Avaya Solution & Interoperability Test Lab

Application Notes for Configuring Cybertech Pro with Avaya Communication Manager and Avaya Application Enablement Services – Issue 1.0

Abstract

These Application Notes describe the compliance testing of the Cybertech Pro voice recording system with Avaya Communication Manager and Avaya Application Enablement Services. The document contains an extensive description of the configurations for both Cybertech Pro and Avaya Communication Manager.

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

1. Introduction

The purpose of this document is to describe the compliance testing carried out with Cybertech Pro and Avaya Communication Manager and Avaya Application Enablement Services. It includes a description of the configuration of both the Avaya and the Cybertech solutions, a description of the tests that were performed and a summary of the results of those tests.

Cybertech Pro is a voice recording system which can be used to record the voice stream of Avaya telephone endpoints. It uses Avaya Communication Manager's 'Service Observe' feature via the Avaya Application Enablement Services (AES) Device, Media, and Call Control (DMCC) interface and the Telephony Services API (TSAPI) to capture the audio and call details for call recording.

The Device, Media and Call Control (DMCC) API associated with the AES server allows the creation of "Virtual" IP phones to monitor analogue, digital or VoIP extensions. A group of virtual IP phones is created in Avaya Communication Manager to be used by the CyberTech recorder application. These virtual phones are used to monitor the status of the target to be recorded. Recording can be activated using 'Service Observe' or 'Single Step Conference'. The method used is selected on the Cybertech recorder.

1.1. Interoperability Compliance Testing

The interoperability compliance tests included feature functionality and serviceability testing. The feature testing focused on testing scenarios that involve interaction between the Cybertech Pro server, Avaya Communication Manager and Avaya Application Enablement Services. The tests included the following:

- Verification of connectivity
- Verification of correct recording of basic internal and external calls
- Verification of correct recording for transfer, hold, and conference operations for internal and external calls
- Verification of call-back and bridged appearance operations
- Verification that agent information is included when monitoring calls to logged-in agents
- Verification of correct recovery after disconnection of various inter-device connections

The serviceability testing focused on verifying the Cybertech Pro's ability to recover from adverse conditions, such as disconnect from Avaya Communication Manager and Avaya Application Enablement Services.

1.2. Support

Technical support from Cybertech can be obtained through the following:

Cybertech Support Desk
Email: supportdesk@Cybertech-int.com
Telephone: +31 72 567 31 79

2. Reference Configuration

Cybertech Pro is a voice recording system which can be used to record the voice stream of Avaya telephone endpoints. The voice traffic of selected endpoints can be monitored and recorded to a voice data archive, with the time and call participants recorded with each call segment file.

The Avaya IP Telephony configuration used to verify these Application Notes is shown in **Figure 1**. The Avaya Application Enablement Services (AES) server was used by Cybertech Pro to receive call status information. Cybertech Pro then used Avaya Communication Manager "Service Observe" facility and "Single Step Conference" to collect voice data streams of endpoints which were selected to be monitored.

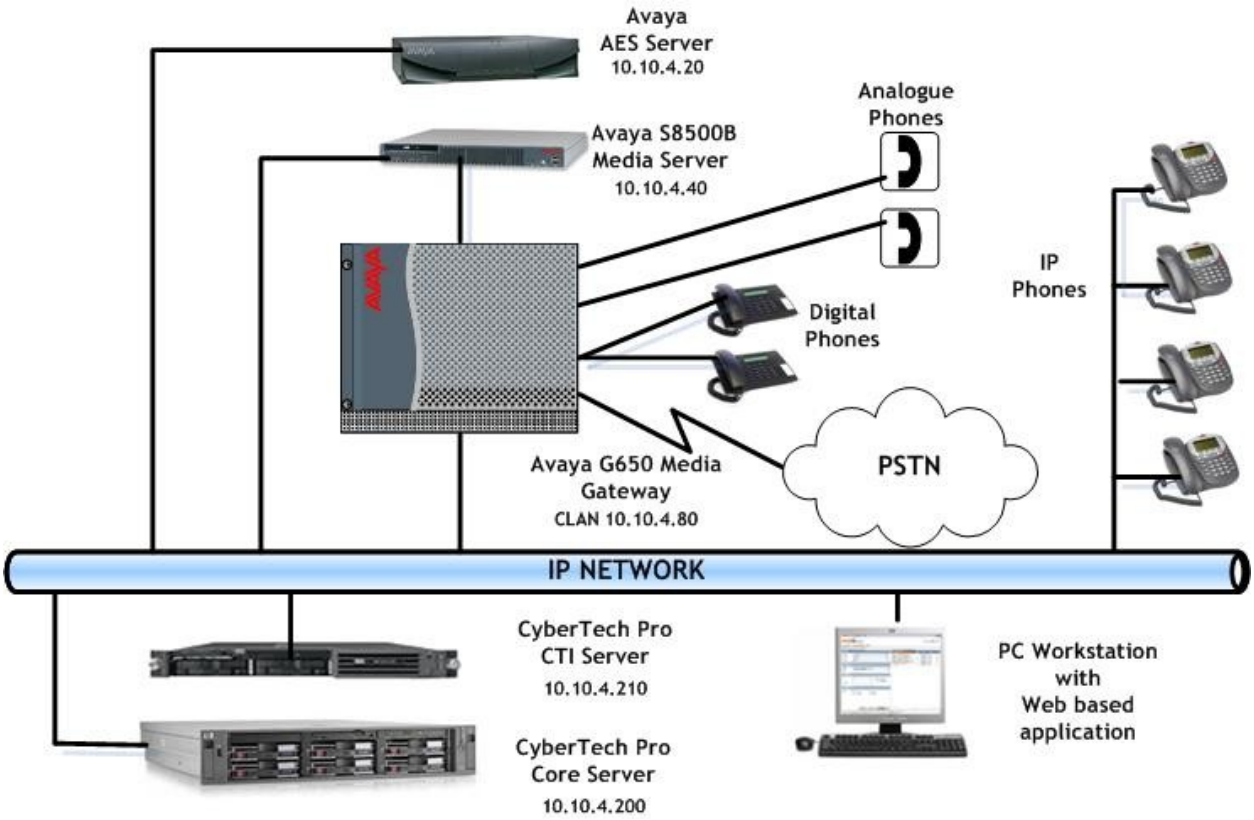


Figure 1: Cybertech Pro Test Configuration

3. Equipment and Software Validated

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

Equipment	Software Version
Avaya™ S8500B Server	Avaya Communications Manager 5.1.2 (R015x.01.2.416.4)
Avaya™ S8500B Server	Avaya Application Enablement Services 4.2.1
Avaya™ G650 Media Gateway IPSI TN2312BP CLAN TN799DP IP Media Processor TN2602AP Analog Card TN793CP DS1 Interface TN246CP Digital Line TN2214CP	 HW15, FM44 HW01, FM26 HW02, FM41 HW09, FM010 HW02, FM019 HW08, FM015
Avaya™ 96xx and 46xx Series IP Telephones (H.323) 9640 9620 4620SW 4621SW 2420 Analog Telephones – POTS	 2.0 2.0 2.9 2.9 R5 N\A
Cybertech Recording server	Version 5.2.0.75
Cybertech CTI Server	Callcontroller – version 1.4.10.438 AvayaLinkController – version .2.4.240

Table 1: Hardware and Software Version Numbers

4. Test Configuration

Table 2 contains the extensions that are used for testing. The capital letter designations correspond to the telephones shown in **Figure 1**. The virtual phones are softphones which were added to act as recording extensions.

Type of Phone	Phone Extension	Station	Button Allocation	Comments	IP Address
IP9640	3002	S1	3 x call-appr, serv-obsrv		10.10.4.52
IP9640	3005	S2	3 x call-appr, serv-obsrv		10.10.4.54
Digital-2420	3009	A	3 x call-appr, auto-cback		
Digital-2420	3006	B	3 x call-appr, auto-cback, call-pkup	*Agent logged in	
IP4610	3000	C	3 x call-appr, brdg-appr D, call-pkup **Added auto-cback	*Agent logged in	
IP9620	3001	D	3 x call-appr		
POTS		E			
POTS		F			
IP Softphone	3012	Virtual 1	3 x call-appr, serv-obsrv	*Recording extension not visible	
IP Softphone	3013	Virtual 2	3 x call-appr, serv-obsrv	*Recording extension – not visible	
External CM	2500	G			
External CM	2510	H			

Table 2: Station Extensions and Details Used for Testing

5. Configuration of Avaya Communication Manager

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

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

The configuration operations described in this section can be summarized as follows:

- Verify that the licenses allocated to the system are sufficient to support the required configuration
- Configure system parameters and system features
- Allocate Feature Access Codes
- Configure IP node names
- Configure the telephone stations that are to be used for testing
- Configure virtual CTI telephone stations
- Configure Class of Restriction for recording devices
- Allocate a call pickup group
- Allocate agent resources
- Configure the interface to AES

The configuration of the PRI interface to the PSTN is outside the scope of these application notes.

5.1. Verify System Parameters Customer Options

Use the **display system-parameters customer-options** command to verify that Avaya Communication Manager is licensed to meet the minimum requirements to interoperate with the Cybertech Pro server. Those items shown in bold in the screen below indicate required values or minimum capacity requirements. If these are not met in the configuration, please contact an Avaya representative for further assistance.

On **Page 2**, the value configured for **Maximum Concurrently Registered IP Stations** must be sufficient to support the total number of IP stations used. For Voice Recording you need double the number of Maximum Concurrently Registered IP stations, than the number of targets.

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

IP PORT CAPACITIES                                           USED
                     Maximum Administered H.323 Trunks: 100   0
          Maximum Concurrently Registered IP Stations: 2400  0
             Maximum Administered Remote Office Trunks: 0     0
Maximum Concurrently Registered Remote Office Stations: 0     0
              Maximum Concurrently Registered IP eCons: 0     0
  Max Concur Registered Unauthenticated H.323 Stations: 10    0
                  Maximum Video Capable H.323 Stations: 10    0
                   Maximum Video Capable IP Softphones: 10    0
                       Maximum Administered SIP Trunks: 10    0
  Maximum Administered Ad-hoc Video Conferencing Ports: 10    0
   Maximum Number of DS1 Boards with Echo Cancellation: 0     0
                             Maximum TN2501 VAL Boards: 10    0
                     Maximum Media Gateway VAL Sources: 0     0
          Maximum TN2602 Boards with 80 VoIP Channels: 128   0
         Maximum TN2602 Boards with 320 VoIP Channels: 128   1
   Maximum Number of Expanded Meet-me Conference Ports: 0     0
```

Verify with your Avaya account team that the required licenses are installed. In this test the following parameters were used though not all may be required for your solution needs. On **Page 3** the parameters are set as follows:

- **Answer Supervision by Call Classifier?** to **y**
- **Computer Telephony Adjunct Links?** to **y**

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

    Abbreviated Dialing Enhanced List? n          Audible Message Waiting? n
        Access Security Gateway (ASG)? n              Authorization Codes? n
        Analog Trunk Incoming Call ID? n                        CAS Branch? n
 A/D Grp/Sys List Dialing Start at 01? n                          CAS Main? n
Answer Supervision by Call Classifier? 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)? n
          ASAI Link Core Capabilities? n                DCS Call Coverage? n
          ASAI Link Plus Capabilities? n               DCS with Rerouting? n
       Async. Transfer Mode (ATM) PNC? n
  Async. Transfer Mode (ATM) Trunking? n    Digital Loss Plan Modification? n
              ATM WAN Spare Processor? n                            DS1 MSP? n
                                  ATMS? n             DS1 Echo Cancellation? y
                    Attendant Vectoring? n
```

On **Page 4**, the **IP Stations** parameter must be set to **y** so that IP stations can be configured.

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

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

On **Page 6,** the **EAS-PHD** parameter must be set to **y** so that skill levels greater that 3 can be selected. This is not mandatory for recording but was used in testing.

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

                           Call Center Release: 5.0

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

5.2. Configure System Parameters Features

Use the **change system-parameters features** command to set the **Call Pickup Alerting?** and **Directed Call Pickup?** parameters to **y**. These features were used in testing but are not mandatory for recording.

```
change system-parameters features                             Page   4 of 17
                        FEATURE-RELATED SYSTEM PARAMETERS
          Reserved Slots for Attendant Priority Queue: 5
                           Time before Off-hook Alert: 10
               Emergency Access Redirection Extension:
 Number of Emergency Calls Allowed in Attendant Queue: 5
 Maximum Number of Digits for Directed Group Call Pickup: 4
               Call Pickup on Intercom Calls? y         Call Pickup Alerting? y
 Temporary Bridged Appearance on Call Pickup? y         Directed Call Pickup? y
                   Extended Group Call Pickup: none

  Deluxe Paging and Call Park Timeout to Originator? n
 Controlled Outward Restriction Intercept Treatment: tone
Controlled Termination Restriction (Do Not Disturb): tone
          Controlled Station to Station Restriction: tone
AUTHORIZATION CODE PARAMETERS        Authorization Codes Enabled? n
```

On **Page 11** ensure the features were set as follows to allow service observing.

- **Service Observing: Warning Tone?** to **y.** It is not mandatory for recording but was used while testing.
- **Allow Two Observers in Same Call?** to **y**

```
display system-parameters features                                Page 11 of 17
                        FEATURE-RELATED SYSTEM PARAMETERS
CALL CENTER SYSTEM PARAMETERS
  EAS
         Expert Agent Selection (EAS) Enabled? y
        Minimum Agent-LoginID Password Length:
          Direct Agent Announcement Extension:                    Delay:
    Message Waiting Lamp Indicates Status For: station

  VECTORING
                    Converse First Data Delay: 0      Second Data Delay: 2
              Converse Signaling Tone (msec): 100         Pause (msec): 70
                     Prompting Timeout (secs): 10

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

Universal Call ID is used to uniquely identify calls. On **Page 5** of the system-parameters features form, set **Create Universal Call ID (UCID)** to **y** and **UCID Network Node ID** to an unassigned node ID.

```
display system-parameters features                                Page   5 of 17
                        FEATURE-RELATED SYSTEM PARAMETERS

SYSTEM PRINTER PARAMETERS
  Endpoint:               Lines Per Page: 60

SYSTEM-WIDE PARAMETERS
                                     Switch Name:
           Emergency Extension Forwarding (min): 10
          Enable Inter-Gateway Alternate Routing? n
Enable Dial Plan Transparency in Survivable Mode? n
                              COR to Use for DPT: station

MALICIOUS CALL TRACE PARAMETERS
               Apply MCT Warning Tone? n   MCT Voice Recorder Trunk Group:

SEND ALL CALLS OPTIONS
     Send All Calls Applies to: station    Auto Inspect on Send All Calls? n

UNIVERSAL CALL ID
     Create Universal Call ID (UCID)? y    UCID Network Node ID: 1
```

On **Page 13**, set **Send UCID to ASAI** to **y**.

```
display system-parameters features                                Page 13 of 17
                        FEATURE-RELATED SYSTEM PARAMETERS

 CALL CENTER MISCELLANEOUS
                         Clear Callr-info: next-call
        Allow Ringer-off with Auto-Answer? n

    Reporting for PC Non-Predictive Calls? n

  ASAI
            Copy ASAI UUI During Conference/Transfer? n
        Call Classification After Answer Supervision? y
                                  Send UCID to ASAI? y
```

5.3. Configure Feature Access Codes

Use the **change feature-access-codes** command to configure all of the access codes shown in the table below.

Parameter	Usage
Call Pickup Access Code	This is used by telephone users to initiate a call-pickup operation.
Auto-in	This is used by the agent to indicate readiness.
Login	Agent login.
Logout	Agent logout.
Service Observing No Talk	This is used by the voice recorder to receive the voice stream without sending voice data. Value used below (#3) is a free choice; the value chosen must match the Cybertech configuration settings.

Table 3: Feature Access Codes

The values set for each option can be seen highlighted on **Page 1** and **Page 5** in the figures below.

```
change feature-access-codes                                       Page   1 of   8
                               FEATURE ACCESS CODE (FAC)
         Abbreviated Dialing List1 Access Code:
         Abbreviated Dialing List2 Access Code:
         Abbreviated Dialing List3 Access Code:
Abbreviated Dial - Prgm Group List Access Code:
                      Announcement Access Code:
                       Answer Back Access Code:
                         Attendant Access Code:
      Auto Alternate Routing (AAR) Access Code:
    Auto Route Selection (ARS) - Access Code 1:       Access Code 2:
                 Automatic Callback Activation:        Deactivation:
Call Forwarding Activation Busy/DA:        All:        Deactivation:
   Call Forwarding Enhanced Status:        Act:        Deactivation:
                         Call Park Access Code:
                       Call Pickup Access Code: #4
CAS Remote Hold/Answer Hold-Unhold Access Code:
                  CDR Account Code Access Code:
                        Change COR Access Code:
                   Change Coverage Access Code:
                   Contact Closure   Open Code:          Close Code:
```

The feature access codes set below are referenced in **Table 3**.

