



Avaya Solution & Interoperability Test Lab

Application Notes for EAL Voice Archiver Voice Recorder with Avaya Aura™ Communication Manager and Avaya Aura™ Application Enablement Services – Issue 1.0

Abstract

These Application Notes describe the configuration steps required for EAL Voice Archiver voice recorder to interoperate with Avaya Aura™ Communication Manager using Avaya Aura™ Application Enablement Services. EAL Voice Archiver voice recorder is a call recording solution. In the compliance testing, EAL Voice Archiver voice recorder used the Telephony Services Application Programming Interface from Avaya Aura™ Application Enablement Services to monitor stations on Avaya Aura™ Communication Manager. This solution also used the Service Observe feature via the Avaya Aura™ Application Enablement Services Device, Media, and Call Control interface to capture the media associated with the monitored stations for call recording.

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

1. Introduction

These Application Notes describe the configuration used to enable the EAL Voice Archiver voice recorder to interoperate with Avaya Aura™ Communication Manager and Avaya Aura™ Application Enablement Services. The Voice Archiver voice recorder offers various methods of voice recording. For the purpose of the tests described by these Application Notes, the Avaya Aura™ Communication Manager Service Observe feature was used.

Voice Archiver can be configured to monitor specific local endpoints and record calls made to or from those endpoints. Calls between or among local endpoints which are each monitored produce multiple voice files: one for each monitored endpoint.

The Voice Archiver product functions as follows for calls involving bridged appearances and hunt groups:

1. Calls answered by bridged appearances are not recorded.
2. Calls made by bridged appearances show the number of the bridged endpoint as the caller, but will only be recorded if the calling endpoint has been configured to be monitored.
3. Calls to hunt groups show the number of the answering device not that of the hunt group.

1.1. Interoperability Compliance Testing

The following tests were performed as part of the compliance testing:

- The following test scenarios were used to test the various Voice Archiver features:
 - Basic call
 - Hold/retrieve
 - Transfer / Blind transfer
 - Conferencing
 - Hunt group calls
 - Calls to/from bridged appearances
- Voice Archiver's robustness was tested by verifying its ability to recover from interruptions to its external connections including:
 - The LAN connection between and Voice Archiver and the network
 - The connection of the PBX to the network
- Voice Archiver's robustness was further tested by verifying its ability to recover from power interruptions to the following components:
 - The Voice Archiver server
 - The Avaya Aura™ Communication Manager Server to which the Voice Archiver is attached.

1.2. Support

Support for Voice Archiver is available at: service@eal.nl

2. Reference Configuration

The following diagram shows the configuration used for compliance testing.

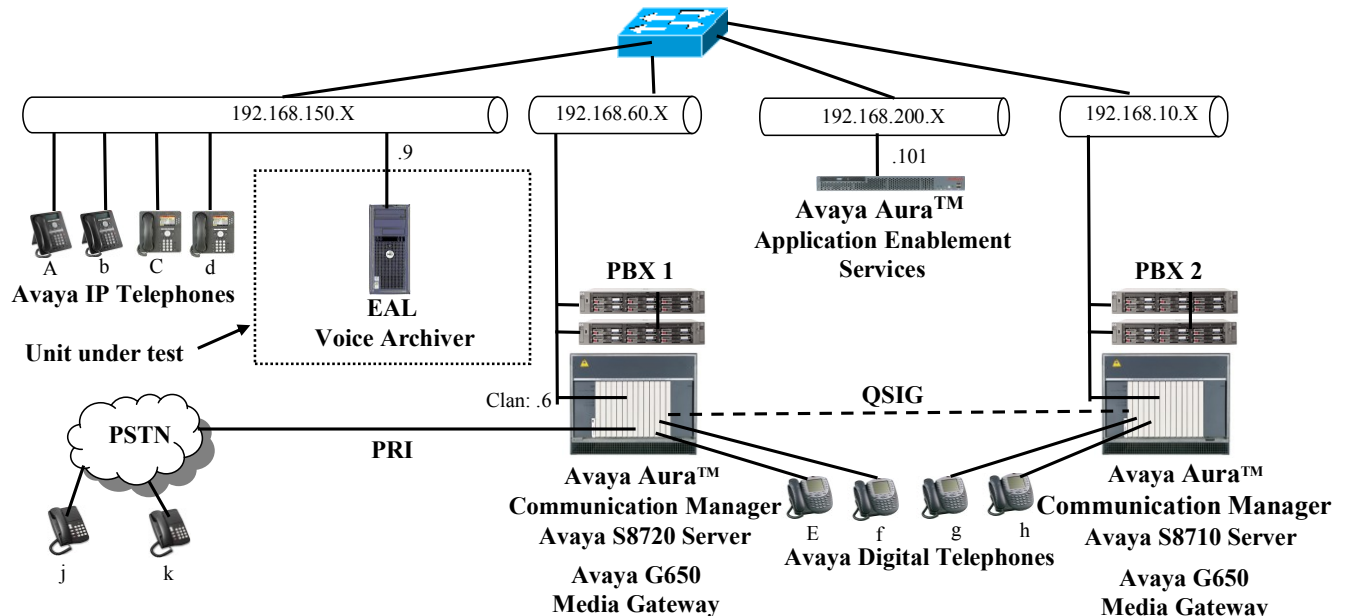


Figure 1: Voice Archiver Test Configuration

In the above diagram, the EAL Voice Archiver records voice conversations from telephones attached to PBX 1. The TSAPI and DMCC services provided by Application Enablement Services are used to monitor call activity and capture voice streams associated with PBX 1. The EAL Voice Archiver voice recorder is attached to PBX 1 via the local area network. PBX 2 is included in the configuration solely to test the ability to monitor conversations which traverse a trunk to a networked PBX. The stations attached to PBX 2 are not monitored by EAL Voice Archiver.

When a call is to be recorded, the Voice Archiver voice recorder uses the Communication Manager Service Observe feature to initiate monitoring for calls which it wishes to record. The voice stream for such calls is received via the LAN interface to PBX 1.

The PBX 2 system is attached to PBX 1 via an IP/QSIG interface, and is used as a networked PBX system. This allows remote networked telephones (g, h) to be included in the test.

The telephones depicted in these Application Notes are designated by an upper case letter if configured to be monitored by the Voice Archiver voice recorder. A lower case letter designates those terminals which have been configured to not be monitored or are possibly unable to be monitored.

The following table contains additional information about each of the telephones shown in **Figure 1**. A “*” in the “Monitored” column indicated that the telephone is monitored by the Voice Archiver voice recorder. Note that one Virtual CTI Station is required for each endpoint which is to be monitored, as these are used by Voice Archiver to initiate Service Observe operations.

