



## **Avaya Solution & Interoperability Test Lab**

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# **Application Notes for Configuring Avaya Aura™ Communication Manager, Avaya Modular Messaging and Intuity™ AUDIX® LX to Support IPC Alliance MX - Issue 1.1**

### **Abstract**

These Application Notes describe the procedure to configure Avaya Aura™ Communication Manager, Avaya Modular Messaging and Intuity™ AUDIX® LX to support IPC Alliance MX using QSIG (Q Signaling Protocol) Connectivity. The IPC Alliance MX is a voice technology product designed to provide a high resiliency platform for provision of telephony and other associated services to financial traders.

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

# 1. Introduction

The IPC Alliance MX is a voice technology product designed to provide a high resiliency platform for provision of telephony and other associated services to financial traders. The objective of this compliance test is to verify that Alliance MX can interoperate with Avaya when connected by E1-QSIG.

The solution will consist of the following Avaya components:

- Avaya Aura™ Communication Manager
- Avaya Modular Messaging
- Intuity™ AUDIX® LX

The solution will consist of the following IPC components:

- IPC Alliance MX
- IPC System Center
- IPC turrets

The Avaya Aura™ Communication Manager will be connected via an E1-QSIG trunk to the Alliance MX. The Alliance MX provides its users with connectivity to various telephone transport services. Included in the transport services is E1 connectivity for connection within the private telephony network where the signaling protocol is QSIG.

These Application Notes describe the required configuration steps for the Avaya solution components. In accordance with the IPC support policy, IPC configuration procedures are not included in these Application Notes. IPC engineers will be responsible for the installation and maintenance of Alliance MX products.

## 1.1. Interoperability Compliance Testing

The interoperability compliance test focused on the ability for the Alliance MX to interoperate with the Avaya components in the solution. The following is a summary of the feature and serviceability testing that was undertaken:

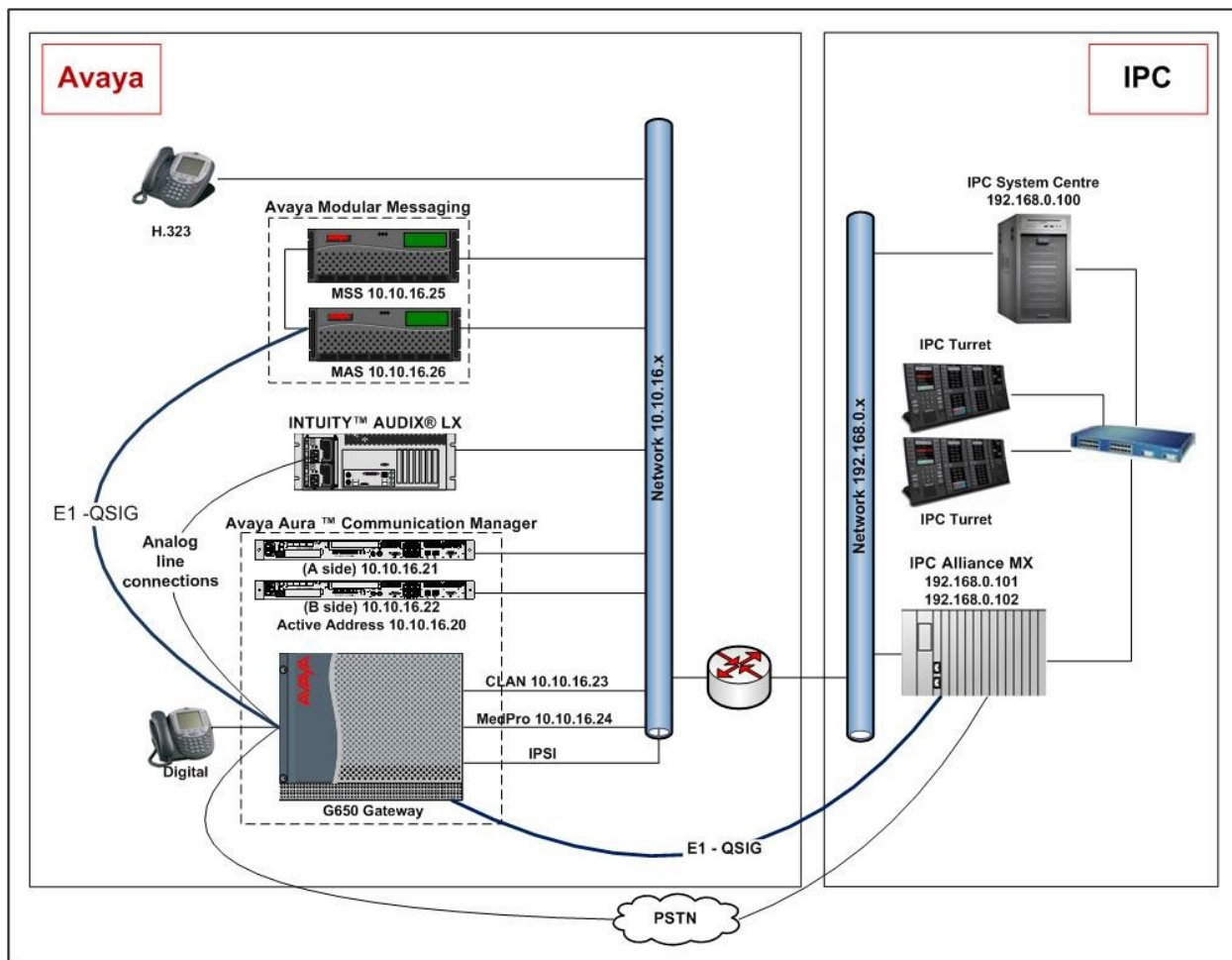
- Basic calls, including calling/connected party name/number display and restriction
- Hold
- Conference
- Call transfer including calling/connected party name/number display and restriction at the primary and secondary party of the transfer
- Call forward with tests for call forward unconditional, call forward busy and call forward no reply
- Multiple call forward including calling/connected party name/number display at the calling and the diverted-to party of the call forward.
- Call forward, loop avoidance
- Mail box access and message retrieval
- Message waiting indicator activation and deactivation

## 1.2. Support

Support for the Avaya products can be obtained from Avaya at [support.avaya.com](http://support.avaya.com).  
Support for the IPC products can be obtained from IPC at [www.ipc.com](http://www.ipc.com).

## 2. Reference Configuration

**Figure 1** illustrates the network topology of the lab environment used for compliance testing.

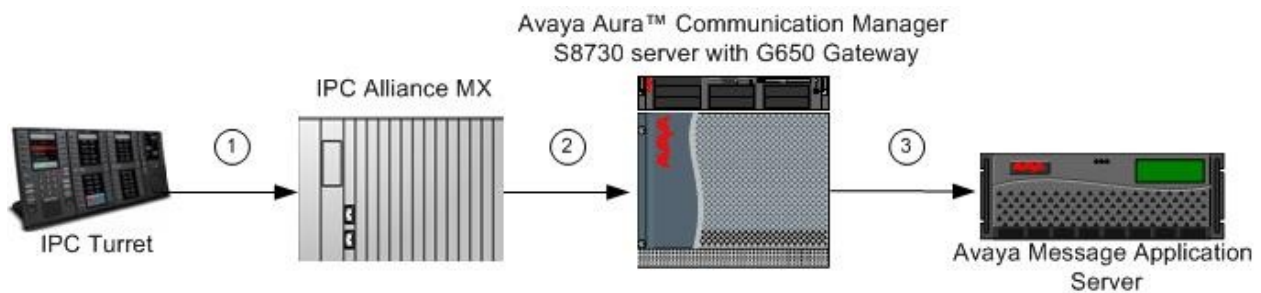


**Figure 1: Test Environment Network Topology**

**Note:** Although the Avaya and IPC IP networks are connected, all voice traffic between Avaya and IPC components use the E1-QSIG connection represented by the blue line toward the bottom of **Figure 1**.

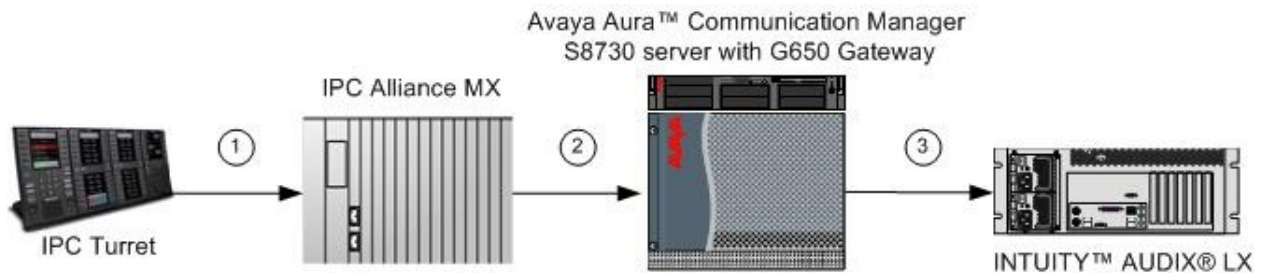
To better understand the logical connections between the two solutions shown in **Figure 1**. Two call flows are described in this section. The first call scenario is an incoming call from an IPC turret to Modular Messaging

1. An IPC turret user dials the Modular Messaging pilot number
2. IPC Alliance MX routes the call via the QSIG trunk to Communication Manager
3. Communication Manager routes the call to Modular Messaging via another QSIG trunk configured to the MAS (Message Application Server) where the call is answered.



