



Avaya Solution & Interoperability Test Lab

Application Notes for IPC Unigy with Avaya Communication Server 1000 7.5 using QSIG Trunks – Issue 1.0

Abstract

These Application Notes describe the configuration steps required for IPC Unigy to interoperate with Avaya Communication Server 1000 7.5 using QSIG trunks.

IPC Unigy is a trading communication solution. In the compliance testing, IPC Unigy used E1 QSIG trunks to Avaya Communication Server 1000, for turgent users on IPC Unigy to reach users on Avaya Communication Server 1000 and on the PSTN.

Information in these Application Notes has been obtained through DevConnect compliance testing and additional technical discussions. Testing was conducted via the DevConnect Program at the Avaya Solution and Interoperability Test Lab.

1. Introduction

These Application Notes describe the configuration steps required for IPC Unigy to interoperate with Avaya Communication Server 1000 7.5 using QSIG trunks.

IPC Unigy (hereafter referred to as Unigy) is a trading communication solution. In the compliance testing, IPC Unigy used E1 QSIG trunks to Avaya Communication Server 1000 7.5 (hereafter referred to as Communication Server 1000), for turret users on IPC Unigy to reach users on Avaya Communication Server 1000 and on the PSTN.

2. General Test Approach and Test Results

The feature test cases were performed manually. Calls were manually established among Unigy turret users with Communication Server 1000 SIP, IP, Digital and/or PSTN users. Call controls were performed from various users to verify the call scenarios.

The serviceability test cases were performed manually by disconnecting and reconnecting the E1 connection to Unigy.

DevConnect Compliance Testing is conducted jointly by Avaya and DevConnect members. The jointly-defined test plan focuses on exercising APIs and/or standards-based interfaces pertinent to the interoperability of the tested products and their functionalities. DevConnect Compliance Testing is not intended to substitute full product performance or feature testing performed by DevConnect members, nor is it to be construed as an endorsement by Avaya of the suitability or completeness of a DevConnect member's solution.

2.1. Interoperability Compliance Testing

The interoperability compliance test included feature and serviceability testing.

The feature testing included basic calls, basic display, G.711MU, G.729A, DTMF, hold/Resume, call forwarding unconditional/ring-no-answer/busy, blind/attended transfer, conference and Voice Mail.

The serviceability testing focused on verifying the ability of Unigy to recover from adverse conditions, such as disconnecting/reconnecting the E1 connection to Unigy.

2.2. Test Results

The objectives outlined in **Section 2.1** were verified and met. All tests were executed and passed with the following observations:

- If the trunk service (D Channel) does not establish between the Communication Server 1000 and IPC Media Gateway automatically after a physical disconnect/connect or restart of Unigy server then the trunk service has to be manually enabled either from the IPC Media Gateway or Communication Server 1000.
- When Avaya IP (SIP) phone are used for Outgoing and Incoming calls. In the case of Attended and un-Attended call transfer, Calling Line ID does not update on the Avaya IP

(SIP) phone. It shows the Calling Line ID of the last Calling/Connected party, not the current Calling/Connected party. These same scenarios work fine in case of Avaya IP (UNISim) phone. This is a known limitation on Avaya IP (SIP) phone since it expects a re-INVITE message from the third party to trigger name and number modification and Unigy sends UPDATES and not re-INVITES to trigger name and number modifications.

- After Completion of Call Transfer, PSTN phone shows Trunk ID instead of connected party number/name.
- When Avaya IP (SIP) phone calls a busy Unigy phone, Avaya IP (SIP) phone Terminal Number (TN) gets stuck in BUSY State, the TN has to be disabled and enabled for Avaya IP (SIP) phone to make new calls. The issue is not seen on Avaya IP (UNISim) phone. To overcome this problem, disable Call Completion Busy Integer (CCBI) which is found under Remote Capabilities (RCAP) field of the QSIG D Channel configuration of the Communication Server 1000.

2.3. Support

Technical support on IPC Unigy can be obtained through the following:

- **Phone:** (800) NEEDIPC, (203) 339-7800
- **Email:** systems.support@ipc.com

3. Reference Configuration

As shown in **Figure 1** below, Unigy configuration consists of the Media Manager, Converged Communication Manager, Media Gateway, and Turrets. The Media Manager and Converged Communication Manager are typically deployed on separate servers. In the compliance testing, the same server hosted the Media Manager and Converged Communication Manager.

There is a physical connection between the 2Mb PRI circuit pack on Avaya Communication Server 1000 with the Unigy Media Gateway. E1 QSIG trunks are used from Unigy to Communication Server 1000, to reach users on Communication Server 1000 and on the PSTN.

A five digit Uniform Dial Plan (UDP) was used to facilitate dialing between the Unigy and Communication Server 1000. During compliance testing, extension ranges 58xxx were associated with Communication Server 1000 users and 36xxx were associated with the Unigy turret users. The Avaya Call Pilot Directory Number (DN) is 58888 and the PSTN number is 96139655570.

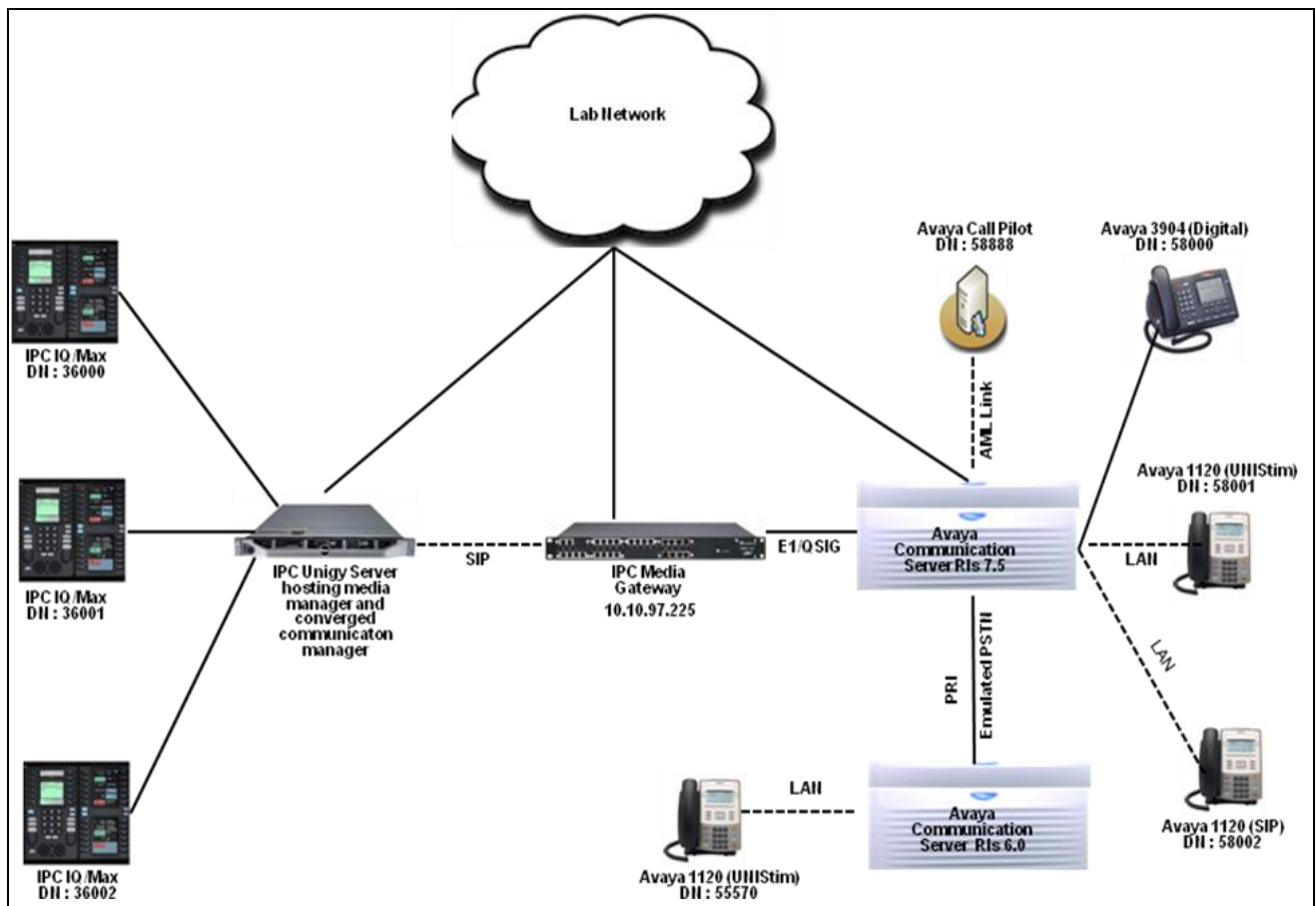


Figure 1: Compliance Test Setup in the lab

4. Equipment and Software Validated

The following equipment and software were used for the sample configuration provided:

Equipment	Software
Avaya Communication Server 1000	7.50.17
Avaya Communication Server 1000 (for emulated PSTN)	6.0
Avaya Call Pilot (600r)	5.00.41.143
Avaya Digital user (3904)	NA
Avaya 1120 IP (UNISTim) Deskphone	0624C8A
Avaya 1120 IP (SIP) Deskphone	04.03.12.00
IPC Unigy <ul style="list-style-type: none">Media ManagerConverged Communication ManagerMedia GatewayTurret (IQ/Max)	02.00.00.00.1536 02.00.00.00.1536 6.40A.042.0004 02.00.00.00.1536

5. Configure Avaya Communication Server 1000

This section provides the procedures for configuring Communication Server 1000 system. The procedures include the following areas:

- Logging into the Element Manager via Unified Communications Manager.
- Configuring the D-Channel Loop.
- Configuring a D-Channel.
- Configuring Route and Trunks.
- Configuring Digit Manipulation Block.
- Configuring Route List Block.
- Configuring Distant Steering Code.

