Avaya Solution & Interoperability Test Lab

Application Notes for Envox CT Connect with Avaya Communication Manager and Avaya Application Enablement Services using ASAI – Issue 1.0

Abstract

These Application Notes describe the configuration steps required for Envox CT Connect to interoperate with Avaya Communication Manager and Avaya Application Enablement Services using the Adjunct Switch Application Interface (ASAI) protocol. Envox CT Connect is a Computer Telephony Integration (CTI) middleware platform that provides call control and monitoring functionality through various application programming interfaces to end user applications.

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.

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1. Introduction

Envox CT Connect is computer telephony call control server software capable of connecting a variety of TDM and VoIP telephone switches to distributed computer application environments.

Envox CT Connect can implement one of two mechanisms to integrate with Avaya Communication Manager, via the Avaya Application Enablement Services (AES) server:

- Avaya Adjunct Switch Application Interface (ASAI) protocol
- Avaya Telephony Service API (TSAPI) interface

This document focuses on integration using the ASAI protocol. Envox CT Connect implements the ASAI protocol to provide Computer Telephony Integration (CTI) call control and monitoring functionality and application programming interfaces to end user business applications. The integration with Avaya Communication Manager is accomplished through the Avaya AES Definity LAN Gateway (DLG) service, as illustrated in **Figure 1**.

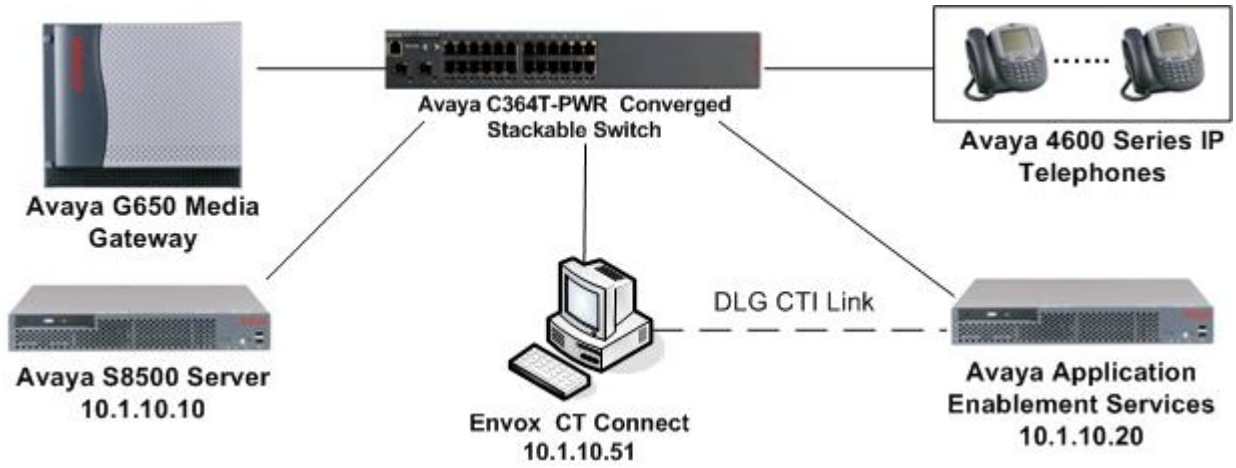

Figure 1: Envox CT Connect with Avaya Communication Manager and Avaya AES

Envox CT Connect utilizes a client/server model to support client applications that can be developed with C, C++, Java, TAPI, and ActiveX to enable application developers to integrate call control features into existing business applications.

The server component of the software runs under Microsoft Windows operating system environments, and supports call control and monitoring through links to telephony switches. The software also includes client application programming interfaces for Microsoft Windows 2000, Microsoft Windows 2003, Microsoft Windows XP, Sun Solaris, Hewlett-Packard HP-UX, Compaq Tru64 UNIX, and OpenVMS operating systems.

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The compliance testing focused on verification of the Envox CT Connect server with Avaya Communication Manager, and did not include verification of interfaces between the Envox CT Connect server with the Envox CT Connect client applications. An Envox CT Connect test tool was utilized to emulate client applications to initiate call actions, verify feature functionality, and troubleshoot.