The second call scenario is an incoming call from an IPC user to Intuity AUDIX LX

1. An IPC turret user dials the AUDIX hunt group number assigned in the Communication Manager
2. IPC Alliance MX routes the call via the QSIG trunk to Communication Manager
3. Communication Manager uses its hunt group with analog lines to route the call to Intuity AUDIX LX where the call is answered.



### 3. Equipment and Software Validated

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

Equipment	Software
Avaya S8730 Servers	Avaya Aura™ Communication Manager 5.2.1 – S8730-15-02.1.016.4. Service Pack 0 (Access Element)
Avaya G650 Media Gateway - CLAN - TN799DP - MedPro - TN 2602AP	HW16 FW032 HW08 FW048
Avaya S3210 Server	INTUITY™ AUDIX® LX 2.0 Service Pack 2. Patch 07034rf+b
Avaya S3500 Server	Avaya Modular Messaging, Message Application Server 5.2. Patch 8
Avaya S3500 Server	Avaya Modular Messaging, Message Storage Server 5.2. Patch 8
Avaya 9630 IP Telephones	H.323: R3.0
- IPC System Center (Dell R710) - IPC Information Systems Alliance MX - IPC IQ/MAX Turrets	16.00.00 Patch 2

## 4. Configure Avaya Aura™ Communication Manager

This section describes the steps for configuring the Communication Manager. All configurations in the section are administered using the System Access Terminal (SAT). These Application Notes assume that the basic Communication Manager configuration has already been administered. The procedures covered include the following:

- Confirm Necessary Features
- Confirm Special Applications
- Confirm Call forwarding Configuration
- Administer Feature Access Codes
- Configure QSIG Trunk to Alliance MX
- Configure QSIG Trunk to Modular Messaging
- Administer Private Numbering
- Administer Route patterns
- Administer Dialplan Analysis
- Administer Uniform Dialplan
- Administer AAR
- Administer Hunt Group for Modular Messaging
- Administer Coverage Path for Modular Messaging
- Administer integration to AUDIX
- Administer Analog Stations for AUDIX
- Administer Hunt Group for AUDIX
- Administer Coverage Path for AUDIX

## 4.1. Confirm Necessary Features

The license file installed on the system controls the maximum values for these attributes. If a required feature is not enabled or there is insufficient capacity, contact an authorized Avaya sales representative to add additional capacity. Log into the Communication Manager SAT interface and use the **display system-parameters customer-options** command to determine these values. On **Page 3** verify the fields **ARS** and **ARS/AAR Partitioning** are set to **y**.

display system-parameters customer-options		Page	3 of 10
OPTIONAL FEATURES			
Abbreviated Dialing Enhanced List? y	Audible Message Waiting? n		
Access Security Gateway (ASG)? n	Authorization Codes? n		
Analog Trunk Incoming Call ID? n	CAS Branch? n		
A/D Grp/Sys List Dialing Start at 01? n	CAS Main? n		
Answer Supervision by Call Classifier? n	Change COR by FAC? n		
<b>ARS? y</b>	Computer Telephony Adjunct Links? n		
<b>ARS/AAR Partitioning? y</b>	Cvg Of Calls Redirected Off-net? y		
ARS/AAR Dialing without FAC? y	DCS (Basic)? n		
ASAI Link Core Capabilities? n	DCS Call Coverage? n		

On **Page 4** verify the fields **ISDN-PRI** and **IP Trunks** are set to **y**.

display system-parameters customer-options		Page	4 of 10
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	<b>ISDN-PRI? y</b>		
ESS Administration? n	Local Survivable Processor? n		
Extended Cvg/Fwd Admin? y	Malicious Call Trace? y		
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 Call Handling (Basic)? y		
Hospitality (Basic)? y	Multimedia Call Handling (Enhanced)? y		
Hospitality (G3V3 Enhancements)? n	Multimedia IP SIP Trunking? y		
<b>IP Trunks? y</b>			

On **Page 5** verify the fields **Private Networking** and **Uniform Dialing Plan** are set to **y**.

```
display system-parameters customer-options                               Page 5 of 10
                                OPTIONAL FEATURES

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

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

On **Page 8**, verify that **Basic Call Setup**, **Basic Supplementary Services**, **Centralized Attendant**, **Supplementary Services with Rerouting** and **Transfer into QSIG Voice Mail** are all set to **y**.

```
display system-parameters customer-options                               Page 8 of 10
                                QSIG OPTIONAL FEATURES

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

Use the **display system-parameters features** command to verify the following. An attendant console was used during the compliance test to intercept calls to unassigned numbers. On **Page 1** verify **DID/Tie/ISDN/SIP Intercept Treatment** is set to **attd** to make sure these calls are routed to the attendant console.

```
display system-parameters features                                       Page 1 of 18
                                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/Tone on Hold: none
                                Music (or Silence) on Transferred Trunk Calls? no
                                DID/Tie/ISDN/SIP Intercept Treatment: attd
                                Internal Auto-Answer of Attd-Extended/Transferred Calls: transferred
                                Automatic Circuit Assurance (ACA) Enabled? n
```

On **Page 8** confirm **QSIG/ETSI TSC Extension** and **QSIG Path Replacement Extension** fields are configured with valid extensions and that the **MWI – Number of Digits Per Voice Mail Subscriber** is configured with the appropriate extension length.

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

ISDN PARAMETERS

Send Non-ISDN Trunk Group Name as Connected Name? y
Display Connected Name/Number for ISDN DCS Calls? y
    Send ISDN Trunk Group Name on Tandem Calls? y
        Send Custom Messages Through QSIG? y

PARAMETERS FOR CREATING
QSIG SELECTION NUMBERS
Network Level:
Level 2 Code:
Level 1 Code:

QSIG/ETSI TSC Extension: 6666
MWI - Number of Digits Per Voice Mail Subscriber: 4
    Feature Plus Ext:
    National CPN Prefix:
    International CPN Prefix:
        Pass Prefixed CPN: ASAI? n    VDN/Vector? n
Unknown Numbers Considered Internal for AUDIX? y    Maximum Length: 5
    USNI Calling Name for Outgoing Calls? n
    Path Replacement with Measurements? y
QSIG Path Replacement Extension: 6667
Send QSIG Path Replacement Conf. Event to ASAI? y
```

On **Page 9** confirm that **CPN/ANI/ICLID PARAMETERS** have relevant settings configured.

```
display system-parameters features                                     Page 9 of 18
                                FEATURE-RELATED SYSTEM PARAMETERS

CPN/ANI/ICLID PARAMETERS
CPN/ANI/ICLID Replacement for Restricted Calls: restricted
CPN/ANI/ICLID Replacement for Unavailable Calls: restricted
```

On **Page 15** confirm that **Chained Call-forwarding** is set to **y**. This feature enables the ability to alter the number of allowed QSIG re-routes covered in **Section 4.3**.

```
display system-parameters features                                     Page 15 of 18
                                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
```

## 4.2. Special Applications

Use the **display system-parameters special-applications** command. On **Page 3**, verify that **(SA8440) - Unmodified QSIG Reroute Number?** is set to **y**. When a call that arrives on a QSIG trunk is then diverted off net, a facility message is sent back toward the switch that originated the call to allow the originating switch to pick a better route to reach the diverted-to party. The facility message contains the number of the diverted-to party. This number is normally processed by Communication Manager so that the digits in the facility message are not the same digits as those entered when the call forwarding feature was activated. When SA8440 feature is active, the number in the facility message will not be processed by Communication Manager so it will exactly match the number entered when call forwarding was activated. If this option is not set, please contact Avaya sales team or business partner for the appropriate license file.

```
display 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
```

### 4.3. Confirm Call Forwarding Configuration

Use the **display system-parameters coverage-forwarding** command to verify on **Page 2** that the **Maximum Number Of Call Forwarding Hops** is set to a value mutually agreed with IPC. This feature determines the number of QSIG re-route requests the Communication Manager will accept. If this value is lower than the value used by IPC then the Communication Manager will reject any QSIG re-route requests from the Alliance MX once the specified value has been reached. This will force the Alliance MX to trombone calls by forward switching any further diversions.

