



**Application Notes for Virtual Hold Concierge 6.7.2 with  
Avaya Aura™ Communication Manager Using Avaya  
Aura™ Application Enablement Services – Issue 1.0**

**Abstract**

These Application Notes describe the configuration steps required for Virtual Hold Concierge 6.7.2 to interoperate with Avaya Aura™ Communication Manager using Avaya Aura™ Application Enablement Services. Virtual Hold Concierge is a contact center solution that uses the Avaya Telephony Services Application Programming Interface from Avaya Aura™ Application Enablement Services to provide intelligent queue management when incoming call traffic exceeds agent availability.

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

# 1. Introduction

These Application Notes describe the configuration steps required for Virtual Hold Concierge 6.7.2 to successfully interoperate with Avaya Aura™ Communication Manager using Avaya Aura™ Application Enablement Services. Virtual Hold Concierge is a contact center solution that uses the Avaya Telephony Services Application Programming Interface (TSAPI) from Avaya Aura™ Application Enablement Services to provide intelligent queue management when incoming call traffic exceeds agent availability.

There is a physical connection between the DS1 circuit pack on Avaya Aura™ Communication Manager with the Dialogic card on Virtual Hold Concierge. Ports on the DS1 circuit pack are configured as line-side DS1 stations on Avaya Aura™ Communication Manager for handling of inbound/outbound calls to/from Virtual Hold Concierge.

The Avaya AES TSAPI service is used by Virtual Hold Concierge to monitor VDNs and line-side DS1 stations, and to query status of ACD queues on Avaya Aura™ Communication Manager. The information obtained from the TSAPI event reports is used to calculate the expected wait time. All incoming ACD calls are routed by Virtual Hold Concierge using the TSAPI adjunct routing capabilities. When the expected wait time for an ACD queue reaches a pre-defined threshold, then Concierge specifies for the call to route to an available line-side DS1 station that terminates to Concierge. The internal Interactive Voice Response (IVR) component of Concierge will play the expected wait time announcement and provide the caller with options to continue to wait in queue or to be called back.

Callers that decide to wait in queue will be transferred by Virtual Hold Concierge to the ACD queue on Avaya Aura™ Communication Manager. Callers that decide to be called back will be prompted for callback number and time, and Virtual Hold Concierge will track the caller position in the virtual queue. When it is almost time for the caller to be serviced from the virtual queue, Virtual Hold Concierge will place a callback call to the caller, and transfer the call to the ACD queue with priority, such that the call will be placed in front of the queue.

The callback calls are originated from available line-side DS1 stations, with call progress tones and tone detection handled by Virtual Hold Concierge. When the callback call is connected and accepted by the caller, Virtual Hold Concierge then utilizes the TSAPI call control capabilities to transfer the callback call to the ACD queue.

## 1.1. Interoperability Compliance Testing

The interoperability compliance test included feature and serviceability testing.

The feature testing focused on verifying the following on Virtual Hold Concierge:

- Use of TSAPI query service to query status on ACD skill groups.
- Use of TSAPI event report service to monitor VDNs and line-side DS1 stations.
- Use of TSAPI routing service to route incoming calls to the inbound line-side DS1 stations.
- Use of TSAPI call control service to handle inbound calls to inbound line-side DS1 stations, and to handle outbound callback calls from outbound line-side DS1 stations.
- Proper handling of call scenarios involving incoming calls under and over the wait time threshold, routing of inbound calls to the inbound line-side DS1 stations, and originating and transferring of outbound callback calls from the outbound line-side DS1 stations.

The serviceability testing focused on verifying the ability of Virtual Hold Concierge to recover from adverse conditions, such as disconnecting/reconnecting the Ethernet cable to Virtual Hold Concierge.

## 1.2. Support

Technical support on Virtual Hold Concierge can be obtained through the following:

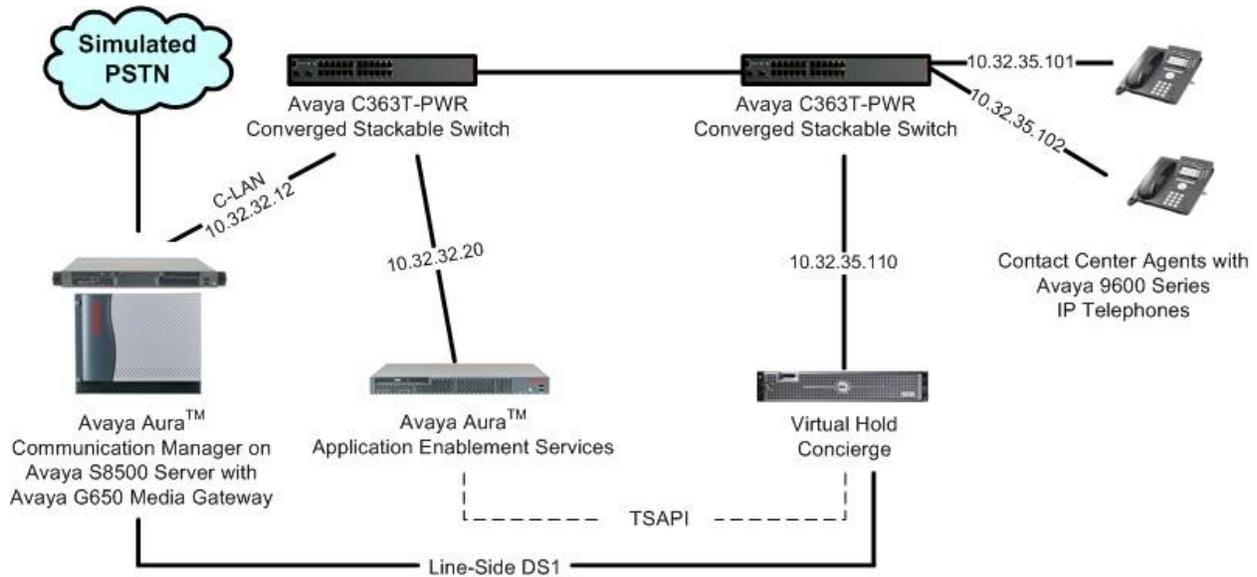
- **Phone:** (866) 670-2223
- **Email:** [support@virtualhold.com](mailto:support@virtualhold.com)

## 2. Reference Configuration

The detailed administration of basic connectivity between Avaya Aura™ Communication Manager and Avaya Aura™ Application Enablement Services, and of contact center devices are not the focus of these Application Notes and will not be described.

The existing contact center devices are listed in the table below. In the compliance testing, Virtual Hold Concierge queried for status on the ACD skill group extension shown below.

Device Type	Value
Skill Group Number	555
Skill Group Extension	65555
Agent Station	65001, 65002



### 3. Equipment and Software Validated

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

Equipment	Software
Avaya Aura™ Communication Manager on Avaya S8500 Server	R015x.02.1.016.4
Avaya MCC1 Media Gateway <ul style="list-style-type: none"><li>• TN799DP C-LAN Circuit Pack</li><li>• TN464HP DS1 Interface</li></ul>	HW01 FW032 HW02 FW024
Avaya Aura™ Application Enablement Services	5.2
Avaya 9600 Series IP Telephones (H.323)	3.1
Virtual Hold Concierge <ul style="list-style-type: none"><li>• Dialogic D/480JCT-2T1 Card</li><li>• Avaya TSAPI</li></ul>	6.7.2.1477 SU 243 4.1.0.323

## 4. Configure Aura™ Avaya Communication Manager

This section provides the procedures for configuring Avaya Aura™ Communication Manager. The procedures include the following areas:

- Verify Communication Manager license
- Administer CTI link
- Administer DS1 circuit pack
- Administer vectors and VDNs
- Administer line-side DS1 stations
- Administer inbound DS1 hunt group

### 4.1. Verify Communication Manager License

Log in to the System Access Terminal (SAT) to verify that the Communication Manager license has proper permissions for features illustrated in these Application Notes. Use the “display system-parameters customer-options” command to verify that the **Computer Telephony Adjunct Links** customer option is set to “y” on **Page 3**. If this option is not set to “y”, then contact the Avaya sales team or business partner for a proper license file.

