example, enter "*" for all.
Called Name	Enter the applicable matching rule used. For example, enter "*" for all.
Redirect Number	Enter the applicable matching rule used. For example, enter "*" for all.
Redirect Name	Enter the applicable matching rule used. For example, enter "*" for all.

Step 59 Under Outbound Routes, enter the following settings.

The rule that you created in Step 57 must be selected. Otherwise, any changes you make apply to another rule.

Table 25: Outbound Routes Settings

Field	Settings
Device Selection	
Outbound Destination	Select **VoIP**.
Host Group	Select the name of the VoIP host group that you created for Unity Connection in Step 31.
CPID Manipulation	
Calling Number	Enter the applicable matching rule used. For example, enter "*" for all.
Calling Name	Enter the applicable matching rule used. For example, enter "*" for all.

Field	Settings
Called Number	Enter the applicable matching rule used. For example, enter "*" for all.
Called Name	Enter the applicable matching rule used. For example, enter "*" for all.
Redirect Number	Enter the applicable matching rule used. For example, enter "*" for all.
Redirect Name	Enter the applicable matching rule used. For example, enter "*" for all.
Select Primary/Alternate Route	
Primary	Select **Primary**.

Step 60 If you want to create more Inbound TDM rules, under Inbound TDM Rules, select **Add Rule**. Otherwise, continue to Step 62.

Step 61 Repeat Step 57 through Step 60 for all remaining inbound TDM rules that you want to create.

Step 62 Select **Submit**.

Step 63

Step 64

Step 65

Step 66 On the Configuration menu, select **TDM** > **General**.

Step 67 On the TDM General Settings page, enter the following settings.

Table 26: TDM General Settings Page Settings

Field	Settings
PCM Coding	Select **uLaw**.
Minimum Call Party Delay (ms)	Enter **500**.
Maximum Call Party Delay (msecs)	Enter **2000**.
Dial Digit on Time (ms)	Enter **100**.
Dial Inter-Digit Time (ms)	Enter **100**.
Dial Pause Time (ms)	Enter **2000**.
Turn MWI On FAC	Enter the code that turns MWIs on.
Turn MWI Off FAC	Enter the code that turns MWIs off.
Outbound Call Connect Timeout (ms)	Enter **10000**.
Wait for Ringback/Connect on Blind Transfer	Select **Yes**.
Hunt Group Extension	Enter the pilot number of the Unity Connection voice messaging ports.

Step 68 Select **Submit**.

Step 69 On the Configuration menu, select **TDM** > **Port Enable**.

Step 70 On the TDM Port Enabling page, select **No** for the ports that you want to disable on the PIMG unit.

Step 71 Confirm that **Yes** is selected for all other ports on the PIMG unit.

Step 72 Select **Submit**.

Step 73 On the Configuration menu, select **VoIP** > **General**.

Step 74 On the VoIP General Settings page, enter the following settings.

Table 27: VoIP General Settings Page Settings

Field	Setting
User-Agent	
Host and Domain Name	Enter the host and domain name of the PIMG unit.
Transport Type	Select **UDP**.
Call as Domain Name	Select **No**.
Invite Expiration (sec)	Enter **120**.
Server	
DNS Server Address	Enter the IP Address of the Domain Name Server that the PIMG unit use.
Registration Server Address	Leave this field blank.
Registration Server Port	Enter **5060**.
Registration Expiration (sec)	Enter **3600**.
TCP/UDP	
UDP/TCP Transports Enabled	Select **Yes**.
TCP/UDP Server Port	Enter **5060**.
Proxy	
Primary Proxy Server Address	Leave this field blank.
Primary Proxy Server Port	Not applicable. Leave the default setting.
Backup Proxy Server Address	Not applicable. Leave the default setting.
Backup Proxy Server Port	Not applicable. Leave the default setting.

Field	Setting
Proxy Query Interval	Enter **10**.
Timing	
T1 Time (ms)	Enter **400**.
T2 Time (ms)	Enter **3000**.
Monitoring	
Monitor Call Connections	Select **No**.

Step 75 Select **Submit**.

Step 76 On the Configuration menu, select **VoIP** > **Media**.

Step 77 On the VoIP Media Settings page, enter the following settings.

Table 28: VoIP Media Settings Page Settings

Field	Settings
Audio	
Audio Compression	Select the preferred codec for audio compression.
RTP Digit Relay Mode	Select **RFC2833**.
Signaling Digit Relay Mode	Select **Off**.
Voice Activity Detection	Select **Off**.
Frame Size	Select the applicable setting: • G.711—**20** • G.729AB—**10** Failure to use the correct setting results in recorded messages containing nothing but silence.
Frames Per Packet	Select the applicable setting: • G.711—**1** • G.729AB—**2** Failure to use the correct setting results in recorded messages containing nothing but silence.

Step 78 Select **Submit**.

Step 79 On the Configuration menu, select **VoIP** > **QOS**.

Step 80 On the VoIP QOS Configuration page, enter the following settings.

Table 29: VoIP QOS Configurative Page Settings

Field	Settings
Call Control QOS Byte	Enter **104**.
RTP QOS Byte	Enter **184**.

Step 81 Select **Submit**.

Step 82 On the Configuration menu, select **IP**.

Step 83 On the IP Settings page, enter the following settings.

Table 30: IP Settings Page Settings

Field	Settings
Client IP Address	Enter the new IP address you want to use for the PIMG unit. (This is the IP address that you enter in Cisco Unity Connection Administration when you create the integration.)
Client Subnet Mask	Enter the new subnet mask, if the subnet mask is different from the default IP address.
Default Network Gateway Address	Enter the IP address of the default network gateway router that the PIMG units uses.
BOOTP Enabled	Select **No**.

Step 84 Select **Submit**.

Step 85 On the Configure menu, select **Tone Detection**.

Step 86 On the Tone Detection page, under Call Progress Tone - Learn, in the Learn Tone Event field, select **Busy** and do the following substeps to verify that the tone is correct.

a) From an available phone, call a second phone.
b) Answer the second phone when it rings, and leave both handsets off so that both phones are busy.
c) From a third phone, dial one of the busy phones.
d) Confirm that you hear a busy tone.
e) Hang up the third phone but leave the handsets for the other two phones off.

Step 87 Under Call Progress Tone - Learn, in the Dial String field, enter the extension that you dialed in Step 86c. from the third phone.

Step 88 Select **Learn**.

Step 89 On the Tone Detection page, under Call Progress Tone - Learn, in the Learn field, select **Error** and do the following substeps to verify that the tone is correct.

a) From an available phone, dial an extension that does not exist.
b) Confirm that you hear the reorder or error tone.
c) Hang up the phone.

Step 90 Under Call Progress Tone - Learn, in the Dial String field, enter the extension that you dialed in Step 89a.

Step 91 On the Tone Detection page, under Call Progress Tone - Learn, in the Learn field, select **Ringback** and do the following substeps to verify that the tone is correct.

a) From an available phone, dial an extension that does exist
b) Confirm that you hear the ringback tone.
c) Hang up the phone.

Step 92 Under Call Progress Tone - Learn, in the Dial String field, enter the extension that you dialed in Step 91a.

Step 93 Select **Learn**.

Step 94 Select **Submit**.

Step 95 Hang up the phones that you used in Step 86.

Step 96 On the Configure menu, select **Restart**.

Step 97 On the Restart page, select **Restart Unit Now**.

Step 98 Repeat Step 2 through Step 97 on all remaining PIMG units.

Configuring Unity Connection for Integration with the Alcatel 4400 Phone System

After ensuring that the Alcatel 4400 phone system, the PIMG units, and Unity Connection are ready for the integration, do the following procedure to set up the integration and to enter the port settings.

Creating an Integration

Step 1 In Cisco Unity Connection Administration, expand **Telephony Integrations**, then select **Phone System**.

Step 2 On the Search Phone Systems page, under Display Name, select the name of the default phone system.

Step 3 On the Phone System Basics page, in the Phone System Name field, enter the descriptive name that you want for the phone system.

Step 4 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 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 5 Under Message Waiting Indicator Settings, select**Use Same Port for Enabling and Disabling MWIs**.

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 applicable settings and select **Save**.

Table 31: Settings for the New Port Group Page

Field	Setting
Phone System	Select the name of the phone system that you entered in Step 3.
Create From	Select **Port Group Template** and select **SIP to DMG/PIMG/TIMG** 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.

Field	Setting
SIP Security Profile	Select **5060**.
SIP Transport Protocol	Select the SIP transport protocol that Unity Connection uses.
IP Address or Host Name	Enter the IP address of the PIMG unit that you are integrating with Unity Connection.
Port	Enter the SIP port of the PIMG unit that Unity Connection connects to. We recommend that you use the default setting. This name must match the setting in the TCP/UDP Server Port field on the Configuration > VoIP > General page of the PIMG unit. Otherwise, the integration cannot function correctly.

Step 9 On the Port Group Basics page, under Message Waiting Indicator Settings, uncheck the **Enable Message Waiting Indicators** check box and select **Save**.

Step 10 In the Related Links drop-down box, select **Add Ports** and select **Go**.

Step 11 On the New Port page, enter the following settings and select **Save**.

Table 32: Settings for the New Port Page

Field	Considerations
Enabled	Check this check box.
Number of Ports	Enter **8**. (If you want to use fewer than eight voice messaging ports, enter the number of voice messaging ports that you want to use on this PIMG unit.) **Note** For a Unity Connection cluster, the server must have the number of voice messaging ports that are set up on the phone system for the PIMG integration so that this server can handle all voice messaging traffic for the cluster if one of the servers stops functioning. For example, if the phone system is set up with 16 voice messaging ports, this server must have 16 voice messaging ports.
Phone System	Select the name of the phone system that you entered in Step 3.
Port Group	Select the name of the port group that you added in Step 8.

Step 12 On the Search Ports page, select the display name of the first voice messaging port that you created for this phone system integration.

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

Step 13 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 33: 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 ringing tone but are not answered. Typically, the port is disabled only by the installer duri testing.
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 incomi calls from unidentified callers or from users.
Perform Message Notification	Check this check box to designate the port for notifying users of messages. Assign Perfor Message Notification to the least busy ports.
Send MWI Requests	(Serial integrations only) Uncheck this check box. Otherwise, the integration may not func correctly. (Digital and analog integrations only) Check this check box to designate the port for turni 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 th phone in Unity Connection web applications. Assign Allow TRAP Connections to the lea busy ports.
Outgoing Hunt Order	Enter the priority order in which Unity Connection uses the ports when dialing out (for exam if the Perform Message Notification, Send MWI Requests, or Allow TRAP Connections cl box is checked). The highest numbers are used first. However, when multiple ports have t same Outgoing Hunt Order number, Unity Connection uses the port that has been idle the longest.

Step 14 Select **Save**.

Step 15 Select **Next**.

Step 16 Repeat Step 13 through Step 15 for all remaining voice messaging ports for the phone system.

Step 17 In Cisco Unity Connection Administration, expand **Telephony Integrations**, then select **Phone System**.

Step 18 On the Search Phone Systems page, under Display Name, select the name of the phone system that you entered in Step 3.

Step 19 Repeat Step 7 through Step 18 for each remaining PIMG unit integrated with Unity Connection.

Note Each PIMG unit is connected to one port group with the applicable voice messaging ports. For example, a system that uses five PIMG units requires five port groups, one port group for each PIMG unit.

Step 20 To create a port group for MWIs, do the following substeps.

Note All MWI requests are handled by the master PIMG unit and sent to the phone system over the RS-232 serial cable (without using voice messaging ports). So the following substeps create a separate port group without voice messaging ports and enable the port group for MWIs that are "not port specific" (they do not use ports).

a) In Cisco Unity Connection Administration expand **Telephony Integration** then select **Port Group** .

b) On the Search Port Groups page, select **Add New**.
c) On the New Port Group page, enter the applicable settings and select **Save**.

Table 34: Settings for the New Port Group Page (MWIs)

Field	Setting
Phone System	Select the name of the phone system that you entered in Step 3.
Create From	Select Port Group Template and select **SIP to DMG/PIMG/TIMG** SIP to in the drop-down box.
Display Name	Enter a **MWI Port Group** or another descriptive name for the port group.
SIP Security Profile	Select **5060**.
SIP Transport Protocol	Select the SIP transport protocol that Unity Connection uses.
IPv4 Address or Host Name	Enter the IP address of the master PIMG unit.
IPv6 Address or Host Name	Do not enter a value in this field. IPv6 is not supported for PIMG integrations.
IP Address or Host Name	Enter the IP address of the master PIMG unit.
Port	Enter the SIP port of the master PIMG unit. **Caution** This name must match the setting in the TCP/UDP Server Port field on the Configuration > VoIP > General page of the PIMG unit. Otherwise, the integration cannot function correctly.

d) On the Port Group Basics page, on the Edit menu, select **Advanced Settings**.
e) On the Edit Advanced Settings page, under SIP MWI Requests, select **Not Port Specific** then select **Save**.
f) On the Edit menu, select **Port Group Basics**.
g) Under Port Group, select **Reset**.
h) Under Message Waiting Indicator Settings, confirm that the **Enable Message Waiting Indicator** check box is checked and select **Save**.

Step 21 If another phone system integration exists, in Cisco Unity Connection Administration, expand **Telephony Integrations**, then select **Trunk**. Otherwise, skip to Step 25.

Step 22 On the Search Phone System Trunks page, on the Phone System Trunk menu, select **New Phone System Trunk**.

Step 23 On the New Phone System Trunk page, enter the following settings for the phone system trunk and select **Save**.

Table 35: Settings for the Phone System Trunk

Field	Setting
From Phone System	Enter the display name of the phone system that you are creating a trunk for.
To Phone System	Enter the display name of the previously existing phone system that the trunk connects to.

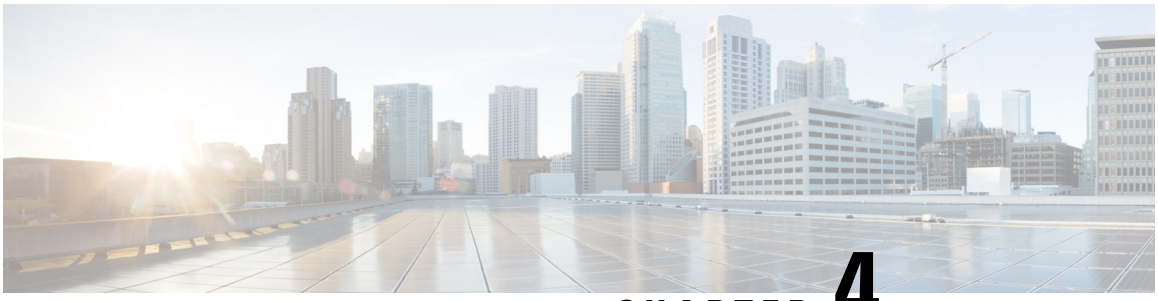
Field	Setting
Trunk Access Code	Enter the extra digits that Unity Connection must dial to transfer calls through the gateway to extensions on the previously existing phone system.

Step 24 Repeat Step 22 and Step 23 for all remaining phone system trunks that you want to create.

Step 25 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 26 In the Task Execution Results window, select **Close**.



CHAPTER 4

Setting up Alcatel 4400 Digital PIMG Integration with Cisco Unity Connection

• Setting Up an Alcatel 4400 Digital PIMG Integration with Cisco Unity Connection, on page 35

Setting Up an Alcatel 4400 Digital PIMG Integration with Cisco Unity Connection

Task List for Alcatel 4400 Digital PIMG Integration

Before doing the following tasks to integrate Cisco Unity Connection with the Alcatel 4400 phone system by using PIMG units (media gateways), confirm that the Cisco Unity Connection server is ready for the integration by completing the applicable tasks in the "Installing Cisco Unity Connection" chapter of the *Install, Upgrade, and Maintenance Guide for Cisco Unity Connection Release 15*, available at https://www.cisco.com/c/en/us/td/docs/voice_ip_comm/connection/15/install_upgrade/guide/b_15cuciumg.html.

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, on page 12 section.
2. Plan how the voice messaging ports will be used by Cisco Unity Connection. See Planning the Usage of Voice Messaging Ports, on page 7 section.
3. Program the Alcatel 4400 phone system and extensions. See the Programming the Alcatel 4400 Digital PIMG Phone System, on page 37 section.
4. Set up the PIMG units. See the Setting Up the Digital PIMG Units section.
5. Create the integration. See the Configuring Unity Connection for Integration with the Alcatel 4400 Digital Phone System, on page 54 section.
6. Test the integration. See Testing the Integration, on page 381 chapter.
7. If this integration is a second or subsequent integration, add the applicable new user templates for the new phone system. See Adding New User Templates for Multiple Integrations, on page 387 section.

Requirements

This integration supports configurations of the following components:

Phone System

- Alcatel 4400 phone system. The voice messaging ports that connect to the PIMG units must be compatible with the 7434ND, 8434, 8434D, or 8434DX digital phones.

  You must use 2-wire line cards for these voice messaging ports. Otherwise, the voice messaging ports will not be compatible with the 7434ND, 8434, 8434D, or 8434DX digital phones.

- One or more of the applicable PIMG units. For details, see Introduction, on page 1
- The voice messaging ports in the phone system connected by digital lines to the ports on the PIMG units.

To simplify troubleshooting, we recommend that you connect the voice messaging ports on the phone system to the ports on the PIMG units in a planned manner. For example, connect the first phone system voice messaging port to the first port on the first PIMG unit, connect the second phone system voice messaging port to the second port on the first PIMG unit, and so on. Alternatively, if you have multiple PIMG units, you can reduce answer times in the event of a PIMG unit failure by connecting the phone system ports to the PIMG units in a round-robin fashion. For example, connect the first phone system voice messaging port to the first port on the first PIMG unit, connect the second phone system voice messaging port to the first port on the second PIMG unit, and so on.

- The PIMG units connected to the same LAN or WAN that Unity Connection is connected to.
- If the PIMG units connect to a WAN, the requirements for the WAN network connections are:
  - For G.729a codec formatting, a minimum of 32.76 Kbps guaranteed bandwidth for each voice messaging port.
  - For G.711 codec formatting, a minimum of 91.56 Kbps guaranteed bandwidth for each voice messaging port.
  - No network devices that implement network address translation (NAT).
  - A maximum 200 ms one-way network latency.
- The phone system ready for the integration, as described in the documentation for the phone system.

Unity Connection Server

- Unity Connection installed following the tasks in the "Installing Cisco Unity Connection" chapter of the *Install, Upgrade, and Maintenance Guide for Cisco Unity Connection Release 15*, available at https://www.cisco.com/c/en/us/td/docs/voice_ip_comm/connection/15/install_upgrade/guide/b_15cuciumg.html.
- A license that enables the applicable number of voice messaging ports.

Programming the Alcatel 4400 Digital PIMG Phone System

The following programming instructions are provided as an example only. The specific programming for your phone system may vary depending on its configuration.

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.

Programming the Alcatel 4400 Phone System

Step 1 Create a coverage path which contains the PIMG unit hunt group number as the coverage point.

Step 2 Assign the coverage path that you created in Step 1 to the user stations that must forward to the voice messaging ports on the PIMG units when calls are not answered or when the user station is busy, based on one of the Unity Connection call transfer types shown in Table 36: Call Transfer Types.

Table 36: Call Transfer Types

Transfer Type	Usage
Release transfer (blind transfer)	Program the user station to forward calls to the pilot number when: • The extension is busy. • The call is not answered.
Supervised transfer	Program the user station to forward calls to the pilot number only when the call is not answered (on the phone system, the number of rings before forwarding must be more than the number of rings to supervise the call). Confirm that call forwarding is disabled when the extension is busy.

Step 3 Use the Add Station <extension number> command (for example, Add Station 2999) to assign an extension number for each voice messaging port, which is a digital line that connects to the PIMG unit. Set the voice messaging port options (Table 37: Voice Messaging Port Options for All Lines) and button assignments (Table 38: Button Assignments for All Lines), and press **Enter**.

Note We recommend that you distribute the voice messaging ports among multiple phone system line cards so that call processing can continue even if a line card becomes inactive.

Table 37: Voice Messaging Port Options for All Lines

Option	Setting
Extension	Enter the extension number of the digital line.

Option	Setting
Type	Enter **7434ND** (recommended). You can also use the following settings. However, you must include the extension with each subscriber name when programming the phone system (for example, "3001 Jane Doe"). Otherwise, the integration will not function correctly. • **8434** • **8434D** • **8434DX** **Note** If the setting that you want is not available, contact the phone system manufacturer.
LWC Reception	Enter **msa**.
LWC Activation?	Enter **y**.
Restrict Last Appearance?	Enter **y**.
Display Module	Enter **y**.

Table 38: Button Assignments for All Lines

Button Assignment	Setting
1	Enter **call-appr**.
2	Enter **call-appr**.
9	Enter **lwc-store**.
10	Enter **lwc-cancel**.

Step 4 Use the Add Hunt <hunt group number> command (for example, Add Hunt 1) to assign a the voice messaging ports to a hunt group. Set the following options.

Table 39: Hunt Group Options

Option	Setting
Group Number	Enter the hunt group number.
Group Extension	Enter the pilot number for the hunt group.
Group Type	Enter **ucd**.
Group Name	Enter the display name for the hunt group.
Queue?	Enter **N**.

Step 5 Enter the group member assignments for the voice messaging ports that will answer calls and press **Enter**.

If you plan to set the voice messaging ports to either answer calls or to dial out (for example, to set MWIs), make sure that you include in the hunt group only the voice messaging ports that will be set to answer calls.

For smaller systems, include in the hunt group all voice messaging ports when the ports will be set to both answer calls and dial out (for example, to set MWIs).

Setting Up the Digital PIMG Units

Do the following procedures to set up the digital PIMG units that are connected to the Alcatel 4400 phone system.

These procedures require that the following tasks have already been completed:

- The phone system is connected to the PIMG units by using digital lines.
- The PIMG units are ready to be connected to the LAN or WAN.
- The PIMG units are connected to a power source.

Fields that are not mentioned in the following procedures must keep their default values. For the default values of all fields, see the manufacturer documentation for the PIMG units.

Downloading the PIMG Firmware Update Files for Digital PIMG Units

Step 1 On a Windows workstation with a high-speed Internet connection that will have access to the PIMG units, go to the Voice and Unified Communications Downloads page at http://tools.cisco.com/support/downloads/pub/Redirect.x?mdfid=278875240.

Note To access the software download page, you must be signed in to Cisco.com as a registered user.

This procedure describes the steps when using Internet Explorer as your web browser. If you are using a different web browser, the steps may differ.

Step 2 In the tree control on the Downloads page, expand **Unified Communications Applications** > **Voice Mail and Unified Messaging** > **Cisco Unity**, and select **Cisco Unity Telephony Integration**.

Step 3 On the Log In page, enter your username and password, then select **Log In**.

Step 4 On the Select a Release page, under Latest Releases, select the most recent release.

Step 5 In the right column, select the version of the firmware for digital PIMG units.

Step 6 On the Download Image page, select **Download**.

Step 7 On the Supporting Document(s) page, select **Agree**.

Step 8 In the File Download dialog box, select **Save**.

Step 9 In the Save As dialog box, browse to the Windows workstation that will have access the PIMG units, browse to a directory where you want to save the file, and select **Save**.

Step 10 In the Download Complete dialog box, select **Open**. The window for extracting the PIMG firmware update files appears.

Step 11 Select **Extract**.

Step 12 In the Extract dialog box, browse to the directory where you want the extracted files, and select **Extract**.

Step 13 Close the window for the extracting application.

Setting Up the Digital PIMG Units (Firmware Version 6.x)

Step 1 On the Windows workstation, add a temporary route to enable access to the PIMG units.

a) On the Windows Start menu, select **Run**.

b) Enter **cmd**, and press **Enter**. The Command Prompt window appears.

c) At the command prompt, enter **route add 10.12.13.74 <IP Address of Workstation>**, and press **Enter**.

For example, if the IP address of the workstation is 198.1.3.25, enter “route add 10.12.13.74<space>198.1.3.25” in the Command Prompt window.

d) Close the Command Prompt window.

Step 2 Connect a PIMG unit to the network.

Step 3 In the web browser, go to **http://10.12.13.74**.

Step 4 To sign in, enter the following case-sensitive settings.

Table 40: Sign-in Settings

Field	Setting
Username	Enter **admin**.
Password	Enter **IpodAdmin**.

Step 5 Select **OK**.

Step 6 On the System menu, select **Upgrade**.

Step 7 On the Upgrade page, select **Browse**.

Step 8 In the Choose File dialog box, browse to the directory on the Windows workstation that has the extracted PIMG firmware update files.

Step 9 Select **Ami<xx** > **.app** (where <xx> is multiple digits), and select **Open**.

Step 10 On the Upgrade page, select **Install File**.

Step 11 After the file is installed, a message prompting you to restart the PIMG unit appears. Select **Cancel**.

Do not restart the PIMG unit until you are instructed to do so later in this procedure, even if the file installation fails. Restarting the PIMG unit at this step may prevent the PIMG unit from functioning correctly.

Step 12 Repeat Step 6 through Step 11 for each of the following files:

- Ami_<xx>.fsh
- Run<xx>FskEcho.dsp
- iNim<xx>.ibt
- iNim<xx>.ilc
- iNim<xx>.iap

Step 13 On the Configuration menu, select **Import/Export**.

Step 14 On the Import/Export page, select **Browse**.

Step 15 In the Choose File dialog box, browse to the file DNI_Cfg_Lucent.ini.

Step 16 Select **DNI_Cfg_Lucent.ini**, and select **Open**.

Step 17 On the Import/Export page, select **Import File**.

Step 18 After the file is imported, a message prompting you to restart the PIMG unit appears. Select **OK**.

Step 19 In the web browser, go to **http://10.12.13.74**.

Step 20 To sign in, enter the following case-sensitive settings.

Table 41: Sign-in Settings

Field	Setting
Username	Enter **admin**.
Password	Enter **IpodAdmin**.

Step 21 Select **OK**.

Step 22 Do the following substeps to configure an RTP port range of 16384 to 32767.

You must set the RTP port range for the PIMG units if your system uses an RTP port range of 16384 to 32767. Otherwise, Unity Connection will not be able to answer calls, and callers will hear ringing or silence.

Note The default RTP port range for PIMG units is 49000 to 50000. Some Unity Connection configurations require a different RTP port range.

a) On the Configuration menu, select **Import/Export**.
b) On the Import/Export page, under Export Settings, select **Export All Settings**.
c) In the File Download dialog box, select **Save**.
d) In the Save As dialog box, browse to the Windows workstation that has access to the PIMG units, browse to a directory where you want to save the file, and select **Save**.
e) In the Download Complete dialog box, select **Open**. Notepad opens the file Config.ini that you saved.
f)
g)
h) Locate the line with the following parameter:

```
gwRTPStartPort
```

i) Change the value of the parameter to **16384** so that the line reads as follows:

```
gwRTPStartPort = 16384
```

j) Locate the line with the following parameter:

```
gwRTPEndPort
```

k) Change the value of the parameter to **32767** so that the line reads as follows:

```
gwRTPEndPort = 32767
```

l) Save the file, and exit Notepad.

m) On the Configuration menu of the PIMG unit, select **Import/Export**.
n) On the Import/Export page, under Browse for Import File, select **Browse**.
o) In the Choose File dialog box, browse to the file Config.ini that you saved.
p) Select **Config.ini**, and select **Open**.
q) On the Import/Export page, select **Import File**.
r) When prompted to restart the PIMG unit, select **OK**.
s) When the PIMG unit has restarted, in the web browser, go to **http://10.12.13.74**.
t) To sign in, enter the following case-sensitive settings.

Table 42: Sign-in Settings

Field	Setting
Username	Enter **admin**.
Password	Enter **IpodAdmin**.

u) Select **OK**.

Step 23 On the System menu, select **Password**.

Step 24 On the Change Password page, enter the following settings.

Table 43: Change Password Page Settings

Field	Setting
Old Password	Enter **IpodAdmin**. (This setting is case sensitive.)
New Password	Enter your new password. (This setting is case sensitive.)
Confirm Password	Enter your new password. (This setting is case sensitive.)

Step 25 Select **Change**.

Step 26 On the Configuration menu, select **Routing Table**.

Step 27 On the Routing Table page, under Router Configuration, select **VoIP Host Groups**.

Step 28 Under VoIP Host Groups, enter the following settings for the first VoIP Host Group.

Table 44: First VoIP Host Group Settings

Field	Settings
Name	Accept the default or enter another descriptive name of the VoIP host group.
Load-Balanced	*(Unity Connection without a cluster)* Select **False**. *(Unity Connection with a cluster configured)* Select **False**.

Field	Settings
Fault-Tolerant	*(Unity Connection without a cluster)* Select **False**. *(Unity Connection with a cluster configured)* Select **True**.

Step 29 For Unity Connection without a cluster, under Host List, enter the host name or IP address of the Unity Connection server and the server port in the format <host name or IP address>:5060.

For Unity Connection with a cluster configured, under Host List, enter the host name or IP address of the subscriber server (the second Cisco Unity Connection server that you installed) and the server port in the format <host name or IP address>:5060.

Step 30 For Unity Connection without a cluster, continue to Step 32. For Unity Connection with a cluster configured, select **Add Host**.

Step 31 In the second field, enter the host name or IP address of the publisher server (the first Unity Connection server that you installed) and the server port in the format <host name or IP address>:5060.

Do not add a third host under Host List or a second host group under VoIP Host Groups. Otherwise, the Unity Connection cluster may not function correctly.

Step 32 Select **Submit**.

Step 33 Under Router Configuration, select **TDM Trunk Groups**.

Step 34 Under TDM Trunk Groups, select **Add Trunk Group**.

Step 35 Under TDM Trunk Groups, enter the following settings for the first TDM trunk group.

Table 45: First TDM Trunk Group Settings (Inbound Calls)

Field	Settings
Name	Enter **Inbound_PBX_Calls** or another unique name. This TDM trunk group will handle all incoming calls from the phone system.
Selection Direction	Select **Ascending**.
Selection Mode	Select **Linear**.
Port/Channel Content	Enter the numbers of the PIMG ports that will handle inbound calls. For example, enter "*" for all PIMG ports, or enter "1-6" for the first six PIMG ports.

Step 36 Under TDM Trunk Groups, select **Add Trunk Group**.

Step 37 Enter the following settings for the second TDM trunk group.

Table 46: Second TDM Trunk Group Settings (MWIs)

Field	Settings
Name	Enter **MWIs** or another unique name. This TDM trunk group will handle outbound MWI calls (where applicable).
Selection Direction	Select **Ascending**.

Field	Settings
Selection Mode	Select **Cyclic**.
Port/Channel Content	Enter the numbers of the PIMG ports that will MWIs. For example, enter "*" for all PIMG ports, or enter "7,8" for the last two PIMG ports.

Step 38 Under TDM Trunk Groups, select **Add Trunk Group**.

Step 39 Enter the following settings for the third TDM trunk group.

Table 47: Third TDM Trunk Group Settings (Outbound Calls)

Field	Settings
Name	Enter **Outbound_PBX_Calls** or another unique name. This TDM trunk group handles all outbound calls from Unity Connection.
Selection Direction	Select **Descending**.
Selection Mode	Select **Linear**.
Port/Channel Content	Enter ***** for all channels in all ports. Enter the numbers of the PIMG ports that will handle outbound (dialout) calls. For example, enter "*" for all PIMG ports, or enter "7,8" for the last two PIMG ports.

Step 40 Select **Submit**.

Step 41 Under Router Configuration, select **Inbound VoIP Rules**.

Step 42 Under Inbound VoIP Rules, uncheck the **Enabled** check box for the default rule.

Step 43 Select **Add Rule**.

Step 44 Under Inbound VoIP Rules, enter the following settings for the first new inbound VoIP rule.

Table 48: First New Inbound VoIP Rule Settings (MWIs)

Field	Settings
Enable	Check this check box.
Rule Label	Enter **MWI_Calls** or another name. This inbound VoIP rule will handle all MWI calls from Unity Connection.
Request Type	Select **Message**.
Originating VoIP Host Address	Enter *****.

Step 45 Under Inbound VoIP Request Matching, enter the following settings.

The rule that you created in Step 44 must be selected. Otherwise, any changes you make will apply to another inbound VoIP rule.

Table 49: Inbound VoIP Request Matching Settings

Field	Settings
Calling Number	Enter *****.
Calling Name	Enter *****.
Called Number	Enter *****.
Called Name	Enter *****.
Redirect Number	Enter *****.
Redirect Name	Enter *****.

Step 46 Under Outbound Routes, enter the following settings.

The rule that you created in Step 44 must be selected. Otherwise, any changes you make will apply to another rule.

Table 50: Outbound Routes Settings

Field	Settings
Device Selection	
Outbound Destination	Select **TDM**.
Trunk Group	Select the name of the TDM trunk group that you created for MWIs in Step 37. For example, select "MWIs."
CPID Manipulation	
Calling Number	Enter **S**.
Calling Name	Enter **S**.
Called Number	Enter **D**.
Called Name	Enter **D**.
Redirect Number	Enter **R**.
Redirect Name	Enter **R**.
Select Primary/Alternate Route	
Primary	Select **Primary**.

Step 47 Under Inbound VoIP Rules, select **Add Rule**.

Step 48 Under Inbound VoIP Rules, enter the following settings for the second new inbound VoIP rule.

Table 51: Second New Inbound VoIP Rule Settings (Outbound Calls)

Field	Settings
Enable	Check this check box.
Rule Label	Enter **Outbound_UC_Calls** or another name. This inbound VoIP rule will handle all outbound calls from Unity Connection.
Request Type	Select **Call**.
Originating VoIP Host Address	Enter *****.

Step 49 Under Inbound VoIP Request Matching, enter the following settings.

The rule that you created in Step 48 must be selected. Otherwise, any changes you make will apply to another rule.

Table 52: Inbound VoIP Request Matching Settings

Field	Settings
Calling Number	Enter *****.
Calling Name	Enter *****.
Called Number	Enter *****.
Called Name	Enter *****.
Redirect Number	Enter *****.
Redirect Name	Enter *****.

Step 50 Under Outbound Routes, enter the following settings.

The rule that you created in Step 48 must be selected. Otherwise, any changes you make will apply to another rule.

Table 53: Outbound Routes Settings

Field	Settings
Device Selection	
Outbound Destination	Select **TDM**.
Trunk Group	Select the name of the TDM trunk group that you created for outbound calls in Step 39. For example, select “Outbound_PBX_Calls.”
CPID Manipulation	
Calling Number	Enter **S**.
Calling Name	Enter **S**.

Field	Settings
Called Number	Enter **D**.
Called Name	Enter **D**.
Redirect Number	Enter **R**.
Redirect Name	Enter **R**.
Select Primary/Alternate Route	
Primary	Select **Primary**.

Step 51 Select **Submit**.

Step 52 Under Router Configuration, select **Inbound TDM Rules**.

Step 53 Under Inbound TDM Rules, enter the following settings for the first inbound TDM rule.

Table 54: First Inbound TDM Rule Settings

Field	Settings
Enable	Check this check box.
Rule Label	Enter **Inbound_Rule_1** or another name. This inbound TDM rule will handle all incoming calls from the phone system.
Request Type	Select **Call**.
Trunk Group	Select the name of the TDM trunk group that you created for incoming calls from the phone system in Step 35. For example, select “Inbound_PBX_Calls.”

Step 54 Under Inbound TDM Request Matching, enter the following settings.

The rule that you created in Step 53 must be selected. Otherwise, any changes you make will apply to another rule.

Table 55: Inbound TDM Request Matching Settings

Field	Settings
Calling Number	Enter the applicable matching rule that will be used. For example, enter “*” for all.
Calling Name	Enter the applicable matching rule that will be used. For example, enter “*” for all.
Called Number	Enter the applicable matching rule that will be used. For example, enter “*” for all.
Called Name	Enter the applicable matching rule that will be used. For example, enter “*” for all.

Field	Settings
Redirect Number	Enter the applicable matching rule that will be used. For example, enter "*" for all.
Redirect Name	Enter the applicable matching rule that will be used. For example, enter "*" for all.

Step 55 Under Outbound Routes, enter the following settings.

The rule that you created in Step 53 must be selected. Otherwise, any changes you make will apply to another rule.

Table 56: Outbound Routes Settings

Field	Settings
Device Selection	
Outbound Destination	Select **VoIP**.
Host Group	Select the name of the VoIP host group that you created for Unity Connection in Step 28.
CPID Manipulation	
Calling Number	Enter S.
Calling Name	Enter S.
Called Number	Enter D.
Called Name	Enter D.
Redirect Number	Enter R.
Redirect Name	Enter R.
Select Primary/Alternate Route	
Primary	Select **Primary**.

Step 56 If you want to create more Inbound TDM rules, under Inbound TDM Rules, select **Add Rule**. Otherwise, continue to Step 58.

Step 57 Repeat Step 53 through Step 56 for all remaining inbound TDM rules that you want to create.

Step 58 Select **Submit**.

Step 59 On the Configuration menu, select **TDM** > **Digital**.

Step 60 On the Digital Telephony page, in the Telephony Switch Type field, select Lucent.

Step 61 Select **Submit**.

Step 62 On the Configuration menu, select **TDM** > **General**.

Step 63 On the TDM General Settings page, enter the following settings.

Table 57: TDM General Settings Page Settings

Field	Settings
PCM Coding	Select **uLaw**.
Minimum Call Party Delay (ms)	Enter **500**.
Maximum Call Party Delay (ms)	Enter **2000**.
Dial Digit on Time (ms)	Enter **100**.
Dial Inter-Digit Time (ms)	Enter **100**.
Dial Pause Time (ms)	Enter **2000**.
Turn MWI On FAC	Leave this field blank.
Turn MWI Off FAC	Leave this field blank.
Outbound Call Connect Timeout (ms)	Enter **10000**.
Wait for Ringback/Connect on Blind Transfer	Select **Yes**.
Hunt Group Extension	Enter the pilot number of the Cisco Unity Connection voice messaging ports.
Disconnect on Fax Cleardown Tone	Select **No**.

Step 64 Select **Submit**.

Step 65 On the Configuration menu, select **TDM** > **Port Enable**.

Step 66 On the TDM Port Enabling page, select **No** for the ports that you want to disable on the PIMG unit.

Step 67 Confirm that **Yes** is selected for all other ports on the PIMG unit.

Step 68 Select **Submit**.

Step 69 On the Configuration menu, select **VoIP** > **General**.

Step 70 On the VoIP General Settings page, enter the following settings.

Table 58: VoIP General Settings Page Settings

Field	Setting
User-Agent	
Host and Domain Name	Enter the host and domain name of the PIMG unit.
Transport Type	Select **UDP**.
Call as Domain Name	Select **No**.

Field	Setting
SIPS URI Scheme Enabled	Select **No**.
Invite Expiration (sec)	Enter **120**.
Server	
DNS Server Address	Enter the IP Address of the Domain Name Server that the PIMG unit will use.
DNS Translation of Phone Numbers	Select **No**.
Registration Server Address	Leave this field blank.
Registration Server Port	Enter **5060**.
Registration Expiration (sec)	Enter **3600**.
TCP/UDP	
UDP/TCP Transports Enabled	Select **Yes**.
TCP/UDP Server Port	Enter **5060**.
TCP Inactivity Timer (sec)	Enter **30**.
TLS	
TLS Transport Enabled	Select **No**.
TLS Server Port	Enter **5061**.
SSL TLS Protocol	Select **SSLv3 TLSv1**.
Mutual TLS Authentication Required	Select **Yes**.
TLS Inactivity Timer (sec)	Enter **30**.
Verify TLS Peer Certificate Date	Select **Yes**.
Verify TLS Peer Certificate Trust	Select **Yes**.
Proxy	

Field	Setting
Primary Proxy Server Address	Leave this field blank.
Primary Proxy Server Port	Not applicable. Leave the default setting.
Backup Proxy Server Address	Not applicable. Leave the default setting.
Backup Proxy Server Port	Not applicable. Leave the default setting.
Proxy Query Interval	Enter **10**.
Timing	
T1 Time (ms)	Enter **400**.
T2 Time (ms)	Enter **3000**.
T4 Time (ms)	Enter **5000**.
Monitoring	
Monitor Call Connections	Select **No**.
Call Monitor Interval (sec)	
Monitor VoIP Hosts	
VoIP Host Monitor Interval (sec)	

Step 71 Select **Submit**.

Step 72 On the Configuration menu, select **VoIP** > **Media**.

Step 73 On the VoIP Media Settings page, enter the following settings.

Table 59: VoIP Media Settings Page Settings

Field	Settings
Audio	
Audio Compression	Select the preferred codec for audio compression.
RTP Digit Relay Mode	Select **RFC2833**.
RTP Fax/Modem Tone Relay Mode	Select **RFC2833**.
RTP Source IP Address Validation	Select **Off**.

Field	Settings
RTP Source UDP Port Validation	Select **Off**.
Signaling Digit Relay Mode	Select **Off**.
Voice Activity Detection	Select **Off**.
RFC 3960 Early Media Support	Select **On Demand**.
Frame Size	Select the applicable setting: • G.711—**20** • G.729AB—**10** Failure to use the correct setting will result in recorded messages containing nothing but silence.
Frames Per Packet	Select the applicable setting: • G.711—**1** • G.729AB—**2** Failure to use the correct setting will result in recorded messages containing nothing but silence.
Fax	
Fax IP-Transport Mode	
SRTP	
SRTP Preference	Select **RTP Only**.
MKI on Transmit Stream	Select **Yes**.
Key Derivation Enable	Select **Yes**.
Key Derivation Rate	Enter **16**.
Anti-replay Window Size Hint	Enter **64**.
Cipher Mode	Select **AES_Counter_Mode**.
Authentication Type	Select **SHA1**.
Authentication Tag Length	Select **SHA1_80_bit**.

Step 74 Select **Submit**.

Step 75 On the Configuration menu, select **VoIP** > **QOS**.

Step 76 On the VoIP QOS Configuration page, enter the following settings.

Table 60: VoIP QOS Configurative Page Settings

Field	Settings
Call Control QOS Byte	Enter **104**.
RTP QOS Byte	Enter **184**.

Step 77 Select **Submit**.

Step 78 On the Configuration menu, select **IP**.

Step 79 On the IP Settings page, enter the following settings.

Table 61: IP Settings Page Settings

Field	Settings
Client IP Address	Enter the new IP address you want to use for the PIMG unit. (This is the IP address that you enter in Cisco Unity Connection Administration when you create the integration.)
Client Subnet Mask	Enter the new subnet mask, if the subnet mask is different from the default IP address.
Default Network Gateway Address	Enter the IP address of the default network gateway router that the PIMG units will use.
BOOTP Enabled	Select **No**.
SNTP Server IP Address	

Step 80 Select **Submit**.

Step 81 On the Configuration menu, select **Tone Detection**.

Step 82 On the Tone Detection page, under Call Progress Tone - Learn, in the Learn Tone Event field, select **Busy** and do the following substeps to verify that the tone is correct.

a) From a available phone, call a second phone.
b) Answer the second phone when it rings, and leave both handsets off so that both phones are busy.
c) From a third phone, dial one of the busy phones.
d) Confirm that you hear a busy tone.
e) Hang up the third phone but leave the handsets for the other two phones off.

Step 83 Under Call Progress Tone - Learn, in the Dial String field, enter the extension that you dialed in Step 82c. from the third phone.

Step 84 Select **Learn**.

Step 85 On the Tone Detection page, under Call Progress Tone - Learn, in the Learn field, select **Error** and do the following substeps to verify that the tone is correct.

a) From an available phone, dial an extension that does not exist.
b) Confirm that you hear the reorder or error tone.
c) Hang up the phone.

Step 86 Under Call Progress Tone - Learn, in the Dial String field, enter the extension that you dialed in Step 85a.

Step 87 Select **Learn**.

Step 88 On the Tone Detection page, under Call Progress Tone - Learn, in the Learn field, select **Ringback** and do the following substeps to verify that the tone is correct.

a) From an available phone, dial an extension that does exist
b) Confirm that you hear the ringback tone.
c) Hang up the phone.

Step 89 Under Call Progress Tone - Learn, in the Dial String field, enter the extension that you dialed in Step 88a.

Step 90 Select **Learn**.

Step 91 Select **Submit**.

Step 92 Hang up the phones that you used in Step 82.

Step 93 On the System menu, select **Restart**.

Step 94 On the Restart page, select **Restart Unit Now**.

Step 95 Repeat Step 2 through Step 94 on all remaining PIMG units.

Configuring Unity Connection for Integration with the Alcatel 4400 Digital Phone System

After ensuring that the Alcatel 4400 Digital phone system, the PIMG units, and Unity Connection are ready for the integration, do the following procedure to set up the integration and to enter the port settings.

Creating an Integration

Step 1 In Cisco Unity Connection Administration, expand **Telephony Integrations**, then select **Phone System**.

Step 2 On the Search Phone Systems page, under Display Name, select the name of the default phone system.

Step 3 On the Phone System Basics page, in the Phone System Name field, enter the descriptive name that you want for the phone system.

Step 4 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 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 5 Under Message Waiting Indicator Settings, select**Use Same Port for Enabling and Disabling MWIs**.

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 applicable settings and select **Save**.

Table 62: Settings for the New Port Group Page

Field	Setting
Phone System	Select the name of the phone system that you entered in Step 3.
Create From	Select **Port Group Template** and select **SIP to DMG/PIMG/TIMG** in the drop-down box.

Field	Setting
Display Name	Enter a descriptive name for the port group. You can accept the default name or enter the name that you want.
SIP Security Profile	Select **5060**.
SIP Transport Protocol	Select the SIP transport protocol that Unity Connection uses.
IP Address or Host Name	Enter the IP address of the PIMG unit that you are integrating with Unity Connection.
Port	Enter the SIP port of the PIMG unit that Unity Connection connects to. We recommend that you use the default setting. This name must match the setting in the TCP/UDP Server Port field on the Configuration > VoIP > General page of the PIMG unit. Otherwise, the integration cannot function correctly.

Step 9 On the Port Group Basics page, under Message Waiting Indicator Settings, uncheck the **Enable Message Waiting Indicators** check box and select **Save**.

Step 10 In the Related Links drop-down box, select **Add Ports** and select **Go**.

Step 11 On the New Port page, enter the following settings and select **Save**.

Table 63: Settings for the New Port Page

Field	Considerations
Enabled	Check this check box.
Number of Ports	Enter **8**. (If you want to use fewer than eight voice messaging ports, enter the number of voice messaging ports that you want to use on this PIMG unit.) **Note** For a Unity Connection cluster, the server must have the number of voice messaging ports that are set up on the phone system for the PIMG integration so that this server can handle all voice messaging traffic for the cluster if one of the servers stops functioning. For example, if the phone system is set up with 16 voice messaging ports, this server must have 16 voice messaging ports.
Phone System	Select the name of the phone system that you entered in Step 3.
Port Group	Select the name of the port group that you added in Step 8.

Step 12 On the Search Ports page, select the display name of the first voice messaging port that you created for this phone system integration.

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

Step 13 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 64: 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.
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	(Serial integrations only) Uncheck this check box. Otherwise, the integration may not functior correctly. (Digital and analog integrations only) 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 Unity Connection web applications. Assign Allow TRAP Connections to the least busy ports.
Outgoing Hunt Order	Enter the priority order in which Unity Connection uses 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, Unity Connection uses the port that has been idle the longest.

Step 14 Select **Save**.

Step 15 Select **Next**.

Step 16 Repeat Step 13 through Step 15 for all remaining voice messaging ports for the phone system.

Step 17 In Cisco Unity Connection Administration, expand **Telephony Integrations**, then select **Phone System**.

Step 18 On the Search Phone Systems page, under Display Name, select the name of the phone system that you entered in Step 3.

Step 19 Repeat Step 7 through Step 18 for each remaining PIMG unit integrated with Unity Connection.

Note Each PIMG unit is connected to one port group with the applicable voice messaging ports. For example, a system that uses five PIMG units requires five port groups, one port group for each PIMG unit.

Step 20 To create a port group for MWIs, do the following substeps.

Note All MWI requests are handled by the master PIMG unit and sent to the phone system over the RS-232 serial cable (without using voice messaging ports). So the following substeps create a separate port group without voice messaging ports and enable the port group for MWIs that are "not port specific" (they do not use ports).

a) In Cisco Unity Connection Administration expand **Telephony Integration** then select **Port Group** .
b) On the Search Port Groups page, select **Add New**.
c) On the New Port Group page, enter the applicable settings and select **Save**.

Table 65: Settings for the New Port Group Page (MWIs)

Field	Setting
Phone System	Select the name of the phone system that you entered in Step 3.
Create From	Select Port Group Template and select **SIP to DMG/PIMG/TIMG** SIP to in the drop-down box.
Display Name	Enter a **MWI Port Group** or another descriptive name for the port group.
SIP Security Profile	Select **5060**.
SIP Transport Protocol	Select the SIP transport protocol that Unity Connection uses.
IPv4 Address or Host Name	Enter the IP address of the master PIMG unit.
IPv6 Address or Host Name	Do not enter a value in this field. IPv6 is not supported for PIMG integrations.
IP Address or Host Name	Enter the IP address of the master PIMG unit.
Port	Enter the SIP port of the master PIMG unit. **Caution** This name must match the setting in the TCP/UDP Server Port field on the Configuration > VoIP > General page of the PIMG unit. Otherwise, the integration cannot function correctly.

d) On the Port Group Basics page, on the Edit menu, select **Advanced Settings**.
e) On the Edit Advanced Settings page, under SIP MWI Requests, select **Not Port Specific** then select **Save**.
f) On the Edit menu, select **Port Group Basics**.
g) Under Port Group, select **Reset**.
h) Under Message Waiting Indicator Settings, confirm that the **Enable Message Waiting Indicator** check box is checked and select **Save**.

Step 21 If another phone system integration exists, in Cisco Unity Connection Administration, expand **Telephony Integrations**, then select **Trunk**. Otherwise, skip to Step 25.

Step 22 On the Search Phone System Trunks page, on the Phone System Trunk menu, select **New Phone System Trunk**.

Step 23 On the New Phone System Trunk page, enter the following settings for the phone system trunk and select **Save**.

Table 66: Settings for the Phone System Trunk

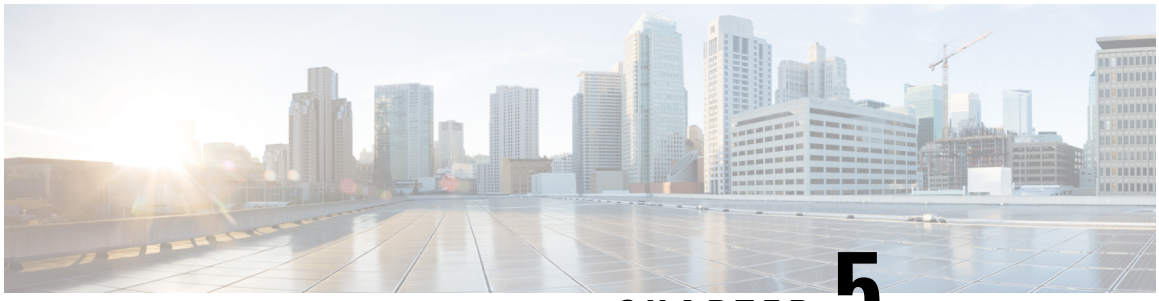
Field	Setting
From Phone System	Enter the display name of the phone system that you are creating a trunk for.
To Phone System	Enter the display name of the previously existing phone system that the trunk connects to.
Trunk Access Code	Enter the extra digits that Unity Connection must dial to transfer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

Step 24 Repeat Step 22 and Step 23 for all remaining phone system trunks that you want to create.

Step 25 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 26 In the Task Execution Results window, select **Close**.



CHAPTER 5

Setting Up an Avaya Definity G3 Digital PIMG Integration with Cisco Unity Connection

• Setting Up an Avaya Definity G3 Digital PIMG Integration, on page 59

Setting Up an Avaya Definity G3 Digital PIMG Integration

Task List for Avaya Definity G3 Integration

Before doing the following tasks to integrate Unity Connection with the Avaya Definity G3 phone system using PIMG units (media gateways), confirm that the Unity Connection server is ready for the integration after completing the server installation, following the tasks in the "Installing Cisco Unity Connection" chapter of the *Install, Upgrade, and Maintenance Guide for Cisco Unity Connection Release 15*, available at https://www.cisco.com/c/en/us/td/docs/voice_ip_comm/connection/15/install_upgrade/guide/b_15cuciumg.html .

1. Review the system and equipment requirements to confirm that all phone system and Unity Connection server requirements have been met. See the Requirements, on page 12 section.
2. Plan how the voice messaging ports are used by Cisco Unity Connection. See the "Planning the Usage of Voice Messaging Ports" chapter.
3. Program the Avaya Definity G3 phone system and extensions. See the Programming Avaya Definity G3 Phone System for Integration section.
4. Set up the PIMG units. See the Setting Up the Digital PIMG Units section.
5. Create the integration. See the Configuring Unity Connection for Integration with the Avaya Definity G3 Phone System section.
6. Test the integration. See the "Testing the Integration" chapter.
7. 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" chapter.

Requirements

This integration supports configurations of the following components:

Phone System

- Avaya Definity G3 phone system. The voice messaging ports that connect to the PIMG units must be compatible with the 7434ND, 8434, 8434D, or 8434DX digital phones.

  You must use 2-wire line cards for these voice messaging ports. Otherwise, the voice messaging ports cannot be compatible with the 7434ND, 8434, 8434D, or 8434DX digital phones.

- Software version 4 or later.
- One or more of the applicable PIMG units. For details, see the Introduction, on page 1 chapter.
- The voice messaging ports in the phone system connected by digital lines to the ports on the PIMG units.

To simplify troubleshooting, you should connect the voice messaging ports on the phone system to the ports on the PIMG units in a planned manner. For example, connect the first phone system voice messaging port to the first port on the first PIMG unit, connect the second phone system voice messaging port to the second port on the first PIMG unit, and so on. Alternatively, if you have multiple PIMG units, you can reduce answer times in the event of a PIMG unit failure by connecting the phone system ports to the PIMG units in a round-robin fashion. For example, connect the first phone system voice messaging port to the first port on the first PIMG unit, connect the second phone system voice messaging port to the first port on the second PIMG unit, and so on.

- The PIMG units connected to the same LAN or WAN that Unity Connection is connected to.
- If the PIMG units connect to a WAN, the requirements for the WAN network connections are:
  - For G.729a codec formatting, a minimum of 32.76 Kbps guaranteed bandwidth for each voice messaging port.
  - For G.711 codec formatting, a minimum of 91.56 Kbps guaranteed bandwidth for each voice messaging port.
  - No network devices that implement network address translation (NAT).
  - A maximum 200 ms one-way network latency.

Unity Connection Server

- Unity Connection installed following the tasks in the "Installing Cisco Unity Connection" chapter of the *Install, Upgrade, and Maintenance Guide for Cisco Unity Connection Release 15*, available at https://www.cisco.com/c/en/us/td/docs/voice_ip_comm/connection/15/install_upgrade/guide/b_15cuciumg.html.
- A license that enables the applicable number of voice messaging ports.

Programming Avaya Definity G3 Phone System for Integration

The following programming instructions are provided as an example only. The specific programming for your phone system may vary depending on its configuration.

Caution In programming the phone system, do not send calls to voice messaging ports in 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.

Programming the Avaya Definity G3 Phone System

Step 1 Create a coverage path which contains the PIMG unit hunt group number as the coverage point.

Step 2 Assign the coverage path that you created in Step 1 to the user stations that must forward to the voice messaging ports on the PIMG units when calls are not answered or when the user station is busy, based on one of the Unity Connection call transfer types shown in Table 67: Call Transfer Types.

Table 67: Call Transfer Types

Transfer Type	Usage
Release transfer (blind transfer)	Program the user station to forward calls to the pilot number when: • The extension is busy. • The call is not answered.
Supervised transfer	Program the user station to forward calls to the pilot number only when the call is not answered (on the phone system, the number of rings before forwarding must be more than the number of rings to supervise the call). Confirm that call forwarding is disabled when the extension is busy.

Step 3 Use the Add Station <extension number> command (for example, Add Station 2999) to assign an extension number for each voice messaging port, which is a digital line that connects to the PIMG unit. Set the voice messaging port options (Table 68: Voice Messaging Port Options for All Lines) and button assignments (Table 69: Button Assignments for All Lines), and press **Enter**.

Note You should distribute the voice messaging ports among multiple phone system line cards so that call processing can continue even if a line card becomes inactive.

Table 68: Voice Messaging Port Options for All Lines

Option	Setting
Extension	Enter the extension number of the digital line.

Option	Setting
Type	Enter **7434ND** You can also use the following settings. However, you must include the extension with each subscriber name when programming the phone system (for example, "3001 Jane Doe"). Otherwise, the integration cannot function correctly. • **8434** • **8434D** • **8434DX** **Note** If the setting that you want is not available, contact the phone system manufacturer.
LWC Reception	Enter **msa**.
LWC Activation?	Enter **y**.
Restrict Last Appearance?	Enter **y**.
Display Module	Enter **y**.

Table 69: Button Assignments for All Lines

Button Assignment	Setting
1	Enter **call-appr**.
2	Enter **call-appr**.
9	Enter **lwc-store**.
10	Enter **lwc-cancel**.

Step 4 Use the Add Hunt <hunt group number> command (for example, Add Hunt 1) to assign a the voice messaging ports to a hunt group. Set the following options.

Table 70: Hunt Group Options

Option	Setting
Group Number	Enter the hunt group number.
Group Extension	Enter the pilot number for the hunt group.
Group Type	Enter **ucd**.
Group Name	Enter the display name for the hunt group.
Queue?	Enter **N**.

Step 5 Enter the group member assignments for the voice messaging ports that answer calls and press **Enter**.

If you plan to set the voice messaging ports to either answer calls or to dial out (for example, to set MWIs), make sure that you include in the hunt group only the voice messaging ports are set to answer calls.

For smaller systems, include in the hunt group all voice messaging ports when the ports are set to both answer calls and dial out (for example, to set MWIs).

Setting Up the Digital PIMG Units

Do the following procedures to set up the digital PIMG units that are connected to the Avaya Definity G3 phone system.

These procedures require that the following tasks have already been completed:

- The phone system is connected to the PIMG units using digital lines.
- The PIMG units are ready to be connected to the LAN or WAN.
- The PIMG units are connected to a power source.

Fields that are not mentioned in the following procedures must keep their default values. For the default values of all fields, see the manufacturer documentation for the PIMG units.

Downloading the PIMG Firmware Update Files for Digital PIMG Units

http://software.cisco.com/download/navigator.html?mdfid=280082558&i=rm.

Note To access the software download page, you must be signed in to Cisco.com as a registered user.

This procedure describes the steps when using Internet Explorer as your web browser. If you are using a different web browser, the steps may differ.

1. In the tree control on the Downloads Home page, expand Unified Communications> **Unified Communications Applications** > **Messaging** > **Cisco Unity** and select **Cisco Unity Telephony Integration**.
2. On the Log In page, enter your username and password, then select **Log In**.
3. On the Select a Release page, under Latest Releases, select the most recent release.
4. In the right column, select the version of the firmware for digital PIMG units.
5. On the Download Image page, select **Download**.
6. On the Supporting Document(s) page, select **Agree**.
7. In the File Download dialog box, select **Save**.
8. In the Save As dialog box, browse to the Windows workstation that have access the PIMG units, browse to a directory where you want to save the file, and select **Save**.
9. In the Download Complete dialog box, select **Open**. The window for extracting the PIMG firmware update files appears and select **Extract**.
10. In the Extract dialog box, browse to the directory where you want the extracted files and select **Extract**.
11. Close the window for the extracting application.

On a Windows workstation that have access to the PIMG units, go to the following link:

Setting Up the Digital PIMG Units (Firmware Version 6.x)

Step 1 On the Windows workstation, add a temporary route to enable access to the PIMG units.

a) On the Windows Start menu, select **Run**.
b) Enter **cmd**, and press **Enter**. The Command Prompt window appears.
c) At the command prompt, enter **route add 10.12.13.74 <IP Address of Workstation>**, and press **Enter**.

For example, if the IP address of the workstation is 198.1.3.25, enter “route add 10.12.13.74<space>198.1.3.25” in the Command Prompt window.

d) Close the Command Prompt window.

Step 2 Connect a PIMG unit to the network.

Step 3 In the web browser, go to **http://10.12.13.74**.

Step 4 To sign in, enter the following case-sensitive settings.

Table 71: Sign-in Settings

Field	Setting
Username	Enter **admin**.
Password	Enter **IpodAdmin**.

Step 5 Select **OK**.

Step 6 On the System menu, select **Upgrade**.

Step 7 On the Upgrade page, select **Browse**.

Step 8 In the Choose File dialog box, browse to the directory on the Windows workstation that has the extracted PIMG firmware update files.

Step 9 Select **Ami<xx** > **.app** (where <xx> is multiple digits), and select **Open**.

Step 10 On the Upgrade page, select **Install File**.

Step 11 After the file is installed, a message prompting you to restart the PIMG unit appears. Select **Cancel**.

Do not restart the PIMG unit until you are instructed to do so later in this procedure, even if the file installation fails. Restarting the PIMG unit at this step may prevent the PIMG unit from functioning correctly.

Step 12 Repeat Step 6 through Step 11 for each of the following files:

- Ami_<xx>.fsh
- Run<xx>FskEcho.dsp
- iNim<xx>.ibt
- iNim<xx>.ilc
- iNim<xx>.iap

Step 13 On the Configuration menu, select **Import/Export**.

Step 14 On the Import/Export page, select **Browse**.

Step 15 In the Choose File dialog box, browse to the file DNI_Cfg_Lucent.ini.

Step 16 Select **DNI_Cfg_Lucent.ini**, and select **Open**.

Step 17 On the Import/Export page, select **Import File**.

Step 18 After the file is imported, a message prompting you to restart the PIMG unit appears. Select **OK**.

Step 19 In the web browser, go to **http://10.12.13.74**.

Step 20 To sign in, enter the following case-sensitive settings.

Table 72: Sign-in Settings

Field	Setting
Username	Enter **admin**.
Password	Enter **IpodAdmin**.

Step 21 Select **OK**.

Step 22 Do the following substeps to configure an RTP port range of 16384 to 32767.

You must set the RTP port range for the PIMG units if your system uses an RTP port range of 16384 to 32767. Otherwise, Unity Connection cannot answer calls and callers hear ringing or silence.

Note The default RTP port range for PIMG units is 49000 to 50000. Some Unity Connection configurations require a different RTP port range.

a) On the Configuration menu, select **Import/Export**.
b) On the Import/Export page, under Export Settings, select **Export All Settings**.
c) In the File Download dialog box, select **Save**.
d) In the Save As dialog box, browse to the Windows workstation that has access to the PIMG units, browse to a directory where you want to save the file, and select **Save**.
e) In the Download Complete dialog box, select **Open**. Notepad opens the file Config.ini that you saved.
f)
g)
h) Locate the line with the following parameter:

```
gwRTPStartPort
```

i) Change the value of the parameter to **16384** so that the line reads as follows:

```
gwRTPStartPort = 16384
```

j) Locate the line with the following parameter:

```
gwRTPEndPort
```

k) Change the value of the parameter to **32767** so that the line reads as follows:

```
gwRTPEndPort = 32767
```

l) Save the file, and exit Notepad.
m) On the Configuration menu of the PIMG unit, select **Import/Export**.
n) On the Import/Export page, under Browse for Import File, select **Browse**.
o) In the Choose File dialog box, browse to the file Config.ini that you saved.
p) Select **Config.ini**, and select **Open**.
q) On the Import/Export page, select **Import File**.
r) When prompted to restart the PIMG unit, select **OK**.
s) When the PIMG unit has restarted, in the web browser, go to **http://10.12.13.74**.
t) To sign in, enter the following case-sensitive settings.

Table 73: Sign-in Settings

Field	Setting
Username	Enter **admin**.
Password	Enter **IpodAdmin**.

u) Select **OK**.

Step 23 On the System menu, select **Password**.

Step 24 On the Change Password page, enter the following settings.

Table 74: Change Password Page Settings

Field	Setting
Old Password	Enter **IpodAdmin**. (This setting is case sensitive.)
New Password	Enter your new password. (This setting is case sensitive.)
Confirm Password	Enter your new password. (This setting is case sensitive.)

Step 25 Select **Change**.

Step 26 On the Configuration menu, select **Routing Table**.

Step 27 On the Routing Table page, under Router Configuration, select **VoIP Host Groups**.

Step 28 Under VoIP Host Groups, enter the following settings for the first VoIP Host Group.

Table 75: First VoIP Host Group Settings

Field	Settings
Name	Accept the default or enter another descriptive name of the VoIP host group.
Load-Balanced	*(Unity Connection without a cluster)* Select **False**. *(Unity Connection with a cluster configured)* Select **False**.
Fault-Tolerant	*(Unity Connection without a cluster)* Select **False**. *(Unity Connection with a cluster configured)* Select **True**.

Step 29 For Unity Connection without a cluster, under Host List, enter the host name or IP address of the Unity Connection server and the server port in the format <host name or IP address>:5060.

For Unity Connection with a cluster configured, under Host List, enter the host name or IP address of the subscriber server (the second Unity Connection server that you installed) and the server port in the format <host name or IP address>:5060.

Step 30 For Unity Connection without a cluster, continue to Step 32. For Unity Connection with a cluster configured, select **Add Host**.

Step 31 In the second field, enter the host name or IP address of the publisher server (the first Unity Connection server that you installed) and the server port in the format <host name or IP address>:5060.

Do not add a third host under Host List or a second host group under VoIP Host Groups. Otherwise, the Unity Connection cluster may not function correctly.

Step 32 Select **Submit**.

Step 33 Under Router Configuration, select **TDM Trunk Groups**.

Step 34 Under TDM Trunk Groups, select **Add Trunk Group**.

Step 35 Under TDM Trunk Groups, enter the following settings for the first TDM trunk group.

Table 76: First TDM Trunk Group Settings (Inbound Calls)

Field	Settings
Name	Enter **Inbound_PBX_Calls** or another unique name. This TDM trunk group handles all incoming calls from the phone system.
Selection Direction	Select **Ascending**.
Selection Mode	Select **Linear**.
Port/Channel Content	Enter the numbers of the PIMG ports that handle inbound calls. For example, enter "*" for all PIMG ports, or enter "1-6" for the first six PIMG ports.

Step 36 Under TDM Trunk Groups, select **Add Trunk Group**.

Step 37 Enter the following settings for the second TDM trunk group.

Table 77: Second TDM Trunk Group Settings (MWIs)

Field	Settings
Name	Enter **MWIs** or another unique name. This TDM trunk group handles outbound MWI calls (where applicable).
Selection Direction	Select **Ascending**.
Selection Mode	Select **Cyclic**.
Port/Channel Content	Enter the numbers of the PIMG ports that dial out MWIs. For example, enter "*" for all PIMG ports, or enter "7,8" for the last two PIMG ports.

Step 38 Under TDM Trunk Groups, select **Add Trunk Group**.

Step 39 Enter the following settings for the third TDM trunk group.

Table 78: Third TDM Trunk Group Settings (Outbound Calls)

Field	Settings
Name	Enter **Outbound_PBX_Calls** or another unique name. This TDM trunk group handles all outbound calls from Unity Connection.
Selection Direction	Select **Descending**.
Selection Mode	Select **Linear**.
Port/Channel Content	Enter ***** for all channels in all ports. Enter the numbers of the PIMG ports that handle outbound (dialout) calls. For example, enter "*" for all PIMG ports, or enter "7,8" for the last two PIMG ports.

Step 40 Select **Submit**.

Step 41 Under Router Configuration, select **Inbound VoIP Rules**.

Step 42 Under Inbound VoIP Rules, uncheck the **Enabled** check box for the default rule.

Step 43 Select **Add Rule**.

Step 44 Under Inbound VoIP Rules, enter the following settings for the first new inbound VoIP rule.

Table 79: First New Inbound VoIP Rule Settings (MWIs)

Field	Settings
Enable	Check this check box.
Rule Label	Enter **MWI_Calls** or another name. This inbound VoIP rule handles all MWI calls from Unity Connection.
Request Type	Select **Message**.
Originating VoIP Host Address	Enter ***.

Step 45 Under Inbound VoIP Request Matching, enter the following settings.

The rule that you created in Step 44 must be selected. Otherwise, any changes you make apply to another inbound VoIP rule.

Table 80: Inbound VoIP Request Matching Settings

Field	Settings
Calling Number	Enter ***.
Calling Name	Enter ***.
Called Number	Enter ***.
Called Name	Enter ***.
Redirect Number	Enter ***.
Redirect Name	Enter ***.

Step 46 Under Outbound Routes, enter the following settings.

The rule that you created in Step 44 must be selected. Otherwise, any changes you make apply to another rule.

Table 81: Outbound Routes Settings

Field	Settings
Device Selection	
Outbound Destination	Select **TDM**.
Trunk Group	Select the name of the TDM trunk group that you created for MWIs in Step 37. For example, select “MWIs.”

Field	Settings
CPID Manipulation	
Calling Number	Enter **S**.
Calling Name	Enter **S**.
Called Number	Enter **D**.
Called Name	Enter **D**.
Redirect Number	Enter **R**.
Redirect Name	Enter **R**.
Select Primary/Alternate Route	
Primary	Select **Primary**.

Step 47 Under Inbound VoIP Rules, select **Add Rule**.

Step 48 Under Inbound VoIP Rules, enter the following settings for the second new inbound VoIP rule.

Table 82: Second New Inbound VoIP Rule Settings (Outbound Calls)

Field	Settings
Enable	Check this check box.
Rule Label	Enter **Outbound_UC_Calls** or another name. This inbound VoIP rule handles all outbound calls from Unity Connection.
Request Type	Select **Call**.
Originating VoIP Host Address	Enter ***.

Step 49 Under Inbound VoIP Request Matching, enter the following settings.

The rule that you created in Step 48 must be selected. Otherwise, any changes you make apply to another rule.

Table 83: Inbound VoIP Request Matching Settings

Field	Settings
Calling Number	Enter ***.
Calling Name	Enter ***.
Called Number	Enter ***.
Called Name	Enter ***.
Redirect Number	Enter ***.

Field	Settings
Redirect Name	Enter *****.

Step 50 Under Outbound Routes, enter the following settings.

The rule that you created in Step 48 must be selected. Otherwise, any changes you make apply to another rule.

Table 84: Outbound Routes Settings

Field	Settings
Device Selection	
Outbound Destination	Select **TDM**.
Trunk Group	Select the name of the TDM trunk group that you created for outbound calls in Step 39. For example, select "Outbound_PBX_Calls."
CPID Manipulation	
Calling Number	Enter **S**.
Calling Name	Enter **S**.
Called Number	Enter **D**.
Called Name	Enter **D**.
Redirect Number	Enter **R**.
Redirect Name	Enter **R**.
Select Primary/Alternate Route	
Primary	Select **Primary**.

Step 51 Select **Submit**.

Step 52 Under Router Configuration, select **Inbound TDM Rules**.

Step 53 Under Inbound TDM Rules, enter the following settings for the first inbound TDM rule.

Table 85: First Inbound TDM Rule Settings

Field	Settings
Enable	Check this check box.
Rule Label	Enter **Inbound_Rule_1** or another name. This inbound TDM rule handles all incoming calls from the phone system.
Request Type	Select **Call**.
Trunk Group	Select the name of the TDM trunk group that you created for incoming calls from the phone system in Step 35. For example, select "Inbound_PBX_Calls."

Step 54 Under Inbound TDM Request Matching, enter the following settings.

The rule that you created in Step 53 must be selected. Otherwise, any changes you make apply to another rule.

Table 86: Inbound TDM Request Matching Settings

Field	Settings
Calling Number	Enter the applicable matching rule used. For example, enter "*" for all.
Calling Name	Enter the applicable matching rule used. For example, enter "*" for all.
Called Number	Enter the applicable matching rule used. For example, enter "*" for all.
Called Name	Enter the applicable matching rule used. For example, enter "*" for all.
Redirect Number	Enter the applicable matching rule used. For example, enter "*" for all.
Redirect Name	Enter the applicable matching rule used. For example, enter "*" for all.

Step 55 Under Outbound Routes, enter the following settings.

The rule that you created in Step 53 must be selected. Otherwise, any changes you make apply to another rule.

Table 87: Outbound Routes Settings

Field	Settings
Device Selection	
Outbound Destination	Select **VoIP**.
Host Group	Select the name of the VoIP host group that you created for Unity Connection in Step 28.
CPID Manipulation	
Calling Number	Enter S.
Calling Name	Enter S.
Called Number	Enter D.
Called Name	Enter D.
Redirect Number	Enter R.
Redirect Name	Enter R.
Select Primary/Alternate Route	
Primary	Select **Primary**.

Step 56 If you want to create more Inbound TDM rules, under Inbound TDM Rules, select **Add Rule**. Otherwise, continue to Step 58.

Step 57 Repeat Step 53 through Step 56 for all remaining inbound TDM rules that you want to create.

Step 58 Select **Submit**.

Step 59 On the Configuration menu, select **TDM** > **Digital**.

Step 60 On the Digital Telephony page, in the Telephony Switch Type field, select Lucent.

Step 61 Select **Submit**.

Step 62 On the Configuration menu, select **TDM** > **General**.

Step 63 On the TDM General Settings page, enter the following settings.

Table 88: TDM General Settings Page Settings

Field	Settings
PCM Coding	Select **uLaw**.
Minimum Call Party Delay (ms)	Enter **500**.
Maximum Call Party Delay (ms)	Enter **2000**.
Dial Digit on Time (ms)	Enter **100**.
Dial Inter-Digit Time (ms)	Enter **100**.
Dial Pause Time (ms)	Enter **2000**.
Turn MWI On FAC	Leave this field blank.
Turn MWI Off FAC	Leave this field blank.
Outbound Call Connect Timeout (ms)	Enter **10000**.
Wait for Ringback/Connect on Blind Transfer	Select **Yes**.
Hunt Group Extension	Enter the pilot number of the Unity Connection voice messaging ports.
Disconnect on Fax Cleardown Tone	Select **No**.

Step 64 Select **Submit**.

Step 65 On the Configuration menu, select **TDM** > **Port Enable**.

Step 66 On the TDM Port Enabling page, select **No** for the ports that you want to disable on the PIMG unit.

Step 67 Confirm that **Yes** is selected for all other ports on the PIMG unit.

Step 68 Select **Submit**.

Step 69 On the Configuration menu, select **VoIP** > **General**.

Step 70 On the VoIP General Settings page, enter the following settings.

Table 89: VoIP General Settings Page Settings

Field	Setting
User-Agent	
Host and Domain Name	Enter the host and domain name of the PIMG unit.
Transport Type	Select **UDP**.
Call as Domain Name	Select **No**.
SIPS URI Scheme Enabled	Select **No**.
Invite Expiration (sec)	Enter **120**.
Server	
DNS Server Address	Enter the IP Address of the Domain Name Server that the PIMG unit uses.
DNS Translation of Phone Numbers	Select **No**.
Registration Server Address	Leave this field blank.
Registration Server Port	Enter **5060**.
Registration Expiration (sec)	Enter **3600**.
TCP/UDP	
UDP/TCP Transports Enabled	Select **Yes**.
TCP/UDP Server Port	Enter **5060**.
TCP Inactivity Timer (sec)	Enter **30**.
TLS	
TLS Transport Enabled	Select **No**.
TLS Server Port	Enter **5061**.
SSL TLS Protocol	Select **SSLv3 TLSv1**.
Mutual TLS Authentication Required	Select **Yes**.
TLS Inactivity Timer (sec)	Enter **30**.

Field	Setting
Verify TLS Peer Certificate Date	Select **Yes**.
Verify TLS Peer Certificate Trust	Select **Yes**.
Proxy	
Primary Proxy Server Address	Leave this field blank.
Primary Proxy Server Port	Not applicable. Leave the default setting.
Backup Proxy Server Address	Not applicable. Leave the default setting.
Backup Proxy Server Port	Not applicable. Leave the default setting.
Proxy Query Interval	Enter **10**.
Timing	
T1 Time (ms)	Enter **400**.
T2 Time (ms)	Enter **3000**.
T4 Time (ms)	Enter **5000**.
Monitoring	
Monitor Call Connections	Select **No**.
Call Monitor Interval (sec)	
Monitor VoIP Hosts	
VoIP Host Monitor Interval (sec)	

Step 71 Select **Submit**.

Step 72 On the Configuration menu, select **VoIP** > **Media**.

Step 73 On the VoIP Media Settings page, enter the following settings.

Table 90: VoIP Media Settings Page Settings

Field	Settings
Audio	

Field	Settings
Audio Compression	Select the preferred codec for audio compression.
RTP Digit Relay Mode	Select **RFC2833**.
RTP Fax/Modem Tone Relay Mode	Select **RFC2833**.
RTP Source IP Address Validation	Select **Off**.
RTP Source UDP Port Validation	Select **Off**.
Signaling Digit Relay Mode	Select **Off**.
Voice Activity Detection	Select **Off**.
RFC 3960 Early Media Support	Select **On Demand**.
Frame Size	Select the applicable setting: • G.711—**20** • G.729AB—**10** Failure to use the correct setting results in recorded messages containing nothing but silence.
Frames Per Packet	Select the applicable setting: • G.711—**1** • G.729AB—**2** Failure to use the correct setting results in recorded messages containing nothing but silence.
Fax	
Fax IP-Transport Mode	
SRTP	
SRTP Preference	Select **RTP Only**.
MKI on Transmit Stream	Select **Yes**.
Key Derivation Enable	Select **Yes**.
Key Derivation Rate	Enter **16**.
Anti-replay Window Size Hint	Enter **64**.
Cipher Mode	Select **AES_Counter_Mode**.
Authentication Type	Select **SHA1**.
Authentication Tag Length	Select **SHA1_80_bit**.

Step 74 Select **Submit**.

Step 75 On the Configuration menu, select **VoIP** > **QOS**.

Step 76 On the VoIP QOS Configuration page, enter the following settings.

Table 91: VoIP QOS Configurative Page Settings

Field	Settings
Call Control QOS Byte	Enter **104**.
RTP QOS Byte	Enter **184**.

Step 77 Select **Submit**.

Step 78 On the Configuration menu, select **IP**.

Step 79 On the IP Settings page, enter the following settings.

Table 92: IP Settings Page Settings

Field	Settings
Client IP Address	Enter the new IP address you want to use for the PIMG unit. (This is the IP address that you enter in Cisco Unity Connection Administration when you create the integration.)
Client Subnet Mask	Enter the new subnet mask, if the subnet mask is different from the default IP address.
Default Network Gateway Address	Enter the IP address of the default network gateway router that the PIMG units use.
BOOTP Enabled	Select **No**.
SNTP Server IP Address	

Step 80 Select **Submit**.

Step 81 On the Configuration menu, select **Tone Detection**.

Step 82 On the Tone Detection page, under Call Progress Tone - Learn, in the Learn Tone Event field, select **Busy** and do the following substeps to verify that the tone is correct.

a) From a available phone, call a second phone.
b) Answer the second phone when it rings, and leave both handsets off so that both phones are busy.
c) From a third phone, dial one of the busy phones.
d) Confirm that you hear a busy tone.
e) Hang up the third phone but leave the handsets for the other two phones off.

Step 83 Under Call Progress Tone - Learn, in the Dial String field, enter the extension that you dialed in Step 82c. from the third phone.

Step 84 Select **Learn**.

Step 85 On the Tone Detection page, under Call Progress Tone - Learn, in the Learn field, select **Error** and do the following substeps to verify that the tone is correct.

a) From an available phone, dial an extension that does not exist.

b) Confirm that you hear the reorder or error tone.
c) Hang up the phone.

Step 86 Under Call Progress Tone - Learn, in the Dial String field, enter the extension that you dialed in Step 85a.

Step 87 Select **Learn**.

Step 88 On the Tone Detection page, under Call Progress Tone - Learn, in the Learn field, select **Ringback** and do the following substeps to verify that the tone is correct.

a) From an available phone, dial an extension that does exist
b) Confirm that you hear the ringback tone.
c) Hang up the phone.

Step 89 Under Call Progress Tone - Learn, in the Dial String field, enter the extension that you dialed in Step 88a.

Step 90 Select **Learn**.

Step 91 Select **Submit**.

Step 92 Hang up the phones that you used in Step 82.

Step 93 On the System menu, select **Restart**.

Step 94 On the Restart page, select **Restart Unit Now**.

Step 95 Repeat Step 2 through Step 94 on all remaining PIMG units.

