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Avaya Solution & Interoperability Test Lab

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

Abstract

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

IPC Alliance is a trading communication solution. In the compliance testing, IPC Allianceused E1 QSIG trunks to Avaya Communication Server 1000, forturret users on IPC to reachusers 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.

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1. Introduction

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

IPC Alliance (hereafter referred to as Alliance) is a trading communication solution. In the compliance testing, IPC Allianceused E1 QSIG trunks to Avaya Communication Server 1000 7.5 (hereafter referred to as CS1000), for turret users on IPC Allianceto reach users on Avaya Communication Server 1000 and on the PSTN.

This solution covered CS1000 IP (UNIStim), Digital and/or PSTN users. SIP endpoints are currently not supported due to an issue with Calls Forward scenario.

2. General Test Approach and Test Results

The feature test cases were performed manually. Calls were manually established among Alliance turret users with CS1000 IP (UNIStim), 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 E1connection to Alliance.

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

2.1. Interoperability Compliance Testing

The interoperability compliance test included feature and serviceability testing.

The feature testing included basic call, basic display, DTMF, hold/reconnect, call forwarding unconditional/ring-no-answer/busy, blind/attended transfer, and attended conference.

The serviceability testing focused on verifying the ability of Alliance to recover from adverse conditions, such as disconnecting/reconnecting the E1connection to Alliance.

2.2. **Test Results**

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

- Call Forward No Answer on a Turret fails if the call is initiated by an Avaya SIP end point. For example, Set A (Avaya SIP end point) calls Set B (Turret) which has a diversion for Call Forward No Answer to Set C (Turret or Avaya). Set B keeps on ringing and call is not forwarded to Set C. Issue is not seen if Set A is a non-SIP Avaya end point.
- Set A (Avaya) initiates a call to Set B (Turret) which is Call Forward No Answer to Set C (Avaya) which is Call forward No Answer to PSTN, which is in a busy state. Set A does not hear the busy tone.
- Alliance has certain issues with Calling Line ID (CLID) when it invokes the restricted CLID feature and during conference calls.

2.3. **Support**

Technical support on IPC Alliance 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, Allianceconfigurationconsists of the IPC Alliance MX and Turrets.

There is a physical connection between the 2MbPRI circuit pack on Avaya CS1000 with the AllianceMX. E1 QSIG trunks are used from Allianceto Avaya CS1000, to reach users on CS1000 and on the PSTN.