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

Abbreviated Dialing Enhanced List? y                               Audible Message Waiting? n
Access Security Gateway (ASG)? n                                   Authorization Codes? n
Analog Trunk Incoming Call ID? y                                  CAS Branch? n
A/D Grp/Sys List Dialing Start at 01? n                           CAS Main? n
Answer Supervision by Call Classifier? n                           Change COR by FAC? y
                                                                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? y                                     DCS Call Coverage? n
ASAI Link Plus Capabilities? y                                     DCS with Rerouting? n
```

Navigate to **Page 6**, and verify that the **Vectoring (Basic)** customer option is set to “y”.

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

                                Call Center Release: 5.0

                                                                ACD? y
                                                                BCMS (Basic)? y
BCMS/VuStats Service Level? n                                     Reason Codes? y
BSR Local Treatment for IP & ISDN? n                               Service Level Maximizer? n
Business Advocate? n                                             Service Observing (Basic)? y
Call Work Codes? y                                               Service Observing (Remote/By FAC)? y
DTMF Feedback Signals For VRU? n                                  Service Observing (VDNs)? y
Dynamic Advocate? n                                               Timed ACW? y
Expert Agent Selection (EAS)? y                                    Vectoring (Basic)? y
                                                                EAS-PHD? n
                                                                Vectoring (Prompting)? y
                                                                Vectoring (G3V4 Enhanced)? y
                                                                Vectoring (3.0 Enhanced)? y
```

## 4.2. Administer CTI Link

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

```
add cti-link 1                                     Page 1 of 3
                                         CTI LINK
CTI Link: 1
Extension: 60100
  Type: ADJ-IP
                                         COR: 1
  Name: Virtual Hold CTI Link
```

## 4.3. Administer DS1 Circuit Pack

Administer a DS1 circuit pack to be used for connectivity to Virtual Hold Concierge. Use the “add ds1 x” command, where “x” is the physical slot number of the DS1 circuit pack. Note that the actual slot number may vary. Enter the following values for the specified fields, and retain the default values for the remaining fields.

- **Name:** A descriptive name.
- **Line Coding:** “ami-basic”
- **Framing Mode:** “d4”
- **Signaling Mode:** “robbed-bit”

```
add ds1 1a10                                     Page 1 of 1
                                         DS1 CIRCUIT PACK
                                         Name: Virtual Hold
Location: 01A10                                     Line Coding: ami-basic
Bit Rate: 1.544                                     Framing Mode: d4
Line Compensation: 1
Signaling Mode: robbed-bit
Interface Comanding: mulaw
Idle Code: 11111111
Slip Detection? n                                     Near-end CSU Type: other
```

## 4.4. Administer Vectors and VDNs

Administer a set of vectors and Vector Directory Numbers (VDNs) for the following purposes:

- **Entry:** To provide adjunct route and failure coverage.
- **Hold:** To queue incoming calls to the skill group at medium priority.
- **Callback:** To queue callback calls to the skill group at high priority.

### 4.4.1. Entry Vector and VDN

Modify an available vector using the “change vector n” command, where “n” is an existing vector number. The vector will be used to provide adjunct route to the CTI link defined in **Section 4.2**.

Note that the vector **Number**, **Name**, **wait-time** and **route-to number** parameters may vary. The **route-to number** is used as the covering point to provide failure coverage in case of failures from the adjunct routing step. In the compliance testing, the covering point is the Hold VDN, which is administered in **Section 4.4.2**.

```
change vector 901                                     Page 1 of 6
                                                    CALL VECTOR
Number: 901                                     Name: VH Entry
Multimedia? n      Attendant Vectoring? n      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 adjunct                                     routing link 1
02 wait-time                                   10 secs hearing silence
03 route-to                                   number 65902           with cov n if unconditionally
04
```

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

```
add vdn 65901                                       Page 1 of 3
                                                    VECTOR DIRECTORY NUMBER
                                                    Extension: 65901
                                                    Name*: VH Entry
                                                    Destination: Vector Number           901
  Attendant Vectoring? n
  Meet-me Conferencing? n
  Allow VDN Override? n
                                                    COR: 1
                                                    TN*: 1
                                                    Measured: none
```

#### 4.4.2. Hold Vector and VDN

Modify an available vector to queue incoming calls to the ACD group at medium priority. Note that the vector **Number**, **Name**, **queue-to skill** and **wait-time** parameters may vary, and that “555” is the existing skill group number from **Section 2**.

```
change vector 902                                     Page 1 of 6
                                                    CALL VECTOR

  Number: 902                Name: VH Hold
Multimedia? n      Attendant Vectoring? n      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 silence
02 queue-to      skill 555 pri m
03 wait-time      20 secs hearing ringback
04 goto step     3 if unconditionally
05
```

Add a VDN with an available extension as shown below. Enter a descriptive **Name**, and the vector number from above for **Vector Number**.

```
add vdn 65902                                         Page 1 of 3
                                                    VECTOR DIRECTORY NUMBER

  Extension: 65902
  Name*: VH Hold
  Destination: Vector Number 902
  Attendant Vectoring? n
  Meet-me Conferencing? n
  Allow VDN Override? n
  COR: 1
  TN*: 1
  Measured: none
```

### 4.4.3. Callback Vector and VDN

Modify an available vector to queue callback calls to the ACD group at high priority. Note that the vector **Number**, **Name**, **queue-to skill** and **wait-time** parameters may vary, and that “555” is the existing skill group number from **Section 2**.

```
change vector 903                                     Page 1 of 6
                                                    CALL VECTOR

  Number: 903                Name: VH Callback
Multimedia? n      Attendant Vectoring? n      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 queue-to      skill 555 pri h
02 wait-time    20 secs hearing ringback
03
```

Add a VDN with an available extension as shown below. Enter a descriptive name for **Name**, and the vector number from above for **Vector Number**.

```
add vdn 65903                                         Page 1 of 3
                                                    VECTOR DIRECTORY NUMBER

  Extension: 65903
  Name*: VH Callback
  Destination: Vector Number          903
  Attendant Vectoring? n
  Meet-me Conferencing? n
  Allow VDN Override? n
  COR: 1
  TN*: 1
  Measured: none
```

## 4.5. Administer Line-Side DS1 Stations

Administer the line-side DS1 stations. Each line-side DS1 station is a port from the DS1 circuit pack that is physically connected to the Dialogic card in the Virtual Hold Concierge server. Typically half of the port capacities are configured to handle inbound calls, and the other half is configured to handle outbound callback calls. For the compliance testing, two ports were configured to handle inbound calls, and two ports for outbound callback calls. The customer can vary the number of ports to be used for each purpose.

### 4.5.1. Inbound Line-Side DS1 Stations

Use the “add station n” command, where “n” is an available extension number. Enter the following values for the specified fields, and retain the default values for all remaining fields. Submit these changes.

- **Type:** “DS1FD” to indicate line-side DS1.
- **Port:** An available port from the DS1 circuit pack.
- **Name:** A descriptive name.

```

add station 67991                                     Page 1 of 4
                                                    STATION
Extension: 67991                                     Lock Messages? n      BCC: 0
  Type: DS1FD                                       Security Code:         TN: 1
  Port: 01A1001                                     Coverage Path 1:      COR: 1
  Name: VH Inbound Line #1                         Coverage Path 2:      COS: 1
                                                    Hunt-to Station:      Tests? y

STATION OPTIONS
                                                    Time of Day Lock Table:
  Loss Group: 4
  Off Premises Station? y
  R Balance Network? n

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

Repeat the “add station n” command to add the desired number of line-side DS1 stations to be used for handling of inbound calls. When possible, use consecutive extension numbers for the line-side DS1 stations, for ease of configuring Virtual Hold Concierge. In the compliance testing, two line-side DS1 stations were configured for handling inbound calls, as shown below.

```

list station 67991 count 2
                                                    STATIONS
Ext/      Port/   Name/      Room/      Cv1/  COR/   Cable/
Hunt-to   Type   Surv GK NN  Move      Data Ext  Cv2  COS TN Jack
67991     01A1001 VH Inbound Line #1           1
          DS1FD           no           1  1
67992     01A1002 VH Inbound Line #2           1
          DS1FD           no           1  1
  
```

## 4.5.2. Outbound Line-Side DS1 Stations

Use the “add station n” command, where “n” is an available extension number. Enter the following values for the specified fields, and retain the default values for all remaining fields. Submit these changes.

- **Type:** “DS1FD” to indicate line-side DS1.
- **Port:** An available port from the DS1 circuit pack.
- **Name:** A descriptive name.

```

add station 67993                                     Page 1 of 4
                                     STATION
Extension: 67993                                     Lock Messages? n      BCC: 0
  Type: DS1FD                                       Security Code:        TN: 1
  Port: 01A1003                                    Coverage Path 1:      COR: 1
  Name: VH Outbound Line #1                       Coverage Path 2:      COS: 1
                                                    Hunt-to Station:      Tests? y

STATION OPTIONS
                                     Time of Day Lock Table:
      Loss Group: 4
Off Premises Station? y
      R Balance Network? n

      Survivable COR: internal
Survivable Trunk Dest? y

```

Repeat the “add station n” command to add the desired number of line-side DS1 stations to be used for handling of outbound callback calls. When possible, use consecutive extension numbers for the line-side DS1 stations, for ease of configuring Virtual Hold Concierge. In the compliance testing, two line-side DS1 stations were configured for handling outbound callback calls, as shown below.