The range of applications that can be developed utilizing Envox CT Connect includes:

- Customer relationship management
- Call recording and quality monitoring
- Contact center workforce management
- Contact center
- Help desk
- Interactive voice response
- Screen pop

2. Equipment and Software Validated

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

Equipment	Software
Avaya S8500B Server	Avaya Communication Manager 5.0 (R015x.00.0.825.4), patch 15175
Avaya Application Enablement Services	4.1, build 31-2
Avaya G650 Media Gateway C-LAN TN799DP Medpro TN2302AP	 HW 1, FW24 HW 20, FW116
Avaya C364T-PWR Converged Stackable Switch	4.3.12
Avaya 4600 Series IP Telephones	2.8 (H.323)
Envox CT Connect on Dell PC	7.0 build 742 SP3 Windows XP Professional

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3. Configure Avaya Communication Manager

Basic configuration of Avaya Communication Manager and Avaya Application Enablement Services Server are beyond the scope of these Application Notes. The detailed administration of contact center devices, such as ACD/Skill groups and logical agents, is assumed to be in place and are not covered in these Application Notes. See Section 10 for Avaya documentation details.

3.1. Verify Avaya Communication Manager License

Log into the System Access Terminal (SAT) to verify that the Avaya Communication Manager license has proper permissions for features illustrated in these Application Notes. Use the **display system-parameters customer-options** command. On Page 3, verify that the following two options are set to "y".

- **ASAI Link Core Capabilities**
- **ASAI Link Plus Capabilities**

The ASAI Link Plus Capabilities option is for applications that utilize Adjunct Routing, Selective Listening, Switch Classified Outbound Calls, and/or ISDN Redirecting Number features.

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

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


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On Page 6, verify that the **Vectoring (Basic)** customer option is set to "y" for applications that utilize the Adjunct Routing feature.

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

                          Call Center Release: 3.0

                                ACD? y                          Reason Codes? y
                       BCMS (Basic)? y               Service Level Maximizer? n
         BCMS/VuStats Service Level? y             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? y                               Timed ACW? y
      DTMF Feedback Signals For VRU? n                     Vectoring (Basic)? y
                   Dynamic Advocate? n                 Vectoring (Prompting)? y
```

3.2. Administer CTI Link for DLG Service

Add a CTI link using the **add cti-link** n command, where "n" is an available CTI link number. Enter an available extension number in the **Extension** field. Note that the CTI link number and extension number may vary. Enter "ASAI-IP" in the **Type** field, and a descriptive name in the **Name** field. Default values may be used in the remaining fields.

```
add cti-link 2                                                   Page   1 of   2
                                     CTI LINK
 CTI Link: 2
Extension: 13302
     Type: ASAI-IP
                                                                     COR: 1
     Name: Envox DLG Link
```

3.3. Administer Vector and VDN for Adjunct Routing

For applications that utilize the Adjunct Routing feature to make call routing decisions, administer a vector and a Vector Directory Number (VDN). Modify the vector using the **change vector** n command, where "n" is an existing vector number. The vector will be used to provide adjunct routing to the CTI link defined previously in Section 3.2. Note that the vector **Number**, **Name**, **wait-time** step, and **route-to number** step may vary. The **route-to number** step is used as the covering point to provide failure coverage in case of failures from adjunct route.

```
change vector 1                                                  Page   1 of   3
                                   CALL VECTOR

    Number: 1                Name: Envox Rt Vector
Multimedia? n                                Meet-me Conf? n           Lock? n
     Basic? y   EAS? y   G3V4 Enhanced? y   ANI/II-Digits? y   ASAI Routing? y
 Prompting? y   LAI? y  G3V4 Adv Route? y   CINFO? y   BSR? n   Holidays? n
 Variables? n   3.0 Enhanced? n
01 adjunct      routing link 2
02 wait-time    30  secs hearing ringback
03 route-to     number 10005            with cov n if unconditionally
04
```


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Add the VDN using the **add vdn** n command, where “n” is an available extension number. Enter a descriptive name for the **Name** field, and the vector number from above for the **Vector Number** field. Retain the default values for all remaining fields.

