

1. Scope

This document is intended to detail a typical installation and configuration of Dialogic[®] 2000 Media Gateway Series (DMG2000) when used to interface between PBX and Microsoft[®] Office Communications Server 2007 (OCS) application.

2. **Configuration Details**

Listed below are the specific details of the PBX and gateways used in the testing to construct the following documentation.

2.1 **PBX**

| PBX Vendor | Avaya |
|------------------|-------------------------------------|
| Model | S8500 |
| Software Version | Comm manager 3.0 - R013x.00.1.346.0 |
| Additional Notes | N/A |

2.2 Gateway

| Gateway Model | Dialogic [®] 2000 Media Gateway Series (DMG2000) |
|------------------|---|
| Software Version | 6.0 (6.0.103) |
| Protocol | T1 QSIG |

2.3 System Diagram

The diagram below details the setup used in the testing and creation of the technical document.



3. Prerequisites

3.1 PBX Prerequisites

PBX must have all supplemental service packages installed for the QSIG protocol to operate properly and provide all advanced supplemental services.

3.1.1 PBX Equipment Required

To support the T1 QSIG configuration as documented you need the TN464F DS1 interface card.

3.1.2 PBX Cabling Requirements

Cabling for QSIG connections must be CAT5e or better. Standard voice quality cable will not provide optimum signal quality and the gateway will have problems establishing connection on the D-Channel.

3.2 Gateway Prerequisites

The gateway needs to support T1 QSIG interface.

4. Summary of Limitations

No limitations noted as of the last update to this document.

5. Gateway Setup Notes

Steps for setting up the gateway:

- Parameter Configuration
- Routing Engine Configuration

5.1 Parameter Configuration

To get the gateway connected between the PBX and mediation server there are only a few configuration options that are required.

During the initial setup of the Dialogic gateway using the serial port you must:

- Assign LAN 1 on the gateway a unique IP address, subnet mask and network gateway address (if the latter is required).
- Configure the gateway to use the SIP VoIP protocol.
- Set the Line Mode to T1.
- Set the Protocol to ISDN QSIG.

During the solution specific setup of the Dialogic gateway using the web interface you must:

- In the IP Settings page:
 - Set the BOOTP Enabled parameter to 'No'. (the default is Yes)

| IP Settings, LAN1 | | | | | | | | |
|-----------------------------------|-------------------|--|--|--|--|--|--|--|
| MAC | 00-0e-0c-ab-d2-3e | | | | | | | |
| * Client IP Address | 192.168.1.2 | | | | | | | |
| * Client Subnet Mask | 255.255.255.0 | | | | | | | |
| * Default Network Gateway Address | 192.168.1.250 | | | | | | | |
| * BOOTP Enabled | No | | | | | | | |
| * SNTP Server IP Address | | | | | | | | |

n Pottinge 1 4110

- In the T1 General page:
 - Set the Line Encoding and Line Framing as required by your T1 Interface. Typical settings are Encoding = B8ZS and Framing = ESF.

| T1/E1 Port Selection | | | | | | | | |
|-------------------------------------|----------------------|--|--|--|--|--|--|--|
| Select Port to Modify 🔄 all ports 💌 | | | | | | | | |
| | | | | | | | | |
| T1/E1 Configurat | tion | | | | | | | |
| Line Settings | | | | | | | | |
| * Line Mode | T1 💌 | | | | | | | |
| * Signaling Mode | ISDN 💌 | | | | | | | |
| * Telephony Port Interface Side | Terminal 💌 | | | | | | | |
| T1 Line | | | | | | | | |
| * Line Encoding | B8ZS 💌 | | | | | | | |
| * Framing | ESF 🔽 | | | | | | | |
| * Selects Transmit Pulse Waveform | Short_Haul_110ft 🛛 🗸 | | | | | | | |
| T1 ISDN protocol | | | | | | | | |
| * ISDN Protocol | QSIG 💌 | | | | | | | |
| ISDN Protocol Variant | None 🔽 | | | | | | | |
| General ISDN Settin | igs | | | | | | | |
| QSIG Protocol Specification | ISO 💌 | | | | | | | |
| Network-Specific Facilities (NSF) | None | | | | | | | |
| ISDN Answer Supervision Enable | Yes 🗸 | | | | | | | |
| Failover Settings | | | | | | | | |
| * Enable Failover | No | | | | | | | |

- In the VoIP General page:
 - Set the Transport Type parameter to TCP (the default is UDP)

| Voip General Settings | | | | | | | |
|-------------------------|-------------------|--|--|--|--|--|--|
| User-Agent | | | | | | | |
| * Host and Domain Name | pbxgw.default.com | | | | | | |
| Transport Type | TCP 💌 | | | | | | |
| Call as Domain Name? | No | | | | | | |
| SIPS URI Scheme Enabled | No 💌 | | | | | | |
| Invite Expiration (sec) | 120 | | | | | | |
| A | | | | | | | |

• In the VoIP Media page:

- Set the RTP Fax/Modem Tone Relay Mode parameter to 'In band-Tone' (the default is RFC2833)
- Set the Signaling Digit Relay Mode parameter to 'Off' (the default is On)
- Set the Voice Activity Detection parameter to 'Off' (the default is On)

| VoIP Media Settings | | | | | | | | | |
|---------------------|-----------------------|-------------------|--|--|--|--|--|--|--|
| | Audio | | | | | | | | |
| * Audio Comp | pression | G.711u/G.711a 🛛 💌 | | | | | | | |
| RTP Digit Rel | ay Mode | BFC2833 | | | | | | | |
| RTP Fax/Mod | em Tone Relay Mode | Inband-Tone 🛛 🗸 | | | | | | | |
| * RTP Source | IP Address Validation | Off | | | | | | | |
| * RTP Source | UDP Port Validation | Off 🗸 🗸 | | | | | | | |
| Signaling Digi | t Relay Mode | Off 🛛 🗸 | | | | | | | |
| Voice Activity | Detection | Off 💌 | | | | | | | |
| RFC 3960 Ear | ly Media Support | OnDemand 🛛 💙 | | | | | | | |
| Codec | Frame Size | Frames per Packet | | | | | | | |
| G.711 | 30 💌 | 1 | | | | | | | |
| G.723.1 | 30 | 1 | | | | | | | |
| G.729AB | 10 | 3 | | | | | | | |

5.2 Routing Engine Configuration

NOTE: For all the examples in this document going forward the term 'inbound call' refers to a call in the TDM to IP direction and the term 'outbound call' refers to a call in the IP to TDM direction.

In the example given in the system diagram at the start of this integration guide we see that we have the following dialing plans in the system:

- All TDM side stations have DID numbers assigned in the 2xxx extension range.
- All OCS side stations have DID numbers assigned in the 5xxx extension range.

We also know that we need to send all inbound calls through to the Mediation Server at a specific IP address.

5.2.1 VoIP Host Group configuration

The first item we should take care of is to set up our IP endpoint to use as our IP destination for all our inbound calls. This is done in the routing table under the section VoIP Host Groups. We define a single host group (using the default group is fine) that includes the IP address of the gateway listening side of the Mediation Server; in our example case we are using the IP address 192.168.1.21 for this.

| | Router Configuration | | | | | | | | | |
|------|--|--|---------------|----------------|---|--|--|--|--|--|
| O II | ◯ Inbound TDM Rules ◯ Inbound VoIP Rules ◯ TDM Trunk Groups ④ VoIP Host Groups | | | | | | | | | |
| | VoIP Host Groups | | | | | | | | | |
| | | Name | Load-Balanced | Fault-Tolerant | Host Summa ry | | | | | |
| | elete | HostGroup-1 | false 💌 | false 💌 | 192.168.1.21; | | | | | |
| | Add Host Group | | | | | | | | | |
| The | e selected | Host Group is referenced by the followin | ig rules: | _ | Host List | | | | | |
| | inbound T inbound T | DM] Inbound Local (Primary Route) DM] Inbound Default (Primary Route) | 2 | | HostGroup-1 192.168.1.21 Delete | | | | | |
| | | | | | Add Host | | | | | |
| | | | | | | | | | | |
| | | | <u> </u> | ~ | | | | | | |

5.2.2 TDM and VoIP Routing Rule Configuration

The second item we need to configure are the routing rules that will associate inbound or outbound calls with the proper digit manipulation rules for the type of call they need to service. This will require that the gateway perform some digit manipulation on calls that go from the TDM side to the IP side as well as in the reverse direction, IP to TDM.

The major idea here to remember is that OCS expects to get, and will send out, all addresses in E.164 format. This means that the gateway needs to recognize the need to convert up and down as needed to and from this format as calls pass through. To do this you make use of the Routing engines CPID manipulation rules.

5.2.2.1 Inbound TDM Rules

When a local user on the PBX picks up their phone and calls one of the extensions on the OCS side within the 6xxx range the gateway will receive a call with a calling party of 4 digits. It then needs to convert that number up to full E.164 format and send the call on to OCS.