```

list station 67993 count 2
                                     STATIONS
Ext/      Port/      Name/      Room/      Cv1/  COR/      Cable/
Hunt-to   Type        Surv GK NN  Move      Data Ext  Cv2  COS  TN  Jack
67993     01A1003  VH Outbound Line #1
          DS1FD                no                1
67994     01A1004  VH Outbound Line #2
          DS1FD                no                1  1

```

## 4.6. Administer Inbound DS1 Hunt Group

Administer a hunt group to be used for routing of inbound calls to the inbound line-side DS1 stations. Use the “add hunt-group n” command, where “n” is an available hunt group number. Enter the following values for the specified fields, and retain the default values for the remaining fields.

- **Group Name:** A descriptive name.
- **Group Extension:** An available extension number.
- **ACD:** “n”
- **Queue:** “n”
- **Vector:** “n”

```
add hunt-group 999                                     Page 1 of 60
                                                    HUNT GROUP
Group Number: 999                                     ACD? n
  Group Name: VH Inbound DS1                          Queue? n
  Group Extension: 67999                              Vector? n
  Group Type: ucd-mia                                Coverage Path:
    TN: 1                                             Night Service Destination:
    COR: 1                                           MM Early Answer? n
  Security Code:                                     Local Agent Preference? n
ISDN/SIP Caller Display:
```

Navigate to **Page 3**, and enter the extensions of all inbound line-side DS1 stations from **Section 4.5.1** as members.

