Configure MiVB 8.0 PR2 for use with TDS Telecom

MARCH 2017
SIP COE   HO933
TECHNICAL CONFIGURATION NOTES
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Mitel Technical Configuration Notes:

Configure the Mitel MiVB 8.0 PR2 for use with TDS TELECOM

March 2017 – HO933
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Overview

This document provides a reference to Mitel Authorized Solutions providers for configuring the Mitel MiVB to connect to TDS TELECOM. The different devices can be configured in various configurations depending on your VoIP solution. This document covers a basic setup with required option setup.

Interop History

<table>
<thead>
<tr>
<th>Version</th>
<th>Date</th>
<th>Reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>May 2014</td>
<td>Interop with Mitel 3300 MCD 6.0 SP3 and TDS TELECOM</td>
</tr>
<tr>
<td>1</td>
<td>March 2017</td>
<td>Interop with Mitel MiVB 8.0 PR2 and TDS TELECOM</td>
</tr>
</tbody>
</table>

Interop Status

The Interop of TDS TELECOM has been given a Certification status. This service provider or trunking device will be included in the SIP CoE Reference Guide. The status TDS TELECOM achieved is:

The most common certification which means TDS TELECOM has been tested and/or validated by the Mitel SIP CoE team. Product support will provide all necessary support related to the interop, but issues unique or specific to the 3rd party will be referred to the 3rd party as appropriate.

Software & Hardware Setup

Test setup to generate a basic SIP call between TDS TELECOM and the MiVB.

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Variant</th>
<th>Software Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mitel</td>
<td>MiVB 8.0 PR2 – Mxe Platform</td>
<td>14.0.0.95</td>
</tr>
<tr>
<td>Mitel</td>
<td>MBG - Gateway</td>
<td>9.4.0.29</td>
</tr>
<tr>
<td>Mitel</td>
<td>MBG - Teleworker</td>
<td>9.4.0.29</td>
</tr>
<tr>
<td>Mitel</td>
<td>Nupoint Voicemail</td>
<td>Build: 17.2.0.3.01</td>
</tr>
<tr>
<td>Mitel</td>
<td>Astra 6869i SIP Set</td>
<td>4.1.0.128</td>
</tr>
<tr>
<td>Mitel</td>
<td>5320/5320e IP Sets</td>
<td>Minet (06.05.00.06)</td>
</tr>
<tr>
<td>Broadsoft</td>
<td>BW Media Server</td>
<td>17SP4</td>
</tr>
<tr>
<td>Metaswitch</td>
<td>PSTN Gateway</td>
<td>8.1</td>
</tr>
<tr>
<td>Metaswitch</td>
<td>Perimata SBC (TDS Edge)</td>
<td>v3.4.01.SU15</td>
</tr>
<tr>
<td>CISCO</td>
<td>CUBE SBC (Customer Edge)</td>
<td>15.2.4.M4</td>
</tr>
</tbody>
</table>
Tested Features

This is an overview of the features tested during the Interop test cycle and not a detailed view of the test cases. Please see the SIP Trunk Side Interoperability Test Plans (08-4940-00034) for detailed test cases.

<table>
<thead>
<tr>
<th>Feature</th>
<th>Feature Description</th>
<th>Issues</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic Call</td>
<td>Making and receiving a call through TDS TELECOM and their PSTN gateway, call holding, transferring, conferencing, busy calls, long calls durations, variable codec.</td>
<td>▲</td>
</tr>
<tr>
<td>Automatic Call Distribution</td>
<td>Making calls to an ACD environment with RAD treatments, Interflow and Overflow call scenarios and DTMF detection.</td>
<td>✓</td>
</tr>
<tr>
<td>NuPoint Voicemail</td>
<td>Terminating calls to a NuPoint voicemail boxes and DTMF detection.</td>
<td>✓</td>
</tr>
<tr>
<td>Packetization</td>
<td>Forcing the MiVB to stream RTP packets through its E2T card at different intervals, from 10ms to 60ms</td>
<td>▲</td>
</tr>
<tr>
<td>Personal Ring Groups</td>
<td>Receiving calls through TDS TELECOM and their PSTN gateway to a personal ring group. Also moving calls to/from the prime member and group members.</td>
<td>✓</td>
</tr>
<tr>
<td>Teleworker</td>
<td>Making and receiving a call through TDS TELECOM and their PSTN gateway to and from Teleworker extensions.</td>
<td>✓</td>
</tr>
<tr>
<td>Video</td>
<td>Making and receiving a call through TDS TELECOM with video capable devices.</td>
<td>☑️</td>
</tr>
<tr>
<td>Fax</td>
<td>T.38 and G711 Fax Calls</td>
<td>▲</td>
</tr>
</tbody>
</table>