A five digit Uniform Dial Plan (UDP) was used to facilitate dialing between the Alliance and CS1000. During compliance testing, extension ranges 58xxx were associated with CS1000 users and36xxx were associated with the Alliance turret users. Avaya Call Pilot DN is 58888 and the PSTN number is 96139655570.
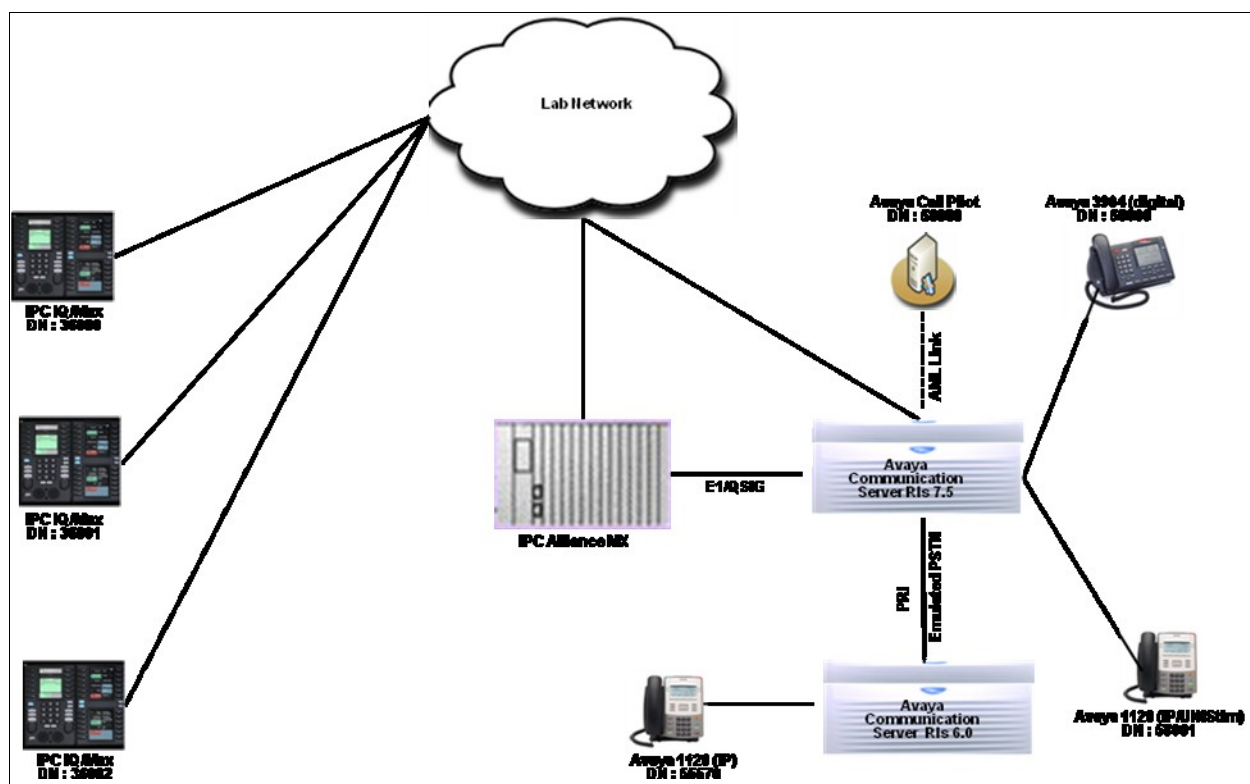
Figure 1: Compliance Test Setup in the lab

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
Avaya Digital user (3904)	NA
Avaya IP (UNIStim) user (1120)	0624C8A
IPC System Interconnect • Alliance MX • Turret (IQ/Max)	16.02.01.00.0007-1 16.02.01.00.0007-1

5. Configure Avaya CS1000

This section provides the procedures for configuring Avaya CS1000 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.

Assumption is made here that the CS1000 users are already created and also the PRI Trunk between CS1000 7.5 and CS1000 6.0 is configured for emulated PSTN setup during compliance testing. For detail configuration of the CS1000 refer to **Section 9 [1]**.

5.1. Log In to Element Manager via Unified Communication Manager

To login to the Unified Communications Manager (UCM) open an Internet Explorer browser and type in the IP address of the UCM in the URL (not shown). **Figure 2** below shows the login screen of the UCM. Enter the **User ID** and **Password** credentials and click on **Log In** to continue.

Figure 2: UCM Login Screen

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From the UCM main screen as shown in **Figure 3** below, click on the Element **EM on cppm1**. This is the element which is configured to access the Element Manager (EM) for the CS1000 Call Server.

Figure 3: UCM Main Screen

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 in **Figure 4** below.
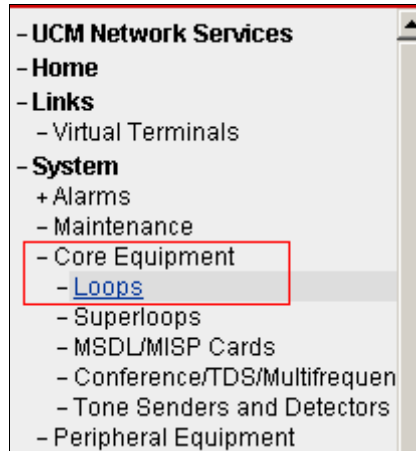
Figure 4: EM Screen showing navigation tree to Loops