```
 change feature-access-codes                                          Page   5 of   8
                                FEATURE ACCESS CODE (FAC)

                          Automatic Call Distribution Features

                     After Call Work Access Code:
                              Assist Access Code:
                            Auto-In Access Code: #2
                           Aux Work Access Code:
                              Login Access Code: #6
                             Logout Access Code: #5
                          Manual-in Access Code:
      Service Observing Listen Only Access Code:
      Service Observing Listen/Talk Access Code:
          Service Observing No Talk Access Code: #3
                     Add Agent Skill Access Code:
                  Remove Agent Skill Access Code:
              Remote Logout of Agent Access Code:
```

5.4. Configure Node Names

Ensure that the CLAN IP address is in the node-names form. Enter the **change node-names ip** command. In the compliance-tested configuration, the 'CLAN' IP address was used for registering H.323 endpoints, and the 'PresAES' IP address was used for connectivity to Avaya AES.

```
change node-names ip                                                  Page   1 of   2
                                   IP NODE NAMES
    Name                IP Address
CLAN                  10.10.4.80
MEDPRO                10.10.4.90
PresAES               10.10.4.40
default               0.0.0.0
procr                 10.255.255.100
```

5.5. Configure Telephone Stations

Use the **add station** command to configure all of the telephones shown in **Section 4**, **Table 2**. Refer to this table when allocating names and button assignments for each test phone.

On **Page 1**, **Phone A, Extension 3009,** is a digital phone therefore a **Type** of **2420** is chosen.

```
add station 3009                                          Page   1 of   5
                                    STATION

Extension: 3009                        Lock Messages? n               BCC: 0
     Type: 2420                        Security Code:                  TN: 1
     Port: 01A0607                   Coverage Path 1:                 COR: 1
     Name: Phone A                   Coverage Path 2:                 COS: 1
                                     Hunt-to Station:
STATION OPTIONS
                                          Time of Day Lock Table:
              Loss Group: 2          Personalized Ringing Pattern: 1
             Data Option: none                 Message Lamp Ext: 3009
            Speakerphone: 2-way              Mute Button Enabled? y
        Display Language: english               Expansion Module? n

          Survivable COR: internal             Media Complex Ext:
   Survivable Trunk Dest? y                         IP SoftPhone? n




                                            Customizable Labels? Y
```

Add the appropriate button assignments as shown in the screen on **Page 4** below.

```
add station 3009                                          Page   4 of   5
                                    STATION
 SITE DATA
       Room:                                            Headset? n
       Jack:                                            Speaker? n
      Cable:                                           Mounting: d
      Floor:                                       Cord Length: 0
   Building:                                         Set Color:

ABBREVIATED DIALING
     List1:                    List2:                    List3:



BUTTON ASSIGNMENTS
 1: call-appr                          5:
 2: call-appr                          6:
 3: call-appr                          7:
 4: auto-cback                         8:

    voice-mail Number:
```

Repeat this process to add stations for telephones B, C, D, S1 and S2 as displayed in **Table 2**, **Section 4**.

5.6. Configure CTI Telephone Stations

Use the **add station** command to configure a station for each of the virtual endpoints shown in **Table 2, Section 4**. Each of the virtual stations has a **Type** of **4620**. Enter in a descriptive **Name** and **Security Code** for each one. Set the **IP Softphone** to **y**.

```
change station 3012                                          Page   1 of   5
                                    STATION

Extension: 3012                        Lock Messages? n               BCC: 0
     Type: 4620                        Security Code: 3012             TN: 1
     Port: S00013                    Coverage Path 1:                 COR: 1
     Name: Virtual 1                 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: 3012
            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 Softphone? n


                                              Customizable Labels? Y
```

Allocate the button assignments as shown in the screen below. Create a **serv-obsrv** button to initiate a service observe from the CTI server.

```
 change station 3012                                         Page   4 of   5
                                    STATION
 SITE DATA
       Room: [B                                        Headset? n
       Jack:                                           Speaker? n
      Cable:                                          Mounting: d
      Floor:                                       Cord Length: 0
   Building:                                         Set Color:

ABBREVIATED DIALING
     List1:                    List2:                    List3:




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

5.7. Configure COR

Set the class of restriction so that the stations can all service observed by a recording device. Set the values in the following screen as follows:

- **Can Be Service Observed?** as **y**
- **Can Be A Service Observer?** as **y**

```
change cor 1                                                    Page   1 of 23
                              CLASS OF RESTRICTION

               COR Number: 1
          COR Description:

                      FRL: 0                                 APLT? y
  Can Be Service Observed? y           Calling Party Restriction: none
Can Be A Service Observer? y            Called Party Restriction: none
 Partitioned Group Number: 1       Forced Entry of Account Codes? n
         Priority Queuing? n                Direct Agent Calling? y
     Restriction Override: none       Facility Access Trunk Test? n
     Restricted Call List? n                 Can Change Coverage? n

            Access to MCT? y            Fully Restricted Service? n
Group II Category For MFC: 7
         Send ANI for MFE? n             Add/Remove Agent Skills? y
            MF ANI Prefix:              Automatic Charge Display? n
Hear System Music on Hold? y   PASTE (Display PBX Data on Phone)? n
                        Can Be Picked Up By Directed Call Pickup? y
                                    Can Use Directed Call Pickup? y
                                    Group Controlled Restriction: inactive
```

On **Page 2** set the value **Service Observing by Recording Device?** to **y**.

```
change cor 1                                                    Page   2 of 23
                              CLASS OF RESTRICTION

                     MF Incoming Call Trace? n
               Brazil Collect Call Blocking? n
                     Block Transfer Display? n
Block Enhanced Conference/Transfer Displays? y
                     Remote Logout of Agent? n


 Station Lock COR: 1       TODSL Release Interval (hours):
  Outgoing Trunk Disconnect Timer (minutes):




      Station-Button Display of UUI IE Data? n
      Service Observing by Recording Device? y
                           ERASE 24XX USER DATA UPON
           Dissociate or unmerge this phone: none
          EMU login or logoff at this phone: none
           Mask CPN/NAME for Internal Calls? n
```

5.8. Configure Pickup Group

Create a pickup group which contains stations A, B, C, D. This is used in conjunction with the "call-pkup" button which is allocated to endpoint B, as shown in **Section 4**, **Table 2**. Use the command **add pickup-group 1** to add this group as shown below. Assign a name and add extensions.

```
add pickup-group 1                                          Page   1 of   4
                              PICKUP GROUP

           Group Number: 1
             Group Name: CallPickUP
GROUP MEMBER ASSIGNMENTS

    Extension       Name
 1: 3009
 2: 3006
 3: 3000
 4: 3001
 5:
 6:
```

5.9. Configure Agents

A hunt group, Vector Directory Number (VDN), vector and two agent logins were created as in the following table. These were created for testing purposes only.

	Value	Name
VDN	1800	VDN1800
Vector	1	Vector1
Skill Ext\Hunt Groups	35001/1	Agent HG1
Agent Login	6001 6002	AgentB AgentC

Table 4: Call Center Agent Details

5.9.1. Configure Agent Hunt Group

Enter the **add hunt-group n** command; where **n** is an unused hunt group number. On Page 1 of the **hunt group** form, assign a **Group Name** and **Group Extension** valid under the provisioned dial plan. Set the following options to yes (**y**) as shown below.

- **ACD?** to **y**
- **Queue?** to **y**
- **Vector?** to **y**
- **Group Type** to **ucd-mia** to specify that the system hunts for the "most idle agent".

```
add hunt-group 1                                                Page   1 of 61
                                    HUNT GROUP

            Group Number: 1                                   ACD? y
              Group Name: Agent HG1                         Queue? y
         Group Extension: 35000                           Vector? y
              Group Type: ucd-mia
                      TN: 1
                     COR: 1                      MM Early Answer? n
           Security Code:                 Local Agent Preference? n
 ISDN/SIP Caller Display:

             Queue Limit: unlimited
 Calls Warning Threshold:      Port:
  Time Warning Threshold:      Port:
```

On **Page 2** set **Skill?** to **y** to indicate that this is a skilled hunt group.

```
add hunt-group 1                                              Page   2 of 61
                                  HUNT GROUP

                   Skill? y      Expected Call Handling Time (sec): 180
                     AAS? n
                 Measured: none
     Supervisor Extension:


      Controlling Adjunct: none



                                Redirect on No Answer (rings):
                                             Redirect to VDN:
                  Forced Entry of Stroke Counts or Call Work Codes? N


                                Redirect on No Answer (rings):
                                             Redirect to VDN:
                  Forced Entry of Stroke Counts or Call Work Codes? n
```

5.9.2. Configure Agent Queue Vector

Enter the **add vector n** command; where **n** is associated to hunt group 1. The **Vector number** is set to **1.** Enter the vector steps to queue to the 1st skill on the VDN as shown below**.**

```
add vector 1                                                    Page   1 of   6
                                  CALL VECTOR

    Number: 1                Name: Vector1
                                                                        Lock? n
     Basic? y   EAS? y   G3V4 Enhanced? y   ANI/II-Digits? y   ASAI Routing? y
 Prompting? y   LAI? n  G3V4 Adv Route? y   CINFO? y   BSR? y   Holidays? y
 Variables? y   3.0 Enhanced? y
01 wait-time    2   secs hearing ringback
02 queue-to     skill 1    pri m
03
```

5.9.3. Configure Agent VDN

Use the **add vdn n** command to create a Vector Directory Number extension which can be used to reference the Operator queue vector. Set the values **Name** and **Vector Number 1** by referencing **Table 3**, **Section 5.8** above. The **1st Skill** is set to **1**.

```
add vdn 1800                                                    Page   1 of   3
                            VECTOR DIRECTORY NUMBER

                             Extension: 1800
                                 Name*: VDN1800
                          Vector Number: 1

                     Allow VDN Override? n
                                   COR: 1
                                   TN*: 1
                              Measured: none

                            1st Skill*: 1
                            2nd Skill*:
                            3rd Skill*:
```

Set **Observe on Agent Answer?** to **y** on **Page 2**. This will initiate service observe after the agent has answered the call.

```
add vdn 1800                                                    Page   2 of   3
                            VECTOR DIRECTORY NUMBER

                                 AUDIX Name:


               BSR Available Agent Strategy*: 1st-found
                           BSR Tie Strategy*: system

                      Observe on Agent Answer? y

               Display VDN for Route-To DAC*? n
 VDN Override for ISDN Trunk ASAI Messages*? n

          Reporting for PC Predictive Calls? N
```

5.9.4. Configure Agent Login

Use the **add agent-loginID n** command; where **n** is a valid extension under the provisioned dial plan. Two agents are created at stations B and C as in **Table 2, Section 4.** The agent loginID chosen is **6001**. Enter a descriptive name for the agent in the **Name** field and set **Password**.

```
add agent-loginID 6001                                          Page   1 of   2
                                 AGENT LOGINID

                Login ID: 6001                                    AAS? n
                    Name: AgentB                                AUDIX? n
                      TN: 1                            LWC Reception: spe
                     COR: 1                     LWC Log External Calls? n
           Coverage Path:                     AUDIX Name for Messaging:
           Security Code:
                                        LoginID for ISDN/SIP Display? n
                                                            Password: 6001
                                                 Password (enter again): 6001
                                                          Auto Answer: station
                                                   MIA Across Skills: system
                                           ACW Agent Considered Idle: system
                                           Aux Work Reason Code Type: system
                                             Logout Reason Code Type: system
                       Maximum time agent in ACW before logout (sec): system
                                            Forced Agent Logout Time:   :
```

Specify the list of skills assigned to the login and the skill level for each of them in the **SN/SL** field as shown below. Set the **Skill Number** to **1**, it should be the same as that configured for the associated vector number. The **Skill Level** is set to **1**.

```
add agent-loginID 6001                                          Page   2 of   2
                                 AGENT LOGINID
      Direct Agent Skill:
Call Handling Preference: skill-level               Local Call Preference? n

    SN      SL          SN      SL          SN      SL          SN      SL
 1: 1       1       16:                 31:                 46:
 2:                 17:                 32:                 47:
```

5.10. Configure Interface to Avaya AES

The Avaya Application Enablement Services server has a TSAPI interface which provides Cybertech Pro with a means of communicating with Avaya Communication Manager to perform telephony operations. Avaya Communication Manager requires the configuration parameters shown in this section.

Use the **add ip-interface** command to allocate a call control interface. The slot value specified should be the CLAN interface. The value used as **Node Name** must be one of the names from the list defined by the **change node-names ip** command. The **Subnet Mask** and **Gateway Address** should be assigned to the values used by the Ethernet network to which the CLAN is attached.

```
add ip-interface 01a02                                        Page   1 of   2
                                  IP INTERFACES

                  Type: C-LAN
                  Slot: 01A02
           Code/Suffix: TN799  D
             Node Name: CLAN
            IP Address: 10 .10 .4  .80
           Subnet Mask: 255.255.255.0                              Link: 1
       Gateway Address: 10 .10 .4  .1
  Enable Ethernet Port? y                       Allow H.323 Endpoints? y
        Network Region: 1                        Allow H.248 Gateways? y
                  VLAN: n                         Gatekeeper Priority: 5

 Target socket load and Warning level: 400
       Receive Buffer TCP Window Size: 8320
                                ETHERNET OPTIONS
                  Auto? y
```

Use the **change ip-services** command to set the parameters for **AESVCS** service for the CLAN as shown below. This was defined above to serve as the interface to the Avaya AES server. On **Page 1** add **CLAN** as the **Local Node** and accept default of **8765** as **Local Port.**

```
change ip-services                                            Page   1 of   3

                                  IP SERVICES
 Service      Enabled     Local        Local       Remote      Remote
  Type                    Node         Port        Node        Port
AESVCS         y       CLAN            8765
```

On **Page 3** an entry for the Avaya AES server must be made in the list in the screen shown below. The name assigned to the Avaya AES server when it was installed must be entered in the **AE Services Server** field for that entry. The **Password** entry must the same as that assigned to the switch connection, as shown in **Section 6.2** of this document.

```
change ip-services                                            Page   3 of   3
                           AE Services Administration

   Server ID    AE Services       Password          Enabled    Status
                  Server
      1:      ~~~~~~~~~~~~~~    xxxxxxxxxxx          n        idle
      2:      PresAES           xxxxxxxxxxxxx        y        in use
      3:
```

Use the **add cti-link** command to add a CTI link for use by TSAPI. The link number can be any value between 1 and 64 which is not currently assigned to another link. The link number specified must be the same value that is used in the **Add / Edit TSAPI Links** configuration screen shown in **Section 6.3** of this document. Use an unused extension as the value for the **Extension** parameter. The value chosen for the **Name** parameter is a matter of personal preference. Specify a **Type** of **ADJ-IP**, as required for a TSAPI link.

```
add cti-link 10                                          Page   1 of   3
                                   CTI LINK
 CTI Link: 10
Extension: 5002
     Type: ADJ-IP
                                                                  COR: 1
     Name: PresAES
```

Use the **add data-module n** command; where **n** is an unassigned extension, to allocate an extension to be used as the data interface for the clan module. The value used as **Data Extension** can be any free extension. The **Name** value is only used for identification purposes. The **Type** field must be **ethernet**. The **Port** should be assigned to port 17 of the CLAN interface. The **Link** number should be assigned a value between 1 and 99.

```
add data-module 3400
                                DATA MODULE

  Data Extension: 3400            Name: CLAN
            Type: ethernet
            Port: 01A0217
            Link: 1




Network uses 1's for Broadcast Addresses? y
```

