

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

For version 9.0 and above

Notice

The information contained in this document is believed to be accurate in all respects but is not warranted by Mitel Networks™ Corporation (MITEL®). Mitel makes no warranty of any kind with regards to this material, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose. The information is subject to change without notice and should not be construed in any way as a commitment by Mitel or any of its affiliates or subsidiaries. Mitel and its affiliates and subsidiaries assume no responsibility for any errors or omissions in this document. Revisions of this document or new editions of it may be issued to incorporate such changes.

No part of this document can be reproduced or transmitted in any form or by any means - electronic or mechanical - for any purpose without written permission from Mitel Networks Corporation.

Trademarks

The trademarks, service marks, logos and graphics (collectively "Trademarks") appearing on Mitel's Internet sites or in its publications are registered and unregistered trademarks of Mitel Networks Corporation (MNC) or its subsidiaries (collectively "Mitel") or others. Use of the Trademarks is prohibited without the express consent from Mitel. Please contact our legal department at legal@mitel.com for additional information. For a list of the worldwide Mitel Networks Corporation registered trademarks, please refer to the website: <http://www.mitel.com/trademarks>.

© Copyright 2017, Mitel Networks Corporation

All rights reserved

Contents

Preface	4
References	4
Documentation	4
Documentation Updates	5
Help	5
Document Conventions	5
Features Supported in this Integration	6
Critical Application Considerations	8
MiCollab AM Application Considerations	8
Application Considerations for MiVoice MX-ONE Service Node	9
Installation Requirements	10
Telephone System Requirements	10
MiCollab AM Requirements	10
Programming MiVoice MX-ONE	11
Initiating the Number Series for the Access Number	11
Initiating the Number Length for the Access Number	11
Setting the Priority-Ordered List of the Audio CODECs	12
Initiating the SIP Trunk Definition	12
Initiating the Number of Ports in MiVoice MX-ONE	13
Enable Media Encryption, SRTP	13
Programming Message Waiting and Call Diversion for Subscriber Telephones	14
Setting up Certificate when using TLS	15
Installing the Network Interface	16
Configuring MiCollab AM	17
Configuring MiCollab AM for the Integration During Initial Installation	17
Configuring Existing MiCollab AM for the Integration	22
Configuring MiCollab AM for SIP Failover	28
Changing the Network Binding Order on the MiCollab AM Platform	30
Windows Server 2008 R2 with Service Pack 1	30
Windows Server 2012 R2	31
Windows Server 2016	31
Configuring Quality of Service (QoS)	32

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 trunk 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.

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 2
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 Application Considerations](#). Calls to MiCollab AM are not queued in the MiVoice MX-ONE Service Node.
2. Third-party conferences are not allowed on an integrated SIP-trunk.
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

- 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.
- Configure the **Hunt Group Access Code** in the **Switch Section Options** dialog box.
- 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 trunk 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 SIP trunk 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.
- The SIP server 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.
- When TLS is configured the certificates has to be configured in MiCollab AM and MiVoice MX-ONE Service Node.
- When the SRTP is used on SIP trunk to MiCollab AM in a system there not all terminals are configured for SRTP and SRTP is in forced in MiCollab AM, calls from terminals with no encryption will fail.

Application Considerations for MiVoice MX-ONE Service Node

- 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, calls are always diverted there, even if individual diversions have been programmed to divert calls elsewhere.
- 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 6.1 or later.
- One or more MGU or Media Server.
- When TLS is used a certificate has to be configured in MiVoice MX-ONE Service Node, see command `mxone_certificate help`.

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 trunk 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 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. The format used in following examples are for MiVoice MX-ONE version 6.1.

The connection to MiCollab AM can be initiated as SIP trunk using TCP or TLS, chose appropriate section for the configuration.

The media encryption is optional and is only enabled if SRTP is required.

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.

The following examples shows the command line interface and there is a reference to menus in the Graphical User Interface of **Service Node Manager** and **Provision Manager**.

Initiating the Number Series for the Access Number

Initiate external destination numbers in Number Analysis for the MiCollab AM. Use ED as the number type and choose a number that are appropriate for your numbering plan.

