Avaya Solution & Interoperability Test Lab

Application Notes for Lyrix PeopleFind with Avaya Communication Manager using E1 and T1 ISDN-PRI QSIG – Issue 1.0

Abstract

These Application Notes describe the procedures for configuring E1 and T1 ISDN-PRI QSIG integration between Lyrix PeopleFind and Avaya Communication Manager. Lyrix PeopleFind is a speech-enabled communications appliance that allows people, customers, teams, and management to find each other without knowledge of their locations or numbers.

During compliance testing, Lyrix PeopleFind successfully transferred calls to the appropriate Avaya Communication Manager extension, and Lyrix Voice Messaging successfully provided typical voice messaging functionality, including Message Waiting Indicator.

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

1. Introduction

These Application Notes describe a compliance-tested solution comprised of Avaya Communication Manager Release 3.1.2, Lyrix PeopleFind 4.0.104-94. Lyrix PeopleFind consists of two applications, Lyrix Auto Attendant (Lyrix PeopleFind) and Lyrix Voice Messaging. Lyrix PeopleFind is a speech-enabled communications appliance that allows people, customers, teams, and management to find each other without knowledge of their locations or numbers. The user provisions the number they can be reached at via the Administration menu. A caller speaks the user's name, and Lyrix PeopleFind locates and connects the user to the caller.

Figure 1 illustrates the network configuration used to verify the Lyrix solution. The configuration focuses on the interface between Avaya Communication Manager and the Lyrix PeopleFind server. Site A is comprised of a pair of Avaya S8700 Media Servers, an Avaya G650 Media Gateway, the Lyrix PeopleFind Server, Avaya 4600 Series IP Telephones, an Avaya 9630 IP Telephone, an Avaya 6402 Digital Telephone, and an ISDN-PRI trunk to the PSTN. Site B was added to test a trunk between Avaya Communication Managers. Site B is comprised of an Avaya S8300 Media Server with an Avaya G700 Media Gateway, Avaya 4600 Series IP Telephones and an Avaya Digital Telephone. The solution described herein is also extensible to other Avaya Media Servers and Media Gateways. The Lyrix PeopleFind server is connected to the Avaya G650 Media Gateway by an E1 or T1 ISDN-PRI QSIG trunk. An IP trunk connects the two Avaya Communication Manager systems between Site A and Site B.

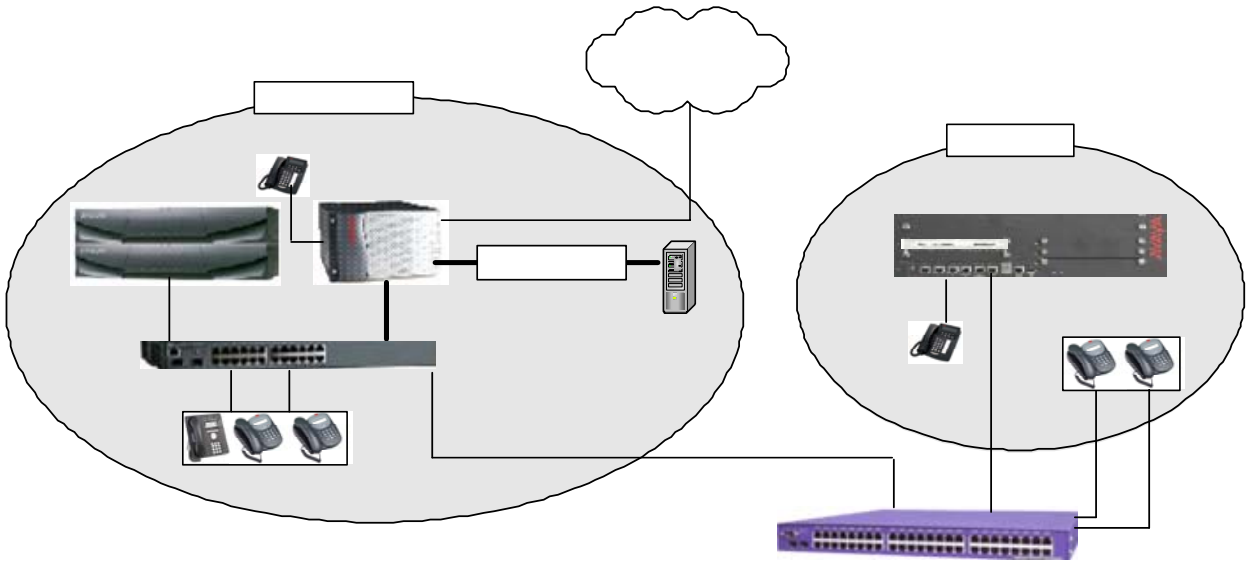

Figure 1: Sample configuration.

