Avaya Solution & Interoperability Test Lab

Application Notes for IPC Alliance 16 with Avaya Aura® Communication Manager 6.3 using QSIG Trunks – Issue 1.0

Abstract

These Application Notes describe the configuration steps required for IPC Alliance 16 to interoperate with Avaya Aura® Communication Manager 6.3 using QSIG trunks.

IPC Alliance 16 is a trading communication solution. In the compliance testing, IPC Alliance used E1 QSIG trunks to Avaya Aura® Communication Manager, for turret users on IPC to reach users on Avaya Aura® Communication Manager 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 Alliance 16 to interoperate with Avaya Aura® Communication Manager 6.3 using QSIG trunks.

IPC Alliance system is a trading communication solution. In the compliance testing, IPC Alliance used E1 QSIG trunks to Avaya Aura® Communication Manager, for turret users on IPC to reach users on Avaya Aura® Communication Manager and on the PSTN.

2. General Test Approach and Test Results

The feature test cases were performed manually. Calls were manually established among IPC turret users with Avaya SIP, H.323, and/or PSTN users. Call controls were performed from the various users to verify the various call scenarios.

The serviceability test cases were performed manually by disconnecting and reconnecting the E1 connection to IPC Alliance 16.

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 call, basic display, G.711, hold/reconnect, DTMF, call forwarding unconditional/ring-no-answer/busy, blind/attended transfer, and conference.

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

2.2. Test Results

All test cases were executed and passed.

2.3. Support

Technical support on IPC Alliance system 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**, IPC Alliance system consists of Alliance MX, System Center, and Turrets.

There is a physical connection between the DS1 circuit pack on Avaya Aura® Communication Manager and the QSIG card on IPC Alliance MX. E1 QSIG trunks are used from IPC Alliance system to Avaya Aura® Communication Manager, to reach users on Avaya Aura® Communication Manager and on the PSTN.

A five digit Uniform Dial Plan (UDP) was used to facilitate dialing between the Central and Remote sites. Unique extension ranges were associated with Communication Manager user(s) at the Central site (720xx), and IPC turret users at the Remote site (333xx).

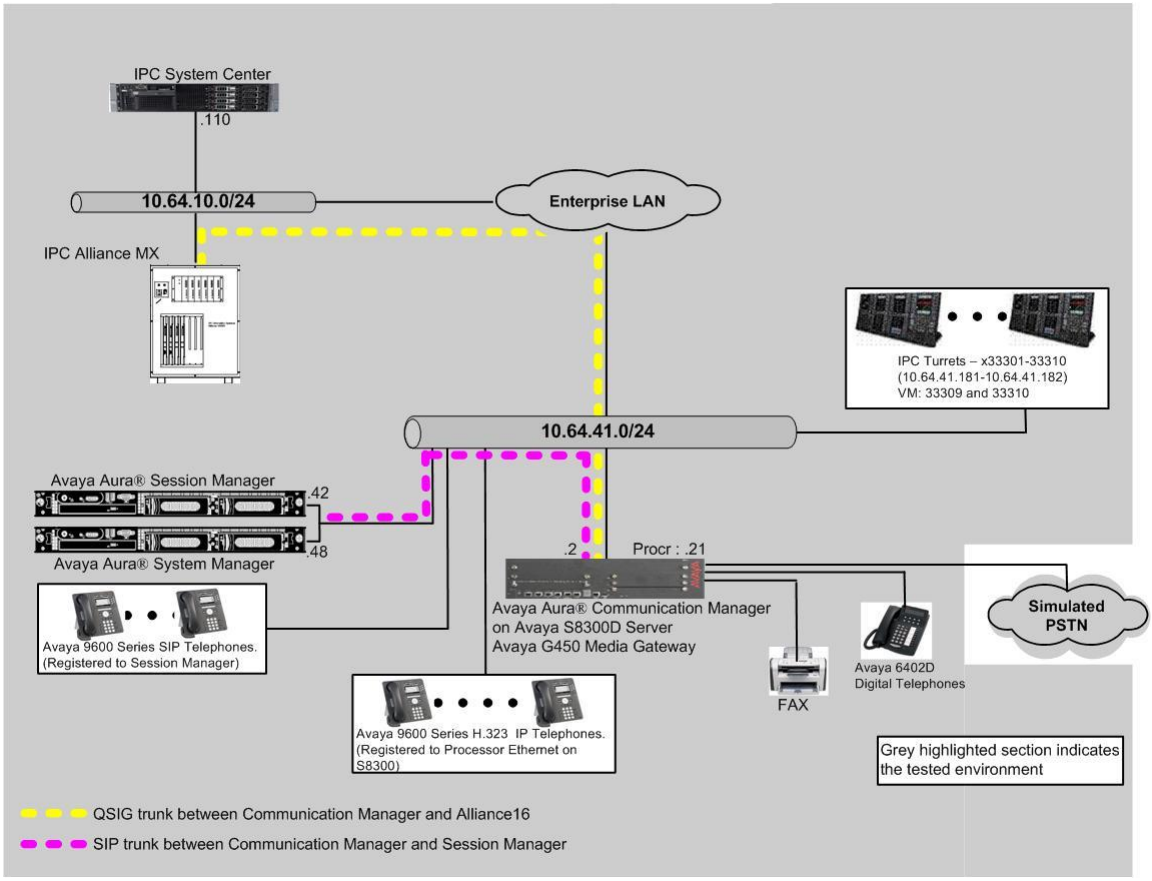


Figure 1: Test Configuration of IPC Alliance

4. Equipment and Software Validated

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

Equipment	Software
Avaya Aura® Communication Manager on Avaya S8300D Server	6.3 (03.0.124.0-20553)
Avaya G450 Media Gateway • MM710AP for E1 QSIG	36.9 HW05 FW021
Avaya 9620 IP Telephone (H.323)	3.2.2
Avaya 9621 IP Telephone (H.323)	6.2.3
Avaya 9630 IP Telephone (SIP)	2.6.12
Avaya 9641 IP Telephone (SIP)	6.4.1
IPC Alliance 16 • One Media Server (OneMS)	 16.02.01.09

5. Configure Avaya Aura® Communication Manager

This section provides the procedures for configuring Avaya Aura® Communication Manager. The procedures include the following areas:

- Verify Communication Manager license
- Administer system parameters special applications
- Administer system parameters features
- Administer system parameters coverage forwarding
- Administer DS1 circuit pack
- Administer ISDN trunk group
- Administer ISDN signaling group
- Administer trunk group members
- Administer route pattern
- Administer public unknown numbering
- Administer uniform dial plan
- Administer AAR analysis
- Administer ISDN trunk group
- Administer tandem calling party number

