Avaya Solution & Interoperability Test Lab

Application Notes for Pridis ESPA Application Server with Avaya Communication Manager – Issue 1.0

Abstract

These are the Application Notes for the conformance testing the Pridis ESPA Application Server with Avaya Communication Manager. ESPA controls wireless paging devices to provide call-me, meet-me, and join-me telephone services for mobile workers. These Application Notes contain a description of the ESPA product, and how it can be configured to interoperate with Communication Manager. The testing focused on the major functions of the ESPA product.

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

1. Introduction

The Pridis ESPA Application Server enables mobile workers in a campus setting to stay in touch using the wireless paging facilities. ESPA provides call-me, meet-me, and join-me features that provide telecommunication mobility in an environment. The following examples illustrate how ESPA can be used in a hospital environment.

The ESPA call-me feature allows doctors in a hospital to be contacted while they are on their rounds. A person who wishes to speak to the doctor dials the call-me extension and enters the doctor's pager number into the phone's keypad. A message is then sent to the doctor's pager with the phone number of the originator of the message, allowing the doctor to return the call.

The meet-me feature allows a person who wishes to speak immediately to a doctor to call the meet-me extension. The caller is prompted to enter the pager number of the doctor to be contacted via the keypad. The caller's phone displays the message "Please wait…", and the text "meet-me" is sent to the doctor's pager. Upon receiving the meet-me pager message, the doctor dials the join-me extension and is prompted to enter his own pager number on the telephone keypad. After entering his pager number, the doctor is connected to the waiting caller.

1.1. System Configuration

The ESPA Application Server in the diagram below uses the TSAPI interface provided by Avaya Application Enablement Services to direct Avaya Communication Manager to perform telephone-switching operations. ESPA also has an interface to the Ascom teleCOURIER paging subsystem, which in turn communicates with wireless handheld pagers. The operation of ESPA is dependent on the presence of the attached paging subsystem.

The Acom teleCOURIER paging subsystem consists of the following items:

- Ascom teleCOURIER 900 Central Control Unit servers as the interface between the ESPA Application Server and the remainder of the paging subsystem.
- Ascom H950T Radio Transmitter sends radio messages to pagers when instructed to do so by the Ascom teleCOURIER 900 Central Control Unit. It is unable to receive information from pagers.
- Ascom T967MC Pager Rack serves as a repository and charger for pagers, which are not in use. It is able to sense the identity of those pagers which it is storing/charging, and reports this information to the Ascom teleCOURIER 900 Central Control Unit.
- Ascom H912T-DAB1 Pager is a battery-operated portable messaging device, which has a LCD display and an audio alarm. It receives radio messages from the Ascom H950T Radio Transmitter. It is unable to transmit information.

The T967MC Pager Rack charges the pager's battery and reports the presence of a pager to the control unit. Thus, ESPA is able to warn a caller who attempts to page a pager that is in the charging rack.

Although Avaya 4600 Series IP telephones shown in the diagram below were used for testing, Avaya analog and digital telephones are also supported.

The Avaya Application Enablement Services (AES) system shown in the diagram is used by the ESPA server to monitor requests resulting from call/meet/join-me operations and to control call flow as required to perform these operations. The AES system is used to monitor the vectors, which perform the various ESPA paging operations, as well as stations involved in calls, which participate in meet-me/join-me operations. The nature of these AES interactions can be seen in the message sequence diagrams in sections 1.2 and 1.3.

The Avaya G650 Media Gateway shown in the diagram contains a VAL board, which is used to send audio instructions to initiators of call/meet/join-me operations describing steps, which are to be performed to complete these operations.

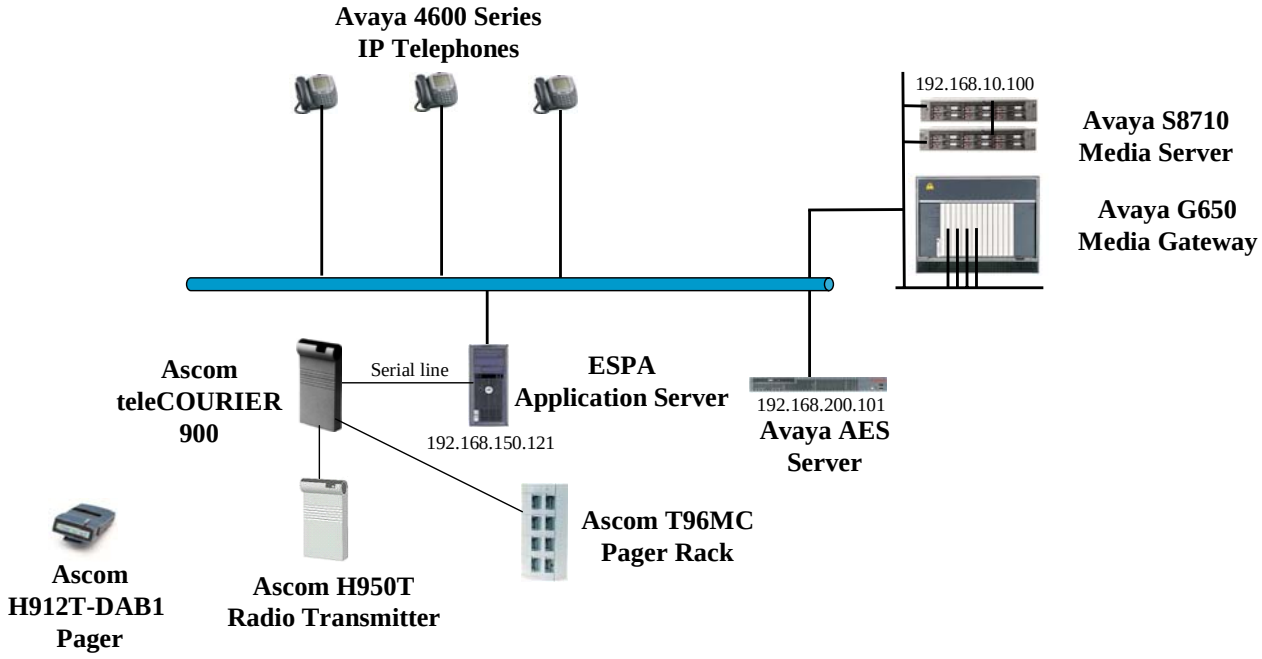


Figure 1: ESPA Test Configuration

1.2. call-me Operation

The call-me operation allows any telephone user to request the owner of a pager to initiate telephone contact. The following diagram illustrates the interaction of the various system components, which are required to perform a call-me operation:

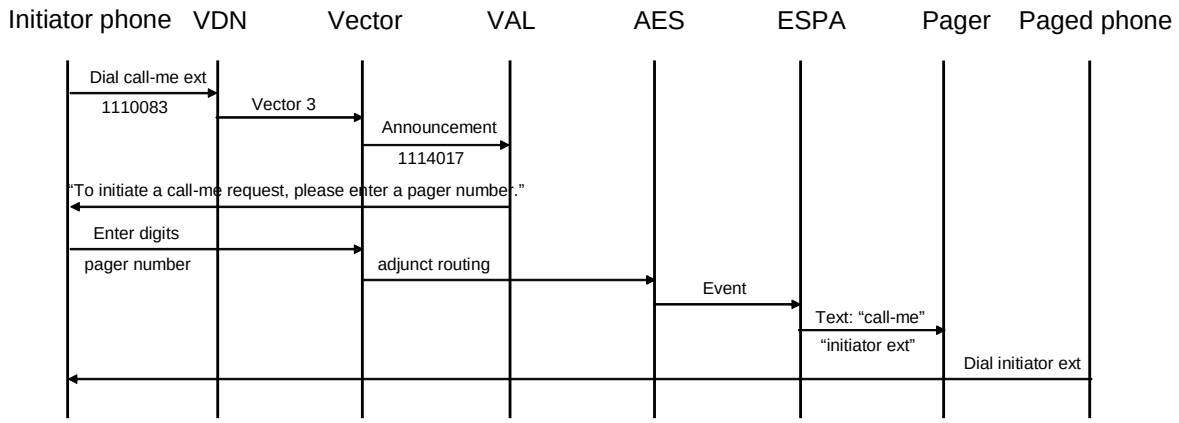


Figure 2: Call-me Interaction Diagram

To initiate a call-me operation,

- the initiator dials the Vector Directory Number (VDN) assigned to this function, as described in Section 3.1.6.
- This activates vector 3, which is described in section 3.1.7.
- The vector plays announcement 1114017 via the VAL interface, as described in section 3.1.5, which instructs the caller to enter a pager number.
- The caller enters the number of the pager on the telephone keypad
- The vector passes the pager number to AES
- AES generates an event containing the pager number.
- The event in intercepted by ESPA
- ESPA sends the extension of the initiator of the call-me operation to the selected pager with the instruction "call-me".
- The pager owner calls the initiator of the call-me operation from any telephone.