The Assumption is made here that the users are already created and also the PRI Trunk between the Communication Servers 7.5 and 6.0 is configured for emulated PSTN setup during compliance testing. For detail configuration details refer to the reference documentation in **Section 10[1]**.

5.1. Logging to Element Manager via Unified Communication Manager

To login to the Unified Communications Manager (UCM) open an IE browser and type in the IP address of the UCM in the URL (not shown). Screen below shows the login screen of the UCM. Enter the **User ID** and **Password** credentials and click on **Log In** to continue.

The image shows the login screen of the Avaya Unified Communications Manager (UCM). The top half of the screen has a solid red background with the white "AVAYA" logo in the bottom right corner. Below the red header, on a white background, is a login form. On the left, there is a disclaimer: "This computer system and network is PRIVATE and PROPRIETARY of [company name] and may only be accessed by authorized users. Unauthorized use of this computer system or network is strictly prohibited and may be subject to criminal prosecution, employee discipline up to and including discharge, or the termination of the vendor/service contracts. The owner, or its agents, may monitor any activity or communication on the computer system or network." To the right of the disclaimer is a red rectangular box containing the login fields. It has "User ID:" followed by a text input field, "Password:" followed by a text input field, and a "Log In" button at the bottom right. At the very bottom of the white area, there is a small copyright notice: "Copyright © 2002-2010 Avaya Inc. All rights reserved."

From the main screen as shown below, click on the Element **EM on cppm1**. This is the element which is configured to access the Element Manager (EM) for the Call Server.

The screenshot shows the Avaya Unified Communications Management interface. On the left is a navigation tree with categories: Network, User Services, and Security. The main panel displays the 'Elements' section. At the top, it shows 'Host Name: ucm1.bwwdev.com' and 'Software Version: 02.20-SNAPSHOT(0000)'. Below this is a search bar with 'Search' and 'Reset' buttons. A table lists the elements, with the first row highlighted in red:

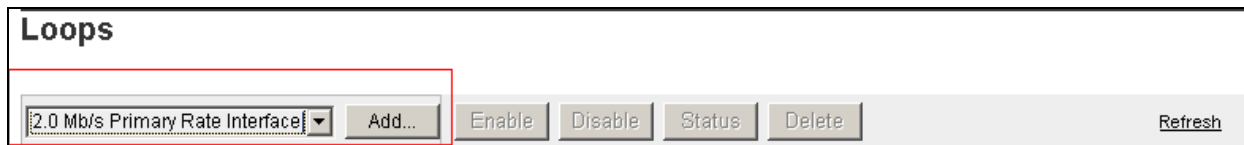
	Element Name	Element Type	Release
1	EM on cppm1	CS1000	7.5
2	cppm1.bwwdev.com (member)	Linux Base	7.5

5.2. Configuring D-Channel Loop

This section explains the configuration required to add a D-Channel loop which will be used to configure the D-Channel on. In the EM left navigator screen, navigate to **System → Core Equipment → Loops** as shown below.

The screenshot shows the left navigation tree of the Avaya Unified Communications Management interface. The tree is expanded to show the 'System' category, which includes 'Alarms', 'Maintenance', 'Core Equipment', and 'Peripheral Equipment'. The 'Core Equipment' category is further expanded, showing 'Loops', 'Superloops', 'MSDL/MISP Cards', 'Conference/TDS/Multifrequen', and 'Tone Senders and Detectors'. The 'Loops' item is highlighted with a red box.

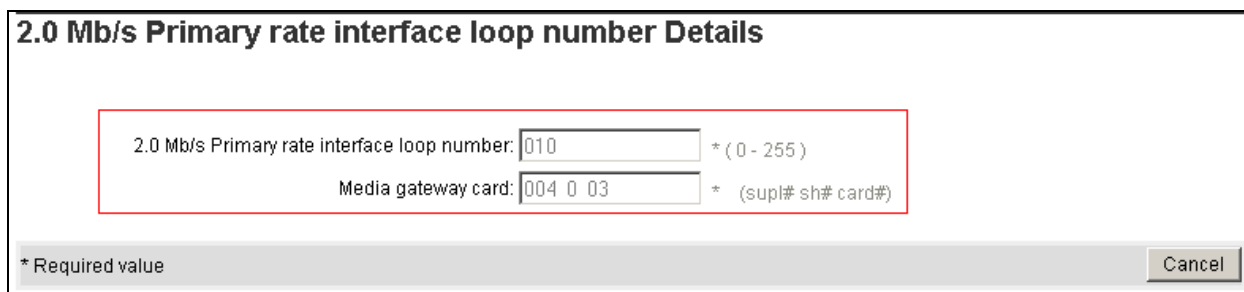
Add a Loop by selecting **2.0 Mb/s Primary Rate Interface** from the drop down menu and click on **Add** to continue as shown below.



Loops

2.0 Mb/s Primary Rate Interface Add... Enable Disable Status Delete Refresh

During compliance testing a loop number of **10** was selected and the physical location of the circuit pack was in **004 0 03**. Enter these values as shown below to complete adding the loop.



2.0 Mb/s Primary rate interface loop number Details

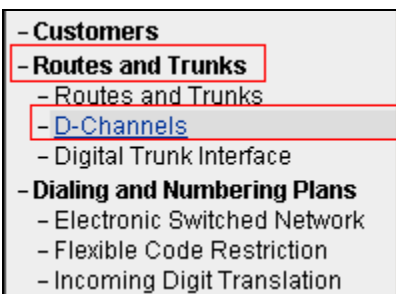
2.0 Mb/s Primary rate interface loop number: 010 * (0 - 255)

Media gateway card: 004 0 03 * (supl# sh# card#)

* Required value Cancel

5.3. Configuring D-Channel

This section explains the configuration of a D-Channel on the 2Mb PRI circuit pack. From the EM navigation screen, navigate to **Routes and Trunks** → **D-Channels** as shown in below.



- Customers
- Routes and Trunks
 - Routes and Trunks
 - D-Channels
 - Digital Trunk Interface
- Dialing and Numbering Plans
 - Electronic Switched Network
 - Flexible Code Restriction
 - Incoming Digit Translation

Choose a D-Channel number to add as shown below. During compliance testing D-Channel number **5** was selected. Click on **to Add** to continue.

D-Channels

Maintenance

[D-Channel Diagnostics \(LD 96\)](#)
[Network and Peripheral Equipment \(LD 32, Virtual D-Channels\)](#)
[MSDL Diagnostics \(LD 96\)](#)
[TMDI Diagnostics \(LD 96\)](#)
[D-Channel Expansion Diagnostics \(LD 48\)](#)

Configuration

Choose a D-Channel Number: **5** and type: **DCH** **to Add**

Configure the **Basic Configuration** values for the D-Channel as shown below. Note here that the D-Channel PRI loop number is the same one that was configured in **Section 5.2** above.

- Basic Configuration	
Input Description	Input Value
Action Device And Number (ADAN):	DCH
D channel Card Type :	MSDL
Media Gateway Card:	004 0 03 (supl# sh# card#) *
Group number:	
Device number:	
Port number:	1
Designator:	QSIG_IPC
Recovery to Primary:	<input type="checkbox"/>
PRI loop number for Backup D-channel:	
User :	Primary Rate Interface (PRI) *
Interface type for D-channel:	ISIG interface with GF platform (ISGF)
Country:	ETS 300=102 basic protocol (ETSI)
D-Channel PRI loop number:	10
Primary Rate Interface:	<input type="text"/> more PRI
Secondary PRI2 loops:	<input type="text"/>
Release ID of the switch at the far end:	5
Central Office switch type:	100% compatible with Bellcore standard (STD)
Integrated Services Signaling Link Maximum:	200 Range: 1 - 4000

To edit the **Remote Capabilities** of the D-Channel, click on the **Edit** button as shown below.

Integrated Services Signaling Link Maximum: 200 Range: 1 - 4000

- Basic options (BSCOPT)

Primary D-channel for a backup DCH: Range: 0 - 254

- PINX customer number: 0

- Progress signal:

- Calling Line Identification: Prefix = 0 for North American dialing plan. (OPT0)

- Output request Buffers: 32

- D-channel transmission Rate: 64 kb/s clear (64KC)

- Channel Negotiation option: No alternative acceptable, exclusive. (1)

- Remote Capabilities: **Edit**

+ - Change protocol timer value (TIMR)

- B channel Service messaging: ☐

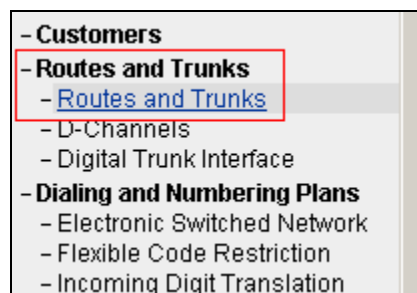
Select the boxes values for the Remote Capabilities as shown in next two screens below. Click on **Return - Remote Capabilities** button to return back to the main screen to complete the D-Channel configuration.

