

MiCollab Advanced Messaging MiVoice MX-ONE Service Node SIP Integration Technical Note

For version 9.0 and above

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Preface

This Integration Technical Note (ITN) is written for dealers who are experienced with MiCollab Advanced Messaging (MiCollab AM) and familiar with MiCollab AM procedures and terminology. It also assumes that you are familiar with the features and programming of MiVoice MX-ONE.

This document describes how to integrate MiCollab AM with a MiVoice MX-ONE system using the Service Node SIP integration, which is a SIP station integration. This integration operates exclusively over a TCP/IP-based network; it does not use analog or digital voice telephony ports, but passes voice communication and signaling information over the network.

The MiVoice MX-ONE Service Node can be configured with its IP station port boards (IPLU or MGU) distributed among multiple Media Gateways. It is also possible to designate one station port board as an entry gatekeeper for the other boards.

Once in operation, the entry gatekeeper polls the network for changes in configuration, such as the addition or removal of a board, and load levels on each of the other boards. It then directs incoming call traffic to boards with relatively low current loads.

In this integration, MiCollab AM communicates exclusively with the entry gatekeeper board to exchange integration information, message-waiting indicator (MWI) clear and set commands, and audio signal data.

The Server designated as containing the entry gatekeeper can designate any of its station port boards for the actual gate-keeping role.

Use this document in conjunction with the *System Installation and Configuration Guide*, the *System Administration Guide*, and with the MiCollab AM online help system.

References

A catalog of technical documentation is included on the MiCollab AM Installation Media. If you are installing any advanced applications, such as Networking and Fax Server applications, you should refer to the appropriate technical documentation for application and installation information.

Documentation

The technical documentation is produced in the PDF format and requires the PDF reader to view it. The documentation set for this MiCollab AM includes the following documents and resources:

- **Developer Resources.** Contains programming guides and API references for developers for integrating the server clients and web applications with MiCollab AM.
- **Integration Technical Notes (ITN).** Contains a set of guides that describe the integration methods and instructions for a variety of phone systems to work with MiCollab AM. The ITNs are generally used by resellers or administrators who are experienced with MiCollab AM and familiar with the integration procedures and terminology.

- **Quick Reference Card (QRC).** Contains shortcuts and quick instructions telling subscribers how to access and use the messaging system.
- **Server Documentation.** Available as a PDF only. Contains administrative guides for administrators about installing, configuring, and administering the messaging system, and user guides for subscribers about accessing the messaging system and checking and sending messages.
- **Spare Parts Documentation.** Contains a set of guides that describe the instructions for installing and configuring hardware parts to work with MiCollab AM. These documents are written for Mitel certified MiCollab AM technicians who are experienced with MiCollab AM and familiar with the procedures and terminology.
- **Software Release Notice (SRN).** This notice introduces the new features, capabilities, and hardware/software requirements for the corresponding MiCollab AM version.

Documentation Updates

Documentation updates may be available from the following sources:

- Mitel certified technicians can view or download the latest/updated documents and program files from our partner web site: connect.mitel.com/connect

Help

The primary source of information about MiCollab AM is the online help available within any of its administrative utilities. You can access **Help** as follows:

- Click the **Help** button in the dialog box or window in which you are working
- Press the **F1** key at any time.

Document Conventions

The following conventions are used in this document:

- **Key Names.** Names of keys on the keyboard are shown in a box.

Example: **Enter**

When two keys must be pressed simultaneously, they are joined by a + sign.

Example: **Alt** + **Tab**

- **Reference to Document.** *Italics* fonts can also signify the titles of other documents.

Example: See the *System Installation and Configuration Guide*.

- **UI Element Names.** Names of UI elements such as dialog windows, screens, menu items, tabs, buttons, icons, etc. are shown in bold.

Example: On the **Startup** screen, click the **Start** icon.

- **User Input.** Information required to be typed is shown in italics.
| **Example:** Type the password *voicemail*.
- **Warning, Caution, Important, and Notes.** Text for the contents that require attention are shown as follows:

WARNING A warning paragraph advises you of circumstances that can result in the loss of data, harm to the system server platform, or personal harm.

CAUTION Failure to follow these recommendations can result in unauthorized access to the system and consequent loss of data.

IMPORTANT An important paragraph gives decision-making information or informs you of the order in which tasks need to be completed.

NOTE A note gives additional information, provides an explanation, or indicates an exception to the information in the preceding text.

Features Supported in this Integration

The following tables list the features supported using the MiVoice MX-ONE Service Node SIP integration.

Table 1. Call forward to personal greeting for these call types

Divert to MiCollab AM on	Supported
No Answer	Yes
Busy	Yes
Forward All	Yes
Follow Me	Yes
Do Not Disturb	No

Table 2. Integration features supported for MiVoice MX-ONE Service Node SIP

Feature	Supported	Notes
Automatic subscriber logon	Yes	
ANI/CLI	Yes	
<i>Announce Busy</i> greeting on forwarded calls	Yes	
Call screening	Yes	
Caller queuing	Yes	Note 1

DNIS	No	
End-to-end DTMF, attendant console	Yes	
End-to-end DTMF, proprietary telephones	Yes	
Fax Tone Detection	Yes	
Internal calling party ID for reply	Yes	
Live record, integrated	No	Note 3
Live reply to sender	Yes	
Message notification callouts	Yes	
MWI, set/clear	Yes	
MWI, inband/outband	Outband	
Networking; AMIS, analog	Yes	
Overflow from MiCollab AM to attendant	Yes	
Overflow to MiCollab AM from attendant	Yes	
PBX-provided disconnect signaling	Yes	
Revert to operator from personal greeting	Yes	
Transfers, blind	Yes	
Transfers, confirmed	No	
Transfers, fully supervised	Yes	
Transfers, monitored	Yes	
Trunk ID for call routing	No	
Multiple Integrations	Yes	Note 3

NOTES

1. Caller Queuing is specific to each local Call Server. Call Servers within the system are unaware of queued calls to the same subscriber on other Call Servers. For more information, refer to the *Critical Consideration Notes*.
2. Third-party conferences are not allowed on an integrated VM port. To use this feature, you must have a separate non-integrated port.
3. See [Critical Application Considerations](#).

Critical Application Considerations

Known limitations or conditions within the telephone system and MiCollab AM that affect the integration performance are listed here. General recommendations are provided when ways to avoid these limitations exist.