In our example here we need to take any number that starts in the 6xxx range and then convert it into the full E.164 format by concatenating a prefix of '+1716639' onto the front of the number. Other calls, such as DIDs that arrive over TDM trunks form the PSTN may provide a full 10 digits to the PBX or they may only provide the extension number after the prefix has been stripped off by the PBX. Depending on your site specific requirements you may need to add or build different rules to handle these cases. In our example the inbound rule we use for local PBX users is shown below:

| Router Configuration | | | | | | | | | |
|------------------------------|------------------------|--------------------------|---------------------|--------------------|-------------|---|--|--|--|
| ⊙ Inbound TDM Rules | ◯ Inbound VoIP Rule | es 🔘 TDM Trunk Gro | oups 🔘 VoIP Host Gr | oups | | | | | |
| | | Inhound T |)M Rules | | | | | | |
| Select Enable | Rule L | .abel | Request Type | | Trunk Group | | | | |
| | Inbound Local | | Any | Any | * | | | | |
| | Inbound Default | | Any | Any | * | | | | |
| Add Rule Delete Rule | | | | | | | | | |
| Detailed Configuration for | Inbound TDM Rule: Inbo | ound Local | | | | | | | |
| | | Inbound TDM Red | uest Matching | | | | | | |
| | | CPID Ma | tching | | | | | | |
| Calling × Number | | Called × | | Redirect Number | × | | | | |
| Calling × Name | | Called × | | Redirect [| × | | | | |
| | · · · | | | | | | | | |
| | | Outbound | Routes | | | | | | |
| | | Device Se | lection | | | | | | |
| Outbound VolP Destination | * | Host HostGro Group | oup-1 💌 | Route Method | Bridged | ~ | | | |
| CPID Manipulation | | | | | | | | | |
| Calling S Number | | Called "+17166 Number | 639''+D | Redirect Number | R | | | | |
| Calling Name S | | Called D Name | | Redirect Name | R | | | | |
| | | Select Primary / / | Alternate Route | | | | | | |
| 💿 Primary 🛛 Alt-1 | 🔾 Alt-2 💦 Alt-3 | 🔿 Alt-4 📃 🗌 Add / | Alternate Route | | | | | | |
| Delete | Delete Delete | Delete | | | | | | | |

You can see how our rule here is out into place. The matching rule is simply a * meaning that any dialed number form a local user presented to this trunk will be seen by this rule. The CPID manipulation rule then uses the digits that are being seen (in this example case it will be a 4 digit number starting with 6 as the trunk is programmed for) and then adds the prefix of "+1716639" onto it to build the full E.164 number as we need for OCS. This rule also set s the destination to the VoIP Host group we have defined previously that points to the inbound IPO address of the Mediation Server.

In addition to this rule you see that we have left a default rule in place that acts as a catch all. This rule does not manipulation at all and just tries to send the call to the VoIP host group as dialed.

5.2.2.2 Inbound VoIP Rules

When an OCS user dials a number OCS will, through the use of normalization rules in the Location profile, provide the gateway with a number in full E.164 format so the gateway needs to be able to recognize various number patterns in inbound IP calls and properly manipulate them for the outbound TDM call that results.

In our example here, OCS has been setup (as you will see latter) with a route that directs all calls that meet the pattern 5xxx to the gateway in full E.164 format. The gateway then needs to know how to identify these numbers as extensions that are local on the PBX and manipulate them accordingly. To do this is needs to simply extract the right 4 digits form the called number provided to remove the prefix of "+1716639" and leave the last 4 digits remaining. Local numbers (off the PBX), as well as national and international numbers, are going to need to be manipulated also since they are going to at very least need a trunk access number, like a 9, appended onto the front of them for processing. These can also be done using manipulation rules as follows:

| Router Configuration | | | | | | | | | | |
|----------------------|--|---------------------------------|------------------|------------------|--------------|--------------------|-----------------------|-----|--|--|
| 🔘 Inbour | ◯Inbound TDM Rules ⊙Inbound VoIP Rules ◯TDM Trunk Groups ◯VoIP Host Groups | | | | | | | | | |
| Inbound YoIP Rules | | | | | | | | | | |
| Select | Enable | Rul | e Label | | Request Type | Origin | ating VoIP Host Addre | 255 | | |
| | V | Outbound Internal | | A | ny 🧧 | × | | | | |
| | V | Outbound Local | | Α | ny | × | | | | |
| | | Outbound National | | A | ny 🚹 | × | | | | |
| | V | Outbound International | | A | ny 🚹 | × | | | | |
| | V | Default | | Α | ny 🚹 | × | | | | |
| | | | A | dd Rule Dek | ete Rule | | | | | |
| Detailed C | onfiguration for 1 | Inbound VoIP Rule: 0 | utbound Inte | ernal | | | | | | |
| | | | Inbound | d VoIP Requ | est Matching | | | | | |
| Calling | * | 1 | Called | CPID Match | ing | Redirect | × | | | |
| Number | | | Number | x17166395xxx | | Number | | | | |
| Calling Name | × | | Called Name | × | | Redirect Name | × | | | |
| | | | | 0 | | | | | | |
| | | | | Device Selec | JUTES | | | | | |
| Outboun Destinati | d TDM | ~ | Trunk Group | Any | ~ | Route Method | Bridged | ~ | | |
| | | | | CPID Manipula | ation | | | | | |
| Calling Number | S | | Called Number | rext(D,4) | | Redirect Number | R | | | |
| Calling N | ame S | | Called Name | D | | Redirect Name | R | | | |
| | | | Select | : Primary / Alte | mate Route | | | | | |
| 📀 Prin | mary OAlt-1 | O Alt-2 O Alt- Delete Delete | 3 O Alt-4 | Add Alter | nate Route | | | | | |
| L | | | | | | | | | | |

We can see here in this first rule labeled as 'Outbound Internal' we are looking for any outbound calls that are specifically for a called party that starts with '+17166397' and end with 3 more digits. This happens to fit into our locally defined set of TDM extensions, indicating that this call needs to stay locally on the PBX for a user. The CPID manipulation rule strips the right 4 digits off the called number provided by OCS and uses that to make the call.

| Router Configuration | | | | | | | | | | |
|----------------------|--|------------------------|------------------|--------------|---------------|-----|--------------------|------------------------|---|--|
| 🔘 Inbour | ○Inbound TDM Rules ④Inbound VoIP Rules ○TDM Trunk Groups ○VoIP Host Groups | | | | | | | | | |
| Inbound YoIP Rules | | | | | | | | | | |
| Select | Enable | Ru | le Label | | Request Type | • | Origina | ting VoIP Host Address | | |
| | > | Outbound Internal | | | Any | * | × | | | |
| | V | Outbound Local | | | Any | * | × | | | |
| | > | Outbound National | | | Any | ~ | × | | | |
| | > | Outbound International | | | Any | ~ | × | | | |
| | v | Default | | | Any | ~ | × | | | |
| | | | Ad | id Rule D | elete Rule | | | | | |
| Detailed C | onfiguration for | Inbound VoIP Rule: (| Dutbound Local | I | | | | | | |
| | | | Inbound | VoIP Req | uest Matching | | | | | |
| | | | | CPID Mate | :hing | | | | | |
| Calling Number | × | | Called Number | x1716xxxxxxx | | | edirect umber | × | | |
| Calling Name | × | | Called Name | × | | R R | edirect ame | × | | |
| | | | | | | | | | | |
| | | | U | Douico Sol | Routes | | | | | |
| Outboun Destinati | d TDM | ~ | Trunk Group | Any | | - | Route Method | Bridged | ~ | |
| | | | | CPID Manip | ulation | | | | | |
| Calling Number | S | | Called Number | "+9"+lrem | (D,5) | | Redirect Number | R | | |
| Calling N | ame S | | Called Name | D | | | Redirect Name | R | | |
| | | | Select I | Primary / Al | ternate Route | | | | | |
| 💿 Prin | nary OAlt-1 | Alt-2 Alt | -3 🔿 Alt-4 | Add Al | ternate Route | | | | | |
| | Delete | Delete | Delete | | | | | | | |

In this rule labeled as 'Outbound Local' we are looking for any number that has been dialed that starts with '+1716' and ends with 7 digits. This indicates to us that it is a local number (off the PBX but within the local calling area) and does not need the area code dialed as part of the number. In the CPID manipulation area we add a trunk access code to the string and strip off the leading 5 characters (the '+1716') and send the full string out as '+9xxxxxxx'.

| Router Configuration | | | | | | | | | | |
|--|----------------|-------------------|------------|------------------|------------------|-----------------|------|--------------------|-------------------|--------|
| ○ Inbound TDM Rules ④ Inbound VoIP Rules ○ TDM Trunk Groups ○ VoIP Host Groups | | | | | | | | | | |
| Inbound VoIP Rules | | | | | | | | | | |
| Select | Enable | | Rule La | abel | | Request | Туре | Origina | ating VoIP Host A | ddress |
| | > | Outbound Inter | nal | | | Any | 1 | × | | |
| | ▼ | Outbound Loca | al | | | Any | 1 | × | | |
| | > | Outbound Natio | onal | | | Any | | × | | |
| | > | Outbound Inter | national | | | Any | 1 | × | | |
| | > | Default | | | | Any | 1 | × | | |
| | | | | Ac | ld Rule | Delete Rule | | | | |
| Detailed Co | onfiguration 1 | or Inbound VoIP F | Rule: Outb | oound Natio | onal VoID Reg | uest Match | ina | | | |
| | | | | Inboana | CPID Ma | tching | ing | | | |
| Calling Number | × | | C. Nu | alled umber | ×1××××××××× | | | Redirect Number | × | |
| Calling Name | × | | | alled [ame | x | | | Redirect Name | × | |
| | | | | | | D | | | | |
| | | | | L | Device Se | Routes | | | | |
| Outbound Destination | d TD | м | ~ | Trunk Group | Any | | ~ | Route Method | Bridged | ~ |
| | | | | | CPID Manij | pulation | | | | |
| Calling Number | S | | | Called Number | ''+9''+lre | m(D,1) | | Redirect Number | R | |
| Calling N | ame S | | | Called Name | D | | | Redirect Name | R | |
| | | | | Select | Primary / A | lternate Route | • | | | |
| 📀 Prin | nary 🔿 Al | t-1 OAlt-2 | Alt-3 | O Alt-4 | Add A | Alternate Route | | | | |
| | Dele | Delete | Velete | Delete | | | | | | |

