



Setting Up a Mitel SX-200 Digital PIMG Integration with Cisco Unity Connection

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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](#) 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-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](#) 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-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 CFM 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 1: 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 2: 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	COMP Zone	Code Index	ID
		DAY	NIGHT1	NIGHT2	DAY	NIGHT1	NIGHT2				
501	1	1	1	1	1	1	1	1	1	1	1
502	1	1	1	1	1	1	1	1	1	1	1
503	1	1	1	1	1	1	1	1	1	1	1
504	1	1	1	1	1	1	1	1	1	1	1
505	1	1	1	1	1	1	1	1	1	1	1
506	1	1	1	1	1	1	1	1	1	1	1
507	1	1	1	1	1	1	1	1	1	1	1
508	1	1	1	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 3: 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: <ul style="list-style-type: none"> • 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 4: 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 5: Call Transfer Types

Transfer Types	Usage
Release transfer (blind transfer)	Program the phone to forward calls to the pilot number when: <ul style="list-style-type: none"> • 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 6: 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 7: 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 8: 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 9: 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 10: First VoIP Host Group Settings

Field	Settings
Name	Accept the default or enter another descriptive name of the VoIP host group.
Load-Balanced	<i>(Unity Connection without a cluster)</i> Select False . <i>(Unity Connection with a cluster configured)</i> Select False .
Fault-Tolerant	<i>(Unity Connection without a cluster)</i> Select False . <i>(Unity Connection with a cluster configured)</i> 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 11: 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 12: 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 13: 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 14: 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 15: 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 *.

- 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 16: 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 .

- Under Inbound VoIP Rules, select **Add Rule**.
- Under Inbound VoIP Rules, enter the following settings for the second new inbound VoIP rule.

Table 17: 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 *.

- 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 *.

- 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 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 20: 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 21: 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 22: 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 23: 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 24: 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 25: 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: <ul style="list-style-type: none"> • G.711—20 • G.729AB—10 <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"> • G.711—1 • G.729AB—2 <p>Failure to use the correct setting results in recorded messages containing nothing but silence.</p>
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 26: 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 27: 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 28: 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 29: 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 30: 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 31: 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 32: 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**.
-