Avaya Solution & Interoperability Test Lab

Application Notes for CallCopy with Avaya Communication Manager using Avaya Application Enablement Services – Issue 1.0

Abstract

These Application Notes describe the configuration steps required for CallCopy to interoperate with Avaya Communication Manager using Avaya Application Enablement Services. CallCopy is a call center quality monitoring and recording solution that can record agent telephony audio and agent desktop activities.

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

1. Introduction

CallCopy is a call center quality monitoring and recording solution that can record agent telephony audio and agent desktop activities. The compliance testing focused on the recording of agent telephony audio.

CallCopy uses the Avaya Application Enablement Services (AES) Telephony Services Application Programming Interface (TSAPI) service to query and monitor incoming calls to contact center devices on Avaya Communication Manager. Upon notification of an established call, CallCopy adds a voice recorder to the call to obtain the audio streams. The voice recorders are administered as line-side DS1 stations on Avaya Communication Manager that terminates to CallCopy. There is a physical connection between the TN464 DS1 Interface card in Avaya Communication Manager and the Ai-Logix Terminate T1/E1 card in CallCopy.

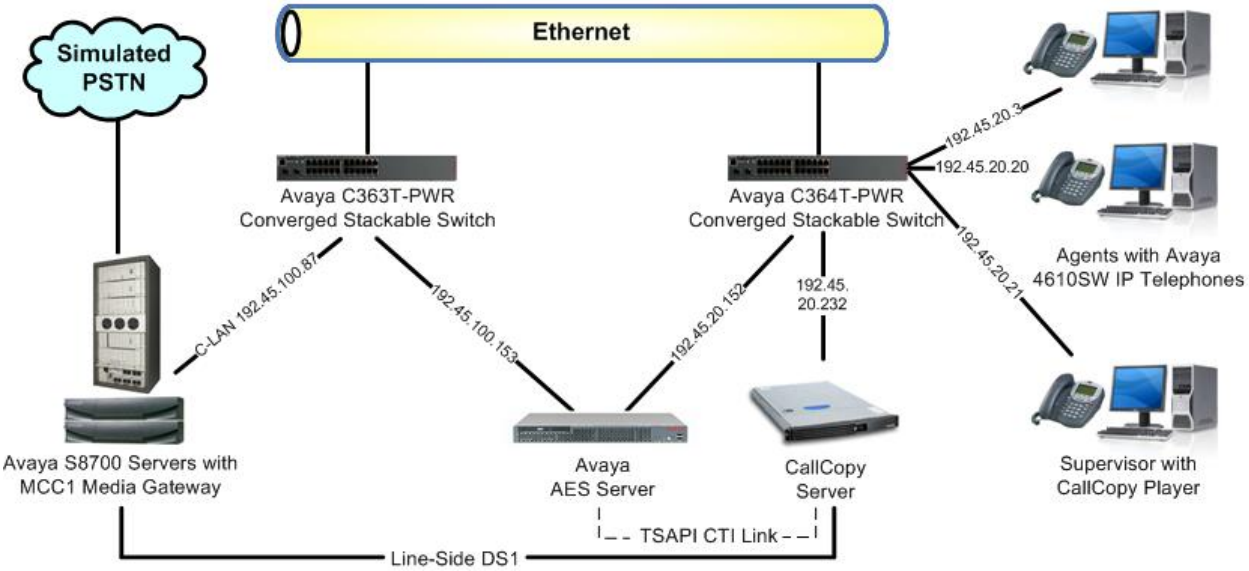


Figure 1: CallCopy with Avaya Communication Manager using Avaya AES

In the compliance testing, CallCopy used the TSAPI Single Step Conference feature to join the voice recorders to the agent answered calls. Information such as calling party number and called party number were obtained through the TSAPI event reports, and associated with the agent call recordings. The configuration included a supervisor running the CallCopy Player client software, used for retrieval/review/playback of call recordings captured by the CallCopy server.

2. Equipment and Software Validated

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

Equipment	Software
Avaya S8700 Servers	Avaya Communication Manager 4.0, R014x.00.0.730.5
Avaya MCC1 Media Gateway • TN464GP DS1 Interface	 HW02 FW019
Avaya Application Enablement Services	4.0, build 47.3
Avaya C363T-PWR Converged Stackable Switches	4.5.14
Avaya 4610SW IP Telephones (H.323)	2.7
CallCopy Server on Alliance Systems V1000 running Windows XP SP2 • Ai-Logix DT6409 Terminate T1/E1	3.4.0.54, with version 3.4.0.125 of cc_AvayaTSAPI.exe Firmware 3.8
CallCopy Player on Dell Precision 380	3.4.0.54 Windows XP Professional SP2

3. Configure Avaya Communication Manager

The detailed administration of basic connectivity between Avaya Communication Manager and Avaya AES are not the focus of these Application Notes and will not be described. The detailed administration of contact center devices, such as Vector Directory Numbers (VDNs), vectors, ACD/Skill groups, logical agent IDs, and agent stations are assumed to be in place and not covered in these Application Notes. For administration of basic connectivity to Avaya AES and contact center devices, refer to the appropriate documentation listed in **Section 10**. This section provides the procedures for the following:

- Verify Avaya Communication Manager License
- Administer TSAPI CTI link
- Administer DS1 Interface card
- Administer line-side DS1 stations

For the compliance testing, the following contact center devices were used. The configuration of line-side DS1 stations is covered in **Section 3.4**.

Device Type	Device Number/Extension
VDN	22999
Vector	999
Skill group	54101
Logical agent IDs	53001, 53002, 53003
Agent stations	22991, 22992, 22993
Line-side DS1 stations	22661, 22662

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 to verify that the **Computer Telephony Adjunct Links** customer option is set to "y" on **Page 3**. If this option is not set to "y", then contact the Avaya sales team or business partner for a proper license file.

```
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? y
          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
```

3.2. Administer TSAPI CTI Link

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 "ADJ-IP" in the **Type** field, and a descriptive name in the **Name** field. Default values may be used in the remaining fields. Submit these changes.

```
add cti-link 4                                                Page   1 of   2
                                   CTI LINK
 CTI Link: 4
Extension: 2204
     Type: ADJ-IP
                                                                  COR: 1
   Name: CallCopy TSAPI Link
```

3.3. Administer DS1 Interface Card

Administer a DS1 Interface card to be used for connectivity to CallCopy. Use the "add ds1 1b17" command. Note that the actual slot number may vary. In this case "1b17" is used as the slot number. Enter the following values for the specified fields, and retain the default values for the remaining fields. Submit these changes.

- **Name:** A descriptive name.
- **Line Coding:** "b8zs"
- **Frame Mode:** "esf"
- **Signaling Mode:** "robbed-bit"
- **Slip Detection:** "y"

```
add ds1 1b17                                                Page   1 of   1
                              DS1 CIRCUIT PACK

            Location: 01B17                          Name: CallCopy
            Bit Rate: 1.544                   Line Coding: b8zs
   Line Compensation: 1                      Framing Mode: esf
      Signaling Mode: robbed-bit

Interface Companding: mulaw
           Idle Code: 11111111

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

3.4. Administer Line-Side DS1 Stations

Add a line-side DS1 station using the "add station n" command, where "n" is an available extension. Enter the following values for the specified fields, and retain the default values for the remaining fields.

- **Type:** "2500"
- **Port:** An available port on the DS1 Interface card.
- **Name:** A descriptive name.
- **Off Premises Station:** "y"

```
add station 22661                                          Page   1 of   4
                                  STATION

Extension: 22661                      Lock Messages? n               BCC: 0
     Type: 2500                       Security Code:                  TN: 1
     Port: 1b1701                   Coverage Path 1:                 COR: 1
     Name: CallCopy line-side 22661 Coverage Path 2:                 COS: 1
                                    Hunt-to Station:               Tests? y
STATION OPTIONS
                                       Time of Day Lock Table:
             Loss Group: 4           Message Waiting Indicator: none
    Off Premises Station? y
       R Balance Network? n


          Survivable COR: internal
   Survivable Trunk Dest? Y
```

Proceed to **Page 2**, and set the **Auto Answer** field to "all", to allow immediate cut through of all incoming calls to the idle station. Repeat this section to add all desired line-side DS1 stations. For the compliance testing, two line-side DS1 stations were added.