2. Equipment and Software Validated

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

Equipment		Software/Firmware
Avaya S8700 Media Servers		Avaya Communication Manager 3.1.2 (R013x.01.2.632.1)
Avaya G650 Media Gateway		-
	TN2312BP IP Server Interface	HW11 FW030
	TN799DP C-LAN Interface	HW1 FW 17
	TN2302AP IP Media Processor	HW20 FW108
	TN464F DS1	000018
Avaya S8300 Media Server with Avaya G700 Media Gateway		Avaya Communication Manager 3.1.2 (R013x.01.2.632.1)
Avaya 4600 Series IP Telephones		
	4620SW (H.323) 4625SW (H.323)	2.6 2.5
Avaya 9600 Series IP Telephone (H.323)		1.1
Avaya 6400 Series Digital Telephones		-
Lyrix PeopleFind		4.0.104-94

3. Configure Avaya Communication Manager

This section describes the steps for configuring E1 ISDN-PRI QSIG and T1 ISDN-PRI QSIG integration, call coverage, and call routing on Avaya Communication Manager. The steps are performed from the Avaya Communication Manager System Access Terminal (SAT) interface.

3.1. E1 Configuration

Before configuring Avaya Communication Manager, the DS1 board must be physically configured for an appropriate mode (T1 or E1). The DS1 board has 24 channels in T1 mode or 32 channels in E1 mode. The default is set to T1 mode. To modify the DS1 board to use it in E1 mode, the dipswitch on the DS1 board must be switched to the 32 channels side.

3.1.1. System Parameters

This section reviews the features that are required for the solution described in these Application Notes. Contact an authorized Avaya account representative to obtain the licenses for required features that are not enabled in the "system-parameters customer-options" form discussed below.

Step	Description
1.	Enter the **display system-parameters customer-options** command. On Page 3 of the system-parameters features form, verify that the Audible Message Waiting field is set to **y**. This license allows Avaya Communication Manager telephones to receive stutter dial tone when a message is waiting. With the Audible Message Waiting license enabled, Audible Message Waiting can also be enabled and disabled on a per-telephone basis.

```
display system-parameters customer-options                      Page   3 of  11
                                OPTIONAL FEATURES

    Abbreviated Dialing Enhanced List? y          Audible Message Waiting? y
        Access Security Gateway (ASG)? n               Authorization Codes? n
        Analog Trunk Incoming Call ID? n Backup Cluster Automatic Takeover? n
 A/D Grp/Sys List Dialing Start at 01? n                        CAS Branch? n
Answer Supervision by Call Classifier? n                          CAS Main? n
                                  ARS? y                 Change COR by FAC? n
                 ARS/AAR Partitioning? n  Computer Telephony Adjunct Links? n
          ARS/AAR Dialing without FAC? y   Cvg Of Calls Redirected Off-net? n
          ASAI Link Core Capabilities? y                       DCS (Basic)? n
          ASAI Link Plus Capabilities? n                 DCS Call Coverage? n
       Async. Transfer Mode (ATM) PNC? n                DCS with Rerouting? n
  Async. Transfer Mode (ATM) Trunking? n
             ATM WAN Spare Processor? n    Digital Loss Plan Modification? n
                                  ATMS? n                          DS1 MSP? n
                  Attendant Vectoring? n            DS1 Echo Cancellation? n
```

Step	Description
2.	On Page 4 of the system-parameters features form, verify that the ISDN-PRI field is set to **y**.

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

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

            IP Attendant Consoles? y
```

Step	Description
3.	On Page 5 of the system-parameters features form, verify that the Private Networking field is set to **y**.

```
display system-parameters customer-options                      Page   5 of  11
                                OPTIONAL FEATURES

                 Multinational Locations? n                  Station and Trunk MSP? n
 Multiple Level Precedence & Preemption? n        Station as Virtual Extension? n
                      Multiple Locations? n

                                                 System Management Data Transfer? n
          Personal Station Access (PSA)? n                    Tenant Partitioning? n
                        Posted Messages? n          Terminal Trans. Init. (TTI)? n
                        PNC Duplication? n                   Time of Day Routing? n
                   Port Network Support? y                  Uniform Dialing Plan? y
                                                  Usage Allocation Enhancements? y
                Processor and System MSP? n          TN2501 VAL Maximum Capacity? y
                      Private Networking? y
                      Processor Ethernet? n                    Wideband Switching? n
                                                                       Wireless? n
                             Remote Office? n
          Restrict Call Forward Off Net? y
                  Secondary Data Module? y
```

Step	Description
4.	On Page 8 of the system-parameters customer-options form, verify that the highlighted fields below are set to **y**.

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

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

5.	Enter the **change system-parameters features** command. On Page 8 of the system-parameters features form, configure the following: • QSIG TSC Extension – enter any unused extension that is valid under the provisioned dial plan. • MWI - Number of Digits Per Voice Mail Subscriber **–** enter the number of digits used for station extensions. • QSIG Path Replacement Extension – enter any unused extension that is valid under the provisioned dial plan.