1.3. meet/join-me Operation

The meet-me/join-me operations allow any telephone user to request the owner of a pager to join a telephone call made by the initiator. The following diagram illustrates the interaction of the various system components, which are required to perform these operations:

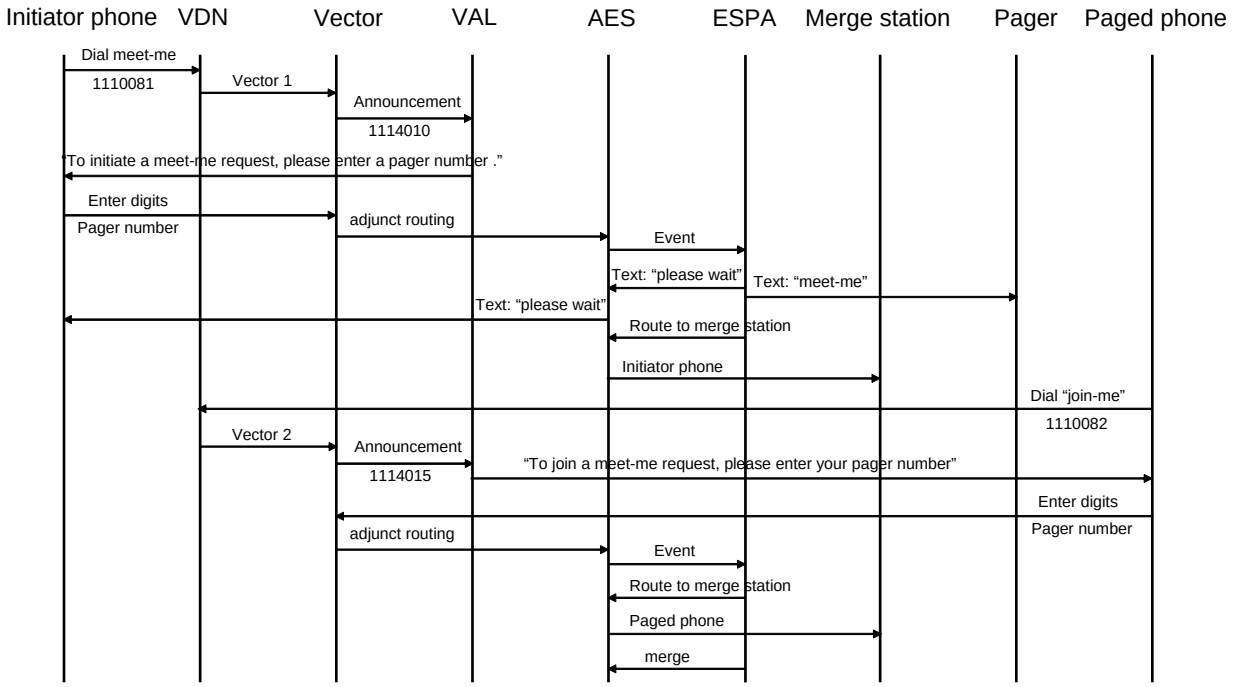


Figure 3: Meet/join-me Interaction Diagram

To initiate a meet/join-me operation,

- the initiator dials the Vector Directory Number (VDN) assigned to this function, as described in Section 3.1.6.
- This activates vector 1, which is described in section 3.1.7.
- The vector plays announcement 1114010 via the VAL interface, as described in section 3.1.5, which instructs the caller to enter a pager number.
- The caller enters the number of the pager on the telephone keypad
- The vector passes the pager number to AES
- AES generates an event containing the pager number.
- The event in intercepted by ESPA
- ESPA sends the message "meet-me" to the pager selected by the initiator of this operation.
- ESPA instructs AES to send the message "please wait…" to display of the telephone used by the initiator of this operation.
- AES sends the message to the initiator
- ESPA sends a route request AES
- AES connects the call to an unused "merge" station (see section 3.1.4)
- The owner of the pager dials the extension assigned to the join-me VDN (see section 3.1.6) from an available telephone, which activates vector 2.

- The vector plays announcement 1114015 via the VAL interface, as described in section 3.1.5, which instructs the paged party to enter his or her pager number.
- The paged party enters his or her pager number via the telephone keypad.
- The vector passes the pager number to AES
- AES generates an event containing the pager number.
- The event in intercepted by ESPA
- ESPA instructs AES to connect the paged party to the initiator of the call-me operation.

2. Equipment and Software Validated

Hardware Component	Version
Avaya S8710 Media Server with Avaya G650 Media Gateway	Avaya Communication Manager Version R013x.01.0.628.6
Avaya TN2312BP IPSI interface	HW11/FW030
Avaya TN799DP C-LAN interface	HW01/FW017
Avaya TN2302AP IP Media Processor	HW20/FW110
Avaya TN2501AP VAL interface	HW03/FW008
Avaya C363T-PWR Stackable Switch	4.3.12
Avaya Application Enablement Servers	3.1
Avaya 4602SW IP	2.3
Avaya 4621SW IP	2.3
Pridis ESPA Application Server	1.5
Microsoft Windows XP (OS platform for ESPA Application Server)	SP2
Ascom Pager H912T-DAB1	N/A
Ascom teleCOURIER 900	N/A
Ascom H950T Radio Transmitter	N/A
Ascom T967MC Pager Rack	N/A

3. Configuration

This section describes the steps required to configure the Pridis ESPA Application Server and the components upon which it relies:

- Avaya Communication Manager
- Avaya Application Enablement Services
- ESPA Application Server

The configuration of the following components was performed by the Ascom, and is thus outside the scope of this document:

- Ascom Pager H912T-DAB1
- Ascom teleCOURIER 900
- Ascom H950T Radio Transmitter
- Ascom T967MC Pager Rack

3.1. Configure Avaya Communication Manager

The screen shots in this section were taken from the output of the Avaya SAT terminal configuration program which is used to configure Avaya Communication Manager.

3.1.1. Verify System-parameters customer-options

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

The value configured for "Maximum Concurrently Registered IP Stations" must be sufficient to support the total number of IP stations used.

The value configured for "Maximum TN2501 VAL Boards" must be configured such that a sufficient number of VAL boards can be used to accommodate the announcement traffic required by ESPA.

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

IP PORT CAPACITIES                                           USED
                     Maximum Administered H.323 Trunks: 10    0
          Maximum Concurrently Registered IP Stations: 50    10
            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: 0     0
                   Maximum Video Capable H.323 Stations: 0     0
                    Maximum Video Capable IP Softphones: 0     0
                        Maximum Administered SIP Trunks: 20    20

   Maximum Number of DS1 Boards with Echo Cancellation: 0     0
                             Maximum TN2501 VAL Boards: 1     1
                    Maximum G250/G350/G700 VAL Sources: 0     0
           Maximum TN2602 Boards with 80 VoIP Channels: 0     0
          Maximum TN2602 Boards with 320 VoIP Channels: 0     0
   Maximum Number of Expanded Meet-me Conference Ports: 0     0
```

The "Computer Telephony Adjunct Links" parameter must be set to "y" for ESPA to access AES.

```
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 Backup Cluster Automatic Takeover? n
 A/D Grp/Sys List Dialing Start at 01? n                        CAS Branch? n
Answer Supervision by Call Classifier? n                          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? n
          ASAI Link Core Capabilities? y                      DCS (Basic)? n
          ASAI Link Plus Capabilities? y                DCS Call Coverage? n
       Async. Transfer Mode (ATM) PNC? n                DCS with Rerouting? n
  Async. Transfer Mode (ATM) Trunking? n
             ATM WAN Spare Processor? n    Digital Loss Plan Modification? n
                               ATMS? n                          DS1 MSP? n
                  Attendant Vectoring? n            DS1 Echo Cancellation? y
```

The “IP Stations” parameter must be set to “y” so that IP stations can be attached.

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

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

           IP Attendant Consoles?
```

The “Vectoring (Basic)” and “Vectoring (Prompting)”parameters must be set to “y”.

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

                          Call Center Release: 3.0

                                 ACD? y                         Reason Codes? n
                       BCMS (Basic)? n                Service Level Maximizer? n
          BCMS/VuStats Service Level? n              Service Observing (Basic)? y
  BSR Local Treatment for IP & ISDN? n      Service Observing (Remote/By FAC)? n
                  Business Advocate? n                Service Observing (VDNs)? n
                    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? n               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
```

The “CTI Stations” parameter must be set to “y”.

```
display system-parameters customer-options                      Page   9 of  11
                           ASAI ENHANCED FEATURES

                                  CTI Stations? y
              Increased Adjunct Route Capacity? n
                               Phantom Calls? y




                         ASAI PROPRIETARY FEATURES

                                Agent States? n
```

The value configured for “IP_Phone” must be sufficient to support the total number of IP stations used.

The value configured for “IP_Agent” must be sufficient to support the total number of simultaneous users of ESPA services.

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

Product ID  Rel. Limit          Used
IP_API_A       : 0              0
IP_API_B       : 0              0
IP_API_C       : 0              0
IP_Agent       : 1              0
IP_IR_A        : 0              0
IP_Phone       : 12000          10
IP_ROMax       : 12000          0
IP_Soft        : 5              0
IP_eCons       : 0              0
```

3.1.2. Configure Interface to AES

The Avaya Application Enablement Services server TSAPI interface provides ESPA 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 **change node-names ip** command to define the address of the “clan” interface.

```
change node-names ip                                            Page   1 of   1
                                   IP NODE NAMES
    Name              IP Address          Name              IP Address
RDTT                192.168.150.1                            .   .   .
clan                192.168.10 .6                            .   .   .
default             0  .0  .0  .0                           .   .   .
ipsi                192.168.10 .5                            .   .   .
medpro              192.168.10 .7                            .   .   .
procr                  .   .   .                             .   .   .
```

Use the **change ip-services** command to set the parameters for **AESVCS** service as shown below for the C-LAN, which was defined above to serve as the interface to the AES server.

```
change ip-services                                          Page   1 of   3

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

An entry for the AES server must be made in the list shown below. The name assigned to the 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 was assigned to the switch connection, as shown in section 3.2 of this document. The CLAN address must also be entered via "Edit CLAN IPs" menu shown also shown in section 3.2 of this document.

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

   Server ID    AE Services       Password          Enabled    Status
                   Server
      1:      aes_server_1      xxxxxxxxxxxxxxx      y
      2:
      3:
      4:
      5:
      6:
      7:
      8:
      9:
     10:
     11:
     12:
     13:
     14:
     15:
     16:
```

Use the **add cti-link** command to add a CTI link for 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 for the "Switch CTI Link Number" in the "Add / Edit TSAPI Links" configuration screen shown in section 3.2 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.

```
add cti-link 4                                              Page   1 of   2
                                  CTI LINK
 CTI Link: 4
Extension: 1999996
     Type: ADJ-IP
                                                                   COR: 1
     Name: AES-devcon223-tsapi
```

Use the **add ip-interface** command to allocate a call control interface. The port value specified should be that of 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   1
                                 IP INTERFACES


                  Type: C-LAN
                  Slot: 01A02
           Code/Suffix: TN799  D
             Node Name: clan
            IP Address: 192.168.10 .6
           Subnet Mask: 255.255.255.0                          Link: 1
       Gateway Address: 192.168.10 .254
  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? n
                 Speed: 10Mbps
                Duplex: Half
```

Use the **add data-module** command to allocate an extension to be used as the data interface for the clan module. The value used as “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 1000000                                       Page   1 of   1
                               DATA MODULE

  Data Extension: 1000000         Name: clan
            Type: ethernet
            Port: 01A0217
            Link: 1




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

3.1.3. Add IP Stations

Telephone stations to be used as participants in various ESPA operational scenarios must be configured. Avaya 4600 Series IP Telephones are used here for this purpose, although no specific station type is required.

Use the **add station** command to add stations, choosing unused values for the "Extension" parameter. The "Type" should correspond to the actual station. The "Security Code" and "Name" values are optional.