```
add station 22661                                          Page   2 of   4
                                  STATION
FEATURE OPTIONS
           LWC Reception: spe
          LWC Activation? y                    Coverage Msg Retrieval? y
  LWC Log External Calls? n                              Auto Answer: all
            CDR Privacy? n                           Data Restriction? n
   Redirect Notification? y                  Call Waiting Indication: y
 Per Button Ring Control? n                Att. Call Waiting Indication: y
   Bridged Call Alerting? n                   Distinctive Audible Alert? y
        Switchhook Flash? y                        Adjunct Supervision? y
    Ignore Rotary Digits? n
        H.320 Conversion? n          Per Station CPN - Send Calling Number?
       Service Link Mode: as-needed
         Multimedia Mode: basic                 Audible Message Waiting? n
    MWI Served User Type:
              AUDIX Name:
                                             Coverage After Forwarding? s
                                               Multimedia Early Answer? n
                                          Direct IP-IP Audio Connections? y
  Emergency Location Ext: 22661                  IP Audio Hairpinning? n
```

4. Configure Avaya Application Enablement Services

This section provides the procedures for configuring Avaya AES. The procedures include the following areas:

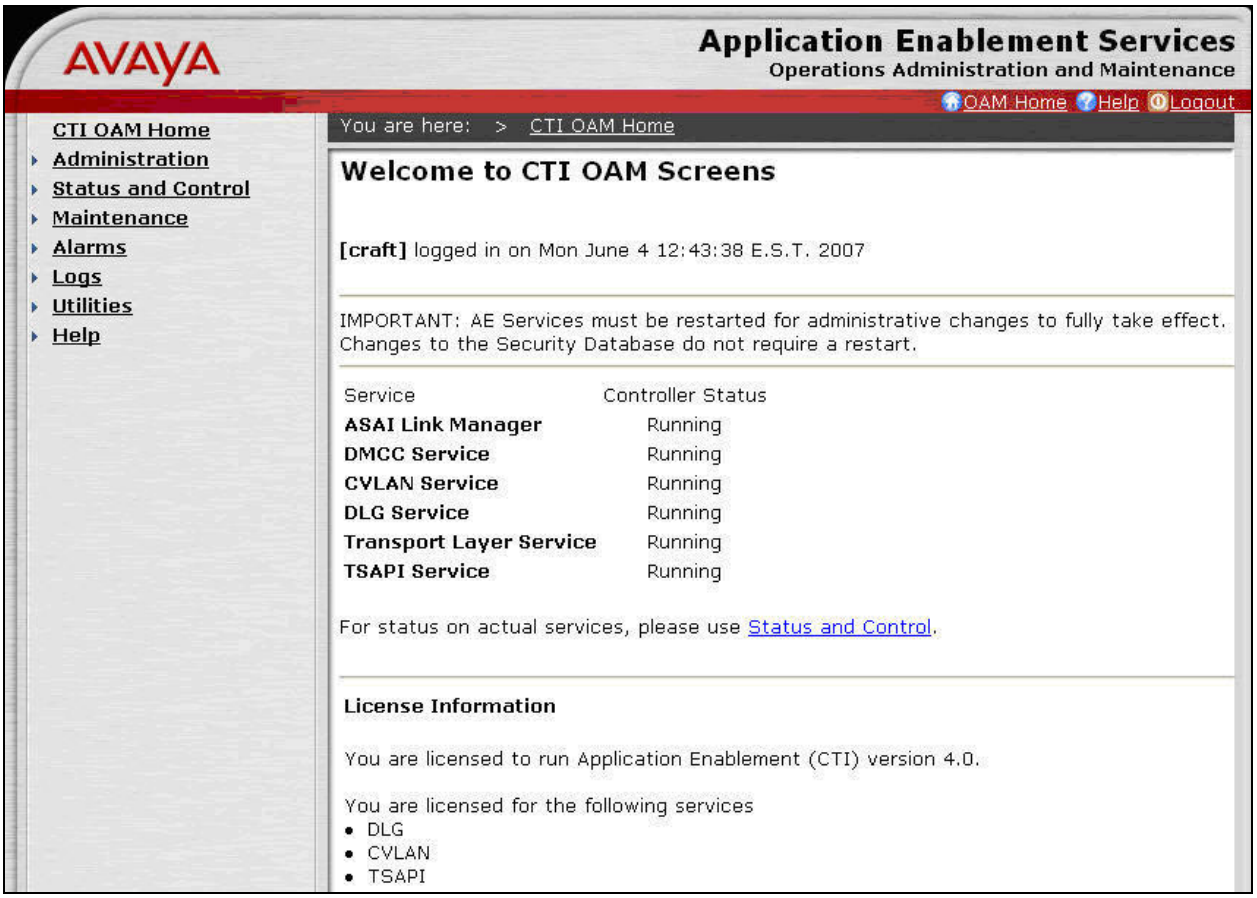
- Verify AES license
- Administer TSAPI link
- Administer security database
- Obtain Tlink name
- Administer CallCopy user
- Restart TSAPI service

4.1. Verify AES License

Access the AES OAM web-based interface by using the URL "https://ip-address:8443/MVAP" in an Internet browser window, where "ip-address" is the IP address of the AES server. The **Login** screen is displayed as shown below. Log in with the appropriate credentials.

The **Welcome to OAM** screen is displayed next. Select **CTI OAM Admin** from the left pane.

The **Welcome to CTI OAM Screens** is displayed. Verify that AES is licensed for the TSAPI service, as shown in the bottom of the screen below. If the TSAPI service is not licensed, contact the Avaya sales team or business partner for a proper license file.

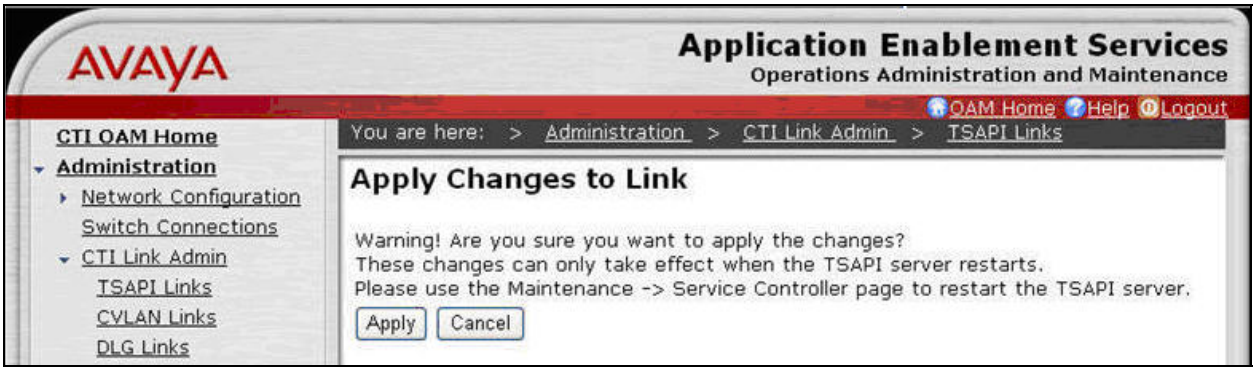


4.2. Administer TSAPI Link