Service Node Manager Menus: **Number Analysis > Number Series**.

For example:

```
number_initiate -number 75001 -numbertype ed
```

To verify your work, type the following command:

```
number_print
```

Initiating the Number Length for the Access Number

Initiate number length of the external destination number to MiCollab AM.

Service Node Manager Menus: **Number Analysis > External Number Length**.

For example:

```
number_data_initiate -externalnumber 75001 -minlength 5 -maxlength 5
```

To verify your work, type the following command:

```
number_print
```

Setting the Priority-Ordered List of the Audio CODECs

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

Service Node Manager Menus: **Telephony > Telephony Domain**.

For example:

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

Then the priority-order of the audio CODECS is **PCMA,G722,PCMU,G729AB,G729A,G723**. Each codec value corresponds to its matching audio CODEC.

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 SIP Trunk Definition

Apply the commands in the following procedure to configure SIP trunk connection to MiCollab AM using TLS.

Service Node Manager Menus: **Telephony > External Lines**.

- 1 Initiate a route category for the route connection to MiCollab AM.

For example:

```
ROCAI:ROU=201,SEL=7110000000000010,SIG=0111110000A0,TRAF=03151515,TRM=4,SERV=31  
10000001,BCAP=000100;
```

To verify your work, type the following command:

```
ROCAP:ROU=201;
```

- 2 Initiate a route data for the route connection to MiCollab AM.

For example:

```
RODAI:ROU=201,TYPE=TL66,VARC=00000000,VARI=00000000,VARO=00000000;
```

To verify your work, type the following command:

```
RODAP:ROU=201;
```

- 3 Initiate a route destination data for the route connection to MiCollab AM.

For example:

```
RODDI:ROU=201,DEST=75001,ADC=0005000000000250000001010000,SRT=1;
```

To verify your work, type the following command:

```
RODDP:DEST=75001;
```

- 4 Initiate a SIP trunk profile for the connection to MiCollab AM. MiVoice MX-ONE Service Node SIP trunk is initiated using the profile **MiCollabAM_TCP** or **MiCollabAM_TLS_SRTP**.

The **tgrp=mxone-system** string can be changed and is used to identify the connected system and later entered as the SIP Parser Qualifier String in MiCollab AM configuration.

The **-mwinumber** parameter is the access number to MiCollab AM, will enable automatic DTMF on extensions when calling MiCollab AM.

The **-uristring0** parameter has to contain the IP of FQDN of MiCollab AM.
Parameter **-match** is the IP of MiCollab AM;

For example - SIP trunk with TCP:

```
sip_route -set -route 201 -profile MiCollabAM_TCP -uristring0 "sip:?@mivoiceam.mx-one;tgrp=my-system" -accept REMOTE_IP -match 192.168.50.90 -mwinumber 75001
```

To verify your work, type the following command:

```
Sip_route -print -route 201
```

For example - SIP trunk with TLS:

```
sip_route -set -route 201 -profile MiCollabAM_TLS_SRTP -uristring0 "sip:?@mivoiceam.trust.mx-one;tgrp=mxone-system" -accept REMOTE_IP -match 192.168.50.90 -mwinumber 75001
```

To verify your work, type the following command:

```
Sip_route -print -route 201
```

Initiating the Number of Ports in MiVoice MX-ONE

Initiate the number of ports in MiVoice MX-ONE Service Node used for calls to MiCollab AM. The number of ports should be the same as the number of ports that can be connected on MiCollab AM. The example initiates 10 ports for calls to MiCollab AM. Ports can be assigned in multiple MiVoice MX-ONE Service Nodes.

Service Node Manager Menus: **Telephony > External Lines.**

For example:

```
ROEQI:ROU=201,TRU=1-1&&1-10;
```

To verify your work, type the following command:

```
ROEDP:ROU=201,TRU=ALL;
```

Enable Media Encryption, SRTP

If media encryptions (SRTP) is used it has to be enabled in MiVoice MX-ONE.

For example:

```
media_encryption_enable -type route
```

To verify your work, type the following command:

```
media_encryption_print
```

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. Provision Manager Menus: **Services > Extension**

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 MiCollab AM access number as the diversion point for subscribers. Use the **diversion_common** command to create a common diversion to voice mail for subscribers, or use the diversion command to create individual diversions.

