CHAPTER 11

Setting Up a Serial (SMDI, MCI, or MD-110) PIMG Integration with Cisco Unity Connection

For detailed instructions for setting up a serial (SMDI, MCI, or MD-110) PIMG integration with Cisco Unity Connection, see the following sections in this chapter:

Task List to Create a Serial (SMDI, MCI, or MD-110) PIMG Integration

Before doing the following tasks to integrate Cisco Unity Connection with the 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 *Cisco Unity Connection Installation Guide*.

1. Review the system and equipment requirements to confirm that all phone system and Cisco Unity Connection server requirements have been met. See the "Requirements" section on page 11-2.
2. Plan how the voice messaging ports will be used by Cisco Unity Connection. See Chapter 2, "Planning How the Voice Messaging Ports Will Be Used by Cisco Unity Connection."
3. Program the phone system and extensions. See the "Programming the Phone System for a Serial Integration with Cisco Unity Connection" section on page 11-3.
4. Set up the PIMG units. See the "Setting Up the Analog PIMG Units for a Serial Integration" section on page 11-4.
5. Create the integration. See the "Creating a New Integration with the Phone System" section on page 11-19.
6. Test the integration. See Chapter 14, "Testing the Integration."
7. If this integration is a second or subsequent integration, add the applicable new user templates for the new phone system. See Chapter 15, "Adding New User Template for Multiple Integrations."

Requirements

The serial (SMDI, MCI, or MD-110) PIMG 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 Chapter 1, "Introduction."
- 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 Cisco 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.

Cisco Unity Connection Server

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

Centralized Voice Messaging

Cisco Unity Connection supports centralized voice messaging through the phone system, which supports various inter-phone system networking protocols including proprietary protocols such as Avaya DCS, Nortel MCDN, or Siemens CorNet, and standards-based protocols such as QSIG or DPNSS. Note that centralized voice messaging is a function of the phone system and its inter-phone system networking, not voice mail. Connection will support centralized voice messaging as long as the phone system and its inter-phone system networking are properly configured. For details, see the "Centralized Voice Messaging" section in the "Integrating Cisco Unity Connection with the Phone System" chapter of the *Cisco Unity Design Guide Release 7.x* at http://www.cisco.com/en/US/docs/voice_ip_comm/connection/7x/design/guide/7xcucdg.html.

Programming the Phone System for a Serial Integration with Cisco Unity Connection

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 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 Perform Message Notification, do not send calls to it.

Instruct the phone system technician to set up the phone system in the manner as directed in the following procedure.

To Program the Phone System for a Serial Integration with Cisco 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 Cisco 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 Cisco 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 the 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 by 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 by 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.

To Download the PIMG Firmware Update Files for Analog 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 logged on 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 click **Cisco Unity Telephony Integration**.

Step 3 On the Log In page, enter your user name and password, then click **Log In**.

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

Step 5 In the right column, click the version of the firmware for analog PIMG units.

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

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

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

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

Step 11 Click **Extract**.

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

Step 13 Close the window for the extracting application.

Revised May 3, 2010

To Set 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, click **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 log in, enter the following case-sensitive settings.

Table 11-1 Login Settings

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

Step 5 Click **OK**.

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

Step 7 On the Upgrade page, click **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 Click **Ls_<xx>.app** (where <xx> is multiple digits), and click **Open**.

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

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

Caution 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, click **Upgrade**.

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

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

Step 16 Click **Ls_<xx>.fsh**, and click **Open**.

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

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

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

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

Table 11-2 Login Settings

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

Step 21 Click **OK**.

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

Caution You must set the RTP port range for the PIMG units if your system uses an RTP port range of 16384 to 32767. Otherwise, Cisco 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 Cisco Unity Connection configurations require a different RTP port range.

a. On the Configuration menu, click **Import/Export**.

b. On the Import/Export page, under Export Files, click **Export All Settings**.

c. In the File Download dialog box, click **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 click **Save**.

e. In the Download Complete dialog box, click **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, click **Import/Export**.

l. On the Import/Export page, under Browse for Import File, click **Browse**.

m. In the Choose File dialog box, browse to the file Config.ini that you saved.

n. Click **Config.ini**, and click **Open**.

o. On the Import/Export page, click **Import File**.

p. When prompted to restart the PIMG unit, click **OK**.

q. When the PIMG unit has restarted, in the web browser, go to **http://10.12.13.74**.

r. To log in, enter the following case-sensitive settings.

Table 11-3 Login Settings

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

s. Click **OK**.

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

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

Table 11-4 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 Click **Change**.

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

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

Table 11-5 Management Protocols Page Settings

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

Step 28 Click **Submit**.