```
change system-parameters features                               Page   8 of  18
                        FEATURE-RELATED SYSTEM PARAMETERS

ISDN PARAMETERS

 Send Non-ISDN Trunk Group Name as Connected Name? n
 Display Connected Name/Number for ISDN DCS Calls? n
       Send ISDN Trunk Group Name on Tandem Calls? n


                                    QSIG TSC Extension: 22228
 MWI - Number of Digits Per Voice Mail Subscriber: 5

                                 National CPN Prefix:
                          International CPN Prefix:
                         Pass Prefixed CPN to ASAI? n
    Unknown Numbers Considered Internal for AUDIX? n
              USNI Calling Name for Outgoing Calls? n
                Path Replacement with Measurements? n
                   QSIG Path Replacement Extension: 22444
             Path Replace While in Queue/Vectoring? n
```

Step	Description
6.	Enter the **change system-parameters coverage-forwarding** command. Set the Maintain SBA at Principal field to **n** to ensure that when a call redirects to coverage (i.e., to voicemail), the appearance on the covered station is removed. Removal of the appearance prevents a person at the station from bridging onto the covered call (i.e., prevents a person from listening to the call as a voice message is being left).

```
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: 1

COVERAGE
                                        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? n
             QSIG VALU Coverage Overrides QSIG Diversion with Rerouting? n
                                       Station Hunt Before Coverage? n

FORWARDING
                                                   Call Forward Override? y
                                                 Coverage After Forwarding? y
```

3.1.2. Dial Plan

Enter the **display dialplan analysis** command to view the provisioned dial plan. Note the following dialed strings are configured in the dial plan below for the test configuration:

- 3-digit dial access codes (indicated with a **Call Type** of **dac**) beginning with the digit 1 – Trunk Access Codes defined for trunk groups must conform to this format.
- 5-digit extensions (indicated with a **Call Type** of **ext**) beginning with the digit 2 or 4 – station, hunt group, QSIG extensions must conform to this format.

```
display dialplan analysis                                       Page   1 of  12
                           DIAL PLAN ANALYSIS TABLE
                                                          Percent Full:    2

      Dialed  Total  Call      Dialed  Total  Call      Dialed  Total  Call
      String  Length Type      String  Length Type      String  Length Type
        1       3    dac
        2       5    ext
        4       5    ext
```

3.1.3. QSIG Trunk

This section describes the steps for configuring Avaya Communication Manager side of the E1 ISDN-PRI QSIG trunk.

Step	Description
1.	Enter the **list configuration all** command and note the Board Number for the DS1 circuit pack to be configured.

```
list configuration all                                          Page   3

                              SYSTEM CONFIGURATION

Board                                                    Assigned Ports
Number    Board Type              Code     Vintage    u=unassigned t=tti p=psa

01A10     DS1 INTERFACE           TN464F   000018     u  u  u  u  u  u  u  u
                                                      u  u  u  u  u  u  u  u
                                                      u  u  u  u  u  u  u  u
                                                      u  u  u  u  u  u  u  u
```

2.	Enter the **add ds1 x** command, where **x** is the board number of the DS1 circuit pack noted in Step 1. Enter a descriptive Name and set the other highlighted fields below to the values indicated.

```
add ds1 1a10                                                 Page   1 of   1
                                DS1 CIRCUIT PACK

            Location: 01A10                          Name: PRI 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


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

Step	Description
3.	Enter the **add signaling-group s** command, where **s** is an unused signaling group number. Set the highlighted fields below to the values indicated. Note that the Primary D-Channel field is channel 16 on the DS1 circuit pack for an E1.

```
add signaling-group 61                                          Page   1 of   1
                                SIGNALING GROUP

 Group Number: 61                Group Type: isdn-pri
                     Associated Signaling? y           Max number of NCA TSC: 10
                        Primary D-Channel: 01A1016      Max number of CA TSC: 10
                                                      Trunk Group for NCA TSC:
       Trunk Group for Channel Selection:
          Supplementary Service Protocol: b
```

4.	Enter the **add trunk-group t** command, where **t** is an unused trunk group number. On Page 1 of the trunk-group form, enter a descriptive Group Name and enter a TAC that is valid under the provisioned dial plan in Section 3.1.2. Set the other highlighted fields below to the values indicated.

```
add trunk-group 61                                              Page   1 of  21
                                TRUNK GROUP

Group Number: 61                      Group Type: isdn          CDR Reports: y
  Group Name: QSIG-E1                       COR: 1        TN: 1        TAC: 112
   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
```

5.	On Page 2 of the trunk-group form, set the Supplementary Service Protocol field to **b** to indicate that QSIG supplementary services will be provided on this trunk group.

```
add trunk-group 61                                              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                      QSIG Value-Added? n
                                                    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
```