6. Configuration of Avaya AES

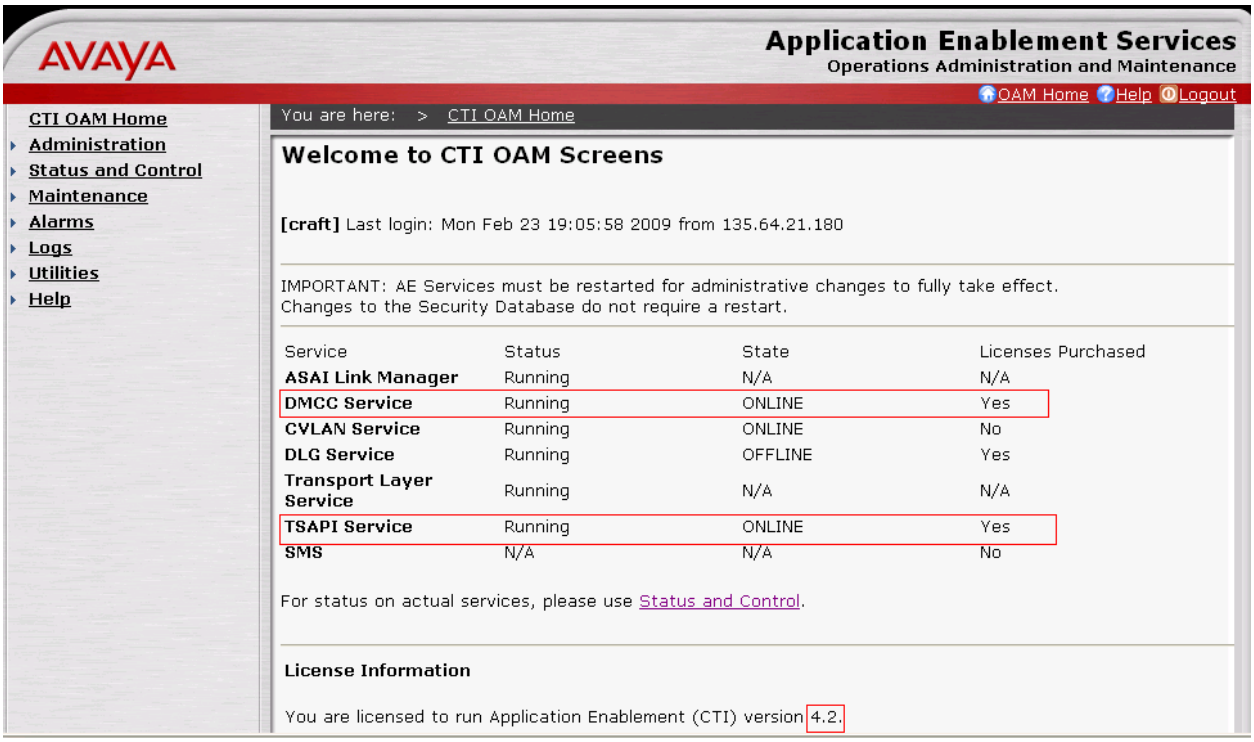
The information provided in this section describes the configuration of Avaya Application Enablement Services for this solution. The configuration includes the following areas:

- Verify Avaya Application Enablement Services License
- Create Switch Connection
- Administer TSAPI link
- Add CTI User
- Enable CTI Link User
- Set DMCC Port

6.1. Verify Avaya AES Licensing

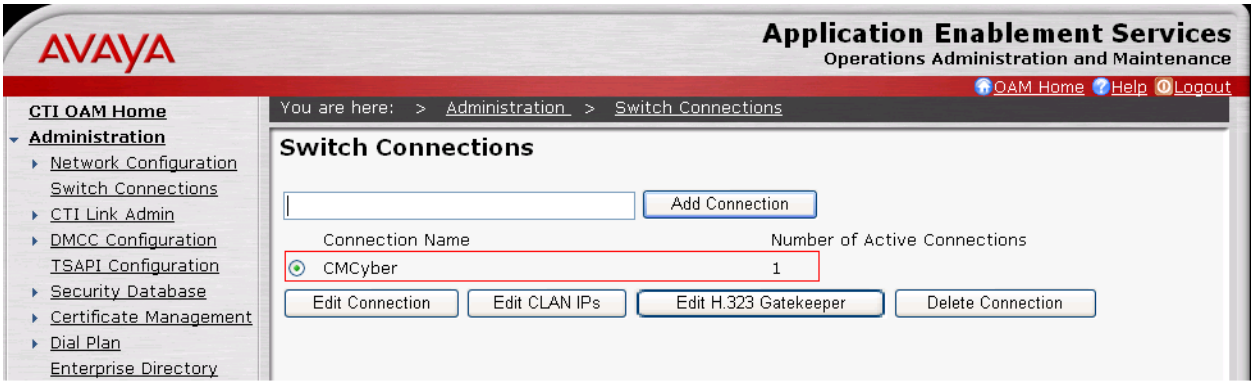
The Avaya AES server is configured via a web browser by accessing the following URL:
https://<Avaya AES server address>/
Once the login screen appears, enter the OAM Admin login ID/password to perform administrative activities on the AE Server. Verify that Avaya Communication Manager/AES is licensed for TSAPI and DMCC by consulting with your Avaya account manager or Business Partner to acquire the proper license for your solution.

From the OAM Home screen select **CTI OAM Admin** (not shown) to bring up the CTI OAM Home menu. Verify that the TSAPI service is licensed at the Welcome to CTI OAM Screens screen by ensuring that **TSAPI Service** and **DMCC Service** are in the list of services in the License Information section.



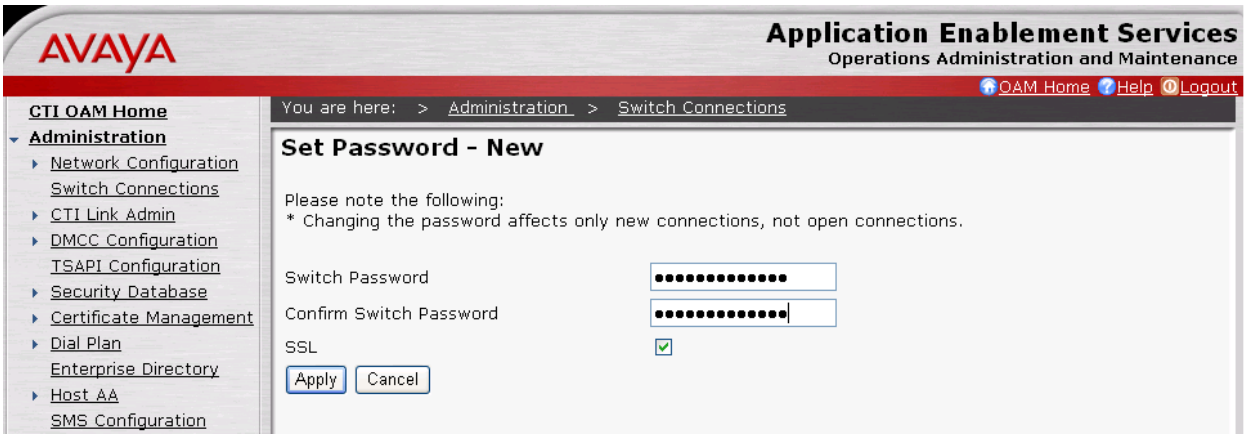
6.2. Create Switch Connection

Navigate to **Administration → Switch Connections**. Enter the name of the Switch Connection to be added and click on the **Add Connection** button. The screen below displays the active switch connection once it has been added.

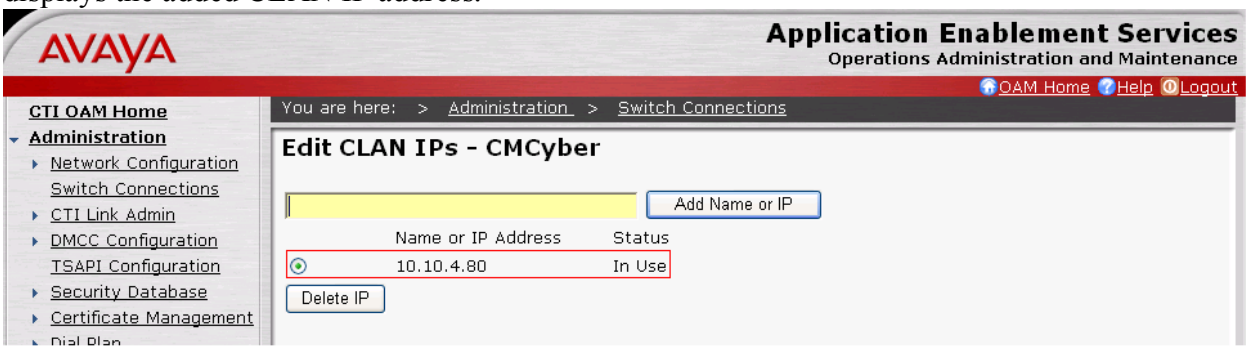


Following the addition of the switch connection the AES Set Switch Connection Password screen is displayed. Enter the screen fields as described below and click the **Apply** button.

- **Switch Password:** The Switch Password must be the same as that entered into Avaya Communication Manager AE Services screen via the **change ip-services** command, described in **Section 5.10**.
- **SSL:** This is enabled

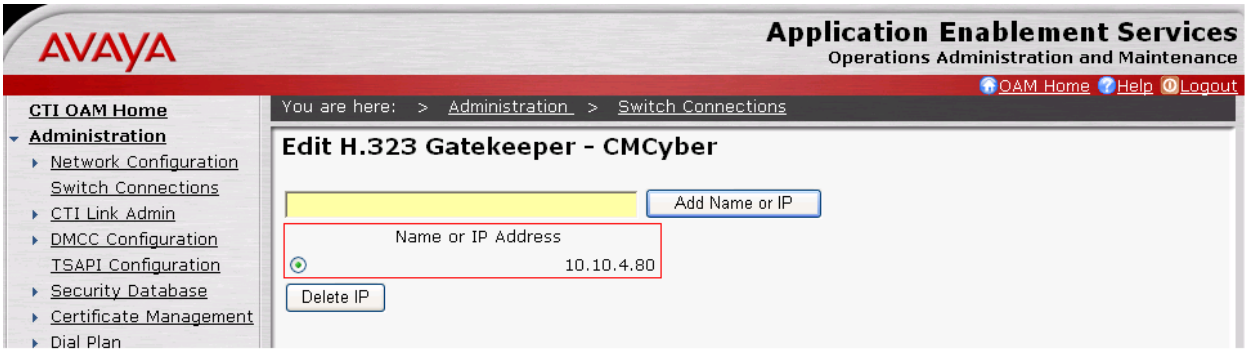


The CLAN IP address must then be set on the AES. From the **Administration → Switch Connections** screen (not shown), click the **Edit CLAN IPs** button. Enter the IP address of the CLAN which the Avaya AES is to use for communication with Avaya Communication Manager as defined in **Section 5.10**. Click the **Add Name or IP** button (not shown). The following screen displays the added CLAN IP address.



The H.323 Gatekeeper should be set up to point to the Avaya Communication Manager where the virtual extensions are registered. Enter the CLAN IP address which will be used for the DMCC service.

Navigate to **CTI OAM Home → Administration → Switch Connection → Edit H323 Gatekeeper**. Enter the IP Address and click **Add Name or IP** button. The screen below shows the added IP address.

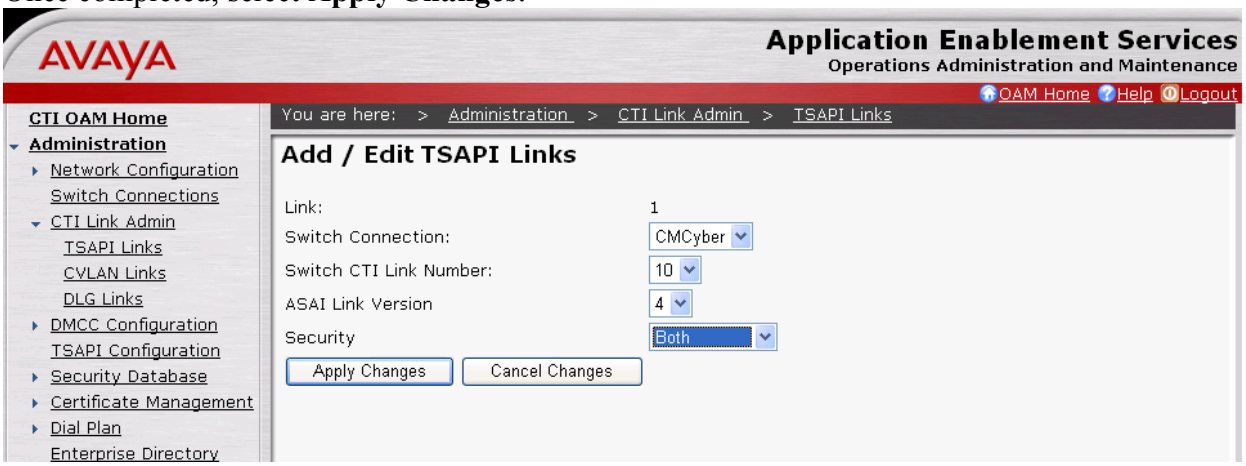


6.3. Administer TSAPI Link

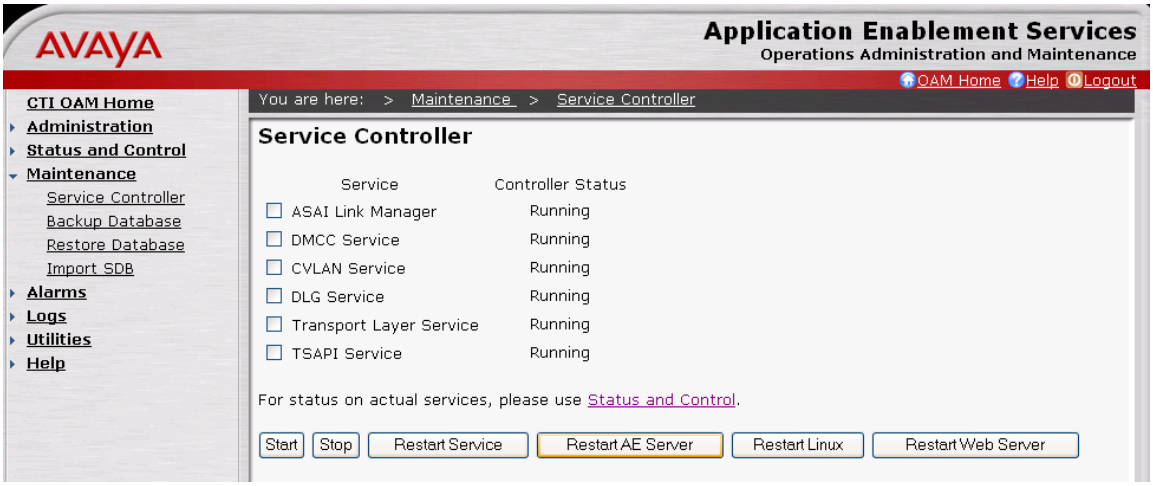
From the CTI OAM Home menu, select **Administration → CTI Link Admin → TSAPI Links**. On the TSAPI Links screen (not shown), select **Add Link**. On the **Add/Edit TSAPI Links** screen, enter the following values:

- **Link:** Select an unused link number. The link number chosen is **1**.
- **Switch Connection:** The "Switch Connection" parameter should be the name of the Avaya Media Server which is to be controlled by this link. Choose the switch connection **CMCyber**, which has already been configured from the drop-down list.
- **Switch CTI Link Number:** Use the **c**orresponding CTI link number configured in **Section 5.10** which is **10**.
- **Security: Both** is the option chosen here. The customer can choose Secure\UnSecure\Both.

Once completed, select **Apply Changes**.

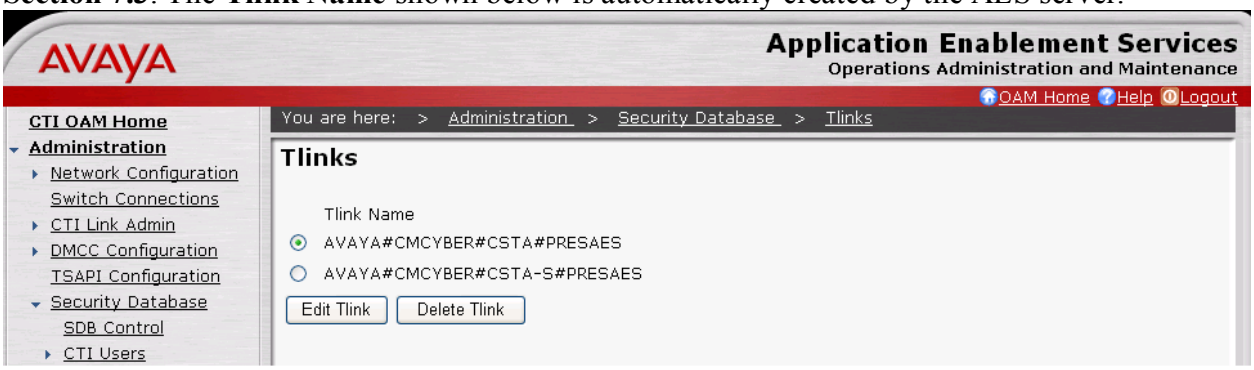


The AES must be restarted to effect the changes made in this section. From the CTI OAM Home menu, select **Maintenance → Service Controller**. On the Service Controller screen, select **Restart AE Server**.



Restart AE Server screen (not shown), select **Restart**. Wait at least 10 minutes and select **Maintenance → Service Controller**. On the Service Controller screen, verify that all services are showing **Running** in the **Controller Status** column (not shown).

Navigate to the Tlinks screen by selecting **Administration → Security Database → Tlinks**. Note the value of the **Tlink Name**, as this will be needed for configuring the Cybertech server in **Section 7.3**. The **Tlink Name** shown below is automatically created by the AES server.