Phone	Monitored	Model	Extension
A	*	Avaya 9640G	60093
b		Avaya 9640G	60092
C	*	Avaya 1608	60063
d		Avaya 1608	60064
E	*	Avaya 2410	60007
f		Avaya 2410	60008
g		Avaya 2410	10009
h		Avaya 2410	10007
j		N/A	069 xxxx 6176
k		N/A	069 xxxx 6630
L		Hunt Group (A & C)	61304
x		CTI Station	61401
y		CTI Station	61402
z		CTI Station	61403

Table 1: Device Monitor Configuration

3. Equipment and Software Validated

Software Component	Version
Avaya Aura™ Communication Manager	R015x.02.1.016.4 02.1.016.4-18111
Avaya TN2312 IP Server Interface	HW15 FW050
Avaya TN799 Control LAN	HW01 FW038
Avaya Aura™ Application Enablement Services	SW Version: r5-2-1- 103-0
Avaya Aura™ Application Enablement Services TSAPI Client	5.2.1 Build 474
Avaya 9640G H.323 Telephones	3.1.1
Avaya 1608 Telephones	1.2.2
EAL Voice Archiver SW	1.25 R004
EAL Voice Archiver platform OS: Vista	Ultimate SP1

Table 2: Hardware/Software Component Versions

4. Configure Avaya Aura™ Communication Manager

The configuration information in this section covers only PBX 1 – the system to which the Voice Archiver voice recorder is attached.

The configuration and verification operations illustrated in this section were all performed using the Communication Manager System Administration Terminal (SAT).

The information provided in this section describes the configuration of Communication Manager for this solution. For all other provisioning information such as installation and configuration, please refer to the product documentation in references [1] and [2].

4.1. Verify system-parameters customer-options

Use the **display system-parameters customer options** command to verify that Communication Manager is configured to meet the minimum requirements to run Voice Archiver. Those items shown in **bold** indicate required values or minimum capacity requirements. If these are not met in the configuration, please contact an Avaya representative for further assistance.

Parameter	Usage
Maximum Concurrently Registered IP Stations (Page 2)	This must be sufficient to support the total number of IP stations.
IP Stations (Page 4)	This parameter must be set to “y”.
Service Observing (Basic) (Page 6)	This parameter must be set to “y”.
IP_Phone (Page 10)	This parameter must be set the number of IP stations plus 1 for each station which is to be monitored.

Table 3: System-Parameters Customer-Options Parameters

```

display system-parameters customer-options                               Page 2 of 11
                                OPTIONAL FEATURES

IP PORT CAPACITIES                                                    USED
      Maximum Administered H.323 Trunks: 1000 70
      Maximum Concurrently Registered IP Stations: 18000 6
      Maximum Administered Remote Office Trunks: 0 0
Maximum Concurrently Registered Remote Office Stations: 0 0
      Maximum Concurrently Registered IP eCons: 10 0
      Max Concur Registered Unauthenticated H.323 Stations: 0 0
      Maximum Video Capable H.323 Stations: 0 0
      Maximum Video Capable IP Softphones: 1000 0
      Maximum Administered SIP Trunks: 1000 255
Maximum Administered Ad-hoc Video Conferencing Ports: 0 0
      Maximum Number of DS1 Boards with Echo Cancellation: 10 0
      Maximum TN2501 VAL Boards: 10 1
      Maximum Media Gateway VAL Sources: 0 0
      Maximum TN2602 Boards with 80 VoIP Channels: 128 1
      Maximum TN2602 Boards with 320 VoIP Channels: 128 0
      Maximum Number of Expanded Meet-me Conference Ports: 0 0
  
```

Figure 2: System-Parameters Customer-Options Screen, Page 2

```

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

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

IP Attendant Consoles? y

```

Figure 3: System-Parameters Customer-Options Screen, Page 4

```

display system-parameters customer-options                               Page 6 of 11
                                CALL CENTER OPTIONAL FEATURES

                                Call Center Release: 5.0

                                ACD? y                               Reason Codes? y
                                BCMS (Basic)? n                     Service Level Maximizer? n
BCMS/VuStats Service Level? n                                     Service Observing (Basic)? y
BSR Local Treatment for IP & ISDN? n                             Service Observing (Remote/By FAC)? y
  Business Advocate? n                                           Service Observing (VDNs)? y
  Call Work Codes? n                                             Timed ACW? n
DTMF Feedback Signals For VRU? n                                 Vectoring (Basic)? y
  Dynamic Advocate? n                                           Vectoring (Prompting)? y
  Expert Agent Selection (EAS)? y                                 Vectoring (G3V4 Enhanced)? y
  EAS-PHD? y                                                     Vectoring (3.0 Enhanced)? y
  Forced ACD Calls? n                                           Vectoring (ANI/II-Digits Routing)? y
  Least Occupied Agent? n                                       Vectoring (G3V4 Advanced Routing)? y
  Lookahead Interflow (LAI)? n                                   Vectoring (CINFO)? y
Multiple Call Handling (On Request)? n                            Vectoring (Best Service Routing)? y
  Multiple Call Handling (Forced)? n                               Vectoring (Holidays)? y
  PASTE (Display PBX Data on Phone)? n                           Vectoring (Variables)? y
(NOTE: You must logoff & login to effect the permission changes.)

```

Figure 4: System-Parameters Customer-Options Screen, Page 6

```

display system-parameters customer-options                               Page 10 of 11
                                MAXIMUM IP REGISTRATIONS BY PRODUCT ID

Product ID  Rel. Limit      Used
IP_API_A   : 1000      0
IP_API_B   : 1000      0
IP_API_C   : 1000      0
IP_Agent   : 1000      0
IP_IR A    : 1000      0
IP_Phone  : 12000    4
IP_ROMax   : 12000     0
IP_Soft    : 1000      0
IP_eCons   : 128       0
oneX_Comm  : 12000     0

```

Figure 5: System-Parameters Customer-Options Screen Page 10

4.2. Configure system-parameters features

Use the **change system-parameters customer options** command to set the parameters as shown in the following table.

Parameter	Usage
Allow Two observers in Same Call	Set this parameter to “y”.

Table 4: System-Parameters Customer-Options Parameters

```

change system-parameters features                                     Page 11 of 18
                                FEATURE-RELATED SYSTEM PARAMETERS
CALL CENTER SYSTEM PARAMETERS
EAS
    Expert Agent Selection (EAS) Enabled? y
    Minimum Agent-LoginID Password Length: 5
    Direct Agent Announcement Extension:          Delay:
    Message Waiting Lamp Indicates Status For: station

VECTORING
    Converse First Data Delay: 0          Second Data Delay: 2
    Converse Signaling Tone (msec): 100   Pause (msec): 30
    Prompting Timeout (secs): 10

    Reverse Star/Pound Digit For Collect Step? n
    Available Agent Adjustments for BSR? n
    BSR Tie Strategy: 1st-found
    Store VDN Name in Station's Local Call Log? n
SERVICE OBSERVING
    Service Observing: Warning Tone? n      or Conference Tone? n
    Service Observing Allowed with Exclusion? y
Allow Two Observers in Same Call? y

```

Figure 6: System-Parameters Features Screen, Page 11

4.3. Configure Avaya Aura™ Application Enablement Services Interface

Use the **change ip-services** command to configure the interface to the Application Enablement Services server, as shown in the following table.

Parameter	Usage
Service Type (Page 1)	Enter “AESVCS”.
Enabled (Page 1)	Enter “y” to enable the service.
Local Node (Page 1)	Enter the IP node name for the CLAN interface.
AE Services Server (Page 4)	Enter the name that was assigned to the Application Enablement Services server when it was installed.
Password (Page 4)	Enter the password that was assigned to the switch connection, as shown in Figure 20 .
Enabled (Page 4)	Enter “y” to enable the connection.

