



# Setting Up a Mitel SX-2000 Digital PIMG Integration with Cisco Unity Connection

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## 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](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](#) 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](#) 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

- 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](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.




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**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.

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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 1: DNI Circuit Assignment Options**

Field	Setting
Cabinet	Enter <b>2</b> .
Shelf	Enter <b>1</b> .
Slot	Enter <b>7</b> .
Circuit	Enter <b>4</b> .
Card Type	Select <b>DNI Line</b> .
Device Type: Channel #1	Select <b>Superset 430</b> .

- 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 2: Multiline Set Key Assignment Options**

Field	Setting
Prime Directory Number	Enter the first directory number.
Key Number: 2	Select <b>not assigned</b> .
Key Number: 3	Select <b>not assigned</b> .
Key Number: 4	Select <b>not assigned</b> .
Key Number: 5	Select <b>not assigned</b> .
Key Number: 6	Select <b>not assigned</b> .
Key Number: 7	Select <b>not assigned</b> .
Key Number: 8	Select <b>not assigned</b> .
Key Number: 9	Select <b>not assigned</b> .
Key Number: 10	Select <b>not assigned</b> .
Key Number: 11	Select <b>not assigned</b> .

- 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 3: Hunt Group Assignment Options*

Field	Setting
Pilot Number	Enter the pilot number for Unity Connection.
Name	Enter <b>IP gateway hunt</b> .
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 4: Hunt Group Assignment Table*

Member	Directory Number	Name
1	<the prime directory number>	Enter <b>IP gateway Port 1</b> .
2	<the second directory number>	Enter <b>IP gateway Port 2</b> .
3	<the third directory number>	Enter <b>IP gateway Port 3</b> .
4	<the next directory number>	Enter <b>IP gateway Port 4</b> .
5	<the next directory number>	Enter <b>IP gateway Port 5</b> .
6	<the next directory number>	Enter <b>IP gateway Port 6</b> .
7	<the next directory number>	Enter <b>IP gateway Port 7</b> .
8	<the next directory number>	Enter <b>IP gateway Port 8</b> .
...	<additional directory numbers>	...
<last member>	<the last directory number>	Enter <b>IP gateway Port &lt;n&gt;</b> .

## 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 5: Sign-in Settings**

Field	Setting
Username	Enter <b>admin</b> .
Password	Enter <b>IpodAdmin</b> .

**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 6: Sign-in Settings**

Field	Setting
Username	Enter <b>admin</b> .

Field	Setting
Password	Enter <b>IpodAdmin</b> .

**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 7: Sign-in Settings**

Field	Setting
Username	Enter <b>admin</b> .

Field	Setting
Password	Enter <b>IpodAdmin</b> .

s) Select **OK**.

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

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

**Table 8: Change Password Page Settings**

Field	Setting
Old Password	Enter <b>IpodAdmin</b> . (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 9: 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 <i>without a cluster</i> ) Select <b>False</b> . (Unity Connection <i>with a cluster configured</i> ) Select <b>False</b> .
Fault-Tolerant	(Unity Connection <i>without a cluster</i> ) Select <b>False</b> . (Unity Connection <i>with a cluster configured</i> ) Select <b>True</b> .

**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 10: First TDM Trunk Group Settings (Inbound Calls)*

Field	Settings
Name	Enter <b>Inbound_PBX_Calls</b> or another unique name. This TDM trunk group handles all incoming calls from the phone system.
Selection Direction	Select <b>Ascending</b> .
Selection Mode	Select <b>Linear</b> .
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 11: Second TDM Trunk Group Settings (MWIs)*

Field	Settings
Name	Enter <b>MWIs</b> or another unique name. This TDM trunk group handles outbound MWI calls (where applicable).
Selection Direction	Select <b>Ascending</b> .
Selection Mode	Select <b>Cyclic</b> .
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 12: Third TDM Trunk Group Settings (Outbound Calls)*

Field	Settings
Name	Enter <b>Outbound_PBX_Calls</b> or another unique name. This TDM trunk group handles all outbound calls from Unity Connection.
Selection Direction	Select <b>Descending</b> .
Selection Mode	Select <b>Linear</b> .

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 13: First New Inbound VoIP Rule Settings (MWIs)**

Field	Settings
Enable	Check this check box.
Rule Label	Enter <b>MWI_Calls</b> or another name.  This inbound VoIP rule handles all MWI calls from Unity Connection.
Request Type	Select <b>Message</b> .
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 14: 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 15: Outbound Routes Settings**

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

**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 16: Second New Inbound VoIP Rule Settings (Outbound Calls)**

Field	Settings
Enable	Check this check box.
Rule Label	Enter <b>Outbound_UC_Calls</b> or another name. This inbound VoIP rule handle all outbound calls from Unity Connection.
Request Type	Select <b>Call</b> .
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 17: 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 18: Outbound Routes Settings*

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

**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 19: First Inbound TDM Rule Settings*

Field	Settings
Enable	Check this check box.