MiCollab AM Application Considerations

- You must populate Line extension numbers on the **Lines** tab before starting MiCollab AM or the integration will fail. The extension numbers are registered as SIP stations with the IP PBX during system startup.
- Configure the MiCollab AM **Incoming Hunt Mode** in the **Switch Section Options** dialog box. The hunt mode must match the type of hunting provided by the IP PBX. This helps to alleviate any *glare* conditions between the IP PBX and MiCollab AM. The default mode is Terminal.
- The Call Queuing feature does not transcend the Call Server. Calls may be queued on multiple Call Servers for the same subscriber but Call Servers do not have knowledge of calls in the queue on other Call Servers within the system. Callers may be prompted with specific information about their place in the queue; however, the information pertains to the specific Call Server on which their call is queued.
- The Call Screening feature requires T-type supervised transfers. To use this feature without having to remove diversion programming from the subscriber telephone, set the TRAF parameter of the extension category to restrict voice mail ports from calling other voice mail ports.
- The Windows quality of service (QoS) packet scheduler must be installed and operational on the network connection serving MiCollab AM and the telephone system. For more information about installing and configuring the QoS packet scheduler, refer to Windows Help.
- On a MiCollab AM server with two or more NICs, the NIC that supports this integration must not occupy first place in the operating system's binding order. The primary (public) network interface card (NIC) must be the first network connection in the network binding order. MiCollab AM binds and communicates to other servers and subscribers on this network connection. For more information, refer to [Changing the Network Binding Order on the MiCollab AM Platform](#).
- MiCollab AM supports one IP-based integration per Call Server. However, MiCollab AM supports up to 10 instances of the MiVoice MX-ONE Service Node SIP integration per Call Server.
- MiCollab AM supports G.729a with support for annex b on the incoming audio stream only. MiCollab AM does not transmit annex b packets.
- When codec negotiation takes place between MiCollab AM and the PBX, MiCollab AM always offers the G.729a audio format as an option. You may configure G.729a as the preferred codec in MiCollab AM; however, the decision whether to use G.729a is always made by the PBX.
- The SIP IP address in the MiCollab AM **Integration Options** dialog box must match the IP Address configured in the telephone system.

- The MiCollab AM **Integration Options** parameter, **Validate Remote Hosts for Media** validates each incoming audio packet and accepts it only if it is sent from a valid endpoint. The parameter is disabled by default. Enabling this parameter causes MiCollab AM to reject RTP packets from invalid endpoints, rejects MWI packets that timeout after a specified number of times, and overcomes port lockups when callers hang up while MiCollab AM is performing a blind transfer.

IMPORTANT Enabling this parameter causes processing overhead and should only be enabled when necessary.

- MiCollab AM supports up to 10 integration types (i.e., licensed integrations) in total per system. However, the following limitations apply to each Call Server:
 - MiCollab AM 9.0 and above:
 - Limited to 3 integration types per Call Server
 - The 3 integration types can be any mix of TDM and SIP (e.g., 1 TDM and 2 SIP)
 - Limited to 1 Cisco UCM SCCP IP integration. Can be mixed with TDM, but not with SIP
 - Connect up to 10 telephone systems total per Call Server (e.g., 2 Avaya Communication Manager systems using SIP + 5 Avaya IP Office systems using SIP + 3 Siemens HiPath 4000 systems using Station Set Emulation).
 - SIP timers for the Mitel TSW IP integrations are incompatible with other SIP integrations. Thus, it is not possible to have a Mitel TSW IP integration with any other SIP integration on the Call Server.

Application Considerations for MiVoice MX-ONE Service Node

- Each IP station port board installed in the MiVoice MX-ONE Service Node, as well as the telephone system itself, must have a static IP address. The MiCollab AM server(s) must be on the same subnet or VLAN as the MiVoice MX-ONE Service Node.
- All network connections between the MiVoice MX-ONE Service Node, MiCollab AM, and the network, must be full duplex 100 Mbps.
- The use of traffic-restricted voice mail ports is not compatible with blind transfers. We recommend that you use the monitored (Monitor) transfer type unless the application requires a supervised (T-type) transfer.
- When using reason code diversions from subscriber telephones, diverted calls will always go to the common diversion position. If MiCollab AM is the common diversion position (CDCOI), calls are always diverted there, even if individual diversions (CDINI) have been programmed to divert calls elsewhere.
- Station numbers cannot have a 0 as the leading digit. The maximum length of a station number is six digits.
- Because the telephone system performs the call progress detection in this integration and passes call progress as out-of-band events to MiCollab AM, MiCollab AM features that rely on analysis of the incoming audio stream do not function properly under this integration. These features include

the following: detection of fax tone and call handling actions such as transfers and callouts to external telephone numbers.

Installation Requirements

Review the following information before performing any of the procedures in this document. To install this integration successfully, you must meet the installation requirements for both the telephone system and MiCollab AM.

Telephone System Requirements

- MiVoice MX-ONE with system software 6.0 or later, V.4.1 SP1 or later and MiVoice MX-ONE V3.2 SP5 or later
- One or more IPLU boards with R6A FW minimum, each of which provides 32 MiCollab AM ports or 1 or more MGU boards, which can provide up to 260 MiCollab AM ports per board
- An external SIP domain entry must be configured in MiVoice MX-ONE to point to the MiCollab AM system in order to handle SIP refer header information elements. With Mitel 700 this is done automatically by the MP configuration wizard during installation

MiCollab AM Requirements

- MiCollab AM version 9.0 or above
- At least one 100 MB or 1000 MB network interface card and cable
- Mitel feature file with the MiVoice MX-ONE Service Node SIP integration enabled and one Virtual SIP license enabled for each port involved in the integration

Programming MiVoice MX-ONE

Follow the recommendations and programming examples in this section to program the MiVoice MX-ONE Service Node for integration with MiCollab AM. Programming examples show commands and parameters of MiVoice MX-ONE version 3.2 and 4.1 that are necessary for integration; they do not represent PBX programming in its entirety.

Depending on which version of the MiVoice MX-ONE Service Node software is running, the command format is different. With MiVoice MX-ONE version 4.1, certain commands have been changed to the standard Linux format. Therefore, both formats are given in the examples below, but only one or the other shall be used depending on the MiVoice MX-ONE Service Node software release.

The installing technician should be familiar with programming the telephone system. For detailed programming information on this software version or other MiVoice MX-ONE Service Node software versions, refer to the appropriate ASB Basic Exchange and Extra Facility documentation and the MiVoice MX-ONE Service Node CPI documentation.

Initiating the Number Series for the IP-Based Extensions

Initiate extension numbers in Number Analysis for the MiCollab AM extensions. Use EX as the NUMTYP. Choose directory numbers that are appropriate for your numbering plan.

For example:

```
NANSI:NUMSE=2300&&2331,NUMTYP=EX;
```

Or

```
number_initiate -number 2300.2331 -numbertype ex
```

To verify your work, type the following command:

```
NADAP;
```

Or

```
number_print
```

Setting the Priority-Ordered List of the Audio CODECs

Define a priority-ordered list of the audio CODECs for the Servers.