Table 5: IP Services Parameters

```

change ip-services                                     Page 1 of 4
                                                    IP SERVICES
Service      Enabled   Local      Local      Remote      Remote
Type         Type          Node       Port       Node       Port
AESVCS     y          clan     8765
  
```

Figure 7: IP Services Screen, Page 1

```

change ip-services                                     Page 4 of 4
                        AE Services Administration
Server ID   AE Services   Password      Enabled   Status
           Server
  1:       aes_server_1  XXXXXXXXXXXXXXXX  y        in use
  
```

Figure 8: IP Services Screen, Page 4

Use the **add cti-link** command to add a CTI link for use by TSAPI. The link number can be any value between 1 and 64 which is not currently assigned to another link. The link number specified must be the same value that is used in the “Switch CTI Link Number” field shown in **Figure 23**. Use an unused extension as the value for the “Extension” parameter. The value chosen for the “Name” parameter is a matter of personal preference.

```

change cti-link 4                                     Page 1 of 3
                                                    CTI LINK
CTI Link: 4
Extension: 69996
  Type: ADJ-IP
                                                    COR: 1
  Name: AES-devcon223-tsapi
  
```

Figure 9: Cti-link Screen

4.4. Configure Stations

4.4.1. Configure IP Stations

Use the **add station** command to create each of the IP stations listed in **Table 1**, using the values shown in the following table.

Parameter	Usage
Extension	Use an unused extension which is compatible with the dial plan.
Type	Use a type value which corresponds to the physical station to be used.
Name	Any alphanumeric string can be assigned as an extension name, which is used for identification purposes.
Security Code	Enter an appropriate numeric string to be used as a security code.

Table 6: Configuration IP Stations

```

add station 60093                                     Page 1 of 5
                                                    STATION
Extension: 60093                                Lock Messages? n                BCC: 0
Type: 9640                                     Security Code: 123456          TN: 1
Port: S00098                                       Coverage Path 1:                COR: 1
Name: extn 60093                               Coverage Path 2:                COS: 1
                                                    Hunt-to Station:
STATION OPTIONS
                                                    Time of Day Lock Table:
Loss Group: 19                                     Personalized Ringing Pattern: 1
                                                    Message Lamp Ext: 60093
Speakerphone: 2-way                               Mute Button Enabled? y
Display Language: english                         Button Modules: 0
Survivable GK Node Name:                          Media Complex Ext:
Survivable COR: internal                           IP SoftPhone? n
Survivable Trunk Dest? y                           IP Video? n
                                                    Customizable Labels? y

```

Figure 10: IP Station Screen

4.4.2. Configure Virtual CTI Stations

Use the **add station** command to create a station for each of the Virtual CTI Stations listed in **Table 1**. A separate Virtual CTI Station is required for each station to be monitored. These stations are subsequently assigned by the EAL Voice Archiver for monitoring in **section 6**. Note that the station numbers must be sequential.

Parameter	Usage
Type (Page 1)	Enter "9620".
Name (Page 1)	Any alphanumeric string can be assigned as an extension name.
Security Code (Page 1)	Enter a security code which is the same as the extension number.
IP Softphone (Page 1)	Enter "y".
Button 5 (Page 4)	Create a "serv-oberv" button.

Table 7: Virtual CTI Station Parameters

```

add station 61401                                     Page 1 of 5
                                                    STATION
Extension: 61401                                     Lock Messages? n          BCC: 0
  Type: 9620                                         Security Code: 1234      TN: 1
  Port: S00104                                       Coverage Path 1:         COR: 1
  Name: CTI 61401                                    Coverage Path 2:         COS: 1
                                                    Hunt-to Station:
STATION OPTIONS
  Loss Group: 19                                     Time of Day Lock Table:
  Speakerphone: 2-way                               Personalized Ringing Pattern: 1
  Display Language: english                         Message Lamp Ext: 61401
  Survivable GK Node Name:                          Mute Button Enabled? y
  Survivable COR: internal                           Media Complex Ext:
  Survivable Trunk Dest? y                           IP SoftPhone? y
                                                    IP Video Softphone? n
                                                    Customizable Labels? y
  
```

Figure 11: Virtual CTI Station Screen, Page 1

```
add station 61401                                     Page 4 of 5
                                                    STATION
SITE DATA
  Room:                                               Headset? n
  Jack:                                               Speaker? n
  Cable:                                              Mounting: d
  Floor:                                              Cord Length: 0
  Building:                                           Set Color:

ABBREVIATED DIALING
  List1:                List2:                List3:

BUTTON ASSIGNMENTS
  1: call-appr                5: serv-obsrv
  2: call-appr                6:
  3: call-appr                7:
  4:                          8:
```

Figure 12: Virtual CTI Station Screen, Page 2

4.5. Configure Hunt Group

Use the **add hunt-group** command to create a hunt group which is used to test the ability of Voice Archiver to monitor hunt groups. Assign an unused extension to the hunt group. Add extensions for telephones “A” and “C” to the hunt group, which are assigned to IP phones which are monitored by Voice Archiver.

Parameter	Usage
Group Name (Page 1)	Any alphanumeric string can be used as a Group Name.
Group Extension (Page 1)	Use an unused extension which is compatible with the dial plan.
MEMBER ASSIGNMENTS (Page 4)	Add the extensions which are to be assigned to this hunt group to this list. For this test, extensions “A” and “C” are used.

Table 8: Configuration IP Stations

```

add hunt-group 4                                     Page 1 of 60
                                     HUNT GROUP

      Group Number: 4                               ACD? n
      Group Name: EAL                               Queue? n
      Group Extension: 61304                         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:
  
```

Figure 13: Hunt Group Screen, Page 1

```

add hunt-group 4                                     Page 3 of 60
                                     HUNT GROUP

      Group Number: 4   Group Extension: 61304   Group Type: ucd-mia
      Member Range Allowed: 1 - 1500             Administered Members (min/max): 1 /2
                                               Total Administered Members: 2

GROUP MEMBER ASSIGNMENTS
  Ext      Name(19 characters)      Ext      Name(19 characters)
  1: 60093   extn 60093                    14:
  2: 60063   extn 60063                    15:
  3:
  4:
  5:
  6:
  7:
  8:
  9:
  10:
  11:
  12:
  13:
  14:
  15:
  16:
  17:
  18:
  19:
  20:
  21:
  22:
  23:
  24:
  25:
  26:

At End of Member List
  
```

Figure 14: Hunt Group Screen, Page 3

5. Configure Avaya Aura™ Application Enablement Services

The Application Enablement Services server is configured via a web browser by accessing the following URL:

http://<AES server address>/

Click “Continue To Login”.



Figure 15: Avaya Application Enablement Services Welcome Screen

Once the login screen appears, enter the credentials for performing administrative activities.