In this rule labeled as 'Outbound National' we are looking for any number dialed that starts with '+1' and includes 10 digits indicating a number that is not in our local area code. In this case the CPID manipulation simply adds a +9 to the start of the number and strips off the leading + creating a result of '91xxxxxxxxx'.

| Router Configuration | | | | | | | | | |
|--|----------------------|----------------------------------|---|-------------------|--------------------|-------------------------|--|--|--|
| ○ Inbound TDM Rules ③ Inbound VoIP Rules ○ TDM Trunk Groups ○ VoIP Host Groups | | | | | | | | | |
| Inbound VoIP Rules | | | | | | | | | |
| Select | Enable | Rule | e Label | Request Type | Origina | iting VoIP Host Address | | | |
| | ✓ | Outbound Internal | | Any | × | | | | |
| | > | Outbound Local | | Any | × | | | | |
| | > | Outbound National | | Any | * | | | | |
| | ✓ | Outbound International | | Any | × | | | | |
| | > | Default | | Any | × | | | | |
| | | | Add Rule (| Delete Rule | | | | | |
| Detailed Co | onfiguration fo | ' Inbound VoIP Rule: 0 | utbound International Inbound VoIP R | equest Matching | | | | | |
| | | | CPID N | atching | | | | | |
| Calling Number | × | | Called x011. Number | | Redirect Number | × | | | |
| Calling Name | × | | Called × Name | | Redirect Name | × | | | |
| | | | | | | | | | |
| | | | Outbour | d Routes | | | | | |
| Outbound Destination | d TDM | * | Trunk Any Group | V | Route Method | Bridged | | | |
| | CPID Manipulation | | | | | | | | |
| Calling Number | S | | Called "+9"+ Number | rem(D,1) | Redirect Number | R | | | |
| Calling Name S Called Name | | | Called D Name D | | Redirect Name | R | | | |
| | | | Select Primary / | Alternate Route | | | | | |
| 💿 Prin | nary OAlt- Delete | 1 OAlt-2 OAlt-: Delete Delete | 3 Alt-4 Ad Delete | d Alternate Route | | | | | |
| _ | | | | | | | | | |

In this rule labeled as 'Outbound International' we are looking for any number dialed that starts with '+011' and includes any number of digits after that indicating a number that is not in our local area code and is indeed an international number. In this case the CPID manipulation simply adds a '+9' to the start of the number and strips off the leading + creating a result of '9011xxxxxxxxx'.

The last rule that you see defined is another default rule that acts as a catch all and simply attempts to dial any number provided that has not matched the previous rules in the list.

Note 1: The last two rules labeled as 'Outbound National' and 'Outbound International' COULD have been combined into one rule since the CPID manipulation was the same in both. We have split them out here in this example simply for clarity of the example. Also, if your environment uses different trunks for local, national (long Distance) and international calls, creaking these rules out into separate segments allows you to also define trunk groups and direct calls of these specific types to those individual trunks.

Note 2: The rules are evaluated in the order they are listed, top down. The first rule that matches is used so the order is important. Always consider placing your more specific rules at the top of the order and the more general at the bottom.

6. PBX Setup Notes

The basic steps of setting up the PBX for use with this gateway and a voice messaging system are as follows:

- Configuring private-numbering.
- Setting up system parameters and customer options.
- Administrating T1 interface.
- Programming AAR for trunk access.

All PBX programming is done via a Windows-based Java application. The basic commands that you will encounter on the PBX to perform these actions are:

• change; delete; and add

6.1 Configuring Private-Numbering

Use the change private-numbering command to modify the Network Level to 0.

| 👙 Native Configur | ation Manager Ve | rsion 3.0-81 conn | ected to 10.242.2 | 02.91 : 5022 | | | |
|------------------------|------------------------|--------------------|-------------------|--------------|----------|----------|--------|
| File View | | | | | | | |
| Command: change | priv | | | | | | ▼ Send |
| CANCEL | REFRESH | ENTER | CLEAR FI | HELP | | | |
| F1 | F2 | F3 | F4 | F5 | F6 | F7 | F8 |
| change priv | ate-numberi | ing | | | Pa | age 1 of | 1 |
| | | | | | | | |
| | | NUMBER | ING - PRIVA | TE FORMAT | | | |
| | Network | Level: 0 | | PBX Identi | lfier: | - | |
| | Level 2 | 2 Code: | _ | Deleted Di | igits: 0 | | |
| | Level 1 | L Code: | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| NOT | E: If after | deletion a | nd insertio | on the numbe | er of | | |
| | digits e | exceeds 15, | no number w | ill be sent | | | |
| Info: Dight click in a | | triac or halp tout | | | | | |
| mo. Right-click in a | r neiu to see vallu er | unes of help text. | | | | | |

Before moving on to the next command, be sure to save your work.

6.2 Setting Up System Parameters and Customer Options

Using the display system-parameters customer options command to ensure that several QSIG and trunking specific parameters that are needed for the integration to operate properly are enabled.

Note that any configuration parameters in this area that are not already enabled may require special maintenance or configuration by Avaya Customer support and/or they may require additional software packages be installed to configure properly. Once the command has been entered press the NEXT PAGE soft key until the Optional Features section is displayed as seen below.

| 🦻 Native Configuration Manager Version 3.0-81 connected to 10.242.202.91 : 5022 | | | | | | | | | | | | |
|---|------------------------------|----------|-----------------|--------------|---------------------|--------|------|--|--|--|--|--|
| File View | | | | | | | | | | | | |
| Command: disp sys cus | | | | | | - | Send | | | | | |
| CANCEL REFRESH | | | HELP | | NEXT PA | PREV P | PA | | | | | |
| F1 F2 | F3 | F4 | F5 | F6 | F7 | F8 | | | | | | |
| display system-parame | ters custome | er-optio | ns | Pa | ige 3 of | 10 | | | | | | |
| | OPTIONAL FEATURES | | | | | | | | | | | |
| Alburnisted Dieli | Recharge | | | | Waiting | | | | | | | |
| Abbreviated Diali | ng Ennancea . ~ . | List? y | Audi | ible Message | e waiting? | У | | | | | | |
| Access Securi | ty Gateway | (ASG)? n | | Authorizati | on Codes? | У | | | | | | |
| Analog Trunk | Incoming Ca. | LI ID? Y | Backup Cluste: | r Automatic | Takeover? | n | | | | | | |
| A/D Grp/Sys List Dia | ling Start a | at UI? y | | CA | AS Branch? | n | | | | | | |
| Answer Supervision by | Call Class: | LTIET? Y | | Channe CC | CAS Main? | n | | | | | | |
| | | ARS? Y | | Change CC | DR by FAC? | n | | | | | | |
| ARS/. | AAR Partitio | oning? y | Computer Tele | epnony Aajur | Ct Links? | n | | | | | | |
| ARS/AAR DIA | iing without | s facy n | CVg OF Calls | s Redirected | (Deriet? | У | | | | | | |
| ASAI LINK C | ore Capabil: lug Gugubil: | lties? n | | | Generation (Basic)? | У | | | | | | |
| ASAI LINK P | ius Capabil: | lties? n | | DCS Call | coverage? | У | | | | | | |
| Async. Transfe | r Mode (ATM |) PNC7 n | | DCS WITH F | kerouting? | У | | | | | | |
| Async. Transfer Mod | e (ATM) Trui | nking? n | | -1 1 | | | | | | | | |
| ATM WAN | spare Proce | essor? n | Digital Los | ss Plan Modi | .Tication? | У | | | | | | |
| | | ATMS? y | _ | | DSI MSP? | n | | | | | | |
| Att | endant Vecto | oring? y | D | SI Echo Cano | cellation? | У | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
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| (NOTE: You mu | st logoff & | login t | o errect the pe | ermission cf | anges.) | | | | | | | |
| Info: | | | | | | | | | | | | |

Review the DCS (Basic), DCS Call Coverage, and DCS with Rerouting options. They must be set to y for this integration to work properly. It they are not enabled then you must contact you Avaya support representative to have these features enabled.

Press the NEXT PAGE soft key and the next page is displayed.

| 불 Native Configur | ation Manager Ve | rsion 3.0-81 conne | ected to 10.242.2 | 02.91 : 5022 | | | | | | | |
|--|--------------------------|--------------------|-------------------|----------------------------|--------------|---------------------------|-----------|--|--|--|--|
| File View | | | | | | | | | | | |
| Command: disp sys | cus | | | | | | ▼ Send | | | | |
| CANCEL | REFRESH | | | HELP | | NEXT PA | PREV PA | | | | |
| F1 | F2 | F3 | F4 | F5 | F6 | F7 | F8 | | | | |
| display sys | tem-paramet | ers custome | r-options | | Pa | ige 4 of | 10 | | | | |
| | | 0 | PTIONAL FEA | TURES | | | | | | | |
| | | | | | | | | | | | |
| Emergenc | y Access to | Attendant? | У | | I | P Stations | ?у | | | | |
| | Enable 'dad | lmin' Login? | У | Inter | net Protoco |) (IP) PNC | ?у | | | | |
| | Enhanced Co | nferencing? | У | | ISDN F∈ | ature Plus | ? n | | | | |
| | Enha | inced EC500? | У | ISDN Net | work Call F | edirection [.] | ? n | | | | |
| Enterpr | ise Surviva | ble Server? | n | | ISDN- | BRI Trunks | ? У | | | | |
| Ente | rprise Wide | Licensing? | n | | | ISDN-PRI | ? У | | | | |
| | ESS Admi | nistration? | n | Local | . Survivable | Processor | ? n | | | | |
| E . | xtended Cvo | /Fwd Admin? | У | | Malicious | Call Trace | ?у | | | | |
| Extern | al Device A | larm Admin? | У | Mec | lia Encrypti | on Over IP | ?у | | | | |
| Five Port | Networks M | lax Per MCC? | n Mode | Code for C | Centralized | Voice Mail' | ?У | | | | |
| | Flexin | le Billing? | У | | | | _ | | | | |
| Forced E | ntry of Acc | ount Codes? | У | Mui | .tifrequency | signaling | y y | | | | |
| GIODE | u call clas | sirication? | y Multimed | lia Appi. Se Multinedie | erver interi | ace (MASI) | 2 n | | | | |
| Themaitelit | HOSPITALI | .ty (Basic)? | У | Muitimedia | l Wandling | .ng (Basic) (Rebended) | су Этт | | | | |
| HOSPICALIC | у (сэхэ вш | TD Trucka | y Mui | cimedia cai | I Handling | (Ennanced) | ́У | | | | |
| | | if flunks? | У | | | | | | | | |
| | TD Attendant Consoles? W | | | | | | | | | | |
| (NOTE: You must logoff $\&$ login to effect the permission changes.) | | | | | | | | | | | |
| (| | <u>.</u> | | PC | | <u> </u> | | | | | |
| info: | | | | | | | | | | | |

Review the ISDN-PRI option. It must be set to y for this integration to work properly. It this option is not enabled then you must contact you Avaya support representative to have these features enabled.

