



## **Avaya Solution & Interoperability Test Lab**

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# **Application Notes for Virtual Hold Concierge 6.7.2 with Avaya Aura<sup>™</sup> Communication Manager Using Avaya Aura<sup>™</sup> 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<sup>™</sup> Communication Manager using Avaya Aura<sup>™</sup> Application Enablement Services. Virtual Hold Concierge is a contact center solution that uses the Avaya Telephony Services Application Programming Interface from Avaya Aura<sup>™</sup> 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:

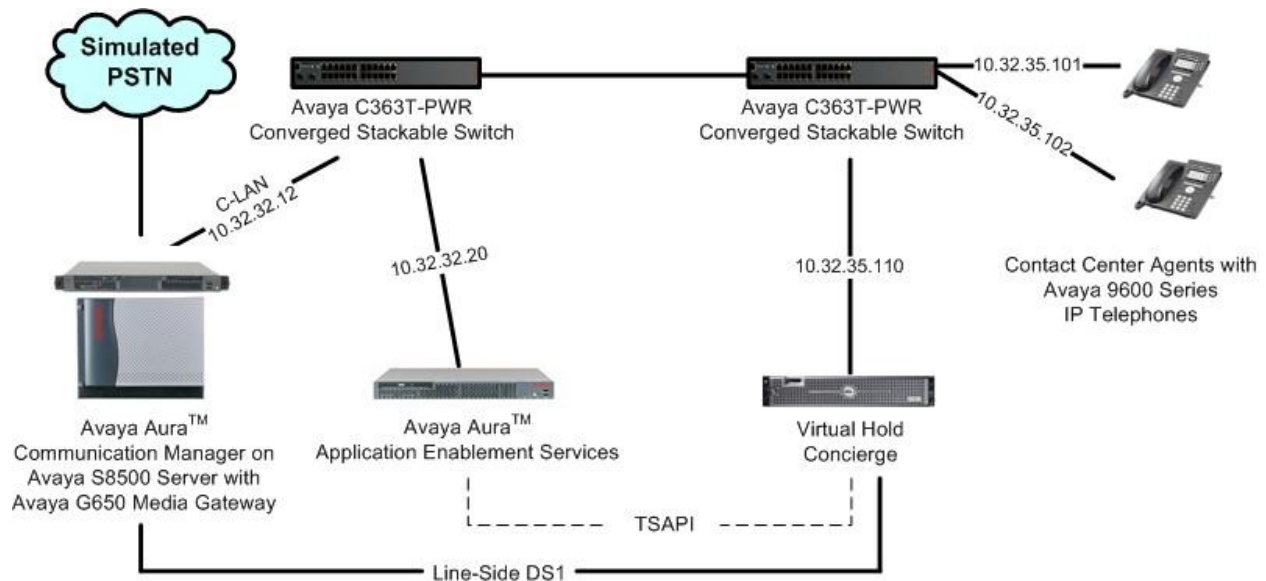
- **Phone:** (866) 670-2223
- **Email:** [support@virtualhold.com](mailto:support@virtualhold.com)

## 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	<b>Computer Telephony Adjunct Links? y</b>
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	Reason Codes? y
BCMS (Basic)? y	Service Level Maximizer? n
BCMS/VuStats Service Level? n	Service Observing (Basic)? y
BSR Local Treatment for IP & ISDN? n	Service Observing (Remote/By FAC)? y
Business Advocate? n	Service Observing (VDNs)? y
Call Work Codes? y	Timed ACW? y
DTMF Feedback Signals For VRU? n	<b>Vectoring (Basic)? y</b>
Dynamic Advocate? n	Vectoring (Prompting)? y
Expert Agent Selection (EAS)? y	Vectoring (G3V4 Enhanced)? y
EAS-PHD? n	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	
<b>Extension:</b> 60100	
<b>Type:</b> ADJ-IP	
COR: 1	
<b>Name:</b> 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	
Location: 01A10	<b>Name:</b> Virtual Hold
Bit Rate: 1.544	<b>Line Coding:</b> ami-basic
Line Compensation: 1	<b>Framing Mode:</b> d4
<b>Signaling Mode:</b> robbed-bit	
Interface Companding: 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
<b>Type: DS1FD</b>	Security Code:	TN: 1
<b>Port: 01A1001</b>	Coverage Path 1:	COR: 1
<b>Name: VH Inbound Line #1</b>	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/ Hunt-to	Port/ Type	Name/ Surv GK NN	Move	Room/ Data Ext	Cv1/ Cv2	COR/ COS	Cable/ 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/ Hunt-to	Port/ Type	Name/ Surv GK NN	Move	Room/ Data Ext	Cv1/ Cv2	COR/ COS	Cable/ TN Jack		
67993	01A1003	VH Outbound Line #1				1			
	DS1FD		no			1	1		
67994	01A1004	VH Outbound Line #2				1			
	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.