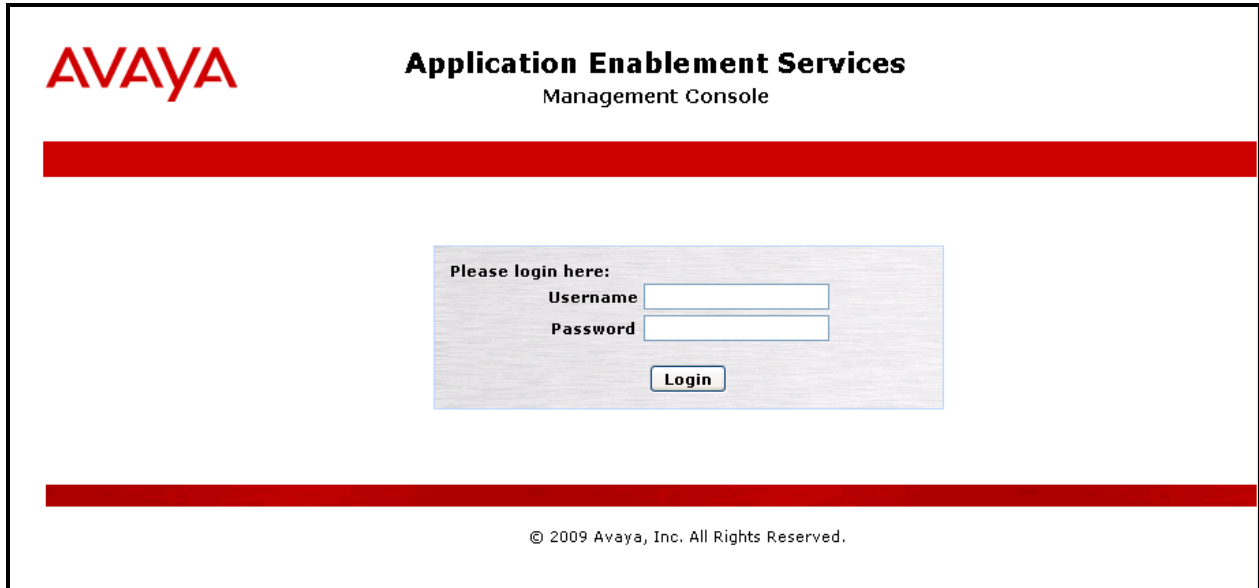


Figure 16: Application Enablement Services Login Screen

Click “AE Services” in left frame.

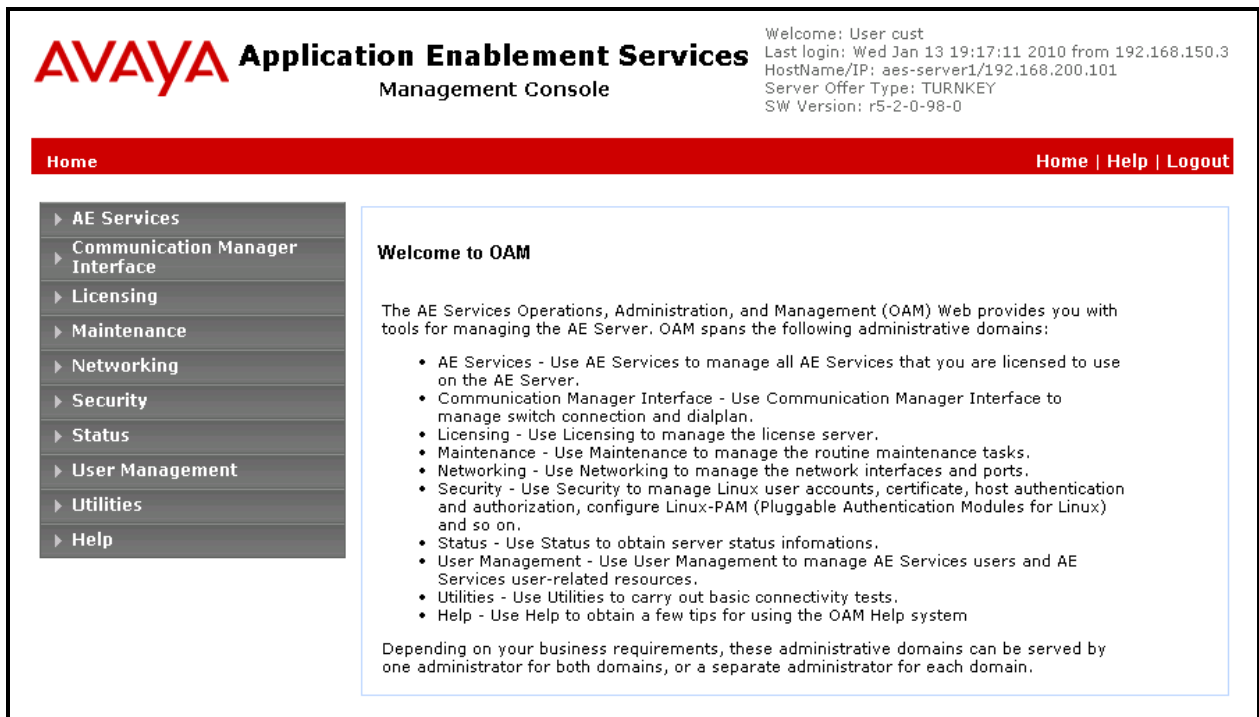


Figure 17: Application Enablement Services Main Screen

Verify that the Application Enablement Services server installation has DMCC and TSAPI service licenses. If this is not the case, please contact an Avaya representative regarding licensing.

Welcome: User cust
 Last login: Thu Feb 4 20:40:18 2010 from 192.168.150.3
 HostName/IP: aes-server1/192.168.200.101
 Server Offer Type: TURNKEY
 SW Version: r5-2-0-98-0

AE Services Home | Help | Logout

AE Services

IMPORTANT: AE Services must be restarted for administrative changes to fully take effect. Changes to the Security Database do not require a restart.

Service	Status	State	License Mode	Cause*
ASAI Link Manager	N/A	Running	N/A	N/A
CVLAN Service	OFFLINE	Running	N/A	N/A
DLG Service	ONLINE	Running	NORMAL MODE	N/A
DMCC Service	ONLINE	Running	NORMAL MODE	N/A
TSAPI Service	ONLINE	Running	NORMAL MODE	N/A
Transport Layer Service	N/A	Running	N/A	N/A

For status on actual services, please use [Status and Control](#)

* -- For more detail, please mouse over the Cause, you'll see the tooltip, or go to help page.

Figure 18: Application Enablement Services Top Level Screen

Navigate to **Communication Manager Interface->Switch Connections**. Enter the name of the Switch Connection to be added, and click on the “Add Connection” button. This name should match what will be used by the EAL Voice Archiver in **section 6**.

AVAYA Application Enablement Services
Management Console

Welcome: User cust
Last login: Wed Jan 13 19:17:11 2010 from 192.168.150.3
HostName/IP: aes-server1/192.168.200.101
Server Offer Type: TURNKEY
SW Version: r5-2-0-98-0

Communication Manager Interface | Switch Connections Home | Help | Logout

- ▶ AE Services
- ▼ Communication Manager Interface
 - Switch Connections
 - ▶ Dial Plan
- ▶ Licensing
- ▶ Maintenance
- ▶ Networking
- ▶ Security
- ▶ Status
- ▶ User Management
- ▶ Utilities
- ▶ Help

Switch Connections

Connection Name	Processor Ethernet	Msg Period	Number of Active Connections
<input checked="" type="radio"/> S8500	No	30	0
<input type="radio"/> S8710	No	30	1

Figure 19: Switch Connection Screen

The Communication Manager Interface | Switch Connections is presented. At this point, enter the screen fields as described in the following table, and click the “Apply” button.