```
add station 1000103                                          Page   1 of   3
                                    STATION

Extension: 1000103                        Lock Messages? n          BCC: 0
     Type: 4602+                          Security Code: 3010001     TN: 1
     Port: S00013                       Coverage Path 1:            COR: 1
     Name: ext 1000103                  Coverage Path 2:            COS: 1
                                        Hunt-to Station:

STATION OPTIONS
              Loss Group: 19            Personalized Ringing Pattern: 1
                                                   Message Lamp Ext: 1000103
           Speakerphone: 1-way                Mute Button Enabled? y
        Display Language: english
 Survivable GK Node Name:
          Survivable COR: internal                Media Complex Ext:
   Survivable Trunk Dest? y                            IP SoftPhone? N
```

Repeat this for extension 1000132.

3.1.4. Add Merge Stations

Merge stations are needed to park and merge the meet/join-me calls. These stations are virtual in nature and do not correspond to actual system hardware. These are used when an ESPA meet-me operation is initiated: the caller is connected to a "merge" station after a meet-me operation is initiated until the paged party performs a join-me operation to connect to the party which initiated the page.

There should a be sufficient number of merge stations such that there is one merge station for each of the anticipated maximum number of simultaneous meet/join-me calls. If the number of allocated merge stations is insufficient to handle the number of simultaneous meet/join-me requests, an audio error message is played to the initiator of a failed operation

Use the **add station** command to create CTI stations for extensions 1110130 to 1110134:

```
add station 1110130                                          Page   1 of   4
                                    STATION

Extension: 1110130                        Lock Messages? n          BCC: 0
     Type: CTI                            Security Code:             TN: 1
     Port: X                         Coverage Path 1:             COR: 1
     Name: cti 1110130               Coverage Path 2:             COS: 15
                                     Hunt-to Station:

STATION OPTIONS
              Loss Group: 1              Personalized Ringing Pattern: 1
             Data Module? n                        Message Lamp Ext: 1110130
          Display Module? n
                                                  Media Complex Ext:
```

3.1.5. Announcements

Announcements are used by ESPA to inform callers of the progress of operations which it performs as well as to signal errors that it encounters. To create an announcement, follow this procedure:

Use the **change cos** command to define one class of service (COS) to have console permission. The selection of a COS value is arbitrary, but should not conflict with existing COS usage.

```
change cos                                              Page   1 of   2
                            CLASS OF SERVICE

                            0  1  2  3  4  5  6  7  8  9 10 11 12 13 14 15
 Auto Callback              n  y  y  n  y  n  y  n  y  n  y  n  y  n  y  y
 Call Fwd-All Calls         n  y  n  y  y  n  n  y  y  n  n  y  y  n  n  y
 Data Privacy               n  y  n  n  n  y  y  y  y  n  n  n  n  y  y  y
 Priority Calling           n  y  n  n  n  n  n  n  n  y  y  y  y  y  y  y
 Console Permissions        n  n  n  n  n  n  n  y  n  n  n  n  n  n  n  y
 Off-hook Alert             n  y  n  n  n  n  n  n  n  n  n  n  n  n  n  n
 Client Room                n  n  n  n  n  n  n  n  n  n  n  n  n  n  n  n
 Restrict Call Fwd-Off Net  y  y  y  y  y  y  y  y  y  y  y  y  y  y  y  y
 Call Forwarding Busy/DA    n  y  n  n  n  n  n  n  n  n  n  n  n  n  n  n
 Personal Station Access (PSA) n  n  n  n  n  n  n  n  n  n  n  n  n  n  n  n
 Extended Forwarding All    n  n  n  n  n  n  n  n  n  n  n  n  n  n  n  n
 Extended Forwarding B/DA   n  n  n  n  n  n  n  n  n  n  n  n  n  n  n  n
 Trk-to-Trk Transfer Override  n  n  n  n  n  n  n  n  n  n  n  n  n  n  n  n
 QSIG Call Offer Originations  n  n  n  n  n  n  n  n  n  n  n  n  n  n  n  n
 Contact Closure Activation n  n  n  n  n  n  n  n  n  n  n  n  n  n  n  n
```

Use the **change station** command to set the (COS) value for the station that will be used to record announcements to the value of the above-defined COS.

```
change station 1000132                                  Page   1 of   4
                                  STATION

Extension: 1000132                    Lock Messages? n          BCC: 0
     Type: 4621                       Security Code: 2310001     TN: 1
     Port: S00033                   Coverage Path 1:            COR: 1
     Name: ext 1000132              Coverage Path 2:            COS: 7
                                    Hunt-to Station:

STATION OPTIONS
              Loss Group: 19        Personalized Ringing Pattern: 1
                                              Message Lamp Ext: 1000132
            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? n




                                           Customizable Labels? y
```

Use the **change dialplan analysis** command to add a feature access code to the dial plan to be used to initiate the recording of announcements.

```
change dialplan analysis                                        Page   1 of  12
                           DIAL PLAN ANALYSIS TABLE
                                                          Percent Full:    1

      Dialed  Total  Call      Dialed  Total  Call      Dialed  Total  Call
      String  Length Type      String  Length Type      String  Length Type
        1       7    ext
        *7      3    fac
```

Use the **change feature-access-codes** command to add the facility announcement access code to list of feature-access-codes.

```
change feature-access-codes                                     Page   1 of   7
                              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: *71
                        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 Park Access Code: *12
                       Call Pickup Access Code: *13
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:
                   Contact Closure  Pulse Code:
```

Use the **change announcements** command to create announcement records on the physical medium, in this case the Avaya TN2501AP VAL interface. The “Ext” value used is the extension which is to be assigned to the announcement. This can be any otherwise unused extension. Assign the “Type” to “integrated”. Any text value can be assigned to “Name”, as it is only used for informational purposes. The VAL interface port should be assigned to “Group/Port”. The Repeat this for each of the announcements shown in the table below.

```
change announcements                                        Page   1 of  16
                          ANNOUNCEMENTS/AUDIO SOURCES

Ann.                                                                 Group/
No.  Ext.     Type       COR TN  Name                        Q QLen P Rt Port

1    1114010  integrated 1   1   "initiate meet-me"          n      n 64 01a09
2                        1   1                               n
3                        1   1                               n
4                        1   1                               n
5                        1   1                               n
6                        1   1                               n
7                        1   1                               n
8                        1   1                               n
9                        1   1                               n
10                       1   1                               n
11                       1   1                               n
12                       1   1                               n
13                       1   1                               n
14                       1   1                               n
15                       1   1                               n
16                       1   1                               n
```

Record the required announcements from the station which has the COS with console permission (Ext. 1000132) via the following procedure:

Dial the Announcement feature access code (*71), which was created above.
Dial the extension of the announcement to be created
Dial 1
Speak the announcement
Dial #

Repeat this procedure for each of the announcements in the following table.

Extension	Announcement
1114010	"To initiate a meet-me request, please enter a pager number."
1114011	"A meet-me call is already pending on this pager number."
1114012	"The pager you are calling is in a pager-rack, you are being diverted to the attendant."
1114013	"The pager number you are trying to call is unknown."
1114014	"There are some Technical Failures on the system, try again later."
1114015	"To join a meet-me request, please enter your pager number."
1114016	"The meet-me initiator has hung up the phone."
1114017	"To initiate a call-me request, please enter a pager number."
1114018	"The call message has been activated."
1114019	"The pager you are calling is in the pager-rack, you are being disconnected."
1114020	"The meet-me call has been sent, please hold."
1114050	"Something is wrong."

3.1.6. Vector Directory Numbers

Create Vector Directory Numbers (VDNs) to be used to access ESPA functions from stations controlled by Communication Manager. Some of these VDNs are referenced from the ESPA configuration file espaCT.conf described below in this document. Additional VDNs are required by ESAP for perform internal functions.

The following VDNs are used to initiate ESPA paging operations directly by callers:

VDN	Usage
1110081	Initiate a meet-me operation
1110082	Initiate a join-me operation
1110083	Initiate a call-me operation

Use the **add vdn** command, as shown below, to create a VDN for each of the entries in the table which follows this screen shot. The “Extension”, “Name”, and “Vector Number” parameters should be specified as show in the corresponding table entry.