Press the NEXT PAGE soft key and the next page is displayed.

| ? Native Configuration Manager Version 3.0-81 connected to 10.242.202.91 : 5022 | | | | | | | | | | | |
|---|--------------|--------------|--------------|---------|--|--|--|--|--|--|--|
| File View | | | | | | | | | | | |
| Command: disp sys cus | | | | - Send | | | | | | | |
| CANCEL REFRESH | HELP | | NEXT PA | PREV PA | | | | | | | |
| F1 F2 F3 F4 | F5 | F6 | F7 | F8 | | | | | | | |
| display system-parameters customer-options | | Pa | ige 5 of | 10 | | | | | | | |
| OPTIONAL FE | ATURES | | | | | | | | | | |
| | | a | | _ | | | | | | | |
| Multinational Locations? n | | station and | I Trunk MSP | / n | | | | | | | |
| Multiple Level Precedence & Preemption? n | Station | n as Virtual | . Extension | ?У | | | | | | | |
| Multiple Locations? y | | | _ | _ | | | | | | | |
| | System Mar | agement Dat | a Transfer' | ? n | | | | | | | |
| Personal Station Access (PSA)? y | | Tenant Pa | rtitioning | ?У | | | | | | | |
| Posted Messages? y | Termin | al Trans. I | nit. (TTI)' | ? У | | | | | | | |
| PNC Duplication? n | | Time of D | ay Routing | ? У | | | | | | | |
| Port Network Support? y | | Uniform Di | aling Plan' | ? У | | | | | | | |
| | Usage Al | location En | hancements' | ?у | | | | | | | |
| Processor and System MSP? n | TN2501 | l VAL Maximu | um Capacity' | ? У | | | | | | | |
| Private Networking? y | | | | | | | | | | | |
| Processor Ethernet? y | | Wideband | l Switching' | ? У | | | | | | | |
| | | | Wireless | ?у | | | | | | | |
| Remote Office? y | | | | | | | | | | | |
| Restrict Call Forward Off Net? y | | | | | | | | | | | |
| Secondary Data Module? y | | | | | | | | | | | |
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| (NOTE: You must logoff & login to e | ffect the pe | ermission ch | anges.) | | | | | | | | |
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Review the Private Networking and Uniform Dialing Plan options. They must be set to y for this integration to work properly. It they are not enabled then you must contact you Avaya support representative to have these features enabled.

Press the NEXT PAGE soft key until page #8 (QSIG Optional Features) is displayed.

| 👙 Native Configu | ration Manager Ve | rsion 3.0-81 conne | ected to 10.242.2 | 02.91 : 5022 | | | |
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| File View | | | | | | | |
| Command: disp sys | s cus | | | | | | - Send |
| CANCEL | REFRESH | | | HELP | | NEXT PA | PREV PA |
| F1 | F2 | F3 | F4 | F5 | F6 | F7 | F8 |
| display sys | stem-paramet | ers custome | r-options | | P | age 8 of | 10 |
| | | QSIG | OPTIONAL F | EATURES | | | |
| | | | Bas | vic Call Set | un? v | | |
| | | Basi | c Supplemer | tarv Servic | es? v | | |
| | | 2401 | Centrali | zed Attenda | int? v | | |
| | | | Interwor | king with D | CS2 v | | |
| | SI | upplementary | Services w | with Rerouti | na? v | | |
| | | Trans | fer into OS | TG Voice Ma | il2 v | | |
| | | 11000 | Value | -Added (VAI | .U) 2 V | | |
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Review the Basic Call Setup, Basic Supplementary Services, Centralized Attendant, Interworking with DCS, Supplementary Services with Rerouting, Transfer into QSIG Voice Mail and Value Added (VALU) options. They must be set to y for this integration to work properly. It they are not enabled then you must contact you Avaya support representative to have these features enabled.

Use the Change System-Parameter Features command to make some required modifications to the systems advanced ISDN and QSIG features. In order to make changes to the following fields you must have administrative rights to the Avaya switch. If you do not then you need to contact your Avaya support representative.

Press the NEXT PAGE soft key until you get to the ISDN Parameters page.

| 👙 Native Configur | ation Manager Ve | rsion 3.0-81 conne | ected to 10.242.2 | 202.91 : 5022 | | | | | | |
|-------------------|---------------------------------------|--------------------|-------------------|---------------|----|---------|---------|--|--|--|
| File View | | | | | | | | | | |
| Command: disp sys | fea | | | | | | ▼ Send | | | |
| CANCEL | REFRESH | | | HELP | | NEXT PA | PREV PA | | | |
| F1 | F2 | F3 | F4 | F5 | F6 | F7 | F8 | | | |
| display sys | tem-paramet | ers feature | s | | Pa | ge 8of | 16 | | | |
| | | FEATURE-R | ELATED SYST | TEM PARAMETE | RS | | | | | |
| TODN DADAME | mppd | | | | | | | | | |
| ISON FARANE | TERS | | | | | | | | | |
| Send Non-I | SDN Trunk G | Froup Name a | s Connected | d Name? n | | | | | | |
| Display Co | nnected Nam | ne/Number fo | r ISDN DCS | Calls? n | | | | | | |
| Send | l ISDN Trunk | Group Name | on Tandem | Calls? y | | | | | | |
| | Send C | Custom Messa | ges Through | n QSIG? y | | | | | | |
| | | 0.7 | | | | | | | | |
| MUT Mussile | | ys Na Daw Maina | IG TSC EXte | ension: 2500 | J | | | | | |
| MOL - Nume | er or bigit | S Per Voice | Maii Subst | Silber. 4 | | | | | | |
| | | Nat | ional CPN H | Prefix: | | | | | | |
| | | Internat | ional CPN H | Prefix: | | | | | | |
| | | Pass Pref | ixed CPN to | ASAI? y | | | | | | |
| Unknown | Numbers Co | nsidered In | ternal for | AUDIX? n | | | | | | |
| | USNI Call | ing Name fo | r Outgoing | Calls? y | | | | | | |
| | Path Re | placement w | ith Measure | ements? y | | | | | | |
| | QSIG Path Replacement Extension: 2501 | | | | | | | | | |
| | Path Repla | ace While in | Queue/Vect | coring? y | | | | | | |
| | | | | | | | | | | |
| Info: | | | | | | | | | | |
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- in the QSIG TSC Extension field enter XXXX
 - where XXXX is any unused extension number.
- In the MWI-Number of Digits Per Voice Mail Subscriber field enter X o where X is the length of digits of the subscribers extensions.
- In the QSIG Path Replacement Extension field enter XXXX o where XXXX is any unused extension number.

Use the change system-parameters coverage-forwarding command to modify the systems features relevant to forwarding of extensions and call coverage to ensure the QSIG supplementary services work properly.

| 👙 Native Configu | ration Manager Ve | rsion 3.0-81 conne | cted to 10.242.2 | 02.91 : 5022 | | | | | | | | |
|------------------|-------------------|--------------------|------------------|--------------|--------------|----------|---------|--|--|--|--|--|
| File View | file View | | | | | | | | | | | |
| Command: display | system-parameters | COV | | | | | ▼ Send | | | | | |
| CANCEL | REFRESH | | | HELP | | NEXT PA | PREV PA | | | | | |
| F1 | F2 | F3 | F4 | F5 | F6 F7 F8 | | | | | | | |
| display sys | tem-paramet | ers coverage | ∋-forwardir | ıq | Pa | qe 1 of | 2 | | | | | |
| | SYSTEM | I PARAMETERS | CALL COVER | RAGE / CALL | FORWARDING | - | | | | | | |
| | | | | | | | | | | | | |
| CALL COVERA | GE/FORWARD1 | NG PARAMETE | RS | | | | | | | | | |
| | | | | | | | | | | | | |
| I | local Cvg Su | ibsequent Re | direction/C | CFWD No Ans | Interval (r | ings): 2 | | | | | | |
| Off | -Net Cvg Su | ibsequent Re | direction/0 | CFWD No Ans | Interval (r | ings): 2 | | | | | | |
| | | Coverage | e - Caller | Response Ir | nterval (sec | onds): 4 | | | | | | |
| Threst | hold for Blo | cking Off-N | et Redirect | tion of Inco | ming Trunk | Calls: 1 | | | | | | |
| COVERAGE | | | | | | | | | | | | |
| | | | Keep |) Held SBA a | at Coverage | Point? y | | | | | | |
| Exte | ernal Covera | ige Treatment | t for Trans | ferred Inco | ming Trunk | Calls? n | | | | | | |
| Imn | nediate Redi | rection on 1 | Receipt of | PROGRESS Ir | nband Inform | ation? n | | | | | | |
| | | | 1 | Maintain | SBA At Prin | cipal? v | | | | | | |
| | OSTG VALU | Coverage O | verrides OS | TG Diversio | on with Rero | uting? n | | | | | | |
| | - | g | | station Hunt | Before Cow | erade? n | | | | | | |
| | | | | | | orago. n | | | | | | |
| FORWARDING | | | | | | | | | | | | |
| 2 CIGNING LING | | | | Call | Forward Ove | rride? n | | | | | | |
| | | | | Coverage | After Forwa | rding? v | | | | | | |
| | | | | coverage | ILCOL FOLMA | raing, y | | | | | | |
| | | | | | | | | | | | | |
| Info: | | | | | | | | | | | | |

• In the Maintain SBA at Principal field enter y to enable this feature.