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 in **Figure 5** below.
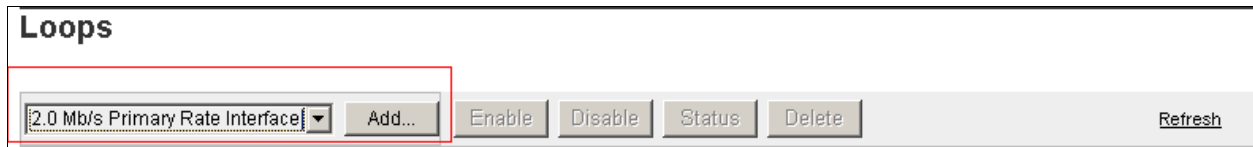
Figure 5: Adding a Loop on the 2Mb PRI circuit pack

During compliance testing a loop number of **10** was selected and the physical location of the circuit pack on the CS1000 was in **004 0 03**. Enter these values as shown in **Figure 6** below to complete adding the loop.

Figure 6: Loop Configuration

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 **Figure 7** 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
```
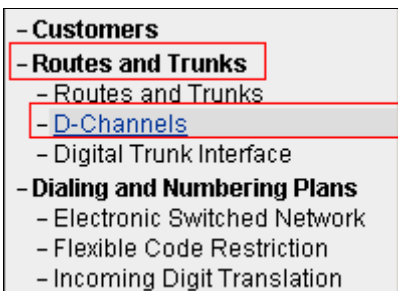
Figure 7: EM Screen showing navigation tree to D-Channels

Choose a D-Channel number to add as shown in **Figure 8** 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

Figure 8: Adding D-Channel

Configure the **Basic Configuration** values for the D-Channel as shown in **Figure 9** below. Note here that the D-Channel PRI loop number is the same one that was configured in **Section 5.2** above.

Figure 9: D-Channel Basic Configuration

To edit the **Remote Capabilities** of the D-Channel, click on **Edit** button as shown in **Figure 10** below.

Figure 10: Editing Remote Capabilities Screen

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Select the boxes values for the Remote Capabilities as shown in **Figures 11a** and **11 b** below. Click on **Return - Remote Capabilities** button to return back to the main screen to complete the D-Channel configuration.

Figure 11a: Remote Capabilities Values

Figure 11b: Remote Capabilities Values (cont'd)

Note that in **LD 73** under **FEAT LPTI**, the value for **MFF** could be **AFF** or **CRC** (not shown). The Alliance QSIG configuration should match with the value that is defined on the CS1000. If there is a mismatch then the D-Channel will not be active.