Configuring Unity Connection for Integration with the Avaya Definity G3 Phone System

After ensuring that the Avaya Definity G3 phone system, the PIMG units, and Unity Connection are ready for the integration, do the following procedure to set up the integration and to enter the port settings.

Creating an Integration

Step 1 In Cisco Unity Connection Administration, expand **Telephony Integrations**, then select **Phone System**.

Step 2 On the Search Phone Systems page, under Display Name, select the name of the default phone system.

Step 3 On the Phone System Basics page, in the Phone System Name field, enter the descriptive name that you want for the phone system.

Step 4 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 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 5 Under Message Waiting Indicator Settings, select**Use Same Port for Enabling and Disabling MWIs**.

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 applicable settings and select **Save**.

Table 93: Settings for the New Port Group Page

Field	Setting
Phone System	Select the name of the phone system that you entered in Step 3.
Create From	Select **Port Group Template** and select **SIP to DMG/PIMG/TIMG** 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.
SIP Security Profile	Select **5060**.
SIP Transport Protocol	Select the SIP transport protocol that Unity Connection uses.
IP Address or Host Name	Enter the IP address of the PIMG unit that you are integrating with Unity Connection.
Port	Enter the SIP port of the PIMG unit that Unity Connection connects to. We recommend that you use the default setting. This name must match the setting in the TCP/UDP Server Port field on the Configuration > VoIP > General page of the PIMG unit. Otherwise, the integration cannot function correctly.

Step 9 On the Port Group Basics page, under Message Waiting Indicator Settings, uncheck the **Enable Message Waiting Indicators** check box and select **Save**.

Step 10 In the Related Links drop-down box, select **Add Ports** and select **Go**.

Step 11 On the New Port page, enter the following settings and select **Save**.

Table 94: Settings for the New Port Page

Field	Considerations
Enabled	Check this check box.
Number of Ports	Enter **8**. (If you want to use fewer than eight voice messaging ports, enter the number of voice messaging ports that you want to use on this PIMG unit.) **Note** For a Unity Connection cluster, the server must have the number of voice messaging ports that are set up on the phone system for the PIMG integration so that this server can handle all voice messaging traffic for the cluster if one of the servers stops functioning. For example, if the phone system is set up with 16 voice messaging ports, this server must have 16 voice messaging ports.
Phone System	Select the name of the phone system that you entered in Step 3.
Port Group	Select the name of the port group that you added in Step 8.

Step 12 On the Search Ports page, select the display name of the first voice messaging port that you created for this phone system integration.

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

Step 13 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 95: 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.
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	(Serial integrations only) Uncheck this check box. Otherwise, the integration may not functior correctly. (Digital and analog integrations only) 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 Unity Connection web applications. Assign Allow TRAP Connections to the least busy ports.
Outgoing Hunt Order	Enter the priority order in which Unity Connection uses 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, Unity Connection uses the port that has been idle the longest.

Step 14 Select **Save**.

Step 15 Select **Next**.

Step 16 Repeat Step 13 through Step 15 for all remaining voice messaging ports for the phone system.

Step 17 In Cisco Unity Connection Administration, expand **Telephony Integrations**, then select **Phone System**.

Step 18 On the Search Phone Systems page, under Display Name, select the name of the phone system that you entered in Step 3.

Step 19 Repeat Step 7 through Step 18 for each remaining PIMG unit integrated with Unity Connection.

Note Each PIMG unit is connected to one port group with the applicable voice messaging ports. For example, a system that uses five PIMG units requires five port groups, one port group for each PIMG unit.

Step 20 To create a port group for MWIs, do the following substeps.

Note All MWI requests are handled by the master PIMG unit and sent to the phone system over the RS-232 serial cable (without using voice messaging ports). So the following substeps create a separate port group without voice messaging ports and enable the port group for MWIs that are "not port specific" (they do not use ports).

a) In Cisco Unity Connection Administration expand **Telephony Integration** then select **Port Group** .
b) On the Search Port Groups page, select **Add New**.
c) On the New Port Group page, enter the applicable settings and select **Save**.

Table 96: Settings for the New Port Group Page (MWIs)

Field	Setting
Phone System	Select the name of the phone system that you entered in Step 3.
Create From	Select Port Group Template and select **SIP to DMG/PIMG/TIMG** SIP to in the drop-down box.
Display Name	Enter a **MWI Port Group** or another descriptive name for the port group.
SIP Security Profile	Select **5060**.
SIP Transport Protocol	Select the SIP transport protocol that Unity Connection uses.
IPv4 Address or Host Name	Enter the IP address of the master PIMG unit.
IPv6 Address or Host Name	Do not enter a value in this field. IPv6 is not supported for PIMG integrations.
IP Address or Host Name	Enter the IP address of the master PIMG unit.
Port	Enter the SIP port of the master PIMG unit. **Caution** This name must match the setting in the TCP/UDP Server Port field on the Configuration > VoIP > General page of the PIMG unit. Otherwise, the integration cannot function correctly.

d) On the Port Group Basics page, on the Edit menu, select **Advanced Settings**.
e) On the Edit Advanced Settings page, under SIP MWI Requests, select **Not Port Specific** then select **Save**.
f) On the Edit menu, select **Port Group Basics**.
g) Under Port Group, select **Reset**.
h) Under Message Waiting Indicator Settings, confirm that the **Enable Message Waiting Indicator** check box is checked and select **Save**.

Step 21 If another phone system integration exists, in Cisco Unity Connection Administration, expand **Telephony Integrations**, then select **Trunk**. Otherwise, skip to Step 25.

Step 22 On the Search Phone System Trunks page, on the Phone System Trunk menu, select **New Phone System Trunk**.

Step 23 On the New Phone System Trunk page, enter the following settings for the phone system trunk and select **Save**.

Table 97: Settings for the Phone System Trunk

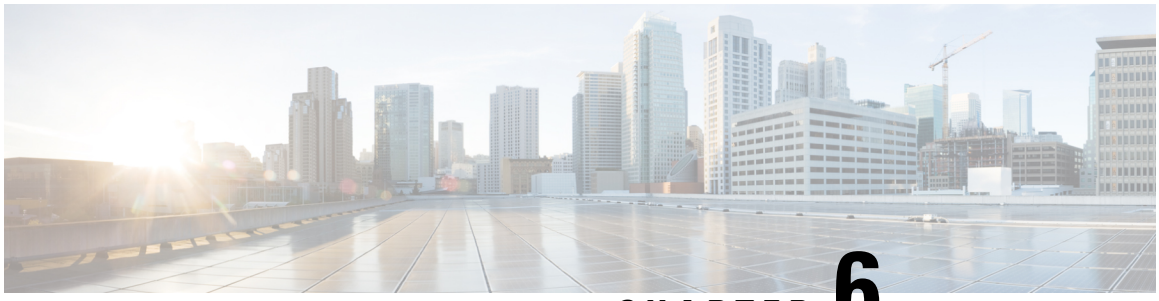
Field	Setting
From Phone System	Enter the display name of the phone system that you are creating a trunk for.
To Phone System	Enter the display name of the previously existing phone system that the trunk connects to.
Trunk Access Code	Enter the extra digits that Unity Connection must dial to transfer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

Step 24 Repeat Step 22 and Step 23 for all remaining phone system trunks that you want to create.

Step 25 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 26 In the Task Execution Results window, select **Close**.



CHAPTER 6

Setting Up an Avaya S8300/S8500/S8700 Digital PIMG Integration with Cisco Unity Connection

• Setting Up an Avaya S8300/S8500/S8700 Digital PIMG Integration, on page 83

Setting Up an Avaya S8300/S8500/S8700 Digital PIMG Integration

Task List for Avaya S8300/S8500/S8700 PIMG Integration

Before doing the following tasks to integrate Unity Connection with the Avaya S8300/S8500/S8700 phone system using PIMG units (media gateways), confirm that the Unity Connection server is ready for the integration after completing the server installation, following the tasks in the "Installing Cisco Unity Connection" chapter of the *Install, Upgrade, and Maintenance Guide for Cisco Unity Connection Release 15*, available at https://www.cisco.com/c/en/us/td/docs/voice_ip_comm/connection/15/install_upgrade/guide/b_15cuciumg.html.

1. Review the system and equipment requirements to confirm that all phone system and Unity Connection server requirements have been met. See the Requirements, on page 12 section.
2. Plan how the voice messaging ports are used by Cisco Unity Connection. See the Planning the Usage of Voice Messaging Ports, on page 7 chapter.
3. Program the Avaya S8300/S8500/S8700 phone system and extensions. See the Programming Avaya S8300/S8500/S8700 PIMG Phone System for Integration section.
4. Set up the PIMG units. See the Setting Up the Digital PIMG Units section.
5. Create the integration. See the Configuring Unity Connection for Integration with the Avaya S8300/S8500/S8700 Phone System section.
6. Test the integration. See the Testing the Integration, on page 381 chapter.
7. 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, on page 387 chapter.

Requirements

This integration supports configurations of the following components:

Phone System

- An Avaya S8300, Avaya S8500, or Avaya S8700 phone system. The voice messaging ports that connect to the PIMG units must be compatible with the 7434ND, 8434, 8434D, or 8434DX digital phones.

  You must use 2-wire line cards for these voice messaging ports. Otherwise, the voice messaging ports are not compatible with the 7434ND, 8434, 8434D, or 8434DX digital phones.
- Software version Communication Manager 2.0.
- One or more of the applicable PIMG units. For details, see the Introduction, on page 1 chapter.
- The voice messaging ports in the phone system connected by digital lines to the ports on the PIMG units.

To simplify troubleshooting, we recommend that you connect the voice messaging ports on the phone system to the ports on the PIMG units in a planned manner. For example, connect the first phone system voice messaging port to the first port on the first PIMG unit, connect the second phone system voice messaging port to the second port on the first PIMG unit, and so on. Alternatively, if you have multiple PIMG units, you can reduce answer times in the event of a PIMG unit failure by connecting the phone system ports to the PIMG units in a round-robin fashion. For example, connect the first phone system voice messaging port to the first port on the first PIMG unit, connect the second phone system voice messaging port to the first port on the second PIMG unit, and so on.

- The PIMG units connected to the same LAN or WAN that Unity Connection is connected to.
- If the PIMG units connect to a WAN, the requirements for the WAN network connections are:
  - For G.729a codec formatting, a minimum of 32.76 Kbps guaranteed bandwidth for each voice messaging port.
  - For G.711 codec formatting, a minimum of 91.56 Kbps guaranteed bandwidth for each voice messaging port.
  - No network devices that implement network address translation (NAT).
  - A maximum 200 ms one-way network latency.

Unity Connection Server

- Unity Connection installed following the tasks in the "Installing Cisco Unity Connection" chapter of the *Install, Upgrade, and Maintenance Guide for Cisco Unity Connection Release 15*, available at https://www.cisco.com/c/en/us/td/docs/voice_ip_comm/connection/15/install_upgrade/guide/b_15cuciumg.html.
- A license that enables the applicable number of voice messaging ports.

Programming Avaya S8300/S8500/S8700 PIMG Phone System for Integration

The following programming instructions are provided as an example only. The specific programming for your phone system may vary depending on its configuration.

Caution In programming the phone system, do not send calls to voice messaging ports in 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.

Programming the Avaya S8300/S8500/S8700Phone System

Step 1 Create a coverage path which contains the PIMG unit hunt group number as the coverage point.

Step 2 Assign the coverage path that you created in Step 1 to the user stations that must forward to the voice messaging ports on the PIMG units when calls are not answered or when the user station is busy, based on one of the Unity Connection call transfer types shown in Table 98: Call Transfer Types.

Table 98: Call Transfer Types

Transfer Type	Usage
Release transfer (blind transfer)	Program the user station to forward calls to the pilot number when: • The extension is busy. • The call is not answered.
Supervised transfer	Program the user station to forward calls to the pilot number only when the call is not answered (on the phone system, the number of rings before forwarding must be more than the number of rings to supervise the call). Confirm that call forwarding is disabled when the extension is busy.

Step 3 Use the Add Station <extension number> command (for example, Add Station 2999) to assign an extension number for each voice messaging port, which is a digital line that connects to the PIMG unit. Set the voice messaging port options (Table 99: Voice Messaging Port Options for All Lines) and button assignments (Table 100: Button Assignments for All Lines), and press **Enter**.

Note We recommend that you distribute the voice messaging ports among multiple phone system line cards so that call processing can continue even if a line card becomes inactive.

Table 99: Voice Messaging Port Options for All Lines

Option	Setting
Extension	Enter the extension number of the digital line.

Option	Setting
Type	Enter **7434ND** (recommended). You can also use the following settings. However, you must include the extension with each subscriber name when programming the phone system (for example, "3001 Jane Doe"). Otherwise, the integration cannot function correctly. • **8434** • **8434D** • **8434DX** **Note** If the setting that you want is not available, contact the phone system manufacturer.
LWC Activation?	Enter **y**.
Restrict Last Appearance?	Enter **y**.
Display Module	Enter **y**.

Table 100: Button Assignments for All Lines

Button Assignment	Setting
1	Enter **call-appr**.
2	Enter **call-appr**.
9	Enter **lwc-store**.
10	Enter **lwc-cancel**.

Step 4 Use the Add Hunt <hunt group number> command (for example, Add Hunt 1) to assign a the voice messaging ports to a hunt group. Set the following options.

Table 101: Hunt Group Options

Option	Setting
Group Number	Enter the hunt group number.
Group Extension	Enter the pilot number for the hunt group.
Group Type	Enter **ucd**.
Group Name	Enter the display name for the hunt group.
Queue?	Enter **N**.

Step 5 Enter the group member assignments for the voice messaging ports that answer calls and press **Enter**.

If you plan to set the voice messaging ports to either answer calls or to dial out (for example, to set MWIs), make sure that you include in the hunt group only the voice messaging ports that are set to answer calls.

For smaller systems, include in the hunt group all voice messaging ports when the ports are set to both answer calls and dial out (for example, to set MWIs).

Setting Up the Digital PIMG Units

Do the following procedures to set up the digital PIMG units that are connected to the Avaya S8300/S8500/S8700 phone system.

These procedures require that the following tasks have already been completed:

- The phone system is connected to the PIMG units using digital lines.
- The PIMG units are ready to be connected to the LAN or WAN.
- The PIMG units are connected to a power source.

Fields that are not mentioned in the following procedures must keep their default values. For the default values of all fields, see the manufacturer documentation for the PIMG units.

Downloading the PIMG Firmware Update Files for Digital PIMG Units

http://software.cisco.com/download/navigator.html?mdfid=280082558&i=rm.

Note To access the software download page, you must be signed in to Cisco.com as a registered user.

This procedure describes the steps when using Internet Explorer as your web browser. If you are using a different web browser, the steps may differ.

1. In the tree control on the Downloads Home page, expand Unified Communications> **Unified Communications Applications** > **Messaging** > **Cisco Unity** and select **Cisco Unity Telephony Integration**.
2. On the Log In page, enter your username and password, then select **Log In**.
3. On the Select a Release page, under Latest Releases, select the most recent release.
4. In the right column, select the version of the firmware for digital PIMG units.
5. On the Download Image page, select **Download**.
6. On the Supporting Document(s) page, select **Agree**.
7. In the File Download dialog box, select **Save**.
8. In the Save As dialog box, browse to the Windows workstation that access the PIMG units, browse to a directory where you want to save the file, and select **Save**.
9. In the Download Complete dialog box, select **Open**. The window for extracting the PIMG firmware update files appears and select **Extract**.
10. In the Extract dialog box, browse to the directory where you want the extracted files, and select **Extract**.
11. Close the window for the extracting application.

On a Windows workstation with a high-speed Internet connection that access to the PIMG units, go to the following link:

Setting Up the Digital PIMG Units (Firmware Version 6.x)

Step 1 On the Windows workstation, add a temporary route to enable access to the PIMG units.

a) On the Windows Start menu, select **Run**.
b) Enter **cmd**, and press **Enter**. The Command Prompt window appears.
c) At the command prompt, enter **route add 10.12.13.74 <IP Address of Workstation>**, and press **Enter**.

For example, if the IP address of the workstation is 198.1.3.25, enter “route add 10.12.13.74<space>198.1.3.25” in the Command Prompt window.

d) Close the Command Prompt window.

Step 2 Connect a PIMG unit to the network.

Step 3 In the web browser, go to **http://10.12.13.74**.

Step 4 To sign in, enter the following case-sensitive settings.

Table 102: Sign-in Settings

Field	Setting
Username	Enter **admin**.
Password	Enter **IpodAdmin**.

Step 5 Select **OK**.

Step 6 On the System menu, select **Upgrade**.

Step 7 On the Upgrade page, select **Browse**.

Step 8 In the Choose File dialog box, browse to the directory on the Windows workstation that has the extracted PIMG firmware update files.

Step 9 Select **Ami<xx** > **.app** (where <xx> is multiple digits), and select **Open**.

Step 10 On the Upgrade page, select **Install File**.

Step 11 After the file is installed, a message prompting you to restart the PIMG unit appears. Select **Cancel**.

Do not restart the PIMG unit until you are instructed to do so later in this procedure, even if the file installation fails. Restarting the PIMG unit at this step may prevent the PIMG unit from functioning correctly.

Step 12 Repeat Step 6 through Step 11 for each of the following files:

- Ami_<xx>.fsh
- Run<xx>FskEcho.dsp
- iNim<xx>.ibt
- iNim<xx>.ilc
- iNim<xx>.iap

Step 13 On the Configuration menu, select **Import/Export**.

Step 14 On the Import/Export page, select **Browse**.

Step 15 In the Choose File dialog box, browse to the file DNI_Cfg_Lucent.ini.

Step 16 Select **DNI_Cfg_Lucent.ini**, and select **Open**.

Step 17 On the Import/Export page, select **Import File**.

Step 18 After the file is imported, a message prompting you to restart the PIMG unit appears. Select **OK**.

Step 19 In the web browser, go to **http://10.12.13.74**.

Step 20 To sign in, enter the following case-sensitive settings.

Table 103: Sign-in Settings

Field	Setting
Username	Enter **admin**.
Password	Enter **IpodAdmin**.

Step 21 Select **OK**.

Step 22 Do the following substeps to configure an RTP port range of 16384 to 32767.

You must set the RTP port range for the PIMG units if your system uses an RTP port range of 16384 to 32767. Otherwise, Unity Connection cannot answer calls and callers hear ringing or silence.

Note The default RTP port range for PIMG units is 49000 to 50000. Some Unity Connection configurations require a different RTP port range.

a) On the Configuration menu, select **Import/Export**.
b) On the Import/Export page, under Export Settings, select **Export All Settings**.
c) In the File Download dialog box, select **Save**.
d) In the Save As dialog box, browse to the Windows workstation that has access to the PIMG units, browse to a directory where you want to save the file, and select **Save**.
e) In the Download Complete dialog box, select **Open**. Notepad opens the file Config.ini that you saved.
f)
g)
h) Locate the line with the following parameter:

```
gwRTPStartPort
```

i) Change the value of the parameter to **16384** so that the line reads as follows:

```
gwRTPStartPort = 16384
```

j) Locate the line with the following parameter:

```
gwRTPEndPort
```

k) Change the value of the parameter to **32767** so that the line reads as follows:

```
gwRTPEndPort = 32767
```

l) Save the file, and exit Notepad.
m) On the Configuration menu of the PIMG unit, select **Import/Export**.
n) On the Import/Export page, under Browse for Import File, select **Browse**.
o) In the Choose File dialog box, browse to the file Config.ini that you saved.
p) Select **Config.ini**, and select **Open**.
q) On the Import/Export page, select **Import File**.
r) When prompted to restart the PIMG unit, select **OK**.
s) When the PIMG unit has restarted, in the web browser, go to **http://10.12.13.74**.
t) To sign in, enter the following case-sensitive settings.

Table 104: Sign-in Settings

Field	Setting
Username	Enter **admin**.
Password	Enter **IpodAdmin**.

u) Select **OK**.

Step 23 On the System menu, select **Password**.

Step 24 On the Change Password page, enter the following settings.

Table 105: Change Password Page Settings

Field	Setting
Old Password	Enter **IpodAdmin**. (This setting is case sensitive.)
New Password	Enter your new password. (This setting is case sensitive.)
Confirm Password	Enter your new password. (This setting is case sensitive.)

Step 25 Select **Change**.

Step 26 On the Configuration menu, select **Routing Table**.

Step 27 On the Routing Table page, under Router Configuration, select **VoIP Host Groups**.

Step 28 Under VoIP Host Groups, enter the following settings for the first VoIP Host Group.

Table 106: First VoIP Host Group Settings

Field	Settings
Name	Accept the default or enter another descriptive name of the VoIP host group.
Load-Balanced	*(Unity Connection without a cluster)* Select **False**. *(Unity Connection with a cluster configured)* Select **False**.
Fault-Tolerant	*(Unity Connection without a cluster)* Select **False**. *(Unity Connection with a cluster configured)* Select **True**.

Step 29 For Unity Connection without a cluster, under Host List, enter the host name or IP address of the Unity Connection server and the server port in the format <host name or IP address>:5060.

For Unity Connection with a cluster configured, under Host List, enter the host name or IP address of the subscriber server (the second Unity Connection server that you installed) and the server port in the format <host name or IP address>:5060.

Step 30 For Unity Connection without a cluster, continue to Step 32. For Unity Connection with a cluster configured, select **Add Host**.

Step 31 In the second field, enter the host name or IP address of the publisher server (the first Unity Connection server that you installed) and the server port in the format <host name or IP address>:5060.

Do not add a third host under Host List or a second host group under VoIP Host Groups. Otherwise, the Unity Connection cluster may not function correctly.

Step 32 Select **Submit**.

Step 33 Under Router Configuration, select **TDM Trunk Groups**.

Step 34 Under TDM Trunk Groups, select **Add Trunk Group**.

Step 35 Under TDM Trunk Groups, enter the following settings for the first TDM trunk group.

Table 107: First TDM Trunk Group Settings (Inbound Calls)

Field	Settings
Name	Enter **Inbound_PBX_Calls** or another unique name. This TDM trunk group handles all incoming calls from the phone system.
Selection Direction	Select **Ascending**.
Selection Mode	Select **Linear**.
Port/Channel Content	Enter the numbers of the PIMG ports that handle inbound calls. For example, enter "*" for all PIMG ports, or enter "1-6" for the first six PIMG ports.

Step 36 Under TDM Trunk Groups, select **Add Trunk Group**.

Step 37 Enter the following settings for the second TDM trunk group.

Table 108: Second TDM Trunk Group Settings (MWIs)

Field	Settings
Name	Enter **MWIs** or another unique name. This TDM trunk group handle outbound MWI calls (where applicable).
Selection Direction	Select **Ascending**.
Selection Mode	Select **Cyclic**.
Port/Channel Content	Enter the numbers of the PIMG ports that dial out MWIs. For example, enter "*" for all PIMG ports, or enter "7,8" for the last two PIMG ports.

Step 38 Under TDM Trunk Groups, select **Add Trunk Group**.

Step 39 Enter the following settings for the third TDM trunk group.

Table 109: Third TDM Trunk Group Settings (Outbound Calls)

Field	Settings
Name	Enter **Outbound_PBX_Calls** or another unique name. This TDM trunk group handles all outbound calls from Unity Connection.
Selection Direction	Select **Descending**.
Selection Mode	Select **Linear**.
Port/Channel Content	Enter ***** for all channels in all ports. Enter the numbers of the PIMG ports that handle outbound (dialout) calls. For example, enter "*" for all PIMG ports, or enter "7,8" for the last two PIMG ports.

Step 40 Select **Submit**.

Step 41 Under Router Configuration, select **Inbound VoIP Rules**.

Step 42 Under Inbound VoIP Rules, uncheck the **Enabled** check box for the default rule.

Step 43 Select **Add Rule**.

Step 44 Under Inbound VoIP Rules, enter the following settings for the first new inbound VoIP rule.

Table 110: First New Inbound VoIP Rule Settings (MWIs)

Field	Settings
Enable	Check this check box.
Rule Label	Enter **MWI_Calls** or another name. This inbound VoIP rule handles all MWI calls from Unity Connection.
Request Type	Select **Message**.
Originating VoIP Host Address	Enter ***.

Step 45 Under Inbound VoIP Request Matching, enter the following settings.

The rule that you created in Step 44 must be selected. Otherwise, any changes you make apply to another inbound VoIP rule.

Table 111: Inbound VoIP Request Matching Settings

Field	Settings
Calling Number	Enter ***.
Calling Name	Enter ***.
Called Number	Enter ***.
Called Name	Enter ***.
Redirect Number	Enter ***.
Redirect Name	Enter ***.

Step 46 Under Outbound Routes, enter the following settings.

The rule that you created in Step 44 must be selected. Otherwise, any changes you make apply to another rule.

Table 112: Outbound Routes Settings

Field	Settings
Device Selection	
Outbound Destination	Select **TDM**.
Trunk Group	Select the name of the TDM trunk group that you created for MWIs in Step 37. For example, select "MWIs."

Field	Settings
CPID Manipulation	
Calling Number	Enter **S**.
Calling Name	Enter **S**.
Called Number	Enter **D**.
Called Name	Enter **D**.
Redirect Number	Enter **R**.
Redirect Name	Enter **R**.
Select Primary/Alternate Route	
Primary	Select **Primary**.

Step 47 Under Inbound VoIP Rules, select **Add Rule**.

Step 48 Under Inbound VoIP Rules, enter the following settings for the second new inbound VoIP rule.

Table 113: Second New Inbound VoIP Rule Settings (Outbound Calls)

Field	Settings
Enable	Check this check box.
Rule Label	Enter **Outbound_UC_Calls** or another name. This inbound VoIP rule handle all outbound calls from Unity Connection.
Request Type	Select **Call**.
Originating VoIP Host Address	Enter ***.

Step 49 Under Inbound VoIP Request Matching, enter the following settings.

The rule that you created in Step 48 must be selected. Otherwise, any changes you make apply to another rule.

Table 114: Inbound VoIP Request Matching Settings

Field	Settings
Calling Number	Enter ***.
Calling Name	Enter ***.
Called Number	Enter ***.
Called Name	Enter ***.
Redirect Number	Enter ***.

Field	Settings
Redirect Name	Enter *****.

Step 50 Under Outbound Routes, enter the following settings.

The rule that you created in Step 48 must be selected. Otherwise, any changes you make apply to another rule.

Table 115: Outbound Routes Settings

Field	Settings
Device Selection	
Outbound Destination	Select **TDM**.
Trunk Group	Select the name of the TDM trunk group that you created for outbound calls in Step 39. For example, select "Outbound_PBX_Calls."
CPID Manipulation	
Calling Number	Enter **S**.
Calling Name	Enter **S**.
Called Number	Enter **D**.
Called Name	Enter **D**.
Redirect Number	Enter **R**.
Redirect Name	Enter **R**.
Select Primary/Alternate Route	
Primary	Select **Primary**.

Step 51 Select **Submit**.

Step 52 Under Router Configuration, select **Inbound TDM Rules**.

Step 53 Under Inbound TDM Rules, enter the following settings for the first inbound TDM rule.

Table 116: First Inbound TDM Rule Settings

Field	Settings
Enable	Check this check box.
Rule Label	Enter **Inbound_Rule_1** or another name. This inbound TDM rule handles all incoming calls from the phone system.
Request Type	Select **Call**.
Trunk Group	Select the name of the TDM trunk group that you created for incoming calls from the phone system in Step 35. For example, select "Inbound_PBX_Calls."

Step 54 Under Inbound TDM Request Matching, enter the following settings.

The rule that you created in Step 53 must be selected. Otherwise, any changes you make apply to another rule.

Table 117: Inbound TDM Request Matching Settings

Field	Settings
Calling Number	Enter the applicable matching rule used. For example, enter "*" for all.
Calling Name	Enter the applicable matching rule used. For example, enter "*" for all.
Called Number	Enter the applicable matching rule used. For example, enter "*" for all.
Called Name	Enter the applicable matching rule used. For example, enter "*" for all.
Redirect Number	Enter the applicable matching rule used. For example, enter "*" for all.
Redirect Name	Enter the applicable matching rule used. For example, enter "*" for all.

Step 55 Under Outbound Routes, enter the following settings.

The rule that you created in Step 53 must be selected. Otherwise, any changes you make apply to another rule.

Table 118: Outbound Routes Settings

Field	Settings
Device Selection	
Outbound Destination	Select **VoIP**.
Host Group	Select the name of the VoIP host group that you created for Unity Connection in Step 28.
CPID Manipulation	
Calling Number	Enter S.
Calling Name	Enter S.
Called Number	Enter D.
Called Name	Enter D.
Redirect Number	Enter R.
Redirect Name	Enter R.
Select Primary/Alternate Route	
Primary	Select **Primary**.

Step 56 If you want to create more Inbound TDM rules, under Inbound TDM Rules, select **Add Rule**. Otherwise, continue to Step 58.

Step 57 Repeat Step 53 through Step 56 for all remaining inbound TDM rules that you want to create.

Step 58 Select **Submit**.

Step 59 On the Configuration menu, select **TDM** > **Digital**.

Step 60 On the Digital Telephony page, in the Telephony Switch Type field, select Lucent.

Step 61 Select **Submit**.

Step 62 On the Configuration menu, select **TDM** > **General**.

Step 63 On the TDM General Settings page, enter the following settings.

Table 119: TDM General Settings Page Settings

Field	Settings
PCM Coding	Select **uLaw**.
Minimum Call Party Delay (ms)	Enter **500**.
Maximum Call Party Delay (ms)	Enter **2000**.
Dial Digit on Time (ms)	Enter **100**.
Dial Inter-Digit Time (ms)	Enter **100**.
Dial Pause Time (ms)	Enter **2000**.
Turn MWI On FAC	Leave this field blank.
Turn MWI Off FAC	Leave this field blank.
Outbound Call Connect Timeout (ms)	Enter **10000**.
Wait for Ringback/Connect on Blind Transfer	Select **Yes**.
Hunt Group Extension	Enter the pilot number of the Unity Connection voice messaging ports.
Disconnect on Fax Cleardown Tone	Select **No**.

Step 64 Select **Submit**.

Step 65 On the Configuration menu, select **TDM** > **Port Enable**.

Step 66 On the TDM Port Enabling page, select **No** for the ports that you want to disable on the PIMG unit.

Step 67 Confirm that **Yes** is selected for all other ports on the PIMG unit.

Step 68 Select **Submit**.

Step 69 On the Configuration menu, select **VoIP** > **General**.

Step 70 On the VoIP General Settings page, enter the following settings.

Table 120: VoIP General Settings Page Settings

Field	Setting
User-Agent	
Host and Domain Name	Enter the host and domain name of the PIMG unit.
Transport Type	Select **UDP**.
Call as Domain Name	Select **No**.
SIPS URI Scheme Enabled	Select **No**.
Invite Expiration (sec)	Enter **120**.
Server	
DNS Server Address	Enter the IP Address of the Domain Name Server that the PIMG unit uses.
DNS Translation of Phone Numbers	Select **No**.
Registration Server Address	Leave this field blank.
Registration Server Port	Enter **5060**.
Registration Expiration (sec)	Enter **3600**.
TCP/UDP	
UDP/TCP Transports Enabled	Select **Yes**.
TCP/UDP Server Port	Enter **5060**.
TCP Inactivity Timer (sec)	Enter **30**.
TLS	
TLS Transport Enabled	Select **No**.
TLS Server Port	Enter **5061**.
SSL TLS Protocol	Select **SSLv3 TLSv1**.
Mutual TLS Authentication Required	Select **Yes**.
TLS Inactivity Timer (sec)	Enter **30**.

Field	Setting
Verify TLS Peer Certificate Date	Select **Yes**.
Verify TLS Peer Certificate Trust	Select **Yes**.
Proxy	
Primary Proxy Server Address	Leave this field blank.
Primary Proxy Server Port	Not applicable. Leave the default setting.
Backup Proxy Server Address	Not applicable. Leave the default setting.
Backup Proxy Server Port	Not applicable. Leave the default setting.
Proxy Query Interval	Enter **10**.
Timing	
T1 Time (ms)	Enter **400**.
T2 Time (ms)	Enter **3000**.
T4 Time (ms)	Enter **5000**.
Monitoring	
Monitor Call Connections	Select **No**.
Call Monitor Interval (sec)	
Monitor VoIP Hosts	
VoIP Host Monitor Interval (sec)	

Step 71 Select **Submit**.

Step 72 On the Configuration menu, select **VoIP** > **Media**.

Step 73 On the VoIP Media Settings page, enter the following settings.

Table 121: VoIP Media Settings Page Settings

Field	Settings
Audio	

Field	Settings
Audio Compression	Select the preferred codec for audio compression.
RTP Digit Relay Mode	Select **RFC2833**.
RTP Fax/Modem Tone Relay Mode	Select **RFC2833**.
RTP Source IP Address Validation	Select **Off**.
RTP Source UDP Port Validation	Select **Off**.
Signaling Digit Relay Mode	Select **Off**.
Voice Activity Detection	Select **Off**.
RFC 3960 Early Media Support	Select **On Demand**.
Frame Size	Select the applicable setting: • G.711—**20** • G.729AB—**10** Failure to use the correct setting results in recorded messages containing nothing but silence.
Frames Per Packet	Select the applicable setting: • G.711—**1** • G.729AB—**2** Failure to use the correct setting results in recorded messages containing nothing but silence.
Fax	
Fax IP-Transport Mode	
SRTP	
SRTP Preference	Select **RTP Only**.
MKI on Transmit Stream	Select **Yes**.
Key Derivation Enable	Select **Yes**.
Key Derivation Rate	Enter **16**.
Anti-replay Window Size Hint	Enter **64**.
Cipher Mode	Select **AES_Counter_Mode**.
Authentication Type	Select **SHA1**.
Authentication Tag Length	Select **SHA1_80_bit**.

Step 74 Select **Submit**.

Step 75 On the Configuration menu, select **VoIP** > **QOS**.

Step 76 On the VoIP QOS Configuration page, enter the following settings.

Table 122: VoIP QOS Configurative Page Settings

Field	Settings
Call Control QOS Byte	Enter **104**.
RTP QOS Byte	Enter **184**.

Step 77 Select **Submit**.

Step 78 On the Configuration menu, select **IP**.

Step 79 On the IP Settings page, enter the following settings.

Table 123: IP Settings Page Settings

Field	Settings
Client IP Address	Enter the new IP address you want to use for the PIMG unit. (This is the IP address that you enter in Cisco Unity Connection Administration when you create the integration.)
Client Subnet Mask	Enter the new subnet mask, if the subnet mask is different from the default IP address.
Default Network Gateway Address	Enter the IP address of the default network gateway router that the PIMG units use.
BOOTP Enabled	Select **No**.
SNTP Server IP Address	

Step 80 Select **Submit**.

Step 81 On the Configuration menu, select **Tone Detection**.

Step 82 On the Tone Detection page, under Call Progress Tone - Learn, in the Learn Tone Event field, select **Busy** and do the following substeps to verify that the tone is correct.

a) From a available phone, call a second phone.
b) Answer the second phone when it rings, and leave both handsets off so that both phones are busy.
c) From a third phone, dial one of the busy phones.
d) Confirm that you hear a busy tone.
e) Hang up the third phone but leave the handsets for the other two phones off.

Step 83 Under Call Progress Tone - Learn, in the Dial String field, enter the extension that you dialed in Step 82c. from the third phone.

Step 84 Select **Learn**.

Step 85 On the Tone Detection page, under Call Progress Tone - Learn, in the Learn field, select **Error** and do the following substeps to verify that the tone is correct.

a) From an available phone, dial an extension that does not exist.

b) Confirm that you hear the reorder or error tone.
c) Hang up the phone.

Step 86 Under Call Progress Tone - Learn, in the Dial String field, enter the extension that you dialed in Step 85a.

Step 87 Select **Learn**.

Step 88 On the Tone Detection page, under Call Progress Tone - Learn, in the Learn field, select **Ringback** and do the following substeps to verify that the tone is correct.

a) From an available phone, dial an extension that does exist
b) Confirm that you hear the ringback tone.
c) Hang up the phone.

Step 89 Under Call Progress Tone - Learn, in the Dial String field, enter the extension that you dialed in Step 88a.

Step 90 Select **Learn**.

Step 91 Select **Submit**.

Step 92 Hang up the phones that you used in Step 82.

Step 93 On the System menu, select **Restart**.

Step 94 On the Restart page, select **Restart Unit Now**.

Step 95 Repeat Step 2 through Step 94 on all remaining PIMG units.

Configuring Unity Connection for Integration with the Avaya S8300/S8500/S8700 Phone System

After ensuring that the Avaya S8300/S8500/S8700 phone system, the PIMG units, and Unity Connection are ready for the integration, do the following procedure to set up the integration and to enter the port settings.

Creating an Integration

Step 1 In Cisco Unity Connection Administration, expand **Telephony Integrations**, then select **Phone System**.

Step 2 On the Search Phone Systems page, under Display Name, select the name of the default phone system.

Step 3 On the Phone System Basics page, in the Phone System Name field, enter the descriptive name that you want for the phone system.

Step 4 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 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 5 Under Message Waiting Indicator Settings, select**Use Same Port for Enabling and Disabling MWIs**.

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 applicable settings and select **Save**.

Table 124: Settings for the New Port Group Page

Field	Setting
Phone System	Select the name of the phone system that you entered in Step 3.
Create From	Select **Port Group Template** and select **SIP to DMG/PIMG/TIMG** 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.
SIP Security Profile	Select **5060**.
SIP Transport Protocol	Select the SIP transport protocol that Unity Connection uses.
IP Address or Host Name	Enter the IP address of the PIMG unit that you are integrating with Unity Connection.
Port	Enter the SIP port of the PIMG unit that Unity Connection connects to. We recommend that you use the default setting. This name must match the setting in the TCP/UDP Server Port field on the Configuration > VoIP > General page of the PIMG unit. Otherwise, the integration cannot function correctly.

Step 9 On the Port Group Basics page, under Message Waiting Indicator Settings, uncheck the **Enable Message Waiting Indicators** check box and select **Save**.

Step 10 In the Related Links drop-down box, select **Add Ports** and select **Go**.

Step 11 On the New Port page, enter the following settings and select **Save**.

Table 125: Settings for the New Port Page

Field	Considerations
Enabled	Check this check box.
Number of Ports	Enter **8**. (If you want to use fewer than eight voice messaging ports, enter the number of voice messaging ports that you want to use on this PIMG unit.) **Note** For a Unity Connection cluster, the server must have the number of voice messaging ports that are set up on the phone system for the PIMG integration so that this server can handle all voice messaging traffic for the cluster if one of the servers stops functioning. For example, if the phone system is set up with 16 voice messaging ports, this server must have 16 voice messaging ports.
Phone System	Select the name of the phone system that you entered in Step 3.
Port Group	Select the name of the port group that you added in Step 8.

Step 12 On the Search Ports page, select the display name of the first voice messaging port that you created for this phone system integration.

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

Step 13 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 126: 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.
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	(Serial integrations only) Uncheck this check box. Otherwise, the integration may not functior correctly. (Digital and analog integrations only) 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 Unity Connection web applications. Assign Allow TRAP Connections to the least busy ports.
Outgoing Hunt Order	Enter the priority order in which Unity Connection uses 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, Unity Connection uses the port that has been idle the longest.

Step 14 Select **Save**.

Step 15 Select **Next**.

Step 16 Repeat Step 13 through Step 15 for all remaining voice messaging ports for the phone system.

Step 17 In Cisco Unity Connection Administration, expand **Telephony Integrations**, then select **Phone System**.

Step 18 On the Search Phone Systems page, under Display Name, select the name of the phone system that you entered in Step 3.

Step 19 Repeat Step 7 through Step 18 for each remaining PIMG unit integrated with Unity Connection.

Note Each PIMG unit is connected to one port group with the applicable voice messaging ports. For example, a system that uses five PIMG units requires five port groups, one port group for each PIMG unit.

Step 20 To create a port group for MWIs, do the following substeps.

Note All MWI requests are handled by the master PIMG unit and sent to the phone system over the RS-232 serial cable (without using voice messaging ports). So the following substeps create a separate port group without voice messaging ports and enable the port group for MWIs that are "not port specific" (they do not use ports).

a) In Cisco Unity Connection Administration expand **Telephony Integration** then select **Port Group** .
b) On the Search Port Groups page, select **Add New**.
c) On the New Port Group page, enter the applicable settings and select **Save**.

Table 127: Settings for the New Port Group Page (MWIs)

Field	Setting
Phone System	Select the name of the phone system that you entered in Step 3.
Create From	Select Port Group Template and select **SIP to DMG/PIMG/TIMG** SIP to in the drop-down box.
Display Name	Enter a **MWI Port Group** or another descriptive name for the port group.
SIP Security Profile	Select **5060**.
SIP Transport Protocol	Select the SIP transport protocol that Unity Connection uses.
IPv4 Address or Host Name	Enter the IP address of the master PIMG unit.
IPv6 Address or Host Name	Do not enter a value in this field. IPv6 is not supported for PIMG integrations.
IP Address or Host Name	Enter the IP address of the master PIMG unit.
Port	Enter the SIP port of the master PIMG unit. **Caution** This name must match the setting in the TCP/UDP Server Port field on the Configuration > VoIP > General page of the PIMG unit. Otherwise, the integration cannot function correctly.

d) On the Port Group Basics page, on the Edit menu, select **Advanced Settings**.
e) On the Edit Advanced Settings page, under SIP MWI Requests, select **Not Port Specific** then select **Save**.
f) On the Edit menu, select **Port Group Basics**.
g) Under Port Group, select **Reset**.
h) Under Message Waiting Indicator Settings, confirm that the **Enable Message Waiting Indicator** check box is checked and select **Save**.

Step 21 If another phone system integration exists, in Cisco Unity Connection Administration, expand **Telephony Integrations**, then select **Trunk**. Otherwise, skip to Step 25.

Step 22 On the Search Phone System Trunks page, on the Phone System Trunk menu, select **New Phone System Trunk**.

Step 23 On the New Phone System Trunk page, enter the following settings for the phone system trunk and select **Save**.

Table 128: Settings for the Phone System Trunk

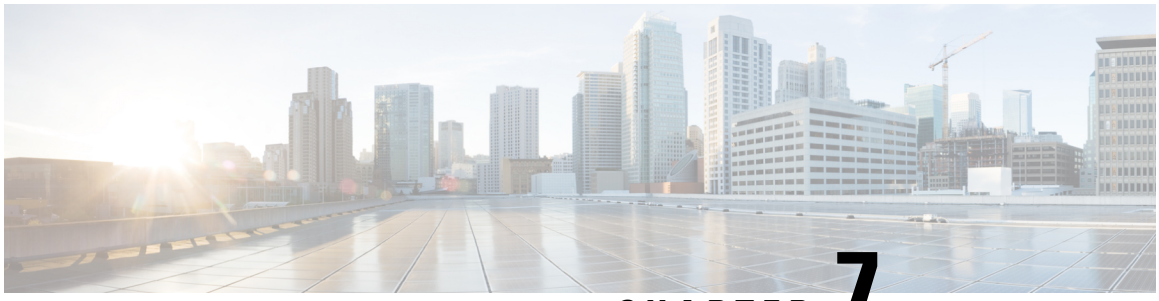
Field	Setting
From Phone System	Enter the display name of the phone system that you are creating a trunk for.
To Phone System	Enter the display name of the previously existing phone system that the trunk connects to.
Trunk Access Code	Enter the extra digits that Unity Connection must dial to transfer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

Step 24 Repeat Step 22 and Step 23 for all remaining phone system trunks that you want to create.

Step 25 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 26 In the Task Execution Results window, select **Close**.



CHAPTER 7

Setting Up a Mitel SX-200 Digital PIMG Integration with Cisco Unity Connection

• Setting Up a Mitel SX-200 Digital PIMG Integration, on page 107

Setting Up a Mitel SX-200 Digital PIMG Integration

Task List for Mitel SX-200 PIMG Phone System Integration

Before doing the following tasks to integrate Unity Connection with the Mitel SX-200 phone system using PIMG units (media gateways), confirm that the Unity Connection server is ready for the integration after completing the server installation, following the tasks in the "Installing Cisco Unity Connection" chapter of the *Install, Upgrade, and Maintenance Guide for Cisco Unity Connection Release 15*, available at https://www.cisco.com/c/en/us/td/docs/voice_ip_comm/connection/15/install_upgrade/guide/b_15cuciumg.html.

1. Review the system and equipment requirements to confirm that all phone system and Unity Connection server requirements have been met. See the Requirements, on page 12 section.
2. Plan how the voice messaging ports are used by Unity Connection. See the Planning the Usage of Voice Messaging Ports, on page 7 chapter.
3. Program the Mitel SX-200 phone system and extensions. See the Programming Mitel SX-200 PIMG Phone System for Integration section.
4. Set up the PIMG units. See the Setting Up the Digital Mitel PIMG Units section.
5. Create the integration. See the Configuring Unity Connection for Integration with Mitel SX-200 Phone System section.
6. Test the integration. See the Testing the Integration, on page 381 chapter.
7. 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, on page 387 chapter.

Requirements

This integration supports configurations of the following components:

Phone System

- Mitel SX-200.
- Software level Lightware 19 or later.
- A DNI Line MC330 line card to support the two-wire station interface.
- One or more of the applicable PIMG units. For details, see the "Introduction" chapter.
- The voice messaging ports in the phone system connected by digital lines to the ports on the PIMG units.

To simplify troubleshooting, we recommend that you connect the voice messaging ports on the phone system to the ports on the PIMG units in a planned manner. For example, connect the first phone system voice messaging port to the first port on the first PIMG unit, connect the second phone system voice messaging port to the second port on the first PIMG unit, and so on. Alternatively, if you have multiple PIMG units, you can reduce answer times in the event of a PIMG unit failure by connecting the phone system ports to the PIMG units in a round-robin fashion. For example, connect the first phone system voice messaging port to the first port on the first PIMG unit, connect the second phone system voice messaging port to the first port on the second PIMG unit, and so on.

- The PIMG units connected to the same LAN or WAN that Unity Connection is connected to.
- If the PIMG units connect to a WAN, the requirements for the WAN network connections are:
  - For G.729a codec formatting, a minimum of 32.76 Kbps guaranteed bandwidth for each voice messaging port.
  - For G.711 codec formatting, a minimum of 91.56 Kbps guaranteed bandwidth for each voice messaging port.
  - No network devices that implement network address translation (NAT).
  - A maximum 200 ms one-way network latency.

Unity Connection Server

- Unity Connection installed following the tasks in the "Installing Cisco Unity Connection" chapter of the *Install, Upgrade, and Maintenance Guide for Cisco Unity Connection Release 15*, available at https://www.cisco.com/c/en/us/td/docs/voice_ip_comm/connection/15/install_upgrade/guide/b_15cuciumg.html.
- A license that enables the applicable number of voice messaging ports.

Programming Mitel SX-200 PIMG Phone System for Integration

The following programming instructions are provided as an example only. The specific programming for your phone system may vary depending on its configuration.

Caution In programming the phone system, do not send calls to voice messaging ports in 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.

Programming the Mitel SX-200 Phone System

Step 1 On the phone system console, go to the Main menu and select **Select Forms**.

Step 2 On the Select Forms screen, select **Class of Service Options Assignment**.

Step 3 On the Class of Service Options Assignment screen, build a class of service template for the ports that connect to the PIMG units. The following is an example of a class of service template.

```
 CLASS OF SERVICE OPTIONS ASSIGNMENT
Class of service number : 1
Comments :
Option                                                  Select
-------------------------------------------------------------
Account Code Verified. . . . . .   No
ACD Silent Monitoring - Accept . . . . . .   No
ACD Silent Monitoring - Allowed. . . . . .   No
ACD Silent Monitoring - Notification . . . . . .   No
ANI/DNIS/ISDN Number Delivery Trunk  . . . . . .  Yes
Auto Answer Allowed. . . . . .  Yes
Brokers Call . . . . . .   No
Busy Override Security . . . . . .   No
Call Announce Line . . . . . .  Yes
Call Forwarding - Accept . . . . . .  Yes
Call Forwarding (External Destination) . . . . . .  Yes
Call Forwarding (Internal Destination) . . . . . .  Yes
Call Forwarding - Override . . . . . .   No
Call Hold. . . . . .  Yes
Call Hold - Remote Retrieve. . . . . .  Yes
Call Hold - Retrieve with Hold Key . . . . . .   No
Call Pickup - Dialed : Accept. . . . . .  Yes
Call Pickup - Directed : Accept. . . . . .  Yes
Call Privacy . . . . . .   No
Call Reroute after CFFM to busy destination. . . . . .   No
Call Waiting - Swap. . . . . .   No
Calling Name Display - Internal . ONS. . . . . .  Yes
Calling Number Display - Internal . ONS. . . . . .  Yes
Camp-on Tone Security. . . . . .   No
Check COR after PSTN Dial Tone . . . . . .   No
Clear All Features Remote. . . . . .   No
Conference Call. . . . . .  Yes
COV/ONS/E&M Voice Mail Port. . . . . .   No
DASS II OLI/TLI Provided . . . . . .   No
Dialed Night Service . . . . . .  Yes
Disable Call Reroute Chaining On Diversion . . . . . .   No
Disable Send Message . . . . . .   No
Display ANI/ISDN Calling Number Only . . . . . .   No
Display ANI/DNIS/ISDN Calling/Called Number. . . . . .  Yes
Display Caller ID on multicall/keylines. . . . . .  Yes
Display DNIS/Called Number Before Digit Modification . .  Yes
Display Dialed Digits during Outgoing Calls. . . . . .  Yes
Display Held Call ID on Transfer . . . . . .   No
Do Not Disturb . . . . . .  Yes
Do Not Disturb - Access to Remote Phones . . . . . .  Yes
Do Not Disturb - Permanent . . . . . .   No
Emergency Call Notification - Audio. . . . . .   No
Emergency Call Notification - Visual . . . . . .   No
Enable Call Duration Limit on External Calls . . . . . .   No
Enable Call Duration Limit on Internal Calls . . . . . .   No
Executive Busy Override. . . . . .   No
External Trunk Standard Ringback . . . . . .   No
Flexible Answer Point. . . . . .   No
```

```
Follow 2nd Alternate Reroute for Recall to Busy ACD Agent  No
Forced Verified Account Code . . . . . .   No
Forced Non-Verified Account Code . . . . . .   No
Group Call Forward Follow Me - Accept. . . . . .   No
Group Call Forward Follow Me - Allow . . . . . .   No
Group Page - Accept. . . . . .   No
Group Page - Allow . . . . . .   No
Handset Volume Adjustment - Saved. . . . . .   No
Handsfree AnswerBack Allowed . . . . . .  Yes
HCI/CTI/TAPI Call Control Allowed. . . . . .   No
HCI/CTI/TAPI Monitor Allowed . . . . . .   No
Head Set Switch Mute . . . . . .   No
Hot Desk Remote Logout Enabled . . . . . .   No
Hot Desk Login Accept. . . . . .   No
Hotel Room Extension . . . . . .   No
Hotel Room Monitor Setup Allowed . . . . . .   No
Hotel Room Monitoring Allowed. . . . . .   No
Hotel/Motel Room Personal Wakeup Call Allowed. . . . . .   No
Hotel/Motel Room Remote Wakeup Call Allowed. . . . . .   No
Individual Trunk Access. . . . . .  Yes
Keep TelDir Entry on Check Out . . . . . .   No
Local Music On Hold source . . . . . .   No
Loudspeaker Pager Override . . . . . .  Yes
Loudspeaker Pager Equivalent Zone Override Security. . .   No
Message Waiting. . . . . .  Yes
Message Waiting - Audible Tone Notification. . . . . .  Yes
Message Waiting - Deactivate On Off-Hook . . . . . .   No
Message Waiting - Inquire. . . . . .  Yes
Multiline Set Loop Test. . . . . .   No
Multiline Set Message Center Remote Read Allowed . . . .   No
Multiline Set Music. . . . . .   No
Multiline Set On Hook Dialing. . . . . .  Yes
Multiline Set Phonebook Allowed. . . . . .  Yes
Multiline Set Voice Mail Callback Message Erasure Allowed  No
Name Suppression on outgoing Trunk Call. . . . . .   No
Non-DID Extension. . . . . .   No
Non-Prime Public Network Identity. . . . . .   No
Non-Verified Account Code. . . . . .  Yes
Off-Hook Voice Announce Allowed. . . . . .   No
ONS CLASS/CLIP: Message Waiting Activate/Deactivate. . .   No
ONS CLASS/CLIP: Set. . . . . .   No
ONS CLASS/CLIP: Visual Call Waiting. . . . . .  Yes
ONS/OPS Internal Ring Cadence for External Callers . . .   No
Override Interconnect Restriction on Transfer. . . . . .   No
Pager Access - All Zones . . . . . .  Yes
Pager Access - Individual Zones. . . . . .   No
Privacy Released . . . . . .   No
Public Network Access via DPNSS. . . . . .  Yes
Public Network Identity Provided . . . . . .  Yes
Public Network To Public Network Connection Allowed. . .  Yes
Public Trunk . . . . . .  Yes
R2 Call Progress Tones . . . . . .   No
Record-A-Call Active . . . . . .   No
Record-A-Call - Start Recording Automatically. . . . . .   No
Record-A-Call - Save Recording on Hang-up. . . . . .   No
Recorded Announcement Device . . . . . .   No
Recorded Announcement Device - Advanced. . . . . .   No
Redial Facilities. . . . . .  Yes
Ringing Line Select. . . . . .   No
SC1000 Attendant Basic Function Key (Yes/NO) . . . . . .   No
SMDR - External. . . . . .   No
SMDR - Internal. . . . . .   No
Speak@Ease Preferred . . . . . .   No
Suite Services Enabled . . . . . .   No
```

```
Suppress Simulated CCM after ISDN Progress . . . . . .   No
Third Party Call Forward Follow Me - Accept. . . . . .  Yes
Third Party Call Forward Follow Me - Allow . . . . . .  Yes
Timed Reminder Allowed . . . . . . . . . . . . . . . .  Yes
Trunk Calling Party Identification . . . . . . . . . .  Yes
Trunk Flash Allowed. . . . . . . . . . . . . . . . . .   No
Use Held Party Device for Call Re-routing. . . . . . .  Yes
Use Called Party Call Hold Timer . . . . . . . . . . .   No
Voice Mail Softkey . . . . . . . . . . . . . . . . . .   No
Timer Options / Account Code Length                   Value
Account Code Length (2-12) . . . . . . . . . . . . . .   12
After Answer Display Time(0-60 secs, Blank=off). . . . .
ANSWER PLUS - Delay To Message Timer (0-300 secs). . . .   20
ANSWER PLUS - Expected Offhook Timer (0-255 secs). . . .   30
ANSWER PLUS - Message Length Timer (0-120 secs). . . . .   10
ANSWER PLUS - System Reroute Timer (0-720 secs). . . . .    0
Attendant Busy-out Timer (1-1440 mins) . . . . . . . . .   10
Auto Camp-on Timer (0-30 secs, Blank for Off). . . . . .   10
Busy Tone Timer ( 1-120 secs). . . . . . . . . . . . . .   30
Call Duration (2-120 mins) . . . . . . . . . . . . . . .   10
Call Duration Forced Cleardown Timer (0-10 mins) . . . .    0
Call Forward - Delay (0-125 secs). . . . . . . . . . . .    0
Call Forward No Answer Timer (0-125 secs). . . . . . . .   15
Call Hold Timer (10-600 secs). . . . . . . . . . . . . .   30
Camp-on Recall Timer (0-180 secs). . . . . . . . . . . .  110
Delay Ring Timer (5-60 secs) . . . . . . . . . . . . . .   10
Dialing Conflict Timer (2-5 secs). . . . . . . . . . . .    3
Emergency Call - Audio Level for Set(Ringer/Medium/High) Ringer
First Digit Timer (5-60 secs). . . . . . . . . . . . . .   15
Inter-Digit Timer (3-60 secs). . . . . . . . . . . . . .   10
Lockout Timer ( 1-60 secs) . . . . . . . . . . . . . . .   45
ACD 2000 Logout Agent No Answer Timer (0-125 secs) . . .   15
Message Waiting Ringing Start Time (00:00 to 23:59). . .    :
Message Waiting Ringing Stop Time (00:00 to 23:59) . . .
No Answer Recall Timer (0-125 secs). . . . . . . . . . .   17
ONS VMail-Delay Dial Tone Timer (5-20 secs). . . . . . .    5
Ringing Timer (60-300 secs). . . . . . . . . . . . . . .  180
Work Timer (0-600 secs). . . . . . . . . . . . . . . . .    0
 DTMF Key Assignments Value
Key A. . . . . . . . . . . . . . . . . . . . . . . . . .
Key B. . . . . . . . . . . . . . . . . . . . . . . . . .
Key C. . . . . . . . . . . . . . . . . . . . . . . . . .
Key D. . . . . . . . . . . . . . . . . . . . . . . . . .
```

Step 4 On the Select Forms screen, select **Multiline Set Forms**.

Step 5 On the Multiline Set Forms screen, select **Multiline Set Assignment**.

Step 6 On the Multiline Set Assignment screen, select **DNI Circuit Assignment**.

Step 7 On the DNI Circuit Assignment screen, enter the following settings for each wiring address used by the ports connecting to the PIMG units.

Table 129: Settings for DNI Circuit Assignment Screen

Field	Setting
Cabinet	Enter the cabinet for the DNI Line MC330 line card.
Shelf	Enter the shelf for the DNI Line MC330 line card.
Slot	Enter the slot for the DNI Line MC330 line card.

Field	Setting
Circuit	Enter the circuit for the DNI Line MC330 line card.
Card Type	Select **DNI Line**.
Device Type: Channel #1	Select **Superset 430**.

Step 8 Return to the Multiline Set Forms screen.

Step 9 On the Multiline Set Forms screen, select **Multiline Set Key Assignment**.

Step 10 On the Multiline Set Key Assignment screen, assign each wiring address to an individual digital station set and directory number as shown in the following table.

Table 130: Settings for Multiline Set Key Assignment Screen

Field	Setting
Prime Directory Number	Enter the directory number for the station.
Prime Ring Type	Select **ring**.
Prime Line Type	Select **single line**.
Line Type	For each key number, select **not assigned**.

Step 11 On the Main menu, select **Station Service Set Forms**.

Step 12 On the Station Service Set Forms screen, select **Station Service Assignment**.

Step 13 On the Station Service Assignment screen, attach each individual digital station set to the class of service template that you built in Step 3. The following example shows a digital station attached to a class of service template.

STATION SERVICE ASSIGNMENT

Directory Number	Intercept Number	Class of Service			Class of Restriction			Default Account Code	COMP Zone Index ID
		DAY	NIGHT1	NIGHT2	DAY	NIGHT1	NIGHT2		
501	1	1	1	1	1	1	1		1
502	1	1	1	1	1	1	1		1
503	1	1	1	1	1	1	1		1
504	1	1	1	1	1	1	1		1
505	1	1	1	1	1	1	1		1
506	1	1	1	1	1	1	1		1
507	1	1	1	1	1	1	1		1
508	1	1	1	1	1	1	1		1

Step 14 On the Main menu, select **Group Forms**.

Step 15 On the Group Forms screen, select **Hunt Group Assignment**.

Step 16 On the Hunt Group Assignment screen, enter the following settings to make a hunt group to act as a central inbound route for calls.

Table 131: Settings for Hunt Group Assignment Screen

Field	Setting
Pilot Number	Enter the pilot number for Unity Connection.
Name	Enter **PIMG hunt group** or another name.
Hunt Mode	Select the hunt mode that you want to use: • **Circular** • **Linear**
Group Type	Select **Voice**.

Step 17 In the Hunt Group Assignment table of the Hunt Group Assignment screen, assign the directory number for each port connecting to the PIMG units as follows.

Table 132: Hunt Group Assignment Table

Member	Directory Number	Name
1	<the directory number of the first port>	Enter **PIMG Port 1**.
2	<the directory number of the second port>	Enter **PIMG Port 2**.
3	<the directory number of the third port>	Enter **PIMG Port 3**.
4	<the directory number of the next port>	Enter **PIMG Port 4**.
5	<the directory number of the next port>	Enter **PIMG Port 5**.
6	<the directory number of the next port>	Enter **PIMG Port 6**.
7	<the directory number of the next port>	Enter **PIMG Port 7**.
8	<the directory number of the next port>	Enter **PIMG Port 8**.
. . .	<directory numbers of additional ports>	. . .
<last member>	<the directory number of the last port>	Enter **PIMG Port <n>**.

Step 18 Program each phone to forward calls to the pilot number hunt group, based on one of the following Unity Connection call transfer types.

Table 133: Call Transfer Types

Transfer Types	Usage
Release transfer (blind transfer)	Program the phone to forward calls to the pilot number when: • The extension is busy • The call is not answered
Supervised transfer	Program the user station to forward calls to the pilot number only when the call is not answered (on the phone system, the number of rings before forwarding must be more than the number of rings to supervise the call). Confirm that call forwarding is disabled when the extension is busy.

Setting Up the Digital Mitel PIMG Units

Do the following procedures to set up the digital Mitel PIMG units that are connected to the Mitel SX-200 phone system.

These procedures require that the following tasks have already been completed:

- The phone system is connected to the digital Mitel PIMG units using digital lines.
- The PIMG units are ready to be connected to the LAN or WAN.
- The PIMG units are connected to a power source.

Fields that are not mentioned in the following procedures must keep their default values. For the default values of all fields, see the manufacturer documentation for the PIMG units.

Downloading the PIMG Firmware Update Files for Digital Mitel PIMG Units

http://software.cisco.com/download/navigator.html?mdfid=280082558&i=rm.

Note To access the software download page, you must be signed in to Cisco.com as a registered user.

This procedure describes the steps when using Internet Explorer as your web browser. If you are using a different web browser, the steps may differ.

1. In the tree control on the Downloads Home page, expand Unified Communications> **Unified Communications Applications** > **Messaging** > **Cisco Unity** and select **Cisco Unity Telephony Integration**.
2. On the Log In page, enter your username and password, then select **Log In**.
3. On the Select a Release page, under Latest Releases, select the most recent release.
4. In the right column, select the version of the firmware for digital Mitel PIMG units.
5. On the Download Image page, select **Download**.
6. On the Supporting Document(s) page, select **Agree**.
7. In the File Download dialog box, select **Save**.
8. In the Save As dialog box, browse to the Windows workstation that have access the PIMG units, browse to a directory where you want to save the file, and select **Save**.
9. In the Download Complete dialog box, select **Open**. The window for extracting the PIMG firmware update files appears and select **Extract**.
10. In the Extract dialog box, browse to the directory where you want the extracted files, and select **Extract**.
11. Close the window for the extracting application.

To Set Up the Digital Mitel PIMG Units (Firmware Version 6.x)

12. On the Windows workstation, add a temporary route to enable access to the PIMG units.
    a. On the Windows Start menu, select **Run**.
    b. Enter **cmd**, and press **Enter**. The Command Prompt window appears.
    c. At the command prompt, enter **route add 10.12.13.74 <IP Address of Workstation>**, and press **Enter**.

       For example, if the IP address of the workstation is 198.1.3.25, enter “route add 10.12.13.74<space>198.1.3.25” in the Command Prompt window.
    d. Close the Command Prompt window.
13. Connect a PIMG unit to the network.
14. In the web browser, go to **http://10.12.13.74**.
15. To sign in, enter the following case-sensitive settings.

Table 134: Sign-in Settings

Field	Setting
Username	Enter **admin**.
Password	Enter **IpodAdmin**.

1. Select **OK**.
2. On the System menu, select **Upgrade**.
3. On the Upgrade page, select **Browse**.
4. In the Choose File dialog box, browse to the directory on the Windows workstation that has the extracted PIMG firmware update files.
5. Select **Mtl_<xx** > **.app** (where <xx> is multiple digits), and select **Open**.
6. On the Upgrade page, select **Install File**.
7. After the file is installed, a message prompting you to restart the PIMG unit appears. Select **Cancel**.

   Do not restart the PIMG unit until you are instructed to do so later in this procedure, even if the file installation fails. Restarting the PIMG unit at this step may prevent the PIMG unit from functioning correctly.
8. Repeat Step 6 through Step 11 for each of the following files:
   - Mtl_<xx>.fsh
   - Run<xx>FskEcho.dsp
   - Mtl<xx>.lca
9. On the Configuration menu, select **Import/Export**.
10. On the Import/Export page, select **Browse**.
11. In the Choose File dialog box, browse to the file MTLDNI_Cfg_Mitel.ini.
12. Select **MTLDNI_Cfg_Mitel.ini**, and select **Open**.
13. On the Import/Export page, select **Import File**.
14. After the file is imported, a message prompting you to restart the PIMG unit appears. Select **OK**.
15. In the web browser, go to **http://10.12.13.74**.
16. To sign in, enter the following case-sensitive settings.

Table 135: Sign-in Settings

Field	Setting
Username	Enter **admin**.
Password	Enter **IpodAdmin**.

1. Select **OK**.
2. If your Unity Connection system must have an RTP port range of 16384 to 32767, do the following substeps. Otherwise, continue to Step 23.

   You must set the RTP port range for the PIMG units if your system uses an RTP port range of 16384 to 32767. Otherwise, Unity Connection cannot answer calls,and callers hear ringing or silence.



Note The default RTP port range for PIMG units is 49000 to 50000. Some Unity Connection configurations require a different RTP port range.

   a. On the Configuration menu, select **Import/Export**.
   b. On the Import/Export page, under Export Files, select **Export All Settings**.
   c. In the File Download dialog box, select **Save**.
   d. In the Save As dialog box, browse to the Windows workstation that has access to the PIMG units, browse to a directory where you want to save the file, and select **Save**.
   e. In the Download Complete dialog box, select **Open**. Notepad opens the file Config.ini that you saved.
   f. Locate the line with the following parameter:

      ```
      gwRTPStartPort
      ```

   g. Change the value of the parameter to **16384** so that the line reads as follows:

      ```
      gwRTPStartPort = 16384
      ```

   h. Locate the line with the following parameter:

      ```
      gwRTPEndPort
      ```

   i. Change the value of the parameter to **32767** so that the line reads as follows:

      ```
      gwRTPEndPort = 32767
      ```

   j. Save the file, and exit Notepad.
   k. On the Configuration menu of the PIMG unit, select **Import/Export**.
   l. On the Import/Export page, under Browse for Import File, select **Browse**.
   m. In the Choose File dialog box, browse to the file Config.ini that you saved.
   n. Select **Config.ini**, and select **Open**.
   o. On the Import/Export page, select **Import File**.
   p. When prompted to restart the PIMG unit, select **OK**.
   q. When the PIMG unit has restarted, in the web browser, go to **http://10.12.13.74**.
   r. To sign in, enter the following case-sensitive settings.

Table 136: Sign-in Settings

Field	Setting
Username	Enter **admin**.
Password	Enter **IpodAdmin**.

1. Select **OK**.

1. On the System menu, select **Password**.
2. On the Change Password page, enter the following settings.

Table 137: Change Password Page Settings

Field	Setting
Old Password	Enter **IpodAdmin**. (This setting is case sensitive.)
New Password	Enter your new password. (This setting is case sensitive.)
Confirm Password	Enter your new password. (This setting is case sensitive.)

1. Select **Change**.
2. On the Configuration menu, select **Routing Table**.
3. On the Routing Table page, under Router Configuration, select **VoIP Host Groups**.
4. Under VoIP Host Groups, enter the following settings for the first VoIP Host Group.

Table 138: First VoIP Host Group Settings

Field	Settings
Name	Accept the default or enter another descriptive name of the VoIP host group.
Load-Balanced	*(Unity Connection without a cluster)* Select **False**. *(Unity Connection with a cluster configured)* Select **False**.
Fault-Tolerant	*(Unity Connection without a cluster)* Select **False**. *(Unity Connection with a cluster configured)* Select **True**.

1. For Unity Connection without a cluster, under Host List, enter the host name or IP address of the Unity Connection server and the server port in the format <host name or IP address>:5060.

For Unity Connection with a cluster configured, under Host List, enter the host name or IP address of the subscriber server (the second Unity Connection server that you installed) and the server port in the format <host name or IP address>:5060.

1. For Unity Connection without a cluster, continue to Step 32. For Unity Connection with a cluster configured, select **Add Host**.

2. In the second field, enter the host name or IP address of the publisher server (the first Unity Connection server that you installed) and the server port in the format <host name or IP address>:5060.

   Do not add a third host under Host List or a second host group under VoIP Host Groups. Otherwise, the Unity Connection cluster may not function correctly.

3. Select **Submit**.
4. Under Router Configuration, select **TDM Trunk Groups**.
5. Under TDM Trunk Groups, select **Add Trunk Group**.
6. Under TDM Trunk Groups, enter the following settings for the first TDM trunk group.

Table 139: First TDM Trunk Group Settings (Inbound Calls)

Field	Settings
Name	Enter **Inbound_PBX_Calls** or another unique name. This TDM trunk group handles all incoming calls from the phone system.
Selection Direction	Select **Ascending**.
Selection Mode	Select **Linear**.
Port/Channel Content	Enter the numbers of the PIMG ports handle inbound calls. For example, enter "*" for all PIMG ports, or enter "1-6" for the first six PIMG ports.

1. Under TDM Trunk Groups, select **Add Trunk Group**.
2. Enter the following settings for the second TDM trunk group.

Table 140: Second TDM Trunk Group Settings (MWIs)

Field	Settings
Name	Enter **MWIs** or another unique name. This TDM trunk group handles outbound MWI calls (where applicable).
Selection Direction	Select **Ascending**.
Selection Mode	Select **Cyclic**.
Port/Channel Content	Enter the numbers of the PIMG ports that dial out MWIs. For example, enter "*" for all PIMG ports, or enter "7,8" for the last two PIMG ports.

1. Under TDM Trunk Groups, select **Add Trunk Group**.
2. Enter the following settings for the third TDM trunk group.

Table 141: Third TDM Trunk Group Settings (Outbound Calls)

Field	Settings
Name	Enter **Outbound_PBX_Calls** or another unique name. This TDM trunk group handles all outbound calls from Unity Connection.
Selection Direction	Select **Descending**.
Selection Mode	Select **Linear**.
Port/Channel Content	Enter ***** for all channels in all ports. Enter the numbers of the PIMG ports that handles outbound (dialout) calls. For example, enter "*" for all PIMG ports, or enter "7,8" for the last two PIMG ports.

1. Select **Submit**.
2. Under Router Configuration, select **Inbound VoIP Rules**.
3. Under Inbound VoIP Rules, uncheck the **Enabled** check box for the default rule.
4. Select **Add Rule**.
5. Under Inbound VoIP Rules, enter the following settings for the first new inbound VoIP rule.

Table 142: First New Inbound VoIP Rule Settings (MWIs)

Field	Settings
Enable	Check this check box.
Rule Label	Enter **MWI_Calls** or another name. This inbound VoIP rule handles all MWI calls from Unity Connection.
Request Type	Select **Message**.
Originating VoIP Host Address	Enter *****.

1. Under Inbound VoIP Request Matching, enter the following settings.

   The rule that you created in Step 44 must be selected. Otherwise, any changes you make apply to another rule.

Table 143: Inbound VoIP Request Matching Settings

Field	Settings
Calling Number	Enter *****.
Calling Name	Enter *****.
Called Number	Enter *****.

Field	Settings
Called Name	Enter *****.
Redirect Number	Enter *****.
Redirect Name	Enter *****.

1. Under Outbound Routes, enter the following settings.

   The rule that you created in Step 44 must be selected. Otherwise, any changes you make apply to another rule.

Table 144: Outbound Routes Settings

Field	Settings
Device Selection	
Outbound Destination	Select **TDM**.
Trunk Group	Select the name of the TDM trunk group that you created for MWIs in Step 37. For example, select "MWIs."
CPID Manipulation	
Calling Number	Enter **S**.
Calling Name	Enter **S**.
Called Number	Enter **D**.
Called Name	Enter **D**.
Redirect Number	Enter **R**.
Redirect Name	Enter **R**.
Select Primary/Alternate Route	
Primary	Select **Primary**.

1. Under Inbound VoIP Rules, select **Add Rule**.
2. Under Inbound VoIP Rules, enter the following settings for the second new inbound VoIP rule.

Table 145: Second New Inbound VoIP Rule Settings (Outbound Calls)

Field	Settings
Enable	Check this check box.
Rule Label	Enter **Outbound_UC_Calls** or another name. This inbound VoIP rule handles all outbound calls from Unity Connection.

Field	Settings
Request Type	Select **Call**.
Originating VoIP Host Address	Enter *****.

1. Under Inbound VoIP Request Matching, enter the following settings.

   The rule that you created in Step 48 must be selected. Otherwise, any changes you make apply to another rule.

Table 146: Inbound VoIP Request Matching Settings

Field	Settings
Calling Number	Enter *****.
Calling Name	Enter *****.
Called Number	Enter *****.
Called Name	Enter *****.
Redirect Number	Enter *****.
Redirect Name	Enter *****.

1. Under Outbound Routes, enter the following settings.

   The rule that you created in Step 48 must be selected. Otherwise, any changes you make apply to another rule.

Table 147: Outbound Routes Settings

Field	Settings
Device Selection	
Outbound Destination	Select **TDM**.
Trunk Group	Select the name of the TDM trunk group that you created for outbound calls in Step 39. For example, select “Outbound_PBX_Calls.”
CPID Manipulation	
Calling Number	Enter **S**.
Calling Name	Enter **S**.
Called Number	Enter **D**.
Called Name	Enter **D**.
Redirect Number	Enter **R**.

Field	Settings
Redirect Name	Enter **R**.
Select Primary/Alternate Route	
Primary	Select **Primary**.

1. Select **Submit**.
2. Under Router Configuration, select **Inbound TDM Rules**.
3. Under Inbound TDM Rules, enter the following settings for the first inbound TDM rule.

Table 148: First Inbound TDM Rule Settings

Field	Settings
Enable	Check this check box.
Rule Label	Enter **Inbound_Rule_1** or another name. This inbound TDM rule handles all incoming calls from the phone system.
Request Type	Select **Call**.
Trunk Group	Select the name of the TDM trunk group that you created for incoming calls from the phone system in Step 35. For example, select "Inbound_PBX_Calls."

1. Under Inbound TDM Request Matching, enter the following settings.

   The rule that you created in Step 53 must be selected. Otherwise, any changes you make apply to another rule.

Table 149: Inbound TDM Request Matching Settings

Field	Settings
Calling Number	Enter the applicable matching rule used. For example, enter "*" for all.
Calling Name	Enter the applicable matching rule used. For example, enter "*" for all.
Called Number	Enter the applicable matching rule used. For example, enter "*" for all.
Called Name	Enter the applicable matching rule used. For example, enter "*" for all.
Redirect Number	Enter the applicable matching rule used. For example, enter "*" for all.
Redirect Name	Enter the applicable matching rule used. For example, enter "*" for all.

1. Under Outbound Routes, enter the following settings.

   The rule that you created in Step 53 must be selected. Otherwise, any changes you make apply to another rule.

Table 150: Outbound Routes Settings

Field	Settings
Device Selection	
Outbound Destination	Select **VoIP**.
Host Group	Select the name of the VoIP host group that you created for Unity Connection in Step 28.
CPID Manipulation	
Calling Number	Enter S.
Calling Name	Enter S.
Called Number	Enter D.
Called Name	Enter D.
Redirect Number	Enter R.
Redirect Name	Enter R.
Select Primary/Alternate Route	
Primary	Select **Primary**.

1. If you want to create more Inbound TDM rules, under Inbound TDM Rules, select **Add Rule**. Otherwise, continue to Step 58.
2. Repeat Step 53 through Step 56 for all remaining inbound TDM rules that you want to create.
3. Select **Submit**.
4. On the Configuration menu, select **TDM** > **General**.
5. On the TDM General Settings page, enter the following settings.

Table 151: TDM General Settings Page Settings

Field	Settings
PCM Coding	Select **uLaw**.
Minimum Call Party Delay (ms)	Enter **500**.
Maximum Call Party Delay (ms)	Enter **2000**.
Dial Digit on Time (ms)	Enter **100**.
Dial Inter-Digit Time (ms)	Enter **100**.

Field	Settings
Dial Pause Time (ms)	Enter **2000**.
Turn MWI On FAC	Enter the code that turns MWIs on.
Turn MWI Off FAC	Enter the code that turns MWIs off.
Outbound Call Connect Timeout (ms)	Enter **10000**.
Wait for Ringback/Connect on Blind Transfer	Select **Yes**.
Hunt Group Extension	Enter the pilot number of the Unity Connection voice messaging ports.
Disconnect on Fax Cleardown Tone	Select **No**.

1. Select **Submit**.
2. On the Configuration menu, select **TDM** > **Port Enable**.
3. On the TDM Port Enabling page, select **No** for the ports that you want to disable on the PIMG unit.
4. Confirm that **Yes** is selected for all other ports on the PIMG unit.
5. Select **Submit**.
6. On the Configuration menu, select **VoIP** > **General**.
7. On the VoIP General Settings page, enter the following settings.

Table 152: VoIP General Settings Page Settings

Field	Setting
User-Agent	
Host and Domain Name	Enter the host and domain name of the PIMG unit.
Transport Type	Select **UDP**.
Call as Domain Name	Select **No**.
SIPS URI Scheme Enabled	Select **No**.
Invite Expiration (sec)	Enter **120**.
Server	
DNS Server Address	Enter the IP Address of the Domain Name Server that the PIMG unit uses.
DNS Translation of Phone Numbers	Select **No**.

Field	Setting
Registration Server Address	Leave this field blank.
Registration Server Port	Enter **5060**.
Registration Expiration (sec)	Enter **3600**.
TCP/UDP	
UDP/TCP Transports Enabled	Select **Yes**.
TCP/UDP Server Port	Enter **5060**.
TCP Inactivity Timer (sec)	Enter **30**.
TLS	
TLS Transport Enabled	Select **No**.
TLS Server Port	Enter **5061**.
SSL TLS Protocol	Select **SSLv3 TLSv1**.
Mutual TLS Authentication Required	Select **Yes**.
TLS Inactivity Timer (sec)	Enter **30**.
Verify TLS Peer Certificate Date	Select **Yes**.
Verify TLS Peer Certificate Trust	Select **Yes**.
Proxy	
Primary Proxy Server Address	Leave this field blank.
Primary Proxy Server Port	Not applicable. Leave the default setting.
Backup Proxy Server Address	Not applicable. Leave the default setting.
Backup Proxy Server Port	Not applicable. Leave the default setting.

Field	Setting
Proxy Query Interval	Enter **10**.
Timing	
T1 Time (ms)	Enter **400**.
T2 Time (ms)	Enter **3000**.
T4 Time (ms)	Enter **5000**.
Monitoring	
Monitor Call Connections	Select **No**.
Call Monitor Interval (sec)	
Monitor VoIP Hosts	
VoIP Host Monitor Interval (sec)	

1. Select **Submit**.
2. On the Configuration menu, select **VoIP** > **Media**.
3. On the VoIP Media Settings page, enter the following settings.

Table 153: VoIP Media Settings Page Settings

Field	Settings
Audio	
Audio Compression	Select the preferred codec for audio compression.
RTP Digit Relay Mode	Select **RFC2833**.
RTP Fax/Modem Tone Relay Mode	Select **RFC2833**.
RTP Source IP Address Validation	Select **Off**.
RTP Source UDP Port Validation	Select **Off**.
Signaling Digit Relay Mode	Select **Off**.
Voice Activity Detection	Select **Off**.
RFC 3960 Early Media Support	Select **On Demand**.

Field	Settings
Frame Size	Select the applicable setting: • G.711—**20** • G.729AB—**10** Failure to use the correct setting results in recorded messages containing nothing but silence.
Frames Per Packet	Select the applicable setting: • G.711—**1** • G.729AB—**2** Failure to use the correct setting results in recorded messages containing nothing but silence.
Fax	
Fax IP-Transport Mode	
SRTP	
SRTP Preference	Select **RTP Only**.
MKI on Transmit Stream	Select **Yes**.
Key Derivation Enable	Select **Yes**.
Key Derivation Rate	Enter **16**.
Anti-replay Window Size Hint	Enter **64**.
Cipher Mode	Select **AES_Counter_Mode**.
Authentication Type	Select **SHA1**.
Authentication Tag Length	Select **SHA1_80_bit**.

1. Select **Submit**.
2. On the Configuration menu, select **VoIP** > **QOS**.
3. On the VoIP QOS Configuration page, enter the following settings.

Table 154: VoIP QOS Configurative Page Settings

Field	Settings
Call Control QOS Byte	Enter **104**.
RTP QOS Byte	Enter **184**.

1. Select **Submit**.
2. On the Configuration menu, select **IP**.
3. On the IP Settings page, enter the following settings.