Before moving on to the step, be sure to save your work.

6.3 Administrating T1 Interface

Use the add ds1 command to setup the DS1 card for the proper settings. The command takes an argument that includes the cabinet and slot number where the DS1 card is located. For example:

```
Command = add ds1 all
```

Add a ds1 circuit card into the configuration that is located in cabinet 'a' and is in slot #11 of that cabinet.

| 불 Native Configur | ation Manager Ve | rsion 3.0-81 cor | nected to 10.242.2 | 02.91 : 5022 | | | | |
|-------------------|------------------|------------------|--------------------|--------------|-------|--------|----------|---------|
| File View | | | | | | | | |
| Command: disp DS | l a11 | | | | | | | - Send |
| CANCEL | REFRESH | | | HELP | | | NEXT PA | PREV PA |
| F1 | F2 | F3 | F4 | F5 | | F6 | F7 | F8 |
| display ds1 | a11 | | | | | Pa | ige 1 of | 2 |
| | | | DS1 CIRCUIT | PACK | | | | |
| | | ~ ~ ~ ~ ~ | | | _ | _ · | | |
| | Location: | UIAII | | л | lame: | Qsig | | |
| | Bit Rate: | 1.544 | | Line Cod | ling: | b8zs | | |
| Line Com | pensation: | 1 | | Framing M | Iode: | esf | | |
| Signa | ling Mode: | isdn-pri | | | | | | |
| | Connect: | pbx | | Interf | ace: | peer-m | laster | |
| TN-C7 Lo | ng Timers? | n | | Peer Proto | col: | Q-SIG | | |
| Interworkin | ıg Message: | PROGress | | 8 | Side: | b | | |
| Interface C | companding: | mulaw | | | CRC? | n | | |
| | Idle Code: | 11111111 | | | | | | |
| | | DC | P/Analog Bea | rer Capabil | ity: | 3.1kHz | | |
| | | | c | 303 Timer(s | sec): | 4 | | |
| slin | Detection? | n | Neat | -end CSU Tu | me. | other | | |
| DITP | Decection. | | | ona obe iy | pc | Jonor | | |
| | | | | | | | | |
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| Info: | | | | | | | | |

- In the Name field enter in any string to assign the DS1 a name
- In the Bit Rate field enter 1.544. (The standard clock rate for T1)
- In the Line Coding field enter b8zs.
- In the Line Compression field enter 1.
- In the Framing Mode field enter esf.
- In the Signaling Mode field enter isdn-pri.
- In the Connect field enter pbx.
- In the Interface field enter peer-master.
- In the Peer Protocol field enter Q-SIG.
- In the Interworking Message field enter PROGress.
- In the Side field enter b.
- In the Interface Companding field enter mulaw.
- In the CRC field enter n.
- In the Idle Code field enter 11111111. (8 1's)

Press the NEXT PAGE soft key to move to the next page of settings.

| 👙 Native Configur | ation Manager Ve | rsion 3.0-81 conne | ected to 10.242.7 | 202.91 : 5022 | | | | | | | |
|-------------------|------------------|--------------------|-------------------|---------------|----------------|---------|--------|--|--|--|--|
| File View | | | | | | | | | | | |
| Command: disp DS1 | 1 a11 | | | | | | ▼ Send | | | | |
| CANCEL | REFRESH | | | HELP | NEXT PA PREV F | | | | | | |
| F1 | F2 | F3 | F4 | F5 | F6 | F7 | F8 | | | | |
| display ds1 | . a11 | | | | Pa | ge 2 of | 2 | | | | |
| | | DS1 | CIRCUIT PA | ACK | | | | | | | |
| ESF DATA L | INK OPTIONS | 3 | | | | | | | | | |
| | N | Jetwork Mana | .gement Prot | tocol: tabs | | | | | | | |
| Send ANSI- | T1.403 One- | Second Perf | ormance Rep | ports? n | | | | | | | |
| | | Far- | end CSU Add | dress: b | | | | | | | |
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• In the Far-end CSU Address field enter b.

Before moving on to the next command, be sure to save your work.

Use the add signaling-group command to build a signaling group for the QSIG link to the gateway. This signaling group is what specifies the type of interface being used, the signaling channel (D-Channel) wiring address for the T1 span being used, and the protocol used on the signaling channel.

| 👙 Native Configur | ation Manager Ve | rsion 3.0-81 conn | ected to 10.24 | 2.202.91 : 50 | 22 | | | | |
|-------------------|------------------|-------------------|----------------|---------------|------|-------------|-----------|----|--------------------------|
| File View | | | | | | | | | |
| Command: | | | | | | | | | Send |
| CANCEL | | | | HELI | p | | | | |
| F1 | F2 | F3 | F4 | F5 | | F6 | F7 | | F8 |
| display sig | naling-grou | ւթ 1 | | | | | | | |
| | | - | IGNALING | GROUP | | | | | |
| | | _ | _ | | | | | | |
| Group Numb | er: 1 | Gro | oup Type: | isdn-pri | | | | | |
| | As | sociated Si | .gnaling? | У | Ma | x number of | NCA TSC: | 10 | |
| | | Primary D- | -Channel: | U1A1124 | _ M | ax number o | T CA TSC: | 10 | |
| _ | | | | _ | Trun | k Group for | NCA TSC: | 3 | |
| Trun | ik Group for | Channel Se | election: | 3 | | | | | |
| S | upplementar | y Service B | Protocol: | b | | | | | |
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| Info: | | | | | | | | | |
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In the Group Type field enter isdn-pri. ٠

•

- In the Associated Signaling field enter y. •
- In the Max number of NCA TSC enter 10. •
- In the Primary D-Channel field enter XXXX24 Where XXXXX24 is the 24th port number of the T1 board. •
- In the Max number of CA TSC field enter 10. •
 - In the $\ensuremath{\mathsf{Trunk}}$ Group for Channel Selection field enter X
 - Where X is the trunk group number created in the next step. You will need to return to here and edit this number after you create the trunk group.
- In the Supplementary Service Protocol field enter b ٠

Before moving on to the next command, be sure to save your work.

Use the add trunk-group command to add a new trunk group that will contain all the members of the ISDN line and tie them together with the signaling group created above.

| 👙 Native Configura | tion Manager Ver | sion 3.0-81 conn | ected to 10.242.2 | 02.91 : 5022 | | | |
|---------------------|------------------|------------------|-------------------|--------------|--------------|--------------|---------|
| File View | | | | | | | |
| Command: disp tru 3 | | | | | | | ▼ Send |
| CANCEL | REFRESH | | | HELP | | NEXT PA | PREV PA |
| F1 | F2 | F3 | F4 | F5 | F6 | F7 | F8 |
| display trum | nk-group 3 | | | | Pa | ige 1 of | 20 |
| | | T | RUNK GROUP | | | | |
| | | | | | | | |
| Group Number | с: З | | Group Typ | e: isdn | CDR F | eports: y | |
| Group Name | e: qsig | | CC |)R: 1 | TN: 1 | TAC: 83 | |
| Direction | n: two-way | Outo | ping Displa | ay? y | Carrier M | Iedium: PRI, | BRI |
| Dial Access | з? у | Bu | ısy Threshol | .d: 99 | Night Ser | vice: | |
| Queue Length | n: O | | | | | | |
| Service Type | e: tie | | Auth Cod | le?n | TestCa | all ITC: rea | st |
| | | Far End | Test Line N | Io: | | | |
| TestCall BCC | C: 4 | | | | | | |
| TRUNK PARAME | TERS | | | | | | |
| Cod | deset to Se | nd Display: | 6 Code | set to Send | d National I | Es: 6 | |
| Max | Message Si | ze to Send: | 260 Char | ge Advice: | none | | |
| Supplement | ary Servic | e Protocol: | b Digi | t Handling | (in/out): e | nbloc/enblo | be |
| | - | | _ | _ | | | |
| | Trunk Hunt | : ascend | | Q | SIG Value-Ad | lded? n | |
| | | | | Dig | ital Loss Gr | oup: 13 | |
| Incoming Cal | ling Numbe | r - Delete: | Insert | : | Form | at: unk-un | c |
| | Bit Rate | : 1200 | Synchro | nization: / | asvnc Dur | lex: full | |
| Disconnect | Supervisio | n - Tn2 v | Out 2 n | | Dup | | |
| Angwer Supe | rvision Ti | meout: 0 | | | | | |
| aube | | mooue. o | | | | | |
| Info: | | | | | | | |

- In the Group Type field enter isdn.
- In the Group Name field enter in a text string to give the group a name.
- In the COR field enter the number of a class of restriction to be used, if there is going to be one. Understand that setting any restrictions via a COR can effect how the trunk operates so these should be as liberal as possible.
- In the TN field enter in the proper tenant number.
- In the TAC field enter XX
 - where XX is an available DAC (used as a trunk access code) number from the dial-plan
- In the Direction field enter two-way.
- In the Outgoing Display field enter y.
- In the Carrier Medium field enter PRI/BRI.
- In the Service Type field enter tie.
- In the Supplementary Service Protocol field enter b.
- In the Digit Handling (in/out) field enter enbloc/enbloc.
- In the Format field enter unk-unk.