To administer a TSAPI link, select **Administration > CTI Link Admin > TSAPI Links** from the left pane. The **TSAPI Links** screen is displayed, as shown below. Click **Add Link**.

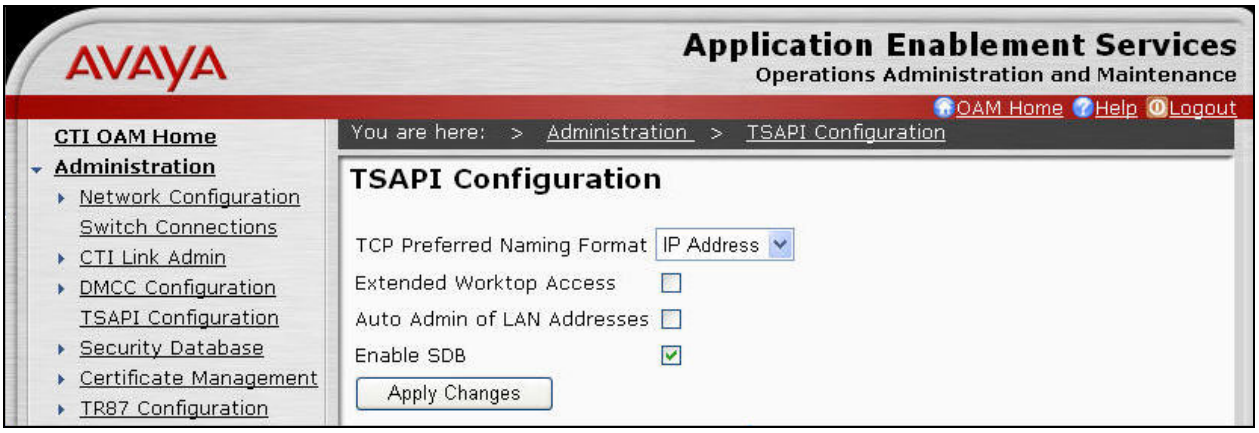
The **Add / Edit TSAPI Links** screen is displayed next. The **Link** field is only local to the AES server, and may be set to any available number. For **Switch Connection**, select the relevant switch connection from the drop-down list. In this case, the existing switch connection "devcon27S8700" is selected. For **Switch CTI Link Number**, select the CTI link number from **Section 3.2**. Click **Apply Changes**.

The **Apply Changes to Link** screen is displayed. Click **Apply**.

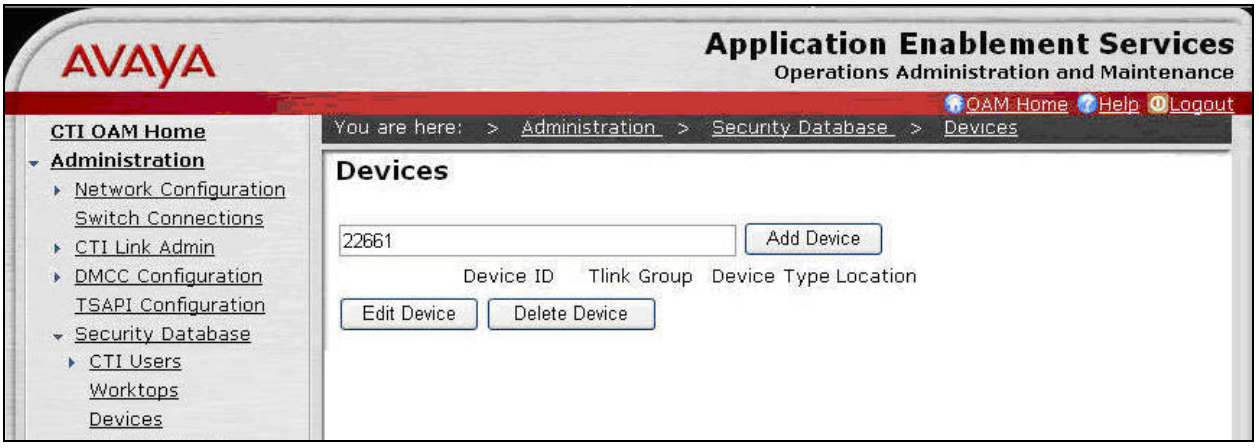


4.3. Administer Security Database

Next, enable the security database on AES, as this functionality is utilized by CallCopy. Select **Administration > TSAPI Configuration** from the left pane, to bring up the **TSAPI Configuration** screen shown below. Check the **Enable SDB** checkbox, and click **Apply Changes**.



Contact center devices of Skill groups, agent stations, and line-side DS1 stations are used by the CallCopy server and need to be configured in the AES security database. Select **Administration > Security Database -> Devices** from the left pane, and add each contact center device by entering the device extension and clicking on **Add Device**.



In the **Add / Edit Device** screen, enter a descriptive **Location** and select the proper **Device Type**. Select "PHONE" as the device type for agent and line-side DS1 stations, and select "ACD" as the device type for Skill groups. Retain the default values in the remaining fields, and click **Apply Changes**.

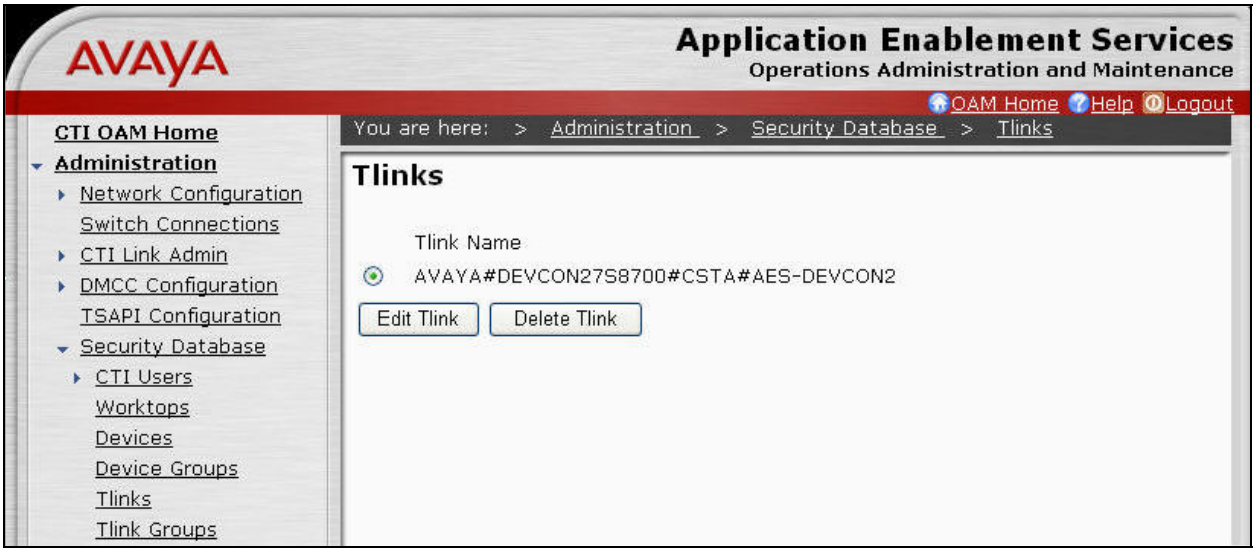
The **Apply Changes to Device Properties** screen is displayed. Click **Apply**.

A listing of the configured devices used for the compliance testing is shown below. Note that the total number of devices may vary, as this depends on the number of extensions used.

4.4. Obtain Tlink Name

Select **Administration > Security Database > Tlinks** from the left pane. The **Tlinks** screen shows a listing of the Tlink names. A new Tlink name is automatically generated by the AES server, upon creation of a new switch connection. Locate the Tlink name associated with the relevant switch connection, which would use the name of the switch connection as part of the Tlink name. Make a note of the associated Tlink name, to be used later for configuring the CallCopy server.