```
add hunt-group 999                                     Page 3 of 60
                                                    HUNT GROUP
Group Number: 999  Group Extension: 67999            Group Type: ucd-mia
Member Range Allowed: 1 - 1500                      Administered Members (min/max): 0 /0
                                                    Total Administered Members: 0
GROUP MEMBER ASSIGNMENTS
  Ext      Name(19 characters)      Ext      Name(19 characters)
  1: 67991                               14:
  2: 67992                               15:
  3:                                       16:
```

## 5. Configure Avaya Aura™ Application Enablement Services

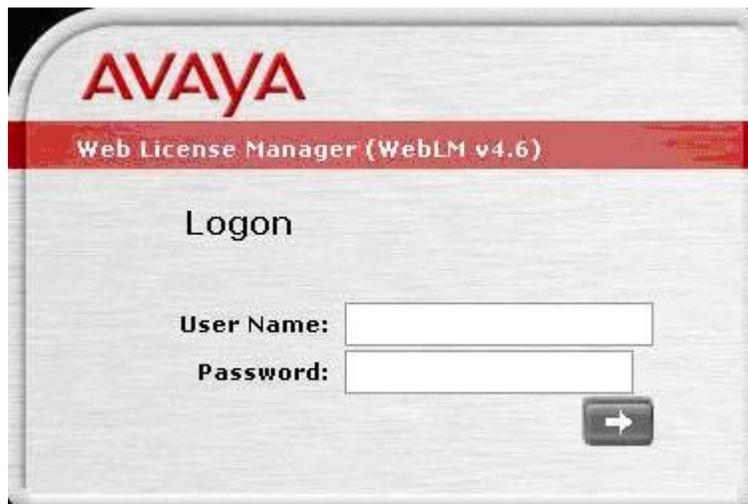
This section provides the procedures for configuring Avaya Aura™ Application Enablement Services. The procedures include the following areas:

- Verify TSAPI license
- Launch OAM interface
- Administer TSAPI link
- Disable security database
- Restart TSAPI service
- Obtain Tlink name
- Administer Virtual Hold user

### 5.1. Verify TSAPI License

Access the Web License Manager interface by using the URL “https://ip-address/WebLM/index.jsp” in an Internet browser window, where “ip-address” is the IP address of the Application Enablement Services server.

The **Web License Manager** screen is displayed. Log in using the appropriate credentials.



The **Web License Manager** screen below is displayed. Select **Licensed products > APPL\_ENAB > Application\_Enablement** in the left pane, to display the **Licensed Features** screen in the right pane.

Verify that there are sufficient licenses for **TSAPI Simultaneous Users**, as shown below. Also verify that there is an applicable advanced switch license, in this case **AES ADVANCED MEDIUM SWITCH** for the Avaya S8500 Server.

The screenshot shows the Avaya Web License Manager interface. The left sidebar contains navigation options: Install License, Licensed Products (expanded to APPL\_ENAB > Application\_Enablement), Uninstall License, Change Password, Server Properties, Manage Users, and Logout. The main content area displays 'Application Enablement (CTI) - Release: 5 - SID: 10503000 (Standard License File)'. Below this, it shows the license installation date and a link to 'View Peak Usage'. The 'Licensed Features' table is as follows:

Feature (Keyword)	Expiration Date	Licensed	Acquired
Unified CC API Desktop Edition (VALUE_AES_AEC_UNIFIED_CC_DESKTOP)	permanent	1000	0
Device Media and Call Control (VALUE_AES_DMCC_DMC)	permanent	100	0
DLG (VALUE_AES_DLG)	permanent	16	0
CVLAN ASAI (VALUE_AES_CVLAN_ASAI)	permanent	16	2
AES ADVANCED SMALL SWITCH (VALUE_AES_AEC_SMALL_ADVANCED)	permanent	3	0
CVLAN Proprietary Links (VALUE_AES_PROPRIETARY_LINKS)	permanent	16	0
AES ADVANCED LARGE SWITCH (VALUE_AES_AEC_LARGE_ADVANCED)	permanent	3	0
TSAPI Simultaneous Users (VALUE_AES_TSAPI_USERS)	permanent	1000	1000
AES ADVANCED MEDIUM SWITCH (VALUE_AES_AEC_MEDIUM_ADVANCED)	permanent	3	1

## 5.2. Launch OAM Interface

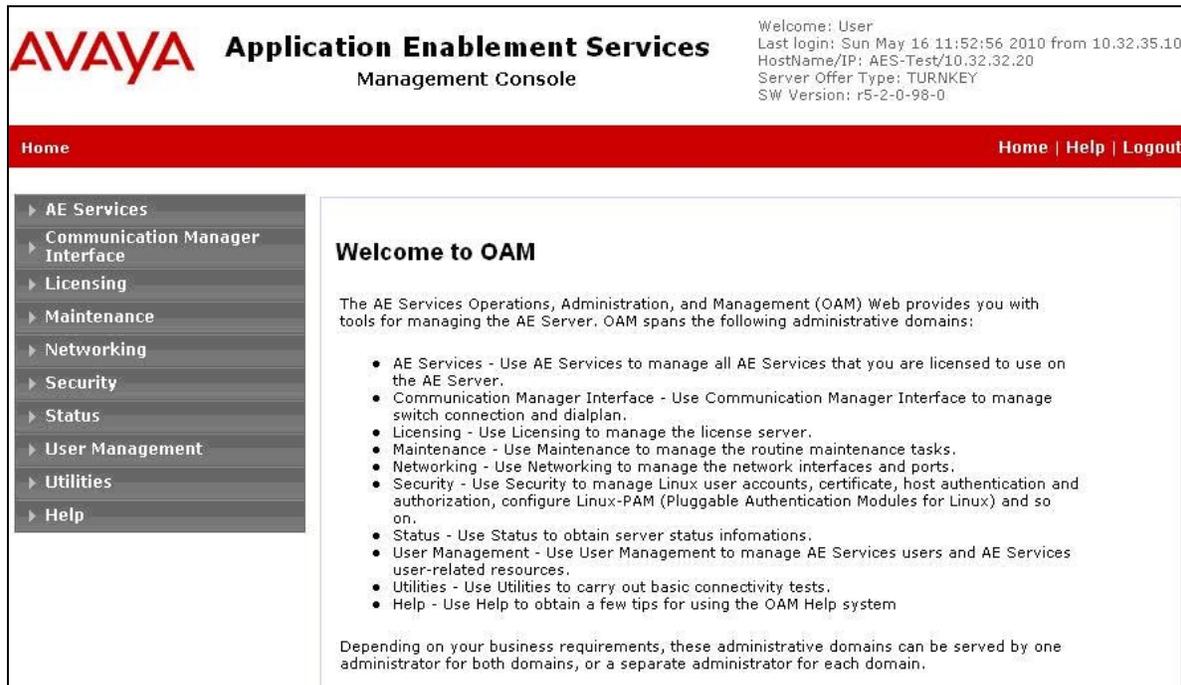
Access the OAM web-based interface by using the URL “https://ip-address” in an Internet browser window, where “ip-address” is the IP address of the Application Enablement Services server.

The **Please login here** screen is displayed. Log in using the appropriate credentials.



The screenshot shows the login page for the AVAYA Application Enablement Services Management Console. At the top, the AVAYA logo is on the left, and the text "Application Enablement Services Management Console" is on the right. A red horizontal bar below the header contains a "Help" link on the right side. The main content area is a light gray box with the text "Please login here:" followed by two input fields: "Username" and "Password". Below these fields is a "Login" button. At the bottom of the page, a red horizontal bar contains the copyright notice: "© 2009 Avaya, Inc. All Rights Reserved."

The **Welcome to OAM** screen is displayed next.



The screenshot shows the "Welcome to OAM" screen. At the top left is the AVAYA logo, followed by "Application Enablement Services Management Console". On the top right, there is a "Welcome" message: "Welcome: User", "Last login: Sun May 16 11:52:56 2010 from 10.32.35.10", "HostName/IP: AES-Test/10.32.32.20", "Server Offer Type: TURNKEY", and "SW Version: r5-2-0-98-0". Below the header is a red navigation bar with "Home" on the left and "Home | Help | Logout" on the right. On the left side, there is a vertical menu with the following items: "AE Services", "Communication Manager Interface", "Licensing", "Maintenance", "Networking", "Security", "Status", "User Management", "Utilities", and "Help". The main content area is titled "Welcome to OAM" and contains the following text: "The AE Services Operations, Administration, and Management (OAM) Web provides you with tools for managing the AE Server. OAM spans the following administrative domains:" followed by a bulleted list of domains and their descriptions. At the bottom, there is a note: "Depending on your business requirements, these administrative domains can be served by one administrator for both domains, or a separate administrator for each domain."

**Welcome to OAM**

The AE Services Operations, Administration, and Management (OAM) Web provides you with tools for managing the AE Server. OAM spans the following administrative domains:

- AE Services - Use AE Services to manage all AE Services that you are licensed to use on the AE Server.
- Communication Manager Interface - Use Communication Manager Interface to manage switch connection and dialplan.
- Licensing - Use Licensing to manage the license server.
- Maintenance - Use Maintenance to manage the routine maintenance tasks.
- Networking - Use Networking to manage the network interfaces and ports.
- Security - Use Security to manage Linux user accounts, certificate, host authentication and authorization, configure Linux-PAM (Pluggable Authentication Modules for Linux) and so on.