```
add vdn 1110080                                          Page   1 of   3
                          VECTOR DIRECTORY NUMBER

                           Extension: 1110080
                               Name*: Monitor
                      Vector Number: 6

                Meet-me Conferencing? n
                  Allow VDN Override? n
                                COR: 1
                                TN*: 1
                            Measured: none


        VDN of Origin Annc. Extension*:
                            1st Skill*:
                            2nd Skill*:
                            3rd Skill*:



* Follows VDN Override Rules
```

VDNs should be created for each of the entries in the following table:

Extension	Name	Vector Number
1110080	Monitor	6
1110081	MeetMe	1
1110082	JoinMe	2
1110083	CallMe	3
1110084	CallFwd	4
1110085	Alarm	5
1110086	Pager in rack MeetMe	7
1110087	Disconnect	9
1110140	VDNToMergeStationBase	20
1110141	Merge station 2 VDN	21
1110142	Merge station 3 VDN	22
1110143	Merge station 4 VDN	23
1110144	Merge station 5 VDN	24

3.1.7. Vectors

Vectors provide the high-level framework for the logic which executes the individual the steps required to perform the ESPA paging operations, such as playing announcements, collecting the digits used to specify pager numbers, and contacting AES.

Use the **change vector** command to create the vectors which are required by ESPA, each of which is linked to one of the VDNs created in the previous step. These vectors each contain a list of steps which are preformed when the vector is activated. Some of these vectors are activated directly when an ESPA user dials one of the extensions assigned to an ESPA operation.

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

    Number: 1               Name: meet-me
                                        Meet-me Conf? n           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    0   secs hearing ringback
02 collect      3    digits after announcement 1114010  for none
03 route-to     number 1110080          with cov y if unconditionally
04 stop
05
06
07
08
09
10
11

                      Press 'Esc f 6' for Vector Editing
```

Repeat the above procedure for each of the vectors show in the following table:

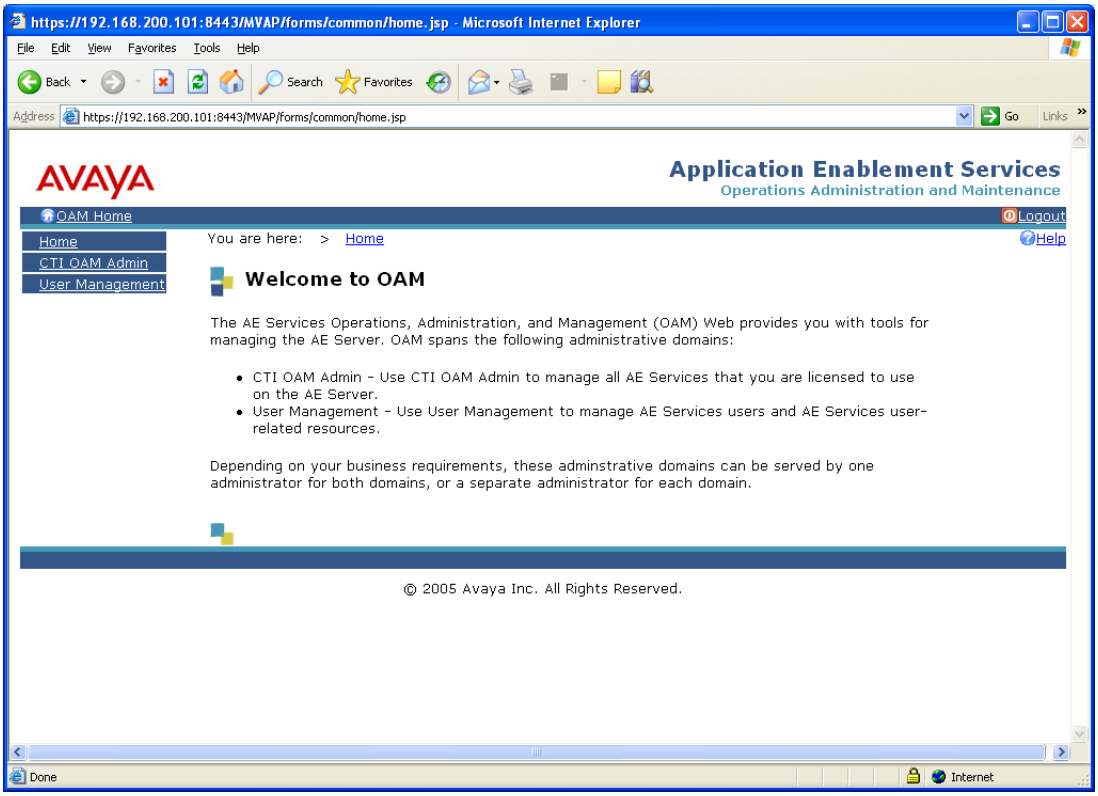
Vector	Name	Steps
1	meet-me	wait-time 0 secs hearing ringback collect 3 digits after announcement 1114010 for none route-to number 1110080 with cov y if unconditionally stop
2	join-me	wait-time 0 secs hearing ringback collect 3 digits after announcement 1114015 for none route-to number 1110080 with cov y if unconditionally stop
3	call-me	wait-time 0 secs hearing ringback collect 3 digits after announcement 1114017 for none route-to number 1110080 with cov y if unconditionally stop
4	Call-Fwd	route-to number 1110080 with cov y if unconditionally stop
5	Alarm	wait-time 0 secs hearing ringback collect 3 digits after announcement 1114023 for none route-to number 1110080 with cov y if unconditionally stop
6	Monitor	wait-time 0 secs hearing ringback adjunct routing link 4 wait-time 4 mins hearing ringback disconnect after announcement 1114050
7	In-rack	announcement 1114012 wait-time 5 secs hearing silence route-to number 11100120 with cov y if unconditionally stop
9	Disconnect	disconnect after announcement none
20	Merge Station 1	announcement 1114020 route-to number 1110130 with cov y if unconditionally stop
21	Merge Station 2	announcement 1114020 route-to number 1110131 with cov y if unconditionally stop
22	Merge Station 3	announcement 1114020 route-to number 1110132 with cov y if unconditionally stop
23	Merge Station 4	announcement 1114020 route-to number 1110133 with cov y if unconditionally stop
24	Merge Station 5	announcement 1114020 route-to number 1110134 with cov y if unconditionally stop

3.2. Configure Avaya Application Enablement Services

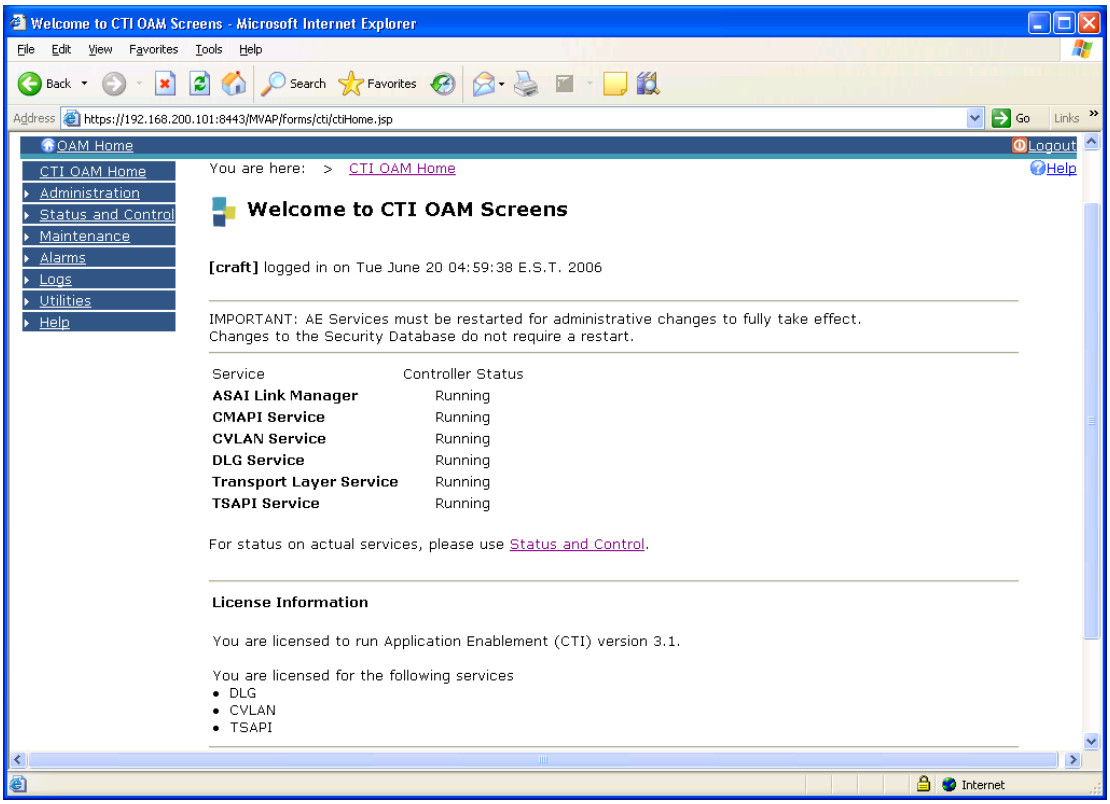
The AES server is configured via a web browser by accessing the following URL:

https://<AES server address>:8443/MVAP/

Once the login screen appears, enter either the OAM Admin login ID/password to perform administrative activities on the AE Server or the User Management ID/password to manage AE Services users and AE Services user-related resources. AE Server administrative activities have been partitioned into two administrative domains to enable each to be administered by separate administrators. To change from one of these domains to the other, first log out and then log in again with the user name/password which corresponds to the domain to be accessed (do not forget the "***s***" on "http***s***", or the login will not succeed).