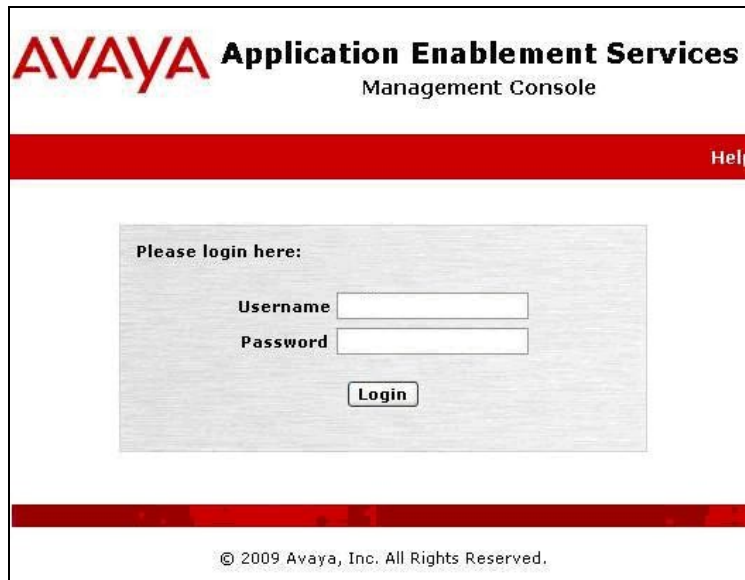
Verify that there are sufficient licenses for **TSAPI Simultaneous Users**, as shown below. Also verify that there is an applicable advanced switch license, in this case **AES ADVANCED MEDIUM SWITCH** for the Avaya S8500 Server.

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

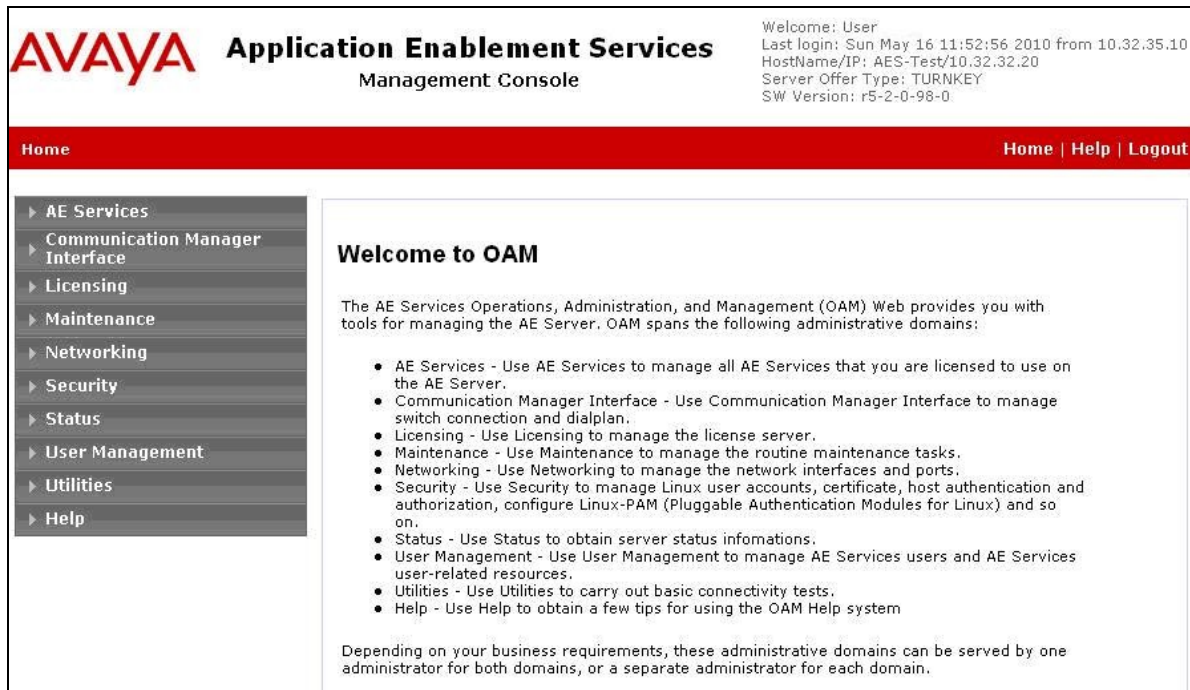
Access the OAM web-based interface by using the URL “https://ip-address” in an Internet browser window, where “ip-address” is the IP address of the Application Enablement Services server.

