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Avaya Solution & Interoperability Test Lab

Application Notes for IPC Alliance MX 16.01 with Avaya Aura® Communication Manager 6.0.1 using QSIG Trunks – Issue 1.0

Abstract

These Application Notes describe the configuration steps required for IPC Alliance MX 16.01 to interoperate with Avaya Aura® Communication Manager 6.0.1 using QSIG trunks.

IPC Alliance MX is a trading communication solution. In the compliance testing, IPC Alliance MX 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.

Solution & Interoperability Test Lab Application Notes

1. Introduction

These Application Notes describe the configuration steps required for IPC Alliance MX 16.01 to interoperate with Avaya Aura® Communication Manager 6.0.1 using QSIG trunks.

IPC System Interconnect is a trading communication solution. In the compliance testing, IPC Alliance MX 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, Avaya 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 MX.

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 attended 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 MX can be obtained through the following:

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

3. Reference Configuration

As shown in the test configuration below, IPC Alliance MX at the Remote Site consists of Alliance MX, System Center, and Turrets.

There is a physical connection between the DS1 circuit pack on Avaya Aura® Communication Manager with the QSIG card on IPC System Center. E1 QSIG trunks are used from IPC Alliance MX 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 Avaya Aura® Communication Manager users at the Central site (65xxx-66xxx), and IPC turret users at the Remote site (63xxx).

The Avaya Aura® Session Manager was used in the configuration to support Avaya SIP endpoints, and the configuration of Avaya Aura® Session Manager was performed via the web interface of Avaya Aura® System Manager.
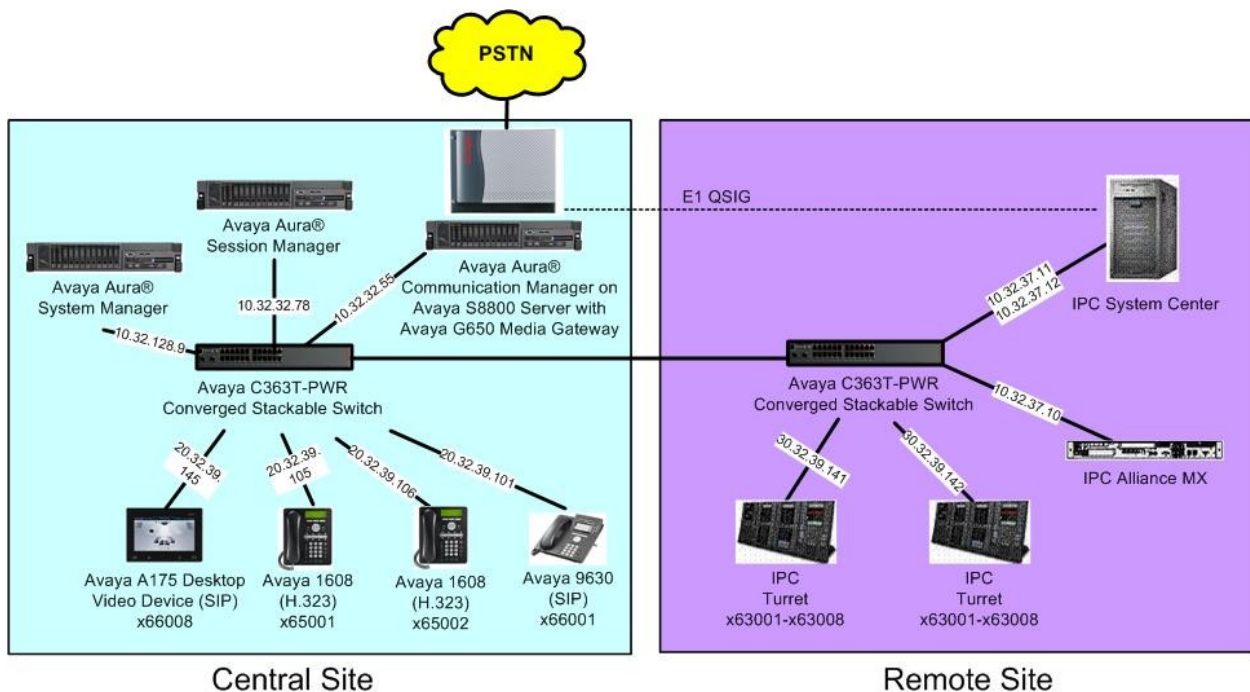
4. Equipment and Software Validated

