



Application Notes for Configuring Aculab's ApplianX IP Gateway to Enable an Avaya Aura® Communication Manager 6.2 using a QSIG Trunk to Interoperate with a Digital Private Network Signalling Trunk - Issue 1.0

Abstract

These Application Notes describe the configuration steps for provisioning an Aculab ApplianX IP Gateway to enable an Avaya Aura® Communication Manager 6.2 using a QSIG trunk to interoperate with a Digital Private Network Signalling System.

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

The ApplianX IP Gateway can be used in a variety of TDM and VoIP migration strategies, whether it is connecting a TDM-based PBX to a new IP network, or IP PBX, or providing a PSTN front end to SIP-based solutions. The ApplianX IP Gateway is a 'plug & play' gateway. On the PSTN side, the ApplianX IP Gateway provides one, two or four universal T1/E1 (USA, Japan, Europe, worldwide) interfaces, with a wide range of signalling protocols, including PRI/ISDN types, T1 robbed bit and E1 CAS, R1, R2 and DTMF, plus PBX protocols, such as QSIG and DPNSS. A different protocol can be selected for each trunk.

2. General Test Approach and Test results

The general test approach was to configure 2 E1 trunks of the Aculab ApplianX IP Gateway (ApplianX) as Q Signalling (QSIG) and Digital Private Network Signalling System (DPNSS). The DPNSS trunk connected to the ApplianX then converted the signalling to QSIG to communicate with the Avaya Media Gateway of the Avaya Aura® Communication Manager (Communication Manager) and vice versa. Testing focused on verifying that DPNSS and QSIG signals were converted correctly.

Note: During compliance testing an Avaya Communication Server 1000E (CS1000E) was used to host the DPNSS trunk.

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 testing included:

- Verification of connectivity between Communication Manager (QSIG) and CS1000E (DPNSS) via the ApplianX IP Gateway
- Basic call tests: Calls from DPNSS to QSIG and vice versa
- Calls on hold (including music-on-hold)
- Transfers and conferences
- Call back when free (Ring again)
- Accessing voice mail
- Route optimisation (Path replacement)
- Call forwards

2.2. Test Results

Tests were performed to insure full interoperability of an Aculab ApplianX IP Gateway when configured for QSIG (using Communication Manager) and DPNSS. The tests were all functional in nature and performance testing was not included. All the test cases passed successfully.

Note: Although during testing a CS1000E was configured with DPNSS trunks, an ApplianX IP Gateway will function with any PBX supporting DPNSS.

2.3. Support

Technical support can be obtained for Aculab products as follows:

- E-mail: support@aculab.com
- Phone: +44(0)1908 273805

Note: An Aculab support contract is required to gain access to Aculab support services.

3. Reference Configuration

Figure 1 illustrates the network configuration used during compliance testing. The Communication Manager was configured to use QSIG and was connected to a QSIG port on the ApplianX via a G450. The DPNSS PBX was connected to a DPNSS port on the ApplianX. The ApplianX was configured with one QSIG Port and one DPNSS port. Avaya 9608 (H323) and Avaya 2420 digital telephones were used to make and receive calls to the DPNSS PBX.

Note: During compliance testing the DPNSS PBX was an Avaya Communication Server 1000E R7.5.

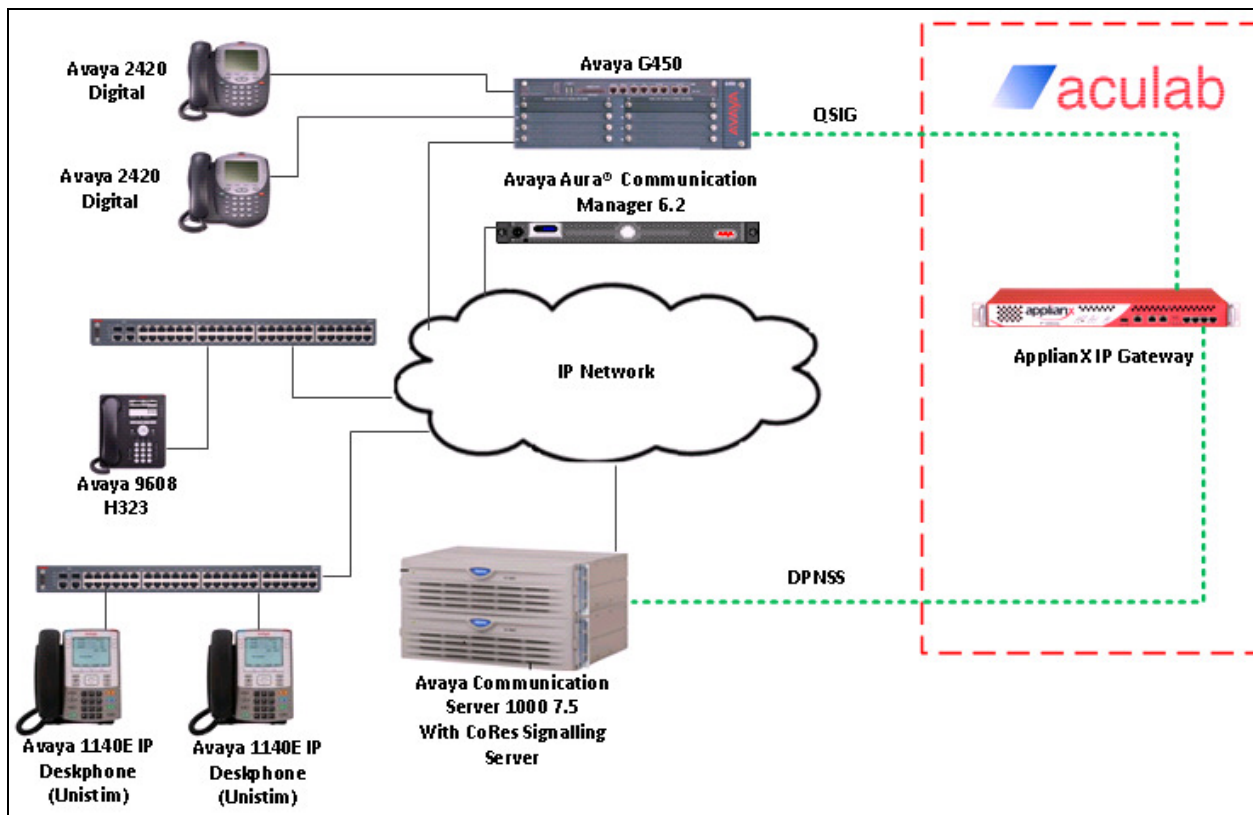


Figure 1: Avaya Aura® Communication Manager with Aculab ApplianX IP Gateway Reference Configuration

4. Equipment and Software Validated

The hardware and associated software used in the compliance testing is listed below.

Avaya Equipment	Software Version
Avaya S8800 Server	Avaya Aura® Communication Manager R6.2 Build R016x.02.0.832.0
Avaya G450 Media Gateway	31.22.1
Avaya 9608 IP phone	S9608_11HALBR6_2_0_09_V452
Avaya 2420 Digital phone	Rel 6.0, FWV 6
Aculab Equipment	Software Version
ApplianX IP Gateway	Version 2.3.0 Build 661

Table 1: Hardware and Software Version Numbers

Note: The DPNSS PBX was an Avaya Communication Server 1000E running Release 7.5.50Q

5. Configure Avaya Aura® Communication Manager

Configuration and verification operations on the Communication Manager illustrated in this section were all performed using Avaya Site Administrator Emulation Mode. The information provided in this section describes the configuration of the Communication Manager for this solution. It is implied a working system is already in place. For all other provisioning information such as initial installation and configuration, please refer to the product documentation in **Section 9**. The configuration operations described in this section can be summarized as follows:

- Configure Avaya G450 Gateway
- Configure signalling Group
- Configure QSIG Trunk

Note: The configuration of the Avaya Communication Server 1000E is outside of the scope of this Application Note. The ApplianX will interoperate with a wide range of PBX's supporting DPNSS trunks.