Press NEXT PAGE to advance to the next page of settings.

| 👙 Native Configur | ation Manager Ve | rsion 3.0-81 conn | ected to 10.242.2 | 02.91 : 5022 | | | | _ 🗆 🗙 |
|---------------------|------------------|-------------------|-------------------|--------------|--------------|-------------|------|------------|
| File View | | | | | | | | |
| Command: disp tru : | 3 | | | | | | - | Send |
| CANCEL | REFRESH | | | HELP | | NEXT PA | PREV | PA |
| F1 | F2 | F3 | F4 | F5 | F6 | F7 | í | F 8 |
| display tru | nk-group 3 | | | | Pa | ige 2 of | 20 | |
| TRUNK FEATU | RES | | | | | | | |
| A | CA Assignme | ent? n | Measu | ired: none | Wideban | d Support? | n | |
| | | | Internal Al | ert? n | Maintena | ince Tests? | У | |
| | | Da | ata Restrict | ion? n | NCA-TSC Tru | ink Member: | 23 | |
| | | | Send N | Jame: n | Send Calli | ng Number: | У | |
| | Used for I | CS? n | Нор | Dgt? n | | | | |
| Suppress | # Outpulsi | .ng?n Fo | rmat: unk-p | ovt | | | | |
| Outgoing C | hannel ID H | Incoding: pr | referred | UUI IE Tre | eatment: ser | vice-provid | der | |
| | | | | Replac | e Restricte | d Numbers? | n | |
| | | | | Replace | . Unavailabl | e Numbers? | n | |
| | | | | nopidos | Send Connect | ed Number: | v | |
| | | | | - Hold/ | 'Unhold Noti | fications? | v | |
| | Send UUT | TE2 V | | Modify 7 | 'andem Calli | ng Number? | n | |
| | Send UC | ID? n | | | | | | |
| Send Codes | et 6/7 LAI | IE? y | | Ds1 | l Echo Cance | llation? n | | |
| | | - | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | Netw | ork (Japan) | Needs Conr | nect Before | Disconnect | ? n | |
| | | | | | | | | |
| Info: | | | | | | | | |

- In the NCA-TSC Trunk Member field enter 23.
- In the Send Calling Number field enter y.
- In the Format field enter unk-pvt.
- In the Outgoing Channel ID Encoding field enter exclusive.
- In the Send Connected Number field enter y.
- In the Send UUI IE field enter y.

Press NEXT PAGE to advance to the next page of settings.

| 👙 Native Configu | ration Manager Ve | rsion 3.0-81 conn | ected to 10.242.2 | 02.91 : 5022 | | | |
|-------------------|---|---|----------------------------|--------------|----|---------|---------|
| File View | | | | | | | |
| Command: disp tru | 3 | | | | | | ▼ Send |
| CANCEL | REFRESH | | | HELP | | NEXT PA | PREV PA |
| F1 | F2 | F3 | F4 | F5 | F6 | F7 | F8 |
| display tru | ink-group 3 | QSIG TRUNH | GROUP OPTI | IONS | Pa | ge 3 of | 20 |
| Path Replac | Diversion b Path Re cement with ch Replaceme | y Reroute? placement? Retention? int Method: SBS? | y y better-rout n | .e | | | |
| Info: | | | | | | | |

- In the Diversion by Reroute field enter y.
- In the Path Replacement field enter y. This is what enables the path replacement functionality of the SQIG supplemental services package.
- In the Path Replacement Method field you can enter in a selection to tune how your path replacement optimization is done.

Press NEXT PAGE to advance to the next page of settings.

On this page we enter in each bearer channel of the T1 span, leaving off the D-Channel since that is connected to the group via the Signaling Group and is not used to carry voice.

| 불 Nativ | e Configurati | ion Manager | Version 3.0-81 c | connected to 10.242.2 | 02.91 : 5022 | | | |] [| . 🗆 🗙 |
|----------|----------------|-------------|------------------|-----------------------|--------------|--------------|---------|------|------|-------|
| File Vie | зw | | | | | | | | | |
| Comman | id: disp tru 3 | | | | | | | | - | Send |
| CA | NCEL | REFRESH | | | HELP | | NEXT P | PA | PREV | PA |
| | F1 | F2 | F3 | F4 | F5 | F6 | F7 | | F8 | 3 |
| disp. | lav trun | k-group | 3 | | | Pa | age 4 | of 2 | 20 | |
| | | - 5 | | TRUNK GROUP | , | | .9- | | | |
| | | | | Admini | stered Memk | oers (min/ma | ax): 1 | /23 | | |
| GROUI | MEMBER | ASSIGNM | ENTS | To | tal Adminis | stered Membe | ers: 23 | 3 | | |
| | | | | | | | | | | |
| | Port | Code | Sfx Name | Night | Sig | g Grp | | | | |
| 1: | 01A1101 | TN464 | F | | 1 | L | | | | |
| 2: | 01A1102 | TN464 | F | | 3 | L | | | | |
| 3: | 01A1103 | TN464 | F | | 3 | L | | | | |
| 4: | 01A1104 | TN464 | F | | 1 | L | | | | |
| 5: | 01A1105 | TN464 | F | | 1 | L | | | | |
| 6: | 01A1106 | TN464 | F | | 1 | L | | | | |
| 7: | 01A1107 | TN464 | F | | 1 | L | | | | |
| 8: | 01A1108 | TN464 | F | | 1 | L | | | | |
| 9: | 01A1109 | TN464 | F | | 1 | L | | | | |
| 10: | 01A1110 | TN464 | F | | 1 | L | | | | |
| 11: | 01A1111 | TN464 | F | | 1 | L | | | | |
| 12: | 01A1112 | TN464 | F | | 1 | L | | | | |
| 13: | 01A1113 | TN464 | F | | 1 | L | | | | |
| 14: | 01A1114 | TN464 | F | | 1 | L | | | | |
| 15: | 01A1115 | TN464 | F | | 1 | L | | | | |
| | | | | | | | | | | |
| Info: | | | | | | | | | | |
| | | | | | | | | | | |

- In each of the port fields enter in the port number that designates the physical wiring address of each of the bearer channels in the span.
- In each of the corresponding Sig Grp fields for each port enter in the number of the Signaling Group created above.

6.4 **Programming AAR for Trunk Access**

Important Note: In order for Path Replacement to work on Join transfers, the inbound calls MUST use an AAR number to access the trunk, and NOT the assigned Trunk Access Code (TAC). When an outgoing call is made using a TAC, or a call was extended by an attendant using DTGS (Direct Trunk Group Selection), the user has intentionally chosen a particular Trunk Group for the outgoing call, and the PBX will not use Path Replacement optimization in these cases.

Use the change uniform-dialplan command to setup an extension that can be used to access the trunks via AAR.

| 👙 Native Configur | ation I | Manag | er Versio | n 3.0-81 | connect | ted to 10. | 242.2 | 02.91 : 50 | 22 | | | | | | |
|------------------------|------------|----------|--------------|--------------|---|------------|-------|------------|-----|-----|--------|-----|-----------------------|------|--------------------------|
| File View | | | | | | | | | | | | | | | |
| Command: change (| uniform | n-dialpl | an 5 | | | | | | | | | | | | Send |
| CANCEL | RE | FRESH | 1 | ENTER | | CLEAR I | Fl | HELI | • | | | NE | XT PA | PR | EV PA |
| F1 | | F2 | | F3 | | F4 | | F5 | | | F6 | | F7 | | F8 |
| change unif | form- | dial | lplan | 5 | | | | | | | Pa | age | 1 of | E 2 | |
| Percent Full: 0 | | | | | | | | | | | | | | | |
| Matching | | | Inser | t | | Node | Ma | tching | | | Insert | | | Node | |
| Pattern | Len | Del | Digit | s Net | Conv | Num | Pa | ttern | Len | Del | Digits | Net | Conv | Num | |
| | | | | aar | n n n n n n n n n n n n n n n n n n n | | | | | | | | | | |
| Info: Right-click in a | i field to | see va | alid entries | ; or help te | xt. | | | | | | | | | | |

- In the Matching Pattern field enter a number to define as a dialable AAR number. In this example we use 5.
- In the Len field enter X.
 - where X is the length of your dialable number. In this example 4.
- In the Del field enter 0.
- In the Net field enter aar.
- In the Conv field enter n.

