Avaya Solution & Interoperability Test Lab

Application Notes for Co-nexus CXM with Avaya Aura™ Communication Manager and Avaya Aura™ Application Enablement Services – Issue 1.0

Abstract

These Application Notes describe the configuration steps required for Co-nexus CXM to interoperate with Avaya Aura™ Communication Manager and Avaya Aura™ Application Enablement Services.

Co-nexus CXM is a call recording solution that interfaces with Communication Manager and Application Enablement Services (AES). Co-nexus CXM can be configured to automatically record all calls full-time, record calls on-demand, record calls based on defined triggers, or even at random. Co-nexus CXM uses the Telephony Service API (TSAPI) to receive call related events. It also uses the Device, Media & Call Control (DMCC) API to register a number of softphones, DMCC recording devices. The softphones are single step conferenced into calls in order to obtain the audio for call recording.

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

These Application Notes describe a compliance tested configuration that comprised of an Avaya Aura™ Communication Manager, an Avaya Aura™ Application Enablement Services server, and a Co-nexus CXM server and client.

Co-nexus CXM is a call recording solution that interfaces with Avaya Communication Manager and Avaya Application Enablement Services. Co-nexus CXM uses a TSAPI CTI link to an Application Enablement Services server to monitor stations, agents, and hunt groups to obtain recording triggers and call information. Co-nexus CXM also uses the DMCC interface of Application Enablement Services to register softphones with Communication Manager. Co-nexus CXM uses the softphones as recording devices. When recording of a call is desired, Co-nexus CXM uses the Single Step Conference feature to conference a softphone into the call to obtain the audio.

1.1. Interoperability Compliance Testing

The interoperability compliance testing focused on feature functionality, serviceability, and performance. The feature functionality testing evaluated the ability of Co-nexus CXM to monitor and record calls placed to and from stations on Communication Manager. The serviceability testing introduced failure conditions to see if CXM could properly resume recording calls after each failure recovery. The performance testing stressed CXM by continuously placing calls over extended periods of time.

The compliance testing validated the monitoring and recording performed by CXM of calls placed to and from analog phones, digital phones, IP phones, softphones, agents, Vector Directory Numbers (VDNs), and hunt groups on Communication Manager.

1.2. Support

Technical support for Co-nexus CXM can be obtained by contacting Co-nexus at:

- Phone: 866.400.4CXM (4296)
- Web: http://www.4cxm.com/cont.asp
- Email: SupportCXM@4cxm.com

2. Reference Configuration

The figure below shows the configuration used during compliance testing. Site A is comprised of an Avaya S8500 Media Server with an Avaya G650 Media Gateway. Site B is comprised of an Avaya S8300 Media Server with an Avaya G450 Media Gateway. The two Communication Manager systems are connected to each other via an IP (H.323) trunk and an ISDN-PRI trunk. The various telephones shown are used to generate intra-switch calls, outbound and inbound calls to and from the PSTN, and inter-switch calls. The Co-nexus CXM server is set up to record calls at Site A.

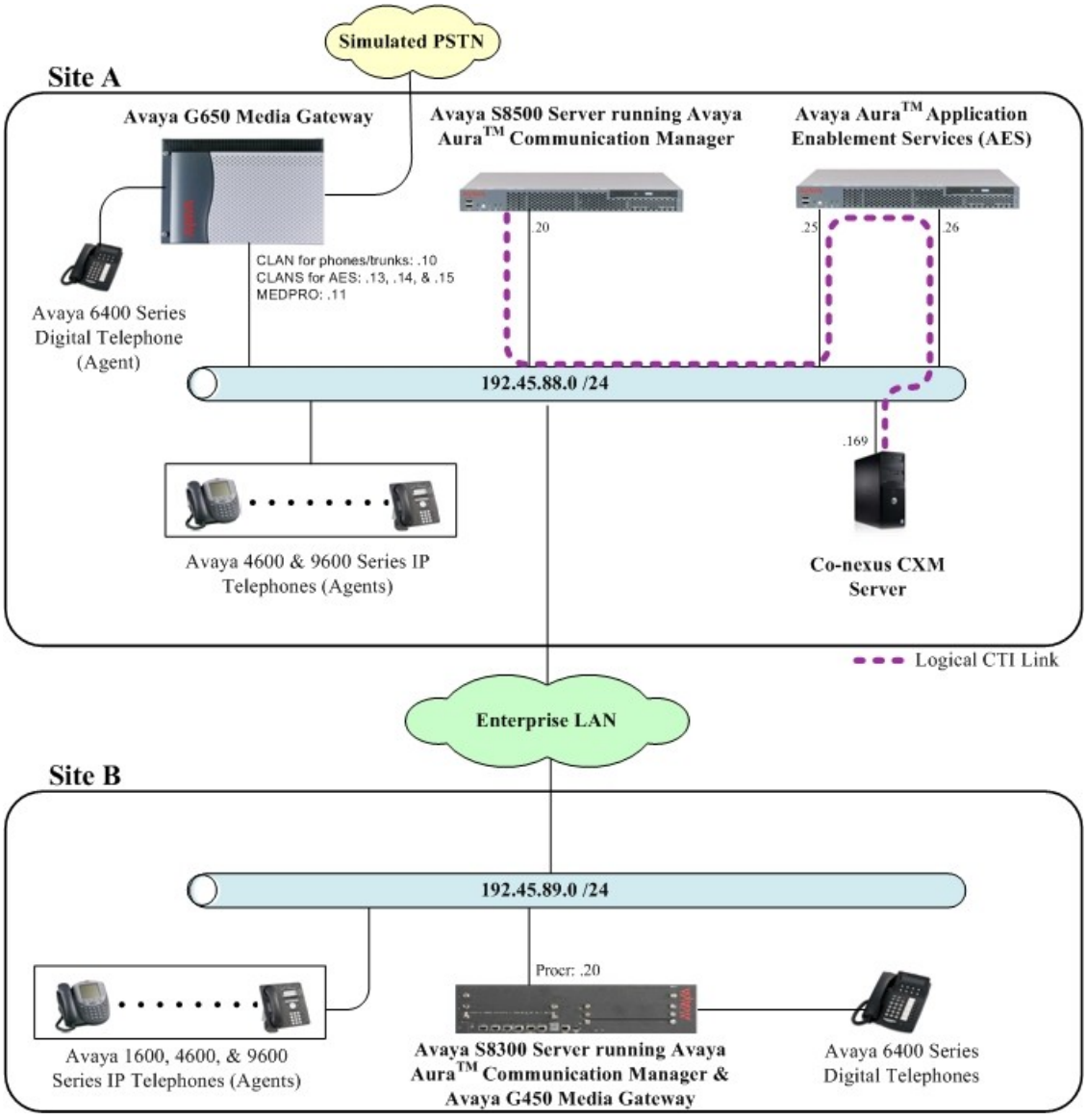


Figure 1: Co-nexus CXM with Communication Manager and AES

3. Equipment and Software Validated

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

Equipment	Software
Avaya S8500 Server (w/ G650)	Avaya Aura™ Communication Manager 5.2 (R015x.02.0.947.3)
Avaya S8300 Server (w/ G450)	Avaya Aura™ Communication Manager 5.2 (R015x.02.0.947.3)
Avaya G650 Media Gateway: TN799DP (C-LAN) TN2602AP (MEDPRO) TN2312BP (IPSI)	 HW01, FW026 HW02, FW007 HW15, FW030
Avaya G450 Media Gateway : MM710BP (DS1) MM712AP (DCP)	 HW11, FW044 HW07, FW009
Avaya Aura™ Application Enablement Services (AES) Server	4.2
Avaya C364T-PWR Converged Stackable Switch	4.5.14
Avaya 1600 Series IP Phones : 1608SW (H.323) 1616SW (H.323)	 1.0.3 1.0.3
Avaya 4600 Series IP Phones: 4610SW (H.323) 4620SW (H.323) 4621SW (H.323)	 2.9 2.9 2.9
Avaya 9600 Series IP Phones: 9620 (H.323) 9230 (SIP)	 3.002 2.4.1
Avaya 6400 Series Digital Phones	-
Co-nexus CXM Server	4.5
Co-nexus CXM Client	4.5

4. Configure Communication Manager

All the configuration changes in this section for Communication Manager are performed through the System Access Terminal (SAT) interface. For more information on configuring Communication Manager, refer to the Avaya product documentation, **Reference [1].**

The information shown on the screens throughout this section indicate the values that were used during compliance testing.

4.1. Configure IP Codec Sets & IP-Network Regions

This section provides the steps required for configuring ip-codec-set and ip-network regions.

1. Enter the **change ip-codec-set <codec set number>** command, where **<codec set number>** is the codec set number to be used with the Co-nexus recording solution.

   - In the **Audio Codec** field, type **G.711MU**.

```
change ip-codec-set 1                                          Page   1 of   2

                         IP Codec Set

   Codec Set: 1

   Audio          Silence      Frames   Packet
   Codec          Suppression  Per Pkt  Size(ms)
 1: G.711MU            n         2        20
 2:
 3:
 4:
 5:
 6:
 7:


    Media Encryption
 1: none
 2:
 3:
```

2. Enter the **change ip-network-region <region number>** command, where **<region number>** is the ip network region number to be used with the Co-nexus recording solution.

   - In the **Code Set** field, type the codec set number administered in **Step 1**. The **Codec Set** field reflects the codec set that must be used for connections between phones within this region or between phones and media processor boards within this region.

```
change ip-network-region 1                                    Page   1 of  19
                            IP NETWORK REGION
  Region: 1
Location: 1       Authoritative Domain: dev8.com
    Name: interop
MEDIA PARAMETERS                Intra-region IP-IP Direct Audio: yes
      Codec Set: 1              Inter-region IP-IP Direct Audio: yes
   UDP Port Min: 2048                     IP Audio Hairpinning? y
   UDP Port Max: 65535
DIFFSERV/TOS PARAMETERS                RTCP Reporting Enabled? y
 Call Control PHB Value: 48      RTCP MONITOR SERVER PARAMETERS
        Audio PHB Value: 48       Use Default Server Parameters? y
        Video PHB Value: 26
802.1P/Q PARAMETERS
 Call Control 802.1p Priority: 6
        Audio 802.1p Priority: 6
        Video 802.1p Priority: 5      AUDIO RESOURCE RESERVATION PARAMETERS
H.323 IP ENDPOINTS                                     RSVP Enabled? n
  H.323 Link Bounce Recovery? y
 Idle Traffic Interval (sec): 20
   Keep-Alive Interval (sec): 5
            Keep-Alive Count: 5
```

During compliance testing, two IP Network regions were used. It is best practice for all CLANs dedicated to AE Services to be in a separate network region from those CLANs servicing endpoints (i.e. phones). For compliance testing, a single CLAN in network region 1 was used to service endpoints, while 3 CLANs in network region 2 were dedicated to Application Enablement Services. Both IP network regions were configured to use IP codec set 1.

4.2. Configure Connectivity to AES and Endpoints

This section provides the steps required for configuring connectivity from Communication Manager to Application Enablement Services and endpoints.

The Application Enablement Services server communicates with Communication Manager by using one or more CLANs to create a switch connection. The following steps show only the configuration required in Communication Manager to set up a switch connection. See **Section 5.1** for the configuration steps required in Application Enablement Services to complete the administration of the switch connection.

1. Enter the **change node-names ip** command.

   - In the **Name** field, type a descriptive name to assign to a CLAN.
   - In the **IP Address** field, type the IP address that will be assigned to the CLAN.

```
change node-names ip                                          Page   1 of   2
                                  IP NODE NAMES
    Name                   IP Address
8300                   192.45.89.20
CLAN                   192.45.88.10
CLAN2                  192.45.88.13
CLAN3                  192.45.88.14
CLAN4                  192.45.88.15
LSP-8300               192.45.88.30
Member-CDR             192.168.199.69
RDTT-CDR               192.45.88.45
SES                    192.45.88.50
cf-medpro              192.45.88.11
default                0.0.0.0
ipoffice               192.45.88.40
procr                  192.45.88.20
```

Repeat this step for each CLAN.

In the compliance tested configuration, the **CLAN** node was used for registering endpoints and the **CLAN2**, **CLAN3**, and **CLAN4** nodes were used for connectivity to Application Enablement Services.

2. Enter the **add ip-interface <board location>** command, where **<board location>** is the board location for the CLAN, for example: 01A02.

- In the **Enable Interface** field, type **y**.
- In the **Network Region** field, type the network region number administered in **Section 4.1**.
- In the **Node Name** field, type **<CLAN name>**, where **<CLAN name>** is the **Name** from **Step 1**.
- In the **Ethernet Link** field, type an available Ethernet link number.

```
add ip-interface 01a08                                        Page   1 of   3
                                IP INTERFACES


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



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

         Ethernet Link: 1
```

Repeat this step for each CLAN

In the compliance tested configuration, the **CLAN** node was assigned to network region 1 and the **CLAN2**, **CLAN3**, and **CLAN4** nodes were assigned to network region 2.