```
display 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? y
    Activate Answer Detection (Preserves SBA) On Final CCRON Cvg Point? y
    Ignore Network Answer Supervision? n
    Disable call classifier for CCRON over ISDN trunks? n
    Disable call classifier for CCRON over SIP trunks? n

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

### 4.4. Administer Feature Access Codes

Use the **display feature-access-codes** command to verify the following. On **Page 1** confirm that **Auto Alternate Routing (AAR) Access Code** is set to a valid feature access code according to the dial plan.

```
display feature-access-codes                                               Page 1 of 8
FEATURE ACCESS CODE (FAC)
Abbreviated Dialing List1 Access Code:
Abbreviated Dialing List2 Access Code:
Abbreviated Dialing List3 Access Code:
Abbreviated Dial - Prgm Group List Access Code:
Announcement Access Code:
Answer Back Access Code: #3
Attendant Access Code:
Auto Alternate Routing (AAR) Access Code: 1
Auto Route Selection (ARS) - Access Code 1: *7      Access Code 2:
Automatic Callback Activation: *4      Deactivation: #4
Call Forwarding Activation Busy/DA: *2      All: *3      Deactivation: #2
Call Forwarding Enhanced Status:      Act: 622      Deactivation: 623
Call Park Access Code: #5
Call Pickup Access Code: *6
CAS Remote Hold/Answer Hold-Unhold Access Code: #6
```

On **Page 3**, Verify a **Per Call CPN Blocking Code Access Code** is assigned.

```
display feature-access-codes                                     Page 3 of 8
                                FEATURE ACCESS CODE (FAC)
    Leave Word Calling Send A Message:
    Leave Word Calling Cancel A Message:
    Limit Number of Concurrent Calls Activation:                Deactivation:
        Malicious Call Trace Activation:                      Deactivation:
    Meet-me Conference Access Code Change:
    Message Sequence Trace (MST) Disable:

PASTE (Display PBX data on Phone) Access Code:
Personal Station Access (PSA) Associate Code:                Dissociate Code:
Per Call CPN Blocking Code Access Code: *34
Per Call CPN Unblocking Code Access Code: *35
    Posted Messages Activation:                                Deactivation:
    Priority Calling Access Code: *30
    Program Access Code:
```

## 4.5. Configure QSIG Trunk to Alliance MX

This section describes the steps needed to configure a QSIG trunk to Alliance MX on the Communication Manager. In the sample configuration this trunk will be used to transit calls between Avaya and IPC.

### 4.5.1. Administer DS1

Use the **add ds1 n** command where **n** is the board location of the DS1 Circuit Pack that will be used for the QSIG connection between Communication Manager and the Alliance MX. The values used should be agreed with IPC prior to configuration. The screen below shows the values used for the compliance test. Modified fields are shown in bold; all other fields were left as default.

```
add ds1 01a06                                                  Page 1 of 1
                                DS1 CIRCUIT PACK

    Location: 01A06                                           Name: QSIG-IPC
    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
```

### 4.5.2. Administer QSIG Signaling Group

Use the **add signaling-group n** command, where **n** is the number of the signaling-group to create.

- Set the **Group Type** field to be **isdn-pri**
- The **Primary D-Channel** is set to channel 16 of the DS1 circuit pack configured in **Section 4.5.1**
- The **TSC Supplementary Service Protocol** is set to **b**

The **Max number of NCA TSC**, **Trunk Group for NCA TSC** and **Trunk Group for Channel Selection** must all be set after the trunk group has been added by running the command **change signaling-group 3**. The **Max number of NCA TSC** must be at least 2, one for Communication Manager and one for Alliance MX.

```
add signaling-group 3                                     Page 1 of 1
                                     SIGNALING GROUP

Group Number: 3          Group Type: isdn-pri
                          Associated Signaling? y      Max number of NCA TSC: 5
                          Primary D-Channel: 01A0616   Max number of CA TSC: 5
                                              Trunk Group for NCA TSC: 3
                          Trunk Group for Channel Selection: 3
                          TSC Supplementary Service Protocol: b
                                              Network Call Transfer? n
```

### 4.5.3. Administer QSIG Trunk Group

Use the command **add trunk-group n** where **n** is the number of the QSIG trunk group to create. This trunk will be used to connect Communication Manager to Alliance MX.

- Set the **Group Type** field to be **isdn**
- Add a descriptive name into the **Group Name** field
- Set the **TAC** field to a valid dial access code (dac) according to the dial plan configuration
- Set the **Carrier Medium** field to **PRI/BRI**
- Set the **Service Type** field to **tie**

```
add trunk-group 3                                         Page 1 of 21
                                     TRUNK GROUP

Group Number: 3          Group Type: isdn              CDR Reports: y
  Group Name: IPC QSIG      COR: 1                    TN: 1      TAC: 503
  Direction: two-way       Outgoing Display? n        Carrier Medium: PRI/BRI
  Dial Access? y           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
```

On **Page 2** of the trunk group form set the **Supplementary Service Protocol** to **b**. The **Digit Handling (in/out)** field should be set to a value mutually agreed with IPC. In the sample configuration **overlap/enbloc** is used.

<b>add trunk-group 3</b>		<b>Page 2 of 21</b>
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	
<b>Supplementary Service Protocol: b</b>	<b>Digit Handling (in/out): overlap/enbloc</b>	
Digit Treatment:	Digits:	
Trunk Hunt: cyclical		
	Digital Loss Group: 13	
Incoming Calling Number - Delete:	Insert:	Format:
Bit Rate: 1200	Synchronization: async	Duplex: full
Disconnect Supervision - In? y Out? n		
Answer Supervision Timeout: 0		
Administer Timers? n	CONNECT Reliable When Call Leaves ISDN? n	

On **Page 3** of the trunk group form set **Send Name** and **Send Calling Number** to **y**. Set the **Format** field to **private** so that calls will reference the private numbering table. Set the **Replace Restricted Numbers?**, **Replace Unavailable Numbers?** and **Send Connected Number** to **y**. **Modify Reroute Number** is the administrative control for special application SA8440 (covered in **Section 4.2**) and should be set to **n**.

<b>add trunk-group 3</b>		<b>Page 3 of 21</b>
TRUNK FEATURES		
ACA Assignment? n	Measured: none	Wideband Support? n
	Internal Alert? n	Maintenance Tests? y
	Data Restriction? n	NCA-TSC Trunk Member: 1
	<b>Send Name: y</b>	<b>Send Calling Number: y</b>
Used for DCS? n	Hop Dgt? n	Send EMU Visitor CPN? n
Suppress # Outpulsing? n	<b>Format: private</b>	
Outgoing Channel ID Encoding: preferred	UII IE Treatment: service-provider	
	<b>Replace Restricted Numbers? y</b>	
	<b>Replace Unavailable Numbers? y</b>	
	<b>Send Connected Number: y</b>	
	Hold/Unhold Notifications? y	
	Modify Tandem Calling Number? n	
Send UII IE? y		
Send UCID? n		
Send Codeset 6/7 LAI IE? y	Dsl Echo Cancellation? n	
	<b>Modify Reroute Number? n</b>	
Apply Local Ringback? n		
Show ANSWERED BY on Display? y		
	Network (Japan) Needs Connect Before Disconnect? n	
DSN Term? n		

On **Page 4** of the trunk group form set **Diversion by Reroute**, **Path Replacement** and **Display Forwarding Party Name** to **y**.

<b>add trunk-group 3</b>	Page 4 of 21
QSIG TRUNK GROUP OPTIONS	
TSC Method for Auto Callback: drop-if-possible	
<b>Diversion by Reroute? y</b>	
<b>Path Replacement? y</b>	
Path Replacement with Retention? n	
Path Replacement Method: better-route	
SBS? n	
<b>Display Forwarding Party Name? y</b>	
Character Set for QSIG Name: eurofont	
QSIG Value-Added? n	

## 4.6. Configure QSIG trunk to Modular Messaging

This section describes the steps needed to configure an E1-QSIG trunk to Modular Messaging on the Communication Manager. In the sample configuration this trunk will be used to transit calls between the Communication Manager and Modular Messaging.

### 4.6.1. Administer DS1

Use the **add ds1 n** command where **n** is the board location of the DS1 Circuit Pack that will be used for the E1-QSIG connection between Communication Manager and Modular Messaging. The screen below shows the values used with the DS1 configuraiton. Modified fields are shown in bold; all other fields were left as default.

<b>add ds1 01a09</b>	Page 1 of 1
DS1 CIRCUIT PACK	
Location: 01A09	Name: <b>MM_QSIG</b>
<b>Bit Rate: 2.048</b>	Line Coding: <b>hdb3</b>
<b>Signaling Mode: isdn-pri</b>	
<b>Connect: pbx</b>	Interface: <b>peer-master</b>
TN-C7 Long Timers? n	<b>Peer Protocol: Q-SIG</b>
Interworking Message: PROgress	Side: <b>a</b>
<b>Interface Companding: alaw</b>	CRC? <b>y</b>
Idle Code: 11111111	<b>Channel Numbering: timeslot</b>
DCP/Analog Bearer Capability: 3.1kHz	
T303 Timer(sec): 4	
Disable Restarts? n	
Slip Detection? n	Near-end CSU Type: other
Echo Cancellation? n	

### 4.6.2. Administer QSIG Signaling Group

Use the **add signaling-group n** command, where **n** is the number of the signaling-group to create.

- Set the **Group Type** field to be **isdn-pri**
- The **Primary D-Channel** is set to channel 16 of the DS1 circuit pack configured in **Section 4.6.1**
- The **TSC Supplementary Service Protocol** is set to **b**

The **Max number of NCA TSC**, **Trunk Group for NCA TSC** and **Trunk Group for Channel Selection** must all be set after the trunk group has been added by running the command **change signaling-group 3**. The **Max number of NCA TSC** must be at least 2, one for Communication Manager and one for Modular Messaging.

```
add signaling-group 89                                     Page 1 of 1
                                     SIGNALING GROUP
Group Number: 89          Group Type: isdn-pri
                          Associated Signaling? y          Max number of NCA TSC: 10
                          Primary D-Channel: 01A0916        Max number of CA TSC: 10
                                                                Trunk Group for NCA TSC: 89
Trunk Group for Channel Selection: 89
TSC Supplementary Service Protocol: b          Network Call Transfer? n
```

### 4.6.3. Administer QSIG Trunk Group

Use the **add trunk-group n** command where **n** is the number of the QSIG trunk group to create. This trunk will be used to connect Communication Manager to Modular Messaging.