For example:

```
IPGKC: LIM=1, GKID=LIM1, TMLOAD=0, CODECS=B;
```

Or

```
ip_domain -c --domain-name DEFAULT --codec-priority-list PCMA
```

Then the priority-order of the audio CODECS is **B0123456789AC**. Each codec value corresponds to an audio CODEC according to the table below.

Table 3. Corresponding Codec values

Number	CODEC	Supported
1	G.729 annex B	X (See Note)
3	G.729 annex A	X
B	G.711 A-law, 64 kbit/s	X
C	G.711 μ -law, 64 kbit/s	X

NOTE MiCollab AM supports G.729a with support for annex b on the incoming audio stream only. MiCollab AM does not transmit annex b packets.

Initiating the Generic Extension Definition

Define a common service profile (CSP) for all IP-based MiVoice MX-ONE Service Node extensions. In this profile, establish an overall traffic restriction level to define the number of simultaneous calls that may be active on the extension lines at one time.

For example:

```
GESPI:CSP=0,TRAF=1103151515,SERV=20715010013000, CDIV=11511110,ROC=023001,NPRES=1010;
Or
extension_profile -i --csp 62 --ext-traf 0103151515 --ext-serv 20013201100030000000 --ext-cdiv
111000001010 --ext-roc 000001 --ext-npres 010000 --csp-name "VM Port"
```

Initiate a generic definition that to apply dynamically to the IP-based MiVoice MX-ONE Service Node extensions. Assign this generic definition to the standard range of directory addresses set aside for IP-based extensions and associate it with the Server on which the entry gatekeeper board is installed.

For example:

```
GEDI:DIR=2300&&2331,LIM=1,CSP=0;
Or
extension -i -d 2300..2331 --lim 1 --csp 62
To verify your work, type the following command:
GEDIP:DIR=2300&&2331;
Or
extension -p -d 2300..2331
```

Creating Individual Extensions

Designate the extensions used to integrate the telephone system with MiCollab AM, associating each extension with the directory address range you have specified.

For example:

```
IPEXI:DIR=2300;
IPEXI:DIR=2301;
```

```
IPEXI:DIR=2302;  
IPEXI:DIR=2303;  
IPEXI:DIR=2304;  
IPEXI:DIR=2305;
```

Or

```
ip_extension -i -d 2300..2305
```

To verify your work, type the following command:

```
IPEXP:DIR=ALL;
```

Or

```
ip_extension -p
```

Initiating the Information Computer Function

Initiate the Information Computer Function for the MiCollab AM extensions.

To initiate the Information Computer Function:

- 1 Specify the USER as **GENERIC**.

For example:

```
ICFUI:IFCIND=1,USER=GENERIC;
```

Or

```
ICFUI:IFCIND=1,ISTYPE=2,INTTYP=1,USER=GENERIC;
```

To verify your work, type the following command:

```
ICFUP;
```

- 2 Configure the Information Computer Function to support the transmission of MWI clear and set commands, as follows:

```
ICFUC:MWF=ALL;
```

To verify your work, type the following command:

```
ICFUP;
```

- 3 Initiate the Message Waiting data for the voice mail port. Define the system ID (SID) of the PBX, the DTXT, and group number (DIG) to be called when subscribers press the message-waiting button (MWC) to retrieve messages.

For example:

```
ICMWC:SID=01,DTXT=3000,DIG=3000,KFCN=MWC;
```

To verify your work, type the following command:

```
ICMWP:SID=01;
```

Creating the Hunt Group

Create a hunt group for the integration, according to the steps in the following procedure.

To create the Hunt Group:

- 1 Initiate a hunt group and assign the MiCollab AM extensions to the group. Specify the type as Longest Free Hunting and set Queuing to 10. Define the SEL parameter to allow overflow diversion when all ports are busy, if desired.

For example:

```
GHGRI:GRP=3000,LIM=1,SERV=1000,TRAF=15,SEL=110,QUE=10;
```

To verify your work, type the following command:

```
GHDAP:GRP=3000;
```

- 2 Assign the MiCollab AM directory numbers to the hunt group.

For example:

```
GHGMI:GRP=3000,DIR=2300&&2331;
```

To verify your work, type the following command:

```
GHDAP:GRP=3000;
```

- 3 You may want to program the MiCollab AM ports to divert when they are unavailable. For instance, the following programming example would divert calls intended for MiCollab AM to the attendant, if all ports were busy or RNA.

For example:

```
CDINI:DIR=3000,DIV=00; (00=operator)
```

To verify your work, type the following command:

```
CDIDP:DIR=3000;
```

Initiating an External SIP Domain Entry for the MiCollab AM System

An external SIP domain entry must be configured in MiVoice MX-ONE to point to the MiCollab AM system in order to handle SIP refer header information elements.

To initiate an external SIP Domain entry:

- 1 Add an external sip domain entry containing the MiCollab AM VM server IP-address. If the MiCollab AM IP address is: 10.10.10.100, the entry would be as follows:

```
MX-ONE 4.1: sip_external_domain -add -domain 10.10.10.100
MX-ONE 5.0: sip_domain -i --remote-domain-name 10.10.10.100
MX-ONE 6.0: sip_domain -i --remote-domain-name 10.10.10.100
```

- 2 To verify your work, type the following command:

```
MX-ONE 4.1: sip_external_domain -print
MX-ONE 5.0: sip_domain -p
MX-ONE 6.0: sip_domain -p
```

Initiating the Voice Mail Function

Initiate the Voice Mail Port. Add the MiCollab AM directory numbers to the Voice Mail Port.

For example:

```
VMGEI:IFCIND=1,DIR=2300&&2331;
```

To verify your work, type the following command:

```
VMGEP;
```

Programming Message Waiting and Call Diversion for Subscriber Telephones

Apply the commands in the following procedure to configure MWI and call diversion options for MiCollab AM subscribers.

To program Message Waiting and Call Diversion for Subscriber Telephones:

- 1 Use the Key System Function Key Change command to assign an MWI key appearance on each subscriber telephone. Digital subscriber telephones can have a lit MWI key assigned in addition to the *Message Waiting* display on their LCD telephones, and subscribers can then press that key to retrieve messages from MiCollab AM.

For example:

```
KSFKC:DIR=2001&&2299,KEY=2,FCN=MEW;
```

To verify your work, type the following command:

```
KSFKP:DIR=2001&&2299;
```

For IP-Extensions (IP-Phones D4 and D5):

This is set in the configuration file, located on the system software server, for the IP-phones.

For example:

```
[FunctionKeysDBC425]
```

```
MessageWaiting=5
```

- 2 Assign the MiCollab AM hunt group as the diversion point for subscribers. Use the CDCOI command to create a common diversion to voice mail for subscribers, or use the CDINI command to create individual diversions.

For example:

```
CDINI:DIR=2001&&2299,DIV=3000;
```

To verify your work, type the following command:

```
CDIDP:DIR=2001&&2299;
```

- 3 Create a call list for generic extensions (H323, SIP, DECT and Remote extension) containing the MiCollab AM hunt group number as last call position. Generic extensions do not have any individual diversion (CDINI).