Table 155: IP Settings Page Settings

Field	Settings
Client IP Address	Enter the new IP address you want to use for the PIMG unit. (This is the IP address that you enter in Cisco Unity Connection Administration when you create the integration.)
Client Subnet Mask	Enter the new subnet mask, if the subnet mask is different from the default IP address.
Default Network Gateway Address	Enter the IP address of the default network gateway router that the PIMG units use.
BOOTP Enabled	Select **No**.
SNTP Server IP Address	

1. Select **Submit**.
2. On the Configuration menu, select **Tone Detection**.
3. On the Tone Detection page, under Call Progress Tone - Learn, in the Learn Tone Event field, select **Busy** and do the following substeps to verify that the tone is correct.
   a. From a available phone, call a second phone.
   b. Answer the second phone when it rings, and leave both handsets off so that both phones are busy.
   c. From a third phone, dial one of the busy phones.
   d. Confirm that you hear a busy tone.
   e. Hang up the third phone but leave the handsets for the other two phones off.
4. Under Call Progress Tone - Learn, in the Dial String field, enter the extension that you dialed in Step 79c. from the third phone.
5. Select **Learn**.
6. On the Tone Detection page, under Call Progress Tone - Learn, in the Learn field, select **Error** and do the following substeps to verify that the tone is correct.
   a. From an available phone, dial an extension that does not exist.
   b. Confirm that you hear the reorder or error tone.
   c. Hang up the phone.
7. Under Call Progress Tone - Learn, in the Dial String field, enter the extension that you dialed in Step 82a.

8. Select **Learn**.
9. On the Tone Detection page, under Call Progress Tone - Learn, in the Learn field, select **Ringback** and do the following substeps to verify that the tone is correct.
   a. From an available phone, dial an extension that does exist.
   b. Confirm that you hear the ringback tone.
   c. Hang up the phone.
10. Under Call Progress Tone - Learn, in the Dial String field, enter the extension that you dialed in Step 85a.
11. Select **Learn**.
12. Select **Submit**.
13. Hang up the phones that you used in Step 79.
14. On the System menu, select **Restart**.
15. On the Restart page, select **Restart Unit Now**.
16. Repeat Step 2 through Step 91 on all remaining PIMG units.

SUMMARY STEPS

1. On a Windows workstation that have access to the PIMG units, go to the following link:

DETAILED STEPS

On a Windows workstation that have access to the PIMG units, go to the following link:

Configuring Unity Connection for Integration with Mitel SX-200 Phone System

After ensuring that the Mitel SX-200 phone system, the PIMG units, and Unity Connection are ready for the integration, do the following procedure to set up the integration and to enter the port settings.

Creating an Integration

Step 1 In Cisco Unity Connection Administration, expand **Telephony Integrations**, then select **Phone System**.

Step 2 On the Search Phone Systems page, under Display Name, select the name of the default phone system.

Step 3 On the Phone System Basics page, in the Phone System Name field, enter the descriptive name that you want for the phone system.

Step 4 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 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 5 Under Message Waiting Indicator Settings, select**Use Same Port for Enabling and Disabling MWIs**.

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 applicable settings and select **Save**.

Table 156: Settings for the New Port Group Page

Field	Setting
Phone System	Select the name of the phone system that you entered in Step 3.
Create From	Select **Port Group Template** and select **SIP to DMG/PIMG/TIMG** 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.
SIP Security Profile	Select **5060**.
SIP Transport Protocol	Select the SIP transport protocol that Unity Connection uses.
IP Address or Host Name	Enter the IP address of the PIMG unit that you are integrating with Unity Connection.
Port	Enter the SIP port of the PIMG unit that Unity Connection connects to. We recommend that you use the default setting. This name must match the setting in the TCP/UDP Server Port field on the Configuration > VoIP > General page of the PIMG unit. Otherwise, the integration cannot function correctly.

Step 9 On the Port Group Basics page, under Message Waiting Indicator Settings, uncheck the **Enable Message Waiting Indicators** check box and select **Save**.

Step 10 In the Related Links drop-down box, select **Add Ports** and select **Go**.

Step 11 On the New Port page, enter the following settings and select **Save**.

Table 157: Settings for the New Port Page

Field	Considerations
Enabled	Check this check box.
Number of Ports	Enter **8**. (If you want to use fewer than eight voice messaging ports, enter the number of voice messaging ports that you want to use on this PIMG unit.) **Note** For a Unity Connection cluster, the server must have the number of voice messaging ports that are set up on the phone system for the PIMG integration so that this server can handle all voice messaging traffic for the cluster if one of the servers stops functioning. For example, if the phone system is set up with 16 voice messaging ports, this server must have 16 voice messaging ports.

Field	Considerations
Phone System	Select the name of the phone system that you entered in Step 3.
Port Group	Select the name of the port group that you added in Step 8.

Step 12 On the Search Ports page, select the display name of the first voice messaging port that you created for this phone system integration.

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

Step 13 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 158: 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.
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	(Serial integrations only) Uncheck this check box. Otherwise, the integration may not functior correctly. (Digital and analog integrations only) 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 Unity Connection web applications. Assign Allow TRAP Connections to the least busy ports.
Outgoing Hunt Order	Enter the priority order in which Unity Connection uses 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, Unity Connection uses the port that has been idle the longest.

Step 14 Select **Save**.

Step 15 Select **Next**.

Step 16 Repeat Step 13 through Step 15 for all remaining voice messaging ports for the phone system.

Step 17 In Cisco Unity Connection Administration, expand **Telephony Integrations**, then select **Phone System**.

Step 18 On the Search Phone Systems page, under Display Name, select the name of the phone system that you entered in Step 3.

Step 19 Repeat Step 7 through Step 18 for each remaining PIMG unit integrated with Unity Connection.

Note Each PIMG unit is connected to one port group with the applicable voice messaging ports. For example, a system that uses five PIMG units requires five port groups, one port group for each PIMG unit.

Step 20 To create a port group for MWIs, do the following substeps.

Note All MWI requests are handled by the master PIMG unit and sent to the phone system over the RS-232 serial cable (without using voice messaging ports). So the following substeps create a separate port group without voice messaging ports and enable the port group for MWIs that are "not port specific" (they do not use ports).

a) In Cisco Unity Connection Administration expand **Telephony Integration** then select **Port Group** .
b) On the Search Port Groups page, select **Add New**.
c) On the New Port Group page, enter the applicable settings and select **Save**.

Table 159: Settings for the New Port Group Page (MWIs)

Field	Setting
Phone System	Select the name of the phone system that you entered in Step 3.
Create From	Select Port Group Template and select **SIP to DMG/PIMG/TIMG** SIP to in the drop-down box.
Display Name	Enter a **MWI Port Group** or another descriptive name for the port group.
SIP Security Profile	Select **5060**.
SIP Transport Protocol	Select the SIP transport protocol that Unity Connection uses.
IPv4 Address or Host Name	Enter the IP address of the master PIMG unit.
IPv6 Address or Host Name	Do not enter a value in this field. IPv6 is not supported for PIMG integrations.
IP Address or Host Name	Enter the IP address of the master PIMG unit.
Port	Enter the SIP port of the master PIMG unit. **Caution** This name must match the setting in the TCP/UDP Server Port field on the Configuration > VoIP > General page of the PIMG unit. Otherwise, the integration cannot function correctly.

d) On the Port Group Basics page, on the Edit menu, select **Advanced Settings**.
e) On the Edit Advanced Settings page, under SIP MWI Requests, select **Not Port Specific** then select **Save**.
f) On the Edit menu, select **Port Group Basics**.
g) Under Port Group, select **Reset**.
h) Under Message Waiting Indicator Settings, confirm that the **Enable Message Waiting Indicator** check box is checked and select **Save**.

Step 21 If another phone system integration exists, in Cisco Unity Connection Administration, expand **Telephony Integrations**, then select **Trunk**. Otherwise, skip to Step 25.

Step 22 On the Search Phone System Trunks page, on the Phone System Trunk menu, select **New Phone System Trunk**.

Step 23 On the New Phone System Trunk page, enter the following settings for the phone system trunk and select **Save**.

Table 160: Settings for the Phone System Trunk

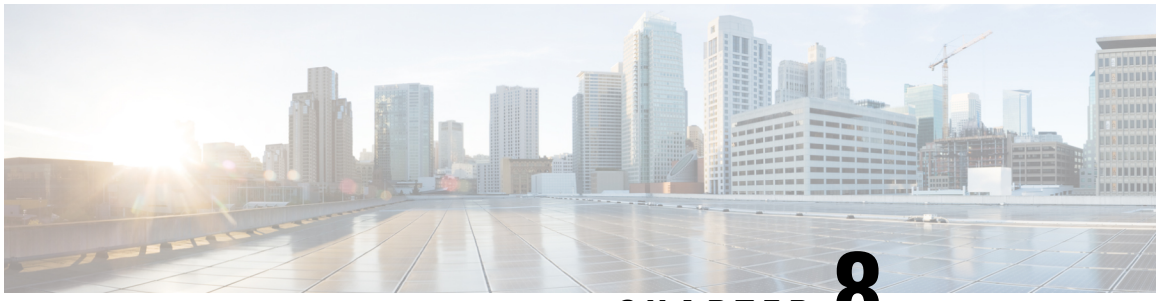
Field	Setting
From Phone System	Enter the display name of the phone system that you are creating a trunk for.
To Phone System	Enter the display name of the previously existing phone system that the trunk connects to.
Trunk Access Code	Enter the extra digits that Unity Connection must dial to transfer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

Step 24 Repeat Step 22 and Step 23 for all remaining phone system trunks that you want to create.

Step 25 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 26 In the Task Execution Results window, select **Close**.



CHAPTER 8

Setting Up a Mitel SX-2000 Digital PIMG Integration with Cisco Unity Connection

• Setting Up a Mitel SX-2000 Digital PIMG Integration, on page 135

Setting Up a Mitel SX-2000 Digital PIMG Integration

Task List for Mitel SX-2000 PIMG Phone System Integration

Before doing the following tasks to integrate Unity Connection with the Mitel SX-2000 phone system using PIMG units (media gateways), confirm that the Unity Connection server is ready for the integration after completing the server installation, following the tasks in the "Installing Cisco Unity Connection" chapter of the *Install, Upgrade, and Maintenance Guide for Cisco Unity Connection Release 15*, available at https://www.cisco.com/c/en/us/td/docs/voice_ip_comm/connection/15/install_upgrade/guide/b_15cuciumg.html

1. Review the system and equipment requirements to confirm that all phone system and Unity Connection server requirements have been met. See the Requirements, on page 12 section.
2. Plan how the voice messaging ports are used by Unity Connection. See the Planning the Usage of Voice Messaging Ports, on page 7 chapter.
3. Program the Mitel SX-2000 phone system and extensions. See the Programming Mitel SX-2000 PIMG Phone System for Integration section.
4. Set up the PIMG units. See the Setting Up the Digital Mitel PIMG Units section.
5. Create the integration. See the Creating an Integration, on page 29 section.
6. Test the integration. See the Testing the Integration, on page 381 chapter.
7. 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, on page 387 chapter.

Requirements

This integration supports configurations of the following components:

Phone System

- Mitel SX-2000.
- One or more of the applicable PIMG units. For details, see the "Introduction" chapter.
- The voice messaging ports in the phone system connected by digital lines to the ports on the PIMG units.

To simplify troubleshooting, we recommend that you connect the voice messaging ports on the phone system to the ports on the PIMG units in a planned manner. For example, connect the first phone system voice messaging port to the first port on the first PIMG unit, connect the second phone system voice messaging port to the second port on the first PIMG unit, and so on. Alternatively, if you have multiple PIMG units, you can reduce answer times in the event of a PIMG unit failure by connecting the phone system ports to the PIMG units in a round-robin fashion. For example, connect the first phone system voice messaging port to the first port on the first PIMG unit, connect the second phone system voice messaging port to the first port on the second PIMG unit, and so on.

- The PIMG units connected to the same LAN or WAN that Unity Connection is connected to.
- If the PIMG units connect to a WAN, the requirements for the WAN network connections are:
  - For G.729a codec formatting, a minimum of 32.76 Kbps guaranteed bandwidth for each voice messaging port.
  - For G.711 codec formatting, a minimum of 91.56 Kbps guaranteed bandwidth for each voice messaging port.
  - No network devices that implement network address translation (NAT).
  - A maximum 200 ms one-way network latency.

Unity Connection Server

- Unity Connection installed following the tasks in the "Installing Cisco Unity Connection" chapter of the *Install, Upgrade, and Maintenance Guide for Cisco Unity Connection Release 15*, available at https://www.cisco.com/c/en/us/td/docs/voice_ip_comm/connection/15/install_upgrade/guide/b_15cuciumg.html.
- A license that enables the applicable number of voice messaging ports.

Programming Mitel SX-2000 PIMG Phone System for Integration

The following programming instructions are provided as an example only. The specific programming for your phone system may vary depending on its configuration.

Caution In programming the phone system, do not send calls to voice messaging ports in 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.

Do the following steps to program the Mitel SX-2000 phone system.

Step 1 On the phone system console, go to the Main Forms screen, and select **Multiline Set Forms**.

Step 2 On the Multiline Set Forms screen, select **Multiline Set Assignment**.

Step 3 On the Multiline Set Assignment screen, select **DNI Circuit Assignment**.

Step 4 On the DNI Circuit Assignment screen, enter the following options.

Table 161: DNI Circuit Assignment Options

Field	Setting
Cabinet	Enter **2**.
Shelf	Enter **1**.
Slot	Enter **7**.
Circuit	Enter **4**.
Card Type	Select **DNI Line**.
Device Type: Channel #1	Select **Superset 430**.

Step 5 Return to the Multiline Set Forms screen.

Step 6 On the Multiline Set Forms screen, select **Multiline Set Key Assignment**.

Step 7 On the Multiline Set Key Assignment screen, enter the following options.

Table 162: Multiline Set Key Assignment Options

Field	Setting
Prime Directory Number	Enter the first directory number.
Key Number: 2	Select **not assigned**.
Key Number: 3	Select **not assigned**.
Key Number: 4	Select **not assigned**.
Key Number: 5	Select **not assigned**.
Key Number: 6	Select **not assigned**.
Key Number: 7	Select **not assigned**.
Key Number: 8	Select **not assigned**.
Key Number: 9	Select **not assigned**.
Key Number: 10	Select **not assigned**.
Key Number: 11	Select **not assigned**.

Step 8 Return to the Form Groups screen.

Step 9 On the Form Groups screen, select **Group Forms**.

Step 10 On the Group Forms screen, select **Hunt Group Assignment**.

Step 11 On the Hunt Group Assignment screen, enter the following options.

Table 163: Hunt Group Assignment Options

Field	Setting
Pilot Number	Enter the pilot number for Unity Connection.
Name	Enter **IP gateway hunt**.
Hunt Mode	Select the hunt mode that you want to use. For example, select "Circular."

Step 12 In the Hunt Group Assignment table of the Hunt Group Assignment screen, assign the directory number for each port on the PIMG units connected to the phone system as follows.

Table 164: Hunt Group Assignment Table

Member	Directory Number	Name
1	<the prime directory number>	Enter **IP gateway Port 1**.
2	<the second directory number>	Enter **IP gateway Port 2**.
3	<the third directory number>	Enter **IP gateway Port 3**.
4	<the next directory number>	Enter **IP gateway Port 4**.
5	<the next directory number>	Enter **IP gateway Port 5**.
6	<the next directory number>	Enter **IP gateway Port 6**.
7	<the next directory number>	Enter **IP gateway Port 7**.
8	<the next directory number>	Enter **IP gateway Port 8**.
. . .	<additional directory numbers>	. . .
<last member>	<the last directory number>	Enter **IP gateway Port <n>**.

Setting Up the Digital Mitel PIMG Units

Do the following procedures to set up the digital Mitel PIMG units that are connected to the Mitel SX-2000 phone system.

These procedures require that the following tasks have already been completed:

- The phone system is connected to the digital Mitel PIMG units using digital lines.
- The PIMG units are ready to be connected to the LAN or WAN.

- The PIMG units are connected to a power source.

Fields that are not mentioned in the following procedures must keep their default values. For the default values of all fields, see the manufacturer documentation for the PIMG units.

Downloading PIMG Firmware Update Files for Digital Mitel PIMG Units

http://software.cisco.com/download/navigator.html?mdfid=280082558&i=rm.



Note To access the software download page, you must be signed in to Cisco.com as a registered user.

This procedure describes the steps when using Internet Explorer as your web browser. If you are using a different web browser, the steps may differ.

1. In the tree control on the Downloads Home page, expand Unified Communications> **Unified Communications Applications** > **Messaging** > **Cisco Unity** and select **Cisco Unity Telephony Integration**.
2. On the Log In page, enter your username and password, then select **Log In**.
3. On the Select a Release page, under Latest Releases, select the most recent release.
4. In the right column, select the version of the firmware for digital Mitel PIMG units.
5. On the Download Image page, select **Download**.
6. On the Supporting Document(s) page, select **Agree**.
7. In the File Download dialog box, select **Save**.
8. In the Save As dialog box, browse to the Windows workstation that have access the PIMG units, browse to a directory where you want to save the file, and select **Save**.
9. In the Download Complete dialog box, select **Open**. The window for extracting the PIMG firmware update files appears and select **Extract**.
10. In the Extract dialog box, browse to the directory where you want the extracted files, and select **Extract**.
11. Close the window for the extracting application.

On a Windows workstation with a high-speed Internet connection that have access to the PIMG units, go to the following link:

Setting Up Digital Mitel PIMG Units (Firmware Version 6.x)

Step 1 On the Windows workstation, add a temporary route to enable access to the PIMG units.

a) On the Windows Start menu, select **Run**.
b) Enter **cmd**, and press **Enter**. The Command Prompt window appears.
c) At the command prompt, enter **route add 10.12.13.74 <IP Address of Workstation>**, and press **Enter**.

For example, if the IP address of the workstation is 198.1.3.25, enter “route add 10.12.13.74<space>198.1.3.25” in the Command Prompt window.

d) Close the Command Prompt window.

Step 2 Connect a PIMG unit to the network.

Step 3 In the web browser, go to **http://10.12.13.74**.

Step 4 To sign in, enter the following case-sensitive settings.

Table 165: Sign-in Settings

Field	Setting
Username	Enter **admin**.
Password	Enter **IpodAdmin**.

Step 5 Select **OK**.

Step 6 On the System menu, select **Upgrade**.

Step 7 On the Upgrade page, select **Browse**.

Step 8 In the Choose File dialog box, browse to the directory on the Windows workstation that has the extracted PIMG firmware update files.

Step 9 Select **Mtl_<xx** > **.app** (where <xx> is multiple digits), and select **Open**.

Step 10 On the Upgrade page, select **Install File**.

Step 11 After the file is installed, a message prompting you to restart the PIMG unit appears. Select **Cancel**.

Do not restart the PIMG unit until you are instructed to do so later in this procedure, even if the file installation fails. Restarting the PIMG unit at this step may prevent the PIMG unit from functioning correctly.

Step 12 Repeat Step 6 through Step 11 for each of the following files:

- Mtl_<xx>.fsh
- Run<xx>FskEcho.dsp
- Mtl<xx>.lca

Step 13 On the Configuration menu, select **Import/Export**.

Step 14 On the Import/Export page, select **Browse**.

Step 15 In the Choose File dialog box, browse to the file MTLDNI_Cfg_Mitel.ini.

Step 16 Select **MTLDNI_Cfg_Mitel.ini**, and select **Open**.

Step 17 On the Import/Export page, select **Import File**.

Step 18 After the file is imported, a message prompting you to restart the PIMG unit appears. Select **OK**.

Step 19 In the web browser, go to **http://10.12.13.74**.

Step 20 To sign in, enter the following case-sensitive settings.

Table 166: Sign-in Settings

Field	Setting
Username	Enter **admin**.

Field	Setting
Password	Enter **IpodAdmin**.

Step 21 Select **OK**.

Step 22 If your Unity Connection system must have an RTP port range of 16384 to 32767, do the following substeps. Otherwise, continue to Step 23.

You must set the RTP port range for the PIMG units if your system uses an RTP port range of 16384 to 32767. Otherwise, Unity Connection cannot answer calls and callers hear ringing or silence.

Note The default RTP port range for PIMG units is 49000 to 50000. Some Unity Connection configurations require a different RTP port range.

a) On the Configuration menu, select **Import/Export**.
b) On the Import/Export page, under Export Files, select **Export All Settings**.
c) In the File Download dialog box, select **Save**.
d) In the Save As dialog box, browse to the Windows workstation that has access to the PIMG units, browse to a directory where you want to save the file, and select **Save**.
e) In the Download Complete dialog box, select **Open**. Notepad opens the file Config.ini that you saved.
f) Locate the line with the following parameter:

```
gwRTPStartPort
```

g) Change the value of the parameter to **16384** so that the line reads as follows:

```
gwRTPStartPort = 16384
```

h) Locate the line with the following parameter:

```
gwRTPEndPort
```

i) Change the value of the parameter to **32767** so that the line reads as follows:

```
gwRTPEndPort = 32767
```

j) Save the file, and exit Notepad.
k) On the Configuration menu of the PIMG unit, select **Import/Export**.
l) On the Import/Export page, under Browse for Import File, select **Browse**.
m) In the Choose File dialog box, browse to the file Config.ini that you saved.
n) Select **Config.ini**, and select **Open**.
o) On the Import/Export page, select **Import File**.
p) When prompted to restart the PIMG unit, select **OK**.
q) When the PIMG unit has restarted, in the web browser, go to **http://10.12.13.74**.
r) To sign in, enter the following case-sensitive settings.

Table 167: Sign-in Settings

Field	Setting
Username	Enter **admin**.

Field	Setting
Password	Enter **IpodAdmin**.

s) Select **OK**.

Step 23 On the System menu, select **Password**.

Step 24 On the Change Password page, enter the following settings.

Table 168: Change Password Page Settings

Field	Setting
Old Password	Enter **IpodAdmin**. (This setting is case sensitive.)
New Password	Enter your new password. (This setting is case sensitive.)
Confirm Password	Enter your new password. (This setting is case sensitive.)

Step 25 Select **Change**.

Step 26 On the Configuration menu, select **Routing Table**.

Step 27 On the Routing Table page, under Router Configuration, select **VoIP Host Groups**.

Step 28 Under VoIP Host Groups, enter the following settings for the first VoIP Host Group.

Table 169: First VoIP Host Group Settings

Field	Settings
Name	Accept the default or enter another descriptive name of the VoIP host group.
Load-Balanced	*(*Unity Connection *without a cluster)* Select **False**. *(*Unity Connection *with a cluster configured)* Select **False**.
Fault-Tolerant	*(*Unity Connection *without a cluster)* Select **False**. *(*Unity Connection *with a cluster configured)* Select **True**.

Step 29 For Unity Connection without a cluster, under Host List, enter the host name or IP address of the Unity Connection server and the server port in the format <host name or IP address>:5060.

For Unity Connection with a cluster configured, under Host List, enter the host name or IP address of the subscriber server (the second Unity Connection server that you installed) and the server port in the format <host name or IP address>:5060.

Step 30 For Unity Connection without a cluster, continue to Step 32. For Unity Connection with a cluster configured, select **Add Host**.

Step 31 In the second field, enter the host name or IP address of the publisher server (the first Unity Connection server that you installed) and the server port in the format <host name or IP address>:5060.

Do not add a third host under Host List or a second host group under VoIP Host Groups. Otherwise, the Unity Connection cluster may not function correctly.

Step 32 Select **Submit**.

Step 33 Under Router Configuration, select **TDM Trunk Groups**.

Step 34 Under TDM Trunk Groups, select **Add Trunk Group**.

Step 35 Under TDM Trunk Groups, enter the following settings for the first TDM trunk group.

Table 170: First TDM Trunk Group Settings (Inbound Calls)

Field	Settings
Name	Enter **Inbound_PBX_Calls** or another unique name. This TDM trunk group handles all incoming calls from the phone system.
Selection Direction	Select **Ascending**.
Selection Mode	Select **Linear**.
Port/Channel Content	Enter the numbers of the PIMG ports handling inbound calls. For example, enter "*" for all PIMG ports, or enter "1-6" for the first six PIMG ports.

Step 36 Under TDM Trunk Groups, select **Add Trunk Group**.

Step 37 Enter the following settings for the second TDM trunk group.

Table 171: Second TDM Trunk Group Settings (MWIs)

Field	Settings
Name	Enter **MWIs** or another unique name. This TDM trunk group handles outbound MWI calls (where applicable).
Selection Direction	Select **Ascending**.
Selection Mode	Select **Cyclic**.
Port/Channel Content	Enter the numbers of the PIMG ports that dial out MWIs. For example, enter "*" for all PIMG ports, or enter "7,8" for the last two PIMG ports.

Step 38 Under TDM Trunk Groups, select **Add Trunk Group**.

Step 39 Enter the following settings for the third TDM trunk group.

Table 172: Third TDM Trunk Group Settings (Outbound Calls)

Field	Settings
Name	Enter **Outbound_PBX_Calls** or another unique name. This TDM trunk group handles all outbound calls from Unity Connection.
Selection Direction	Select **Descending**.
Selection Mode	Select **Linear**.

Field	Settings
Port/Channel Content	Enter * for all channels in all ports. Enter the numbers of the PIMG ports that handle outbound (dialout) calls. For example, enter "*" for all PIMG ports, or enter "7,8" for the last two PIMG ports.

Step 40 Select **Submit**.

Step 41 Under Router Configuration, select **Inbound VoIP Rules**.

Step 42 Under Inbound VoIP Rules, uncheck the **Enabled** check box for the default rule.

Step 43 Select **Add Rule**.

Step 44 Under Inbound VoIP Rules, enter the following settings for the first new inbound VoIP rule.

Table 173: First New Inbound VoIP Rule Settings (MWIs)

Field	Settings
Enable	Check this check box.
Rule Label	Enter **MWI_Calls** or another name. This inbound VoIP rule handles all MWI calls from Unity Connection.
Request Type	Select **Message**.
Originating VoIP Host Address	Enter *.

Step 45 Under Inbound VoIP Request Matching, enter the following settings.

The rule that you created in Step 44 must be selected. Otherwise, any changes you make apply to another rule.

Table 174: Inbound VoIP Request Matching Settings

Field	Settings
Calling Number	Enter *.
Calling Name	Enter *.
Called Number	Enter *.
Called Name	Enter *.
Redirect Number	Enter *.
Redirect Name	Enter *.

Step 46 Under Outbound Routes, enter the following settings.

The rule that you created in Step 44 must be selected. Otherwise, any changes you make apply to another rule.

Table 175: Outbound Routes Settings

Field	Settings
Device Selection	
Outbound Destination	Select **TDM**.
Trunk Group	Select the name of the TDM trunk group that you created for MWIs in Step 37. For example, select "MWIs."
CPID Manipulation	
Calling Number	Enter **S**.
Calling Name	Enter **S**.
Called Number	Enter **D**.
Called Name	Enter **D**.
Redirect Number	Enter **R**.
Redirect Name	Enter **R**.
Select Primary/Alternate Route	
Primary	Select **Primary**.

Step 47 Under Inbound VoIP Rules, select **Add Rule**.

Step 48 Under Inbound VoIP Rules, enter the following settings for the second new inbound VoIP rule.

Table 176: Second New Inbound VoIP Rule Settings (Outbound Calls)

Field	Settings
Enable	Check this check box.
Rule Label	Enter **Outbound_UC_Calls** or another name. This inbound VoIP rule handle all outbound calls from Unity Connection.
Request Type	Select **Call**.
Originating VoIP Host Address	Enter ***.

Step 49 Under Inbound VoIP Request Matching, enter the following settings.

The rule that you created in Step 48 must be selected. Otherwise, any changes you make apply to another rule.

Table 177: Inbound VoIP Request Matching Settings

Field	Settings
Calling Number	Enter ***.

Field	Settings
Calling Name	Enter *****.
Called Number	Enter *****.
Called Name	Enter *****.
Redirect Number	Enter *****.
Redirect Name	Enter *****.

Step 50 Under Outbound Routes, enter the following settings.

The rule that you created in Step 48 must be selected. Otherwise, any changes you make apply to another rule.

Table 178: Outbound Routes Settings

Field	Settings
Device Selection	
Outbound Destination	Select **TDM**.
Trunk Group	Select the name of the TDM trunk group that you created for outbound calls in Step 39. For example, select "Outbound_PBX_Calls."
CPID Manipulation	
Calling Number	Enter **S**.
Calling Name	Enter **S**.
Called Number	Enter **D**.
Called Name	Enter **D**.
Redirect Number	Enter **R**.
Redirect Name	Enter **R**.
Select Primary/Alternate Route	
Primary	Select **Primary**.

Step 51 Select **Submit**.

Step 52 Under Router Configuration, select **Inbound TDM Rules**.

Step 53 Under Inbound TDM Rules, enter the following settings for the first inbound TDM rule.

Table 179: First Inbound TDM Rule Settings

Field	Settings
Enable	Check this check box.

Field	Settings
Rule Label	Enter **Inbound_Rule_1** or another name. This inbound TDM rule handles all incoming calls from the phone system.
Request Type	Select **Call**.
Trunk Group	Select the name of the TDM trunk group that you created for incoming calls from the phone system in Step 35. For example, select “Inbound_PBX_Calls.”

Step 54 Under Inbound TDM Request Matching, enter the following settings.

The rule that you created in Step 53 must be selected. Otherwise, any changes you make apply to another rule.

Table 180: Inbound TDM Request Matching Settings

Field	Settings
Calling Number	Enter the applicable matching rule used. For example, enter “*” for all.
Calling Name	Enter the applicable matching rule used. For example, enter “*” for all.
Called Number	Enter the applicable matching rule used. For example, enter “*” for all.
Called Name	Enter the applicable matching rule used. For example, enter “*” for all.
Redirect Number	Enter the applicable matching rule used. For example, enter “*” for all.
Redirect Name	Enter the applicable matching rule used. For example, enter “*” for all.

Step 55 Under Outbound Routes, enter the following settings.

The rule that you created in Step 53 must be selected. Otherwise, any changes you make apply to another rule.

Table 181: Outbound Routes Settings

Field	Settings
Device Selection	
Outbound Destination	Select **VoIP**.
Host Group	Select the name of the VoIP host group that you created for Cisco Unity Connection in Step 28.
CPID Manipulation	
Calling Number	Enter S.
Calling Name	Enter S.
Called Number	Enter D.
Called Name	Enter D.

Field	Settings
Redirect Number	Enter R.
Redirect Name	Enter R.
Select Primary/Alternate Route	
Primary	Select **Primary**.

Step 56 If you want to create more Inbound TDM rules, under Inbound TDM Rules, select **Add Rule**. Otherwise, continue to Step 58.

Step 57 Repeat Step 53 through Step 56 for all remaining inbound TDM rules that you want to create.

Step 58 Select **Submit**.

Step 59 On the Configuration menu, select **TDM** > **General**.

Step 60 On the TDM General Settings page, enter the following settings.

Table 182: TDM General Settings Page Settings

Field	Settings
PCM Coding	Select **uLaw**.
Minimum Call Party Delay (ms)	Enter **500**.
Maximum Call Party Delay (ms)	Enter **2000**.
Dial Digit on Time (ms)	Enter **100**.
Dial Inter-Digit Time (ms)	Enter **100**.
Dial Pause Time (ms)	Enter **2000**.
Turn MWI On FAC	Enter the code that turns MWIs on.
Turn MWI Off FAC	Enter the code that turns MWIs off.
Outbound Call Connect Timeout (ms)	Enter **10000**.
Wait for Ringback/Connect on Blind Transfer	Select **Yes**.
Hunt Group Extension	Enter the pilot number of the Unity Connection voice messaging ports.
Disconnect on Fax Cleardown Tone	Select **No**.

Step 61 Select **Submit**.

Step 62 On the Configuration menu, select **TDM** > **Port Enable**.

Step 63 On the TDM Port Enabling page, select **No** for the ports that you want to disable on the PIMG unit.

Step 64 Confirm that **Yes** is selected for all other ports on the PIMG unit.

Step 65 Select **Submit**.

Step 66 On the Configuration menu, select **VoIP** > **General**.

Step 67 On the VoIP General Settings page, enter the following settings.

Table 183: VoIP General Settings Page Settings

Field	Setting
User-Agent	
Host and Domain Name	Enter the host and domain name of the PIMG unit.
Transport Type	Select **UDP**.
Call as Domain Name	Select **No**.
SIPS URI Scheme Enabled	Select **No**.
Invite Expiration (sec)	Enter **120**.
Server	
DNS Server Address	Enter the IP Address of the Domain Name Server that the PIMG unit uses.
DNS Translation of Phone Numbers	Select **No**.
Registration Server Address	Leave this field blank.
Registration Server Port	Enter **5060**.
Registration Expiration (sec)	Enter **3600**.
TCP/UDP	
UDP/TCP Transports Enabled	Select **Yes**.
TCP/UDP Server Port	Enter **5060**.
TCP Inactivity Timer (sec)	Enter **30**.
TLS	
TLS Transport Enabled	Select **No**.
TLS Server Port	Enter **5061**.
SSL TLS Protocol	Select **SSLv3 TLSv1**.

Field	Setting
Mutual TLS Authentication Required	Select **Yes**.
TLS Inactivity Timer (sec)	Enter **30**.
Verify TLS Peer Certificate Date	Select **Yes**.
Verify TLS Peer Certificate Trust	Select **Yes**.
Proxy	
Primary Proxy Server Address	Leave this field blank. Unity Connection
Primary Proxy Server Port	Not applicable. Leave the default setting.
Backup Proxy Server Address	Not applicable. Leave the default setting.
Backup Proxy Server Port	Not applicable. Leave the default setting.
Proxy Query Interval	Enter **10**.
Timing	
T1 Time (ms)	Enter **400**.
T2 Time (ms)	Enter **3000**.
T4 Time (ms)	Enter **5000**.
Monitoring	
Monitor Call Connections	Select **No**.
Call Monitor Interval (sec)	
Monitor VoIP Hosts	
VoIP Host Monitor Interval (sec)	

Step 68 Select **Submit**.

Step 69 On the Configuration menu, select **VoIP** > **Media**.

Step 70 On the VoIP Media Settings page, enter the following settings.

Table 184: VoIP Media Settings Page Settings

Field	Settings
Audio	
Audio Compression	Select the preferred codec for audio compression.
RTP Digit Relay Mode	Select **RFC2833**.
RTP Fax/Modem Tone Relay Mode	Select **RFC2833**.
RTP Source IP Address Validation	Select **Off**.
RTP Source UDP Port Validation	Select **Off**.
Signaling Digit Relay Mode	Select **Off**.
Voice Activity Detection	Select **Off**.
RFC 3960 Early Media Support	Select **On Demand**.
Frame Size	Select the applicable setting: • G.711—**20** • G.729AB—**10** Failure to use the correct setting results in recorded messages containing nothing but silence.
Frames Per Packet	Select the applicable setting: • G.711—**1** • G.729AB—**2** Failure to use the correct setting results in recorded messages containing nothing but silence.
Fax	
Fax IP-Transport Mode	
SRTP	
SRTP Preference	Select **RTP Only**.
MKI on Transmit Stream	Select **Yes**.
Key Derivation Enable	Select **Yes**.
Key Derivation Rate	Enter **16**.
Anti-replay Window Size Hint	Enter **64**.

Field	Settings
Cipher Mode	Select **AES_Counter_Mode**.
Authentication Type	Select **SHA1**.
Authentication Tag Length	Select **SHA1_80_bit**.

Step 71 Select **Submit**.

Step 72 On the Configuration menu, select **VoIP** > **QOS**.

Step 73 On the VoIP QOS Configuration page, enter the following settings.

Table 185: VoIP QOS Configurative Page Settings

Field	Settings
Call Control QOS Byte	Enter **104**.
RTP QOS Byte	Enter **184**.

Step 74 Select **Submit**.

Step 75 On the Configuration menu, select **IP**.

Step 76 On the IP Settings page, enter the following settings.

Table 186: IP Settings Page Settings

Field	Settings
Client IP Address	Enter the new IP address you want to use for the PIMG unit. (This is the IP address that you enter in Cisco Unity Connection Administration when you create the integration.)
Client Subnet Mask	Enter the new subnet mask, if the subnet mask is different from the default IP address.
Default Network Gateway Address	Enter the IP address of the default network gateway router that the PIMG units use.
BOOTP Enabled	Select **No**.
SNTP Server IP Address	

Step 77 Select **Submit**.

Step 78 On the Configuration menu, select **Tone Detection**.

Step 79 On the Tone Detection page, under Call Progress Tone - Learn, in the Learn Tone Event field, select **Busy** and do the following substeps to verify that the tone is correct.

a) From a available phone, call a second phone.
b) Answer the second phone when it rings, and leave both handsets off so that both phones are busy.
c) From a third phone, dial one of the busy phones.
d) Confirm that you hear a busy tone.

e) Hang up the third phone but leave the handsets for the other two phones off.

Step 80 Under Call Progress Tone - Learn, in the Dial String field, enter the extension that you dialed in Step 79c. from the third phone.

Step 81 Select **Learn**.

Step 82 On the Tone Detection page, under Call Progress Tone - Learn, in the Learn field, select **Error** and do the following substeps to verify that the tone is correct.

a) From an available phone, dial an extension that does not exist.
b) Confirm that you hear the reorder or error tone.
c) Hang up the phone.

Step 83 Under Call Progress Tone - Learn, in the Dial String field, enter the extension that you dialed in Step 82a.

Step 84 Select **Learn**.

Step 85 On the Tone Detection page, under Call Progress Tone - Learn, in the Learn field, select **Ringback** and do the following substeps to verify that the tone is correct.

a) From an available phone, dial an extension that does exist.
b) Confirm that you hear the ringback tone.
c) Hang up the phone.

Step 86 Under Call Progress Tone - Learn, in the Dial String field, enter the extension that you dialed in Step 85a.

Step 87 Select **Learn**.

Step 88 Select **Submit**.

Step 89 Hang up the phones that you used in Step 79.

Step 90 On the System menu, select **Restart**.

Step 91 On the Restart page, select **Restart Unit Now**.

Step 92 Repeat Step 2 through Step 91 on all remaining PIMG units.

Configuring Unity Connection Integration with Mitel SX-2000 Phone System

After ensuring that the Mitel SX-2000 phone system, the PIMG units, and Unity Connection are ready for the integration, do the following procedure to set up the integration and to enter the port settings.

Creating an Integration

Step 1 In Cisco Unity Connection Administration, expand **Telephony Integrations**, then select **Phone System**.

Step 2 On the Search Phone Systems page, under Display Name, select the name of the default phone system.

Step 3 On the Phone System Basics page, in the Phone System Name field, enter the descriptive name that you want for the phone system.

Step 4 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 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 5 Under Message Waiting Indicator Settings, select**Use Same Port for Enabling and Disabling MWIs**.

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 applicable settings and select **Save**.

Table 187: Settings for the New Port Group Page

Field	Setting
Phone System	Select the name of the phone system that you entered in Step 3.
Create From	Select **Port Group Template** and select **SIP to DMG/PIMG/TIMG** 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.
SIP Security Profile	Select **5060**.
SIP Transport Protocol	Select the SIP transport protocol that Unity Connection uses.
IP Address or Host Name	Enter the IP address of the PIMG unit that you are integrating with Unity Connection.
Port	Enter the SIP port of the PIMG unit that Unity Connection connects to. We recommend that you use the default setting. This name must match the setting in the TCP/UDP Server Port field on the Configuration > VoIP > General page of the PIMG unit. Otherwise, the integration cannot function correctly.

Step 9 On the Port Group Basics page, under Message Waiting Indicator Settings, uncheck the **Enable Message Waiting Indicators** check box and select **Save**.

Step 10 In the Related Links drop-down box, select **Add Ports** and select **Go**.

Step 11 On the New Port page, enter the following settings and select **Save**.

Table 188: Settings for the New Port Page

Field	Considerations
Enabled	Check this check box.
Number of Ports	Enter **8**. (If you want to use fewer than eight voice messaging ports, enter the number of voice messaging ports that you want to use on this PIMG unit.) **Note** For a Unity Connection cluster, the server must have the number of voice messaging ports that are set up on the phone system for the PIMG integration so that this server can handle all voice messaging traffic for the cluster if one of the servers stops functioning. For example, if the phone system is set up with 16 voice messaging ports, this server must have 16 voice messaging ports.
Phone System	Select the name of the phone system that you entered in Step 3.

Field	Considerations
Port Group	Select the name of the port group that you added in Step 8.

Step 12 On the Search Ports page, select the display name of the first voice messaging port that you created for this phone system integration.

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

Step 13 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 189: 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 ringing tone but are not answered. Typically, the port is disabled only by the installer duri testing.
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 incomi calls from unidentified callers or from users.
Perform Message Notification	Check this check box to designate the port for notifying users of messages. Assign Perfor Message Notification to the least busy ports.
Send MWI Requests	(Serial integrations only) Uncheck this check box. Otherwise, the integration may not func correctly. (Digital and analog integrations only) Check this check box to designate the port for turni 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 th phone in Unity Connection web applications. Assign Allow TRAP Connections to the lea busy ports.
Outgoing Hunt Order	Enter the priority order in which Unity Connection uses the ports when dialing out (for exam if the Perform Message Notification, Send MWI Requests, or Allow TRAP Connections cl box is checked). The highest numbers are used first. However, when multiple ports have t same Outgoing Hunt Order number, Unity Connection uses the port that has been idle the longest.

Step 14 Select **Save**.

Step 15 Select **Next**.

Step 16 Repeat Step 13 through Step 15 for all remaining voice messaging ports for the phone system.

Step 17 In Cisco Unity Connection Administration, expand **Telephony Integrations**, then select **Phone System**.

Step 18 On the Search Phone Systems page, under Display Name, select the name of the phone system that you entered in Step 3.

Step 19 Repeat Step 7 through Step 18 for each remaining PIMG unit integrated with Unity Connection.

Note Each PIMG unit is connected to one port group with the applicable voice messaging ports. For example, a system that uses five PIMG units requires five port groups, one port group for each PIMG unit.

Step 20 To create a port group for MWIs, do the following substeps.

Note All MWI requests are handled by the master PIMG unit and sent to the phone system over the RS-232 serial cable (without using voice messaging ports). So the following substeps create a separate port group without voice messaging ports and enable the port group for MWIs that are "not port specific" (they do not use ports).

a) In Cisco Unity Connection Administration expand **Telephony Integration** then select **Port Group** .
b) On the Search Port Groups page, select **Add New**.
c) On the New Port Group page, enter the applicable settings and select **Save**.

Table 190: Settings for the New Port Group Page (MWIs)

Field	Setting
Phone System	Select the name of the phone system that you entered in Step 3.
Create From	Select Port Group Template and select **SIP to DMG/PIMG/TIMG** SIP to in the drop-down box.
Display Name	Enter a **MWI Port Group** or another descriptive name for the port group.
SIP Security Profile	Select **5060**.
SIP Transport Protocol	Select the SIP transport protocol that Unity Connection uses.
IPv4 Address or Host Name	Enter the IP address of the master PIMG unit.
IPv6 Address or Host Name	Do not enter a value in this field. IPv6 is not supported for PIMG integrations.
IP Address or Host Name	Enter the IP address of the master PIMG unit.
Port	Enter the SIP port of the master PIMG unit. **Caution** This name must match the setting in the TCP/UDP Server Port field on the Configuration > VoIP > General page of the PIMG unit. Otherwise, the integration cannot function correctly.

d) On the Port Group Basics page, on the Edit menu, select **Advanced Settings**.
e) On the Edit Advanced Settings page, under SIP MWI Requests, select **Not Port Specific** then select **Save**.
f) On the Edit menu, select **Port Group Basics**.
g) Under Port Group, select **Reset**.
h) Under Message Waiting Indicator Settings, confirm that the **Enable Message Waiting Indicator** check box is checked and select **Save**.

Step 21 If another phone system integration exists, in Cisco Unity Connection Administration, expand **Telephony Integrations**, then select **Trunk**. Otherwise, skip to Step 25.

Step 22 On the Search Phone System Trunks page, on the Phone System Trunk menu, select **New Phone System Trunk**.

Step 23 On the New Phone System Trunk page, enter the following settings for the phone system trunk and select **Save**.

Table 191: Settings for the Phone System Trunk

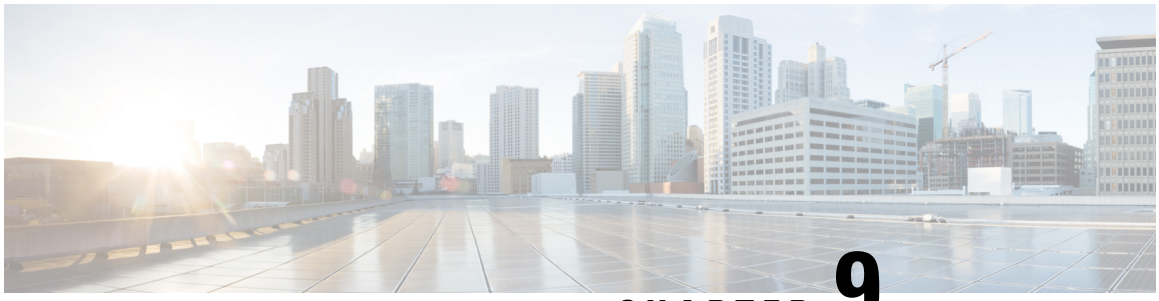
Field	Setting
From Phone System	Enter the display name of the phone system that you are creating a trunk for.
To Phone System	Enter the display name of the previously existing phone system that the trunk connects to.
Trunk Access Code	Enter the extra digits that Unity Connection must dial to transfer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

Step 24 Repeat Step 22 and Step 23 for all remaining phone system trunks that you want to create.

Step 25 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 26 In the Task Execution Results window, select **Close**.



CHAPTER 9

Setting Up an NEC NEAX 2400 Digital PIMG Integration with Cisco Unity Connection

• Setting Up an NEC NEAX 2400 Digital PIMG Integration, on page 159

Setting Up an NEC NEAX 2400 Digital PIMG Integration

Task List for NEC NEAX 2400 PIMG Phone System Integration

Before doing the following tasks to integrate Unity Connection with the NEC NEAX 2400 phone system using PIMG units (media gateways), confirm that the Unity Connection server is ready for the integration after completing the server installation, following the tasks in the "Installing Cisco Unity Connection" chapter of the *Install, Upgrade, and Maintenance Guide for Cisco Unity Connection Release 15*, available at https://www.cisco.com/c/en/us/td/docs/voice_ip_comm/connection/15/install_upgrade/guide/b_15cuciumg.html.

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, on page 12 section.
2. Plan how the voice messaging ports are used by Unity Connection. See the Planning the Usage of Voice Messaging Ports, on page 7 chapter.
3. Program the NEC NEAX 2400 phone system and extensions. See the Programming NEC NEAX 2400 PIMG Phone System Integration section.
4. Set up the PIMG units. See the Setting Up Digital PIMG Units section.
5. Create the integration. See the Configuring Unity Connection for Integration with NEC NEAX 2400 Phone System, on page 178 section.
6. Test the integration. See the Testing the Integration, on page 381 chapter.
7. If this integration is a second or subsequent integration, add the applicable new user templates for the new phone system. See the Integrations with Multiple Phone Systems, on page 5 chapter.

Requirements

This integration supports configurations of the following components:

Phone System

- One of the following NEC NEAX 2400 phone systems:
  - IMG
  - IMX
  - IPX (release 15 or later)
- One or more of the applicable PIMG units. For details, see the "Introduction" chapter.
- The voice messaging ports in the phone system connected by digital lines to the ports on the PIMG units.

To simplify troubleshooting, we recommend that you connect the voice messaging ports on the phone system to the ports on the PIMG units in a planned manner. For example, connect the first phone system voice messaging port to the first port on the first PIMG unit, connect the second phone system voice messaging port to the second port on the first PIMG unit, and so on. Alternatively, if you have multiple PIMG units, you can reduce answer times in the event of a PIMG unit failure by connecting the phone system ports to the PIMG units in a round-robin fashion. For example, connect the first phone system voice messaging port to the first port on the first PIMG unit, connect the second phone system voice messaging port to the first port on the second PIMG unit, and so on.

- The PIMG units connected to the same LAN or WAN that Unity Connection is connected to.
- If the PIMG units connect to a WAN, the requirements for the WAN network connections are:
  - For G.729a codec formatting, a minimum of 32.76 Kbps guaranteed bandwidth for each voice messaging port.
  - For G.711 codec formatting, a minimum of 91.56 Kbps guaranteed bandwidth for each voice messaging port.
  - No network devices that implement network address translation (NAT).
  - A maximum 200 ms one-way network latency.

Unity Connection Server

- Unity Connection installed following the tasks in the "Installing Cisco Unity Connection" chapter of the *Install, Upgrade, and Maintenance Guide for Cisco Unity Connection Release 15*, available at https://www.cisco.com/c/en/us/td/docs/voice_ip_comm/connection/15/install_upgrade/guide/b_15cuciumg.html.
- A license that enables the applicable number of voice messaging ports.

Programming NEC NEAX 2400 PIMG Phone System Integration

The following programming instructions are provided as an example only. The specific programming for your phone system may vary depending on its configuration.

Caution In programming the phone system, do not send calls to voice messaging ports in 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.

Do the following steps to program the NEC NEAX 2400 phone system using Command Line Interface

Step 1 Sign in to the NEC NEAX 2400 administration terminal and go to the Maintenance Command Menu page.

Step 2 On the Maintenance Command Menu page, enter **14** (Installation).

Step 3 On the Installation Menu page, enter **3** (ASYD) to assign system data.

Step 4 Enter the following settings.

Table 192: Assignment of System Data Settings

Field	Setting
Sys	Enter **1**.
Index	Enter **78**.
Data	Enter **0B**.

Step 5 On the Maintenance Command Menu page, enter **6** (Station Data).

Step 6 On the Station Data Commands page, enter **3** (ASTN) to assign the station numbers for the voice messaging ports.

Step 7 On the Station Number Assignment page, enter the extension for the first port that connects to the PIMG unit.

Confirm that the station number (extension) is not already assigned. Otherwise, the integration cannot function correctly.

Step 8 On the Station Data Commands page, enter **2** (ASCL).

Step 9 On the Station Class Data page, assign the applicable station class information to the voice messaging port.

Step 10 On the Station Data Commands page, enter **1** (ASDT).

Step 11 On the Station Data page, in the LENS field, enter the applicable line equipment number for the voice messaging port.

Step 12 On the Station Data Commands page, enter **5** (AKYD).

Step 13 On the Key Data page, select **Assignment/Change** and press **Enter**.

Step 14 On the Assignment of Key Data page, enter the following settings to enable the PRIMARY APPEARANCE function on Key 1.

Table 193: Assignment of Key Data Settings for Key 1

Field	Setting
KYN	Enter **1**.
KYI	Enter **2**.

Step 15 Press **Esc** to move to the next operation.

Step 16 Enter the following settings to enable the MWL SET function on Key 5.

Table 194: Assignment of Key Data Settings for Key 5

Field	Setting
KYN	Enter **5**.
FKI	Enter **9**.

Step 17 Press **Esc** to move to the next operation.

Step 18 Enter the following settings to enable the MWL CNCL function on Key 6.

Table 195: Assignment of Key Data Settings for Key 6

Field	Setting
KYN	Enter **6**.
FKY	Enter **11**.

Step 19 On the Maintenance Command Menu page, enter **13** (Restriction Data).

Step 20 On the Restriction Data Commands page, enter **2** (ASFC).

Step 21 On the Service Feature Assignment page, enter the following settings.

Table 196: Service Feature Assignment Settings

Field	Setting
TN:1	Enter **SFI:74**.
TN:1	Enter **SFI:82**.

Step 22 Program each phone to forward calls to the pilot number assigned to the voice messaging ports, based on one of the Unity Connection call transfer types shown in Table 197: Call Transfer Types.

Table 197: Call Transfer Types

Transfer Type	Usage
Release transfer (blind transfer)	Program the phone to forward calls to the pilot number when: • The extension is busy. • The call is not answered.
Supervised transfer	Program the user station to forward calls to the pilot number only when the call is not answered (on the phone system, the number of rings before forwarding must be more than the number of rings to supervise the call). Confirm that call forwarding is disabled when the extension is busy.

Setting Up Digital PIMG Units

Do the following procedures to set up the digital PIMG units that are connected to the NEC NEAX 2400 phone system.

These procedures require that the following tasks have already been completed:

- The phone system is connected to the PIMG units using digital lines.
- The PIMG units are ready to be connected to the LAN or WAN.
- The PIMG units are connected to a power source.

Fields that are not mentioned in the following procedures must keep their default values. For the default values of all fields, see the manufacturer documentation for the PIMG units.

Downloading the PIMG Firmware Update Files for Digital PIMG Units

http://software.cisco.com/download/navigator.html?mdfid=280082558&i=rm.

Note To access the software download page, you must be signed in to Cisco.com as a registered user.

This procedure describes the steps when using Internet Explorer as your web browser. If you are using a different web browser, the steps may differ.

1. In the tree control on the Downloads Home page, expand Unified Communications> **Unified Communications Applications** > **Messaging** > **Cisco Unity** and select **Cisco Unity Telephony Integration**.
2. On the Log In page, enter your username and password, then select **Log In**.
3. On the Select a Release page, under Latest Releases, select the most recent release.
4. In the right column, select the version of the firmware for digital PIMG units.
5. On the Download Image page, select **Download**.
6. On the Supporting Document(s) page, select **Agree**.
7. In the File Download dialog box, select **Save**.
8. In the Save As dialog box, browse to the Windows workstation that have access the PIMG units, browse to a directory where you want to save the file, and select **Save**.
9. In the Download Complete dialog box, select **Open**. The window for extracting the PIMG firmware update files appears and select **Extract**.
10. In the Extract dialog box, browse to the directory where you want the extracted files, and select **Extract**.
11. Close the window for the extracting application.

On a Windows workstation that have access to the PIMG units, go to the following link:

Setting Up the Digital PIMG Units (Firmware Version 6.x)

Step 1 On the Windows workstation, add a temporary route to enable access to the PIMG units.

a) On the Windows Start menu, select **Run**.

b) Enter **cmd**, and press **Enter**. The Command Prompt window appears.

c) At the command prompt, enter **route add 10.12.13.74 <IP Address of Workstation>**, and press **Enter**.

For example, if the IP address of the workstation is 198.1.3.25, enter “route add 10.12.13.74<space>198.1.3.25” in the Command Prompt window.

d) Close the Command Prompt window.

Step 2 Connect a PIMG unit to the network.

Step 3 In the web browser, go to **http://10.12.13.74**.

Step 4 To sign in, enter the following case-sensitive settings.

Table 198: Sign-in Settings

Field	Setting
Username	Enter **admin**.
Password	Enter **IpodAdmin**.

Step 5 Select **OK**.

Step 6 On the System menu, select **Upgrade**.

Step 7 On the Upgrade page, select **Browse**.

Step 8 In the Choose File dialog box, browse to the directory on the Windows workstation that has the extracted PIMG firmware update files.

Step 9 Select **Ami<xx** > **.app** (where <xx> is multiple digits), and select **Open**.

Step 10 On the Upgrade page, select **Install File**.

Step 11 After the file is installed, a message prompting you to restart the PIMG unit appears. Select **Cancel**.

Do not restart the PIMG unit until you are instructed to do so later in this procedure, even if the file installation fails. Restarting the PIMG unit at this step may prevent the PIMG unit from functioning correctly.

Step 12 Repeat Step 6 through Step 11 for each of the following files:

- Ami_<xx>.fsh
- Run<xx>FskEcho.dsp
- iNim<xx>.ibt
- iNim<xx>.ilc
- iNim<xx>.iap

Step 13 On the Configuration menu, select **Import/Export**.

Step 14 On the Import/Export page, select **Browse**.

Step 15 In the Choose File dialog box, browse to the file DNI_Cfg_Generic.ini.

Step 16 Select **DNI_Cfg_Generic.ini**, and select **Open**.

Step 17 On the Import/Export page, select **Import File**.

Step 18 After the file is imported, a message prompting you to restart the PIMG unit appears. Select **OK**.

Step 19 In the web browser, go to **http://10.12.13.74**.

Step 20 To sign in, enter the following case-sensitive settings.

Table 199: Sign-in Settings

Field	Setting
Username	Enter **admin**.
Password	Enter **IpodAdmin**.

Step 21 Select **OK**.

Step 22 Do the following substeps to configure an RTP port range of 16384 to 32767.

You must set the RTP port range for the PIMG units if your system uses an RTP port range of 16384 to 32767. Otherwise, Unity Connection cannot answer calls and callers hear ringing or silence.

Note The default RTP port range for PIMG units is 49000 to 50000. Some Unity Connection configurations require a different RTP port range.

a) On the Configuration menu, select **Import/Export**.
b) On the Import/Export page, under Export Settings, select **Export All Settings**.
c) In the File Download dialog box, select **Save**.
d) In the Save As dialog box, browse to the Windows workstation that has access to the PIMG units, browse to a directory where you want to save the file, and select **Save**.
e) In the Download Complete dialog box, select **Open**. Notepad opens the file Config.ini that you saved.
f)
g)
h) Locate the line with the following parameter:

```
gwRTPStartPort
```

i) Change the value of the parameter to **16384** so that the line reads as follows:

```
gwRTPStartPort = 16384
```

j) Locate the line with the following parameter:

```
gwRTPEndPort
```

k) Change the value of the parameter to **32767** so that the line reads as follows:

```
gwRTPEndPort = 32767
```

l) Save the file, and exit Notepad.
m) On the Configuration menu of the PIMG unit, select **Import/Export**.
n) On the Import/Export page, under Browse for Import File, select **Browse**.
o) In the Choose File dialog box, browse to the file Config.ini that you saved.

p) Select **Config.ini**, and select **Open**.
q) On the Import/Export page, select **Import File**.
r) When prompted to restart the PIMG unit, select **OK**.
s) When the PIMG unit has restarted, in the web browser, go to **http://10.12.13.74**.
t) To sign in, enter the following case-sensitive settings.

Table 200: Sign-in Settings

Field	Setting
Username	Enter **admin**.
Password	Enter **IpodAdmin**.

u) Select **OK**.

Step 23 On the System menu, select **Password**.

Step 24 On the Change Password page, enter the following settings.

Table 201: Change Password Page Settings

Field	Setting
Old Password	Enter **IpodAdmin**. (This setting is case sensitive.)
New Password	Enter your new password. (This setting is case sensitive.)
Confirm Password	Enter your new password. (This setting is case sensitive.)

Step 25 Select **Change**.

Step 26 On the Configuration menu, select **Routing Table**.

Step 27 On the Routing Table page, under Router Configuration, select **VoIP Host Groups**.

Step 28 Under VoIP Host Groups, enter the following settings for the first VoIP Host Group.

Table 202: First VoIP Host Group Settings

Field	Settings
Name	Accept the default or enter another descriptive name of the VoIP host group.
Load-Balanced	*(*Unity Connection *without a cluster)* Select **False**. *(*Unity Connection *with a cluster configured)* Select **False**.
Fault-Tolerant	*(*Unity Connection *without a cluster)* Select **False**. *(*Unity Connection *with a cluster configured)* Select **True**.

Step 29 For Unity Connection without a cluster, under Host List, enter the host name or IP address of the Unity Connection server and the server port in the format <host name or IP address>:5060.

For Unity Connection with a cluster configured, under Host List, enter the host name or IP address of the subscriber server (the second Unity Connection server that you installed) and the server port in the format <host name or IP address>:5060.

Step 30 For Unity Connection without a cluster, continue to Step 32. For Unity Connection with a cluster configured, select **Add Host**.

Step 31 In the second field, enter the host name or IP address of the publisher server (the first Unity Connection server that you installed) and the server port in the format <host name or IP address>:5060.

Do not add a third host under Host List or a second host group under VoIP Host Groups. Otherwise, the Unity Connection cluster may not function correctly.

Step 32 Select **Submit**.

Step 33 Under Router Configuration, select **TDM Trunk Groups**.

Step 34 Under TDM Trunk Groups, select **Add Trunk Group**.

Step 35 Under TDM Trunk Groups, enter the following settings for the first TDM trunk group.

Table 203: First TDM Trunk Group Settings (Inbound Calls)

Field	Settings
Name	Enter **Inbound_PBX_Calls** or another unique name. This TDM trunk group handles all incoming calls from the phone system.
Selection Direction	Select **Ascending**.
Selection Mode	Select **Linear**.
Port/Channel Content	Enter the numbers of the PIMG ports that handle inbound calls. For example, enter "*" for all PIMG ports, or enter "1-6" for the first six PIMG ports.

Step 36 Under TDM Trunk Groups, select **Add Trunk Group**.

Step 37 Enter the following settings for the second TDM trunk group.

Table 204: Second TDM Trunk Group Settings (MWIs)

Field	Settings
Name	Enter **MWIs** or another unique name. This TDM trunk group handles outbound MWI calls (where applicable).
Selection Direction	Select **Ascending**.
Selection Mode	Select **Cyclic**.
Port/Channel Content	Enter the numbers of the PIMG ports that MWIs. For example, enter "*" for all PIMG ports, or enter "7,8" for the last two PIMG ports.

Step 38 Under TDM Trunk Groups, select **Add Trunk Group**.

Step 39 Enter the following settings for the third TDM trunk group.

Table 205: Third TDM Trunk Group Settings (Outbound Calls)

Field	Settings
Name	Enter **Outbound_PBX_Calls** or another unique name. This TDM trunk group handles all outbound calls from Unity Connection.
Selection Direction	Select **Descending**.
Selection Mode	Select **Linear**.
Port/Channel Content	Enter ***** for all channels in all ports. Enter the numbers of the PIMG ports that handle outbound (dialout) calls. For example, enter "*" for all PIMG ports, or enter "7,8" for the last two PIMG ports.

Step 40 Select **Submit**.

Step 41 Under Router Configuration, select **Inbound VoIP Rules**.

Step 42 Under Inbound VoIP Rules, uncheck the **Enabled** check box for the default rule.

Step 43 Select **Add Rule**.

Step 44 Under Inbound VoIP Rules, enter the following settings for the first new inbound VoIP rule.

Table 206: First New Inbound VoIP Rule Settings (MWIs)

Field	Settings
Enable	Check this check box.
Rule Label	Enter **MWI_Calls** or another name. This inbound VoIP rule handles all MWI calls from Unity Connection.
Request Type	Select **Message**.
Originating VoIP Host Address	Enter *****.

Step 45 Under Inbound VoIP Request Matching, enter the following settings.

The rule that you created in Step 44 must be selected. Otherwise, any changes you make apply to another inbound VoIP rule.

Table 207: Inbound VoIP Request Matching Settings

Field	Settings
Calling Number	Enter *****.
Calling Name	Enter *****.
Called Number	Enter *****.
Called Name	Enter *****.

Field	Settings
Redirect Number	Enter *****.
Redirect Name	Enter *****.

Step 46 Under Outbound Routes, enter the following settings.

The rule that you created in Step 44 must be selected. Otherwise, any changes you make apply to another rule.

Table 208: Outbound Routes Settings

Field	Settings
Device Selection	
Outbound Destination	Select **TDM**.
Trunk Group	Select the name of the TDM trunk group that you created for MWIs in Step 37. For example, select "MWIs."
CPID Manipulation	
Calling Number	Enter **S**.
Calling Name	Enter **S**.
Called Number	Enter **D**.
Called Name	Enter **D**.
Redirect Number	Enter **R**.
Redirect Name	Enter **R**.
Select Primary/Alternate Route	
Primary	Select **Primary**.

Step 47 Under Inbound VoIP Rules, select **Add Rule**.

Step 48 Under Inbound VoIP Rules, enter the following settings for the second new inbound VoIP rule.

Table 209: Second New Inbound VoIP Rule Settings (Outbound Calls)

Field	Settings
Enable	Check this check box.
Rule Label	Enter **Outbound_UC_Calls** or another name. This inbound VoIP rule handles all outbound calls from Unity Connection.
Request Type	Select **Call**.

Field	Settings
Originating VoIP Host Address	Enter *****.

Step 49 Under Inbound VoIP Request Matching, enter the following settings.

The rule that you created in Step 48 must be selected. Otherwise, any changes you make apply to another rule.

Table 210: Inbound VoIP Request Matching Settings

Field	Settings
Calling Number	Enter *****.
Calling Name	Enter *****.
Called Number	Enter *****.
Called Name	Enter *****.
Redirect Number	Enter *****.
Redirect Name	Enter *****.

Step 50 Under Outbound Routes, enter the following settings.

The rule that you created in Step 48 must be selected. Otherwise, any changes you make apply to another rule.

Table 211: Outbound Routes Settings

Field	Settings
Device Selection	
Outbound Destination	Select **TDM**.
Trunk Group	Select the name of the TDM trunk group that you created for outbound calls in Step 39. For example, select “Outbound_PBX_Calls.”
CPID Manipulation	
Calling Number	Enter **S**.
Calling Name	Enter **S**.
Called Number	Enter **D**.
Called Name	Enter **D**.
Redirect Number	Enter **R**.
Redirect Name	Enter **R**.
Select Primary/Alternate Route	

Field	Settings
Primary	Select **Primary**.

Step 51 Select **Submit**.

Step 52 Under Router Configuration, select **Inbound TDM Rules**.

Step 53 Under Inbound TDM Rules, enter the following settings for the first inbound TDM rule.

Table 212: First Inbound TDM Rule Settings

Field	Settings
Enable	Check this check box.
Rule Label	Enter **Inbound_Rule_1** or another name. This inbound TDM rule handles all incoming calls from the phone system.
Request Type	Select **Call**.
Trunk Group	Select the name of the TDM trunk group that you created for incoming calls from the phone system in Step 35. For example, select “Inbound_PBX_Calls.”

Step 54 Under Inbound TDM Request Matching, enter the following settings.

The rule that you created in Step 53 must be selected. Otherwise, any changes you make apply to another rule.

Table 213: Inbound TDM Request Matching Settings

Field	Settings
Calling Number	Enter the applicable matching rule used. For example, enter “*” for all.
Calling Name	Enter the applicable matching rule used. For example, enter “*” for all.
Called Number	Enter the applicable matching rule used. For example, enter “*” for all.
Called Name	Enter the applicable matching rule used. For example, enter “*” for all.
Redirect Number	Enter the applicable matching rule used. For example, enter “*” for all.
Redirect Name	Enter the applicable matching rule used. For example, enter “*” for all.

Step 55 Under Outbound Routes, enter the following settings.

The rule that you created in Step 53 must be selected. Otherwise, any changes you make apply to another rule.

Table 214: Outbound Routes Settings

Field	Settings
Device Selection	
Outbound Destination	Select **VoIP**.

Field	Settings
Host Group	Select the name of the VoIP host group that you created for Unity Connection in Step 28.
CPID Manipulation	
Calling Number	Enter S.
Calling Name	Enter S.
Called Number	Enter D.
Called Name	Enter D.
Redirect Number	Enter R.
Redirect Name	Enter R.
Select Primary/Alternate Route	
Primary	Select **Primary**.

Step 56 If you want to create more Inbound TDM rules, under Inbound TDM Rules, select **Add Rule**. Otherwise, continue to Step 58.

Step 57 Repeat Step 53 through Step 56 for all remaining inbound TDM rules that you want to create.

Step 58 Select **Submit**.

Step 59 On the Configuration menu, select **TDM** > **Digital**.

Step 60 On the Digital Telephony page, in the Telephony Switch Type field, select NEC_NEAX.

Step 61 Select **Submit**.

Step 62 On the Configuration menu, select **TDM** > **General**.

Step 63 On the TDM General Settings page, enter the following settings.

Table 215: TDM General Settings Page Settings

Field	Settings
PCM Coding	Select **uLaw**.
Minimum Call Party Delay (ms)	Enter **500**.
Maximum Call Party Delay (ms)	Enter **2000**.
Dial Digit on Time (ms)	Enter **100**.
Dial Inter-Digit Time (ms)	Enter **100**.
Dial Pause Time (ms)	Enter **2000**.
Turn MWI On FAC	Leave this field blank.

Field	Settings
Turn MWI Off FAC	Leave this field blank.
Outbound Call Connect Timeout (ms)	Enter **10000**.
Wait for Ringback/Connect on Blind Transfer	Select **Yes**.
Hunt Group Extension	Enter the pilot number of the Unity Connection voice messaging ports.
Disconnect on Fax Cleardown Tone	Select **No**.

Step 64 Select **Submit**.

Step 65 On the Configuration menu, select **TDM** > **Port Enable**.

Step 66 On the TDM Port Enabling page, select **No** for the ports that you want to disable on the PIMG unit.

Step 67 Confirm that **Yes** is selected for all other ports on the PIMG unit.

Step 68 Select **Submit**.

Step 69 On the Configuration menu, select **VoIP** > **General**.

Step 70 On the VoIP General Settings page, enter the following settings.

Table 216: VoIP General Settings Page Settings

Field	Setting
User-Agent	
Host and Domain Name	Enter the host and domain name of the PIMG unit.
Transport Type	Select **UDP**.
Call as Domain Name	Select **No**.
SIPS URI Scheme Enabled	Select **No**.
Invite Expiration (sec)	Enter **120**.
Server	
DNS Server Address	Enter the IP Address of the Domain Name Server that the PIMG unit uses.
DNS Translation of Phone Numbers	Select **No**.
Registration Server Address	Leave this field blank.
Registration Server Port	Enter **5060**.

Field	Setting
Registration Expiration (sec)	Enter **3600**.
TCP/UDP	
UDP/TCP Transports Enabled	Select **Yes**.
TCP/UDP Server Port	Enter **5060**.
TCP Inactivity Timer (sec)	Enter **30**.
TLS	
TLS Transport Enabled	Select **No**.
TLS Server Port	Enter **5061**.
SSL TLS Protocol	Select **SSLv3 TLSv1**.
Mutual TLS Authentication Required	Select **Yes**.
TLS Inactivity Timer (sec)	Enter **30**.
Verify TLS Peer Certificate Date	Select **Yes**.
Verify TLS Peer Certificate Trust	Select **Yes**.
Proxy	
Primary Proxy Server Address	Leave this field blank. Unity Connection
Primary Proxy Server Port	Not applicable. Leave the default setting.
Backup Proxy Server Address	Not applicable. Leave the default setting.
Backup Proxy Server Port	Not applicable. Leave the default setting.
Proxy Query Interval	Enter **10**.
Timing	
T1 Time (ms)	Enter **400**.

Field	Setting
T2 Time (ms)	Enter **3000**.
T4 Time (ms)	Enter **5000**.
Monitoring	
Monitor Call Connections	Select **No**.
Call Monitor Interval (sec)	
Monitor VoIP Hosts	
VoIP Host Monitor Interval (sec)	

Step 71 Select **Submit**.

Step 72 On the Configuration menu, select **VoIP** > **Media**.

Step 73 On the VoIP Media Settings page, enter the following settings.

Table 217: VoIP Media Settings Page Settings

Field	Settings
Audio	
Audio Compression	Select the preferred codec for audio compression.
RTP Digit Relay Mode	Select **RFC2833**.
RTP Fax/Modem Tone Relay Mode	Select **RFC2833**.
RTP Source IP Address Validation	Select **Off**.
RTP Source UDP Port Validation	Select **Off**.
Signaling Digit Relay Mode	Select **Off**.
Voice Activity Detection	Select **Off**.
RFC 3960 Early Media Support	Select **On Demand**.
Frame Size	Select the applicable setting: • G.711—**20** • G.729AB—**10** Failure to use the correct setting results in recorded messages containing nothing but silence.

Field	Settings
Frames Per Packet	Select the applicable setting: • G.711—**1** • G.729AB—**2** Failure to use the correct setting results in recorded messages containing nothing but silence.
Fax	
Fax IP-Transport Mode	
SRTP	
SRTP Preference	Select **RTP Only**.
MKI on Transmit Stream	Select **Yes**.
Key Derivation Enable	Select **Yes**.
Key Derivation Rate	Enter **16**.
Anti-replay Window Size Hint	Enter **64**.
Cipher Mode	Select **AES_Counter_Mode**.
Authentication Type	Select **SHA1**.
Authentication Tag Length	Select **SHA1_80_bit**.

Step 74 Select **Submit**.

Step 75 On the Configuration menu, select **VoIP** > **QOS**.

Step 76 On the VoIP QOS Configuration page, enter the following settings.

Table 218: VoIP QOS Configurative Page Settings

Field	Settings
Call Control QOS Byte	Enter **104**.
RTP QOS Byte	Enter **184**.

Step 77 Select **Submit**.

Step 78 On the Configuration menu, select **IP**.

Step 79 On the IP Settings page, enter the following settings.

Table 219: IP Settings Page Settings

Field	Settings
Client IP Address	Enter the new IP address you want to use for the PIMG unit. (This is the IP address that you enter in Cisco Unity Connection Administration when you create the integration.)
Client Subnet Mask	Enter the new subnet mask, if the subnet mask is different from the default IP address.
Default Network Gateway Address	Enter the IP address of the default network gateway router that the PIMG units use.
BOOTP Enabled	Select **No**.
SNTP Server IP Address	

Step 80 Select **Submit**.

Step 81 On the Configuration menu, select **Tone Detection**.

Step 82 On the Tone Detection page, under Call Progress Tone - Learn, in the Learn Tone Event field, select **Busy** and do the following substeps to verify that the tone is correct.

a) From a available phone, call a second phone.
b) Answer the second phone when it rings, and leave both handsets off so that both phones are busy.
c) From a third phone, dial one of the busy phones.
d) Confirm that you hear a busy tone.
e) Hang up the third phone but leave the handsets for the other two phones off.

Step 83 Under Call Progress Tone - Learn, in the Dial String field, enter the extension that you dialed in Step 82c. from the third phone.

Step 84 Select **Learn**.

Step 85 On the Tone Detection page, under Call Progress Tone - Learn, in the Learn field, select **Error** and do the following substeps to verify that the tone is correct.

a) From an available phone, dial an extension that does not exist.
b) Confirm that you hear the reorder or error tone.
c) Hang up the phone.

Step 86 Under Call Progress Tone - Learn, in the Dial String field, enter the extension that you dialed in Step 85a.

Step 87 Select **Learn**.

Step 88 On the Tone Detection page, under Call Progress Tone - Learn, in the Learn field, select **Ringback** and do the following substeps to verify that the tone is correct.

a) From an available phone, dial an extension that does exist
b) Confirm that you hear the ringback tone.
c) Hang up the phone.

Step 89 Under Call Progress Tone - Learn, in the Dial String field, enter the extension that you dialed in Step 88a.

Step 90 Select **Learn**.

Step 91 Select **Submit**.

Step 92 Hang up the phones that you used in Step 82.

Step 93 On the System menu, select **Restart**.

Step 94 On the Restart page, select **Restart Unit Now**.

Step 95 Repeat Step 2 through Step 94 on all remaining PIMG units.

Configuring Unity Connection for Integration with NEC NEAX 2400 Phone System

After ensuring that the NEC NEAX 2400 phone system, the PIMG units, and Unity Connection are ready for the integration, do the following procedure to set up the integration and to enter the port settings.

Creating an Integration

Step 1 In Cisco Unity Connection Administration, expand **Telephony Integrations**, then select **Phone System**.

Step 2 On the Search Phone Systems page, under Display Name, select the name of the default phone system.

Step 3 On the Phone System Basics page, in the Phone System Name field, enter the descriptive name that you want for the phone system.

Step 4 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 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 5 Under Message Waiting Indicator Settings, select**Use Same Port for Enabling and Disabling MWIs**.

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 applicable settings and select **Save**.

Table 220: Settings for the New Port Group Page

Field	Setting
Phone System	Select the name of the phone system that you entered in Step 3.
Create From	Select **Port Group Template** and select **SIP to DMG/PIMG/TIMG** 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.
SIP Security Profile	Select **5060**.
SIP Transport Protocol	Select the SIP transport protocol that Unity Connection uses.
IP Address or Host Name	Enter the IP address of the PIMG unit that you are integrating with Unity Connection.

Field	Setting
Port	Enter the SIP port of the PIMG unit that Unity Connection connects to. We recommend that you use the default setting. This name must match the setting in the TCP/UDP Server Port field on the Configuration > VoIP > General page of the PIMG unit. Otherwise, the integration cannot function correctly.

Step 9 On the Port Group Basics page, under Message Waiting Indicator Settings, uncheck the **Enable Message Waiting Indicators** check box and select **Save**.

Step 10 In the Related Links drop-down box, select **Add Ports** and select **Go**.

Step 11 On the New Port page, enter the following settings and select **Save**.

Table 221: Settings for the New Port Page

Field	Considerations
Enabled	Check this check box.
Number of Ports	Enter **8**. (If you want to use fewer than eight voice messaging ports, enter the number of voice messaging ports that you want to use on this PIMG unit.) **Note** For a Unity Connection cluster, the server must have the number of voice messaging ports that are set up on the phone system for the PIMG integration so that this server can handle all voice messaging traffic for the cluster if one of the servers stops functioning. For example, if the phone system is set up with 16 voice messaging ports, this server must have 16 voice messaging ports.
Phone System	Select the name of the phone system that you entered in Step 3.
Port Group	Select the name of the port group that you added in Step 8.

Step 12 On the Search Ports page, select the display name of the first voice messaging port that you created for this phone system integration.

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

Step 13 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 222: 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.
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	(Serial integrations only) Uncheck this check box. Otherwise, the integration may not functior correctly. (Digital and analog integrations only) 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 Unity Connection web applications. Assign Allow TRAP Connections to the least busy ports.
Outgoing Hunt Order	Enter the priority order in which Unity Connection uses 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, Unity Connection uses the port that has been idle the longest.

Step 14 Select **Save**.

Step 15 Select **Next**.

Step 16 Repeat Step 13 through Step 15 for all remaining voice messaging ports for the phone system.

Step 17 In Cisco Unity Connection Administration, expand **Telephony Integrations**, then select **Phone System**.

Step 18 On the Search Phone Systems page, under Display Name, select the name of the phone system that you entered in Step 3.

Step 19 Repeat Step 7 through Step 18 for each remaining PIMG unit integrated with Unity Connection.

Note Each PIMG unit is connected to one port group with the applicable voice messaging ports. For example, a system that uses five PIMG units requires five port groups, one port group for each PIMG unit.

Step 20 To create a port group for MWIs, do the following substeps.

Note All MWI requests are handled by the master PIMG unit and sent to the phone system over the RS-232 serial cable (without using voice messaging ports). So the following substeps create a separate port group without voice messaging ports and enable the port group for MWIs that are "not port specific" (they do not use ports).

a) In Cisco Unity Connection Administration expand **Telephony Integration** then select **Port Group** .

b) On the Search Port Groups page, select **Add New**.
c) On the New Port Group page, enter the applicable settings and select **Save**.

Table 223: Settings for the New Port Group Page (MWIs)

Field	Setting
Phone System	Select the name of the phone system that you entered in Step 3.
Create From	Select Port Group Template and select **SIP to DMG/PIMG/TIMG** SIP to in the drop-down box.
Display Name	Enter a **MWI Port Group** or another descriptive name for the port group.
SIP Security Profile	Select **5060**.
SIP Transport Protocol	Select the SIP transport protocol that Unity Connection uses.
IPv4 Address or Host Name	Enter the IP address of the master PIMG unit.
IPv6 Address or Host Name	Do not enter a value in this field. IPv6 is not supported for PIMG integrations.
IP Address or Host Name	Enter the IP address of the master PIMG unit.
Port	Enter the SIP port of the master PIMG unit. **Caution** This name must match the setting in the TCP/UDP Server Port field on the Configuration > VoIP > General page of the PIMG unit. Otherwise, the integration cannot function correctly.

d) On the Port Group Basics page, on the Edit menu, select **Advanced Settings**.
e) On the Edit Advanced Settings page, under SIP MWI Requests, select **Not Port Specific** then select **Save**.
f) On the Edit menu, select **Port Group Basics**.
g) Under Port Group, select **Reset**.
h) Under Message Waiting Indicator Settings, confirm that the **Enable Message Waiting Indicator** check box is checked and select **Save**.

Step 21 If another phone system integration exists, in Cisco Unity Connection Administration, expand **Telephony Integrations**, then select **Trunk**. Otherwise, skip to Step 25.

Step 22 On the Search Phone System Trunks page, on the Phone System Trunk menu, select **New Phone System Trunk**.

Step 23 On the New Phone System Trunk page, enter the following settings for the phone system trunk and select **Save**.

Table 224: Settings for the Phone System Trunk

Field	Setting
From Phone System	Enter the display name of the phone system that you are creating a trunk for.
To Phone System	Enter the display name of the previously existing phone system that the trunk connects to.