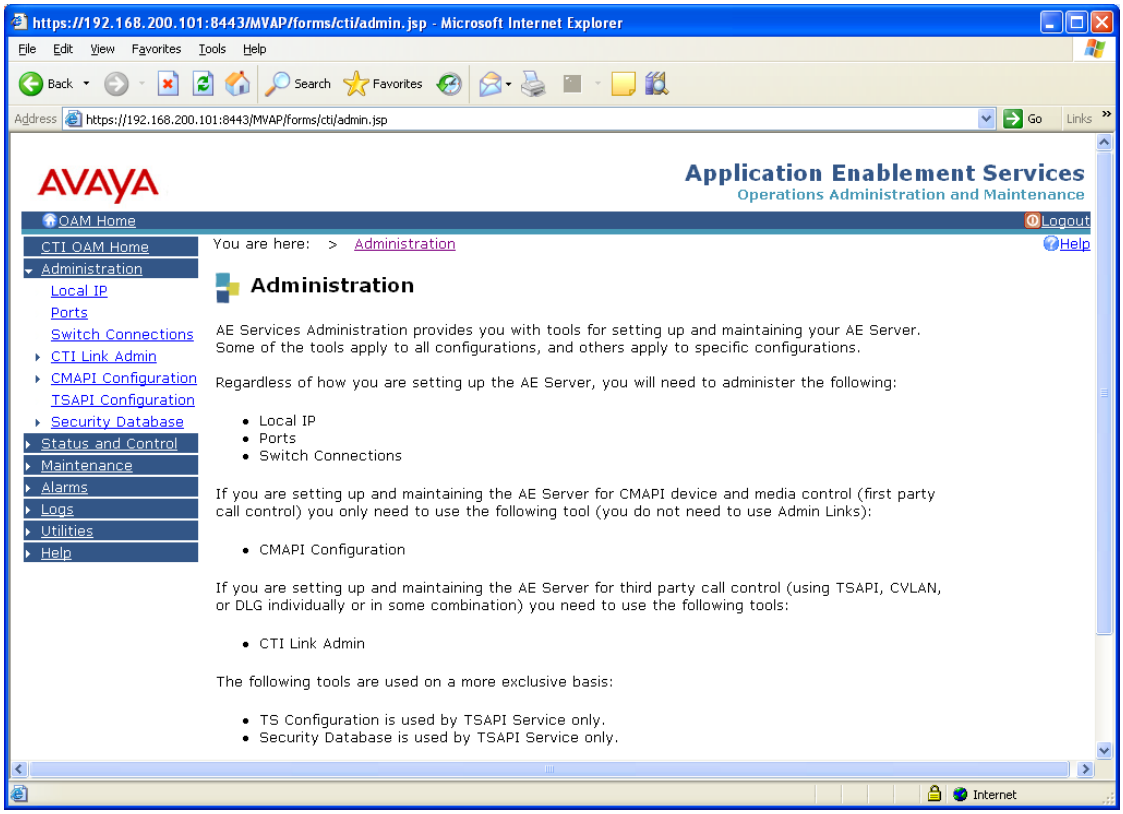


After logging in with the OAM Admin user ID/password, the “CTI OAM Admin” function can be selected, which causes the following screen to be presented:

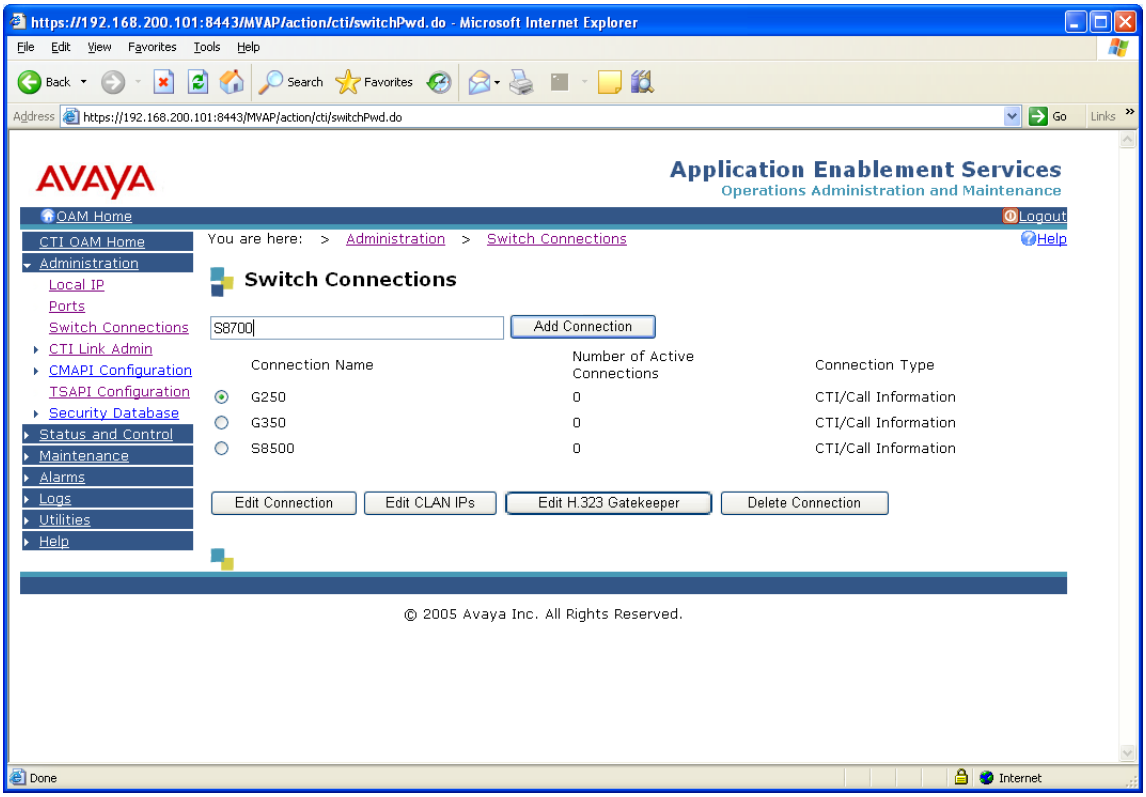


Verify that the AES server installation has a TSAPI service license. If this is not the case, please contact an Avaya representative regarding licensing conditions.

Selection of the “Administration” menu item causes the following screen to be presented:

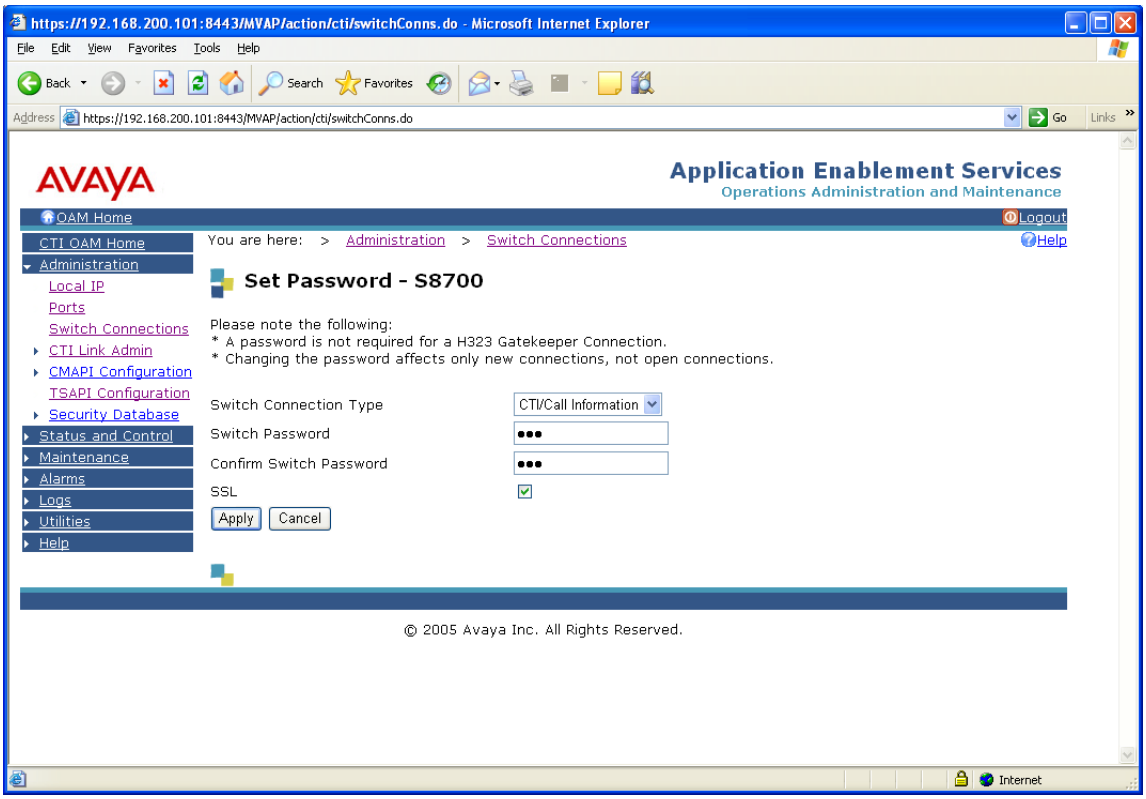


Selection of the “Switch Connections” menu item causes the following screen to be presented:



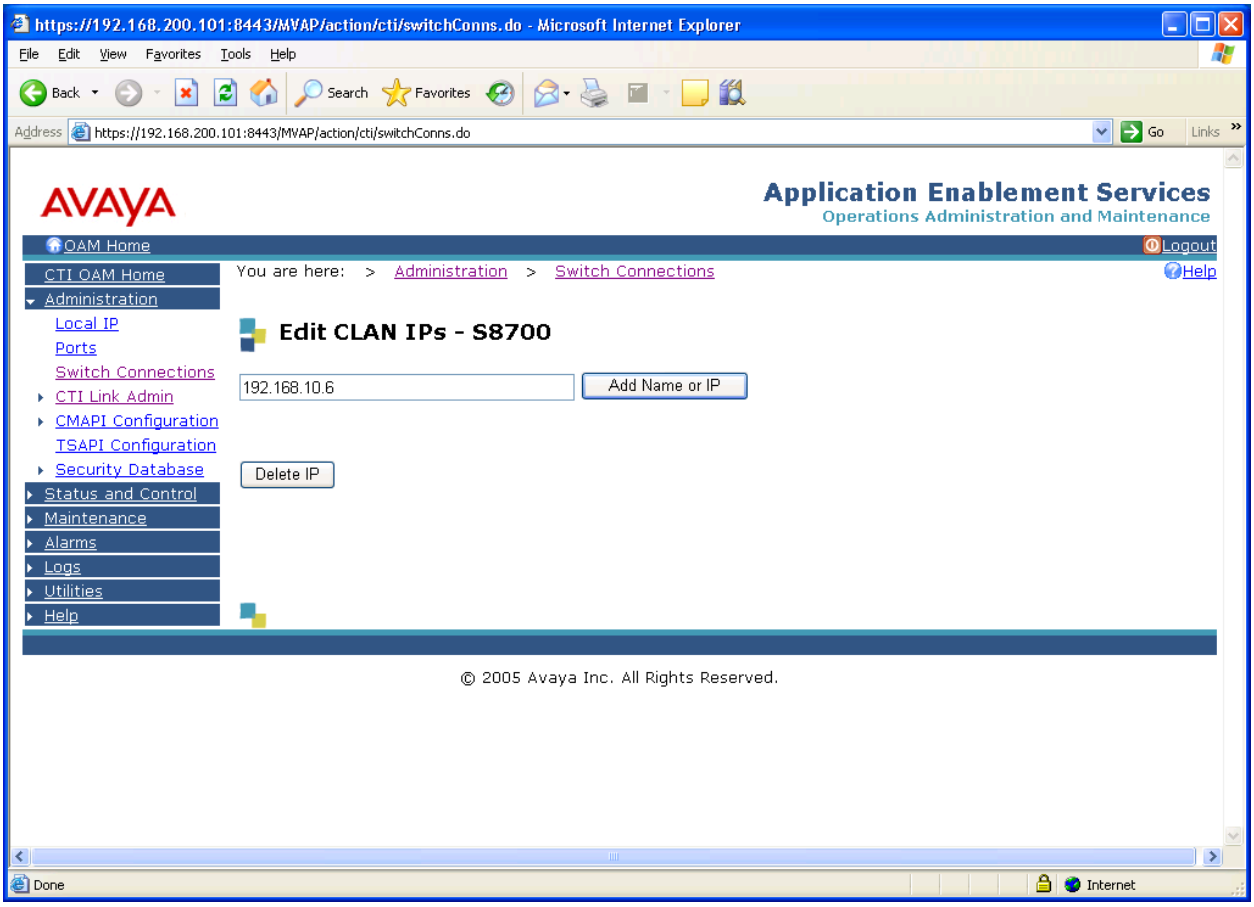
At this point, enter the name of the Switch Connection to be added, and click on the “Add Connection” button. This name should match that which is used in the espaCT.config file, as described is section 3.3.2 of this document.