For example:

```
PELPI:DIR=2201,CHO=1,ANSPOS=2201,LIST=1,TIME=25;
```

```
PELPI:DIR=2201,CHO=2,ANSPOS=3000,LIST=1,TIME=5;
```

Or

```
call_list -i -d 2201 --list 1 --position 1 --dest-number 2201 --ringing-time 25
```

```
call_list -i -d 2201 --list 1 --position 2 --dest-number 3000 --ringing-time 5
```

If Call Diversion/Call List is not programmed, subscribers must use the Follow Me feature to divert calls to MiCollab AM.

NOTE If MiCollab AM is configured as the common diversion position (CDCOI), ICS calls are always diverted to this position, even if CDINI is programmed to divert calls elsewhere. In other words, reason code diversion always goes to the common diversion position. Refer to the *Voice Intercept Messaging* online book for more information on programming reason code diversions.

Installing the Network Interface

The Ethernet network adapter card and TCP/IP protocol may have been installed during initial installation of the operating system. Alternatively, you can install both the network adapter and the required TCP/IP protocol now. Consult the site system administrator for specific information on how to configure the network environment for the MiCollab AM platform. Refer to the operating system documentation or online help for information on installing network adapter cards and network protocols.

Once the network environment is configured and MiCollab AM has joined the same network as the MiVoice MX-ONE Service Node, verify that MiCollab AM can communicate with the PBX via TCP/IP. At the MiCollab AM Call Server, open a command prompt window. Type the Ping command followed by the TCP/IP address assigned to the PBX. If the TCP/IP protocol and network interface is installed properly, the PBX will reply. The following is an example of how to use the Ping command:

```
C:\>ping 245.17.41.1
Pinging 245.17.41.1 with 32 bytes of data:
Reply from 245.17.41.1: bytes=32 time<10ms TTL=128
Reply from 245.17.41.1: bytes=32 time<10ms TTL=128
Reply from 245.17.41.1: bytes=32 time<10ms TTL=128
```

Configuring MiCollab AM

Once the telephone system is programmed, you must configure MiCollab AM for the integration. There are two ways you can configure MiCollab AM: (1) Configuring MiCollab AM for the telephone system integration when you are installing MiCollab AM for the first time, or (2) Configuring the existing MiCollab AM with the new telephone system integration.

Click the appropriate steps that your system requires from below and follow the steps:

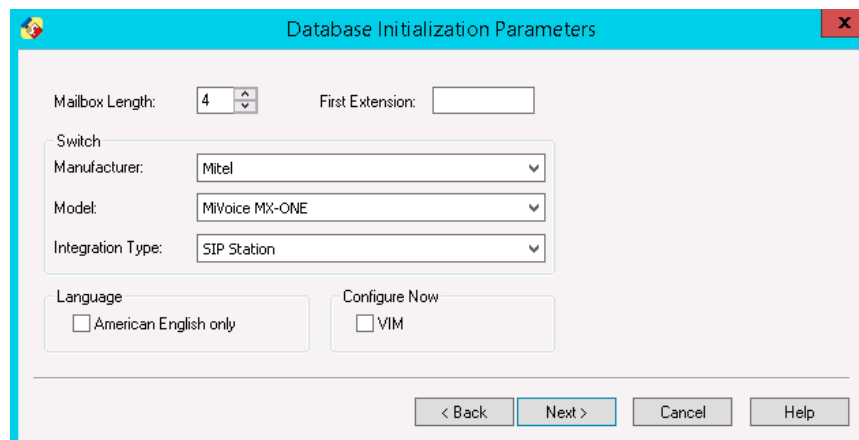
- [Configuring MiCollab AM for the Integration During Initial Installation](#): Integrate the telephone system while you install MiCollab AM for the first time.
- [Configuring Existing MiCollab AM for the Integration](#): Integrate a new telephone system on your exiting MiCollab AM system.

NOTE For general information on integrations, refer to the **Integrating MiCollab AM with the Telephone System** chapter in the *System Installation and Configuration Guide*, and the topic, **Integrating MiCollab AM with the Telephone System**, in the online help.

Configuring MiCollab AM for the Integration During Initial Installation

To configure MiCollab AM with the integration during the initial installation:

- 1 In the **Database Initialization Parameters** dialog box, configure the following options:



Database Initialization Parameters

Mailbox Length: 4 First Extension:

Switch

Manufacturer: Mitel

Model: MiVoice MX-ONE

Integration Type: SIP Station

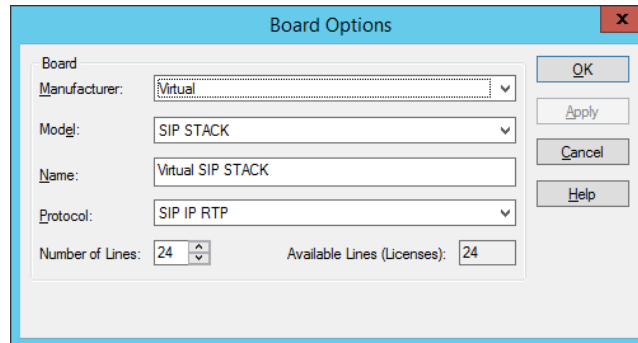
Language ☒ American English only

Configure Now ☒ VIM

< Back Next > Cancel Help

- a In the **Mailbox Length** box, enter the mailbox length in digits.
- b In the **First Extension** box, enter first extension number for the first line. You can also leave the **First Extension** box empty.
- c From the **Manufacturer** drop-down list, select **Mitel**.

- d From the **Model** drop-down list, select **MiVoice MX-ONE**.
 - e From the **Integration Type** drop-down list, select **SIP Station**.
- 2 Click **Next**. The **Board Options** dialog box displays for the virtual board configuration.

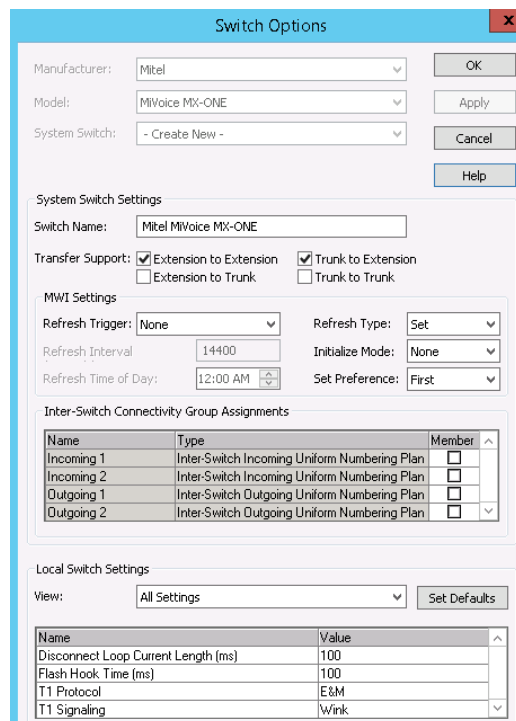


The **Board Options** dialog box is shown with the following settings:

- Board:** Virtual
- Manufacturer:** Virtual
- Model:** SIP STACK
- Name:** Virtual SIP STACK
- Protocol:** SIP IP RTP
- Number of Lines:** 24
- Available Lines (Licenses):** 24

Buttons on the right: OK, Apply, Cancel, Help.