5.4. **Configuring Route and Trunks**

This section explains the configuration of the QSIG route and trunks which will be used by
CS1000 and Alliance to communicate between them. To add a new route, navigate to **Routes
and Trunks > Routes and Trunks** from the EM left hand navigator window as shown in
Figure 12 below.
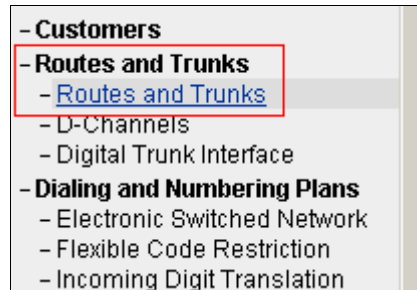
Figure 12: EM Screen showing navigation tree to Routes and Trunks

From the Routes and Trunks screen click on **Add route** button to start configuring a new route
as shown in **Figure 13** below.
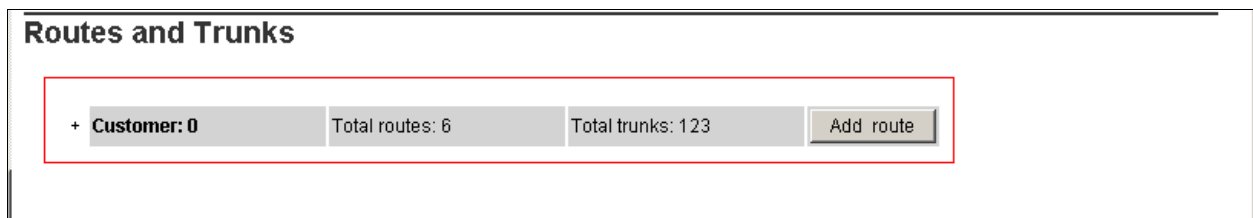
Figure 13: Adding a new Route

During compliance testing **Route number 50** was added. Select the values from the drop down menu and configure the values as shown in **Figures 14a** and **14b** below.

Figure 14a: Route Basic Configuration values

Figure 14b: Route Network Options values

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Configure the trunk values as shown in **Figure 15** 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.

Figure 15: Trunk Properties

Figures 16a and **16b** 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.

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Figure 16a: Trunk Class of Service

Figure 16b: Trunk Class of Service (cont'd)

5.5. Configuring Digit Manipulation Block

This section explains the digit manipulation block that is to be configured in the CS1000 dialing plan for its users to communicate with the Alliance system. From the EM navigator pane, navigate to **Dialing and Numbering Plans > Electronic Switched Network** as shown in **Figure 17** below.
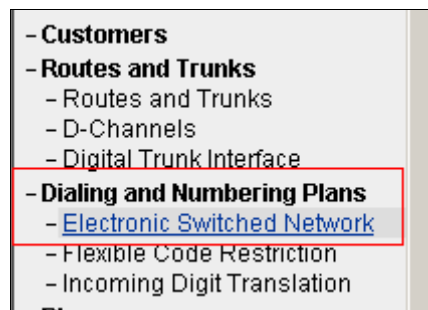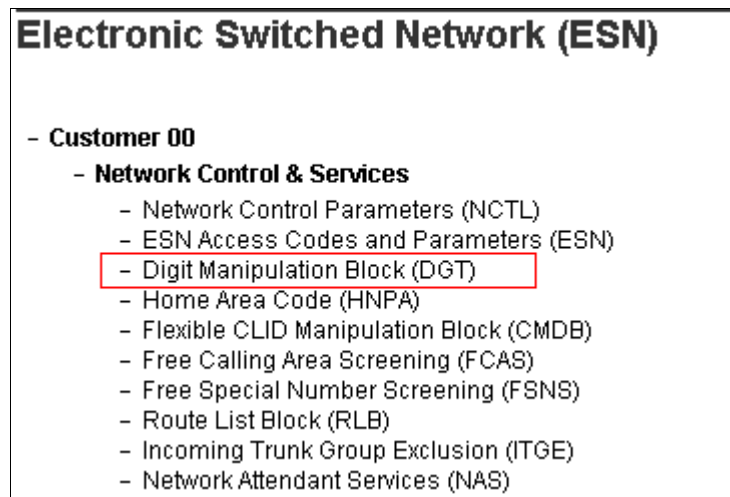