In this case, the associated Tlink name is "AVAYA#**DEVCON27S8700**#CSTA#AES-DEVCON2". Note the use of the switch connection "devcon27S8700" as part of the Tlink name.

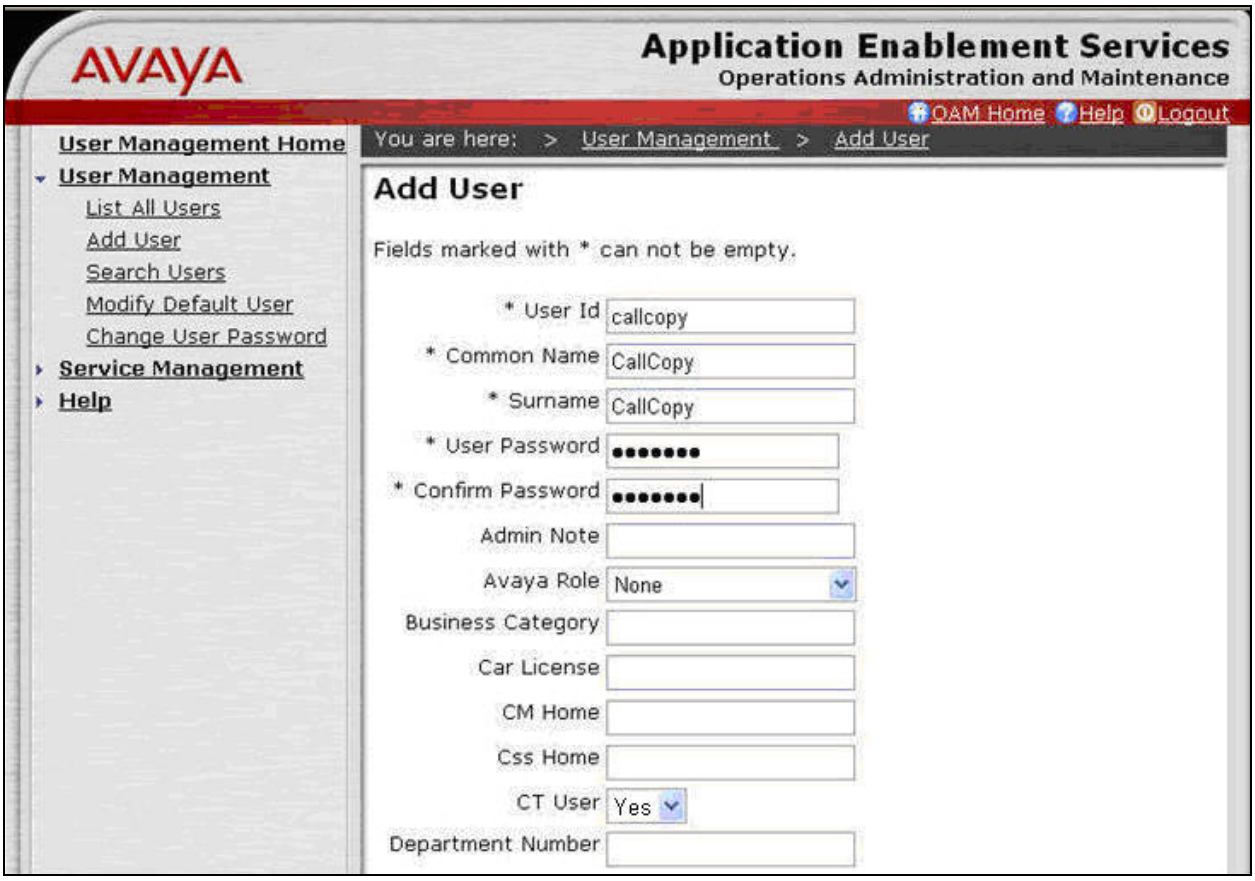


4.5. Administer CallCopy User

Administer a new user account for the CallCopy server, which is created from the AES User Management web pages. Select **OAM Home**, located at the upper right corner of the screen, to display the **Welcome to OAM** screen below. Select **User Management** from the left pane.

The **Welcome to the User Management home page** screen is displayed, as shown below.

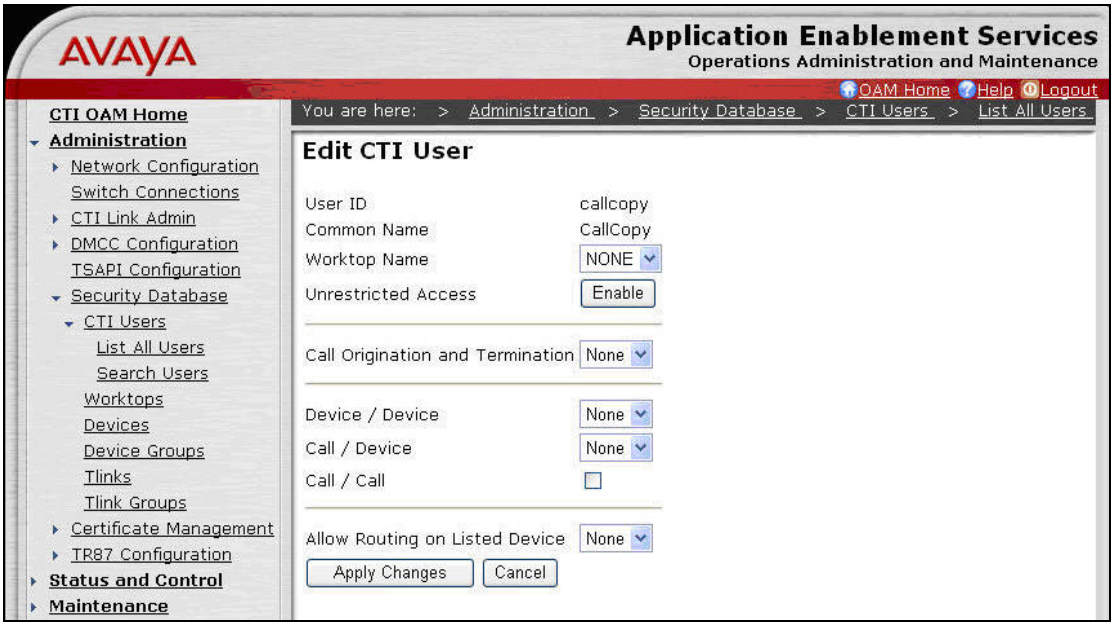
Select **User Management > Add User** from the left pane. In the **Add User** screen shown below, enter descriptive values for the **User Id**, **Common Name**, **Surname**, **User Password**, and **Confirm Password** fields. For the **CT User** field, select "Yes" from the drop-down list. Retain the default value in the remaining fields. Click **Apply** at the bottom of the screen (not shown below).



Next, administer the permissions for the CallCopy user, which is performed from the AES CTI OAM Admin web pages. Select **OAM Home**, located at the upper right corner of the screen, to display the **Welcome to OAM** screen shown in **Section 4.1**. Select **CTI OAM Admin** from the left pane, to display the **Welcome to CTI OAM Screens** shown in **Section 4.1**.

Select **Administration > Security Database > CTI Users > List All Users** to get a listing of all CTI users, as shown below. Select the user ID created for the CallCopy server, and click **Edit**.

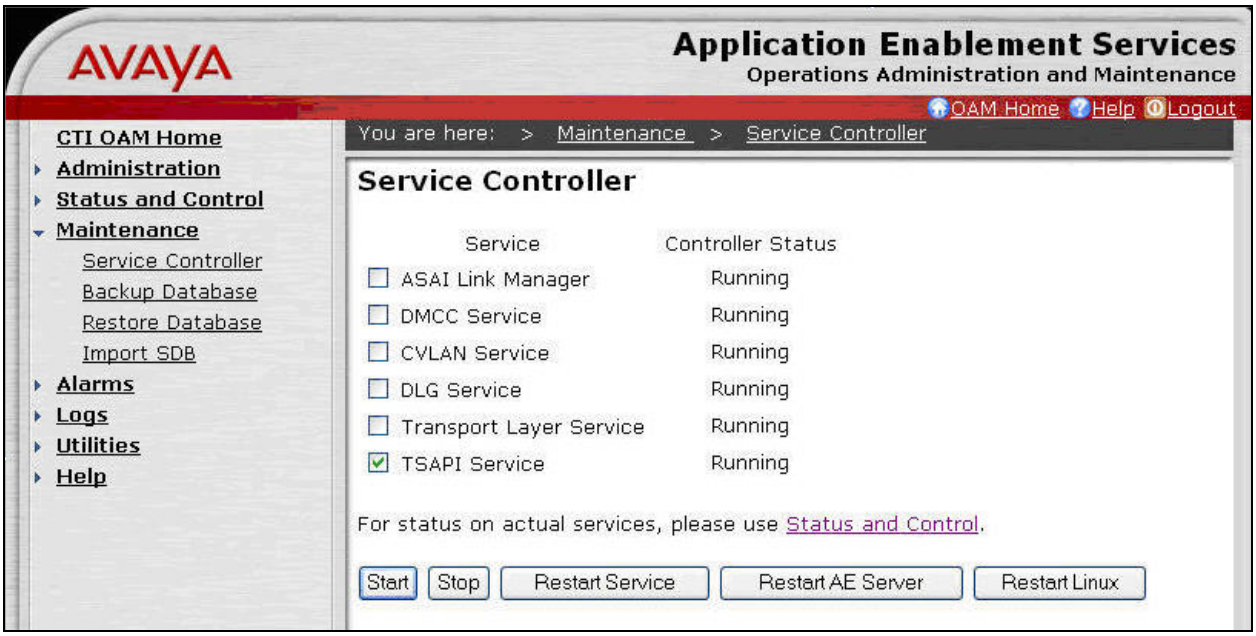
The **Edit CTI User** screen is displayed next, as shown below. Click **Enable** next to **Unrestricted Access**, followed by **Apply Changes**. This will provide the CallCopy server with unrestricted access, which was used for the compliance testing. If unrestricted access is not desired, then consult the appropriate documentation in **Section 10** for guidance on configuring the user privileges.



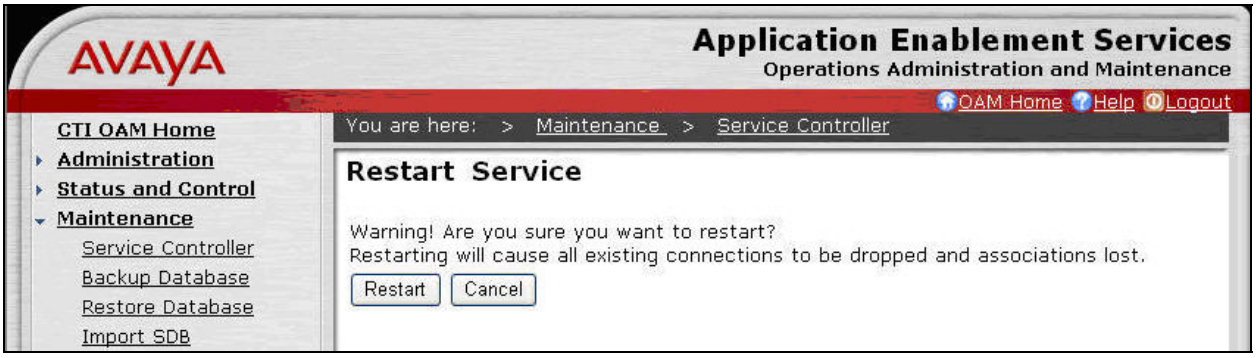
The **Apply Changes to CTI User Properties** screen is displayed next. Click **Apply**.

4.6. Restart TSAPI Service