```
add vdn 1                                                       Page   1 of   2
                            VECTOR DIRECTORY NUMBER

                             Extension: 17001
                                  Name: Envox Routing VDN
                       Vector Number: 1

                 Meet-me Conferencing? n
                   Allow VDN Override? n
                                  COR: 1
                                   TN: 1
```


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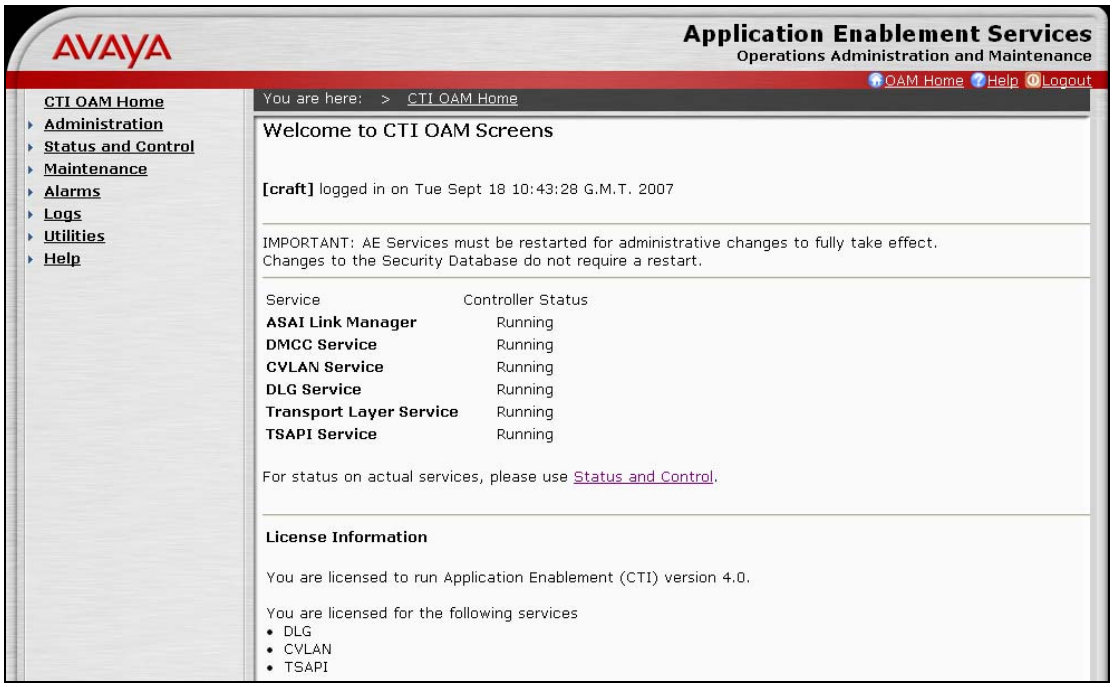
4. Configure Avaya Application Enablement Services Server

This section provides the procedures for configuring Avaya Application Enablement Services. The procedures fall into the following areas:

- Verify Avaya Application Enablement Services License
- Administer DLG link

4.1. Verify Avaya AES Licensing

Initialise the Avaya AES OAM web interface by browsing to "http://x.x.x.x:8443/MVAP/index.jsp", where "x.x.x.x" is the IP address of the Avaya AES, and log in (not shown). From the OAM Home screen select **CTI OAM Admin** (not shown) to bring up the CTI OAM Home screen. Verify the DLG service is licensed at the Welcome to CTI OAM Screens screen by ensuring that "DLG" is in the list of services in the License Information section.