Step	Description
6.	On Page 3 of the trunk-group form, set the highlighted fields below to the values indicated.

```
add trunk-group 61                                          Page   3 of  21
TRUNK FEATURES
          ACA Assignment? n           Measured: none      Wideband Support? 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? n
   Suppress # Outpulsing? n    Format: unk-pvt
 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? n
                Send UCID? n
 Send Codeset 6/7 LAI IE? y                          Ds1 Echo Cancellation? n

    Apply Local Ringback? n

                              Network (Japan) Needs Connect Before Disconnect? n
```

7.	On Page 4 of the trunk-group form, set the highlighted fields below to the values indicated.

```
add trunk-group 61                                          Page   4 of  21
                        QSIG TRUNK GROUP OPTIONS




           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
```

Step	Description
8.	On Page 5 of the trunk-group form, add trunk members by entering: • **xxxxxzz** for **Port**, where **xxxxx** is the board number of the DS1 circuit pack configured in Step 2, and **zz** is a channel in the E1 ISDN-PRI. • the number of the signaling group configured in Step 3 for the Sig Grp field. For the compliance test, channels 1 – 15 and 17 – 31 (not shown) of the E1 ISDN-PRI were added. Channel 16, the signaling channel configured in Step 3, was excluded.

```
add trunk-group 61                                              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: 01A1001  TN464  F                               61
  2: 01A1002  TN464  F                               61
  3: 01A1003  TN464  F                               61
  4: 01A1004  TN464  F                               61
  5: 01A1005  TN464  F                               61
  6: 01A1006  TN464  F                               61
  7: 01A1007  TN464  F                               61
  8: 01A1008  TN464  F                               61
  9: 01A1009  TN464  F                               61
 10: 01A1010  TN464  F                               61
 11: 01A1011  TN464  F                               61
 12: 01A1012  TN464  F                               61
 13: 01A1013  TN464  F                               61
 14: 01A1014  TN464  F                               61
 15: 01A1015  TN464  F                               61
```

9.	Return to Page 3 of the trunk-group form, and set the NCA-TSC Trunk Member field to a trunk member added in Step 8.

```
add trunk-group 61                                              Page   3 of  21
TRUNK FEATURES
         ACA Assignment? n            Measured: none      Wideband Support? n
                                                         Maintenance Tests? y
                                Data Restriction? n     NCA-TSC Trunk Member: 31
                                       Send Name: y      Send Calling Number: y
           Used for DCS? n                              Send EMU Visitor CPN? n
  Suppress # Outpulsing? n    Format: unk-pvt
 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? n
              Send UCID? n
 Send Codeset 6/7 LAI IE? y                           Ds1 Echo Cancellation? n

    Apply Local Ringback? n

                               Network (Japan) Needs Connect Before Disconnect? n
```

Step	Description
10.	Enter the **change signaling-group s** command, where **s** is the number of the signaling group configured in Step 3. Set the Trunk Group for NCA TSC and Trunk Group for Channel Selection field values to the trunk group configured in Steps 4 – 9.
	change signaling-group 61 Page 1 of 1 SIGNALING GROUP Group Number: 61 Group Type: isdn-pri Associated Signaling? y Max number of NCA TSC: 10 Primary D-Channel: 01A1016 Max number of CA TSC: 10 Trunk Group for NCA TSC: 61 Trunk Group for Channel Selection: 61 Supplementary Service Protocol: b
11.	Enter the **change private numbering** command. Ensure that the Network Level field is set to **0** and the Level 2 Code and Level 1 Code field values are blank.
	change private-numbering Page 1 of 1 NUMBERING - PRIVATE FORMAT Network Level: 0 PBX Identifier: Level 2 Code: Deleted Digits: 0 Level 1 Code:
12.	Enter the **change public-unknown numbering l** command, where **l** is an extension length defined in the dial plan (see Section 3.1.2). This table defines the Calling Party Number (CPN) on outbound calls sent to specific ISDN-PRI trunk groups, such as the trunk group connected to Lyrix Enterprise Voice Messaging. Add an entry as follows: • Ext Len and Ext Code – set to the length and to one or more digits consistent with dial plan. • Trk Grp(s) – enter the number of the trunk group configured in Steps 4 – 9. • CPN Prefix – enter any digits to prepend to the extension of the calling station. In the example below, no additional digits are prepended. • CPN Len – enter the total CPN length, comprised of the Ext Len and the CPN Prefix.
	change public-unknown-numbering 5 Page 1 of 2 NUMBERING - PUBLIC/UNKNOWN FORMAT Total Total Ext Ext Trk CPN CPN Ext Ext Trk CPN CPN Len Code Grp(s) Prefix Len Len Code Grp(s) Prefix Len 5 4 61 5

3.1.4. Routing to Lyrix PeopleFind

This section describes the configuration steps for routing calls to the E1 ISDN-PRI QSIG trunk connected to Lyrix PeopleFind and Lyrix Voice Messaging.