Parameter	Usage
Switch Password	The Switch Password must be the same as was entered into the Communication Manager AE Services Administration form via the “change ip-services” command, described in Figure 8 . Passwords must consist of 12 to 16 alphanumeric characters
SSL	SSL (Secure Socket Layer) is enabled by default. Keep the default setting unless you are adding a Switch Connection for a DEFINITY Server CSI

Table 9: Configuration of Switch Password

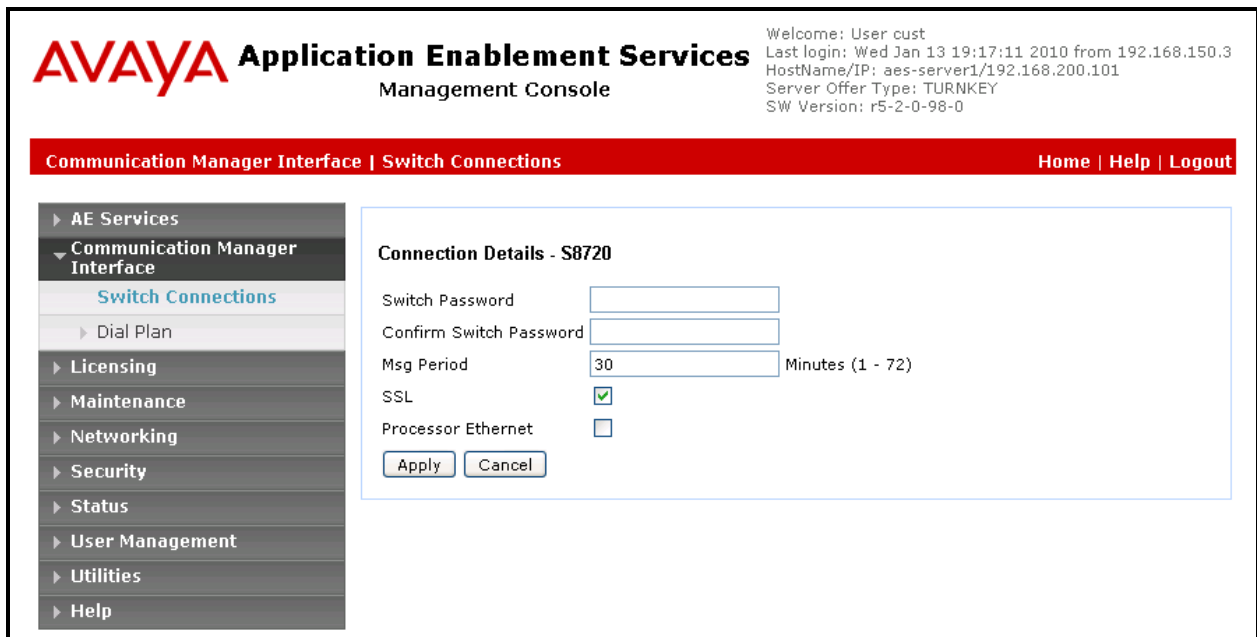


Figure 20: Set Switch Password Screen

From the **Communication Manager Interface->Switch Connections** screen, click the “Edit CLAN IPs” button, (not shown), to display the screen shown below. Enter the IP address of the CLAN that Application Enablement Services will use for communication with the switch, and click the “Add Name or IP” button.

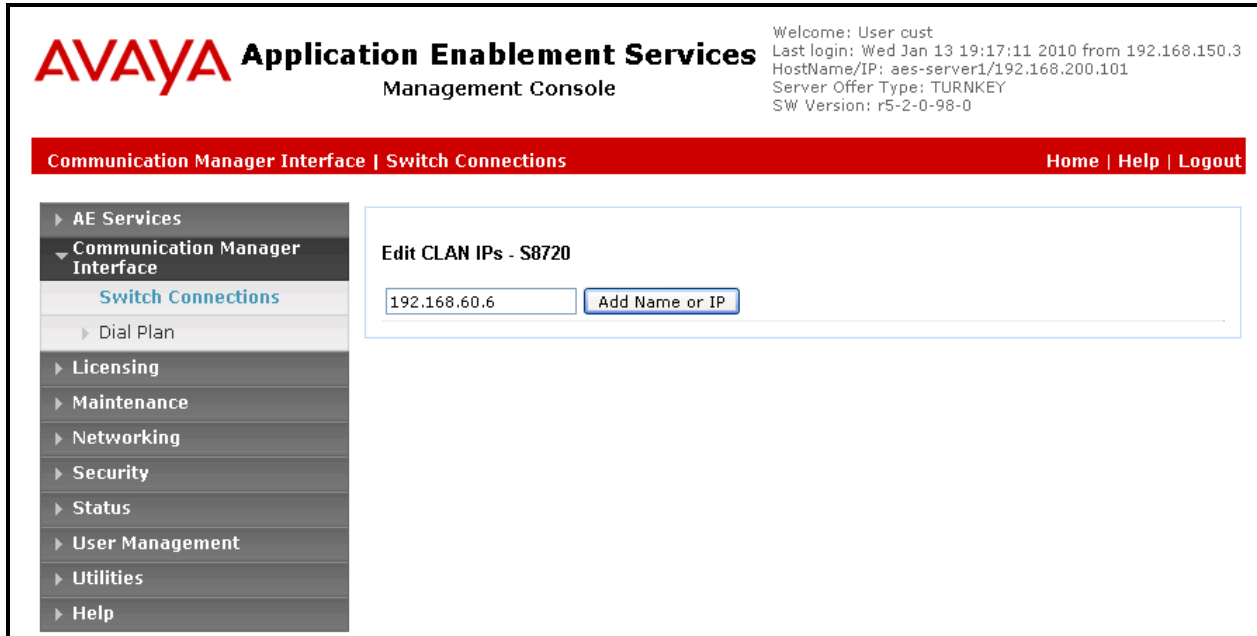


Figure 21: CLAN Screen

Navigate to **AE Services>TSAPI->TSAPI Links**. The following screen is displayed. Click the “Add Link” button.

AVAYA Application Enablement Services
Management Console

Welcome: User cust
Last login: Wed Jan 13 19:17:11 2010 from 192.168.150.3
HostName/IP: aes-server1/192.168.200.101
Server Offer Type: TURNKEY
SW Version: r5-2-0-98-0

AE Services | TSAPI | TSAPI Link Home | Help | Logout

- ▼ AE Services
 - ▶ CVLAN
 - ▶ DLG
 - ▶ DMCC
 - ▶ SMS
 - ▼ TSAPI
 - **TSAPI Links**
 - TSAPI Properties
 - ▶ Communication Manager Interface
 - ▶ Licensing
 - ▶ Maintenance
 - ▶ Networking
 - ▶ Security
 - ▶ Status
 - ▶ User Management
 - ▶ Utilities
 - ▶ Help

TSAPI Links

Link	Switch Connection	Switch CTI Link #	ASAI Link Version	Security
<input checked="" type="radio"/> 1	S8710	4	5	Unencrypted
<input type="radio"/> 2	S8500	4	UNKNOWN	Unencrypted

Figure 22: TSAPI Links Screen

Fill in the parameters for the link to be added. The “Link” parameter must be a unique value between 1 and 16. The “Switch Connection” parameter should be the name of the Avaya Server which is to be controlled by this link. The value for the TSAPI “Switch CTI Link Number” must be a value between 1 and 64, and must be the same as was used in the Avaya Aura™ Communication Manager “add cti-link” configuration command in **Figure 9**. Click the “Apply Changes” button.