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

Equipment	Software
Avaya Aura® Communication Manager on Avaya S8800 Server	6.0.1 SP2 with special patch 18993 (R016x.00.1.510.1-18993)
Avaya G650 Media Gateway • TN799DP C-LAN Circuit Pack • TN2302AP IP Media Processor • TN464HP DS1 Interface	 HW01 FW038 HW20 FW122 HW02 FW024
Avaya Aura® Session Manager	6.1 SP2
Avaya Aura® System Manager	6.1 SP2
Avaya A175 Desktop Video Device (SIP)	1.0.2
Avaya 1608 IP Telephone (H.323)	1.3
Avaya 9630 IP Telephone (SIP)	2.6.4
IPC • Alliance MX • System Center ○ QSIG Line Card • Turrets	 16.01.01.04.0005 16.01.01.04.0005 16.01.01.04.0005 16.01.01.04.0005

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 PSTN 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? n
                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
```

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   9
                          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 call 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? y
                               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: attd
        Internal Auto-Answer of Attd-Extended/Transferred Calls: none
                     Automatic Circuit Assurance (ACA) Enabled? 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
```

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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 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? y
COVERAGE
```

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 n" command, where "n" 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"
- **Peer Protocol:**   "Q-SIG"
- **Interface Companding:**   "alaw"
- **Channel Numbering:**   "timeslot"

```
add ds1 1a14                                                   Page   1 of   1
                            DS1 CIRCUIT PACK


          Location: 01A14                           Name: IPC QSIG
          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: a
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? n              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 63                                              Page   1 of  21
                              TRUNK GROUP

Group Number: 63                      Group Type: isdn          CDR Reports: y
  Group Name: IPC QSIG                        COR: 1      TN: 1       TAC: 1063
   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 "overlap/enbloc". For **Format**, enter "unk-unk". Retain the default values for the remaining fields.

```
add trunk-group 63                                              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): overlap/enbloc
       Digit Treatment:                                        Digits:
           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
                                   Delay Call Setup When Accessed Via IGAR? N
```

Navigate to **Page 3**. Enable **Send Name**, **Send Calling Number**, and **Send Connected Number**. For **Format**, enter "unknown". Disable **Modify Reroute Number**, as shown below.

```
add trunk-group 63                                           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              Hop Dgt? n     Send EMU Visitor CPN? n
   Suppress # Outpulsing? n    Format: unknown
Outgoing Channel ID Encoding: preferred     UUI IE Treatment: service-provider

                                              Replace Restricted Numbers? n
                                            Replace Unavailable Numbers? n
                                              Send 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? n

    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". 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 the **Supplementary Service Protocol** field, enter "b" for QSIG. Retain the default values for the remaining fields.

```
add signaling-group 63                                        Page   1 of   1
                            SIGNALING GROUP

 Group Number: 63            Group Type: isdn-pri
                    Associated Signaling? y      Max number of NCA TSC: 5
                    Primary D-Channel: 1a1416     Max number of CA TSC: 5
                                                 Trunk Group for NCA TSC: 63
        Trunk Group for Channel Selection: 63   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 63                                        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: unknown
Outgoing Channel ID Encoding: preferred      UUI IE Treatment: service-provider

                                              Replace Restricted Numbers? n
                                            Replace Unavailable Numbers? n
                                               Send 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? n
    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** and **Sfx** fields 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 63                                        Page   5 of  21
                                TRUNK GROUP
                                  Administered Members (min/max):   0/0
GROUP MEMBER ASSIGNMENTS              Total Administered Members:   0