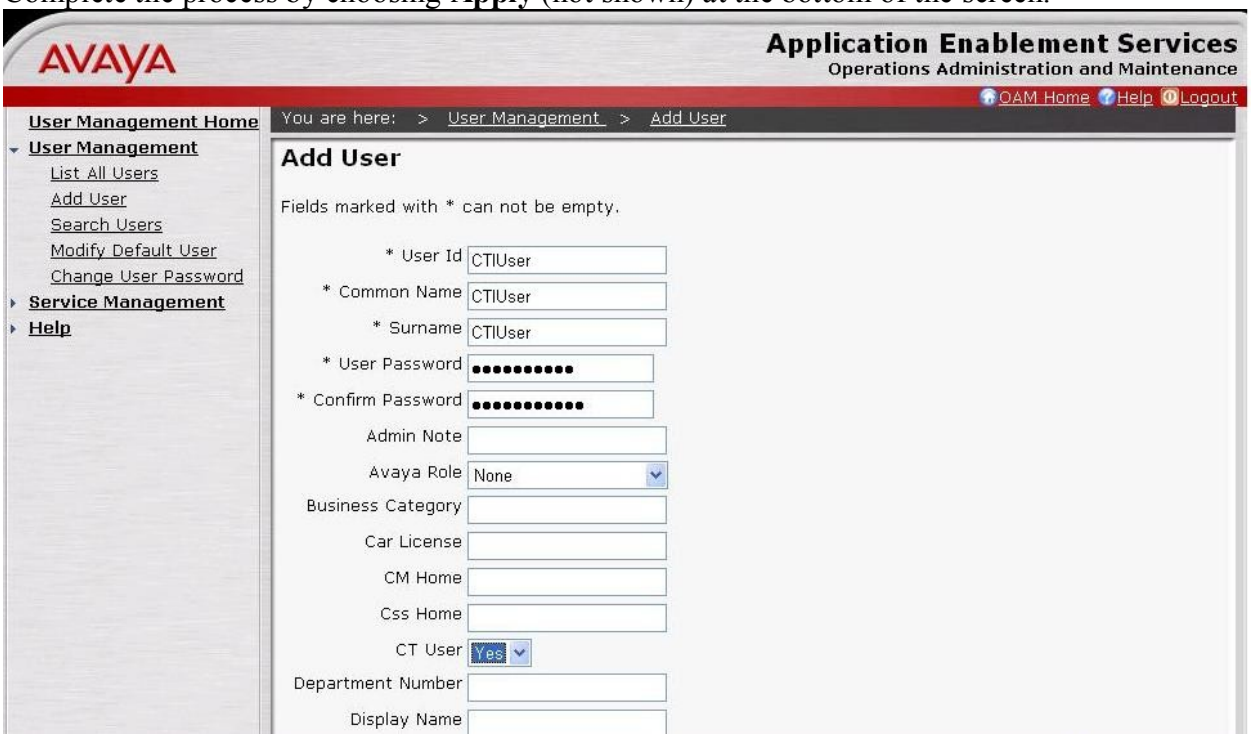


6.4. Create Avaya CTI User

A User ID and password needs to be configured for the Cybertech Pro server to communicate as a TSAPI Client with the AES server to monitor stations and initiate switching operations.
Click on **OAM Home → User Management** and log into the **User Management** page. Click on **User Management** and then **Add User**.
In the **Add User** screen shown below, enter the following values:

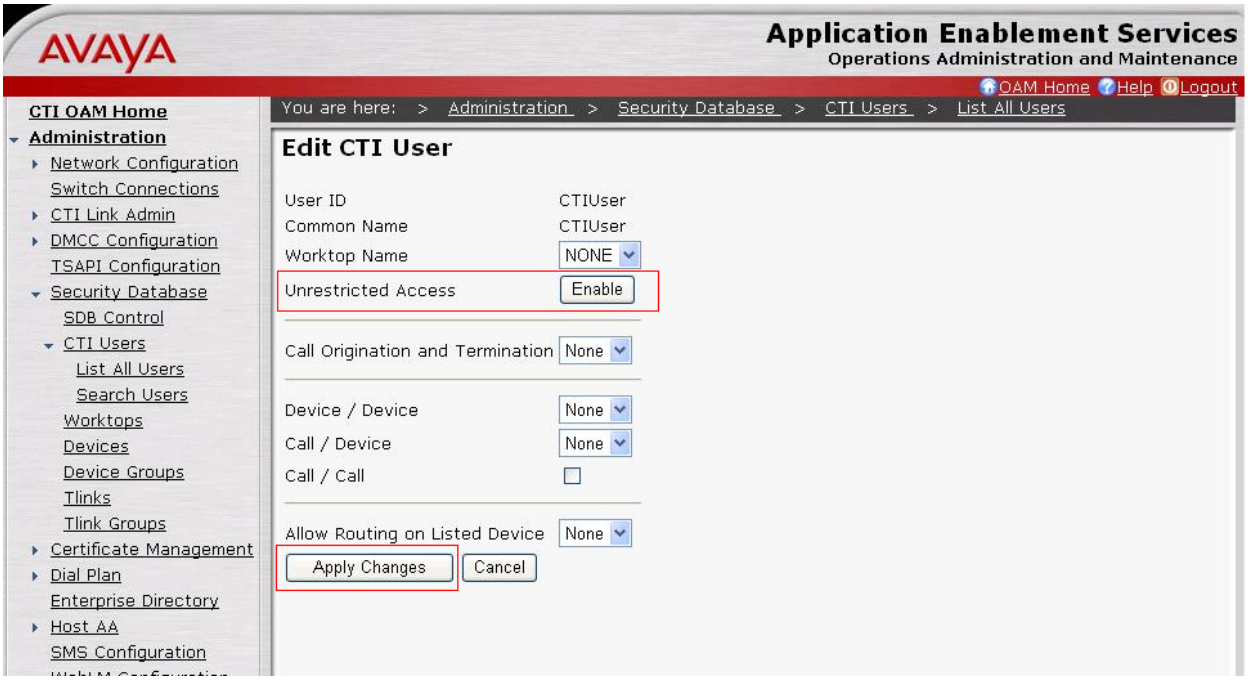
- **User ID –** This will be used by the Cybertech server in **Section 7.3**.
- **Common Name and Surname –** A descriptive name needs to be entered.
- **New Password and Confirm Password –** This will be used with the User Id in **Section 7.3**.
- **CT User –** Select **Yes** from the drop-down menu

Complete the process by choosing **Apply** (not shown) at the bottom of the screen.



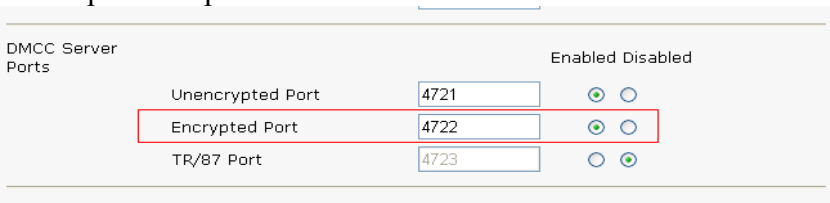
6.5. Enable CTI User

Navigate to the CTI Users by selecting **Administration → Security Database → CTI Users → List All Users**. Select the **CTIUser** user that was set up in **Section 6.4** and select the Edit option. For the **Unrestricted Access** option, select the **Enable** button and **Apply Changes** at the bottom of the screen.



6.6. Configure DMCC Ports

Navigate to **CTI OAM Home → Administration → Network Configuration → Ports** to set the DMCC server port. During the compliance test, the **Encrypted Port** was enabled as shown in the following screen. Click the **Apply Changes** button (not shown) at the bottom of the screen to complete the process.



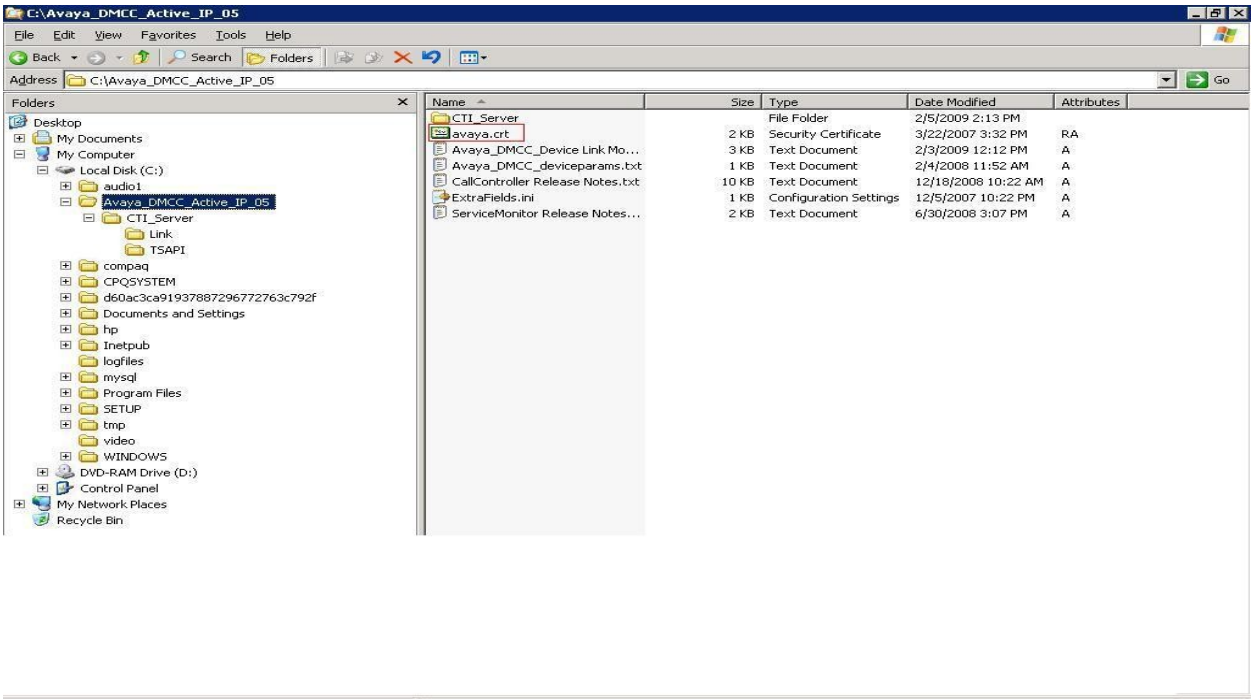
7. Configure Cybertech CTI Server

The Cybertech Pro CTI server is largely pre-configured for the customer by Cybertech prior to delivery. This section shows those configuration steps which need to be made after delivery. The configuration includes the following areas:

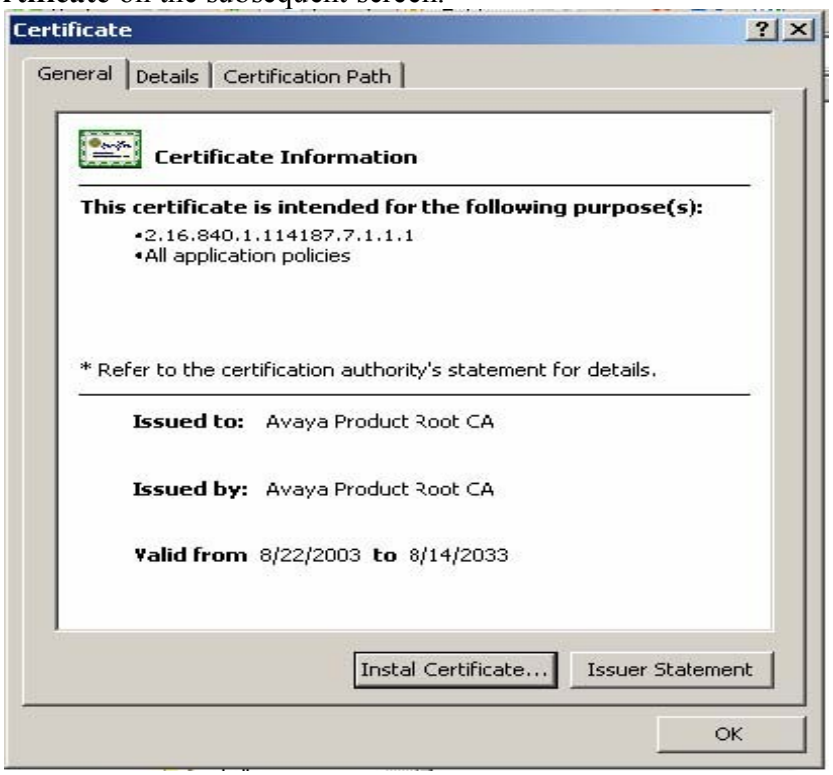
- Install of the SSL Certificate
- Install of the Avaya Link Controller, Call Controller and the TSAPI Client
- Configure the Cybertech Pro Voice Recorder

7.1. Install the SSL Certificate for the AES Connection

The Cybertech CTI server requires a certificate to communicate with the Avaya AES Server. After installation the following files are present on the CTI server. Double click on the 'avaya' certificate in the directory containing the distribution files. Please check CyberTech Connectivity Manual for latest details.

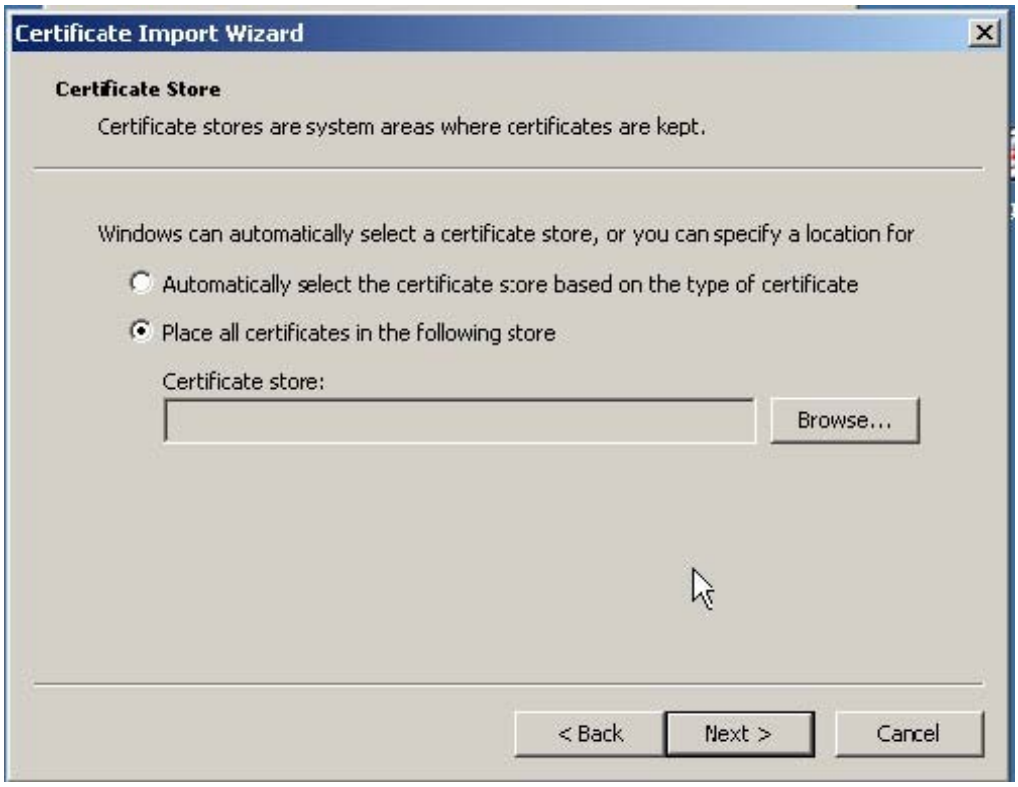


Click **Install Certificate** on the subsequent screen.