Input Description	Input Value
Basic rate interface (BRI)	<input type="checkbox"/>
Call completion on busy using integer value (CCBI)	<input checked="" type="checkbox"/>
Call completion on busy using object identifier (CCBO)	<input type="checkbox"/>
Call completion on busy for QSIG and EuroISDN BRI (CCBS)	<input type="checkbox"/>
Call completion on no response using integer value (CCNI)	<input checked="" type="checkbox"/>
Call completion on no response using object identifier (CCNO)	<input type="checkbox"/>
Call completion to no reply for QSIG and EuroISDN BRI (CCNR)	<input type="checkbox"/>
Network call park (CPK)	<input type="checkbox"/>
Connected line identification presentation (COLP)	<input checked="" type="checkbox"/>
Call transfer integer (CTI)	<input checked="" type="checkbox"/>
Call transfer object (CTO)	<input type="checkbox"/>
Diversion info. is sent using integer value (DV1I)	<input type="checkbox"/>
Diversion info. is sent using object identifier (DV1O)	<input type="checkbox"/>
Rerouting requests processed using integer value (DV2I)	<input type="checkbox"/>
Rerouting requests processed using object identifier (DV2O)	<input type="checkbox"/>
Diversion info. sent. rerouting requests processed (DV3I)	<input checked="" type="checkbox"/>
EuroISDN - div. info sent. rerouting req. processed (DV3O)	<input type="checkbox"/>

Network name display method 2 (ND2)	<input type="checkbox"/>
Network name display method 3 (ND3)	<input type="checkbox"/>
Name display - integer ID coding (NDI)	<input checked="" type="checkbox"/>
Name display - object ID coding (NDO)	<input type="checkbox"/>
Path replacement uses integer values (PRI)	<input checked="" type="checkbox"/>
Path replacement uses object identifier (PRO)	<input type="checkbox"/>
Release Link Trunks over IP (RLTI)	<input type="checkbox"/>
Remote virtual queuing (RVQ)	<input type="checkbox"/>
Trunk anti-tromboning operation (TAT)	<input type="checkbox"/>
User to user service 1 (UUS1)	<input type="checkbox"/>
N1-2 name display option. (NDS)	<input type="checkbox"/>
Message waiting indication using integer values (QMWI)	<input checked="" type="checkbox"/>
Message waiting indication using object identifier (QMWO)	<input type="checkbox"/>
User to user signalling (UUI)	<input type="checkbox"/>

5.4. Configuring Route and Trunks

This section explains the configuration of the QSIG route and trunks which will be used by Communication Server 1000 and Unigy. To add a new route, navigate to **Routes and Trunks** → **Routes and Trunks** from the EM left hand navigator window as shown below.



From the Routes and Trunks screen click on **Add route** button to start configuring a new route as shown below.

Routes and Trunks

+ Customer: 0

Total routes: 6

Total trunks: 123

Add route

During compliance testing **Route number 50** was added. Select the values from the drop down menu and configure the values as shown in the next two screens below.

- Basic Configuration

Route data block (RDB) (TYPE) : RDB

Customer number (CUST) : 00

Route number (ROUT) : 50

Designator field for trunk (DES) : QSIG_IPC

Trunk type (TKTP) : TIE

Incoming and outgoing trunk (ICOG) : Incoming and Outgoing (IAO)

Access code for the trunk route (ACOD) : 8050 *

Trunk type M911P (M911P) : ☐

The route is for a virtual trunk route (VTRK) : ☐

Digital trunk route (DTRK) : ☒

- ISDN BRI packet handler route (BRIP) : ☐

- Digital trunk type (DGTP) : PRI2

Integrated services digital network option (ISDN) : ☒

- Mode of operation (MODE) : ISDN/PRA route, DTRK must be YES (PRA)

- Interface type for route (IFC) : ISIG interface with GF platform. (ISGF)

- Send billing number (SBN) : ☐

- Private network identifier (PNI) : 00003 (0 - 32700)

- Call type for outgoing direct dialed TIE route (CTYP) : Unknown Call type (UKWN)

- Insert ESN access code (INAC) : ☒

- Display of access prefix on CLID (DAPC) : ☐

Process notification networked calls (PNNC) : ☐

- Network Options

Electronic switched network pad control (ESN) : ☐

Signaling arrangement (SIGO) : Standard (STD)

Route class (RCLS) : Route Class marked as external (EXT)

Off-hook queuing (OHQ) : ☐

Off-hook queue threshold (OHQT) : 0

Call back queuing (CBQ) : ☐

Number of digits (NDIG) : 2

Authcode (AUTH) : ☐

Configure the trunk values as shown below. Note that the **Terminal number** starts with **010 01** since the D-Channel loop was built on Loop 10. Click on **Edit** button to configure the required **Class of Service** for the trunks.

Customer 0, Route 50, Trunk 1 Property Configuration

- Basic Configuration

Auto increment member number: ☒

Trunk data block: TIE

Terminal number: 010 01

Designator field for trunk: QSIG_IPC

Extended trunk:

Member number: 1

Level 3 Signaling:

Card density: SD

Start arrangement Incoming:

Start arrangement Outgoing:

Trunk group access restriction: 0

Channel ID for this trunk:

Network music: ☐

Class of Service: **Edit**

+ Advanced Trunk Configurations

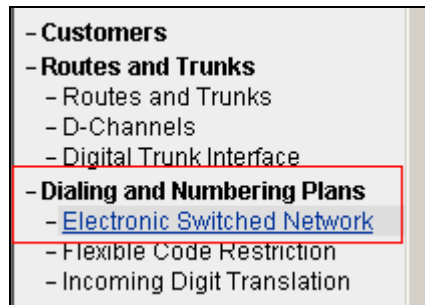
The two screens below shows the **Class of Service** values selected for the compliance testing from the drop down menu. Click on **Return Class of Service** button to complete the trunks configuration.

- Class of Service	
Input Description	Input Value
- ACD Priority:	ACD Priority not required (APN)
- Analog Semi-Permanent Connections:	Analog Semi-Permanent Connections Denied (SPCD)
- ARF Supervised COT:	
- Barring:	Barring Denied (BARD)
- Battery Supervised COT:	
- Busy Tone Supervised COT:	
- Calling Line Identification:	
- Calling party:	Calling party Denied (CND)
- Central Office Ringback:	
- Centrex Switchhook Flash:	Centrex Switchhook Flash Denied (THFD)
- Dial Pulse:	Dial Pulse (DIP)
- DTR PAD value:	
- Echo Canceling:	Echo Canceling Denied (ECD)
- Hong Kong DTI:	
- Loop Break Supervised COT:	
- Make-break ratio for dial pulse:	10 pulses per second (P10)
- Manual Incoming:	

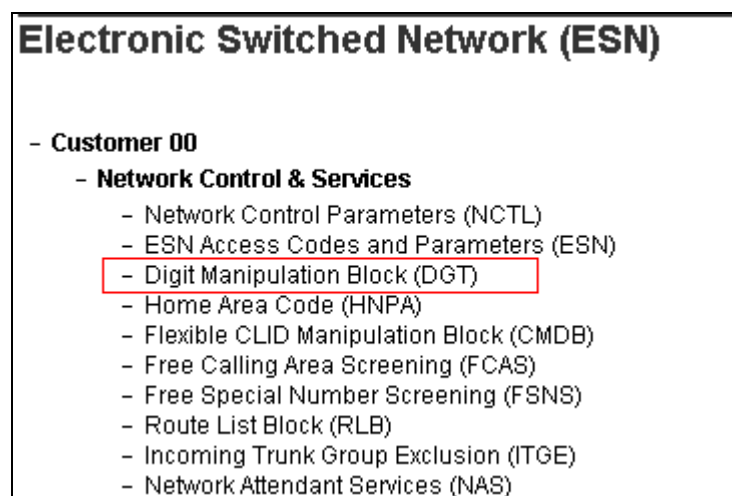
- Polarity:	
- Priority:	Low Priority (LPR)
- Restriction level:	Unrestricted (UNR)
- Reversed Ear Piece:	Reversed Ear Piece denied (XREP)
- Short or long line:	
- Transmission Class of Service:	Via Net Loss (VNL)
- Warning Tone:	Warning Tone Allowed (WTA)
- Reversed Ear Piece:	Reversed Ear Piece denied (XREP)
- ARF Supervised COT:	

5.5. Configuring Digit Manipulation Block

This section explains the digit manipulation block that is to be configured in the Communication Server 1000 dialing plan for its users to communicate with the Unigy system. From the EM navigator pane, navigate to **Dialing and Numbering Plans** → **Electronic Switched Network** as shown below.



Click on **Digit Manipulation Block (DGT)** option as shown below.



Select a block index to configure and click on **to Add** button as shown in below. During compliance testing **Digit Manipulation Block Index** of **7** was added.

Digit Manipulation Block List

Please choose the

Screen below shows the values configured. Click on **Submit** to complete adding the Digit Manipulation Block configuration.

Digit Manipulation Block

Digit Manipulation Index numbers:

Number of leading digits to be deleted: (0 - 19)

Insert:

IP Special Number: ☐

Call Type to be used by the manipulated digits:

Submit

Refresh

Delete

Cancel

5.6. Configuring Route List Block

This section explains the route list block that is to be configured in the Communication Server 1000dialing plan for its users to communicate with the Unigy system. From the EM navigator pane, navigate to **Dialing and Numbering Plans** → **Electronic Switched Network** (shown in **Section 5.5**). Click on **Route List Block (RLB)** option as shown below.