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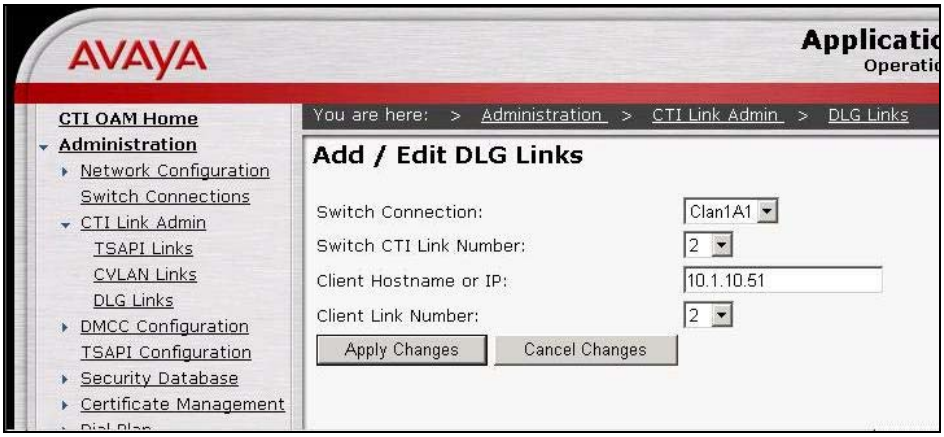
4.2. Administer DLG link

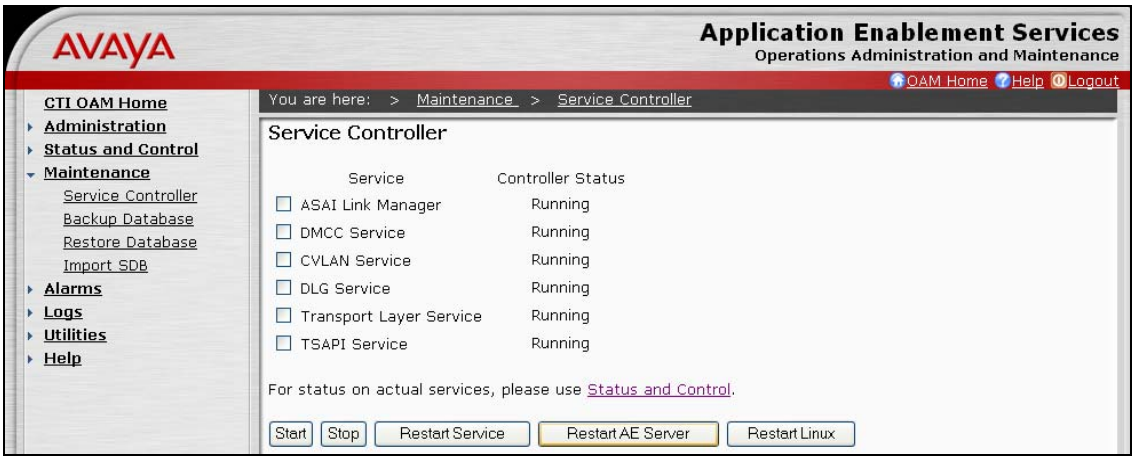
From the CTI OAM Home menu, select **Administration → CTI Link Admin → DLG Links**. On the DLG Links screen (not shown), select **Add Link**. On the Add / Edit DLG Links screen, enter the following values for the specified fields:

- **Switch Connection:** Choose the switch connection already configured from the drop-down list.
- **Switch CTI Link Number:** Corresponding CTI link number from Section 3.2.
- **Client Hostname or IP:** IP address of the Envox CT Connect server from **Figure 1**.
- **Client Link Number:** Link number of Envox CT Connect server from Section 5.4.

Once completed, click **Apply Changes**. On the Apply Changes to Link screen that appears next (not shown). Click on **Apply**.



The DLG Service must be restarted to effect the changes made in this section. From the CTI OAM Home menu, select **Maintenance → Service Controller**. Check the **DLG Service** check box and click **Restart Service**. On the Restart Service screen (not shown), select **Restart**.