Figure 17: EM Screen showing navigation tree to Electronic Switched Network

Click on **Digit Manipulation Block (DGT)** option as shown in **Figure 18** below.
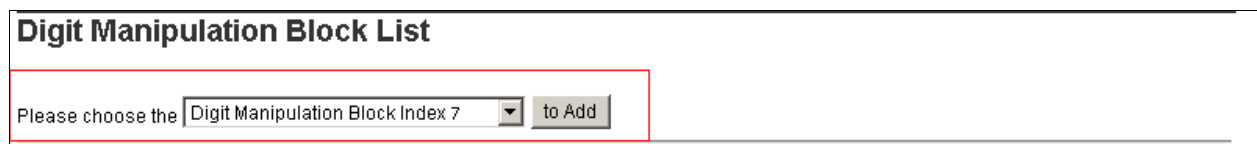

Figure 18: Accessing Digit Manipulation Block

Select a block index to configure and click on **to Add** button as shown in **Figure 19** below. During compliance testing **Digit Manipulation Block Index** of **7** was added.
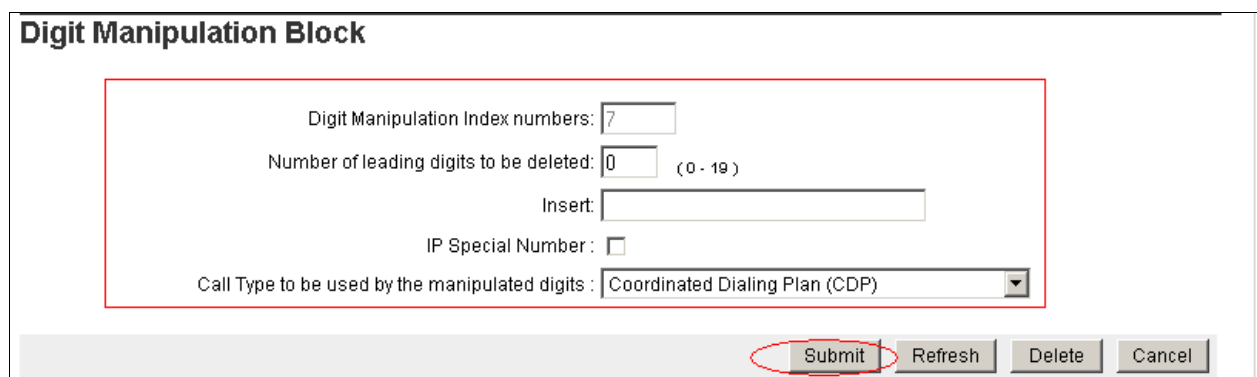

Figure 19: Adding a Digit Manipulation Block Index

Figure 20 below shows the values configured. Click on **Submit** to complete adding the Digit Manipulation Block configuration.

Figure 20: Digit Manipulation Block properties

5.6. Configuring Route List Block

This section explains the route list block that is to be configured in the CS1000 dialing plan for its users to communicate with the Alliance system. From the EM navigator pane, navigate to **Dialing and Numbering Plans > Electronic Switched Network** as shown in **Figure 17** above. Click on **Route List Block (RLB)** option as shown in **Figure 21** below.
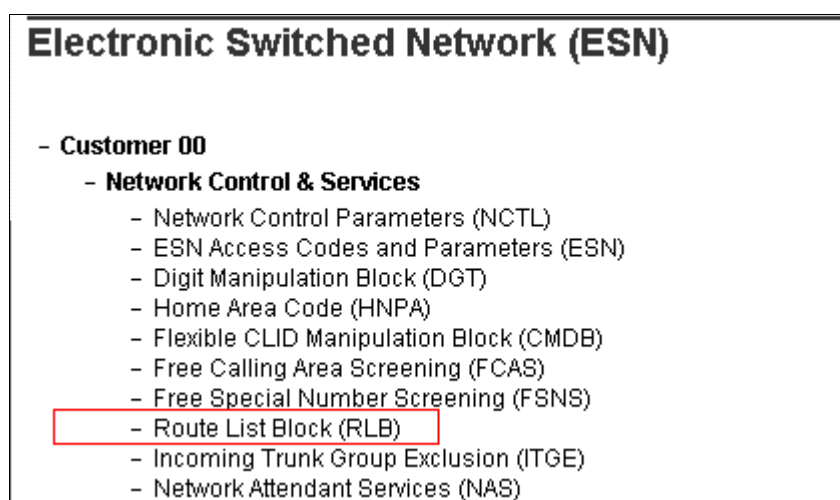

Figure 21: Accessing Route List Block

Start adding a **route list index** as shown in **Figure 22** below. During compliance testing list index **50** was added. Click on **to Add** to continue.
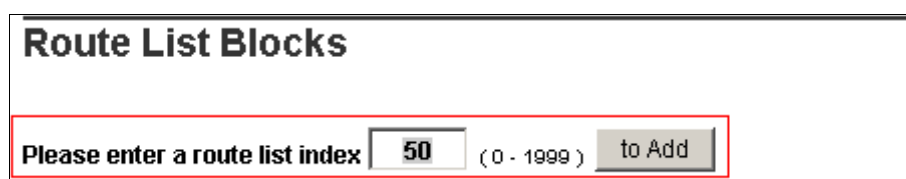

Figure 22: AddingRoute ListIndex

Add a **Data Entry Index** as shown in **Figure 23** below. During compliance testing entry index **1** was selected and click on **to Add** to continue.
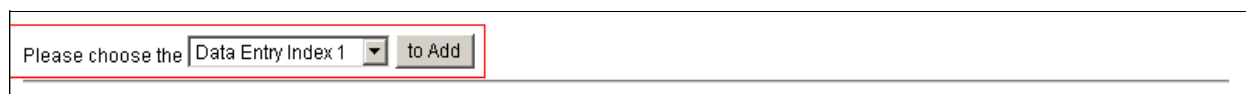

Figure 23: Adding Data Entry Index

Figures 24a and **24b** 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.