For example:

```
diversion -c -d 2001..2299--div-destination-number 75001
```

To verify your work, type the following command:

```
diversion -p -d 2001..2299
```

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

For example:

```
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 75001--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, ICS calls are always diverted to this position, even if individual call diversion 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* document for more information on programming reason code diversions.

Setting up Certificate when using TLS

To configure certificate in MiVoice MX-ONE Service Node, see the command `mxone_certificate` help to perform the appropriate configuration.

The following is an example of steps needed to setup a certificate and signing it with your own certificate when no previous certificate configuration exist. The procedure may not be the same for a different type of certificate. If certificate is already configured only an update of configuration file and Server Certificate is necessary.

To configure root and server certificate:

- 1 Start configuration with command **mxone_certificate** from the menus, and then select **Manage Root Certificate**.
 - Select **Create Root Certificate**.
 - Select **Install Root Certificate**.
- 2 Start configuration with command **mxone_certificate**, and then select **Manage Server Certificate**.
 - Select **Create configuration file with default settings**.
 - Edit the **Default file** and enter the **FQDN** and **IP** of MiCollab AM and MiVoice MX-ONE Service Nodes.
 - Select **Create Server Certificate** using configuration file.
 - Select **Install Server Certificate** and follow the instruction.

To sign the MiCollab AM certificate:

- 1 The CSR (Certificate Signing Request) from MiCollab AM is signed with command **mxone_certificate**.
 - Select **Manage Root Certificate**.
 - Select **Sign a server Certificate**.

NOTE Make sure the configuration file is configured with **FQDN** and **IP** of MiCollab AM and MiVoice MX-ONE Service Nodes.

- 2 Copy the resulting file to MiCollab AM that contains two certificates, **Local Certificate** and **Remote Trusted Certificate**.

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:

Examples:

```
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:

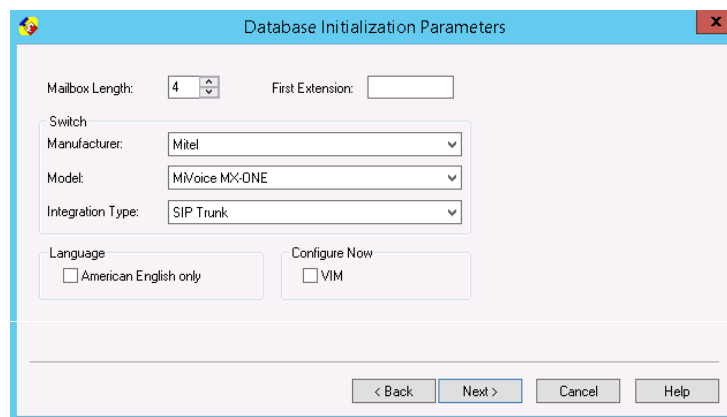
- [Configuring MiCollab AM for the Integration During Initial Installation](#): Integrate the telephone system while you install MiCollab AM for the first time.
- [Configuring Existing MiCollab AM for the Integration](#): Integrate a new telephone system on your exiting MiCollab AM system.

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

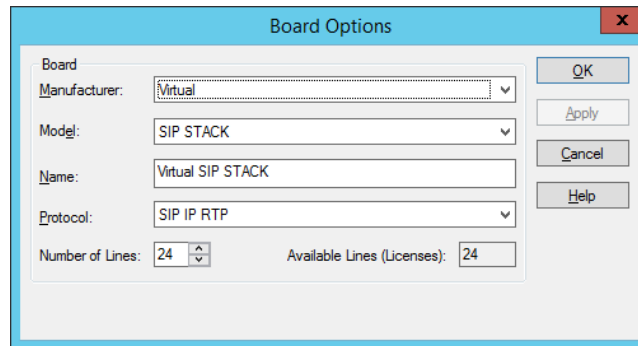
To configure MiCollab AM for the integration during the initial installation:

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



- a In the **Mailbox Length** box, enter the mailbox length in digits.
- b 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 Trunk**.