☑️ - No issues found  ☑️ - Issues found, cannot recommend to use  ▲ - Issues found
Device Limitations and Known Issues

This is a list of not supported features when TDS TELECOM is connected to the Mitel MiVB 8.0 PR2.

<table>
<thead>
<tr>
<th>Feature</th>
<th>Problem Description</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>G.729, G722 Codecs</td>
<td>TDS TELECOM has full G.711u support (tested) but does not support G.729 as well as G.722 Codec calls over SIP Trunks.</td>
<td><strong>Recommendation:</strong> Use G.711u Codec.</td>
</tr>
<tr>
<td>Video</td>
<td>TDS TELECOM does not support video calls over SIP Trunks.</td>
<td><strong>Recommendation:</strong> Consult TDS TELECOM for future deployment.</td>
</tr>
<tr>
<td>Packetization</td>
<td>MiVB was exclusively tested with stream RTP packets through its E2T card at 10ms-60ms. It is observed that when we offer 30ms-60ms and answer from TDS is 20 ms, we send RTP packets with 30-60 ms instead of 20 ms.</td>
<td><strong>Recommendation:</strong> Use TDS TELECOM 20ms recommended setting.</td>
</tr>
<tr>
<td>T.38 Fax</td>
<td>TDS TELECOM does not support T.38 Fax over SIP Trunks.</td>
<td><strong>Recommendation:</strong> Consult TDS TELECOM for future.</td>
</tr>
<tr>
<td>TLS/SRTP</td>
<td>TDS TELECOM does not support TLS/SRTP over SIP Trunks.</td>
<td><strong>Recommendation:</strong> Consult TDS TELECOM for future deployment.</td>
</tr>
</tbody>
</table>
Network Topology

This diagram shows how the testing network is configured for reference.

Figure 1 – Network Topology
Configuration Notes

This section is a description of how the SIP Interop was configured. These notes should give a guideline how a device can be configured in a customer environment and how TDS TELECOM MiVB programming was configured in our test environment.

Disclaimer: Although Mitel has attempted to setup the interop testing facility as closely as possible to a customer premise environment, implementation setup could be different onsite. YOU MUST EXERCISE YOUR OWN DUE DILIGENCE IN REVIEWING, planning, implementing, and testing a customer configuration.

TDS TELECOM Configuration Notes

<table>
<thead>
<tr>
<th>SIP Service Provider Server IP address</th>
<th>SBC IP: Provided by the service provider</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registration and Authentication</td>
<td>N/A</td>
</tr>
<tr>
<td>Pilot Number</td>
<td></td>
</tr>
<tr>
<td>Username/Password</td>
<td>N/A</td>
</tr>
<tr>
<td>DIDs</td>
<td>Provided by the Service Provider</td>
</tr>
<tr>
<td>Preferred Codec</td>
<td>G.711u</td>
</tr>
<tr>
<td>SIP port</td>
<td>5060</td>
</tr>
<tr>
<td>Transport Type</td>
<td>UDP</td>
</tr>
<tr>
<td>Session Timer</td>
<td>1800 secs</td>
</tr>
</tbody>
</table>
Mitel MiVB Configuration Notes

The following steps show how to program a MiVB to interconnect with TDS TELECOM.