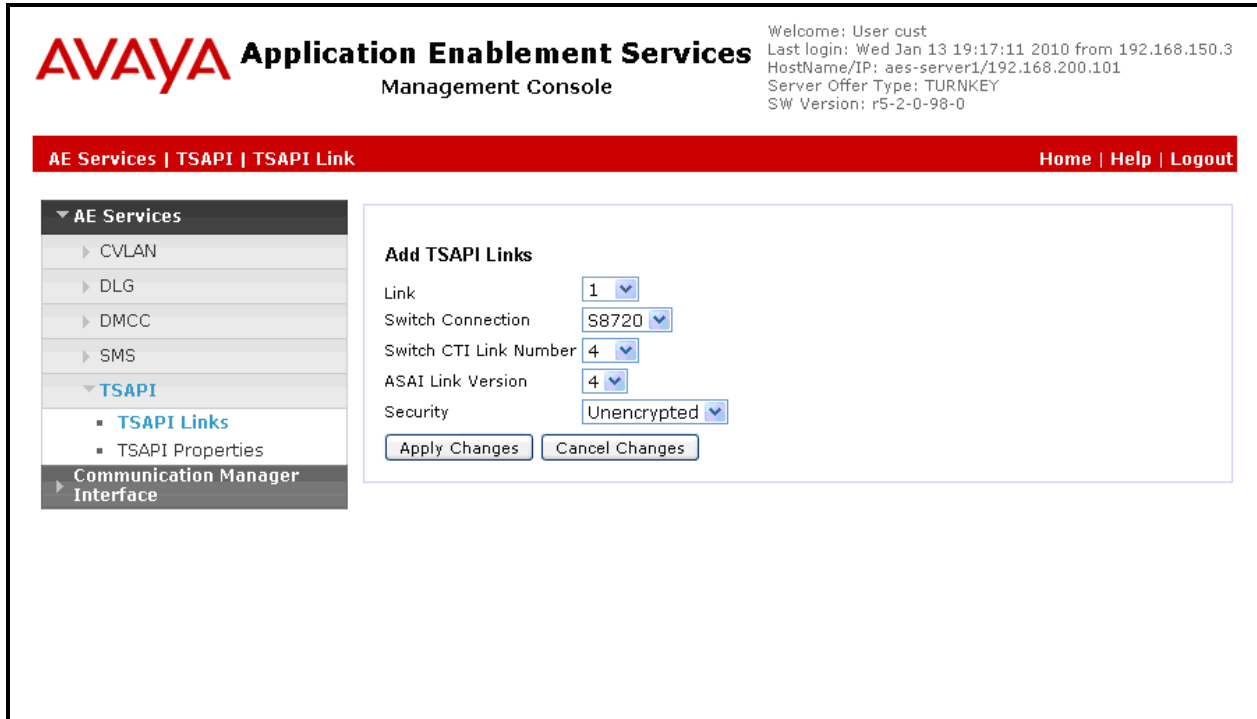


Figure 23: Add TSAPI Link Screen

Navigate to **User Management->User Admin->Add User**. The “CT User” field for this user must be set to “Yes”. In this case, the Application Enablement Services user is the Voice Archiver application, which uses Application Enablement Services to monitor stations and initiate switching operations. The “User Id” and “User Password” must be the same as what will be configured for EAL Voice Archiver in **section 6**.

AVAYA **Application Enablement Services**
Management Console

Welcome: User cust
Last login: Mon Apr 19 17:29:00 2010 from :
HostName/IP: aes-server1/192.168.200.101
Server Offer Type: TURNKEY
SW Version: r5-2-1-103-0

User Management | User Admin | Add User Home | H

Add User

Fields marked with * can not be empty.

* User Id

* Common Name

* Surname

* User Password

* Confirm Password

Admin Note

Avaya Role

Business Category

Car License

CM Home

Cms Home

CT User

Department Number

Display Name

Employee Number

Figure 24: Add User Screen

Navigate to **Security** -> **Security Database** -> **CTI Users** -> **List All Users**, and then click “Edit User” for the newly added user “EAL”, (not shown). Enable “Unrestricted Access” and click “Apply Changes”.

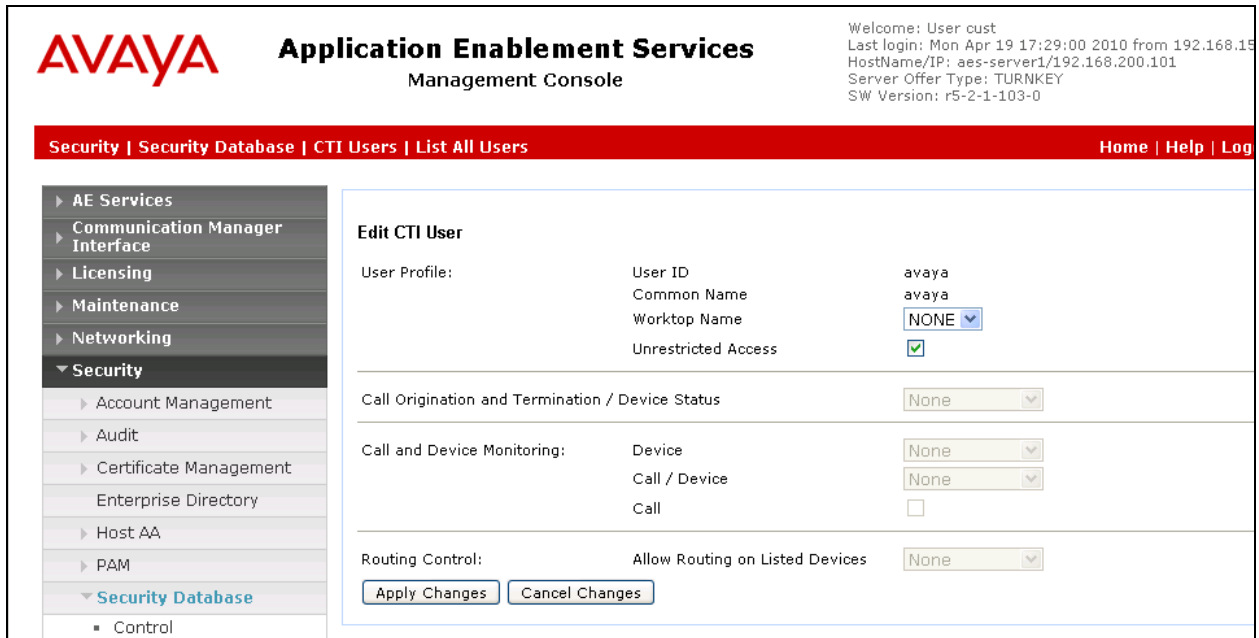


Figure 25: Edit CTI User Screen

Navigate to **Networking-> Ports** and configure the DMCC Server Ports as shown in the following table.

Parameter	Usage
Unencrypted Port	Set this port to 4721.

Table 10: Avaya Aura™ Application Enablement Services Port Parameters

The screenshot shows the Avaya Application Enablement Services Management Console. The top navigation bar includes 'Networking | Ports' and 'Home | Help | Logout'. A sidebar on the left lists various management options, with 'Networking' expanded to show 'Ports'. The main content area is titled 'Ports' and is divided into three sections:

- CVLAN Ports:**
 - Unencrypted TCP Port: 9999 (Enabled)
 - Encrypted TCP Port: 9998 (Enabled)
- DLG Port:**
 - TCP Port: 5678
- TSAPI Ports:**
 - TSAPI Service Port: 450 (Enabled)
 - Local TLINK Ports:
 - TCP Port Min: 1024
 - TCP Port Max: 1039
 - Unencrypted TLINK Ports:
 - TCP Port Min: 1050
 - TCP Port Max: 1065
 - Encrypted TLINK Ports:
 - TCP Port Min: 1066
 - TCP Port Max: 1081
- DMCC Server Ports:**
 - Unencrypted Port: 4721 (Enabled)
 - Encrypted Port: 4722 (Enabled)

Figure 26: Application Enablement Services Port Configuration

6. Configure EAL Voice Archiver Server

Prior to configuring the EAL Voice Archiver, determine the Tlink used by Avaya Application Enablement Services for Voice Archiver. Navigate to **Status -> Status and Control --> TSAPI Service Summary**. From the “Tlink” drop-down menu, select the element for the Voice Archiver link. This link name will be used subsequently for configuring Voice Archiver.