Electronic Switched Network (ESN)

- Customer 00

- Network Control & Services

- Network Control Parameters (NCTL)

- ESN Access Codes and Parameters (ESN)

- Digit Manipulation Block (DGT)

- Home Area Code (HNPA)

- Flexible CLID Manipulation Block (CMDB)

- Free Calling Area Screening (FCAS)

- Free Special Number Screening (FSNS)

- Route List Block (RLB)

- Incoming Trunk Group Exclusion (ITGE)

- Network Attendant Services (NAS)

Start adding a **route list index** as shown below. During compliance testing list index **50** was added. Click on **to Add** to continue.

Route List Blocks

Please enter a route list index (0 - 1999)

Add a **Data Entry Index** as shown below. During compliance testing entry index **1** was selected and click on **to Add** to continue.

Please choose the

Next two screens below show the values configured for the index block used during compliance testing. **Route Number** of **50** and **Digit Manipulation Index** of **7** were selected as per the configuration explained in **Sections 5.4** and **5.5** respectively. Click on **Submit** to complete the configuration.

Indexes

Time of Day Schedule:

Facility Restriction Level: (0 - 7)

Digit Manipulation Index:

ISL D-Channel Down Digit Manipulation Index: (0 - 1999)

Free Calling Area Screening Index:

Free Special Number Screening Index:

Business Network Extension Route: ☐

Incoming CLID Table: (0 - 100)

Options

Local Termination entry: ☐

Route Number:

Skip Conventional Signaling: ☐

Use Tone Detector: ☐

Conversion to LDN: ☐

Expensive Route: ☐

Strategy on Congestion:

- QSIG Alternate Routing Causes:

Preferred Routing:

ISDN Drop Back Busy:

ISDN Off-Hook Queuing Option: ☐

Off-Hook Queuing Allowed: ☐

Call Back Queuing Allowed: ☐

VNS Options

Entry is a VNS Route: ☐

5.7. Configuring Distant Steering Code

This section explains the distant steering code that is to be configured in the dialing plan for its users to communicate with the Unigy system. From the EM navigator pane, navigate to **Dialing and Numbering Plans** → **Electronic Switched Network** (shown in **Section 5.5**). Click on **Distant Steering Code (DSC)** option as shown below.

Electronic Switched Network (ESN)

- **Customer 00**
 - **Network Control & Services**
 - Network Control Parameters (NCTL)
 - ESN Access Codes and Parameters (ESN)
 - Digit Manipulation Block (DGT)
 - Home Area Code (HNPA)
 - Flexible CLID Manipulation Block (CMDB)
 - Free Calling Area Screening (FCAS)
 - Free Special Number Screening (FSNS)
 - Route List Block (RLB)
 - Incoming Trunk Group Exclusion (ITGE)
 - Network Attendant Services (NAS)
 - **Coordinated Dialing Plan (CDP)**
 - Local Steering Code (LSC)
 - **Distant Steering Code (DSC)**
 - Trunk Steering Code (TSC)

From the drop down menu select **Add** and enter a distant steering code to add as shown below. During compliance testing a code of **360** was added since the Unigy extension range started with 36xxx. Click on **to Add** to continue.

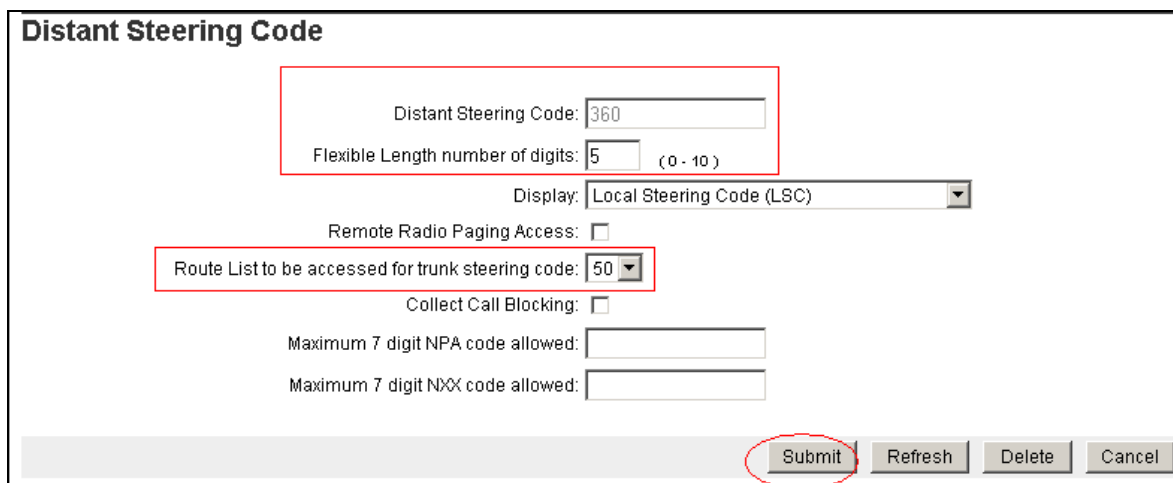


Distant Steering Code List

Add ▼

Please enter a distant steering code to Add

Enter the values as shown below. Note that **Route List to be accessed for trunk steering code** value selected is **50** based on the configuration explained in **Section 5.6** above. Click on **Submit** to complete the configuration.



Distant Steering Code

Distant Steering Code:

Flexible Length number of digits: (0 - 10)

Display:

Remote Radio Paging Access: ☐

Route List to be accessed for trunk steering code:

Collect Call Blocking: ☐

Maximum 7 digit NPA code allowed:

Maximum 7 digit NXX code allowed:

6. Configure IPC Converged Communication Manager

This section provides the procedures for configuring IPC Converged Communication Manager. The procedures include the following areas:

- Launch Unigy Management System
- Administer media gateway
- Administer trunk groups
- Administer route lists
- Administer dial patterns
- Administer route plans

The configuration of Converged Communication Manager is typically performed by IPC installation technicians. The procedural steps are presented in these Application Notes for informational purposes. For detail administration and configuration of Unigy system refer to **Section 10 [2]**.

6.1. Launch Unigy Management System

Access the Unigy Management System web interface by using the URL “http://ip-address” in an Internet browser window, where “ip-address” is the IP address of the Converged Communication Manager. Log in using the appropriate credentials.

The screen shown below is displayed. Enter the appropriate credentials. Check **I agree with the Terms of Use**, and click **Login**.

In the subsequent screen (not shown), click **Continue**.



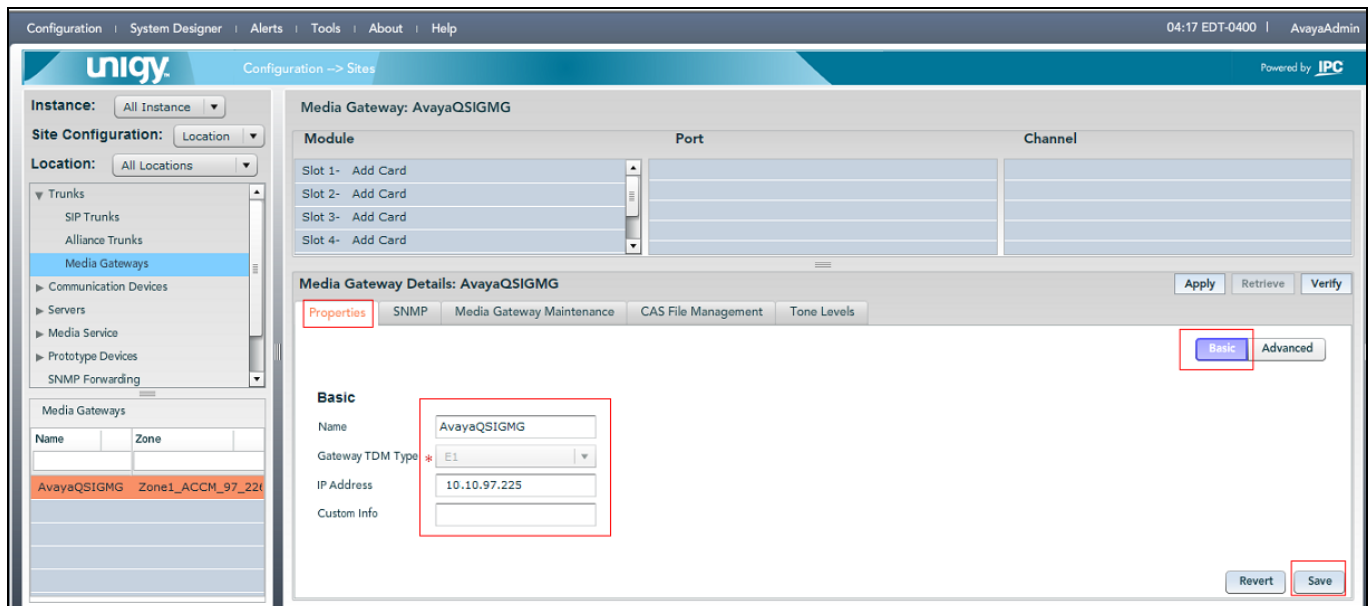
The screenshot shows the login interface for the IPC Unigy Management System. It features a blue square logo with the letters 'IPC' in white. To the right of the logo are two input fields: 'User Name:' and 'Password:'. Below these fields is a checkbox labeled 'I agree with the' followed by a blue underlined link 'Terms of Use'. A 'Login' button is positioned to the right of the checkbox. At the bottom of the interface, the text reads: 'IPC Unigy™ Management System', 'Unigy™ Version 02.00.00.00.1536', and '© Copyright 2012 IPC Systems, Inc.'