Select **Maintenance > Service Controller** from the left pane. The **Service Controller** screen is displayed, and shows a listing of the services and associated status. Check the **TSAPI Service**, and click **Restart Service**.



The following **Restart Service** screen is displayed. Click **Restart** to confirm.



5. Configure CallCopy

This section provides the procedures for configuring the CallCopy server. The procedures include the following areas:

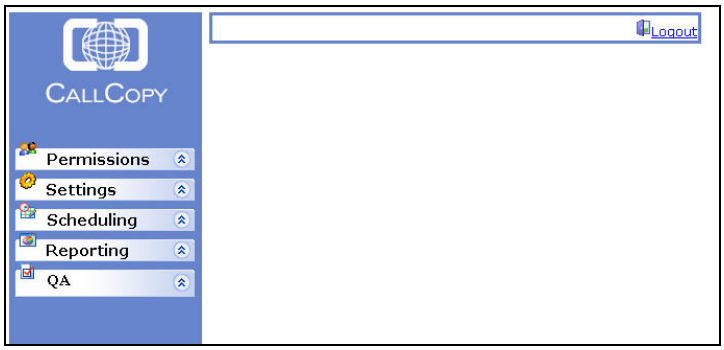
- Launch Admin Portal
- Administer CTI configuration
- Administer CTI monitors
- Administer voice boards
- Create schedule
- Administer Ai-Logix card

Configuration of CallCopy is typically performed by CallCopy installation technicians. The procedural steps are presented in these Application Notes for informational purposes.

5.1. Launch Admin Portal

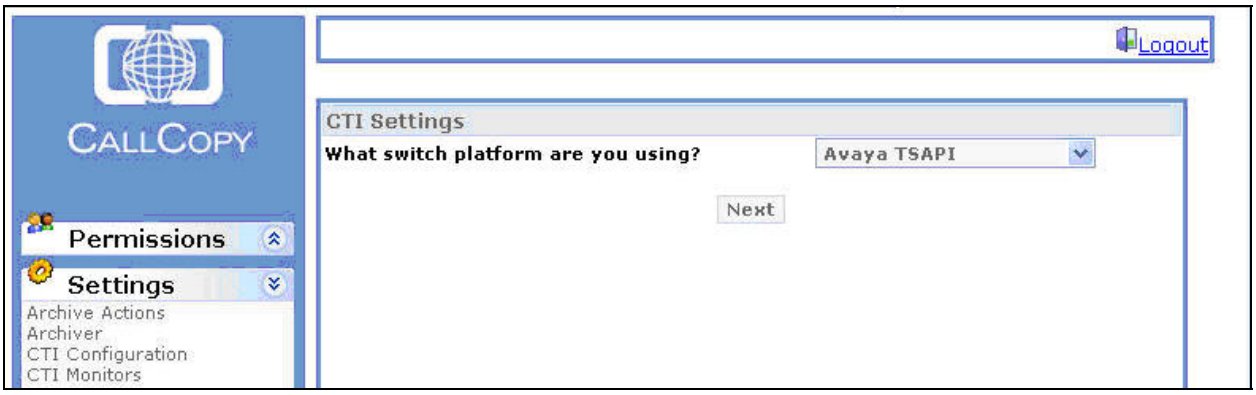
Access the CallCopy web-based Admin Portal by using the URL "http://ip-address" in an Internet browser window, where "ip-address" is the IP address of the CallCopy server. The **USER LOGIN** screen is displayed, as shown below. Enter the administrator credentials, and click **Login**.

The screen below is displayed next.



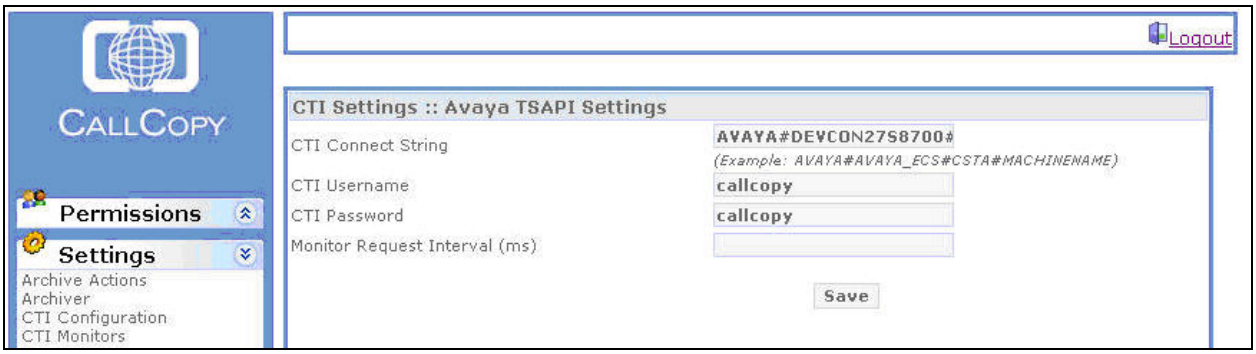
5.2. Administer CTI Configuration

Select **Settings > CTI Configuration** from the left pane. The **CTI Settings** screen is displayed. Select "Avaya TSAPI" from the drop-down list for switch platform, and click **Next**.



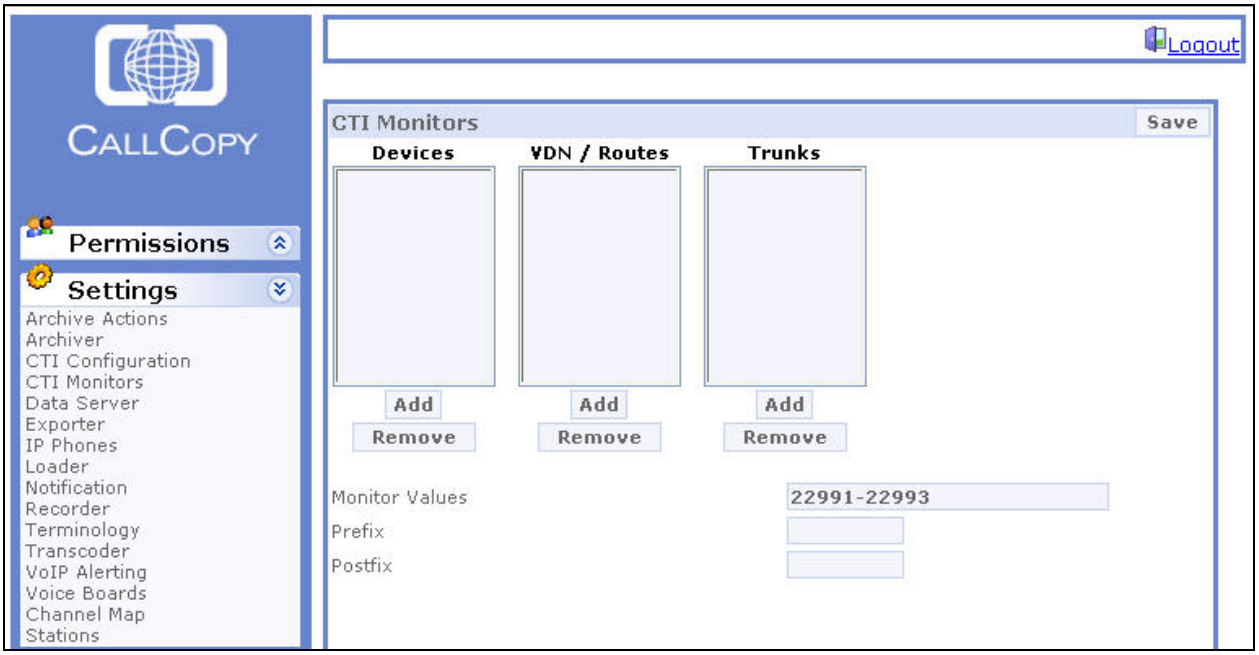
The **CTI Settings :: Avaya TSAPI Settings** screen is displayed next. Enter the following values for the specified fields, and retain the default values for the remaining fields. Click **Save**.

- **CTI Connect String:** The Tlink name from **Section 4.4**.
- **CTI Username:** The user ID from **Section 4.5**.
- **CTI Password:** The user password from **Section 4.5**.

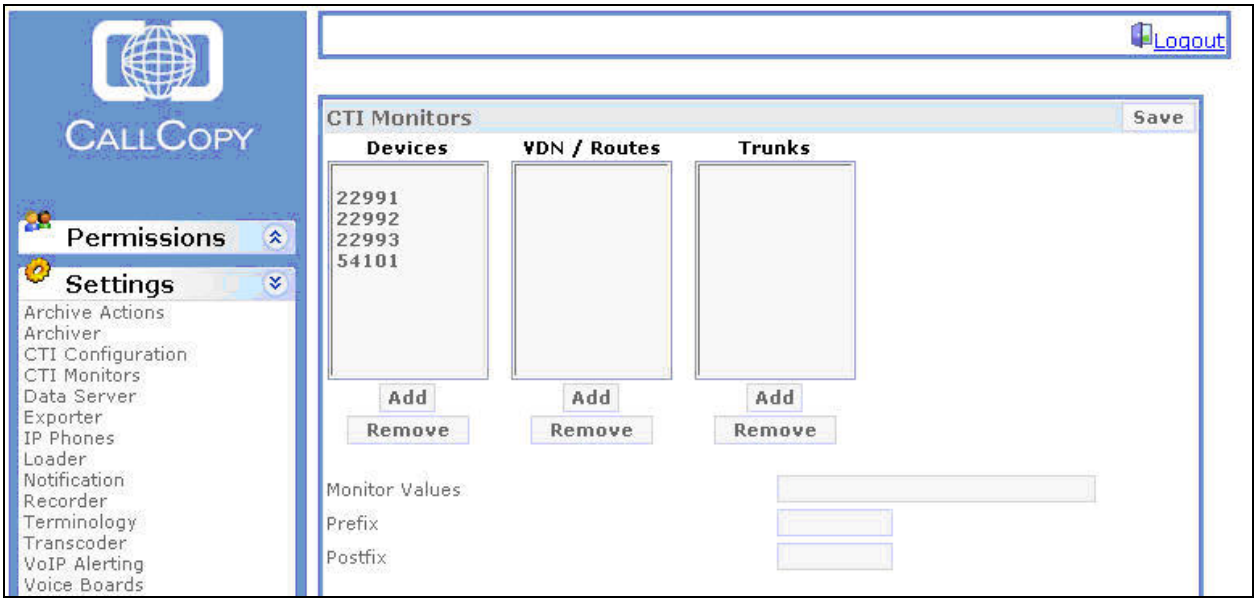


5.3. Administer CTI Monitors

Select **Settings > CTI Monitors** from the left pane. The **CTI Monitors** screen is displayed. In the **Monitor Values** field, enter the extension of a monitored device. A range of extensions can also be used, as shown below. Click **Add** below **Devices** to add these as device extensions.

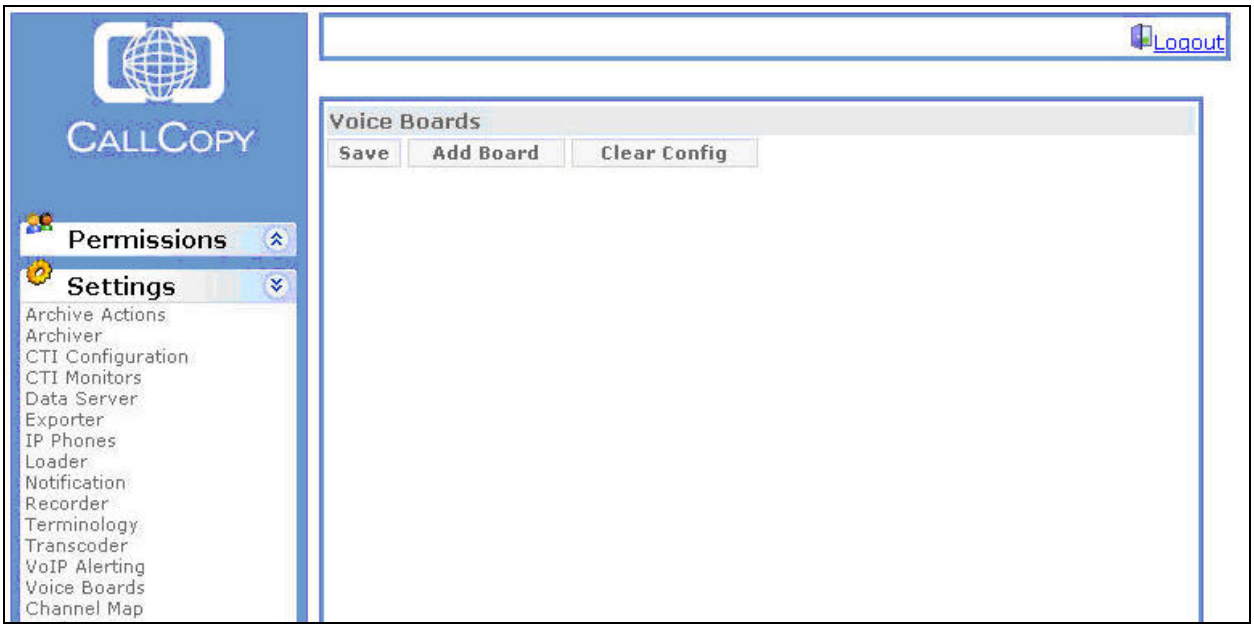