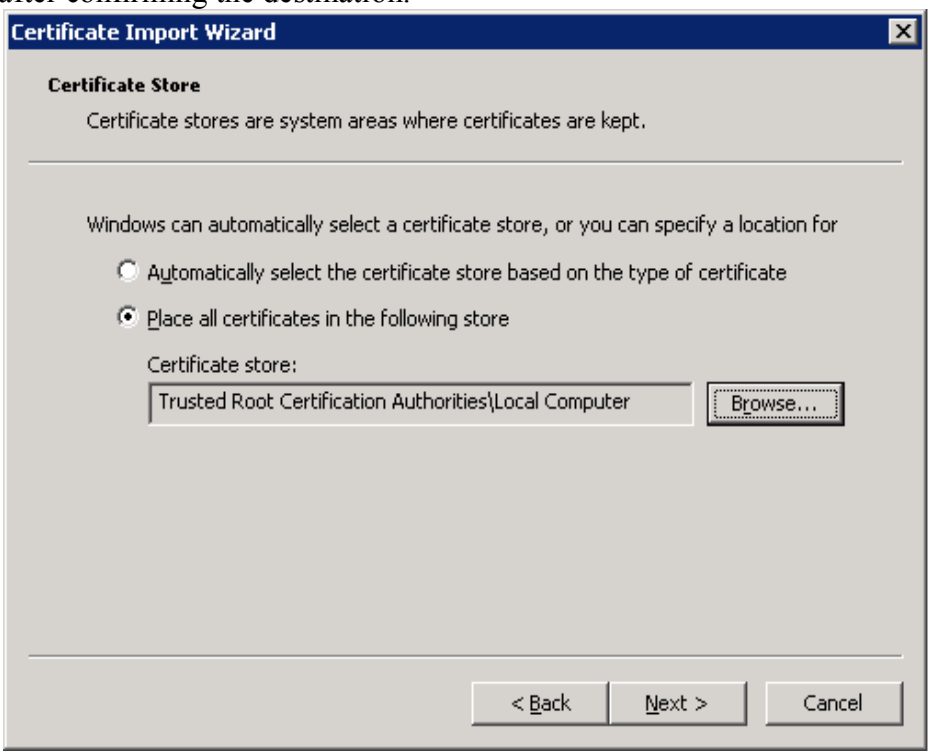
The Certificate Import Wizard is displayed. Click **Next** to begin the import.

Click **Browse** to select the certificate destination.

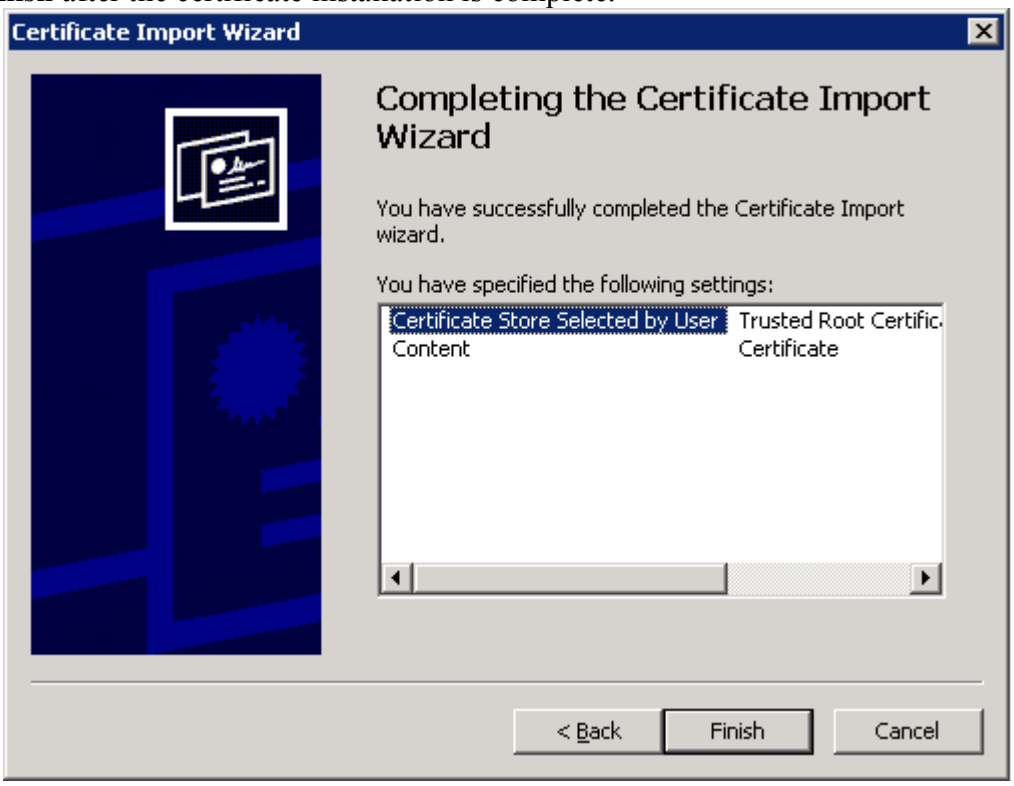


Select the **Local Computer**, as shown.

Click **Next** after confirming the destination.

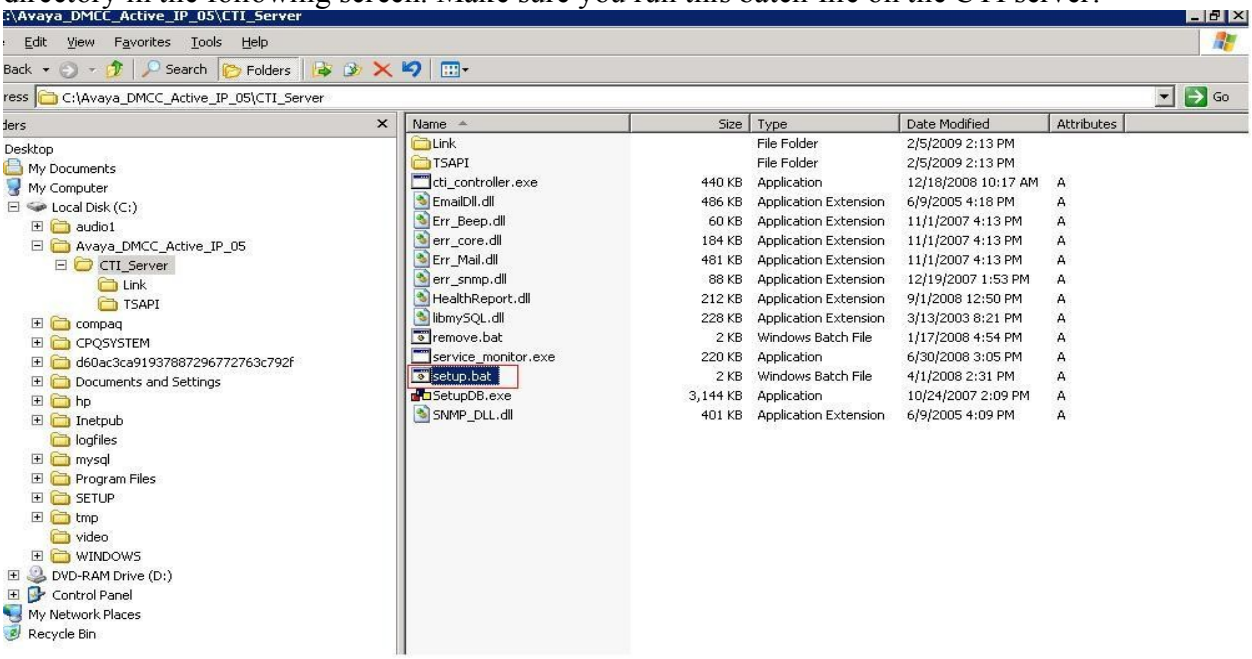


Click **Finish** after the certificate installation is complete.

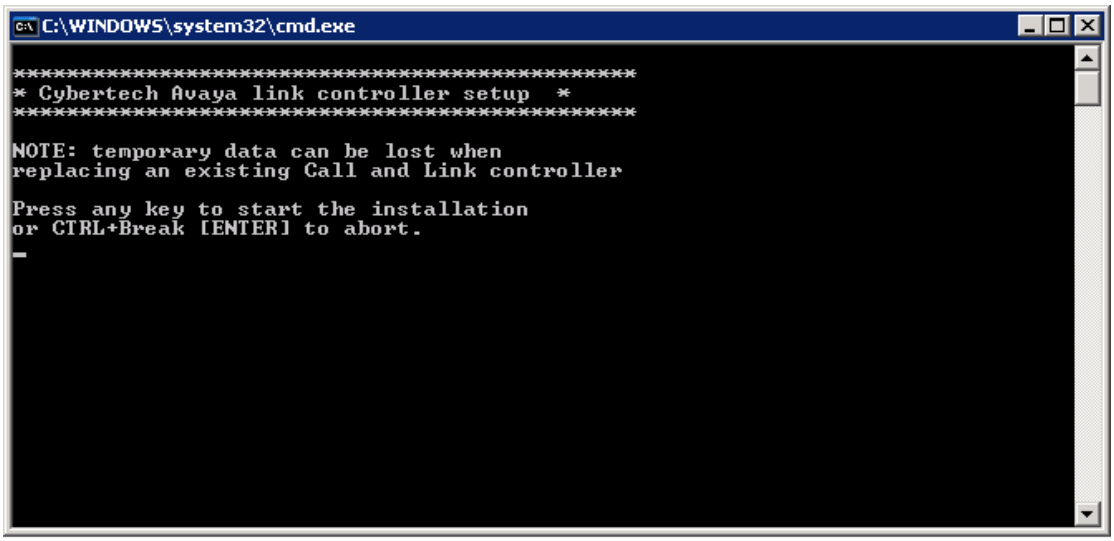


7.2. Install Avaya Link Controller, Call Controller and the TSAPI Client on CTI Server

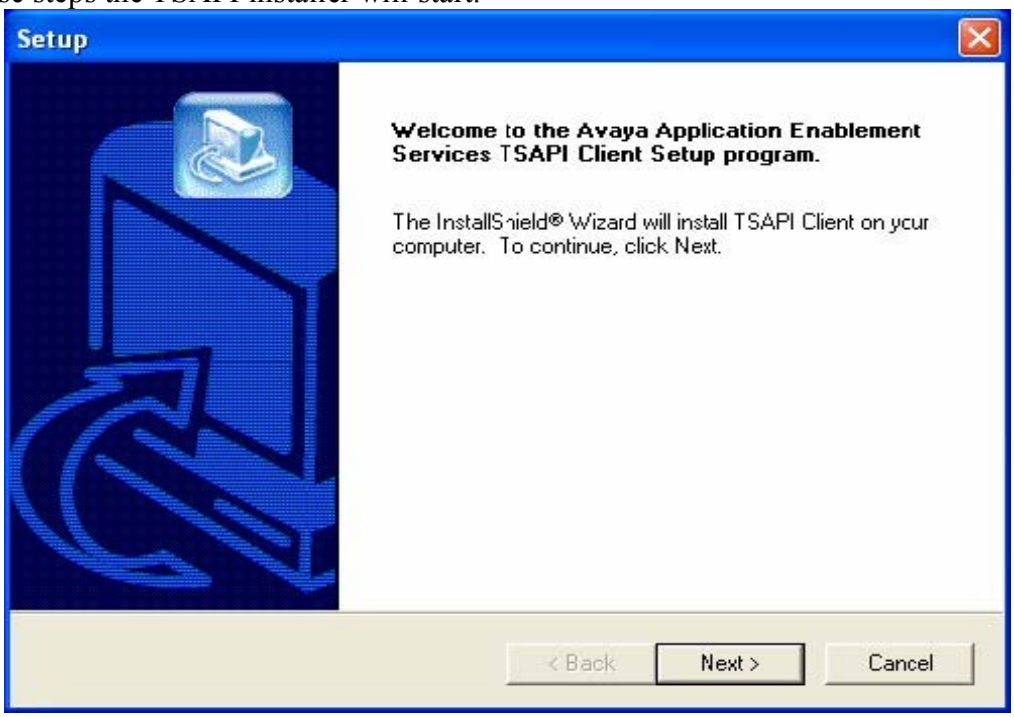
The Avaya Link Controller, Call Controller and the TSAPI Client must be installed on the CTI Server, as shown by the following steps. First, execute the 'setup.bat' file as shown in the default directory in the following screen. Make sure you run this batch file on the CTI server.



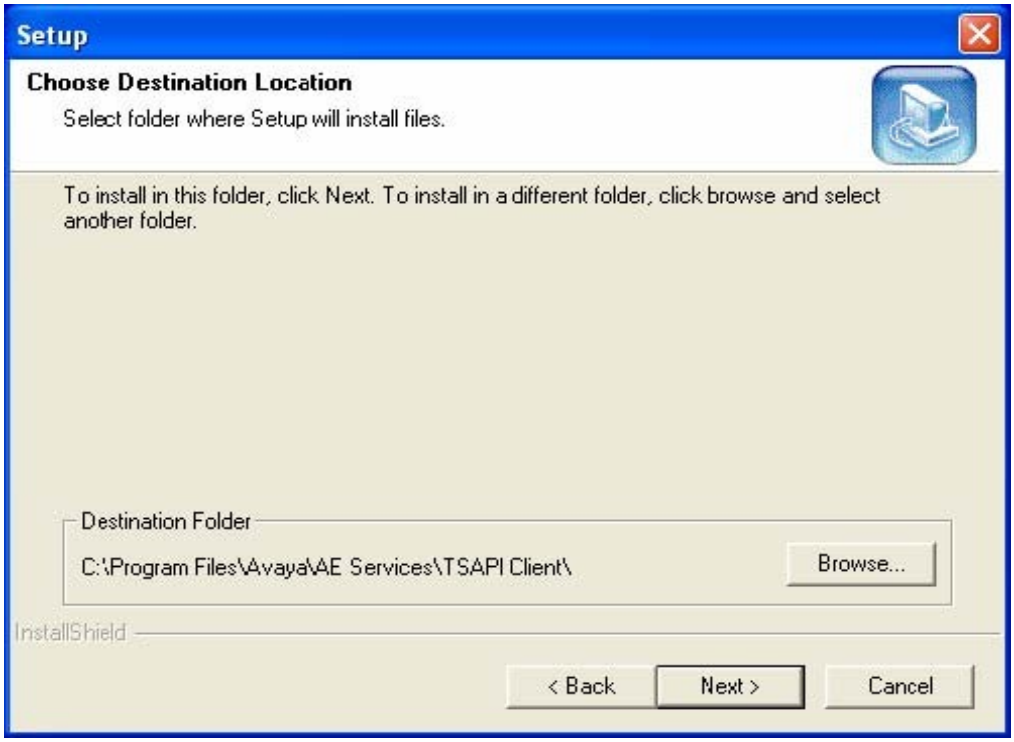
This will open a dialog box as follows. Press any key to automatically install the Avaya Link controller and the Call controller to the CTI server.



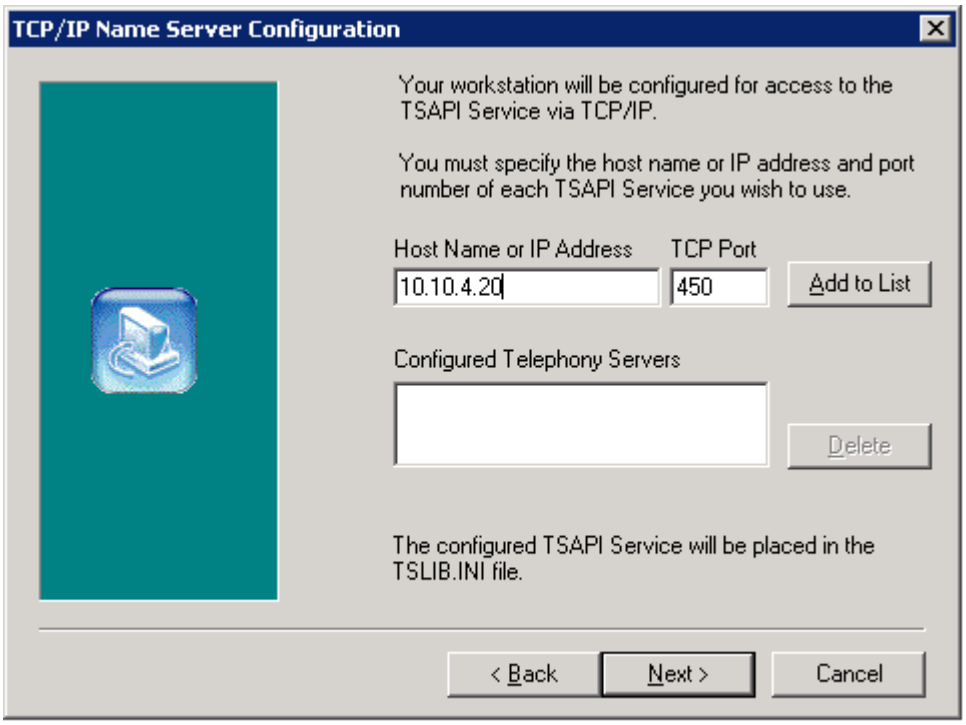
After these steps the TSAPI installer will start.