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

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

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

Table 11-6 First VoIP Host Group Settings

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

Step 32 For Cisco Unity Connection without a cluster, under Host List, enter the host name or IP address of the Cisco 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 Cisco Unity Connection server (the second Cisco Unity Connection server that you installed) and the server port in the format <host name or IP address>:5060.

Step 33 For Cisco Unity Connection without a cluster, continue to Step 35. For Cisco Unity Connection with a cluster configured, click **Add Host**.

Step 34 In the second field, enter the host name or IP address of the publisher Cisco Unity Connection server (the first Cisco Unity Connection server that you installed) and the server port in the format <host name or IP address>:5060.

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

Step 35 Click **Submit**.

Step 36 Under Router Configuration, click **TDM Trunk Groups**.

Step 37 Under TDM Trunk Groups, click **Add Trunk Group**.

Step 38 Under TDM Trunk Groups, enter the following settings for the first TDM trunk group.

Table 11-7 First TDM Trunk Group Settings (All Calls)

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

Step 39 Click **Submit**.

Step 40 Under Router Configuration, click **Inbound VoIP Rules**.

Step 41 Under Inbound VoIP Rules, uncheck the **Enabled** check box for the default rule.

Step 42 Click **Add Rule**.

Step 43 Under Inbound VoIP Rules, enter the following settings for the first new inbound VoIP rule.

Table 11-8 First New Inbound VoIP Rule Settings (All Calls)

Field	Settings
Enable	Check this check box.
Rule Label	Do one of the following: • If you will use CPID manipulation, enter **All_UC_Calls** or another name. This inbound VoIP rule will handle all outbound calls from Cisco Unity Connection. • If you will not use CPID manipulation, enter **UC_Calls_and_Messages** or another name. This inbound VoIP rule will handle all outbound calls and MWI calls from Cisco Unity Connection.
Request Type	Do one of the following: • If you will use CPID manipulation, click **Call**. • If you will not use CPID manipulation, click **Any**.
Originating VoIP Host Address	Enter *.

Step 44 Under Inbound VoIP Request Matching, enter the following settings.

Caution The rule that you created in Step 43 must be selected. Otherwise, any changes you make will apply to another rule.

Table 11-9 Inbound VoIP 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.
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 45 Under Outbound Routes, enter the following settings.

Caution The rule that you created in Step 43 must be selected. Otherwise, any changes you make will apply to another rule.

Table 11-10 Outbound Routes Settings

Field	Settings
Device Selection	
Outbound Destination	Click **TDM**.
Trunk Group	Click the name of the TDM trunk group that you created for outbound calls in Step 38. For example, click "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	Click **Primary**.

Step 46 If you will not use CPID manipulation, skip to Step 50. Otherwise, under Inbound VoIP Rules, click **Add Rule**.

Step 47 Under Inbound VoIP Rules, enter the following settings for the second new inbound VoIP rule.

Table 11-11 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 will handle all MWIs from Cisco Unity Connection.
Request Type	Click **Message**.
Originating VoIP Host Address	Enter *.

Step 48 Under Inbound VoIP Request Matching, enter the following settings.

Caution The rule that you created in Step 47 must be selected. Otherwise, any changes you make will apply to another rule.

Table 11-12 Inbound VoIP 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.
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 49 Under Outbound Routes, enter the following settings.

Caution The rule that you created in Step 47 must be selected. Otherwise, any changes you make will apply to another rule.

Table 11-13 Outbound Routes Settings

Field	Settings
Device Selection	
Outbound Destination	Click **TDM**.
Trunk Group	Click the name of the TDM trunk group that you created for outbound calls in Step 38. For example, click "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	Click **Primary**.

Step 50 Click **Submit**.

Step 51 Under Router Configuration, click **Inbound TDM Rules**.

Step 52 Under Inbound TDM Rules, enter the following settings for the first inbound TDM rule.

Table 11-14 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	Click **Call**.
Trunk Group	Click the name of the TDM trunk group that you created for incoming calls from the phone system in Step 38. For example, click "All_Calls."

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

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

Table 11-15 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.
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 54 Under Outbound Routes, enter the following settings.

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

Table 11-16 Outbound Routes Settings

Field	Settings
Device Selection	
Outbound Destination	Click **VoIP**.

Table 11-16 Outbound Routes Settings (continued)

Field	Settings
Host Group	Click the name of the VoIP host group that you created for Cisco 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	Click **Primary**.

Step 55 If you want to create more Inbound TDM rules, under Inbound TDM Rules, click **Add Rule**. Otherwise, continue to Step 57.