Use the change route-pattern command to define a route rule pattern that when referenced will direct calls to the trunk group you created above.

| b Nativ | e Configuration Ma | inager Vers | sion 3.0-81 co | nnected to 10 |).242.2 | 02.91 : 5022 | | | | | (| |
|-----------|----------------------------|---------------|--------------------|----------------|---------|--------------|---------|-------|--------|---------------|------|------|
| File Vie | 9W | | | | | | | | | | | |
| Comman | nd: cha rou 15 | | | | | | | | | | - | Send |
| CA | INCEL REFF | RESH | ENTER | CLEAR | Fl | HELP | | | NEXT | PA | PREV | PA |
| | F1 F | 2 | F3 | F4 | | F5 | F6 | | F7 | | F | -8 |
| chang | ge route-pat | tern 1 | 5 | | | | | Pa | ge 1 | of | 3 | |
| | | Pat | ttern Num | ber: <u>15</u> | Patt | ern Name: | Tl qsig | | | | | |
| | | | SC | CAN? n | Se | cure SIP? | n | | | | | |
| | GrpFRL NPA | Pfx Hop | p Toll No | . Inser | ted | | | | D | ics/ 1 | IXC | |
| | No | Mrk Lmt | t List De | l Digit | s | | | | Q | SIG | | |
| | | | Dg | ts | | | | | I | ntw | | |
| 1: | 3 0 | | | _ | | | | | | У | | |
| 2: | | | | | | | | | | n | | |
| 3: | | | | _ | | | | | | n | | |
| 4: | | | | | | | | | | n | | |
| 6. | | | | _ | | | | | | n | | |
| 0. 1 | | | | | | | | | - | | - | |
| | BCC VALUE | TSC CA- | -TSC I | TC BCIE | Servi | .ce/Feature | PARM N | VO. N | umberi | ng L <i>i</i> | AR | |
| 1 | 0 1 2 3 4 W | Red | quest | | | | Dç | gts F | ormat | - | | |
| | | | | | | | Subad | ddres | s | | | |
| 1: | yyyyyn | y as | -needed r | est | | | | u | nk-unk | : n | one | |
| 2: | y y y y y n | n | r | est | | | | | | n | one | |
| 3: | y y y y y n | n | r | est | | | | | | n | one | |
| 4: | yyyyyn | n | r | est | | | _ | _ | | n | one | |
| 5: | y y y y y n | n | r | est | | | _ | _ | | n | one | |
| 6: ; | yyyyyn | n | r | est | | | | | | n | one | |
| Info: Rig | ght-click in a field to se | ee valid entr | ries or help text. | | | | | | | | | |
| J | | | | | | | | | | | | |

- In the Grp field enter X.
 - where X is the number of the trunk group assigned above.
- In the FRL field enter 0.
- In the Intw field enter y.
- In the TSC Request field enter as-needed.
- In the Dgts Format field enter unk-unk.

Use the change AAR Digit Analysis Table command to set up AAR to bind your dialable number setup in UDP to the route pattern we just defined.

| 👉 Native Configur | ation Manager Ver | sion 3.0-81 c | onnecte | d to 10.242.2 | 02.91 : 5022 | 2 | | | |
|--|-----------------------|--------------------|-----------|------------------|--------------|-------------|--|----------|--------------------------|
| File View | | | | | | | | | |
| Command: change a | ar analysis 5 | | | | | | | | Send |
| CANCEL | REFRESH | ENTER | | CLEAR FI | HELP | | | NEXT PA | PREV PA |
| F1 | F2 | F3 | | F4 | F5 | | F6 | F7 | F8 |
| change aar analysis 5 Page 1 of 2 AAR DIGIT ANALYSIS TABLE | | | | | | | | | |
| D | ialed tring | Tota Min | al Max | Route Pattern | Call Type | Node Num | ANI | ic full. | 0 |
| 5 | field to see valid em | | | Pattern 15 | aar | | keqd n n n n n n n n n n n n n n n n | | |
| Info: Right-click in a | field to see valid en | tries or help text | t. | | | | | | |

- In the Dialed String field enter in the number you defined in UDP as the AAR number. In this example we use 5.
- In the Min and Max fields enter in the length of the number you are going to dial. In this example 4 for the min and 12 for the max.
- In the Route Pattern field enter in the number of the route pattern that we defined above. In this example 2.
- In the Call Type field enter aar.
- In the ANI Reqd field enter n.

Use the busyout board and the release board commands to reset the trunk device that has been defined. When a T1 card is initially programmed, by default it is in a busy state. In order to enable the T1 card, it must be set to busy and then released.

| 불 Native Configu | ration Manager Ver | sion 3.0-81 con | nected to 10.242.3 | 202.91 : 5022 | | | |
|-------------------|--------------------|------------------|--------------------|---------------|-------|---------|--------------------------|
| File View | | | | | | | |
| Command: bus bo a | a11 | | | | | | Send |
| CANCEL | | | | | | NEXT PA | |
| F1 | F2 | F3 | F4 | F5 | F6 | F7 | F8 |
| busyout boa | ard all | | | | | Page | 1 |
| | | COM | MAND RESULTS | 3 | | | |
| | | | | | _ | | |
| Port | Maintenanc | e Name Al | t. Name | Result | Erroi | Code | |
| 01A11 | UDS1-BD | | | PASS | | | |
| 01A1101 | ISDN-TRK | 00 | 03/001 | PASS | | | |
| 01A1102 | ISDN-TRK | 00 | 03/002 | PASS | | | |
| 01A1103 | ISDN-TRK | 00 | 03/003 | PASS | | | |
| 01A1104 | ISDN-TRK | 00 | 03/004 | PASS | | | |
| 01A1105 | ISDN-TRK | 00 | 03/005 | PASS | | | |
| 01A1106 | ISDN-TRK | 00 | 03/006 | PASS | | | |
| 01A1107 | ISDN-TRK | 00 | 03/007 | PASS | | | |
| 01A1108 | ISDN-TRK | 00 | 03/008 | PASS | | | |
| 01A1109 | ISDN-TRK | 00 | 03/009 | PASS | | | |
| 01A1110 | ISDN-TRK | 00 | 03/010 | PASS | | | |
| 01A1111 | ISDN-TRK | 00 | 03/011 | PASS | | | |
| 01A1112 | ISDN-TRK | 00 | 03/012 | PASS | | | |
| 01A1113 | ISDN-TRK | 00 | 03/013 | PASS | | | |
| 01A1114 | ISDN-TRK | 00 | 03/014 | PASS | | | |
| | | | | | | | |
| | | | | | | | |
| Info: | pre | ess CANCEL to qu | it press NEXT PAG | E to continue | | | |
|) | | | | | | | |

| 🍰 Native Configur | ration Manager Ve | rsion 3.0-81 con | nected to 10.242. | 202.91 : 5022 | | | |
|--------------------|-------------------|--------------------|-------------------|----------------|-------|---------|--------------------------|
| File View | | | | | | | |
| Command: ststa tru | ink 3 | | | | | | Send |
| CANCEL | | | | | | NEXT PA | |
| F1 | F2 | F3 | F4 | F5 | F6 | F7 | F8 |
| release boa | ard all | | | | | Page | 1 |
| | | COM | | | | | |
| | | | | | | | |
| Port | Maintenanc | e Name Al | t. Name | Result | Erroi | Code | |
| 01A11 | UDS1-BD | | | DASS | | | |
| 01A1101 | TSDN-TRK | 0.0 | 03/001 | PASS | | | |
| 01A1102 | ISDN-TRK | 00 | 03/002 | PASS | | | |
| 01A1103 | ISDN-TRK | 00 | 03/003 | PASS | | | |
| 01A1104 | ISDN-TRK | 00 | 03/004 | PASS | | | |
| 01A1105 | ISDN-TRK | 00 | 03/005 | PASS | | | |
| 01A1106 | ISDN-TRK | 00 | 03/006 | PASS | | | |
| 01A1107 | ISDN-TRK | 00 | 03/007 | PASS | | | |
| 01A1108 | ISDN-TRK | 00 | 03/008 | PASS | | | |
| 01A1109 | ISDN-TRK | 00 | 03/009 | PASS | | | |
| 01A1110 | ISDN-TRK | 00 | 03/010 | PASS | | | |
| 01A1111 | ISDN-TRK | 00 | 03/011 | PASS | | | |
| 01A1112 | ISDN-TRK | 00 | 03/012 | PASS | | | |
| 01A1113 | ISDN-TRK | 00 | 03/013 | PASS | | | |
| 01A1114 | ISDN-TRK | 00 | 03/014 | PASS | | | |
| | | | | | | | |
| | | | | | | | |
| Info | nr | ess CANCEL to du | it nress NEXT PAG | E to continue | | | |
| J | pi | 000 07110 EE 10 qu | n prosoniextriad | E to contailde | | | |

In both commands you can use the $\tt NEXT \ \ PAGE$ soft key to view the trunk channels that are not visible on the page.

7. Microsoft[®] Office Communications Server 2007 (OCS) Setup

7.1 Steps for Configuring OCS

Normalization rules are used to convert all possible dial numbers into full E.164 formatted numbers. OCS uses the standard E.164 format to search for all users listed in Active Directory (AD).

When an OCS user dials an internal extension number (normally 3-5 digits), the normalization rules convert it into full E.164 format. These normalization rules should cover dialed digits that are for internal extensions, local numbers, long distance numbers, and international numbers.