6.2. Administer Media Gateway

The screen as shown below is displayed next. Select **Configuration → Sites** (not shown) from the top menu.



Screen below shows the **Sites** information displayed in the left pane. Select **Trunks → Media Gateways** to view already added Media Gateway which was earlier added through Unigy Management System (**Tools → Hardware Deployment → Select Zone → Media Gateways → Add Device**). Under the **Properties** tab in the **Basic** configuration screen as shown below enter the **Name** and **IP Address** for the Media Gateway. From the **Gateway TDM Type** drop down menu select **E1** and click on **Save** to complete the configuration.



Screen below shows the **Sites** information displayed in the left pane. Select **Trunks** → **Media Gateways**, to display a list of media gateway in the lower left pane. Select the applicable media gateway from the listing, in this case **AvayaQSIGMG**.

The **Media Gateway** information is displayed in the upper right pane. Select the applicable **Module** to be added, in this case **Slot 1-Add Card**.

The **Media Gateway Module Details: Add Card** information is displayed in the lower right pane. Select **2 Port TDM** for **Type**, and click **Save**.

The screenshot displays the Unigy Configuration interface. The top navigation bar includes links for Configuration, System Designer, Alerts, Tools, About, and Help. The main header shows the Unigy logo and the current path: Configuration --> Sites. The interface is divided into three main panes. The left pane, titled 'Instance: All Instance', shows a tree view under 'Site Configuration: Location'. The 'Media Gateways' option is selected and highlighted. Below this, a table lists media gateways, with 'AvayaQSIGMG' in the 'Name' column and 'Zone1_ACCM_97_22' in the 'Zone' column. The middle pane, titled 'Media Gateway: AvayaQSIGMG', contains a table with columns 'Module', 'Port', and 'Channel'. The 'Module' column lists 'Slot 1- Add Card', 'Slot 2- Add Card', 'Slot 3- Add Card', and 'Slot 4- Add Card'. The right pane, titled 'Media Gateway Module Details: Add Card', shows the 'Basic' configuration section. It includes fields for 'Module Name', 'Type' (set to '2 Port TDM'), and 'Module Number' (set to '1'). At the bottom right of this pane are buttons for 'Revert' and 'Save'.

Screen below shows the added Port 1. Click on a desired **Port** in the upper right pane, in this case **Port 1**.

The **Media Gateway Port Details: Port 1** screen is shown below. Select the **Advanced** option for the **Port Properties** tab. The values shown in the screen were used during compliance testing.

The screenshot shows the Unigy configuration interface. On the left, a navigation pane lists various configuration categories, with 'Media Gateways' selected. The main area displays the 'Media Gateway: AvayaQSIGMG' configuration. A table at the top lists ports: 'Slot 1- 2 Port TDM' and 'Port1'. The 'Port Properties' tab is active, and the 'Advanced' sub-tab is selected. The following parameters are configured:

Parameter	Value
Protocol Type	E1 QSIG
Alliance ICM Trunk	<input type="checkbox"/>
Trunk	ISDN
Alliance Site	
Alliance Site IP Address	
Clock Master	CLOCK-MASTER-OFF
Line Code	HDB3
Far End Connection	CO
Framing Method	E1-FRAMING-MFF-CR
Trace Level	NO-TRACE

Screen below shows the **Port Properties** values continued. Click **Save** followed by **Apply** to complete port properties configuration.

This screenshot continues the configuration of the 'Media Gateway Port Details: Port 1'. The 'Advanced' sub-tab is still selected. The following parameters are configured:

Parameter	Value
Line Code	HDB3
Far End Connection	CO
Framing Method	E1-FRAMING-MFF-CR
Trace Level	NO-TRACE
Time For Reorder Tone [sec]	255

At the bottom right, the 'Save' button is highlighted with a red box.

Following four screens shows the values configured for the **ISDN** tab. Note that 10.10.97.225 is the IP address of the Media Gateway. Click **Save** followed by **Apply** to complete the configuration.

Configuration | System Designer | Alerts | Tools | About | Help 04:22 EDT-0400 | AvayaAdmin

Configuration -> Sites

Instance: All Instance Site Configuration: Location Location: All Locations

Media Gateways

Name	Zone
AvayaQSIGMG	Zone1_ACCM_97_225

Media Gateway: AvayaQSIGMG

Module	Port	Channel
Slot 1- 2 Port TDM	Port1	
Slot 2- Add Card	Port2	

Media Gateway Port Details: Port1

Port Properties ISDN

Basic Advanced

Basic

Trunk Name	QSIG/ISDN Trunk 1
Destination Address	10.10.97.225
Destination Port	5060
Connected Party Update	UPDATE
SubscribeMWI	0
MWI Subscription Time	0
Trunk Group ID	1

Save Revert

Configuration | System Designer | Alerts | Tools | About | Help 04:23 EDT-0400 | AvayaAdmin

Configuration -> Sites

Instance: All Instance Site Configuration: Location Location: All Locations

Media Gateways

Name	Zone
AvayaQSIGMG	Zone1_ACCM_97_225

Media Gateway: AvayaQSIGMG

Module	Port	Channel
Slot 1- 2 Port TDM	Port1	
Slot 2- Add Card	Port2	

Media Gateway Port Details: Port1

Port Properties ISDN

Basic Advanced

Advanced

Diversion Header	History-Info
Outgoing Transport Type	UDP
Connection Type	Dial Tone
Channel Select Mode	Cyclic Ascending
Registration Mode	Do Not Register
Echo Canceler	Off
PSTN Alert Timeout	600

Save Revert

Configuration | System Designer | Alerts | Tools | About | Help 04:23 EDT-0400 | AvayaAdmin

unigy Configuration -> Sites Powered by IPC

Instance: All Instance Site Configuration: Location Location: All Locations

Trunks
SIP Trunks
Alliance Trunks
Media Gateways
Communication Devices
Servers
Media Service
Prototype Devices
SNMP Forwarding

Media Gateways

Name	Zone
AvayaQSIGMG	Zone1_ACCM_97_221

Media Gateway: AvayaQSIGMG

Module	Port	Channel
Slot 1- 2 Port TDM	Port1	
Slot 2- Add Card	Port2	

Media Gateway Port Details: Port1

Port Properties ISDN

Basic Advanced

Play Ringback Tone to Trunk * Play On Local

ISDN Termination Side USER-TERMINATION-

Q931 Layer Response Behavior 0x40080007

Outgoing Calls Behavior 0x600

Incoming Calls Behavior 0x11000

General Call Control Behavior 0x80

D-channel Configuration DCH-CONFIG-PRIMA

QSIG Transfer Mode

Save Revert

Configuration | System Designer | Alerts | Tools | About | Help 04:24 EDT-0400 | AvayaAdmin

unigy Configuration -> Sites Powered by IPC

Instance: All Instance Site Configuration: Location Location: All Locations

Trunks
SIP Trunks
Alliance Trunks
Media Gateways
Communication Devices
Servers
Media Service
Prototype Devices
SNMP Forwarding

Media Gateways

Name	Zone
AvayaQSIGMG	Zone1_ACCM_97_221

Media Gateway: AvayaQSIGMG

Module	Port	Channel
Slot 1- 2 Port TDM	Port1	
Slot 2- Add Card	Port2	

Media Gateway Port Details: Port1

Port Properties ISDN

Basic Advanced

Outgoing Calls Behavior 0x600

Incoming Calls Behavior 0x11000

General Call Control Behavior 0x80

D-channel Configuration DCH-CONFIG-PRIMA

QSIG Transfer Mode

ISDN Transfer Capabilities doNotOverwrite

Progress Indicator to ISDN No PI

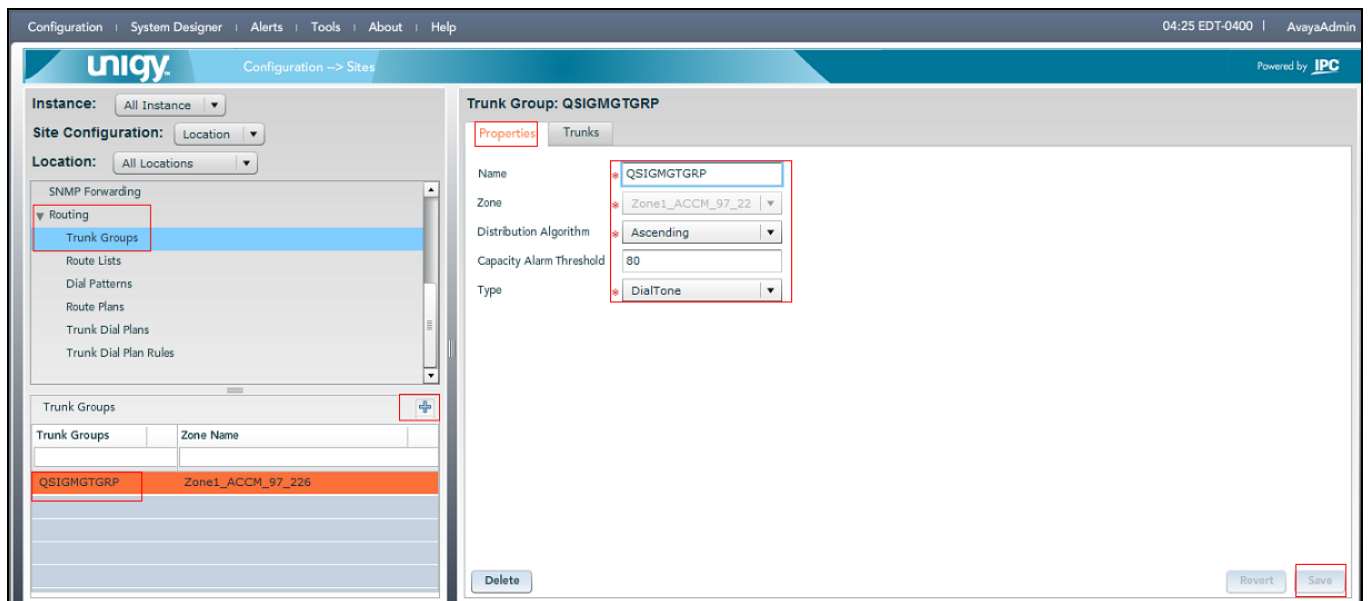
Enable Receiving of Overlap Dialing Disable