- 3 In the **Board Options** dialog box, configure the following options:
- a From the **Manufacturer** drop-down list, select **Virtual**.
 - b From the **Model** drop-down list, select **SIP STACK**.
 - c In the **Name** field, the name for this board is automatically generated. Enter a new name if necessary.
 - d From the **Protocol** drop-down list, select **SIP IP RTP**.
 - e In the **Number of Lines** field, enter the number of lines this board uses. The total number of lines is limited by the capacity of the board and the number of **Available Line Licenses**.
- 4 Click **OK**. The **Switch Options** dialog box appears.



The **Switch Options** dialog box is shown with the following settings:

- Manufacturer:** Mitel
- Model:** MiVoice MX-ONE
- System Switch:** - Create New -
- System Switch Settings:**
 - Switch Name:** Mitel MiVoice MX-ONE
 - Transfer Support:**
 - ☒ Extension to Extension
 - ☒ Trunk to Extension
 - ☐ Extension to Trunk
 - ☐ Trunk to Trunk
 - MWI Settings:**
 - Refresh Trigger:** None
 - Refresh Interval:** 14400
 - Refresh Time of Day:** 12:00 AM
 - Refresh Type:** Set
 - Initialize Mode:** None
 - Set Preference:** First
- Inter-Switch Connectivity Group Assignments:**

Name	Type	Member
Incoming 1	Inter-Switch Incoming Uniform Numbering Plan	<input type="checkbox"/>
Incoming 2	Inter-Switch Incoming Uniform Numbering Plan	<input type="checkbox"/>
Outgoing 1	Inter-Switch Outgoing Uniform Numbering Plan	<input type="checkbox"/>
Outgoing 2	Inter-Switch Outgoing Uniform Numbering Plan	<input type="checkbox"/>
- Local Switch Settings:**
 - View:** All Settings
 - Set Defaults** button
 - Table:**

Name	Value
Disconnect Loop Current Length (ms)	100
Flash Hook Time (ms)	100
T1 Protocol	E&M
T1 Signaling	Wink

Buttons on the right: OK, Apply, Cancel, Help.

- 5 If necessary, make any changes to the default settings your site requires in the **Switch Options** dialog box.

NOTE The settings related to the telephone system in the **Switch Options** dialog box are filled in automatically when you select the correct telephone system during setup.

If you need to customize settings on the **Switch Options** dialog box to meet requirements specific to your site, refer to the documentation accompanying the telephone system, the online help, and the *System Installation and Configuration Guide*.

- 6 Click **OK**. The **Integration Options** dialog box appears.

- 7 In the **Integration Options** dialog box, configure the following options:

- a In the **Local Integration Settings** section, select the **Required Parameters** view, and configure the following settings:

Table 4. Required Parameters View – Integration Options

Field	Required Value
SIP Server Address	Enter the IP address of the IPLU board that functions as the entry gatekeeper.
SIP Server Port	Enter the port MiCollab AM on which listens for incoming SIP messages. The default value is 5060 .
Local IP Address to bind on	Enter the IP address of the network interface card (NIC) on the MiCollab AM Call Server platform that supports the media server. If there is only one NIC on the Call Server platform, this field typically contains the IP address of that NIC already.

SIP Location Connection Port	<p>Enter the TCP port MiCollab AM listens for incoming SIP messages.</p> <p>The default value is 5060.</p>
SIP parser qualifier string	<ul style="list-style-type: none"> • Single SIP integration on the call server: Enter the local IP address to which the integration is bound. This field is used by MiCollab AM to match SIP packets to the appropriate SIP integration. • Multiple SIP integrations on the call server: Use a string that is unique to each SIP integration. <p>For example:</p> <p>The extension that will be used as the hunt number on the PBX followed by the @ symbol and the IP of the call server, such as 5000@172.16.4.202. <i>The hunt number must be unique across all IP integrations.</i></p> <p>The Fully Qualified Domain Name (FQDN) of the switch, such as pbx1.sipdomain.com.</p> <div style="background-color: #e6f2ff; padding: 10px; margin-top: 10px;"> <p>NOTE This setting must match a string in the SIP header that is unique to this particular integration</p> </div>
PBX Registration Password	<p>Enter the password that you assigned to the user definitions for the integrated ports.</p>
Media packet size (milliseconds)	<p>MiCollab AM sends/receives packets containing the number of milliseconds worth of audio data set here.</p> <p>The default value is 20.</p>
Voice Message System ID (SID)	<p>Enter the system ID (SID) number that you created in the section, Initiating the Information Computer Function.</p>
MWI Subscription Period in seconds	<p>Enter the MWI Subscription period in seconds.</p> <p>The default value is 3600.</p>

- b** In the **Local Integration Settings** section, select the **Integration Specific Parameters** view, and configure the following settings:

Local Integration Settings

View: Integration Specific Parameters Set Defaults

Name	Value
Base ASR Sensitivity (External)	5
Use Single Channel on Blind Transfers	<input checked="" type="checkbox"/>
Use Single Channel for Monitor Transfers	<input checked="" type="checkbox"/>
Type of call progress to use for external calls	Digital
Enable SIP server failover	<input type="checkbox"/>
Delay (in MS) between Failover attempts	1000
Enable fallback to primary SIP server	<input type="checkbox"/>
Rehome to Primary server timer (in MS)	90000
Maximum SIP message size (in Kilobytes)	4

- Find **Type of Call Progress to use for External Calls** and set the value as how the gateway is used for the integration.
 - Digital:** Select if the gateway supports call progress through to the endpoint.
 - Media:** Select if the gateway reports early that the call is connected, such as before the phone rings or while the phone is ringing.

8 Click **OK**. The **Switch Section Options** dialog box appears.

Switch Section Options

Local Switch: Mitel MiVoice MX-ONE OK

System Switch Section: Mitel MiVoice MX-ONE Section Apply

System Switch Section Settings

Name: Mitel MiVoice MX-ONE Section

Node Code:

Location Code:

Location: Seattle

MWI Integration: Mitel MiVoice MX-ONE SIP Station Cancel

Help

Local Switch Section Settings

View: Required Parameters Set Defaults

Name	Value
Incoming Hunt Mode	Terminal
Hunt Group Access Code	

- 9 In the **Switch Section Options** dialog box, configure the following options.
- In the **Local Switch Settings** section, select **Required Parameters** view.
 - In the **Incoming Hunt Mode** field, select the mode appropriate for your configuration.
 - In the **Hunt Group Access Code** field, type the pilot number or destination code that users dial to reach MiCollab AM.