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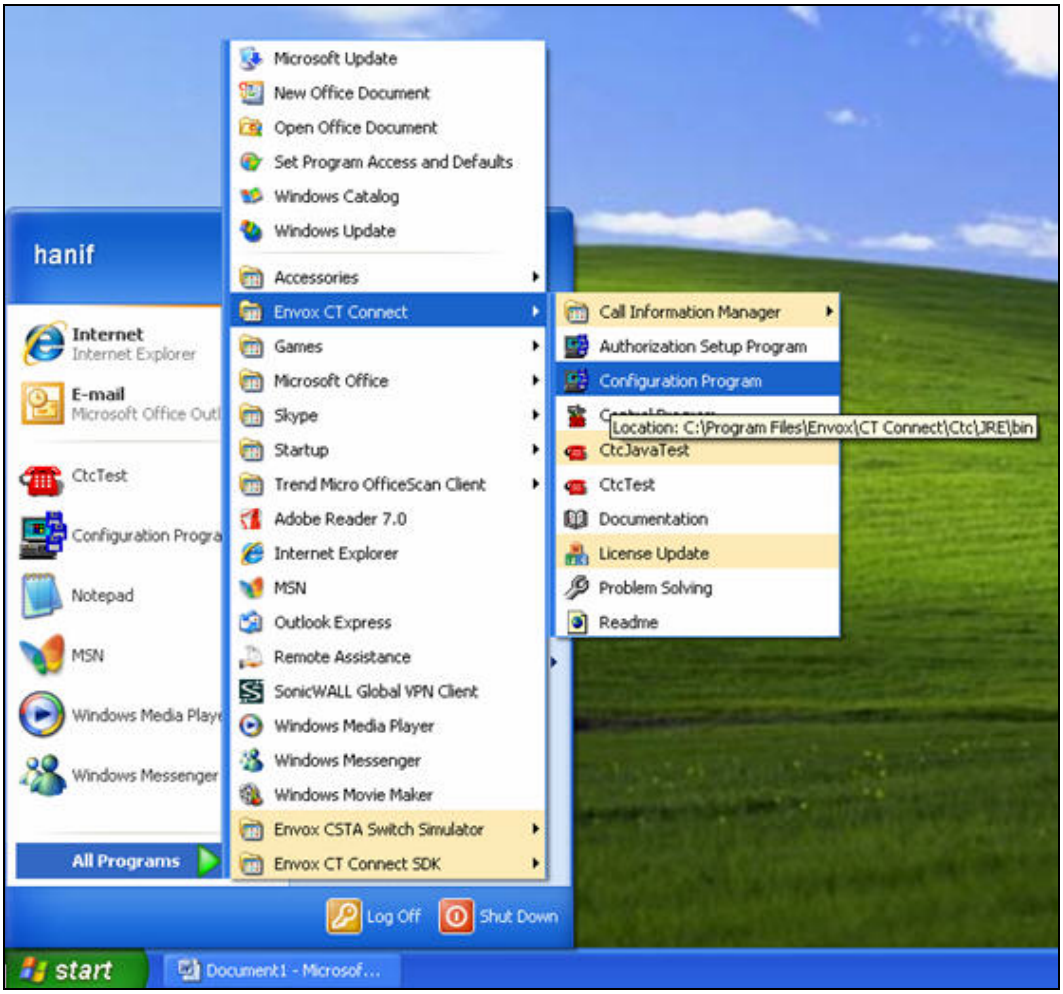
5. Configure Envox CT Connect

This section provides the procedures for configuring the Envox CT Connect server. The procedures include the following areas:

- Launch configuration program
- Administer link
- Administer switch type
- Administer IP address and link number

5.1. Launch Configuration Program

Envox CT Connect uses a GUI based configuration program to configure communication links between the Envox CT Connect server and telephone switches. From the Envox CT Connect server, launch the configuration program by selecting **Start → All Programs → Envox CT Connect → Configuration Program** as shown below.



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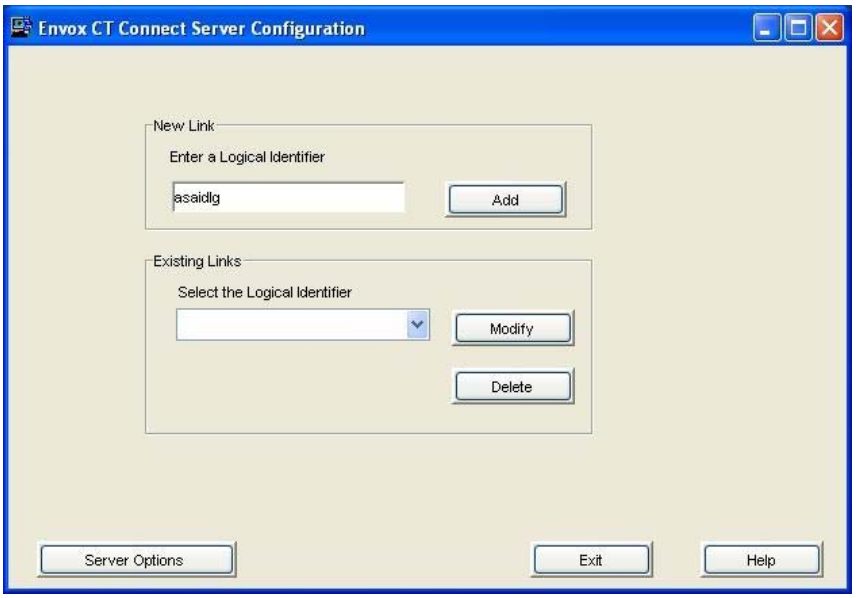
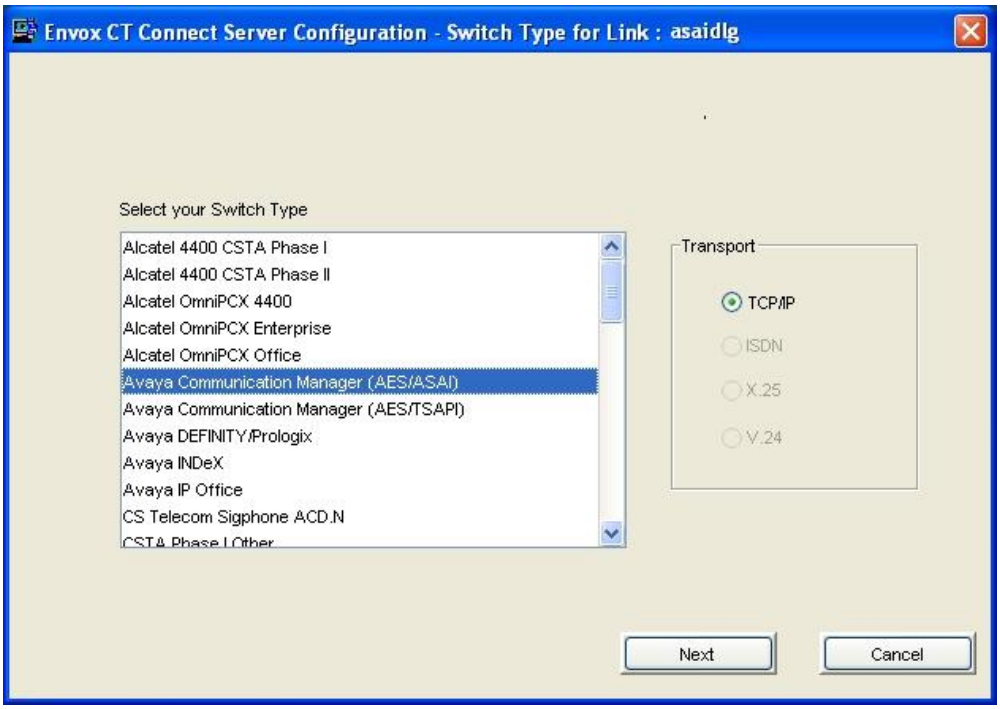
5.2. Administer Link

The Envox CT Connect Server Configuration screen is displayed. Enter a descriptive name for the **Enter a Logical Identifier** field, in this case "asaidlg". Click on the **Add** button.



5.3. Administer Switch Type