- Status - Use Status to obtain server status informations.
- User Management - Use User Management to manage AE Services users and AE Services user-related resources.
- Utilities - Use Utilities to carry out basic connectivity tests.
- Help - Use Help to obtain a few tips for using the OAM Help system

Depending on your business requirements, these administrative domains can be served by one administrator for both domains, or a separate administrator for each domain.

### 5.3. Administer TSAPI Link

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

The screenshot shows the AVAYA Application Enablement Services Management Console. The top navigation bar includes "AE Services | TSAPI | TSAPI Link" and "Home | Help | Logout". The left sidebar shows a tree view with "AE Services" expanded to "TSAPI Links". The main content area is titled "TSAPI Links" and contains a table with columns: "Link", "Switch Connection", "Switch CTI Link #", "ASAI Link Version", and "Security". Below the table are three buttons: "Add Link", "Edit Link", and "Delete Link".

The **Add TSAPI Links** screen is displayed next.

The **Link** field is only local to the Application Enablement Services server, and may be set to any available number. For **Switch Connection**, select the relevant switch connection from the drop-down list. In this case, the existing switch connection "S8500" is selected. For **Switch CTI Link Number**, select the CTI link number from **Section 4.2**. Retain the default values in the remaining fields, and click **Apply Changes**.

The screenshot shows the AVAYA Application Enablement Services Management Console with the "Add TSAPI Links" screen. The top navigation bar includes "AE Services | TSAPI | TSAPI Link" and "Home | Help | Logout". The left sidebar shows a tree view with "AE Services" expanded to "TSAPI Links". The main content area is titled "Add TSAPI Links" and contains a form with the following fields: "Link" (value: 1), "Switch Connection" (value: S8500), "Switch CTI Link Number" (value: 1), "ASAI Link Version" (value: 4), and "Security" (value: Unencrypted). Below the form are two buttons: "Apply Changes" and "Cancel Changes".

## 5.4. Disable Security Database

Select **Security > Security Database > Control** from the left pane, to display the **SDB Control for DMCC and TSAPI** screen in the right pane. Uncheck **Enable SDB TSAPI Service, JTAPI and Telephony Service**, and click **Apply Changes**.

The screenshot shows the Avaya Application Enablement Services Management Console. The top navigation bar includes the Avaya logo, the title "Application Enablement Services Management Console", and a user welcome message: "Welcome: User", "Last login: Fri Apr 16 13:22:45 2010 from 10.32.35.10", "HostName/IP: AES-Test/10.32.32.20", "Server Offer Type: TURNKEY", and "SW Version: r5-2-0-98-0". The breadcrumb trail is "Security | Security Database | Control". The left sidebar shows a tree view with "Security Database" expanded to "Control". The main content area is titled "SDB Control for DMCC and TSAPI" and contains two unchecked checkboxes: "Enable SDB for DMCC Service" and "Enable SDB TSAPI Service, JTAPI and Telephony Service". An "Apply Changes" button is located below the checkboxes.

## 5.5. Restart TSAPI Service

Select **Maintenance > Service Controller** from the left pane, to display the **Service Controller** screen in the right pane. Check the **TSAPI Service**, and click **Restart Service**.

The screenshot shows the Avaya Application Enablement Services Management Console. The top navigation bar includes the Avaya logo, the title "Application Enablement Services Management Console", and a user welcome message: "Welcome: User", "Last login: Fri Apr 16 12:12:49 2010 from 10.32.35.10", "HostName/IP: AES-Test/10.32.32.20", "Server Offer Type: TURNKEY", and "SW Version: r5-2-0-98-0". The breadcrumb trail is "Maintenance | Service Controller". The left sidebar shows a tree view with "Maintenance" expanded to "Service Controller". The main content area is titled "Service Controller" and contains a table with two columns: "Service" and "Controller Status".

Service	Controller Status
<input type="checkbox"/> ASAI Link Manager	Running
<input type="checkbox"/> DMCC Service	Running
<input type="checkbox"/> CVLAN Service	Running
<input type="checkbox"/> DLG Service	Running
<input type="checkbox"/> Transport Layer Service	Running
<input checked="" type="checkbox"/> TSAPI Service	Running

For status on actual services, please use [Status and Control](#)

Buttons: Start, Stop, Restart Service, Restart AE Server, Restart Linux, Restart Web Server

## 5.6. Obtain Tlink Name

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

In this case, the associated Tlink name is “AVAYA#S8500#CSTA#AES-TEST”. Note the use of the switch connection “S8500” from **Section 5.3** as part of the Tlink name.

The screenshot displays the Avaya Application Enablement Services Management Console. The top header includes the Avaya logo, the title "Application Enablement Services Management Console", and a welcome message: "Welcome: User", "Last login: Fri Apr 16 12:12:49 2010 from 10.32.35.10", "HostName/IP: AES-Test/10.32.32.20", "Server Offer Type: TURNKEY", and "SW Version: r5-2-0-98-0". A red navigation bar contains "Security | Security Database | Tlinks" and "Home | Help | Logout". The left sidebar shows a tree view with "Security Database" expanded to "Tlinks". The main content area, titled "Tlinks", shows a "Tlink Name" field with a radio button selected next to "AVAYA#S8500#CSTA#AES-TEST", and two buttons: "Edit Tlink" and "Delete Tlink".

## 5.7. Administer Virtual Hold User

Select **User Management > User Admin > Add User** from the left pane, to display the **Add User** screen in the right pane.

Enter desired values for **User Id**, **Common Name**, **Surname**, **User Password**, and **Confirm Password**. For **CT User**, select “Yes” from the drop-down list. Retain the default value in the remaining fields. Click **Apply** at the bottom of the screen (not shown below).