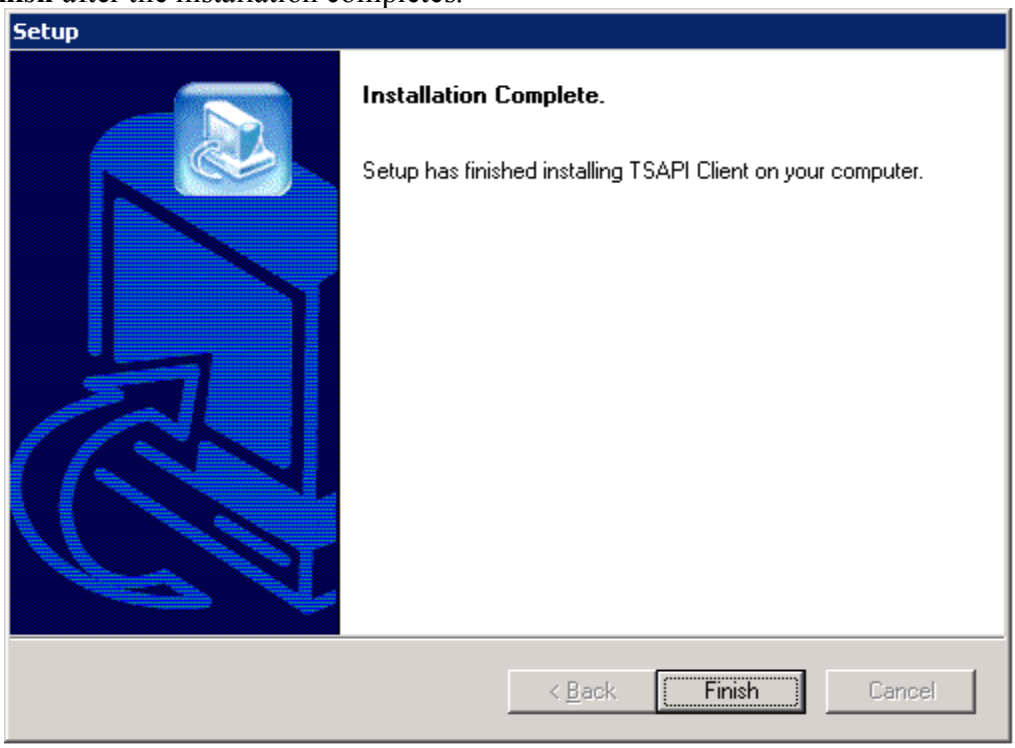
Retain the default installation folder and click **Next**.



Enter the IP address of the Avaya AES server in the **Host Name or IP Address** field, retaining the default port of **450**. Click **Add to List** and then **Next.**



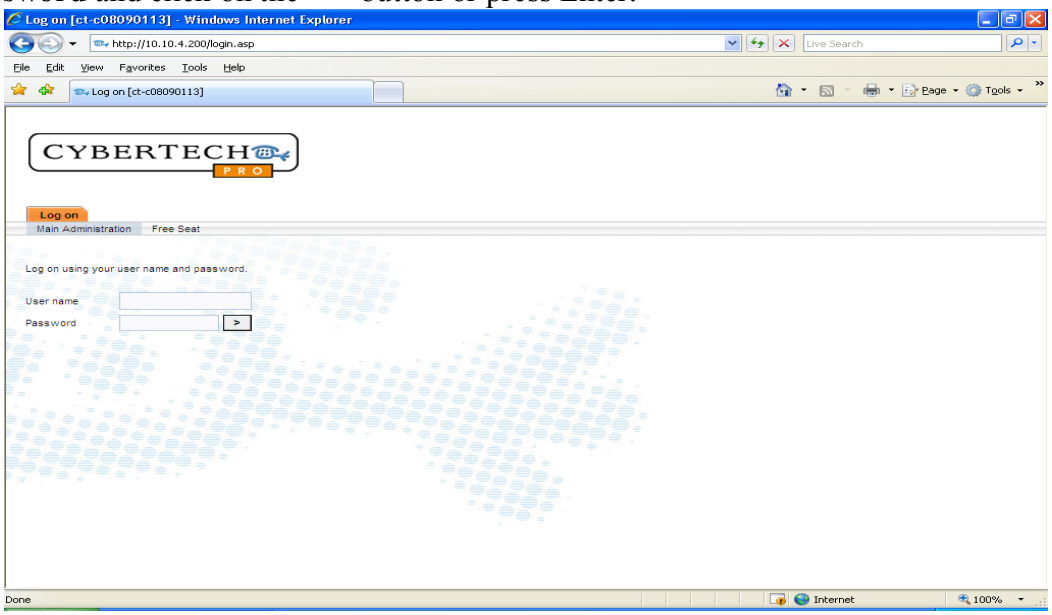
Click **Finish** after the installation completes.



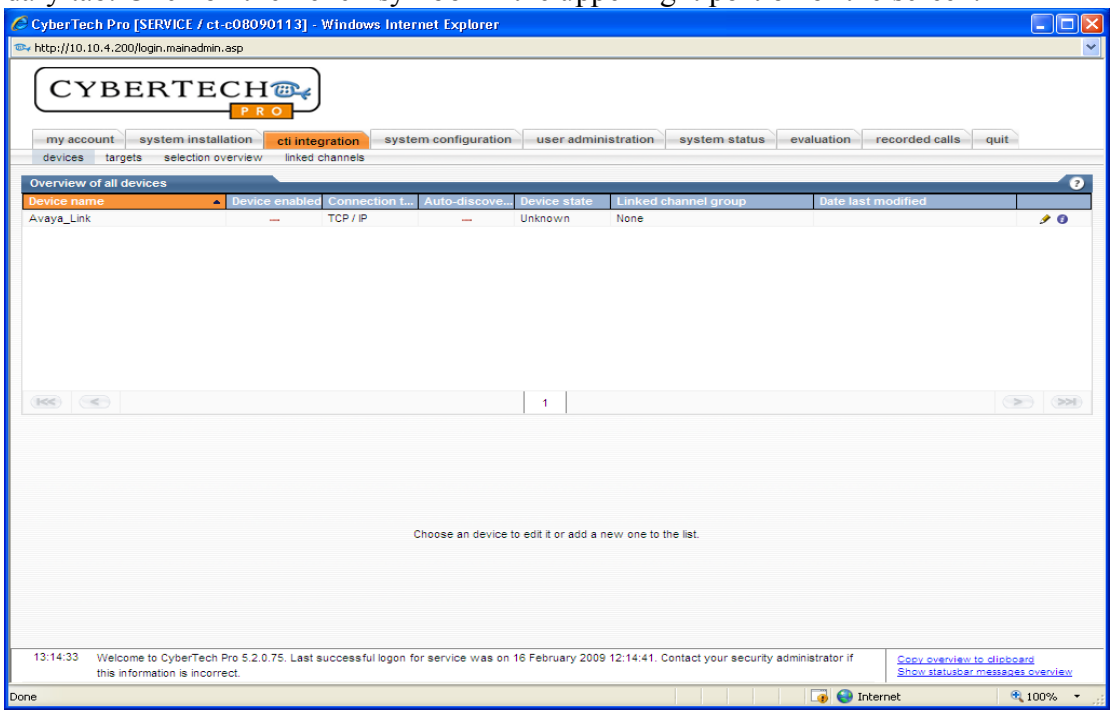
7.3. Configure the Cybertech Pro Voice Recorder

The Cybertech Pro Voice Recorder is configured for each of "Service Observe" and "Single Step Conference" modes in this section.

Enter the URL of the Cybertech Voice Recorder in the web browser and enter the **User name** and **Password** and click on the ">" button or press Enter.



Once logged in, select the **cti integration** tab which initially displays the **devices** on the secondary tab. Click on the Pencil symbol in the upper right portion of the screen.



In the next screen **General device parameters** form below ensure that the **Device Parameters** values in **Table 5** are entered. Then select **Device Enabled** as **Yes**. The **TSAPIServerName** value depends on whether the TSAPI link is set to Encrypted, Unencrypted or Both. Refer to **Section 6.3.**

Parameter	Value
SwitchName	CMCyber
ObserveCode	#3
TSAPIServerName	AVAYA#CMCYBER#CSTA#PRESAES ***or*** AVAYA#CMCYBER#CSTA-S#PRESAES
ConnectionUseSSL	Yes
ConnectionProtocol	4.2

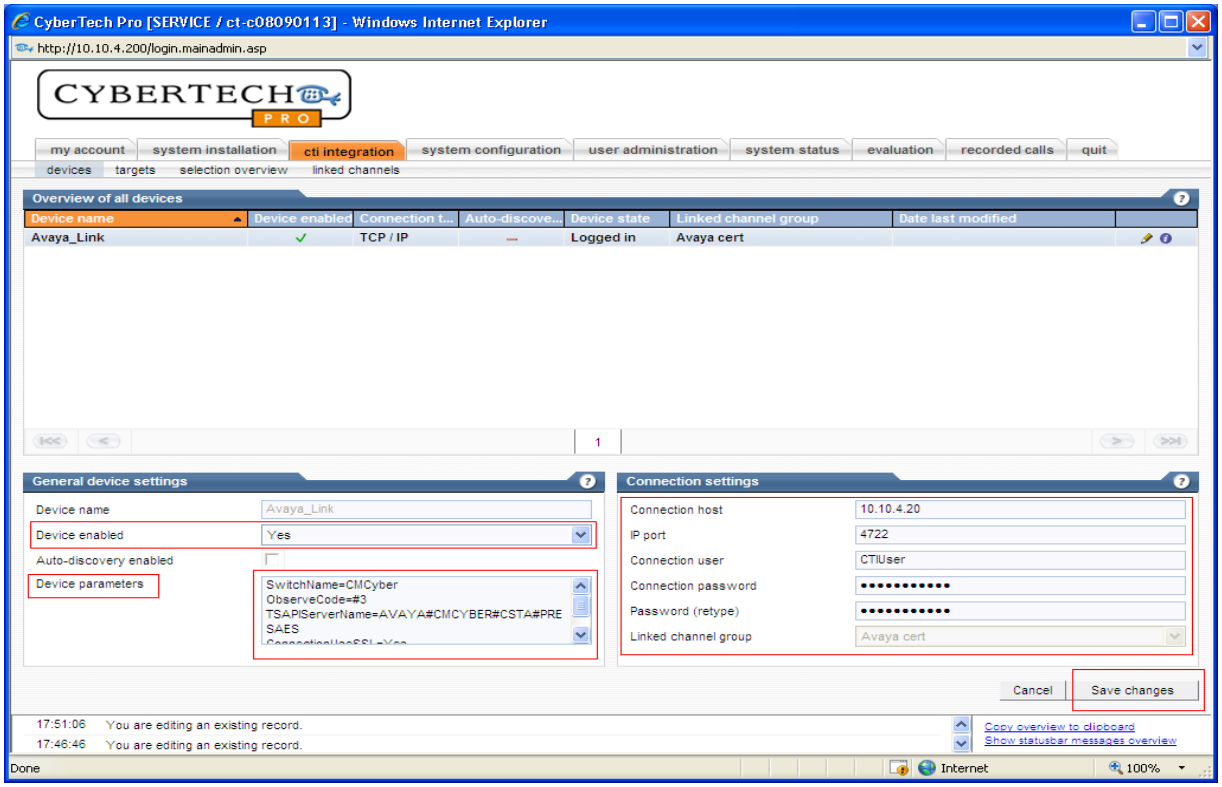
Table 5: Cybertech Device Parameter Settings

Under the **Connections settings** parameters in the same form, configure the **Connection settings** as shown in the **Table 6** below.

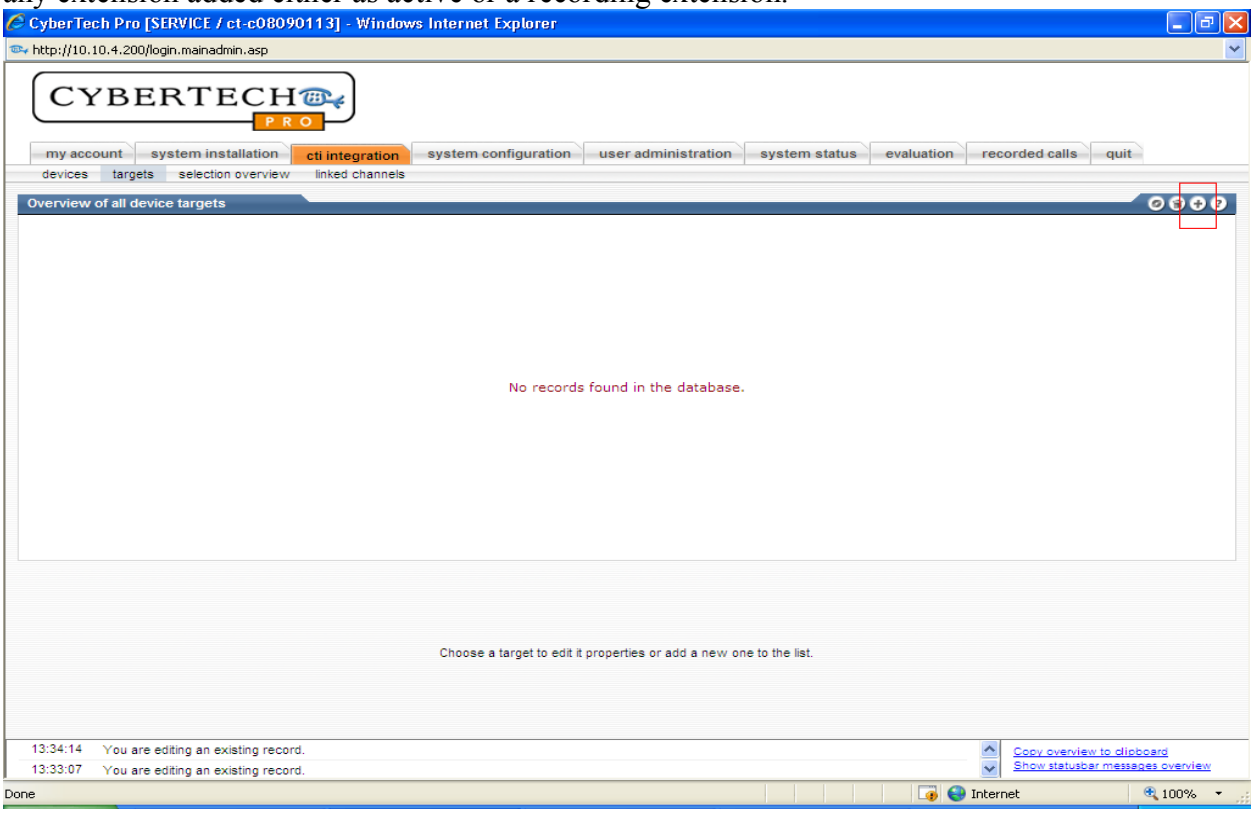
Parameter	Usage
Connection host	Enter the IP address of the Avaya AES Server.
IP port	Enter the default port address of "4722".
Connection user	Enter the user name which was defined in **Section 6.4**.
Connection password	Enter the "User Password" which was defined in **Section 6.4**.

Table 6: Cybertech Pro Connection Settings

Click **Save changes** once the values have been added.



Select the **targets** secondary tab and click the "+" symbol for each target to be added. A target is any extension added either as active or a recording extension.

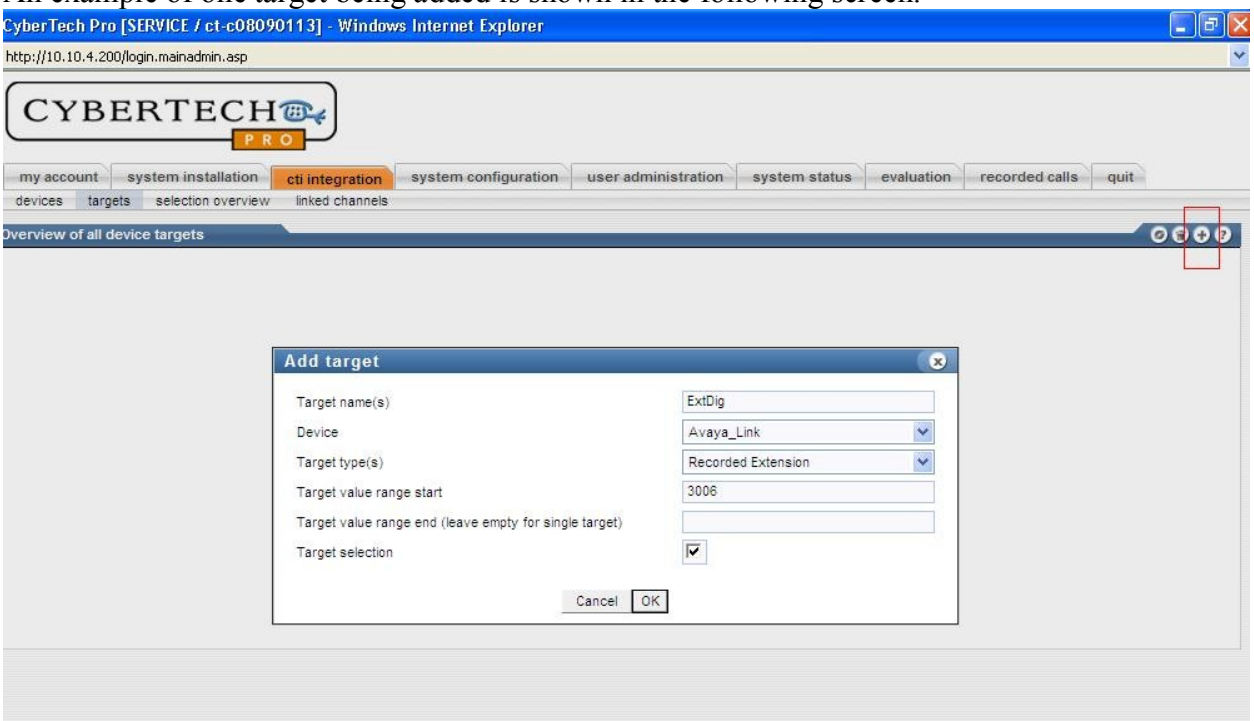


The **Device info** control appears each time the "+" control is clicked. Enter information for each of the targets to be monitored, as shown in the following table.