Network Requirements

- There must be adequate bandwidth to support the voice over IP. As a guide, the Ethernet bandwidth is approx 85 Kb/s per G.711 voice session and 29 Kb/s per G.729 voice session (assumes 20ms packetization). As an example, for 20 simultaneous SIP sessions, the Ethernet bandwidth consumption will be approx 1.7 Mb/s for G.711 and 0.6Mb/s. Almost all Enterprise LAN networks can support this level of traffic without any special engineering. Please refer to the MiVB Engineering guidelines for further information.
- For high quality voice, the network connectivity must support a voice-quality grade of service (packet loss <1%, jitter < 30ms, one-way delay < 80ms).

Assumptions for the MiVB MCD Programming

- The SIP signaling connection uses UDP on Port 5060
Licensing and Option Selection – SIP Licensing

Ensure that the MiVB is equipped with enough SIP trunking licenses for the connection to TDS TELECOM. This can be verified within the License and Option Selection form.

Enter the total number of licenses in the SIP Trunk Licences field. This is the maximum number of SIP trunk sessions that can be configured in the MiVB to be used with all service providers, applications and SIP trunking devices.

Figure 2 – License and Option Selection
Class of Service Assignment

The Class of Service Options Assignment form is used to create or edit a Class of Service and specify its options. Classes of Service, identified by Class of Service numbers, are referenced in the Trunk Service Assignment form for SIP trunks.

Many different options may be required for your site deployment, but ensure that “Public Network Access via DPNSS” Class of Service Option is configured for all devices that make outgoing calls through the SIP trunks in the MiVB.

- Public Network Access via DPNSS set to Yes
- Campon Tone Security/FAX Machine set to Yes
- Busy Override Security set to Yes
- Clear Auto Campon Timer to enable 486 BUSY testing

![Figure 3 – Class of Service](image-url)
Network Element Assignment

Create a network element for TDS TELECOM. In this example, the softswitch is reachable by an IP Address and is defined as “TDS” in the network element assignment form. **The FQDN or IP addresses of the SIP Peer (Network Element), the External SIP Proxy and Registrar are provided by your service provider.**

If your service provider trusts your network connection by asking for your gateway external IP address, then programming the IP address for the SIP Peer, Outbound Proxy and Registrar is not required for SIP trunk integration. This will need to be verified with your service provider. Set the transport to UDP and port to 5060.

![Figure 4 – Network Element Assignment](image-url)
Network Element Assignment (Proxy)

In addition, depending on your configuration, a Proxy may need to be configured to route SIP data to the service provider. If you have a Proxy server installed in your network, the MiVB will require knowledge of this by programming the Proxy as a network element then referencing this proxy in the SIP Peer Profile form (later in this document).

![Image](image_url)

Figure 5 – Network Element (Proxy)
Trunk Service Assignment

This is configured in the Trunk Service Assignment form. In this example the Trunk Service Assignment is defined for Trunk Service Number 23 which will be used to direct incoming calls to an answer point in the MiVB.

Program the Non-dial In or Dial In Trunks (DID) according to the site requirements and what type of service was ordered from your service provider.

The example below shows configuration for incoming DID calls. The MiVB will absorb the first 5 digits of the DID number from TDS TELECOM leaving 5 digits for the MiVB to translate and ring a 4 digit extension. For example, TDS TELECOM delivers 608-210-0812 through the SIP trunk to the MiVB. The MiVB will absorb the first 5 digits (60821) leaving the MiVB to ring extension 00812. Extension 00812 must be programmed as a valid 5 digit dialable number in the MiVB via system speed call. Please refer to the MiVB System Administration documentation for further programming information.