3. Enter the **change ip-services** command.

- In the **Service Type** field, type **AESVCS**.
- In the **Enabled** field, type **y**.
- In the **Local Node** field type **<nodename>**, where **<nodename>** is the name of the CLAN board used for connectivity to Application Enablement Services.
- In the **Local Port** field, accept the default port (**8765**).

```
change ip-services                                            Page   1 of   4

                                IP SERVICES
 Service      Enabled      Local        Local       Remote      Remote
   Type                    Node         Port        Node        Port
AESVCS         y       CLAN2           8765
AESVCS         y       CLAN3           8765
AESVCS         y       CLAN4           8765
```

Repeat this step for each CLAN used for connectivity to Application Enablement Services.

On **Page 4**,

- In the **AE Services Server** field, type the **<name>** of the Application Enablement Services server. On the Application Enablement Services server, the name can be obtained by typing "uname –n" at the command prompt. The name entered on Communication Manager must match the Application Enablement Services server name exactly.
- In the **Password** field, enter an alphanumeric password. The passwords must exactly match on both Communication Manager and Application Enablement Services (administered in **Section 5.1**).
- In the **Enabled** field, type **y**.

```
change ip-services                                          Page   4 of   4
                           AE Services Administration

   Server ID    AE Services       Password          Enabled    Status
                   Server
      1:      aeserver25        xxxxxxxxxxxx          y        in use
      2:
      3:
```

4.3. Configure CTI Link

This section provides the steps required for configuring a CTI link on Communication Manager. See **Section 5.3** for the configuration steps required on Application Enablement Services to complete the administration.

1. Enter the **display system-parameters customer-options** command.

   - On **Page 3**, verify that the **Computer Telephony Adjunct Links** field is set to **y**. If not, contact an authorized Avaya account representative to obtain the license.

```
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                      CAS Branch? n
 A/D Grp/Sys List Dialing Start at 01? n                        CAS Main? n
Answer Supervision by Call Classifier? y                Change COR by FAC? n
                                ARS? y  Computer Telephony Adjunct Links? y
                ARS/AAR Partitioning? y   Cvg Of Calls Redirected Off-net? n
          ARS/AAR Dialing without FAC? y                      DCS (Basic)? y
          ASAI Link Core Capabilities? y                DCS Call Coverage? y
          ASAI Link Plus Capabilities? y               DCS with Rerouting? y
       Async. Transfer Mode (ATM) PNC? n
  Async. Transfer Mode (ATM) Trunking? n    Digital Loss Plan Modification? y
             ATM WAN Spare Processor? n                           DS1 MSP? y
                               ATMS? y             DS1 Echo Cancellation? y
                  Attendant Vectoring? y
```

2. Enter **add cti-link <link number>** command, where **<link number>** is an available CTI link number.

   - In the **Extension** field, type **<station extension>**, where **<station extension>** is a valid station extension.
   - In the **Type** field, type **ADJ-IP**.
   - In the **Name** field, type a descriptive name.

```
add cti-link 10                                               Page   1 of   3
                                   CTI LINK
 CTI Link: 10
Extension: 39010
     Type: ADJ-IP
                                                                      COR: 1
     Name: TSAPI Link 1 - aeserver25
```

4.4. Configure Stations (DMCC Recording Devices)

This section provides the steps required for configuring stations on Communication Manager that will function as recording devices for Co-nexus CXM.

For the purpose of this document, devices that have been registered using the DMCC service will be called "DMCC devices". When a client application registers itself as a DMCC device at an extension, it can act like an IP softphone to control and monitor physical aspects of the extension (button pushes, lamps, the display, etc.) or access and control the media streams at the extension. For a client application to be able to control the media at an extension, and record calls at that extension, it must register itself as a DMCC device with the media mode set to "Client". Client media mode indicates that the client application will handle the media streams from the DMCC device. DMCC devices that have been registered in the Client media mode will be called "DMCC recording devices".

The DMCC recording devices used by Co-nexus CXM are administered as IP softphones on Avaya Communication Manager. Each DMCC recording device requires either an "IP_API_A" license on Communication Manager or a "VALUE_DMCC_DMC" license on Application Enablement Services.

Note that these licenses are separate and independent from the Avaya IP Softphone licenses required on Communication Manager for Avaya IP Softphones, but not for DMCC recording devices.

1. Enter the **display system-parameters customer-options** command to verify that there are sufficient **IP_API_A** licenses for the DMCC recording devices. If not, contact an authorized Avaya account representative to obtain these licenses.

```
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        : 0              0
IP_Phone       : 2400           3
IP_ROMax       : 2400           0
IP_Soft        : 2              0
IP_eCons       : 0              0
oneX_Comm      : 2400           0
               : 0              0
```

2. Enter the **add station <extension>** command, where **<extension>** is a valid station extension.

   - In the **Type** field, type an IP telephone set type with configurable buttons; for example, **4620**.
   - In the **Security Code**, type the value entered for **<extension>** (the station extension and security code must match).
   - In the **Name** field, type a descriptive name.
   - In the **IP SoftPhone**, type **y**.

```
add station 31126                                          Page   1 of   5
                                    STATION

Extension: 31126                       Lock Messages? n              BCC: 0
     Type: 4620                        Security Code: 31126           TN: 1
     Port: IP                        Coverage Path 1:                COR: 1
     Name: DMCC Softphone            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: 31126
           Speakerphone: 2-way              Mute Button Enabled? y
        Display Language: english              Expansion Module? n
 Survivable GK Node Name:
          Survivable COR: internal            Media Complex Ext:
   Survivable Trunk Dest? y                        IP SoftPhone? y

                                                      IP Video? n


                                            Customizable Labels? Y
```

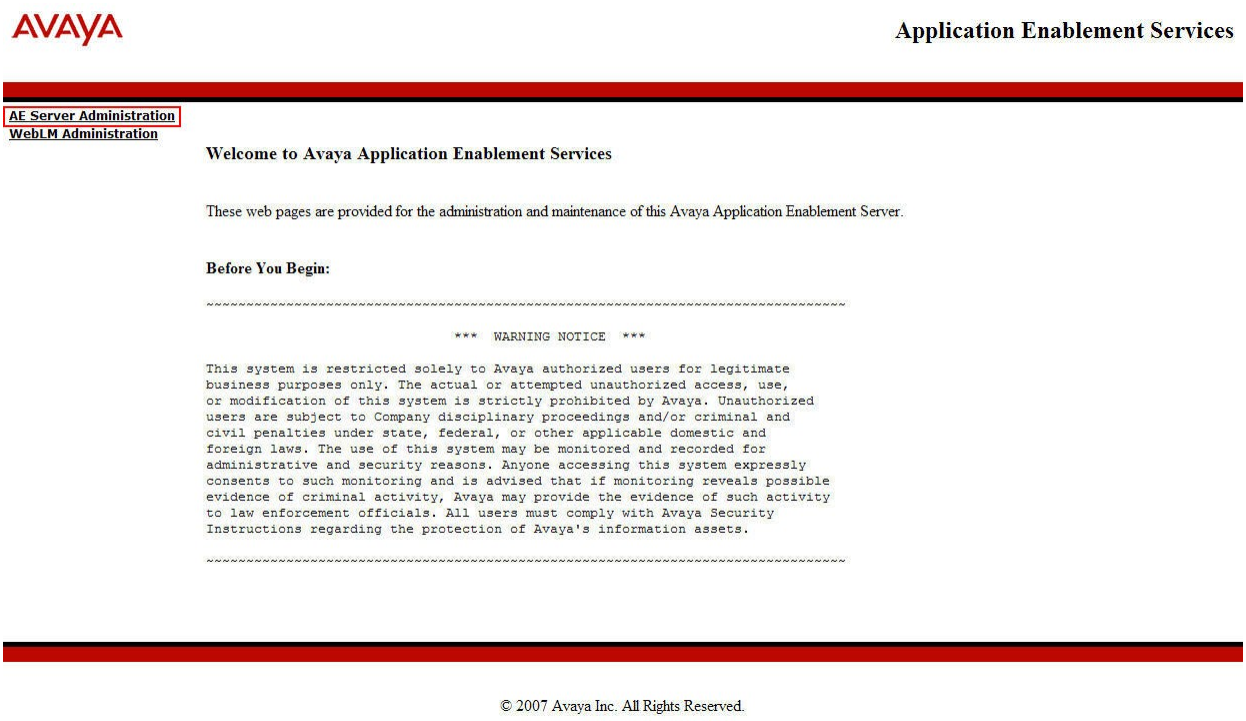
This completes the Avaya Aura™ Communication Manager configuration.

5. Configure Application Enablement Services

The Application Enablement Services (AES) server enables Computer Telephony Interface (CTI) applications to monitor and control telephony resources on Communication Manager. The Application Enablement Services server receives requests from CTI applications, and forwards them to Communication Manager. Conversely, the Application Enablement Services server receives responses and events from Communication Manager and forwards them to the appropriate CTI applications.

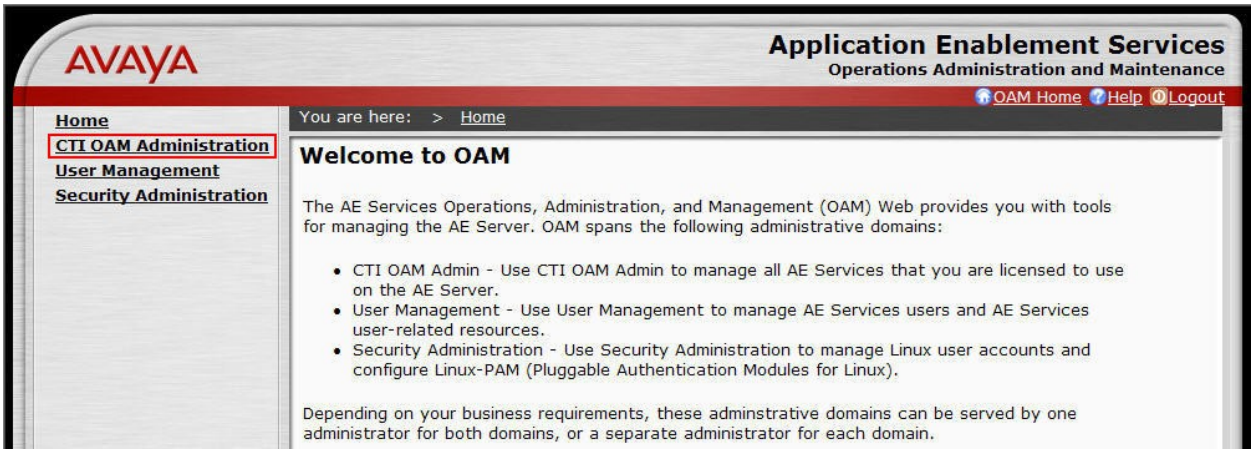
This section assumes that the installation and basic administration of the Application Enablement Services server has already been performed. For more information on administering Application Enablement Services, refer to the Avaya product documentation, **Reference [2]**.

1. Launch a web browser and enter https://<IP address of AES Server> in the address field. Click **AE Server Administration**.