5.1. Verify Communication Manager License

Log into the System Access Terminal (SAT) to verify that the Communication Manager license has proper permissions for features illustrated in these Application Notes. Use the "display system-parameters customer-options" command. Navigate to **Page 4**, and verify that **ISDN-PRI** is enabled, as shown below.

```
display system-parameters customer-options                    Page   4 of  11
                              OPTIONAL FEATURES

   Emergency Access to Attendant? y                             IP Stations? y
            Enable 'dadmin' Login? y
            Enhanced Conferencing? y                      ISDN Feature Plus? y
                  Enhanced EC500? y       ISDN/SIP Network Call Redirection? y
    Enterprise Survivable Server? n                          ISDN-BRI Trunks? y
       Enterprise Wide Licensing? n                                ISDN-PRI? y
              ESS Administration? y              Local Survivable Processor? n
         Extended Cvg/Fwd Admin? y                   Malicious Call Trace? y
     External Device Alarm Admin? y                Media Encryption Over IP? n
  Five Port Networks Max Per MCC? n    Mode Code for Centralized Voice Mail? n
                Flexible Billing? n
   Forced Entry of Account Codes? y                Multifrequency Signaling? y
      Global Call Classification? y        Multimedia Call Handling (Basic)? y
             Hospitality (Basic)? y      Multimedia Call Handling (Enhanced)? y
 Hospitality (G3V3 Enhancements)? y              Multimedia IP SIP Trunking? y
                      IP Trunks? y

          IP Attendant Consoles? y
        (NOTE: You must logoff & login to effect the permission changes.)
```

Navigate to **Page 8**, and verify the highlighted QSIG features are enabled, as shown below.

```
display system-parameters customer-options                    Page   8 of  11
                            QSIG OPTIONAL FEATURES

                                          Basic Call Setup? y
                                Basic Supplementary Services? y
                                       Centralized Attendant? y
                                       Interworking with DCS? y
                          Supplementary Services with Rerouting? y
                                  Transfer into QSIG Voice Mail? y
                                            Value-Added (VALU)? y
```

5.2. Administer System Parameters Special Applications

Use the "change system-parameters special-applications" command, and navigate to **Page 3** to enable **(SA8440) – Unmodified QSIG Reroute Number**.

Under the QSIG call forwarding feature, when a call comes into Communication Manager over the ISDN trunk administered for supplementary service option B and terminates to a station with call forwarding activated to an off-net number, Communication Manager sends an ISDN facility message back to the originating switch with the complete forward-to number that can include dial plan prefixes and route pattern digit manipulation, etc.

The **Unmodified QSIG ReRoute Number** special application allows the option of bypassing the number manipulation for the forwarded-to party.

```
change system-parameters special-applications                 Page   3 of  10
                            SPECIAL APPLICATIONS

                    (SA8141) - LDN Attendant Queue Priority? n
       (SA8143) - Omit Designated Extensions From Displays? n
            (SA8146) - Display Update for Redirected Calls? n
              (SA8156) - Attendant Priority Queuing by COR? n
               (SA8157) - Toll Free Vectoring until Answer? n
  (SA8201) - Start Time and 4-Digit Year CDR Custom Fields? n
                         (SA8202) - Intra-switch CDR by COS? n
                     (SA8211) - Prime Appearance Preference? n
                       (SA8240) - Station User Admin of FBI? n
                                  (SA8312) - Meet-Me Paging? n
                   (SA8323) - Idle Call Preference Display? n
                         (SA8339) - PHS X-Station Mobility? n
                  (SA8348) - Map NCID to Universal Call ID? n
                (SA8428) - Station User Button Ring Control? n
              (SA8434) - Delay PSTN Connect on Agent Answer? n
                         (SA8439) - Forward Held-Call CPN? n
                (SA8440) - Unmodified QSIG Reroute Number? y

                                              (SA8475) - SOSM? n
```

5.3. Administer System Parameters Features

Use the "change system-parameters features" command to allow for trunk-to-trunk transfers. This feature is needed to be able to transfer an incoming call from IPC back out to IPC (incoming trunk to outgoing trunk), and to transfer an outgoing call to IPC to another outgoing trunk to IPC (outgoing trunk to outgoing trunk). For ease of compliance testing, the **Trunk-to-Trunk Transfer** field was set to "all" to enable all trunk-to-trunk transfers on a system wide basis. Note that this feature poses significant security risk, and must be used with caution. For alternatives, the trunk-to-trunk feature can be implemented on the Class Of Restriction or Class Of Service levels. Refer to **[1]** for more details.

```
change system-parameters features                              Page   1 of  19
                            FEATURE-RELATED SYSTEM PARAMETERS
                               Self Station Display Enabled? n
                                    Trunk-to-Trunk Transfer: all
                 Automatic Callback with Called Party Queuing? n
    Automatic Callback - No Answer Timeout Interval (rings): 3
                       Call Park Timeout Interval (minutes): 10
        Off-Premises Tone Detect Timeout Interval (seconds): 20
                                 AAR/ARS Dial Tone Required? y

              Music (or Silence) on Transferred Trunk Calls? no
              DID/Tie/ISDN/SIP Intercept Treatment: attendant
    Internal Auto-Answer of Attd-Extended/Transferred Calls: transferred
                  Automatic Circuit Assurance (ACA) Enabled? n




            Abbreviated Dial Programming by Assigned Lists? n
       Auto Abbreviated/Delayed Transition Interval (rings): 2
                    Protocol for Caller ID Analog Terminals: Bellcore
    Display Calling Number for Room to Room Caller ID Calls? n
```

Navigate to **Page 16**. Enable **Chained Call Forwarding**, to allow changes to the maximum number of call forwarding hops parameter in **Section 5.4**.

```
change system-parameters features                              Page  16 of  19
                         FEATURE-RELATED SYSTEM PARAMETERS

SPECIAL TONE
                                  Special Dial Tone? n
          Special Dial Tone for Digital/IP Stations: none

REDIRECTION NOTIFICATION
                            Display Notification for Do Not Disturb? n
                            Display Notification for Send All Calls? n
                              Display Notification for Call Forward? n
                      Display Notification for Enhanced Call Forward? n
                           Display Notification for a locked Station? n
         Display Notification for Limit Number of Concurrent Calls? n
                            Display Notification for Posted Messages? n
                                 Scroll Status messages Timer(sec.):

Chained Call Forwarding? Y
```

5.4. Administer System Parameters Coverage Forwarding

Use the "change system-parameters coverage-forwarding" command. Set **Threshold for Blocking Off-Net Redirection of Incoming Trunk Calls** to the desired value. In the compliance testing, the threshold was disabled so that there will be no blocking on the number of calls being redirected off-net within the Call Forward timer.

```
change system-parameters coverage-forwarding                    Page   1 of   2
                SYSTEM PARAMETERS CALL COVERAGE / CALL FORWARDING
CALL COVERAGE/FORWARDING PARAMETERS
          Local Cvg Subsequent Redirection/CFWD No Ans Interval (rings): 2
        Off-Net Cvg Subsequent Redirection/CFWD No Ans Interval (rings): 2
                         Coverage - Caller Response Interval (seconds): 4
     Threshold for Blocking Off-Net Redirection of Incoming Trunk Calls: n
                         Location for Covered and Forwarded Calls: called
                       PGN/TN/COR for Covered and Forwarded Calls: caller
                    COR/FRL check for Covered and Forwarded Calls? n
       QSIG/SIP Diverted Calls Follow Diverted to Party's Coverage Path? n
COVERAGE
                                Criteria for Logged Off/PSA/TTI Stations? n
                                     Keep Held SBA at Coverage Point? y
       External Coverage Treatment for Transferred Incoming Trunk Calls? n
        Immediate Redirection on Receipt of PROGRESS Inband Information? n
                                               Maintain SBA At Principal? y
             QSIG VALU Coverage Overrides QSIG Diversion with Rerouting? n
                                          Station Hunt Before Coverage? n
FORWARDING
                                                 Call Forward Override? n
                                               Coverage After Forwarding? y
```