Step	Description
1.	Enter the **add hunt-group h** command, where **h** is an unused hunt group number. On Page 1 of the hunt-group form, enter a descriptive Group Name and assign a Group Extension that is valid under the provisioned dial plan.
	`add hunt-group 2` Page 1 of 60 HUNT GROUP Group Number: 2 ACD? n Group Name: Voicemail Queue? n Group Extension: 22999 Vector? n Group Type: ucd-mia Coverage Path: TN: 1 Night Service Destination: COR: 1 MM Early Answer? n Security Code: Local Agent Preference? n ISDN/SIP Caller Display: grp-name
2.	On Page 2 of the hunt-group form, configure the Message Center field to **qsig-mwi**, the Send Reroute Request field to **y** and the Voice Mail Number field to a number to be used for routing calls to Lyrix Voice Messaging. The Lyrix Voice Messaging extension for the compliance test was configured as x**44445**. Calls placed to the Group Extension of this hunt group (i.e., for retrieval of voice messages or management of voice mailboxes) will be routed via AAR. Calls placed to Avaya Communication Manager stations and covered to this hunt group will also be routed via AAR. AAR will use the Voice Mail Number to select a route pattern containing the QSIG trunk group to Lyrix Enterprise Voice Messaging.
	`add hunt-group 2` Page 2 of 60 HUNT GROUP LWC Reception: none AUDIX Name: Message Center: qsig-mwi Send Reroute Request: y Voice Mail Number: 44445 Routing Digits (e.g. AAR/ARS Access Code): Provide Ringback? n TSC per MWI Interrogation? n

Step	Description
3.	Enter the **change aar analysis d** command, where **d** is any digit that is valid under the provisioned dial plan. Enter the whole or a partial Voice Mail Number configured in Step 2 for the Dialed String field. Enter the number of an unused route pattern for the Route Pattern filed. The route pattern will be defined in Step 5. The Call Type field is set to **aar**.

```
change aar analysis 444                                    Page   1 of   2
                            AAR DIGIT ANALYSIS TABLE
                                                          Percent Full:    2

          Dialed           Total     Route    Call   Node  ANI
          String          Min  Max  Pattern   Type   Num   Reqd
     444                  5    5     61        aar          n
```

Step	Description
4.	Enter the **change uniform-dialplan d** command, where **d** is any digit that is valid under the provisioned dial plan. Enter the whole or a partial Voice Mail Number configured in Step 2 for the Dialed String field. Enter the Voice Mail Number's first digit (or first few digits) for the Matching Pattern field. Enter the length of the Voice Mail Number extension for the Len field. The Del field set to **0**, and the Net field is set to **aar**.

```
change uniform-dialplan 4                                  Page   1 of   2
                        UNIFORM DIAL PLAN TABLE
                                                         Percent Full: 0

  Matching                    Insert                 Node
  Pattern        Len Del      Digits     Net Conv Num
 4                5   0                  aar  n
                                            n
                                            n
                                            n
```

Step	Description
5.	Enter the **change route-pattern r** command, where **r** is the number of the route pattern specified in Step 3. Enter the number of the trunk group configured in Section 3.1.3 Steps 4 – 9 for the Grp No field. Assign a Facility Restriction Level to this routing preference for the FRL field. The FRL value 0 is the least restrictive. During compliance testing, the extension, 44444, was configured on the Lyrix PeopleFind, and the extension, 44445, was configured on Lyrix Voice Messaging as the voicemail access number.

```
change route-pattern 61                                          Page   1 of   3
                   Pattern Number: 61   Pattern Name: Lyrix
                                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: 61    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 3 4 W     Request                                  Dgts Format
                                                          Subaddress
 1: y y y y y n  n            rest                                     none
 2: y y y y y n  n            rest                                     none
 3: y y y y y n  n            rest                                     none
 4: y y y y y n  n            rest                                     none
 5: y y y y y n  n            rest                                     none
 6: y y y y y n  n            rest                                     none
```

6.	To allow external/PSTN callers to access Lyrix Voice Messaging (i.e., to retrieve voice messages) ensure that the proper digit treatment is applied to incoming trunk calls. For the compliance test, the incoming called number needs be manipulated to match the hunt group extension. This can be accomplished by using the **change inc-call-handling-trmt trunk-group x**, where **x** is the incoming calls trunk group number.

3.1.5. Coverage Path

This section describes the steps for configuring a coverage path and assigning the coverage path to Avaya Communication Manager stations.