- Set the **Group Type** field to be **isdn**
- Add a descriptive name into the **Group Name** field
- Set the **TAC** field to a valid dial access code (dac) according to the dial plan configuration
- Set the **Carrier Medium** field to **PRI/BRI**
- Set the **Service Type** field to **tie**

```
add trunk-group 89                                         Page 1 of 21
                                     TRUNK GROUP
Group Number: 89          Group Type: isdn                CDR Reports: y
Group Name: MM-QSIG        COR: 1                          TN: 1          TAC: 589
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
```

On **Page 2** of the trunk group form set the **Supplementary Service Protocol** to **b**. The **Digit Handling (in/out)** field should be set to **enbloc/enbloc**.

<b>add trunk-group 89</b>		<b>Page 2 of 21</b>
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	
<b>Supplementary Service Protocol: b</b>	<b>Digit Handling (in/out): enbloc/enbloc</b>	
Trunk Hunt: cyclical		
		Digital Loss Group: 13
Incoming Calling Number - Delete:	Insert:	Format:
Bit Rate: 1200	Synchronization: async	Duplex: full
Disconnect Supervision - In? y Out? n		
Answer Supervision Timeout: 0		
Administer Timers? n	CONNECT Reliable When Call Leaves ISDN? n	

On **Page 3** of the trunk group form set **Send Name** and **Send Calling Number** to **y**. Set the **Format** field to **unk-pvt** so that calls will reference the private numbering table. Set the **Send Connected Number** field to **y**.

<b>add trunk-group 89</b>		<b>Page 3 of 21</b>
TRUNK FEATURES		
ACA Assignment? n	Measured: none	Wideband Support? n
	Internal Alert? n	Maintenance Tests? y
	Data Restriction? n	NCA-TSC Trunk Member: 29
	<b>Send Name: y</b>	<b>Send Calling Number: y</b>
Used for DCS? n	Hop Dgt? n	Send EMU Visitor CPN? n
Suppress # Outpulsing? n	<b>Format: unk-pvt</b>	
Outgoing Channel ID Encoding: preferred	UII IE Treatment: service-provider	
	Replace Restricted Numbers? n	
	Replace Unavailable Numbers? n	
	<b>Send Connected Number: y</b>	
	Hold/Unhold Notifications? y	
Send UII IE? y	Modify Tandem Calling Number? n	
Send UCID? n		
Send Codeset 6/7 LAI IE? y	Dsl Echo Cancellation? n	
Apply Local Ringback? n		
Show ANSWERED BY on Display? y		
	Network (Japan) Needs Connect Before Disconnect? n	
DSN Term? n		

On **Page 4** of the trunk group form set **Diversion by Reroute**, **Path Replacement** and **Display Forwarding Party Name** to **y**.

add trunk-group 89		Page 4 of 21
QSIG TRUNK GROUP OPTIONS		
TSC Method for Auto Callback: drop-if-possible		
Diversion by Reroute? y		
Path Replacement? y		
Path Replacement with Retention? n		
Path Replacement Method: better-route		
SBS? n		
Display Forwarding Party Name? y		
Character Set for QSIG Name: eurofont		
QSIG Value-Added? n		

## 4.7. Administer Private Numbering

To ensure that the caller number is correctly presented, the QSIG trunk groups set up in **Sections 4.5.3 and 4.6.3** reference the private numbering table. Enter the command **change private-numbering 0** and set the following values:

- Set **Ext Len** field to **4**. This is the length of the extensions that will be using the table
- Set **Ext Code** to match the leading digits of extension ranges to be used
- Set **Trk Grp(s)** to **3**. This is the number of the trunk group that will use this entry
- Set **Total Len** to **4** this is the total length of the calling number that will be presented by the trunk group

change private-numbering 0					Page 1 of 2
NUMBERING - PRIVATE FORMAT					
Ext Len	Ext Code	Trk Grp(s)	Private Prefix	Total Len	
4	31	3		4	Total Administered: 4
4	37			4	Maximum Entries: 540
4	66	3		4	

## 4.8. Administer Route Patterns

Use the **change route-pattern n** command to add the route pattern that will direct calls to the IPC QSIG trunk group. AAR will select this route pattern for calls to IPC. In this configuration trunk group **3** is added under the **Grp No** field. Set **TSC** to **y**, **CA TSC Request** to **none** and the **Numbering Format** field to **unk-unk**.

change route-pattern 3													Page 1 of 3							
Pattern Number: 3										Pattern Name: IPC_QSIG										
SCCAN? n										Secure SIP? n										
Grp	FRL	NPA	Pfx	Hop	Toll	No.	Inserted						DCS/	IXC						
No			Mrk	Lmt	List	Del	Digits						QSIG							
															Intw					
1:	3		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	none	rest				unk-unk	none					
2:	y	y	y	y	y	n		n		rest					none					

Use the **change route-pattern n** command to add the route pattern that will direct calls to the Modular Messaging QSIG trunk group. AAR will select this route pattern for calls to Modular Messaging. In this configuration trunk group **89** is added under the **Grp No** field. Set **TSC** to **y**, **CA TSC Request** to **none**, the **Numbering Format** field to **unk-unk** and **LAR** to **rehu**

change route-pattern 89															Page 1 of 3	
Pattern Number: 89										Pattern Name: MM-QSIG						
SCCAN? n										Secure SIP? n						
Grp	FRL	NPA	Pfx	Hop	Toll	No.	Inserted	DCS/ IXC								
No			Mrk	Lmt	List	Del	Digits	QSIG								
								Intw								
1: 89 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 none										rest unk-unk rehu						
2: y y y y y n n										rest none						

## 4.9. Administer Dialplan Analysis

Use the **change dialplan analysis** command to administer the dialplan. In this configuration extensions in the range 31xx are assigned to IPC turrets and are configured as **udp** to send calls via UDP (Uniform Dial Plan). Extensions ranges 66xx, 89xx, 88xx and 79xx are Communication Manager extensions and are configured as **ext**.

change dialplan analysis									Page 1 of 12	
DIAL PLAN ANALYSIS TABLE										
Location: all									Percent Full: 1	
Dialed String	Total Length	Call Type	Dialed String	Total Length	Call Type	Dialed String	Total Length	Call Type		
0	1	ext	663	4	udp					
1	1	fac	<b>79</b>	<b>4</b>	<b>ext</b>					
2	4	udp	<b>88</b>	<b>4</b>	<b>ext</b>					
30	9	udp	<b>89</b>	<b>4</b>	<b>ext</b>					
3005	8	udp	972	5	udp					
<b>31</b>	<b>4</b>	<b>udp</b>	99	4	ext					
33	4	udp	*	2	fac					
37	4	udp	#	2	fac					
38	5	aar								
4	4	aar								
4	5	ext								
5	3	dac								
6	3	fac								
61	4	ext								
<b>66</b>	<b>4</b>	<b>ext</b>								

## 4.10. Administer Uniform Dialplan

Use the **change uniform-dialplan** command to administer UDP routing. It is possible to use UDP to manipulate the dialed digits, but in this configuration UDP is used to direct the matching calls to AAR. In addition to 31xx calls for IPC turrets, extension 8889 is directed to AAR as it is the Modular Messaging pilot number

change uniform-dialplan							
UNIFORM DIAL PLAN TABLE							
Matching Pattern	Len	Del	Insert Digits	Net	Conv	Node	Num
<b>31</b>	<b>4</b>	<b>0</b>		<b>aar</b>	<b>n</b>		
33	4	0		aar	n		
37	4	0		aar	n		
663	4	0		aar	n		
<b>8889</b>	<b>4</b>	<b>0</b>		<b>aar</b>	<b>n</b>		
972	5	0		aar	n		

## 4.11. Administer AAR

Use the **change aar analysis 0** command to specify which route pattern to use based upon the number dialed. In this example, **Route Pattern 3** is used for IPC extensions beginning **31** and **Route Pattern 89** is used for the Modular Messaging pilot number **8889**.

change aar analysis 0							Page	1 of	2
AAR DIGIT ANALYSIS TABLE									
Location: all							Percent Full:	1	
Dialed String	Total Min	Max	Route Pattern	Call Type	Node Num	ANI Req'd			
31	4	4	3	aar		n			
33	4	4	2	aar		n			
37	4	4	7	aar		n			
663	4	4	2	aar		n			
8889	4	4	89	aar		n			
972	5	5	4	aar		n			

## 4.12. Administer Hunt Group for Modular Messaging

Use the **add hunt-group n** command where **n** is the number of the hunt-group to add. Give the hunt group a descriptive name and a valid extension according to the dial plan. The **Group Extension** must be different from the Modular Messaging pilot number. The **group type** must be **ucd-mia**. Set **ISDN/SIP Caller Display** to **mbr-name**.

add hunt-group 89		Page	1 of 60
HUNT GROUP			
Group Number:	89	ACD?	n
Group Name:	MM QSIG	Queue?	n
Group Extension:	8899	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:	mbr-name		

On **Page 2** of the hunt group form set the **Message Center** to be **qsig-mwi**. Set **Send Reroute Request** to **y**. Enter the Modular Messaging pilot number for **Voice Mail Number**. Enter the AAR access code as defined in the feature access codes form (**Section 4.4**) for **Routing Digits**.

add hunt-group 89		Page	2 of 60
HUNT GROUP			
LWC Reception: none		AUDIX Name:	
Message Center: qsig-mwi			
Send Reroute Request: y			
Voice Mail Number: 8889			
Routing Digits (e.g. AAR/ARS Access Code): 1		Provide Ringback? n	
TSC per MWI Interrogation? n			

## 4.13. Administer Coverage Path for Modular Messaging

Use command **change coverage path n** where **n** is the number of the coverage path to administer. Set **Point 1** to **h89** to send covered calls using this coverage path to hunt group 89.