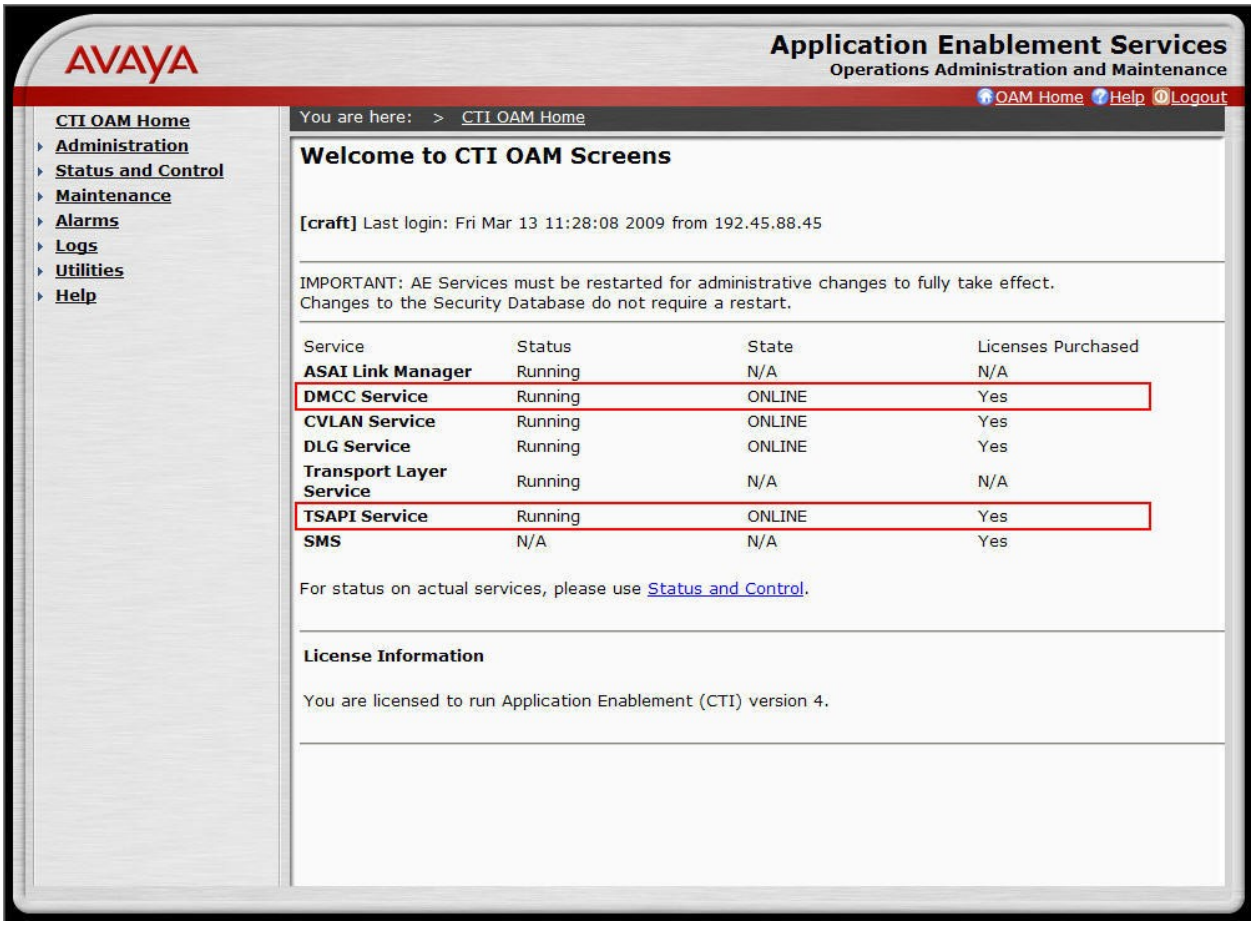


2. Log in with the appropriate credentials for accessing the Application Enablement Services CTI OAM web pages.

3. Click **CTI OAM Administration** in the left pane menu.



4. Verify that Application Enablement Services is licensed for the TSAPI and DMCC services. If these services are not licensed, contact an authorized Avaya account representative to obtain these licenses.

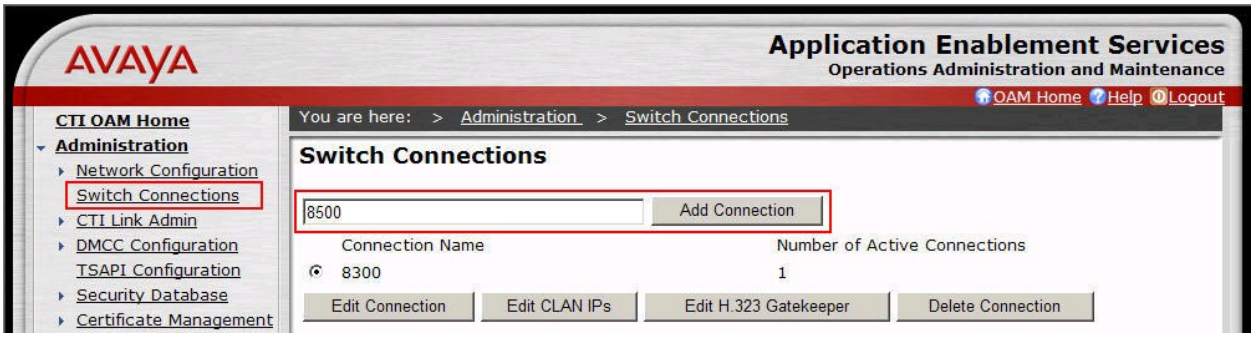


5. Each DMCC recording device used by Co-nexus CXM requires either an "IP_API_A" license on Avaya Communication Manager or a "VALUE_DMCC_DMC" license on Application Enablement Services. If "VALUE_DMCC_DMC" licenses are being used, log in to the Avaya Web License Manager (WebLM) and verify that there are sufficient licenses for the DMCC recording devices. Additionally, verify there are sufficient TSAPI licenses to monitor and control Communication Manager resources for call events and Single Step Conferencing. If not, contact an authorized Avaya account representative to obtain these licenses.

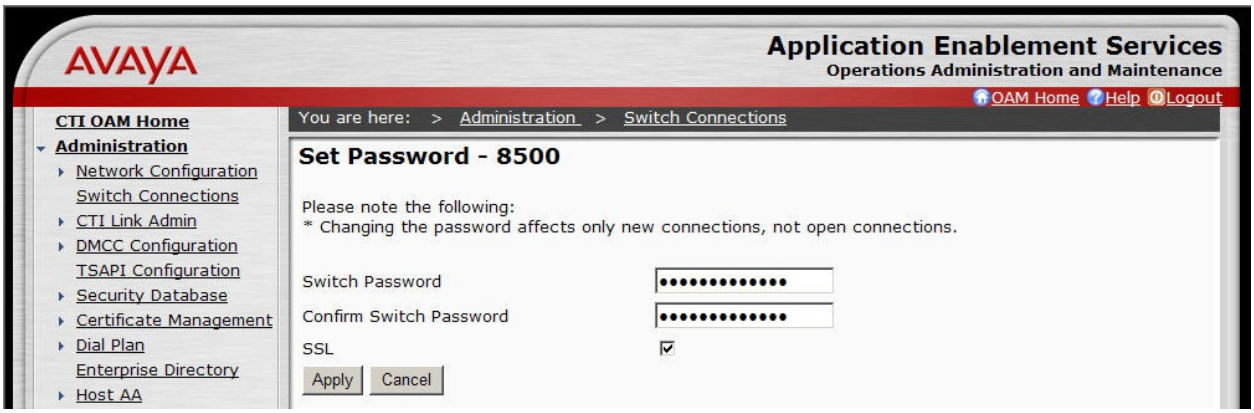
5.1. Configure a Switch Connection

This section provides the steps required for configure a Switch Connection. A Switch Connection defines a connection between the Application Enablement Services server and Communication Manager.

1. Select **Administration > Switch Connections** from the left pane menu. In the **Add Connection** field, type a descriptive name and click **Add Connection**.

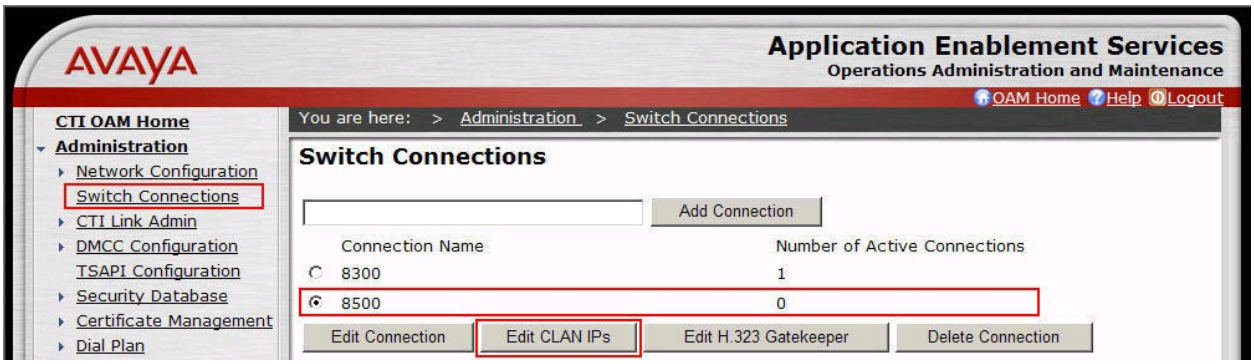


2. In the **Switch Password** field, type the password that was entered during **Step 3** of **Section 4.2**. Re-type the password in the **Confirm Switch Password** field. Leave **SSL** checked if using a secure connection to Communication Manager. Click **Apply**.

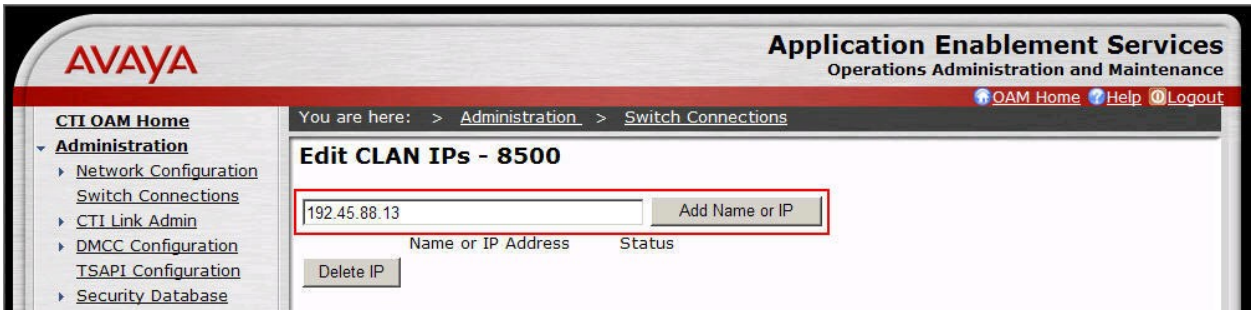


OAM adds the switch connection and returns to the "Switch Connections" page.

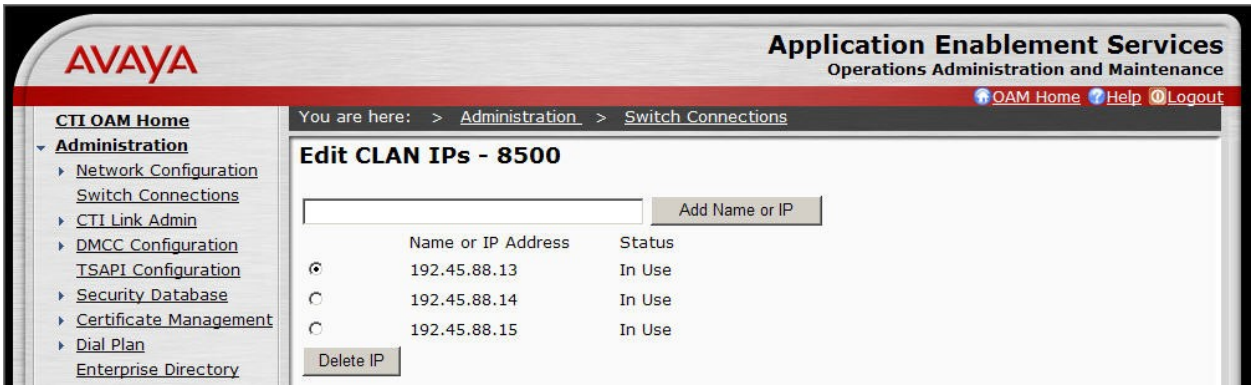
3. From the "Switch Connections" page, select the newly added switch connection, and click **Edit CLAN IPs**.



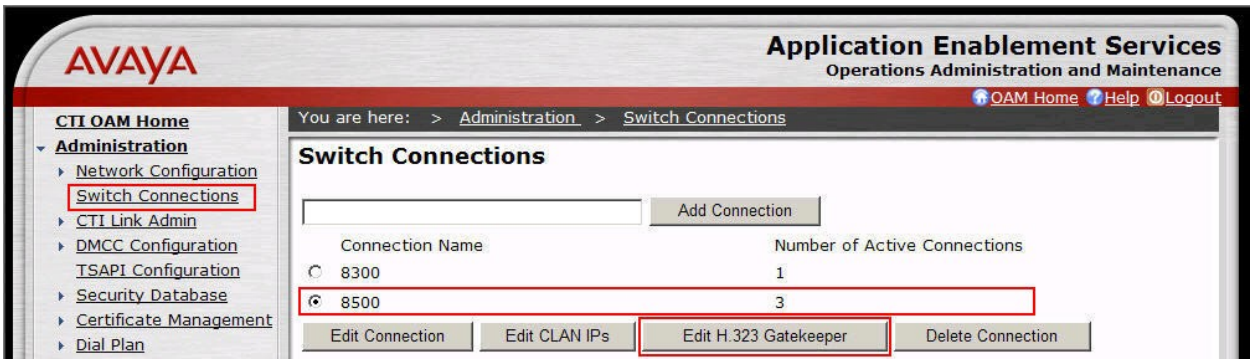
4. In the **Add Name or IP** field, type the **<Host Name>** or the **<IP Address>** of the CLAN, and click **Add Name or IP** (use the Host Name or IP address of the CLAN that was administered for Application Enablement Services connectivity in **Section 4.2**).