Repeat this section to add all monitored Skills and agent station extensions. The screen below shows the devices that were monitored during the compliance testing. Click **Save**, located in the upper right of the screen, after all monitored devices have been added.

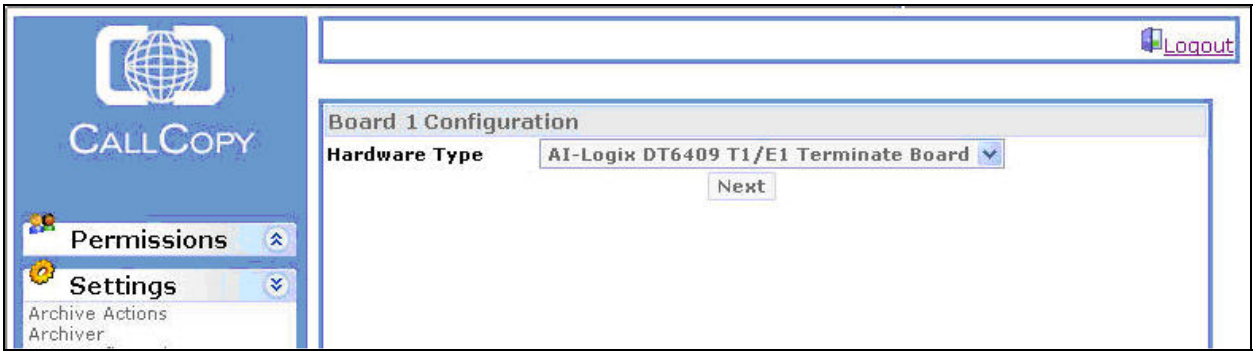


5.4. Administer Voice Boards

Select **Settings > Voice Boards** from the left pane. The **Voice Boards** screen is displayed. Click **Add Board** to add a new voice board.



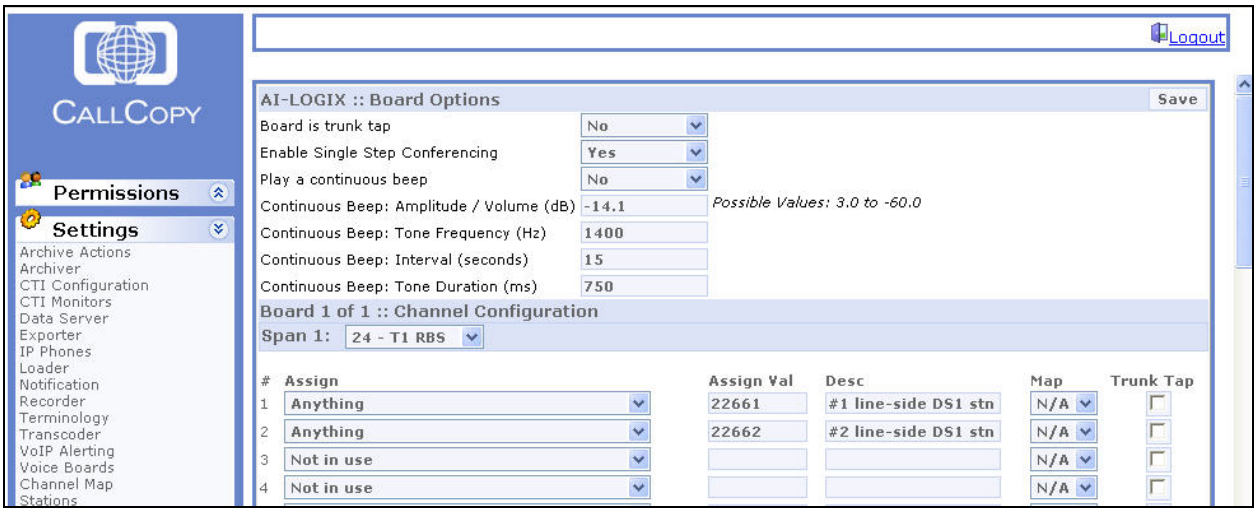
The **Board 1 Configuration** screen is displayed next. Select "AI-Logix DT6409 T1/E1 Terminate Board" as the hardware type. Click **Next**.



The **AI-LOGIX :: Board Options** screen is displayed. For the **Enable Single Step Conferencing** field, select "Yes" from the drop-down list. For the **Span 1** field, select "24 – T1 RBS" from the drop-down list. For each line-side DS1 station in **Section 3.4**, administer a corresponding channel under **Span 1** as follows:

- **Assign Val:** The extension of the corresponding line-side DS1 station from **Section 3.4**.
- **Desc:** A descriptive text.

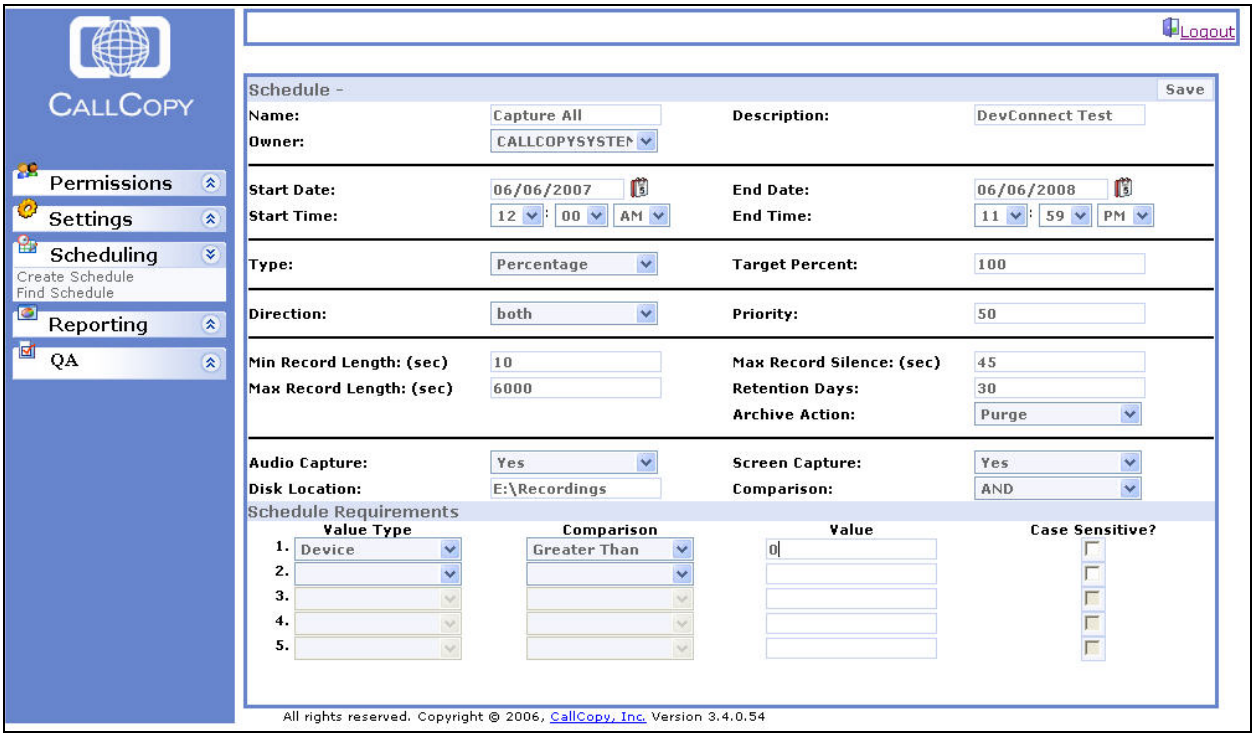
For all unused channels, select "Not in use" in the **Assign** field drop-down list. Scroll down the screen to select "24 – T1 RBS" from the **Span 2** field drop-down list (not shown). Retain the default values in the remaining fields. Click **Save** toward the top of the screen.



5.5. Create Schedule

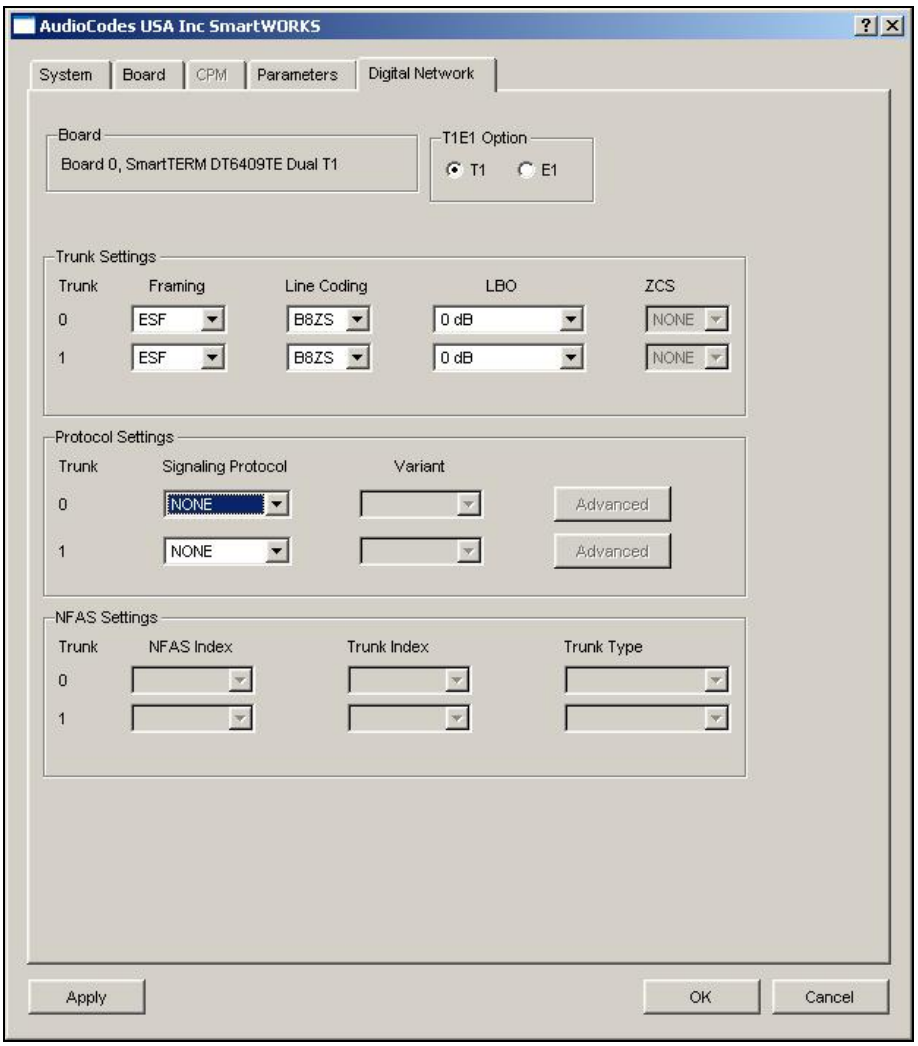
Select **Scheduling > Create Schedule** from the left pane. The **Schedule Wizard** screen is displayed. Click **3. Create A Custom Schedule (Advanced)**.

The **Schedule** screen is displayed next. Enter descriptive values for the **Name** and **Description** fields. Enter "100" for the **Target Percent** field to enable recording of all calls. In the bottom section of the screen, select "Device" for **Value Type**, select "Greater Than" for **Comparison**, and enter "0" for **Value** to enable recording of calls to all monitored devices. These values can be modified as necessary to correspond to the customer call recording criteria. Retain the default values for all remaining fields, and click **Save** toward the top of the screen.



5.6. Administer Ai-Logix card