The screenshot displays the Avaya Application Enablement Services Management Console. The top header includes the Avaya logo, the title 'Application Enablement Services Management Console', and a welcome message: 'Welcome: User', 'Last login: Sun May 16 11:52:56 2010 from 10.32.35.10', 'HostName/IP: AES-Test/10.32.32.20', 'Server Offer Type: TURNKEY', and 'SW Version: r5-2-0-98-0'. A red navigation bar contains 'User Management | User Admin | Add User' and 'Home | Help | Logout'. The left sidebar shows a tree view with 'User Management' expanded to 'User Admin', where 'Add User' is selected. The main content area is titled 'Add User' and contains a form with the following fields: '\* User Id' (VirtualHold), '\* Common Name' (Virtual Hold), '\* Surname' (Virtual Hold), '\* User Password' (masked with dots), '\* Confirm Password' (masked with dots), 'Admin Note' (empty), 'Avaya Role' (None), 'Business Category' (empty), 'Car License' (empty), 'CM Home' (empty), 'Css Home' (empty), 'CT User' (Yes), 'Department Number' (empty), and 'Display Name' (empty). A note above the form states 'Fields marked with \* can not be empty.'

## 6. Configure Virtual Hold Concierge

This section provides the procedures for configuring Virtual Hold Concierge. The procedures include the following areas:

- Launch configuration wizard
- Administer switch connection
- Administer agent groups
- Administer IVR servers and extensions
- Administer queues
- Administer incoming extensions

Virtual Hold Concierge can be configured on a single server or with components distributed across multiple servers. For ease of compliance testing, the configuration used a single server hosting all components.

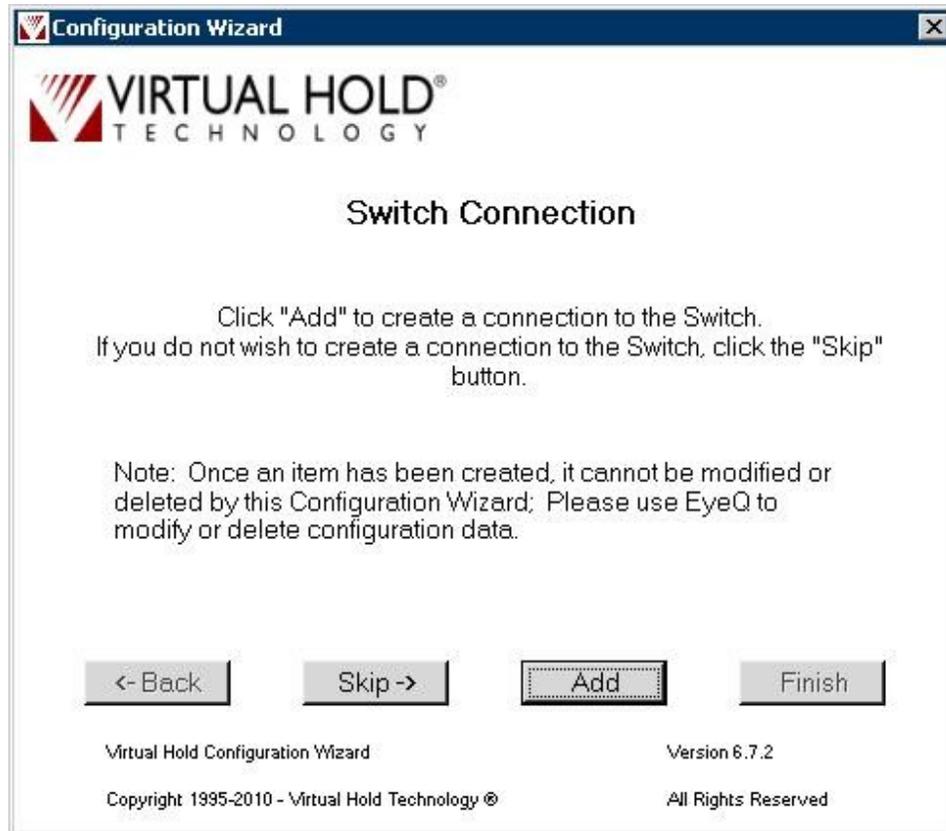
### 6.1. Launch Configuration Wizard

From the Virtual Hold Concierge server, navigate to **Start > All Programs > Virtual Hold > VHT\_ConfigurationWizard** to launch the Configuration Wizard. The **Welcome to the Virtual Hold Configuration Wizard** screen is displayed, as shown below. Click **Configure** to proceed.



## 6.2. Administer Switch Connection

The **Switch Connection** screen is displayed. Click **Add** to create a connection to the switch.



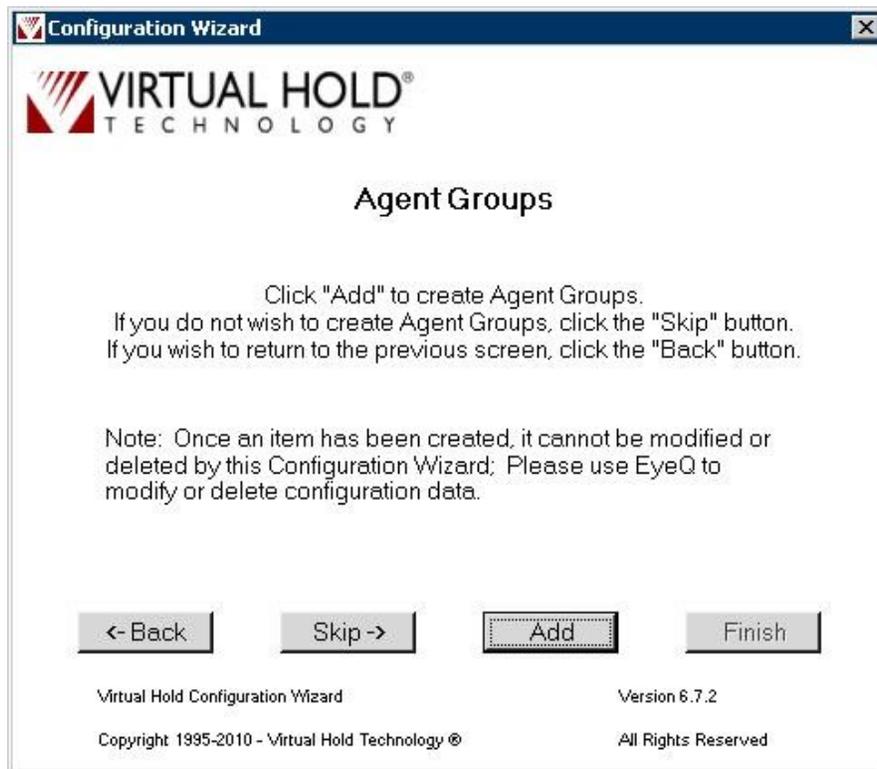
The **Switch Types** screen is displayed next. For **Switch Type**, select "TIALAvayaTSAPI" from the drop-down list. Note that the value of **Site Name** is populated automatically, and was created as part of installation.

Retain the default values in the remaining fields. Click **Create**, followed by **Close**.



### 6.3. Administer Agent Groups

The **Agent Groups** screen is displayed next. Click **Add** to create agent groups.



The **Agent Groups** screen is displayed. This screen is used to define the skill group. Retain the default value for **Site Name**. For **Starting Agent Group**, enter “x:y:z”, where “x” and “y” are desired agent group name and agent group ID, and “z” is the existing skill group extension from **Section 2**. Note the agent group name, in this case “VHT\_Test”, which will be used later to configure queues in **Section 6.5**. Click **Create**, followed by **Close**.

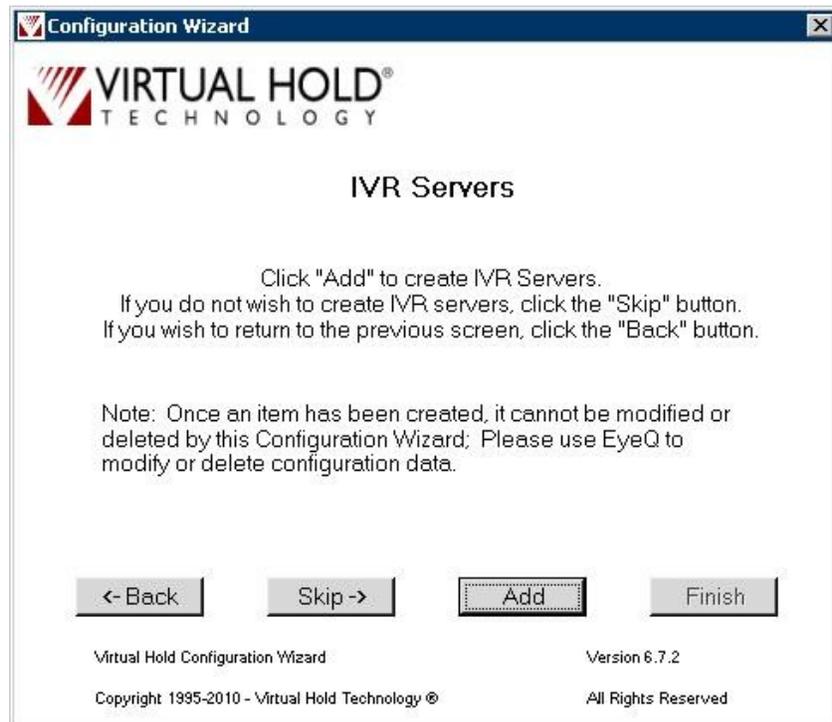


The **Agents** screen is displayed next. Click **Skip**.

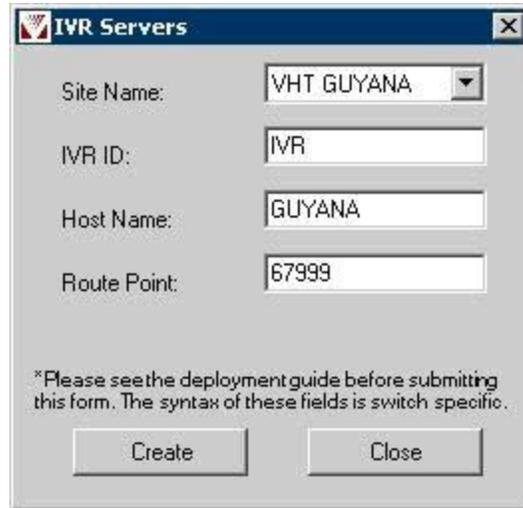


#### 6.4. Administer IVR Servers and Extensions

The **IVR Servers** screen is displayed. Click **Add** to create IVR servers.

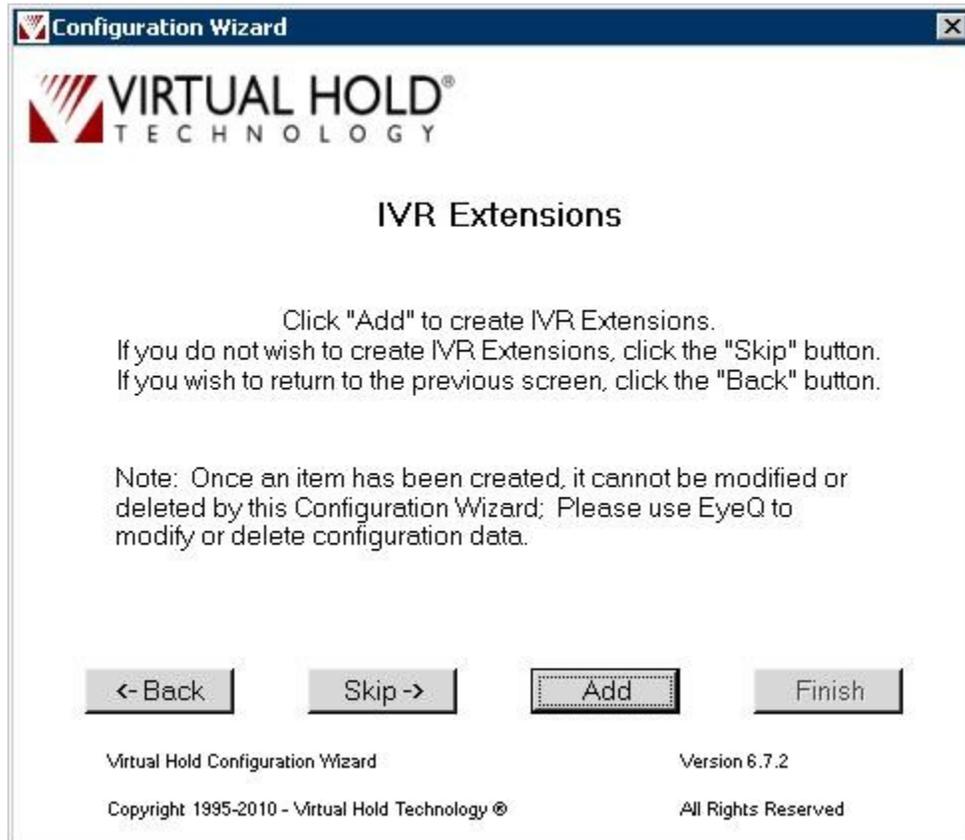


The **IVR Servers** screen below is displayed. For **Route Point**, enter the inbound DS1 hunt group extension number from **Section 4.6**. Retain the default values in the remaining fields. Click **Create**, followed by **Close**.



The screenshot shows a window titled "IVR Servers" with a close button in the top right corner. It contains four input fields: "Site Name" with a dropdown menu showing "VHT GUYANA", "IVR ID" with the text "IVR", "Host Name" with the text "GUYANA", and "Route Point" with the text "67999". Below the fields is a note: "\*Please see the deployment guide before submitting this form. The syntax of these fields is switch specific." At the bottom are two buttons: "Create" and "Close".

The **IVR Extensions** screen is displayed next. Click **Add** to create IVR extensions.



The screenshot shows a window titled "Configuration Wizard" with a close button in the top right corner. It features the Virtual Hold Technology logo at the top left. The main heading is "IVR Extensions". Below the heading is the instruction: "Click 'Add' to create IVR Extensions. If you do not wish to create IVR Extensions, click the 'Skip' button. If you wish to return to the previous screen, click the 'Back' button." A note follows: "Note: Once an item has been created, it cannot be modified or deleted by this Configuration Wizard. Please use EyeQ to modify or delete configuration data." At the bottom are four buttons: "<- Back", "Skip ->", "Add", and "Finish". The "Add" button is highlighted with a dashed border. At the very bottom, it says "Virtual Hold Configuration Wizard Version 6.7.2" and "Copyright 1995-2010 - Virtual Hold Technology © All Rights Reserved".

The **IVR Extensions** screen is displayed. For the **Starting Extension** fields, enter the starting extension number of the inbound and outbound line-side DS1 stations from **Section 4.5**. For the **Starting Line Number** and **Starting Time Slot** fields, enter the starting DS1 port number of the inbound and outbound line-side DS1 stations from **Section 4.5**. For the **Number to Create** fields, enter the number of inbound and outbound line-side DS1 stations that were created from **Section 4.5**. Retain the default values for all remaining fields. Click **Create**, followed by **Close**.

## 6.5. Administer Queues

The **Queues** screen is displayed next. Click **Add** to create queues.