The screenshot displays the Avaya Application Enablement Services Management Console. The top navigation bar includes the Avaya logo, the title "Application Enablement Services Management Console", and a welcome message for user "cust" with login details. A red breadcrumb trail shows the path: "Status | Status and Control | TSAPI Service Summary". A sidebar on the left lists various service categories, with "Status and Control" expanded to show "TSAPI Service Summary" selected. The main content area is titled "Tlink Status" and features a checkbox for "Enable page refresh every 60 seconds". A dropdown menu for "Tlink" is highlighted with a red box, showing the selected value "AVAYA#S8720#CSTA#AES-SERVER1". Below this are "Submit" and "TSDI Info" buttons. The page displays general information for the selected Tlink, including registration status, stream counts, version, protocols, and security. It also shows flow control settings for the TSDI buffer and invoke ID usage, each with a "Reset" button. A "Back" button is located at the bottom of the main content area.

AVAYA Application Enablement Services Management Console

Welcome: User cust
Last login: Tue Jun 1 23:43:45 2010 from 192.168.150.3
HostName/IP: aes-server1/192.168.200.101
Server Offer Type: TURNKEY
SW Version: r5-2-1-103-0

Status | Status and Control | TSAPI Service Summary Home | Help | Logout

AE Services
Communication Manager Interface
Licensing
Maintenance
Networking
Security
Status
Alarm Viewer
Logs
Status and Control
CVLAN Service Summary
DLG Services Summary
DMCC Service Summary
Switch Conn Summary
TSAPI Service Summary
User Management
Utilities
Help

Tlink Status

Enable page refresh every 60 seconds

Tlink | AVAYA#S8720#CSTA#AES-SERVER1

Submit TSDI Info

AVAYA#S8500#CSTA#AES-SERVER1

General Info

Registered	YES
Number of Open Streams	0
Tlink Version	5.2.1 Build 474
Supported Protocols	TS1-2
Security	CSTA

Flow Control - TSDI Buffer

Max Flow Allowed	800
Max Flow Reached	0

Reset Max Flow Reached

Invoke IDs

In Use	0
Max Used	1

Reset Max IDs

Outstanding Connections

Current	0
Max Used	1

Reset Max Connections

Back

Figure 27: Tlink Status

The Windows registry is used as a repository for Voice Archiver configuration information for the interface to AES. After installation of Voice Archiver, the required registry entries are created with default parameters which can be edited with the Windows Registry Editor. The following registry parameters must be configured within the registry section HKEY_LOCAL_MACHINE\SOFTWARE\.

Section	Parameter	Usage
Eal\Eva\VoIP\Avaya\AES	AvayaAESHostName	Enter the FQDN or IP address of Avaya Application Enablement Services.
	UserName	Enter the user name which was created in Figure 24 .
	Password	Enter the password which was created in Figure 24 .
	LinkName	Enter the switch connection name which was created in Figure 19 .
Eal\Eva\VoIP\Avaya\DnRange	DNFirst	Enter the number of the first CTI Station shown in Table 1 .
	DNLast	Enter the number of the last CTI Station shown in Table 1 .
	SecurityCode	Enter the security code assigned to CTI stations, as show in Figure 11 .
Eal\Eva\VoIP\Avaya\RTP	StartRtpPort	Enter the value assigned to the Unencrypted DMCC Server Port in Figure 26 .
Eal\Eva\VoIP\Avaya\Switch	AvayaSwitchHostName	Enter the FQDN or IP address of the Avaya Communication Manager switching interface. For this configuration this is the CLAN interface.
Eal\Eva\Cti\Types \Avaya_CSTA\PBX	PbxHost	Enter the Tlink name as shown in Figure 27 .

Table 11: Windows Registry Configuration Parameters

7. General Test Approach and Test Results

The compliance testing done between EAL Voice Archiver and Communication Manager was performed manually. The tests were all functional in nature, and no performance testing was done. The test method employed can be described as follows:

- Avaya Aura™ Communication Manager was configured to support various local IP telephones, as well as a networked PBX connection and a PSTN connection.
- An E1 PSTN interface was attached to Avaya Aura™ Communication Manager.
- The EAL Voice Archiver was configured to monitor various telephones attached to Avaya Aura™ Communication Manager.
- The major EAL Voice Archiver features and functions were verified using the above-mentioned local and external telephones, including the ability to record calls made to and from
 - Locally attached IP and digital telephones
 - Telephones attached to the PSTN via E1 trunk.
 - Telephones attached to a networked PBX via QSIG trunk.

The tests which were performed are shown in **Section 1.1**. All tests which were performed produced the expected result.

8. Verification Steps

The correct installation and configuration of EAL Voice Archiver voice recorder can be verified by performing the following steps using the SAT terminal from PBX 1.

- Use the “status aesvcs cti-link” command to verify that the TSAPI link allocated in **Figure 9** is “established”.

```
status aesvcs cti-link
```

AE SERVICES CTI LINK STATUS						
CTI Link	Version	Mnt Busy	AE Services Server	Service State	Msgs Sent	Msgs Rcvd
1		no		down	0	0
2		no		down	0	0
3		no		down	0	0
4	4	no	aes-server1	established	15	15

Figure 28: Status Aesvcs Cti-link Screen

- Login to Avaya Aura™ Application Enablement Services, and navigate to the **AE Services** screen. Verify that the DMCC and TSAPI Services are licensed, ONLINE, and Running.

AVAYA Application Enablement Services Management Console

Welcome: User cust
 Last login: Tue Jun 1 21:04:16 2010 from 192.168.150.3
 HostName/IP: aes-server1/192.168.200.101
 Server Offer Type: TURNKEY
 SW Version: r5-2-1-103-0

AE Services Home | Help | Logout

▼ AE Services

- ▶ CVLAN
- ▶ DLG
- ▶ DMCC
- ▶ SMS
- ▶ TSAPI
- ▶ Communication Manager Interface
- ▶ Licensing
- ▶ Maintenance
- ▶ Networking
- ▶ Security
- ▶ Status
- ▶ User Management
- ▶ Utilities
- ▶ Help

AE Services

IMPORTANT: AE Services must be restarted for administrative changes to fully take effect. Changes to the Security Database do not require a restart.

Service	Status	State	License Mode	Cause*
ASAI Link Manager	N/A	Running	N/A	N/A
CVLAN Service	OFFLINE	Running	N/A	N/A
DLG Service	ONLINE	Running	NORMAL MODE	N/A
DMCC Service	ONLINE	Running	NORMAL MODE	N/A
TSAPI Service	ONLINE	Running	NORMAL MODE	N/A
Transport Layer Service	N/A	Running	N/A	N/A

For status on actual services, please use [Status and Control](#)

* -- For more detail, please mouse over the Cause, you'll see the tooltip, or go to help page.