From the CallCopy server, select **Start > Settings > Control Panel > Smart Control**. The **AudioCodes USA Inc SmartWORKS** screen is displayed. Select the **Digital Network** tab. Select "ESF" and "B8ZS" from the **Framing** and **Line Coding** field drop-down lists respectively. For the **Signaling Protocol** fields, select "NONE" to enable software to control the signaling. Retain the default values in the remaining fields, and click **Apply**.



6. Interoperability Compliance Testing

The interoperability compliance test included feature and serviceability testing. The feature testing focused on verifying CallCopy on the following:

- Handling of TSAPI messages in the areas of query, monitor, event report, and single step conference call control services.
- Proper use of event reports to associate call recordings with correct agents in basic, transfer, and conference scenarios.
- Proper call recordings that can be retrieved and played back.

The serviceability testing focused on verifying the ability of CallCopy 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

The feature test cases were performed both automatically and manually. Upon start of the application, CallCopy automatically requested device query and monitoring of calls to all administered Skills and agent stations. For the manual part of the testing, incoming calls were made to the monitored Skill group to trigger event reports to CallCopy for call recordings. Manual call controls from the agent telephones were exercised to verify remaining scenarios such as conference and transfer, and the proper utilization of these event reports to start/stop the call recordings.

The serviceability test cases were performed manually by busying out and releasing the CTI link, and by disconnecting and reconnecting the LAN cables.

6.2. Test Results

All feature test cases were executed and passed.

There was an observation from the compliance testing. A patch, version 3.4.0.125 of cc_AvayaTSAPI.exe, is needed in order for CallCopy to re-request monitoring of devices when the CTI link has been down for 30 seconds or longer.

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 CallCopy.

7.1. Verify Avaya Communication Manager

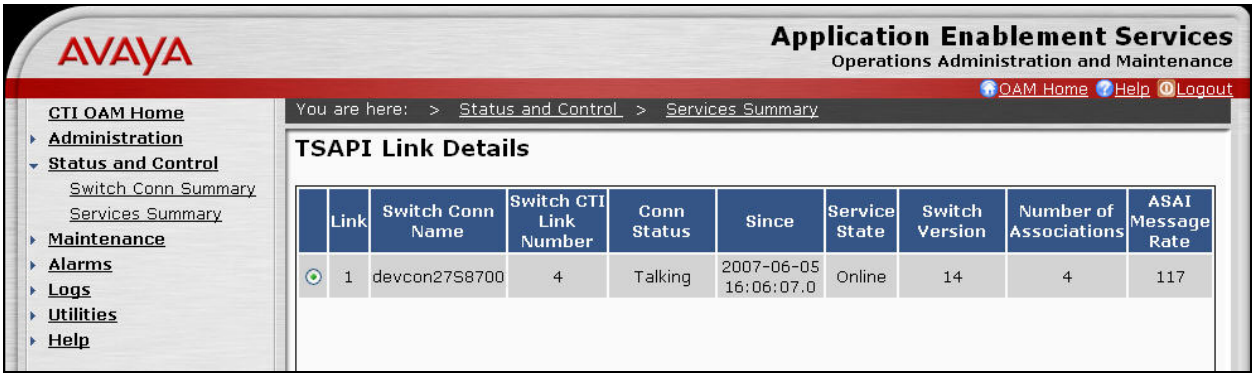
Verify the status of the administered CTI link by using the "status aesvcs cti-link" command. Verify the **Service State** is "established" for the CTI link number administered in **Section 3.2**, as shown below.