Repeat this step for each CLAN. The screen below shows the CLANs that were used during compliance testing.

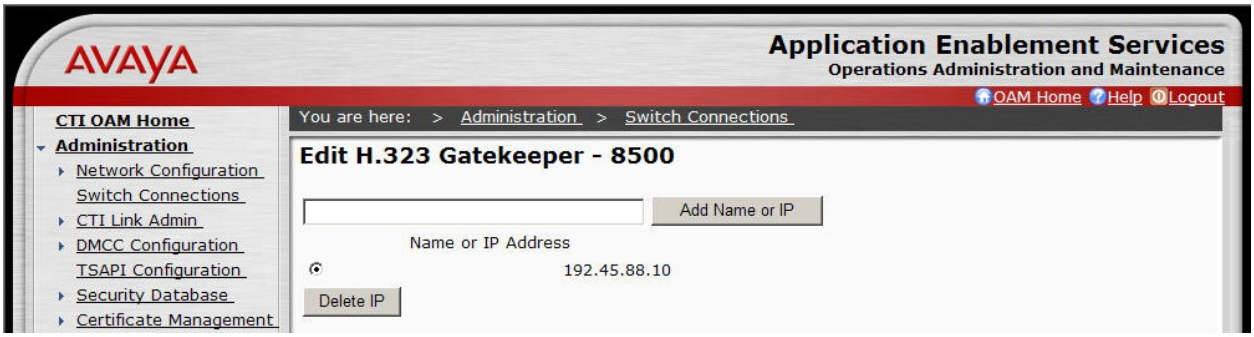


5. Navigate back to **Administration > Switch Connections**. Select the switch connection, and click **Edit H.323 Gatekeeper**.



6. In the **Add Name or IP** field, type the **<Host Name>** or **<IP address>** of the CLAN to be used. Click **Add Name or IP**.

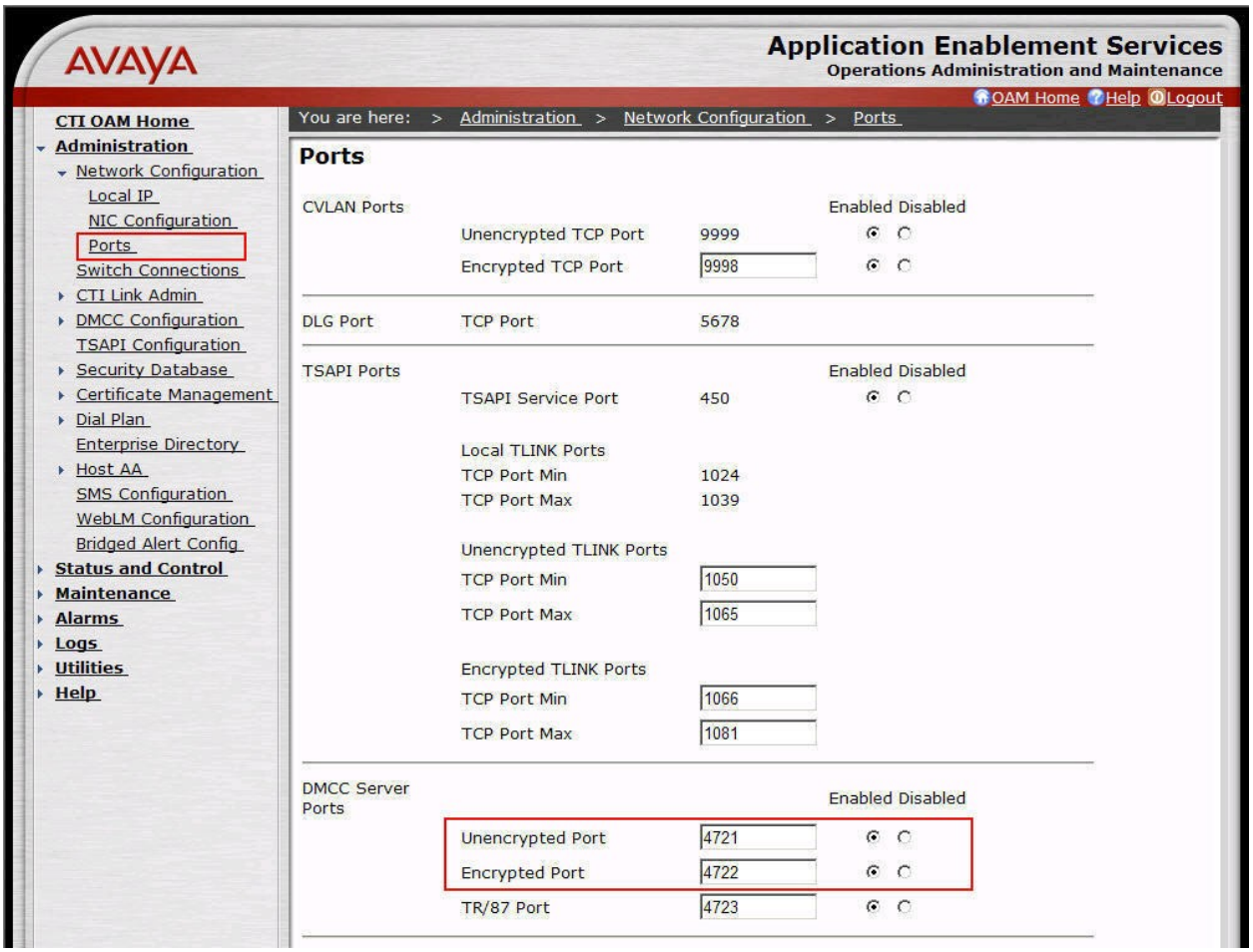
Repeat this step as necessary to add multiple H.323 Gatekeepers. The screen below shows the CLANs that were used during compliance testing.



5.2. Configure DMCC Server Ports

This section provides the steps required for configuring DMCC server ports.

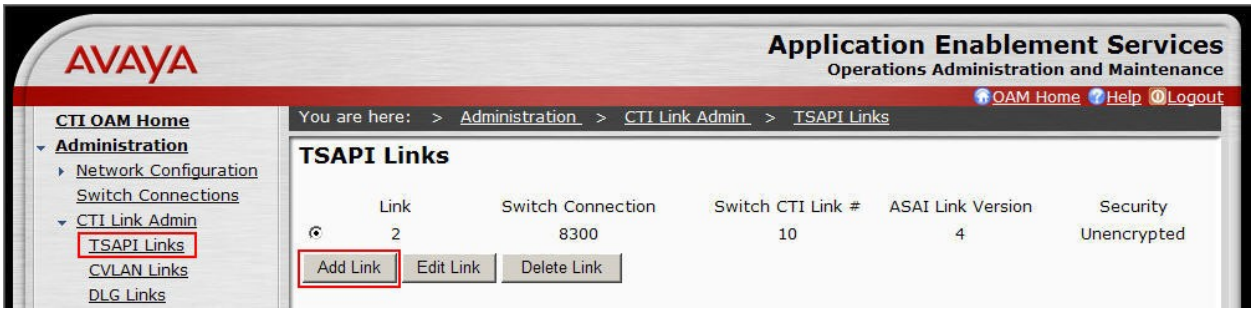
1. Navigate to the **CTI OAM Home > Administration > Ports** page. During compliance testing, the default port values shown in the screen below were utilized. Set either the **Encrypted Port** or the **Unencrypted Port** field to **Enabled**. During compliance testing, the encrypted port was used. Click the **Apply Changes** button (not shown) at the bottom of the screen to complete the process.



5.3. Configure TSAPI Link

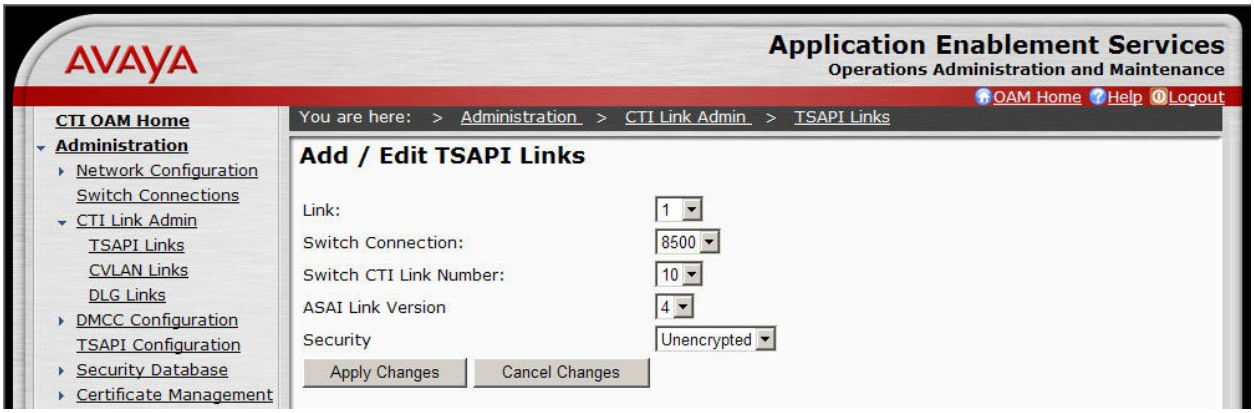
This section provides the steps required for configuring a TSAPI Link.

1. From the CTI OAM main menu select **Administration > CTI Link Admin > TSAPI Links**. Click **Add Link**.



2. Complete the "Add / Edit TSAPI Links" page as follows:

- In the **Link** field, select an available link number.
- In the **Switch Connection** field, select the switch connection configured in **Section 5.1**.
- In the **Switch CTI Link Number** field, select the CTI link number that was administered on Communication Manager in **Step 2** of **Section 4.3**.
- In the **ASAI Link Version** field, select the default value, **4**.
- In the **Security** field, select the appropriate encryption option for connectivity to the Co-nexus CXM server.

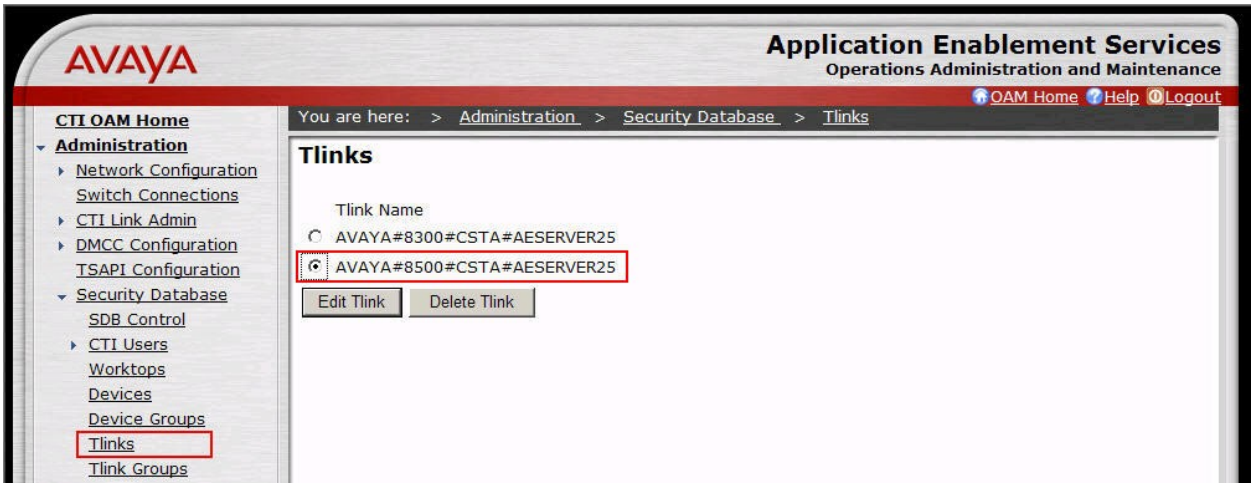


5.4. Display Tlink

This section provides the steps required to display Tlinks.

Tlinks are service identifiers (names) dynamically created by the TSAPI Service. Tlinks are created automatically once the TSAPI CTI links are created. The appropriate Tlink name will be needed during the configuration of the Co-nexus CXM server. This section just illustrates how to obtain the Tlink name.