Navigate to **Page 2**, and set **Maximum Number Of Call Forwarding Hops** to a value mutually agreeable with IPC.

```
change system-parameters coverage-forwarding                    Page   2 of   2
                SYSTEM PARAMETERS CALL COVERAGE / CALL FORWARDING

COVERAGE OF CALLS REDIRECTED OFF-NET (CCRON)

                       Coverage Of Calls Redirected Off-Net Enabled? n




CHAINED CALL FORWARDING
                              Maximum Number Of Call Forwarding Hops: 6
                Station Coverage Path For Coverage After Forwarding: principal
```

5.5. Administer DS1 Circuit Pack

Use the "add ds1 x" command, where "x" is the slot number of the DS1 circuit pack with physical connectivity to IPC. Enter the following values for the specified fields, and retain the default values for the remaining fields.

- **Name:** A descriptive name.
- **Bit Rate:** "2.048"
- **Line Coding:** "hdb3"
- **Signaling Mode:** "isdn-pri"
- **Connect:** "pbx"
- **Interface:** "peer-master"[This means IPC side is set to "peer-slave"]
- **Peer Protocol:** "Q-SIG"
- **Side:** "b"
- **Interface Companding:** "alaw"
- **CRC:** "y"
- **Channel Numbering:** "timeslot"

```
change ds1 1v8                                                Page   1 of   1
                                DS1 CIRCUIT PACK

            Location: 001V8                              Name: IPC-Alliance
            Bit Rate: 2.048                     Line Coding: hdb3

      Signaling Mode: isdn-pri
             Connect: pbx                           Interface: peer-master
   TN-C7 Long Timers? n                         Peer Protocol: Q-SIG
Interworking Message: PROGress                          Side: b
Interface Companding: alaw                              CRC? y
           Idle Code: 11111111            Channel Numbering: timeslot
                              DCP/Analog Bearer Capability: 3.1kHz

                                           T303 Timer(sec): 4
                                          Disable Restarts? n

      Slip Detection? y                  Near-end CSU Type: other

   Echo Cancellation? n
```

5.6. Administer ISDN Trunk Group

Administer an ISDN trunk group to interface with IPC. Use the "add trunk-group n" command, where "n" is an available trunk group number. Enter the following values for the specified fields, and retain the default values for the remaining fields.

- **Group Type:** "isdn"
- **Group Name:** A descriptive name.
- **TAC:** An available trunk access code.
- **Direction:** "two-way"
- **Carrier Medium:** "PRI/BRI"
- **Service Type:** "tie"

```
add trunk-group 70                                          Page   1 of  21
                                TRUNK GROUP

Group Number: 70                     Group Type: isdn           CDR Reports: y
  Group Name: E1QSIG-All15.3              COR: 1        TN: 1        TAC: 1070
   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
```

Navigate to **Page 2**. For **Supplementary Service Protocol**, enter "b" for QSIG. For **Digit Handling (in/out)**, enter "enbloc/enbloc". For **Format**, enter "unk-unk". Retain the default values for the remaining fields.

```
add trunk-group 70                                          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: unk-unk
              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
 CPN to Send for Redirected Calls: calling
```

Navigate to **Page 3**. Enable **Send Name**, **Send Calling Number**, and **Send Called/Busy/Connected Number**. For **Format**, enter "private". Enable **Modify Reroute Number**, as shown below.

```
add trunk-group 70                                          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: 30
                                     Send Name: y      Send Calling Number: y
            Used for DCS? n            Hop Dgt? n     Send EMU Visitor CPN? n
   Suppress # Outpulsing? n    Format: private
 Outgoing Channel ID Encoding: preferred     UUI IE Treatment: service-provider

                                              Replace Restricted Numbers? n
                                             Replace Unavailable Numbers? n
                                   Send Called/Busy/Connected Number: y
                                              Hold/Unhold Notifications? y
             Send UUI IE? y     Modify Tandem Calling Number: no
               Send UCID? n
 Send Codeset 6/7 LAI IE? y                          Ds1 Echo Cancellation? n
                                                    Modify Reroute Number? y
    Apply Local Ringback? n
 Show ANSWERED BY on Display? y
                             Network (Japan) Needs Connect Before Disconnect? n
```

5.7. Administer ISDN Signaling Group

Administer an ISDN signaling group for the new trunk group to use for signaling. Use the "add signaling-group n" command, where "n" is an available signaling group number. For **Primary D-Channel**, enter the slot number for the DS1 circuit pack from **Section 5.5** and port "16". The following shows different D-Channel assignments for T1 and E1 interfaces:

- T1 – Port 24
- E1 – Port 16

Set desired values for **Max number of NCA TSC** and **Max number of CA TSC**.

For **Trunk Group for NCA TSC** and **Trunk Group for Channel Selection**, enter the ISDN trunk group number from **Section 5.6**. For **TSC Supplementary Service Protocol**, enter "b" for QSIG. Retain the default values for the remaining fields.

```
add signaling-group 70                                      Page   1 of   1
                              SIGNALING GROUP

 Group Number: 70             Group Type: isdn-pri
                    Associated Signaling? y          Max number of NCA TSC: 30
                       Primary D-Channel: 001V816      Max number of CA TSC: 30
                                                  Trunk Group for NCA TSC: 70
      Trunk Group for Channel Selection: 70      X-Mobility/Wireless Type: NONE
     TSC Supplementary Service Protocol: b         Network Call Transfer? n
```

5.8. Administer Trunk Group Members

Use the "change trunk-group n" command, where "n" is the ISDN trunk group number added in **Section 5.6**. Navigate to **Page 3**. For **NCA-TSA Trunk Member**, enter the highest trunk group member number to use for routing of tandem QSIG call independent signaling connections.

```
change trunk-group 70                                          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: 30
                                     Send Name: y      Send Calling Number: y
            Used for DCS? n            Hop Dgt? n     Send EMU Visitor CPN? n
   Suppress # Outpulsing? n    Format: private
 Outgoing Channel ID Encoding: preferred     UUI IE Treatment: service-provider

                                                 Replace Restricted Numbers? n
                                                Replace Unavailable Numbers? n
                                          Send Called/Busy/Connected Number: y
                                            Hold/Unhold Notifications? y
             Send UUI IE? y     Modify Tandem Calling Number: no
               Send UCID? n
 Send Codeset 6/7 LAI IE? y                          Ds1 Echo Cancellation? n
                                                       Modify Reroute Number? y
    Apply Local Ringback? n
 Show ANSWERED BY on Display? y
                             Network (Japan) Needs Connect Before Disconnect? n
```