Step	Description
1.	Enter the **add coverage path c** command, where **c** is the number of an unused coverage path, and set the Point1 field to the hunt group configured in Section 3.1.4 Steps 1 – 2. The value for the Point1 field is set to **h2**, which means utilizing Hunt Group 2.

```
add coverage path 99                                          Page   1 of   1
                                COVERAGE PATH

                  Coverage Path Number: 99
                                                 Hunt after Coverage? n
                      Next Path Number:          Linkage

COVERAGE CRITERIA

    Station/Group Status    Inside Call     Outside Call
              Active?             n               n
                Busy?             y               y
       Don't Answer?              y               y         Number of Rings: 3
                 All?             n               n
 DND/SAC/Goto Cover?              y               y
   Holiday Coverage?              n               n

COVERAGE POINTS
    Terminate to Coverage Pts. with Bridged Appearances? n

   Point1: h2        Rng:    Point2:                  Point3:
   Point4:                   Point5:                  Point6:
```

Step	Description
2.	Enter the **change station e** command, where **e** is the extension of a station that is a Lyrix Voice Messaging subscriber. On Page 1 of the station form, set **Coverage Path 1** to the number of the coverage path configured in the previous step.

```
change station 22001                                          Page   1 of   4
                                    STATION

Extension: 22001                          Lock Messages? n           BCC: 0
     Type: 4620                           Security Code: *****        TN: 1
     Port: S00003                         Coverage Path 1: 99        COR: 1
     Name: STA-22001                      Coverage Path 2:           COS: 1
                                          Hunt-to Station:
STATION OPTIONS
              Loss Group: 19              Personalized Ringing Pattern: 1
                                                    Message Lamp Ext: 50001
           Speakerphone: 2-way                   Mute Button Enabled? y
         Display Language: english
 Survivable GK Node Name:
          Survivable COR: internal                  Media Complex Ext:
   Survivable Trunk Dest? y                              IP SoftPhone? y

                                                    IP Video Softphone? y

                                                   Customizable Labels? y
```

3.	On Page 2 of the station form, set the MWI Served User Type field to **qsig-mwi**. If the station does not have a MWI, for example if the station is an analog telephone, then it may be desirable to set the Audible Message Waiting field to **y**.

```
change station 22001                                          Page   2 of   4
                                    STATION
FEATURE OPTIONS
           LWC Reception: spe              Auto Select Any Idle Appearance? n
          LWC Activation? y                        Coverage Msg Retrieval? y
  LWC Log External Calls? n                              Auto Answer: none
            CDR Privacy? n                           Data Restriction? n
   Redirect Notification? y                  Idle Appearance Preference? n
 Per Button Ring Control? n                 Bridged Idle Line Preference? n
   Bridged Call Alerting? n                     Restrict Last Appearance? y
  Active Station Ringing: single          Conf/Trans on Primary Appearance? n
                                                    EMU Login Allowed? n
        H.320 Conversion? n          Per Station CPN - Send Calling Number?
      Service Link Mode: as-needed
        Multimedia Mode: enhanced                 Audible Message Waiting? n
    MWI Served User Type: qsig-mwi              Display Client Redirection? n
                                               Select Last Used Appearance? n
                                                 Coverage After Forwarding? s

 Remote Softphone Emergency Calls: as-on-local Direct IP-IP Audio Connections? y
 Emergency Location Ext: 50001     Always Use? n      IP Audio Hairpinning? y
```

4.	Enter the **save translation** command to save the changes made on Avaya Communication Manager.

3.2. T1 Configuration

Before configuring Avaya Communication Manager, the DS1 board must be physically configured for an appropriate mode (T1 or E1). The DS1 board has 24 channels in T1 mode or 32 channels in E1 mode. The default is set to T1 mode. To modify the DS1 board to use it in T1 mode, the dipswitch on the DS1 board must be switched to the 24 channels side. Steps for the T1 configuration are mostly the same as for the E1 configuration, previously discussed in Section 3.1. This section only describes the steps unique to the T1 configuration.

3.2.1. System Parameters

Refer to Section 3.1.1.

3.2.2. Dial Plan

Refer to Section 3.1.2.

3.2.3. QSIG Trunk

This section describes the steps for configuring the Avaya Communication Manager side of the T1 ISDN-PRI QSIG trunk.

Step	Description
1.	Enter the **list configuration all** command and note the Board Number of the DS1 circuit pack to be configured.

```
list configuration all                                          Page   3

                              SYSTEM CONFIGURATION

Board                                                    Assigned Ports
Number    Board Type              Code     Vintage    u=unassigned t=tti p=psa

01A10     DS1 INTERFACE            TN464F  000018     u  u  u  u  u  u  u  u
                                                      u  u  u  u  u  u  u  u
                                                      u  u  u  u  u  u  u  u
                                                      u  u  u  u  u  u  u  u
```

Step	Description
2.	Enter the **add ds1 xxxxx** command, where **xxxxx** is the board number of the DS1 circuit pack noted in Step 1. Enter a descriptive **Name** and set the other highlighted fields below to the values indicated.

```
display ds1 1a10                                              Page   1 of   2
                                DS1 CIRCUIT PACK

            Location: 01A10                          Name: PRI QSIG
            Bit Rate: 1.544                    Line Coding: b8zs
   Line Compensation: 1                       Framing Mode: esf
      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? n
           Idle Code: 11111111
                              DCP/Analog Bearer Capability: 3.1kHz

                                          T303 Timer(sec): 4


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

3.	Enter the **add signaling-group s** command, where **s** is an unused signaling group number. Set the highlighted fields below to the values indicated. Note that the Primary D-Channel field is set to channel 24of the DS1 circuit pack for the T1 signaling-group.