From the Start menu select the following to configure the OCS server:

- Programs
- Administrative Tools
- OCS 2007

On the tree presented in the configuration window right click on Forest then select Properties and then Voice Properties form the menu provided. Edit a location profile as shown in the example below.

| <u>N</u> ame: | Location1 |
|------------------------------------|---|
| Description: | |
| Test Location profile | |
| Normalization Rules | |
| Normalization rules are pro | cessed in list order; please use the buttons on the |
| side for adjusting the order | · |
| | |
| 2xxx | |
| l Local | |
| Local National | |
| Local National International | |
| Local National International | Шр |
| Local National International | <u>Up</u> D <u>o</u> wn |
| Local National International | <u>⊔p</u> D <u>o</u> wn |
| Local National International | <u>Up</u> D <u>o</u> wn |
| Local National International | Up D <u>o</u> wn |
| Local National International | Up Down Edit |

Click Add or Edit to create or change a particular rule.

| Edit Phone Number Normalization Rule | × |
|---|--------------------|
| Name: 2xxx | |
| Click to copy an existing rule. | <u>С</u> ору |
| Description: | |
| Normalize 2xxx to E.164 | |
| | v |
| Translation | |
| Phone pattern regular expression: | |
| ^(2[0-9](3))\$ | |
| Iranslation pattern regular expression: | |
| +1716639\$1 | |
| Valid translation characters are +, numbers, and \$. Example | e: +1425\$1. |
| Click Helper for assistance in creating common phone num regular expressions and translations. | ber <u>H</u> elper |
| Test translation | |
| To test the translation, enter a sample dialed number. If it m pattern, the translation will be shown. | atches the phone |
| <u>S</u> ample dialed number: | |
| I | |
| T <u>r</u> anslated number: | |
| | |
| OK Cano | el Help |

In this example, when a user dials any 4-digit number starting with 7, it will be converted to its E.164 equivalent of +1716639xxxx and then that number will be searched for in AD.

| Name | Phone Pattern | Translation Pattern | Descriptions |
|---------------|----------------|---------------------|----------------------------|
| 7xxx | ^(2[0-9]{3})\$ | +1716639\$1 | Normalize 2xxx to E.164 |
| Local | ^(\d{7})\$ | +1716\$1 | Local number |
| National | ^1(\d*)\$ | +1\$1 | Long distance number |
| International | ^011(\d*) | +011\$1 | International number |

More examples are shown in the following table:

A default route is used to route all calls to the Mediation server. If you need to route some calls to a different Mediation server, configure the Target phone numbers field accordingly.

From the Start menu select the following to configure the OCS server:

- Programs
- Administrative Tools
- OCS 2007

On the tree presented in the configuration window right click on Forest then select Properties and then Voice Properties form the menu provided. Edit a route as shown in the example below.

| Edit Route | | | | | x |
|--|---------------------------------|---------------------|------------|-------------------|----------|
| <u>N</u> ame: | Universal Ro | ute | | | |
| Description: | , | | | | |
| Route all calls to this m | ediation server | | | | ▲ |
| A route requires a targe gateways, and one or n | t phone numbe nore phone usa | r regular e ges. | expression | n, one or more | ; |
| Target phone number | rs: | | | | |
| Target regular expres | sion | | | | |
| ^\+?(\d*)\$ | | | | | |
| | | | | <u>H</u> elper | |
| <u>G</u> ateways | | | | | |
| Address | 1.5001 | | | | |
| amg4000.BuroCS.h | 0001:0061 | | | | |
| | | Ad | d | <u>R</u> emove | |
| Phone usages | | | | | _ |
| Default Usage | | | | | |
| | | | | <u>C</u> onfigure | |
| | 0K. | | ancel | Help | |

This entry routes any number with or without '+' prefix followed by any digits to Mediation server dmg4000.bufocs.local

Restart the Front End Services for the above changes to take effect, including all Normalization rules. This can be done from Window Services.

Note: Unless the dialed number from OCS client (such as Office Communicator) is in E.164 format, OCS must find a normalization rule to convert the dialed number to E.164.

7.2 Steps for Configuring OCS Clients

The domain users need to be enabled for making calls through OCS server.

| 🚡 Console1 - [Console Root\Active Dire | ectory Users and | Computers [ocste | st01.BufOCS.local]\BufOCS | i.local\Users] |
|--|------------------|------------------|--------------------------------|---------------------------|
| 🚡 Eile <u>A</u> ction <u>V</u> iew Fav <u>o</u> rites <u>W</u> ind | low <u>H</u> elp | | | |
| | 🖻 😫 🖬 🛛 | 🧑 📆 📸 🝸 🤞 | a 🐂 | |
| | Name | Type | Description | |
| 🚊 🔯 Microsoft Office Communications Se | G Administrator | User | Built-in account for admini | |
| E-A Forest - BufOCS.local | 🖸 Bob Doe | User | | |
| 🕀 📄 Enterprise pools | Cert Publishers | Security Group | Members of this group are | |
| 🖻 📲 Standard Edition Servers | CERTSVC_D | | | |
| ⊡ 🚺 ocstest01 | 🕵 Dave Bergquist | Ray Lassick Prop | ercies | |
| | 🕵 DHCP Admini | Member Of | Dial-in Enviro | nment Sessions |
| | DHCP Users | General Add | ress Account Profile | Telephones Organization |
| | 💯 DnsAdmins | Remote control | Terminal Services Profile | COM+ Communications |
| 🗄 💼 Mediation Servers | 💯 DnsUpdatePr | Enable use | r for Office Communications Se | |
| 🗄 💼 Live Communications Serve | 🕵 Domain Admins | | a for onice communications se | |
| 🗄 👰 Event Viewer (Local) | Domain Com | Sign-in name: | | |
| Services (Local) | Domain Cont | sip:rcassi | ok 🛛 🕘 🛛 BufOCS | 6.local 🔹 |
| Active Directory Users and Comput | Domain Guests | Server or pool: | | |
| E BufOCS local | Epterprise 0 | | Ruf0CS local | |
| | Group Policy | Jocstestor | .buloco.local | |
| | Guest | Meetings | | |
| 🕀 🙆 Domain Controllers | HelpServices | Allow ar | ionymous participants | |
| 🕀 💼 ForeignSecurityPrincipals | MIIS WPG | <u>P</u> olicy: | Default Policy | v |
| Users | 1USR_OCSTE | | | |
| | 🔮 IWAM_OCST | | | <u>lew</u> |
| | 💆 John Doe | Note: Meeti | ng settings cannot be changed | unless the global setting |
| | 🕵 RAS and IAS | allows per u | ser configuration. | |
| | 😨 Ray Cassick | | | |
| | RTC Compon | A 1.192 1 | | Carlana |
| | RTC Local Ad | Additional opti | ons: | |
| | RIC Local Re | | | |
| | | | | |
| | RTC Server L | | | |
| | RTCArchiving | | OK Cancel | Apply Help |
| | RTCCompon | | | |
| | RTCCompon | Security Group | Members can be used as | |
| | RTCHSUniver | Security Group | Members can be used as | |
| | RTCProxyUni | Security Group | Members can be used as | |
| | RTCService | User | Service account of Office | |
| | 🕵 RTCUniversal | Security Group | Members have read acces | |

Under Communications tab, check the Enable user for Office Communications Server option and then click the Configure button.

| User Options | | × | | |
|---|-----------------|---|--|--|
| Telephony Select a telephony option. These settings affect only those calls that are routed through IP-PSTN or remote call control gateways. | | | | |
| Enable <u>P</u> C-to-PC communication only | | | | |
| C Enable <u>R</u> emote call control | | | | |
| Enable Enterprise Voice | | | | |
| Enable PBX integration | | | | |
| Note: To enable both remote call control and PBX integration, you must specify a Server URI below. | | | | |
| P <u>o</u> licy: | Pefault Policy | | | |
| Server URI: | p:4000 | 1 | | |
| Line URI: | el:+17166395100 | | | |
| Federation | | | | |
| Enable remote user access | | | | |
| Enable public IM connectivity | | | | |
| Archiving | | | | |
| ☐ Archive internal I <u>M</u> conversations | | | | |
| Archive federated IM conversations | | | | |
| Note: Archiving settings cannot be changed unless the global setting allows per user configuration. | | | | |
| Enable enhanged presence | | | | |
| Note: Enhanced presence cannot be changed once it has been set. | | | | |
| | OK Cancel Help | 1 | | |
| | | | | |

In the above configuration for user Ray Cassick, when an inbound PSTN call for 5100, it will be converted by the gateway CPID manipulation and routing rules into +17166395100. OCS will match that number provided by the gateway to the Line URI parameter for this user and ring Ray Cassick if he is logged on to OCS from Office Communicator or any OCS supported device.

8. Testing Validation Matrix

The table below shows various test scenarios that are run as typical validation scenarios when the gateway is used in a voice messaging situation. The notes column specifies any notable parts of the test.

The test scenarios below assume that all gateway configuration parameters are at their default values. For a complete sample showing call flows and states please consult the Gateway SIP Compatibility Guide.

| Test Number | Call Scenario Description | Notes | |
|------------------------|---|-------|--|
| Inbound call scenarios | | | |
| 1 | Direct call from TDM station set to OCS client. | | |
| 2 | Direct call from OCS client to TDM station set. | | |

9. Troubleshooting

9.1 Important Debugging Tools

- Ethereal/Wireshark Used to view and analyze the network captures provided by the Dialogic gateway diagnostic firmware.
- Adobe Audition Used to review and analyze the audio extracted from the network captures to troubleshoot any audio-related issues.

9.2 Important Gateway Trace Masks

These keys are helpful during all troubleshooting scenarios and should be considered keys to activate by default fro all troubleshooting cases.

- voip prot and voip code this allows the collection of all SIP-related messages as they are sent from and received by the gateway. This data is important in cases where you feel that the gateway is not able to communicate properly with the messaging server.
- tel event and tel code This allows the collection of all circuit-side activity of the emulated station set such as display updates, key presses, light transitions and hook state changes. This data is very important in the following scenarios:
 - Call control problems (dropped calls, failing transfers, etc...)
 - Integration problems (incorrect mailbox placement, missed auto-attendant greetings etc...)
- teldrv prot This allows the collection of all ISDN messages both transmitted and received on the gateways front-end interface. This data is very important in the following scenarios:
 - o Call control problems (dropped calls, failing transfers, etc...)
 - Integration problems (incorrect mailbox placement, missed auto-attendant greetings etc...)

- Routingtable (all keys) This allows you to look inside the routing table engine and see how matching rules and CPID manipulation rules work with respect to your call. This data is very important in the following scenarios:
 - Call routing problem (reaching the incorrect OCS client or no client at all, etc...)

NOTE: Turning on all traces is not recommended. Doing this floods the debug stream with significant amounts of information that can cause delays in determining the root cause of a problem.

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