Field	Settings
Rule Label	Enter <b>Inbound_Rule_1</b> or another name. This inbound TDM rule handles all incoming calls from the phone system.
Request Type	Select <b>Call</b> .
Trunk Group	Select the name of the TDM trunk group that you created for incoming calls from the phone system in <a href="#">Step 35</a> . 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 20: 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 21: Outbound Routes Settings**

Field	Settings
<b>Device Selection</b>	
Outbound Destination	Select <b>VoIP</b> .
Host Group	Select the name of the VoIP host group that you created for Cisco Unity Connection in <a href="#">Step 28</a> .
<b>CPID Manipulation</b>	
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.
<b>Select Primary/Alternate Route</b>	
Primary	Select <b>Primary</b> .

**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 22: TDM General Settings Page Settings**

Field	Settings
PCM Coding	Select <b>uLaw</b> .
Minimum Call Party Delay (ms)	Enter <b>500</b> .
Maximum Call Party Delay (ms)	Enter <b>2000</b> .
Dial Digit on Time (ms)	Enter <b>100</b> .
Dial Inter-Digit Time (ms)	Enter <b>100</b> .
Dial Pause Time (ms)	Enter <b>2000</b> .
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 <b>10000</b> .
Wait for Ringback/Connect on Blind Transfer	Select <b>Yes</b> .
Hunt Group Extension	Enter the pilot number of the Unity Connection voice messaging ports.
Disconnect on Fax Cleardown Tone	Select <b>No</b> .

**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 23: VoIP General Settings Page Settings**

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

Field	Setting
Mutual TLS Authentication Required	Select <b>Yes</b> .
TLS Inactivity Timer (sec)	Enter <b>30</b> .
Verify TLS Peer Certificate Date	Select <b>Yes</b> .
Verify TLS Peer Certificate Trust	Select <b>Yes</b> .
<b>Proxy</b>	
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 <b>10</b> .
<b>Timing</b>	
T1 Time (ms)	Enter <b>400</b> .
T2 Time (ms)	Enter <b>3000</b> .
T4 Time (ms)	Enter <b>5000</b> .
<b>Monitoring</b>	
Monitor Call Connections	Select <b>No</b> .
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 24: VoIP Media Settings Page Settings**

Field	Settings
<b>Audio</b>	
Audio Compression	Select the preferred codec for audio compression.
RTP Digit Relay Mode	Select <b>RFC2833</b> .
RTP Fax/Modem Tone Relay Mode	Select <b>RFC2833</b> .
RTP Source IP Address Validation	Select <b>Off</b> .
RTP Source UDP Port Validation	Select <b>Off</b> .
Signaling Digit Relay Mode	Select <b>Off</b> .
Voice Activity Detection	Select <b>Off</b> .
RFC 3960 Early Media Support	Select <b>On Demand</b> .
Frame Size	Select the applicable setting: <ul style="list-style-type: none"> <li>• G.711—<b>20</b></li> <li>• G.729AB—<b>10</b></li> </ul> <p>Failure to use the correct setting results in recorded messages containing nothing but silence.</p>
Frames Per Packet	Select the applicable setting: <ul style="list-style-type: none"> <li>• G.711—<b>1</b></li> <li>• G.729AB—<b>2</b></li> </ul> <p>Failure to use the correct setting results in recorded messages containing nothing but silence.</p>
<b>Fax</b>	
Fax IP-Transport Mode	
<b>SRTP</b>	
SRTP Preference	Select <b>RTP Only</b> .
MKI on Transmit Stream	Select <b>Yes</b> .
Key Derivation Enable	Select <b>Yes</b> .
Key Derivation Rate	Enter <b>16</b> .
Anti-replay Window Size Hint	Enter <b>64</b> .

Field	Settings
Cipher Mode	Select <b>AES_Counter_Mode</b> .
Authentication Type	Select <b>SHA1</b> .
Authentication Tag Length	Select <b>SHA1_80_bit</b> .

**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 25: VoIP QOS Configurative Page Settings**

Field	Settings
Call Control QOS Byte	Enter <b>104</b> .
RTP QOS Byte	Enter <b>184</b> .

**Step 74** Select **Submit**.

**Step 75** On the Configuration menu, select **IP**.

**Step 76** On the IP Settings page, enter the following settings.

**Table 26: 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 <b>No</b> .
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.

- From a available phone, call a second phone.
- Answer the second phone when it rings, and leave both handsets off so that both phones are busy.
- From a third phone, dial one of the busy phones.
- 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.
- From an available phone, dial an extension that does not exist.
  - Confirm that you hear the reorder or error tone.
  - 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.
- From an available phone, dial an extension that does exist.
  - Confirm that you hear the ringback tone.
  - 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.
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## 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

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- 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 27: Settings for the New Port Group Page**

Field	Setting
Phone System	Select the name of the phone system that you entered in <a href="#">Step 3</a> .
Create From	Select <b>Port Group Template</b> and select <b>SIP to DMG/PIMG/TIMG</b> 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 <b>5060</b> .
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 28: Settings for the New Port Page**

Field	Considerations
Enabled	Check this check box.
Number of Ports	Enter <b>8</b> .  (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.)  <b>Note</b> 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 <a href="#">Step 3</a> .

Field	Considerations
Port Group	Select the name of the port group that you added in <a href="#">Step 8</a> .

**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 29: 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 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 30: 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 <b>SIP to DMG/PIMG/TIMG SIP to</b> in the drop-down box.
Display Name	Enter a <b>MWI Port Group</b> or another descriptive name for the port group.
SIP Security Profile	Select <b>5060</b> .
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.  <b>Caution</b> 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 31: 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**.