```
add signaling-group 61                                        Page   1 of   1
                               SIGNALING GROUP

 Group Number: 61                Group Type: isdn-pri
                     Associated Signaling? y          Max number of NCA TSC: 10
                        Primary D-Channel: 01A1024     Max number of CA TSC: 10
                                                    Trunk Group for NCA TSC:
       Trunk Group for Channel Selection:
          Supplementary Service Protocol: b
```

4.	Enter the **add trunk-group t** command, where **t** is an unused trunk group number. On Page 1 of the trunk-group form, enter a descriptive Group Name and enter a TAC that is valid under the provisioned dial plan. Set the other highlighted fields below to the values indicated.

```
add trunk-group 61                                            Page   1 of  21
                               TRUNK GROUP

Group Number: 61                      Group Type: isdn          CDR Reports: y
  Group Name: QSIG-T1                       COR: 1        TN: 1        TAC: 112
   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
```

Step	Description
5.	On Page 2 of the trunk-group form, set the Supplementary Service Protocol field to **b** to indicate that QSIG supplementary services will be provided on this trunk group.

```
add trunk-group 61                                              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                      QSIG Value-Added? n
                                                   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
```

Step	Description
6.	On Page 3 of the trunk-group form, set the highlighted fields below to the values indicated.

```
add trunk-group 61                                              Page   3 of  21
TRUNK FEATURES
          ACA Assignment? n            Measured: none      Wideband Support? 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? n
   Suppress # Outpulsing? n    Format: unk-pvt
 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? n
               Send UCID? n
 Send Codeset 6/7 LAI IE? y                         Ds1 Echo Cancellation? n

    Apply Local Ringback? n

                               Network (Japan) Needs Connect Before Disconnect? n
```

Step	Description
7.	On Page 4 of the trunk-group form, set the highlighted fields below to the values indicated.

```
add trunk-group 61                                              Page   4 of  21
                        QSIG TRUNK GROUP OPTIONS




           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
```

8.	On Page 5 of the trunk-group form, add trunk members by entering: • **xxxxxzz** for **Port**, where **xxxxx** is the board number of the DS1 circuit pack configured in Step 2, and **zz** is a channel in the T1 ISDN-PRI. • the number of the signaling group configured in Step 3 for the Sig Grp field. For the compliance test, channels 1 – 23 of the T1 ISDN-PRI were added (channel 24, the signaling channel configured in Step 3, was excluded). The following screen only shows a partial trunk group member (1 through 15).

```
add trunk-group 61                                              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: 01A1001  TN464  F                               61
  2: 01A1002  TN464  F                               61
  3: 01A1003  TN464  F                               61
  4: 01A1004  TN464  F                               61
  5: 01A1005  TN464  F                               61
  6: 01A1006  TN464  F                               61
  7: 01A1007  TN464  F                               61
  8: 01A1008  TN464  F                               61
  9: 01A1009  TN464  F                               61
 10: 01A1010  TN464  F                               61
 11: 01A1011  TN464  F                               61
 12: 01A1012  TN464  F                               61
 13: 01A1013  TN464  F                               61
 14: 01A1014  TN464  F                               61
 15: 01A1015  TN464  F                               61
```

Step	Description

9.	Return to Page 3 of the trunk-group form, and set the NCA-TSC Trunk Member field to a trunk member added in Step 8.
	
	`add trunk-group 61 Page 3 of 21`
	`TRUNK FEATURES`
	`ACA Assignment? n Measured: none Wideband Support? n`
	`Maintenance Tests? y`
	`Data Restriction? n NCA-TSC Trunk Member: 23`
	`Send Name: y Send Calling Number: y`
	`Used for DCS? n Send EMU Visitor CPN? n`
	`Suppress # Outpulsing? n Format: unk-pvt`
	`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? n`
	`Send UCID? n`
	`Send Codeset 6/7 LAI IE? y Ds1 Echo Cancellation? n`
	
	`Apply Local Ringback? n`
	
	`Network (Japan) Needs Connect Before Disconnect? n`

10.	Enter the **change signaling-group s** command, where **s** is the number of the signaling group configured in Step 3. Set the Trunk Group for NCA TSC and Trunk Group for Channel Selection field values to the trunk group configured in Steps 4 – 9.
	
	`change signaling-group 61 Page 1 of 1`
	`SIGNALING GROUP`
	
	`Group Number: 61 Group Type: isdn-pri`
	`Associated Signaling? y Max number of NCA TSC: 10`
	`Primary D-Channel: 01A1023 Max number of CA TSC: 10`
	`Trunk Group for NCA TSC: 61`
	`Trunk Group for Channel Selection: 61`
	`Supplementary Service Protocol: b`

11.	Enter the **change private numbering** command. Ensure that Network Level is set to **0** and the Level 2 Code and Level 1 Code field values are blank.
	
	`change private-numbering Page 1 of 1`
	
	`NUMBERING - PRIVATE FORMAT`
	
	`Network Level: 0 PBX Identifier:`
	`Level 2 Code: Deleted Digits: 0`
	`Level 1 Code:`

Step	Description
12.	Enter the **change public-unknown numbering l** command, where **l** is an extension length defined in the dial plan (see Section 3.1.2). This table defines the Calling Party Number (CPN) on outbound calls sent to specific ISDN-PRI trunk groups, such as the trunk group connected to Lyrix Enterprise Voice Messaging. Add an entry as follows: • Ext Len and Ext Code – set to the length and one or more digits consistent with dial plan. • Trk Grp(s) – enter the number of the trunk group configured in Steps 4 – 9. • CPN Prefix – enter any digits to prepend to the extension of the calling station. In the example below, no additional digits are prepended. • CPN Len – enter the total CPN length, comprised of the Ext Len and the CPN Prefix.