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



The screenshot shows the login page of 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. Below this is a red horizontal bar with the word "Help" in white on the right side. The main content area has a light gray background with the text "Please login here:" followed by two input fields labeled "Username" and "Password". Below these fields is a "Login" button. At the bottom of the page, there is a red horizontal bar and 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 of 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. To the right of the header, 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 horizontal 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 has a light gray background with the heading "Welcome to OAM". Below the heading, there is a paragraph: "The AE Services Operations, Administration, and Management (OAM) Web provides you with tools for managing the AE Server. OAM spans the following administrative domains:". This is followed by a bulleted list of administrative domains and their functions. At the bottom, there is a paragraph: "Depending on your business requirements, these administrative domains can be served by one administrator for both domains, or a separate administrator for each domain."

**AVAYA Application Enablement Services Management Console**

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  
SW Version: r5-2-0-98-0

Home | Help | Logout

Home

AE Services  
Communication Manager Interface  
Licensing  
Maintenance  
Networking  
Security  
Status  
User Management  
Utilities  
Help

### 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 header includes the AVAYA logo, the title "Application Enablement Services Management Console", and a welcome message for the user. The left navigation pane shows a tree structure with "AE Services" expanded, containing "CVLAN", "DLG", "DMCC", "SMS", "TSAPI" (expanded), "TSAPI Links" (selected), and "TSAPI Properties". 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 left navigation pane is the same as the previous screenshot, but "Communication Manager Interface" and "Licensing" are also visible under "TSAPI". 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). At the bottom of 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 left navigation pane has 'Security' expanded, with 'Security Database' and 'Control' selected. The main content area is titled 'SDB Control for DMCC and TSAPI' and contains two checkboxes: 'Enable SDB for DMCC Service' (checked) and 'Enable SDB TSAPI Service, JTAPI and Telephony Service' (unchecked). An 'Apply Changes' button is at the bottom.

AVAYA Application Enablement Services Management Console

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  
SW Version: r5-2-0-98-0

Security | Security Database | Control

Home | Help | Logout

AE Services  
Communication Manager Interface  
Licensing  
Maintenance  
Networking  
Security  
Account Management  
Audit  
Certificate Management  
Enterprise Directory  
Host AA  
PAM  
Security Database  
Control

**SDB Control for DMCC and TSAPI**

☒ Enable SDB for DMCC Service  
☐ Enable SDB TSAPI Service, JTAPI and Telephony Service

## 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 left navigation pane has 'Maintenance' expanded, with 'Service Controller' selected. The main content area is titled 'Service Controller' and contains a table with two columns: 'Service' and 'Controller Status'. The table lists several services, with 'TSAPI Service' checked. Below the table is a link 'Status and Control' and a row of buttons: 'Start', 'Stop', 'Restart Service', 'Restart AE Server', 'Restart Linux', and 'Restart Web Server'.

AVAYA Application Enablement Services Management Console

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  
SW Version: r5-2-0-98-0

Maintenance | Service Controller

Home | Help | Logout

AE Services  
Communication Manager Interface  
Licensing  
Maintenance  
Date Time/NTP Server  
Security Database  
Service Controller  
Server Data  
Networking  
Security  
Status  
User Management

**Service Controller**

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](#)

## 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 for the user. The main navigation bar shows "Security | Security Database | Tlinks" and links for "Home | Help | Logout". The left sidebar contains a tree view of the application's structure, with "Security Database" expanded to show "Tlinks" selected. The main content area, titled "Tlinks", displays a single Tlink entry with the name "AVAYA#S8500#CSTA#AES-TEST" and buttons for "Edit Tlink" and "Delete Tlink".