Figure 6 – Trunk Service Assignment
SIP Peer Profile

The recommended connectivity via SIP Trunking does not require additional physical interfaces. IP/Ethernet connectivity is part of the base MiVB Platform. The SIP Peer Profile should be configured with the following options:

**Network Element:** The selected SIP Peer Profile needs to be associated with previously created “TDS” Network Element.

**Registration User Name:** TDS TELECOM does not require the use of a Registration User Name.

**Address Type:** Select IP address.

**Default CPN:** This number will be provided by TDS TELECOM. Do not use a Default CPN if you want public numbers to be preserved through the SIP interface. Add private numbers into the DID ranges for CPN Substitution form (see DID Ranges for CPN Substitution). Then select the appropriate numbers in the Outgoing DID Ranges in this form (SIP Peer Profile).

**Trunk Service Assignment:** Enter the trunk service assignment previously configured.

**SMDR:** If Call Detail Records are required for SIP Trunking, the SMDR Tag should be configured (by default there is no SMDR and this field is left blank).

**Maximum Simultaneous Calls:** This entry should be configured to maximum number of SIP trunks provided by TDS TELECOM.

**NOTE-1:** Ensure the remaining SIP Peer profile policy options are similar the screen capture below.

**NOTE-2:** TDS Session Timer was set to 1800.
### SIP Peer Profile

<table>
<thead>
<tr>
<th>SIP Peer Profile</th>
<th>TDM Metro</th>
<th>TDM Metro</th>
<th>mTS_3_4</th>
<th>Yes</th>
<th>1</th>
<th>300</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Call Routing</td>
<td>Calling Line ID</td>
<td>CDR Options</td>
<td>Signaling and Header Manipulation</td>
<td>Timers</td>
<td>Key Press Event</td>
<td>Outgoing DDI Ranges</td>
<td>Profile Information</td>
</tr>
</tbody>
</table>

#### Default CPN
- Default CPN Name
- CPN Restrictions
- Public Calling Party Number Presentation
- Strip PNI
- Use Displayed Party Number as Calling Party Number
- Use Original Calling Party Number if Available

### TDM Metro Profile

<table>
<thead>
<tr>
<th>SIP Peer Profile</th>
<th>TDM Metro</th>
<th>TDM Metro</th>
<th>mTS_3_4</th>
<th>Yes</th>
<th>1</th>
<th>300</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Call Routing</td>
<td>Calling Line ID</td>
<td>CDR Options</td>
<td>Signaling and Header Manipulation</td>
<td>Timers</td>
<td>Key Press Event</td>
<td>Outgoing DDI Ranges</td>
<td>Profile Information</td>
</tr>
</tbody>
</table>

#### Default CPN
- Default CPN Name
- CPN Restrictions
- Public Calling Party Number Presentation
- Strip PNI
- Use Displayed Party Number as Calling Party Number
- Use Original Calling Party Number if Available

---

**Note:** The images display the interface of Mitel MiVoice Business with details on SIP Peer Profiles and their configurations.
### SIP Peer Profile

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOS_Metro</td>
<td>TOSMetr</td>
</tr>
<tr>
<td>SIPDevice</td>
<td>8600_3.4</td>
</tr>
<tr>
<td>KeepAlive (OPTION 80)</td>
<td>125</td>
</tr>
<tr>
<td>Registrations Period (%)</td>
<td>9000</td>
</tr>
<tr>
<td>Registrations Period</td>
<td>9000</td>
</tr>
<tr>
<td>MaxFwd</td>
<td>2000</td>
</tr>
<tr>
<td>MaxFwd</td>
<td>2000</td>
</tr>
<tr>
<td>MaxFwd</td>
<td>0</td>
</tr>
</tbody>
</table>

### Integrated Directory Services

- License
- LAN/WAN Configuration
- Voice Network
- System Properties
- Hardware
- Trunks
- trunkAttributes
- IPvNET
- SIP
- DID Ranges for CNF Substitution
- SIP Peer Profile
- SIP Peer Profile Assignment by Income
- SIP Peer Profile called Party: call-out
- SIP Peer Profile called Party: call-in
- CRNG Number Translation

### Users and Devices

- Local_501

### Options

- Add
- Change
- Delete

---

**TDSTMetro**

**SIPDevice**

**8600_3.4**

**Yes**

**1**

**300**

**1**
HO933

TDS Telecom
Figure 7 – SIP Peer Profile Assignment
SIP Peer Profile Assignment by Incoming DID

This form is used to assign incoming digits from TDS TELECOM. DID range numbers assigned by TDS TELECOM and are associated to a particular SIP Peer.