```
change public-unknown-numbering 5                              Page   1 of   2
                      NUMBERING - PUBLIC/UNKNOWN FORMAT
                                   Total                                  Total
Ext Ext    Trk        CPN            CPN Ext Ext    Trk        CPN          CPN
Len Code   Grp(s)     Prefix          Len Len Code   Grp(s)     Prefix       Len

 5 4        61                           5
```

3.2.4. Routing to Lyrix PeopleFind

Refer to Section 3.1.4

3.2.5. Coverage Path

Refer to Section 3.1.5.

4. Configuring Lyrix PeopleFind

Lyrix configures the PeopleFind application for their end customers. Ensure that the PeopleFind configuration is consistent with the corresponding Avaya Communication Manager configurations described in Section 3.

5. Interoperability Compliance Testing

The interoperability compliance testing focused on verifying E1 and T1 ISDN-PRI QSIG integration between Avaya Communication Manager and Lyrix PeopleFind.

5.1. General Test Approach

The general test approach was to place calls to Lyrix PeopleFind and provide the employee's name. The Lyrix PeopleFind locates the employee by dialing the number at which they can be reached. The employee previously provisioned the number in Lyrix PeopleFind using the Administration menu. The main objectives were to verify that:

- Calls from internal and external callers placed to Lyrix PeopleFind are successfully transferred to the extension selected or entered by the caller.
- Internal and external callers are able to leave voice messages on the Lyrix Voice Messaging server for the correct subscribers.

- Subscribers are able to retrieve their voice messages from the Lyrix Enterprise Voice Messaging server from their own stations, other stations, and external telephones.
- Lyrix Voice Messaging properly turns the Message Waiting Indicator (MWI) of subscriber stations on and off.
- Lyrix PeopleFind components function properly after recovering from failures such as cable disconnects, maintenance activities (busyout/release and reset) on the Avaya TN464F DS1 circuit pack, reset of the Lyrix PeopleFind server, and reset of Avaya Communication Manager.
- Lyrix PeopleFind successfully performs QSIG path replacement after transferring a caller to an Avaya Communication Manager extension.

5.2. Test Results

The feature and functionality test cases passed.

6. Verification Steps

The following steps may be used to verify the configuration:

- From the SAT, enter the command **status signaling-group s**, where **s** is the number of the signaling group configured in Section 3, and verify that the Group State is "in-service"**.**
- From the SAT, enter the command **status trunk-group s**, where **s** is the number of the trunk group configured in Section 3, and verify that the Service States of all trunks are either "in-service/idle" or "in-service/active"**.**
- Place a call to the Lyrix PeopleFind number and provide the employee name. Verify the call is successfully transferred and that the trunks between Avaya Communication Manager and the Lyrix server are released due to QSIG path replacement.
- Place a call to the Lyrix PeopleFind number and verify the Administration Menu.

7. Support

For technical support on Lyrix PeopleFind, contact Lyrix support at:

- Phone: 1-800-982-9900
- E-mail: lyrix@lyrix.com

8. Conclusion

These Application Notes described the procedures for configuring E1 and T1 ISDN-PRI QSIG integration between a Lyrix PeopleFind server and Avaya Communication Manager Release 3.1.2. During compliance testing, Lyrix PeopleFind successfully transferred calls to the appropriate Avaya Communication Manager extension, and provided typical voice messaging functionality, including Message Waiting Indicator.

9. Additional References

Product documentation for Avaya products may be found at http://support.avaya.com.

[1] *Administrator Guide for Avaya Communication Manager*, Issue 2.1, May 2006, Document Number 03-300509

Product documentation for Lyrix products may be requested at http://www.lyrix.com.
[2] *Lyrix PeopleFind Administration Tool*, Version 3.0
[3] *Lyrix QSIG User's Guide*, February 7, 2007

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 Developer*Connection* Program at devconnect@avaya.com.