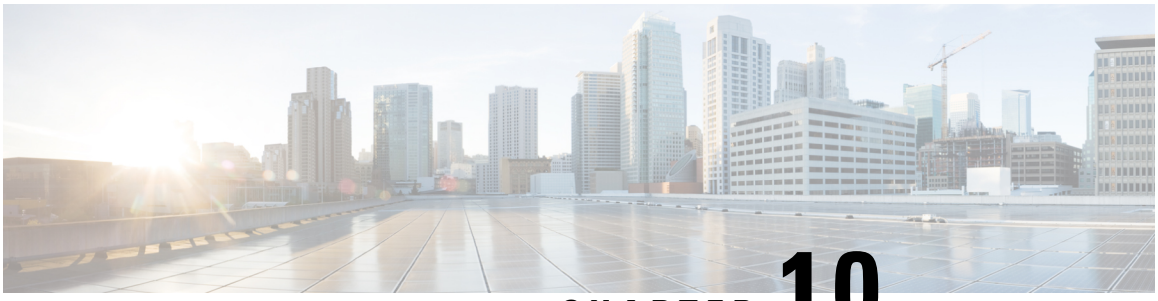
Field	Setting
Trunk Access Code	Enter the extra digits that Unity Connection must dial to transfer calls through the gateway to extensions on the previously existing phone system.

Step 24 Repeat Step 22 and Step 23 for all remaining phone system trunks that you want to create.

Step 25 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 26 In the Task Execution Results window, select **Close**.



CHAPTER 10

Setting Up a Nortel Meridian 1 Digital PIMG Integration with Cisco Unity Connection

• Setting Up a Nortel Meridian 1 Digital PIMG Integration, on page 183

Setting Up a Nortel Meridian 1 Digital PIMG Integration

Task List for Nortel Meridian 1 PIMG Phone System Integration

Before doing the following tasks to integrate Unity Connection with the Nortel Meridian 1 phone system using PIMG units (media gateways), confirm that the Unity Connection server is ready for the integration after completing the server installation, following the tasks in the "Installing Cisco Unity Connection" chapter of the *Install, Upgrade, and Maintenance Guide for Cisco Unity Connection Release 15*, available at https://www.cisco.com/c/en/us/td/docs/voice_ip_comm/connection/15/install_upgrade/guide/b_15cuciumg.html.

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, on page 12 section.
2. Plan how the voice messaging ports are used by Unity Connection. See the Planning the Usage of Voice Messaging Ports, on page 7 chapter.
3. Program the Nortel Meridian 1 phone system and extensions. See the Programming Nortel Meridian 1 PIMG Phone System Integration section.
4. Set up the PIMG units. See the Setting Up Digital PIMG Units section.
5. Create the integration. See the Configuring Unity Connection for Integration with Nortel Meridian 1 Phone System, on page 208section .
6. Test the integration. See the Testing the Integration, on page 381 chapter.
7. If this integration is a second or subsequent integration, add the applicable new user templates for the new phone system. See the Integrations with Multiple Phone Systems, on page 5 chapter.

Requirements

This integration supports configurations of the following components:

Phone System

- One of the following models:
  - Nortel Meridian 1 phone system (Option 11, 21, 51, 61, 71, or 81), software release 17 or later.
  - Nortel Succession (CS 1000) phone system, software release 3.0 or later.
  - The Nortel SL 1 phone system, when upgraded to Meridian 1 so that it is compatible with the M2616 digital phone.
- The following software option packages installed:
  - Package 19, Digit Display Software (DDSP)
  - Package 46, Message Waiting Center (MWC)
- One or more digital lines that are compatible with the M2616 digital phone for connecting to the PIMG units.
- One or more of the applicable PIMG units. For details, see the "Introduction" chapter.
- The voice messaging ports in the phone system connected by digital lines to the ports on the PIMG units.

To simplify troubleshooting, we recommend that you connect the voice messaging ports on the phone system to the ports on the PIMG units in a planned manner. For example, connect the first phone system voice messaging port to the first port on the first PIMG unit, connect the second phone system voice messaging port to the second port on the first PIMG unit, and so on. Alternatively, if you have multiple PIMG units, you can reduce answer times in the event of a PIMG unit failure by connecting the phone system ports to the PIMG units in a round-robin fashion. For example, connect the first phone system voice messaging port to the first port on the first PIMG unit, connect the second phone system voice messaging port to the first port on the second PIMG unit, and so on.

- The PIMG units connected to the same LAN or WAN that Unity Connection is connected to.
- If the PIMG units connect to a WAN, the requirements for the WAN network connections are:
  - For G.729a codec formatting, a minimum of 32.76 Kbps guaranteed bandwidth for each voice messaging port.
  - For G.711 codec formatting, a minimum of 91.56 Kbps guaranteed bandwidth for each voice messaging port.
  - No network devices that implement network address translation (NAT).
  - A maximum 200 ms one-way network latency.

Unity Connection Server

- Unity Connection installed following the tasks in the "Installing Cisco Unity Connection" chapter of the *Install, Upgrade, and Maintenance Guide for Cisco Unity Connection Release 15*, available at https://www.cisco.com/c/en/us/td/docs/voice_ip_comm/connection/15/install_upgrade/guide/b_15cuciumg.html.
- A license that enables the applicable number of voice messaging ports.

Programming Nortel Meridian 1 PIMG Phone System Integration

The following programming instructions are provided as an example only. The specific programming for your phone system may vary depending on its configuration.

Caution In programming the phone system, do not send calls to voice messaging ports in 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.

Do the following steps to program the Nortel Meridian 1 phone system.

Step 1 Assign extensions for the voice messaging ports.

Step 2 Confirm that the software on the phone system has the necessary following option packages using overlay 22:

- DDSP (Package 19, Digit Display Software)
- MWC (Package 46, Message Waiting Center)

If either of these options is missing, contact your sales representative.

Step 3 On overlay 11, set the following options to create the M2616 digital set emulation for the first port.

Table 225: Digital Set Emulation Options for the Second Port

Option	Setting
REQ	Enter **NEW**.
TYPE	Enter **2616**.
TN	Enter **0 0 6 2**.
CUST	Enter **0**.
CLS	Enter **ADD HFD CNDA HTA MWA**.
HUNT	Enter the extension of the second port on the PIMG unit.
KEY 00 SCR	Enter the primary number for this PIMG unit. Enter any valid unused number.
KEY 13 MIK	
KEY 14 MCK	
KEY 15 TRN	

Step 4 Set the following options to create the digital set emulation for the second port.

Table 226: Digital Set Emulation Options for the Second Port

Option	Setting
REQ	Enter **NEW**.
TYPE	Enter **2616**.
TN	Enter **0 0 6 3**.
CUST	Enter **0**.
CLS	Enter **ADD HFD CNDA HTA MWA**.
HUNT	Enter the extension of the next port on the PIMG unit.
KEY 00 SCR	Enter the extension for this PIMG unit port. Enter any valid unused number.
KEY 13 MIK	
KEY 14 MCK	
KEY 15 TRN	

Step 5 Repeat Step 4 for all remaining ports on the PIMG units.

Step 6 On overlay 95, set the following options to enable display of a four-letter code that represents why the call was forwarded.

Table 227: Calling Party Display Options

Option	Setting
REQ	Enter **CHG**.
TYPE	Enter **CPND**.
CUST	Enter the customer number.
RESN	Enter **YES**.
CFWD	Enter **CFWD**.
CFNA	Enter **CFNA**.
HUNT	Enter **HUNT**.
XFER	Enter **T**.
AAA	Enter **A**.

Step 7 On each subscriber phone, program the phone to forward calls to the pilot number assigned to the voice messaging ports, based on one of the Unity Connection call transfer types shown in Table 228: Call Transfer Types.

Table 228: Call Transfer Types

Transfer Type	Usage
Release transfer (blind transfer)	Program the phone to forward calls to the pilot number when: • The extension is busy • The call is not answered
Supervised transfer	Program the user station to forward calls to the pilot number only when the call is not answered (on the phone system, the number of rings before forwarding must be more than the number of rings to supervise the call). Confirm that call forwarding is disabled when the extension is busy.

Step 8 Use Table 229: Hunt Methods for the Nortel Meridian 1 Phone System to determine the hunt method that you want to use, and do the applicable procedure.

Table 229: Hunt Methods for the Nortel Meridian 1 Phone System

Hunt Method	Procedure
Hunting Group • Use for systems with up to 30 voice messaging ports. • The search route calls to the next idle PIMG port in the group when a call encounters a busy port. • When the search reaches a PIMG port that has been disabled or has lost its Unity Connection to the PIMG unit, the search stops at this port. The call rings until the caller hangs up.	See the Setting Up Hunt Group for Up to 30 Ports.
ACD Hunt Group • Use for systems with more than 30 voice messaging ports. • The search route calls to the next idle PIMG port in the group when a call encounters a busy port. • When the search reaches a PIMG port that has been disabled or has lost its Unity Connection to the PIMG unit, the search stops at this port. The call rings until the caller hangs up.	See the Setting Up ACD Hunt Group for More Than 30 Ports.

Hunt Method	Procedure
Group Hunt Feature • Use for systems with any number of voice messaging ports. • Software option package 120 must be installed on the phone system. • The search route calls to the next idle PIMG port in the group when a call encounters a busy port. • When the search reaches a PIMG port that has been disabled or has lost its Unity Connection to the PIMG unit, the search continues to the next available port.	See the Setting Up ACD Hunt Group for More Than 30 Ports.

Setting Up Hunt Group for Up to 30 Ports

See Table 229: Hunt Methods for the Nortel Meridian 1 Phone System for considerations about using this procedure.

Step 1 Set up the first voice messaging port as the pilot number of the hunt group.

Step 2 Set the first voice messaging port to hunt to the second voice messaging port.

Step 3 Set the second voice messaging port to hunt to the third, then continue up to the 30th.

Step 4 Set the 30th voice messaging port to hunt to the first voice messaging port. See the example in Table 230: Example of a 30-Port Hunt Group.

Table 230: Example of a 30-Port Hunt Group

Device	Setting	Destination
Port 1	HUNT	Port 2
Port 2	HUNT	Port 3
Port 3	HUNT	Port 4
. . .	HUNT	<additional ports>
Port 29	HUNT	Port 30
Port 30	HUNT	Port 1

Setting Up ACD Hunt Group for More Than 30 Ports

See Table 229: Hunt Methods for the Nortel Meridian 1 Phone System for considerations about using this procedure.

Step 1 Set up ACD 1 as the pilot number of the hunt group.

Step 2 With the Night Call Forward Destination (NCFW) command, set ACD 1 to forward to the first voice messaging port.

Step 3 Set the first voice messaging port to hunt to the second, then continue up to the 30th.

Step 4 Set the 30th voice messaging port to hunt to ACD 2.

Step 5 With the NCFW command, set ACD 2 to forward to the 31st voice messaging port.

Step 6 Set the 31st voice messaging port to hunt to the 32nd, and so on.

Step 7 Continue creating 30-port hunt groups in this manner until the last voice messaging port.

Step 8 Set the last voice messaging port to hunt to ACD 1. See the example in Table 231: Example of a 72-Port ACD Hunt Group.

Table 231: Example of a 72-Port ACD Hunt Group

Device	Settings	Destination
ACD 1 (pilot number)	NCFW	Port 1
Port 1	HUNT	Port 2
Port 2	HUNT	Port 3
<additional ports>		<additional ports>
Port 29	HUNT	Port 30
Port 30	HUNT	ACD 2
ACD 2	NCFW	Port 31
Port 31	HUNT	Port 32
<additional ports>		<additional ports>
Port 59	HUNT	Port 60
Port 60	HUNT	ACD 3
ACD 3	NCFW	Port 61
Port 61	HUNT	Port 62
<additional ports>		<additional ports>
Port 71	HUNT	Port 72
Port 72	HUNT	ACD 1

Setting Up the Group Hunt Feature

See Table 229: Hunt Methods for the Nortel Meridian 1 Phone System for considerations about using this procedure.

Step 1 In LD 22, verify that software package 120 is equipped.

Table 232: Entries for LD 22

Prompt	Entry
REQ:	Enter **PRT** to start a print request.
TYPE:	Enter **PKG** to print the list of equipped packages.

Step 2 In LD 18, create a Group Hunt list number.

Table 233: Entries for LD 18

Prompt	Entry
REQ:	Enter **NEW**.
TYPE:	Enter **GHT**.
LSNO:	Enter the list number for the Group Hunt list. For example, enter 1.
CUST:	Enter the customer number as defined in LD 15.
DNSZ:	Enter the maximum length of DN allowed for Group Hunt list.
SIZE:	Enter the maximum number of DNs in the Group Hunt list.
WRT:	Enter **YES** to write the information to the data store.
STOR:	Press **Enter**.

Step 3 In LD 57, define the Pilot DN (PLDN) and associate it with the number for the Group Hunt list.

Table 234: Entries for LD 57

Prompt	Entry
REQ:	Enter **CHG**.
TYPE:	Enter **FFC**.
CUST:	Enter the customer number as defined in LD 15.
FFCT:	Press **Enter**.
CODE:	Enter **PLDN** for the Pilot DN.
PLDN:	Enter the DN that is the pilot for the Group Hunt list.

Prompt	Entry
USE:	Enter **GPHT**.
LSNO:	Enter the Group Hunt list number that you created in LD 18.
HTYP:	Do one of the following: • If you want linear hunting, enter **LIN**. • If you want round robin hunting, enter **RRB**.
CFWI:	Do one of the following: • If you want Group Hunting to skip idle stations with Call Forward All Calls active, enter **NO**. • If you want Group Hunting to terminate on idle stations with Call Forward All Calls active, enter **YES**.
MQUE:	Do one of the following to configure the maximum number of calls allowed in the Pilot DN queue: • If you want to no calls in the queue, enter **0**. • If you want only one call in the queue at a time, enter **1**. • If you want no limit on the number of calls in the queue, enter **ALL**. • If you want the number of calls in the queue to be less than or equal to the number of active members of the Group Hunt list, enter **ACTM**.

Step 4 In LD 18, modify the Group Hunt list number.

Table 235: Entries for LD 18

Prompt	Entry
REQ:	Enter **CHG**.
TYPE:	Enter **GHT**.
LSNO:	Enter the list number for the Group Hunt list that you created in Step 2. For example, enter 1.
SIZE:	Enter the maximum number of DNs in the Group Hunt list.
WRT:	Enter **YES** to write the information to the data store.
STOR:	Enter the first DN in the Group Hunt list in the following format: `x...x  y...y` For example, enter 00 2216.
WRT:	Enter **YES** to write the information to the data store.

Prompt	Entry
STOR:	Enter the second DN in the Group Hunt list in the following format: `x...x  y...y` For example, enter 01 2217.
WRT:	Enter **YES** to write the information to the data store.
STOR:	Enter the third DN in the Group Hunt list in the following format: `x...x  y...y` For example, enter 02 2218.
. . .	Add more DNs in the Group Hunt list.
WRT:	Enter **YES** to write the information to the data store.
STOR:	Enter the last DN in the Group Hunt list in the following format: `x...x  y...y` For example, enter 07 2223.

Step 5 In LD 11, enter a Group Hunt Pilot DN (PLDN) for each DN in the Group Hunt list that connects to a PIMG port.

Table 236: Entries for LD 11

Prompt	Entry
REQ:	Enter **CHG**.
TYPE:	Enter the first DN in the Group Hunt list. For example, enter 2616.
TN:	Enter **1 0 0 7**.
ECHG:	Enter **YES**.
	Enter **FDN <extension>** for the PLDN that you configured in Step 3.
	Enter **HUNT <extension>** for the PLDN that you configured in Step 3.
	If applicable, enter **EHT <extension>** for the PLDN that you configured in Step 3.
	If applicable, enter **EFD <extension>** for the PLDN that you configured in Step 3.

Step 6 Repeat Step 5 for all remaining DNs in the Group Hunt list.

Setting Up Digital PIMG Units

Do the following procedures to set up the digital PIMG units that are connected to the Nortel Meridian 1 phone system.

These procedures require that the following tasks have already been completed:

- The phone system is connected to the PIMG units using digital lines.
- The PIMG units are ready to be connected to the LAN or WAN.
- The PIMG units are connected to a power source.

Fields that are not mentioned in the following procedures must keep their default values. For the default values of all fields, see the manufacturer documentation for the PIMG units.

Downloading the PIMG firmware update files for digital PIMG units

http://software.cisco.com/download/navigator.html?mdfid=280082558&i=rm.

Note To access the software download page, you must be signed in to Cisco.com as a registered user.

This procedure describes the steps when using Internet Explorer as your web browser. If you are using a different web browser, the steps may differ.

1. In the tree control on the Downloads Home page, expand Unified Communications> **Unified Communications Applications** > **Messaging** > **Cisco Unity** and select **Cisco Unity Telephony Integration**.
2. On the Log In page, enter your username and password, then select **Log In**.
3. On the Select a Release page, under Latest Releases, select the most recent release.
4. In the right column, select the version of the firmware for digital PIMG units.
5. On the Download Image page, select **Download**.
6. On the Supporting Document(s) page, select **Agree**.
7. In the File Download dialog box, select **Save**.
8. In the Save As dialog box, browse to the Windows workstation that have access the PIMG units, browse to a directory where you want to save the file, and select **Save**.
9. In the Download Complete dialog box, select **Open**. The window for extracting the PIMG firmware update files appears and select **Extract**.
10. In the Extract dialog box, browse to the directory where you want the extracted files, and select **Extract**.
11. Close the window for the extracting application.

On a Windows workstation that have access to the PIMG units, go to the following link:

Setting Up Digital PIMG Units (Firmware Version 6.x)

Step 1 On the Windows workstation, add a temporary route to enable access to the PIMG units.

a) On the Windows Start menu, select **Run**.

b) Enter **cmd**, and press **Enter**. The Command Prompt window appears.

c) At the command prompt, enter **route add 10.12.13.74 <IP Address of Workstation>**, and press **Enter**.

For example, if the IP address of the workstation is 198.1.3.25, enter “route add 10.12.13.74<space>198.1.3.25” in the Command Prompt window.

d) Close the Command Prompt window.

Step 2 Connect a PIMG unit to the network.

Step 3 In the web browser, go to **http://10.12.13.74**.

Step 4 To sign in, enter the following case-sensitive settings.

Table 237: Sign-in Settings

Field	Setting
Username	Enter **admin**.
Password	Enter **IpodAdmin**.

Step 5 Select **OK**.

Step 6 On the System menu, select **Upgrade**.

Step 7 On the Upgrade page, select **Browse**.

Step 8 In the Choose File dialog box, browse to the directory on the Windows workstation that has the extracted PIMG firmware update files.

Step 9 Select **Ami<xx** > **.app** (where <xx> is multiple digits), and select **Open**.

Step 10 On the Upgrade page, select **Install File**.

Step 11 After the file is installed, a message prompting you to restart the PIMG unit appears. Select **Cancel**.

Do not restart the PIMG unit until you are instructed to do so later in this procedure, even if the file installation fails. Restarting the PIMG unit at this step may prevent the PIMG unit from functioning correctly.

Step 12 Repeat Step 6 through Step 11 for each of the following files:

- Ami_<xx>.fsh
- Run<xx>FskEcho.dsp
- iNim<xx>.ibt
- iNim<xx>.ilc
- iNim<xx>.iap

Step 13 On the Configuration menu, select **Import/Export**.

Step 14 On the Import/Export page, select **Browse**.

Step 15 In the Choose File dialog box, browse to the file DNI_Cfg_Generic.ini.

Step 16 Select **DNI_Cfg_Generic.ini**, and select **Open**.

Step 17 On the Import/Export page, select **Import File**.

Step 18 After the file is imported, a message prompting you to restart the PIMG unit appears. Select **OK**.

Step 19 In the web browser, go to **http://10.12.13.74**.

Step 20 To sign in, enter the following case-sensitive settings.

Table 238: Sign-in Settings

Field	Setting
Username	Enter **admin**.
Password	Enter **IpodAdmin**.

Step 21 Select **OK**.

Step 22 Do the following substeps to configure an RTP port range of 16384 to 32767.

You must set the RTP port range for the PIMG units if your system uses an RTP port range of 16384 to 32767. Otherwise, Unity Connection cannot answer calls and callers hear ringing or silence.

Note The default RTP port range for PIMG units is 49000 to 50000. Some Unity Connection configurations require a different RTP port range.

a) On the Configuration menu, select **Import/Export**.
b) On the Import/Export page, under Export Settings, select **Export All Settings**.
c) In the File Download dialog box, select **Save**.
d) In the Save As dialog box, browse to the Windows workstation that has access to the PIMG units, browse to a directory where you want to save the file, and select **Save**.
e) In the Download Complete dialog box, select **Open**. Notepad opens the file Config.ini that you saved.
f)
g)
h) Locate the line with the following parameter:

```
gwRTPStartPort
```

i) Change the value of the parameter to **16384** so that the line reads as follows:

```
gwRTPStartPort = 16384
```

j) Locate the line with the following parameter:

```
gwRTPEndPort
```

k) Change the value of the parameter to **32767** so that the line reads as follows:

```
gwRTPEndPort = 32767
```

l) Save the file, and exit Notepad.
m) On the Configuration menu of the PIMG unit, select **Import/Export**.
n) On the Import/Export page, under Browse for Import File, select **Browse**.
o) In the Choose File dialog box, browse to the file Config.ini that you saved.

p) Select **Config.ini**, and select **Open**.
q) On the Import/Export page, select **Import File**.
r) When prompted to restart the PIMG unit, select **OK**.
s) When the PIMG unit has restarted, in the web browser, go to **http://10.12.13.74**.
t) To sign in, enter the following case-sensitive settings.

Table 239: Sign-in Settings

Field	Setting
Username	Enter **admin**.
Password	Enter **IpodAdmin**.

u) Select **OK**.

Step 23 On the System menu, select **Password**.

Step 24 On the Change Password page, enter the following settings.

Table 240: Change Password Page Settings

Field	Setting
Old Password	Enter **IpodAdmin**. (This setting is case sensitive.)
New Password	Enter your new password. (This setting is case sensitive.)
Confirm Password	Enter your new password. (This setting is case sensitive.)

Step 25 Select **Change**.

Step 26 On the Configuration menu, select **Routing Table**.

Step 27 On the Routing Table page, under Router Configuration, select **VoIP Host Groups**.

Step 28 Under VoIP Host Groups, enter the following settings for the first VoIP Host Group.

Table 241: First VoIP Host Group Settings

Field	Settings
Name	Accept the default or enter another descriptive name of the VoIP host group.
Load-Balanced	*(*Unity Connection *without a cluster)* Select **False**. *(*Unity Connection *with a cluster configured)* Select **False**.
Fault-Tolerant	*(*Unity Connection *without a cluster)* Select **False**. *(*Unity Connection *with a cluster configured)* Select **True**.

Step 29 For Unity Connection without a cluster, under Host List, enter the host name or IP address of the Unity Connection server and the server port in the format <host name or IP address>:5060.

For Unity Connection with a cluster configured, under Host List, enter the host name or IP address of the subscriber server (the second Unity Connection server that you installed) and the server port in the format <host name or IP address>:5060.

Step 30 For Unity Connection without a cluster, continue to Step 32. For Unity Connection with a cluster configured, select **Add Host**.

Step 31 In the second field, enter the host name or IP address of the publisher server (the first Unity Connection server that you installed) and the server port in the format <host name or IP address>:5060.

Do not add a third host under Host List or a second host group under VoIP Host Groups. Otherwise, the Unity Connection cluster may not function correctly.

Step 32 Select **Submit**.

Step 33 Under Router Configuration, select **TDM Trunk Groups**.

Step 34 Under TDM Trunk Groups, select **Add Trunk Group**.

Step 35 Under TDM Trunk Groups, enter the following settings for the first TDM trunk group.

Table 242: First TDM Trunk Group Settings (Inbound Calls)

Field	Settings
Name	Enter **Inbound_PBX_Calls** or another unique name. This TDM trunk group handles all incoming calls from the phone system.
Selection Direction	Select **Ascending**.
Selection Mode	Select **Linear**.
Port/Channel Content	Enter the numbers of the PIMG ports that handles inbound calls. For example, enter "*" for all PIMG ports, or enter "1-6" for the first six PIMG ports.

Step 36 Under TDM Trunk Groups, select **Add Trunk Group**.

Step 37 Enter the following settings for the second TDM trunk group.

Table 243: Second TDM Trunk Group Settings (MWIs)

Field	Settings
Name	Enter **MWIs** or another unique name. This TDM trunk group handles outbound MWI calls (where applicable).
Selection Direction	Select **Ascending**.
Selection Mode	Select **Cyclic**.
Port/Channel Content	Enter the numbers of the PIMG ports that dial out MWIs. For example, enter "*" for all PIMG ports, or enter "7,8" for the last two PIMG ports.

Step 38 Under TDM Trunk Groups, select **Add Trunk Group**.

Step 39 Enter the following settings for the third TDM trunk group.

Table 244: Third TDM Trunk Group Settings (Outbound Calls)

Field	Settings
Name	Enter **Outbound_PBX_Calls** or another unique name. This TDM trunk group handles all outbound calls from Unity Connection.
Selection Direction	Select **Descending**.
Selection Mode	Select **Linear**.
Port/Channel Content	Enter ***** for all channels in all ports. Enter the numbers of the PIMG ports that handle outbound (dialout) calls. For example, enter "*" for all PIMG ports, or enter "7,8" for the last two PIMG ports.

Step 40 Select **Submit**.

Step 41 Under Router Configuration, select **Inbound VoIP Rules**.

Step 42 Under Inbound VoIP Rules, uncheck the **Enabled** check box for the default rule.

Step 43 Select **Add Rule**.

Step 44 Under Inbound VoIP Rules, enter the following settings for the first new inbound VoIP rule.

Table 245: First New Inbound VoIP Rule Settings (MWIs)

Field	Settings
Enable	Check this check box.
Rule Label	Enter **MWI_Calls** or another name. This inbound VoIP rule handles all MWI calls from Unity Connection.
Request Type	Select **Message**.
Originating VoIP Host Address	Enter *****.

Step 45 Under Inbound VoIP Request Matching, enter the following settings.

The rule that you created in Step 44 must be selected. Otherwise, any changes you make apply to another inbound VoIP rule.

Table 246: Inbound VoIP Request Matching Settings

Field	Settings
Calling Number	Enter *****.
Calling Name	Enter *****.
Called Number	Enter *****.
Called Name	Enter *****.

Field	Settings
Redirect Number	Enter *****.
Redirect Name	Enter *****.

Step 46 Under Outbound Routes, enter the following settings.

The rule that you created in Step 44 must be selected. Otherwise, any changes you make apply to another rule.

Table 247: Outbound Routes Settings

Field	Settings
Device Selection	
Outbound Destination	Select **TDM**.
Trunk Group	Select the name of the TDM trunk group that you created for MWIs in Step 37. For example, select "MWIs."
CPID Manipulation	
Calling Number	Enter **S**.
Calling Name	Enter **S**.
Called Number	Enter **D**.
Called Name	Enter **D**.
Redirect Number	Enter **R**.
Redirect Name	Enter **R**.
Select Primary/Alternate Route	
Primary	Select **Primary**.

Step 47 Under Inbound VoIP Rules, select **Add Rule**.

Step 48 Under Inbound VoIP Rules, enter the following settings for the second new inbound VoIP rule.

Table 248: Second New Inbound VoIP Rule Settings (Outbound Calls)

Field	Settings
Enable	Check this check box.
Rule Label	Enter **Outbound_UC_Calls** or another name. This inbound VoIP rule handles all outbound calls from Unity Connection.
Request Type	Select **Call**.

Field	Settings
Originating VoIP Host Address	Enter *****.

Step 49 Under Inbound VoIP Request Matching, enter the following settings.

The rule that you created in Step 48 must be selected. Otherwise, any changes you make apply to another rule.

s

Table 249: Inbound VoIP Request Matching Settings

Field	Settings
Calling Number	Enter *****.
Calling Name	Enter *****.
Called Number	Enter *****.
Called Name	Enter *****.
Redirect Number	Enter *****.
Redirect Name	Enter *****.

Step 50 Under Outbound Routes, enter the following settings.

The rule that you created in Step 48 must be selected. Otherwise, any changes you make apply to another rule.

Table 250: Outbound Routes Settings

Field	Settings
Device Selection	
Outbound Destination	Select **TDM**.
Trunk Group	Select the name of the TDM trunk group that you created for outbound calls in Step 39. For example, select “Outbound_PBX_Calls.”
CPID Manipulation	
Calling Number	Enter **S**.
Calling Name	Enter **S**.
Called Number	Enter **D**.
Called Name	Enter **D**.
Redirect Number	Enter **R**.
Redirect Name	Enter **R**.

Field	Settings
Select Primary/Alternate Route	
Primary	Select **Primary**.

Step 51 Select **Submit**.

Step 52 Under Router Configuration, select **Inbound TDM Rules**.

Step 53 Under Inbound TDM Rules, enter the following settings for the first inbound TDM rule.

Table 251: First Inbound TDM Rule Settings

Field	Settings
Enable	Check this check box.
Rule Label	Enter **Inbound_Rule_1** or another name. This inbound TDM rule handles all incoming calls from the phone system.
Request Type	Select **Call**.
Trunk Group	Select the name of the TDM trunk group that you created for incoming calls from the phone system in Step 35. For example, select "Inbound_PBX_Calls."

Step 54 Under Inbound TDM Request Matching, enter the following settings.

The rule that you created in Step 53 must be selected. Otherwise, any changes you make apply to another rule.

Table 252: Inbound TDM Request Matching Settings

Field	Settings
Calling Number	Enter the applicable matching rule used. For example, enter "*" for all.
Calling Name	Enter the applicable matching rule used. For example, enter "*" for all.
Called Number	Enter the applicable matching rule used. For example, enter "*" for all.
Called Name	Enter the applicable matching rule used. For example, enter "*" for all.
Redirect Number	Enter the applicable matching rule used. For example, enter "*" for all.
Redirect Name	Enter the applicable matching rule used. For example, enter "*" for all.

Step 55 Under Outbound Routes, enter the following settings.

The rule that you created in Step 53 must be selected. Otherwise, any changes you make apply to another rule.

Table 253: Outbound Routes Settings

Field	Settings
Device Selection	

Field	Settings
Outbound Destination	Select **VoIP**.
Host Group	Select the name of the VoIP host group that you created for Unity Connection in Step 28.
CPID Manipulation	
Calling Number	Enter S.
Calling Name	Enter S.
Called Number	Enter D.
Called Name	Enter D.
Redirect Number	Enter R.
Redirect Name	Enter R.
Select Primary/Alternate Route	
Primary	Select **Primary**.

Step 56 If you want to create more Inbound TDM rules, under Inbound TDM Rules, select **Add Rule**. Otherwise, continue to Step 58.

Step 57 Repeat Step 53 through Step 56 for all remaining inbound TDM rules that you want to create.

Step 58 Select **Submit**.

Step 59 On the Configuration menu, select **TDM** > **Digital**.

Step 60 On the Digital Telephony page, in the Telephony Switch Type field, select M1.

Step 61 Select **Submit**.

Step 62 On the Configuration menu, select **TDM** > **General**.

Step 63 On the TDM General Settings page, enter the following settings.

Table 254: TDM General Settings Page Settings

Field	Settings
PCM Coding	Select **uLaw**.
Minimum Call Party Delay (ms)	Enter **500**.
Maximum Call Party Delay (ms)	Enter **2000**.
Dial Digit on Time (ms)	Enter **100**.
Dial Inter-Digit Time (ms)	Enter **100**.
Dial Pause Time (ms)	Enter **2000**.

Field	Settings
Turn MWI On FAC	Leave this field blank.
Turn MWI Off FAC	Leave this field blank.
Outbound Call Connect Timeout (ms)	Enter **10000**.
Wait for Ringback/Connect on Blind Transfer	Select **Yes**.
Hunt Group Extension	Enter the pilot number of the Unity Connection voice messaging ports.
Disconnect on Fax Cleardown Tone	Select **No**.

Step 64 Select **Submit**.

Step 65 On the Configuration menu, select **TDM** > **Port Enable**.

Step 66 On the TDM Port Enabling page, select **No** for the ports that you want to disable on the PIMG unit.

Step 67 Confirm that **Yes** is selected for all other ports on the PIMG unit.

Step 68 Select **Submit**.

Step 69 On the Configuration menu, select **VoIP** > **General**.

Step 70 On the VoIP General Settings page, enter the following settings.

Table 255: VoIP General Settings Page Settings

Field	Setting
User-Agent	
Host and Domain Name	Enter the host and domain name of the PIMG unit.
Transport Type	Select **UDP**.
Call as Domain Name	Select **No**.
SIPS URI Scheme Enabled	Select **No**.
Invite Expiration (sec)	Enter **120**.
Server	
DNS Server Address	Enter the IP Address of the Domain Name Server that the PIMG unit uses.
DNS Translation of Phone Numbers	Select **No**.
Registration Server Address	Leave this field blank.
Registration Server Port	Enter **5060**.

Field	Setting
Registration Expiration (sec)	Enter **3600**.
TCP/UDP	
UDP/TCP Transports Enabled	Select **Yes**.
TCP/UDP Server Port	Enter **5060**.
TCP Inactivity Timer (sec)	Enter **30**.
TLS	
TLS Transport Enabled	Select **No**.
TLS Server Port	Enter **5061**.
SSL TLS Protocol	Select **SSLv3 TLSv1**.
Mutual TLS Authentication Required	Select **Yes**.
TLS Inactivity Timer (sec)	Enter **30**.
Verify TLS Peer Certificate Date	Select **Yes**.
Verify TLS Peer Certificate Trust	Select **Yes**.
Proxy	
Primary Proxy Server Address	Leave this field blank. Unity Connection
Primary Proxy Server Port	Not applicable. Leave the default setting.
Backup Proxy Server Address	Not applicable. Leave the default setting.
Backup Proxy Server Port	Not applicable. Leave the default setting.
Proxy Query Interval	Enter **10**.
Timing	
T1 Time (ms)	Enter **400**.

Field	Setting
T2 Time (ms)	Enter **3000**.
T4 Time (ms)	Enter **5000**.
Monitoring	
Monitor Call Connections	Select **No**.
Call Monitor Interval (sec)	
Monitor VoIP Hosts	
VoIP Host Monitor Interval (sec)	

Step 71 Select **Submit**.

Step 72 On the Configuration menu, select **VoIP** > **Media**.

Step 73 On the VoIP Media Settings page, enter the following settings.

Table 256: VoIP Media Settings Page Settings

Field	Settings
Audio	
Audio Compression	Select the preferred codec for audio compression.
RTP Digit Relay Mode	Select **RFC2833**.
RTP Fax/Modem Tone Relay Mode	Select **RFC2833**.
RTP Source IP Address Validation	Select **Off**.
RTP Source UDP Port Validation	Select **Off**.
Signaling Digit Relay Mode	Select **Off**.
Voice Activity Detection	Select **Off**.
RFC 3960 Early Media Support	Select **On Demand**.
Frame Size	Select the applicable setting: • G.711—**20** • G.729AB—**10** Failure to use the correct setting results in recorded messages containing nothing but silence.

Field	Settings
Frames Per Packet	Select the applicable setting: • G.711—**1** • G.729AB—**2** Failure to use the correct setting results in recorded messages containing nothing but silence.
Fax	
Fax IP-Transport Mode	
SRTP	
SRTP Preference	Select **RTP Only**.
MKI on Transmit Stream	Select **Yes**.
Key Derivation Enable	Select **Yes**.
Key Derivation Rate	Enter **16**.
Anti-replay Window Size Hint	Enter **64**.
Cipher Mode	Select **AES_Counter_Mode**.
Authentication Type	Select **SHA1**.
Authentication Tag Length	Select **SHA1_80_bit**.

Step 74 Select **Submit**.

Step 75 On the Configuration menu, select **VoIP** > **QOS**.

Step 76 On the VoIP QOS Configuration page, enter the following settings.

Table 257: VoIP QOS Configurative Page Settings

Field	Settings
Call Control QOS Byte	Enter **104**.
RTP QOS Byte	Enter **184**.

Step 77 Select **Submit**.

Step 78 On the Configuration menu, select **IP**.

Step 79 On the IP Settings page, enter the following settings.

Table 258: IP Settings Page Settings

Field	Settings
Client IP Address	Enter the new IP address you want to use for the PIMG unit. (This is the IP address that you enter in Cisco Unity Connection Administration when you create the integration.)
Client Subnet Mask	Enter the new subnet mask, if the subnet mask is different from the default IP address.
Default Network Gateway Address	Enter the IP address of the default network gateway router that the PIMG units use.
BOOTP Enabled	Select **No**.
SNTP Server IP Address	

Step 80 Select **Submit**.

Step 81 On the Configuration menu, select **Tone Detection**.

Step 82 On the Tone Detection page, under Call Progress Tone - Learn, in the Learn Tone Event field, select **Busy** and do the following substeps to verify that the tone is correct.

a) From a available phone, call a second phone.
b) Answer the second phone when it rings, and leave both handsets off so that both phones are busy.
c) From a third phone, dial one of the busy phones.
d) Confirm that you hear a busy tone.
e) Hang up the third phone but leave the handsets for the other two phones off.

Step 83 Under Call Progress Tone - Learn, in the Dial String field, enter the extension that you dialed in Step 82c. from the third phone.

Step 84 Select **Learn**.

Step 85 On the Tone Detection page, under Call Progress Tone - Learn, in the Learn field, select **Error** and do the following substeps to verify that the tone is correct.

a) From an available phone, dial an extension that does not exist.
b) Confirm that you hear the reorder or error tone.
c) Hang up the phone.

Step 86 Under Call Progress Tone - Learn, in the Dial String field, enter the extension that you dialed in Step 85a.

Step 87 Select **Learn**.

Step 88 On the Tone Detection page, under Call Progress Tone - Learn, in the Learn field, select **Ringback** and do the following substeps to verify that the tone is correct.

a) From an available phone, dial an extension that does exist
b) Confirm that you hear the ringback tone.
c) Hang up the phone.

Step 89 Under Call Progress Tone - Learn, in the Dial String field, enter the extension that you dialed in Step 88a.

Step 90 Select **Learn**.

Step 91 Select **Submit**.

Step 92 Hang up the phones that you used in Step 82.

Step 93 On the System menu, select **Restart**.

Step 94 On the Restart page, select **Restart Unit Now**.

Step 95 Repeat Step 2 through Step 94 on all remaining PIMG units.

Configuring Unity Connection for Integration with Nortel Meridian 1 Phone System

After ensuring that the Nortel Meridian 1 phone system, the PIMG units, and Unity Connection are ready for the integration, do the following procedure to set up the integration and to enter the port settings.

Creating an Integration

Step 1 In Cisco Unity Connection Administration, expand **Telephony Integrations**, then select **Phone System**.

Step 2 On the Search Phone Systems page, under Display Name, select the name of the default phone system.

Step 3 On the Phone System Basics page, in the Phone System Name field, enter the descriptive name that you want for the phone system.

Step 4 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 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 5 Under Message Waiting Indicator Settings, select**Use Same Port for Enabling and Disabling MWIs**.

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 applicable settings and select **Save**.

Table 259: Settings for the New Port Group Page

Field	Setting
Phone System	Select the name of the phone system that you entered in Step 3.
Create From	Select **Port Group Template** and select **SIP to DMG/PIMG/TIMG** 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.
SIP Security Profile	Select **5060**.
SIP Transport Protocol	Select the SIP transport protocol that Unity Connection uses.
IP Address or Host Name	Enter the IP address of the PIMG unit that you are integrating with Unity Connection.

Field	Setting
Port	Enter the SIP port of the PIMG unit that Unity Connection connects to. We recommend that you use the default setting. This name must match the setting in the TCP/UDP Server Port field on the Configuration > VoIP > General page of the PIMG unit. Otherwise, the integration cannot function correctly.

Step 9 On the Port Group Basics page, under Message Waiting Indicator Settings, uncheck the **Enable Message Waiting Indicators** check box and select **Save**.

Step 10 In the Related Links drop-down box, select **Add Ports** and select **Go**.

Step 11 On the New Port page, enter the following settings and select **Save**.

Table 260: Settings for the New Port Page

Field	Considerations
Enabled	Check this check box.
Number of Ports	Enter **8**. (If you want to use fewer than eight voice messaging ports, enter the number of voice messaging ports that you want to use on this PIMG unit.) **Note** For a Unity Connection cluster, the server must have the number of voice messaging ports that are set up on the phone system for the PIMG integration so that this server can handle all voice messaging traffic for the cluster if one of the servers stops functioning. For example, if the phone system is set up with 16 voice messaging ports, this server must have 16 voice messaging ports.
Phone System	Select the name of the phone system that you entered in Step 3.
Port Group	Select the name of the port group that you added in Step 8.

Step 12 On the Search Ports page, select the display name of the first voice messaging port that you created for this phone system integration.

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

Step 13 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 261: 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.
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	(Serial integrations only) Uncheck this check box. Otherwise, the integration may not functior correctly. (Digital and analog integrations only) 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 Unity Connection web applications. Assign Allow TRAP Connections to the least busy ports.
Outgoing Hunt Order	Enter the priority order in which Unity Connection uses 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, Unity Connection uses the port that has been idle the longest.

Step 14 Select **Save**.

Step 15 Select **Next**.

Step 16 Repeat Step 13 through Step 15 for all remaining voice messaging ports for the phone system.

Step 17 In Cisco Unity Connection Administration, expand **Telephony Integrations**, then select **Phone System**.

Step 18 On the Search Phone Systems page, under Display Name, select the name of the phone system that you entered in Step 3.

Step 19 Repeat Step 7 through Step 18 for each remaining PIMG unit integrated with Unity Connection.

Note Each PIMG unit is connected to one port group with the applicable voice messaging ports. For example, a system that uses five PIMG units requires five port groups, one port group for each PIMG unit.

Step 20 To create a port group for MWIs, do the following substeps.

Note All MWI requests are handled by the master PIMG unit and sent to the phone system over the RS-232 serial cable (without using voice messaging ports). So the following substeps create a separate port group without voice messaging ports and enable the port group for MWIs that are "not port specific" (they do not use ports).

a) In Cisco Unity Connection Administration expand **Telephony Integration** then select **Port Group** .

b) On the Search Port Groups page, select **Add New**.
c) On the New Port Group page, enter the applicable settings and select **Save**.

Table 262: Settings for the New Port Group Page (MWIs)

Field	Setting
Phone System	Select the name of the phone system that you entered in Step 3.
Create From	Select Port Group Template and select **SIP to DMG/PIMG/TIMG** SIP to in the drop-down box.
Display Name	Enter a **MWI Port Group** or another descriptive name for the port group.
SIP Security Profile	Select **5060**.
SIP Transport Protocol	Select the SIP transport protocol that Unity Connection uses.
IPv4 Address or Host Name	Enter the IP address of the master PIMG unit.
IPv6 Address or Host Name	Do not enter a value in this field. IPv6 is not supported for PIMG integrations.
IP Address or Host Name	Enter the IP address of the master PIMG unit.
Port	Enter the SIP port of the master PIMG unit. **Caution** This name must match the setting in the TCP/UDP Server Port field on the Configuration > VoIP > General page of the PIMG unit. Otherwise, the integration cannot function correctly.

d) On the Port Group Basics page, on the Edit menu, select **Advanced Settings**.
e) On the Edit Advanced Settings page, under SIP MWI Requests, select **Not Port Specific** then select **Save**.
f) On the Edit menu, select **Port Group Basics**.
g) Under Port Group, select **Reset**.
h) Under Message Waiting Indicator Settings, confirm that the **Enable Message Waiting Indicator** check box is checked and select **Save**.

Step 21 If another phone system integration exists, in Cisco Unity Connection Administration, expand **Telephony Integrations**, then select **Trunk**. Otherwise, skip to Step 25.

Step 22 On the Search Phone System Trunks page, on the Phone System Trunk menu, select **New Phone System Trunk**.

Step 23 On the New Phone System Trunk page, enter the following settings for the phone system trunk and select **Save**.

Table 263: Settings for the Phone System Trunk

Field	Setting
From Phone System	Enter the display name of the phone system that you are creating a trunk for.
To Phone System	Enter the display name of the previously existing phone system that the trunk connects to.

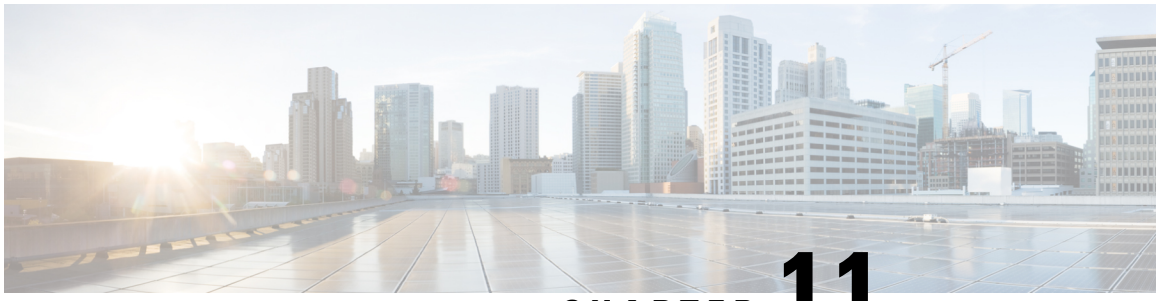
Field	Setting
Trunk Access Code	Enter the extra digits that Unity Connection must dial to transfer calls through the gateway to extensions on the previously existing phone system.

Step 24 Repeat Step 22 and Step 23 for all remaining phone system trunks that you want to create.

Step 25 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 26 In the Task Execution Results window, select **Close**.



CHAPTER 11

Setting Up a Rolm 9751 Digital PIMG Integration with Cisco Unity Connection

- Task List for ROLM 9751 Digital PIMG Phone System Integration, on page 213
- Requirements, on page 214
- Programming ROLM 9751 Digital PIMG Phone System for Integration, on page 215
- Setting Up Digital Rolm PIMG Units, on page 219
- Configuring Unity Connection for Integration with Rolm 9751 Phone System, on page 234

Task List for ROLM 9751 Digital PIMG Phone System Integration

Before doing the following tasks to integrate Unity Connection with the ROLM 9751 phone system using PIMG units (media gateways), confirm that the Unity Connection server is ready for the integration after completing the server installation, following the tasks in the "Installing Cisco Unity Connection" chapter of the *Install, Upgrade, and Maintenance Guide for Cisco Unity Connection Release 15*, available at https://www.cisco.com/c/en/us/td/docs/voice_ip_comm/connection/15/install_upgrade/guide/b_15cuciumg.html .

1. Review the system and equipment requirements to confirm that all phone system and Unity Connection server requirements have been met. See the Requirements, on page 12 section.
2. Plan how the voice messaging ports are used by Unity Connection. See the Planning the Usage of Voice Messaging Ports, on page 7 chapter.
3. Program the ROLM 9751 phone system and extensions. See the Programming ROLM 9751 Digital PIMG Phone System for Integration, on page 215 section.
4. Set up the PIMG units.
5. Create the integration. See the Configuring Unity Connection for Integration with Rolm 9751 Phone System, on page 234 section.
6. Test the integration. See the Testing the Integration, on page 381 chapter.
7. 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, on page 387 chapter.

Requirements

This integration supports configurations of the following components:

Phone System

- ROML 9751 phone system with ROLMphone digital phones.
- One of the following software releases:
  - 9005.
  - 9006.
- *(Software release 9005 only)* RolmLink Interface (RLI) card.
- *(Software release 9006 only)* SLMR-type line card.
- One or more of the applicable PIMG units. For details, see the "Introduction" chapter.
- The voice messaging ports in the phone system connected by digital lines to the ports on the PIMG units.

To simplify troubleshooting, we recommend that you connect the voice messaging ports on the phone system to the ports on the PIMG units in a planned manner. For example, connect the first phone system voice messaging port to the first port on the first PIMG unit, connect the second phone system voice messaging port to the second port on the first PIMG unit, and so on. Alternatively, if you have multiple PIMG units, you can reduce answer times in the event of a PIMG unit failure by connecting the phone system ports to the PIMG units in a round-robin fashion. For example, connect the first phone system voice messaging port to the first port on the first PIMG unit, connect the second phone system voice messaging port to the first port on the second PIMG unit, and so on.

- The PIMG units connected to the same LAN or WAN that Unity Connection is connected to.
- If the PIMG units connect to a WAN, the requirements for the WAN network connections are:
  - For G.729a codec formatting, a minimum of 32.76 Kbps guaranteed bandwidth for each voice messaging port.
  - For G.711 codec formatting, a minimum of 91.56 Kbps guaranteed bandwidth for each voice messaging port.
  - No network devices that implement network address translation (NAT).
  - A maximum 200 ms one-way network latency.

Unity Connection Server

- Unity Connection installed following the tasks in the "Installing Cisco Unity Connection" chapter of the *Install, Upgrade, and Maintenance Guide for Cisco Unity Connection Release 15*, available at https://www.cisco.com/c/en/us/td/docs/voice_ip_comm/connection/15/install_upgrade/guide/b_15cuciumg.html.
- A license that enables the applicable number of voice messaging ports.

Programming ROLM 9751 Digital PIMG Phone System for Integration

If you use programming options other than those supplied in the following procedure, the performance of the integration may be affected.

The following programming instructions are provided as an example only. The specific programming for your phone system may vary depending on its configuration.

Caution In programming the phone system, do not send calls to voice messaging ports in 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.

Programing the Rolm 9751 Phone System (Software Release 9005)

Step 1 Use the MO COS_FEATURE command to modify the class of service (COS) for the voice messaging port and the ROLMphone 400 lines so that the following features are set as indicated:

- APV (always in privacy)—Yes
- NFL (no flash allowed)—No
- NOH (no howler)—Yes
- DND (do not disturb)—No

Step 2 On an unused Feature Configuration Table, use the CRE BUTTON _400 command to make the following button assignments for the ROLMphone 400. Cancel all remaining button assignments.

Table 264: Required Button Assignments

Button	Setting
9	Enter **LINE 1**.
10	Enter **HOLD**.
30	Enter **CNCT** (connect).
37	Enter **MWCTR** (message waiting center).
38	Enter **XFER** (transfer).

All buttons not listed in Table 264: Required Button Assignments must have no assignments. Otherwise the integration cannot function correctly.

Step 3 Use the CRE EXT command to create an extension number for each port connects to the PIMG units.

For example, the first port can be extension 501, the second port can be extension 502, and so on.

Step 4 Use the CRE RPI <xx><yy><zz> (where <xx> is the shelf number, <yy> is the card slot number, and <zz> is the card channel number) to assign the extension numbers, telephone type (400) and button feature table to the Rolm digital channels. One RPI channel per PIMG port is required.

Step 5 Use the CRE HD_Group 500 command to place all PIMG ports into a hunt group that has the pilot number 500.

Step 6 Continue with the Setting Up Digital Rolm PIMG Units.

Programing the ROLM 9751Phone System (Software Release 9006)

Step 1 Use the ADDDPLN command to create a dial plan for the voice messaging port extensions with the following settings.

Table 265: ADD Directory Number Table Settings

Field	Setting
TYPE	Enter **DGTS**.
DGTS	Enter the extension of the first port connects to the PIMG units.
DPLN	Enter **0**.
CPS	Leave this field blank.
DAR	Enter **STN**.
CHECK	Enter **N**.
ACDP	Leave this field blank.
AC2	Leave this field blank.
CPS2	Leave this field blank.
ACDP2	Leave this field blank.
SKIPDGTS	Leave this field blank.

Step 2 Repeat Step 1 for all remaining ports connect to the PIMG units.

Step 3 Use the ADDSTN command to configure the PIMG ports as ROLMphone 400 station sets with the following settings. Accept the default settings for all other fields.

Table 266: PIMG Port Settings

Field	Setting
Station Number/Loc	Enter **2052**.
Port Location	Enter **1- 1-115- 2**.

Field	Setting
Device Type	Enter **RP400**.
Faceplate#/PrimeKey#	Enter **10/9**.

Step 4 Make the following faceplate key assignments.

Table 267: Required Faceplate Key Assignments

Key	Setting
DIGTYPE	Enter **RP400**.
9	Enter **LINE**.
30	Enter **CNCT**.
38	Enter **XFER**.
40	Enter **CALLWT**.

Step 5 If you use a hunt group for the PIMG ports, do the following substeps. Otherwise, continue to Step 6.

a) Use the ADDDPLN command to change the dial plan for the pilot number with the following settings.

Table 268: ADD Directory Number Table Settings for the Hunt Group Pilot Number

Field	Setting
TYPE	Enter **DGTS**.
DGTS	Enter the pilot number of the hunt group for the PIMG ports.
CPS	Enter **0**.
DAR	Enter **HUNT**.
ACDP	Enter **N**.

b) Use the ADDHUNT command to add the PIMG port extensions to the hunt group with the following settings.

Table 269: ADD Hunt Group Settings for the PIMG Ports

Field	Setting
TYPE	Enter **VCE**.
AC	Enter the pilot number of the hunt group for the PIMG ports.
DPLN	Enter the number of the dial plan that you created in Step 1.
STNO	Enter the extension numbers of all the ports connect to the PIMG units.
NAME	Leave this field blank.

Field	Setting
CQMAX	Enter **0**.
FNA	Enter **Y**.
STYPE	Enter **LIN**.

Step 6 Use the CHACOS command to configure the class of service (COS) with the following settings for administrators and technicians who must be able to call the PIMG units directly for troubleshooting.

Table 270: COS Restriction Table Settings

Field	Setting
COS	Enter the number of the COS that you are setting up.
AVCE	Enter **huntb&huntna&mscap**.
ADTE	Leave this field blank.
AFAX	Leave this field blank.
DVCE	Leave this field blank.
DDTE	Leave this field blank.
DFAX	Leave this field blank.

Step 7 Configure forwarding for all subscriber extensions with the following settings.

Table 271: Forwarding Settings for Subscriber Extensions

Field	Setting
VCE Call Forward Dest Type	Enter **DN**.
Busy Internal	Enter **Y**.
Busy External	Enter **Y**.
Do Not Disturb Internal	Enter **Y**.
Do Not Disturb External	Enter **Y**.
Ring No Answer Internal	Enter **Y**.
Ring No Answer External	Enter **Y**.
All Conditions Internal	Enter **Y**.
All Conditions External	Enter **Y**.

Field	Setting
Night Option: VCE Call Forward Dest 1	Enter the pilot number of the hunt group for the PIMG ports.
Night Option: VCE Call Forward Dest 2	Leave this field blank.
Station Hunt Dest	Leave this field blank.
DNIS Display	Enter **Y**.
Delayed CFW on Busy	Enter **N**.
Simplex Voice Call Dest	Leave this field blank.

Step 8 Continue with the Setting Up Digital Rolm PIMG Units.

Setting Up Digital Rolm PIMG Units

Do the following procedures to set up the digital Rolm PIMG units that are connected to the Siemens Hicom 150 phone system.

These procedures require that the following tasks have already been completed:

- The phone system is connected to the digital Rolm PIMG units using digital lines.
- The PIMG units are ready to be connected to the LAN or WAN.
- The PIMG units are connected to a power source.

Fields that are not mentioned in the following procedures must keep their default values. For the default values of all fields, see the documentation for the PIMG units.

Downloading the PIMG Firmware Update Files for Digital Rolm PIMG Units

Step 1 On a Windows workstation with a high-speed Internet connection that have access to the PIMG units, go to the Voice and Unified Communications Downloads page at http://software.cisco.com/download/navigator.html?mdfid=280082558&i=rm.

Note To access the software download page, you must be signed in to Cisco.com as a registered user.

This procedure describes the steps when using Internet Explorer as your web browser. If you are using a different web browser, the steps may differ.

Step 2 In the tree control on the Downloads Home page, expand Unified Communications> **Unified Communications Applications** > **Messaging** > **Cisco Unity** and select **Cisco Unity Telephony Integration**.

Step 3 On the Log In page, enter your username and password, then select **Log In**.

Step 4 On the Select a Release page, under Latest Releases, select the most recent release.

Step 5 In the right column, select the version of the firmware for digital Rolm PIMG units.

Step 6 On the Download Image page, select **Download**.

Step 7 On the Supporting Document(s) page, select **Agree**.

Step 8 In the File Download dialog box, select **Save**.

Step 9 In the Save As dialog box, browse to the Windows workstation that have access the PIMG units, browse to a directory where you want to save the file, and select **Save**.

Step 10 In the Download Complete dialog box, select **Open**. The window for extracting the PIMG firmware update files appears.

Step 11 Select **Extract**.

Step 12 In the Extract dialog box, browse to the directory where you want the extracted files, and select **Extract**.

Step 13 Close the window for the extracting application.

Setting Up the Digital Rolm PIMG Units (Firmware Version 6.x)

Step 1 On the Windows workstation, add a temporary route to enable access to the PIMG units.

a) On the Windows Start menu, select **Run**.

b) Enter **cmd**, and press **Enter**. The Command Prompt window appears.

c) At the command prompt, enter **route add 10.12.13.74 <IP Address of Workstation>**, and press **Enter**.

For example, if the IP address of the workstation is 198.1.3.25, enter “route add 10.12.13.74<space>198.1.3.25” in the Command Prompt window.

d) Close the Command Prompt window.

Step 2 Connect a PIMG unit to the network.

Step 3 In the web browser, go to **http://10.12.13.74**.

Step 4 To sign in, enter the following case-sensitive settings.

Table 272: Sign-in Settings

Field	Setting
Username	Enter **admin**.
Password	Enter **IpodAdmin**.

Step 5 Select **OK**.

Step 6 On the System menu, select **Upgrade**.

Step 7 On the Upgrade page, select **Browse**.

Step 8 In the Choose File dialog box, browse to the directory on the Windows workstation that has the extracted PIMG firmware update files.

Step 9 Select **Mtl_<xx** > **.app** (where <xx> is multiple digits), and select **Open**.

Step 10 On the Upgrade page, select **Install File**.

Step 11 After the file is installed, a message prompting you to restart the PIMG unit appears. Select **Cancel**.

Do not restart the PIMG unit until you are instructed to do so later in this procedure, even if the file installation fails. Restarting the PIMG unit at this step may prevent the PIMG unit from functioning correctly.

Step 12 Repeat Step 6 through Step 11 for each of the following files (where <xx> is multiple digits):

- Mtl_<xx>.fsh
- Run<xx>FskEcho.dsp
- Mtl<xx>.lca

Step 13 On the Configuration menu, select **Import/Export**.

Step 14 On the Import/Export page, select **Browse**.

Step 15 In the Choose File dialog box, browse to the file RLMDNI_Cfg_Rolm.ini.

Step 16 Select **RLMDNI_Cfg_Rolm.ini**, and select **Open**.

Step 17 On the Import/Export page, select **Import File**.

Step 18 After the file is imported, a message prompting you to restart the PIMG unit appears. Select **OK**.

Step 19 In the web browser, go to **http://10.12.13.74**.

Step 20 To sign in, enter the following case-sensitive settings.

Table 273: Sign-in Settings

Field	Setting
Username	Enter **admin**.
Password	Enter **IpodAdmin**.

Step 21 Select **OK**.

Step 22 If your Unity Connection system must have an RTP port range of 16384 to 32767, do the following substeps. Otherwise, continue to Step 23.

You must set the RTP port range for the PIMG units if your system uses an RTP port range of 16384 to 32767. Otherwise, Unity Connection cannot be able answer calls and callers hear ringing or silence.

Note The default RTP port range for PIMG units is 49000 to 50000. Some Unity Connection configurations require a different RTP port range.

a) On the Configuration menu, select **Import/Export**.
b) On the Import/Export page, under Export Files, select **Export All Settings**.
c) In the File Download dialog box, select **Save**.
d) In the Save As dialog box, browse to the Windows workstation that has access to the PIMG units, browse to a directory where you want to save the file, and select **Save**.
e) In the Download Complete dialog box, select **Open**. Notepad opens the file Config.ini that you saved.
f) Locate the line with the following parameter:

```
gwRTPStartPort
```

g) Change the value of the parameter to **16384** so that the line reads as follows:

```
gwRTPStartPort = 16384
```

h) Locate the line with the following parameter:

```
gwRTPEndPort
```

i) Change the value of the parameter to **32767** so that the line reads as follows:

```
gwRTPEndPort = 32767
```

j) Save the file, and exit Notepad.
k) On the Configuration menu of the PIMG unit, select **Import/Export**.
l) On the Import/Export page, under Browse for Import File, select **Browse**.
m) In the Choose File dialog box, browse to the file Config.ini that you saved.
n) Select **Config.ini**, and select **Open**.
o) On the Import/Export page, select **Import File**.
p) When prompted to restart the PIMG unit, select **OK**.
q) When the PIMG unit has restarted, in the web browser, go to **http://10.12.13.74**.
r) To sign in, enter the following case-sensitive settings.

Table 274: Sign-in Settings

Field	Setting
Username	Enter **admin**.
Password	Enter **IpodAdmin**.

s) Select **OK**.

Step 23 On the System menu, select **Password**.

Step 24 On the Change Password page, enter the following settings.

Table 275: Change Password Page Settings

Field	Setting
Old Password	Enter **IpodAdmin**. (This setting is case sensitive.)
New Password	Enter your new password. (This setting is case sensitive.)
Confirm Password	Enter your new password. (This setting is case sensitive.)

Step 25 Select **Change**.

Step 26 On the Configuration menu, select **Routing Table**.

Step 27 On the Routing Table page, under Router Configuration, select **VoIP Host Groups**.

Step 28 Under VoIP Host Groups, enter the following settings for the first VoIP Host Group.

Table 276: First VoIP Host Group Settings

Field	Settings
Name	Accept the default or enter another descriptive name of the VoIP host group.

Field	Settings
Load-Balanced	*(Unity Connection without a cluster)* Select **False**. *(Unity Connection with a cluster configured)* Select **False**.
Fault-Tolerant	*(Unity Connection without a cluster)* Select **False**. *(Unity Connection with a cluster configured)* Select **True**.

Step 29 For Unity Connection without a cluster, under Host List, enter the host name or IP address of the Unity Connection server and the server port in the format <host name or IP address>:5060.

For Unity Connection with a cluster configured, under Host List, enter the host name or IP address of the subscriber server (the second Unity Connection server that you installed) and the server port in the format <host name or IP address>:5060.

Step 30 For Unity Connection without a cluster, continue to Step 32. For Unity Connection with a cluster configured, select **Add Host**.

Step 31 In the second field, enter the host name or IP address of the publisher server (the first Unity Connection server that you installed) and the server port in the format <host name or IP address>:5060.

Do not add a third host under Host List or a second host group under VoIP Host Groups. Otherwise, the Unity Connection cluster may not function correctly.

Step 32 Select **Submit**.

Step 33 Under Router Configuration, select **TDM Trunk Groups**.

Step 34 Under TDM Trunk Groups, select **Add Trunk Group**.

Step 35 Under TDM Trunk Groups, enter the following settings for the first TDM trunk group.

Table 277: First TDM Trunk Group Settings (Inbound Calls)

Field	Settings
Name	Enter **Inbound_PBX_Calls** or another unique name. This TDM trunk group handles all incoming calls from the phone system.
Selection Direction	Select **Ascending**.
Selection Mode	Select **Linear**.
Port/Channel Content	Enter the numbers of the PIMG ports that handle inbound calls. For example, enter "*" for all PIMG ports, or enter "1-6" for the first six PIMG ports.

Step 36 Under TDM Trunk Groups, select **Add Trunk Group**.

Step 37 Enter the following settings for the second TDM trunk group.

Table 278: Second TDM Trunk Group Settings (MWIs)

Field	Settings
Name	Enter **MWIs** or another unique name. This TDM trunk group handles outbound MWI calls (where applicable).

Field	Settings
Selection Direction	Select **Ascending**.
Selection Mode	Select **Cyclic**.
Port/Channel Content	Enter the numbers of the PIMG ports that dial out MWIs. For example, enter "*" for all PIMG ports, or enter "7,8" for the last two PIMG ports.

Step 38 Under TDM Trunk Groups, select **Add Trunk Group**.

Step 39 Enter the following settings for the third TDM trunk group.

Table 279: Third TDM Trunk Group Settings (Outbound Calls)

Field	Settings
Name	Enter **Outbound_PBX_Calls** or another unique name. This TDM trunk group handles all outbound calls from Unity Connection.
Selection Direction	Select **Descending**.
Selection Mode	Select **Linear**.
Port/Channel Content	Enter ***** for all channels in all ports. Enter the numbers of the PIMG ports that handles outbound (dialout) calls. For example, enter "*" for all PIMG ports, or enter "7,8" for the last two PIMG ports.

Step 40 Select **Submit**.

Step 41 Under Router Configuration, select **Inbound VoIP Rules**.

Step 42 Under Inbound VoIP Rules, uncheck the **Enabled** check box for the default rule.

Step 43 Select **Add Rule**.

Step 44 Under Inbound VoIP Rules, enter the following settings for the first new inbound VoIP rule.

Table 280: First New Inbound VoIP Rule Settings (MWIs)

Field	Settings
Enable	Check this check box.
Rule Label	Enter **MWI_Calls** or another name. This inbound VoIP rule handles all MWI calls from Unity Connection.
Request Type	Select **Message**.
Originating VoIP Host Address	Enter *****.

Step 45 Under Inbound VoIP Request Matching, enter the following settings.

The rule that you created in Step 44 must be selected. Otherwise, any changes you make apply to another rule.

Table 281: Inbound VoIP Request Matching Settings

Field	Settings
Calling Number	Enter *****.
Calling Name	Enter *****.
Called Number	Enter *****.
Called Name	Enter *****.
Redirect Number	Enter *****.
Redirect Name	Enter *****.

Step 46 Under Outbound Routes, enter the following settings.

The rule that you created in Step 44 must be selected. Otherwise, any changes you make apply to another rule.

Table 282: Outbound Routes Settings

Field	Settings
Device Selection	
Outbound Destination	Select **TDM**.
Trunk Group	Select the name of the TDM trunk group that you created for MWIs in Step 37. For example, select "MWIs.
CPID Manipulation	
Calling Number	Enter **S**.
Calling Name	Enter **S**.
Called Number	Enter **D**.
Called Name	Enter **D**.
Redirect Number	Enter **R**.
Redirect Name	Enter **R**.
Select Primary/Alternate Route	
Primary	Select **Primary**.

Step 47 Under Inbound VoIP Rules, select **Add Rule**.

Step 48 Under Inbound VoIP Rules, enter the following settings for the second new inbound VoIP rule.

Table 283: Second New Inbound VoIP Rule Settings (Outbound Calls)

Field	Settings
Enable	Check this check box.
Rule Label	Enter **Outbound_UC_Calls** or another name. This inbound VoIP rule handle all outbound calls from Unity Connection.
Request Type	Select **Call**.
Originating VoIP Host Address	Enter *****.

Step 49 Under Inbound VoIP Request Matching, enter the following settings.

The rule that you created in Step 48 must be selected. Otherwise, any changes you make apply to another rule.

Table 284: Inbound VoIP Request Matching Settings

Field	Settings
Calling Number	Enter *****.
Calling Name	Enter *****.
Called Number	Enter *****.
Called Name	Enter *****.
Redirect Number	Enter *****.
Redirect Name	Enter *****.

Step 50 Under Outbound Routes, enter the following settings.

The rule that you created in Step 48 must be selected. Otherwise, any changes you make apply to another rule.

Table 285: Outbound Routes Settings

Field	Settings
Device Selection	
Outbound Destination	Select **TDM**.
Trunk Group	Select the name of the TDM trunk group that you created for outbound calls in Step 39. For example, select “Outbound_PBX_Calls.”
CPID Manipulation	
Calling Number	Enter **S**.
Calling Name	Enter **S**.

Field	Settings
Called Number	Enter **D**.
Called Name	Enter **D**.
Redirect Number	Enter **R**.
Redirect Name	Enter **R**.
Select Primary/Alternate Route	
Primary	Select **Primary**.

Step 51 Select **Submit**.

Step 52 Under Router Configuration, select **Inbound TDM Rules**.

Step 53 Under Inbound TDM Rules, enter the following settings for the first inbound TDM rule.

Table 286: First Inbound TDM Rule Settings

Field	Settings
Enable	Check this check box.
Rule Label	Enter **Inbound_Rule_1** or another name. This inbound TDM rule handles all incoming calls from the phone system.
Request Type	Select **Call**.
Trunk Group	Select the name of the TDM trunk group that you created for incoming calls from the phone system in Step 35. For example, select “Inbound_PBX_Calls.”

Step 54 Under Inbound TDM Request Matching, enter the following settings.

The rule that you created in Step 53 must be selected. Otherwise, any changes you make apply to another rule.

Table 287: Inbound TDM Request Matching Settings

Field	Settings
Calling Number	Enter the applicable matching rule used. For example, enter “*” for all.
Calling Name	Enter the applicable matching rule used. For example, enter “*” for all.
Called Number	Enter the applicable matching rule used. For example, enter “*” for all.
Called Name	Enter the applicable matching rule used. For example, enter “*” for all.
Redirect Number	Enter the applicable matching rule used. For example, enter “*” for all.
Redirect Name	Enter the applicable matching rule used. For example, enter “*” for all.

Step 55 Under Outbound Routes, enter the following settings.

The rule that you created in Step 53 must be selected. Otherwise, any changes you make apply to another rule.

Table 288: Outbound Routes Settings

Field	Settings
Device Selection	
Outbound Destination	Select **VoIP**.
Host Group	Select the name of the VoIP host group that you created for Unity Connection in Step 28.
CPID Manipulation	
Calling Number	Enter S.
Calling Name	Enter S.
Called Number	Enter D.
Called Name	Enter D.
Redirect Number	Enter R.
Redirect Name	Enter R.
Select Primary/Alternate Route	
Primary	Select **Primary**.

Step 56 If you want to create more Inbound TDM rules, under Inbound TDM Rules, select **Add Rule**. Otherwise, continue to Step 58.

Step 57 Repeat Step 53 through Step 56 for all remaining inbound TDM rules that you want to create.

Step 58 Select **Submit**.

Step 59 On the Configuration menu, select **TDM** > **Digital**.

Step 60 On the Digital Telephony page, in the Telephony Switch Type field, select the applicable setting for your phone system:

- **Rolm_9751_SW9005**
- **Rolm_9751_SW9006**

Step 61 Select **Submit**.

Step 62 On the Configuration menu, select **TDM** > **General**.

Step 63 On the TDM General Settings page, enter the following settings.

Table 289: TDM General Settings Page Settings

Field	Settings
PCM Coding	Select **uLaw**.

Field	Settings
Minimum Call Party Delay (ms)	Enter **500**.
Maximum Call Party Delay (ms)	Enter **2000**.
Dial Digit on Time (ms)	Enter **100**.
Dial Inter-Digit Time (ms)	Enter **100**.
Dial Pause Time (ms)	Enter **2000**.
Turn MWI On FAC	Leave this field blank.
Turn MWI Off FAC	Leave this field blank.
Outbound Call Connect Timeout (ms)	Enter **10000**.
Wait for Ringback/Connect on Blind Transfer	Select **Yes**.
Hunt Group Extension	Enter the pilot number of the Unity Connection voice messaging ports.
Disconnect on Fax Cleardown Tone	Select **No**.

Step 64 Select **Submit**.

Step 65 On the Configuration menu, select **TDM** > **Port Enable**.

Step 66 On the TDM Port Enabling page, select **No** for the ports that you want to disable on the PIMG unit.

Step 67 Confirm that **Yes** is selected for all other ports on the PIMG unit.

Step 68 Select **Submit**.

Step 69 On the Configuration menu, select **VoIP** > **General**.

Step 70 On the VoIP General Settings page, enter the following settings.

Table 290: VoIP General Settings Page Settings

Field	Setting
User-Agent	
Host and Domain Name	Enter the host and domain name of the PIMG unit.
Transport Type	Select **UDP**.
Call as Domain Name	Select **No**.
SIPS URI Scheme Enabled	Select **No**.
Invite Expiration (sec)	Enter **120**.

Field	Setting
Server	
DNS Server Address	Enter the IP Address of the Domain Name Server that the PIMG unit uses.
DNS Translation of Phone Numbers	Select **No**.
Registration Server Address	Leave this field blank.
Registration Server Port	Enter **5060**.
Registration Expiration (sec)	Enter **3600**.
TCP/UDP	
UDP/TCP Transports Enabled	Select **Yes**.
TCP/UDP Server Port	Enter **5060**.
TCP Inactivity Timer (sec)	Enter **30**.
TLS	
TLS Transport Enabled	Select **No**.
TLS Server Port	Enter **5061**.
SSL TLS Protocol	Select **SSLv3 TLSv1**.
Mutual TLS Authentication Required	Select **Yes**.
TLS Inactivity Timer (sec)	Enter **30**.
Verify TLS Peer Certificate Date	Select **Yes**.
Verify TLS Peer Certificate Trust	Select **Yes**.
Proxy	
Primary Proxy Server Address	Leave this field blank.
Primary Proxy Server Port	Not applicable. Leave the default setting.

Field	Setting
Backup Proxy Server Address	Not applicable. Leave the default setting.
Backup Proxy Server Port	Not applicable. Leave the default setting.
Proxy Query Interval	Enter **10**.
Timing	
T1 Time (ms)	Enter **400**.
T2 Time (ms)	Enter **3000**.
T4 Time (ms)	Enter **5000**.
Monitoring	
Monitor Call Connections	Select **No**.
Call Monitor Interval (sec)	
Monitor VoIP Hosts	
VoIP Host Monitor Interval (sec)	

Step 71 Select **Submit**.

Step 72 On the Configuration menu, select **VoIP** > **Media**.

Step 73 On the VoIP Media Settings page, enter the following settings.

Table 291: VoIP Media Settings Page Settings

Field	Settings
Audio	
Audio Compression	Select the preferred codec for audio compression.
RTP Digit Relay Mode	Select **RFC2833**.
RTP Fax/Modem Tone Relay Mode	Select **RFC2833**.
RTP Source IP Address Validation	Select **Off**.
RTP Source UDP Port Validation	Select **Off**.
Signaling Digit Relay Mode	Select **Off**.
Voice Activity Detection	Select **Off**.

Field	Settings
RFC 3960 Early Media Support	Select **On Demand**.
Frame Size	Select the applicable setting: • G.711—**20** • G.729AB—**10** Failure to use the correct setting results in recorded messages containing nothing but silence.
Frames Per Packet	Select the applicable setting: • G.711—**1** • G.729AB—**2** Failure to use the correct setting results in recorded messages containing nothing but silence.
Fax	
Fax IP-Transport Mode	
SRTP	
SRTP Preference	Select **RTP Only**.
MKI on Transmit Stream	Select **Yes**.
Key Derivation Enable	Select **Yes**.
Key Derivation Rate	Enter **16**.
Anti-replay Window Size Hint	Enter **64**.
Cipher Mode	Select **AES_Counter_Mode**.
Authentication Type	Select **SHA1**.
Authentication Tag Length	Select **SHA1_80_bit**.

Step 74 Select **Submit**.

Step 75 On the Configuration menu, select **VoIP** > **QOS**.

Step 76 On the VoIP QOS Configuration page, enter the following settings.

Table 292: VoIP QOS Configurative Page Settings

Field	Settings
Call Control QOS Byte	Enter **104**.
RTP QOS Byte	Enter **184**.

Step 77 Select **Submit**.

Step 78 On the Configuration menu, select **IP**.

Step 79 On the IP Settings page, enter the following settings.

Table 293: IP Settings Page Settings

Field	Settings
Client IP Address	Enter the new IP address you want to use for the PIMG unit. (This is the IP address that you enter in Cisco Unity Connection Administration when you create the integration.)
Client Subnet Mask	Enter the new subnet mask, if the subnet mask is different from the default IP address.
Default Network Gateway Address	Enter the IP address of the default network gateway router that the PIMG units use.
BOOTP Enabled	Select **No**.
SNTP Server IP Address	

Step 80 Select **Submit**.

Step 81 On the Configuration menu, select **Tone Detection**.

Step 82 On the Tone Detection page, under Call Progress Tone - Learn, in the Learn Tone Event field, select **Busy** and do the following substeps to verify that the tone is correct.

a) From a available phone, call a second phone.
b) Answer the second phone when it rings, and leave both handsets off so that both phones are busy.
c) From a third phone, dial one of the busy phones.
d) Confirm that you hear a busy tone.
e) Hang up the third phone but leave the handsets for the other two phones off.

Step 83 Under Call Progress Tone - Learn, in the Dial String field, enter the extension that you dialed in Step 82c. from the third phone.

Step 84 Select **Learn**.

Step 85 On the Tone Detection page, under Call Progress Tone - Learn, in the Learn field, select **Error** and do the following substeps to verify that the tone is correct.

a) From an available phone, dial an extension that does not exist.
b) Confirm that you hear the reorder or error tone.
c) Hang up the phone.

Step 86 Under Call Progress Tone - Learn, in the Dial String field, enter the extension that you dialed in Step 85a.

Step 87 Select **Learn**.

Step 88 On the Tone Detection page, under Call Progress Tone - Learn, in the Learn field, select **Ringback** and do the following substeps to verify that the tone is correct.

a) From an available phone, dial an extension that does exist.
b) Confirm that you hear the ringback tone.
c) Hang up the phone.

Step 89 Under Call Progress Tone - Learn, in the Dial String field, enter the extension that you dialed in Step 88a.

Step 90 Select **Learn**.

Step 91 Select **Submit**.

Step 92 Hang up the phones that you used in Step 82.

Step 93 On the System menu, select **Restart**.

Step 94 On the Restart page, select **Restart Unit Now**.

Step 95 Repeat Step 2 through Step 94 on all remaining PIMG units.

Configuring Unity Connection for Integration with Rolm 9751 Phone System

After ensuring that the Rolm 9751 phone system, the PIMG units, and Unity Connection are ready for the integration, do the following procedure to set up the integration and to enter the port settings.

Creating an Integration

Step 1 In Cisco Unity Connection Administration, expand **Telephony Integrations**, then select **Phone System**.

Step 2 On the Search Phone Systems page, under Display Name, select the name of the default phone system.

Step 3 On the Phone System Basics page, in the Phone System Name field, enter the descriptive name that you want for the phone system.

Step 4 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 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 5 Under Message Waiting Indicator Settings, select**Use Same Port for Enabling and Disabling MWIs**.

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 applicable settings and select **Save**.

Table 294: Settings for the New Port Group Page

Field	Setting
Phone System	Select the name of the phone system that you entered in Step 3.
Create From	Select **Port Group Template** and select **SIP to DMG/PIMG/TIMG** 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.
SIP Security Profile	Select **5060**.

Field	Setting
SIP Transport Protocol	Select the SIP transport protocol that Unity Connection uses.
IP Address or Host Name	Enter the IP address of the PIMG unit that you are integrating with Unity Connection.
Port	Enter the SIP port of the PIMG unit that Unity Connection connects to. We recommend that you use the default setting. This name must match the setting in the TCP/UDP Server Port field on the Configuration > VoIP > General page of the PIMG unit. Otherwise, the integration cannot function correctly.

Step 9 On the Port Group Basics page, under Message Waiting Indicator Settings, uncheck the **Enable Message Waiting Indicators** check box and select **Save**.

Step 10 In the Related Links drop-down box, select **Add Ports** and select **Go**.

Step 11 On the New Port page, enter the following settings and select **Save**.

Table 295: Settings for the New Port Page

Field	Considerations
Enabled	Check this check box.
Number of Ports	Enter **8**. (If you want to use fewer than eight voice messaging ports, enter the number of voice messaging ports that you want to use on this PIMG unit.) **Note** For a Unity Connection cluster, the server must have the number of voice messaging ports that are set up on the phone system for the PIMG integration so that this server can handle all voice messaging traffic for the cluster if one of the servers stops functioning. For example, if the phone system is set up with 16 voice messaging ports, this server must have 16 voice messaging ports.
Phone System	Select the name of the phone system that you entered in Step 3.
Port Group	Select the name of the port group that you added in Step 8.

Step 12 On the Search Ports page, select the display name of the first voice messaging port that you created for this phone system integration.

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

Step 13 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 296: 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.
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	(Serial integrations only) Uncheck this check box. Otherwise, the integration may not functior correctly. (Digital and analog integrations only) 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 Unity Connection web applications. Assign Allow TRAP Connections to the least busy ports.
Outgoing Hunt Order	Enter the priority order in which Unity Connection uses 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, Unity Connection uses the port that has been idle the longest.

Step 14 Select **Save**.

Step 15 Select **Next**.

Step 16 Repeat Step 13 through Step 15 for all remaining voice messaging ports for the phone system.