Figure 24a: Route List Block properties

Figure 24b: Route List Block properties (cont'd)

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5.7. **Configuring Distant Steering Code**

This section explains the distant steering code that is to be configured in the CS1000 dialing plan for its users to communicate with the Alliance system. From the EM navigator pane, navigate to **Dialing and Numbering Plans > Electronic Switched Network** as shown in **Figure 17** above. Click on **Distant Steering Code (DSC)** option as shown in **Figure 25** below.
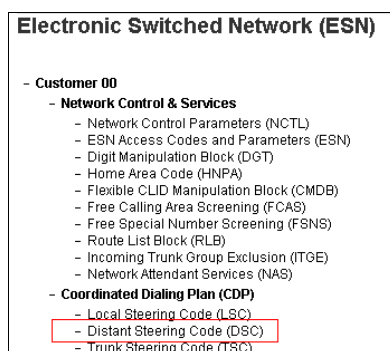

Figure 25: Accessing Distant Steering Code

From the drop down menu select **Add** and enter a distant steering code to add as shown in **Figure 26** below. During compliance testing a code of **360** was added since the Alliance extension range started with 360xx. Click on **to Add** to continue.
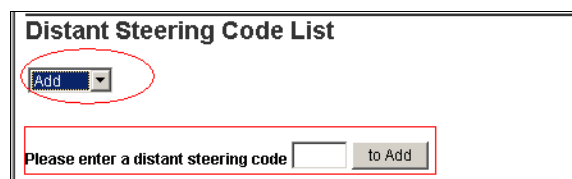
Figure 26: Adding a Distant Steering Code

Enter the values as shown in **Figure 27** 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.

Figure 27: Distant Steering Code properties

6. Configure IPC System Interconnect

This section provides the procedures for configuring IPC System Interconnect. The procedures include the following areas:

- Launch One Management System
- Administer wire groups

The configuration of Media 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 Alliance system refer to **Section 9 [2]**.

6.1. Launch One Management System