- 2 Click **Next**. The **Board Options** dialog box displays for the virtual board configuration.
- 3 In the **Board Options** dialog box, configure the following options:



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

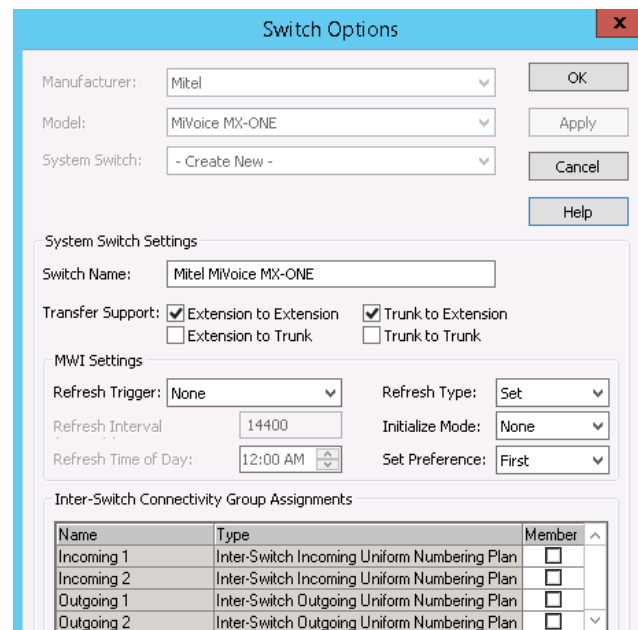
- Manufacturer:** Virtual
- Model:** SIP STACK
- Name:** Virtual SIP STACK
- Protocol:** SIP IP RTP
- Number of Lines:** 24
- Available Lines (Licenses):** 24

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

- a From the **Manufacturer** drop-down list, select **Virtual**.
 - b From the **Model** drop-down list, select **SIP STACK**.
 - c From the **Protocol** drop-down list, select **SIP IP RTP**.
 - d 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.
 - 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*.



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"/>

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

Image continued on next page

Image continued from previous page

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

Integration Options

System Switch: Mitel MiVoice MX-ONE OK

Integration Type: SIP Trunk Apply

Integration: - Create New - Cancel

Name: Mitel MiVoice MX-ONE SIP Trunk Help

ITN...

Local Integration Settings

View: Required Parameters Set Defaults

Name	Value
SIP Server Address	
SIP Server Port	5060
Use configured Domain Name	<input checked="" type="checkbox"/>
SIP Domain Name	MX-ONE
Transport for outgoing SIP messages	TCP
Local IP Address to bind on	fd8b:552b:a82a:15f8:eda:669:219b
SIP Local Connection Port	5060
SIP parser qualifier string	

- 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 settings as follows:

Table 3. Required Parameters View – Integration Options

Field	Setting
SIP Server Address	Enter the IP address of the MiVoice MX-ONE Service Node. This can be the IP address (in the form of IPv4) or a Fully Qualified Domain Name (FQDN).
SIP Server Port	<p>This is the port on which MiVoice MX-ONE Service Node is listening for SIP messages. MiCollab AM will send all SIP messages to this port.</p> <p>The default port is 5060. When configured for TLS, the default is 5061.</p>

Use Configured Domain Name	Select this checkbox if you want to use the domain name configured in the SIP Domain Name field instead of SIP Server Address .
SIP Domain Name	If Use Configured Domain Name is enabled, enter a string that will be used to populate the host portion of the Request-URI , To , and From headers.
Local SIP Domain Name (if available)	<p>If Use Configured Domain Name is enabled, enter a string that will be used to populate the host portion of the Request-URI, To, and From headers of the outgoing SIP requests.</p> <p>This field overrides the value of SIP Domain Name (but for the From headers only).</p> <p>This field was added to the MiCollab AM configuration to support the environments where the MiCollab AM extensions (or the pilot number) are placed in a SIP domain that is different from the SIP domain for the rest of the extensions.</p>
Transport for outgoing SIP messages	<p>This is the transport medium that will be used to send outgoing SIP messages.</p> <ul style="list-style-type: none"> • Enter <i>TCP</i> when using the TCP SIP trunk profile. • Enter <i>TLS</i> when using the TLS_S RTP SIP trunk profile.
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.
SIP Local Connection Port	Enter the port number where MiCollab AM listens for incoming SIP messages. The default value is 5060 .
SIP parser qualifier string	<p>In cases of a 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.</p> <p>In cases where there are multiple SIP integrations on the MiCollab AM, use a string that is unique to each SIP integration.</p> <p>For example:</p> <p>The SIP trunk profile is initiated with string tgrp=mxone-system. This string is entered as a unique string to identify the integration.</p> <p>NOTE This setting must match a string in the SIP header that is unique to this particular integration</p>