<b>change coverage path 89</b>		Page 1 of 1	
COVERAGE PATH			
Coverage Path Number: 89			
Cvg Enabled for VDN Route-To Party? n		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: 2
All?	n	n	
DND/SAC/Goto Cover?	y	y	
Holiday Coverage?	n	n	
COVERAGE POINTS			
Terminate to Coverage Pts. with Bridged Appearances? n			
Point1: h89	Rng:	Point2:	
Point3:		Point4:	

Use the **change station n** command to add the coverage path to a station where **n** is the extension number of the station to administer. Enter the coverage path number in the **Coverage Path 1** field.

<b>change station 6621</b>		Page 1 of 5	
STATION			
Extension: 6621	Lock Messages? n	BCC: 0	
Type: 9630	Security Code: ****	TN: 1	
Port: S00002	<b>Coverage Path 1: 89</b>	COR: 1	
Name: IP2nd	Coverage Path 2:	COS: 1	
	Hunt-to Station:		

## 4.14. Administer Integration to AUDIX

Communication Manager is connected to AUDIX by a combination of analog stations and links configured against a CLAN.

### 4.14.1. Verify Local Node Number

Enter **display dialplan parameters** and verify a **Local Node Number** has been assigned. If no node number has been assigned enter **1**. This number will be used as the Machine ID in administering MWI in **Section 4.14.5** and in configuring communication-interface processor-channels in **Section 4.14.4**.

```
display dialplan parameters
                                DIAL PLAN PARAMETERS

                                Local Node Number: 1
                                ETA Node Number:
UDP-ARS Calls Considered Offnet? n      ETA Routing Pattern:
                                UDP Extension Search Order: local-extensions-first
```

### 4.14.2. Verify CLAN link number

To verify the link number that will be used when configuring the communication-interface processor-channels, enter the command **display ip-interface n**, where **n** is the board location of the CLAN used to interface with AUDIX. The link number can be seen in the **Ethernet Link** field

```
display ip-interface 1a02
                                IP INTERFACES
                                Type: C-LAN
                                Slot: 01A02
                                Code/Suffix: TN799 D
                                Enable Interface? y
                                VLAN: n
                                Network Region: 1
                                Target socket load and Warning level: 400
                                Receive Buffer TCP Window Size: 8320
                                Allow H.323 Endpoints? y
                                Allow H.248 Gateways? y
                                Gatekeeper Priority: 5

                                IPV4 PARAMETERS
                                Node Name: CLAN1
                                Subnet Mask: /24
                                Gateway Node Name: Gateway

                                Ethernet Link: 1
                                Network uses 1's for Broadcast Addresses? y
                                Page 1 of 3
```

### 4.14.3. Administer AUDIX Node Names

Use the **change node-names audix** command to define a name and **IP Address** for AUDIX

```
change node-names audix
                                AUDIX NODE NAMES

                                Audix Names    IP Address
                                intuition      10 .10 .16 .35
                                . . . . .
```

#### 4.14.4. Administer Communication Processor Channels

Use the **change communication-interface processor-channels** command to administer the required processor channels. In total three processor channels are required for this sample configuration. The following values should be used:

- **Enable** should be set to **y** to activate the channels once the entries have been saved.
- For **Appl.** the first channel should be set to **audix** for the link between Communication Manager and AUDIX. The second channel should be set to **qsig-mwi** for MWI interrogation and the third channel should be set to **gateway** for remote-AUDIX integration.
- **Mode** is always set to **s**.
- **Interface Link** should be set to the CLAN link number verified in **Section 4.14.2**.
- Set **Interface Chan** to **5002** for the **audix** application, for **qsig-mwi** and **gateway** applications a port beginning with **6** must be used.
- **Destination Node** must match the name assigned on the node-name AUDIX screen in **Section 4.14.3**.
- **Destination Port** is always set to **0** for direct connection with AUDIX
- Set **Session Local** to **1** for the **audix** application to match the node number assigned on the dialplan parameters screen in **section 4.14.1**. Set to **2** for the **qsig-mwi** application which will match the **machine ID** in the isnd mwi-prefixes screen (to be configured in the next step). Set to **3** for the **gateway** application. These session numbers will be matched to the configuration of AUDIX system
- **Session Remote** must match the AUDIX number assigned in the configuration of AUDIX system.
- **Mach ID** should be set to **1** for the **audix** application and **2** for the **qsig-mwi** application

change communication-interface processor-channels									Page 1 of 24	
PROCESSOR CHANNEL ASSIGNMENT										
Proc		Gtwy		Interface		Destination		Session		Mach
Chan	Enable	Appl.	To	Mode	Link/Chan	Node	Port	Local/Remote	ID	
1:	y	audix		s	1 5002	intuity	0	1 1	1	
2:	y	qsig-mwi		s	1 6003	intuity	0	2 1	2	
3:	y	gateway		s	1 6001	intuity	0	3 1		
4:	n						0			

#### 4.14.5. Administer MWI

Use command **change isdn mwi-prefixes** to configure support for MWI interrogation. In the **Machine ID** row matching the Session Local and Mach ID assigned in **Section 4.14.4** for the **qsig-mwi** application add an **AUDIX Mach ID**. The **AUDIX Mach ID** should match the Session Local and Mach ID assigned in **Section 4.14.4** for the **audix** application

<b>change isdn mwi-prefixes</b>		Page 1 of 7	
MESSAGE WAITING INDICATION SUBSCRIBER NUMBER PREFIXES			
Send QSIG Message Center ID? n			
Machine	Inserted	Routing	AUDIX
ID	Digits	Digits	Mach ID
1:			
2:		1	
3:			

#### 4.15. Administer Analog stations for AUDIX

Analog stations must be configured on Communication Manager to provide voice connectivity to the AUDIX system. These stations are then used in the hunt group configured to route calls to AUDIX voicemail. To add an analog station use **add station n** command, where **n** is the extension number of the station to add. On **Page 1** of the station form set **Type** to **2500**. In the **Port** field enter the port and board location of the analog card that will be connected to AUDIX. Enter a descriptive **Name** for the station and define an appropriate **COR** and **COS**.

<b>add station 7991</b>		Page 1 of 4	
STATION			
Extension: 7991	Lock Messages? n	BCC: 0	
<b>Type: 2500</b>	Security Code: 1234	TN: 1	
<b>Port: 01A1101</b>	Coverage Path 1:	<b>COR: 11</b>	
<b>Name: Audix Port 1</b>	Coverage Path 2:	<b>COS: 11</b>	
	Hunt-to Station:	Tests? y	
STATION OPTIONS			
XOIP Endpoint type: auto		Time of Day Lock Table:	
Loss Group: 1		Message Waiting Indicator: led	
Off Premises Station? n		Message Lamp Ext: 7991	
Survivable COR: internal			
Survivable Trunk Dest? y			

On **Page 2** set **Switchhook Flash** and **Adjunct Supervision** to **y**. The **Multimedia Mode** is set to **basic** and the **AUDIX Name** should be set to the AUDIX node name defined in **Section 4.14.3**

add station 7991		Page 2 of 4
STATION		
FEATURE OPTIONS		
LWC Reception: audix		
LWC Activation? y		Coverage Msg Retrieval? y
LWC Log External Calls? n		Auto Answer: none
CDR Privacy? n		Data Restriction? n
Redirect Notification? y		Call Waiting Indication: y
Per Button Ring Control? n		Att. Call Waiting Indication: y
Bridged Call Alerting? n		Distinctive Audible Alert? y
<b>Switchhook Flash? y</b>		<b>Adjunct Supervision? y</b>
Ignore Rotary Digits? n		
H.320 Conversion? n	Per Station CPN - Send Calling Number?	
Service Link Mode: as-needed		
<b>Multimedia Mode: basic</b>		
MWI Served User Type:		
<b>AUDIX Name: intuition</b>		
		Coverage After Forwarding? s
		Multimedia Early Answer? n
		Direct IP-IP Audio Connections? y
		IP Audio Hairpinning? n
Emergency Location Ext: 7991		
Precedence Call Waiting? y		

Repeat these steps to configure additional analog stations that will be connected to the AUDIX system and used in the hunt group for AUDIX. In the sample configuration stations 7991, 7992, 7993 and 7994 were added.