5.1. Configure Avaya G450 Gateway

It is implied that the Avaya G450 is already operational and the DS1 Circuit pack is installed. The screen shot below shows how the DS1 interface was configured during compliance testing.

```
display ds1 001v8

DS1 CIRCUIT PACK

Location: 001V8                      Name: Qsig
Bit Rate: 2.048                      Line Coding: hdb3

Signaling Mode: isdn-pri
Connect: pbx                          Interface: network
TN-C7 Long Timers? n                 Country Protocol: etsi
Interworking Message: PROGress
Interface Companding: alaw           CRC? n
Idle Code: 11111111
DCP/Analog Bearer Capability: 3.1kHz

T303 Timer(sec): 4
Disable Restarts? n

Slip Detection? n                    Near-end CSU Type: other
```

5.2. Configure Signaling Group

A signaling group is required before a trunk-group can be configured. Use the **add signaling-group** command followed by next available signaling-group number to configure the following:

- **Group Type:** Enter **isdn-pri**
- **Primary D-Channel:** Enter **001V816** (this is the D-Channel associated with the DS1 Circuit Pack)
- **Trunk Group for Channel Selection:** Enter **2** (This will be the trunk-group used in **Section 5.3**)
- **TSC Supplementary Service Protocol:** Enter **b**

```
add signaling-group 2

SIGNALING GROUP

Group Number: 2                      Group Type: isdn-pri
Associated Signaling? y               Max number of NCA TSC:
10                                   Max number of CA TSC: 0
Primary D-Channel: 001V816           Trunk Group for NCA TSC: 2
Trunk Group for Channel Selection: 2 X-Mobility/Wireless Type:
NONE                                  TSC Supplementary Service Protocol: b
Network Call Transfer? n
```

5.3. Configure QSIG Trunk

This section describes the QSIG trunk configuration used during compliance. Use the **add trunk-group** command followed by next available Group number to configure the following:

Note: Only the unique inputs are described, all other input may be left as default.

Page 1

- **Group Type:** Enter **isdn**
- **Group Name:** Enter an informative name for the trunk i.e. **QSIG**
- **TAC** Enter a TAC number i.e. **702**
- **Service Type:** Enter **tie**

```
add trunk-group 2                                     Page 1 of 21
                                     TRUNK GROUP
Group Number: 2                      Group Type: isdn          CDR Reports: y
  Group Name: QSIG                     COR: 1                TN: 1          TAC: 702
    Direction: two-way                Outgoing Display? n    Carrier Medium:
PRI/BRI
    Dial Access? n                    Busy Threshold: 255    Night Service:
Queue Length: 0
Service Type: tie                      Auth Code? n          TestCall ITC: rest
                                     Far End Test Line No:
TestCall BCC: 4
```

Page 2

- **Supplementary Service Protocol:** Enter **b**

```
add trunk-group 2                                     Page 2 of 21
  Group Type: isdn
TRUNK PARAMETERS
  Codeset to Send Display: 6          Codeset to Send National IEs: 6
  Max Message Size to Send: 260      Charge Advice: none
  Supplementary Service Protocol: b   Digit Handling (in/out):
enbloc/enbloc
    Trunk Hunt: cyclical
                                     Digital Loss Group: 13
Incoming Calling Number - Delete:      Insert:                  Format:
    Bit Rate: 1200                    Synchronization: async  Duplex: full
Disconnect Supervision - In? y Out? n
Answer Supervision Timeout: 0
  Administer Timers? n                CONNECT Reliable When Call Leaves ISDN? n
  XOIP Treatment: auto               Delay Call Setup When Accessed Via IGAR? n
```

Page 3

- **Send Connected Number:** Enter y

add trunk-group 2	Page 3 of 21
TRUNK FEATURES	
ACA Assignment? n	Measured: none Wideband Support? n
	Internal Alert? n Maintenance Tests? y
	Data Restriction? n NCA-TSC Trunk Member: 19
	Send Name: n Send Calling Number: y
Used for DCS? n	Hop Dgt? n Send EMU Visitor CPN? n
Suppress # Outpulsing? n	Format: unk-pvt
Outgoing Channel ID Encoding: preferred	UII IE Treatment: service-provider
	Replace Restricted Numbers? n
	Replace Unavailable Numbers? n
	Send Connected Number: y
	Hold/Unhold Notifications? y
	Send UII IE? y
	Modify Tandem Calling Number: no
	Send UCID? n
Send Codeset 6/7 LAI IE? y	Dsl Echo Cancellation? n
Apply Local Ringback? n	
Show ANSWERED BY on Display? y	
	Network (Japan) Needs Connect Before Disconnect? n

Page 4

- **TSC Method for Auto Callback:** Enter always-retain
- **Path Replacement Method:** Enter always

add trunk-group 2	Page 4 of 21
QSIG TRUNK GROUP OPTIONS	
TSC Method for Auto Callback: always-retain	
	Diversion by Reroute? y
	Path Replacement? y
Path Replacement with Retention? n	
Path Replacement Method: always	
	SBS? n
Display Forwarding Party Name? y	
Character Set for QSIG Name: eurofont	
QSIG Value-Added? n	

The screen shot below shows the trunk group members used during compliance testing.

Note: The Ports are related to the location of the DS1 Circuit pack on the G450. The **Sig Grp** is the signaling-group configured in **Section 5.2**

add trunk-group 2				Page 5 of 21	
				TRUNK GROUP	
				Administered Members (min/max): 1/19	
GROUP MEMBER ASSIGNMENTS				Total Administered Members: 19	
	Port	Code Sfx	Name	Night	Sig Grp
1:	001V801	MM710	B		2
2:	001V802	MM710	B		2
3:	001V803	MM710	B		2
4:	001V804	MM710	B		2
5:	001V805	MM710	B		2
6:	001V806	MM710	B		2
7:	001V807	MM710	B		2
8:	001V808	MM710	B		2
9:	001V809	MM710	B		2
10:	001V810	MM710	B		2
11:	001V811	MM710	B		2
12:	001V812	MM710	B		2
13:	001V813	MM710	B		2
14:	001V814	MM710	B		2
15:	001V815	MM710	B		2

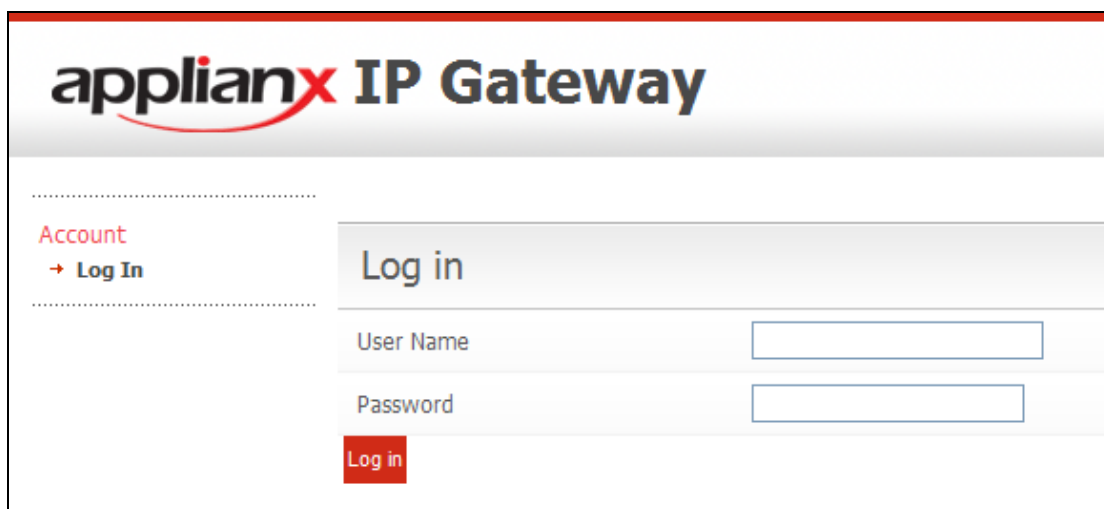
6. Configure Aculab ApplianX IP Gateway

A number of steps are required to configure the Aculab ApplianX IP Gateway, the initial assigning of the administration IP Address, administration user name and password are assumed to be completed. The configuration operations described in this section can be summarized as follows:

- Login to ApplianX
- Setup Wizard
- Configure DPNSS Trunk
- Configure QSIG Trunk
- Configure Groups
- Edit DPNSS Group
- Edit QSIG Group
- Configure DPNSS Route
- Configure QSIG Route
- Configure Clocking
- Save configuration
- Use configuration

6.1. Login to ApplianX

Login by accessing the browser-based GUI, using the URL *http://<ip-address>* assigned to the ApplianX. Once the ApplianX IP Gateway Web page opens Log in with the appropriate credentials and click on the **Log in** button.