- b** In the **Local Integration Settings** section, select the **Connection Security Parameters** View and configure the settings as follows:

Table 6. Configuration Connection Security Settings Values

Field	Setting
Enable TLS	Indicates whether or not to enable TLS . NOTE Only enabled if SIP trunk profile with TLS is used.
SIP Server Address	Enter the IP addresses of all MiVoice MX-ONE Service Nodes that will be connecting to MiCollab AM. These are the addresses for trusted remote SIP servers that will process the TLS messages. NOTE To add more lines for this field, click the Add Trusted Address button.
SIP Server TLS Port	Enter the port number on the remote MiVoice MX-ONE Service Nodes that is configured to receive the TLS messages. The default value is 5061 .
SIP Local TLS Port	Enter the port number on the MiCollab AM system that will receive TLS messages. Specify a port that is not already in use by MiCollab AM (or another application). The default value is 5061 .
Local Certificate File Name	Path to the local security certificate file.
Local Private Key File Name	Path to the local private key file.
Local Issuer Certificate File Name	Path to a local issuer certificate key file (may not be needed in some configurations).
Remote Trusted Certificate File Name	Path to a remote trusted certificate.

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

Image continued on next page

Image continued from previous page

Local Switch Section Settings

View: Incoming Call Settings Set Defaults

Name	Value
Incoming Hunt Mode	Terminal
Hunt Group Access Code	
Incoming Line Reserve	48
Maximum Ports on Hold	48

- 9 In the **Switch Section Options** dialog box, configure the following options:
 - a In the **Local Integration Settings** section, select the **Incoming Call Settings** view.
 - b For the **Incoming Hunt Mode** value, select **Terminal**.
 - c In the **Hunt Group Access Code** field, enter the value for this integration.

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, configure callouts for the application. For information on configuring callout settings, see the topic *Configuring Callout Settings*, in the online help system.
- 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.

- 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 Trunk**.
- 5 Click **OK**. The **Switch Options** dialog box appears.
- 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*.

Switch Options ✕

Manufacturer: OK

Model: Apply

System Switch: Cancel

Help

System Switch Settings

Switch Name:

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

MWI Settings

Refresh Trigger: Refresh Type:

Refresh Interval: Initialize Mode:

Refresh Time of Day: Set Preference:

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: Set Defaults

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

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

Integration Options ✕

System Switch: OK

Integration Type: Apply

Integration: Cancel

Name: Help

ITN...

Local Integration Settings

View: Set Defaults

Name	Value
SIP Server Address	
SIP Server Port	5060
Use configured Domain Name	<input checked="" type="checkbox"/>
SIP Domain Name	MX-ONE
Transport for outgoing SIP messages	TCP
Local IP Address to bind on	fddb:552b:a82a:5004:15f8:eda:669:219b
SIP Local Connection Port	5060
SIP parser qualifier string	

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 4. Required Parameter View – Integration Options