Save Revert

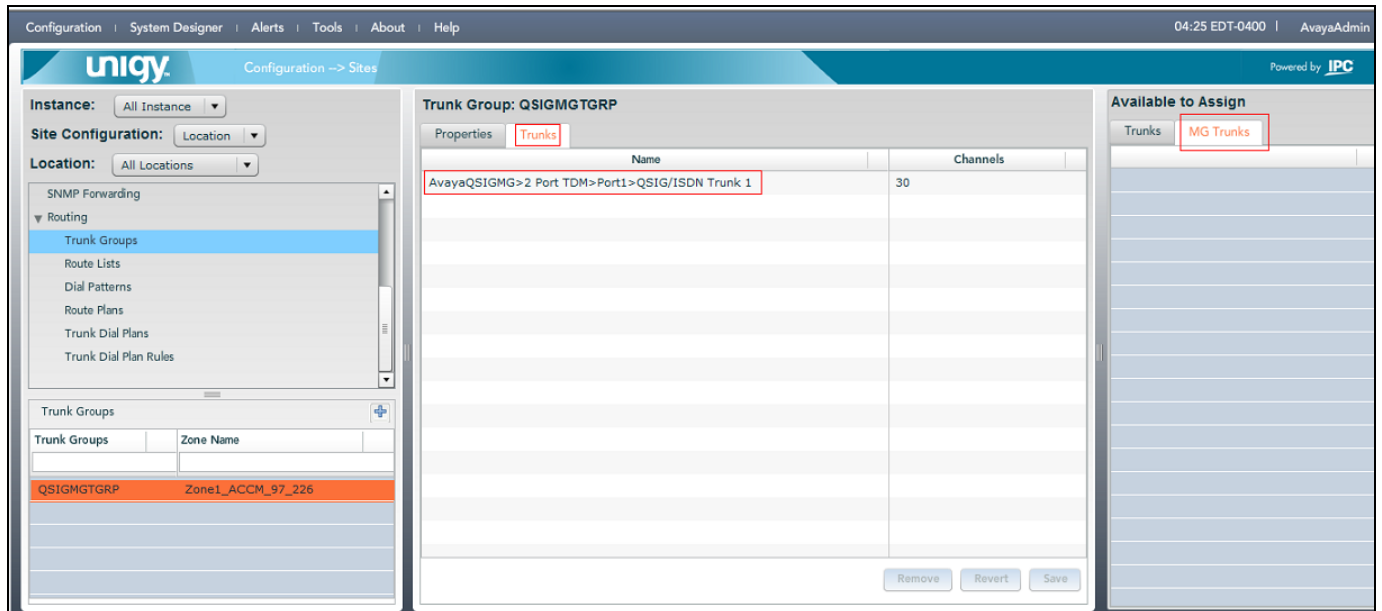
6.3. Administer Trunk Groups

From **Configuration → Sites**, select **Routing → Trunk Groups** in the left pane, and click the “+” icon in the lower left pane to add a new trunk group as shown in screen below.

The **Trunk Group** screen is displayed in the right pane. Select **Properties** tab, the screen shows the values configured for compliance testing. Click on **Save** to complete the configuration.



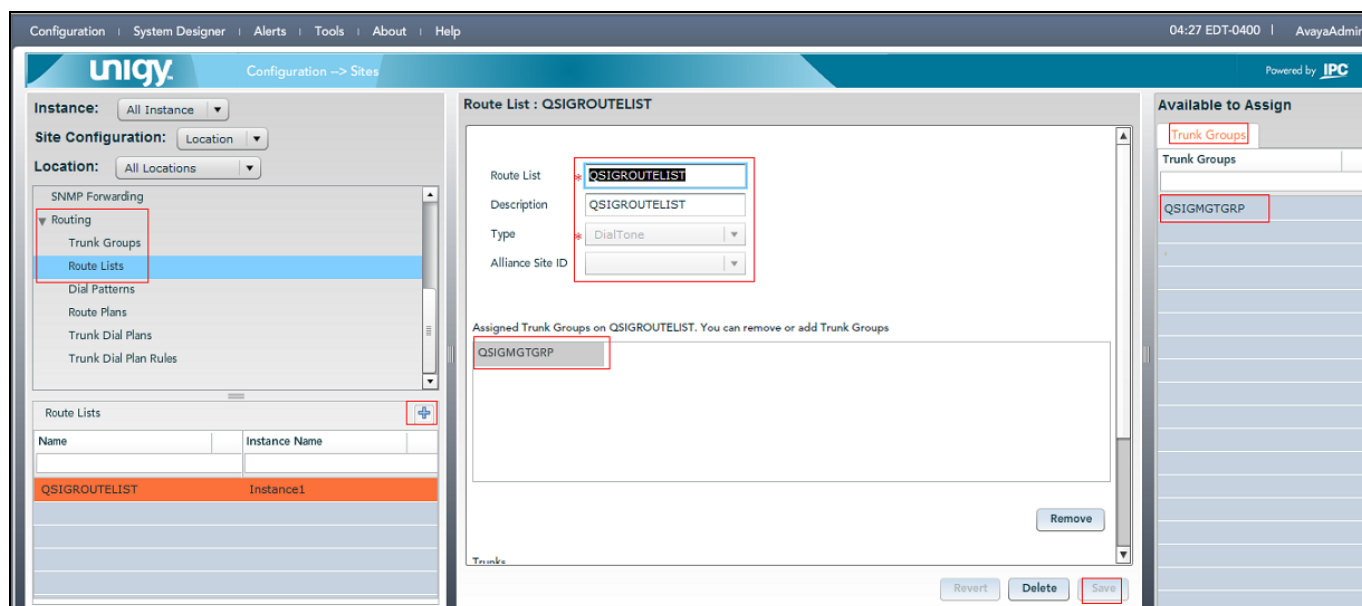
Select the **Trunks** tab in the right pane as shown in screen below. The screen is updated with three panes. In the new right pane, select the **MG Trunks** tab. In the **Media Gateway** listing, select and expand the applicable media gateway slot and port (not shown) from **Section 6.2**, and drag the selection to the **Name** column in the middle pane as shown below. Click on **Save** to complete the configuration.



6.4. Administer Route Lists

Select **Routing** → **Route Lists** in the left pane from **Configuration** → **Sites**, and click the “+” icon in the lower left pane to add a new route list as shown in screen below.

The **Route List** screen is displayed in the middle pane. Screen shows the values configured for compliance testing. In the right pane, select the trunk group from **Section 6.3** and drag into the **Assigned Trunk Groups on QSIGROUTE LIST** sub-section in the middle pane, as shown below. Click on **Save** to complete the configuration.



6.5. Administer Dial Patterns

Select **Routing** → **Dial Patterns** in the left pane from **Configuration** → **Sites** to display the **Dial Patterns** screen in the right pane. Click **Add New** in the upper right pane as shown in the screen below.

In the **Dial pattern Details** sub-section in the lower right pane, enter the desired **Name** and **Description**. For **Pattern String**, enter the dial pattern to match the Avaya extensions, in this case **58\$\$\$** with “\$” matching to any digit. Click on **Save** to complete adding a dial pattern.

Configuration | System Designer | Alerts | Tools | About | Help 04:28 EDT-0400 | AvayaAdmin

unigy Configuration -> Sites Powered by IPC

Instance: All Instance Site Configuration: Location Location: All Locations

Trunks
SIP Trunks
Alliance Trunks
Media Gateways
Communication Devices
Servers
Media Service
Prototype Devices
SNMP Forwarding
Routing
Trunk Groups
Route Lists
Dial Patterns
Route Plans
Trunk Dial Plans
Trunk Dial Plan Rules

Dial Patterns

Name	Pattern String	Description	Zone Name
------	----------------	-------------	-----------

Add New Delete

Dial pattern Details

Properties

Name: Pattern1
Zone: Zone1_ACCM_97_22
Description: Pattern1
Pattern String: 58\$\$\$

Revert Save

Repeat this section to add another dial pattern to reach the PSTN, and include any required prefix. In the compliance testing, two dial patterns were created as shown in the screen below.