License Information
 You are licensed to run Application Enablement (CTI) version 5.0

Figure 29: Application Enablement Services AE Services Screen

- Navigate to **Status** -> **Status and Control** -> **Switch Conn Summary** select the PBX 1, and click “Switch Connection Details”. Verify that the connection state is “Online” and “Talking”.

AVAYA Application Enablement Services Management Console

Welcome: User cust
 Last login: Tue Jun 1 21:04:16 2010 from 192.168.150.3
 HostName/IP: aes-server1/192.168.200.101
 Server Offer Type: TURNKEY
 SW Version: r5-2-1-103-0

Status | Status and Control | Switch Conn Summary Home | Help | Logout

▶ AE Services
 ▶ Communication Manager Interface
 ▶ Licensing
 ▶ Maintenance
 ▶ Networking
 ▶ Security
 ▼ **Status**
 Alarm Viewer
 ▶ Logs
 ▼ **Status and Control**
 ▪ CVLAN Service Summary
 ▪ DLG Services Summary
 ▪ DMCC Service Summary
 ▪ **Switch Conn Summary**

Switch Connections Summary

Enable page refresh every seconds

	Switch Conn	Conn State	Since	Online/Offline	Active/Admin'd AEP Conns	Num of TCI Conns	SSL	Msgs To Switch	Msgs From Switch	Msg Period
	S8720	Talking	Tue Jun 1 23:21:17 2010	Online	1 / 1	2	Enabled	680	679	30

Figure 30: Application Enablement Services Switch Connection Details Screen

- Navigate to **Status** -> **Status and Control** -> **TSAPI Service Summary** and click “Details” for “TSAPI Service”. Verify that the TSAPI service for PBX 1 is “Online” and “Talking”.

AVAYA Application Enablement Services Management Console

Welcome: User cust
 Last login: Tue Jun 1 21:04:16 2010 from 192.168.150.3
 HostName/IP: aes-server1/192.168.200.101
 Server Offer Type: TURNKEY
 SW Version: r5-2-1-103-0

Status | Status and Control | TSAPI Service Summary Home | Help | Logout

▶ AE Services
 ▶ Communication Manager Interface
 ▶ Licensing
 ▶ Maintenance
 ▶ Networking
 ▶ Security
 ▼ Status
 Alarm Viewer
 ▶ Logs
 ▼ Status and Control
 ▪ CVLAN Service Summary
 ▪ DLG Services Summary
 ▪ DMCC Service Summary
 ▪ Switch Conn Summary
 ▪ **TSAPI Service Summary**

TSAPI Link Details

Enable page refresh every seconds

	Link	Switch Name	Switch CTI Link ID	Status	Since	State	Switch Version	Associations	Msgs to Switch	Msgs from Switch	Msgs Period
<input checked="" type="radio"/>	1	S8720	4	Talking	Tue Jun 1 23:21:17 2010	Online	15	3	57	102	30

For service-wide information, choose one of the following:

Figure 31: TSAPI Link Details Screen

- Navigate to **Status -> Status and Control -> DMCC Service Summary** and click “Service Summary”. Verify that the EAL Voice Archiver has established a session.

AVAYA Application Enablement Services Management Console

Welcome: User cust
 Last login: Tue Jun 1 21:04:16 2010 from 192.168.150.3
 HostName/IP: aes-server1/192.168.200.101
 Server Offer Type: TURNKEY
 SW Version: r5-2-1-103-0

Status | Status and Control | DMCC Service Summary Home | Help | Logout

- ▶ AE Services
- ▶ Communication Manager Interface
- ▶ Licensing
- ▶ Maintenance
- ▶ Networking
- ▶ Security
- ▼ **Status**
 - Alarm Viewer
 - ▶ Logs
 - ▼ **Status and Control**
 - CVLAN Service Summary
 - DLG Services Summary
 - **DMCC Service Summary**
 - Switch Conn Summary

DMCC Service Summary - Session Summary

Enable page refresh every seconds

Session Summary [Device Summary](#)
 Generated on Tue Jun 01 23:46:42 CEST 2010

Service Uptime: 46 days, 6 hours 39 minutes
 Number of Active Sessions: 1
 Number of Sessions Created Since Service Boot: 348
 Number of Existing Devices: 3
 Number of Devices Created Since Service Boot: 707

■	Session ID	User	Application	Far-end Identifier	Connection Type	# of Associated Devices
<input type="checkbox"/>	8B7A75680798BE8E6 6C6D075F58542BE-355	avaya	Eal2Avaya	192.168.150.9	XML Unencrypted	3

Figure 32: DMCC Service Summary Screen

- Navigate to **Status -> Status and Control -> DMCC Service Summary** and click “Device Summary”. Verify that the EAL Voice Archiver has registered each of the CTI stations.

The screenshot shows the Avaya Application Enablement Services Management Console. The header includes the Avaya logo, the title "Application Enablement Services Management Console", and user information: "Welcome: User cust", "Last login: Tue Jun 1 21:04:16 2010 from 192.168.150.3", "HostName/IP: aes-server1/192.168.200.101", "Server Offer Type: TURNKEY", and "SW Version: r5-2-1-103-0". The navigation menu on the left includes "AE Services", "Communication Manager Interface", "Licensing", "Maintenance", "Networking", "Security", "Status", "Alarm Viewer", "Logs", and "Status and Control". The "Status and Control" section is expanded, showing "CVLAN Service Summary", "DLG Services Summary", "DMCC Service Summary", "Switch Conn Summary", and "TSAPI Service Summary". The main content area displays the "DMCC Service Summary - Device Summary" page. It includes a checkbox for "Enable page refresh every 60 seconds" and a "Session Summary" section with the following statistics: "Generated on Tue Jun 01 23:47:08 CEST 2010", "Service Uptime: 46 days, 6 hours and 40 minutes", "Number of Active Sessions: 1", "Number of Sessions Created Since Service Boot: 348", "Number of Existing Devices: 3", and "Number of Devices Created Since Service Boot: 707". Below the statistics is a table with the following data:

	Device ID	State	Associated Sessions
<input type="checkbox"/>	61401:S8720:192.168.60.6:0	REGISTERED	1
<input type="checkbox"/>	61402:S8720:192.168.60.6:0	REGISTERED	1
<input type="checkbox"/>	61403:S8720:192.168.60.6:0	REGISTERED	1

At the bottom of the table is a "Terminate Devices" button.

Figure 33: DMCC Device Summary Screen

9. References

- [1] *Administering Avaya Aura™ Communication Manager*, May 2009, Document Number 03-300509.
- [2] *Avaya Aura™ Communication Manager Feature Description and Implementation*, May 2009, Issue 7, Document Number 555-245-205.
- [3] *Avaya Aura™ Application Enablement Services Administration and Maintenance Guide*, November 2009, Document Number 02-300357
- [4] EAL product descriptions: <http://www.eal.nl>

10. Conclusion

These Application Notes describe the compliance testing of the EAL Voice Archiver voice recorder with Avaya Aura™ Communication Manager. Silent monitoring via the Service Observe recording method offered by the Voice Archiver was tested. A detailed description of the configuration required for both the Avaya and the EAL equipment is documented within these Application Notes. The Voice Archiver passed all of the tests performed, which included both functional and robustness tests.

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