This causes the following screen to be presented. At this point, the Switch Connection password should be entered. The “Switch Password” must be the same as was entered into the Communication Manager AE Services Administration form via the “change ip-services” command.

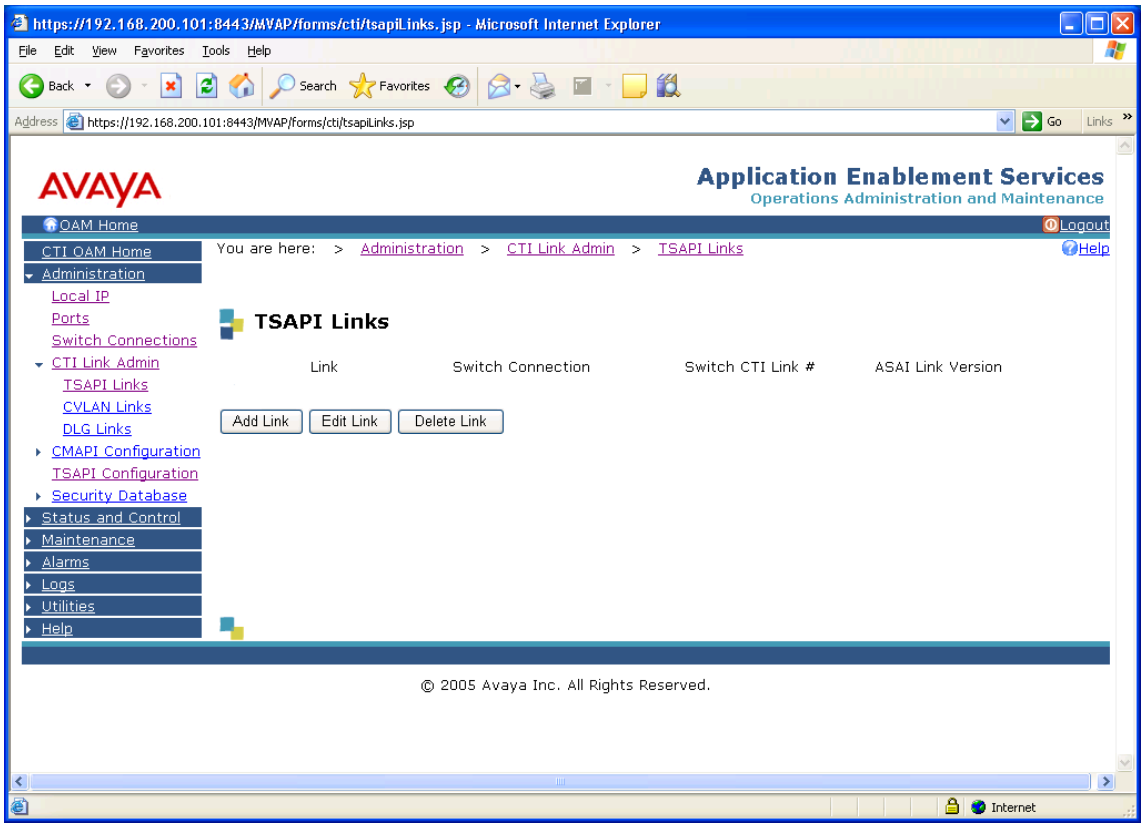


Once the password has been set, return to the “Switch Connections” menu and click the “Edit CLAN IPs” for the newly added connection.

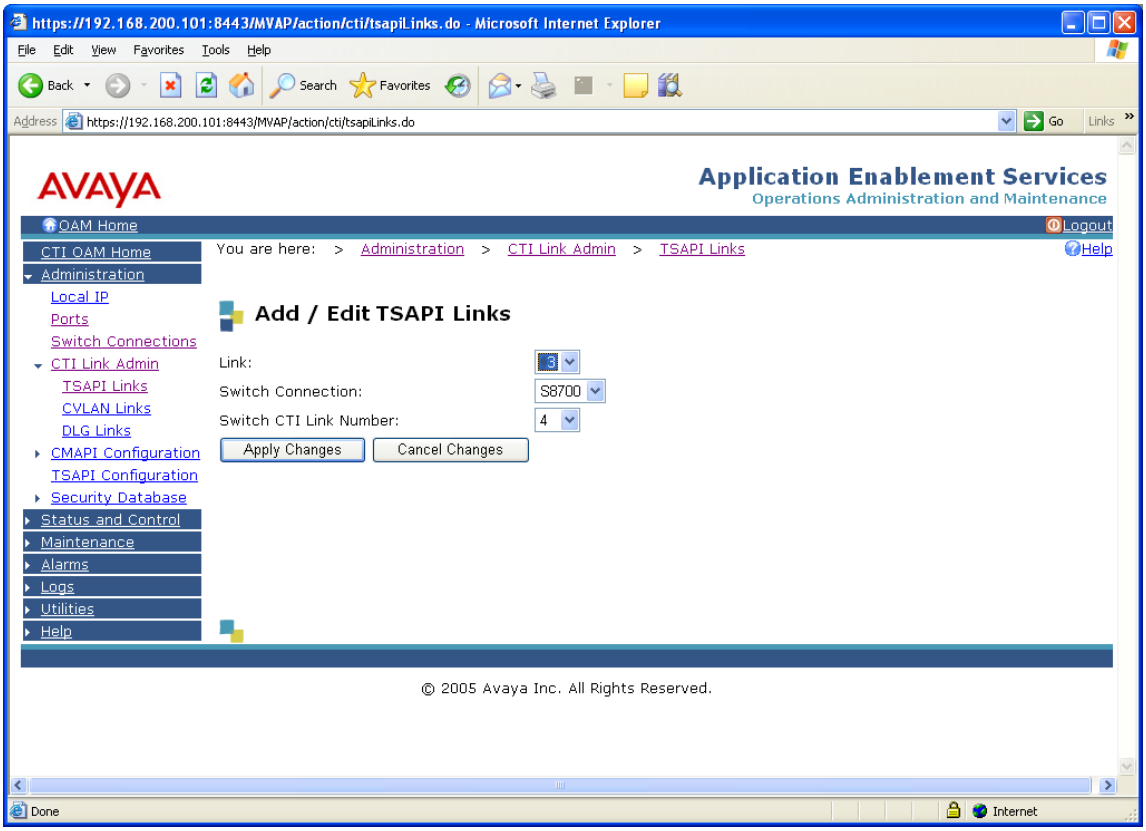
Enter the IP address of the CLAN interface for the newly added switch, and click the “Add name or IP” button. This is the same address as the CLAN entry used in the “change node-names” and “change ip-services” commands shown in section 3.1.2.



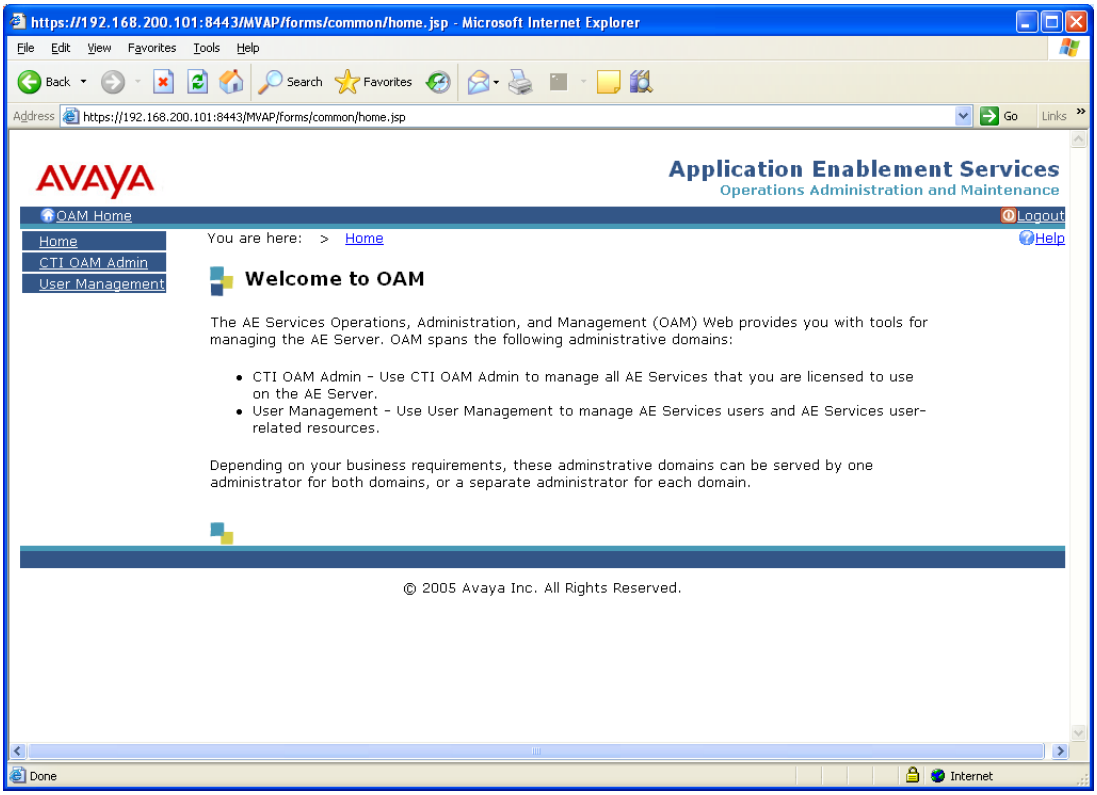
On the left margin of the screen, click Administration->CTI Link Admin->TSAPI Links. The following screen is displayed. At this point, click the "Add Link" button.