Step 17 In Cisco Unity Connection Administration, expand **Telephony Integrations**, then select **Phone System**.

Step 18 On the Search Phone Systems page, under Display Name, select the name of the phone system that you entered in Step 3.

Step 19 Repeat Step 7 through Step 18 for each remaining PIMG unit integrated with Unity Connection.

Note Each PIMG unit is connected to one port group with the applicable voice messaging ports. For example, a system that uses five PIMG units requires five port groups, one port group for each PIMG unit.

Step 20 To create a port group for MWIs, do the following substeps.

Note All MWI requests are handled by the master PIMG unit and sent to the phone system over the RS-232 serial cable (without using voice messaging ports). So the following substeps create a separate port group without voice messaging ports and enable the port group for MWIs that are "not port specific" (they do not use ports).

a) In Cisco Unity Connection Administration expand **Telephony Integration** then select **Port Group** .

b) On the Search Port Groups page, select **Add New**.
c) On the New Port Group page, enter the applicable settings and select **Save**.

Table 297: Settings for the New Port Group Page (MWIs)

Field	Setting
Phone System	Select the name of the phone system that you entered in Step 3.
Create From	Select Port Group Template and select **SIP to DMG/PIMG/TIMG** SIP to in the drop-down box.
Display Name	Enter a **MWI Port Group** or another descriptive name for the port group.
SIP Security Profile	Select **5060**.
SIP Transport Protocol	Select the SIP transport protocol that Unity Connection uses.
IPv4 Address or Host Name	Enter the IP address of the master PIMG unit.
IPv6 Address or Host Name	Do not enter a value in this field. IPv6 is not supported for PIMG integrations.
IP Address or Host Name	Enter the IP address of the master PIMG unit.
Port	Enter the SIP port of the master PIMG unit. **Caution** This name must match the setting in the TCP/UDP Server Port field on the Configuration > VoIP > General page of the PIMG unit. Otherwise, the integration cannot function correctly.

d) On the Port Group Basics page, on the Edit menu, select **Advanced Settings**.
e) On the Edit Advanced Settings page, under SIP MWI Requests, select **Not Port Specific** then select **Save**.
f) On the Edit menu, select **Port Group Basics**.
g) Under Port Group, select **Reset**.
h) Under Message Waiting Indicator Settings, confirm that the **Enable Message Waiting Indicator** check box is checked and select **Save**.

Step 21 If another phone system integration exists, in Cisco Unity Connection Administration, expand **Telephony Integrations**, then select **Trunk**. Otherwise, skip to Step 25.

Step 22 On the Search Phone System Trunks page, on the Phone System Trunk menu, select **New Phone System Trunk**.

Step 23 On the New Phone System Trunk page, enter the following settings for the phone system trunk and select **Save**.

Table 298: Settings for the Phone System Trunk

Field	Setting
From Phone System	Enter the display name of the phone system that you are creating a trunk for.
To Phone System	Enter the display name of the previously existing phone system that the trunk connects to.

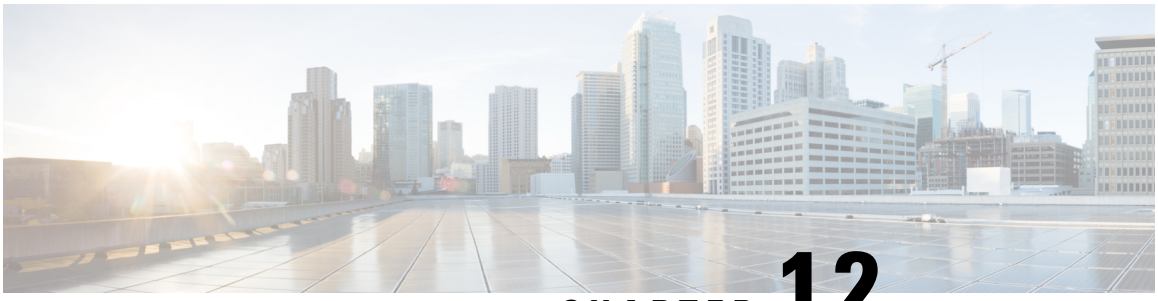
Field	Setting
Trunk Access Code	Enter the extra digits that Unity Connection must dial to transfer calls through the gateway to extensions on the previously existing phone system.

Step 24 Repeat Step 22 and Step 23 for all remaining phone system trunks that you want to create.

Step 25 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 26 In the Task Execution Results window, select **Close**.



CHAPTER 12

Setting Up a Serial (SMDI, MCI, or MD-110) PIMG Integration with Cisco Unity Connection

• Setting Up a Serial (SMDI, MCI, or MD-110) PIMG Integration, on page 239

Setting Up a Serial (SMDI, MCI, or MD-110) PIMG Integration

Task List for Serial (SMDI, MCI, or MD-110) PIMG Integration

Before doing the following tasks to integrate Unity Connection with the Serial phone system using PIMG units (media gateways), confirm that the Unity Connection server is ready for the integration after completing the server installation, following the tasks in the "Installing Cisco Unity Connection" chapter of the *Install, Upgrade, and Maintenance Guide for Cisco Unity Connection Release 15*, available at https://www.cisco.com/c/en/us/td/docs/voice_ip_comm/connection/15/install_upgrade/guide/b_15cuciumg.html.

1. Review the system and equipment requirements to confirm that all phone system and Unity Connection server requirements have been met. See the Requirements, on page 12 section.
2. Plan how the voice messaging ports are used by Unity Connection. See the Planning the Usage of Voice Messaging Ports, on page 7 chapter.
3. Program the phone system and extensions. See the Programming Phone System for a Serial Integration section.
4. Set up the PIMG units. See the Setting Up Analog PIMG Units for a Serial Integration section.
5. Create the integration. See the Configuring Unity Connection for Integration with the Phone System, on page 256 section.
6. Test the integration. See the Testing the Integration, on page 381 chapter.
7. 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, on page 387 chapter.

Requirements

This integration supports configurations of the following components:

Phone System

- A phone system that supports the SMDI, MCI, or MD-110 serial protocols.
- For a Centrex phone system only:
  - A Centrex service SMDI package, with one SMDI 4-wire private data link connected to the external modem.
  - A type 202T or 212A external modem, set to 1200 baud.
- One or more of the applicable PIMG units. For details, see the "Introduction" chapter.
- The serial data port on the phone system connected to the serial port on the master PIMG unit through an RS-232 serial cable (which is available from Cisco).

Specifications for the serial cable are in *Connecting PBX-IP Media Gateway (PIMG) to the Serial Port of a PBX* at http://www.dialogic.com/support/helpweb/mg/tn117.htm.

We recommend that the serial cable have the following construction:

- A maximum of 50 feet (15.24 m) in length
- 24 AWG stranded conductors
- Low capacitance—for example, no more than 12 pF/ft (39.4 pF/m) between conductors
- At least 65 percent braided shield over aluminized polymer sleeve around conductors
- UL-recognized overall cable jacket insulation with low dielectric constant
- Braided shield fully terminated to and enclosed by a metal connector backshell
- Gold-plated connector contacts
- The voice messaging ports in the phone system connected by analog lines to the ports on the PIMG units.

We recommend that you connect the voice messaging ports on the phone system to the ports on the PIMG units in a planned manner to simplify troubleshooting. For example, the first phone system voice messaging port connects to the first port on the first PIMG unit, the second phone system voice messaging port connects to the second port on the first PIMG unit, and so on.

- The PIMG units connected to the same LAN or WAN that Unity Connection is connected to.
- If the PIMG units connect to a WAN, the requirements for the WAN network connections are:
  - For G.729a codec formatting, a minimum of 32.76 Kbps guaranteed bandwidth for each voice messaging port.
  - For G.711 codec formatting, a minimum of 91.56 Kbps guaranteed bandwidth for each voice messaging port.
  - No network devices that implement network address translation (NAT).
  - A maximum 200 ms one-way network latency.

Unity Connection Server

- Unity Connection installed following the tasks in the "Installing Cisco Unity Connection" chapter of the *Install, Upgrade, and Maintenance Guide for Cisco Unity Connection Release 15*, available at https://www.cisco.com/c/en/us/td/docs/voice_ip_comm/connection/15/install_upgrade/guide/b_15cuciumg.html.
- A license that enables the applicable number of voice messaging ports.

Programming Phone System for a Serial Integration

If you use programming options other than those supplied in the following procedure, the performance of the integration may be affected.

Caution In programming the phone system, do not send calls to voice messaging ports in 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 Perform Message Notification, do not send calls to it.

Do the following steps to program the phone system for a serial integration with Unity Connection

Step 1 Program the analog lines connecting to the voice messaging ports on the PIMG units as a multiline hunt group.

Make sure that the phone system sends calls only to Unity Connection voice ports that are set to Answer Calls. Calls sent to a voice port not set to Answer Calls cannot be answered by Unity Connection and may cause other problems.

Step 2 Enable hookflash transfer capability on each analog line that connects to the voice messaging ports on the PIMG units.

Step 3 Enable caller ID (via SMDI, MCI, or MD-110) on each subscriber extension.

Step 4 For each subscriber extension, set the call forwarding options to the following:

- Unrestricted source
- Forward when the extension is not answered
- Forward when the extension is busy

Setting Up Analog PIMG Units for a Serial Integration

Do the following procedures to set up the analog PIMG units that are connected to the phone system for a serial integration using the SMDI, MCI, or MD-110 protocol.

These procedures require that the following tasks have already been completed:

- The phone system is connected to the PIMG units using analog lines and the applicable RS-232 serial cable.
- The PIMG units are ready to be connected to the LAN or WAN.
- The PIMG units are connected to a power source.

Fields that are not mentioned in the following procedures must keep their default values. For the default values of all fields, see the manufacturer documentation for the PIMG units.

Downloading PIMG Firmware Update Files for Analog PIMG Units

Step 1 On a Windows workstation with a high-speed Internet connection that have access to the PIMG units, go to the Voice and Unified Communications Downloads page at http://software.cisco.com/download/navigator.html?mdfid=280082558&i=rm.

Note To access the software download page, you must be signed in to Cisco.com as a registered user.

This procedure describes the steps when using Internet Explorer as your web browser. If you are using a different web browser, the steps may differ.

Step 2 In the tree control on the Downloads Home page, expand Unified Communications> **Unified Communications Applications** > **Messaging** > **Cisco Unity** and select **Cisco Unity Telephony Integration**.

Step 3 On the Log In page, enter your username and password, then select **Log In**.

Step 4 On the Select a Release page, under Latest Releases, select the most recent release.

Step 5 In the right column, select the version of the firmware for analog PIMG units.

Step 6 On the Download Image page, select **Download**.

Step 7 On the Supporting Document(s) page, select **Agree**.

Step 8 In the File Download dialog box, select **Save**.

Step 9 In the Save As dialog box, browse to the Windows workstation that have access the PIMG units, browse to a directory where you want to save the file, and select **Save**.

Step 10 In the Download Complete dialog box, select **Open**. The window for extracting the PIMG firmware update files appears.

Step 11 Select **Extract**.

Step 12 In the Extract dialog box, browse to the directory where you want the extracted files, and select **Extract**.

Step 13 Close the window for the extracting application.

Setting Up Analog PIMG Units (Firmware Version 6.x)

Step 1 On the Windows workstation, add a temporary route to enable access to the PIMG units.

a) On the Windows Start menu, select **Run**.

b) Enter **cmd**, and press **Enter**. The Command Prompt window appears.

c) At the command prompt, enter **route add 10.12.13.74 <IP Address of Workstation>**, and press **Enter**.

For example, if the IP address of the workstation is 198.1.3.25, enter “route add 10.12.13.74<space>198.1.3.25” in the Command Prompt window.

d) Close the Command Prompt window.

Step 2 Connect a PIMG unit to the network.

Step 3 In the web browser, go to **http://10.12.13.74**.

Step 4 To sign in, enter the following case-sensitive settings.

Table 299: Sign-in Settings

Field	Setting
Username	Enter **admin**.
Password	Enter **IpodAdmin**.

Step 5 Select **OK**.

Step 6 On the System menu, select **Upgrade**.

Step 7 On the Upgrade page, select **Browse**.

Step 8 In the Choose File dialog box, browse to the directory on the Windows workstation that has the extracted PIMG firmware update files.

Step 9 Select **Ls_<xx** > **.app** (where <xx> is multiple digits), and select **Open**.

Step 10 On the Upgrade page, select **Install File**.

Step 11 After the file is installed, a message prompting you to restart the PIMG unit appears. Select **Cancel**.

Do not restart the PIMG unit until you are instructed to do so later in this procedure, even if the file installation fails. Restarting the PIMG unit at this step may prevent the PIMG unit from functioning correctly.

Step 12 Repeat Step 6 through Step 11 for the file **Run_<xx** > **.dsp**.

Step 13 On the System menu, select **Upgrade**.

Step 14 On the Upgrade page, under Import, select **Browse**.

Step 15 In the Choose File dialog box, browse to the file **Ls_<xx** > **.fsh**.

Step 16 Select **Ls_<xx** > **.fsh**, and select **Open**.

Step 17 On the Upgrade page, select **Install File**.

Step 18 After the file is installed, a message prompting you to restart the PIMG unit appears. Select **OK**.

Step 19 In the web browser, go to **http://10.12.13.74**.

Step 20 To sign in, enter the following case-sensitive settings.

Table 300: Sign-in Settings

Field	Setting
Username	Enter **admin**.
Password	Enter **IpodAdmin**.

Step 21 Select **OK**.

Step 22 If your Unity Connection system must have an RTP port range of 16384 to 32767, do the following substeps. Otherwise, continue to Step 23.

You must set the RTP port range for the PIMG units if your system uses an RTP port range of 16384 to 32767. Otherwise, Unity Connection cannot answer calls and callers hear ringing or silence.

Note The default RTP port range for PIMG units is 49000 to 50000. Some Unity Connection configurations require a different RTP port range.

a) On the Configuration menu, select **Import/Export**.

b) On the Import/Export page, under Export Files, select **Export All Settings**.

c) In the File Download dialog box, select **Save**.
d) In the Save As dialog box, browse to the Windows workstation that has access to the PIMG units, browse to a directory where you want to save the file, and select **Save**.
e) In the Download Complete dialog box, select **Open**. Notepad opens the file Config.ini that you saved.
f) Locate the line with the following parameter:

```
gwRTPStartPort
```

g) Change the value of the parameter to **16384** so that the line reads as follows:

```
gwRTPStartPort = 16384
```

h) Locate the line with the following parameter:

```
gwRTPEndPort
```

i) Change the value of the parameter to **32767** so that the line reads as follows:

```
gwRTPEndPort = 32767
```

j) Save the file, and exit Notepad.
k) On the Configuration menu of the PIMG unit, select **Import/Export**.
l) On the Import/Export page, under Browse for Import File, select **Browse**.
m) In the Choose File dialog box, browse to the file Config.ini that you saved.
n) Select **Config.ini**, and select **Open**.
o) On the Import/Export page, select **Import File**.
p) When prompted to restart the PIMG unit, select **OK**.
q) When the PIMG unit has restarted, in the web browser, go to **http://10.12.13.74**.
r) To sign in, enter the following case-sensitive settings.

Table 301: Sign-in Settings

Field	Setting
Username	Enter **admin**.
Password	Enter **IpodAdmin**.

s) Select **OK**.

Step 23 On the System menu, select **Password**.

Step 24 On the Change Password page, enter the following settings.

Table 302: Change Password Page Settings

Field	Setting
Old Password	Enter **IpodAdmin**. (This setting is case sensitive.)
New Password	Enter your new password. (This setting is case sensitive.)
Confirm Password	Enter your new password. (This setting is case sensitive.)

Step 25 Select **Change**.

Step 26 On the Configuration menu, select **Mgmt Protocols**.

Step 27 On the Management Protocols page, enter the following settings.

Table 303: Management Protocols Page Settings

Field	Settings
E-mail Alarms Enabled	Select **No**.
SNMP Traps Enabled	Select **No**.

Step 28 Select **Submit**.

Step 29 On the Configuration menu, select **Routing Table**.

Step 30 On the Routing Table page, under Router Configuration, select **VoIP Host Groups**.

Step 31 Under VoIP Host Groups, enter the following settings for the first VoIP Host Group.

Table 304: First VoIP Host Group Settings

Field	Settings
Name	Accept the default or enter another descriptive name of the VoIP host group.
Load-Balanced	*(Unity Connection without a cluster)* Select **False**. *(Unity Connection with a cluster configured)* Select **False**.
Fault-Tolerant	*(Unity Connection without a cluster)* Select **False**. *(Unity Connection with a cluster configured)* Select **True**.

Step 32 For Unity Connection without a cluster, under Host List, enter the host name or IP address of the Unity Connection server and the server port in the format <host name or IP address>:5060.

For Cisco Unity Connection with a cluster configured, under Host List, enter the host name or IP address of the subscriber server (the second Unity Connection server that you installed) and the server port in the format <host name or IP address>:5060.

Step 33 For Unity Connection without a cluster, continue to Step 35. For Unity Connection with a cluster configured, select **Add Host**.

Step 34 In the second field, enter the host name or IP address of the publisher server (the first Unity Connection server that you installed) and the server port in the format <host name or IP address>:5060.

Do not add a third host under Host List or a second host group under VoIP Host Groups. Otherwise, the Unity Connection cluster may not function correctly.

Step 35 Select **Submit**.

Step 36 Under Router Configuration, select **TDM Trunk Groups**.

Step 37 Under TDM Trunk Groups, select **Add Trunk Group**.

Step 38 Under TDM Trunk Groups, enter the following settings for the first TDM trunk group.

Table 305: First TDM Trunk Group Settings (All Calls)

Field	Settings
Name	Enter **All_Calls** or another unique name. This TDM trunk group handles all calls to and from the phone system.
Selection Direction	Select **Ascending**.
Selection Mode	Select **Linear**.
Port/Channel Content	Enter the numbers of the PIMG ports that handle all calls. For example, enter "*" for all PIMG ports, or enter "1-6" for the first six PIMG ports.

Step 39 Select **Submit**.

Step 40 Under Router Configuration, select **Inbound VoIP Rules**.

Step 41 Under Inbound VoIP Rules, uncheck the **Enabled** check box for the default rule.

Step 42 Select **Add Rule**.

Step 43 Under Inbound VoIP Rules, enter the following settings for the first new inbound VoIP rule.

Table 306: First New Inbound VoIP Rule Settings (All Calls)

Field	Settings
Enable	Check this check box.
Rule Label	Do one of the following: • If you use CPID manipulation, enter **All_UC_Calls** or another name. This inbound VoIP rule handles all outbound calls from Unity Connection. • If you cannot use CPID manipulation, enter **UC_Calls_and_Messages** or another name. This inbound VoIP rule handles all outbound calls and MWI calls from Unity Connection.
Request Type	Do one of the following: • If you use CPID manipulation, select **Call**. • If you cannot use CPID manipulation, select **Any**.
Originating VoIP Host Address	Enter ***.

Step 44 Under Inbound VoIP Request Matching, enter the following settings.

The rule that you created in Step 43 must be selected. Otherwise, any changes you make apply to another rule.

Table 307: Inbound VoIP Request Matching Settings

Field	Settings
Calling Number	Enter the applicable matching rule used. For example, enter "*" for all.
Calling Name	Enter the applicable matching rule used. For example, enter "*" for all.
Called Number	Enter the applicable matching rule used. For example, enter "*" for all.
Called Name	Enter the applicable matching rule used. For example, enter "*" for all.
Redirect Number	Enter the applicable matching rule used. For example, enter "*" for all.
Redirect Name	Enter the applicable matching rule used. For example, enter "*" for all.

Step 45 Under Outbound Routes, enter the following settings.

The rule that you created in Step 43 must be selected. Otherwise, any changes you make apply to another rule.

Table 308: Outbound Routes Settings

Field	Settings
Device Selection	
Outbound Destination	Select **TDM**.
Trunk Group	Select the name of the TDM trunk group that you created for outbound calls in Step 38. For example, select "All_Calls."
CPID Manipulation	
Calling Number	Enter **S**.
Calling Name	Enter **S**.
Called Number	Enter **D**.
Called Name	Enter **D**.
Redirect Number	Enter **R**.
Redirect Name	Enter **R**.
Select Primary/Alternate Route	
Primary	Select **Primary**.

Step 46 If you cannot use CPID manipulation, skip to Step 50. Otherwise, under Inbound VoIP Rules, select **Add Rule**.

Step 47 Under Inbound VoIP Rules, enter the following settings for the second new inbound VoIP rule.

Table 309: Second New Inbound VoIP Rule Settings (MWIs)

Field	Settings
Enable	Check this check box.
Rule Label	Enter **UC_MWIs** or another name. This inbound VoIP rule handles all MWIs from Unity Connection.
Request Type	Select **Message**.
Originating VoIP Host Address	Enter *****.

Step 48 Under Inbound VoIP Request Matching, enter the following settings.

The rule that you created in Step 47 must be selected. Otherwise, any changes you make apply to another rule.

Table 310: Inbound VoIP Request Matching Settings

Field	Settings
Calling Number	Enter the applicable matching rule used. For example, enter "*" for all.
Calling Name	Enter the applicable matching rule used. For example, enter "*" for all.
Called Number	Enter the applicable matching rule used. For example, enter "*" for all.
Called Name	Enter the applicable matching rule used. For example, enter "*" for all.
Redirect Number	Enter the applicable matching rule used. For example, enter "*" for all.
Redirect Name	Enter the applicable matching rule used. For example, enter "*" for all.

Step 49 Under Outbound Routes, enter the following settings.

The rule that you created in Step 47 must be selected. Otherwise, any changes you make apply to another rule.

Table 311: Outbound Routes Settings

Field	Settings
Device Selection	
Outbound Destination	Select **TDM**.
Trunk Group	Select the name of the TDM trunk group that you created for outbound calls in Step 38. For example, select "All_Calls."
CPID Manipulation	
Calling Number	Enter **S**.
Calling Name	Enter **S**.

Field	Settings
Called Number	Enter **D**.
Called Name	Enter **D**.
Redirect Number	Enter **R**.
Redirect Name	Enter **R**.
Select Primary/Alternate Route	
Primary	Select **Primary**.

Step 50 Select **Submit**.

Step 51 Under Router Configuration, select **Inbound TDM Rules**.

Step 52 Under Inbound TDM Rules, enter the following settings for the first inbound TDM rule.

Table 312: First Inbound TDM Rule Settings

Field	Settings
Enable	Check this check box.
Rule Label	Enter **Inbound_Rule_1** or another name. This inbound TDM rule handles all incoming calls from the phone system.
Request Type	Select **Call**.
Trunk Group	Select the name of the TDM trunk group that you created for incoming calls from the phone system in Step 38. For example, select “All_Calls.”

Step 53 Under Inbound TDM Request Matching, enter the following settings.

The rule that you created in Step 52 must be selected. Otherwise, any changes you make apply to another rule.

Table 313: Inbound TDM Request Matching Settings

Field	Settings
Calling Number	Enter the applicable matching rule used. For example, enter “*” for all.
Calling Name	Enter the applicable matching rule used. For example, enter “*” for all.
Called Number	Enter the applicable matching rule used. For example, enter “*” for all.
Called Name	Enter the applicable matching rule used. For example, enter “*” for all.
Redirect Number	Enter the applicable matching rule used. For example, enter “*” for all.
Redirect Name	Enter the applicable matching rule used. For example, enter “*” for all.

Step 54 Under Outbound Routes, enter the following settings.

The rule that you created in Step 52 must be selected. Otherwise, any changes you make apply to another rule.

Table 314: Outbound Routes Settings

Field	Settings
Device Selection	
Outbound Destination	Select **VoIP**.
Host Group	Select the name of the VoIP host group that you created for Unity Connection in Step 31.
CPID Manipulation	
Calling Number	Enter **S**.
Calling Name	Enter **S**.
Called Number	Enter **D**.
Called Name	Enter **D**.
Redirect Number	Enter **R**.
Redirect Name	Enter **R**.
Select Primary/Alternate Route	
Primary	Select **Primary**.

Step 55 If you want to create more Inbound TDM rules, under Inbound TDM Rules, select **Add Rule**. Otherwise, continue to Step 57.

Note that additional Inbound TDM rules are not necessary if you cannot use CPID manipulation.

Step 56 Repeat Step 52 through Step 55 for all remaining inbound TDM rules that you want to create.

Step 57 Select **Submit**.

Step 58

Step 59

Step 60

Step 61 On the Configuration menu, select **TDM** > **General**.

Step 62 On the TDM General Settings page, enter the following settings.

Table 315: TDM General Settings Page Settings

Field	Settings
PCM Coding	Select **uLaw**.
Minimum Call Party Delay (ms)	Enter **500**.

Field	Settings
Maximum Call Party Delay (ms)	Enter **2000**.
Dial Digit on Time (ms)	Enter **100**.
Dial Inter-Digit Time (ms)	Enter **100**.
Dial Pause Time (ms)	Enter **2000**.
Turn MWI On FAC	Leave this field blank.
Turn MWI Off FAC	Leave this field blank.
Outbound Call Connect Timeout (ms)	Enter **10000**.
Wait for Ringback/Connect on Blind Transfer	Select **Yes**.
Hunt Group Extension	Enter the pilot number of the Unity Connection voice messaging ports.

Step 63 Select **Submit**.

Step 64 On the Configuration menu, select **TDM** > **Port Enable**.

Step 65 On the TDM Port Enabling page, select **No** for the ports that you want to disable on the PIMG unit.

Step 66 Confirm that **Yes** is selected for all other ports on the PIMG unit.

Step 67 Select **Submit**.

Step 68 On the Configuration menu, select **VoIP** > **General**.

Step 69 On the VoIP General Settings page, enter the following settings.

Table 316: VoIP General Settings Page Settings

Field	Setting
User-Agent	
Host and Domain Name	Enter the host and domain name of the PIMG unit.
Transport Type	Select **UDP**.
Call as Domain Name	Select **No**.
Invite Expiration (sec)	Enter **120**.
Server	
DNS Server Address	Enter the IP Address of the Domain Name Server that the PIMG unit uses.
Registration Server Address	Leave this field blank.
Registration Server Port	Enter **5060**.

Field	Setting
Registration Expiration (sec)	Enter **3600**.
TCP/UDP	
UDP/TCP Transports Enabled	Select **Yes**.
TCP/UDP Server Port	Enter **5060**.
Proxy	
Primary Proxy Server Address	Leave this field blank.
Primary Proxy Server Port	Not applicable. Leave the default setting.
Backup Proxy Server Address	Not applicable. Leave the default setting.
Backup Proxy Server Port	Not applicable. Leave the default setting.
Proxy Query Interval	Enter **10**.
Timing	
T1 Time (ms)	Enter **400**.
T2 Time (ms)	Enter **3000**.
Monitoring	
Monitor Call Connections	Select **No**.

Step 70 Select **Submit**.

Step 71 On the Configuration menu, select **VoIP** > **Media**.

Step 72 On the VoIP Media Settings page, enter the following settings.

Table 317: VoIP Media Settings Page Settings

Field	Settings
Audio	
Audio Compression	Select the preferred codec for audio compression.
RTP Digit Relay Mode	Select **RFC2833**.
Signaling Digit Relay Mode	Select **Off**.

Field	Settings
Voice Activity Detection	Select **Off**.
Frame Size	Select the applicable setting: • G.711—**20** • G.729AB—**10** Failure to use the correct setting results in recorded messages containing nothing but silence.
Frames Per Packet	Select the applicable setting: • G.711—**1** • G.729AB—**2** Failure to use the correct setting results in recorded messages containing nothing but silence.

Step 73 Select **Submit**.

Step 74 On the Configuration menu, select **VoIP** > **QOS**.

Step 75 On the VoIP QOS Configuration page, enter the following settings.

Table 318: VoIP QOS Configurative Page Settings

Field	Settings
Call Control QOS Byte	Enter **104**.
RTP QOS Byte	Enter **184**.

Step 76 Select **Submit**.

Step 77 On the Configuration menu, select **IP**.

Step 78 On the IP Settings page, enter the following settings.

Table 319: IP Settings Page Settings

Field	Settings
Client IP Address	Enter the new IP address you want to use for the PIMG unit. (This is the IP address that you enter in Cisco Unity Connection Administration when you create the integration.)
Client Subnet Mask	Enter the new subnet mask, if the subnet mask is different from the default IP address.
Default Network Gateway Address	Enter the IP address of the default network gateway router that the PIMG units use.
BOOTP Enabled	Select **No**.

Step 79 Select **Submit**.

Step 80 On the Configuration menu, select **Serial** > **General**.

Step 81 On the Serial Port, COM 1 page, enter the following settings.

Table 320: Serial Port, COM 1 Page Settings

Field	Settings
Serial Port Baud Rate	Select the setting that is configured on the phone system. The default setting is 9600.
Serial Port Parity	Select the setting that is configured on the phone system. The default setting is None.
Serial Port Data Bits	Select the setting that is configured on the phone system. The default setting is 8.
Serial Port Stop Bits	Select the setting that is configured on the phone system. The default setting is 1.

Step 82 Select **Submit**.

Step 83 On the Configuration menu, select **Serial** > **Switch Protocol**.

Step 84 On the Switch Protocol page, enter the following settings.

Table 321: Switch Protocol Page Settings

Field	Settings
Serial Port, COM 1	
Serial Mode	Select the applicable setting: • **Master**—Select this setting when this PIMG unit is connected to the data link serial cable from the phone system. There can be only one master PIMG unit in a phone system integration. • **Slave**—Select this setting when this PIMG unit is not connected to the data link serial cable from the phone system. There can be multiple slave PIMG units in a phone system integration.
Serial Interface Protocol	Select the serial protocol that your phone system uses: • **SMDI** • **MCI** • **MD-110**
Cpid Len	Select the applicable setting. Typically, the settings are 7 or 10.

Field	Settings
Cpid Padding String	Enter the applicable string or leave this field blank. Typically, the setting is one of the following: • A string of zeros, where the number of zeros matches the setting of the Cpid Len field. • A prefix that is provided by the Centrex service.
Voice Mail Port Len	If the setting of the Serial Interface Protocol field is MD-110, enter **2**. Otherwise, accept the default of **7**.
System Number	Enter the applicable setting. Typically, the setting is 1.
MWI Response Timeout	Enter **2000**.
IP Address of Serial Server	If the PIMG unit is the master, this field is for display only. If the PIMG unit is a slave, enter the IP address of the master PIMG unit (the PIMG unit that is connected to the data link serial cable from the phone system).
Serial Cpid Expiration	Enter **2000**.
Logical Extension Number	
1	If the setting of the Serial Interface Protocol field is MCI or MD-110, enter the extension number for each port on the PIMG unit. If the setting of the Serial Interface Protocol field is SMDI, enter the logical port number. Typically, the setting is 1 for port 1, 2 for port 2, and so on beginning with the master PIMG unit and continuing through each of the slave PIMG units.
2	
3	
4	
5	
6	
7	
8	

Step 85 Select **Submit**.

Step 86 On the Configure menu, select **Tone Detection**.

Step 87 On the Tone Detection page, under Call Progress Tone - Learn, in the Learn Tone Event field, select **Busy** and do the following substeps to verify that the tone is correct.

a) From a available phone, call a second phone.
b) Answer the second phone when it rings, and leave both handsets off so that both phones are busy.
c) From a third phone, dial one of the busy phones.
d) Confirm that you hear a busy tone.
e) Hang up the third phone but leave the handsets for the other two phones off.

Step 88 Under Call Progress Tone - Learn, in the Dial String field, enter the extension that you dialed in Step 87c. from the third phone.

Step 89 Select **Learn**.

Step 90 On the Tone Detection page, under Call Progress Tone - Learn, in the Learn field, select **Error** and do the following substeps to verify that the tone is correct.

a) From an available phone, dial an extension that does not exist.
b) Confirm that you hear the reorder or error tone.
c) Hang up the phone.

Step 91 Under Call Progress Tone - Learn, in the Dial String field, enter the extension that you dialed in Step 90a.

Step 92 Select **Learn**.

Step 93 On the Tone Detection page, under Call Progress Tone - Learn, in the Learn field, select **Ringback** and do the following substeps to verify that the tone is correct.

a) From an available phone, dial an extension that does exist.
b) Confirm that you hear the ringback tone.
c) Hang up the phone.

Step 94 Under Call Progress Tone - Learn, in the Dial String field, enter the extension that you dialed in Step 93a.

Step 95 Select **Learn**.

Step 96 Select **Submit**.

Step 97 Hang up the phones that you used in Step 87.

Step 98 On the System menu, select **Restart**.

Step 99 On the Restart page, select **Restart Unit Now**.

Step 100 Repeat Step 2 through Step 99 on all remaining PIMG units.

Configuring Unity Connection for Integration with the Phone System

After ensuring that the phone system, the PIMG units, and Unity Connection are ready for the integration, do the following procedure to set up the integration and to enter the port settings.

Creating an Integration

Step 1 In Cisco Unity Connection Administration, expand **Telephony Integrations**, then select **Phone System**.

Step 2 On the Search Phone Systems page, under Display Name, select the name of the default phone system.

Step 3 On the Phone System Basics page, in the Phone System Name field, enter the descriptive name that you want for the phone system.

Step 4 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 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 5 Under Message Waiting Indicator Settings, select**Use Same Port for Enabling and Disabling MWIs**.

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 applicable settings and select **Save**.

Table 322: Settings for the New Port Group Page

Field	Setting
Phone System	Select the name of the phone system that you entered in Step 3.
Create From	Select **Port Group Template** and select **SIP to DMG/PIMG/TIMG** 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.
SIP Security Profile	Select **5060**.
SIP Transport Protocol	Select the SIP transport protocol that Unity Connection uses.
IP Address or Host Name	Enter the IP address of the PIMG unit that you are integrating with Unity Connection.
Port	Enter the SIP port of the PIMG unit that Unity Connection connects to. We recommend that you use the default setting. This name must match the setting in the TCP/UDP Server Port field on the Configuration > VoIP > General page of the PIMG unit. Otherwise, the integration cannot function correctly.

Step 9 On the Port Group Basics page, under Message Waiting Indicator Settings, uncheck the **Enable Message Waiting Indicators** check box and select **Save**.

Step 10 In the Related Links drop-down box, select **Add Ports** and select **Go**.

Step 11 On the New Port page, enter the following settings and select **Save**.

Table 323: Settings for the New Port Page

Field	Considerations
Enabled	Check this check box.
Number of Ports	Enter **8**. (If you want to use fewer than eight voice messaging ports, enter the number of voice messaging ports that you want to use on this PIMG unit.) **Note** For a Unity Connection cluster, the server must have the number of voice messaging ports that are set up on the phone system for the PIMG integration so that this server can handle all voice messaging traffic for the cluster if one of the servers stops functioning. For example, if the phone system is set up with 16 voice messaging ports, this server must have 16 voice messaging ports.
Phone System	Select the name of the phone system that you entered in Step 3.
Port Group	Select the name of the port group that you added in Step 8.

Step 12 On the Search Ports page, select the display name of the first voice messaging port that you created for this phone system integration.

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

Step 13 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 324: 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.
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	(Serial integrations only) Uncheck this check box. Otherwise, the integration may not functior correctly. (Digital and analog integrations only) 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 Unity Connection web applications. Assign Allow TRAP Connections to the least busy ports.
Outgoing Hunt Order	Enter the priority order in which Unity Connection uses 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, Unity Connection uses the port that has been idle the longest.

Step 14 Select **Save**.

Step 15 Select **Next**.

Step 16 Repeat Step 13 through Step 15 for all remaining voice messaging ports for the phone system.

Step 17 In Cisco Unity Connection Administration, expand **Telephony Integrations**, then select **Phone System**.

Step 18 On the Search Phone Systems page, under Display Name, select the name of the phone system that you entered in Step 3.

Step 19 Repeat Step 7 through Step 18 for each remaining PIMG unit integrated with Unity Connection.

Note Each PIMG unit is connected to one port group with the applicable voice messaging ports. For example, a system that uses five PIMG units requires five port groups, one port group for each PIMG unit.

Step 20 To create a port group for MWIs, do the following substeps.

Note All MWI requests are handled by the master PIMG unit and sent to the phone system over the RS-232 serial cable (without using voice messaging ports). So the following substeps create a separate port group without voice messaging ports and enable the port group for MWIs that are "not port specific" (they do not use ports).

a) In Cisco Unity Connection Administration expand **Telephony Integration** then select **Port Group** .
b) On the Search Port Groups page, select **Add New**.
c) On the New Port Group page, enter the applicable settings and select **Save**.

Table 325: Settings for the New Port Group Page (MWIs)

Field	Setting
Phone System	Select the name of the phone system that you entered in Step 3.
Create From	Select Port Group Template and select **SIP to DMG/PIMG/TIMG** SIP to in the drop-down box.
Display Name	Enter a **MWI Port Group** or another descriptive name for the port group.
SIP Security Profile	Select **5060**.
SIP Transport Protocol	Select the SIP transport protocol that Unity Connection uses.
IPv4 Address or Host Name	Enter the IP address of the master PIMG unit.
IPv6 Address or Host Name	Do not enter a value in this field. IPv6 is not supported for PIMG integrations.
IP Address or Host Name	Enter the IP address of the master PIMG unit.
Port	Enter the SIP port of the master PIMG unit. **Caution** This name must match the setting in the TCP/UDP Server Port field on the Configuration > VoIP > General page of the PIMG unit. Otherwise, the integration cannot function correctly.

d) On the Port Group Basics page, on the Edit menu, select **Advanced Settings**.
e) On the Edit Advanced Settings page, under SIP MWI Requests, select **Not Port Specific** then select **Save**.
f) On the Edit menu, select **Port Group Basics**.
g) Under Port Group, select **Reset**.
h) Under Message Waiting Indicator Settings, confirm that the **Enable Message Waiting Indicator** check box is checked and select **Save**.

Step 21 If another phone system integration exists, in Cisco Unity Connection Administration, expand **Telephony Integrations**, then select **Trunk**. Otherwise, skip to Step 25.

Step 22 On the Search Phone System Trunks page, on the Phone System Trunk menu, select **New Phone System Trunk**.

Step 23 On the New Phone System Trunk page, enter the following settings for the phone system trunk and select **Save**.

Table 326: Settings for the Phone System Trunk

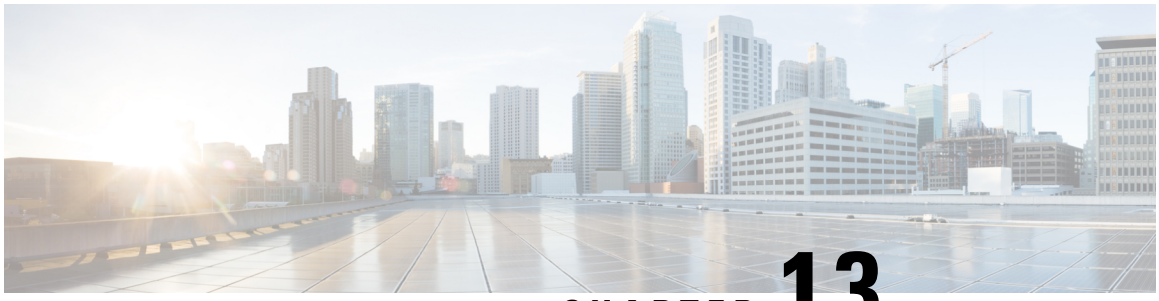
Field	Setting
From Phone System	Enter the display name of the phone system that you are creating a trunk for.
To Phone System	Enter the display name of the previously existing phone system that the trunk connects to.
Trunk Access Code	Enter the extra digits that Unity Connection must dial to transfer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

Step 24 Repeat Step 22 and Step 23 for all remaining phone system trunks that you want to create.

Step 25 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 26 In the Task Execution Results window, select **Close**.



CHAPTER 13

Setting Up a Siemens Hicom 150 Analog PIMG Integration with Cisco Unity Connection

• Setting Up a Siemens Hicom 150 Analog PIMG Integration, on page 261

Setting Up a Siemens Hicom 150 Analog PIMG Integration

Task List for ROLM 9751 Digital PIMG Phone System Integration

Before doing the following tasks to integrate Unity Connection with the ROLM 9751 phone system using PIMG units (media gateways), confirm that the Unity Connection server is ready for the integration after completing the server installation, following the tasks in the "Installing Cisco Unity Connection" chapter of the *Install, Upgrade, and Maintenance Guide for Cisco Unity Connection Release 15*, available at https://www.cisco.com/c/en/us/td/docs/voice_ip_comm/connection/15/install_upgrade/guide/b_15cuciumg.html .

1. Review the system and equipment requirements to confirm that all phone system and Unity Connection server requirements have been met. See the Requirements, on page 12 section.
2. Plan how the voice messaging ports are used by Unity Connection. See the Planning the Usage of Voice Messaging Ports, on page 7 chapter.
3. Program the ROLM 9751 phone system and extensions. See the Programming ROLM 9751 Digital PIMG Phone System for Integration, on page 215 section.
4. Set up the PIMG units.
5. Create the integration. See the Configuring Unity Connection for Integration with Rolm 9751 Phone System, on page 234 section.
6. Test the integration. See the Testing the Integration, on page 381 chapter.
7. 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, on page 387 chapter.

Requirements

This integration supports configurations of the following components:

Phone System

- The Siemens Hicom 150 phone system.
- Software version HE520MO4.809 or later.
- One or more of the applicable PIMG units. For details, see the "Introduction" chapter.
- The voice messaging ports in the phone system connected by analog lines to the ports on the PIMG units.

We recommend that you connect the voice messaging ports on the phone system to the ports on the PIMG units in a planned manner to simplify troubleshooting. For example, the first phone system voice messaging port connects to the first port on the first PIMG unit, the second phone system voice messaging port connects to the second port on the first PIMG unit, and so on.

- The PIMG units connected to the same LAN or WAN that Unity Connection is connected to.
- If the PIMG units connect to a WAN, the requirements for the WAN network connections are:
  - For G.729a codec formatting, a minimum of 32.76 Kbps guaranteed bandwidth for each voice messaging port.
  - For G.711 codec formatting, a minimum of 91.56 Kbps guaranteed bandwidth for each voice messaging port.
  - No network devices that implement network address translation (NAT).
  - A maximum 200 ms one-way network latency.

Unity Connection Server

- Unity Connection installed following the tasks in the "Installing Cisco Unity Connection" chapter of the *Install, Upgrade, and Maintenance Guide for Cisco Unity Connection Release 15*, available at https://www.cisco.com/c/en/us/td/docs/voice_ip_comm/connection/15/install_upgrade/guide/b_15cuciumg.html.
- A license that enables the applicable number of voice messaging ports.

Programming Siemens Hicom 150 Phone System for Integration

If you use programming options other than those supplied in the following procedure, the performance of the integration may be affected.

The following programming instructions are provided as an example only. The specific programming for your phone system may vary depending on its configuration.

Caution In programming the phone system, do not send calls to voice messaging ports in 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.

Do the following steps to program the Siemens Hicom 150 phone system.

Step 1 In the Siemens Hicom 150 interface, configure the stations for the ports on all of the PIMG units using the following settings.

Table 327: Station Settings

Field	Setting
Call No.	Enter the internal call number that is associated with each port on the PIMG units.
DID	Enter the DID for ports on the PIMG units dialing out (for example, to set MWIs).
Name	Enter a name that you want for the station. For example, enter "PIMG port 1" for the first port. Note that you can enter a maximum of 16 characters.
Type	*(Display only)* The phone device that the phone system has configured for the port.
Type	Select **PhoneMail** for the applicable dial plan.

Step 2 Select **Apply**.

Step 3 Configure the access number to forward calls to subscriber mailboxes.

Step 4 Configure the hunt group for the ports on the PIMG units that answer calls using the following settings.

Table 328: Hunt Group Settings

Field	Setting
Index	Select an available index that you want to use for the ports on the PIMG units.
Call No.	Enter the pilot number for Unity Connection.
DID	Enter the four-digit DID that is associated with call number that is associated with the hunt group.
Name	Enter a name for the hunt group.
Type	From the drop-down box, select **Linear**. You must use a linear hunt group. Otherwise, the integration cannot function correctly.

Step 5 Select **Apply**.

Step 6 Under Group, in the Call No. column, select the call number for the hunt group that you created in Step 4.

Step 7 In the Selection box, highlight all the ports on the PIMG units that answer calls.

Step 8 Add the highlighted ports to the Members box by selecting **-**.

Step 9 In the Members box, highlight the ports that dial out (for example, to set MWIs), and select **Down** until all dialout ports are at the bottom of the box.

Step 10 Configure call forwarding for the ports on the PIMG units that answer calls. For the fields under Call Dest. List - Definition, use the following settings.

Table 329: Call Dest. List - Definition Settings

Field	Setting
No.	The call destination number that you use for the ports on the PIMG units.
Target 1	Leave this field blank.
Cycles	Enter **1** (which equals about 5 seconds).
SR Type	Select **Immediate**.
RNA	Check this check box.

Step 11 Under Call Dest. List - Station Assignment, select **Show All Stations**.

Step 12 In the table, assign the call destination for the definition using the following settings.

Table 330: Call Dest. List - Station Assignment Settings

Field	Setting
Call No.	Select the extension for a port on the PIMG units, which you assigned in Step 1.
Day	From the drop-down box, select the call destination number, which you defined in Step 10.
Night	From the drop-down box, select the call destination number, which you defined in Step 10.
Internal	From the drop-down box, select the call destination number, which you defined in Step 10.

Step 13 Select **Apply**.

Step 14 Repeat Step 12 and Step 13 for all remaining ports on the PIMG units.

Step 15 Program each phone to forward calls to the pilot number assigned to the voice messaging ports, based on one of the Unity Connection call transfer types shown in Table 331: Call Transfer Types.

Table 331: Call Transfer Types

Transfer Types	Usage
Release transfer (blind transfer)	Program the phone to forward calls to the pilot number when: • The extension is busy • The call is not answered

Transfer Types	Usage
Supervised transfer	Program the user station to forward calls to the pilot number only when the call is not answered (on the phone system, the number of rings before forwarding must be more than the number of rings to supervise the call). Confirm that call forwarding is disabled when the extension is busy.

Setting Up the Analog PIMG Units for a DTMF Integration

Do the following procedures to set up the analog PIMG units that are connected to the Siemens Hicom 150 phone system for a DTMF integration.

These procedures require that the following tasks have already been completed:

- The phone system is connected to the PIMG units using analog lines.
- The PIMG units are ready to be connected to the LAN or WAN.
- The PIMG units are connected to a power source.

Fields that are not mentioned in the following procedures must keep their default values. For the default values of all fields, see the manufacturer documentation for the PIMG units.

Downloading PIMG Firmware Update Files for Analog PIMG Units

Step 1 On a Windows workstation with a high-speed Internet connection that have access to the PIMG units, go to the Voice and Unified Communications Downloads page at http://software.cisco.com/download/navigator.html?mdfid=280082558&i=rm.

Note To access the software download page, you must be signed in to Cisco.com as a registered user.

This procedure describes the steps when using Internet Explorer as your web browser. If you are using a different web browser, the steps may differ.

Step 2 In the tree control on the Downloads Home page, expand Unified Communications> **Unified Communications Applications** > **Messaging** > **Cisco Unity** and select **Cisco Unity Telephony Integration**.

Step 3 On the Log In page, enter your username and password, then select **Log In**.

Step 4 On the Select a Release page, under Latest Releases, select the most recent release.

Step 5 In the right column, select the version of the firmware for analog PIMG units.

Step 6 On the Download Image page, select **Download**.

Step 7 On the Supporting Document(s) page, select **Agree**.

Step 8 In the File Download dialog box, select **Save**.

Step 9 In the Save As dialog box, browse to the Windows workstation that have access the PIMG units, browse to a directory where you want to save the file, and select **Save**.

Step 10 In the Download Complete dialog box, select **Open**. The window for extracting the PIMG firmware update files appears.

Step 11 Select **Extract**.

Step 12 In the Extract dialog box, browse to the directory where you want the extracted files, and select **Extract**.

Step 13 Close the window for the extracting application.

Setting Up Analog PIMG Units (Firmware Version 6.x)

Step 1 On the Windows workstation, add a temporary route to enable access to the PIMG units.

a) On the Windows Start menu, select **Run**.

b) Enter **cmd**, and press **Enter**. The Command Prompt window appears.

c) At the command prompt, enter **route add 10.12.13.74 <IP Address of Workstation>**, and press **Enter**.

For example, if the IP address of the workstation is 198.1.3.25, enter “route add 10.12.13.74<space>198.1.3.25” in the Command Prompt window.

d) Close the Command Prompt window.

Step 2 Connect a PIMG unit to the network.

Step 3 In the web browser, go to **http://10.12.13.74**.

Step 4 To sign in, enter the following case-sensitive settings.

Table 332: Sign-in Settings

Field	Settings
Username	Enter **admin**.
Password	Enter **IpodAdmin**.

Step 5 Select **OK**.

Step 6 On the System menu, select **Upgrade**.

Step 7 On the Upgrade page, select **Browse**.

Step 8 In the Choose File dialog box, browse to the directory on the Windows workstation that has the extracted PIMG firmware update files.

Step 9 Select **Ls_<xx** > **.app** (where <xx> is multiple digits), and select **Open**.

Step 10 On the Upgrade page, select **Install File**.

Step 11 After the file is installed, a message prompting you to restart the PIMG unit appears. Select **Cancel**.

Do not restart the PIMG unit until you are instructed to do so later in this procedure, even if the file installation fails. Restarting the PIMG unit at this step may prevent the PIMG unit from functioning correctly.

Step 12 Repeat Step 6 through Step 11 for the following files:

- Run_<xx>FskEcho.dsp
- Ls_<xx>.fsh

1. On the Configuration menu, select **Import/Export**.
2. On the Import/Export page, select **Browse**.

3. In the Choose File dialog box, browse to the file Ls_Cfg_Hicom300E.ini.
4. Select **Ls_Cfg_Hicom300E.ini**, and select **Open**.
5. On the Import/Export page, select **Import File**.
6. After the file is imported, a message prompting you to restart the PIMG unit appears. Select **OK**.
7. In the web browser, go to **http://10.12.13.74**.
8. To sign in, enter the following case-sensitive settings.

Table 333: Sign-in Settings

Field	Settings
Username	Enter **admin**.
Password	Enter **IpodAdmin**.

1. Select **OK**.
2. Do the following substeps to configure an RTP port range of 16384 to 32767.

   You must set the RTP port range for the PIMG units if your system uses an RTP port range of 16384 to 32767. Otherwise, Unity Connection cannot answer calls and callers hear ringing or silence.

Note The default RTP port range for PIMG units is 49000 to 50000. Some Unity Connection configurations require a different RTP port range.

   a. On the Configuration menu, select **Import/Export**.
   b. On the Import/Export page, under Export Files, select **Export All Settings**.
   c. In the File Download dialog box, select **Save**.
   d. In the Save As dialog box, browse to the Windows workstation that has access to the PIMG units, browse to a directory where you want to save the file, and select **Save**.
   e. In the Download Complete dialog box, select **Open**. Notepad opens the file Config.ini that you saved.
   f.
   g.
   h. Locate the line with the following parameter:

```
gwRTPStartPort
```

   i. Change the value of the parameter to **16384** so that the line reads as follows:

```
gwRTPStartPort = 16384
```

   j. Locate the line with the following parameter:

```
gwRTPEndPort
```

k. Change the value of the parameter to **32767** so that the line reads as follows:

```
gwRTPEndPort = 32767
```

l. Save the file, and exit Notepad.

m. On the Configuration menu of the PIMG unit, select **Import/Export**.

n. On the Import/Export page, under Browse for Import File, select **Browse**.

o. In the Choose File dialog box, browse to the file Config.ini that you saved.

p. Select **Config.ini**, and select **Open**.

q. On the Import/Export page, select **Import File**.

r. When prompted to restart the PIMG unit, select **OK**.

s. When the PIMG unit has restarted, in the web browser, go to **http://10.12.13.74**.

t. To sign in, enter the following case-sensitive settings.

Table 334: Sign-in Settings

Field	Setting
Username	Enter **admin**.
Password	Enter **IpodAdmin**.

1. Select **OK**.

1. On the System menu, select **Password**.
2. On the Change Password page, enter the following settings.

Table 335: Change Password Page Settings

Field	Settings
Old Password	Enter **IpodAdmin**. (This setting is case sensitive.)
New Password	Enter your new password. (This setting is case sensitive.)
Confirm Password	Enter your new password. (This setting is case sensitive.)

1. Select **Change**.
2. On the Configuration menu, select **Mgmt Protocols**.
3. On the Management Protocols page, enter the following settings.

Table 336: Management Protocols Page Settings

Field	Settings
E-mail Alarms Enabled	Select **No**.
SNMP Traps Enabled	Select **No**.

1. Select **Submit**.
2. On the Configuration menu, select **Routing Table**.
3. On the Routing Table page, under Router Configuration, select **VoIP Host Groups**.
4. Under VoIP Host Groups, enter the following settings for the first VoIP Host Group.

Table 337: First VoIP Host Group Settings

Field	Settings
Name	Accept the default or enter another descriptive name of the VoIP host group.
Load-Balanced	*(Unity Connection without a cluster)* Select **False**. *(Unity Connection with a cluster configured)* Select **False**.
Fault-Tolerant	*(Unity Connection without a cluster)* Select **False**. *(Unity Connection with a cluster configured)* Select **True**.

1. For Unity Connection without a cluster, under Host List, enter the host name or IP address of the Unity Connection server and the server port in the format <host name or IP address>:5060.

For Unity Connection with a cluster configured, under Host List, confirm that field contains the host name or IP address of the publisher server (the first Unity Connection server that you installed) and the server port in the format <host name or IP address>:5060.

1. For Unity Connection without a cluster, continue to Step 36. For Unity Connection with a cluster configured, under Host List, enter the host name or IP address of the subscriber server (the second Unity Connection server that you installed) and the server port in the format <host name or IP address>:5060.
2. Select **Add Host**.
3. In the second field, enter the host name or IP address of the publisher server (the first Unity Connection server that you installed) and the server port in the format <host name or IP address>:5060.

   Do not add a third host under Host List or a second host group under VoIP Host Groups. Otherwise, the Unity Connection cluster may not function correctly.
4. Select **Submit**.
5. Under Router Configuration, select **TDM Trunk Groups**.
6. Under TDM Trunk Groups, select **Add Trunk Group**.
7. Under TDM Trunk Groups, enter the following settings for the first TDM trunk group.

Table 338: First TDM Trunk Group Settings (Inbound Calls)

Field	Settings
Name	Enter **Inbound_PBX_Calls** or another unique name. This TDM trunk group handles all incoming calls from the phone system.
Selection Direction	Select **Ascending**.
Selection Mode	Select **Linear**.
Port/Channel Content	Enter the numbers of the PIMG ports that handle inbound calls. For example, enter "*" for all PIMG ports, or enter "1-6" for the first six PIMG ports.

1. Under TDM Trunk Groups, select **Add Trunk Group**.
2. Enter the following settings for the second TDM trunk group.

Table 339: Second TDM Trunk Group Settings (MWIs)

Field	Settings
Name	Enter **MWIs** or another unique name. This TDM trunk group handles outbound MWI calls (where applicable).
Selection Direction	Select **Ascending**.
Selection Mode	Select **Cyclic**.
Port/Channel Content	Enter the numbers of the PIMG ports that dial out MWIs. For example, enter "*" for all PIMG ports, or enter "7,8" for the last two PIMG ports.

1. Under TDM Trunk Groups, select **Add Trunk Group**.
2. Enter the following settings for the third TDM trunk group.

Table 340: Third TDM Trunk Group Settings (Outbound Calls)

Field	Settings
Name	Enter **Outbound_PBX_Calls** or another unique name. This TDM trunk group handles all outbound calls from Unity Connection.
Selection Direction	Select **Descending**.
Selection Mode	Select **Linear**.
Port/Channel Content	Enter ***** for all channels in all ports. Enter the numbers of the PIMG ports that handle outbound (dialout) calls. For example, enter "*" for all PIMG ports, or enter "7,8" for the last two PIMG ports.

1. Select **Submit**.
2. Under Router Configuration, select **Inbound VoIP Rules**.
3. Under Inbound VoIP Rules, uncheck the **Enabled** check box for the default rule.
4. Select **Add Rule**.
5. Under Inbound VoIP Rules, enter the following settings for the first new inbound VoIP rule.

Table 341: First New Inbound VoIP Rule Settings (MWIs)

Field	Settings
Enable	Check this check box.
Rule Label	Enter **MWI_Calls** or another name. This inbound VoIP rule handles all MWI calls from Unity Connection.
Request Type	Select **Message**.
Originating VoIP Host Address	Enter *.

1. Under Inbound VoIP Request Matching, enter the following settings.

   The rule that you created in Step 48 must be selected. Otherwise, any changes you make apply to another rule.

Table 342: Inbound VoIP Request Matching Settings

Field	Settings
Calling Number	Enter *.
Calling Name	Enter *.
Called Number	Enter *.
Called Name	Enter *.
Redirect Number	Enter *.
Redirect Name	Enter *.

1. Under Outbound Routes, enter the following settings.

   The rule that you created in Step 48 must be selected. Otherwise, any changes you make apply to another rule.

Table 343: Outbound Routes Settings

Field	Settings
Device Selection	

Field	Settings
Outbound Destination	Select **TDM**.
Trunk Group	Select the name of the TDM trunk group that you created for MWIs in Step 41. For example, select "MWIs."
CPID Manipulation	
Calling Number	Enter **S**.
Calling Name	Enter **S**.
Called Number	Enter **D**.
Called Name	Enter **D**.
Redirect Number	Enter **R**.
Redirect Name	Enter **R**.
Select Primary/Alternate Route	
Primary	Select **Primary**.

1. Under Inbound VoIP Rules, select **Add Rule**.
2. Under Inbound VoIP Rules, enter the following settings for the second new inbound VoIP rule.

Table 344: Second New Inbound VoIP Rule Settings (Outbound Calls)

Field	Settings
Enable	Check this check box.
Rule Label	Enter **Outbound_UC_Calls** or another name. This inbound VoIP rule handles all outbound calls from Unity Connection.
Request Type	Select **Call**.
Originating VoIP Host Address	Enter ***.

1. Under Inbound VoIP Request Matching, enter the following settings.

   The rule that you created in Step 52 must be selected. Otherwise, any changes you make apply to another rule.

Table 345: Inbound VoIP Request Matching Settings

Field	Settings
Calling Number	Enter ***.

Field	Settings
Calling Name	Enter *.
Called Number	Enter *.
Called Name	Enter *.
Redirect Number	Enter *.
Redirect Name	Enter *.

1. Under Outbound Routes, enter the following settings.

   The rule that you created in Step 52 must be selected. Otherwise, any changes you make apply to another rule.

Table 346: Outbound Routes Settings

Field	Settings
Device Selection	
Outbound Destination	Select **TDM**.
Trunk Group	Select the name of the TDM trunk group that you created for outbound calls in Step 43. For example, select "Outbound_PBX_Calls."
CPID Manipulation	
Calling Number	Enter **S**.
Calling Name	Enter **S**.
Called Number	Enter **D**.
Called Name	Enter **D**.
Redirect Number	Enter **R**.
Redirect Name	Enter **R**.
Select Primary/Alternate Route	
Primary	Select **Primary**.

1. Select **Submit**.
2. Under Router Configuration, select **Inbound TDM Rules**.
3. Under Inbound TDM Rules, enter the following settings for the first inbound TDM rule.

Table 347: First Inbound TDM Rule Settings

Field	Settings
Enable	Check this check box.
Rule Label	Enter **Inbound_Rule_1** or another name. This inbound TDM rule handles all incoming calls from the phone system.
Request Type	Select **Call**.
Trunk Group	Select the name of the TDM trunk group that you created for incoming calls from the phone system in Step 39. For example, select "Inbound_PBX_Calls."

1. Under Inbound TDM Request Matching, enter the following settings.

   The rule that you created in Step 57 must be selected. Otherwise, any changes you make apply to another rule.

Table 348: Inbound TDM Request Matching Settings

Field	Settings
Calling Number	Enter the applicable matching rule used. For example, enter "*" for all.
Calling Name	Enter the applicable matching rule used. For example, enter "*" for all.
Called Number	Enter the applicable matching rule used. For example, enter "*" for all.
Called Name	Enter the applicable matching rule used. For example, enter "*" for all.
Redirect Number	Enter the applicable matching rule used. For example, enter "*" for all.
Redirect Name	Enter the applicable matching rule used. For example, enter "*" for all.

1. Under Outbound Routes, enter the following settings.

   The rule that you created in Step 57 must be selected. Otherwise, any changes you make apply to another rule.

Table 349: Outbound Routes Settings

Field	Settings
Device Selection	
Outbound Destination	Select **VoIP**.
Host Group	Select the name of the VoIP host group that you created for Unity Connection in Step 31.
CPID Manipulation	
Calling Number	Enter the applicable matching rule used. For example, enter "*" for all.

Field	Settings
Calling Name	Enter the applicable matching rule used. For example, enter "*" for all.
Called Number	Enter the applicable matching rule used. For example, enter "*" for all.
Called Name	Enter the applicable matching rule used. For example, enter "*" for all.
Redirect Number	Enter the applicable matching rule used. For example, enter "*" for all.
Redirect Name	Enter the applicable matching rule used. For example, enter "*" for all.
Select Primary/Alternate Route	
Primary	Select **Primary**.

1. If you want to create more Inbound TDM rules, under Inbound TDM Rules, select **Add Rule**. Otherwise, continue to Step 62.
2. Repeat Step 57 through Step 60 for all remaining inbound TDM rules that you want to create.
3. Select **Submit**.
4. On the Configuration menu, select **TDM** > **General**.
5. On the TDM General Settings page, enter the following settings.

Table 350: TDM General Settings Page Settings

Field	Settings
PCM Coding	Select **uLaw**.
Minimum Call Party Delay (ms)	Enter **500**.
Maximum Call Party Delay (ms)	Enter **2000**.
Dial Digit on Time (ms)	Enter **100**.
Dial Inter-Digit Time (ms)	Enter **100**.
Dial Pause Time (ms)	Enter **2000**.
Turn MWI On FAC	Enter the code that turns MWIs on.
Turn MWI Off FAC	Enter the code that turns MWIs off.
Outbound Call Connect Timeout (ms)	Enter **10000**.
Wait for Ringback/Connect on Blind Transfer	Select **Yes**.
Hunt Group Extension	Enter the pilot number of the Unity Connection voice messaging ports.

Field	Settings
Disconnect on Fax Cleardown Tone	Select **No**.

1. Select **Submit**.
2. On the Configuration menu, select **TDM** > **Port Enable**.
3. On the TDM Port Enabling page, select **No** for the ports that you want to disable on the PIMG unit.
4. Confirm that **Yes** is selected for all other ports on the PIMG unit.
5. Select **Submit**.
6. On the Configuration menu, select **VoIP** > **General**.
7. On the VoIP General Settings page, enter the following settings.

Table 351: VoIP General Settings Page Settings

Field	Setting
User-Agent	
Host and Domain Name	Enter the host and domain name of the PIMG unit.
Transport Type	Select **UDP**.
Call as Domain Name	Select **No**.
SIPS URI Scheme Enabled	
Invite Expiration (sec)	Enter **120**.
Server	
DNS Server Address	Enter the IP Address of the Domain Name Server that the PIMG unit uses.
DNS Translation of Phone Numbers	
Registration Server Address	Leave this field blank.
Registration Server Port	Enter **5060**.
Registration Expiration (sec)	Enter **3600**.
TCP/UDP	
UDP/TCP Transports Enabled	Select **Yes**.

Field	Setting
TCP/UDP Server Port	Enter **5060**.
TCP Inactivity Timer (sec)	Enter **30**.
TLS	
TLS Transport Enabled	
TLS Server Port	
SSL TLS Protocol	
Mutual TLS Authentication Required	
TLS Inactivity Timer (sec)	
Verify TLS Peer Certificate Date	
Verify TLS Peer Certificate Trust	
Proxy	
Primary Proxy Server Address	Leave this field blank.
Primary Proxy Server Port	Not applicable. Leave the default setting.
Backup Proxy Server Address	Not applicable. Leave the default setting.
Backup Proxy Server Port	Not applicable. Leave the default setting.
Proxy Query Interval	Enter **10**.
Timing	
T1 Time (ms)	Enter **400**.
T2 Time (ms)	Enter **3000**.
T4 Time (ms)	Enter **5000**.
Monitoring	
Monitor Call Connections	Select **No**.

Field	Setting
Call Monitor Interval (sec)	
Monitor VoIP Hosts	
VoIP Host Monitor Interval (sec)	

1. Select **Submit**.
2. On the Configuration menu, select **VoIP** > **Media**.
3. On the VoIP Media Settings page, enter the following settings.

Table 352: VoIP Media Settings Page Settings

Field	Settings
Audio	
Audio Compression	Select the preferred codec for audio compression.
RTP Digit Relay Mode	Select **RFC2833**.
RTP Fax/Modem Tone Relay Mode	Select **RFC2833**.
RTP Source IP Address Validation	Select **Off**.
RTP Source UDP Port Validation	Select **Off**.
Signaling Digit Relay Mode	Select **Off**.
Voice Activity Detection	Select **Off**.
RFC 3960 Early Media Support	Select **On Demand**.
Frame Size	Select the applicable setting: • G.711—**20** • G.729AB—**10** Failure to use the correct setting results in recorded messages containing nothing but silence.
Frames Per Packet	Select the applicable setting: • G.711—**1** • G.729AB—**2** Failure to use the correct setting results in recorded messages containing nothing but silence.

Field	Settings
Fax	
Fax IP-Transport Mode	

1. Select **Submit**.
2. On the Configuration menu, select **VoIP** > **QOS**.
3. On the VoIP QOS Configuration page, enter the following settings.

Table 353: VoIP QOS Configuration Page Settings

Field	Settings
Call Control QOS Byte	Enter **104**.
RTP QOS Byte	Enter **184**.

1. Select **Submit**.
2. On the Configuration menu, select **IP**.
3. On the IP Settings page, enter the following settings.

Table 354: IP Settings Page Settings

Field	Settings
Client IP Address	Enter the new IP address you want to use for the PIMG unit. (This is the IP address that you enter in Cisco Unity Connection Administration when you create the integration.)
Client Subnet Mask	Enter the new subnet mask, if the subnet mask is different from the default IP address.
Default Network Gateway Address	Enter the IP address of the default network gateway router that the PIMG units use.
BOOTP Enabled	Select **No**.

1. Select **Submit**.
2. On the Configuration menu, select **Tone Detection**.
3. On the Tone Detection page, under Call Progress Tone - Learn, in the Learn Tone Event field, select **Busy** and do the following substeps to verify that the tone is correct.
   a. From an available phone, call a second phone.
   b. Answer the second phone when it rings, and leave both handsets off so that both phones are busy.
   c. From a third phone, dial one of the busy phones.

d. Confirm that you hear a busy tone.

e. Hang up the third phone but leave the handsets for the other two phones off.

4. Under Call Progress Tone - Learn, in the Dial String field, enter the extension that you dialed in Step 83c. from the third phone.
5. Select **Learn**.
6. On the Tone Detection page, under Call Progress Tone - Learn, in the Learn field, select **Error** and do the following substeps to verify that the tone is correct.

   a. From an available phone, dial an extension that does not exist.

   b. Confirm that you hear the reorder or error tone.

   c. Hang up the phone.

7. Under Call Progress Tone - Learn, in the Dial String field, enter the extension that you dialed in Step 86a.
8. Select **Learn**.
9. On the Tone Detection page, under Call Progress Tone - Learn, in the Learn field, select **Ringback** and and do the following substeps to verify that the tone is correct.

   a. From an available phone, dial an extension that does exist

   b. Confirm that you hear the ringback tone.

   c. Hang up the phone.

10. Under Call Progress Tone - Learn, in the Dial String field, enter the extension that you dialed in Step 89a.
11. Select **Learn**.
12. Select **Submit**.
13. Hang up the phones that you used in Step 89.
14. On the System menu, select **Restart**.
15. On the Restart page, select **Restart Unit Now**.
16. Repeat Step 2 through Step 95 on all remaining PIMG units.

Configuring Unity Connection for Integration with Siemens Hicom 150 Phone System

After ensuring that the Siemens Hicom 150 phone system, the PIMG units, and Unity Connection are ready for the integration, do the following procedure to set up the integration and to enter the port settings.

Creating an Integration

Step 1 In Cisco Unity Connection Administration, expand **Telephony Integrations**, then select **Phone System**.

Step 2 On the Search Phone Systems page, under Display Name, select the name of the default phone system.

Step 3 On the Phone System Basics page, in the Phone System Name field, enter the descriptive name that you want for the phone system.

Step 4 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 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 5 Under Message Waiting Indicator Settings, select**Use Same Port for Enabling and Disabling MWIs**.

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 applicable settings and select **Save**.

Table 355: Settings for the New Port Group Page

Field	Setting
Phone System	Select the name of the phone system that you entered in Step 3.
Create From	Select **Port Group Template** and select **SIP to DMG/PIMG/TIMG** 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.
SIP Security Profile	Select **5060**.
SIP Transport Protocol	Select the SIP transport protocol that Unity Connection uses.
IP Address or Host Name	Enter the IP address of the PIMG unit that you are integrating with Unity Connection.
Port	Enter the SIP port of the PIMG unit that Unity Connection connects to. We recommend that you use the default setting. This name must match the setting in the TCP/UDP Server Port field on the Configuration > VoIP > General page of the PIMG unit. Otherwise, the integration cannot function correctly.

Step 9 On the Port Group Basics page, under Message Waiting Indicator Settings, uncheck the **Enable Message Waiting Indicators** check box and select **Save**.

Step 10 In the Related Links drop-down box, select **Add Ports** and select **Go**.

Step 11 On the New Port page, enter the following settings and select **Save**.

Table 356: Settings for the New Port Page

Field	Considerations
Enabled	Check this check box.

Field	Considerations
Number of Ports	Enter **8**. (If you want to use fewer than eight voice messaging ports, enter the number of voice messaging ports that you want to use on this PIMG unit.) **Note** For a Unity Connection cluster, the server must have the number of voice messaging ports that are set up on the phone system for the PIMG integration so that this server can handle all voice messaging traffic for the cluster if one of the servers stops functioning. For example, if the phone system is set up with 16 voice messaging ports, this server must have 16 voice messaging ports.
Phone System	Select the name of the phone system that you entered in Step 3.
Port Group	Select the name of the port group that you added in Step 8.

Step 12 On the Search Ports page, select the display name of the first voice messaging port that you created for this phone system integration.

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

Step 13 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 357: 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.
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	(Serial integrations only) Uncheck this check box. Otherwise, the integration may not functior correctly. (Digital and analog integrations only) 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 Unity Connection web applications. Assign Allow TRAP Connections to the least busy ports.

Field	Considerations
Outgoing Hunt Order	Enter the priority order in which Unity Connection uses the ports when dialing out (for exam if the Perform Message Notification, Send MWI Requests, or Allow TRAP Connections cl box is checked). The highest numbers are used first. However, when multiple ports have t same Outgoing Hunt Order number, Unity Connection uses the port that has been idle the longest.

Step 14 Select **Save**.

Step 15 Select **Next**.

Step 16 Repeat Step 13 through Step 15 for all remaining voice messaging ports for the phone system.

Step 17 In Cisco Unity Connection Administration, expand **Telephony Integrations**, then select **Phone System**.

Step 18 On the Search Phone Systems page, under Display Name, select the name of the phone system that you entered in Step 3.

Step 19 Repeat Step 7 through Step 18 for each remaining PIMG unit integrated with Unity Connection.

Note Each PIMG unit is connected to one port group with the applicable voice messaging ports. For example, a system that uses five PIMG units requires five port groups, one port group for each PIMG unit.

Step 20 To create a port group for MWIs, do the following substeps.

Note All MWI requests are handled by the master PIMG unit and sent to the phone system over the RS-232 serial cable (without using voice messaging ports). So the following substeps create a separate port group without voice messaging ports and enable the port group for MWIs that are "not port specific" (they do not use ports).

a) In Cisco Unity Connection Administration expand **Telephony Integration** then select **Port Group** .

b) On the Search Port Groups page, select **Add New**.

c) On the New Port Group page, enter the applicable settings and select **Save**.

Table 358: Settings for the New Port Group Page (MWIs)

Field	Setting
Phone System	Select the name of the phone system that you entered in Step 3.
Create From	Select Port Group Template and select **SIP to DMG/PIMG/TIMG** SIP to in the drop-down box.
Display Name	Enter a **MWI Port Group** or another descriptive name for the port group.
SIP Security Profile	Select **5060**.
SIP Transport Protocol	Select the SIP transport protocol that Unity Connection uses.
IPv4 Address or Host Name	Enter the IP address of the master PIMG unit.
IPv6 Address or Host Name	Do not enter a value in this field. IPv6 is not supported for PIMG integrations.
IP Address or Host Name	Enter the IP address of the master PIMG unit.

Field	Setting
Port	Enter the SIP port of the master PIMG unit. **Caution** This name must match the setting in the TCP/UDP Server Port field on the Configuration > VoIP > General page of the PIMG unit. Otherwise, the integration cannot function correctly.

d) On the Port Group Basics page, on the Edit menu, select **Advanced Settings**.
e) On the Edit Advanced Settings page, under SIP MWI Requests, select **Not Port Specific** then select **Save**.
f) On the Edit menu, select **Port Group Basics**.
g) Under Port Group, select **Reset**.
h) Under Message Waiting Indicator Settings, confirm that the **Enable Message Waiting Indicator** check box is checked and select **Save**.

Step 21 If another phone system integration exists, in Cisco Unity Connection Administration, expand **Telephony Integrations**, then select **Trunk**. Otherwise, skip to Step 25.

Step 22 On the Search Phone System Trunks page, on the Phone System Trunk menu, select **New Phone System Trunk**.

Step 23 On the New Phone System Trunk page, enter the following settings for the phone system trunk and select **Save**.

Table 359: Settings for the Phone System Trunk

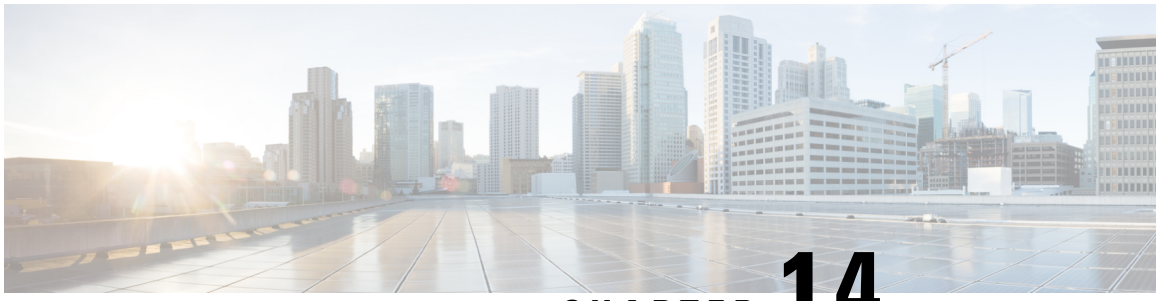
Field	Setting
From Phone System	Enter the display name of the phone system that you are creating a trunk for.
To Phone System	Enter the display name of the previously existing phone system that the trunk connects to.
Trunk Access Code	Enter the extra digits that Unity Connection must dial to transfer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

Step 24 Repeat Step 22 and Step 23 for all remaining phone system trunks that you want to create.

Step 25 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 26 In the Task Execution Results window, select **Close**.



CHAPTER 14

Setting Up a Siemens Hicom 300 E (European) Analog PIMG Integration with Cisco Unity Connection

• Setting Up a Siemens Hicom 300 E (European) Analog PIMG Integration, on page 285

Setting Up a Siemens Hicom 300 E (European) Analog PIMG Integration

Task List for Siemens Hicom 300 E (European) PIMG Phone System Integration

Before doing the following tasks to integrate Unity Connection with the Siemens Hicom 300 E phone system using PIMG units (media gateways), confirm that the Unity Connection server is ready for the integration after completing the server installation, following the tasks in the "Installing Cisco Unity Connection" chapter of the *Install, Upgrade, and Maintenance Guide for Cisco Unity Connection Release 15*, available at https://www.cisco.com/c/en/us/td/docs/voice_ip_comm/connection/15/install_upgrade/guide/b_15cuciumg.html.

1. Review the system and equipment requirements to confirm that all phone system and Unity Connection server requirements have been met. See the Requirements, on page 12 section.
2. Plan how the voice messaging ports are used by Unity Connection. See the Planning the Usage of Voice Messaging Ports, on page 7 chapter.
3. Program the Siemens Hicom 300 E (European) phone system and extensions. See the Programming Siemens Hicom 300 E (European) PIMG Phone System section.
4. Set up the PIMG units. See the Setting Up the Analog PIMG Units for a DTMF Integration section.
5. Create the integration. See the Configuring Unity Connection for Integration with Siemens Hicom 300 E (European) Phone System, on page 304 section.
6. Test the integration. See the Testing the Integration, on page 381 chapter.
7. 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, on page 387 chapter.

Requirements

This integration supports configurations of the following components:

Phone System

- Siemens Hicom 300 E (European) phone system.
- Software version 3.0, release 0.17 or later.
- One or more of the applicable PIMG units. For details, see the "Introduction" chapter.
- The voice messaging ports in the phone system connected by analog lines to the ports on the PIMG units.

To simplify troubleshooting, we recommend that you connect the voice messaging ports on the phone system to the ports on the PIMG units in a planned manner. For example, connect the first phone system voice messaging port to the first port on the first PIMG unit, connect the second phone system voice messaging port to the second port on the first PIMG unit, and so on. Alternatively, if you have multiple PIMG units, you can reduce answer times in the event of a PIMG unit failure by connecting the phone system ports to the PIMG units in a round-robin fashion. For example, connect the first phone system voice messaging port to the first port on the first PIMG unit, connect the second phone system voice messaging port to the first port on the second PIMG unit, and so on.

- The PIMG units connected to the same LAN or WAN that Unity Connection is connected to.
- If the PIMG units connect to a WAN, the requirements for the WAN network connections are:
  - For G.729a codec formatting, a minimum of 32.76 Kbps guaranteed bandwidth for each voice messaging port.
  - For G.711 codec formatting, a minimum of 91.56 Kbps guaranteed bandwidth for each voice messaging port.
  - No network devices that implement network address translation (NAT).
  - A maximum 200 ms one-way network latency.

Unity Connection Server

- Unity Connection installed following the tasks in the "Installing Cisco Unity Connection" chapter of the *Install, Upgrade, and Maintenance Guide for Cisco Unity Connection Release 15*, available at https://www.cisco.com/c/en/us/td/docs/voice_ip_comm/connection/15/install_upgrade/guide/b_15cuciumg.html.
- A license that enables the applicable number of voice messaging ports.

Programming Siemens Hicom 300 E (European) PIMG Phone System

The following programming instructions are provided as an example only. The specific programming for your phone system may vary depending on its configuration.

Caution In programming the phone system, do not send calls to voice messaging ports in 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.

Step 1 Use the CHA-TAPRO command to create a button table to use on the voice messaging port extensions. The button table must have the following parameters while the remaining parameters keep their default values.

Table 360: Button Table Parameter Settings

English		**German**	
Parameter	Setting	Parameter	Setting
STNO	Leave this field blank.	STNO	Leave this field blank.
STD	Enter **4**.	SNU	Enter **4**.
DIGTYP	Enter **OPTIT12**.	DIGTYP	Enter **OPTIT12**.
KY03	Enter **MB**.	KY03	Enter **BK**.
KY04	Enter **RLS**.	KY04	Enter **TR**.
KY07	Enter **NAME**.	KY07	Enter **NA**.
KY10	Enter **CONF**.	KY10	Enter **KF**.
KY11	Enter **CONS**.	KY11	Enter **RF**.
KY12	Enter **TRANSFER**.	KY12	Enter **UEG**.

Step 2 If the Call Route mode on the PIMG unit cannot be set to Pooled, continue to Step 3. Otherwise, use the ADD-SA command to create a hunt group for the voice messaging ports that are connected to the PIMG units. The hunt group must have the following parameters set while the remaining parameters keep their default values.

Table 361: ADD-SA Parameter Settings for Voice Messaging Ports on the Analog PIMG Units

English		**German**	
Parameter	Setting	Parameter	Setting
SERVICE	Enter **VCE**.	DIENST	Enter **SPR**.
CD	Enter the pilot number for the hunt group.	RNR	Enter the pilot number for the hunt group.
DPLN	Enter **0**.	WABE	Enter **0**.