Enter one or more telephone numbers. The maximum number of digits per telephone number is 26. You can enter a mix of ranges or single numbers (for example, “01661520417,01282505152”). The entire field width is limited to 60 characters.

Use a comma to separate telephone numbers and ranges. Use a dash (-) to indicate a range of telephone numbers. The first and last characters cannot be a comma or a dash. If the numbers do not fit within the 60 character maximum, you can create a new entry for the same profile.

Use a ‘*’ to reduce the number of entries that need to be programmed. This is a type of “prefix identifier”, and cannot be used as a range with ‘-’. For example, the string “11*” would be used to associate a peer with any number in the range from 110 up to the maximum digits per telephone number (In this case, 11999999999999999999999999.) Note that the string “11” by itself would not count as a match, as the ‘*’ represents 1 or more digits.

Figure 8 – SIP Peer Profile Assignment by Incoming DID

ARS Digit Modification Number

Ensure that Digit Modification for outgoing calls on the SIP trunk to TDS TELECOM absorbs or inject additional digits according to your dialling plan. In this example, we will be absorbing 3 digits for both prefixes used: 926 prefix to dial out followed by 10 digits (DID Calls) and 927 prefix followed by 11 digits (International Calls).
Create a route for SIP Trunks connecting a trunk to TDS TELECOM. In this example, the SIP trunk is assigned to Route Number 35. Choose SIP Trunk as a routing medium and choose the SIP Peer Profile and Digit Modification entry created earlier.
ARS Digits Dialed Assignment

ARS initiates the routing of trunk calls when certain digits are dialed from a station. In this example, when a user dials 926 (local calls) or 927 (1-long distance calls), the call will be routed to TDS TELECOM (ie. Route 31).
Fax Configuration

TDS TELECOM uses the inter-zone FAX profile. This form allows you to define the settings for FAX communication over the IP network. You can modify the default settings for the:

**Inter-zone FAX profile**: defines the FAX settings between different zones in the network. There is only one Inter-zone FAX profile; it applies to all inter-zone FAX communication. It defaults to V.29, 7200bps. It defines the settings for FAX Relay (T.38) FAX communication.

**Intra-zone FAX profile**: defines the FAX settings within each zone in the network.

- Profile 1 defines the settings for G.711 pass through communication.
- Profile 2 to 64 define the settings for FAX Relay (T.38) FAX communication.
- All zones default to G.711 pass through communication (Profile 1).
Figure 12 – Fax Service Profiles

Figure 13 – Fax Advanced Settings
Zone Assignment

By default, all zones are set to Intra-zone FAX Profile 1.

Based on your network diagram, assign the Intra-zone FAX Profiles to the Zone IDs of the zones. If audio compression is required within the same zone, set Intra-Zone Compression to “Yes”. TDS TELECOM uses the Inter-zone FAX Profile.

Figure 14 – Zone Assignment
Mitel Border Gateway Setup

MBG Setup

Figure 15 – MBG setup
ICP Setup

To program an MCD into the MBG, click on ICP’s Add an ICP.

Enter a name for the MCD.

Enter the IP address of the MCD and select the Type as MCD.

Figure 16 – ICP setup

SIP Trunk Setup

Under the Services tab, click on SIP trunking and then “Add a SIP Trunk”. Enter the SIP trunk’s details as shown in Figure 17:

Name – is the name of the trunk

Remote trunk endpoint address – the public IP address of the provider’s switch or gateway (this address should be given to you by the provider).
**Local/Remote RTP framesize (ms)** – is the packetization rate you want to set on this trunk

**Routing rule one** – it allows routing of any digits to the selected Mitel MiVB

The rest of the settings are optional and could be configured if required. Click **Save** button

---

**Figure 17 – Services - SIP Trunking setup**