The screenshot shows the ApplianX IP Gateway login interface. At the top is the logo "applianx IP Gateway". Below it, on the left, is a sidebar with the heading "Account" and a link "→ Log In". The main area has a "Log in" header, followed by input fields for "User Name" and "Password". At the bottom of the main area is a red "Log in" button.

6.2. Setup Wizard

After the main web page opens Select **Setup Wizard** from System Configuration section.



The screenshot shows the ApplianX IP Gateway main menu. At the top is the logo "applianx IP Gateway". Below it, on the left, is a sidebar with three main sections: "Overview", "System Configuration", and "Gateway Configuration". Under "System Configuration", the "Setup Wizard" link is highlighted with a red box. The main area has a header "Overview" followed by a list of items: "Status", "Incoming calls", "Outgoing calls", "Unroutable calls", and "Clock source". At the bottom of the main area is a section titled "Required Actions" with the text "There are currently no actions required".

Once the **Setup Wizard** page opens, select **DPNSS** from the **Protocol for all trunks**, drop-down list, and click on the **Apply** button.

The screenshot shows the 'Setup Wizard' page for the 'ApplianX IP Gateway'. On the left is a sidebar with a 'Status' section containing links to Overview, Alarms, Calls, Call Log, and Trunk Status, and a 'System Configuration' section. The main content area has a title 'ApplianX IP Gateway' and two rows of settings. The first row is for 'SIP Proxy' with a question mark icon, a radio button for 'No proxy' (which is selected), and a radio button for 'Enter proxy address manually'. The second row is for 'Protocol for all trunks' with a question mark icon and a dropdown menu showing 'Select protocol later'. At the bottom of the settings are 'Apply' and 'Cancel' buttons.

After clicking the **Apply** button in the previous step, the **Edit Configurations** page opens. Click on the **Edit** button for **My Configuration**.

The screenshot shows the 'Edit Configurations' page. The sidebar is similar to the previous page but includes a 'Gateway Configuration' section. The main content area has a title 'Edit Configurations' and two sections: 'Active configuration' and 'Available configurations'. Each section has a table with columns 'Name', 'Description', and 'Last updated'. In the 'Available configurations' table, the row for 'My configuration' (dated 2013-06-11 18:43:28) has an 'Edit' button highlighted with a red box. There are also 'View' and 'Copy' buttons for the active configuration and 'Delete', 'Copy', and 'Use' buttons for the available configuration.

Once the **Editing: My Configuration** page opens, give a descriptive name to the configuration. During compliance testing, **Avaya DQ Test Setup** was used. Click on the **Trunks** Tab.

The screenshot shows the 'Editing: My configuration' page. The sidebar is similar to the previous pages. The main content area has a title 'Editing: My configuration' and a tabbed interface with tabs for General, Trunks, Endpoints, Groups, Routes, Clocking, SIP, Codecs, Survivability, and Test. The 'Trunks' tab is selected and highlighted with a red box. Below the tabs is a section titled 'General Configuration Information' with a 'Configuration name' field containing 'Avaya DQ Test Setup' (highlighted with a red box) and a 'Configuration description' field.

6.3. Configure DPNSS Trunk

Click on **Trunk 1 Edit** button. This trunk was configured for DPNSS. A cable should be connected between the E1/T1 Trunk 1 port on the front of the ApplianX and the DPNSS PBX.

The screenshot shows the 'applanx IP Gateway' configuration page. The breadcrumb trail is 'Edit Configurations > Trunk Overview'. The left sidebar contains navigation links for Status, System Configuration, Gateway Configuration, and Diagnostics. The main content area is titled 'Editing: Avaya DQ Test Setup' and has tabs for General, Trunks, Endpoints, Groups, Routes, Clocking, SIP, Codecs, Survivability, and Test. The 'SIP trunks' section is expanded, showing a table with columns: Name, Description, Type, and Group. The table lists Trunk 5 (SIP, No group) and Trunk 1 (TDM, No group). Trunk 1 has an 'Edit' button. Below the table are 'Save Configuration' and 'Cancel Changes' buttons.

Name	Description	Type	Group
Trunk 5		SIP	No group
Trunk 1		TDM	No group
Trunk 2		TDM	No group
Trunk 3		TDM	No group
Trunk 4		TDM	No group

Once the new web page opens, configure all as shown in the following screen shot. Click on the **Change** button in the **Protocol configuration** section.

The screenshot shows the 'applanx IP Gateway' configuration page. The breadcrumb trail is 'Edit Configurations > Trunk Overview > Edit Trunk'. The left sidebar contains navigation links for Status, System Configuration, Gateway Configuration, and Diagnostics. The main content area is titled 'Editing: Avaya DQ Test Setup' and has tabs for General settings, SNMP configuration, and Protocol configuration. The 'General settings' section is expanded, showing fields for Trunk name (DPNSS trunk), Trunk description (DPNSS), Open inward speech path before answer (checked), Routing group (DPNSS Group), Block trunk from call activity (No), Outgoing timeslot allocation strategy (Highest available), Minimum digit count (0), Interdigit timeout (3000), Interdigit timeout for virtual calls (1000), Send sending complete on outgoing calls (checked), Send overlap digits on outgoing calls (checked), and Response to unroutable incoming calls (Release). The 'SNMP configuration' section is expanded, showing 'Enable SNMP traps' (checked). The 'Protocol configuration' section is expanded, showing 'Protocol' (DPNSS) and 'Change' button.

Field	Value
Trunk name	DPNSS trunk
Trunk description	DPNSS
Open inward speech path before answer	<input checked="" type="checkbox"/>
Routing group	DPNSS Group
Block trunk from call activity	No
Outgoing timeslot allocation strategy	Highest available
Minimum digit count	0
Interdigit timeout (milliseconds)	3000
Interdigit timeout for virtual calls (milliseconds)	1000
Send sending complete on outgoing calls	<input checked="" type="checkbox"/>
Send overlap digits on outgoing calls	<input checked="" type="checkbox"/>
Response to unroutable incoming calls	Release

When the **Select a protocol** page opens select DPNSS

applianx IP Gateway You are logged in as: admin

Select a protocol

Status

- Overview
- Alarms
- Calls
- Call Log
- Trunk Status

System Configuration

- Global Configuration
- Networking
- Setup Wizard
- SIP Credentials

Gateway Configuration

- Alias Registrar
- DDI Barring
- Edit Configurations
- Interoperability
- Cause Mappings

Diagnostics

- Remote Logging
- Network Diagnostics
- Watchdog Status
- Restart
- Diagnostic Log
- Endpoint Status
- About