1. Navigate to **Administration > Security Database > CTI Users > Tlinks**.



To identify the correct Tlink, note that a Tlink has the following format:

AVAYA#switch_connection_name#service_type#AE_server_name

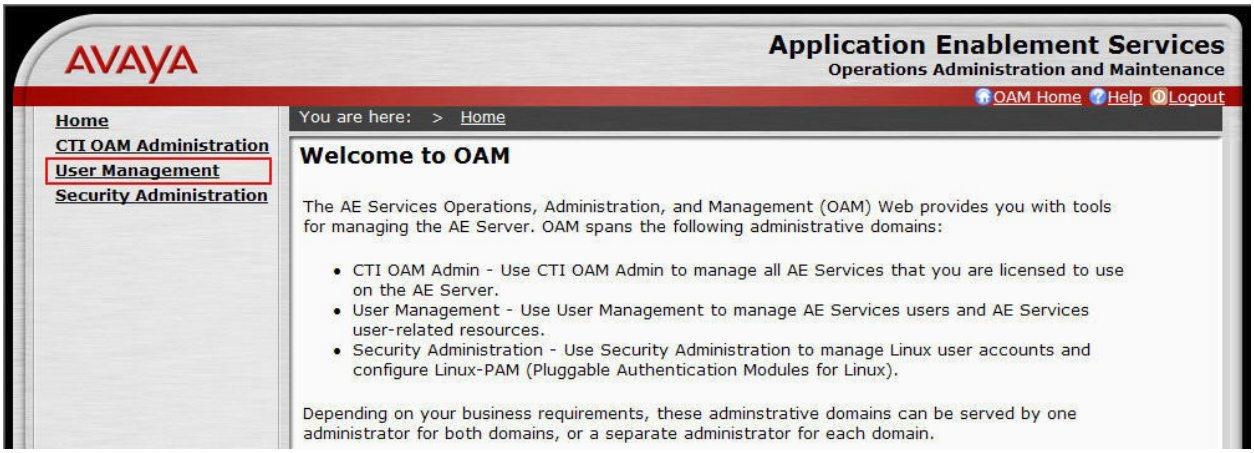
where:

- **AVAYA** is a fixed constant.
- **switch_connection_name** represents the Switch Connection name administered in **Section 5.1**.
- **service_type** refers to the CSTA service type. It can be either of the following:
  - **CSTA**, if the TSAPI Link was administered as unencrypted in **Section 5.3**.
  - **CSTA-S**, if the TSAPI Link was administered as encrypted in **Section 5.3**.
- **AE_server_name** represents the Application Enablement Services Server name.

5.5. Configure CTI Users

This section provides the steps required to configure a CTI user. If necessary, log in to the Application Enablement Services server again with the appropriate credentials for accessing the "User Management" pages.

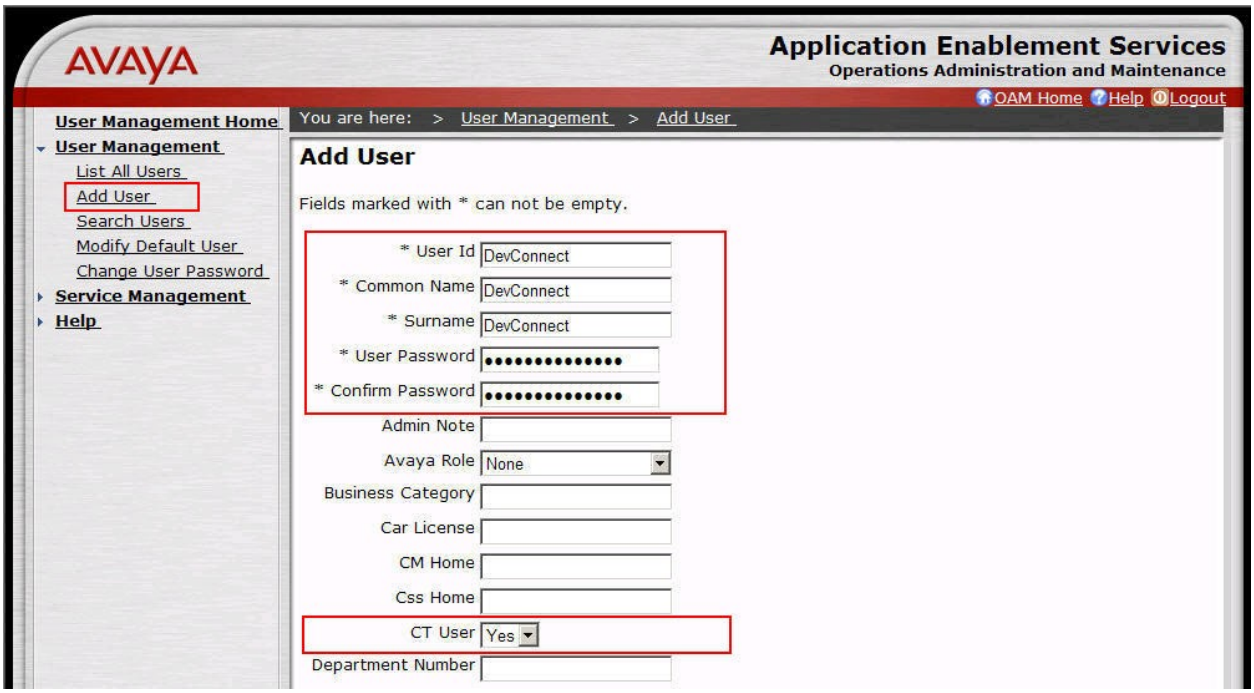
1. Navigate to the "OAM Home" page. Select **User Management** from the left pane menu.



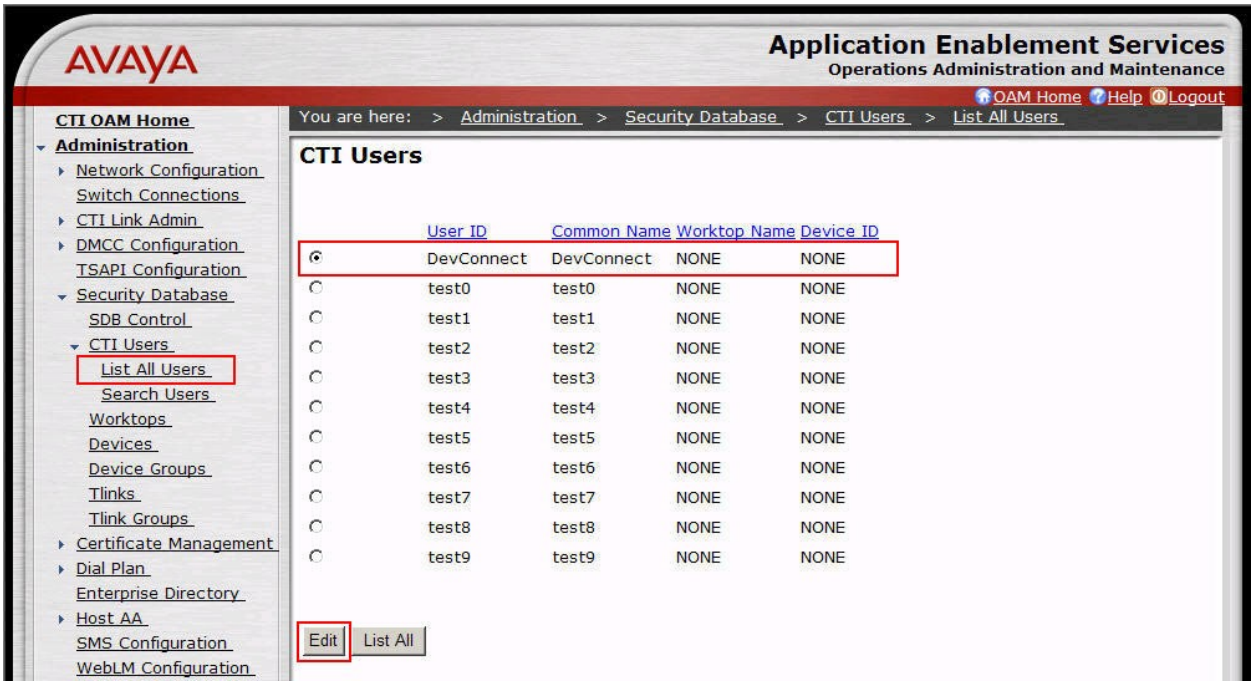
2. Navigate to **User Management > Add User**. On the "Add User" page, provide the following information:

- In the **User Id** field, type the user ID being assigned to the user.
- In the **Common Name** field, enter the name the user prefers to use.
- In the **Surname** field, type the surname**.**
- In the **User Password** field, type the password being assigned to the user.
- In the **Confirm Password** field, re-type the assigned password.
- In the **CT User field,** select **Yes** to add the user as a member of the Security Database (SDB).

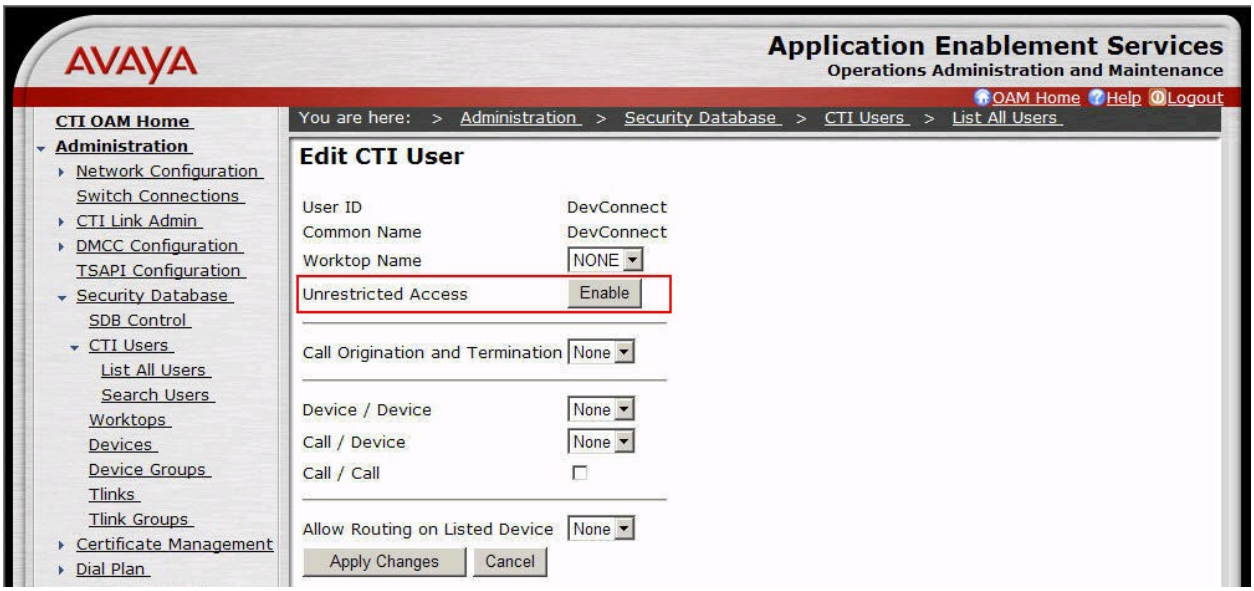
Click the **Apply** button (not shown) at the bottom of the screen.



3. Select **OAM Home** in upper right and navigate to the **CTI OAM Administration → Security Database → CTI Users → List All Users** page. Select the **User ID** created in **Step 2**, and click the **Edit** button to set the permissions of the user.



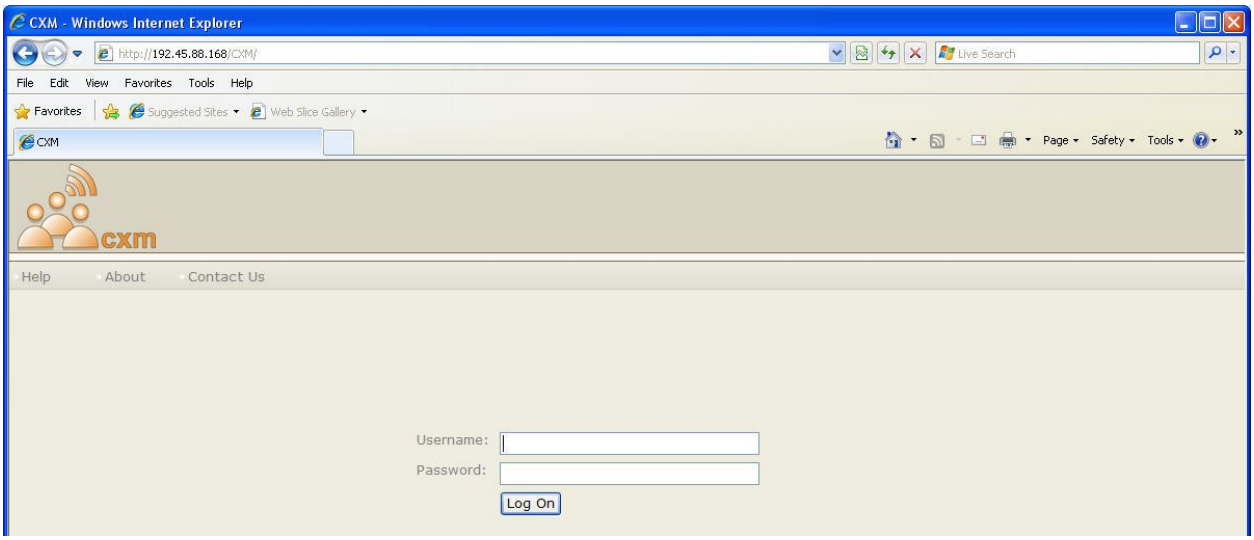
4. Provide the user with unrestricted access privileges by clicking the **Enable** button on the **Unrestricted Access** field. A Warning screen will be displayed (not shown). Click **Apply**.