Navigate to **Page 5** and **6**. Enter all 30 ports of the DS1 circuit pack into the **Port** fields, and the corresponding **Code** field will be populated automatically. Enter the ISDN signaling group number from **Section 5.7** into the **Sig Grp** fields as shown below.

```
change trunk-group 70                                          Page   5 of  21
                                  TRUNK GROUP
                                       Administered Members (min/max):   1/30
GROUP MEMBER ASSIGNMENTS                   Total Administered Members:  30

       Port    Code Sfx Name        Night            Sig Grp
  1: 001V801  MM710                                    70
  2: 001V802  MM710                                    70
  3: 001V803  MM710                                    70
  4: 001V804  MM710                                    70
  5: 001V805  MM710                                    70
  6: 001V806  MM710                                    70
  7: 001V807  MM710                                    70
  8: 001V808  MM710                                    70
  9: 001V809  MM710                                    70
 10: 001V810  MM710                                    70
 11: 001V811  MM710                                    70
 12: 001V812  MM710                                    70
 13: 001V813  MM710                                    70
 14: 001V814  MM710                                    70
 15: 001V815  MM710                                    70
```

```
change trunk-group 70                                          Page   6 of  21
                                  TRUNK GROUP
                                       Administered Members (min/max):   1/30
GROUP MEMBER ASSIGNMENTS                   Total Administered Members:  30

       Port    Code Sfx Name        Night           Sig Grp
 16: 001V817  MM710                                  70
 17: 001V818  MM710                                  70
 18: 001V819  MM710                                  70
 19: 001V820  MM710                                  70
 20: 001V821  MM710                                  70
 21: 001V822  MM710                                  70
 22: 001V823  MM710                                  70
 23: 001V824  MM710                                  70
 24: 001V825  MM710                                  70
 25: 001V826  MM710                                  70
 26: 001V827  MM710                                  70
 27: 001V828  MM710                                  70
 28: 001V829  MM710                                  70
 29: 001V830  MM710                                  70
 30: 001V831  MM710                                  70
```

5.9. Administer Route Pattern

Use the "change route-pattern n" command, where "n" is the existing route pattern number to reach IPC, in this case "70". Enter the following values for the specified fields, and retain the default values for the remaining fields.

- **Pattern Name:** A descriptive name.
- **Grp No:** The ISDN trunk group number from **Section 5.6**.
- **FRL:** A level that allows access to this trunk, with 0 being least restrictive.
- **TSC:** "y"
- **CA-TSC Request:** "as-needed"
- **Numbering Format:** "unk-unk"

```
change route-pattern 70                                        Page   1 of   3
                    Pattern Number: 70  Pattern Name: To Alliance15.3
                              SCCAN? n     Secure SIP? n
    Grp FRL NPA Pfx Hop Toll No.  Inserted                          DCS/ IXC
    No          Mrk Lmt List Del  Digits                            QSIG
                              Dgts                                  Intw
 1: 70   0                                                           n   user
 2:                                                                  n   user
 3:                                                                  n   user
 4:                                                                  n   user
 5:                                                                  n   user
 6:                                                                  n   user

     BCC VALUE  TSC CA-TSC    ITC BCIE Service/Feature PARM  No. Numbering LAR
    0 1 2 M 4 W     Request                                 Dgts Format
                                                         Subaddress
 1: y y y y y n  y  as-needed rest                                unk-unk   none
 2: y y y y y n  n            rest                                        none
 3: y y y y y n  n            rest                                        none
```

5.10. Administer Public Unknown Numbering

Use the "change private-numbering 0" command, to define the calling party number to send to IPC. Add an entry for the trunk group defined in **Section 5.6**. In the example shown below, all calls originating from a 5-digit extension beginning with 720 and routed to trunk group 70 will result in a 5-digit calling number.

```
change private-numbering 0                                    Page   1 of   2
                        NUMBERING - PUBLIC/UNKNOWN FORMAT
                                              Total
Ext  Ext              Trk        CPN            CPN
Len  Code             Grp(s)     Prefix         Len
                                                    Total Administered: 6
 5   720              10                        5       Maximum Entries: 240
 5   720              26                        5
 5   720              70                        5
```

5.11. Administer Uniform Dial Plan

This section provides a sample AAR routing used for routing calls with dialed digits 33xxx to IPC. Note that other methods of routing may be used. Use the "change uniform-dialplan 0" command, and add an entry to specify the use of AAR for routing digits 33xxx, as shown below.

```
change uniform-dialplan 0                                     Page   1 of   2
                        UNIFORM DIAL PLAN TABLE
                                                            Percent Full: 0

  Matching                    Insert                 Node
  Pattern        Len Del      Digits      Net Conv   Num
 2                5   0                   aar   n
 33               5   0                   aar   n
```

5.12. Administer AAR Analysis

Use the "change aar analysis 3" command, and add an entry to specify how to route calls to 33xxx. In the example shown below, calls with digits 33xxx will be routed as an AAR call using route pattern "70" from **Section 5.9**.

```
change aar analysis 3                                         Page   1 of   2
                            AAR DIGIT ANALYSIS TABLE
                                  Location: all            Percent Full: 3

          Dialed            Total      Route     Call    Node  ANI
          String           Min  Max   Pattern    Type    Num   Reqd

     33                    5    5     70         aar           n
```

5.13. Administer ISDN Trunk Group

Use the "change trunk-group n" command, where "n" is the existing ISDN trunk group number used to reach the PSTN, in this case "80". Navigate to **Page 3**.

For **Modify Tandem Calling Number**, enter "tandem-cpn-form" to allow for the calling party number from IPC to be modified. By enabling this feature, the calling party number will be sent to PSTN when call is coming from IPC side via a SIP trunk.

```
change trunk-group 80                                          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:
                                      Send Name: y      Send Calling Number: y
            Used for DCS? n                            Send EMU Visitor CPN? y
   Suppress # Outpulsing? n    Format: natl-pub
 Outgoing Channel ID Encoding: preferred     UUI IE Treatment: service-provider

                                                 Replace Restricted Numbers? n
                                                Replace Unavailable Numbers? n
                                                      Send Connected Number: n
Network Call Redirection: none                     Hold/Unhold Notifications? n
             Send UUI IE? y     Modify Tandem Calling Number: tandem-cpn-form
               Send UCID? n
 Send Codeset 6/7 LAI IE? y                          Ds1 Echo Cancellation? n

    Apply Local Ringback? n                US NI Delayed Calling Name Update? n
 Show ANSWERED BY on Display? y
                              Network (Japan) Needs Connect Before Disconnect? n
```

5.14. Administer Tandem Calling Party Number

Use the "change tandem-calling-party-num" command, to define the calling party number to send to the PSTN for tandem calls from IPC turret users.