Configuration | System Designer | Alerts | Tools | About | Help 04:30 EDT-0400 | AvayaAdmin

unigy Configuration -> Sites Powered by IPC

Instance: All Instance Site Configuration: Location Location: All Locations

Trunks
SIP Trunks
Alliance Trunks
Media Gateways
Communication Devices
Servers
Media Service
Prototype Devices
SNMP Forwarding
Routing
Trunk Groups
Route Lists
Dial Patterns
Route Plans
Trunk Dial Plans
Trunk Dial Plan Rules

Dial Patterns

Name	Pattern String	Description	Zone Name
Pattern1	58\$\$\$	Pattern1	Zone1_ACCM_97_226
Pattern2	961396\$\$\$\$\$	Pattern2	Zone1_ACCM_97_226

Add New Delete

Dial pattern Details

Properties

Name: *

6.6. Administer Route Plans

Select **Routing** → **Route Plans** in the left pane from **Configuration** → **Sites** and click **Add New** (not shown) in the right pane to create a new route plan as shown in screen below.

The screen is updated with three panes, as shown below. In the **Route Plan** middle pane, enter a descriptive **UI Name** and optional **Description**. For **Calling Party**, enter * to denote any calling party from Unigy. For **Destination**, select the dial pattern for the Avaya users from **Section 6.5**. Select **Forward** for **Action**, **Instance 1** for Instance and click on **Save**.

Configuration | System Designer | Alerts | Tools | About | Help

04:41 EDT-0400 | AvayaAdmin

unigy Configuration -> Sites

Instance: All Instance

Site Configuration: Location

Location: All Locations

Trunks

- SIP Trunks
- Alliance Trunks
- Media Gateways
- Communication Devices
- Servers
- Media Service
- Prototype Devices
- SNMP Forwarding
- Routing
 - Trunk Groups
 - Route Lists
 - Dial Patterns
 - Route Plans
 - Trunk Dial Plans
 - Trunk Dial Plan Rules

Route Plan

Create New Route Plan

UI Name: * RPPattern1

Description: RPPattern1

Calling Party: *

Destination: 58\$\$\$

Action: Forward

Instance: Instance1

Route List:

Back Revert Save

Assign Trunk Groups

Available to Assign

Route Lists

Name

QSIGROUTE LIST

The screen is updated with the newly created route plan as shown in **screen** below. Select the route plan, and click **Edit** toward the bottom of the screen (not shown).

Configuration | System Designer | Alerts | Tools | About | Help

unigy Configuration -> Sites

Instance: All Instance

Site Configuration: Location

Location: All Locations

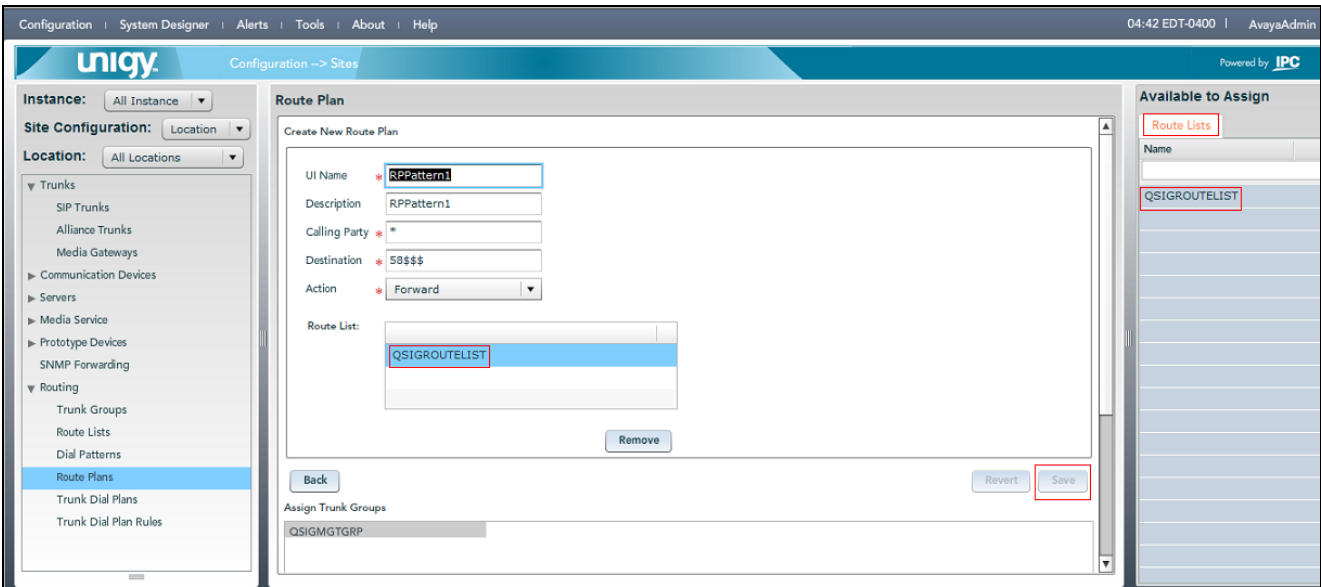
Trunks

Route Plan

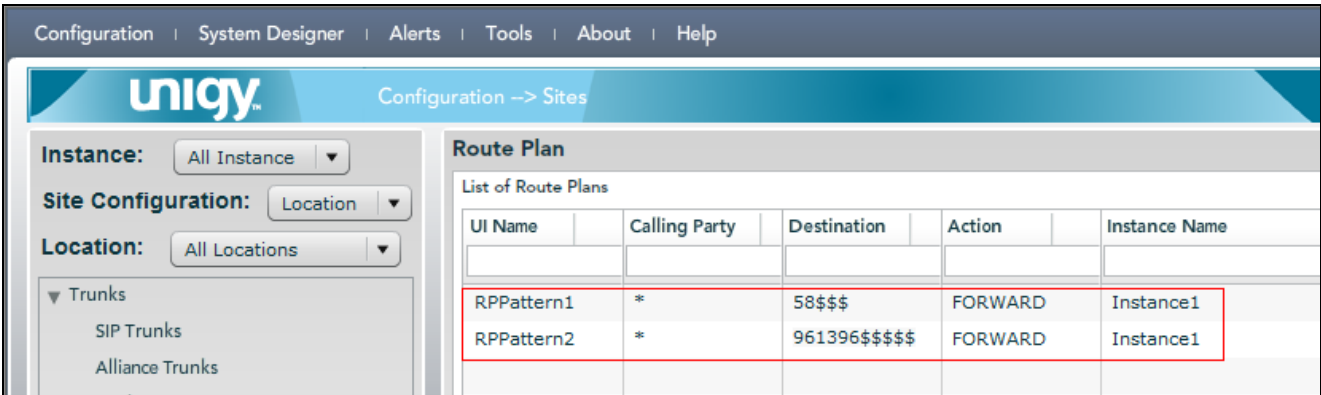
List of Route Plans

UI Name	Calling Party	Destination	Action	Instance Name
RPPattern1	*	58\$\$\$	FORWARD	Instance1

The screen is updated with three panes again, as shown below. In the right pane, select the route list from **Section 6.4** and drag into the **Route List** sub-section in the middle pane, as shown below. Click on **Save** to complete the configuration.



Repeat this section to add another route plan for the PSTN. During compliance testing, two route plans were created as shown below.



7. Configure IPC Media Gateway

This section provides the procedures for configuring IPC Media Gateway. The procedures include the following areas:

- Launch gateway web interface.
- Administer trunk settings.

The configuration of the Media Gateway is typically performed by IPC installation technicians. The procedural steps are presented in these Application Notes for informational purposes. Note that IPC resells the AudioCodes Mediant 1000 MSBG as part of their solution.

7.1. Launch Gateway Web Interface

Access the Media Gateway web interface by using the URL “http://ip-address” in an Internet browser window, where “ip-address” is the IP address of the Media Gateway. Log in (not shown) using the appropriate credentials.





7.2. Administer Trunk Settings

The screen as shown below is displayed. Select the radio button for **Full** in the left pane, and select **VoIP → PSTN Settings → Trunk Settings**, to display the **Trunk Settings** screen. During compliance testing the values shown below were selected from the drop down menu.

The screenshot displays the AudioCodes Mediant 1000 - MSBG web interface. The top navigation bar includes the AudioCodes logo, the title 'Mediant 1000 - MSBG', and buttons for 'Submit', 'Burn', 'Device Actions', 'Home', 'Help', and 'Log off'. The left sidebar shows a tree view with categories: Configuration, Maintenance, and Status & Diagnostics. Under Configuration, the 'Full' radio button is selected. The tree view includes System, VoIP, Network, TDM, Security, PSTN, CAS State Machines, Trunk Settings (highlighted), Signaling, Media, Services, Control Network, SIP Definitions, Coders And Profiles, GW and IP to IP, IP Media, and Data. The main content area is titled 'Trunk Settings' and features a 'Basic Parameter List' tab. The settings are organized into two sections: General Settings and Trunk Configuration. General Settings includes Module ID (1), Trunk ID (1), Trunk Configuration State (Inactive), and Protocol Type (E1 QSIG). Trunk Configuration includes Clock Master (Recovered), Auto Clock Trunk Priority (0), Line Code (HDB3), Line Build Out Loss (0 dB), Trace Level (No Trace), Line Build Out Overwrite (OFF), and Framing Method (E1 FRAMING MFF CRC4 EXT). At the bottom left, there is a green checkmark icon and the text 'Apply to All Trunks'. At the bottom right, there is a green checkmark icon and the text 'Apply Trunk Settings'.