## 4.16. Administer Hunt Group for AUDIX

Use the **add hunt-group n** command where **n** is the number of the hunt-group to add. Give the hunt group a descriptive name and a valid extension according to the dial plan. The **group type** must be **ucd-mia**. Set **ISDN/SIP Caller Display** to **grp-name**.

add hunt-group 79		Page 1 of 60
HUNT GROUP		
Group Number: 79		ACD? n
<b>Group Name: Audix</b>		Queue? n
<b>Group Extension: 7999</b>		Vector? n
<b>Group Type: ucd-mia</b>		Coverage Path:
TN: 1	Night Service Destination:	
COR: 1	MM Early Answer? n	
Security Code:	Local Agent Preference? n	
<b>ISDN/SIP Caller Display: grp-name</b>		

On **Page 2** set the **LWC Reception** and **Message Center** fields to **audix**. Set the **AUDIX Name** and **Message Center AUDIX Name** field to the AUDIX node name entered in **Section 4.14.3**. The **Calling Party Number to INTUITY AUDIX** field should be set to y

add hunt-group 79		Page 2 of 60
HUNT GROUP		
LWC Reception: audix	AUDIX Name: intuity	
Message Center: audix		
Message Center AUDIX Name: intuity		
Primary? n		
Calling Party Number to INTUITY AUDIX? y		

On **Page 3** enter the analog stations that are connected to the AUDIX system configured in **Section 4.15**

add hunt-group 79		Page 3 of 60
HUNT GROUP		
Group Number: 79	Group Extension: 7999	Group Type: ucd-mia
Member Range Allowed: 1 - 1500	Administered Members (min/max): 1 /4	
Total Administered Members: 4		
GROUP MEMBER ASSIGNMENTS		
Ext	Name(19 characters)	Ext Name(19 characters)
1: 7991		14:
2: 7992		15:
3: 7993		16:
4: 7994		17:

## 4.17. Administer Coverage Path for AUDIX

Use command **change coverage path n** where **n** is the number of the coverage path to administer. Set **Point 1** to **h79** to send covered calls using this coverage path to hunt group 79.

change coverage path 79		Page 1 of 1
COVERAGE PATH		
Coverage Path Number: 79		
Cvg Enabled for VDN Route-To Party? n	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
All?	n	n
DND/SAC/Goto Cover?	y	y
Holiday Coverage?	n	n
COVERAGE POINTS		
Terminate to Coverage Pts. with Bridged Appearances? n		
Point1: h79	Rng:	Point2:
Point3:		Point4:

Use the **change station n** command to add the coverage path to a station where **n** is the extension number of the station to administer. Enter the coverage path number in the **Coverage Path 1** field.

<b>change station 6622</b>		Page 1 of 5
STATION		
Extension: 6622	Lock Messages? n	BCC: 0
Type: 9630	Security Code: ****	TN: 1
Port: S00003	<b>Coverage Path 1: 79</b>	COR: 1
Name: IP3rd	Coverage Path 2:	COS: 1
	Hunt-to Station:	

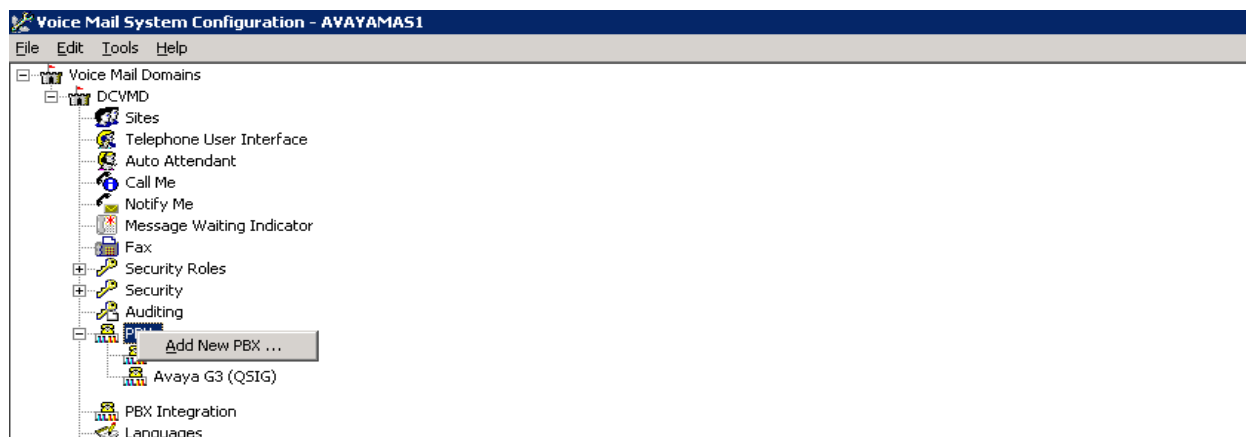
## 5. Configure Avaya Modular Messaging

This section provides the procedures for configuring Modular Messaging. The procedures include the following areas:

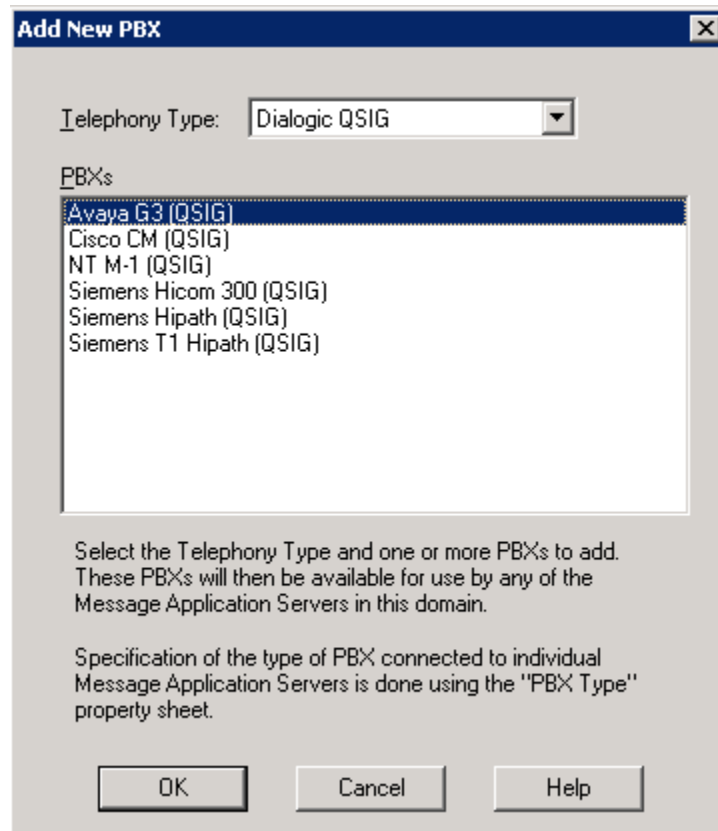
- Configure Avaya Message Application Server
- Configure Avaya Message Storage Server

### 5.1. Configure Avaya Message Application Server

Select **Start → Programs → Avaya Modular Messaging → Voice Mail System Configuration – AVAYAMAS1**. Expand **Voice Mail Domains** and the administered domain name (**DCVMD** in the screenshot below). Right-click on **PBXs** and select **Add New PBX ...**

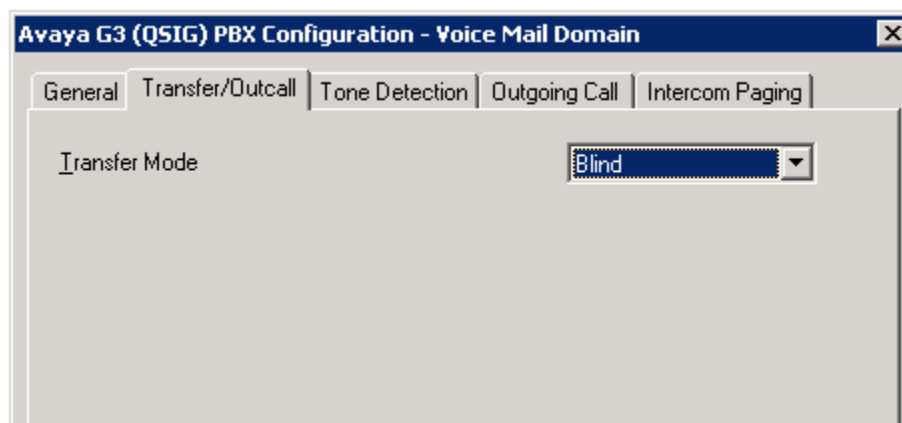


On the **Add New PBX** screen, select **Dialogic QSIG** from the **Telephony Type** drop down box, then select **Avaya G3 (QSIG)** from the **PBXs** box. Select **OK** when completed.



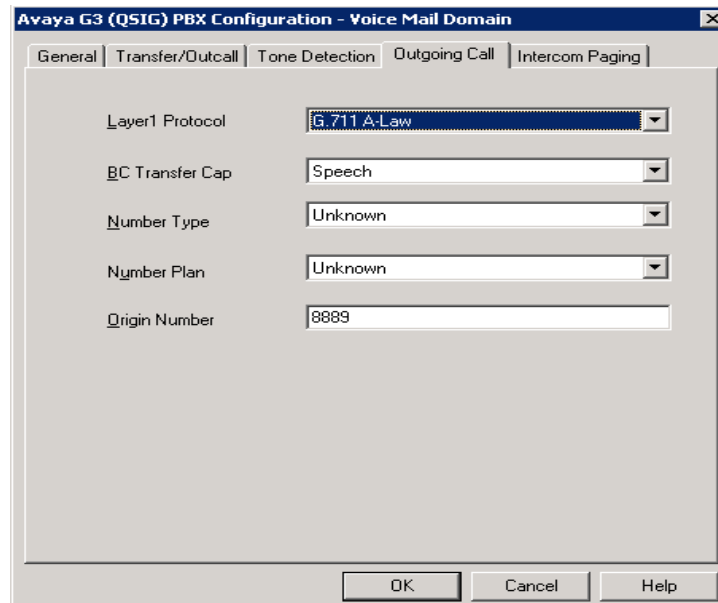
O

Select the **Transfer/Outcall** tab, in the **Transfer Mode** field select **Blind** from the drop down menu.