English		German	
NAME	Enter name for the hunt group. For example, enter “UNITY TELEPHONSVA.”	NAME	Enter name for the hunt group. For example, enter “UNITY TELEPHONSVA.”
CALL PROG. STATE	Leave this field blank.	VERKEHRSSITUATION	Leave this field blank.
STNO	Enter the extensions for the ports that answer calls. Do not include the MWI-only ports.	TLNNU	Enter the extensions for the ports that answer calls. Do not include the MWI-only ports.
TYP	Enter **LIN**.	ART	Enter **LIN**.
CQMAX	Enter **6**.	ANOKAP	Enter **6**.
OVERFLOW	Enter **-.**	UEBERLAUF	Enter **-**.

Step 3 Use the CHA-COSSU command to enable the mailbox feature in the class of service (COS) for the voice messaging ports. The mailbox feature must have the following parameters while the remaining parameters keep their default values.

Table 362: HA-COSSU Parameter Settings for the Mailbox Feature

English		German	
Parameter	Setting	Parameter	Setting
TYPE	Enter **COS**.	ART	Enter **COS**.
COS	Enter the number of the class of service for which the mailbox feature is enabled. For example, enter “47”.	COS	Enter the number of the class of service for which the mailbox feature is enabled. For example, enter “47”.
VOICE	Enter **TA TNOTCR MB COSXCD VCE NOANSA FWDNWK ANSYN FWDECA**.	SPRACHE	Enter **FBKW QVKW BRK BUC SSM RWS AULEXT ANSYN AULERU**.
FAX	Enter **NOCO NOTIE**.		Enter **NIB NQVB**.
TTX	Enter **NOCO NOTIE**.		Enter **NIB NQVB**.
VTX	Enter **NOCO NOTIE**.	BTX	Enter **NIB NQVB**.
DTE	Enter **TA TNOTCR BASIC**.	DEE	Enter **FBKW QVKW GRUBE**.

Step 4 Program each phone to forward calls to the pilot number assigned to the voice messaging ports, based on one of the Cisco Unity Connection call transfer types shown in Table 363: Call Transfer Types.

Table 363: Call Transfer Types

Transfer Type	Usage
Release transfer (blind transfer)	Program the phone to forward calls to the pilot number when: • The extension is busy. • The call is not answered.
Supervised transfer	Program the user station to forward calls to the pilot number only when the call is not answered (on the phone system, the number of rings before forwarding must be more than the number of rings to supervise the call). Confirm that call forwarding is disabled when the extension is busy.

Setting Up the Analog PIMG Units for a DTMF Integration

Do the following procedures to set up the analog PIMG units that are connected to the Siemens Hicom 300 E (European) phone system for a DTMF integration.

These procedures require that the following tasks have already been completed:

- The phone system is connected to the PIMG units using analog lines.
- The PIMG units are ready to be connected to the LAN or WAN.
- The PIMG units are connected to a power source.

Fields that are not mentioned in the following procedures must keep their default values. For the default values of all fields, see the manufacturer documentation for the PIMG units.

Downloading PIMG Firmware Update Files for Analog PIMG Units

Step 1 On a Windows workstation that have access to the PIMG units, go to the following link: http://software.cisco.com/download/navigator.html?mdfid=280082558&i=rm.

Note To access the software download page, you must be signed in to Cisco.com as a registered user.

This procedure describes the steps when using Internet Explorer as your web browser. If you are using a different web browser, the steps may differ.

Step 2 In the tree control on the Downloads Home page, expand Unified Communications> **Unified Communications Applications** > **Messaging** > **Cisco Unity** and select **Cisco Unity Telephony Integration**.

Step 3 On the Log In page, enter your username and password, then select **Log In**.

Step 4 On the Select a Release page, under Latest Releases, select the most recent release.

Step 5 In the right column, select the version of the firmware for analog PIMG units.

Step 6 On the Download Image page, select **Download**.

Step 7 On the Supporting Document(s) page, select **Agree**.

Step 8 In the File Download dialog box, select **Save**.

Step 9 In the Save As dialog box, browse to the Windows workstation that have access the PIMG units, browse to a directory where you want to save the file, and select **Save**.

Step 10 In the Download Complete dialog box, select **Open**. The window for extracting the PIMG firmware update files appears.

Step 11 Select **Extract**.

Step 12 In the Extract dialog box, browse to the directory where you want the extracted files, and select **Extract**.

Step 13 Close the window for the extracting application.

Setting Up Analog PIMG Units (Firmware Version 6.x)

Step 1 On the Windows workstation, add a temporary route to enable access to the PIMG units.

a) On the Windows Start menu, select **Run**.

b) Enter **cmd**, and press **Enter**. The Command Prompt window appears.

c) At the command prompt, enter **route add 10.12.13.74 <IP Address of Workstation>**, and press **Enter**.

For example, if the IP address of the workstation is 198.1.3.25, enter “route add 10.12.13.74<space>198.1.3.25” in the Command Prompt window.

d) Close the Command Prompt window.

Step 2 Connect a PIMG unit to the network.

Step 3 In the web browser, go to **http://10.12.13.74**.

Step 4 To sign in, enter the following case-sensitive settings.

Table 364: Sign-in Settings

Field	Settings
Username	Enter **admin**.
Password	Enter **IpodAdmin**.

Step 5 Select **OK**.

Step 6 On the System menu, select **Upgrade**.

Step 7 On the Upgrade page, select **Browse**.

Step 8 In the Choose File dialog box, browse to the directory on the Windows workstation that has the extracted PIMG firmware update files.

Step 9 Select **Ls_<xx** > **.app** (where <xx> is multiple digits), and select **Open**.

Step 10 On the Upgrade page, select **Install File**.

Step 11 After the file is installed, a message prompting you to restart the PIMG unit appears. Select **Cancel**.

Do not restart the PIMG unit until you are instructed to do so later in this procedure, even if the file installation fails. Restarting the PIMG unit at this step may prevent the PIMG unit from functioning correctly.

Step 12 Repeat Step 6 through Step 11 for the following files:

- Run_<xx>FskEcho.dsp
- Ls_<xx>.fsh

1. On the Configuration menu, select **Import/Export**.
2. On the Import/Export page, select **Browse**.
3. In the Choose File dialog box, browse to the file Ls_Cfg_Hicom300ECS.ini.
4. Select **Ls_Cfg_Hicom300ECS.ini**, and select **Open**.
5. On the Import/Export page, select **Import File**.
6. After the file is imported, a message prompting you to restart the PIMG unit appears. Select **OK**.
7. In the web browser, go to **http://10.12.13.74**.
8. To sign in, enter the following case-sensitive settings.

Table 365: Sign-in Settings

Field	Settings
Username	Enter **admin**.
Password	Enter **IpodAdmin**.

1. Select **OK**.
2. Do the following substeps to configure an RTP port range of 16384 to 32767.

   You must set the RTP port range for the PIMG units if your system uses an RTP port range of 16384 to 32767. Otherwise, Unity Connection cannot answer calls and callers hear ringing or silence.



Note The default RTP port range for PIMG units is 49000 to 50000. Some Unity Connection configurations require a different RTP port range.

   a. On the Configuration menu, select **Import/Export**.
   b. On the Import/Export page, under Export Files, select **Export All Settings**.
   c. In the File Download dialog box, select **Save**.
   d. In the Save As dialog box, browse to the Windows workstation that has access to the PIMG units, browse to a directory where you want to save the file, and select **Save**.
   e. In the Download Complete dialog box, select **Open**. Notepad opens the file Config.ini that you saved.
   f.
   g.
   h. Locate the line with the following parameter:

```
gwRTPStartPort
```

i. Change the value of the parameter to **16384** so that the line reads as follows:

```
gwRTPStartPort = 16384
```

j. Locate the line with the following parameter:

```
gwRTPEndPort
```

k. Change the value of the parameter to **32767** so that the line reads as follows:

```
gwRTPEndPort = 32767
```

l. Save the file, and exit Notepad.

m. On the Configuration menu of the PIMG unit, select **Import/Export**.

n. On the Import/Export page, under Browse for Import File, select **Browse**.

o. In the Choose File dialog box, browse to the file Config.ini that you saved.

p. Select **Config.ini**, and select **Open**.

q. On the Import/Export page, select **Import File**.

r. When prompted to restart the PIMG unit, select **OK**.

s. When the PIMG unit has restarted, in the web browser, go to **http://10.12.13.74**.

t. To sign in, enter the following case-sensitive settings.

Table 366: Sign-in Settings

Field	Setting
Username	Enter **admin**.
Password	Enter **IpodAdmin**.

1. Select **OK**.

1. On the System menu, select **Password**.
2. On the Change Password page, enter the following settings.

Table 367: Change Password Page Settings

Field	Settings
Old Password	Enter **IpodAdmin**. (This setting is case sensitive.)
New Password	Enter your new password. (This setting is case sensitive.)
Confirm Password	Enter your new password. (This setting is case sensitive.)

1. Select **Change**.

2. On the Configuration menu, select **Mgmt Protocols**.
3. On the Management Protocols page, enter the following settings.

Table 368: Management Protocols Page Settings

Field	Settings
E-mail Alarms Enabled	Select **No**.
SNMP Traps Enabled	Select **No**.

1. Select **Submit**.
2. On the Configuration menu, select **Routing Table**.
3. On the Routing Table page, under Router Configuration, select **VoIP Host Groups**.
4. Under VoIP Host Groups, enter the following settings for the first VoIP Host Group.

Table 369: First VoIP Host Group Settings

Field	Settings
Name	Accept the default or enter another descriptive name of the VoIP host group.
Load-Balanced	*(Unity Connection without a cluster)* Select **False**. *(Unity Connection with a cluster configured)* Select **False**.
Fault-Tolerant	*(Unity Connection without a cluster)* Select **False**. *(Unity Connection with a cluster configured)* Select **True**.

1. For Unity Connection without a cluster, under Host List, enter the host name or IP address of the Unity Connection server and the server port in the format <host name or IP address>:5060.

For Unity Connection with a cluster configured, under Host List, enter the host name or IP address of the subscriber server (the second Unity Connection server that you installed) and the server port in the format <host name or IP address>:5060.

1. For Unity Connection without a cluster, continue to Step 35. For Unity Connection with a cluster configured, select **Add Host**.
2. In the second field, enter the host name or IP address of the publisher server (the first Unity Connection server that you installed) and the server port in the format <host name or IP address>:5060.

   Do not add a third host under Host List or a second host group under VoIP Host Groups. Otherwise, the Unity Connection cluster may not function correctly.
3. Select **Submit**.
4. Under Router Configuration, select **TDM Trunk Groups**.
5. Under TDM Trunk Groups, select **Add Trunk Group**.
6. Under TDM Trunk Groups, enter the following settings for the first TDM trunk group.

Table 370: First TDM Trunk Group Settings (Inbound Calls)

Field	Settings
Name	Enter **Inbound_PBX_Calls** or another unique name. This TDM trunk group handles all incoming calls from the phone system.
Selection Direction	Select **Ascending**.
Selection Mode	Select **Linear**.
Port/Channel Content	Enter the numbers of the PIMG ports that handle inbound calls. For example, enter "*" for all PIMG ports, or enter "1-6" for the first six PIMG ports.

1. Under TDM Trunk Groups, select **Add Trunk Group**.
2. Enter the following settings for the second TDM trunk group.

Table 371: Second TDM Trunk Group Settings (MWIs)

Field	Settings
Name	Enter **MWIs** or another unique name. This TDM trunk group handles outbound MWI calls (where applicable).
Selection Direction	Select **Ascending**.
Selection Mode	Select **Cyclic**.
Port/Channel Content	Enter the numbers of the PIMG ports that dial out MWIs. For example, enter "*" for all PIMG ports, or enter "7,8" for the last two PIMG ports.

1. Under TDM Trunk Groups, select **Add Trunk Group**.
2. Enter the following settings for the third TDM trunk group.

Table 372: Third TDM Trunk Group Settings (Outbound Calls)

Field	Settings
Name	Enter **Outbound_PBX_Calls** or another unique name. This TDM trunk group handles all outbound calls from Unity Connection.
Selection Direction	Select **Descending**.
Selection Mode	Select **Linear**.
Port/Channel Content	Enter ***** for all channels in all ports. Enter the numbers of the PIMG ports that handles outbound (dialout) calls. For example, enter "*" for all PIMG ports, or enter "7,8" for the last two PIMG ports.

1. Select **Submit**.
2. Under Router Configuration, select **Inbound VoIP Rules**.
3. Under Inbound VoIP Rules, uncheck the **Enabled** check box for the default rule.
4. Select **Add Rule**.
5. Under Inbound VoIP Rules, enter the following settings for the first new inbound VoIP rule.

Table 373: First New Inbound VoIP Rule Settings (MWIs)

Field	Settings
Enable	Check this check box.
Rule Label	Enter **MWI_Calls** or another name. This inbound VoIP rule handles all MWI calls from Unity Connection.
Request Type	Select **Message**.
Originating VoIP Host Address	Enter *.

1. Under Inbound VoIP Request Matching, enter the following settings.

   The rule that you created in Step 47 must be selected. Otherwise, any changes you make apply to another rule.

Table 374: Inbound VoIP Request Matching Settings

Field	Settings
Calling Number	Enter *.
Calling Name	Enter *.
Called Number	Enter *.
Called Name	Enter *.
Redirect Number	Enter *.
Redirect Name	Enter *.

1. Under Outbound Routes, enter the following settings.

   The rule that you created in Step 47 must be selected. Otherwise, any changes you make apply to another rule.

Table 375: Outbound Routes Settings

Field	Settings
Device Selection	

Field	Settings
Outbound Destination	Select **TDM**.
Trunk Group	Select the name of the TDM trunk group that you created for MWIs in Step 40. For example, select "MWIs."
CPID Manipulation	
Calling Number	Enter **S**.
Calling Name	Enter **S**.
Called Number	Enter **D**.
Called Name	Enter **D**.
Redirect Number	Enter **R**.
Redirect Name	Enter **R**.
Select Primary/Alternate Route	
Primary	Select **Primary**.

1. Under Inbound VoIP Rules, select **Add Rule**.
2. Under Inbound VoIP Rules, enter the following settings for the second new inbound VoIP rule.

Table 376: Second New Inbound VoIP Rule Settings (Outbound Calls)

Field	Settings
Enable	Check this check box.
Rule Label	Enter **Outbound_UC_Calls** or another name. This inbound VoIP rule handles all outbound calls from Unity Connection.
Request Type	Select **Call**.
Originating VoIP Host Address	Enter ***.

1. Under Inbound VoIP Request Matching, enter the following settings.

   The rule that you created in Step 51 must be selected. Otherwise, any changes you make apply to another rule.

Table 377: Inbound VoIP Request Matching Settings

Field	Settings
Calling Number	Enter ***.

Field	Settings
Calling Name	Enter *.
Called Number	Enter *.
Called Name	Enter *.
Redirect Number	Enter *.
Redirect Name	Enter *.

1. Under Outbound Routes, enter the following settings.

   The rule that you created in Step 51 must be selected. Otherwise, any changes you make apply to another rule.

Table 378: Outbound Routes Settings

Field	Settings
Device Selection	
Outbound Destination	Select **TDM**.
Trunk Group	Select the name of the TDM trunk group that you created for outbound calls in Step 42. For example, select "Outbound_PBX_Calls."
CPID Manipulation	
Calling Number	Enter **S**.
Calling Name	Enter **S**.
Called Number	Enter **D**.
Called Name	Enter **D**.
Redirect Number	Enter **R**.
Redirect Name	Enter **R**.
Select Primary/Alternate Route	
Primary	Select **Primary**.

1. Select **Submit**.
2. Under Router Configuration, select **Inbound TDM Rules**.
3. Under Inbound TDM Rules, enter the following settings for the first inbound TDM rule.

Table 379: First Inbound TDM Rule Settings

Field	Settings
Enable	Check this check box.
Rule Label	Enter **Inbound_Rule_1** or another name. This inbound TDM rule handles all incoming calls from the phone system.
Request Type	Select **Call**.
Trunk Group	Select the name of the TDM trunk group that you created for incoming calls from the phone system in Step 38. For example, select "Inbound_PBX_Calls."

1. Under Inbound TDM Request Matching, enter the following settings.

   The rule that you created in Step 56 must be selected. Otherwise, any changes you make apply to another rule.

Table 380: Inbound TDM Request Matching Settings

Field	Settings
Calling Number	Enter the applicable matching rule used. For example, enter "*" for all.
Calling Name	Enter the applicable matching rule used. For example, enter "*" for all.
Called Number	Enter the applicable matching rule used. For example, enter "*" for all.
Called Name	Enter the applicable matching rule used. For example, enter "*" for all.
Redirect Number	Enter the applicable matching rule used. For example, enter "*" for all.
Redirect Name	Enter the applicable matching rule used. For example, enter "*" for all.

1. Under Outbound Routes, enter the following settings.

   The rule that you created in Step 56 must be selected. Otherwise, any changes you make apply to another rule.

Table 381: Outbound Routes Settings

Field	Settings
Device Selection	
Outbound Destination	Select **VoIP**.
Host Group	Select the name of the VoIP host group that you created for Unity Connection in Step 31.
CPID Manipulation	
Calling Number	Enter S.

Field	Settings
Calling Name	Enter S.
Called Number	Enter D.
Called Name	Enter D.
Redirect Number	Enter R.
Redirect Name	Enter R.
Select Primary/Alternate Route	
Primary	Select **Primary**.

1. If you want to create more Inbound TDM rules, under Inbound TDM Rules, select **Add Rule**. Otherwise, continue to Step 61.
2. Repeat Step 56 through Step 59 for all remaining inbound TDM rules that you want to create.
3. Select **Submit**.
4. On the Configuration menu, select **TDM** > **General**.
5. On the TDM General Settings page, enter the following settings.

Table 382: TDM General Settings Page Settings

Field	Settings
PCM Coding	Select **uLaw**.
Minimum Call Party Delay (ms)	Enter **500**.
Maximum Call Party Delay (ms)	Enter **2000**.
Dial Digit on Time (ms)	Enter **100**.
Dial Inter-Digit Time (ms)	Enter **100**.
Dial Pause Time (ms)	Enter **2000**.
Turn MWI On FAC	Enter the code that turns MWIs on.
Turn MWI Off FAC	Enter the code that turns MWIs off.
Outbound Call Connect Timeout (ms)	Enter **10000**.
Wait for Ringback/Connect on Blind Transfer	Select **Yes**.
Hunt Group Extension	Enter the pilot number of the Unity Connection voice messaging ports.

Field	Settings
Disconnect on Fax Cleardown Tone	Select **No**.

1. Select **Submit**.
2. On the Configuration menu, select **TDM** > **Port Enable**.
3. On the TDM Port Enabling page, select **No** for the ports that you want to disable on the PIMG unit.
4. Confirm that **Yes** is selected for all other ports on the PIMG unit.
5. Select **Submit**.
6. On the Configuration menu, select **VoIP** > **General**.
7. On the VoIP General Settings page, enter the following settings.

Table 383: VoIP General Settings Page Settings

Field	Setting
User-Agent	
Host and Domain Name	Enter the host and domain name of the PIMG unit.
Transport Type	Select **UDP**.
Call as Domain Name	Select **No**.
SIPS URI Scheme Enabled	
Invite Expiration (sec)	Enter **120**.
Server	
DNS Server Address	Enter the IP Address of the Domain Name Server that the PIMG unit uses.
DNS Translation of Phone Numbers	
Registration Server Address	Leave this field blank.
Registration Server Port	Enter **5060**.
Registration Expiration (sec)	Enter **3600**.
TCP/UDP	
UDP/TCP Transports Enabled	Select **Yes**.

Field	Setting
TCP/UDP Server Port	Enter **5060**.
TCP Inactivity Timer (sec)	Enter **30**.
TLS	
TLS Transport Enabled	
TLS Server Port	
SSL TLS Protocol	
Mutual TLS Authentication Required	
TLS Inactivity Timer (sec)	
Verify TLS Peer Certificate Date	
Verify TLS Peer Certificate Trust	
Proxy	
Primary Proxy Server Address	Leave this field blank.
Primary Proxy Server Port	Not applicable. Leave the default setting.
Backup Proxy Server Address	Not applicable. Leave the default setting.
Backup Proxy Server Port	Not applicable. Leave the default setting.
Proxy Query Interval	Enter **10**.
Timing	
T1 Time (ms)	Enter **400**.
T2 Time (ms)	Enter **3000**.
T4 Time (ms)	Enter **5000**.
Monitoring	
Monitor Call Connections	Select **No**.

Field	Setting
Call Monitor Interval (sec)	
Monitor VoIP Hosts	
VoIP Host Monitor Interval (sec)	

1. Select **Submit**.
2. On the Configuration menu, select **VoIP** > **Media**.
3. On the VoIP Media Settings page, enter the following settings.

Table 384: VoIP Media Settings Page Settings

Field	Settings
Audio	
Audio Compression	Select the preferred codec for audio compression.
RTP Digit Relay Mode	Select **RFC2833**.
RTP Fax/Modem Tone Relay Mode	Select **RFC2833**.
RTP Source IP Address Validation	Select **Off**.
RTP Source UDP Port Validation	Select **Off**.
Signaling Digit Relay Mode	Select **Off**.
Voice Activity Detection	Select **Off**.
RFC 3960 Early Media Support	Select **On Demand**.
Frame Size	Select the applicable setting: • G.711—**20** • G.729AB—**10** Failure to use the correct setting results in recorded messages containing nothing but silence.
Frames Per Packet	Select the applicable setting: • G.711—**1** • G.729AB—**2** Failure to use the correct setting results in recorded messages containing nothing but silence.

Field	Settings
Fax	
Fax IP-Transport Mode	

1. Select **Submit**.
2. On the Configuration menu, select **VoIP** > **QOS**.
3. On the VoIP QOS Configuration page, enter the following settings.

Table 385: VoIP QOS Configuration Page Settings

Field	Settings
Call Control QOS Byte	Enter **104**.
RTP QOS Byte	Enter **184**.

1. Select **Submit**.
2. On the Configuration menu, select **IP**.
3. On the IP Settings page, enter the following settings.

Table 386: IP Settings Page Settings

Field	Settings
Client IP Address	Enter the new IP address you want to use for the PIMG unit. (This is the IP address that you enter in Cisco Unity Connection Administration when you create the integration.)
Client Subnet Mask	Enter the new subnet mask, if the subnet mask is different from the default IP address.
Default Network Gateway Address	Enter the IP address of the default network gateway router that the PIMG units use.
BOOTP Enabled	Select **No**.

1. Select **Submit**.
2. On the Configuration menu, select **Tone Detection**.
3. On the Tone Detection page, under Call Progress Tone - Learn, in the Learn Tone Event field, select **Busy** and do the following substeps to verify that the tone is correct.
   a. From an available phone, call a second phone.
   b. Answer the second phone when it rings, and leave both handsets off so that both phones are busy.
   c. From a third phone, dial one of the busy phones.

d. Confirm that you hear a busy tone.

e. Hang up the third phone but leave the handsets for the other two phones off.

4. Under Call Progress Tone - Learn, in the Dial String field, enter the extension that you dialed in Step 82c. from the third phone.
5. Select **Learn**.
6. On the Tone Detection page, under Call Progress Tone - Learn, in the Learn field, select **Error** and do the following substeps to verify that the tone is correct.

   a. From an available phone, dial an extension that does not exist.

   b. Confirm that you hear the reorder or error tone.

   c. Hang up the phone.

7. Under Call Progress Tone - Learn, in the Dial String field, enter the extension that you dialed in Step 85a.
8. Select **Learn**.
9. On the Tone Detection page, under Call Progress Tone - Learn, in the Learn field, select **Ringback** and and do the following substeps to verify that the tone is correct.

   a. From an available phone, dial an extension that does exist

   b. Confirm that you hear the ringback tone.

   c. Hang up the phone.

10. Under Call Progress Tone - Learn, in the Dial String field, enter the extension that you dialed in Step 88a.
11. Select **Learn**.
12. Select **Submit**.
13. Hang up the phones that you used in Step 88.
14. On the System menu, select **Restart**.
15. On the Restart page, select **Restart Unit Now**.
16. Repeat Step 2 through Step 94 on all remaining PIMG units.

Configuring Unity Connection for Integration with Siemens Hicom 300 E (European) Phone System

After ensuring that the Siemens Hicom 300 E (European) phone system, the PIMG units, and Unity Connection are ready for the integration, do the following procedure to set up the integration and to enter the port settings.

Creating an Integration

Step 1 In Cisco Unity Connection Administration, expand **Telephony Integrations**, then select **Phone System**.

Step 2 On the Search Phone Systems page, under Display Name, select the name of the default phone system.

Step 3 On the Phone System Basics page, in the Phone System Name field, enter the descriptive name that you want for the phone system.

Step 4 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 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 5 Under Message Waiting Indicator Settings, select**Use Same Port for Enabling and Disabling MWIs**.

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 applicable settings and select **Save**.

Table 387: Settings for the New Port Group Page

Field	Setting
Phone System	Select the name of the phone system that you entered in Step 3.
Create From	Select **Port Group Template** and select **SIP to DMG/PIMG/TIMG** 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.
SIP Security Profile	Select **5060**.
SIP Transport Protocol	Select the SIP transport protocol that Unity Connection uses.
IP Address or Host Name	Enter the IP address of the PIMG unit that you are integrating with Unity Connection.
Port	Enter the SIP port of the PIMG unit that Unity Connection connects to. We recommend that you use the default setting. This name must match the setting in the TCP/UDP Server Port field on the Configuration > VoIP > General page of the PIMG unit. Otherwise, the integration cannot function correctly.

Step 9 On the Port Group Basics page, under Message Waiting Indicator Settings, uncheck the **Enable Message Waiting Indicators** check box and select **Save**.

Step 10 In the Related Links drop-down box, select **Add Ports** and select **Go**.

Step 11 On the New Port page, enter the following settings and select **Save**.

Table 388: Settings for the New Port Page

Field	Considerations
Enabled	Check this check box.

Field	Considerations
Number of Ports	Enter **8**. (If you want to use fewer than eight voice messaging ports, enter the number of voice messaging ports that you want to use on this PIMG unit.) **Note** For a Unity Connection cluster, the server must have the number of voice messaging ports that are set up on the phone system for the PIMG integration so that this server can handle all voice messaging traffic for the cluster if one of the servers stops functioning. For example, if the phone system is set up with 16 voice messaging ports, this server must have 16 voice messaging ports.
Phone System	Select the name of the phone system that you entered in Step 3.
Port Group	Select the name of the port group that you added in Step 8.

Step 12 On the Search Ports page, select the display name of the first voice messaging port that you created for this phone system integration.

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

Step 13 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 389: 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.
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	(Serial integrations only) Uncheck this check box. Otherwise, the integration may not functior correctly. (Digital and analog integrations only) 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 Unity Connection web applications. Assign Allow TRAP Connections to the least busy ports.

Field	Considerations
Outgoing Hunt Order	Enter the priority order in which Unity Connection uses the ports when dialing out (for exam if the Perform Message Notification, Send MWI Requests, or Allow TRAP Connections cl box is checked). The highest numbers are used first. However, when multiple ports have t same Outgoing Hunt Order number, Unity Connection uses the port that has been idle the longest.

Step 14 Select **Save**.

Step 15 Select **Next**.

Step 16 Repeat Step 13 through Step 15 for all remaining voice messaging ports for the phone system.

Step 17 In Cisco Unity Connection Administration, expand **Telephony Integrations**, then select **Phone System**.

Step 18 On the Search Phone Systems page, under Display Name, select the name of the phone system that you entered in Step 3.

Step 19 Repeat Step 7 through Step 18 for each remaining PIMG unit integrated with Unity Connection.

Note Each PIMG unit is connected to one port group with the applicable voice messaging ports. For example, a system that uses five PIMG units requires five port groups, one port group for each PIMG unit.

Step 20 To create a port group for MWIs, do the following substeps.

Note All MWI requests are handled by the master PIMG unit and sent to the phone system over the RS-232 serial cable (without using voice messaging ports). So the following substeps create a separate port group without voice messaging ports and enable the port group for MWIs that are "not port specific" (they do not use ports).

a) In Cisco Unity Connection Administration expand **Telephony Integration** then select **Port Group** .

b) On the Search Port Groups page, select **Add New**.

c) On the New Port Group page, enter the applicable settings and select **Save**.

Table 390: Settings for the New Port Group Page (MWIs)

Field	Setting
Phone System	Select the name of the phone system that you entered in Step 3.
Create From	Select Port Group Template and select **SIP to DMG/PIMG/TIMG** SIP to in the drop-down box.
Display Name	Enter a **MWI Port Group** or another descriptive name for the port group.
SIP Security Profile	Select **5060**.
SIP Transport Protocol	Select the SIP transport protocol that Unity Connection uses.
IPv4 Address or Host Name	Enter the IP address of the master PIMG unit.
IPv6 Address or Host Name	Do not enter a value in this field. IPv6 is not supported for PIMG integrations.
IP Address or Host Name	Enter the IP address of the master PIMG unit.

Field	Setting
Port	Enter the SIP port of the master PIMG unit. **Caution** This name must match the setting in the TCP/UDP Server Port field on the Configuration > VoIP > General page of the PIMG unit. Otherwise, the integration cannot function correctly.

d) On the Port Group Basics page, on the Edit menu, select **Advanced Settings**.
e) On the Edit Advanced Settings page, under SIP MWI Requests, select **Not Port Specific** then select **Save**.
f) On the Edit menu, select **Port Group Basics**.
g) Under Port Group, select **Reset**.
h) Under Message Waiting Indicator Settings, confirm that the **Enable Message Waiting Indicator** check box is checked and select **Save**.

Step 21 If another phone system integration exists, in Cisco Unity Connection Administration, expand **Telephony Integrations**, then select **Trunk**. Otherwise, skip to Step 25.

Step 22 On the Search Phone System Trunks page, on the Phone System Trunk menu, select **New Phone System Trunk**.

Step 23 On the New Phone System Trunk page, enter the following settings for the phone system trunk and select **Save**.

Table 391: Settings for the Phone System Trunk

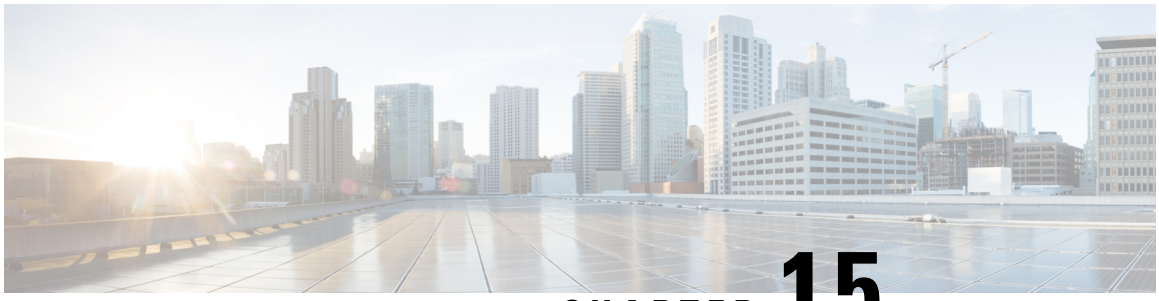
Field	Setting
From Phone System	Enter the display name of the phone system that you are creating a trunk for.
To Phone System	Enter the display name of the previously existing phone system that the trunk connects to.
Trunk Access Code	Enter the extra digits that Unity Connection must dial to transfer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

Step 24 Repeat Step 22 and Step 23 for all remaining phone system trunks that you want to create.

Step 25 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 26 In the Task Execution Results window, select **Close**.



CHAPTER 15

Setting Up a Siemens Hicom 300 E (North American) Digital PIMG Integration

For detailed instructions for setting up a Siemens Hicom 300-series E (North American) digital PIMG integration with Cisco Unity Connection, see the sections in this chapter:

• Setting Up a Siemens Hicom 300 E (North American) Digital PIMG Integration, on page 309

Setting Up a Siemens Hicom 300 E (North American) Digital PIMG Integration

For detailed instructions for setting up a Siemens Hicom 300-series E (North American) digital PIMG integration with Cisco Unity Connection, see the sections in this chapter:

Task List for Siemens Hicom 300 PIMG Phone System Integration

Before doing the following tasks to integrate Unity Connection with the Hicom 300 phone system using PIMG units (media gateways), confirm that the Unity Connection server is ready for the integration after completing the server installation, following the tasks in the "Installing Cisco Unity Connection" chapter of the *Install, Upgrade, and Maintenance Guide for Cisco Unity Connection Release 15*, available at https://www.cisco.com/c/en/us/td/docs/voice_ip_comm/connection/15/install_upgrade/guide/b_15cuciumg.html.

1. Review the system and equipment requirements to confirm that all phone system and Unity Connection server requirements have been met. See the Requirements, on page 12 section.
2. Plan how the voice messaging ports are used by Unity Connection. See the Planning the Usage of Voice Messaging Ports, on page 7 chapter.
3. If you have a legacy voice messaging system, clear the MWIs for users who are migrating to Unity Connection. See the Clearing MWIs from a Legacy Voice Messaging System section.
4. Program the Siemens Hicom 300 phone system and extensions. See the Programming the Siemens Hicom 300 E (North American) Phone System Integration Using the Command Line Interface section.
5. Set up the PIMG units. See the Setting Up the Digital PIMG Units section.
6. Create the integration. See the Configuring Unity Connection for Integration with Siemens Hicom 300 E (North American) Phone System, on page 329 section.

7. Test the integration. See the Testing the Integration, on page 381 chapter.
8. 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, on page 387 chapter.

Requirements

This integration supports configurations of the following components:

Phone System

- Siemens Hicom 300-series E CS (North American) phone system.
- Software version 9006.4 or later.
- SLMO line cards installed for connecting to the PIMG units.
- One or more of the applicable PIMG units. For details, see the "Introduction" chapter.
- The voice messaging ports in the phone system connected by digital lines to the ports on the PIMG units.

To simplify troubleshooting, we recommend that you connect the voice messaging ports on the phone system to the ports on the PIMG units in a planned manner. For example, connect the first phone system voice messaging port to the first port on the first PIMG unit, connect the second phone system voice messaging port to the second port on the first PIMG unit, and so on. Alternatively, if you have multiple PIMG units, you can reduce answer times in the event of a PIMG unit failure by connecting the phone system ports to the PIMG units in a round-robin fashion. For example, connect the first phone system voice messaging port to the first port on the first PIMG unit, connect the second phone system voice messaging port to the first port on the second PIMG unit, and so on.

- The PIMG units connected to the same LAN or WAN that Unity Connection is connected to.
- If the PIMG units connect to a WAN, the requirements for the WAN network connections are:
  - For G.729a codec formatting, a minimum of 32.76 Kbps guaranteed bandwidth for each voice messaging port.
  - For G.711 codec formatting, a minimum of 91.56 Kbps guaranteed bandwidth for each voice messaging port.
  - No network devices that implement network address translation (NAT).
  - A maximum 200 ms one-way network latency.
- The phone system ready for the integration, as described in the documentation for the phone system.

Unity Connection Server

- Unity Connection installed following the tasks in the "Installing Cisco Unity Connection" chapter of the *Install, Upgrade, and Maintenance Guide for Cisco Unity Connection Release 15*, available at https://www.cisco.com/c/en/us/td/docs/voice_ip_comm/connection/15/install_upgrade/guide/b_15cuciumg.html.
- A license that enables the applicable number of voice messaging ports.

Clearing MWIs from a Legacy Voice Messaging System

If users do not have existing voicemail on a legacy voice messaging system, skip this section and continue with the next section.

If users have existing voicemail on a legacy voice messaging system, do the following procedure.

1. Have all users who are migrating to Unity Connection delete or listen to their voice messages on the legacy voice messaging system.
2. Confirm that all MWIs for the subscribers migrating to Unity Connection are turned off.

Programming the Siemens Hicom 300 E (North American) Phone System Integration Using the Command Line Interface

The following programming instructions are provided as an example only. The specific programming for your phone system may vary depending on its configuration.

Caution In programming the phone system, do not send calls to voice messaging ports in 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.

Step 1 Use the ADD-COS command to add INTDTMF to the class of service that you use. The class of service must have the following parameters while the remaining parameters keep their default values.

Table 392: ADD-COS Parameter Settings

Parameter	Setting
NEWCOS	Enter the class of service that you are using.
AVCE	Enter **indtmf;**.

Step 2 Use the ADD-DPLN command to create an extension for each voice messaging port on the PIMG units. Each extension must have the following parameters set while the remaining parameters keep their default values.

Table 393: ADD-DPLN Parameter Settings for Voice Messaging Ports on the PIMG Units

Parameter	Setting
DGTS	Enter **<first extension>&&<last extension>**.
DPLN	Enter **0**.
CPS	Leave this field blank.
DAR	Enter **STN**.
CHECK	Enter **N**.

Step 3 Use the ADD-SCSU command to create the first voice messaging port on the first PIMG unit. The voice messaging port must have the following parameters while the remaining parameters keep their default values.

Table 394: ADD-SCSU Parameter Settings for Voice Messaging Ports on the PIMG Units

Parameter	Setting
STNO	Enter the extension number.
PEN	Enter the port equipment number.
DPLN	Enter **0**.
ITR	Enter **0**.
COS1	Enter the class of service that you are using.
COS2	Enter the class of service that you are using.
COSX	Enter **0**.
PUBSCR	Enter the PSTN prefix plus the extension number.
NTYPE	Enter **NAT**.
ACTCDE	Enter **000000000000**.
HTLNIDX	Leave this field blank.
DEVFUNC	Enter **OPTI**.
INS	Enter **Y**.
OPTITYPE	Enter **OEADPLC**.
CUI	Enter **Y**.

Step 4 Repeat Step 3 for each remaining voice messaging port on all PIMG units.

Step 5 Use the CHA-KEPRO command to program the first voice messaging port on the first PIMG unit. The voice messaging port must have the following parameters while the remaining parameters keep their default values.

Table 395: CHA-KEPRO Parameter Settings for Voice Messaging Ports on the PIMG Units

Parameter	Setting
STNO	Enter the extension number of the voice messaging port.
STD	Enter **1**.
DIGTYPE	Enter **OPTIE12**.

Step 6 Confirm that the key assignments for the voice messaging port match the key assignments shown in Table 396: Required Key Assignments for Voice Messaging Ports on the PIMG Units.

Table 396: Required Key Assignments for Voice Messaging Ports on the PIMG Units

Key	Assignment
1	LINE
2	VACANT
3	VACANT
4	VACANT
5	CONF
6	XFER
7	CNCT
8	HOLDM
9	MB
10	SYSSP1
11	SYSSP2
12	VACANT

The key assignments must match the key assignments shown above. Otherwise, the integration cannot function correctly.

Step 7 Repeat Step 5 and Step 6 for each remaining voice messaging port on all PIMG units.

Step 8 Use the ADD-KCSU command to set the primary line options for the first voice messaging port on the first PIMG unit. The voice messaging port must have the following parameters while the remaining parameters keep their default values.

Table 397: ADD-KCSU Parameter Settings for Voice Messaging Ports on the PIMG Units

Parameter	Setting
STNO	Enter the extension number of the voice messaging port.
TYPE	Enter **KEY**.
PRIMKEY	Enter **1**.
RIOP	Enter **Y**.
ORLNPF	Enter **PRIM**.
TMLNPF	Enter **RING**.
SGLBMOD	Enter **Y**.
ROLRING	Enter **STAND**.
APRIVAT	Enter **N**.

Parameter	Setting
AICS	Enter **Y**.

Step 9 Repeat Step 8 for each remaining voice messaging port on all PIMG units.

Step 10 In the station configuration section, in the Common User Interface field, enter **Yes**.

Step 11 Program each phone to forward calls to the pilot number assigned to the voice messaging ports, based on one of the Unity Connection call transfer types shown in Table 398: Call Transfer Types.

Table 398: Call Transfer Types

Transfer Type	Usage
Release transfer (blind transfer)	Program the phone to forward calls to the pilot number when: • The extension is busy. • The call is not answered.
Supervised transfer	Program the user station to forward calls to the pilot number only when the call is not answered (on the phone system, the number of rings before forwarding must be more than the number of rings to supervise the call). Confirm that call forwarding is disabled when the extension is busy.

Setting Up the Digital PIMG Units

Do the following procedures to set up the digital PIMG units that are connected to the Siemens Hicom 300 phone system.

These procedures require that the following tasks have already been completed:

- The phone system is connected to the PIMG units using digital lines.
- The PIMG units are ready to be connected to the LAN or WAN.
- The PIMG units are connected to a power source.

Fields that are not mentioned in the following procedures must keep their default values. For the default values of all fields, see the manufacturer documentation for the PIMG units.

Downloading the PIMG Firmware Update Files for Digital PIMG Units

Step 1 On a Windows workstation with a high-speed Internet connection that have access to the PIMG units, go to the Voice and Unified Communications Downloads page at http://software.cisco.com/download/navigator.html?mdfid=280082558&i=rm.

Note To access the software download page, you must be signed in to Cisco.com as a registered user.

This procedure describes the steps when using Internet Explorer as your web browser. If you are using a different web browser, the steps may differ.

Step 2 In the tree control on the Downloads Home page, expand Unified Communications> **Unified Communications Applications** > **Messaging** > **Cisco Unity** and select **Cisco Unity Telephony Integration**.

Step 3 On the Log In page, enter your username and password, then select **Log In**.

Step 4 On the Select a Release page, under Latest Releases, select the most recent release.

Step 5 In the right column, select the version of the firmware for digital PIMG units.

Step 6 On the Download Image page, select **Download**.

Step 7 On the Supporting Document(s) page, select **Agree**.

Step 8 In the File Download dialog box, select **Save**.

Step 9 In the Save As dialog box, browse to the Windows workstation that have access the PIMG units, browse to a directory where you want to save the file, and select **Save**.

Step 10 In the Download Complete dialog box, select **Open**. The window for extracting the PIMG firmware update files appears.

Step 11 Select **Extract**.

Step 12 In the Extract dialog box, browse to the directory where you want the extracted files, and select **Extract**.

Step 13 Close the window for the extracting application.

Setting Up the Digital PIMG Units (Firmware Version 6.x)

Step 1 On the Windows workstation, add a temporary route to enable access to the PIMG units.

a) On the Windows Start menu, select **Run**.

b) Enter **cmd**, and press **Enter**. The Command Prompt window appears.

c) At the command prompt, enter **route add 10.12.13.74 <IP Address of Workstation>**, and press **Enter**.

For example, if the IP address of the workstation is 198.1.3.25, enter “route add 10.12.13.74<space>198.1.3.25” in the Command Prompt window.

d) Close the Command Prompt window.

Step 2 Connect a PIMG unit to the network.

Step 3 In the web browser, go to **http://10.12.13.74**.

Step 4 To sign in, enter the following case-sensitive settings.

Table 399: Sign-in Settings

Field	Setting
Username	Enter **admin**.
Password	Enter **IpodAdmin**.

Step 5 Select **OK**.

Step 6 On the System menu, select **Upgrade**.

Step 7 On the Upgrade page, select **Browse**.

Step 8 In the Choose File dialog box, browse to the directory on the Windows workstation that has the extracted PIMG firmware update files.

Step 9 Select **Ami<xx** > **.app** (where <xx> is multiple digits), and select **Open**.

Step 10 On the Upgrade page, select **Install File**.

Step 11 After the file is installed, a message prompting you to restart the PIMG unit appears. Select **Cancel**.

Do not restart the PIMG unit until you are instructed to do so later in this procedure, even if the file installation fails. Restarting the PIMG unit at this step may prevent the PIMG unit from functioning correctly.

Step 12 Repeat Step 6 through Step 11 for each of the following files:

- Ami_<xx>.fsh
- Run<xx>FskEcho.dsp
- iNim<xx>.ibt
- iNim<xx>.ilc
- iNim<xx>.iap

Step 13 On the Configuration menu, select **Import/Export**.

Step 14 On the Import/Export page, select **Browse**.

Step 15 In the Choose File dialog box, browse to the file DNI_Cfg_Generic.ini.

Step 16 Select **DNI_Cfg_Generic.ini**, and select **Open**.

Step 17 On the Import/Export page, select **Import File**.

Step 18 After the file is imported, a message prompting you to restart the PIMG unit appears. Select **OK**.

Step 19 In the web browser, go to **http://10.12.13.74**.

Step 20 To sign in, enter the following case-sensitive settings.

Table 400: Sign-in Settings

Field	Setting
Username	Enter **admin**.
Password	Enter **IpodAdmin**.

Step 21 Select **OK**.

Step 22 Do the following substeps to configure an RTP port range of 16384 to 32767.

You must set the RTP port range for the PIMG units if your system uses an RTP port range of 16384 to 32767. Otherwise, Unity Connection cannot answer calls and callers hear ringing or silence.

Note The default RTP port range for PIMG units is 49000 to 50000. Some Unity Connection configurations require a different RTP port range.

a) On the Configuration menu, select **Import/Export**.
b) On the Import/Export page, under Export Settings, select **Export All Settings**.
c) In the File Download dialog box, select **Save**.
d) In the Save As dialog box, browse to the Windows workstation that has access to the PIMG units, browse to a directory where you want to save the file, and select **Save**.
e) In the Download Complete dialog box, select **Open**. Notepad opens the file Config.ini that you saved.
f)
g)

h) Locate the line with the following parameter:

```
gwRTPStartPort
```

i) Change the value of the parameter to **16384** so that the line reads as follows:

```
gwRTPStartPort = 16384
```

j) Locate the line with the following parameter:

```
gwRTPEndPort
```

k) Change the value of the parameter to **32767** so that the line reads as follows:

```
gwRTPEndPort = 32767
```

l) Save the file, and exit Notepad.
m) On the Configuration menu of the PIMG unit, select **Import/Export**.
n) On the Import/Export page, under Browse for Import File, select **Browse**.
o) In the Choose File dialog box, browse to the file Config.ini that you saved.
p) Select **Config.ini**, and select **Open**.
q) On the Import/Export page, select **Import File**.
r) When prompted to restart the PIMG unit, select **OK**.
s) When the PIMG unit has restarted, in the web browser, go to **http://10.12.13.74**.
t) To sign in, enter the following case-sensitive settings.

Table 401: Sign-in Settings

Field	Setting
Username	Enter **admin**.
Password	Enter **IpodAdmin**.

u) Select **OK**.

Step 23 On the System menu, select **Password**.

Step 24 On the Change Password page, enter the following settings.

Table 402: Change Password Page Settings

Field	Setting
Old Password	Enter **IpodAdmin**. (This setting is case sensitive.)
New Password	Enter your new password. (This setting is case sensitive.)
Confirm Password	Enter your new password. (This setting is case sensitive.)

Step 25 Select **Change**.

Step 26 On the Configuration menu, select **Routing Table**.

Step 27 On the Routing Table page, under Router Configuration, select **VoIP Host Groups**.

Step 28 Under VoIP Host Groups, enter the following settings for the first VoIP Host Group.

Table 403: First VoIP Host Group Settings

Field	Settings
Name	Accept the default or enter another descriptive name of the VoIP host group.
Load-Balanced	*(Unity Connection without a cluster)* Select **False**. *(Unity Connection with a cluster configured)* Select **False**.
Fault-Tolerant	*(Unity Connection without a cluster)* Select **False**. *(Unity Connection with a cluster configured)* Select **True**.

Step 29 For Unity Connection without a cluster, under Host List, enter the host name or IP address of the Unity Connection server and the server port in the format <host name or IP address>:5060.

For Unity Connection with a cluster configured, under Host List, enter the host name or IP address of the subscriber server (the second Unity Connection server that you installed) and the server port in the format <host name or IP address>:5060.

Step 30 For Unity Connection without a cluster, continue to Step 32. For Unity Connection with a cluster configured, select **Add Host**.

Step 31 In the second field, enter the host name or IP address of the publisher server (the first Unity Connection server that you installed) and the server port in the format <host name or IP address>:5060.

Do not add a third host under Host List or a second host group under VoIP Host Groups. Otherwise, the Unity Connection cluster may not function correctly.

Step 32 Select **Submit**.

Step 33 Under Router Configuration, select **TDM Trunk Groups**.

Step 34 Under TDM Trunk Groups, select **Add Trunk Group**.

Step 35 Under TDM Trunk Groups, enter the following settings for the first TDM trunk group.

Table 404: First TDM Trunk Group Settings (Inbound Calls)

Field	Settings
Name	Enter **Inbound_PBX_Calls** or another unique name. This TDM trunk group handles all incoming calls from the phone system.
Selection Direction	Select **Ascending**.
Selection Mode	Select **Linear**.
Port/Channel Content	Enter the numbers of the PIMG ports that handle inbound calls. For example, enter "*" for all PIMG ports, or enter "1-6" for the first six PIMG ports.

Step 36 Under TDM Trunk Groups, select **Add Trunk Group**.

Step 37 Enter the following settings for the second TDM trunk group.

Table 405: Second TDM Trunk Group Settings (MWIs)

Field	Settings
Name	Enter **MWIs** or another unique name. This TDM trunk group handles outbound MWI calls (where applicable).
Selection Direction	Select **Ascending**.
Selection Mode	Select **Cyclic**.
Port/Channel Content	Enter the numbers of the PIMG ports that dial out MWIs. For example, enter "*" for all PIMG ports, or enter "7,8" for the last two PIMG ports.

Step 38 Under TDM Trunk Groups, select **Add Trunk Group**.

Step 39 Enter the following settings for the third TDM trunk group.

Table 406: Third TDM Trunk Group Settings (Outbound Calls)

Field	Settings
Name	Enter **Outbound_PBX_Calls** or another unique name. This TDM trunk group handles all outbound calls from Unity Connection.
Selection Direction	Select **Descending**.
Selection Mode	Select **Linear**.
Port/Channel Content	Enter ***** for all channels in all ports. Enter the numbers of the PIMG ports that handle outbound (dialout) calls. For example, enter "*" for all PIMG ports, or enter "7,8" for the last two PIMG ports.

Step 40 Select **Submit**.

Step 41 Under Router Configuration, select **Inbound VoIP Rules**.

Step 42 Under Inbound VoIP Rules, uncheck the **Enabled** check box for the default rule.

Step 43 Select **Add Rule**.

Step 44 Under Inbound VoIP Rules, enter the following settings for the first new inbound VoIP rule.

Table 407: First New Inbound VoIP Rule Settings (MWIs)

Field	Settings
Enable	Check this check box.
Rule Label	Enter **MWI_Calls** or another name. This inbound VoIP rule handles all MWI calls from Unity Connection.
Request Type	Select **Message**.

Field	Settings
Originating VoIP Host Address	Enter *****.

Step 45 Under Inbound VoIP Request Matching, enter the following settings.

The rule that you created in Step 44 must be selected. Otherwise, any changes you make apply to another inbound VoIP rule.

Table 408: Inbound VoIP Request Matching Settings

Field	Settings
Calling Number	Enter *****.
Calling Name	Enter *****.
Called Number	Enter *****.
Called Name	Enter *****.
Redirect Number	Enter *****.
Redirect Name	Enter *****.

Step 46 Under Outbound Routes, enter the following settings.

The rule that you created in Step 44 must be selected. Otherwise, any changes you make apply to another rule.

Table 409: Outbound Routes Settings

Field	Settings
Device Selection	
Outbound Destination	Select **TDM**.
Trunk Group	Select the name of the TDM trunk group that you created for MWIs in Step 37. For example, select "MWIs."
CPID Manipulation	
Calling Number	Enter **S**.
Calling Name	Enter **S**.
Called Number	Enter **D**.
Called Name	Enter **D**.
Redirect Number	Enter **R**.
Redirect Name	Enter **R**.
Select Primary/Alternate Route	

Field	Settings
Primary	Select **Primary**.

Step 47 Under Inbound VoIP Rules, select **Add Rule**.

Step 48 Under Inbound VoIP Rules, enter the following settings for the second new inbound VoIP rule.

Table 410: Second New Inbound VoIP Rule Settings (Outbound Calls)

Field	Settings
Enable	Check this check box.
Rule Label	Enter **Outbound_UC_Calls** or another name. This inbound VoIP rule handles all outbound calls from Unity Connection.
Request Type	Select **Call**.
Originating VoIP Host Address	Enter ***.

Step 49 Under Inbound VoIP Request Matching, enter the following settings.

The rule that you created in Step 48 must be selected. Otherwise, any changes you make apply to another rule.

Table 411: Inbound VoIP Request Matching Settings

Field	Settings
Calling Number	Enter ***.
Calling Name	Enter ***.
Called Number	Enter ***.
Called Name	Enter ***.
Redirect Number	Enter ***.
Redirect Name	Enter ***.

Step 50 Under Outbound Routes, enter the following settings.

The rule that you created in Step 48 must be selected. Otherwise, any changes you make apply to another rule.

Table 412: Outbound Routes Settings

Field	Settings
Device Selection	
Outbound Destination	Select **TDM**.

Field	Settings
Trunk Group	Select the name of the TDM trunk group that you created for outbound calls in Step 39. For example, select "Outbound_PBX_Calls."
CPID Manipulation	
Calling Number	Enter **S**.
Calling Name	Enter **S**.
Called Number	Enter **D**.
Called Name	Enter **D**.
Redirect Number	Enter **R**.
Redirect Name	Enter **R**.
Select Primary/Alternate Route	
Primary	Select **Primary**.

Step 51 Select **Submit**.

Step 52 Under Router Configuration, select **Inbound TDM Rules**.

Step 53 Under Inbound TDM Rules, enter the following settings for the first inbound TDM rule.

Table 413: First Inbound TDM Rule Settings

Field	Settings
Enable	Check this check box.
Rule Label	Enter **Inbound_Rule_1** or another name. This inbound TDM rule handles all incoming calls from the phone system.
Request Type	Select **Call**.
Trunk Group	Select the name of the TDM trunk group that you created for incoming calls from the phone system in Step 35. For example, select "Inbound_PBX_Calls."

Step 54 Under Inbound TDM Request Matching, enter the following settings.

The rule that you created in Step 53 must be selected. Otherwise, any changes you make apply to another rule.

Table 414: Inbound TDM Request Matching Settings

Field	Settings
Calling Number	Enter the applicable matching rule used. For example, enter "*" for all.
Calling Name	Enter the applicable matching rule used. For example, enter "*" for all.
Called Number	Enter the applicable matching rule used. For example, enter "*" for all.

Field	Settings
Called Name	Enter the applicable matching rule used. For example, enter "*" for all.
Redirect Number	Enter the applicable matching rule used. For example, enter "*" for all.
Redirect Name	Enter the applicable matching rule used. For example, enter "*" for all.

Step 55 Under Outbound Routes, enter the following settings.

The rule that you created in Step 53 must be selected. Otherwise, any changes you make apply to another rule.

Table 415: Outbound Routes Settings

Field	Settings
Device Selection	
Outbound Destination	Select **VoIP**.
Host Group	Select the name of the VoIP host group that you created for Unity Connection in Step 28.
CPID Manipulation	
Calling Number	Enter S.
Calling Name	Enter S.
Called Number	Enter D.
Called Name	Enter D.
Redirect Number	Enter R.
Redirect Name	Enter R.
Select Primary/Alternate Route	
Primary	Select **Primary**.

Step 56 If you want to create more Inbound TDM rules, under Inbound TDM Rules, select **Add Rule**. Otherwise, continue to Step 58.

Step 57 Repeat Step 53 through Step 56 for all remaining inbound TDM rules that you want to create.

Step 58 Select **Submit**.

Step 59 On the Configuration menu, select **TDM** > **Digital**.

Step 60 On the Digital Telephony page, in the Telephony Switch Type field, select Optiset_300ECS.

Step 61 Select **Submit**.

Step 62 On the Configuration menu, select **TDM** > **General**.

Step 63 On the TDM General Settings page, enter the following settings.

Table 416: TDM General Settings Page Settings

Field	Settings
PCM Coding	Select **uLaw**.
Minimum Call Party Delay (ms)	Enter **500**.
Maximum Call Party Delay (ms)	Enter **2000**.
Dial Digit on Time (ms)	Enter **100**.
Dial Inter-Digit Time (ms)	Enter **100**.
Dial Pause Time (ms)	Enter **2000**.
Turn MWI On FAC	Leave this field blank.
Turn MWI Off FAC	Leave this field blank.
Outbound Call Connect Timeout (ms)	Enter **10000**.
Wait for Ringback/Connect on Blind Transfer	Select **Yes**.
Hunt Group Extension	Enter the pilot number of the Unity Connection voice messaging ports.
Disconnect on Fax Cleardown Tone	Select **No**.

Step 64 Select **Submit**.

Step 65 On the Configuration menu, select **TDM** > **Port Enable**.

Step 66 On the TDM Port Enabling page, select **No** for the ports that you want to disable on the PIMG unit.

Step 67 Confirm that **Yes** is selected for all other ports on the PIMG unit.

Step 68 Select **Submit**.

Step 69 On the Configuration menu, select **VoIP** > **General**.

Step 70 On the VoIP General Settings page, enter the following settings.

Table 417: VoIP General Settings Page Settings

Field	Setting
User-Agent	
Host and Domain Name	Enter the host and domain name of the PIMG unit.
Transport Type	Select **UDP**.
Call as Domain Name	Select **No**.

Field	Setting
SIPS URI Scheme Enabled	Select **No**.
Invite Expiration (sec)	Enter **120**.
Server	
DNS Server Address	Enter the IP Address of the Domain Name Server that the PIMG unit uses.
DNS Translation of Phone Numbers	Select **No**.
Registration Server Address	Leave this field blank.
Registration Server Port	Enter **5060**.
Registration Expiration (sec)	Enter **3600**.
TCP/UDP	
UDP/TCP Transports Enabled	Select **Yes**.
TCP/UDP Server Port	Enter **5060**.
TCP Inactivity Timer (sec)	Enter **30**.
TLS	
TLS Transport Enabled	Select **No**.
TLS Server Port	Enter **5061**.
SSL TLS Protocol	Select **SSLv3 TLSv1**.
Mutual TLS Authentication Required	Select **Yes**.
TLS Inactivity Timer (sec)	Enter **30**.
Verify TLS Peer Certificate Date	Select **Yes**.
Verify TLS Peer Certificate Trust	Select **Yes**.
Proxy	

Field	Setting
Primary Proxy Server Address	Leave this field blank.
Primary Proxy Server Port	Not applicable. Leave the default setting.
Backup Proxy Server Address	Not applicable. Leave the default setting.
Backup Proxy Server Port	Not applicable. Leave the default setting.
Proxy Query Interval	Enter **10**.
Timing	
T1 Time (ms)	Enter **400**.
T2 Time (ms)	Enter **3000**.
T4 Time (ms)	Enter **5000**.
Monitoring	
Monitor Call Connections	Select **No**.
Call Monitor Interval (sec)	
Monitor VoIP Hosts	
VoIP Host Monitor Interval (sec)	

Step 71 Select **Submit**.

Step 72 On the Configuration menu, select **VoIP** > **Media**.

Step 73 On the VoIP Media Settings page, enter the following settings.

Table 418: VoIP Media Settings Page Settings

Field	Settings
Audio	
Audio Compression	Select the preferred codec for audio compression.
RTP Digit Relay Mode	Select **RFC2833**.
RTP Fax/Modem Tone Relay Mode	Select **RFC2833**.
RTP Source IP Address Validation	Select **Off**.

Field	Settings
RTP Source UDP Port Validation	Select **Off**.
Signaling Digit Relay Mode	Select **Off**.
Voice Activity Detection	Select **Off**.
RFC 3960 Early Media Support	Select **On Demand**.
Frame Size	Select the applicable setting: • G.711—**20** • G.729AB—**10** Failure to use the correct setting results in recorded messages containing nothing but silence.
Frames Per Packet	Select the applicable setting: • G.711—**1** • G.729AB—**2** Failure to use the correct setting results in recorded messages containing nothing but silence.
Fax	
Fax IP-Transport Mode	
SRTP	
SRTP Preference	Select **RTP Only**.
MKI on Transmit Stream	Select **Yes**.
Key Derivation Enable	Select **Yes**.
Key Derivation Rate	Enter **16**.
Anti-replay Window Size Hint	Enter **64**.
Cipher Mode	Select **AES_Counter_Mode**.
Authentication Type	Select **SHA1**.
Authentication Tag Length	Select **SHA1_80_bit**.

Step 74 Select **Submit**.

Step 75 On the Configuration menu, select **VoIP** > **QOS**.

Step 76 On the VoIP QOS Configuration page, enter the following settings.

Table 419: VoIP QOS Configurative Page Settings

Field	Settings
Call Control QOS Byte	Enter **104**.
RTP QOS Byte	Enter **184**.

Step 77 Select **Submit**.

Step 78 On the Configuration menu, select **IP**.

Step 79 On the IP Settings page, enter the following settings.

Table 420: IP Settings Page Settings

Field	Settings
Client IP Address	Enter the new IP address you want to use for the PIMG unit. (This is the IP address that you enter in Cisco Unity Connection Administration when you create the integration.)
Client Subnet Mask	Enter the new subnet mask, if the subnet mask is different from the default IP address.
Default Network Gateway Address	Enter the IP address of the default network gateway router that the PIMG units use.
BOOTP Enabled	Select **No**.
SNTP Server IP Address	

Step 80 Select **Submit**.

Step 81 On the Configuration menu, select **Tone Detection**.

Step 82 On the Tone Detection page, under Call Progress Tone - Learn, in the Learn Tone Event field, select **Busy** and do the following substeps to verify that the tone is correct.

a) From a available phone, call a second phone.
b) Answer the second phone when it rings, and leave both handsets off so that both phones are busy.
c) From a third phone, dial one of the busy phones.
d) Confirm that you hear a busy tone.
e) Hang up the third phone but leave the handsets for the other two phones off.

Step 83 Under Call Progress Tone - Learn, in the Dial String field, enter the extension that you dialed in Step 82c. from the third phone.

Step 84 Select **Learn**.

Step 85 On the Tone Detection page, under Call Progress Tone - Learn, in the Learn field, select **Error** and do the following substeps to verify that the tone is correct.

a) From an available phone, dial an extension that does not exist.
b) Confirm that you hear the reorder or error tone.
c) Hang up the phone.

Step 86 Under Call Progress Tone - Learn, in the Dial String field, enter the extension that you dialed in Step 85a.

Step 87 Select **Learn**.

Step 88 On the Tone Detection page, under Call Progress Tone - Learn, in the Learn field, select **Ringback** and do the following substeps to verify that the tone is correct.

a) From an available phone, dial an extension that does exist
b) Confirm that you hear the ringback tone.
c) Hang up the phone.

Step 89 Under Call Progress Tone - Learn, in the Dial String field, enter the extension that you dialed in Step 88a.

Step 90 Select **Learn**.

Step 91 Select **Submit**.

Step 92 Hang up the phones that you used in Step 82.

Step 93 On the System menu, select **Restart**.

Step 94 On the Restart page, select **Restart Unit Now**.

Step 95 Repeat Step 2 through Step 94 on all remaining PIMG units.

Configuring Unity Connection for Integration with Siemens Hicom 300 E (North American) Phone System

After ensuring that the Siemens Hicom 300 E (North American) phone system, the PIMG units, and Unity Connection are ready for the integration, do the following procedure to set up the integration and to enter the port settings.

Creating an Integration

Step 1 In Cisco Unity Connection Administration, expand **Telephony Integrations**, then select **Phone System**.

Step 2 On the Search Phone Systems page, under Display Name, select the name of the default phone system.

Step 3 On the Phone System Basics page, in the Phone System Name field, enter the descriptive name that you want for the phone system.

Step 4 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 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 5 Under Message Waiting Indicator Settings, select**Use Same Port for Enabling and Disabling MWIs**.

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 applicable settings and select **Save**.

Table 421: Settings for the New Port Group Page

Field	Setting
Phone System	Select the name of the phone system that you entered in Step 3.

Field	Setting
Create From	Select **Port Group Template** and select **SIP to DMG/PIMG/TIMG** 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.
SIP Security Profile	Select **5060**.
SIP Transport Protocol	Select the SIP transport protocol that Unity Connection uses.
IP Address or Host Name	Enter the IP address of the PIMG unit that you are integrating with Unity Connection.
Port	Enter the SIP port of the PIMG unit that Unity Connection connects to. We recommend that you use the default setting. This name must match the setting in the TCP/UDP Server Port field on the Configuration > VoIP > General page of the PIMG unit. Otherwise, the integration cannot function correctly.

Step 9 On the Port Group Basics page, under Message Waiting Indicator Settings, uncheck the **Enable Message Waiting Indicators** check box and select **Save**.

Step 10 In the Related Links drop-down box, select **Add Ports** and select **Go**.

Step 11 On the New Port page, enter the following settings and select **Save**.

Table 422: Settings for the New Port Page

Field	Considerations
Enabled	Check this check box.
Number of Ports	Enter **8**. (If you want to use fewer than eight voice messaging ports, enter the number of voice messaging ports that you want to use on this PIMG unit.) **Note** For a Unity Connection cluster, the server must have the number of voice messaging ports that are set up on the phone system for the PIMG integration so that this server can handle all voice messaging traffic for the cluster if one of the servers stops functioning. For example, if the phone system is set up with 16 voice messaging ports, this server must have 16 voice messaging ports.
Phone System	Select the name of the phone system that you entered in Step 3.
Port Group	Select the name of the port group that you added in Step 8.

Step 12 On the Search Ports page, select the display name of the first voice messaging port that you created for this phone system integration.

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

Step 13 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 423: 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 ringing tone but are not answered. Typically, the port is disabled only by the installer duri testing.
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 incomi calls from unidentified callers or from users.
Perform Message Notification	Check this check box to designate the port for notifying users of messages. Assign Perfor Message Notification to the least busy ports.
Send MWI Requests	(Serial integrations only) Uncheck this check box. Otherwise, the integration may not func correctly. (Digital and analog integrations only) Check this check box to designate the port for turni 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 th phone in Unity Connection web applications. Assign Allow TRAP Connections to the lea busy ports.
Outgoing Hunt Order	Enter the priority order in which Unity Connection uses the ports when dialing out (for exam if the Perform Message Notification, Send MWI Requests, or Allow TRAP Connections cl box is checked). The highest numbers are used first. However, when multiple ports have t same Outgoing Hunt Order number, Unity Connection uses the port that has been idle the longest.

Step 14 Select **Save**.

Step 15 Select **Next**.

Step 16 Repeat Step 13 through Step 15 for all remaining voice messaging ports for the phone system.

Step 17 In Cisco Unity Connection Administration, expand **Telephony Integrations**, then select **Phone System**.

Step 18 On the Search Phone Systems page, under Display Name, select the name of the phone system that you entered in Step 3.

Step 19 Repeat Step 7 through Step 18 for each remaining PIMG unit integrated with Unity Connection.

Note Each PIMG unit is connected to one port group with the applicable voice messaging ports. For example, a system that uses five PIMG units requires five port groups, one port group for each PIMG unit.

Step 20 To create a port group for MWIs, do the following substeps.

Note All MWI requests are handled by the master PIMG unit and sent to the phone system over the RS-232 serial cable (without using voice messaging ports). So the following substeps create a separate port group without voice messaging ports and enable the port group for MWIs that are "not port specific" (they do not use ports).

a) In Cisco Unity Connection Administration expand **Telephony Integration** then select **Port Group** .
b) On the Search Port Groups page, select **Add New**.
c) On the New Port Group page, enter the applicable settings and select **Save**.

Table 424: Settings for the New Port Group Page (MWIs)

Field	Setting
Phone System	Select the name of the phone system that you entered in Step 3.
Create From	Select Port Group Template and select **SIP to DMG/PIMG/TIMG** SIP to in the drop-down box.
Display Name	Enter a **MWI Port Group** or another descriptive name for the port group.
SIP Security Profile	Select **5060**.
SIP Transport Protocol	Select the SIP transport protocol that Unity Connection uses.
IPv4 Address or Host Name	Enter the IP address of the master PIMG unit.
IPv6 Address or Host Name	Do not enter a value in this field. IPv6 is not supported for PIMG integrations.
IP Address or Host Name	Enter the IP address of the master PIMG unit.
Port	Enter the SIP port of the master PIMG unit. **Caution** This name must match the setting in the TCP/UDP Server Port field on the Configuration > VoIP > General page of the PIMG unit. Otherwise, the integration cannot function correctly.

d) On the Port Group Basics page, on the Edit menu, select **Advanced Settings**.
e) On the Edit Advanced Settings page, under SIP MWI Requests, select **Not Port Specific** then select **Save**.
f) On the Edit menu, select **Port Group Basics**.
g) Under Port Group, select **Reset**.
h) Under Message Waiting Indicator Settings, confirm that the **Enable Message Waiting Indicator** check box is checked and select **Save**.

Step 21 If another phone system integration exists, in Cisco Unity Connection Administration, expand **Telephony Integrations**, then select **Trunk**. Otherwise, skip to Step 25.

Step 22 On the Search Phone System Trunks page, on the Phone System Trunk menu, select **New Phone System Trunk**.

Step 23 On the New Phone System Trunk page, enter the following settings for the phone system trunk and select **Save**.

Table 425: Settings for the Phone System Trunk

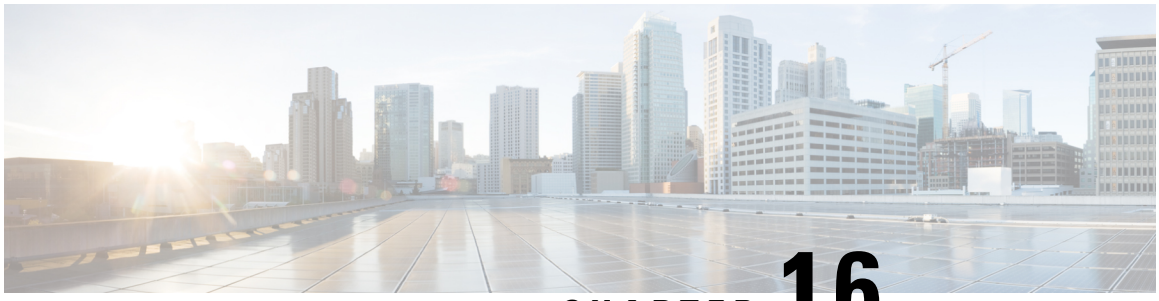
Field	Setting
From Phone System	Enter the display name of the phone system that you are creating a trunk for.
To Phone System	Enter the display name of the previously existing phone system that the trunk connects to.
Trunk Access Code	Enter the extra digits that Unity Connection must dial to transfer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

Step 24 Repeat Step 22 and Step 23 for all remaining phone system trunks that you want to create.

Step 25 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 26 In the Task Execution Results window, select **Close**.



CHAPTER 16

Creating New Integration with Siemens Hipath 3750 Phone System

After ensuring that the Siemens Hipath 3750 phone system, the PIMG units, and Unity Connection are ready for the integration, do the following procedure to set up the integration and to enter the port settings.

- Setting Up a Siemens Hipath 3750 Analog PIMG Integration, on page 335

Setting Up a Siemens Hipath 3750 Analog PIMG Integration

Task List for Siemens Hipath 3750 PIMG Integration

Before doing the following tasks to integrate Unity Connection with the Hipath 3750 phone system using PIMG units (media gateways), confirm that the Unity Connection server is ready for the integration after completing the server installation, following the tasks in the "Installing Cisco Unity Connection" chapter of the *Install, Upgrade, and Maintenance Guide for Cisco Unity Connection Release 15*, available at https://www.cisco.com/c/en/us/td/docs/voice_ip_comm/connection/15/install_upgrade/guide/b_15cuciumg.html.

1. Review the system and equipment requirements to confirm that all phone system and Unity Connection server requirements have been met. See the Requirements, on page 12 section.
2. Plan how the voice messaging ports are used by Unity Connection. See the Planning the Usage of Voice Messaging Ports, on page 7 chapter.
3. Program the Siemens Hipath 3750 phone system and extensions. See the Programming Siemens Hipath 3750 Phone System for Integration Using the Command Line Interface section.
4. Set up the PIMG units.
5. Create the integration. See the Creating New Integration with Siemens Hipath 3750 Phone System, on page 354 section.
6. Test the integration. See the Testing the Integration, on page 381 chapter.
7. 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, on page 387 chapter.

Requirements

This integration supports configurations of the following components:

Phone System

- The Siemens Hipath 3750 phone system.
- Software version HE580S.13.108 or later.
- One or more of the applicable PIMG units. For details, see the "Introduction" chapter.
- The voice messaging ports in the phone system connected by analog lines to the ports on the PIMG units.

We recommend that you connect the voice messaging ports on the phone system to the ports on the PIMG units in a planned manner to simplify troubleshooting. For example, the first phone system voice messaging port connects to the first port on the first PIMG unit, the second phone system voice messaging port connects to the second port on the first PIMG unit, and so on.

- The PIMG units connected to the same LAN or WAN that Unity Connection is connected to.
- If the PIMG units connect to a WAN, the requirements for the WAN network connections are:
  - For G.729a codec formatting, a minimum of 32.76 Kbps guaranteed bandwidth for each voice messaging port.
  - For G.711 codec formatting, a minimum of 91.56 Kbps guaranteed bandwidth for each voice messaging port.
  - No network devices that implement network address translation (NAT).
  - A maximum 200 ms one-way network latency.
- The phone system ready for the integration, as described in the documentation for the phone system.

Unity Connection Server

- Unity Connection installed following the tasks in the "Installing Cisco Unity Connection" chapter of the *Install, Upgrade, and Maintenance Guide for Cisco Unity Connection Release 15*, available at https://www.cisco.com/c/en/us/td/docs/voice_ip_comm/connection/15/install_upgrade/guide/b_15cuciumg.html.
- A license that enables the applicable number of voice messaging ports.

Programming Siemens Hipath 3750 Phone System for Integration Using the Command Line Interface

The following programming instructions are provided as an example only. The specific programming for your phone system may vary depending on its configuration.

Caution In programming the phone system, do not send calls to voice messaging ports in 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.

Step 1 In the Siemens Hipath 3750 interface, configure the stations for the ports on all of the PIMG units using the following settings.

Table 426: Station Settings

Field	Setting
Call No.	Enter the internal call number that is associated with each port on the PIMG units.
DID	Enter the DID for ports on the PIMG units are dialing out (for example, to set MWIs).
Name	Enter a name that you want for the station. For example, enter "PIMG port 1" for the first port. Note that you can enter a maximum of 16 characters.
Type	*(Display only)* The phone device that the phone system has configured for the port.
Type	Click **PhoneMail** for the applicable dial plan.

Step 2 Click **Apply**.

Step 3 Configure the access number to forward calls to subscriber mailboxes.

Step 4 Configure the hunt group for the ports on the PIMG units that answer calls using the following settings.

Table 427: Hunt Group Settings

Field	Setting
Index	Click an available index that you want to use for the ports on the PIMG units.
Call No.	Enter the pilot number for Unity Connection.
DID	Enter the four-digit DID that is associated with call number that is associated with the hunt group.
Name	Enter a name for the hunt group.
Type	From the drop-down box, click **Linear**. You must use a linear hunt group. Otherwise, the integration cannot function correctly.

Step 5 Click **Apply**.

Step 6 Under Group, in the Call No. column, click the call number for the hunt group that you created in Step 4.

Step 7 In the Selection box, highlight all the ports on the PIMG units that answer calls.

Step 8 Add the highlighted ports to the Members box by clicking -.

Step 9 In the Members box, highlight the ports that dial out (for example, to set MWIs), and click **Down** until all dialout ports are at the bottom of the box.

Step 10 Configure call forwarding for the ports on the PIMG units that answer calls. For the fields under Call Dest. List - Definition, use the following settings.

Table 428: Call Dest. List - Definition Settings

Field	Setting
No.	The call destination number that you use for the ports on the PIMG units.
Target 1	Leave this field blank.
Cycles	Enter **1** (which equals about 5 seconds).
SR Type	Click **Immediate**.
RNA	Check this check box.

Step 11 Under Call Dest. List - Station Assignment, click **Show All Stations**.

Step 12 In the table, assign the call destination for the definition using the following settings.

Table 429: Call Dest. List - Station Assignment Settings

Field	Setting
Call No.	Click the extension for a port on the PIMG units, which you assigned in Step 1.
Day	From the drop-down box, click the call destination number, which you defined in Step 10.
Night	From the drop-down box, click the call destination number, which you defined in Step 10.
Internal	From the drop-down box, click the call destination number, which you defined in Step 10.

Step 13 Click **Apply**.

Step 14 Repeat Step 12 and Step 13 for all remaining ports on the PIMG units.

Step 15 Program each phone to forward calls to the pilot number assigned to the voice messaging ports, based on one of the Unity Connection call transfer types shown in Table 430: Call Transfer Types.

Table 430: Call Transfer Types

Transfer Types	Usage
Release transfer (blind transfer)	Program the phone to forward calls to the pilot number when: • The extension is busy • The call is not answered
Supervised transfer	Program the user station to forward calls to the pilot number only when the call is not answered (on the phone system, the number of rings before forwarding must be more than the number of rings to supervise the call). Confirm that call forwarding is disabled when the extension is busy.

Setting Up the Analog PIMG Units for a DTMF Integration

Do the following procedures to set up the analog PIMG units that are connected to the Siemens Hipath 3750 phone system for a DTMF integration.

These procedures require that the following tasks have already been completed:

- The phone system is connected to the PIMG units using analog lines.
- The PIMG units are ready to be connected to the LAN or WAN.
- The PIMG units are connected to a power source.

Fields that are not mentioned in the following procedures must keep their default values. For the default values of all fields, see the manufacturer documentation for the PIMG units.

Downloading the PIMG Firmware Update Files for Analog PIMG Units

Step 1 On a Windows workstation with a high-speed Internet connection that have access to the PIMG units, go to the Voice and Unified Communications Downloads page at http://software.cisco.com/download/navigator.html?mdfid=280082558&i=rm.

Note To access the software download page, you must be signed in to Cisco.com as a registered user.

This procedure describes the steps when using Internet Explorer as your web browser. If you are using a different web browser, the steps may differ.

Step 2 In the tree control on the Downloads Home page, expand Unified Communications> **Unified Communications Applications** > **Messaging** > **Cisco Unity** and select **Cisco Unity Telephony Integration**.

Step 3 On the Log In page, enter your username and password, then select **Log In**.

Step 4 On the Select a Release page, under Latest Releases, select the most recent release.

Step 5 In the right column, select the version of the firmware for analog PIMG units.

Step 6 On the Download Image page, select **Download**.

Step 7 On the Supporting Document(s) page, select **Agree**.

Step 8 In the File Download dialog box, select **Save**.

Step 9 In the Save As dialog box, browse to the Windows workstation that have access the PIMG units, browse to a directory where you want to save the file, and select **Save**.

Step 10 In the Download Complete dialog box, select **Open**. The window for extracting the PIMG firmware update files appears.

Step 11 Select **Extract**.

Step 12 In the Extract dialog box, browse to the directory where you want the extracted files, and select **Extract**.

Step 13 Close the window for the extracting application.

To Set Up the Analog PIMG Units (Firmware Version 6.x)

Step 14 On the Windows workstation, add a temporary route to enable access to the PIMG units.

a) On the Windows Start menu, select **Run**.

b) Enter **cmd**, and press **Enter**. The Command Prompt window appears.

c) At the command prompt, enter **route add 10.12.13.74 <IP Address of Workstation>**, and press **Enter**.

For example, if the IP address of the workstation is 198.1.3.25, enter “route add 10.12.13.74<space>198.1.3.25” in the Command Prompt window.

d) Close the Command Prompt window.

Step 15 Connect a PIMG unit to the network.

Step 16 In the web browser, go to **http://10.12.13.74**.

Step 17 To sign in, enter the following case-sensitive settings.

Table 431: Sign-in Settings

Field	Settings
Username	Enter **admin**.
Password	Enter **IpodAdmin**.

Step 18 Select **OK**.

Step 19 On the System menu, select **Upgrade**.

Step 20 On the Upgrade page, select **Browse**.

Step 21 In the Choose File dialog box, browse to the directory on the Windows workstation that has the extracted PIMG firmware update files.

Step 22 Select **Ls_<xx** > **.app** (where <xx> is multiple digits), and select **Open**.

Step 23 On the Upgrade page, select **Install File**.

Step 24 After the file is installed, a message prompting you to restart the PIMG unit appears. Select **Cancel**.

Do not restart the PIMG unit until you are instructed to do so later in this procedure, even if the file installation fails. Restarting the PIMG unit at this step may prevent the PIMG unit from functioning correctly.