The **Queues Setup** screen is displayed. The **QueueSettings** section contains parameters relating to the ACD queue. The **Business Hours** section contains the hours of normal business operation. The **Callbacks Offered** section contains the hours of when the callback option will be offered to the callers. The **Callbacks Allowed** section contains the maximum threshold of callback calls that can be launched. Consult the Concierge documentation for proper configuration of these parameters. The screenshot below shows the values used for the compliance test.

For **Queue ID** and **Name**, enter the agent group name from **Section 6.3**. Click **Create**, followed by **Close**.

The screenshot shows the 'Queues Setup' dialog box with the following configuration:

- Site Name:** VHT\_GUYANA
- Queue ID:** VHT\_Test
- Buttons:** Use Production Defaults, Use Test Defaults
- QueueSettings:**
  - Op Mode:** Normal
  - Name:** VHT\_Test
  - Mode:** Predictive
  - Group:** (empty)
  - Default Number of Agents:** 1
  - Turn On Threshold (sec):** 0
  - Script Number:** 1
  - Agents Staffed Override:** TRUE
  - Callback Threshold (secs):** 45
  - Call Handle Time (secs):** 45
  - Busy Attempts:** 3
  - Busy Period (secs):** 60
  - No Ans Attempts:** 3
  - No Ans Period (sec):** 60
  - Try Again Attempts:** 3
  - Try Again Period (secs):** 60
  - Max Attempts:** 5
- Business Hours:**
  - Day Of Week:** Sun, Mon, Tues, Wed, Thur, Fri, Sat (all checked)
  - Time Begin:** 00:00
  - Time End:** 23:59
- Callbacks Offered:**
  - Day Of Week:** Sun, Mon, Tues, Wed, Thur, Fri, Sat (all checked)
  - Time Begin:** 00:00
  - Time End:** 23:59
- Callbacks Allowed:**
  - Day Of Week:** Sun, Mon, Tues, Wed, Thurs, Fri, Sat (all checked)
  - Sched callbacks allowed/15 min:** 15
- Buttons:** Create, Close

The **Callback and Holding Queues** screen is displayed (not shown below). Click **Add** to create queues.

The screen below is displayed next. In the **Callback Queues** section, enter the Callback VDN extension number from **Section 4.4.3** for **Callback Queue ID** and **Transfer Device**. Click **Create**.

In the **Holding Queues** section, enter the Hold VDN extension number from **Section 4.4.2** for **Holding Queue ID**, **Route Device**, and **Transfer Device**. Click **Create**, followed by **Close**.

**Callback and Holding Queues**

Site Name: VHT GUYANA

VH Server Switch Name: VHAESID

**Callback Queues**

Use VH Server Switch Name prefix

Callback Queue ID\*: 65903

Transfer Device: 65903

**Callback Queue "VHAESID:65903" created** Create

**Holding Queues**

Use VH Server Switch Name prefix

Holding Queue ID\*: 65902

Route Device: 65902

Transfer Device: 65902

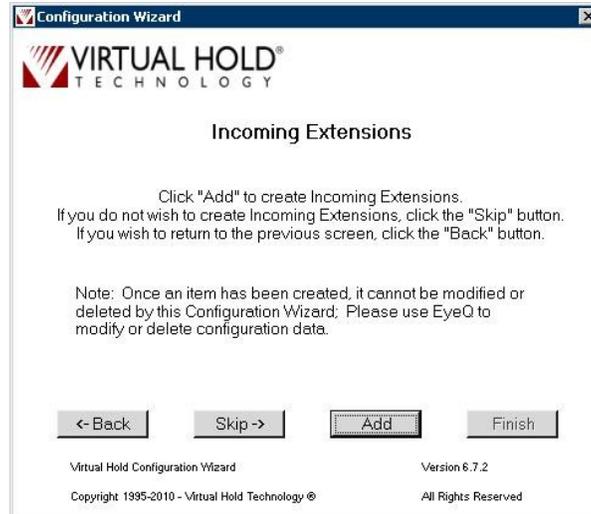
**Holding Queue "VHAESID:65902" created** Create

\*Please see the deployment guide before submitting this form. The syntax of these fields is switch specific.

\*Verify VH Server Switch Name Close

## 6.6. Administer Incoming Extensions

The **Incoming Extensions** screen is displayed next. Click **Add**.



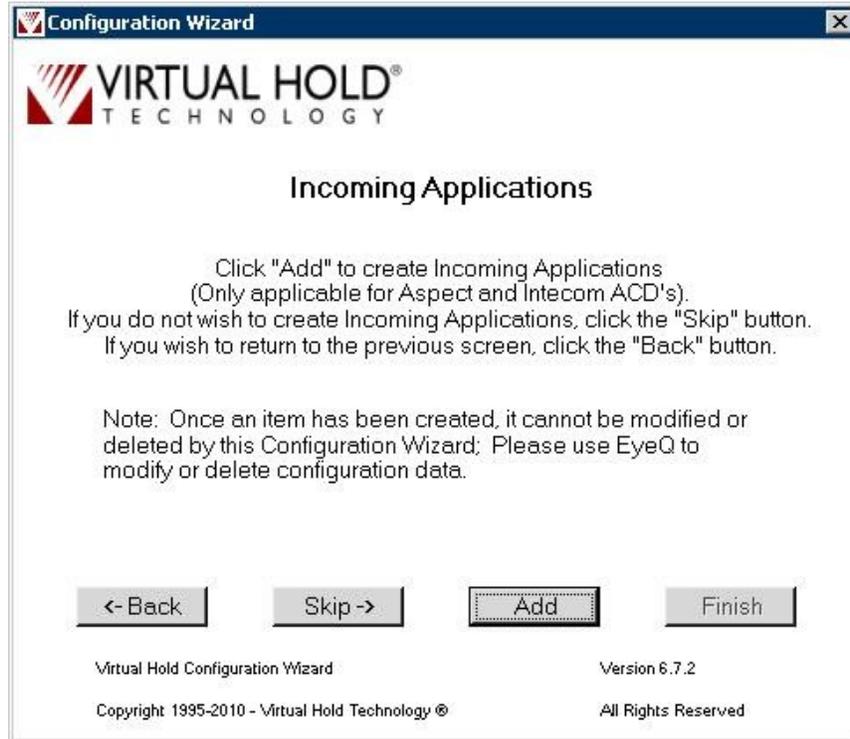
The screen below is displayed. For **Extension**, enter the Entry VDN extension number from **Section 4.4.1**. Retain the default values in the remaining fields. Click **Create**, followed by **Close**.

The screenshot shows a window titled "Incoming Extensions" with a form for configuration. The fields are as follows:

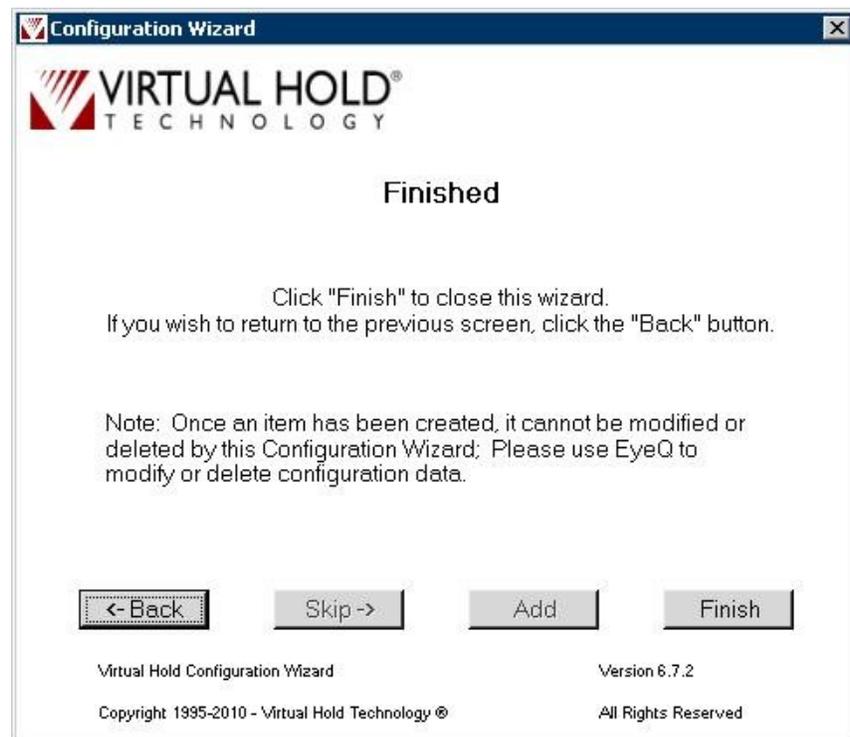
- Site Name: VHT GUYANA (dropdown)
- Queue ID: VHT\_Test (dropdown)
- VH Server Switch Name: VHAESID (text)
- Incoming Extensions section:
  - Extension\*: 65901 (text)
  - Label: Extension (text)
  - Country ID: 1 (text)
  - Treatment Type: 0 (dropdown)
  - ScriptNumber: (empty text)
  - IVR ID: IVR (dropdown)
  - Holding Queue ID: VHAESID:65902 (dropdown)
  - Callback Queue ID: VHAESID:65903 (dropdown)
  - UnderThreshold Queue ID: VHAESID:65902 (dropdown)
  - IB IVR Group ID: NONE (dropdown)
  - OB IVR Group ID: NONE (dropdown)

At the bottom of the form is a "Create" button. Below the form, there is a note: "\* Verify VH Server Switch Name" and a "Close" button.

The **Incoming Applications** screen is displayed. Click Skip.



The **Finished** screen is displayed next. Click **Finish** to close the Configuration Wizard.



## 7. General Test Approach and Test Results

The feature test cases were performed both automatically and manually. Upon start of the Virtual Hold Concierge application, the application automatically sends queries to Application Enablement Services for ACD skill group status, and requests monitoring on VDNs and line-side DS1 stations. For the manual part of the testing, incoming calls were made to the monitored VDNs to enable adjunct route and event reports to be sent to Virtual Hold Concierge. Manual call controls from the customer and agent telephones were exercised to verify remaining event reports, and the scheduling and delivering of callback calls.

The serviceability test cases were performed manually by disconnecting and reconnecting the LAN cable to the Virtual Hold Concierge server.

The verification of all tests included checking of proper states at the telephone sets, and monitoring the event report logs from the Virtual Hold Concierge server log files.

All test cases were executed and passed. The one observation on Virtual Hold Concierge from the compliance testing is that a negative acknowledgement from a Route Register request was not logged in the log file.

## 8. Verification Steps

This section provides the tests that can be performed to verify proper configuration of Avaya Aura™ Communication Manager, Avaya Aura™ Application Enablement Services, and Virtual Hold Concierge.

### 8.1. Verify Avaya Aura™ Communication Manager

On Communication Manager, verify the status of the administered CTI link by using the “status aesvcs cti-link” command. Verify that the **Service State** is “established” for the CTI link number administered in **Section 4.2**, as shown below.