NOTE Select the hunt mode that matches the hunt mode type in IP PBX programming.

d Click **OK**.

- 10 Continue through and complete the configuration. At the end of the configuration, a confirmation dialog box appears. Click **OK**.

- 11 If **MiCollab AM Configuration** does not open automatically after the configuration completes, open **MiCollab AM Configuration**, and select the **Lines** tab.
- 12 In the table from the **Lines** tab, enter the extension number of each integrated line on the Call Server.

IMPORTANT You must enter the PBX extension numbers that the Call Server is configured to answer or the integration will fail. The extension numbers are registered as SIP stations with the IP PBX during system startup.

- 13 Click **OK** to save all changes.

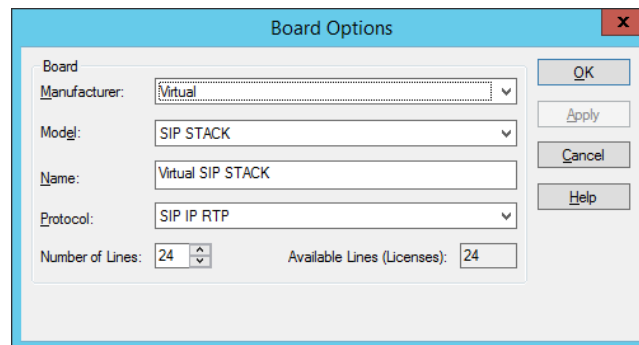
Configuring Existing MiCollab AM for the Integration

To configure exiting MiCollab AM for the telephone integration:

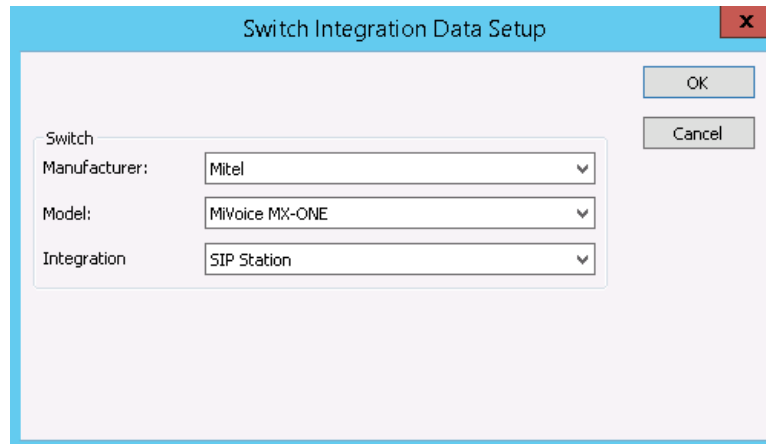
- 1 Open **MiCollab AM Configuration**, and go to the **Main** tab.
- 2 In the **Main** tab, click **Shutdown** to stop the system. Wait until the **Current Status** shows **Stopped**.

NOTE If you have not configured the virtual board with your MiCollab AM system yet, complete **Step 3**. If your MiCollab AM already has the virtual board configured, skip to **Step 4**.

- 3 **[Optional]** Select the **Boards** tab, and then click the **Add** button. The **Board Options** dialog box appears.



- a From the **Manufacturer** drop-down list, select **Virtual**.
 - b From the **Model** drop-down list, select **SIP STACK**.
 - c In the **Name** field, the name for this board is automatically generated. Enter a new name if necessary.
 - d From the **Protocol** drop-down list, select **SIP IP RTP**.
 - e In the **Number of Lines** field, enter the number of lines this board uses. The total number of lines is limited by the capacity of the board and the number of **Available Line Licenses**.
 - f Click **OK**.
- 4 Select the **Switches** tab and click the **Add** button. The **Switch Integration Data Setup** dialog box appears.



Switch Integration Data Setup

Switch

Manufacturer: Mitel

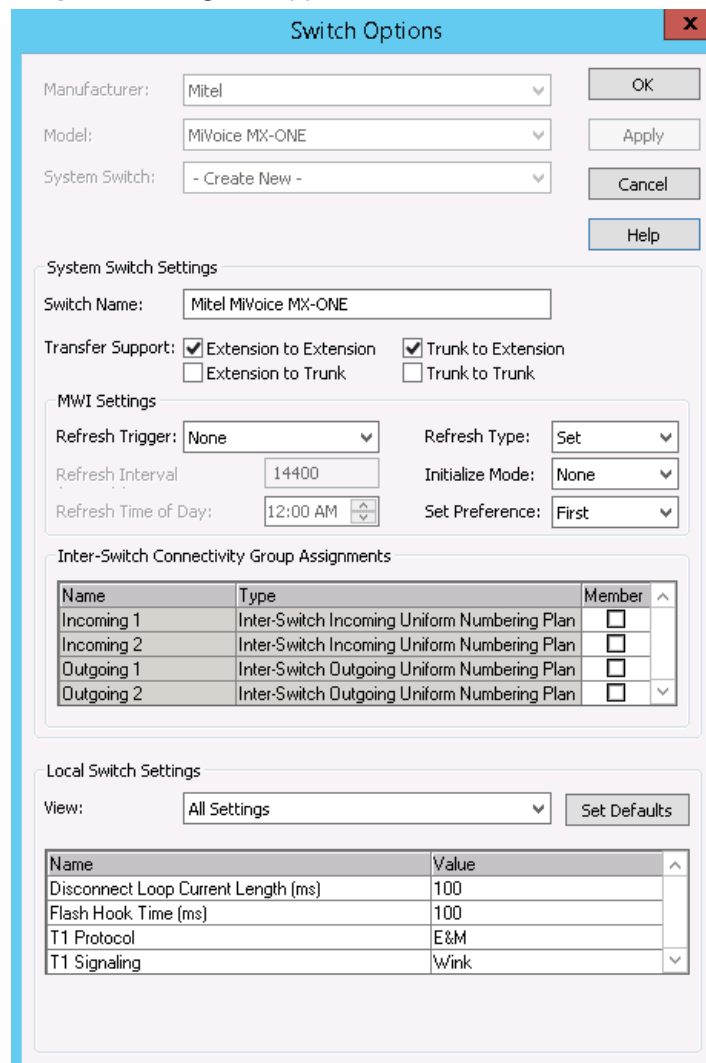
Model: MiVoice MX-ONE

Integration: SIP Station

OK

Cancel

- a From the **Manufacturer** drop-down list, select **Mitel**.
 - b From the **Model** drop-down list, select **MiVoice MX-ONE**.
 - c From the **Integration Type** drop-down list, select **SIP Station**.
- 5 Click **OK**. The **Switch Options** dialog box appears.