Access the One Management System web interface by using the URL "http://ip-address/oneview" in an Internet browser window, where "ip-address" is the IP address of IPC System Center. Log in using the appropriate credentials. The **Login** screen is displayed as shown in **Figure 28** below. Enter the appropriate credentials. Check **I agree to the terms and conditions**, and click **Login**. The **License Login** screen is displayed next (not shown). Enter the appropriate password and click **Login**. In the subsequent **Login Information** screen (not shown), click **Continue**.

Figure 28: One Management System Login Screen

6.2. Administer Wire Groups

Select **MAIN MENU** from the top menu to display the **Main Menu** screen. Select **GROUPS > Engineering Groups > Wire Groups**, as shown in **Figure 29** below.
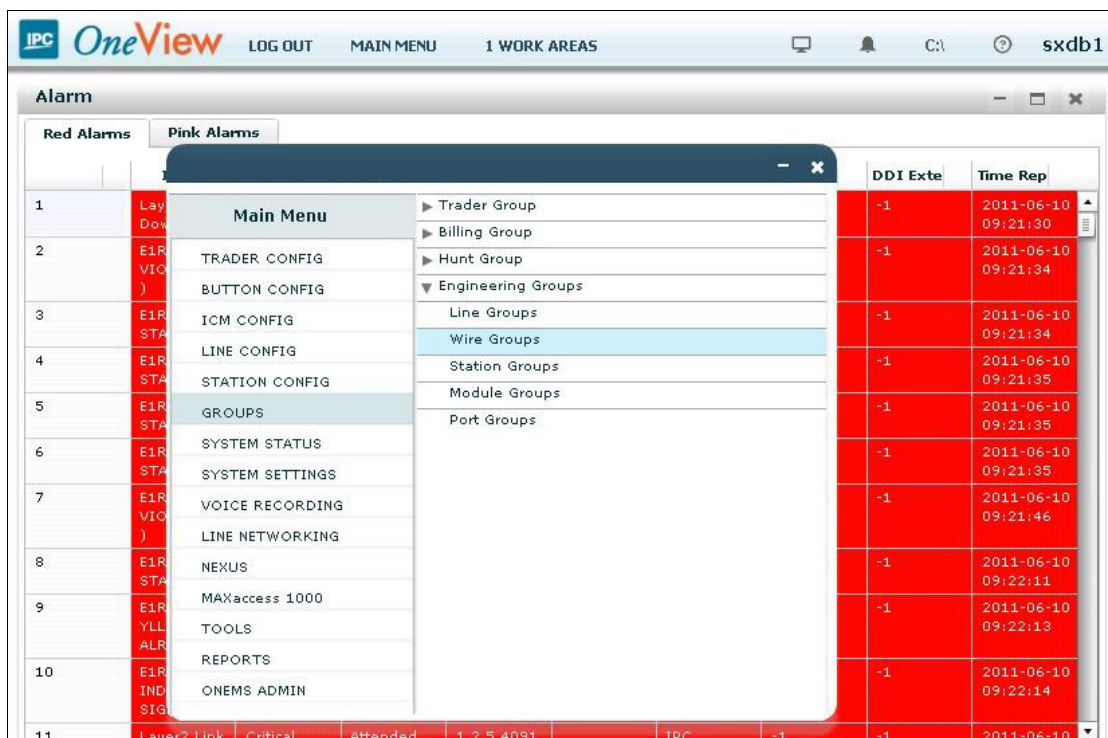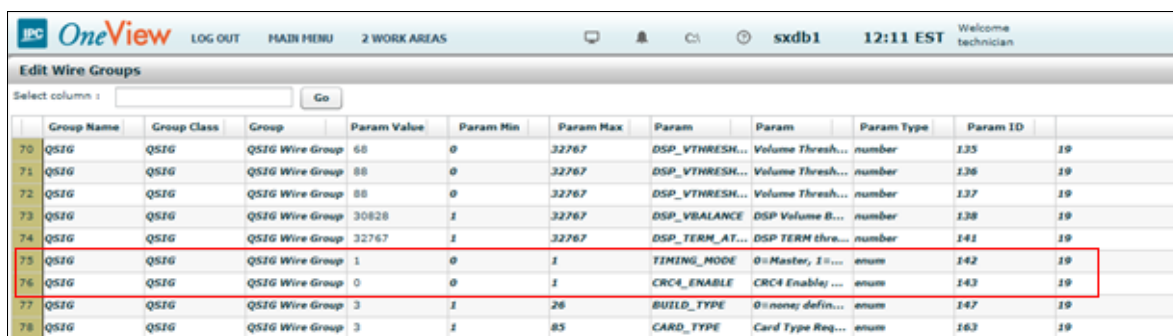

Figure 29: Wire Groups

The **Wire Groups** screen is displayed as shown in **Figure 30** next. Select "QSIG" from the **Select Wire Group** drop-down list, and "Edit" from the **Select Operation** drop-down list, as shown below.
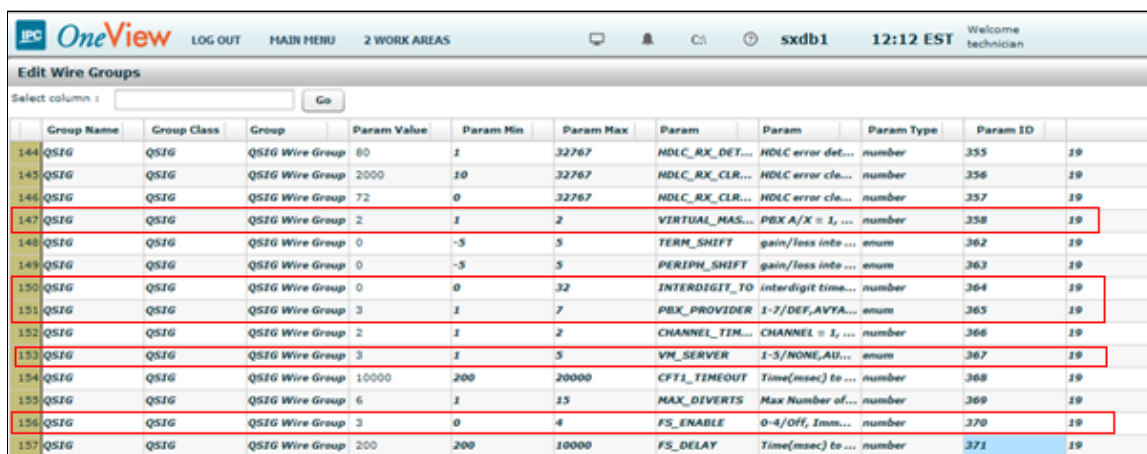

Figure 30: QSIG Wire Group Selection

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The **Edit Wire Groups** screen is displayed as shown in **Figures31a** and **b** below.

- Locate the entry with **Param ID** of "142". Double click on the corresponding **Param Value** field, and enter "1"
- Scroll down to locate the entry with **Param ID** of "143". Double click on the corresponding **Param Value** field, and enter "0"
- Scroll down to locate the entry with **Param ID** of "358". Double click on the corresponding **Param Value** field, and enter "2"
- Locate the entry with **Param ID** of "364". Double click on the corresponding **Param Value** field, and enter "0"