Step 25 Repeat Step 6 through Step 11 for the following files:

- Run_<xx>FskEcho.dsp
- Ls_<xx>.fsh

1. On the Configuration menu, select **Import/Export**.
2. On the Import/Export page, select **Browse**.
3. In the Choose File dialog box, browse to the file Ls_Cfg_Hicom300E.ini.
4. Select **Ls_Cfg_Hicom300E.ini**, and select **Open**.
5. On the Import/Export page, select **Import File**.
6. After the file is imported, a message prompting you to restart the PIMG unit appears. Select **OK**.
7. In the web browser, go to **http://10.12.13.74**.
8. To sign in, enter the following case-sensitive settings.

Table 432: Sign-in Settings

Field	Settings
Username	Enter **admin**.
Password	Enter **IpodAdmin**.

1. Select **OK**.
2. Do the following substeps to configure an RTP port range of 16384 to 32767.

   You must set the RTP port range for the PIMG units if your system uses an RTP port range of 16384 to 32767. Otherwise, Unity Connection cannot answer calls and callers hear ringing or silence.

Note The default RTP port range for PIMG units is 49000 to 50000. Some Cisco Unity Connection configurations require a different RTP port range.

   a. On the Configuration menu, select **Import/Export**.
   b. On the Import/Export page, under Export Files, select **Export All Settings**.
   c. In the File Download dialog box, select **Save**.
   d. In the Save As dialog box, browse to the Windows workstation that has access to the PIMG units, browse to a directory where you want to save the file, and select **Save**.
   e. In the Download Complete dialog box, select **Open**. Notepad opens the file Config.ini that you saved.
   f.
   g.
   h. Locate the line with the following parameter:

      ```
      gwRTPStartPort
      ```

   i. Change the value of the parameter to **16384** so that the line reads as follows:

      ```
      gwRTPStartPort = 16384
      ```

   j. Locate the line with the following parameter:

      ```
      gwRTPEndPort
      ```

   k. Change the value of the parameter to **32767** so that the line reads as follows:

      ```
      gwRTPEndPort = 32767
      ```

   l. Save the file, and exit Notepad.
   m. On the Configuration menu of the PIMG unit, select **Import/Export**.
   n. On the Import/Export page, under Browse for Import File, select **Browse**.
   o. In the Choose File dialog box, browse to the file Config.ini that you saved.

p. Select **Config.ini**, and select **Open**.

q. On the Import/Export page, select **Import File**.

r. When prompted to restart the PIMG unit, select **OK**.

s. When the PIMG unit has restarted, in the web browser, go to **http://10.12.13.74**.

t. To sign in, enter the following case-sensitive settings.

Table 433: Sign-in Settings

Field	Setting
Username	Enter **admin**.
Password	Enter **IpodAdmin**.

1. Select **OK**.

1. On the System menu, select **Password**.
2. On the Change Password page, enter the following settings.

Table 434: Change Password Page Settings

Field	Settings
Old Password	Enter **IpodAdmin**. (This setting is case sensitive.)
New Password	Enter your new password. (This setting is case sensitive.)
Confirm Password	Enter your new password. (This setting is case sensitive.)

1. Select **Change**.
2. On the Configuration menu, select **Mgmt Protocols**.
3. On the Management Protocols page, enter the following settings.

Table 435: Management Protocols Page Settings

Field	Settings
E-mail Alarms Enabled	Select **No**.
SNMP Traps Enabled	Select **No**.

1. Select **Submit**.
2. On the Configuration menu, select **Routing Table**.
3. On the Routing Table page, under Router Configuration, select **VoIP Host Groups**.
4. Under VoIP Host Groups, enter the following settings for the first VoIP Host Group.

Table 436: First VoIP Host Group Settings

Field	Settings
Name	Accept the default or enter another descriptive name of the VoIP host group.
Load-Balanced	*(Unity Connection without a cluster)* Select **False**. *(Unity Connection with a cluster configured)* Select **False**.
Fault-Tolerant	*(Unity Connection without a cluster)* Select **False**. *(Unity Connection with a cluster configured)* Select **True**.

1. For Unity Connection without a cluster, under Host List, enter the host name or IP address of the Unity Connection server and the server port in the format <host name or IP address>:5060.

For Unity Connection with a cluster configured, under Host List, confirm that field contains the host name or IP address of the publisher server (the first Unity Connection server that you installed) and the server port in the format <host name or IP address>:5060.

1. For Unity Connection without a cluster, continue to Step 36. For Unity Connection with a cluster configured, under Host List, enter the host name or IP address of the subscriber server (the second Unity Connection server that you installed) and the server port in the format <host name or IP address>:5060.
2. Select **Add Host**.
3. In the second field, enter the host name or IP address of the publisher server (the first Unity Connection server that you installed) and the server port in the format <host name or IP address>:5060.

   Do not add a third host under Host List or a second host group under VoIP Host Groups. Otherwise, the Unity Connection cluster may not function correctly.
4. Select **Submit**.
5. Under Router Configuration, select **TDM Trunk Groups**.
6. Under TDM Trunk Groups, select **Add Trunk Group**.
7. Under TDM Trunk Groups, enter the following settings for the first TDM trunk group.

Table 437: First TDM Trunk Group Settings (Inbound Calls)

Field	Settings
Name	Enter **Inbound_PBX_Calls** or another unique name. This TDM trunk group handles all incoming calls from the phone system.
Selection Direction	Select **Ascending**.
Selection Mode	Select **Linear**.
Port/Channel Content	Enter the numbers of the PIMG ports that handle inbound calls. For example, enter "*" for all PIMG ports, or enter "1-6" for the first six PIMG ports.

1. Under TDM Trunk Groups, select **Add Trunk Group**.

2. Enter the following settings for the second TDM trunk group.

Table 438: Second TDM Trunk Group Settings (MWIs)

Field	Settings
Name	Enter **MWIs** or another unique name. This TDM trunk group handles outbound MWI calls (where applicable).
Selection Direction	Select **Ascending**.
Selection Mode	Select **Cyclic**.
Port/Channel Content	Enter the numbers of the PIMG ports that dial out MWIs. For example, enter "*" for all PIMG ports, or enter "7,8" for the last two PIMG ports.

1. Under TDM Trunk Groups, select **Add Trunk Group**.
2. Enter the following settings for the third TDM trunk group.

Table 439: Third TDM Trunk Group Settings (Outbound Calls)

Field	Settings
Name	Enter **Outbound_PBX_Calls** or another unique name. This TDM trunk group handles all outbound calls from Unity Connection.
Selection Direction	Select **Descending**.
Selection Mode	Select **Linear**.
Port/Channel Content	Enter ***** for all channels in all ports. Enter the numbers of the PIMG ports that handle outbound (dialout) calls. For example, enter "*" for all PIMG ports, or enter "7,8" for the last two PIMG ports.

1. Select **Submit**.
2. Under Router Configuration, select **Inbound VoIP Rules**.
3. Under Inbound VoIP Rules, uncheck the **Enabled** check box for the default rule.
4. Select **Add Rule**.
5. Under Inbound VoIP Rules, enter the following settings for the first new inbound VoIP rule.

Table 440: First New Inbound VoIP Rule Settings (MWIs)

Field	Settings
Enable	Check this check box.

Field	Settings
Rule Label	Enter **MWI_Calls** or another name. This inbound VoIP rule handles all MWI calls from Unity Connection.
Request Type	Select **Message**.
Originating VoIP Host Address	Enter ***.

1. Under Inbound VoIP Request Matching, enter the following settings.

   The rule that you created in Step 48 must be selected. Otherwise, any changes you make apply to another rule.

Table 441: Inbound VoIP Request Matching Settings

Field	Settings
Calling Number	Enter ***.
Calling Name	Enter ***.
Called Number	Enter ***.
Called Name	Enter ***.
Redirect Number	Enter ***.
Redirect Name	Enter ***.

1. Under Outbound Routes, enter the following settings.

   The rule that you created in Step 48 must be selected. Otherwise, any changes you make apply to another rule.

Table 442: Outbound Routes Settings

Field	Settings
Device Selection	
Outbound Destination	Select **TDM**.
Trunk Group	Select the name of the TDM trunk group that you created for MWIs in Step 41. For example, select “MWIs.”
CPID Manipulation	
Calling Number	Enter **S**.
Calling Name	Enter **S**.
Called Number	Enter **D**.

Field	Settings
Called Name	Enter **D**.
Redirect Number	Enter **R**.
Redirect Name	Enter **R**.
Select Primary/Alternate Route	
Primary	Select **Primary**.

1. Under Inbound VoIP Rules, select **Add Rule**.
2. Under Inbound VoIP Rules, enter the following settings for the second new inbound VoIP rule.

Table 443: Second New Inbound VoIP Rule Settings (Outbound Calls)

Field	Settings
Enable	Check this check box.
Rule Label	Enter **Outbound_UC_Calls** or another name. This inbound VoIP rule handles all outbound calls from Unity Connection.
Request Type	Select **Call**.
Originating VoIP Host Address	Enter *****.

1. Under Inbound VoIP Request Matching, enter the following settings.

   The rule that you created in Step 52 must be selected. Otherwise, any changes you make apply to another rule.

Table 444: Inbound VoIP Request Matching Settings

Field	Settings
Calling Number	Enter *****.
Calling Name	Enter *****.
Called Number	Enter *****.
Called Name	Enter *****.
Redirect Number	Enter *****.
Redirect Name	Enter *****.

1. Under Outbound Routes, enter the following settings.

The rule that you created in Step 52 must be selected. Otherwise, any changes you make apply to another rule.

Table 445: Outbound Routes Settings

Field	Settings
Device Selection	
Outbound Destination	Select **TDM**.
Trunk Group	Select the name of the TDM trunk group that you created for outbound calls in Step 43. For example, select "Outbound_PBX_Calls."
CPID Manipulation	
Calling Number	Enter **S**.
Calling Name	Enter **S**.
Called Number	Enter **D**.
Called Name	Enter **D**.
Redirect Number	Enter **R**.
Redirect Name	Enter **R**.
Select Primary/Alternate Route	
Primary	Select **Primary**.

1. Select **Submit**.
2. Under Router Configuration, select **Inbound TDM Rules**.
3. Under Inbound TDM Rules, enter the following settings for the first inbound TDM rule.

Table 446: First Inbound TDM Rule Settings

Field	Settings
Enable	Check this check box.
Rule Label	Enter **Inbound_Rule_1** or another name. This inbound TDM rule handles all incoming calls from the phone system.
Request Type	Select **Call**.
Trunk Group	Select the name of the TDM trunk group that you created for incoming calls from the phone system in Step 39. For example, select "Inbound_PBX_Calls."

1. Under Inbound TDM Request Matching, enter the following settings.

The rule that you created in Step 57 must be selected. Otherwise, any changes you make apply to another rule.

Table 447: Inbound TDM Request Matching Settings

Field	Settings
Calling Number	Enter the applicable matching rule used. For example, enter "*" for all.
Calling Name	Enter the applicable matching rule used. For example, enter "*" for all.
Called Number	Enter the applicable matching ruleused. For example, enter "*" for all.
Called Name	Enter the applicable matching rule used. For example, enter "*" for all.
Redirect Number	Enter the applicable matching rule used. For example, enter "*" for all.
Redirect Name	Enter the applicable matching rule used. For example, enter "*" for all.

1. Under Outbound Routes, enter the following settings.

   The rule that you created in Step 57 must be selected. Otherwise, any changes you make apply to another rule.

Table 448: Outbound Routes Settings

Field	Settings
Device Selection	
Outbound Destination	Select **VoIP**.
Host Group	Select the name of the VoIP host group that you created for Unity Connection in Step 31.
CPID Manipulation	
Calling Number	Enter the applicable matching rule used. For example, enter "*" for all.
Calling Name	Enter the applicable matching rule used. For example, enter "*" for all.
Called Number	Enter the applicable matching rule used. For example, enter "*" for all.
Called Name	Enter the applicable matching rule used. For example, enter "*" for all.
Redirect Number	Enter the applicable matching rule used. For example, enter "*" for all.
Redirect Name	Enter the applicable matching rule used. For example, enter "*" for all.
Select Primary/Alternate Route	
Primary	Select **Primary**.

1. If you want to create more Inbound TDM rules, under Inbound TDM Rules, select **Add Rule**. Otherwise, continue to Step 62.

2. Repeat Step 57 through Step 60 for all remaining inbound TDM rules that you want to create.
3. Select **Submit**.
4. On the Configuration menu, select **TDM** > **General**.
5. On the TDM General Settings page, enter the following settings.

Table 449: TDM General Settings Page Settings

Field	Settings
PCM Coding	Select **uLaw**.
Minimum Call Party Delay (ms)	Enter **500**.
Maximum Call Party Delay (ms)	Enter **2000**.
Dial Digit on Time (ms)	Enter **100**.
Dial Inter-Digit Time (ms)	Enter **100**.
Dial Pause Time (ms)	Enter **2000**.
Turn MWI On FAC	Enter the code that turns MWIs on.
Turn MWI Off FAC	Enter the code that turns MWIs off.
Outbound Call Connect Timeout (ms)	Enter **10000**.
Wait for Ringback/Connect on Blind Transfer	Select **Yes**.
Hunt Group Extension	Enter the pilot number of the Unity Connection voice messaging ports.
Disconnect on Fax Cleardown Tone	Select **No**.

1. Select **Submit**.
2. On the Configuration menu, select **TDM** > **Port Enable**.
3. On the TDM Port Enabling page, select **No** for the ports that you want to disable on the PIMG unit.
4. Confirm that **Yes** is selected for all other ports on the PIMG unit.
5. Select **Submit**.
6. On the Configuration menu, select **VoIP** > **General**.
7. On the VoIP General Settings page, enter the following settings.

Table 450: VoIP General Settings Page Settings

Field	Setting
User-Agent	
Host and Domain Name	Enter the host and domain name of the PIMG unit.
Transport Type	Select **UDP**.
Call as Domain Name	Select **No**.
SIPS URI Scheme Enabled	
Invite Expiration (sec)	Enter **120**.
Server	
DNS Server Address	Enter the IP Address of the Domain Name Server that the PIMG unit uses.
DNS Translation of Phone Numbers	
Registration Server Address	Leave this field blank.
Registration Server Port	Enter **5060**.
Registration Expiration (sec)	Enter **3600**.
TCP/UDP	
UDP/TCP Transports Enabled	Select **Yes**.
TCP/UDP Server Port	Enter **5060**.
TCP Inactivity Timer (sec)	Enter **30**.
TLS	
TLS Transport Enabled	
TLS Server Port	
SSL TLS Protocol	
Mutual TLS Authentication Required	
TLS Inactivity Timer (sec)	

Field	Setting
Verify TLS Peer Certificate Date	
Verify TLS Peer Certificate Trust	
Proxy	
Primary Proxy Server Address	Leave this field blank.
Primary Proxy Server Port	Not applicable. Leave the default setting.
Backup Proxy Server Address	Not applicable. Leave the default setting.
Backup Proxy Server Port	Not applicable. Leave the default setting.
Proxy Query Interval	Enter **10**.
Timing	
T1 Time (ms)	Enter **400**.
T2 Time (ms)	Enter **3000**.
T4 Time (ms)	Enter **5000**.
Monitoring	
Monitor Call Connections	Select **No**.
Call Monitor Interval (sec)	
Monitor VoIP Hosts	
VoIP Host Monitor Interval (sec)	

1. Select **Submit**.
2. On the Configuration menu, select **VoIP** > **Media**.
3. On the VoIP Media Settings page, enter the following settings.

Table 451: VoIP Media Settings Page Settings

Field	Settings
Audio	
Audio Compression	Select the preferred codec for audio compression.
RTP Digit Relay Mode	Select **RFC2833**.
RTP Fax/Modem Tone Relay Mode	Select **RFC2833**.
RTP Source IP Address Validation	Select **Off**.
RTP Source UDP Port Validation	Select **Off**.
Signaling Digit Relay Mode	Select **Off**.
Voice Activity Detection	Select **Off**.
RFC 3960 Early Media Support	Select **On Demand**.
Frame Size	Select the applicable setting: • G.711—**20** • G.729AB—**10** Failure to use the correct setting results in recorded messages containing nothing but silence.
Frames Per Packet	Select the applicable setting: • G.711—**1** • G.729AB—**2** Failure to use the correct setting results in recorded messages containing nothing but silence.
Fax	
Fax IP-Transport Mode	

1. Select **Submit**.
2. On the Configuration menu, select **VoIP** > **QOS**.
3. On the VoIP QOS Configuration page, enter the following settings.

Table 452: VoIP QOS Configuration Page Settings

Field	Settings
Call Control QOS Byte	Enter **104**.
RTP QOS Byte	Enter **184**.

1. Select **Submit**.
2. On the Configuration menu, select **IP**.
3. On the IP Settings page, enter the following settings.

Table 453: IP Settings Page Settings

Field	Settings
Client IP Address	Enter the new IP address you want to use for the PIMG unit. (This is the IP address that you enter in Cisco Unity Connection Administration when you create the integration.)
Client Subnet Mask	Enter the new subnet mask, if the subnet mask is different from the default IP address.
Default Network Gateway Address	Enter the IP address of the default network gateway router that the PIMG units use.
BOOTP Enabled	Select **No**.

1. Select **Submit**.
2. On the Configuration menu, select **Tone Detection**.
3. On the Tone Detection page, under Call Progress Tone - Learn, in the Learn Tone Event field, select **Busy** and do the following substeps to verify that the tone is correct.
   a. From an available phone, call a second phone.
   b. Answer the second phone when it rings, and leave both handsets off so that both phones are busy.
   c. From a third phone, dial one of the busy phones.
   d. Confirm that you hear a busy tone.
   e. Hang up the third phone but leave the handsets for the other two phones off.
4. Under Call Progress Tone - Learn, in the Dial String field, enter the extension that you dialed in Step 83c. from the third phone.
5. Select **Learn**.
6. On the Tone Detection page, under Call Progress Tone - Learn, in the Learn field, select **Error** and do the following substeps to verify that the tone is correct.
   a. From an available phone, dial an extension that does not exist.
   b. Confirm that you hear the reorder or error tone.
   c. Hang up the phone.
7. Under Call Progress Tone - Learn, in the Dial String field, enter the extension that you dialed in Step 86a.
8. Select **Learn**.

9. On the Tone Detection page, under Call Progress Tone - Learn, in the Learn field, select **Ringback** and and do the following substeps to verify that the tone is correct.
   a. From an available phone, dial an extension that does exist
   b. Confirm that you hear the ringback tone.
   c. Hang up the phone.
10. Under Call Progress Tone - Learn, in the Dial String field, enter the extension that you dialed in Step 89a.
11. Select **Learn**.
12. Select **Submit**.
13. Hang up the phones that you used in Step 89.
14. On the System menu, select **Restart**.
15. On the Restart page, select **Restart Unit Now**.
16. Repeat Step 2 through Step 95 on all remaining PIMG units.

Creating New Integration with Siemens Hipath 3750 Phone System

After ensuring that the Siemens Hipath 3750 phone system, the PIMG units, and Unity Connection are ready for the integration, do the following procedure to set up the integration and to enter the port settings.

Creating an Integration

Step 1 In Cisco Unity Connection Administration, expand **Telephony Integrations**, then select **Phone System**.

Step 2 On the Search Phone Systems page, under Display Name, select the name of the default phone system.

Step 3 On the Phone System Basics page, in the Phone System Name field, enter the descriptive name that you want for the phone system.

Step 4 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 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 5 Under Message Waiting Indicator Settings, select**Use Same Port for Enabling and Disabling MWIs**.

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 applicable settings and select **Save**.

Table 454: Settings for the New Port Group Page

Field	Setting
Phone System	Select the name of the phone system that you entered in Step 3.
Create From	Select **Port Group Template** and select **SIP to DMG/PIMG/TIMG** in the drop-down box.

Field	Setting
Display Name	Enter a descriptive name for the port group. You can accept the default name or enter the name that you want.
SIP Security Profile	Select **5060**.
SIP Transport Protocol	Select the SIP transport protocol that Unity Connection uses.
IP Address or Host Name	Enter the IP address of the PIMG unit that you are integrating with Unity Connection.
Port	Enter the SIP port of the PIMG unit that Unity Connection connects to. We recommend that you use the default setting. This name must match the setting in the TCP/UDP Server Port field on the Configuration > VoIP > General page of the PIMG unit. Otherwise, the integration cannot function correctly.

Step 9 On the Port Group Basics page, under Message Waiting Indicator Settings, uncheck the **Enable Message Waiting Indicators** check box and select **Save**.

Step 10 In the Related Links drop-down box, select **Add Ports** and select **Go**.

Step 11 On the New Port page, enter the following settings and select **Save**.

Table 455: Settings for the New Port Page

Field	Considerations
Enabled	Check this check box.
Number of Ports	Enter **8**. (If you want to use fewer than eight voice messaging ports, enter the number of voice messaging ports that you want to use on this PIMG unit.) **Note** For a Unity Connection cluster, the server must have the number of voice messaging ports that are set up on the phone system for the PIMG integration so that this server can handle all voice messaging traffic for the cluster if one of the servers stops functioning. For example, if the phone system is set up with 16 voice messaging ports, this server must have 16 voice messaging ports.
Phone System	Select the name of the phone system that you entered in Step 3.
Port Group	Select the name of the port group that you added in Step 8.

Step 12 On the Search Ports page, select the display name of the first voice messaging port that you created for this phone system integration.

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

Step 13 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 456: 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.
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	(Serial integrations only) Uncheck this check box. Otherwise, the integration may not functior correctly. (Digital and analog integrations only) 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 Unity Connection web applications. Assign Allow TRAP Connections to the least busy ports.
Outgoing Hunt Order	Enter the priority order in which Unity Connection uses 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, Unity Connection uses the port that has been idle the longest.

Step 14 Select **Save**.

Step 15 Select **Next**.

Step 16 Repeat Step 13 through Step 15 for all remaining voice messaging ports for the phone system.

Step 17 In Cisco Unity Connection Administration, expand **Telephony Integrations**, then select **Phone System**.

Step 18 On the Search Phone Systems page, under Display Name, select the name of the phone system that you entered in Step 3.

Step 19 Repeat Step 7 through Step 18 for each remaining PIMG unit integrated with Unity Connection.

Note Each PIMG unit is connected to one port group with the applicable voice messaging ports. For example, a system that uses five PIMG units requires five port groups, one port group for each PIMG unit.

Step 20 To create a port group for MWIs, do the following substeps.

Note All MWI requests are handled by the master PIMG unit and sent to the phone system over the RS-232 serial cable (without using voice messaging ports). So the following substeps create a separate port group without voice messaging ports and enable the port group for MWIs that are "not port specific" (they do not use ports).

a) In Cisco Unity Connection Administration expand **Telephony Integration** then select **Port Group** .
b) On the Search Port Groups page, select **Add New**.
c) On the New Port Group page, enter the applicable settings and select **Save**.

Table 457: Settings for the New Port Group Page (MWIs)

Field	Setting
Phone System	Select the name of the phone system that you entered in Step 3.
Create From	Select Port Group Template and select **SIP to DMG/PIMG/TIMG** SIP to in the drop-down box.
Display Name	Enter a **MWI Port Group** or another descriptive name for the port group.
SIP Security Profile	Select **5060**.
SIP Transport Protocol	Select the SIP transport protocol that Unity Connection uses.
IPv4 Address or Host Name	Enter the IP address of the master PIMG unit.
IPv6 Address or Host Name	Do not enter a value in this field. IPv6 is not supported for PIMG integrations.
IP Address or Host Name	Enter the IP address of the master PIMG unit.
Port	Enter the SIP port of the master PIMG unit. **Caution** This name must match the setting in the TCP/UDP Server Port field on the Configuration > VoIP > General page of the PIMG unit. Otherwise, the integration cannot function correctly.

d) On the Port Group Basics page, on the Edit menu, select **Advanced Settings**.
e) On the Edit Advanced Settings page, under SIP MWI Requests, select **Not Port Specific** then select **Save**.
f) On the Edit menu, select **Port Group Basics**.
g) Under Port Group, select **Reset**.
h) Under Message Waiting Indicator Settings, confirm that the **Enable Message Waiting Indicator** check box is checked and select **Save**.

Step 21 If another phone system integration exists, in Cisco Unity Connection Administration, expand **Telephony Integrations**, then select **Trunk**. Otherwise, skip to Step 25.

Step 22 On the Search Phone System Trunks page, on the Phone System Trunk menu, select **New Phone System Trunk**.

Step 23 On the New Phone System Trunk page, enter the following settings for the phone system trunk and select **Save**.

Table 458: Settings for the Phone System Trunk

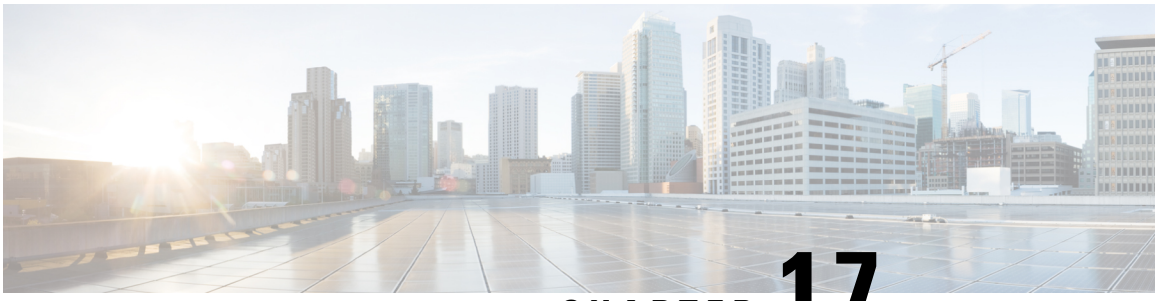
Field	Setting
From Phone System	Enter the display name of the phone system that you are creating a trunk for.
To Phone System	Enter the display name of the previously existing phone system that the trunk connects to.
Trunk Access Code	Enter the extra digits that Unity Connection must dial to transfer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

Step 24 Repeat Step 22 and Step 23 for all remaining phone system trunks that you want to create.

Step 25 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 26 In the Task Execution Results window, select **Close**.



CHAPTER 17

Setting Up a Siemens Hipath 4000 Analog PIMG Integration

For detailed instructions for setting up an Siemens Hipath 4000 analog PIMG integration with Cisco Unity Connection, see the following sections in this chapter:

• Setting Up a Siemens Hipath 4000 Analog PIMG Integration, on page 359

Setting Up a Siemens Hipath 4000 Analog PIMG Integration

For detailed instructions for setting up an Siemens Hipath 4000 analog PIMG integration with Cisco Unity Connection, see the following sections in this chapter:

Task List for Siemens Hipath 4000 PIMG Integration

Before doing the following tasks to integrate Unity Connection with the Hipath 4000 phone system using PIMG units (media gateways), confirm that the Unity Connection server is ready for the integration after completing the server installation, following the tasks in the "Installing Cisco Unity Connection" chapter of the *Install, Upgrade, and Maintenance Guide for Cisco Unity Connection Release 15*, available at https://www.cisco.com/c/en/us/td/docs/voice_ip_comm/connection/15/install_upgrade/guide/b_15cuciumg.html.

1. Review the system and equipment requirements to confirm that all phone system and Unity Connection server requirements have been met. See the Requirements, on page 12 section.
2. Plan how the voice messaging ports are used by Unity Connection. See the Planning the Usage of Voice Messaging Ports, on page 7 chapter.
3. Program the Siemens Hipath 4000 phone system and extensions. See the Programming Siemens Hipath 4000 Phone System for Integration section.
4. Set up the PIMG units.
5. Create the integration. See the Creating New Integration with Siemens Hipath 4000 Phone System, on page 377 section.
6. Test the integration. See the Testing the Integration, on page 381 chapter.
7. 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, on page 387 chapter.

Requirements

This integration supports configurations of the following components:

Phone System

- The Siemens Hipath 4000 phone system.
- Software version 2.0 SMR9 SMP0 or later.
- SLMA24 - Q2245 analog line card.
- One or more of the applicable PIMG units. For details, see the "Introduction" chapter.
- The voice messaging ports in the phone system connected by analog lines to the ports on the PIMG units.

We recommend that you connect the voice messaging ports on the phone system to the ports on the PIMG units in a planned manner to simplify troubleshooting. For example, the first phone system voice messaging port connects to the first port on the first PIMG unit, the second phone system voice messaging port connects to the second port on the first PIMG unit, and so on.

- The PIMG units connected to the same LAN or WAN that Unity Connection is connected to.
- If the PIMG units connect to a WAN, the requirements for the WAN network connections are:
  - For G.729a codec formatting, a minimum of 32.76 Kbps guaranteed bandwidth for each voice messaging port.
  - For G.711 codec formatting, a minimum of 91.56 Kbps guaranteed bandwidth for each voice messaging port.
  - No network devices that implement network address translation (NAT).
  - A maximum 200 ms one-way network latency.
- The phone system ready for the integration, as described in the documentation for the phone system.

Unity Connection Server

- Unity Connection installed following the tasks in the "Installing Cisco Unity Connection" chapter of the *Install, Upgrade, and Maintenance Guide for Cisco Unity Connection Release 15*, available at https://www.cisco.com/c/en/us/td/docs/voice_ip_comm/connection/15/install_upgrade/guide/b_15cuciumg.html.
- A license that enables the applicable number of voice messaging ports.

Programming Siemens Hipath 4000 Phone System for Integration

The following programming instructions are provided as an example only. The specific programming for your phone system may vary depending on its configuration.

Caution In programming the phone system, do not send calls to voice messaging ports in 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.

Step 1 In the Siemens Hipath 4000 interface, use the CHA-ZAND command for the systemwide configuration for the analog ports using the following settings.

Table 459: Systemwide Port Settings

Field	Setting
TYPE	Enter **alldata**.
TRANSFER	Enter **extend**.
RNGTNINT	Enter **yes**.
PREDIA	Enter **yes**.

Step 2 Use the CHA-ZAND command for the systemwide configuration for MWIs using the following settings.

Table 460: Systemwide MWI Settings

Field	Setting
TYPE	Enter **vmi**.
MWIOPEN	Enter **yes**.
ALEN	Enter the one more than the number of digits in the calling party extension. For example, if the calling party extension has four digits, enter 5.
BLEN	Enter the one more than the number of digits in the called party extension. For example, if the called party extension has four digits, enter 5.

Step 3 Use the ADD-COSSU command to configure a class of service template that have the following classes of service for the ports that connect to the PIMG units:

For incoming lines	• RTAx • RTAy • TNOTCR • RKOABS • NOANSA

For outgoing lines	• RTAx • RTAy • TNOTCR • RKOABS • NOANSA • CDRx

Step 4 Use the ADD-SCSU command to configure each port that connects to the PIMG units using the following settings.

Table 461: Individual Port Settings

Field	Setting
STNO	Enter the extension of the port.
DVCFIG	Enter **ANATE**.
DPLN	Enter the number of digits that the dial plan uses for extensions.
ITR	Enter the number of digits that the dial plan uses for extensions.
COS1	Enter the number of the class of service that you defined in Step 3.
COS2	Enter the number of the class of service that you defined in Step 3.
LCOSV1	Enter the number of the class of service that you defined in Step 3.
LCOSV2	Enter the number of the class of service that you defined in Step 3.
LCOSD1	Enter the number of the class of service that you defined in Step 3.
LCOSD2	Enter the number of the class of service that you defined in Step 3.
COFIDX	Enter **0**.
SPEC	Enter **SUFDIAL&SSTN**.
DIAL	Enter **DTMF**.
DPHAR	Enter **DTMFSTN&PREDIA&ASEND&BSEND**.

Step 5 Use the ADD-SA command to configure a hunt group for the ports that connect to the PIMG units. The following is an example of a hunt group configuration.

```
TYPE = stn
CD = 500
DPLN = 3
CPS =
SVC = vce
STNO = 501&502&503&504&505&506&507&508
POS =
```

Step 6 Program each phone to forward calls to the pilot number assigned to the voice messaging ports, based on one of the Unity Connection call transfer types shown in the following table.

Table 462: Call Transfer Types

Transfer Types	Usage
Release transfer (blind transfer)	Program the phone to forward calls to the pilot number when: • The extension is busy • The call is not answered
Supervised transfer	Program the user station to forward calls to the pilot number only when the call is not answered (on the phone system, the number of rings before forwarding must be more than the number of rings to supervise the call). Confirm that call forwarding is disabled when the extension is busy.

Setting Up the Analog PIMG Units for a DTMF Integration

Do the following procedures to set up the analog PIMG units that are connected to the Siemens Hipath 4000 phone system for a DTMF integration.

These procedures require that the following tasks have already been completed:

- The phone system is connected to the PIMG units using analog lines.
- The PIMG units are ready to be connected to the LAN or WAN.
- The PIMG units are connected to a power source.

Fields that are not mentioned in the following procedures must keep their default values. For the default values of all fields, see the manufacturer documentation for the PIMG units.

Downloading the PIMG Firmware Update Files for Analog PIMG Units

Step 1 On a Windows workstation with a high-speed Internet connection that have access to the PIMG units, go to the Voice and Unified Communications Downloads page at http://software.cisco.com/download/navigator.html?mdfid=280082558&i=rm.

Note To access the software download page, you must be signed in to Cisco.com as a registered user.

This procedure describes the steps when using Internet Explorer as your web browser. If you are using a different web browser, the steps may differ.

Step 2 In the tree control on the Downloads Home page, expand Unified Communications> **Unified Communications Applications** > **Messaging** > **Cisco Unity** and select **Cisco Unity Telephony Integration**.

Step 3 On the Log In page, enter your username and password, then select **Log In**.

Step 4 On the Select a Release page, under Latest Releases, select the most recent release.

Step 5 In the right column, select the version of the firmware for analog PIMG units.

Step 6 On the Download Image page, select **Download**.

Step 7 On the Supporting Document(s) page, select **Agree**.

Step 8 In the File Download dialog box, select **Save**.

Step 9 In the Save As dialog box, browse to the Windows workstation that have access the PIMG units, browse to a directory where you want to save the file, and select **Save**.

Step 10 In the Download Complete dialog box, select **Open**. The window for extracting the PIMG firmware update files appears.

Step 11 Select **Extract**.

Step 12 In the Extract dialog box, browse to the directory where you want the extracted files, and select **Extract**.

Step 13 Close the window for the extracting application.

Setting Up the Analog PIMG Units (Firmware Version 6.x)

Step 1 On the Windows workstation, add a temporary route to enable access to the PIMG units.

a) On the Windows Start menu, select **Run**.

b) Enter **cmd**, and press **Enter**. The Command Prompt window appears.

c) At the command prompt, enter **route add 10.12.13.74 <IP Address of Workstation>**, and press **Enter**.

For example, if the IP address of the workstation is 198.1.3.25, enter “route add 10.12.13.74<space>198.1.3.25” in the Command Prompt window.

d) Close the Command Prompt window.

Step 2 Connect a PIMG unit to the network.

Step 3 In the web browser, go to **http://10.12.13.74**.

Step 4 To sign in, enter the following case-sensitive settings.

Table 463: Sign-in Settings

Field	Settings
Username	Enter **admin**.
Password	Enter **IpodAdmin**.

Step 5 Select **OK**.

Step 6 On the System menu, select **Upgrade**.

Step 7 On the Upgrade page, select **Browse**.

Step 8 In the Choose File dialog box, browse to the directory on the Windows workstation that has the extracted PIMG firmware update files.

Step 9 Select **Ls_<xx** > **.app** (where <xx> is multiple digits), and select **Open**.

Step 10 On the Upgrade page, select **Install File**.

Step 11 After the file is installed, a message prompting you to restart the PIMG unit appears. Select **Cancel**.

Do not restart the PIMG unit until you are instructed to do so later in this procedure, even if the file installation fails. Restarting the PIMG unit at this step may prevent the PIMG unit from functioning correctly.

Step 12 Repeat Step 6 through Step 11 for the file **Run_<xx** > **.dsp**.

Step 13 On the System menu, select **Upgrade**.

Step 14 On the Upgrade page, under Import, select **Browse**.

Step 15 In the Choose File dialog box, browse to the file **Ls_<xx > .fsh**.

Step 16 Select **Ls_<xx > .fsh**, and select **Open**.

Step 17 On the Upgrade page, select **Install File**.

Step 18 After the file is installed, a message prompting you to restart the PIMG unit appears. Select **OK**.

Step 19 In the web browser, go to **http://10.12.13.74**.

Step 20 To sign in, enter the following case-sensitive settings.

Table 464: Sign-in Settings

Field	Settings
Username	Enter **admin**.
Password	Enter **IpodAdmin**.

Step 21 Select **OK**.

Step 22 If your Unity Connection system must have an RTP port range of 16384 to 32767, do the following substeps. Otherwise, continue to Step 23.

You must set the RTP port range for the PIMG units if your system uses an RTP port range of 16384 to 32767. Otherwise, Unity Connection cannot answer calls and callers hear ringing or silence.

Note The default RTP port range for PIMG units is 49000 to 50000. Some Unity Connection configurations require a different RTP port range.

a) On the Configuration menu, select **Import/Export**.
b) On the Import/Export page, under Export Files, select **Export All Settings**.
c) In the File Download dialog box, select **Save**.
d) In the Save As dialog box, browse to the Windows workstation that has access to the PIMG units, browse to a directory where you want to save the file, and select **Save**.
e) In the Download Complete dialog box, select **Open**. Notepad opens the file Config.ini that you saved.
f) Locate the line with the following parameter:

```
gwRTPStartPort
```

g) Change the value of the parameter to **16384** so that the line reads as follows:

```
gwRTPStartPort = 16384
```

h) Locate the line with the following parameter:

```
gwRTPEndPort
```

i) Change the value of the parameter to **32767** so that the line reads as follows:

```
gwRTPEndPort = 32767
```

j) Save the file, and exit Notepad.
k) On the Configuration menu of the PIMG unit, select **Import/Export**.

l) On the Import/Export page, under Browse for Import Settings, select **Browse**.
m) In the Choose File dialog box, browse to the file Config.ini that you saved.
n) Select **Config.ini**, and select **Open**.
o) On the Import/Export page, select **Import File**.
p) When prompted to restart the PIMG unit, select **OK**.
q) When the PIMG unit has restarted, in the web browser, go to **http://10.12.13.74**.
r) To sign in, enter the following case-sensitive settings.

Table 465: Sign-in Settings

Field	Setting
Username	Enter **admin**.
Password	Enter **IpodAdmin**.

s) Select **OK**.

Step 23 On the System menu, select **Password**.

Step 24 On the Change Password page, enter the following settings.

Table 466: Change Password Page Settings

Field	Settings
Old Password	Enter **IpodAdmin**. (This setting is case sensitive.)
New Password	Enter your new password. (This setting is case sensitive.)
Confirm Password	Enter your new password. (This setting is case sensitive.)

Step 25 Select **Change**.

Step 26 On the Configuration menu, select **Mgmt Protocols**.

Step 27 On the Management Protocols page, enter the following settings.

Table 467: Management Protocols Page Settings

Field	Settings
E-mail Alarms Enabled	Select **No**.
SNMP Traps Enabled	Select **No**.

Step 28 Select **Submit**.

Step 29 On the Configuration menu, select **Routing Table**.

Step 30 On the Routing Table page, under Router Configuration, select **VoIP Host Groups**.

Step 31 Under VoIP Host Groups, enter the following settings for the first VoIP Host Group.

Table 468: First VoIP Host Group Settings

Field	Settings
Name	Accept the default or enter another descriptive name of the VoIP host group.
Load-Balanced	*(Unity Connection without a cluster)* Select **False**. *(Unity Connection with a cluster configured)* Select **False**.
Fault-Tolerant	*(Unity Connection without a cluster)* Select **False**. *(Unity Connection with a cluster configured)* Select **True**.

Step 32 For Unity Connection without a cluster, under Host List, enter the host name or IP address of the Unity Connection server and the server port in the format <host name or IP address>:5060.

For Unity Connection with a cluster configured, under Host List, confirm that field contains the host name or IP address of the publisher server (the first Unity Connection server that you installed) and the server port in the format <host name or IP address>:5060.

Step 33 For Unity Connection without a cluster, continue to Step 36. For Unity Connection with a cluster configured, under Host List, enter the host name or IP address of the subscriber server (the second Unity Connection server that you installed) and the server port in the format <host name or IP address>:5060.

Step 34 Select **Add Host**.

Step 35 In the second field, enter the host name or IP address of the publisher server (the first Unity Connection server that you installed) and the server port in the format <host name or IP address>:5060.

Do not add a third host under Host List or a second host group under VoIP Host Groups. Otherwise, the Unity Connection cluster may not function correctly.

Step 36 Select **Submit**.

Step 37 Under Router Configuration, select **TDM Trunk Groups**.

Step 38 Under TDM Trunk Groups, select **Add Trunk Group**.

Step 39 Under TDM Trunk Groups, enter the following settings for the first TDM trunk group.

Table 469: First TDM Trunk Group Settings (Inbound Calls)

Field	Settings
Name	Enter **Inbound_PBX_Calls** or another unique name. This TDM trunk group handles all incoming calls from the phone system.
Selection Direction	Select **Ascending**.
Selection Mode	Select **Linear**.
Port/Channel Content	Enter the numbers of the PIMG ports that handle inbound calls. For example, enter "*" for all PIMG ports, or enter "1-6" for the first six PIMG ports.

Step 40 Under TDM Trunk Groups, select **Add Trunk Group**.

Step 41 Enter the following settings for the second TDM trunk group.

Table 470: Second TDM Trunk Group Settings (MWIs)

Field	Settings
Name	Enter **MWIs** or another unique name. This TDM trunk group handles outbound MWI calls (where applicable).
Selection Direction	Select **Ascending**.
Selection Mode	Select **Cyclic**.
Port/Channel Content	Enter the numbers of the PIMG ports that dial out MWIs. For example, enter "*" for all PIMG ports, or enter "7,8" for the last two PIMG ports.

Step 42 Under TDM Trunk Groups, select **Add Trunk Group**.

Step 43 Enter the following settings for the third TDM trunk group.

Table 471: Third TDM Trunk Group Settings (Outbound Calls)

Field	Settings
Name	Enter **Outbound_PBX_Calls** or another unique name. This TDM trunk group handles all outbound calls from Unity Connection.
Selection Direction	Select **Descending**.
Selection Mode	Select **Linear**.
Port/Channel Content	Enter ***** for all channels in all ports. Enter the numbers of the PIMG ports that handle outbound (dialout) calls. For example, enter "*" for all PIMG ports, or enter "7,8" for the last two PIMG ports.

Step 44 Select **Submit**.

Step 45 Under Router Configuration, select **Inbound VoIP Rules**.

Step 46 Under Inbound VoIP Rules, uncheck the **Enabled** check box for the default rule.

Step 47 Select **Add Rule**.

Step 48 Under Inbound VoIP Rules, enter the following settings for the first new inbound VoIP rule.

Table 472: First New Inbound VoIP Rule Settings (MWIs)

Field	Settings
Enable	Check this check box.
Rule Label	Enter **MWI_Calls** or another name. This inbound VoIP rule handles all MWI calls from Unity Connection.

Field	Settings
Request Type	Select **Message**.
Originating VoIP Host Address	Enter *****.

Step 49 Under Inbound VoIP Request Matching, enter the following settings.

The rule that you created in Step 48 must be selected. Otherwise, any changes you make apply to another rule.

Table 473: Inbound VoIP Request Matching Settings

Field	Settings
Calling Number	Enter *****.
Calling Name	Enter *****.
Called Number	Enter *****.
Called Name	Enter *****.
Redirect Number	Enter *****.
Redirect Name	Enter *****.

Step 50 Under Outbound Routes, enter the following settings.

The rule that you created in Step 48 must be selected. Otherwise, any changes you make apply to another rule.

Table 474: Outbound Routes Settings

Field	Settings
Device Selection	
Outbound Destination	Select **TDM**.
Trunk Group	Select the name of the TDM trunk group that you created for MWIs in Step 41. For example, select "MWIs."
CPID Manipulation	
Calling Number	Enter **S**.
Calling Name	Enter **S**.
Called Number	Enter **D**.
Called Name	Enter **D**.
Redirect Number	Enter **R**.
Redirect Name	Enter **R**.

Field	Settings
Select Primary/Alternate Route	
Primary	Select **Primary**.

Step 51 Under Inbound VoIP Rules, select **Add Rule**.

Step 52 Under Inbound VoIP Rules, enter the following settings for the second new inbound VoIP rule.

Table 475: Second New Inbound VoIP Rule Settings (Outbound Calls)

Field	Settings
Enable	Check this check box.
Rule Label	Enter **Outbound_UC_Calls** or another name. This inbound VoIP rule handles all outbound calls from Unity Connection.
Request Type	Select **Call**.
Originating VoIP Host Address	Enter ***.

Step 53 Under Inbound VoIP Request Matching, enter the following settings.

The rule that you created in Step 52 must be selected. Otherwise, any changes you make apply to another rule.

Table 476: Inbound VoIP Request Matching Settings

Field	Settings
Calling Number	Enter ***.
Calling Name	Enter ***.
Called Number	Enter ***.
Called Name	Enter ***.
Redirect Number	Enter ***.
Redirect Name	Enter ***.

Step 54 Under Outbound Routes, enter the following settings.

The rule that you created in Step 52 must be selected. Otherwise, any changes you make apply to another rule.

Table 477: Outbound Routes Settings

Field	Settings
Device Selection	
Outbound Destination	Select **TDM**.

Field	Settings
Trunk Group	Select the name of the TDM trunk group that you created for outbound calls in Step 43. For example, select "Outbound_PBX_Calls."
CPID Manipulation	
Calling Number	Enter **S**.
Calling Name	Enter **S**.
Called Number	Enter **D**.
Called Name	Enter **D**.
Redirect Number	Enter **R**.
Redirect Name	Enter **R**.
Select Primary/Alternate Route	
Primary	Select **Primary**.

Step 55 Select **Submit**.

Step 56 Under Router Configuration, select **Inbound TDM Rules**.

Step 57 Under Inbound TDM Rules, enter the following settings for the first inbound TDM rule.

Table 478: First Inbound TDM Rule Settings

Field	Settings
Enable	Check this check box.
Rule Label	Enter **Inbound_Rule_1** or another name. This inbound TDM rule handles all incoming calls from the phone system.
Request Type	Select **Call**.
Trunk Group	Select the name of the TDM trunk group that you created for incoming calls from the phone system in Step 39. For example, select "Inbound_PBX_Calls."

Step 58 Under Inbound TDM Request Matching, enter the following settings.

The rule that you created in Step 57 must be selected. Otherwise, any changes you make apply to another rule.

Table 479: Inbound TDM Request Matching Settings

Field	Settings
Calling Number	Enter the applicable matching rule used. For example, enter "*" for all.
Calling Name	Enter the applicable matching rule used. For example, enter "*" for all.
Called Number	Enter the applicable matching rule used. For example, enter "*" for all.

Field	Settings
Called Name	Enter the applicable matching rule used. For example, enter "*" for all.
Redirect Number	Enter the applicable matching rule used. For example, enter "*" for all.
Redirect Name	Enter the applicable matching rule used. For example, enter "*" for all.

Step 59 Under Outbound Routes, enter the following settings.

The rule that you created in Step 57 must be selected. Otherwise, any changes you make apply to another rule.

Table 480: Outbound Routes Settings

Field	Settings
Device Selection	
Outbound Destination	Select **VoIP**.
Host Group	Select the name of the VoIP host group that you created for Unity Connection in Step 31.
CPID Manipulation	
Calling Number	Enter the applicable matching rule used. For example, enter "*" for all.
Calling Name	Enter the applicable matching rule used. For example, enter "*" for all.
Called Number	Enter the applicable matching rule used. For example, enter "*" for all.
Called Name	Enter the applicable matching rule used. For example, enter "*" for all.
Redirect Number	Enter the applicable matching rule used. For example, enter "*" for all.
Redirect Name	Enter the applicable matching rule used. For example, enter "*" for all.
Select Primary/Alternate Route	
Primary	Select **Primary**.

Step 60 If you want to create more Inbound TDM rules, under Inbound TDM Rules, select **Add Rule**. Otherwise, continue to Step 62.

Step 61 Repeat Step 57 through Step 60 for all remaining inbound TDM rules that you want to create.

Step 62 Select **Submit**.

Step 63

Step 64

Step 65

Step 66 On the Configuration menu, select **TDM** > **General**.

Step 67 On the TDM General Settings page, enter the following settings.

Table 481: TDM General Settings Page Settings

Field	Settings
PCM Coding	Select **uLaw**.
Minimum Call Party Delay (ms)	Enter **500**.
Maximum Call Party Delay (msecs)	Enter **2000**.
Dial Digit on Time (ms)	Enter **100**.
Dial Inter-Digit Time (ms)	Enter **100**.
Dial Pause Time (ms)	Enter **2000**.
Turn MWI On FAC	Enter the code that turns MWIs on.
Turn MWI Off FAC	Enter the code that turns MWIs off.
Outbound Call Connect Timeout (ms)	Enter **10000**.
Wait for Ringback/Connect on Blind Transfer	Select **Yes**.
Hunt Group Extension	Enter the pilot number of the Unity Connection voice messaging ports.

Step 68 Select **Submit**.

Step 69 On the Configuration menu, select **TDM** > **Port Enable**.

Step 70 On the TDM Port Enabling page, select **No** for the ports that you want to disable on the PIMG unit.

Step 71 Confirm that **Yes** is selected for all other ports on the PIMG unit.

Step 72 Select **Submit**.

Step 73 On the Configuration menu, select **VoIP** > **General**.

Step 74 On the VoIP General Settings page, enter the following settings.

Table 482: VoIP General Settings Page Settings

Field	Setting
User-Agent	
Host and Domain Name	Enter the host and domain name of the PIMG unit.
Transport Type	Select **UDP**.
Call as Domain Name	Select **No**.
Invite Expiration (sec)	Enter **120**.
Server	

Field	Setting
DNS Server Address	Enter the IP Address of the Domain Name Server that the PIMG unit uses.
Registration Server Address	Leave this field blank.
Registration Server Port	Enter **5060**.
Registration Expiration (sec)	Enter **3600**.
TCP/UDP	
UDP/TCP Transports Enabled	Select **Yes**.
TCP/UDP Server Port	Enter **5060**.
Proxy	
Primary Proxy Server Address	Leave this field blank.
Primary Proxy Server Port	Not applicable. Leave the default setting.
Backup Proxy Server Address	Not applicable. Leave the default setting.
Backup Proxy Server Port	Not applicable. Leave the default setting.
Proxy Query Interval	Enter **10**.
Timing	
T1 Time (ms)	Enter **400**.
T2 Time (ms)	Enter **3000**.
Monitoring	
Monitor Call Connections	Select **No**.

Step 75 Select **Submit**.

Step 76 On the Configuration menu, select **VoIP** > **Media**.

Step 77 On the VoIP Media Settings page, enter the following settings.

Table 483: VoIP Media Settings Page Settings

Field	Settings
Audio	
Audio Compression	Select the preferred codec for audio compression.
RTP Digit Relay Mode	Select **RFC2833**.
Signaling Digit Relay Mode	Select **Off**.
Voice Activity Detection	Select **Off**.
Frame Size	Select the applicable setting: • G.711—**20** • G.729AB—**10** Failure to use the correct setting results in recorded messages containing nothing but silence.
Frames Per Packet	Select the applicable setting: • G.711—**1** • G.729AB—**2** Failure to use the correct setting results in recorded messages containing nothing but silence.

Step 78 Select **Submit**.

Step 79 On the Configuration menu, select **VoIP** > **QOS**.

Step 80 On the VoIP QOS Configuration page, enter the following settings.

Table 484: VoIP QOS Configurative Page Settings

Field	Settings
Call Control QOS Byte	Enter **104**.
RTP QOS Byte	Enter **184**.

Step 81 Select **Submit**.

Step 82 On the Configuration menu, select **IP**.

Step 83 On the IP Settings page, enter the following settings.

Table 485: IP Settings Page Settings

Field	Settings
Client IP Address	Enter the new IP address you want to use for the PIMG unit. (This is the IP address that you enter in Cisco Unity Connection Administration when you create the integration.)
Client Subnet Mask	Enter the new subnet mask, if the subnet mask is different from the default IP address.
Default Network Gateway Address	Enter the IP address of the default network gateway router that the PIMG units use.
BOOTP Enabled	Select **No**.

Step 84 Select **Submit**.

Step 85 On the Configure menu, select **Tone Detection**.

Step 86 On the Tone Detection page, under Call Progress Tone - Learn, in the Learn Tone Event field, select **Busy** and do the following substeps to verify that the tone is correct.

a) From an available phone, call a second phone.
b) Answer the second phone when it rings, and leave both handsets off so that both phones are busy.
c) From a third phone, dial one of the busy phones.
d) Confirm that you hear a busy tone.
e) Hang up the third phone but leave the handsets for the other two phones off.

Step 87 Under Call Progress Tone - Learn, in the Dial String field, enter the extension that you dialed in Step 86c. from the third phone.

Step 88 Select **Learn**.

Step 89 On the Tone Detection page, under Call Progress Tone - Learn, in the Learn field, select **Error** and do the following substeps to verify that the tone is correct.

a) From an available phone, dial an extension that does not exist.
b) Confirm that you hear the reorder or error tone.
c) Hang up the phone.

Step 90 Under Call Progress Tone - Learn, in the Dial String field, enter the extension that you dialed in Step 89a.

Step 91 On the Tone Detection page, under Call Progress Tone - Learn, in the Learn field, select **Ringback** and do the following substeps to verify that the tone is correct.

a) From an available phone, dial an extension that does exist
b) Confirm that you hear the ringback tone.
c) Hang up the phone.

Step 92 Under Call Progress Tone - Learn, in the Dial String field, enter the extension that you dialed in Step 91a.

Step 93 Select **Learn**.

Step 94 Select **Submit**.

Step 95 Hang up the phones that you used in Step 86.

Step 96 On the Configure menu, select **Restart**.

Step 97 On the Restart page, select **Restart Unit Now**.

Step 98 Repeat Step 2 through Step 97 on all remaining PIMG units.

Creating New Integration with Siemens Hipath 4000 Phone System

After ensuring that the Siemens Hipath 4000 phone system, the PIMG units, and Unity Connection are ready for the integration, do the following procedure to set up the integration and to enter the port settings.

Creating an Integration

Step 1 In Cisco Unity Connection Administration, expand **Telephony Integrations**, then select **Phone System**.

Step 2 On the Search Phone Systems page, under Display Name, select the name of the default phone system.

Step 3 On the Phone System Basics page, in the Phone System Name field, enter the descriptive name that you want for the phone system.

Step 4 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 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 5 Under Message Waiting Indicator Settings, select**Use Same Port for Enabling and Disabling MWIs**.

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 applicable settings and select **Save**.

Table 486: Settings for the New Port Group Page

Field	Setting
Phone System	Select the name of the phone system that you entered in Step 3.
Create From	Select **Port Group Template** and select **SIP to DMG/PIMG/TIMG** 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.
SIP Security Profile	Select **5060**.
SIP Transport Protocol	Select the SIP transport protocol that Unity Connection uses.
IP Address or Host Name	Enter the IP address of the PIMG unit that you are integrating with Unity Connection.
Port	Enter the SIP port of the PIMG unit that Unity Connection connects to. We recommend that you use the default setting. This name must match the setting in the TCP/UDP Server Port field on the Configuration > VoIP > General page of the PIMG unit. Otherwise, the integration cannot function correctly.

Step 9 On the Port Group Basics page, under Message Waiting Indicator Settings, uncheck the **Enable Message Waiting Indicators** check box and select **Save**.

Step 10 In the Related Links drop-down box, select **Add Ports** and select **Go**.

Step 11 On the New Port page, enter the following settings and select **Save**.

Table 487: Settings for the New Port Page

Field	Considerations
Enabled	Check this check box.
Number of Ports	Enter **8**. (If you want to use fewer than eight voice messaging ports, enter the number of voice messaging ports that you want to use on this PIMG unit.) **Note** For a Unity Connection cluster, the server must have the number of voice messaging ports that are set up on the phone system for the PIMG integration so that this server can handle all voice messaging traffic for the cluster if one of the servers stops functioning. For example, if the phone system is set up with 16 voice messaging ports, this server must have 16 voice messaging ports.
Phone System	Select the name of the phone system that you entered in Step 3.
Port Group	Select the name of the port group that you added in Step 8.

Step 12 On the Search Ports page, select the display name of the first voice messaging port that you created for this phone system integration.

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

Step 13 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 488: 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.
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.

Field	Considerations
Send MWI Requests	(Serial integrations only) Uncheck this check box. Otherwise, the integration may not func correctly. (Digital and analog integrations only) Check this check box to designate the port for turni 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 th phone in Unity Connection web applications. Assign Allow TRAP Connections to the lea busy ports.
Outgoing Hunt Order	Enter the priority order in which Unity Connection uses the ports when dialing out (for exam if the Perform Message Notification, Send MWI Requests, or Allow TRAP Connections cl box is checked). The highest numbers are used first. However, when multiple ports have t same Outgoing Hunt Order number, Unity Connection uses the port that has been idle the longest.

Step 14 Select **Save**.

Step 15 Select **Next**.

Step 16 Repeat Step 13 through Step 15 for all remaining voice messaging ports for the phone system.

Step 17 In Cisco Unity Connection Administration, expand **Telephony Integrations**, then select **Phone System**.

Step 18 On the Search Phone Systems page, under Display Name, select the name of the phone system that you entered in Step 3.

Step 19 Repeat Step 7 through Step 18 for each remaining PIMG unit integrated with Unity Connection.

Note Each PIMG unit is connected to one port group with the applicable voice messaging ports. For example, a system that uses five PIMG units requires five port groups, one port group for each PIMG unit.

Step 20 To create a port group for MWIs, do the following substeps.

Note All MWI requests are handled by the master PIMG unit and sent to the phone system over the RS-232 serial cable (without using voice messaging ports). So the following substeps create a separate port group without voice messaging ports and enable the port group for MWIs that are "not port specific" (they do not use ports).

a) In Cisco Unity Connection Administration expand **Telephony Integration** then select **Port Group** .
b) On the Search Port Groups page, select **Add New**.
c) On the New Port Group page, enter the applicable settings and select **Save**.

Table 489: Settings for the New Port Group Page (MWIs)

Field	Setting
Phone System	Select the name of the phone system that you entered in Step 3.
Create From	Select Port Group Template and select **SIP to DMG/PIMG/TIMG** SIP to in the drop-down box.
Display Name	Enter a **MWI Port Group** or another descriptive name for the port group.
SIP Security Profile	Select **5060**.

Field	Setting
SIP Transport Protocol	Select the SIP transport protocol that Unity Connection uses.
IPv4 Address or Host Name	Enter the IP address of the master PIMG unit.
IPv6 Address or Host Name	Do not enter a value in this field. IPv6 is not supported for PIMG integrations.
IP Address or Host Name	Enter the IP address of the master PIMG unit.
Port	Enter the SIP port of the master PIMG unit. **Caution** This name must match the setting in the TCP/UDP Server Port field on the Configuration > VoIP > General page of the PIMG unit. Otherwise, the integration cannot function correctly.

d) On the Port Group Basics page, on the Edit menu, select **Advanced Settings**.
e) On the Edit Advanced Settings page, under SIP MWI Requests, select **Not Port Specific** then select **Save**.
f) On the Edit menu, select **Port Group Basics**.
g) Under Port Group, select **Reset**.
h) Under Message Waiting Indicator Settings, confirm that the **Enable Message Waiting Indicator** check box is checked and select **Save**.

Step 21 If another phone system integration exists, in Cisco Unity Connection Administration, expand **Telephony Integrations**, then select **Trunk**. Otherwise, skip to Step 25.

Step 22 On the Search Phone System Trunks page, on the Phone System Trunk menu, select **New Phone System Trunk**.

Step 23 On the New Phone System Trunk page, enter the following settings for the phone system trunk and select **Save**.

Table 490: Settings for the Phone System Trunk

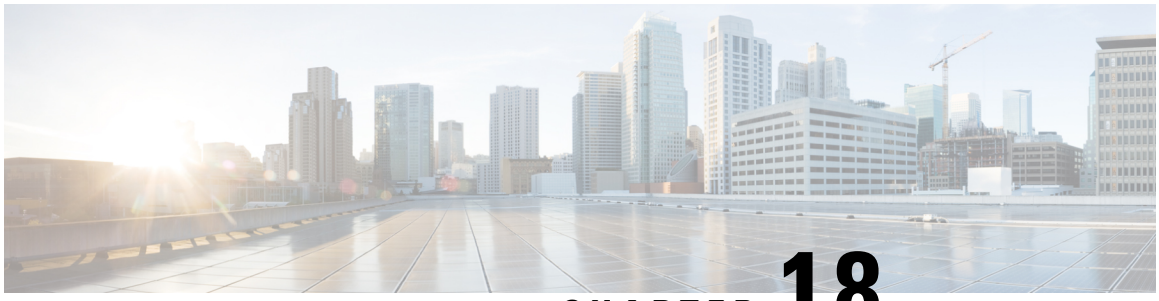
Field	Setting
From Phone System	Enter the display name of the phone system that you are creating a trunk for.
To Phone System	Enter the display name of the previously existing phone system that the trunk connects to.
Trunk Access Code	Enter the extra digits that Unity Connection must dial to transfer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

Step 24 Repeat Step 22 and Step 23 for all remaining phone system trunks that you want to create.

Step 25 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 26 In the Task Execution Results window, select **Close**.



CHAPTER 18

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 15, available at https://www.cisco.com/c/en/us/td/docs/voice_ip_comm/connection/15/troubleshooting/guide/b_15cuctsg.html.
- The setup information earlier in this guide.

- Testing the Integration, on page 381

Testing the Integration

Setting Up the Test Configuration

SUMMARY STEPS

1. Set up two test extensions (Phone 1 and Phone 2) on the same phone system that Unity Connection is connected to.
2. Set Phone 1 to forward calls to the Unity Connection pilot number when calls are not answered.
3. In Cisco Unity Connection Administration, expand **Users**, then select **Users**.
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.
5. On the Edit User Basics page, uncheck the **Set for Self-enrollment at Next Login** check box.
6. In the Voice Name field, record a recorded name for the test user.
7. Select **Save**.
8. On the Edit menu, select **Message Waiting Indicators**.
9. On the Message Waiting Indicators page, select the message waiting indicator. If no message waiting indication is in the table, select **Add New**.
10. On the Edit Message Waiting Indicator page, enter the following settings.
11. Select **Save**.
12. On the Edit menu, select **Transfer Options**.
13. On the Transfer Options page, select the active option.

14. On the Edit Transfer Option page, under Transfer Action, select the **Extension** option and enter the extension of Phone 1.
15. In the Transfer Type field, select **Release to Switch**.
16. Select **Save**.
17. Minimize the Cisco Unity Connection Administration window.
18. Sign in to the Cisco Unified Real-Time Monitoring Tool (RTMT).
19. On the Unity Connection menu, select **Port Monitor**. The Port Monitor tool appears in the right pane.
20. In the right pane, select **Start Polling**. The Port Monitor displays which port is handling the calls that you make.

DETAILED STEPS

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

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

The phone system must forward calls to the 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 491: 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 Options**.

Step 13 On the Transfer Options page, select the active option.

Step 14 On the Edit Transfer Option page, under Transfer Action, select the **Extension** option 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 use it again in a later procedure.

Step 18 Sign in to the Cisco Unified 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 displays which port is handling the calls that you make.

Testing an External Call with Release Transfer

SUMMARY STEPS

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 Unity Connection.
2. In the Port Monitor, note which port handles this call.
3. When you hear the opening greeting, enter the extension for Phone 1. Hearing the opening greeting means that the port is configured correctly.
4. Confirm that Phone 1 rings and that you hear a ringback tone on Phone 2. Hearing a ringback tone means that Unity Connection correctly released the call and transferred it to Phone 1.
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.
6. Confirm that, after the number of rings that the phone system is set to wait, the call is forwarded to 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 Unity Connection, which correctly interpreted the information.
7. On the Port Monitor, note which port handles this call.
8. Leave a message for the test user and hang up Phone 2.
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.
10. Confirm that the MWI on Phone 1 is activated. The activated MWI means that the phone system and Unity Connection are successfully integrated for turning on MWIs.

DETAILED STEPS

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 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 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 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 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 Unity Connection are successfully integrated for turning on MWIs.

Testing Listening to Messages

SUMMARY STEPS

1. From Phone 1, enter the internal pilot number for Unity Connection.
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 Unity Connection, which correctly interpreted the information.
3. Confirm that you hear the recorded name for the test user (if you did not record a name for the test user, you hear the extension number for Phone 1). Hearing the recorded name means that Unity Connection correctly identified the user by the extension.
4. Listen to the message.
5. After listening to the message, delete the message.
6. Confirm that the MWI on Phone 1 is deactivated. The deactivated MWI means that the phone system and Unity Connection are successfully integrated for turning off MWIs.
7. Hang up Phone 1.
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.

DETAILED STEPS

Step 1 From Phone 1, enter the internal pilot number for 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 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 hear the extension number for Phone 1). Hearing the recorded name means that 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 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.

Setting Up Supervised Transfer on Unity Connection

SUMMARY STEPS

1. In Cisco Unity Connection Administration, on the Edit Transfer Option page for the test user, in the Transfer Type field, select **Supervise Transfer**.
2. In the Rings to Wait For field, enter **3**.
3. Select **Save**.
4. Minimize the Cisco Unity Connection Administration window.

DETAILED STEPS

Step 1 In Cisco Unity Connection Administration, on the Edit Transfer Option 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 use it again in a later procedure.

Testing Supervised Transfer

SUMMARY STEPS

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 Unity Connection.
2. On the Port Monitor, note which port handles this call.
3. When you hear the opening greeting, enter the extension for Phone 1. Hearing the opening greeting means that the port is configured correctly.
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).
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 Unity Connection is supervising the transfer.
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.
7. During the greeting, hang up Phone 2.
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.
9. Select **Stop Polling**.
10. Exit RTMT.

DETAILED STEPS

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 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 Unity Connection is supervising the transfer.

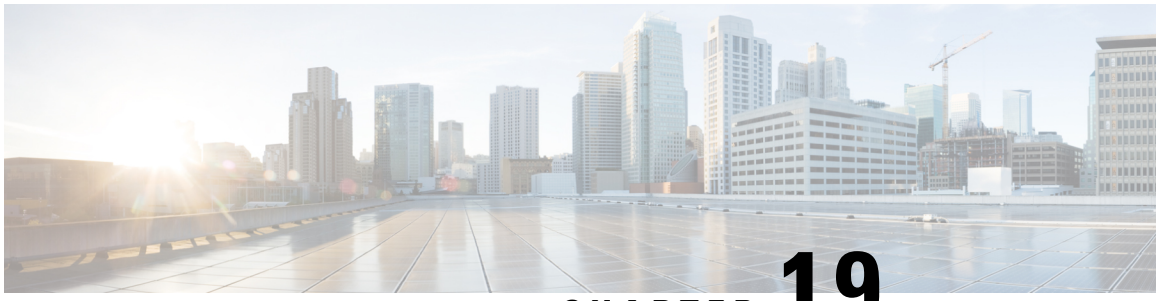
Step 6 Confirm that, after three rings, you hear the greeting for the test user. Hearing the greeting means that Cisco Unity Connection successfully recalled the supervised-transfer call.

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 Exit RTMT.



CHAPTER 19

Adding New User Templates for Multiple Integrations

• Adding New User Templates for Multiple Integrations, on page 387

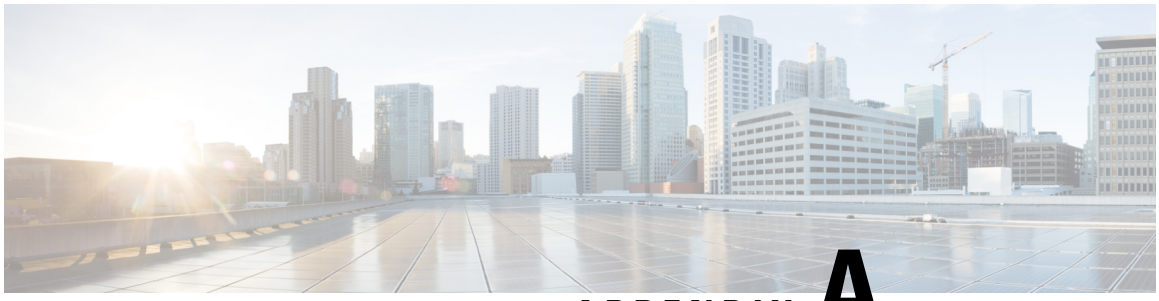
Adding New User Templates for Multiple Integrations

Introduction

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 are 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 assign users to the new phone system. You must add the new templates before you add new users who are 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 "User Templates" section of the "User Attributes" chapter of the *System Administration Guide for Cisco Unity Connection, Release 15*, available at https://www.cisco.com/c/en/us/td/docs/voice_ip_comm/connection/15/administration/guide/b_15cucsag.html.



APPENDIX A

Adding a Secondary Master PIMG Unit

Because the master PIMG unit processes all call information and MWI requests for the system, the integration loses important functionality if the master PIMG unit stops working. If you want to minimize this risk, you can add a secondary master PIMG unit to process call information and MWI requests when the primary master PIMG unit is no longer functioning.

During normal operation, the primary master PIMG unit is connected to power and is functioning, while the secondary master PIMG unit is not connected to power and is not functioning. To activate the secondary master PIMG unit, you must disconnect power to the primary master PIMG unit, then connect power to the secondary master PIMG unit.

The following task list describes the process for adding a secondary master PIMG unit.

- Adding a Secondary Master PIMG Unit, on page 389

Adding a Secondary Master PIMG Unit

Because the master PIMG unit processes all call information and MWI requests for the system, the integration loses important functionality if the master PIMG unit stops working. If you want to minimize this risk, you can add a secondary master PIMG unit to process call information and MWI requests when the primary master PIMG unit is no longer functioning.

During normal operation, the primary master PIMG unit is connected to power and is functioning, while the secondary master PIMG unit is not connected to power and is not functioning. To activate the secondary master PIMG unit, you must disconnect power to the primary master PIMG unit, then connect power to the secondary master PIMG unit.

The following task list describes the process for adding a secondary master PIMG unit.

Task List to Add a Secondary Master PIMG Unit

Use the following task list to add a secondary master PIMG unit.

1. Set up the analog voice line connections to the master PIMG units. See the Analog Voice Line Connections for the Master PIMG Units.
2. Set up the serial data cable connections to the master PIMG units. See the Serial Data Cable Connections for the Master PIMG Units.
3. Configure the secondary master PIMG unit. See the Configuring the Secondary Master PIMG Unit.

Analog Voice Line Connections for the Master PIMG Units

Circuit-switched phone systems typically have 25-pair or 32-pair cables to provide analog voice connections. It is common that the cable is broken into individual lines that may attach to a punchdown cross-connect block (for example, 66-Type), or the cable may terminate with RJ-11 or RJ-14 connectors to accept analog voice lines.

A punchdown cross-connect block or line splitters may be used to split the analog lines. It is possible to use these devices in combination to manage and split the lines.

Note No devices other than those described in this appendix should be connected to the analog voice lines for any voice messaging port on the master PIMG units. Otherwise, the ring equivalency number (REN) may be exceeded and the primary and secondary servers may not receive sufficient ring current to answer calls.

Requirements

The following components are required for common configurations:

- Two or three analog voice patch cables for each port on the phone system.
- The applicable device to split the analog lines:
  - One or more punchdown cross-connect blocks (for example, 66-Type), installed and ready to accept lines.
  - One line splitter for every one or two ports on the phone system. The line splitter accepts both RJ-11 and RJ-14 connectors.
- The applicable connectors (RJ-11 and/or RJ-14) for the analog voice lines. Figure A-1 shows the pinout for the RJ-11 connector, and Figure A-2 shows the pinout for the RJ-14 connector.

Figure 4: Figure A-1 RJ-11 Connector Pinout

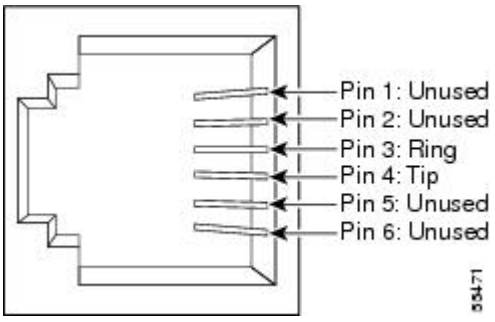
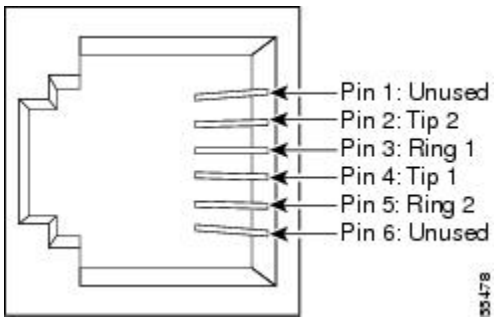


Figure 5: Figure A-2 RJ-14 Connector Pinout



Connections Using RJ-11 Connectors

The following figures illustrate common configurations:

- Figure A-3 shows the connections between a phone system and the primary and secondary master PIMG units, through a punchdown cross-connect block.
- Figure A-4 shows the connections between a phone system with an RJ-11 connector and the primary and secondary master PIMG units.
- Figure A-5 shows the connections between a phone system with an RJ-14 connector and the primary and secondary master PIMG units.

Figure 6: Figure A-3 Connections from the Phone System Through a Punchdown Block

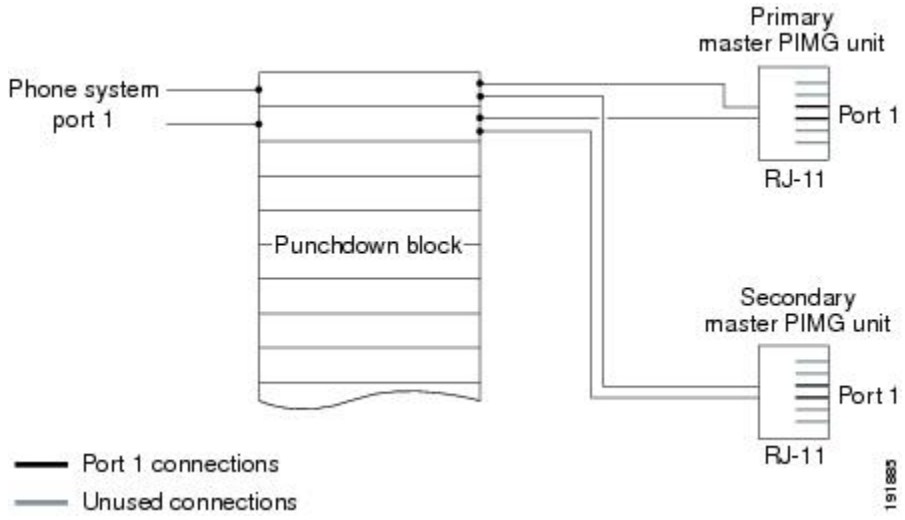


Figure 7: Figure A-4 Connections for an RJ-11 Connector from the Phone System

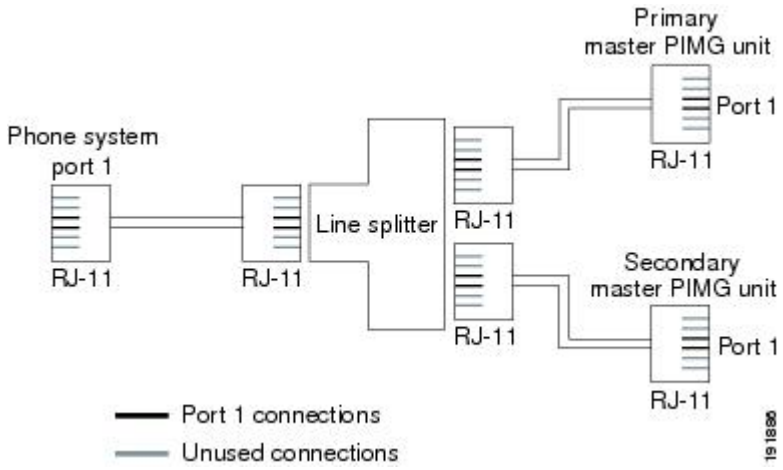
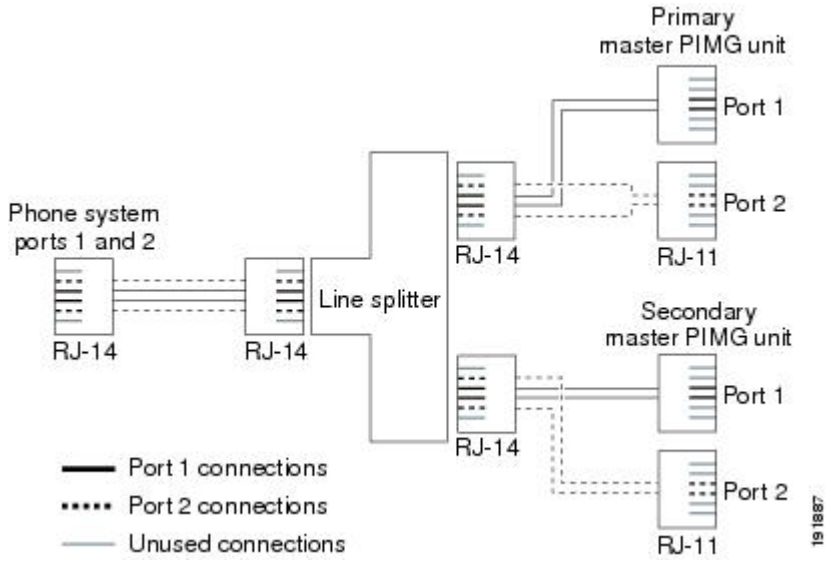


Figure 8: Figure A-5 Connections for an RJ-11 Connector from the Phone System



Serial Data Cable Connections for the Master PIMG Units

Connecting the RS-232 serial cables between a circuit-switched phone system and the primary and secondary master PIMG varies depending on the number of serial ports the phone system has.

Requirements

The following components are required for phone systems with only one serial port:

- Three RS-232 serial cables
- Data splitter unit

The following components are required for phone systems with multiple serial ports:

- Two RS-232 serial cables

Connections for the Serial Data Cables

Figure A-6 shows the connections between the serial port on a phone system that has only one serial port to the serial ports on the primary and secondary master PIMG units. Figure A-6 shows the connections between the serial ports on a phone system that has two serial ports to the serial ports on the master PIMG units.

Note that the following figures do not show the analog voice lines, which are described in the Analog Voice Line Connections for the Master PIMG Units.

Figure 9: Figure A-6 Serial Cable Connections from a Single Serial Port on the Phone System to the Serial Ports on the Master PIMG Units

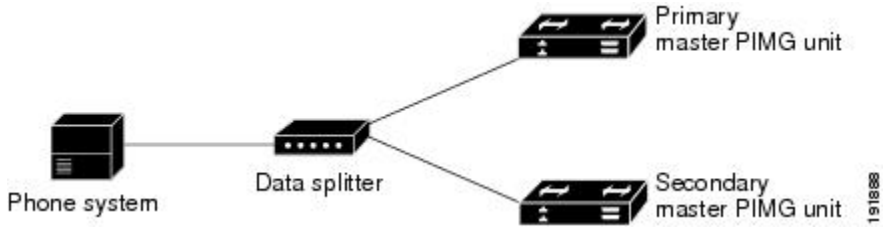


Figure 10: Figure A-7 Serial Cable Connections from Multiple Serial Ports on the Phone System to the Serial Ports on the Master PIMG Units



Configuring the Secondary Master PIMG Unit

This procedure has the following requirements:

- All analog lines and serial cables must be correctly connected.
- The primary secondary master PIMG units must have the same firmware version installed.
- The primary master PIMG unit is connected to power, while the secondary master PIMG unit is disconnected from power.
- You have a Windows workstation that has access to the PIMG units.

Do the following procedure to make the configuration of the secondary master PIMG unit match the configuration of the primary master PIMG unit.

Configuring the Secondary Master PIMG Unit

SUMMARY STEPS

1. On a Windows workstation, in a web browser, sign in to the primary master PIMG unit.

2. On the Configuration menu, select **Import/Export**.
3. On the Import/Export page, under Export Files, select **Export All Settings**.
4. In the File Download dialog box, select **Save**.
5. In the Save As dialog box, browse to the Windows workstation, browse to a directory where you want to save the file, and select **Save**.
6. Exit the PIMG web interface.
7. Disconnect power from the primary master PIMG unit.
8. Connect power to the secondary master PIMG unit.
9. On the Windows workstation, in a web browser, sign in the secondary master PIMG unit by entering the following case-sensitive settings.
10. Select **OK**.
11. On the Configuration menu of the secondary master PIMG unit, select **Import/Export**.
12. On the Import/Export page, under Import File, select **Browse**.
13. In the Choose File dialog box, browse to the file Config.ini that you saved from the primary master PIMG unit in Step 5.
14. Select **Config.ini**, and select **Open**.
15. On the Import/Export page, select **Import File**.
16. When prompted to restart the PIMG unit, select **OK**.
17. Disconnect power from the secondary master PIMG unit.
18. Connect power to the primary master PIMG unit.