Note that additional Inbound TDM rules are not necessary if you will not use CPID manipulation.

Step 56 Repeat Step 52 through Step 55 for all remaining inbound TDM rules that you want to create.

Step 57 Click **Submit**.

Step 58 On the Configuration menu, click **TDM > General**.

Step 59 On the TDM General Settings page, enter the following settings.

Table 11-17 TDM General Settings Page Settings

Field	Settings
PCM Coding	Click **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**.

Table 11-17 TDM General Settings Page Settings (continued)

Field	Settings
Wait for Ringback/Connect on Blind Transfer	Click **Yes**.
Hunt Group Extension	Enter the pilot number of the Cisco Unity Connection voice messaging ports.

Step 60 Click **Submit**.

Step 61 On the Configuration menu, click **TDM > Port Enable**.

Step 62 On the TDM Port Enabling page, click **No** for the ports that you want to disable on the PIMG unit.

Step 63 Confirm that **Yes** is selected for all other ports on the PIMG unit.

Step 64 Click **Submit**.

Step 65 On the Configuration menu, click **VoIP > General**.

Step 66 On the VoIP General Settings page, enter the following settings.

Table 11-18 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	Click **UDP**.
Call as Domain Name	Click **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.
Registration Server Address	Leave this field blank.
Registration Server Port	Enter **5060**.
Registration Expiration (sec)	Enter **3600**.
TCP/UDP	
UDP/TCP Transports Enabled	Click **Yes**.
TCP/UDP Server Port	Enter **5060**.
Proxy	
Primary Proxy Server Address	Leave this field blank.

Table 11-18 VoIP General Settings Page Settings (continued)

Field	Setting
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	Click **No**.

Step 67 Click **Submit**.

Step 68 On the Configuration menu, click **VoIP > Media**.

Step 69 On the VoIP Media Settings page, enter the following settings.

Table 11-19 VoIP Media Settings Page Settings

Field	Settings
Audio	
Audio Compression	Click the preferred codec for audio compression.
RTP Digit Relay Mode	Click **RFC2833**.
Signaling Digit Relay Mode	Click **Off**.
Voice Activity Detection	Click **Off**.

Table 11-19 VoIP Media Settings Page Settings (continued)

Field	Settings
Frame Size	Click the applicable setting: • G.711—**20** • G.729AB—**10** **Caution** Failure to use the correct setting will result in recorded messages containing nothing but silence.
Frames Per Packet	Click the applicable setting: • G.711—**1** • G.729AB—**2** **Caution** Failure to use the correct setting will result in recorded messages containing nothing but silence.

Step 70 Click **Submit**.

Step 71 On the Configuration menu, click **VoIP > QOS**.

Step 72 On the VoIP QOS Configuration page, enter the following settings.

Table 11-20 VoIP QOS Configurative Page Settings

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

Step 73 Click **Submit**.

Step 74 On the Configuration menu, click **IP**.

Step 75 On the IP Settings page, enter the following settings.

Table 11-21 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	Click **No**.

Step 76 Click **Submit**.

Step 77 On the Configuration menu, click **Serial > General**.

Step 78 On the Serial Port, COM 1 page, enter the following settings.

Table 11-22 Serial Port, COM 1 Page Settings

Field	Settings
Serial Port Baud Rate	Click the setting that is configured on the phone system. The default setting is 9600.
Serial Port Parity	Click the setting that is configured on the phone system. The default setting is None.
Serial Port Data Bits	Click the setting that is configured on the phone system. The default setting is 8.
Serial Port Stop Bits	Click the setting that is configured on the phone system. The default setting is 1.

Step 79 Click **Submit**.

Step 80 On the Configuration menu, click **Serial > Switch Protocol**.

Step 81 On the Switch Protocol page, enter the following settings.

Table 11-23 Switch Protocol Page Settings

Field	Settings
Serial Port, COM 1	
Serial Mode	Click the applicable setting: • **Master**—Click 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**—Click 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	Click the serial protocol that your phone system uses: • **SMDI** • **MCI** • **MD-110**
Cpid Len	Click 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.

Table 11-23 Switch Protocol Page Settings (continued)

Field	Settings
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 82 Click **Submit**.

Step 83 On the Configure menu, click **Tone Detection**.

Step 84 On the Tone Detection page, under Call Progress Tone - Learn, in the Learn Tone Event field, click **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 85 Under Call Progress Tone - Learn, in the Dial String field, enter the extension that you dialed in Step 84c. from the third phone.

Step 86 Click **Learn**.

Step 87 On the Tone Detection page, under Call Progress Tone - Learn, in the Learn field, click **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 88 Under Call Progress Tone - Learn, in the Dial String field, enter the extension that you dialed in Step 87a.