Select **Avaya Communication Manager (AES/ASAI)** from the list and click **Next**.



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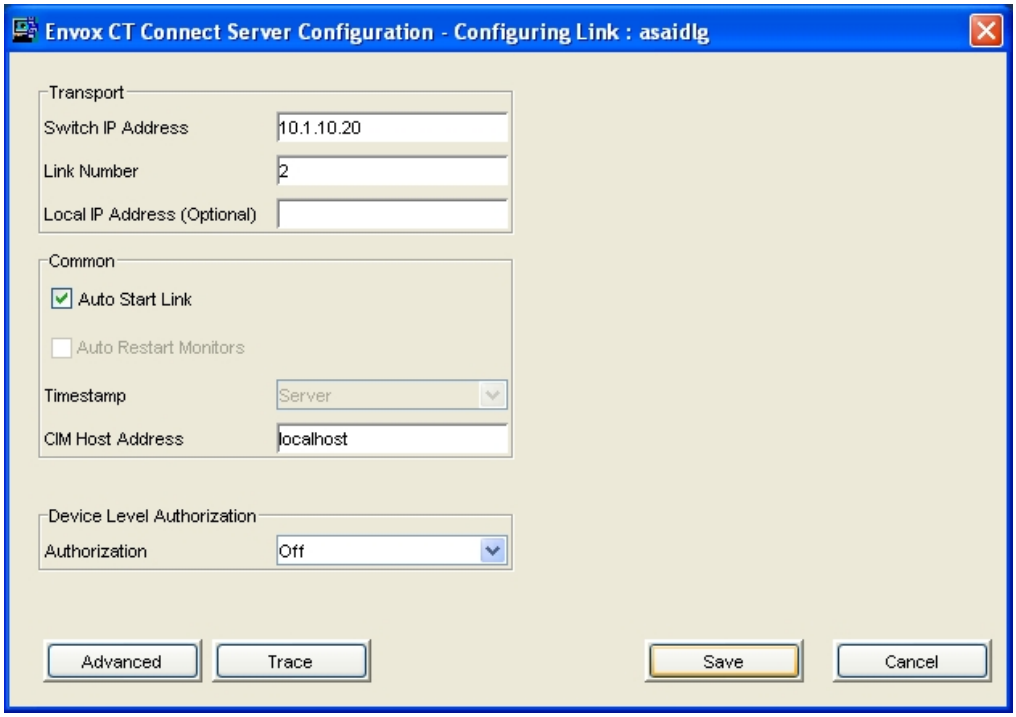
5.4. Administer IP Address and Link Number

Enter the following values for the specified fields, and retain the default values in the remaining fields. Click on **Save**.

- **Switch IP Address:** AES client connectivity IP address from **Figure 1**.
- **Link Number:** Link number used for connectivity to Avaya AES from Section 4.2.



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6. Interoperability Compliance Testing

The interoperability compliance test included feature and serviceability testing. The feature testing focused on verifying Envox CT Connect handling of CTI messages in the areas of domain control, call control, event notification, routing, value query, request feature, and set value. The serviceability testing focused on verifying the ability of Envox CT Connect to recover from adverse conditions, such as busying out the CTI link and disconnecting the Ethernet cable for the CTI link.

6.1. General Test Approach