Name	Device	Type	Range Start
3012	AvayaLink	Active Extension	3012
3013	AvayaLink	Active Extension	3013
3006	AvayaLink	Active Extension	3006
AgentB	AvayaLink	Extension	6001
AgentC	AvayaLink	Extension	6002
VDN	AvayaLink	Extension	1800
Huntgroup	AvayaLink	Extension	3090
Target_B	AvayaLink	Recorded Extension	3006
Target_C	AvayaLink	Recorded Extension	3000

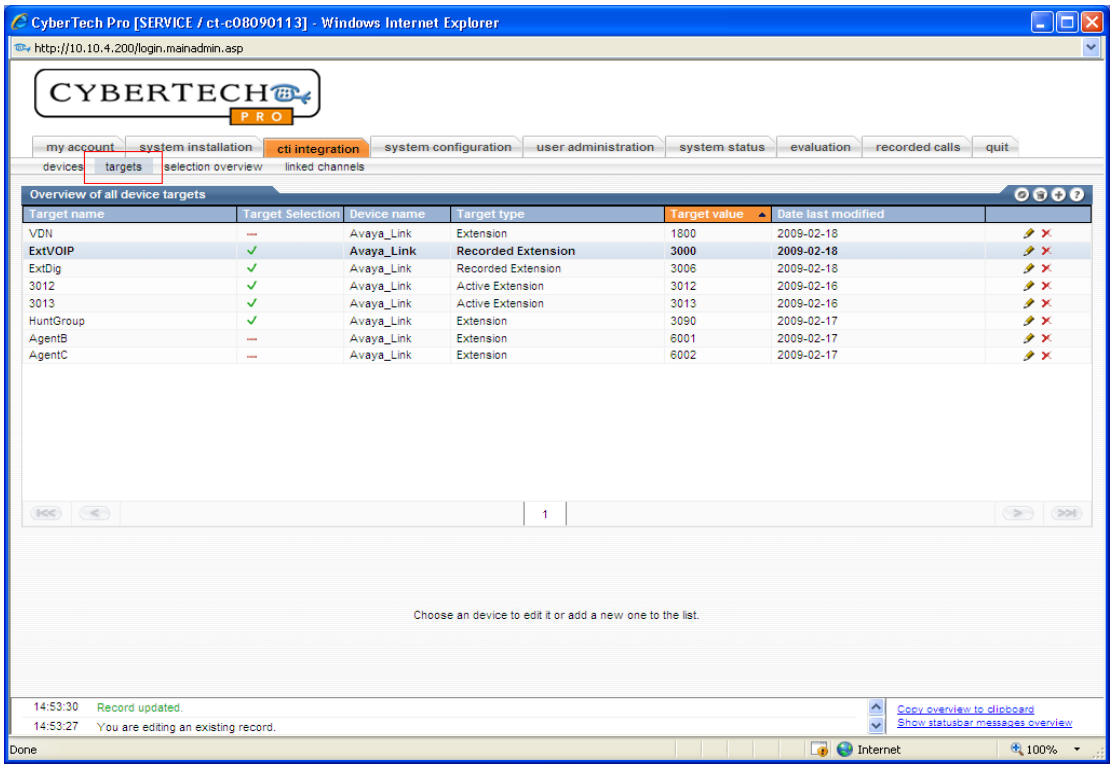
Table 7: Cybertech Pro Target Device Info Parameters

An example of one target being added is shown in the following screen.

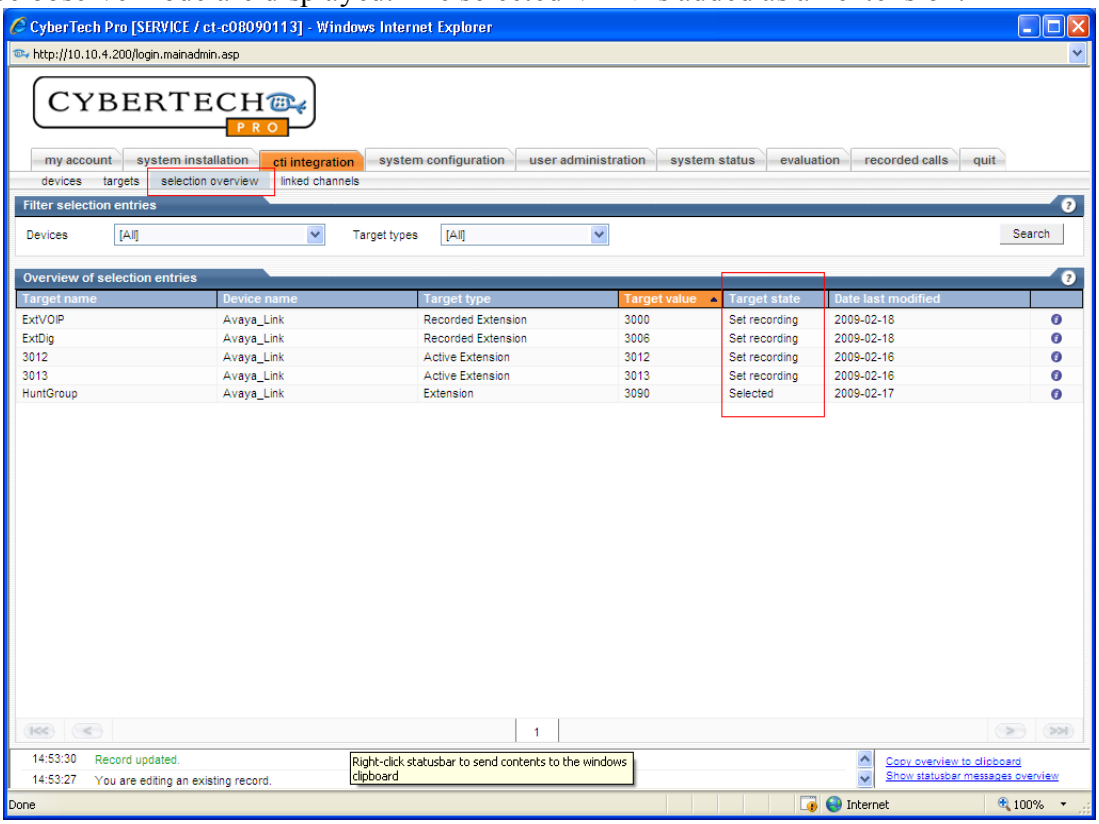


Service Observe mode

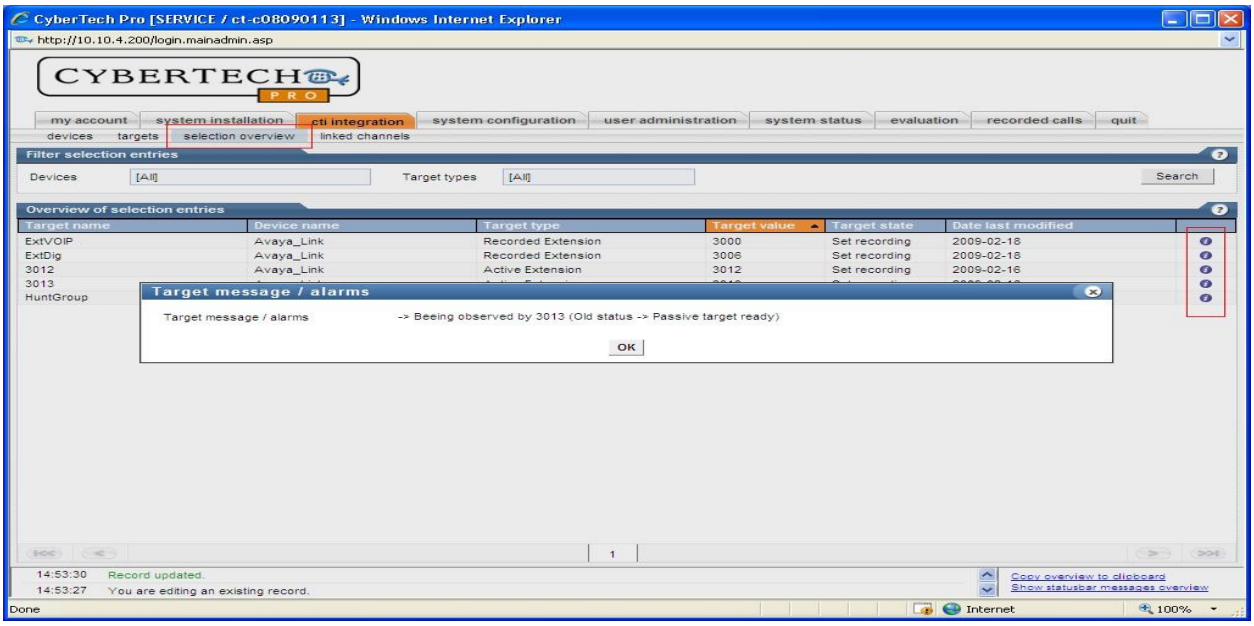
After the targets have been entered, it should contain the following information in Service Observe mode.



In the selection overview screen below the selected extensions which will be monitored in Service observe mode are displayed. The selected VDN is added as an extension.

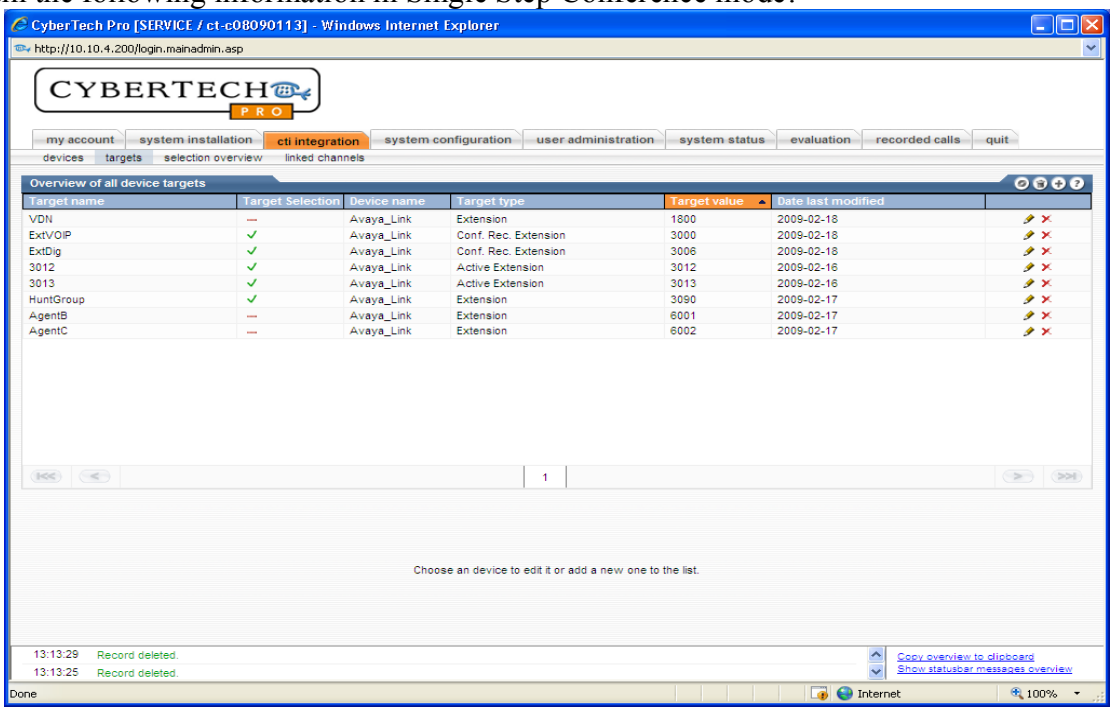


Additional information about each of the targets is available via the **I** button. For example, this mechanism can be used to determine that endpoint C is being observed via virtual extension 3013.

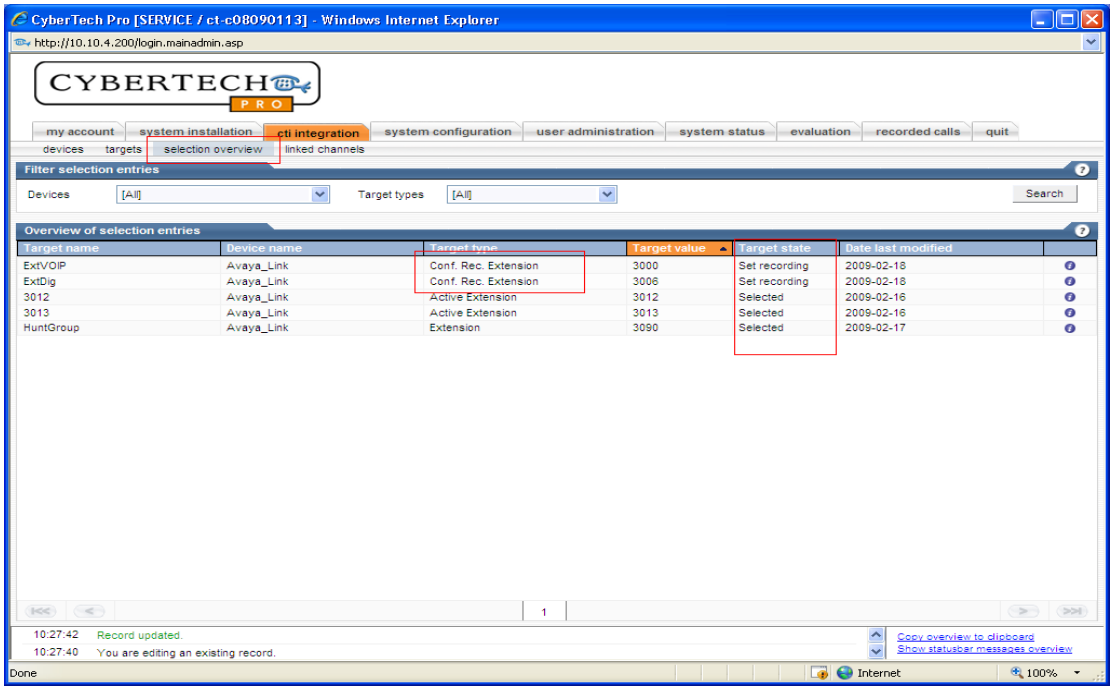


Single Step Conference mode

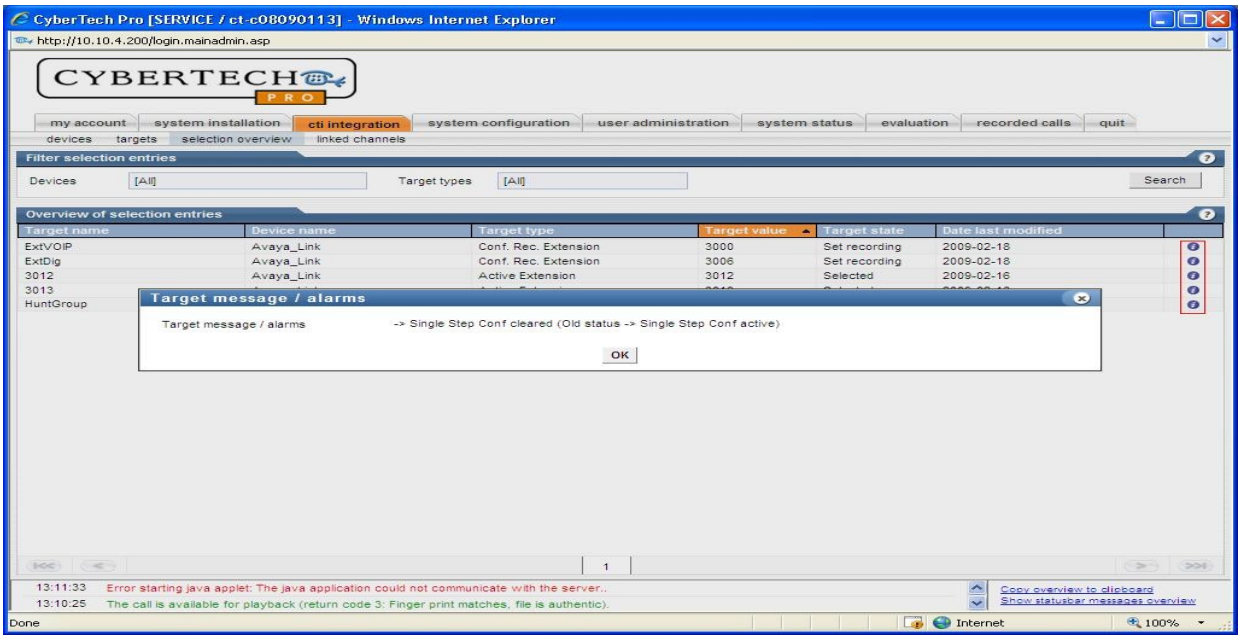
The Cybertech Pro Recorder is configured for Single Step Conferencing for compliance testing. Targets are added as in Service Observe mode. After the targets have been entered, it should contain the following information in Single Step Conference mode.