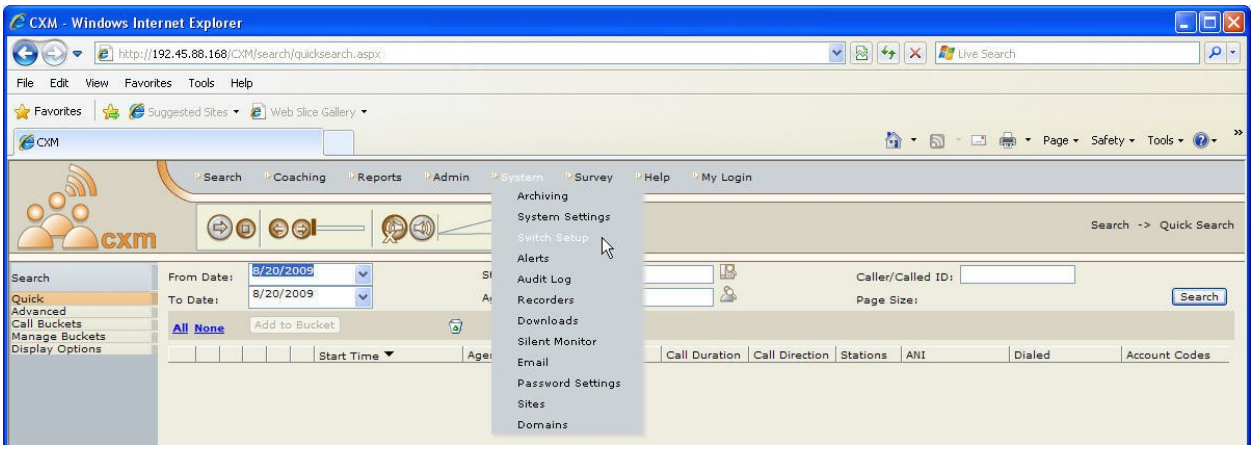
6. Configure Co-nexus CXM

This section describes the configuration required for the Co-nexus CXM server to interface with Application Enablement Services and Communication Manager.

1. Launch a web browser, enter http://<IP address of Co-nexus server>/CXM in the URL, and log in with the appropriate credentials.

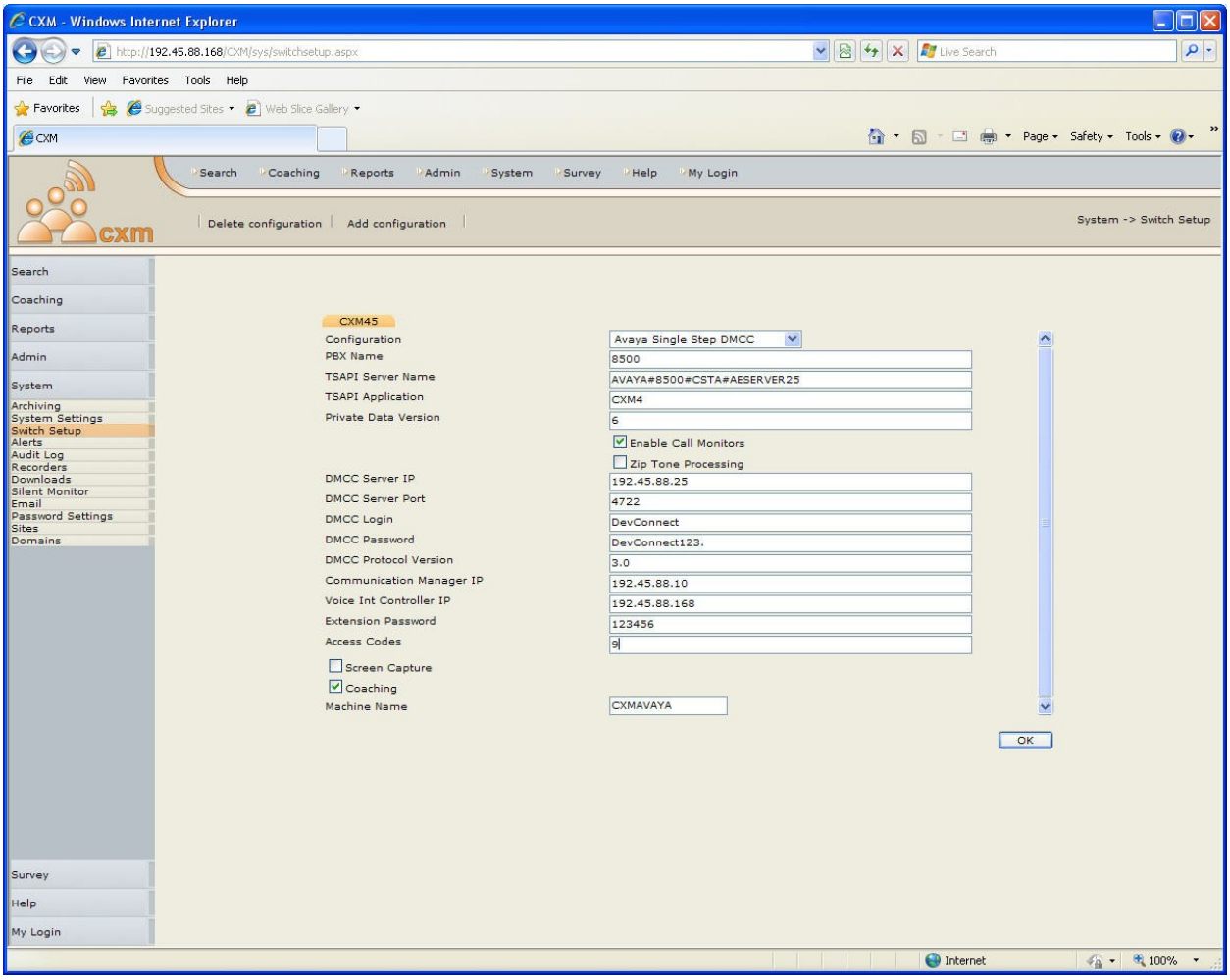


2. Use the menu on top of the screen to select the **System → Switch Setup** link.

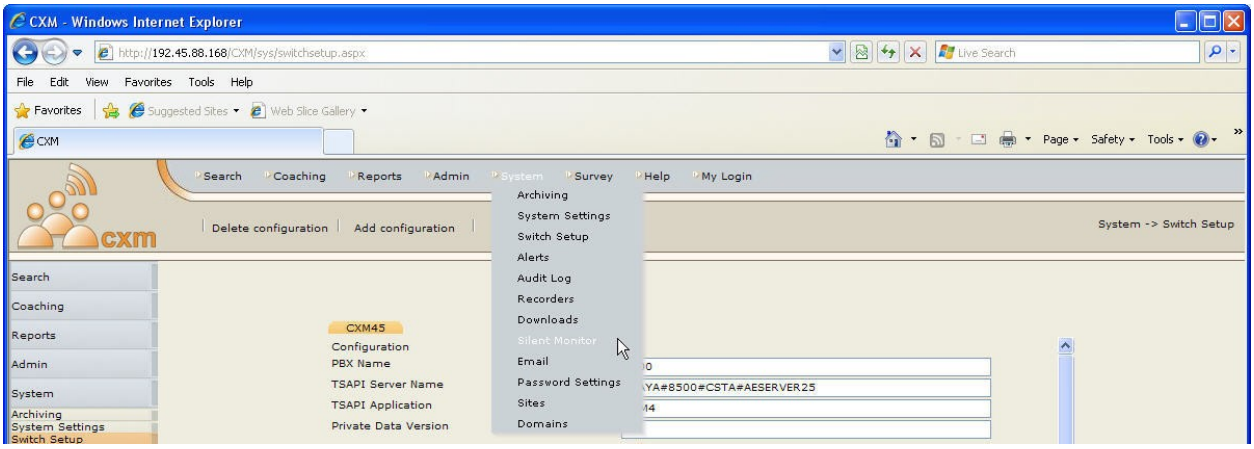


3. On the **Switch Setup** screen, provide the following information:

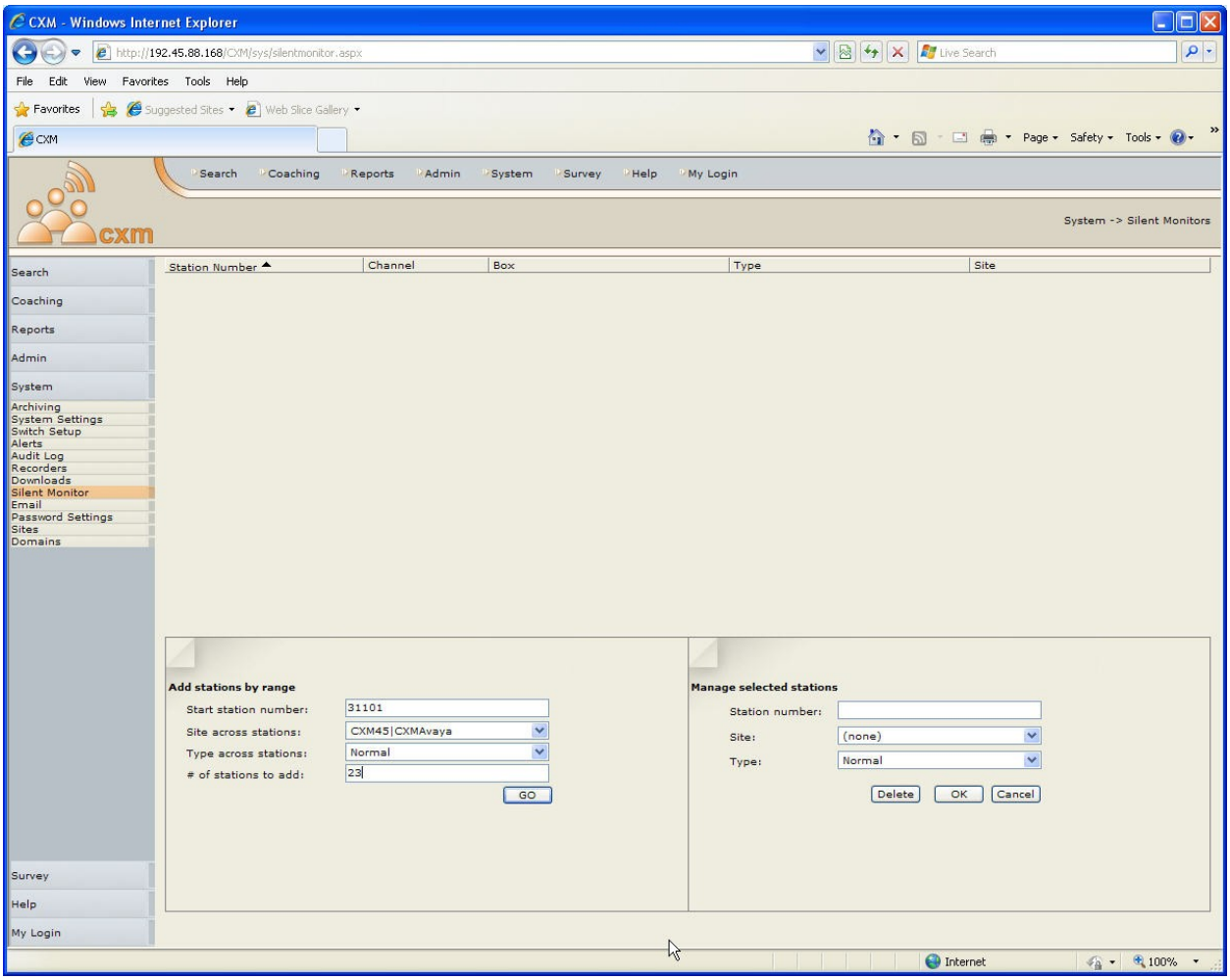
- In the **Configuration** drop down menu, select **Avaya Single Step DMMC**.
- In the **PBX Name** field, enter the switch connection name from **Section 5.1**.
- In the **DMCC Server IP** field, enter the IP address of the Application Enablement Services server.
- In the **DMCC Server Port** field, enter the DMCC port from **Section 5.2**.
- In the **DMMC Login** and **DMCC Password** fields, enter the user ID and password from **Section 5.5**.
- In the **Communication Manager IP** field, enter the CLAN IP address from **Section 4.2**.
- If the **Extension Password** field, enter the Security Code of the DMCC recording devices from **Section 4.4**.