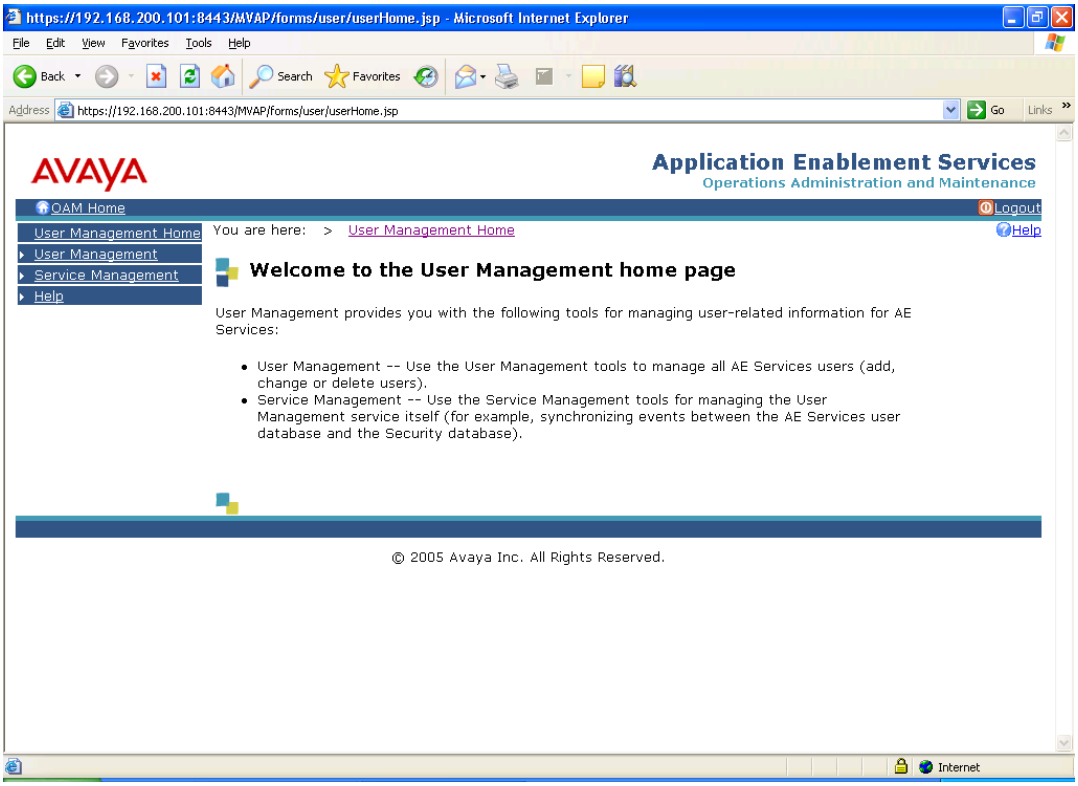
Fill in the parameters for the link to be added. The “Link” parameter must be a value between 1 and 16 which is not assigned to another link. The “Switch Connection” parameter should be set to the name of the Avaya Communication Server which is to be controlled by this link. The value for the TSAPI “Switch CTI Link Number” must be a value between 1 and 64, and must be the same as was used in the Avaya Communication Manager “add cti-link” configuration command in section 3.1.2.



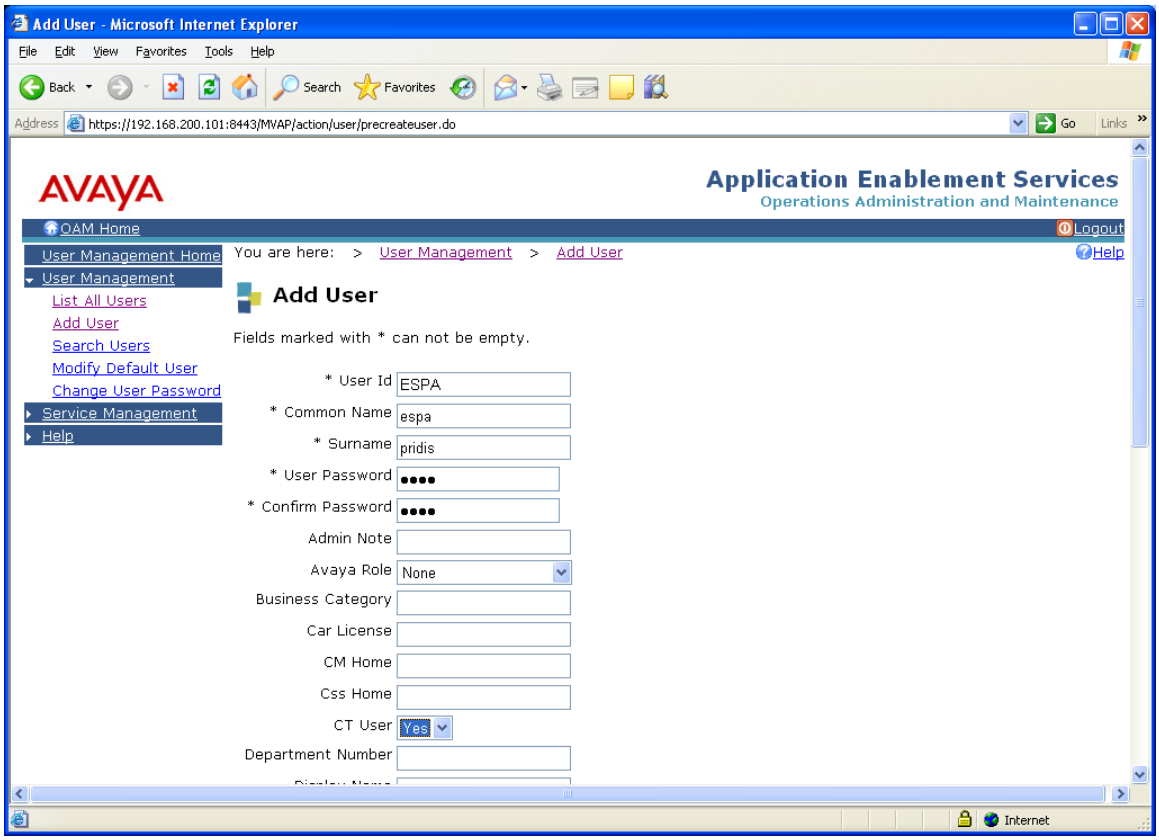
Log out and log in again with the user administration ID/password, which will cause the "Welcome to OAM" screen to be displayed just as after the previous login. Click the "User Management" menu item on the left margin of the screen.



At this point, click on the “User Management->Add User” control that is contained on the left margin of the screen.



The parameters in the “Add User” screen are to identify an AES user. In this case, the AES user is the ESPA application, which uses AES to monitor stations and initiate switching operations. The values chosen for the “User Id” and “User Password” fields must be the same as those contained espaCT.config file, described in section 3.3.2. The “CT User” field for this user must be set to “Yes”.



3.3. Configure ESPA Server

3.3.1. Configure AES Server Address

The TSLIB.ini configuration file is installed in the C:\Windows directory of the PC on which EPSA runs when the ESPA product is installed from the distribution media. Use a text editor to edit the TSLIB.ini file so that it contains the correct IP/port address of the AES Server:

```
[Telephony Servers]
192.168.200.101=450
; This is a list of the servers offering Telephony Services via TCP/IP.
; Either domain name or IP address may be used; default port number is 450
; The form is: host_name=port_number   For example:
;
; tserver.mydomain.com=450
; 127.0.0.1=450
;
[Shared Admin]
; Instead of each workstation maintaining its own list of servers, a shared
; tslib.ini file may be placed on a network file system, for example:
;
; tslib.ini=n:\csta\tslib.ini
;
; This entry overrides the [Telephony Servers] section, if any.
```

3.3.2. Configure espaCT.config File

Edit the espaCT.conf configuration file. This file is installed with default parameters in the same directory as the ESPA Sever executable program during the install process.