Switch Options

Manufacturer: Mitel

Model: MiVoice MX-ONE

System Switch: - Create New -

OK

Apply

Cancel

Help

System Switch Settings

Switch Name: Mitel MiVoice MX-ONE

Transfer Support: ☒ Extension to Extension ☒ Trunk to Extension
☐ Extension to Trunk ☐ Trunk to Trunk

MWI Settings

Refresh Trigger: None

Refresh Interval: 14400

Refresh Time of Day: 12:00 AM

Refresh Type: Set

Initialize Mode: None

Set Preference: First

Inter-Switch Connectivity Group Assignments

Name	Type	Member
Incoming 1	Inter-Switch Incoming Uniform Numbering Plan	<input type="checkbox"/>
Incoming 2	Inter-Switch Incoming Uniform Numbering Plan	<input type="checkbox"/>
Outgoing 1	Inter-Switch Outgoing Uniform Numbering Plan	<input type="checkbox"/>
Outgoing 2	Inter-Switch Outgoing Uniform Numbering Plan	<input type="checkbox"/>

Local Switch Settings

View: All Settings

Set Defaults

Name	Value
Disconnect Loop Current Length (ms)	100
Flash Hook Time (ms)	100
T1 Protocol	E&M
T1 Signaling	Wink

- 6 If necessary, make any changes to the default settings your site requires in the **Switch Options** dialog box.

NOTE The settings related to the telephone system in the **Switch Options** dialog box are filled in automatically when you select the correct telephone system during setup.

If you need to customize settings on the **Switch Options** dialog box to meet requirements specific to your site, refer to the documentation accompanying the telephone system, the online help, and the *System Installation and Configuration Guide*.

- 7 Click **OK**. The **Integration Options** dialog box appears.

- 8 In the **Integration Options** dialog box, configure the following options:

- a In the **Local Integration Settings** section, select the **Required Parameters** view, and configure the settings as follows:

Table 5. Required Parameters View – Integration Options

Field	Required Value
SIP Server Address	Enter the IP address of the IPLU board that functions as the entry gatekeeper.
SIP Server Port	Enter the port MiCollab AM on which listens for incoming SIP messages. The default value is 5060 .
Local IP Address to bind on	Enter the IP address of the network interface card (NIC) on the MiCollab AM Call Server platform that supports the media server. If there is only one NIC on the Call Server platform, this field typically contains the IP address of that NIC already.

SIP Location Connection Port	Enter the TCP port MiCollab AM listens for incoming SIP messages. The default value is 5060 .
SIP parser qualifier string	<ul style="list-style-type: none"> • Single SIP integration on the call server: Enter the local IP address to which the integration is bound. This field is used by MiCollab AM to match SIP packets to the appropriate SIP integration. • Multiple SIP integrations on the call server: Use a string that is unique to each SIP integration. <p>For example:</p> <p>The extension that will be used as the hunt number on the PBX followed by the @ symbol and the IP of the call server, such as 5000@172.16.4.202. <i>The hunt number must be unique across all IP integrations.</i></p> <p>The Fully Qualified Domain Name (FQDN) of the switch, such as pbx1.sipdomain.com.</p> <p>NOTE This setting must match a string in the SIP header that is unique to this particular integration</p>
PBX Registration Password	Enter the password that you assigned to the user definitions for the integrated ports.
Media packet size (milliseconds)	MiCollab AM sends/receives packets containing the number of milliseconds worth of audio data set here. The default value is 20 .
Voice Message System ID (SID)	Enter the system ID (SID) number that you created in the section, Initiating the Information Computer Function .
MWI Subscription Period in seconds	Enter the MWI Subscription period in seconds. The default value is 3600 .

- b** In the **Local Integration Settings** section, select the **Integration Specific Parameters** view, and configure the following settings:

Name	Value
Base ASR Sensitivity (External)	5
Use Single Channel on Blind Transfers	<input checked="" type="checkbox"/>
Use Single Channel for Monitor Transfers	<input checked="" type="checkbox"/>
Type of call progress to use for external calls	Digital
Enable SIP server failover	<input type="checkbox"/>
Delay (in MS) between Failover attempts	1000
Enable fallback to primary SIP server	<input type="checkbox"/>
Rehome to Primary server timer (in MS)	90000
Maximum SIP message size (in Kilobytes)	4

- Find **Type of Call Progress to use for External Calls**, How this should be set depends on the gateway used for the integration.

- If the gateway supports call progress through to the endpoint, set to **Digital**.
- If the gateway reports early that the call is connected, such as before the phone rings or while the phone is ringing, set to **Media**.

9 Click **OK**. The **Switch Section Options** dialog box appears.

10 In the **Switch Section Options** dialog box, configure the following options:

- In the **Local Switch Settings** section, select the **Required Parameters** view.
- In the **Incoming Hunt Mode** field, select the mode appropriate for your configuration.

NOTE Select the hunt mode that matches the hunt mode type in IP PBX programming.

- In the **Hunt Group Access Code** field, type the pilot number or destination code that users dial to reach MiCollab AM.
- Click **OK**.

11 In **MiCollab AM Configuration**, verify that that the telephone system is properly added and configured in the **Switches**, **Switch Sections**, and **Integrations** tabs.

12 Select the **Lines** tab.

13 In the table from the **Lines** tab, enter the extension number of each integrated line on the Call Server.

IMPORTANT You must enter the PBX extension numbers that the Call Server is configured to answer or the integration will fail. The extension numbers are registered as SIP stations with the IP PBX during system startup.

14 Click **OK** to save all changes.

Configuring MiCollab AM for SIP Failover

MiCollab AM can be configured for automatic failover to the secondary SIP server in the event of the primary/host SIP server failure. Use the instructions provided in this section to add or remove secondary SIP server(s) for failover.

To add a SIP failover server:

- 1 From **MiCollab AM Configuration**, click the **Integrations** tab.
- 2 From the **Integrations** list, select your integration, and then click **Edit**.
- 3 In the **Integration Options** dialog box, go to the **Local Integration Settings** section.
- 4 From the **View** drop-down list, select **Failover Server Settings**.
- 5 Click the **Add Failover Server** button. Two new rows are added to configure the secondary SIP server.
- 6 In the **Secondary SIP Server Address** and **Secondary SIP Server Port** rows, enter the appropriate value as follows:

Table 6. Secondary SIP Server Address and the Secondary SIP Server Port example

Field	Value
Secondary SIP Server Address	<p>Enter the TCP/IP address or an FQDN of the secondary node.</p> <p>For example: The IP address 123.45.6.789 as displayed on the Review/Modify SIP Gateway screen.</p> <p>NOTE This integration requires the machine name to be a fully qualified domain name. Therefore, use the Machine Name field as displayed on the Review/Modify SIP Gateway screen during the integration process.</p> <p>IMPORTANT This value must match the configuration on the Gateway of the secondary node.</p>
Secondary SIP Server Port	<p>Enter the port number of the secondary node. The default value is 5060.</p>

- 7 From the **View** drop-down list, select **Integration Specific Parameters**. The **Integration Specific Parameters** view appears.
- 8 In the **Integration Specific Parameters** list, enter the information as shown in the following table:

NOTE The parameters in the following table is listed in alphabetical order. The actual Integration Specific Parameters on your system may not be listed in the same order presented in the table below.