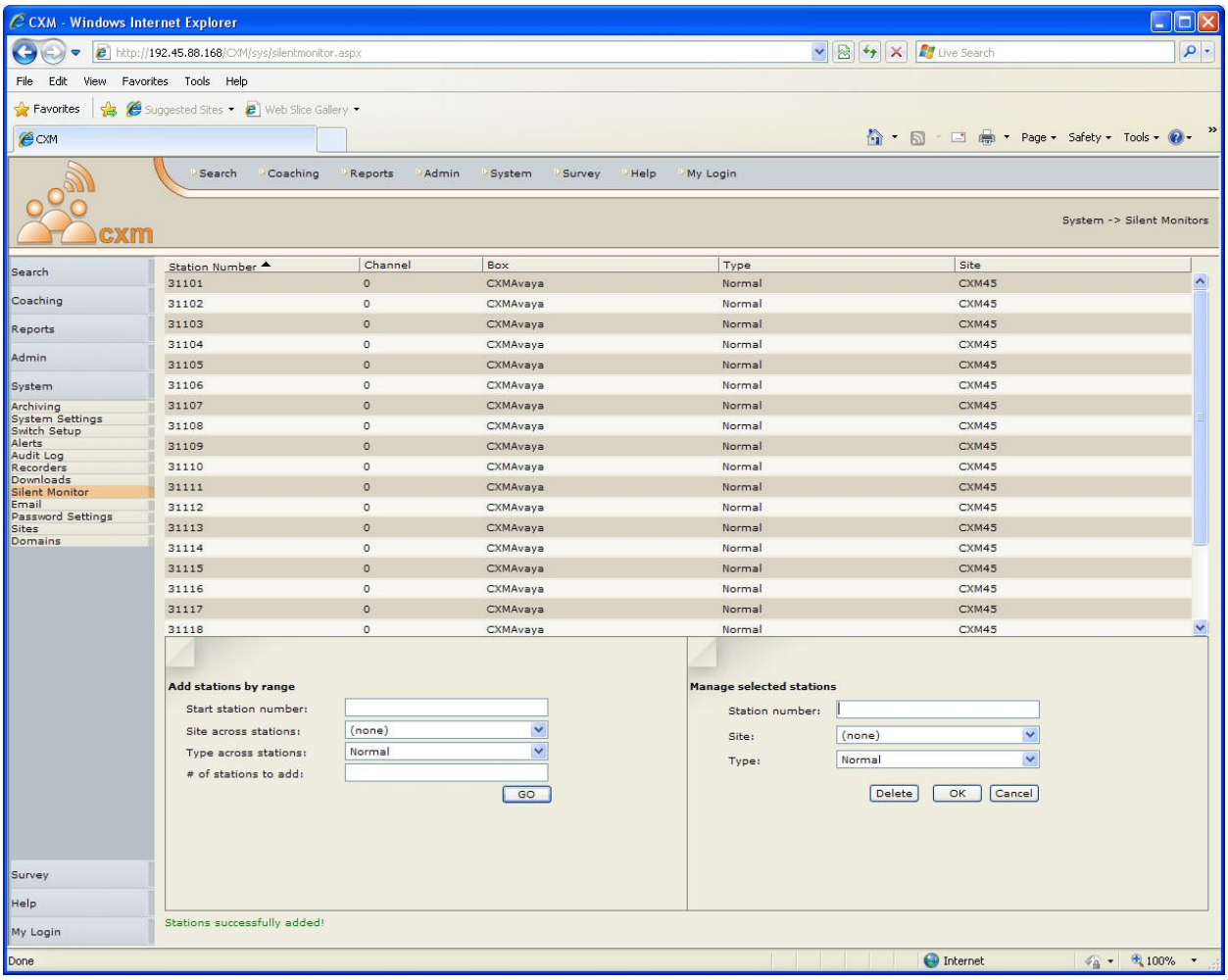
4. Use the menu on top of the screen to select the **System → Silent Monitor** link.



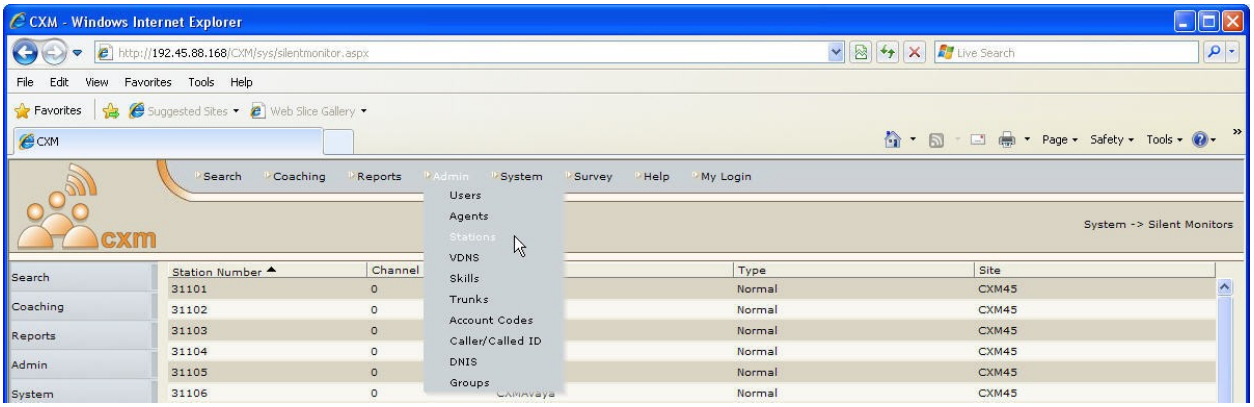
5. Use the **Add stations by range** fields to add the DMCC recording devices from **Section 4.4**.



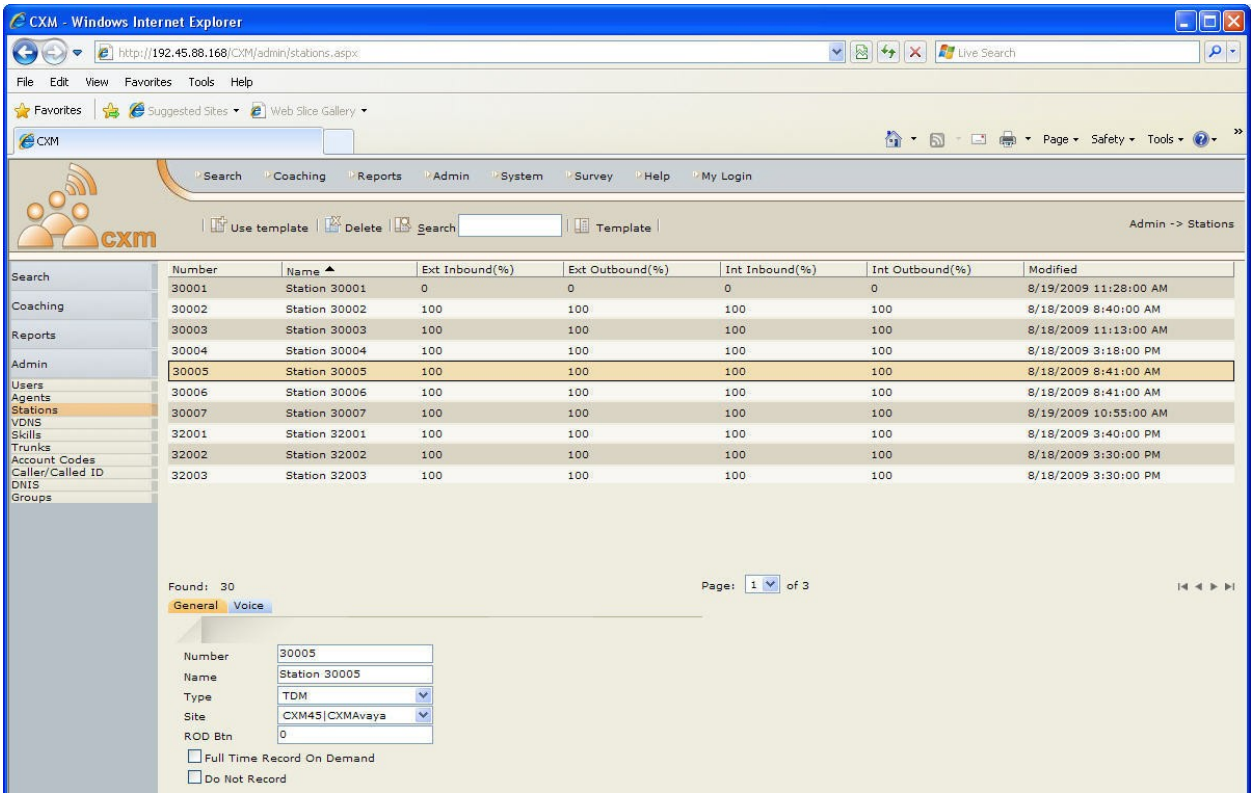
The screen below shows a subset of the DMCC recording devices used during compliance testing.



6. Use the **Admin** menu on top of the screen to select objects to be administered. Refer to the Co-nexus documentation for more details. During compliance testing, Agents, Stations, and VDNs were administered. As an example, to administer the stations to be recorded, select the **Admin → Stations** link.



The screen below shows a subset of the stations that were used during compliance testing.



7. General Test Approach and Test Results

The general test approach was to place calls and use basic telephony operations to verify that Co-nexus CXM could properly record the calls, associate the calls with the correct stations and agents, and to confirm that quality recordings could be retrieved and played back. The test cases were broken down into three categories: feature testing, serviceability testing, and performance testing.

For feature testing, several types of calls were placed, including:

- Internal calls
- Inbound trunk calls
- Outbound trunk calls
- Transfer and Conference calls

The calls were placed to and from various endpoints, including: stations, agents, VDNs, and hunt groups.

For serviceability testing, failure conditions were introduced into the test configuration, such as network cable pulls, CTI link busyouts, and server resets to verify that Co-nexus CXM could properly resume operation after failure recovery.

For performance testing, a sustained volume of calls were generated for an extended period of time to verify that Co-nexus CXM could record all the calls during that time period.

All test cases were executed and passed.

8. Verification Steps

This section provides the steps that can be performed to verify proper configuration of Communication Manager, Application Enablement Services, and Co-nexus CXM.

8.1. Verify Communication Manager

This section provides the steps required to verify the status of the link(s) to Application Enablement Services and the CTI link.

1. Enter the **status aesvcs link** command. Verify the **Remote IP** is the IP address of the Application Enablement Services server, the **Local Node** displays each CLAN used for connectivity to Application Enablement Services, and that there is appropriate message traffic over the links (**Msgs Sent** and **Msgs Rcvd**).

```
status aesvcs link

                          AE SERVICES LINK STATUS

Srvr/  AE Services     Remote IP        Remote  Local Node      Msgs    Msgs
Link   Server                          Port                    Sent    Rcvd

01/01  aeserver25      192. 45. 88. 25  56300   CLAN2           207     192
01/02  aeserver25      192. 45. 88. 25  56302   CLAN4           180     180
01/03  aeserver25      192. 45. 88. 25  56304   CLAN3           180     180
```

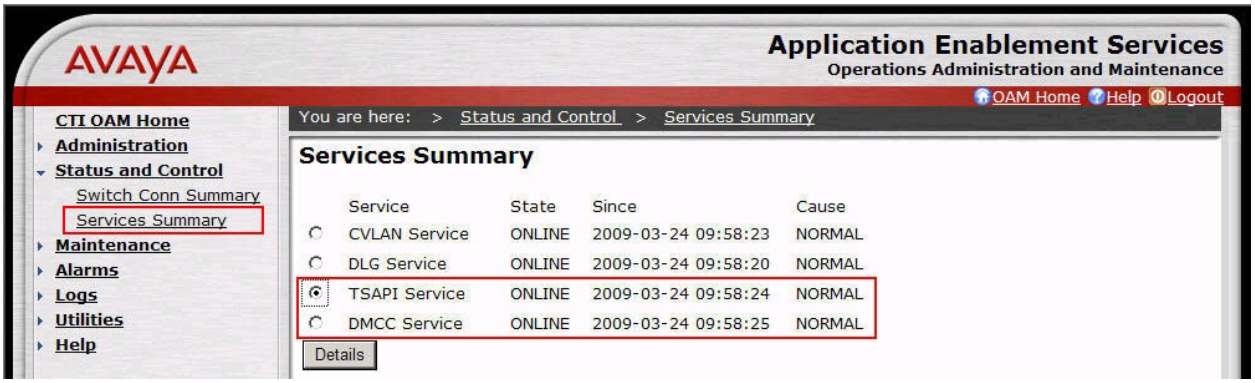
2. Enter the **status aesvcs cti-link** command. Verify the **Service State** is **established** for the CTI link number administered in **Section 4.3**.

```
status aesvcs cti-link

                        AE SERVICES CTI LINK STATUS

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

1              no                     down          0        0
2              no                     down          0        0
3              no                     down          0        0
4              no                     down          0        0
5              no                     down          0        0
6              no                     down          0        0
7              no                     down          0        0
8              no                     down          0        0
9              no                     down          0        0
10     4       no    aeserver25       established   15       15
```