        Port      Code Sfx Name        Night         Sig Grp
  1: 1a1401    TN464  G                                63
  2: 1a1402    TN464  G                                63
  3: 1a1403    TN464  G                                63
  4: 1a1404    TN464  G                                63
  5: 1a1405    TN464  G                                63
  6: 1a1406    TN464  G                                63
  7: 1a1407    TN464  G                                63
  8: 1a1408    TN464  G                                63
  9: 1a1409    TN464  G                                63
 10: 1a1410    TN464  G                                63
 11: 1a1411    TN464  G                                63
 12: 1a1412    TN464  G                                63
 13: 1a1413    TN464  G                                63
 14: 1a1414    TN464  G                                63
 15: 1a1415    TN464  G                                63
```

```
change trunk-group 63                                          Page   6 of  21
                              TRUNK GROUP
                                Administered Members (min/max):   0/0
GROUP MEMBER ASSIGNMENTS                    Total Administered Members:   0


        Port      Code Sfx Name        Night          Sig Grp
 16: 01A1417    TN464  H                              63
 17: 01A1418    TN464  H                              63
 18: 01A1419    TN464  H                              63
 19: 01A1420    TN464  H                              63
 20: 01A1421    TN464  H                              63
 21: 01A1422    TN464  H                              63
 22: 01A1423    TN464  H                              63
 23: 01A1424    TN464  H                              63
 24: 01A1425    TN464  H                              63
 25: 01A1426    TN464  H                              63
 26: 01A1427    TN464  H                              63
 27: 01A1428    TN464  H                              63
 28: 01A1429    TN464  H                              63
 29: 01A1430    TN464  H                              63
 30: 01A1431    TN464  H                              63
```

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 "63". 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 63                                        Page   1 of   3
                   Pattern Number: 63  Pattern Name: IPC
                            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: 63   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 public-unknown-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 6 and routed to trunk group 63 will result in a 5-digit calling number.

```
change public-unknown-numbering 0                              Page   1 of   2
                    NUMBERING - PUBLIC/UNKNOWN FORMAT
                                             Total
Ext Ext            Trk       CPN            CPN
Len Code           Grp(s)    Prefix         Len
                                                   Total Administered: 3
 5  6              63                        5         Maximum Entries: 9999
```

5.11. Administer Uniform Dial Plan

This section provides a sample AAR routing used for routing calls with dialed digits 63xxx 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 63xxx, 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

 63              5   0                    aar  n
```

5.12. Administer AAR Analysis

Use the "change aar analysis 0" command, and add an entry to specify how to route calls to 63xxx. In the example shown below, calls with digits 63xxx will be routed as an AAR call using route pattern "63" from **Section 5.9**.

```
change aar analysis 0                                          Page   1 of   2
                    AAR DIGIT ANALYSIS TABLE
                         Location:  all        Percent Full:    2

         Dialed          Total     Route    Call   Node ANI
         String          Min  Max  Pattern  Type   Num  Reqd
   63                    5    5    63       aar         n
```

5.13. Administer PSTN 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 "10".

For **Modify Tandem Calling Number**, enter "tandem-cpn-form" to allow for the calling party number from IPC to be modified.

```
change trunk-group 10                                        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: public
 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 6 and routed to trunk group 10, which includes IPC turret users, 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
    CPN            Trk                              Number
 Len Prefix        Grp(s)     Delete   Insert       Format

 5   6             10                  90884        pub-unk
```

6. Configure IPC Alliance MX

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

- Launch One Management System
- Administer line data view
- Administer wire data view
- Administer wire groups

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

6.1. Launch One Management System

Access the One Management System web interface by using the URL "http://ip-address/oneview" in an Internet browser window, where "ip-address" is the IP address of IPC System Center. Log in using the appropriate credentials.

The **Login** screen is displayed. Enter the appropriate credentials. Check **I agree to the terms and conditions**, and click **Login**.

The **License Login** screen is displayed next (not shown). Enter the appropriate password and click **Login**. In the subsequent **Login Information** screen (not shown), click **Continue**.

6.2. Administer Line Data View

The screen below is displayed next, with the **Main Menu** screen in the forefront. Select **LINE CONFIG > Lines > Line Data View**, as shown below.

The **Line Data View** screen is displayed. For **Card LAC**, select the relevant QSIG trunk card number from the drop-down list, in this case "16638". Click **Submit**.

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The **Line Data View** screen is updated with the located **Card LAC** entries.