Table 7. Integration Specific Parameters

Field	Value
Enable SIP server failover	Select this check box to allow for failover and to enable the failover server setting changes.
Delay (in ms) between Failover attempts	The delay in milliseconds before MiCollab AM attempts to register its port with the SIP server. The default is 1000 ms.
Incoming off hook delay	800
Outgoing off hook delay	0
On hook delay	300
Type of Call Progress to use for External Calls	<p>How this should be set depends on the gateway used for the integration.</p> <ul style="list-style-type: none"> • If the gateway supports call progress through to the endpoint, set to Digital. • If the gateway reports early that the call is connected, such as before the phone rings or while the phone is ringing, set to Media.

- 9 Click **Apply** to save the changes.
- 10 To add another failover server repeat **Steps 4-9**.
- 11 Click **OK** to close the **Integration Options** dialog box.

To remove a SIP Failover Server:

- 1 From **MiCollab AM Configuration**, click the **Integrations** tab.
- 2 From the **Integrations** list, select your integration, and then click **Edit**.
- 3 In the **Integration Options** dialog box, go to the **Local Integration Settings** section.
- 4 From the **View** drop-down list, select **Failover Server Settings**.
- 5 In the **Failover Server Settings** view, click the **Remove Failover Server** button.
- 6 At the confirmation prompt, click **Yes** to confirm the deletion.

NOTE If multiple servers are listed, the last server address and port pair on the list is deleted first.

- 7 Click **Apply** to save the changes, and then click **OK** to close the **Integration Options** dialog box.

Changing the Network Binding Order on the MiCollab AM Platform

If your MiCollab AM server platform is a component of two or more local or wide area networks (LANs or WANs), you must make sure that this integration does not interfere with the normal network operation of the server. By default, MiCollab AM uses the primary (public) network interface card (NIC) in the platform, the first NIC in the network binding order. If you want MiCollab AM to use a NIC other than the first one, you must make several required configuration changes. It is much easier to configure the Integration to use another NIC by simply setting the integration parameter **Local IP Address to bind on** to the address of the NIC connected to the PBX.

NOTE The operating system gives precedence to the first network connection in the list followed by the remaining connections based on their position in the list.

The instructions in this section ensure that the binding order is correct when you set up the integration. If you replace a NIC on the MiCollab AM server platform later, the platform's operating system registers the new adapter at the bottom of its binding order. Restoring the original binding order should correct any problems caused by the change.

IMPORTANT The following procedure shifts the binding order of the network interface cards. To determine which NIC is associated with a specific network connection, right-click the connection in the **Network Connections** window, and then select **Properties**.

Windows Server 2008 R2 with Service Pack 1

To change the binding order of multiple NICs:

- 1 From the taskbar, click **Start** > **Control Panel**.
- 2 In the **Control Panel**, click **Network and Sharing Center**.
- 3 On the left pane, select **Change Adapter Settings**.
- 4 Press **Alt** to display the menu bar.
- 5 On the menu bar, select **Advanced**, and then click **Advanced Settings**.
- 6 On the **Adapters and Bindings** tab of **Advanced Settings**, click the network connection that serves MiCollab AM.
- 7 Click the up arrow button to the right of the **Connections** list as many times as needed to move the connection to the top of the list.
- 8 Click **OK**, and then close the **Network Connections** window and the **Control Panel**.

Windows Server 2012 R2

To change the binding order of multiple NICs:

- 1 From the taskbar, click **Start > Control Panel**.
- 2 In the **Control Panel**, click **Network and Sharing Center**.
- 3 On the left pane, select **Change Adapter Settings**.
- 4 Press **Alt** to display the menu bar.
- 5 On the menu bar, select **Advanced**, and then click **Advanced Settings**.
- 6 On the **Adapters and Bindings** tab of **Advanced Settings**, click the network connection that serves MiCollab AM.
- 7 Click the up arrow button to the right of the **Connections** list as many times as needed to move the connection to the top of the list.
- 8 Click **OK**, and then close the **Network Connections** window and the **Control Panel**.

Windows Server 2016

To change the binding order of multiple NICs:

- 1 From the taskbar, select **Start > Control Panel**.
- 2 In the **Control Panel**, click **Network and Internet > Network and Sharing Center**.
- 3 On the left pane, select **Change Adapter Settings**.
- 4 Right-click the network connection that serves MiCollab AM and then select **Properties**.
- 5 On the **Networking** tab of the **Local Area Connection Properties** dialog box, select **Internet Protocol Version 4 (TCP/IPv4)**, and then click **Properties**.
- 6 On the **General** tab of the **Internet Protocol Version 4 (TCP/IPv4) Properties** dialog box, click the **Advanced** button.
- 7 On the **IP Settings** tab of the **Advanced TCP/IP Settings** dialog box, clear the **Automatic metric** check box and then type in a low value in the **Interface metric** field. The lower the value, the higher the priority.

NOTE For all Windows systems, the value 1 is reserved for the loopback adapter. It is recommended to use a value of 2 or higher for the network connection that serves MiCollab AM.

- 8 Click **OK** on all of the dialog boxes to save the settings, and then close the **Local Area Connection Properties** dialog box.
- 9 Repeat steps 4 through 8 to assign an Interface metric value to all other network adapters.

Configuring Quality of Service (QoS)

As of version 6.0, MiCollab AM has no internal support for QoS. QoS must now be implemented externally via group policies as Policy-Based QoS. Refer to your operating system's documentation for details.

Table 8. QoS Configuration

Field	Setting
Application Name	At_TelephonyServer.exe
Protocol	Match the setting used for the integration UDP or TCP
Source Port	<p>MiCollab AM requires a range of ports for audio support. The MiCollab AM audio ports start at the Local Media Base UDP Port configured in the Server tab. Each MiCollab AM line reserves 10 ports. Hence, the port range starts from the number configured there, and goes to the last port of the last line. The formula for calculating the highest port number in the range is as follows:</p> $\text{BasePortNumber} + (\text{NumberOfCXPorts} * 10) - 1.$ <p>Hence, if the base port is 10000, and MiCollab AM has 8 lines, then the port range to use would be:</p> <p>10000:10079</p>
DSCP Value	46