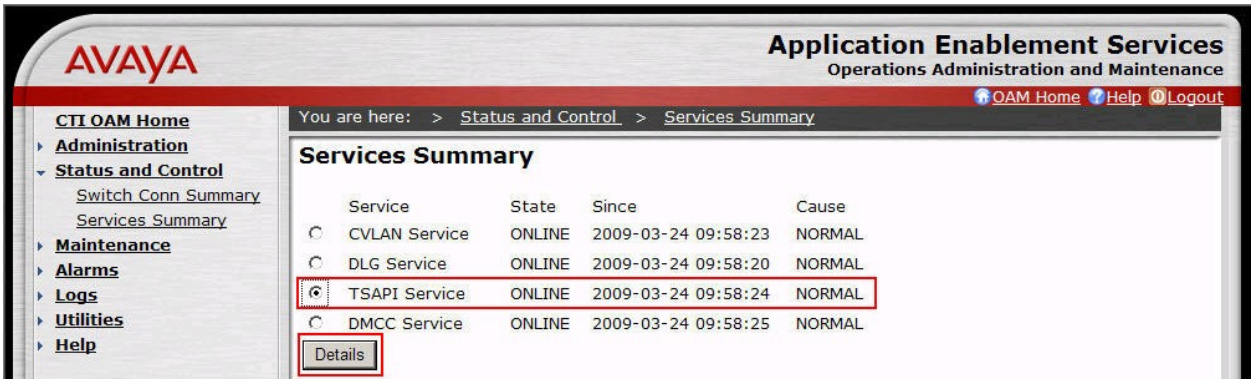
8.2. Verify Application Enablement Services

This section provides the steps required to verify the status of the TSAPI and DMCC services.

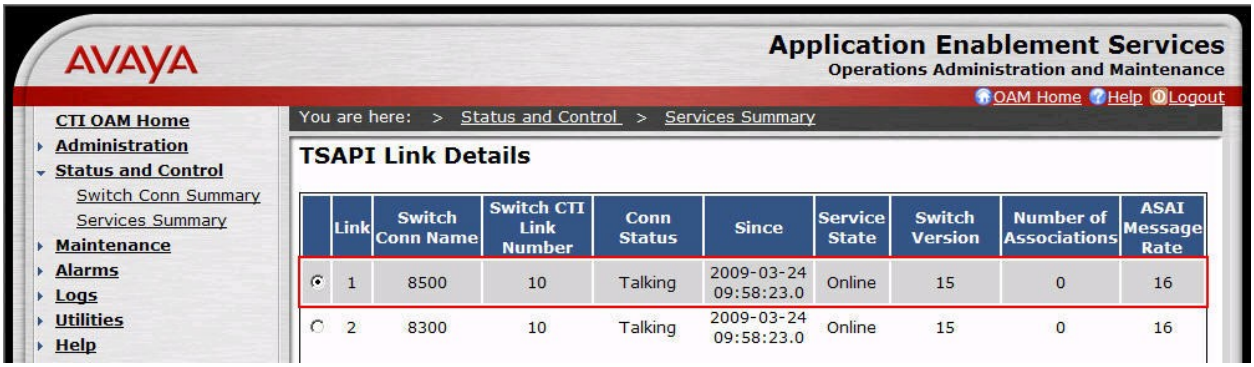
1. From the Application Enablement Services "CTI OAM Admin" web pages, navigate to **Status and Control > Services Summary** in the left pane menu. Verify that the **State** of the **TSAPI Service** and the **DMCC Service** is **ONLINE**.



2. Select the radio button for **TSAPI Service**, and click **Details**.



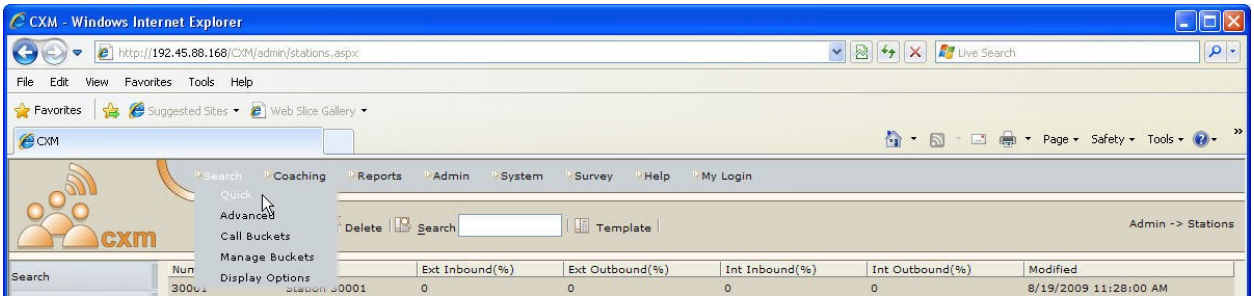
3. Verify that the **Conn Status** is **Talking** for the TSAPI link administered in **Section 5.3**.



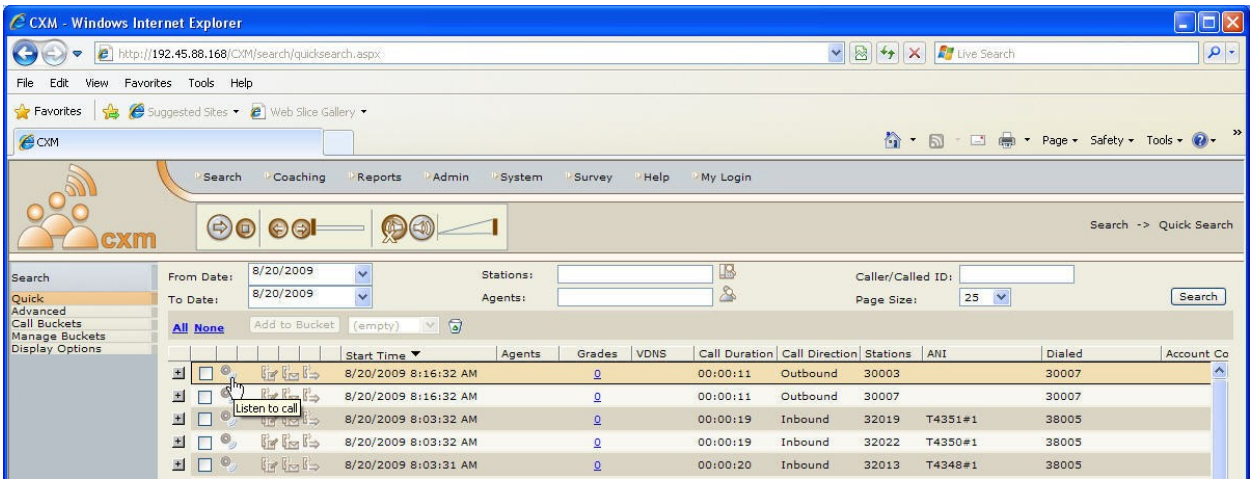
8.3. Verify Co-nexus CXM Call Recordings

This section provides the steps required to verify calls are being recorded properly by the Co-nexus CXM server.

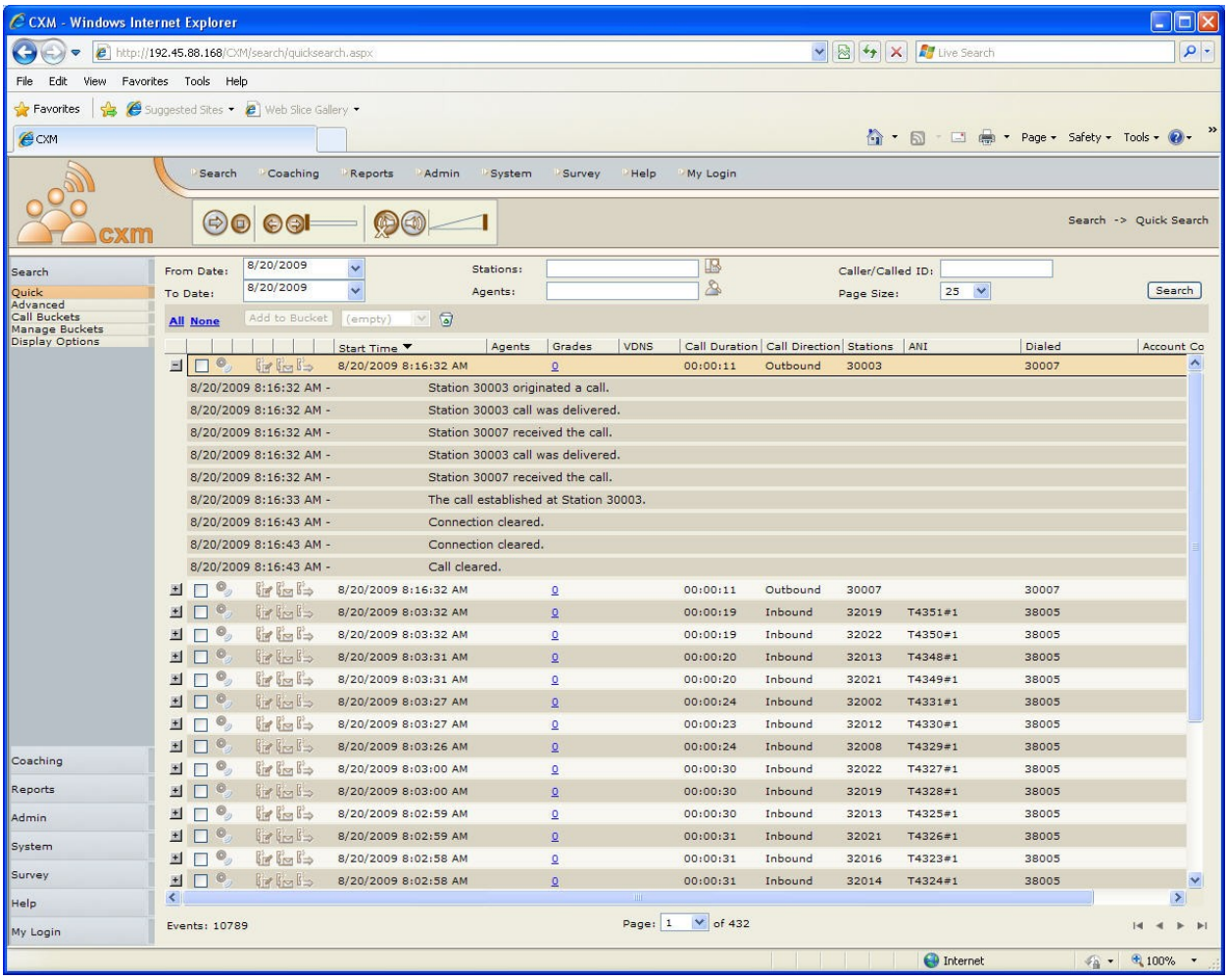
1. Place several calls to and from recorded stations. Use the menu on top of the screen to select the **Search → Quick** link.



2. Click the **Listen to call** icon to listen to one of the recorded calls. Verify the entire call was recorded and verify the quality of the recording.



3. Click the **"+"** icon at the beginning of the row to expand the call details. Verify the call details are correct.



9. Conclusion

These Application Notes describe the configuration steps required for Co-nexus CXM 4.5 to interoperate with Avaya Aura™ Communication Manager and Avaya Aura™ Application Enablement Services. All feature, serviceability, and performance test cases were completed and passed.

10. Additional References

This section references the Avaya and Co-nexus product documentation that are relevant to these Application Notes.

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

[1] *Administering Avaya Aura™ Communication Manager,* Doc ID: 03-300509, Issue 5.0, Release 5.2, May 2009

[2] *Avaya MultiVantage Application Enablement Services Administration and Maintenance Guide*, Doc ID: 02-300357, Release 4.2, Issue 10, May 2008

Co-nexus CXM product documentation can be obtained by contacting Co-nexus. Contact information for Co-nexus can be found at http://www.4cxm.com/cont.asp.

Please e-mail any questions or comments pertaining to these Application Notes along with the full title name and filename, located in the lower right corner, directly to the Avaya DevConnect Program at devconnect@avaya.com.