Protocol	Description	Select
DPNSS	DPNSS Enhanced. Conforming to BTNR-188.	Select
QSIG	QSIG, also known as PSS1. Conforming to ECMA-143.	Select
ETS300	EuroISDN. Conforming to ETS300-102.	Select
INS1500	T1 Q.931 variant conforming to the INS-Net Interface and Services specification published by the NTT.	Select
DASS	DASS2 conforming to BTNR 190	Select
AT&T	T1 Q.931 variant conforming to AT&T TR 41459. Sometimes called SESS.	Select
DMS100	T1 Q.931 variant conforming to the Nortel NIS-A211-1 Primary Rate User-Network Interface Specification.	Select
NI2	T1 Q.931 variant conforming to National ISDN 2 (Bellcore).	Select
E1LS	'E1 Lineside' as implemented by AT&T Definity and Nortel Meridian switches. E&M Immediate Start, Delay Dial and Wink Start, Loopstart User (LSU) and Loopstart Network (LSN), Feature Group B (FGB), and Feature Group D (FGD) configuration options available. MFR1, DTMF or Decadic Register signalling available. (A-Law)	Select
T1RB	A highly configurable implementation of T1 Robbed Bit. E&M Immediate Start, Delay Dial and Wink Start, Loopstart User (LSU) and Loopstart Network (LSN), Feature Group B (FGB), and Feature Group D (FGD) configuration options available. MFR1, DTMF or Decadic Register signalling available. (U-law)	Select
R2T1	A highly configurable implementation of R2 based on the CCITT Blue Book, a collection of Ericsson specifications, and a multitude of National signalling specifications. MFCR2 DTMF or Decadic Register signalling available. (A-Law)	Select
IEM	Indonesian E&M protocol. Also known as discontinuous line signalling. MFCR2 Register signalling. (A-Law)	Select
T1HK	T1 Robbed Bit for Hong Kong. MFR1, DTMF or Decadic Register signalling available. (U-law)	Select

Cancel

Once the DPNSS web page opens, configure all as shown in the following screen shots.

applianx IP Gateway

Protocol Options

Status

- Overview
- Alarms
- Calls
- Call Log
- Trunk Status

System Configuration

- Global Configuration
- Networking
- Setup Wizard
- SIP Credentials

Gateway Configuration

- Alias Registrar
- DDI Barring
- Edit Configurations
- Interoperability
- Cause Mappings

Diagnostics

- Remote Logging
- Network Diagnostics
- Watchdog Status
- Restart
- Diagnostic Log
- Endpoint Status
- About
- Hardware

Account

- Log Out
- Change Password

DPNSS

General settings

Impedance: 120 Ohms (default) [v]

CRC enabled: ☐

Master/Slave configuration: BY [v]

Basic features

Display direction: Send and receive [v]

Allow incoming data calls: ☒

Loop avoidance mapping: ☐ Disabled ☒ Transparent ☐ Transit

Global transit limit: 25 [v]

Insert loop avoidance in outgoing calls: ☐

Do-not-disturb mapping: ☒

Method for generating CLC: ☐ Use a fixed value ☒ Map from the other call leg (default) ☐ Map from the calling name

CLC when map is not possible: CLC-DEC [v]

Override CLC when OLI restricted: No Override [v]

Insert Bearer Service Selection (BSS): ☒ Disabled ☐ Preferred ☐ Mandatory

Call Offer Enabled: ☒

Call Transfer Enabled: ☒

Continuation....

Call Diversion Supplementary Service Support	
Call Diversion Enabled ?	<input checked="" type="checkbox"/>
Divert as proxy ?	<input type="checkbox"/>
Divert unmatched to outgoing group ?	<input checked="" type="checkbox"/>
Send Diverted Address ?	<input checked="" type="checkbox"/>
Automatic Diversion Validation ?	<input type="checkbox"/>
Call Redirection Enabled ?	<input checked="" type="checkbox"/>
CBWF/CBWNNU (CC) Supplementary Service Support	
CBWF/CBWNNU (CC) Enabled ?	<input checked="" type="checkbox"/>
Postpone CBWNNU request until the real call (waiting for answer) has cleared ?	<input checked="" type="checkbox"/>
Message Waiting Supplementary Service Support	
Message Waiting Method ?	Call-Back Messaging (default) ▼
Message Waiting On NSI string ?	B*AN*1
Message Waiting Off NSI string ?	B*AN*0
Route Optimisation	
Route Optimisation Enabled ?	<input checked="" type="checkbox"/>
Use newer call reference embedding scheme ?	<input checked="" type="checkbox"/>
Pad digit for DPNSS call references ?	9
Operate as originating end if other side cannot ?	<input checked="" type="checkbox"/>
Operate as terminating end if other side cannot ?	<input checked="" type="checkbox"/>
Delay in seconds after transfer before a Route Optimisation/Path Replacement proposal can be sent	30
Delay in seconds after a Route Optimisation/Path Replacement rejection before a new proposal can be sent	60

Click on the **Apply** button.

Raw configuration options	
Options ?	
Apply Cancel	

6.4. Configure QSIG Trunk

Click on **Trunk 2 Edit** button. This trunk was configured for QSIG. A cable should be connected between the E1/T1 Trunk 2 port on the front of the ApplianX and the T1/E1 port on the G450 Gateway of the Communication Manager.

applianx IP Gateway

Edit Configurations > Trunk Overview

Status

- Overview
- Alarms
- Calls
- Call Log
- Trunk Status

System Configuration

- Global Configuration
- Networking
- Setup Wizard
- SIP Credentials

Gateway Configuration

- Alias Registrar
- DDI Barring
- Edit Configurations**
- Interoperability
- Cause Mappings

Diagnostics

- Remote Logging
- Network Diagnostics
- Watchdog Status

Editing: Avaya DQ Test Setup

General Trunks Endpoints Groups Routes Clocking SIP Codecs Survivability Test

SIP trunks

Name	Description	Type	Group	
Trunk 5		SIP	No group	Edit

TDM trunks

Name	Description	Type	Group	
DPNSS trunk	DPNSS	TDM	TDM trunks	Edit
Trunk 2		TDM	TDM trunks	Edit
Trunk 3		TDM	TDM trunks	Edit
Trunk 4		TDM	TDM trunks	Edit

Save Configuration Cancel Changes

Once the new web page opens, configure all as shown in the following screen shot. Click on the **Change** button in the **Protocol configuration** section.

applianx IP Gateway

Edit Configurations > Trunk Overview > Edit Trunk

Status

- Overview
- Alarms
- Calls
- Call Log
- Trunk Status

System Configuration

- Global Configuration
- Networking
- Setup Wizard
- SIP Credentials

Gateway Configuration

- Alias Registrar
- DDI Barring
- Edit Configurations**
- Interoperability
- Cause Mappings

Diagnostics

- Remote Logging
- Network Diagnostics
- Watchdog Status
- Restart
- Diagnostic Log
- Endpoint Status
- About
- Hardware