All feature and serviceability test cases were performed manually. The Envox CT Connect test tool was used to emulate a client application's initiation of domain control, call control, device monitoring, adjunct routing, value query, request feature, and set value requests. Incoming calls were made to the monitored/controlled/routing devices, to verify proper handling of event reports and routing requests by Envox CT Connect. The verification included both manual checking of proper states at the telephone sets, and capturing CTI message traces and analyzing them with the Envox CT Connect test tool.

6.2. Test Results

All feature test cases were executed and passed.

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7. Verification Steps

This section provides the tests that can be performed to verify proper configuration of Avaya Communication Manager, Avaya Application Enablement Services, and Envox CT Connect.

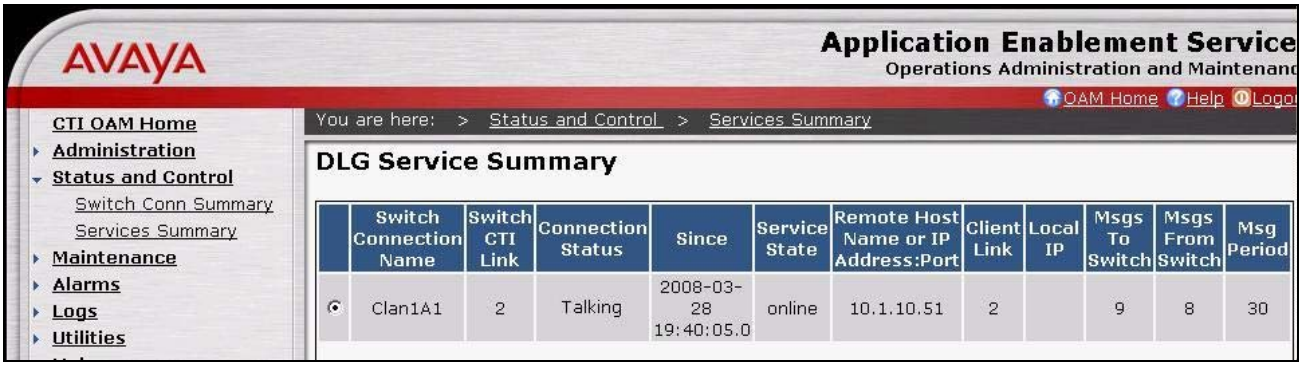
7.1. Verify Avaya Communication Manager

Verify the status of the administered CTI link by using the **status aesvcs cti-link** command. Verify that the **Service State** is "established" for the CTI link number administered in Section 3.2, as shown below.