In the example shown below, all calls originating from a 5-digit extension beginning with 33 and routed to trunk group 80 will result in a 10-digit calling number. For **Number Format**, use an applicable format, in this case "pub-unk".

```
change tandem-calling-party-num                                Page   1 of   8
                        CALLING PARTY NUMBER CONVERSION
                                FOR TANDEM CALLS
                     Incoming                                    Outgoing
     CPN             Number   Trk                                Number
 Len Prefix          Format   Grp(s)     Delete  Insert          Format
 5   33                       80                 3035383547      pub-unk
```

6. Configure IPC Alliance One Management System

This section provides the procedures for configuring IPC Alliance system center. The procedures include the following areas:

- Configuring a default protocol (QSIG/SIP)
- Administer wire groups

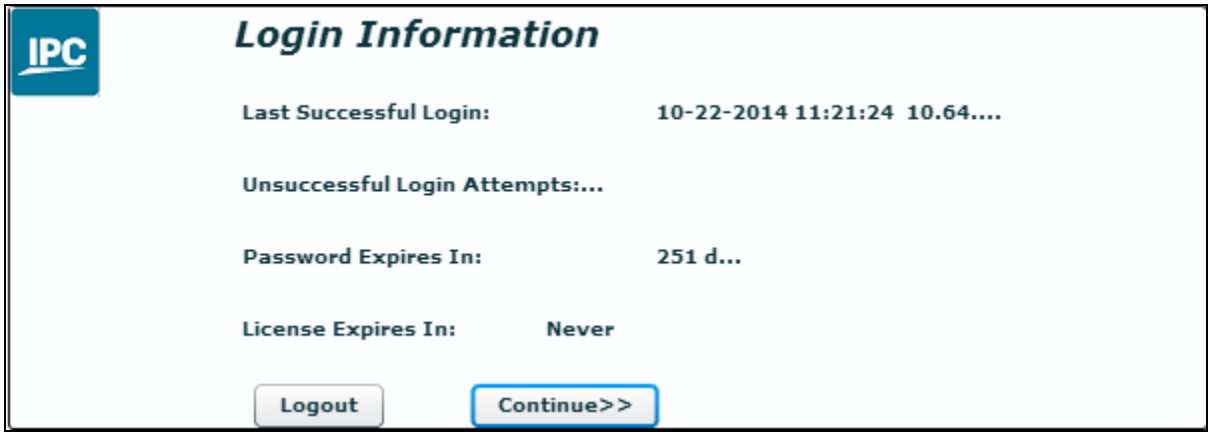
The configuration of Alliance system center is typically performed by IPC installation technicians. The procedural steps are presented in these Application Notes for informational purposes.

6.1. Configuring a Default Protocol

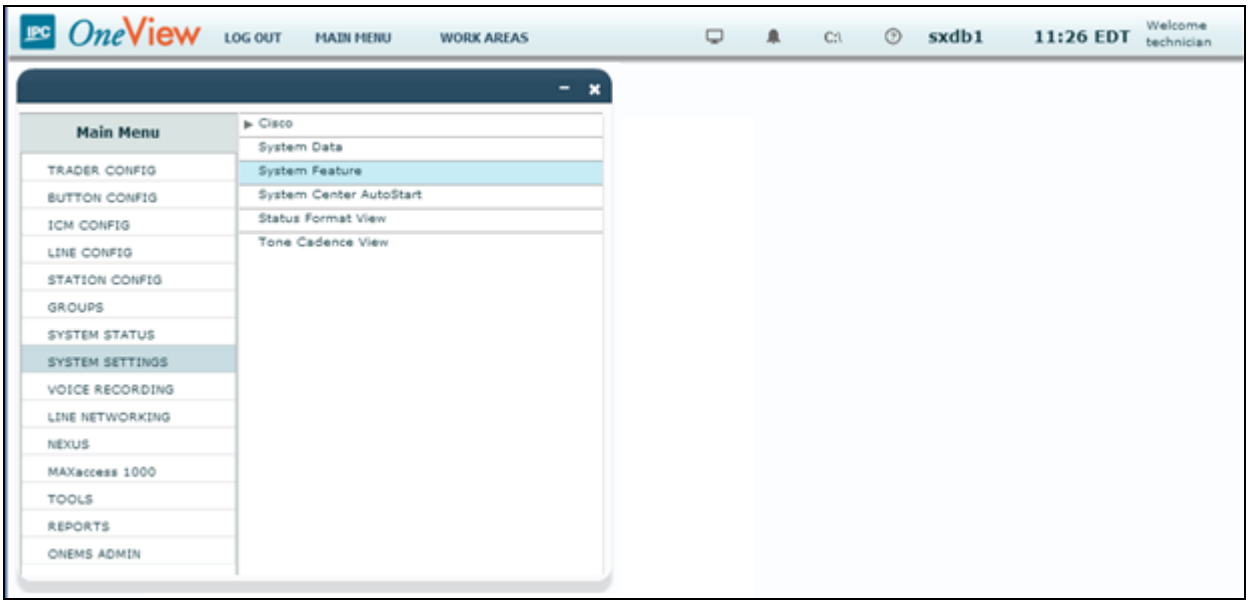
Access the IPC Alliance web interface by using the URL, http://<ip-address>/oneview in an Internet browser window, where "ip-address" is the IP address of IPC Alliance system center. The **Logon** screen is displayed. Log in using a valid user name and password. Check the checkbox on **I agree to the terms and Conditions** and select the **Login** button.

The **License Login** page appears next. Enter the appropriate licensing password, and select **Login**.

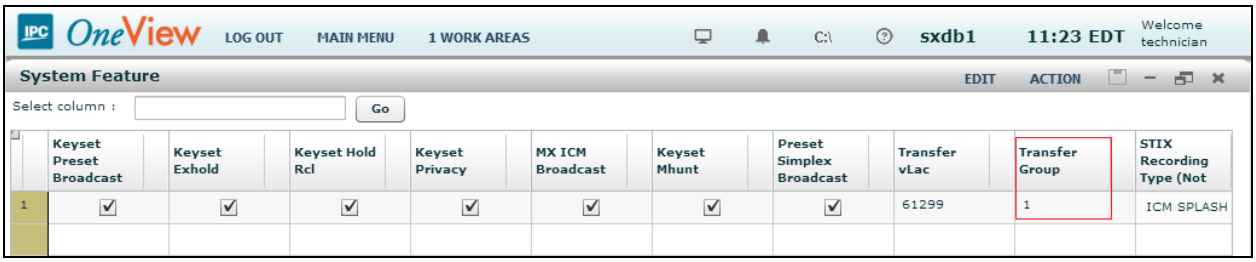
On the **Login Information** page, select **Continue>>**.