Account

- Log Out
- Change Password

Editing: Avaya DQ Test Setup

Apply Cancel

General settings

Trunk name QSIG Trunk

Trunk description QSIG

Open inward speech path before answer ? ☒

Routing group QSIG Group

Block trunk from call activity ? No

Outgoing timeslot allocation strategy ? Lowest available

Minimum digit count ? 0

Interdigit timeout (milliseconds) ? 3000

Interdigit timeout for virtual calls (milliseconds) ? 1000

Send sending complete on outgoing calls ? ☒

Send overlap digits on outgoing calls ? ☒

Response to unroutable incoming calls ? Release

SNMP configuration

Enable SNMP traps ☒

Protocol configuration

Protocol QSIG Edit Change

When the **Select a protocol** page opens select QSIG

applianceX IP Gateway You are logged in as: admin

Select a protocol

Protocol	Description	Select
DPNSS	DPNSS Enhanced. Conforming to BTNR-188.	Select
QSIG	QSIG, also known as PSS1. Conforming to ECMA-143.	Select
ETS300	EuroISDN. Conforming to ETS300-102.	Select
INS1500	T1 Q.931 variant conforming to the INS-Net Interface and Services specification published by the NTT.	Select
DASS	DASS2 conforming to BTNR 190	Select
AT&T	T1 Q.931 variant conforming to AT&T TR 41459. Sometimes called SESS.	Select
DMS100	T1 Q.931 variant conforming to the Nortel NIS-A211-1 Primary Rate User-Network Interface Specification.	Select
NI2	T1 Q.931 variant conforming to National ISDN 2 (Belcore).	Select
E1LS	'E1 Lineside' as implemented by AT&T Definity and Nortel Meridian switches. E&M Immediate Start, Delay Dial and Wink Start, Loopstart User (LSU) and Loopstart Network (LSN), Feature Group B (FGB), and Feature Group D (FGD) configuration options available. MFR1, DTMF or Decadic Register signalling available. (A-Law)	Select
T1RB	A highly configurable implementation of T1 Robbed Bit. E&M Immediate Start, Delay Dial and Wink Start, Loopstart User (LSU) and Loopstart Network (LSN), Feature Group B (FGB), and Feature Group D (FGD) configuration options available. MFR1, DTMF or Decadic Register signalling available. (U-law)	Select
R2T1	A highly configurable implementation of R2 based on the CCITT Blue Book, a collection of Ericsson specifications, and a multitude of National signalling specifications. MFCR2 DTMF or Decadic Register signalling available. (A-Law)	Select
IEM	Indonesian E&M protocol. Also known as discontinuous line signalling. MFCR2 Register signalling. (A-Law)	Select
T1HK	T1 Robbed Bit for Hong Kong. MFR1, DTMF or Decadic Register signalling available. (U-law)	Select

Cancel

Once the QSIG web page opens, configure all as shown in the following screen shots.

applianceX IP Gateway

Protocol Options

Status

- Overview
- Alarms
- Calls
- Call Log
- Trunk Status

System Configuration

- Global Configuration
- Networking
- Setup Wizard
- SIP Credentials

Gateway Configuration

- Alias Registrar
- DDI Barring
- Edit Configurations
- Interoperability
- Cause Mappings

Diagnostics

- Remote Logging
- Network Diagnostics
- Watchdog Status
- Restart
- Diagnostic Log
- Endpoint Status
- About
- Hardware

Account

- Log Out
- Change Password

QSIG

General settings

Trunk mode: E1

Impedance: 120 Ohms (default)

CRC enabled: ☐

Master/Slave configuration: Slave, Priority B

Basic features

Display direction: Send and receive

Loop avoidance mapping: ☒ Transparent

Global transit limit: 25

Insert loop avoidance in outgoing calls: ☐

Do-not-disturb mapping: ☒

Party Category Mode: Send using ANF-CMN (default)

Send progress indicators: ☒

Allow incoming data calls: ☒

Use 3.1kHz Audio bearer for speech: ☐

Hold method: None (default)

Call Offer Enabled: ☒

Call Transfer Enabled: ☒

Continuation....

Call Diversion Supplementary Service Support	
Call Diversion Enabled ?	<input checked="" type="checkbox"/>
Divert as proxy ?	<input type="checkbox"/>
Divert unmatched to outgoing group ?	<input checked="" type="checkbox"/>
Send Diverted Address ?	<input checked="" type="checkbox"/>
Automatic Diversion Validation ?	<input type="checkbox"/>
Basic Service Type ?	Speech
Subscription Option Type ?	Notify With Number
'divertingLegInformation3.inv' Send Mode ?	Presentation Allowed
Default Party Number Type ?	Unknown
Include pSS1InfoElement Progress Indicator ?	<input checked="" type="checkbox"/>
CBWF/CBWNNU (CC) Supplementary Service Support	
CBWF/CBWNNU (CC) Enabled ?	<input checked="" type="checkbox"/>
Retain Signalling Connection ?	<input type="checkbox"/>
Message Waiting Supplementary Service Support	
Message Waiting Method ?	Facility (default)

Click on the **Apply** button.

Path Replacement Additional Network Feature	
Path Replacement Enabled ?	<input checked="" type="checkbox"/>
Dummy QSIG call identity ?	9999
Operate as originating end if other side cannot ?	<input checked="" type="checkbox"/>
Operate as terminating end if other side cannot ?	<input checked="" type="checkbox"/>
Allow Path Replacement proposal by terminating end also ?	<input checked="" type="checkbox"/>
Accept Path Replacement proposal when originating end ?	<input checked="" type="checkbox"/>
Delay in seconds after transfer before a Route Optimisation/Path Replacement proposal can be sent	30
Delay in seconds after a Route Optimisation/Path Replacement rejection before a new proposal can be sent	30
QSIG Protocol Compatibility	
Length of invoke ids (in bytes) ?	2
Facility protocol profile ?	0x9F - ISO (default)
Send NFE and Interpretation APDUs ?	<input checked="" type="checkbox"/>
Use global IDs in Facility ?	<input type="checkbox"/>
Raw configuration options	
Options ?	
Apply Cancel	

After returning to the Editing page, click on the **Apply** button.

The screenshot shows the 'Editing: Avaya DQ Test Setup' page. On the left is a navigation menu with sections: Status (Overview, Alarms, Calls, Call Log, Trunk Status), System Configuration (Global Configuration, Networking, Setup Wizard), Gateway Configuration (Alias Registrar, DDI Barring, Edit Configurations, Interoperability, Cause Mappings), and Diagnostics (Remote Logging, Network Diagnostics, Watchdog Status). The main content area has a breadcrumb 'Edit Configurations > Trunk Overview > Edit Trunk'. Below the title 'Editing: Avaya DQ Test Setup' are 'Apply' and 'Cancel' buttons. A red bar indicates the 'General settings' section. Below it, 'Trunk name' is set to 'QSIG Trunk' and 'Trunk description' is set to 'QSIG'.

6.5. Configure Groups

Click on the **Groups** tab.

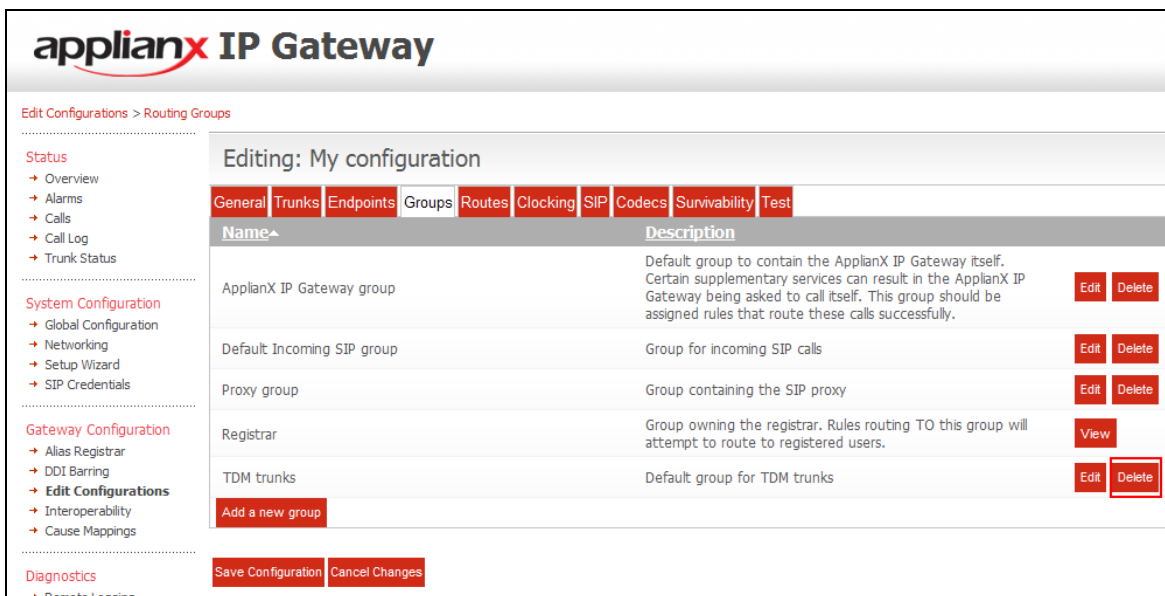
The screenshot shows the 'Editing: Avaya DQ Test Setup' page with the 'Groups' tab selected. The navigation menu is the same as in the previous screenshot. The main content area has a breadcrumb 'Edit Configurations > Trunk Overview'. Below the title 'Editing: Avaya DQ Test Setup' are tabs for 'General', 'Trunks', 'Endpoints', 'Groups' (selected), 'Routes', 'Clocking', 'SIP', 'Codecs', 'Survivability', and 'Test'. A red bar indicates the 'SIP trunks' section. Below it is a table with columns 'Name', 'Description', 'Type', and 'Group'. The table has one row: 'Trunk 5', 'QSIG', 'SIP', 'No group'. Below this is a red bar for 'TDM trunks' and another table with columns 'Name', 'Description', 'Type', and 'Group'. This table has four rows: 'DPNSS trunk', 'DPNSS', 'TDM', 'DPNSS Group'; 'QSIG Trunk', 'QSIG', 'TDM', 'QSIG Group'; 'Trunk 3', 'No group'; and 'Trunk 4', 'No group'. At the bottom are 'Save Configuration' and 'Cancel Changes' buttons.