```
status aesvcs cti-link

                        AE SERVICES CTI LINK STATUS

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

4     4        no    AES-DevCon2      established   125      104
15    4        no    devconaes01      established   27       37
16             no                     down          0        0
```

7.2. Verify Avaya Application Enablement Services

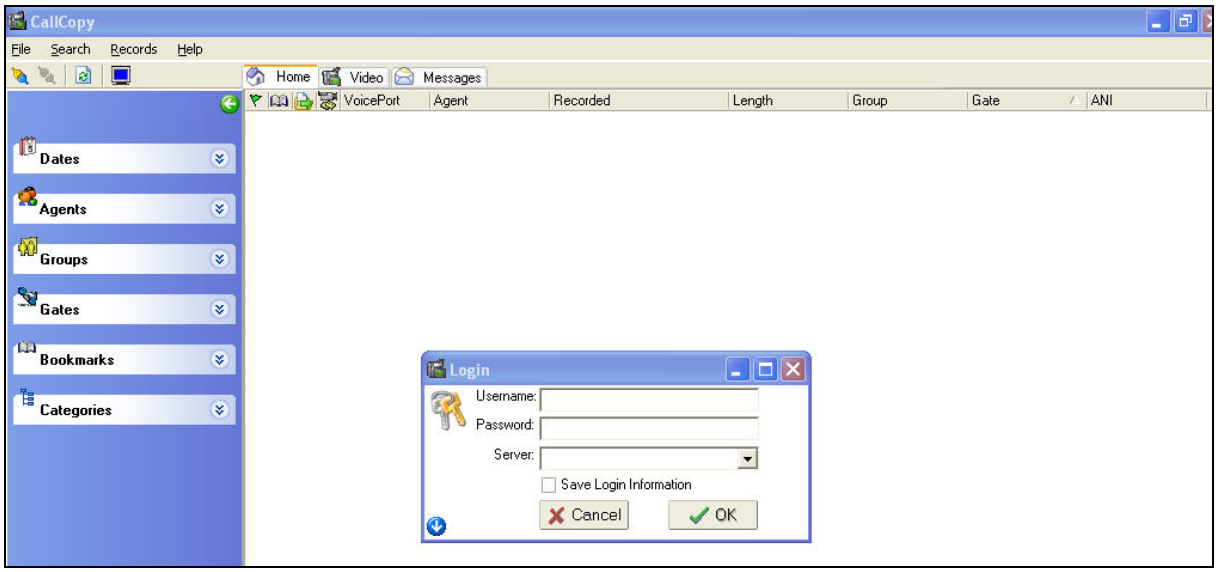
From the AES CTI OAM Admin web pages, verify the status of the TSAPI link by selecting **Status and Control > Services Summary** from the left pane. Select the radio button for **TSAPI Service**, and click **Details**.

The **TSAPI Link Details** screen is displayed. Verify that the **Conn Status** is "Talking", as shown below.

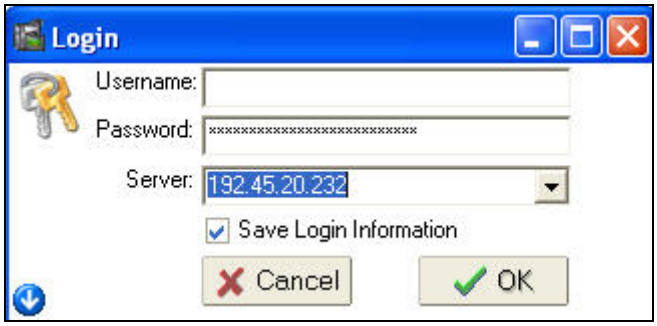


7.3. Verify CallCopy

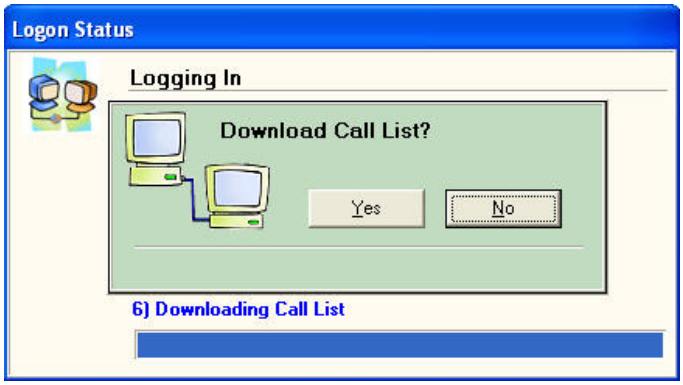
Prior to the verification, generate a few call recordings by making calls to the monitored Skill group with available agents. From the supervisor PC running the CallCopy Player client software, select **Start > All Programs > CallCopy Player > CallCopy Player** to bring up the screen below.



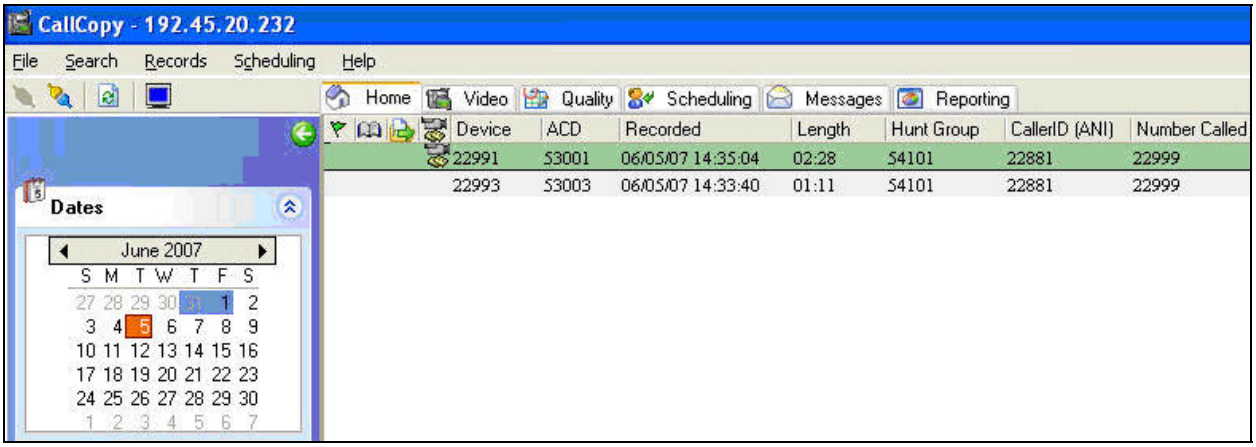
In the **Login** dialog box, enter the appropriate credentials for **Username** and **Password**. For the **Server** field, select the appropriate name or IP address for the CallCopy server that was created as part of installation, and click **OK**.



The **Logon Status** dialog box is displayed next, click **Yes** to download the call recordings.



The **CallCopy** screen is displayed again with a listing of call recordings. Verify that the **Device** column shows the proper agent station extension, the **ACD** column shows the associated logical agent ID, the **Hunt Group** column shows the Skill group extension, the **CallerID (ANI)** column shows the calling party number, and that the **Number Called** column shows the called party number. Double-click on a call recording entry and verify the proper recording of the entire call.



8. Support

Technical support on CallCopy can be obtained through the following:

- **Phone:** (888) 922-5526
- **Web:** http://www.callcopy.com/support
- **Email:** support@callcopy.com

9. Conclusion

These Application Notes describe the configuration steps required for CallCopy 3.4.0.54 to interoperate with Avaya Communication Manager 4.0 using Avaya Application Enablement Services 4.0. All feature and serviceability test cases were completed.

There was an observation from the compliance testing. A patch, version 3.4.0.125 of cc_AvayaTSAPI.exe, is needed in order for CallCopy to re-request monitoring of devices when the CTI link has been down for 30 seconds or longer.

10. Additional References

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

- *Administrator Guide for Avaya Communication Manager*, Document 03-300509, Issue 3.1, February 2007, available at http://support.avaya.com.
- *Avaya MultiVantage Application Enablement Services Administration and Maintenance Guide Release 4.0*, Document ID 02-300357, Issue 6, February 2007, available at http://support.avaya.com.
- *Avaya TSAPI Integration*, Version 3.4 R1, May 2007, available from the CallCopy 3.4.0.54 installation CD.
- *Avaya Single Step Conferencing Configuration*, available from the CallCopy 3.4.0.54 installation CD.
- *CallCopy System Administrator Guide*, Version 3.1 R1, November 2006, available from the CallCopy 3.4.0.54 installation CD.

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