- Scroll down the screen as necessary to locate the entry with **Param ID** of "365". Double click on the corresponding **Param Value** field, and enter "3" to denote Nortel (note that IPC still uses Nortel to represent CS1000) as the PBX provider.
- Locate the entry with **Param ID** of "367". Double click on the corresponding **Param Value** field, and enter "3".
- Locate the entry with **Param ID** of "370". Double click on the corresponding **Param Value** field, and enter "3".

Figure 31a: QSIG Wire Groups Configuration

Figure 31b: QSIG Wire Groups Configuration (cont'd)

7. Verification Steps

The following tests were conducted to verify the solution between the CS1000 and Alliance system:

- All basic call features operate successfully between CS1000 and Alliance users.
- E1 connection in the Media Gateway is successfully established when the physical cable is disconnected and connected back.
- Login to the CS1000 using command line interface (not shown) and verify the status of the D-Channel and D-Channel loop in **LD 96** and **60** respectively. **Figure 32** below shows the D-Channel active and established and the loop enabled with the channels idle.

Figure32: CS1000 DCH and Loop Status

8. Conclusion

These Application Notes describe the configuration steps required for IPC Alliance to successfully interoperate with Avaya Communication Server 1000 7.5 using QSIG trunks. All of the executed test cases have passed and met the objectives outlined in **Section 2**. The Alliance System is considered compliant with Avaya CS1000 Release 7.5.

9. Additional References

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

1. *CS1000 7.50 Administering and System Programming documents*, available at http://support.avaya.com.

2. Documents upon request from IPC Support.

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