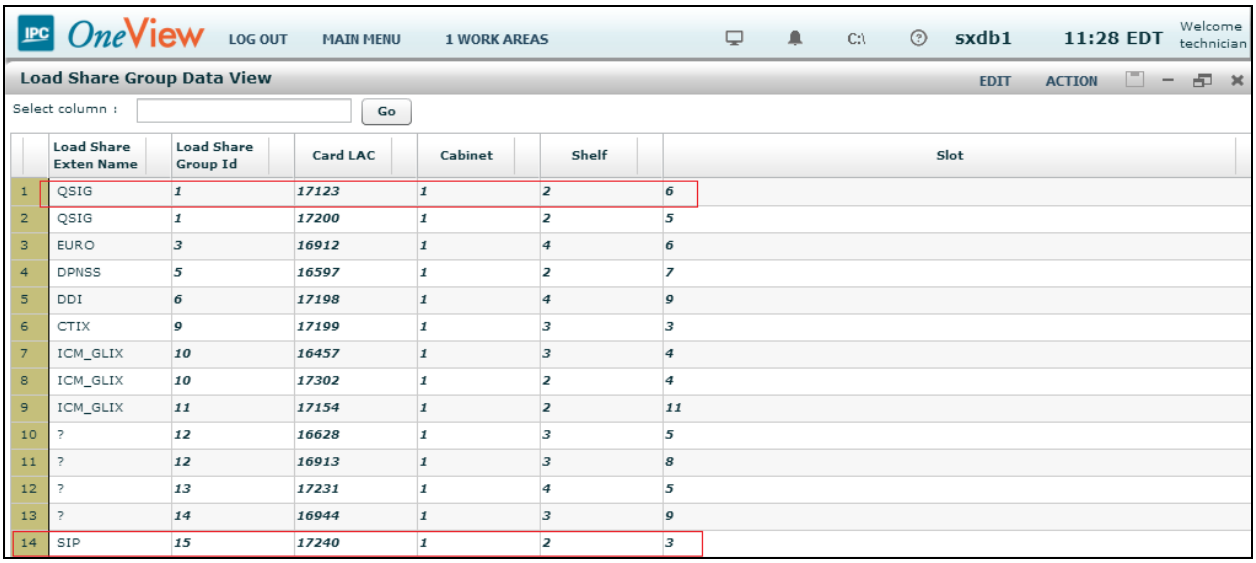
The **Main Menu** is displayed. From the **Main Menu** page, select **SYSTEM SETTINGS → System Feature**.



On the **System Feature** page, the **Transfer Group** column displayed "**1**". The value "**1**" indicates QSIG trunk, and therefore all calls will go out through the QSIG trunk.



The above Transfer Group value comes from the **Load Share Group Data View** page, which is shown below. To view the **Load Share Group Data View** page, navigate to **LINE CONFIG → Load Share Group Data View** from the Main Menu (not shown). In this screen, the **Load Share Group Id** "1" indicates QSIG, and the **Load Share Group Id** "15" indicates SIP.



	Load Share Exten Name	Load Share Group Id	Card LAC	Cabinet	Shelf	Slot
1	QSIG	1	17123	1	2	6
2	QSIG	1	17200	1	2	5
3	EURO	3	16912	1	4	6
4	DPNSS	5	16597	1	2	7
5	DDI	6	17198	1	4	9
6	CTIX	9	17199	1	3	3
7	ICM_GLIX	10	16457	1	3	4
8	ICM_GLIX	10	17302	1	2	4
9	ICM_GLIX	11	17154	1	2	11
10	?	12	16628	1	3	5
11	?	12	16913	1	3	8
12	?	13	17231	1	4	5
13	?	14	16944	1	3	9
14	SIP	15	17240	1	2	3

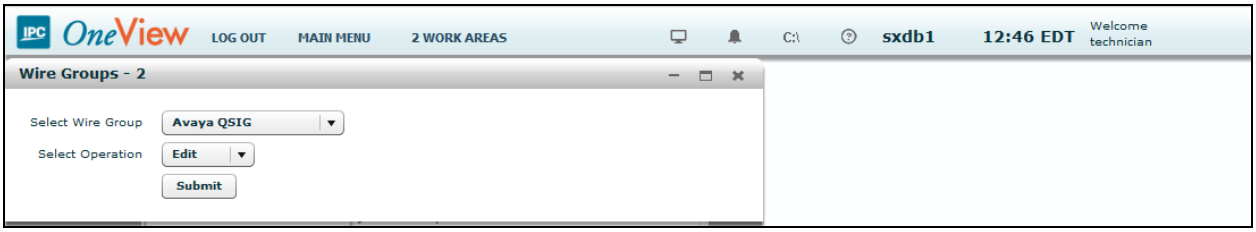
6.2. Administer Wire Groups

From the Main Menu (not shown), navigate to **GROUPS → Engineering Groups → Wire Groups**.

Provide the following information:

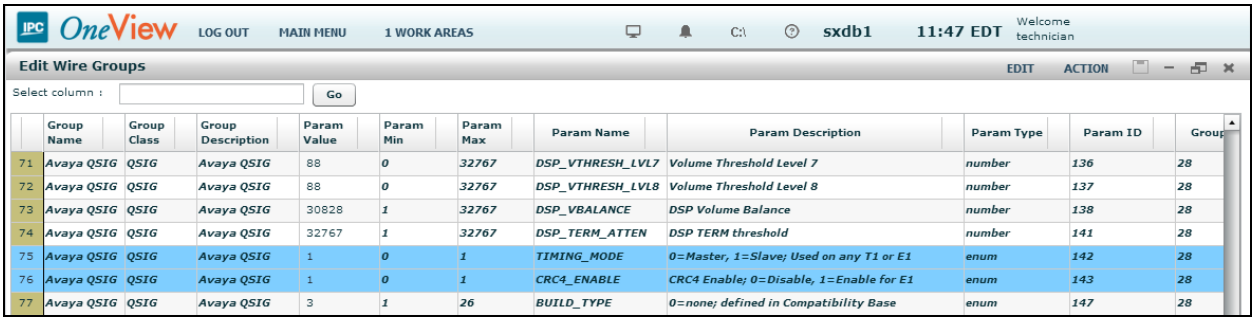
- **Select Wire Group** Select "Avaya QSIG" using a drop-down menu. As a default, the Wire Group shows up as "QSIG".
- **Select Operation** Select "Edit" using a drop-down menu.

Click **Submit**.



The **Edit Wire Groups** screen is displayed next. Scroll down the screen as necessary to locate the entry with **Param Id** of "142". Double click on the corresponding **Param Value** field, and enter "1" to denote IPC as the slave in the ISDN connection.