<ctserver> settings

The values in the <ctserver> section of this file are to be assigned as follows:

Parameter	Value
serverid	See below.
login	the AES login ID (defined in the AES “Add User” screen)
password	the AES password (defined in the AES “Add User” screen)

The <serverid> parameter consists of the following fields, separated by “#” characters:

Parameter	Value
AVAYA	This is a fixed value.
S8700	This is the name that was assigned to the Switch Connection, which was assigned on the AES Administration -> Switch Connections screen (see the section 3.2 of this document).
CSTA	This is a fixed value.
AES_SERVER_1	This is the name that was assigned to the AES server when the AES software installation was performed.

```
    <serverid>AVAYA#S8700#CSTA#AES_SERVER_1</serverid>
    <loginid>espa</loginid>
    <passwd>password</passwd>
  </ctserver>
  <fac>
    <monitor>1110080</monitor>
    <meetme>1110081</meetme>
    <joinme>1110082</joinme>
    <callme>1110083</callme>
    <callfwd>1110084</callfwd>
    <alarm>1110085</alarm>
  </fac>
  <announcements>
    <default>
      <unavailable>1114013</unavailable>
      <queued>1114018</queued>
      <absend>1114019</absend>
      <failure>1114014</failure>
    </default>
    <meetme>
      <pending>1114011</pending>
    </meetme>
    <joinme>
      <callerhungup>1114016</callerhungup>
    </joinme>
  </announcements>
  <vdn>
    <mergebase>1110130</mergebase>
    <mergeanncoffset>10</mergeanncoffset>
    <mergesta>5</mergesta>
    <lines>5</lines>
    <mmabsend>1110086</mmabsend>
    <disconnect>1110087</disconnect>
    <fwdext>yes</fwdext>
  </vdn>
  <range1>
    <first>1</first>
  </range1>
</config>
```

Pager range specifications

Pager range specifications are configurable value ranges which are used to validate pager numbers which are input by users of the ESPA system, for example pager numbers which are input as destinations for call-me operations. If a designated pager number does not match one of the pager range specifications, the operation is not performed and the user receives an error response.

Up to four pager range specifications can be specified, each of which consists of a single numeric string enclosed between a pair of tags. To validate a pager number, the digits in the pager range specification strings are compared with the digits which comprise the pager number, until either a match is found, or all of the pager range specifications have been examined. If no match is found, the pager number is assumed to be erroneous.

Pager numbers are compared with pager range specifications each starting with the most significant digit. The digits are compared one at a time until all of the digits in a given pager range specification have been examined, or a pair of digits is found which do not match.

The following are some example pager range specifications which can be used to validate the pager numbers shown.

Pager Numbers	Pager Range Specifications
100 ... 199	<range1>1</range1>
100 ... 109	<range1>10</range1>
120 ... 129	<range1>12</range1>

Depending on numbers of the pagers which are included an ESPA system, it might not be possible to define pager range specifications which can validate a pager number with complete certainty. For example, if an ESPA system has pagers with the numbers “100” to “108”, a pager range specification of “10” will not identify a pager number of “109” as being incorrect.

4. Interoperability Compliance Testing

The objective of compliance testing done on the Pridis ESPA Application Server product was to verify that it is compatible with Avaya Communication Manager. This includes verifying that the essential ESPA features function properly when used with Communication Manager, and that Communication Manager features are not hindered by the interaction with ESPA. Furthermore, ESPA’s robustness is to be verified.

4.1. General Test Approach

The test method employed can be described as follows:

- ESPA Application Server’s call-me, meet-me, and join-me features were tested.
- Error conditions were tested, including
  - The detection of attempts to page a pager which is in the charging rack

- The detection of attempts to initiate a Meet-Me operation while a prior Meet-Me operation is pending
- The ability to detect abandoned meet-me requests
- The detection of the attempt to contact an unknown pager

- ESPA's robustness was tested by verifying its ability to recover from interruptions to its external connections to both the IP network and the Ascom teleCOURIER 900.

All testing was performed manually. The tests were all functional in nature.

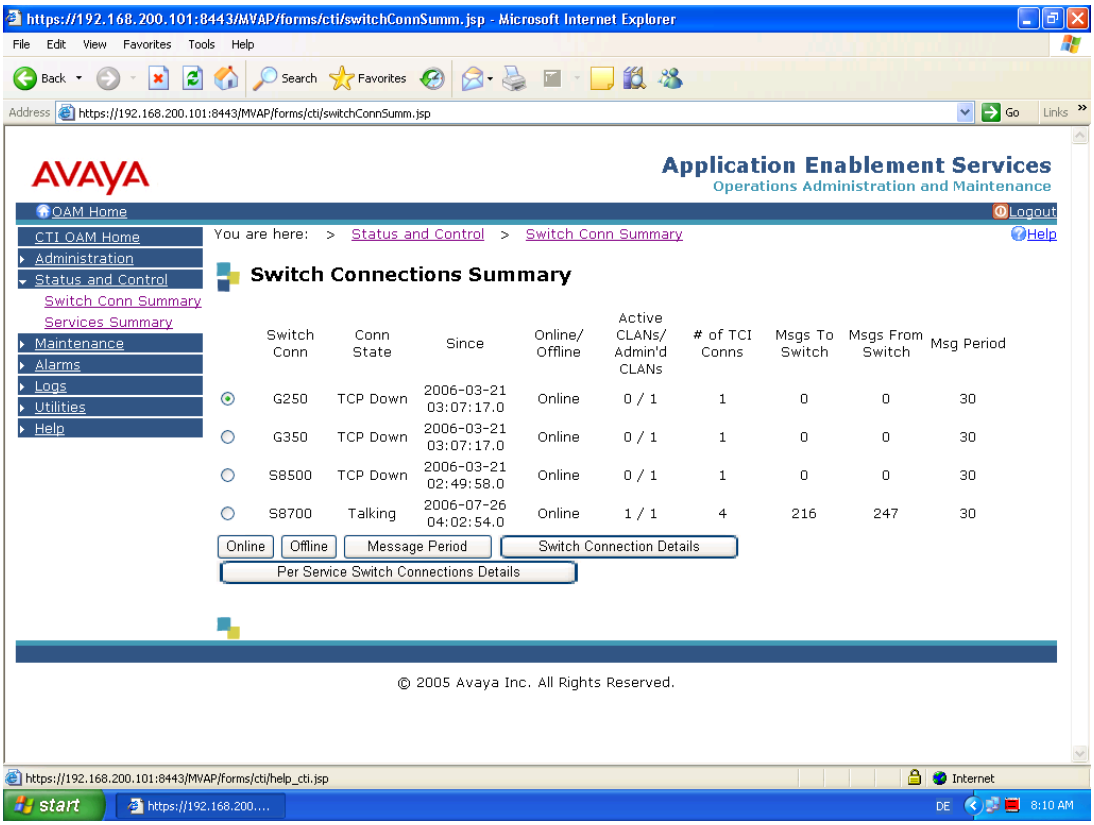
4.2. Test Results

All tests which were performed produced the expected result.

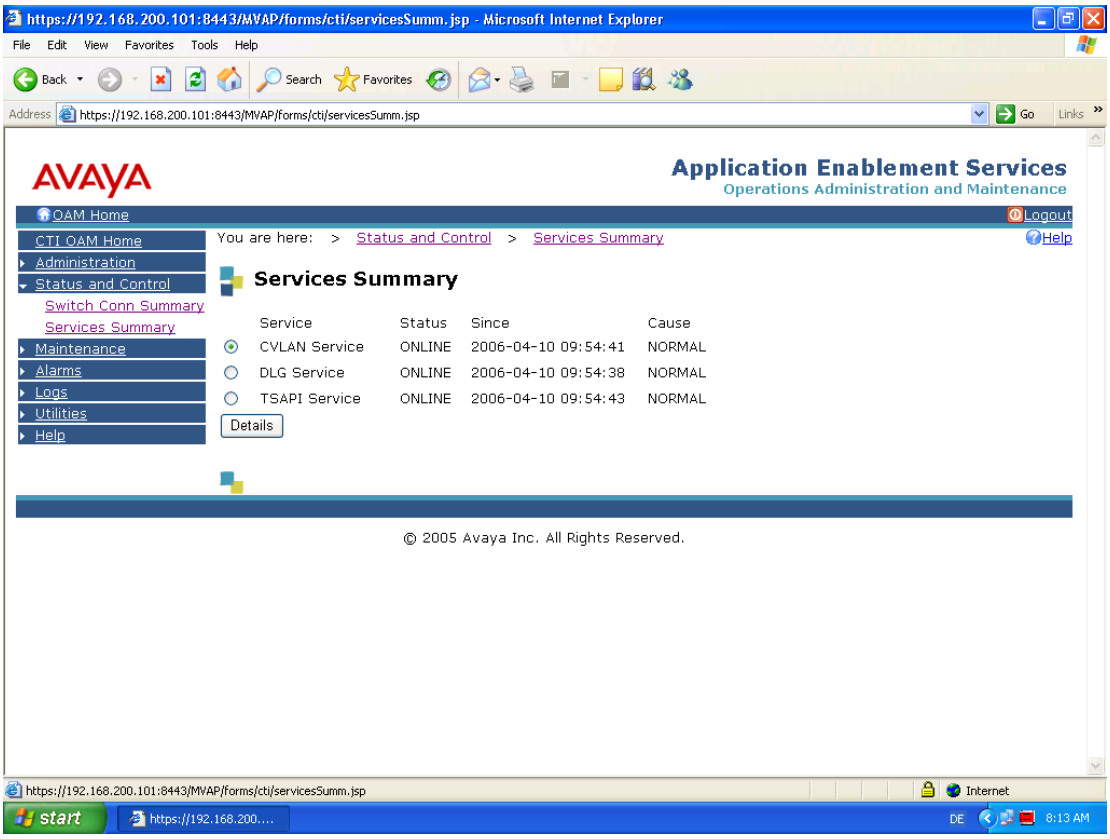
5. Verification Steps

The following steps can be performed to verify the correct installation and configuration of ESPA Application Server:

- Verify then the AES and ESPA systems can ping each other.
- Verify that the various telephones can call each other.
- Verify that CTI OAM Status and Control "Switch Connection Summary" shows that the connection between AES and Avaya Communication Manager is operational, as can be seen below by a "Conn State" of "Talking" for the S8700 switch connection.



- Verify that CTI OAM Status and Control “Services Summary” shows that TSAPI service is “ONLINE”:



6. Support

Support for ESPA is available at:

Pridis B.V.
Computer Telephony Products
Ambachtsstraat 13 D
3861 RH Nijkerk
The Netherlands
Phone: +31 (0)33 4697086
e-mail: info@pridis.com
info: www.pridis.com

7. Conclusion

The ESPA Application Server has successfully passed interoperability compliance testing with Avaya Communication Manager.

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.