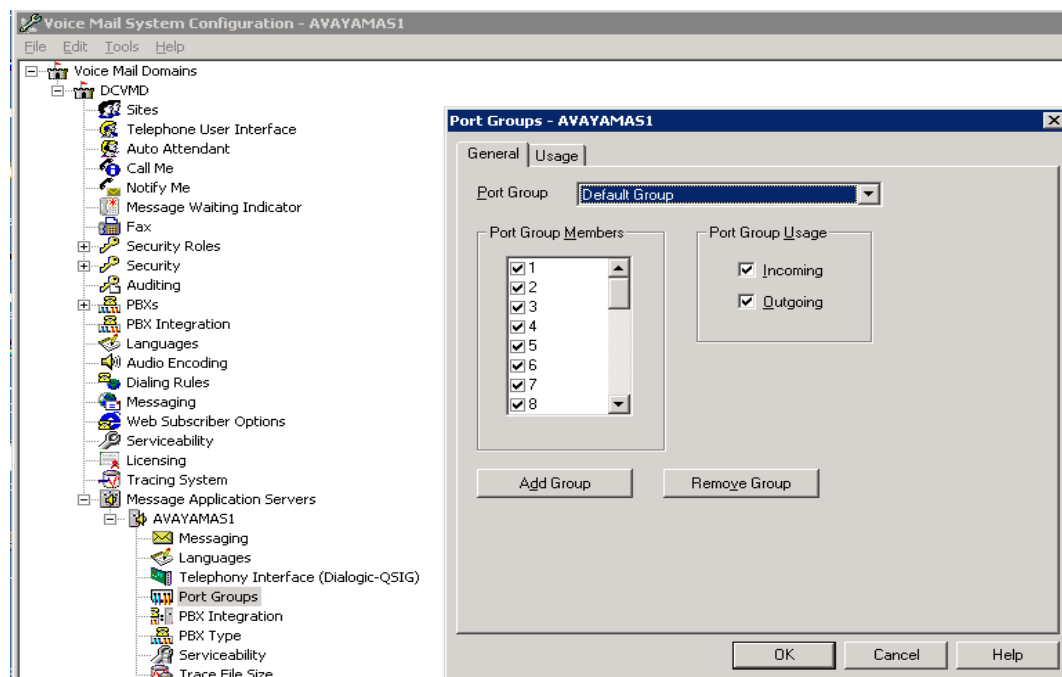


Select the **Outgoing Call** tab and enter the following fields.

- In the **layer 1 Protocol** select **G.711 A-Law**
- In the **BC Transfer Cap** field select **Speech**
- In the **Origin Number** field enter Modular Messaging pilot number



On the **Voice Mail System Configuration – AVAYAMAS1** screen, expand **Message Application Servers** and expand the appropriate MAS server. Double click **Port Groups** and confirm all the **Port Group Members** and both the **Incoming** and **Outgoing** check boxes are selected.



## 5.2. Configure Avaya Message Storage Server

From a Web browser, navigate to <http://<ip-addr>> where <ip-addr> is the IP address of the Avaya MSS. After logging in with an appropriate login and password, the main page appears. (not shown). Select **Messaging Administration** → **Classes-of-Service** from the left panel. From the **Manage Classes-of-Service** screen that is presented, select a Class of Service (COS) that will be used by subscribers using IPC turrets (in this example **class00** is selected). Click **Edit the Selected COS** button.

The screenshot shows the 'Manage Classes-of-Service' web interface. The left navigation pane includes the following menu items:

- Help Log Off
- Messaging Administration**
  - Subscriber Management
  - Activity Log Configuration
  - Messaging Attributes
  - Classes-of-Service
  - Enhanced-Lists
  - Sending Restrictions
  - System Administration
  - Request Remote Update
  - Networked Machines
  - Trusted Servers
- Server Administration**
  - Configure Using DCT
  - TCP/IP Network Configuration
  - External Hosts
  - MAS Host Setup
  - MAS Host Send
  - Windows Domain Setup
  - Console Reboot Option
  - Date/Time/NTP Server
  - Syslog Server
  - Modem/Terminal Display
  - Modem/Terminal Configuration
  - Modem/Terminal Removal
  - TCP/IP Service Settings
- IMAP/SMTP Administration**
  - SMTP Options
  - Mail Options
  - IMAP/SMTP Status
- Server Information**
  - Server Status
  - Alarm Summary
  - Disk Information
  - Server Notes
  - CMOS Settings
  - RAID Status
  - Rebuild RAID Status
  - Reboot Interval
- Utilities**
  - Rebuild RAID 1 Array
  - CD-ROM Mount

The main content area is titled 'Manage Classes-of-Service'. It displays the following information:

Server Name: 10.10.16.25      Number of Classes-of-Service: 512

COS Name	COS Number
class00	0
class01	1
class02	2
class03	3
class04	4
class05	5
class06	6
class07	7
ELA	8
class09	9
class10	10
class11	11
class12	12
class13	13
class14	14

Below the table, there are three buttons:

- Sort By Name
- Display Report of COSs
- Edit the Selected COS

In the **Edit a Class-of-Service** screen that follows, select **yes** from the drop-down menu for the **Message Waiting Indication Allowed** field. Scroll down to the bottom of the screen and click the **Save** button.

## Edit a Class-of-Service

Class of Service Number: 0		<a href="#">Class of Service Name</a> class00	
MESSAGE RETENTION SETTINGS			
<a href="#">Retain New Messages (days)</a>	<input type="checkbox"/> Forever 45	<a href="#">Retain Saved Messages (days)</a>	<input type="checkbox"/> Forever 45
<a href="#">Retain Filed Messages (days)</a>	<input type="checkbox"/> Forever 45		
MAILBOX AND MESSAGE SIZES			
<a href="#">Maximum Mailbox Size</a>	36 Minutes	<a href="#">Maximum Call Answer Message</a>	5 Minutes
<a href="#">Maximum Voice Mail Message</a>	5 Minutes		
SUBSCRIBER FEATURES and SERVICES			
<a href="#">Time Zone</a>	Use System Timezone		
<a href="#">Message Waiting Indication Allowed</a>	yes	<a href="#">Call Me Allowed</a>	no
<a href="#">Find Me Allowed</a>	yes	<a href="#">Notify Me Allowed</a>	no
<a href="#">Call Handling</a>	yes	<a href="#">Call Screening</a>	yes
<a href="#">Outbound Fax Calls</a>	no	<a href="#">Extended Absence Greeting Allowed</a>	yes
<a href="#">Inbound Fax</a>	yes	<a href="#">Aria TUI Date &amp; Time Playback</a>	Never
<a href="#">Page via PBX</a>	no	<a href="#">Record Mailbox Greetings</a>	yes
<a href="#">Caller Application Announcement Recording</a>	no	<a href="#">Caller Application</a>	(none)
<a href="#">Telephone User Interface</a>	MM Aria	<a href="#">Restrict Client Access</a>	yes
<a href="#">Personal Operator Configuration</a>	no	<a href="#">Unsent Message Allowed</a>	no
<a href="#">Allow message after EAG</a>	Always		
<input type="button" value="Back"/> <input type="button" value="Save"/> <input type="button" value="Help"/>			

Select **Messaging Administration** → **Subscriber Management** in the left pane. The **Manage Subscribers** page appears, as shown below. In the **Local Subscriber Mailbox Number** field, enter the extension of the desired IPC turret and click the **Add or Edit** button.

In the **Add Local Subscriber** screen, fill in the required fields. In this example, IPC extension 3109 is used:

- For **Last Name** and **First Name** fields enter values appropriate for the user
- **Password**: Enter a default password for accessing the subscriber's mailbox, from one to 15 digits
- **Mailbox Number**: Enter a number, from 2 to 10 digits in length, which uniquely identifies the mailbox for the purpose of logging in or addressing messages. It must be within the range of Mailbox Numbers assigned to this system and be a valid length on the local machine
- **Numeric Address**: Enter a unique address in the voice mail network
- **Class of Service**: Select the Class of Service
- **VoiceMail Enabled**: verify it is set to yes

Repeat this step for all IPC extensions.

To verify that mailboxes have been created, select **Messaging Administration** → **Subscriber Management**, click the **Manage** button to the right of the **Local Subscribers** entry. In the resulting **Manage Local Subscribers** screen that is presented (see below), verify that the mailboxes created appear in the list of subscribers.