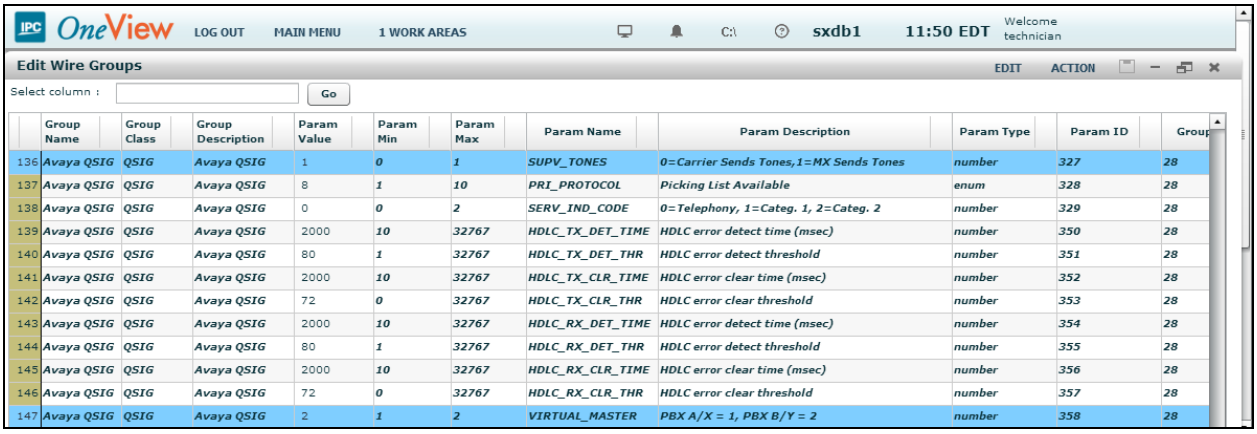
Locate the entry with **Param Id** of "143". Double click on the corresponding **Param Value** field, and enter "1" to enable **CRC4_ENABLE**.



	Group Name	Group Class	Group Description	Param Value	Param Min	Param Max	Param Name	Param Description	Param Type	Param ID	Group
71	Avaya QSIG	QSIG	Avaya QSIG	88	0	32767	DSP_VTHRESH_LVL7	Volume Threshold Level 7	number	136	28
72	Avaya QSIG	QSIG	Avaya QSIG	88	0	32767	DSP_VTHRESH_LVL8	Volume Threshold Level 8	number	137	28
73	Avaya QSIG	QSIG	Avaya QSIG	30828	1	32767	DSP_VBALANCE	DSP Volume Balance	number	138	28
74	Avaya QSIG	QSIG	Avaya QSIG	32767	1	32767	DSP_TERM_ATTEN	DSP TERM threshold	number	141	28
75	Avaya QSIG	QSIG	Avaya QSIG	1	0	1	TIMING_MODE	0=Master, 1=Slave; Used on any T1 or E1	enum	142	28
76	Avaya QSIG	QSIG	Avaya QSIG	1	0	1	CRC4_ENABLE	CRC4 Enable; 0=Disable, 1=Enable for E1	enum	143	28
77	Avaya QSIG	QSIG	Avaya QSIG	3	1	26	BUILD_TYPE	0=none; defined in Compatibility Base	enum	147	28

Scroll down the screen as necessary to locate the entry with **Param Id** of "327". Double click on the corresponding **Param Value** field, and enter "1" to enable Alliance to send tones.

Locate the entry with **Param Id** of "358". Double click on the corresponding **Param Value** field, and enter "2" for **VIRTUAL_MASTER**. This value indicates the IPC side is set to "Peer-Slave" on the QSIG trunk.



	Group Name	Group Class	Group Description	Param Value	Param Min	Param Max	Param Name	Param Description	Param Type	Param ID	Group
136	Avaya QSIG	QSIG	Avaya QSIG	1	0	1	SUPV_TONES	0=Carrier Sends Tones,1=MX Sends Tones	number	327	28
137	Avaya QSIG	QSIG	Avaya QSIG	8	1	10	PRI_PROTOCOL	Picking List Available	enum	328	28
138	Avaya QSIG	QSIG	Avaya QSIG	0	0	2	SERV_IND_CODE	0=Telephony, 1=Categ. 1, 2=Categ. 2	number	329	28
139	Avaya QSIG	QSIG	Avaya QSIG	2000	10	32767	HDLC_TX_DET_TIME	HDLC error detect time (msec)	number	350	28
140	Avaya QSIG	QSIG	Avaya QSIG	80	1	32767	HDLC_TX_DET_THR	HDLC error detect threshold	number	351	28
141	Avaya QSIG	QSIG	Avaya QSIG	2000	10	32767	HDLC_TX_CLR_TIME	HDLC error clear time (msec)	number	352	28
142	Avaya QSIG	QSIG	Avaya QSIG	72	0	32767	HDLC_TX_CLR_THR	HDLC error clear threshold	number	353	28
143	Avaya QSIG	QSIG	Avaya QSIG	2000	10	32767	HDLC_RX_DET_TIME	HDLC error detect time (msec)	number	354	28
144	Avaya QSIG	QSIG	Avaya QSIG	80	1	32767	HDLC_RX_DET_THR	HDLC error detect threshold	number	355	28
145	Avaya QSIG	QSIG	Avaya QSIG	2000	10	32767	HDLC_RX_CLR_TIME	HDLC error clear time (msec)	number	356	28
146	Avaya QSIG	QSIG	Avaya QSIG	72	0	32767	HDLC_RX_CLR_THR	HDLC error clear threshold	number	357	28
147	Avaya QSIG	QSIG	Avaya QSIG	2	1	2	VIRTUAL_MASTER	PBX A/X = 1, PBX B/Y = 2	number	358	28

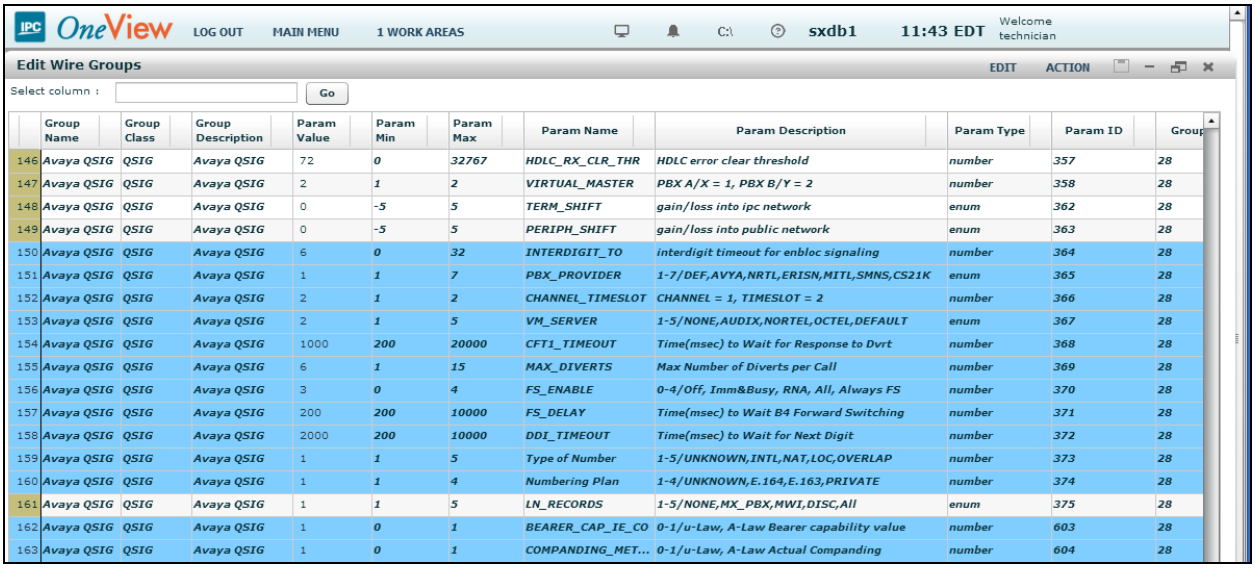
Scroll down the screen as necessary to locate entries with **Param Id** of "364-374" and "603-604". Double click on the corresponding **Param Value** field, and set the values as shown below.