Name	Description	Type	Group
Trunk 5	QSIG	SIP	No group

Name	Description	Type	Group
DPNSS trunk	DPNSS	TDM	DPNSS Group
QSIG Trunk	QSIG	TDM	QSIG Group
Trunk 3		TDM	No group
Trunk 4		TDM	No group

6.5.1. Delete TDM trunks Group

Before configuring the DPNSS and QSIG groups, the default TDM trunks group must be deleted. Click on the **Delete** button.

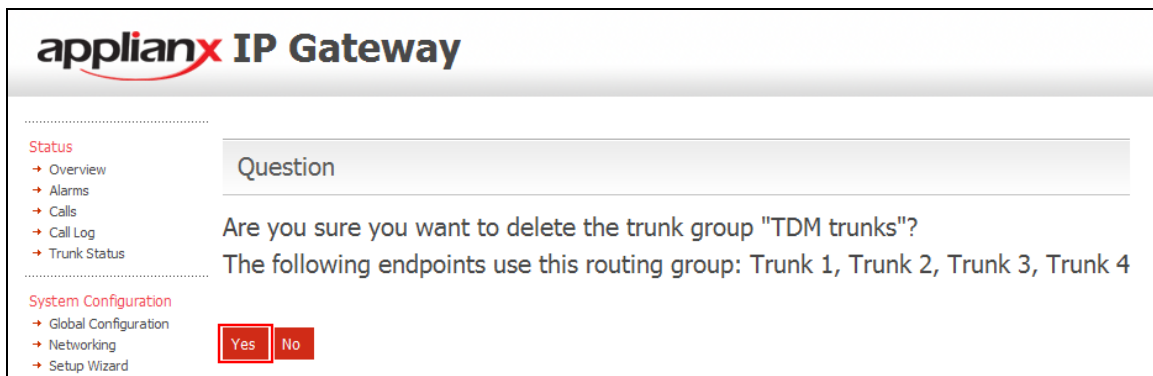


The screenshot shows the 'applanx IP Gateway' web interface. The left sidebar contains navigation links under 'Status', 'System Configuration', 'Gateway Configuration', and 'Diagnostics'. The main content area is titled 'Editing: My configuration' and has tabs for 'General', 'Trunks', 'Endpoints', 'Groups', 'Routes', 'Clocking', 'SIP', 'Codecs', 'Survivability', and 'Test'. The 'Groups' tab is active, displaying a table of routing groups:

Name	Description	Actions
ApplanX IP Gateway group	Default group to contain the ApplanX IP Gateway itself. Certain supplementary services can result in the ApplanX IP Gateway being asked to call itself. This group should be assigned rules that route these calls successfully.	Edit Delete
Default Incoming SIP group	Group for incoming SIP calls	Edit Delete
Proxy group	Group containing the SIP proxy	Edit Delete
Registrar	Group owning the registrar. Rules routing TO this group will attempt to route to registered users.	View
TDM trunks	Default group for TDM trunks	Edit Delete

Below the table is an 'Add a new group' button. At the bottom of the configuration area are 'Save Configuration' and 'Cancel Changes' buttons.

Click on the **Yes** button to complete the delete.



The screenshot shows a confirmation dialog box titled 'Question'. The text inside asks: 'Are you sure you want to delete the trunk group "TDM trunks"? The following endpoints use this routing group: Trunk 1, Trunk 2, Trunk 3, Trunk 4'. At the bottom of the dialog are 'Yes' and 'No' buttons.

6.5.2. Configure DPNSS Group

To add the DPNSS Group, click on the **Add a new group** button.

The screenshot shows the 'applanX IP Gateway' web interface. The breadcrumb trail is 'Edit Configurations > Routing Groups'. The left sidebar has a 'Status' section with links to Overview, Alarms, Calls, Call Log, and Trunk Status. Below that is 'System Configuration' with links to Global Configuration, Networking, Setup Wizard, and SIP Credentials. The 'Gateway Configuration' section includes links to Alias Registrar, DDI Barring, and 'Edit Configurations', which is highlighted. The main content area is titled 'Editing: My configuration' and has tabs for General, Trunks, Endpoints, Groups, Routes, Clocking, SIP, Codecs, Survivability, and Test. The 'Groups' tab is active, showing a table with columns 'Name' and 'Description'. The table lists four groups: 'ApplanX IP Gateway group', 'Default Incoming SIP group', 'Proxy group', and 'Registrar'. Each group has 'Edit' and 'Delete' buttons, except for 'Registrar' which has a 'View' button. At the bottom of the table, there is a red button labeled 'Add a new group'.

Once the next page opens, enter the following:

- **Routing Group Name** Enter a Group name
- **Routing Group Description** Enter a description
- **Endpoint selection method** Select **Round robin**

Click on the **Apply** button to continue.

The screenshot shows the 'applanX IP Gateway' web interface at the 'Edit Routing Group' page. The breadcrumb trail is 'Edit Configurations > Routing Groups > Edit Routing Group'. The left sidebar is the same as the previous screenshot. The main content area is titled 'Editing: My configuration' and has 'Apply' and 'Cancel' buttons. Below these is a red header for 'General settings'. The 'General settings' section contains three input fields: 'Routing Group Name' (with the value 'DPNSS Group'), 'Routing Group Description' (with the value 'DPNSS'), and 'Endpoint selection method' (a dropdown menu with 'Round robin' selected). Below this is another red header for 'Endpoints assigned to this Routing Group'. Under this header is a section titled 'Endpoint Name' with a message: 'There are no endpoints assigned to this group. Endpoints in a group must be either all TDM or all SIP. When you have added an endpoint, of the same type will be available to add.' Below the message is an 'Add' button and a dropdown menu showing 'Trunk 1 (no group)'.

6.5.3. Configure QSIG Group

To add the QSIG Group, click on the **Add a new group** button.

The screenshot shows the 'ApplanX IP Gateway' configuration page. The breadcrumb trail is 'Edit Configurations > Routing Groups'. The left sidebar has sections for 'Status' (Overview, Alarms, Calls, Call Log, Trunk Status), 'System Configuration' (Global Configuration, Networking, Setup Wizard, SIP Credentials), and 'Gateway Configuration' (Alias Registrar, DDI Barring, Edit Configurations). The main area is titled 'Editing: My configuration' and has tabs for General, Trunks, Endpoints, Groups, Routes, Clocking, SIP, Codecs, Survivability, and Test. The 'Groups' tab is active, showing a table with columns 'Name' and 'Description'. The table lists four groups: 'ApplanX IP Gateway group', 'Default Incoming SIP group', 'Proxy group', and 'Registrar'. Each group has an 'Edit' or 'Delete' button. At the bottom of the table, there is a red button labeled 'Add a new group' which is highlighted with a red box.