Scroll to the right, and make sure **Line** is enabled on every entry.

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Solution & Interoperability Test Lab Application Notes
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All-CM6-Q

6.3. Administer Wire Data View

Select **MAIN MENU** from the top menu to display the **Main Menu** screen. Select **LINE CONFIG > Wires > Wire Data View**, as shown below.

The **Wire Data View** screen is displayed. For **Card LAC**, select the relevant QSIG trunk card number from the drop-down list, in this case "16638". Click **Submit**.

The **Wire Data View** screen is updated with the located **Card LAC** entry. Set the **Card Type**, **Wired For**, and **Wire Group** parameters as shown below.

6.4. Administer Wire Groups

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

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

The **Edit Wire Groups** screen is displayed. 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**.

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**.

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:**   "0"
- **PBX_PROVIDER:**   "2"
- **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:**   "0"

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

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

	Param Value	Param Min	Param Max	Param	Param Description	Param Type	Param ID
150	0	0	32	INTERDIGIT_TO	interdigit timeout for enbloc signaling	number	364
151	2	1	7	PBX_PROVIDER	1-7/DEF,AVYA,NRTL,ERISN,MITL,SMNS	enum	365
152	2	1	2	CHANNEL_TIMESl	CHANNEL = 1, TIMESLOT = 2	number	366
153	2	1	5	VM_SERVER	1-5/NONE,AUDIX,NORTEL,OCTEL,DEFA	enum	367
154	1000	200	20000	CFT1_TIMEOUT	Time(msec) to Wait for Response to	number	368
155	6	1	15	MAX_DIVERTS	Max Number of Diverts per Call	number	369
156	3	0	4	FS_ENABLE	0-4/Off, Imm&Busy, RNA, All, Always	number	370
157	200	200	10000	FS_DELAY	Time(msec) to Wait B4 Forward Switcl	number	371
158	2000	200	10000	DDI_TIMEOUT	Time(msec) to Wait for Next Digit	number	372
159	1	1	5	Type of Number	1-5/UNKNOWN,INTL,NAT,LOC,OVERLA	number	373
160	1	1	4	Numbering Plan	1-4/UNKNOWN,E.164,E.163,PRIVATE	number	374
161	1	1	5	LN_RECORDS	1-5/NONE,MX_PBX,MWI,DISC,All	enum	375
162	1	0	1	BEARER_CAP_IE_	0-1/u-Law, A-Law Companding Value	number	603
163	0	0	1	COMPANDING_M	0-1/A-Law, u-Law Actual Companding	number	604
164	0	0	1	Send * and #	OFF = 0, ON = 1	number	662

7. Verification Steps

This section provides 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 63                                               Page   1

                        TRUNK GROUP STATUS

Member   Port    Service State      Mtce Connected Ports
                                    Busy

0063/001 01A1401  in-service/idle     no
0063/002 01A1402  in-service/idle     no
0063/003 01A1403  in-service/idle     no
0063/004 01A1404  in-service/idle     no
0063/005 01A1405  in-service/idle     no
0063/006 01A1406  in-service/idle     no
0063/007 01A1407  in-service/idle     no
0063/008 01A1408  in-service/idle     no
0063/009 01A1409  in-service/idle     no
0063/010 01A1410  in-service/idle     no
0063/011 01A1411  in-service/idle     no
0063/012 01A1412  in-service/idle     no
0063/013 01A1413  in-service/idle     no
0063/014 01A1414  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 63
                     STATUS SIGNALING GROUP

      Group ID: 63                          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: 01A1416          Level 3 State: in-service
```

8. Conclusion

These Application Notes describe the configuration steps required for IPC Alliance MX 16.01 to successfully interoperate with Avaya Aura® Communication Manager 6.0.1 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*^{TM} *Communication Manager*, Document 03-300509, Issue 6.0, Release 6.0, June 2010, available at http://support.avaya.com.

2. *Alliance MX 16.1 Loads and Syncs*, Part Number B02200152, Revision Number 00, upon request to IPC Support.

3. *Alliance MX 16.1 Configuring Call Diversions*, Part Number B02200138, Revision Number 00, upon request to IPC Support.

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