- **INTERDIGIT_TO:** "6"
- **PBX_PROVIDER:** "1"
- **CHANNEL_TIMESLOT:** "2"
- **VM_SERVER:** "2"
- **CFT1_TIMEOUT:** "1000"
- **MAX_DIVERTS:** "6"
- **FS_ENABLE:** "3"
- **FS_DELAY:** "200"
- **DDI_TIMEOUT:** "2000"
- **Type of Number:** "1"
- **Numbering Plan:** "1"
- **BEARER_CAP_IE_CODE:** "1"
- **COMPANDING_METHOD:** "1"

Note that the MAX_DIVERTS value should match the maximum number of call forwarding hops from **Section 5.4**.

Also note that the COMPANDING_METHOD in Alliance should match value set for Avaya side in **Section 5.5**. During the compliance test, Alaw was successfully tested.

Follow the system load procedure in **[2]** to reboot the QSIG trunk card.



	Group Name	Group Class	Group Description	Param Value	Param Min	Param Max	Param Name	Param Description	Param Type	Param ID	Group
146	Avaya QSIG	QSIG	Avaya QSIG	72	0	32767	HDLC_RX_CLR_THR	HDLC error clear threshold	number	357	28
147	Avaya QSIG	QSIG	Avaya QSIG	2	1	2	VIRTUAL_MASTER	PBX A/X = 1, PBX B/Y = 2	number	358	28
148	Avaya QSIG	QSIG	Avaya QSIG	0	-5	5	TERM_SHIFT	gain/loss into ipc network	enum	362	28
149	Avaya QSIG	QSIG	Avaya QSIG	0	-5	5	PERIPH_SHIFT	gain/loss into public network	enum	363	28
150	Avaya QSIG	QSIG	Avaya QSIG	6	0	32	INTERDIGIT_TO	interdigit timeout for enbloc signaling	number	364	28
151	Avaya QSIG	QSIG	Avaya QSIG	1	1	7	PBX_PROVIDER	1-7/DEF,AVYA,NRTL,ERISN,MITL,SMNS,CS21K	enum	365	28
152	Avaya QSIG	QSIG	Avaya QSIG	2	1	2	CHANNEL_TIMESLOT	CHANNEL = 1, TIMESLOT = 2	number	366	28
153	Avaya QSIG	QSIG	Avaya QSIG	2	1	5	VM_SERVER	1-5/NONE,AUDIX,NORTEL,OCTEL,DEFAULT	enum	367	28
154	Avaya QSIG	QSIG	Avaya QSIG	1000	200	20000	CFT1_TIMEOUT	Time(msec) to Wait for Response to Dvrt	number	368	28
155	Avaya QSIG	QSIG	Avaya QSIG	6	1	15	MAX_DIVERTS	Max Number of Diverts per Call	number	369	28
156	Avaya QSIG	QSIG	Avaya QSIG	3	0	4	FS_ENABLE	0-4/Off, Imm&Busy, RNA, All, Always FS	number	370	28
157	Avaya QSIG	QSIG	Avaya QSIG	200	200	10000	FS_DELAY	Time(msec) to Wait B4 Forward Switching	number	371	28
158	Avaya QSIG	QSIG	Avaya QSIG	2000	200	10000	DDI_TIMEOUT	Time(msec) to Wait for Next Digit	number	372	28
159	Avaya QSIG	QSIG	Avaya QSIG	1	1	5	Type of Number	1-5/UNKNOWN,INTL,NAT,LOC,OVERLAP	number	373	28
160	Avaya QSIG	QSIG	Avaya QSIG	1	1	4	Numbering Plan	1-4/UNKNOWN,E.164,E.163,PRIVATE	number	374	28
161	Avaya QSIG	QSIG	Avaya QSIG	1	1	5	LN_RECORDS	1-5/NONE,MX_PBX,MWI,DISC,All	enum	375	28
162	Avaya QSIG	QSIG	Avaya QSIG	1	0	1	BEARER_CAP_IE_CO	0-1/u-Law, A-Law Bearer capability value	number	603	28
163	Avaya QSIG	QSIG	Avaya QSIG	1	0	1	COMPANDING_MET...	0-1/u-Law, A-Law Actual Companding	number	604	28

7. Verification Steps

This section provides the tests that can be performed to verify proper configuration of Avaya Aura® Communication Manager and IPC Alliance MX.

From the Communication Manager SAT interface, verify the status of the ISDN trunk group by using the "status trunk n" command, where "n" is the ISDN trunk group number administered in **Section 5.6**. Verify that all trunks are in the "in-service/idle" state as shown below.

```
status trunk 70                                                    Page   1

                            TRUNK GROUP STATUS

Member   Port     Service State      Mtce Connected Ports
                                     Busy

0070/001 001V801  in-service/idle    no
0070/002 001V802  in-service/idle    no
0070/003 001V803  in-service/idle    no
0070/004 001V804  in-service/idle    no
0070/005 001V805  in-service/idle    no
0070/006 001V806  in-service/idle    no
0070/007 001V807  in-service/idle    no
0070/008 001V808  in-service/idle    no
0070/009 001V809  in-service/idle    no
0070/010 001V810  in-service/idle    no
0070/011 001V811  in-service/idle    no
0070/012 001V812  in-service/idle    no
0070/013 001V813  in-service/idle    no
0070/014 001V814  in-service/idle    no
```

Verify the status of the ISDN signaling groups by using the "status signaling-group n" command, where "n" is the ISDN signaling group number administered in **Section 5.7**. Verify that the signaling group is "in-service" as indicated in the **Group State** and **Level 3 State** fields shown below.

```
status signaling-group 70
                        STATUS SIGNALING GROUP

       Group ID: 70                              Active NCA-TSC Count: 0
     Group Type: isdn-pri                         Active CA-TSC Count: 0
  Signaling Type: facility associated signaling
    Group State: in-service


                          Primary D-Channel


            Port: 001V816        Level 3 State: in-service


                         Secondary D-Channel


            Port:                Level 3 State: no-link
```

8. Conclusion

These Application Notes describe the configuration steps required for IPC Alliance 16 to successfully interoperate with Avaya Aura® Communication Manager 6.3 using QSIG trunks. All feature and serviceability test cases were completed.

9. Additional References

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

1. *Administering Avaya Aura® Communication Manager*, Document 03-300509, Issue 10, Release 6.3, June 2014, available at http://support.avaya.com.

2. *IPC PATCH 16.02.01.09 Install Guide*, Revision Number 9, April 15, 2014, available upon request to IPC Support.

Please e-mail any questions or comments pertaining to these Application Notes along with the full title name and filename, located in the lower right corner, directly to the Avaya DevConnect Program at devconnect@avaya.com.