General Settings	
Module ID	1
Trunk ID	1
Trunk Configuration State	Inactive
Protocol Type	E1 QSIG

Trunk Configuration	
Clock Master	Recovered
Auto Clock Trunk Priority	0
Line Code	HDB3
Line Build Out Loss	0 dB
Trace Level	No Trace
Line Build Out Overwrite	OFF
Framing Method	E1 FRAMING MFF CRC4 EXT

▼ ISDN Configuration		
ISDN Termination Side	User side	
Q931 Layer Response Behavior	0x40080007	
Outgoing Calls Behavior	0x600	
Incoming Calls Behavior	0x11000	
General Call Control Behavior	0x80	
ISDN NS Behaviour 2	0x0	
NFAS Group Number	0	
IUA Interface ID	-1	
NFAS Interface ID	255	
D-channel Configuration	PRIMARY	

PSTN Alert Timeout	600
Transfer Mode	Disable
Local ISDN Ringback Tone Source	Gateway
Set PI in Rx Disconnect Message	Not Configured
ISDN Transfer Capabilities	Not Configured
Progress Indicator to ISDN	No PI
Select Receiving of Overlap Dialing	None
B-channel Negotiation	Not Configured
Out-Of-Service Behavior	Not Configured
Remove Calling Name	Disable
Play Ringback Tone to Trunk	Play on Local
Call Rerouting Mode	None
ISDN Duplicate Q931 BuffMode	0

Click **Stop Trunk** (not shown), followed by the arrow next to **Q931 Layer Response Behavior** seen under **ISDN Configuration**.

Q931 Layer Response Behavior screen shown below is displayed. Enable the corresponding bits for the following values and click on **Submit**.

- **NO STATUS ON UNKNOWN IE**
- **NO STATUS ON INV OP IE**
- **ACCEPT UNKNOWN FAC IE**
- **ACCEPT A LAW**
- **QSI ENCODE INTEGER**

AudioCodes Mediant 1000 - MSBG

Configuration Maintenance Status & Diagnostics

Search

Basic Full

System

VoIP

Network

TDM

Security

PSTN

CAS State Machines

Trunk Settings

Signaling

Media

Services

Control Network

SIP Definitions

Coders And Profiles

GW and IP to IP

IP Media

Data

Q931 Layer Response Behavior

Q931 Layer Response Behavior 0x40080007

Bit Hex Value	Bit Name	Bit Value
0x000001	NO STATUS ON UNKNOWN IE	1
0x000002	NO STATUS ON INV OP IE	1
0x000004	ACCEPT UNKNOWN FAC IE	1
0x000080	SEND USER CONNECT ACK	0
0x000200	EXPLICIT INTERFACE ID	0
0x000800	ALWAYS EXPLICIT	0
0x008000	ACCEPT MU LAW	0
0x010000	EXPLICIT PRES SCREENING	0
0x020000	STATUS INCOMPATIBLE STATE	0
0x040000	STATUS ERROR CAUSE	0
0x080000	ACCEPT A LAW	1
0x200000	RESTART INDICATION	0
0x400000	FORCED RESTART	0
0x40000000	QSI ENCODE INTEGER	1
0x04000000	NS ACCEPT ANY CAUSE	0
0x80000000	SESS National Mode For Bch Maintenance	Custom Mode

Submit

Click on the arrow next to **Outgoing Calls Behavior** seen under **ISDN Configuration**. **Outgoing Calls Behavior** screen shown below is displayed. Enable the corresponding bits for the following values and click on **Submit**.

- **USE A LAW**
- **USER CALLING NB TYPE PLAN**

Outgoing Calls Behavior

Outgoing Calls Behavior 0x600

Bit Hex Value	Bit Name	Bit Value
0x0002	USER SENDING COMPLETE	0
0x0010	USE MU LAW	0
0x0080	DIAL WITH KEYPAD	0
0x0100	STORE CHANNEL ID IN SETUP	0
0x0200	USE A LAW	1
0x0400	USER CALLING NB TYPE PLAN	1
0x4000	DLCI REVERSED OPTION	0

Submit

Click on the arrow next to **Incoming Calls Behavior** seen under **ISDN Configuration**. **Incoming Calls Behavior** screen shown below is displayed. Enable the corresponding bits for the following values and click on **Submit**.

- **USER SETUP ACK**
- **PROGR IND IN SETUP ACK**

Incoming Calls Behavior

Incoming Calls Behavior	0x11000	
Bit Hex Value	Bit Name	Bit Value
0x00020	DATA CONN RS	0 ▾
0x00040	VOICE CONN RS	0 ▾
0x00800	CHAN ID IN FIRST RS	0 ▾
0x01000	USER SETUP ACK	1 ▾
0x02000	CHAN ID IN CALL PROC	0 ▾
0x10000	PROGR IND IN SETUP ACK	1 ▾
0x80000000	USER SCREEN INDICATOR	0 ▾

Return to the **Trunk Settings** screen as shown in the beginning of **Section 7.2** above; click **Apply Trunk Settings**, followed by **Burn** to commit the changes (not shown).

8. Verification Steps

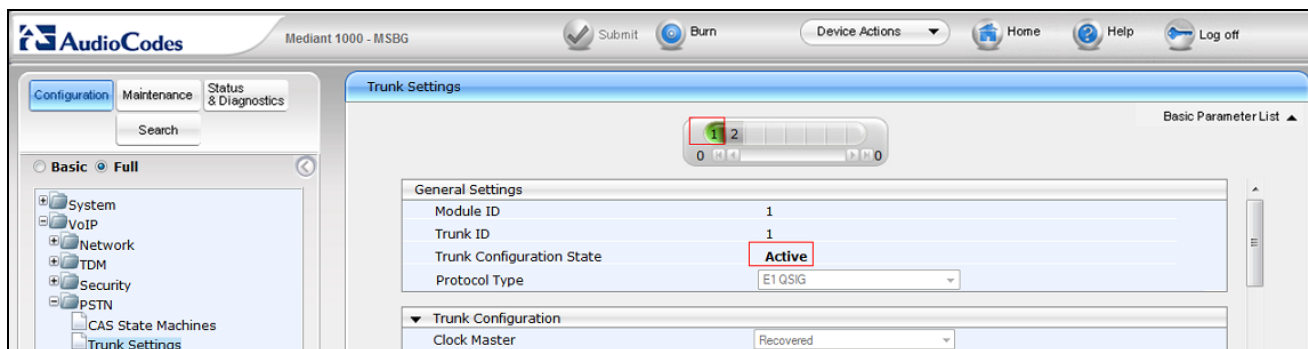
The following tests were conducted to verify the solution:

- Basic call features operate successfully between users on both systems.
- E1 connection in the Media Gateway is successfully established when the physical cable is disconnected and connected back.
- Login to the Avaya Communication Server 1000 using command line interface (not shown) and verify the status of the D-Channel and D-Channel loop in **LD 96** and **60** respectively. Screen below shows the D-Channel active and established and the loop enabled with the channels idle.

```
>ld 96
DCH000
.stat dch 5
DCH 005 : OPER      EST  ACTV  AUTO
DES : QSIG_IPC
****
OVL000
>ld 60
DTI000
.stat 10

PRI2 LOOP 10 - ENBL
REF CLK: DSBL
SERVICE RESTORE: YES
ALARM STATUS: ACCEPTABLE
CH 01 - IDLE TIE  VOD *
CH 03 - IDLE TIE  VOD *
CH 05 - IDLE TIE  VOD *
CH 07 - IDLE TIE  VOD *
CH 09 - IDLE TIE  VOD *
CH 11 - IDLE TIE  VOD *
CH 13 - IDLE TIE  VOD *
CH 15 - IDLE TIE  VOD *
CH 17 - IDLE TIE  VOD *
CH 19 - IDLE TIE  VOD *
CH 21 - IDLE TIE  VOD *
CH 23 - IDLE TIE  VOD *
CH 25 - IDLE TIE  VOD *
CH 27 - IDLE TIE  VOD *
CH 29 - IDLE TIE  VOD *
CH 31 - DCH 5
CH 02 - IDLE TIE  VOD *
CH 04 - IDLE TIE  VOD *
CH 06 - IDLE TIE  VOD *
CH 08 - IDLE TIE  VOD *
CH 10 - IDLE TIE  VOD *
CH 12 - IDLE TIE  VOD *
CH 14 - IDLE TIE  VOD *
CH 16 - IDLE TIE  VOD *
CH 18 - IDLE TIE  VOD *
CH 20 - IDLE TIE  VOD *
CH 22 - IDLE TIE  VOD *
CH 24 - IDLE TIE  VOD *
CH 26 - IDLE TIE  VOD *
CH 28 - IDLE TIE  VOD *
CH 30 - IDLE TIE  VOD *
```

- From the Media Gateway web interface, select **VoIP → PSTN Settings → Trunk Settings** to display the **Trunk Settings** screen as shown below. Toward the top of the screen, click the applicable trunk port from **Section 6.2**, in this case **1**. Verify that the **Trunk Configuration State** is **Active**.



9. Conclusion

These Application Notes describe the configuration steps required for IPC Unigy to successfully interoperate with Avaya Communication Server 1000 7.5 using QSIG trunks. The entire executed test cases passed and met the objectives outlined in **Section 2** and the observations noted in **Section 2.2**.

10. Additional References

This section references the product documentation relevant to these Application Notes.

1. *Software Input Output Reference — Administration Avaya Communication Server 1000 7.5 NN43001-611, Standard 05.13 September 2012* available at <http://support.avaya.com>.
2. *Unigy System Configuration*, upon request to IPC Support.

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