Once the next page opens, enter the following:

- **Routing Group Name** Enter a Group name
- **Routing Group Description** Enter a description
- **Endpoint selection method** Select **Round robin**

Click on the **Apply** button to continue.

The screenshot shows the 'ApplanX IP Gateway' configuration page, specifically the 'Edit Routing Group' sub-page. The breadcrumb trail is 'Edit Configurations > Routing Groups > Edit Routing Group'. The left sidebar is the same as the previous screenshot. The main area is titled 'Editing: My configuration' and has buttons for 'Apply' and 'Cancel'. Below these buttons is a red bar with a right-pointing arrow and the text 'General settings'. Under this bar, there are three form fields: 'Routing Group Name' with the value 'QSIG Group', 'Routing Group Description' with the value 'QSIG', and 'Endpoint selection method' with a dropdown menu showing 'Round robin'.

6.6. Edit DPNSS Group

To edit the DPNSS group click on the **Edit** button.

The screenshot shows the 'ApplanX IP Gateway' configuration interface. The breadcrumb trail is 'Edit Configurations > Routing Groups'. The page title is 'Editing: Avaya DQ Test Setup'. The 'Groups' tab is active, showing a table of routing groups:

Name	Description	Actions
ApplanX IP Gateway group	Default group to contain the ApplanX IP Gateway itself. Certain supplementary services can result in the ApplanX IP Gateway being asked to call itself. This group should be assigned rules that route these calls successfully.	Edit Delete
Default Incoming SIP group	Group for incoming SIP calls	Edit Delete
DPNSS Group		Edit Delete
Proxy group	Group containing the SIP proxy	Edit Delete
QSIG Group		Edit Delete
Registrar	Group owning the registrar. Rules routing TO this group will attempt to route to registered users.	View

At the bottom of the table is an 'Add a new group' button. Below the table are 'Save Configuration' and 'Cancel Changes' buttons.

From the dropdown box select **DPNSS** and click on the **Add** button followed by the **Apply** button.

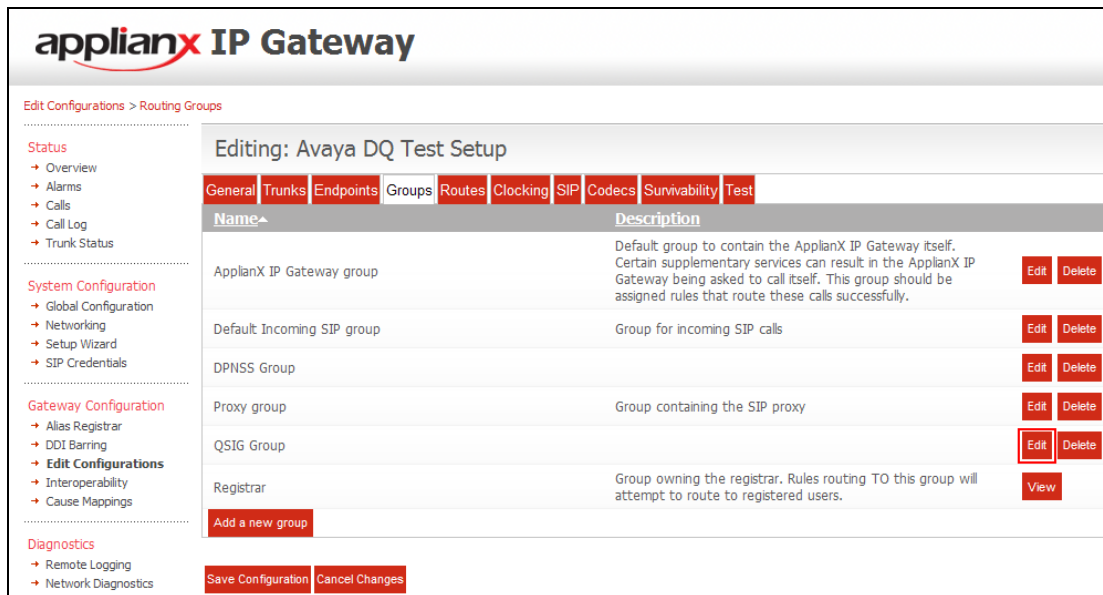
The screenshot shows the 'ApplanX IP Gateway' configuration interface. The breadcrumb trail is 'Edit Configurations > Routing Groups > Edit Routing Group'. The page title is 'Editing: Avaya DQ Test Setup'. The 'General settings' section is visible, showing fields for 'Routing Group Name' (DPNSS Group), 'Routing Group Description', and 'Endpoint selection method' (Round robin). The 'Endpoints assigned to this Routing Group' section shows a dropdown menu with the following options:

- DPNSS trunk (currently in group DPNSS Group)
- DPNSS trunk (currently in group DPNSS Group)
- QSIG Trunk (currently in group QSIG Group)
- Trunk 3 (no group)
- Trunk 4 (no group)
- Default SIP Endpoint (currently in group Default Incoming SIP group)
- ApplanX IP Gateway self (currently in group ApplanX IP Gateway group)
- ApplanX IP Gateway registered users (currently in group Registrar)
- Proxy (currently in group Proxy group)

The 'Add' button is circled in red.

6.7. Edit QSIG Group

To edit the QSIGgroup click on the **Edit** button.



The screenshot shows the 'applanx IP Gateway' interface. The breadcrumb trail is 'Edit Configurations > Routing Groups'. The left sidebar contains navigation links for Status, System Configuration, Gateway Configuration, and Diagnostics. The main content area is titled 'Editing: Avaya DQ Test Setup' and has tabs for General, Trunks, Endpoints, Groups, Routes, Clocking, SIP, Codecs, Survivability, and Test. The 'Groups' tab is active, showing a table of routing groups. The 'QSIG Group' is highlighted, and the 'Edit' button is visible.

Name	Description	Actions
ApplanX IP Gateway group	Default group to contain the ApplanX IP Gateway itself. Certain supplementary services can result in the ApplanX IP Gateway being asked to call itself. This group should be assigned rules that route these calls successfully.	Edit Delete
Default Incoming SIP group	Group for incoming SIP calls	Edit Delete
DPNSS Group		Edit Delete
Proxy group	Group containing the SIP proxy	Edit Delete
QSIG Group		Edit Delete
Registrar	Group owning the registrar. Rules routing TO this group will attempt to route to registered users.	View

Buttons: Add a new group, Save Configuration, Cancel Changes

From the dropdown box select **QSIG trunk** and click on the **Add** button followed by the **Apply** button.



The screenshot shows the 'applanx IP Gateway' interface. The breadcrumb trail is 'Edit Configurations > Routing Groups > Edit Routing Group'. The left sidebar contains navigation links for Status, System Configuration, Gateway Configuration, and Diagnostics. The main content area is titled 'Editing: Avaya DQ Test Setup' and has buttons for Apply and Cancel. The 'General settings' tab is active, showing fields for Routing Group Name (QSIG Group), Routing Group Description, and Endpoint selection method (Round robin). The 'Endpoints assigned to this Routing Group' section is visible, showing a list of endpoints. The 'Add' button is highlighted, and a dropdown menu is shown with 'QSIG Trunk (currently in group QSIG Group)' selected.

Buttons: Apply, Cancel

General settings

Routing Group Name: QSIG Group

Routing Group Description:

Endpoint selection method: Round robin

Endpoints assigned to this Routing Group

Endpoint Name

There are no endpoints assigned to this group. Endpoints in a group must be either all TDM or all SIP. When you have added an endpoint of the same type will be available to add.

Add

- DPNSS trunk (currently in group DPNSS Group)
- DPNSS trunk (currently in group DPNSS Group)
- QSIG Trunk (currently in group QSIG Group)
- Trunk 3 (no group)
- Trunk 4 (no group)
- Default SIP Endpoint (currently in group Default Incoming SIP group)
- ApplanX IP Gateway self (currently in group ApplanX IP Gateway group)
- ApplanX IP Gateway registered users (currently in group Registrar)
- Proxy (currently in group Proxy group)

6.8. Configure DPNSS Route

To configure the DPNSS Route click on the **Routes** tab. Uncheck the **Use the same rules for all groups** check box. Enter a name in the **Name** box and select **QSIG Group** from the **Destination** dropdown box.