DETAILED STEPS

Step 1 On a Windows workstation, in a web browser, sign in to the primary master PIMG unit.

Step 2 On the Configuration menu, select **Import/Export**.

Step 3 On the Import/Export page, under Export Files, select **Export All Settings**.

Step 4 In the File Download dialog box, select **Save**.

Step 5 In the Save As dialog box, browse to the Windows workstation, browse to a directory where you want to save the file, and select **Save**.

Step 6 Exit the PIMG web interface.

Step 7 Disconnect power from the primary master PIMG unit.

Step 8 Connect power to the secondary master PIMG unit.

Step 9 On the Windows workstation, in a web browser, sign in the secondary master PIMG unit by entering the following case-sensitive settings.

Table 492: Default Sign-in Settings

Field	Setting
Username	Enter **admin**.
Password	Enter **IpodAdmin**.

Step 10 Select **OK**.

Step 11 On the Configuration menu of the secondary master PIMG unit, select **Import/Export**.

Adding a Secondary Master PIMG Unit

Step 12 On the Import/Export page, under Import File, select **Browse**.

Step 13 In the Choose File dialog box, browse to the file Config.ini that you saved from the primary master PIMG unit in Step 5.

Step 14 Select **Config.ini**, and select **Open**.

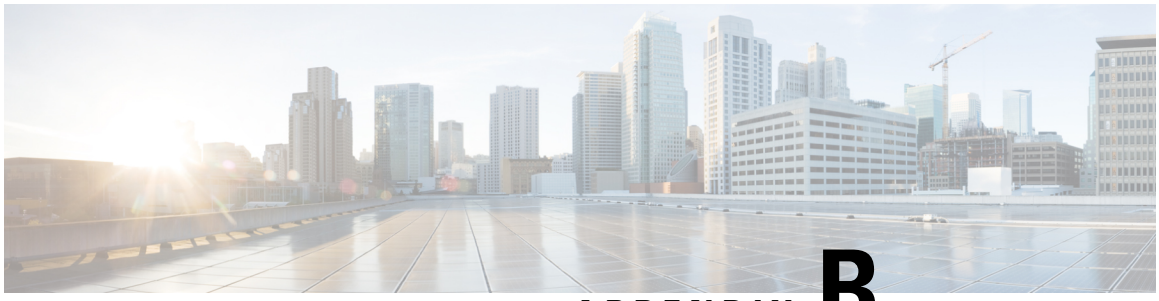
Step 15 On the Import/Export page, select **Import File**.

Step 16 When prompted to restart the PIMG unit, select **OK**.

Step 17 Disconnect power from the secondary master PIMG unit.

Step 18 Connect power to the primary master PIMG unit.

Adding a Secondary Master PIMG Unit



APPENDIX B

Application Note for the Ericsson MD-110 Serial PIMG Integration

This is an application note for programming the Ericsson MD-110 phone system for a serial MD-110 integration with Cisco Unity Connection using analog PIMG units. For instructions on setting up the PIMG units and creating the integration in Unity Connection, see the Setting Up a Serial (SMDI, MCI, or MD-110) PIMG Integration with Cisco Unity Connection , on page 239 chapter.

- Application Note for the Ericsson MD-110 Serial PIMG Integration, on page 397

Application Note for the Ericsson MD-110 Serial PIMG Integration

Introduction

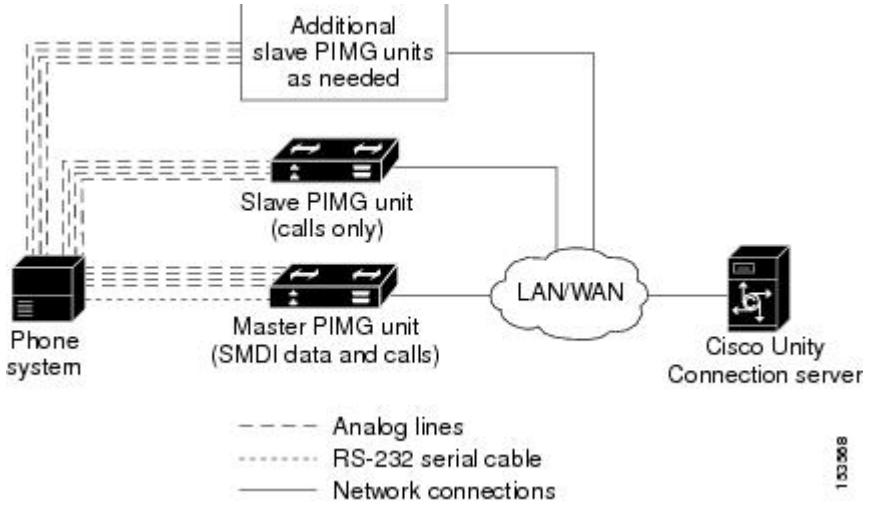
This is an application note for programming the Ericsson MD-110 phone system for a serial MD-110 integration with Cisco Unity Connection using analog PIMG units. For instructions on setting up the PIMG units and creating the integration in Unity Connection, see the Setting Up a Serial (SMDI, MCI, or MD-110) PIMG Integration with Cisco Unity Connection , on page 239chapter.

Network Topology

Figure B-1 shows the required connections for a serial MD-110 integration using analog PIMG units.

For more information about this integration, see Chapter 1, “Introduction.”

Figure 11: Figure B-1 Connections for a Serial MD-110 Integration by Using Analog PIMG Units



Requirements

The Ericsson MD-110 phone system met the following requirements:

- The Ericsson MD-110 phone system.
- Software level BC6 or later.

Programming Ericsson MD-110 Phone System for Serial Integration

The following programming instructions are provided as an example of a functioning integration. The specific programming for your phone system may vary depending on its configuration.

Caution In programming the phone system, do not send calls to voice messaging ports in 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 Perform Message Notification, do not send calls to it.

1. Check the software version on the phone system and the country variant that is configured. This information may be useful for troubleshooting problems with the integration. For example:

```
<cadap;                          ==> Check the software version and Country variant
CALENDAR DATA

IDENTITY=ACM1
VERSION=CXP1010101/4/TSWSP02/R3A ==> 01 == Standard Application
```

2. Configure the analog extensions for the voice messaging ports similarly to the following example:

```
<excap:dir=1063&1064;            ==> print analog extension
EXTENSION CATEGORY FIELDS

DIR       TRAF      SERV        CDIV       ROC       TRM       ADC        BSEC
```

Application Note for the Ericsson MD-110 Serial PIMG Integration

```
1063      00151515  0201120600  000151000  000001    0         010001701  0
1064      00151515  0201120600  000151000  000001    0         010001701  0
```

3. Configure the hunt group number for the voice messaging ports on the PIMG units similarly to the following example:

```
<vmpop:grp=all;                 ==> print VM HuntGroup number
VOICE MAIL GROUP DATA
GRP      IFCIND
4500     1
```

4. Associate the voice messaging port extensions with the hunt group number similarly to the following example:

```
<vmpop:dir=all;                 ==> print VM port DN associated with the HuntGroup
number
VOICE MAIL PORT DATA
DIR      PORT     IFCIND
1063     1063     1
1064     1064     1
```

5. Configure the voice mail function information similarly to the following:

```
<vmfup:ifcind=1;                ==> print VM function information
VOICE MAIL FUNCTION DATA
IFCIND   VMF    POFMT
1        EXTN3  4
```

6. Configure the I/O device interface for voice mail similarly to the following:

```
<ioddp;                         ==> print I/O Device interface
I/O DEVICE DATA
NODE           IODEV/SUBFS     BPOS/EQU    I/O-BUS TYPE/USAGE    STATUS    AUTH
SYSN           V-MAIL          001-0-60-3  -       OUT           IN SERVICE
```

7. Configure the I/O device function for voice mail similarly to the following example:

```
<iofdp;                         ==> print I/O Device Function
I/O FUNCTIONS DEFINITION
IODEV            TRD         NDC              CALLS  WAIT  DELAY  SUPER
V-MAIL           BOTH                           2     30      5  YES
```

8. Configure the serial connection parameters for voice mail similarly to the following example:

```
<ioifp;                         ==> print I/O Device serial interface parameters VM
I/O INTERFACE CHARACTERISTICS
IODEV           IFACE   BAUDR    WORDL   PARITY  STPBIT  PROC
SYSTERMINAL     V24       ALL     8      NONE     1      ECHO
V-MAIL          V24      9600     8      NONE     1      ECHO
```

9. Configure MWIs to be sent over the serial cable similarly to the following example:

```
<icmwp:sid=1;                   ==> print MWI ext using on serial interface
INFORMATION COMPUTER MESSAGE WAITING DATA
SID  DTXT            KFCN DIG
1    4500            MWC  4500
```

10. Configure the filler information similarly to the following example:

Application Note for the Ericsson MD-110 Serial PIMG Integration

```
<ICFUP:ifcind=1;                ==> print the filler information
INFORMATION COMPUTER COMMON FUNCTIONS DATA

MESSAGE WAITING FUNCTIONALITY IS ALL

INFORMATION COMPUTER EQUIPMENT DATA

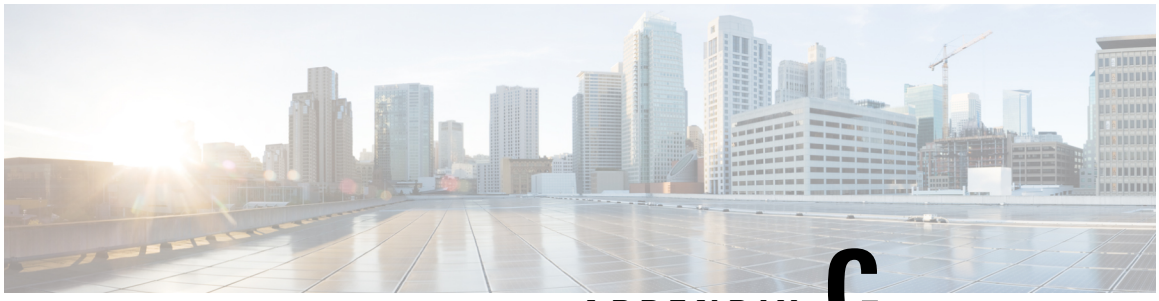
IFCIND  IODEV           EQU          RATE   DFMT  UPDFCN  PARITY  CCHECK
1       V-MAIL                               4     YES
                     FILLER=48     ICEXG=NONE     USER=NONE
```

11. Configure the hookflash timer similarly to the following example:

```
<aspap:parnum=253;              ==> print Hookflash timer
APPLICATION SYSTEM PARAMETERS
PARNUM     PARVAL
   253        110
```

12. Configure the on-hook timer similarly to the following example:

```
<aspap:parnum=252;            ==> print On-hook timer
APPLICATION SYSTEM PARAMETERS
PARNUM     PARVAL
   252        225
```



APPENDIX C

Application Note for the Nortel SL-100 Serial SMDI TIMG Integration

This is an application note for programming the Nortel SL-100 phone system for a serial SMDI integration with Cisco Unity Connection using TIMG units. For instructions on setting up analog PIMG units and creating the serial PIMG integration in Unity Connection, see the Setting Up a Serial (SMDI, MCI, or MD-110) PIMG Integration with Cisco Unity Connection , on page 239 chapter.

- Application Note for the Nortel SL-100 Serial SMDI TIMG Integration, on page 401

Application Note for the Nortel SL-100 Serial SMDI TIMG Integration

Introduction

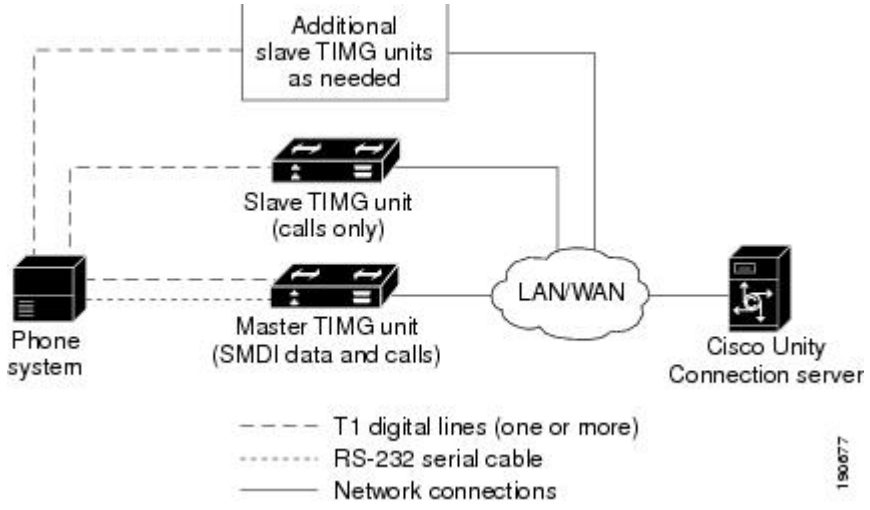
This is an application note for programming the Nortel SL-100 phone system for a serial SMDI integration with Cisco Unity Connection using TIMG units. For instructions on setting up analog PIMG units and creating the serial PIMG integration in Unity Connection, see the "Setting Up a Serial (SMDI, MCI, or MD-110) PIMG Integration with Cisco Unity Connection " chapter.

Network Topology

Figure C-1 shows the required connections for a serial SMDI integration using TIMG units.

For more information about this integration, see the chapterIntroduction, on page 1.

Figure 12: Figure C-1 Connections for a Serial SMDI Integration Using TIMG Units



Requirements

The phone system was as follows:

- Nortel SL-100.
- Software version SE-06 or later.
- Line Side T1 Card (NT5D11 or equivalent) to terminate the T1 line.

Programming Nortel SL-100 Phone System for Serial Integration

The following programming instructions are provided as an example of a functioning integration. The specific programming for your phone system may vary depending on its configuration.

Caution In programming the phone system, do not send calls to voice messaging ports in 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 Perform Message Notification, do not send calls to it.

1. On the MAP terminal, enter **table mpc** and press **Enter**.
2. Enter **add** and press **Enter**.
3. On Table MPC, enter the following settings.

Table 493: Settings for Table MPC

Field	Setting
MPCNO	Enter the MPC number used for SMDI.

Application Note for the Nortel SL-100 Serial SMDI TIMG Integration

Field	Setting
MPCIOC	Enter the number associated with the MPC (SMDI) card.
IOCCCT	Enter the slot position on the IOC shelf multiplied by 4, from 0 to 32.
EQ	Enter the NT product engineering code for the MPC card in the format 1X89zz or FX30zz, where zz are the two letters at the end of the product code.
DLDFILE	In the format MPCAxxyy, enter the name of the 8-character download file for SMDI and MPCA.

1. Enter **table mpclink** and press **Enter**.
2. Enter **add** and press **Enter**.
3. On Table MPCLINK, enter the following settings.

Table 494: Settings for Table MPCLINK

Field	Subfield	Setting
LINKKEY	MPCNO	Enter the MPC number used for SMDI (the same number entered in Table MPC).
	LINKNO	Enter the MPC link number for SMDI application with ASYNC protocol.
LINKALM		Enter **Y** to activate the MPCLINK alarm for system busy (SYSB) MPC links. Enter **N** if you do not want to activate the MPCLINK alarm for system busy (SYSB) MPC links. **Note** If you enter N, the system does not generate MPC908 (MPC link state transition) logs.
PROTOCOL		Enter **ASYNC**.
LINKNABL		Enter **765**.
PARM		Enter **APLDEFN**.
ADEFN		Enter **SMDI**.
PARM		Enter **BAUDRATE**.
RATE		Enter **B9600**.
PARM		Enter **PARITY**.
PRTY		Enter **EVEN**.

Application Note for the Nortel SL-100 Serial SMDI TIMG Integration

Field	Subfield	Setting
PARM		The following are among the optional parameters: L1IDLY, L2IDLY, LNKDOWN. If you enter a parameter, you are then prompted to enter a value for it. L1IDLY and L2IDLY timers can be used in offices with heavy SMDI/VMS traffic to shorten the amount of time the MPC can delay sending an MWI to the switch. (The default is 3 seconds.) The LNKDOWN timer adjusts the length of time the switch takes to recognize LINK failure and sets the LINK to SYSB. (The default is 2 seconds.)
CHARBITS		Enter **BIT7**.

1. Enter **table sllnkdev** and press **Enter**.
2. Enter **add** and press **Enter**.
3. On Table SLLNKDEV, enter the following settings.

Table 495: Settings for Table SLLNKDEV

Field	Setting
DEVNAME	Enter a unique device name.
DEVICE	Enter **1X89**.
MPCNO	Enter the value MPC number that was specified in Table MPC.
LINKNO	Enter the value for the MPC link number that was specified in Table MPCLINK.
XLATION	Enter **NONE**.
PROTOCOL	Enter **NONE**.
DIRECTION	Enter **INOUTLK**.
XFER	Enter **SMDIDATA**.
OPTION	Enter **NUMOFDIGS**.
NUMDIGS	Enter the number of digits sent by the phone system to the voice messaging system through the SMDI link. **Note** The entry value selected should match the dialing plan configured on the phone system.
OPTION	Enter **CGNADDRDN**.
OPTION	Enter **$**.

1. Enter **table ofrt** and press **Enter**.

Application Note for the Nortel SL-100 Serial SMDI TIMG Integration

You use Table OFRT to set up a treatment for unanswered calls. The following example shows settings for routing unanswered calls back to the voice messaging system.

1. Enter **add** and press **Enter**.
2. On Table OFRT, enter the following settings.

Table 496: Settings for Table OFRT

Field	Setting
RTE	If the record is the first in the route list, enter the route reference number assigned to the route list. Otherwise, leave this field blank.
RTESEL	Enter the route selector.
SNPA	Enter the serving NPA (area code) of the DN.
TYPCALL	Enter the type of call: • DD • NP • OA
ORIGSCRE	Enter **LCL** (for local) or **NLCL** (for non-local).
REPLDIGS	Enter up to 11 replace digits.
CANCNORC	Enter **Y** or **N** to indicate whether to cancel normal change.
BILLCODE	Enter the billing code. If there is no billing number, enter **N**.

1. Enter table **digcol** and press **Enter**.

You use Table DIGCOL to set up the action that the line module must take with the first digit that is dialed.

1. Enter **add** and press **Enter**.
2. On Table DIGCOL, enter the following settings.

Table 497: Settings for Table DIGCOL

Field	Subfield	Setting
DGKEY	DATNAME	Enter the character assigned to the block of data in Table DIGCOL.
	DIGIT	Enter a numeric value from 0–9, STAR (*), or OCT (#) to specify the digit that is applicable to the record.
DGDATA	DGCOLSEL	Enter **COL** for the collection of more digits.

Application Note for the Nortel SL-100 Serial SMDI TIMG Integration

Field	Subfield	Setting
COLDATA	TMODE	Enter S for short timing mode.
	NUMDIGS	Number of digits. If the TMODE value is S, specify the number of digits for which short timing is required after the receipt of each digit. The number of digits specified, which does not include the initial digit, must be no greater than three for short timing.

1. Enter **table ucdgroup** and press **Enter**.

You use Table UCDGRP to set up the UCD group.



Note The UCD group must have a unique primary DN.

1. Enter **add** and press **Enter**.
2. On Table UCDGRP, enter the following settings.

Table 498: Settings for Table UCDGRP

Field	Setting
UCDNAME	This is the name of the UCD group. It can be up to 16 characters in length. The first eight characters must be unique.
ACD	Enter **N**.
CUSTGRP	Name of the customer group to which the UCD group belongs.
UCDRNGTH	Ringing threshold, in one-second intervals, after which an unanswered call to a UCD agent is forwarded to the route specified in the THROUT field. The range is 0–63.
TABNAME	Enter **OFRT**.
INDEX	Enter the number assigned to the route list in Table OFRT (1–1023).
TABNAME	Enter **OFRT** for the table to which translations are routed.
INDEX	Enter the number assigned to the route list in Table OFRT (1–1023).
PRIOPRO	Enter Maximum time, in seconds, a call can wait in a UCD group (0–255).
MAXPOS	Enter the maximum number of UCD agent positions that can be active at one time. This number should be the number of ports on the all TIMG units that are connected to the phone system.
DBG	Delayed billing. Enter **Y** if billing starts when the call is answered by a UCD agent. Enter **N** if billing starts when the caller receives a recorded announcement.
DEFPRIO	Enter **0**.

Application Note for the Nortel SL-100 Serial SMDI TIMG Integration

Field	Setting
RLSCNT	Enter **0**.
MAXWAIT	Enter the maximum time, in seconds, that a call waits in the incoming call queue before being answered (0–1800).
MAXCQSIZ	Enter the maximum number of calls that can be in the incoming queue waiting for an idle channel (0–511).
OPTION	Enter **UCD_SMDI**.
SMDI_LINK	Enter the terminal designation defined in Table SLLNKDEV.
SMDI_ DESK_NO	Enter the message desk number (1–63). If you have more than one UCD group, one of them must be set to 63. We recommend that the first UCD group on a data link be set to 63. The second is set to 62, and so on. **Note** If CRR (Call Request Retrieval) is used, all requests are made to the UCD group with SMDI_DSK_NO = 63.

1. Enter **table dnroute** and press **Enter**.

You use Table DNROUTE to set up the UCD group.



Note The UCD group must have a unique primary DN.

1. Enter **add** and press **Enter**.
2. On Table DNROUTE, enter the following settings.

Table 499: Settings for Table DNROUTE

Field	Subfield	Setting
DNNM	AREACODE	Enter the DN for the UCD group specified as the UCDGRP. **Note** The UCD DN must be a dialable number from an agent on the phone system so that dialing plans and translation tables do not conflict.
	OFCCODE	
	STNCODE	
DN_SEL		Enter **FEAT**.
FEATURE		Enter **UCD**.
UCDGRP		Enter the value for the UCDNAME field that is defined in Table UCDGROUP.
DNTYPE		Enter **PRIM**.
TOLLPRIO		Enter **0**.

Application Note for the Nortel SL-100 Serial SMDI TIMG Integration

1. Enter **table lninv** and press **Enter**.

You use Table LNINV to assign card slots on the line or remote line module.

1. Enter **add** and press **Enter**.
2. On Table LNINV, enter the following settings.

Table 500: Settings for Table LNINV

Field	Setting
LEN	Enter the line equipment number of the card slot.
CARDCODE	Enter **5d11ae**.
PADGRP	Enter the name of the appropriate pad group that appears in the PADDATA table.
STATUS	Enter **WORKING**.
GND	Enter **Y**.
BNV	Enter **NL**.
MNO	Enter **Y**.
CARDTYPE	Enter **NIL**.

1. Enter **servord** and press **Enter**.

You can add agents to the UCD group by entering the following inputs at the prompts.

Table 501: Inputs for Adding Agents to the UCD Group

Prompt	Input	Description
SO:	NEW	
SONUMBER:	Press **Enter**.	When to invoke this service. Pressing Enter starts the service at the current date and time.
DN:		The Directory Number of the line. Use ten-digit DNs.
LCC_ACC:	IBN	The line class code of service.
GROUP:		The name of the IBN customer group to which the line belongs. For example, covm.
SUBGRP:		The subgroup number. For example, 0.
NCOS:		The network class of service. For example, 1.
SNPA:		The serving NPA (area code) of the DN.
LEN_OR_LT D:		The line equipment number of the line. For example, 4 0 1 0 (separated by spaces).

Application Note for the Nortel SL-100 Serial SMDI TIMG Integration

Prompt	Input	Description
OPTION:	COD	The cut-off on disconnect.
OPTION:	UCD	Uniform call distribution.
OPTION:	DGT	Digitone.
OPTION:	3WC	Three-way calling.
OPTION:	CXR	Call Transfer.
CXFERTYP:	CTALL	Call Transfer Type. CTALL = transfer all calls.
CXRRCL:	N	Call Transfer Recall.
METHOD:	STD	Method of Call Transfer: Std = Std Call Transfer method.
OPTION:	SMDI	Simplified message desk interface.
LINENO:		The UCD terminal number. This is the line number associated with the SMDI channel. This parameter must be unique for each agent in the associated UCDGRP.
UCDGRP:		The UCDNAME from the UCDGRP table. This is the UCD group to which you are adding the agent.
AUTO_LOG:	Y	Autologon capability required.
OPTION:	$	The data you have entered appears.
	Y	Enter **Y**.

1. Enter **servord** and press **Enter**.

You can add a pilot number (UCD group DN) for the ports on the TIMG units by entering the following inputs at the prompts.

Table 502: Inputs for Adding Agents to the UCD Group

Prompt	Input	Description
SO:	NEW	
SONUMBER:	Press Enter.	When to invoke this service. Pressing Enter starts the service at the current date and time.
DN:		The directory number of the line. This is the DN that you enter in the SDN table.
LCC:	IBN	The line class code of service.
GROUP:		The name of the IBN customer group to which the line belongs.
SUBGRP:		The subgroup number.

Application Note for the Nortel SL-100 Serial SMDI TIMG Integration

Prompt	Input	Description
NCOS:		The network class of service.
SNPA:		Serving NPA (area code) of the DN.
LEN:		Line equipment number of the line. For example, 4 0 1 0.
OPTION:	cfb	Call Forward Busy. **Note** This input is optional.
CFBCNTL:	N	Normal assignment for CFB. **Note** This input is optional.
CFBDN:		The primary UCD DN. **Note** This input is optional.
OPTION:	CFF	Call Forward Fixed.
CFFDN:		The primary UCD DN.
OPTION:	CFU	Call Forward Universal.
OVRDACR:	N	Override Automatic Callback.
OPTION:	$	The data you entered appears.
	Y	Enter **Y** to confirm the data.

1. Connect a phone to the line.
2. Pick up the handset.
3. Dial the call forward activation code followed by the pilot number (UCD DN). For example, dial *80 5551234.



Note If you do not know this code, look it up in Table IBNXLA. The code is in the CFWP field.

4. Confirm that you hear the confirmation tone, which indicates that the line has been forwarded.



Note If the phone system is restarted, you must repeat Step 27. through Step 30. for each line DN that CFUs to the UCD group.

5. Enter **table ibnxla** and press **Enter**.

You use Table IBNXLA to set up and message waiting indicators (MWIs).

1. Enter **add** and press **Enter**.

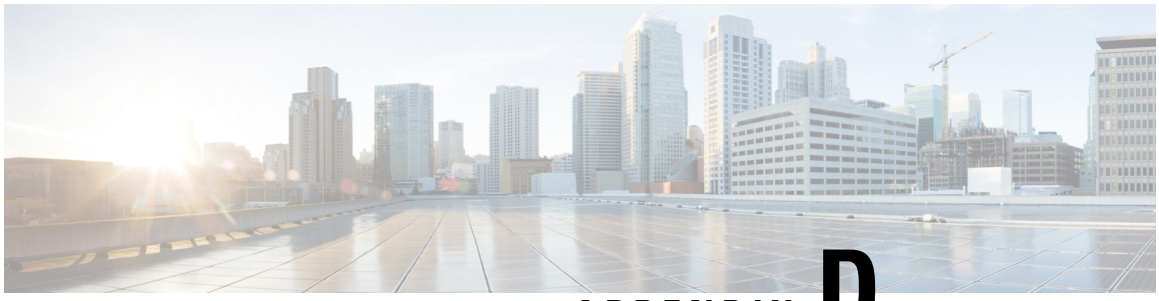
Application Note for the Nortel SL-100 Serial SMDI TIMG Integration

2. On Table IBNXLA, enter the following settings.

Table 503: Settings for Table DNROUTE

Field	Subfield	Setting
KEY	XLANAME	Enter the name of the translator, 1–8 characters, for the MWI feature.
	DGLIDX	Enter the access code for the MWI feature.
RESULT	TRSEL	Enter **FEAT**.
	ACR	Enter **N**.
	SMDR	Enter **N**.
	FEATURE	Enter the following features: **CRA CRR CRDS CRDA UCDD UCDA CFWP CFWC**

Application Note for the Nortel SL-100 Serial SMDI TIMG Integration



APPENDIX D

Settings for PIMG Firmware Version 5.x

• Settings for PIMG Firmware Version 5.x, on page 413

Settings for PIMG Firmware Version 5.x

Digital PIMG Settings (Firmware Version 5.x)

Do the following steps to set up the Digital PIMG units

SUMMARY STEPS

1. On a Windows workstation, sign in to a PIMG unit.
2. In the Configure menu, select **System**.
3. On the System page, enter the following settings.
4. Select **Apply Changes**.
5. On the Configure menu, select **Gateway**.
6. On the Gateway page, select the **Gateway Routing** tab.
7. On the Gateway Routing tab, Unity Connection without a cluster, skip to Step 8. If Unity Connection has a cluster configured, do the following substeps:
8. Under VoIP Endpoint ID, enter the following settings.
9. Select **Apply Changes**.
10. Select the **Gateway Advanced** tab.
11. On the Gateway Advanced tab, enter the following settings.
12. Select **Apply Changes**.
13. Select the **Gateway Capabilities** tab.
14. Depending on how you have planned to use the voice messaging ports, select the applicable setting for each port in the Telephony Port Capability column.
15. Select **Apply Changes**.
16. On the Configure menu, select **SIP**.
17. On the SIP page, enter the following settings.
18. Select **Apply Changes**.
19. On the Configure menu, select **IP**.
20. On the IP page, enter the following settings.

Settings for PIMG Firmware Version 5.x

21. Select **Apply Changes**.
22. On the Configure menu, select **Tones**.
23. On the Tones page, select the **Learn** tab.
24. On the Tones page, for the Dialtone event, confirm that the Acquire Tone check box is checked and leave the Destination Address field blank.
25. On the Tones page, for the Busy Tone event, confirm that the Acquire Tone check box is checked and do the following substeps to verify that the tone is correct.
26. On the Tones page, in the Destination Address field for Busy Tone, enter the extension that you dialed in Step 25c. from the third phone.
27. On the Tones page, for the Error/Reorder Tone event, confirm that the Acquire Tone check box is checked and do the following substeps to verify that the tone is correct.
28. On the Tones page, in the Destination Address field for Error/Reorder Tone, enter the extension that you dialed in Step 27a.
29. On the Tones page, for the Ringback Tone event, confirm that the Acquire Tone check box is checked and do the following substeps to verify that the tone is correct.
30. On the Tones page, in the Destination Address field for Ringback Tone, enter the extension that you dialed in Step 29a.
31. Select **Learn**.
32. When the process is complete, check the check box for each newly learned tone and select **Apply**.
33. Hang up the phones that you used in Step 25.
34. On the Configure menu, select **Restart**.
35. On the Restart page, select **Restart Unit Now**.
36. When the PIMG unit has restarted, in the View menu, select **Refresh**.
37. Repeat Step 1 through Step 36 on all remaining PIMG units.

DETAILED STEPS

Step 1 On a Windows workstation, sign in to a PIMG unit.

Step 2 In the Configure menu, select **System**.

Step 3 On the System page, enter the following settings.

Table 504: System Page Settings

Field	Setting
Operating Mode	Select **SIP**.
PBX Type	Select the applicable setting: • For Avaya phone systems, select **Lucent**. • For NEC phone systems, select **NEC_NEAX**. • For Nortel phone systems, select **M1**. • For Siemens phone systems, select **Optiset_300ECS**.
PCM Coding	Select **uLaw**.

Step 4 Select **Apply Changes**.

Step 5 On the Configure menu, select **Gateway**.

Step 6 On the Gateway page, select the **Gateway Routing** tab.

Step 7 On the Gateway Routing tab, Unity Connection without a cluster, skip to Step 8. If Unity Connection has a cluster configured, do the following substeps:

a) In the Fault Tolerance Enabled field, select **Yes**.

b) In the Load Balancing Enabled field, select No.

Step 8 Under VoIP Endpoint ID, enter the following settings.

Note To add endpoints, select **Add New Endpoint**.

Table 505: Gateway Routing Tab Settings

Count	VoIP Endpoint ID
1	*(Unity Connection without a cluster)* Enter the server name of the Unity Connection server. *(Unity Connection with a cluster configured)* Enter the server name of the subscriber Unity Connection server.
2	*(Unity Connection without a cluster)* Enter the server name of the Unity Connection server. *(Unity Connection with a cluster configured)* Enter the server name of the publisher server.

Step 9 Select **Apply Changes**.

Step 10 Select the **Gateway Advanced** tab.

Step 11 On the Gateway Advanced tab, enter the following settings.

Table 506: Gateway Advanced Tab Settings

Field	Settings
Call Connect Mode	Select **OnAnswer**.
Destination for Unroutable PBX Calls	Enter the extension of an attendant who receives calls to Cisco Unity Connection that are unanswered.
Minimum Call Party Delay (msecs)	Enter **500**.
Turn MWI On FAC	For Siemens Hicom 300 E (North American) phone systems, enter Enter **#*1**. Otherwise, leave this field blank.
Turn MWI Off FAC	For Siemens Hicom 300 ECS phone systems, enter Enter **#*8**. Otherwise, leave this field blank.
Wait for Ringback/Connect on Blind Transfer	Select **Yes**.

Field	Settings
Hunt Group Extension	Enter the pilot number of the Unity Connection voice messaging ports.
Audio Compression	Select the preferred codec for audio compression: • **G.711** • **G.729AB**
Signaling Digit Relay Mode	Select **Off**.
Voice Activity Detection	Select **Off**.
Frame Size	Select the applicable setting: • G.711—**20** • G.729AB—**10** Failure to use the correct setting results in recorded messages containing nothing but silence.
Frames Per Packet	Select the applicable setting: • G.711—**1** • G.729AB—**2** Failure to use the correct setting results in recorded messages containing nothing but silence.
Call Control QOS Byte	Enter **104** (equivalent to DSCP AF31).
RTP QOS Byte	Enter **184** (equivalent to DSCP EF).

Step 12 Select **Apply Changes**.

Step 13 Select the **Gateway Capabilities** tab.

Step 14 Depending on how you have planned to use the voice messaging ports, select the applicable setting for each port in the Telephony Port Capability column.

Table 507: Gateway Capabilities Tab Settings

Telephony Port Capability Settings	Voice Messaging Port Usage
Calls-Only	The port answers incoming calls only and cannot dial out (for example, to set MWIs or send message notifications).
MWIs-Only	The port dial out only (for example, to set MWIs or send message notifications) and cannot answer incoming calls.
Both	The port answers incoming calls and also dial out (for example, to set MWIs or send message notifications).

In setting up the PIMG unit, do not send calls to ports in 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. Otherwise the integration cannot function correctly.

If a port in Unity Connection is disabled, select **No** in the Telephony Port Enabled column for the corresponding port on this tab. Note that changing a setting in the Telephony Port Enabled column requires restarting the PIMG unit.

Step 15 Select **Apply Changes**.

Step 16 On the Configure menu, select **SIP**.

Step 17 On the SIP page, enter the following settings.

Table 508: SIP Page Settings

Field	Setting
Host and Domain Name	Enter the domain name of the PIMG unit.
Server Port	Enter **5060**.
Primary Proxy Server Address	Leave this field blank.
Primary Proxy Server Port	Not applicable. Leave the default setting.
Backup Proxy Server Address	Not applicable. Leave the default setting.
Backup Proxy Server Port	Not applicable. Leave the default setting.
Proxy Query Interval	Enter **10**.
T1 Time	Enter **400**.
T2 Time	Enter **3000**.

Step 18 Select **Apply Changes**.

Step 19 On the Configure menu, select **IP**.

Step 20 On the IP page, enter the following settings.

Table 509: IP Page Settings

Field	Setting
Client IP Address	Enter the new IP address you want to use for the PIMG unit. (This is the IP address that you enter in Cisco Unity Connection Administration when you create the integration.)
Client Subnet Mask	Enter the new subnet mask, if the subnet mask is different from the default IP address.
Default Network Gateway Address	Enter the IP address of the default network gateway router that the PIMG units use.
BOOTP Enabled	Select **No**.

Settings for PIMG Firmware Version 5.x

Step 21 Select **Apply Changes**.

Step 22 On the Configure menu, select **Tones**.

Step 23 On the Tones page, select the **Learn** tab.

Destination addresses cannot be duplicated in the same session. Otherwise, the process for learning tones cannot succeed. If you do not have enough available phones to learn all the tones at one time, you can run multiple sessions to learn tones individually by checking or unchecking the applicable Acquire Tone check boxes.

Step 24 On the Tones page, for the Dialtone event, confirm that the Acquire Tone check box is checked and leave the Destination Address field blank.

Step 25 On the Tones page, for the Busy Tone event, confirm that the Acquire Tone check box is checked and do the following substeps to verify that the tone is correct.

a) From a available phone, call a second phone.
b) Answer the second phone when it rings, and leave both handsets off so that both phones are busy.
c) From a third phone, dial one of the busy phones.
d) Confirm that you hear a busy tone.
e) Hang up the third phone but leave the handsets for the other two phones off.

Step 26 On the Tones page, in the Destination Address field for Busy Tone, enter the extension that you dialed in Step 25c. from the third phone.

Step 27 On the Tones page, for the Error/Reorder Tone event, confirm that the Acquire Tone check box is checked and do the following substeps to verify that the tone is correct.

a) From an available phone, dial an extension that does not exist.
b) Confirm that you hear the reorder or error tone.
c) Hang up the phone.

Step 28 On the Tones page, in the Destination Address field for Error/Reorder Tone, enter the extension that you dialed in Step 27a.

Step 29 On the Tones page, for the Ringback Tone event, confirm that the Acquire Tone check box is checked and do the following substeps to verify that the tone is correct.

a) From an available phone, dial an extension that does exist
b) Confirm that you hear the ringback tone.
c) Hang up the phone.

Step 30 On the Tones page, in the Destination Address field for Ringback Tone, enter the extension that you dialed in Step 29a.

Step 31 Select **Learn**.

Note When running learn tones, the PIMG unit restarts after learning the first tone.

Step 32 When the process is complete, check the check box for each newly learned tone and select **Apply**.

Step 33 Hang up the phones that you used in Step 25.

Step 34 On the Configure menu, select **Restart**.

Step 35 On the Restart page, select **Restart Unit Now**.

Step 36 When the PIMG unit has restarted, in the View menu, select **Refresh**.

Step 37 Repeat Step 1 through Step 36 on all remaining PIMG units.

Analog PIMG Settings for DTMF Integration (Firmware Version 5.x)

Do the following steps to set up the analog PIMG units for a DTMF integration

SUMMARY STEPS

1. On a Windows workstation, sign in to a PIMG unit.
2. On the Configure menu, select **System**.
3. On the System page, enter the following settings.
4. Select **Apply Changes**.
5. On the Configure menu, select **Gateway**.
6. On the Gateway page, select the **Gateway Routing** tab.
7. On the Gateway Routing tab, Unity Connection without a cluster, skip to Step 8. If Unity Connection has a cluster configured, do the following substeps:
8. Under VoIP Endpoint ID, enter the following settings.
9. Select **Apply Changes**.
10. Select the **Gateway Advanced** tab.
11. On the Gateway Advanced tab, enter the following settings.
12. Select **Apply Changes**.
13. Select the **Gateway Capabilities** tab.
14. Depending on how you have planned to use the voice messaging ports, select the applicable setting for each port in the Telephony Port Capability column.
15. Select **Apply Changes**.
16. On the Configure menu, select **SIP**.
17. On the SIP page, enter the following settings.
18. Select **Apply Changes**.
19. On the Configure menu, select **IP**.
20. On the IP page, enter the following settings.
21. Select **Apply Changes**.
22. On the Configure menu, select **Tones**.
23. On the Tones page, select the **Learn** tab.
24. On the Tones page, for the Dialtone event, confirm that the Acquire Tone check box is checked and leave the Destination Address field blank.
25. On the Tones page, for the Busy Tone event, confirm that the Acquire Tone check box is checked and do the following substeps to verify that the tone is correct.
26. On the Tones page, in the Destination Address field for Busy Tone, enter the extension that you dialed in Step 25c. from the third phone.
27. On the Tones page, for the Error/Reorder Tone event, confirm that the Acquire Tone check box is checked and do the following substeps to verify that the tone is correct.
28. On the Tones page, in the Destination Address field for Error/Reorder Tone, enter the extension that you dialed in Step 27a.
29. On the Tones page, for the Ringback Tone event, confirm that the Acquire Tone check box is checked and do the following substeps to verify that the tone is correct.
30. On the Tones page, in the Destination Address field for Ringback Tone, enter the extension that you dialed in Step 29a.
31. Select **Learn**.
32. When the process is complete, check the check box for each newly learned tone and select **Apply**.

Settings for PIMG Firmware Version 5.x

33. Hang up the phones that you used in Step 25.
34. On the Configure menu, select **Restart**.
35. On the Restart page, select **Restart Unit Now**.
36. When the PIMG unit has restarted, in the View menu, select **Refresh**.
37. Repeat Step 1 through Step 36 on all remaining PIMG units.

DETAILED STEPS

Step 1 On a Windows workstation, sign in to a PIMG unit.

Step 2 On the Configure menu, select **System**.

Step 3 On the System page, enter the following settings.

Table 510: System Page Settings

Field	Settings
Operating Mode	Select **SIP**.
PBX Type	Select **None**.
PCM Coding	Select **uLaw**.

Step 4 Select **Apply Changes**.

Step 5 On the Configure menu, select **Gateway**.

Step 6 On the Gateway page, select the **Gateway Routing** tab.

Step 7 On the Gateway Routing tab, Unity Connection without a cluster, skip to Step 8. If Unity Connection has a cluster configured, do the following substeps:

a) In the Fault Tolerance Enabled field, select **Yes**.
b) In the Load Balancing Enabled field, select No.

Step 8 Under VoIP Endpoint ID, enter the following settings.

Note To add endpoints, select **Add New Endpoint**.

Table 511: Gateway Routing Tab Settings

Count	VoIP Endpoint ID
1	*(Unity Connection without a cluster)* Enter the server name of the Unity Connection server. *(Unity Connection with a cluster configured)* Enter the server name of the subscriber server.
2	*(Unity Connection without a cluster)* Enter the server name of the Unity Connection server. *(Unity Connection with a cluster configured)* Enter the server name of the publisher server.

Step 9 Select **Apply Changes**.

Step 10 Select the **Gateway Advanced** tab.

Step 11 On the Gateway Advanced tab, enter the following settings.

Table 512: Gateway Advanced Tab Settings

Field	Settings
Call Connect Mode	Select **OnAnswer**.
Destination for Unroutable IP Calls	Leave this field blank.
Destination for Unroutable PBX Calls	Leave this field blank.
Monitor Call Connections	Select **No**.
Minimum Call Party Delay (msecs)	Enter **500**.
Maximum Call Party Delay (msecs)	Enter **2000**.
Dial Digit on Time (msecs)	Enter **100**.
Dial Inter-Digit Time (msecs)	Enter **100**.
Dial Pause Time (msecs)	Enter **2000**.
Turn MWI On FAC	Enter the code that turns MWIs on.
Turn MWI Off FAC	Enter the code that turns MWIs off.
Outbound Call Connect Timeout (msecs)	Enter **10000**.
Wait for Ringback/Connect on Blind Transfer	Select **Yes**.
Hunt Group Extension	Enter the pilot number of the Unity Connection voice messaging ports.
Audio Compression	Select the preferred codec for audio compression: • **G.711** • **G.729AB**
RTP Digit Relay Mode	Select **RFC2833**.
Signaling Digit Relay Mode	Select **Off**.
Voice Activity Detection	Select **Off**.
Frame Size	Select the applicable setting: • G.711—**20** • G.729AB—**10** Failure to use the correct setting results in recorded messages containing nothing but silence.

Field	Settings
Frames Per Packet	Select the applicable setting: • G.711—**1** • G.729AB—**2** Failure to use the correct setting results in recorded messages containing nothing but silence.
Call Control QOS Byte	Enter **104** (equivalent to DSCP AF31).
RTP QOS Byte	Enter **184** (equivalent to DSCP EF).
SNMP Traps Enabled	Select **No**.
E-mail Alarms Enabled	Select **No**.

Step 12 Select **Apply Changes**.

Step 13 Select the **Gateway Capabilities** tab.

Step 14 Depending on how you have planned to use the voice messaging ports, select the applicable setting for each port in the Telephony Port Capability column.

Table 513: Gateway Capabilities Tab Settings

Telephony Port Capability Settings	Voice Messaging Port Usage
Calls-Only	The port answers incoming calls only and cannot dial out (for example, to set MWIs or send message notifications).
MWIs-Only	The port dial out only (for example, to set MWIs or send message notifications) and cannot answer incoming calls.
Both	The port answers incoming calls and also dial out (for example, to set MWIs or send message notifications).

In setting up the PIMG unit, do not send calls to ports in 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. Otherwise the integration cannot function correctly.

If a port in Unity Connection is disabled, select **No** in the Telephony Port Enabled column for the corresponding port on this tab. Note that changing a setting in the Telephony Port Enabled column requires restarting the PIMG unit.

Step 15 Select **Apply Changes**.

Step 16 On the Configure menu, select **SIP**.

Step 17 On the SIP page, enter the following settings.

Table 514: SIP Page Settings

Field	Settings
Host and Domain Name	Enter the domain name of the PIMG unit.

Field	Settings
Server Port	Enter **5060**.
Transport Type	Select **UDP**.
Call as Domain Name	Select **No**.
Registration Server Address	Leave this field blank.
Registration Server Port	Enter **5060**.
Registration Expiration (sec)	Enter **3600**.
Primary Proxy Server Address	Leave this field blank.
Primary Proxy Server Port	Not applicable. Leave the default setting.
Backup Proxy Server Address	Not applicable. Leave the default setting.
Backup Proxy Server Port	Not applicable. Leave the default setting.
Proxy Query Interval	Enter **10**.
T1 Time (msecs)	Enter **400**.
T2 Time (msecs)	Enter **3000**.
Invite Expiration (sec)	Enter **120**.

Step 18 Select **Apply Changes**.

Step 19 On the Configure menu, select **IP**.

Step 20 On the IP page, enter the following settings.

Table 515: IP Page Settings

Field	Settings
Client IP Address	Enter the new IP address you want to use for the PIMG unit. (This is the IP address that you enter in Cisco Unity Connection Administration when you create the integration.)
Client Subnet Mask	Enter the new subnet mask, if the subnet mask is different from the default IP address.
Default Network Gateway Address	Enter the IP address of the default network gateway router that the PIMG units use.
BOOTP Enabled	Select **No**.

Step 21 Select **Apply Changes**.

Step 22 On the Configure menu, select **Tones**.

Step 23 On the Tones page, select the **Learn** tab.

Destination addresses cannot be duplicated in the same session. Otherwise, the process for learning tones cannot succeed. If you do not have enough available phones to learn all the tones at one time, you can run multiple sessions to learn tones individually by checking or unchecking the applicable Acquire Tone check boxes.

Step 24 On the Tones page, for the Dialtone event, confirm that the Acquire Tone check box is checked and leave the Destination Address field blank.

Step 25 On the Tones page, for the Busy Tone event, confirm that the Acquire Tone check box is checked and do the following substeps to verify that the tone is correct.

a) From an available phone, call a second phone.
b) Answer the second phone when it rings, and leave both handsets off so that both phones are busy.
c) From a third phone, dial one of the busy phones.
d) Confirm that you hear a busy tone.
e) Hang up the third phone but leave the handsets for the other two phones off.

Step 26 On the Tones page, in the Destination Address field for Busy Tone, enter the extension that you dialed in Step 25c. from the third phone.

Step 27 On the Tones page, for the Error/Reorder Tone event, confirm that the Acquire Tone check box is checked and do the following substeps to verify that the tone is correct.

a) From an available phone, dial an extension that does not exist.
b) Confirm that you hear the reorder or error tone.
c) Hang up the phone.

Step 28 On the Tones page, in the Destination Address field for Error/Reorder Tone, enter the extension that you dialed in Step 27a.

Step 29 On the Tones page, for the Ringback Tone event, confirm that the Acquire Tone check box is checked and do the following substeps to verify that the tone is correct.

a) From an available phone, dial an extension that does exist
b) Confirm that you hear the ringback tone.
c) Hang up the phone.

Step 30 On the Tones page, in the Destination Address field for Ringback Tone, enter the extension that you dialed in Step 29a.

Step 31 Select **Learn**.

Note When running learn tones, the PIMG unit restarts after learning the first tone.

Step 32 When the process is complete, check the check box for each newly learned tone and select **Apply**.

Step 33 Hang up the phones that you used in Step 25.

Step 34 On the Configure menu, select **Restart**.

Step 35 On the Restart page, select **Restart Unit Now**.

Step 36 When the PIMG unit has restarted, in the View menu, select **Refresh**.

Step 37 Repeat Step 1 through Step 36 on all remaining PIMG units.

Analog PIMG Settings for Serial Integration (Firmware Version 5.x)

Do the following steps to set up the analog PIMG units for a Serial integration

SUMMARY STEPS

1. On a Windows workstation, sign in to a PIMG unit.
2. On the Configure menu, select **System**.
3. On the System page, enter the following settings.
4. Select **Apply Changes**.
5. On the Configure menu, select **Gateway**.
6. On the Gateway page, select the **Gateway Routing** tab.
7. On the Gateway Routing tab, Unity Connection without a cluster, skip to Step 8. If Unity Connection has a cluster configured, do the following substeps:
8. Under VoIP Endpoint ID, enter the following settings.
9. Select **Apply Changes**.
10. Select the **Gateway Advanced** tab.
11. On the Gateway Advanced tab, enter the following settings.
12. Select **Apply Changes**.
13. Select the **Gateway Capabilities** tab.
14. Depending on how you have planned to use the voice messaging ports, select the applicable setting for each port in the Telephony Port Capability column.
15. Select **Apply Changes**.
16. On the Configure menu, select **Serial Protocol**.
17. On the Serial Protocol page, enter the following settings.
18. Select **Apply Changes**.
19. On the Configure menu, select **SIP**.
20. On the SIP page, enter the following settings.
21. Select **Apply Changes**.
22. On the Configure menu, select **IP**.
23. On the IP page, enter the following settings.
24. Select **Apply Changes**.
25. On the Configure menu, select **Tones**.
26. On the Tones page, select the **Learn** tab.
27. On the Tones page, for the Dialtone event, confirm that the Acquire Tone check box is checked and leave the Destination Address field blank.
28. On the Tones page, for the Busy Tone event, confirm that the Acquire Tone check box is checked and do the following substeps to verify that the tone is correct.
29. On the Tones page, in the Destination Address field for Busy Tone, enter the extension that you dialed in Step 28c. from the third phone.
30. On the Tones page, for the Error/Reorder Tone event, confirm that the Acquire Tone check box is checked and do the following substeps to verify that the tone is correct.
31. On the Tones page, in the Destination Address field for Error/Reorder Tone, enter the extension that you dialed in Step 30a.
32. On the Tones page, for the Ringback Tone event, confirm that the Acquire Tone check box is checked and do the following substeps to verify that the tone is correct.
33. On the Tones page, in the Destination Address field for Ringback Tone, enter the extension that you dialed in Step 32a.
34. Select **Learn**.
35. When the process is complete, check the check box for each newly learned tone and select **Apply**.
36. Hang up the phones that you used in Step 28.

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37. On the Configure menu, select **Restart**.
38. On the Restart page, select **Restart Unit Now**.
39. When the PIMG unit has restarted, in the View menu, select **Refresh**.
40. Repeat Step 1 through Step 39 on all remaining PIMG units.

DETAILED STEPS

Step 1 On a Windows workstation, sign in to a PIMG unit.

Step 2 On the Configure menu, select **System**.

Step 3 On the System page, enter the following settings.

Table 516: System Page Settings

Field	Setting
Operating Mode	Select **SIP**.
PCM Coding	Select **uLaw**.
Serial Port Baud Rate	Select the setting that is configured on the phone system. The default setting is 9600.
Serial Port Parity	Select the setting that is configured on the phone system. The default setting is None.
Serial Port Data Bits	Select the setting that is configured on the phone system. The default setting is 8.
Serial Port Stop Bits	Select the setting that is configured on the phone system. The default setting is 1.

Step 4 Select **Apply Changes**.

Step 5 On the Configure menu, select **Gateway**.

Step 6 On the Gateway page, select the **Gateway Routing** tab.

Step 7 On the Gateway Routing tab, Unity Connection without a cluster, skip to Step 8. If Unity Connection has a cluster configured, do the following substeps:

a) In the Fault Tolerance Enabled field, select **Yes**.
b) In the Load Balancing Enabled field, select No.

Step 8 Under VoIP Endpoint ID, enter the following settings.

Note To add endpoints, select **Add New Endpoint**.

Table 517: Gateway Routing Tab Settings

Count	VoIP Endpoint ID
1	*(Unity Connection without a cluster)* Enter the server name of the Unity Connection server. *(Unity Connection with a cluster configured)* Enter the server name of the subscriber server.
2	*(Unity Connection without a cluster)* Enter the server name of the Unity Connection server. *(Unity Connection with a cluster configured)* Enter the server name of the publisher server.

Step 9 Select **Apply Changes**.

Step 10 Select the **Gateway Advanced** tab.

Step 11 On the Gateway Advanced tab, enter the following settings.

Table 518: Gateway Advanced Tab Settings

Field	Settings
Advanced Call Routing	
Call Connect Mode	Select **OnAnswer**.
Destination for Unroutable IP Calls	Leave this field blank.
Destination for Unroutable PBX Calls	Leave this field blank.
Monitor Call Connections	Select **No**.
Telephony	
Minimum Call Party Delay	Enter **500**.
Maximum Call Party Delay	Enter **2000**.
Dial Digit on Time	Enter **100**.
Dial Inter-Digit Time	Enter **100**.
Dial Pause Time	Enter **2000**.
Turn MWI On FAC	Leave this field blank.
Turn MWI Off FAC	Leave this field blank.
Outbound Call Connect Timeout	Enter **10000**.
Wait for Ringback/Connect on Blind Transfer	Select **Yes**.
Hunt Group Extension	Enter the pilot number of the Unity Connection voice messaging ports.

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Field	Settings
Audio	
Audio Compression	Select the preferred codec for audio compression: • **G.711** • **G.729AB**
RTP Digit Relay Mode	Select **RFC2833**.
Signaling Digit Relay Mode	Select **Off**.
Voice Activity Detection	Select **Off**.
Frame Size	Select the applicable setting: • G.711—**20** • G.729AB—**10** Failure to use the correct setting results in recorded messages containing nothing but silence.
Frames Per Packet	Select the applicable setting: • G.711—**1** • G.729AB—**2** Failure to use the correct setting results in recorded messages containing nothing but silence.
Quality of Service	
Call Control QOS Byte	Enter **104** (equivalent to DSCP AF31).
RTP QOS Byte	Enter **184** (equivalent to DSCP EF).
Traps and Alarms	
E-mail Alarms Enabled	Select **No**.
SNMP Traps Enabled	Select **No**.

Step 12 Select **Apply Changes**.

Step 13 Select the **Gateway Capabilities** tab.

Step 14 Depending on how you have planned to use the voice messaging ports, select the applicable setting for each port in the Telephony Port Capability column.

Table 519: Gateway Capabilities Tab Settings

Telephony Port Capability Settings	Voice Messaging Port Usage
Calls-Only	The port answers incoming calls only and cannot dial out (for example, to set MWIs or send message notifications).
MWIs-Only	The port dial out only (for example, to set MWIs or send message notifications) and cannot answer incoming calls.
Both	The port answers incoming calls and also dial out (for example, to set MWIs or send message notifications).

In setting up the PIMG unit, do not send calls to ports in 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. Otherwise the integration cannot function correctly.

If a port in Unity Connection is disabled, select **No** in the Telephony Port Enabled column for the corresponding port on this tab. Note that changing a setting in the Telephony Port Enabled column requires restarting the PIMG unit.

Step 15 Select **Apply Changes**.

Step 16 On the Configure menu, select **Serial Protocol**.

Step 17 On the Serial Protocol page, enter the following settings.

Table 520: Serial Protocol Page Settings

Field	Setting
Serial Mode	Select the applicable setting: • **Master**—Select this setting when this PIMG unit is connected to the data link serial cable from the phone system. There can be only one master PIMG unit in a phone system integration. • **Slave**—Select this setting when this PIMG unit is not connected to the data link serial cable from the phone system. There can be multiple slave PIMG units in a phone system integration.
Serial Interface Protocol	Select the serial protocol that your phone system uses: • **SMDI** • **MCI** • **MD-110**
Cpid Len	Select the applicable setting. Typically, the settings are 7 or 10.
Cpid Padding String	Enter the applicable string or leave this field blank. Typically, the setting is one of the following: • A string of zeros, where the number of zeros matches the setting of the Cpid Len field. • A prefix that is provided by the Centrex service.

Field	Setting
Voice Mail Port Len	If the setting of the Serial Interface Protocol field is MD-110, enter **2**. Otherwise, accept the default of **7**.
System Number	Enter the applicable setting. Typically, the setting is 1.
MWI Response Timeout	Enter **2000**.
IP Address of Serial Server	If the PIMG unit is the master, leave this field blank. If the PIMG unit is a slave, enter the IP address of the master PIMG unit (the PIMG unit that is connected to the data link serial cable from the phone system).
Serial Cpid Expiration	Enter **2000**.
Logical Extension Number	If the setting of the Serial Interface Protocol field is MCI or MD-110, enter the extension number for each port on the PIMG unit. If the setting of the Serial Interface Protocol field is SMDI, enter the logical port number. Typically, the setting is 1 for port 1, 2 for port 2, and so on beginning with the master PIMG unit and continuing through each of the slave PIMG units.

Step 18 Select **Apply Changes**.

Step 19 On the Configure menu, select **SIP**.

Step 20 On the SIP page, enter the following settings.

Table 521: SIP Page Settings

Field	Setting
Host and Domain Name	Enter the domain name of the PIMG unit. This setting must match the name of the port group in Cisco Unity Connection Administration that has the voice messaging ports connecting to the PIMG unit.
Server Port	Enter **5060**.
Primary Proxy Server Address	Leave this field blank.
Primary Proxy Server Port	Not applicable. Leave the default setting.
Backup Proxy Server Address	Not applicable. Leave the default setting.
Backup Proxy Server Port	Not applicable. Leave the default setting.
Proxy Query Interval	Enter **10**.
T1 Time	Enter **400**.
T2 Time	Enter **3000**.

Step 21 Select **Apply Changes**.

Step 22 On the Configure menu, select **IP**.

Step 23 On the IP page, enter the following settings.

Table 522: IP Page Settings

Field	Setting
Client IP Address	Enter the new IP address you want to use for the PIMG unit. (This is the IP address that you enter in Cisco Unity Connection Administration when you create the integration.)
Client Subnet Mask	Enter the new subnet mask, if the subnet mask is different from the default IP address.
Default Network Gateway Address	Enter the IP address of the default network gateway router that the PIMG units use.
BOOTP Enabled	Select **No**.

Step 24 Select **Apply Changes**.

Step 25 On the Configure menu, select **Tones**.

Step 26 On the Tones page, select the **Learn** tab.

Destination addresses cannot be duplicated in the same session. Otherwise, the process for learning tones do not succeed. If you do not have enough available phones to learn all the tones at one time, you can run multiple sessions to learn tones individually by checking or unchecking the applicable Acquire Tone check boxes.

Step 27 On the Tones page, for the Dialtone event, confirm that the Acquire Tone check box is checked and leave the Destination Address field blank.

Step 28 On the Tones page, for the Busy Tone event, confirm that the Acquire Tone check box is checked and do the following substeps to verify that the tone is correct.

a) From a available phone, call a second phone.
b) Answer the second phone when it rings, and leave both handsets off so that both phones are busy.
c) From a third phone, dial one of the busy phones.
d) Confirm that you hear a busy tone.
e) Hang up the third phone but leave the handsets for the other two phones off.

Step 29 On the Tones page, in the Destination Address field for Busy Tone, enter the extension that you dialed in Step 28c. from the third phone.

Step 30 On the Tones page, for the Error/Reorder Tone event, confirm that the Acquire Tone check box is checked and do the following substeps to verify that the tone is correct.

a) From an available phone, dial an extension that does not exist.
b) Confirm that you hear the reorder or error tone.
c) Hang up the phone.

Step 31 On the Tones page, in the Destination Address field for Error/Reorder Tone, enter the extension that you dialed in Step 30a.

Step 32 On the Tones page, for the Ringback Tone event, confirm that the Acquire Tone check box is checked and do the following substeps to verify that the tone is correct.

a) From an available phone, dial an extension that does exist.
b) Confirm that you hear the ringback tone.
c) Hang up the phone.

Step 33 On the Tones page, in the Destination Address field for Ringback Tone, enter the extension that you dialed in Step 32a.

Step 34 Select **Learn**.

Note When running learn tones, the PIMG unit restarts after learning the first tone.

Step 35 When the process is complete, check the check box for each newly learned tone and select **Apply**.

Step 36 Hang up the phones that you used in Step 28.

Step 37 On the Configure menu, select **Restart**.

Step 38 On the Restart page, select **Restart Unit Now**.

Step 39 When the PIMG unit has restarted, in the View menu, select **Refresh**.

Step 40 Repeat Step 1 through Step 39 on all remaining PIMG units.

Digital Mitel PIMG Settings (Firmware Version 5.x)

Do the following steps to set up the digital Mitel PIMG units

SUMMARY STEPS

1. On a Windows workstation, sign in to a PIMG unit.
2. On the Configure menu, select **System**.
3. On the System page, enter the following settings.
4. Select **Apply Changes**.
5. On the Configure menu, select **Gateway**.
6. On the Gateway page, select the **Gateway Routing** tab.
7. On the Gateway Routing tab, Unity Connection without a cluster, skip to Step 8. If Unity Connection has a cluster configured, do the following substeps:
8. Under VoIP Endpoint ID, enter the following settings.
9. Select **Apply Changes**.
10. Select the **Gateway Advanced** tab.
11. On the Gateway Advanced tab, enter the following settings.
12. Select **Apply Changes**.
13. Select the **Gateway Capabilities** tab.
14. Depending on how you have planned to use the voice messaging ports, select the applicable setting for each port in the Telephony Port Capability column.
15. Select **Apply Changes**.
16. On the Configure menu, select **SIP**.
17. On the SIP page, enter the following settings.
18. Select **Apply Changes**.
19. On the Configure menu, select **IP**.
20. On the IP page, enter the following settings.
21. Select **Apply Changes**.

22. On the Configure menu, select **Tones**.
23. On the Tones page, select the **Learn** tab.
24. On the Tones page, for the Dialtone event, confirm that the Acquire Tone check box is checked and leave the Destination Address field blank.
25. On the Tones page, for the Busy Tone event, confirm that the Acquire Tone check box is checked and do the following substeps to verify that the tone is correct.
26. On the Tones page, in the Destination Address field for Busy Tone, enter the extension that you dialed in Step 25c. from the third phone.
27. On the Tones page, for the Error/Reorder Tone event, confirm that the Acquire Tone check box is checked and do the following substeps to verify that the tone is correct.
28. On the Tones page, in the Destination Address field for Error/Reorder Tone, enter the extension that you dialed in Step 27a.
29. On the Tones page, for the Ringback Tone event, confirm that the Acquire Tone check box is checked and do the following substeps to verify that the tone is correct.
30. On the Tones page, in the Destination Address field for Ringback Tone, enter the extension that you dialed in Step 29a.
31. Select **Learn**.
32. When the process is complete, check the check box for each newly learned tone and select **Apply**.
33. Hang up the phones that you used in Step 25.
34. On the Configure menu, select **Restart**.
35. On the Restart page, select **Restart Unit Now**.
36. When the PIMG unit has restarted, in the View menu, select **Refresh**.
37. Repeat Step 1 through Step 36 on all remaining PIMG units.

DETAILED STEPS

Step 1 On a Windows workstation, sign in to a PIMG unit.

Step 2 On the Configure menu, select **System**.

Step 3 On the System page, enter the following settings.

Table 523: System Page Settings

Field	Setting
Operating Mode	Select **SIP**.
PBX Type	(This setting does not apply.)
PCM Coding	Select **uLaw**.

Step 4 Select **Apply Changes**.

Step 5 On the Configure menu, select **Gateway**.

Step 6 On the Gateway page, select the **Gateway Routing** tab.

Step 7 On the Gateway Routing tab, Unity Connection without a cluster, skip to Step 8. If Unity Connection has a cluster configured, do the following substeps:

a) In the Fault Tolerance Enabled field, select **Yes**.
b) In the Load Balancing Enabled field, select No.

Step 8 Under VoIP Endpoint ID, enter the following settings.

Note To add endpoints, select **Add New Endpoint**.

Table 524: Gateway Routing Tab Settings

Count	VoIP Endpoint ID
1	*(Unity Connection without a cluster)* Enter the server name of the Unity Connection server. *(Unity Connection with a cluster configured)* Enter the server name of the subscriber server.
2	*(Unity Connection without a cluster)* Enter the server name of the Unity Connection server. *(Unity Connection with a cluster configured)* Enter the server name of the publisher server.

Step 9 Select **Apply Changes**.

Step 10 Select the **Gateway Advanced** tab.

Step 11 On the Gateway Advanced tab, enter the following settings.

Table 525: Gateway Advanced Tab Settings

Field	Settings
Call Connect Mode	Select **OnAnswer**.
Destination for Unroutable PBX Calls	Enter the extension of an attendant who receive calls to Unity Connection that are unanswered.
Minimum Call Party Delay (msecs)	Enter **500**.
Turn MWI On FAC	Enter the code that turns MWIs on.
Turn MWI Off FAC	Enter the code that turns MWIs off.
Wait for Ringback/Connect on Blind Transfer	Select **Yes**.
Hunt Group Extension	Enter the pilot number of the Unity Connection voice messaging ports.
Audio Compression	Select the preferred codec for audio compression: • **G.711** • **G.729AB**
Signaling Digit Relay Mode	Select **Off**.
Voice Activity Detection	Select **Off**.

Field	Settings
Frame Size	Select the applicable setting: • G.711—**20** • G.729AB—**10** Failure to use the correct setting results in recorded messages containing nothing but silence.
Frames Per Packet	Select the applicable setting: • G.711—**1** • G.729AB—**2** Failure to use the correct setting results in recorded messages containing nothing but silence.
Call Control QOS Byte	Enter **104** (equivalent to DSCP AF31).
RTP QOS Byte	Enter **184** (equivalent to DSCP EF).

Step 12 Select **Apply Changes**.

Step 13 Select the **Gateway Capabilities** tab.

Step 14 Depending on how you have planned to use the voice messaging ports, select the applicable setting for each port in the Telephony Port Capability column.

Table 526: Gateway Capabilities Tab Settings

Telephony Port Capability Settings	Voice Messaging Port Usage
Calls-Only	The port answer incoming calls only and cannot dial out (for example, to set MWIs or send message notifications).
MWIs-Only	The port dial out only (for example, to set MWIs or send message notifications) and cannot answer incoming calls.
Both	The port answers incoming calls and also dial out (for example, to set MWIs or send message notifications).

In setting up the PIMG unit, do not send calls to ports in 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. Otherwise the integration cannot function correctly.

If a port in Unity Connection is disabled, select **No** in the Telephony Port Enabled column for the corresponding port on this tab. Note that changing a setting in the Telephony Port Enabled column requires restarting the PIMG unit.

Step 15 Select **Apply Changes**.

Step 16 On the Configure menu, select **SIP**.

Step 17 On the SIP page, enter the following settings.

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Table 527: SIP Page Settings

Field	Setting
Host and Domain Name	Enter the domain name of the PIMG unit.
Server Port	Enter **5060**.
Primary Proxy Server Address	Leave this field blank.
Primary Proxy Server Port	Not applicable. Leave the default setting.
Backup Proxy Server Address	Not applicable. Leave the default setting.
Backup Proxy Server Port	Not applicable. Leave the default setting.
Proxy Query Interval	Enter **10**.
T1 Time	Enter **400**.
T2 Time	Enter **3000**.

Step 18 Select **Apply Changes**.

Step 19 On the Configure menu, select **IP**.

Step 20 On the IP page, enter the following settings.

Table 528: IP Page Settings

Field	Setting
Client IP Address	Enter the new IP address you want to use for the PIMG unit. (This is the IP address that you enter in Cisco Unity Connection Administration when you create the integration.)
Client Subnet Mask	Enter the new subnet mask, if the subnet mask is different from the default IP address.
Default Network Gateway Address	Enter the IP address of the default network gateway router that the PIMG units use.
BOOTP Enabled	Select **No**.

Step 21 Select **Apply Changes**.

Step 22 On the Configure menu, select **Tones**.

Step 23 On the Tones page, select the **Learn** tab.

Destination addresses cannot be duplicated in the same session. Otherwise, the process for learning tones cannot succeed. If you do not have enough available phones to learn all the tones at one time, you can run multiple sessions to learn tones individually by checking or unchecking the applicable Acquire Tone check boxes.

Step 24 On the Tones page, for the Dialtone event, confirm that the Acquire Tone check box is checked and leave the Destination Address field blank.

Step 25 On the Tones page, for the Busy Tone event, confirm that the Acquire Tone check box is checked and do the following substeps to verify that the tone is correct.

a) From a available phone, call a second phone.
b) Answer the second phone when it rings, and leave both handsets off so that both phones are busy.
c) From a third phone, dial one of the busy phones.
d) Confirm that you hear a busy tone.
e) Hang up the third phone but leave the handsets for the other two phones off.

Step 26 On the Tones page, in the Destination Address field for Busy Tone, enter the extension that you dialed in Step 25c. from the third phone.

Step 27 On the Tones page, for the Error/Reorder Tone event, confirm that the Acquire Tone check box is checked and do the following substeps to verify that the tone is correct.

a) From an available phone, dial an extension that does not exist.
b) Confirm that you hear the reorder or error tone.
c) Hang up the phone.

Step 28 On the Tones page, in the Destination Address field for Error/Reorder Tone, enter the extension that you dialed in Step 27a.

Step 29 On the Tones page, for the Ringback Tone event, confirm that the Acquire Tone check box is checked and do the following substeps to verify that the tone is correct.

a) From an available phone, dial an extension that does exist.
b) Confirm that you hear the ringback tone.
c) Hang up the phone.

Step 30 On the Tones page, in the Destination Address field for Ringback Tone, enter the extension that you dialed in Step 29a.

Step 31 Select **Learn**.

Note When running learn tones, the PIMG unit restarts after learning the first tone.

Step 32 When the process is complete, check the check box for each newly learned tone and select **Apply**.

Step 33 Hang up the phones that you used in Step 25.

Step 34 On the Configure menu, select **Restart**.

Step 35 On the Restart page, select **Restart Unit Now**.

Step 36 When the PIMG unit has restarted, in the View menu, select **Refresh**.

Step 37 Repeat Step 1 through Step 36 on all remaining PIMG units.

Digital Rolm PIMG Settings (Firmware Version 5.x)

Do the following steps to set up the digital Rolm PIMG units

SUMMARY STEPS

1. On a Windows workstation, sign in to a PIMG unit.
2. On the Configure menu, select **System**.
3. On the System page, enter the following settings.
4. Select **Apply Changes**.
5. On the Configure menu, select **Gateway**.

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6. On the Gateway page, select the **Gateway Routing** tab.
7. On the Gateway Routing tab, Unity Connection without a cluster, skip to Step 8. If Unity Connection has a cluster configured, do the following substeps:
8. Under VoIP Endpoint ID, enter the following settings.
9. Select **Apply Changes**.
10. Select the **Gateway Advanced** tab.
11. On the Gateway Advanced tab, enter the following settings.
12. Select **Apply Changes**.
13. Select the **Gateway Capabilities** tab.
14. Depending on how you have planned to use the voice messaging ports, select the applicable setting for each port in the Telephony Port Capability column.
15. Select **Apply Changes**.
16. On the Configure menu, select **SIP**.
17. On the SIP page, enter the following settings.
18. Select **Apply Changes**.
19. On the Configure menu, select **IP**.
20. On the IP page, enter the following settings.
21. Select **Apply Changes**.
22. On the Configure menu, select **Tones**.
23. On the Tones page, select the **Learn** tab.
24. On the Tones page, for the Dialtone event, confirm that the Acquire Tone check box is checked and leave the Destination Address field blank.
25. On the Tones page, for the Busy Tone event, confirm that the Acquire Tone check box is checked and do the following substeps to verify that the tone is correct.
26. On the Tones page, in the Destination Address field for Busy Tone, enter the extension that you dialed in Step 25c. from the third phone.
27. On the Tones page, for the Error/Reorder Tone event, confirm that the Acquire Tone check box is checked and do the following substeps to verify that the tone is correct.
28. On the Tones page, in the Destination Address field for Error/Reorder Tone, enter the extension that you dialed in Step 27a.
29. On the Tones page, for the Ringback Tone event, confirm that the Acquire Tone check box is checked and do the following substeps to verify that the tone is correct.
30. On the Tones page, in the Destination Address field for Ringback Tone, enter the extension that you dialed in Step 29a.
31. Select **Learn**.
32. When the process is complete, check the check box for each newly learned tone and select **Apply**.
33. Hang up the phones that you used in Step 25.
34. On the Configure menu, select **Restart**.
35. On the Restart page, select **Restart Unit Now**.
36. When the PIMG unit has restarted, in the View menu, select **Refresh**.
37. Repeat Step 1 through Step 36 on all remaining PIMG units.

DETAILED STEPS

Step 1 On a Windows workstation, sign in to a PIMG unit.

Step 2 On the Configure menu, select **System**.

Step 3 On the System page, enter the following settings.

Table 529: System Page Settings

Field	Setting
Operating Mode	Select **SIP**.
PBX Type	Depending on your phone system, select one of the following: • **Rolm_9751_SW9005** • **Rolm_9751_SW9006**
PCM Coding	Select **uLaw**.

Step 4 Select **Apply Changes**.

Step 5 On the Configure menu, select **Gateway**.

Step 6 On the Gateway page, select the **Gateway Routing** tab.

Step 7 On the Gateway Routing tab, Unity Connection without a cluster, skip to Step 8. If Unity Connection has a cluster configured, do the following substeps:

a) In the Fault Tolerance Enabled field, select **Yes**.

b) In the Load Balancing Enabled field, select No.

Step 8 Under VoIP Endpoint ID, enter the following settings.

Note To add endpoints, select **Add New Endpoint**.

Table 530: Gateway Routing Tab Settings

Count	VoIP Endpoint ID
1	*(Unity Connection without a cluster)* Enter the server name of the Unity Connection server. *(Unity Connection with a cluster configured)* Enter the server name of the subscriber server.
2	*(Unity Connection without a cluster)* Enter the server name of the Unity Connection server. *(Unity Connection with a cluster configured)* Enter the server name of the publisher server.

Step 9 Select **Apply Changes**.

Step 10 Select the **Gateway Advanced** tab.

Step 11 On the Gateway Advanced tab, enter the following settings.

Table 531: Gateway Advanced Tab Settings

Field	Settings
Call Connect Mode	Select **OnAnswer**.
Destination for Unroutable PBX Calls	Enter the extension of an attendant who receives calls to Unity Connection that are unanswered.
Minimum Call Party Delay (msecs)	Enter **500**.
Turn MWI On FAC	Leave this field blank.
Turn MWI Off FAC	Leave this field blank.
Wait for Ringback/Connect on Blind Transfer	Select **Yes**.
Hunt Group Extension	Enter the pilot number of the Unity Connection voice messaging ports.
Audio Compression	Select the preferred codec for audio compression: • **G.711** • **G.729AB**
Signaling Digit Relay Mode	Select **Off**.
Voice Activity Detection	Select **Off**.
Frame Size	Select the applicable setting: • G.711—**20** • G.729AB—**10** Failure to use the correct setting results in recorded messages containing nothing but silence.
Frames Per Packet	Select the applicable setting: • G.711—**1** • G.729AB—**2** Failure to use the correct setting results in recorded messages containing nothing but silence.
Call Control QOS Byte	Enter **104** (equivalent to DSCP AF31).
RTP QOS Byte	Enter **184** (equivalent to DSCP EF).

Step 12 Select **Apply Changes**.

Step 13 Select the **Gateway Capabilities** tab.

Step 14 Depending on how you have planned to use the voice messaging ports, select the applicable setting for each port in the Telephony Port Capability column.

Table 532: Gateway Capabilities Tab Settings

Telephony Port Capability Settings	Voice Messaging Port Usage
Calls-Only	The port answers incoming calls only and cannot dial out (for example, to set MWIs or send message notifications).
MWIs-Only	The port dial out only (for example, to set MWIs or send message notifications) and cannot answer incoming calls.
Both	The port answers incoming calls and also dial out (for example, to set MWIs or send message notifications).

In setting up the PIMG unit, do not send calls to ports in 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. Otherwise the integration cannot function correctly.

If a port in Unity Connection is disabled, select **No** in the Telephony Port Enabled column for the corresponding port on this tab. Note that changing a setting in the Telephony Port Enabled column requires restarting the PIMG unit.

Step 15 Select **Apply Changes**.

Step 16 On the Configure menu, select **SIP**.

Step 17 On the SIP page, enter the following settings.

Table 533: SIP Page Settings

Field	Setting
Host and Domain Name	Enter the domain name of the PIMG unit.
Server Port	Enter **5060**.
Primary Proxy Server Address	Leave this field blank.
Primary Proxy Server Port	Not applicable. Leave the default setting.
Backup Proxy Server Address	Not applicable. Leave the default setting.
Backup Proxy Server Port	Not applicable. Leave the default setting.
Proxy Query Interval	Enter **10**.
T1 Time	Enter **400**.
T2 Time	Enter **3000**.

Step 18 Select **Apply Changes**.

Step 19 On the Configure menu, select **IP**.

Step 20 On the IP page, enter the following settings.

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Table 534: IP Page Settings

Field	Setting
Client IP Address	Enter the new IP address you want to use for the PIMG unit. (This is the IP address that you enter in Cisco Unity Connection Administration when you create the integration.)
Client Subnet Mask	Enter the new subnet mask, if the subnet mask is different from the default IP address.
Default Network Gateway Address	Enter the IP address of the default network gateway router that the PIMG units use.
BOOTP Enabled	Select **No**.

Step 21 Select **Apply Changes**.

Step 22 On the Configure menu, select **Tones**.

Step 23 On the Tones page, select the **Learn** tab.

Destination addresses cannot be duplicated in the same session. Otherwise, the process for learning tones cannot succeed. If you do not have enough available phones to learn all the tones at one time, you can run multiple sessions to learn tones individually by checking or unchecking the applicable Acquire Tone check boxes.

Step 24 On the Tones page, for the Dialtone event, confirm that the Acquire Tone check box is checked and leave the Destination Address field blank.

Step 25 On the Tones page, for the Busy Tone event, confirm that the Acquire Tone check box is checked and do the following substeps to verify that the tone is correct.

a) From a available phone, call a second phone.
b) Answer the second phone when it rings, and leave both handsets off so that both phones are busy.
c) From a third phone, dial one of the busy phones.
d) Confirm that you hear a busy tone.
e) Hang up the third phone but leave the handsets for the other two phones off.

Step 26 On the Tones page, in the Destination Address field for Busy Tone, enter the extension that you dialed in Step 25c. from the third phone.

Step 27 On the Tones page, for the Error/Reorder Tone event, confirm that the Acquire Tone check box is checked and do the following substeps to verify that the tone is correct.

a) From an available phone, dial an extension that does not exist.
b) Confirm that you hear the reorder or error tone.
c) Hang up the phone.

Step 28 On the Tones page, in the Destination Address field for Error/Reorder Tone, enter the extension that you dialed in Step 27a.

Step 29 On the Tones page, for the Ringback Tone event, confirm that the Acquire Tone check box is checked and do the following substeps to verify that the tone is correct.

a) From an available phone, dial an extension that does exist.
b) Confirm that you hear the ringback tone.
c) Hang up the phone.

Step 30 On the Tones page, in the Destination Address field for Ringback Tone, enter the extension that you dialed in Step 29a.

Step 31 Select **Learn**.

Note When running learn tones, the PIMG unit restarts after learning the first tone.

Step 32 When the process is complete, check the check box for each newly learned tone and select **Apply**.

Step 33 Hang up the phones that you used in Step 25.

Step 34 On the Configure menu, select **Restart**.

Step 35 On the Restart page, select **Restart Unit Now**.

Step 36 When the PIMG unit has restarted, in the View menu, select **Refresh**.

Step 37 Repeat Step 1 through Step 36 on all remaining PIMG units.

Settings for PIMG Firmware Version 5.x