In the **selection overview** tab on the screen below, the selected extensions are displayed which will be monitored in Single Step Conference mode. The selected Hunt group is added as an extension.



Additional information about each of the targets is available via the **I** button. For example, this mechanism can be used to determine that endpoint C is being observed in Single Step Conference mode.



8. General Test Approach and Test Results

The test approach used placed calls using digital, VOIP and analogue phones. The tests were to verify the calls were being placed correctly and accurate audio recordings were being generated and collected by the Cybertech solution. Testing was performed manually. The tests were all functional in nature and performance testing was not included.

All of the test cases were executed and overall the solution was successful. One area of failure was a missing CLI on three calls.

The following results were obtained

- Confirmation of the ability of Cybertech Pro to correctly create voice recording files of various telephony operations
- Confirmation that the correct number of voice recording files is created for each operation performed
- Confirmation the voice content of each of the files is correct
- Confirmation the calling and called party for each of the files is correct
- Confirmation the start and stop times of each of the files is correct

The following was observed during testing:
A test had been included for bridged call appearance for Service Observe though the AES does not support this feature for Service Observe.

The test plan details the results and contains a complete summary report.

9. Verification Steps

9.1. Verify Avaya Communication Manager Status

The following steps can ensure that the communication between Avaya Communication Manager and the Avaya Application Enablement Services server is functioning correctly.

Verify that the service state of the TSAPI link is established. Check the TSAPI link status with AES by using the command below. The CTI Link is 10.

```
status aesvcs cti-link

                          AE SERVICES CTI LINK STATUS

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

10    4        no    PresAES          established   12       13
```

Verify that the status of AES interface is connected and listening.

```
status aesvcs interface

                          AE SERVICES INTERFACE STATUS

Local Node        Enabled?  Number of     Status
                            Connections

CLAN              yes       1             listening
```

Verify that the there is a link with the AES and that messages are being sent and received.

```
status aesvcs link

                            AE SERVICES LINK STATUS

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

02/01  PresAES          10. 10.  4. 20  51158   CLAN            25      25
```

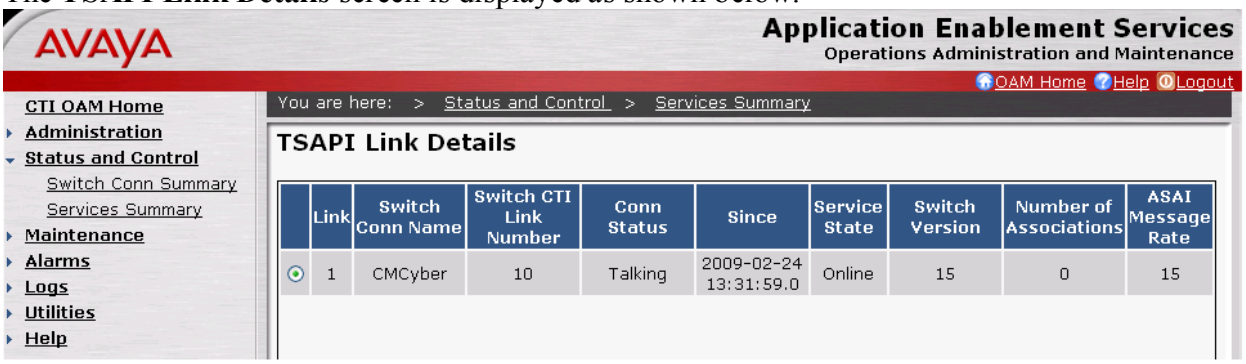
9.2. Verify Avaya AES Status

The following steps are carried out on the Application Enablement Services to ensure that the communication link between Avaya Communication Manager and the Avaya Application Enablement Services server is functioning correctly.

9.2.1. TSAPI Link

Verify the status of the TSAPI link by selecting **Status and Control → Services Summary**. Select **TSAPI Service** (not shown), followed by **Details**.

The **TSAPI Link Details** screen is displayed as shown below.

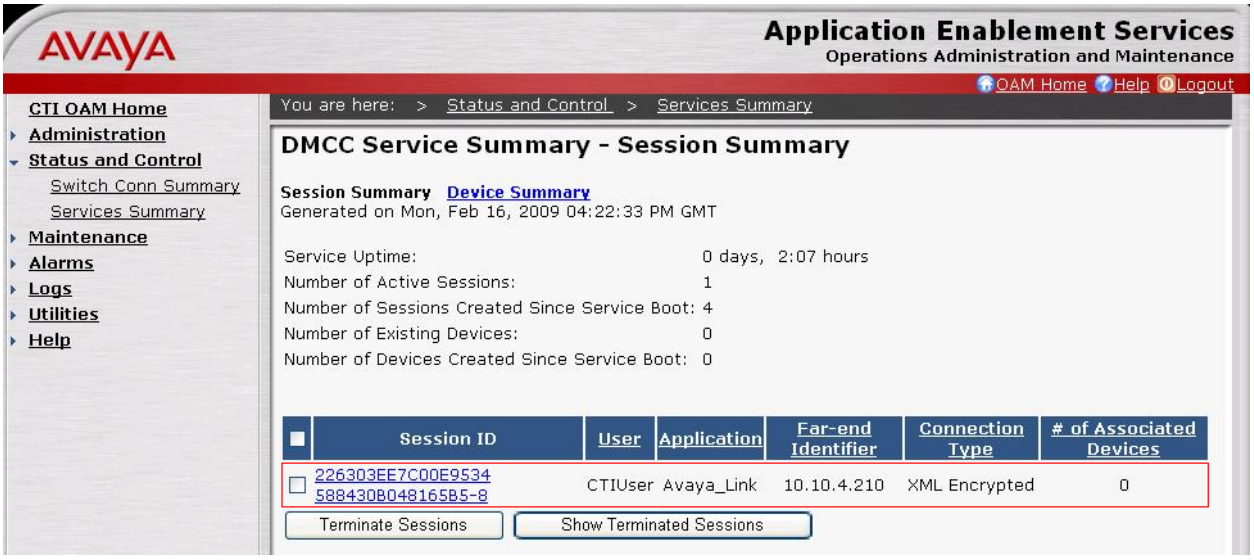


	Link	Switch Conn Name	Switch CTI Link Number	Conn Status	Since	Service State	Switch Version	Number of Associations	ASAI Message Rate
⊙	1	CMCyber	10	Talking	2009-02-24 13:31:59.0	Online	15	0	15

Verify the status of the TSAPI link by checking that the **Connection Status** is **Talking** and the **Service State** is **Online**.

9.2.2. DMCC Service

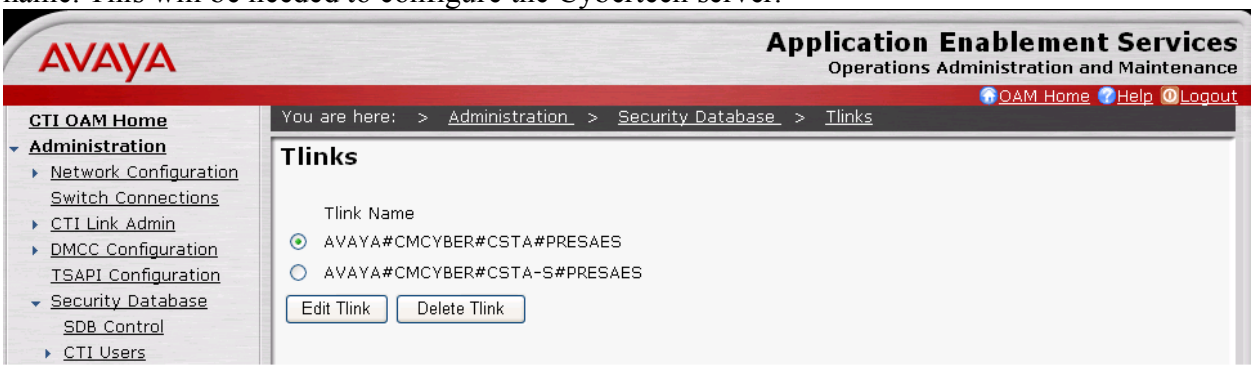
Verify the status of the DMCC service by selecting **Status and Control → Services Summary.** Select **DMCC Service** (not shown), followed by **Details**. **The DMCC Services Summary** screen is displayed as shown below. It shows a connection to the Cybertech CTI Server, IP address '10.10.4.210'.



Session ID	User	Application	Far-end Identifier	Connection Type	# of Associated Devices
226303EE7C00E9534 588430B048165B5-8	CTIUser	Avaya_Link	10.10.4.210	XML Encrypted	0

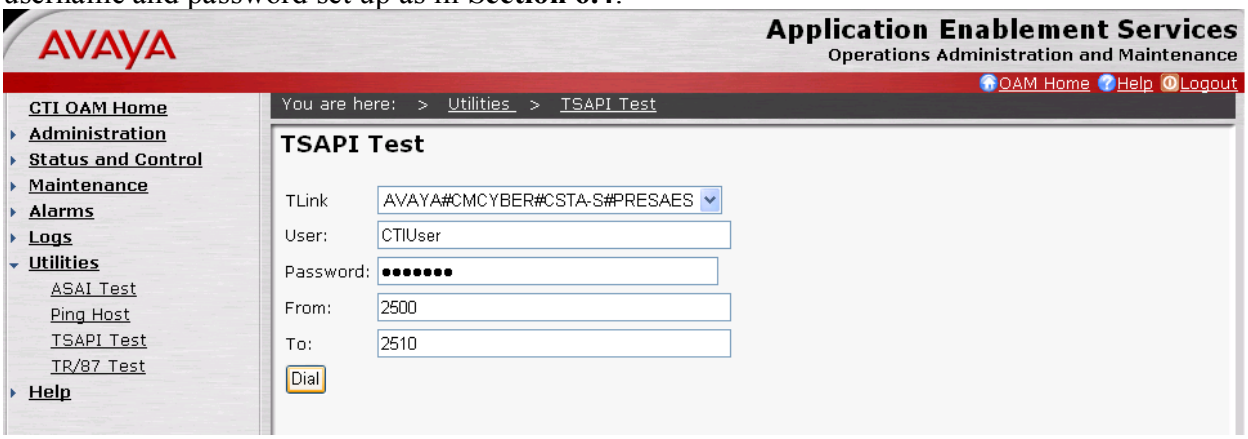
9.2.3. TLinks

Navigate to **Administration → Security Database → TLinks**. Verify the value of the Tlinks name. This will be needed to configure the Cybertech server.



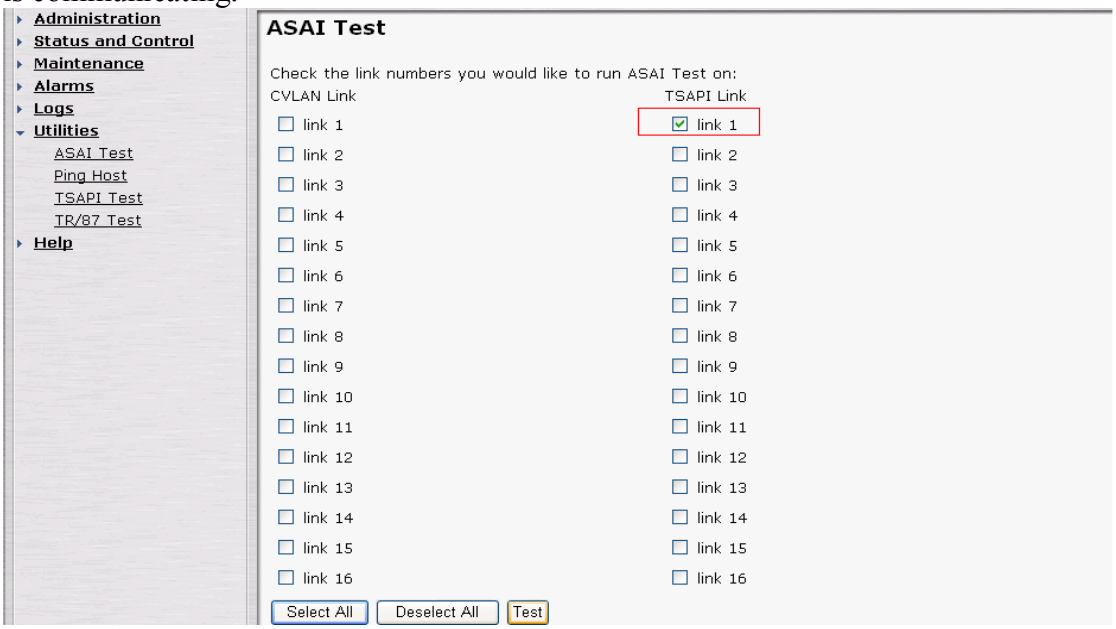
9.2.4. TSAPI Test

Make a call between two stations on Avaya Communication Manager using the TSAPI Link. Navigate to the screen as follows **CTI OAM Home → Utilities → TSAPI Test.** Use the username and password set up as in **Section 6.4**.

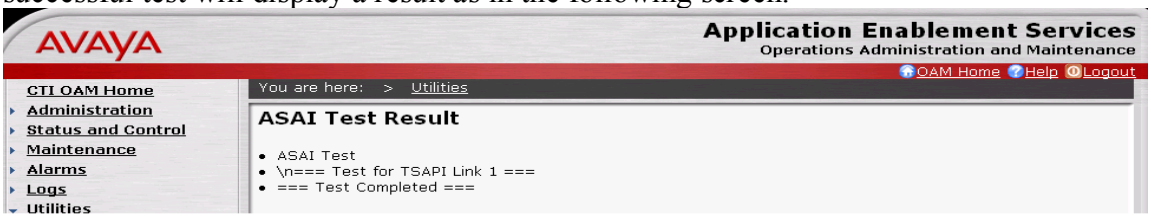


9.2.5. ASAI Test

Additional tests can be carried out by the using the ASAI Test. Open this screen under **CTI OAM Home → Utilities → ASAI Test**. This verifies that the TSAPI Link set up in **Section 6.3** is communicating.



Run the ASAI Test and check the TSAPI link number on which you would like to run the test. A successful test will display a result as in the following screen.



9.3. Verify Cybertech Configuration

The following steps can be performed to verify the basic operation of the system components:

- Make calls local and external to and from monitored stations to verify that the correct call records are produced
- Perform hold, transfer, blind transfer, and conferencing operations to verify that correct call records are produced
- Make calls to and from bridged appearances to verify that correct call records are produced
- Make calls from external telephones to a VDN to verify that correct call records are produced
- Make calls to agents and verify that correct call records are produced

10. Conclusion

These Application Notes describe the conformance testing of the Cybertech Pro with Avaya Communication Manager and Avaya Application Enablement Services. All functionality and serviceability test cases were completed successfully by the Cybertech Pro solution.

11. Additional References

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

Product documentation for Avaya products may be found at http://support.avaya.com

1. ***Administrator Guide for Avaya Communication Manager****, Document No 03-300509, Issue 4, January 2008*
2. ***Change Description for Release 5.1 of Avaya Communication Manager, SIP Enablement Services, Avaya Servers, and Media Gateways,*** *Document No 03-602958, Issue 1, June 2008*
3. ***Avaya MultiVantage® Application Enablement Services Administration and Maintenance Guide - Release 4.2, Document No 02-30****0357, Issue 10, May 2008*
4. ***Developing Client-side IP Recording Applications using Avaya Application Enablement Services****, An Avaya DevConnect Application Note, October 2008*

The following documentation is available on request from Cybertech http://www.cybertech-int.com

1. ***Cybertech CT Recording Solutions R5 – Installation Manual v5.3***
2. ***Cybertech Parrot DSC - VOIP installation manual***
3. ***Cybertech CT Recording Solutions R5 - CTI manual***
4. ***Cybertech AVAYA DMCC connectivity manual***

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.