```
status aesvcs cti-link

                          AE SERVICES CTI LINK STATUS

CTI    Version  Mnt    AE Services      Service       Msgs     Msgs
Link            Busy   Server           State         Sent     Rcvd

2      4        no     AEServer         established   14       14
3      4        no     AEServer         established   30       15
```

7.2. Verify Avaya Application Enablement Services

From the **CTI OAM Home** menu, verify the status of the DLG link by selecting **Status and Control → Services Summary** from the left pane. Click on **DLG Service**, followed by the **Details** button (not shown). The DLG Service Summary screen is displayed. Verify that the **Connection Status** is "Talking", as shown below.



	Switch Connection Name	Switch CTI Link	Connection Status	Since	Service State	Remote Host Name or IP Address:Port	Client Link	Local IP	Msgs To Switch	Msgs From Switch	Msg Period
◉	Clan1A1	2	Talking	2008-03-28 19:40:05.0	online	10.1.10.51	2		9	8	30

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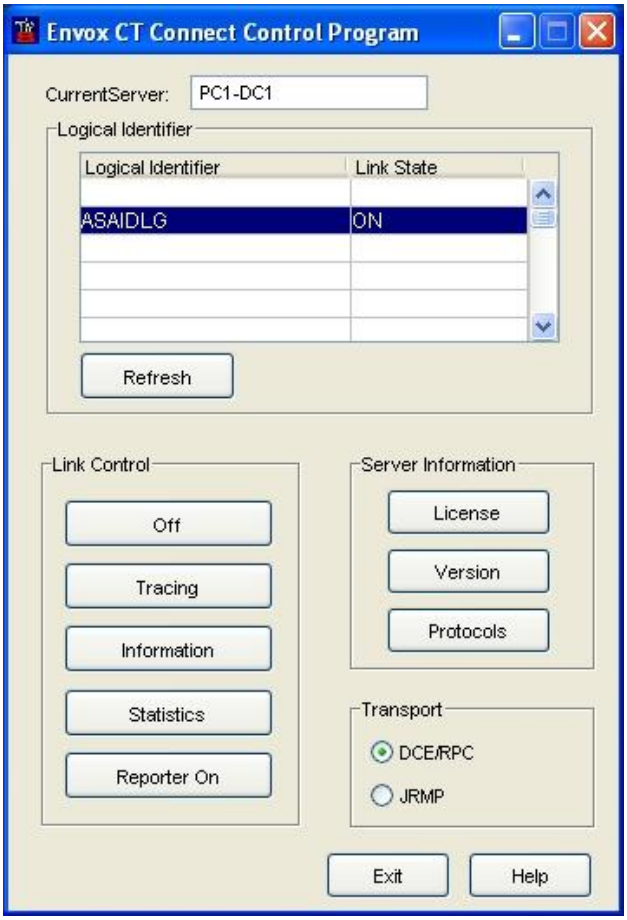
7.3. Verify Envox CT Connect

From the Envox CT Connect server, select **Start → All Programs → Envox CT Connect → Control Program** to bring up the Envox CT Connect Control Program screen below. Check that the **Link State** associated with the administered **Logical Identifier** from Section 5.2 (in this case "ASAIDLG") is "ON".



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8. Support

For technical support on Envox CT Connect, contact the regional Envox support center or the local Envox distributor. Envox technical support contact details are as follows:

Americas
+1 508 898 2600
us.support@envox.com
EMEA
+44 1252 61 8888
euro.support@envox.com
Asia Pacific
+65 6358 2241
asia.support@envox.com

9. Conclusion

These Application Notes describe the configuration steps required for Envox CT Connect 7.0 to interoperate with Avaya Communication Manager 5.0 and Avaya Application Enablement Services 4.1 using ASAI. All feature and serviceability test cases were completed.

10. Additional References

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

Avaya product documentation can be found at http://support.avaya.com.

- *Administrator Guide for Avaya Communication Manager (5.0),* Document ID 03-300509, Issue 4, January 2008
- *Avaya Application Enablement Services 4.1 Administration and Maintenance Guide,* Document ID 02-300357, Issue 9, February 2008

Envox CT Connect product information available at:
http://www.envox.com/software/envox-ct-connect.asp

- Envox CT Connect Product Brief
- Envox CT Connect Documentation
- Download Evaluation Server

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