ASCII Name	Mailbox Number	Numeric Address	COS	CID	Subscriber Name
103, 3	3103	3103	0	1	103, 3
3106, Q-SIG	3106	3106	0	1	3106, Q-SIG
6610, Station	6610	6610	0	1	6610, Station
6630, SIP	6630	6630	0	1	6630, SIP
7200, PSTN	7200	7200	0	1	7200, PSTN
IP Station, second	6621	6621	0	1	1 hundred, 6
IP, Station	6620	6620	0	1	Station, IP
Leah, Princess	1601	1601	0	1	Leah, Princess
Mailbox, Pilot	8889	8889	0	1	Mailbox, Pilot
REM CM, Station	3701	3701	0	1	REM CM, Station
SIP, IPC Extension	3301	3301	0	1	SIP, IPC Extension
Solo, Hans	1602	1602	0	1	Solo, Hans
Station, IPC	3109	3109	0	1	Station, IPC
Station, IPC	3308	3308	0	1	Station, IPC
Station, IPC	3309	3309	0	1	Station, IPC

## 6. AUDIX Configuration

This section provides the procedures for configuring Intuity AUDIX LX. It is assumed that the basic install of Intuity AUDIX LX has already been completed. The procedures covered in this section include the following:

- Logging on to AUDIX
- Configure AUDIX system links
- Add AUDIX subscribers
- Configure AUDIX COS

### 6.1. Logging into AUDIX.

From a Web browser, navigate to **http://<ip-addr>** where **<ip-addr>** is the IP address of the AUDIX. After logging in with an appropriate login and password, the main page appears.

## 6.2. Configure AUDIX System Links

Select **Switch Administration** → **Switch Link Administration**. Ensure that the **Extension Length** field is set to the correct length. Three switch links will need to be added, one for each communication processor channel application configured in **Section 4.14.4**. Click **Add** three times to add three switch link rows. The Switch number selected should match the Session Local field as configured in **Section 4.14.4**. In each case the **IP Address/Host Name** fields should be set as the IP address of the connecting CLAN. The TCP port configured should match the port assigned to the interface channel in **Section 4.14.4**.

Switch Link Administration

Switch Link Type: LAN Host Switch Number: 1 Country: OTHER

Extension Length: 4 Audix Number: 1 Switch: DEFINITY OVERLAN

Row #	Select to Delete	Switch Number	IP Address/Host Name	TCP Port	Row #	Select to Delete	Switch Number	IP Address/Host Name	TCP Port
1	<input type="checkbox"/>	1	10.10.16.23	5002	2	<input type="checkbox"/>	2	10.10.16.23	6003
3	<input type="checkbox"/>	3	10.10.16.23	6001					

Add Update Help

### 6.3. Add Subscribers

From the administration web interface navigate to **Messaging Administration → Messaging**. In the resulting emulation window enter the appropriate login credentials and run the command **add subscriber n**. Enter a descriptive **Name** and assign the appropriate **COS (Class of Service)**. The **Switch Number** used for Avaya subscribers is **1**.

audix	Active	Alarms:	WA	Logins: 1
add subscriber 6623				Page 1 of 2
SUBSCRIBER				
Name: <u>Avaya,Station</u>		Locked? <u>n</u>		
Extension: <u>6623</u>		Password: _____		
COS: <u>class00</u>		Miscellaneous 1: _____		
Switch Number: <u>1</u>		Miscellaneous 2: _____		
Community ID: <u>1</u>		Miscellaneous 3: _____		
Secondary Ext: _____		Miscellaneous 4: _____		
Account Code: _____		Covering Extension: _____		
		Broadcast Mailbox? <u>_</u>		
Email Address: <u>6623@audix.</u>				
Press [ENTER] to execute or press [CANCEL] to abort				
enter command: add subscriber 6623				
Cancel	Refresh	Enter	ClearFld	Help Choices NextPage PrevPage

To add a subscriber for an IPC user repeat the previous step. The **Switch Number** used for IPC subscribers is **2**

audix	Active	Alarms: wA	Logins: 1
add subscriber 3109		Page 1 of 2	
SUBSCRIBER			
Name: IPC,Station		Locked? n	
Extension: 3109		Password: <input type="password"/>	
COS: class00		Miscellaneous 1: <input type="text"/>	
Switch Number: 2		Miscellaneous 2: <input type="text"/>	
Community ID: 1		Miscellaneous 3: <input type="text"/>	
Secondary Ext: <input type="text"/>		Miscellaneous 4: <input type="text"/>	
Account Code: <input type="text"/>		Covering Extension: <input type="text"/>	
		Broadcast Mailbox? <input type="text"/>	
Email Address: 3109@audix.			
Press [ENTER] to execute or press [CANCEL] to abort			
enter command: add subscriber 3109			
Cancel	Refresh	Enter	ClearFld
Help	Choices	NextPage	PrevPage

## 6.4. Administer Class of Service

Run the command **change cos n** where **n** is the number of the class of service assigned to the previously added subscribers. Set **Outcalling** to **y**. All other fields can remain as default.

audix	Active	Alarms: none	Logins: 1
change cos 0			Page 1 of 2
CLASS OF SERVICE			
Name: <u>class00</u>	COS Number: 0	Modified? y	
Addressing Format: <u>extension</u>			
Login Announcement Set: <u>System</u>			
System Multilingual is ON		Call Answer Primary Annc. Set: <u>System</u>	
Call Answer Language Choice? <u>n</u>		Call Answer Secondary Annc. Set: <u>System</u>	
PERMISSIONS			
Type: <u>call-answer</u>	Announcement Control? <u>n</u>	Outcalling? <u>y</u>	
Priority Messages? <u>y</u>	Broadcast: <u>none</u>	IMAPI Access? <u>y</u>	
IMAPI Message Transfer? <u>y</u>	Fax Creation? <u>y</u>	Trusted Server Access? <u>y</u>	
enter command: change cos 0			
Cancel	Refresh	Enter	ClearFld
Help	Choices	NextPage	PrevPage

## 7. General Test Approach and Test Results

A simulated enterprise site using an Avaya IP telephony environment was connected to IPC via an E1-QSIG connection provisioned between Communication Manager and IPC's Alliance MX. The compliance test included the following:

- Incoming calls to the Avaya telephones: calls were made from IPC turrets to Avaya H.323, digital and analog telephones.
- Outgoing calls from the Avaya telephones: calls were made from Avaya H.323, digital and analog telephones to IPC turrets
- DTMF transmission with successful Voice Mail navigation
- User features such as hold and resume, transfer, conference, call forwarding, etc.
- Caller ID Presentation and Caller ID Restriction.
- Voicemail coverage and retrieval for endpoints at the enterprise sites.

Testing of the sample configuration was completed with successful results for the IPC QSIG architecture.

## 8. Verification Steps

The following steps can be used to verify that the required configuration has been correctly administered to support IPC QSIG architecture. To verify that any of the trunk groups are up, from the Communication Manager SAT use the **status trunk n** command, where **n** is the number of the trunk group (refer to **Sections 4.5.3 and 4.6.3** for trunk details). Verify for each trunk, that the **Service State** shows **in-service/idle**.

TRUNK GROUP STATUS			
Member	Port	Service State	Mtce Connected Ports Busy
0003/001	01A0601	in-service/idle	no
0003/002	01A0602	in-service/idle	no
0003/003	01A0603	in-service/idle	no

To ensure that the links to AUDIX are up and in service, from the AUDIX administration web interface navigate to **Diagnostics → Link Diagnostics** and confirm that both **Session Status** and **Link Status** for each link configured shows as **UP**

The screenshot shows the AUDIX administration web interface. The top bar indicates the server IP is 10.10.16.35. The left sidebar contains navigation options: Help, Log Off, Restore, Software Management, Web Server, Reports, System Evaluation, IMAP/SMTP Traffic, TCP/IP Packet Statistics, Diagnostics, Link Diagnostics, SMTP Connection, Session Layer Diagnostics, POP3 Connection, IMAP4 Connection, Mail Delivery, Ping Another Server, Name Server Lookup, Software Management, and Messaging Software Display. The main content area is titled 'Link Diagnostics' and includes a form with 'Switch Link Type' (LAN), 'Country' (OTHER), and 'Switch' (DEFINITY OVERLAN). Below the form is a table with columns: Row #, Switch Number, Link Status, Session Status, Row #, Switch Number, Link Status, Session Status. The table contains three rows, all with 'UP' status. At the bottom of the table are buttons: Reset Link, Check Link, Busy Out, Release, and Help.

Row #	Switch Number	Link Status	Session Status	Row #	Switch Number	Link Status	Session Status
1	1	UP	UP	2	2	UP	UP
3	3	UP	UP				

## 9. Conclusion

These Application Notes describe the steps required to configure the Avaya telephony and voice messaging components to successfully interoperate with IPC Alliance MX using E1-QSIG as the transport method between the Avaya and IPC environments. The configured and verified Avaya components include Avaya Aura<sup>TM</sup> Communication Manager, Avaya Modular Messaging, and Intuity<sup>TM</sup> AUDIX® LX.

## 10. Additional References

This section references the Avaya documentation relevant to these Application Notes. Additional Avaya product documentation is available at <http://support.avaya.com>.

- [1] *Administering Avaya Aura™ Communication Manager*, 04-May-2009, Document Number 03-300509
- [2] *Avaya Aura™ Communication Manager Special Application Features*, 10-Nov-2009
- [3] *Modular Messaging Admin Guide Release 5.2 with Avaya MSS*, 29-Nov-2009
- [4] *INTUITY AUDIX LX Release 2.0 Documentation CD*, 08-May-2007

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