Step 89 Click **Learn**.

Step 90 On the Tone Detection page, under Call Progress Tone - Learn, in the Learn field, click **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 91 Under Call Progress Tone - Learn, in the Dial String field, enter the extension that you dialed in Step 90a.

Step 92 Click **Learn**.

Step 93 Click **Submit**.

Step 94 Hang up the phones that you used in Step 84.

Step 95 On the System menu, click **Restart**.

Step 96 On the Restart page, click **Restart Unit Now**.

Step 97 Repeat Step 2 through Step 96 on all remaining PIMG units.

Creating a New Integration with the Phone System

Revised August 14, 2009

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

To Create an Integration

Step 1 Log on to Cisco Unity Connection Administration.

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

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

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

Step 5 If you want to use this phone system for TRaP connections (when users record and playback through the phone in Cisco Unity Connection web applications), check the Default TRAP Switch check box. If you want to use another phone system for TRaP connections, uncheck this check box.

Step 6 Click **Save**.

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

Step 8 On the New Port Group page, enter the applicable settings and click **Save**.

Table 11-24 Settings for the New Port Group Page

Field	Setting
Phone System	Click the name of the phone system that you entered in Step 4.
Create From	Click **Port Group Template** and click **SIP to DMG/PIMG/TIMG** in the drop-down box.

Table 11-24 Settings for the New Port Group Page (continued)

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	Click **5060**.
SIP Transport Protocol	Click the SIP transport protocol that Cisco Unity Connection will use.
IP Address or Host Name	Enter the IP address of the PIMG unit that you are integrating with Cisco Unity Connection.
Port	Enter the SIP port of the PIMG unit that Cisco Unity Connection will connect to. We recommend that you use the default setting. **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 will not function correctly.

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

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

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

Table 11-25 Settings for the New Ports 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 Cisco Unity Connection cluster, the Cisco Unity Connection server must have the number of voice messaging ports that are set up on the phone system for the PIMG integration so that this Cisco Unity Connection server can handle all voice messaging traffic for the Cisco Unity Connection cluster if one of the servers stops functioning. For example, if the phone system is set up with 16 voice messaging ports, this Cisco Unity Connection server must have 16 voice messaging ports.
Phone System	Click the name of the phone system that you entered in Step 4.
Port Group	Click the name of the port group that you added in Step 8.

Step 12 On the Search Ports page, click 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 11-26 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 function 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 Cisco Unity Connection web applications. Assign Allow TRAP Connections to the least busy ports.
Outgoing Hunt Order	Enter the priority order in which Cisco Unity Connection will use the ports when dialing out (for example, if the Perform Message Notification, Send MWI Requests, or Allow TRAP Connections check box is checked). The highest numbers are used first. However, when multiple ports have the same Outgoing Hunt Order number, Cisco Unity Connection will use the port that has been idle the longest.

Step 14 Click **Save**.

Step 15 Click **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 click **Phone System**.

Step 18 On the Search Phone Systems page, under Display Name, click the name of the phone system that you entered in Step 4.

Step 19 Repeat Step 7 through Step 18 for each remaining PIMG unit that will be integrated with Cisco 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 Integrations**, then click **Port Group**.

b. On the Search Port Groups page, click **Add New**.

c. On the New Port Group page, enter the applicable settings and click **Save**.

Table 11-27 Settings for the New Port Group Page (MWIs)

Field	Setting
Phone System	Click the name of the phone system that you entered in Step 4.
Create From	Click **Port Group Template** and click **SIP to DMG/PIMG/TIMG** in the drop-down box.
Display Name	Enter a **MWI Port Group** or another descriptive name for the port group.
SIP Security Profile	Click **5060**.
SIP Transport Protocol	Click the SIP transport protocol that Cisco Unity Connection will use.
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 Configure > SIP page of the PIMG unit. Otherwise, the integration will not function correctly.

d. On the Port Basics page, on the Edit menu, click **Advanced Settings**.

e. On the Edit Advanced Settings page, under SIP MWI Requests, click **Not Port Specific**. and click **Save**.

f. On the Edit menu, click **Port Group Basics**.

g. Under Port Group, click **Reset**.

h. Under Message Waiting Indicator Settings, confirm that the **Enable Message Waiting Indicators** check box is checked and click **Save**.

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

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

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

Table 11-28 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 will connect to.
Trunk Access Code	Enter the extra digits that Cisco Unity Connection must dial to transfer calls through the gateway to extensions on the previously existing phone system.

Step 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, click **Check Telephony Configuration** and click **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, click **Close**.