The screenshot shows the 'applanX IP Gateway' configuration interface. The 'Routes' tab is selected. In the 'Routing Rules' section, a rule named 'DPNSS>QSIG' is configured. The 'Destination' dropdown is set to 'QSIG Group'. The 'Use the same rules for all groups' checkbox is unchecked.

Name	DDI/DID criteria	DDI/DID man.	CLI/ANI criteria	CLI/ANI man.	Destination
DPNSS>QSIG	%	%	%	%	QSIG Group

6.9. Configure QSIG Route

To configure the QSIG Route, select **QSIG Group** from the **Select the group for which you want to configure the routing** dropdown box.

The screenshot shows the 'applanX IP Gateway' configuration interface. The 'Routes' tab is selected. In the 'Routing Rules' section, a rule named 'DPNSS>QSIG' is configured. The 'Destination' dropdown is set to 'QSIG Group'. The 'Use the same rules for all groups' checkbox is unchecked.

Name	DDI/DID criteria	DDI/DID man.	CLI/ANI criteria	CLI/ANI man.	Destination
DPNSS>QSIG	%	%	%	%	QSIG Group

Enter a name in the **Name** box and select **DPNSS Group** from the **Destination** dropdown box.

The screenshot shows the 'ApplanX IP Gateway' web interface. The main title is 'Editing: Avaya DQ Test Setup'. Below the title are tabs for 'General', 'Trunks', 'Endpoints', 'Groups', 'Routes', 'Clocking', 'SIP', 'Codecs', 'Survivability', and 'Test'. The 'Clocking' tab is selected. On the left sidebar, there are sections for 'Status', 'System Configuration', 'Gateway Configuration', and 'Diagnostics'. The 'Gateway Configuration' section includes 'Edit Configurations'. The main content area has a 'Routing Options' section with checkboxes for 'Use the same rules for all groups' and 'Allow calls from unknown endpoints'. Below this is a 'Routing Rules' section. A dropdown menu is open for 'Select the group for which you want to configure the routing', showing 'QSIG Group' selected. Below the dropdown is a table with columns: 'Name', 'DDI/DID criteria', 'DDI/DID man.', 'CLI/ANI criteria', 'CLI/ANI man.', and 'Destination'. The first row is 'QSIG>DPNSS' with a '%' in the 'DDI/DID criteria' column. The 'Destination' column has a dropdown menu open, showing 'DPNSS Group' selected. At the bottom of the page are 'Save Configuration' and 'Cancel Changes' buttons.

6.10. Configure Clocking

During compliance testing, clocking was provided by the QSIG trunk. To configure clocking click on the **Clocking** tab and highlight the **QSIG Trunk** from the **Selected clock sources** frame and click on the Left icon button .

The screenshot shows the 'ApplanX IP Gateway' web interface with the 'Clocking' tab selected. The main title is 'Editing: Avaya DQ Test Setup'. Below the title are tabs for 'General', 'Trunks', 'Endpoints', 'Groups', 'Routes', 'Clocking', 'SIP', 'Codecs', 'Survivability', and 'Test'. The 'Clocking' tab is selected. On the left sidebar, there are sections for 'Status', 'System Configuration', 'Gateway Configuration', and 'Diagnostics'. The 'Gateway Configuration' section includes 'Edit Configurations'. The main content area has two columns: 'Available clock sources' and 'Selected clock sources'. The 'Available clock sources' column is empty. The 'Selected clock sources' column contains a list of clock sources: 'DPNSS trunk', 'Trunk 3', 'Trunk 4', and 'QSIG Trunk'. The 'QSIG Trunk' is highlighted. Between the two columns are four buttons: '>', '>>', '<', and '<<'. The '<' button is highlighted. At the bottom of the page are 'Save Configuration' and 'Cancel Changes' buttons.

6.11. Save Configuration

Once all the configuration changes have been made click on the **Save Configuration** button.

applianceX IP Gateway

Edit Configurations > Clocking

Status

- Overview
- Alarms
- Calls
- Call Log
- Trunk Status

System Configuration

- Global Configuration
- Networking
- Setup Wizard
- SIP Credentials

Gateway Configuration

- Alias Registrar
- DDI Barring
- **Edit Configurations**
- Interoperability
- Cause Mappings

Diagnostics

- Remote Logging
- Network Diagnostics
- Watchdog Status
- Restart
- Diagnostic Log
- Endpoint Status
- About
- Hardware

Editing: Avaya DQ Test Setup

General Trunks Endpoints Groups Routes Clocking SIP Codecs Survivability Test

Available clock sources

Selected clock sources

QSIG Trunk

Trunk 3
Trunk 4
DPNSS trunk

Move up Move down

Fall back to local clock ☒

Save Configuration Cancel Changes

6.12. Use Configuration

Once all the configurations have been made and saved click on the **Use** button to apply them to the ApplianceX.

applianceX IP Gateway

Edit Configurations

Changes saved

Edit Configurations

Active configuration

Name	Description	Last updated
Avaya DQ Test Setup		2013-06-11 22:22:50

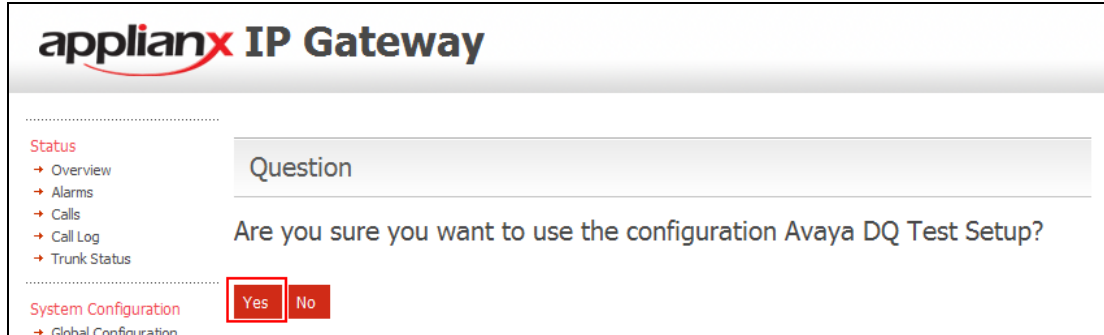
Available configurations

Name	Description	Last updated
Avaya DQ Test Setup		2013-06-11 22:22:50

View Copy

Edit Delete Copy Use

Click on the **Yes** button to confirm.



7. Verification Steps

This section provides the tests that can be performed to verify correct configuration of the Avaya and Aculab solution.

1. Make a call to the DPNSS PBX from the Communication Manager. Ensure the call is connected and there is two way speech.
2. Make a call to the Communication Manager from the DPNSS PBX. Ensure the call is connected and there is two way speech.

8. Conclusion

These Application Notes describe the configuration steps required for an Aculab ApplianX IP Gateway to enable an Avaya Aura® Communication Manager 6.2 using a QSIG trunk to interoperate with a Digital Private Network Signalling trunk. All test cases have passed and met the objectives outlined in **Section 2.2**.

9. Additional References

This section references the Avaya and Aculab documentation that is relevant to these Application Notes.

Product documentation for Avaya products may be found at:

<http://support.avaya.com>

- [1] *Administering Avaya Aura® Communication Manager*, Release 6.2, June 2012, Issue 6.2, Document Number 03-300509
- [2] *Avaya Aura® Communication Manager Feature Description and Implementation*, Release 6.2, Feb 2012, Issue 0.9, Doc# 555-245-205

Technical documentation for Aculab can be found at the following location:

<http://www.aculab.com/documents/>

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