Field	Setting
SIP Server Address	Enter the IP address of the MiVoice MX-ONE Service Node. This can be the IP address (in the form of IPv4) or a Fully Qualified Domain Name (FQDN).
SIP Server Port	This is the port on which MiVoice MX-ONE Service Node is listening for SIP messages. MiCollab AM will send all SIP messages to this port. The default port is 5060 . When configured for TLS , the default is 5061 .
Use Configured Domain Name	Select this checkbox if you want to use the domain name configured in the SIP Domain Name field instead of SIP Server Address .
SIP Domain Name	If Use Configured Domain Name is enabled, enter a string that will be used to populate the host portion of the Request-URI , To , and From headers.
Local SIP Domain Name (if available)	If Use Configured Domain Name is enabled, enter a string that will be used to populate the host portion of the Request-URI , To , and From headers of the outgoing SIP requests. This field overrides the value of SIP Domain Name (but for the From headers only). This field was added to the MiCollab AM configuration to support the environments where the MiCollab AM extensions (or the pilot number) are placed in a SIP domain that is different from the SIP domain for the rest of the extensions.
Transport for outgoing SIP messages	This is the transport medium that will be used to send outgoing SIP messages. <ul style="list-style-type: none">• Enter <i>TCP</i> when using the TCP SIP trunk profile.• Enter <i>TLS</i> when using the TLS_SRTP SIP trunk profile.
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.
SIP Local Connection Port	Enter the port number where MiCollab AM listens for incoming SIP messages. The default value is 5060 .

SIP parser qualifier string	<p>In cases of a 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.</p> <p>In cases where there are multiple SIP integrations on the MiCollab AM, use a string that is unique to each SIP integration.</p> <p>For example:</p> <p>The SIP trunk profile is initiated with string tgrp=mxone-system. This string is entered as a unique string to identify the integration.</p> <p>NOTE This setting must match a string in the SIP header that is unique to this particular integration</p>
-----------------------------	---

- b** In the **Local Integration Settings** section, select the **Connection Security Parameters** View and configure the settings as follows:

Table 6. Configuration Connection Security Settings Values

Field	Setting
Enable TLS	<p>Indicates whether or not to enable TLS.</p> <p>NOTE Only enabled if SIP trunk profile with TLS is used.</p>
SIP Server Address	<p>Enter the IP addresses of all MiVoice MX-ONE Service Nodes that will be connecting to MiCollab AM. These are the addresses for trusted remote SIP servers that will process the TLS messages.</p> <p>NOTE To add more lines for this field, click the Add Trusted Address button.</p>
SIP Server TLS Port	<p>Enter the port number on the remote MiVoice MX-ONE Service Nodes that is configured to receive the TLS messages. The default value is 5061.</p>
SIP Local TLS Port	<p>Enter the port number on the MiCollab AM system that will receive TLS messages. Specify a port that is not already in use by MiCollab AM (or another application). The default value is 5061.</p>
Local Certificate File Name	<p>Path to the local security certificate file.</p>
Local Private Key File Name	<p>Path to the local private key file.</p>
Local Issuer Certificate File Name	<p>Path to a local issuer certificate key file (may not be needed in some configurations).</p>

Remote Trusted Certificate Path to a remote trusted certificate.
File Name

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

Switch Section Options

Local Switch: Mitel MiVoice MX-ONE

System Switch Section: - Create New -

System Switch Section Settings

Name: Mitel MiVoice MX-ONE Section

Node Code:

Location Code:

Location: Auto Location

MWI Integration: Mitel MiVoice MX-ONE SIP Trunk

Local Switch Section Settings

View: Incoming Call Settings

Name	Value
Incoming Hunt Mode	Terminal
Hunt Group Access Code	
Incoming Line Reserve	48
Maximum Ports on Hold	48

- 10 In the **Switch Section Options** dialog box, configure the following options:
- a In the **Local Integration Settings** section, select the **Incoming Call Settings** view.
 - b For the **Incoming Hunt Mode** value, select **Terminal**.
 - c In the **Hunt Group Access Code** field, enter the value for this integration.

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

- d Click **OK**.
- 11 In **MiCollab AM Configuration**, verify 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, configure callouts for the application. For information on configuring callout settings, see the topic *Configuring Callout Settings*, in the online help system.
- 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 5. Secondary SIP Server Address and the Secondary SIP Server Port example

Field	Value
Secondary SIP Server Address	<div>Enter the TCP/IP address or an FQDN of the secondary node.</div> <div>For example: The IP address 123.45.6.789 as displayed on the Review/Modify SIP Gateway screen.</div> <div>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.</div> <div>IMPORTANT This value must match the configuration on the Gateway of the secondary node.</div>
Secondary SIP Server Port	Enter the port number of the secondary node. The default value is 5060 .

- 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 6. 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 7. 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