```
status aesvcs cti-link
```

AE SERVICES CTI LINK STATUS						
CTI Link	Version	Mnt Busy	AE Services Server	Service State	Msgs Sent	Msgs Rcvd
1	4	no	AES-Test	established	825	642
2	4	no	AES-Test	restarted	29	15

Verify the status of an inbound line-side DS1 station during an active inbound call using the “status station n” command, where “n” is the extension of the connected station from **Section 4.5.1**. Verify that the **Service State** is “in-service/off-hook” as shown below.

```
status station 67991
```

GENERAL STATUS		Page 1 of 5
Administered Type: DS1FD	<b>Service State: in-service/off-hook</b>	
Connected Type: N/A		
Extension: 67991		
Port: 01A1001	Parameter Download: not-applicable	
Call Parked? no	SAC Activated? no	
Ring Cut Off Act? no		
Active Coverage Option: 1	one-X Server Status: N	

Verify the status of an outbound line-side DS1 station during an active outbound callback call using the “status station n” command, where “n” is the extension of the connected station from **Section 4.5.2**. Verify that the **Service State** is “in-service/off-hook” as shown below.

```
status station 67993
```

GENERAL STATUS		Page 1 of 5
Administered Type: DS1FD	<b>Service State: in-service/off-hook</b>	
Connected Type: N/A		
Extension: 67993		
Port: 01A1003	Parameter Download: not-applicable	
Call Parked? no	SAC Activated? no	
Ring Cut Off Act? no		
Active Coverage Option: 1	one-X Server Status: N/A	

## 8.2. Verify Avaya Aura™ Application Enablement Services

On Application Enablement Services, verify the status of the TSAPI link by selecting **Status > Status and Control > TSAPI Service Summary** from the left pane. The **TSAPI Link Details** screen is displayed. Verify the **Status** is “Talking” for the TSAPI link administered in **Section 5.3**, as shown below.

### Application Enablement Services

Management Console

Welcome: User  
 Last login: Mon May 17 15:10:04 2010 from 10.32.35.110  
 HostName/IP: AES-Test/10.32.32.20  
 Server Offer Type: TURNKEY  
 SW Version: r5-2-0-98-0

Status | Status and Control | TSAPI Service Summary
Home | Help | Logout

- ▶ AE Services
- ▶ Communication Manager Interface
- ▶ Licensing
- ▶ Maintenance
- ▶ Networking
- ▶ Security
- ▼ Status
  - Alarm Viewer
  - ▶ Logs
  - ▼ Status and Control
    - CVLAN Service Summary
    - DLG Services Summary
    - DMCC Service Summary
    - Switch Conn Summary
    - **TSAPI Service Summary**

#### TSAPI Link Details

Enable page refresh every  seconds

	Link	Switch Name	Switch CTI Link ID	Status	Since	State	Switch Version	Associations	Msgs to Switch	Msgs from Switch	Msgs Period
▶	1	S8500	1	Talking	Fri May 14 16:33:04 2010	Online	15	7	650	833	30

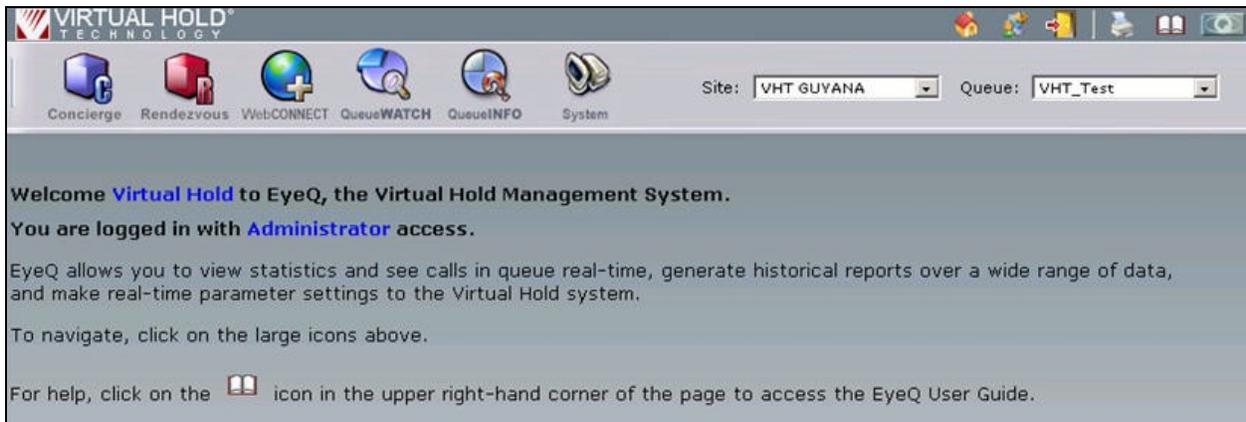
For service-wide information, choose one of the following:

### 8.3. Verify Virtual Hold Concierge

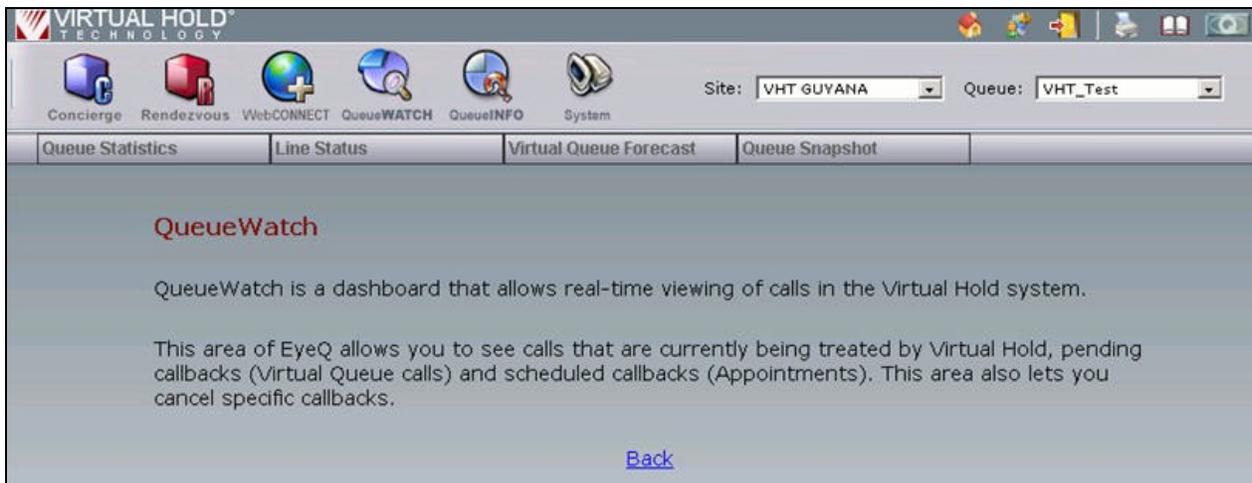
Access the Virtual Hold Concierge web-based EyeQ application by using the URL “http://host name/eyeQ/Home.aspx” in an Internet browser window, where “host name” is the host name of the Virtual Hold Concierge server. Log in with the proper credentials.

A login form with a dark blue background. It contains three input fields: 'User name', 'Password', and 'Locale' (set to 'English'). Below the fields are 'Clear' and 'Login' buttons. The 'VIRTUAL HOLD TECHNOLOGY' logo is at the bottom.

The screen below is displayed next. Click on the **QueueWATCH** icon.



The **QueueWatch** screen is displayed. Select the **Line Status** tab.



The **Line Status** pop-up window is displayed. Verify that the **Status** of the “Inbound” DS1 lines is “wait”, and that the **Status** of the “Outbound” DS1 lines is “idle”, as shown below.

Site Name	Queue Name	Line Number	Line Type	Status
VHT GUYANA	n-a	1	Inbound	wait
VHT GUYANA	n-a	2	Inbound	wait
VHT GUYANA	n-a	3	Outbound	idle
VHT GUYANA	n-a	4	Outbound	idle
-	-	-	-	-

Make a few calls to the entry VDN. From the **QueueWatch** screen, select the **Queue Statistics** tab.

**QueueWatch**

QueueWatch is a dashboard that allows real-time viewing of calls in the Virtual Hold system.

This area of EyeQ allows you to see calls that are currently being treated by Virtual Hold, pending callbacks (Virtual Queue calls) and scheduled callbacks (Appointments). This area also lets you cancel specific callbacks.

[Back](#)

The **Queue Statistics** pop-up window is displayed. Verify that the data values properly reflect the current system activities.

Queue Name	Op Mode	Mode Status	EWT	Agents Available	Agents Staffed	ACD Queue	Holding Queue	Virtual Queue	Priority Queue	Calls in IVR	Total Calls in VH	Appts
VHT_Test	Normal	Normal	00:03:07	0	1	3	3	0	0	0	3	0

## 9. Conclusion

These Application Notes describe the configuration steps required for Virtual Hold Concierge 6.7.2 to successfully interoperate with Avaya Aura™ Communication Manager using Avaya Aura™ Application Enablement Services. All feature and serviceability test cases were completed with an observation noted in **Section 7**.

## 10. Additional References

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

- *Administrator Guide for Avaya Aura™ Communication Manager*, Document 03-300509, Issue 5.0, Release 5.2, May 2009, available at <http://support.avaya.com>.
- *Avaya Aura™ Application Enablement Services Administration and Maintenance Guide*, Release 5.2, Document ID 02-300357, Issue 11, November 2009, available at <http://support.avaya.com>.
- *Virtual Hold ACD Configuration Guide*, available from the Virtual Hold Concierge 6.7.2 Installation CD.
- *Virtual Hold Version 6 Deployment Guide*, available from the Virtual Hold Concierge 6.7.2 Installation CD.

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