**AVAYA** Application Enablement Services Management Console

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  
SW Version: r5-2-0-98-0

Security | Security Database | Tlinks Home | Help | Logout


**Tlinks**

Tlink Name  
AVAYA#S8500#CSTA#AES-TEST  
Edit Tlink 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).

**Application Enablement  
Services  
Management Console**

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  
SW Version: r5-2-0-98-0

User Management | User Admin | Add UserHome | Help | Logout

▶ AE Services

▶ Communication Manager  
Interface

▶ Licensing

▶ Maintenance

▶ Networking

▶ Security

▶ Status

▼ User Management

▶ Service Admin

▼ User Admin

▪ Add User

▪ Change User Password

▪ List All Users

▪ Modify Default Users

▪ Search Users

▶ Utilities

▶ Help

### Add User

Fields marked with \* can not be empty.

* User Id	<input type="text" value="VirtualHold"/>
* Common Name	<input type="text" value="Virtual Hold"/>
* Surname	<input type="text" value="Virtual Hold"/>
* User Password	<input type="password" value="....."/>
* Confirm Password	<input type="password" value="....."/>
Admin Note	<input type="text"/>
Avaya Role	<input type="text" value="None"/>
Business Category	<input type="text"/>
Car License	<input type="text"/>
CM Home	<input type="text"/>
Css Home	<input type="text"/>
CT User	<input type="text" value="Yes"/>
Department Number	<input type="text"/>
Display Name	<input type="text"/>

## 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.

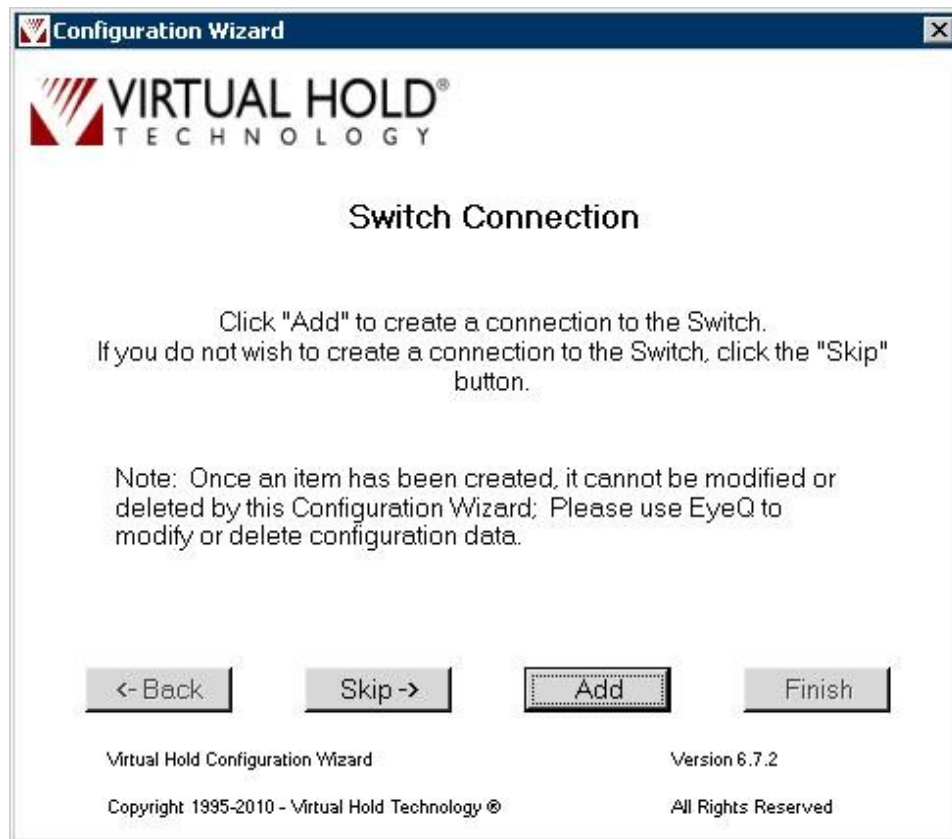
### 6.1. Launch Configuration Wizard

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.



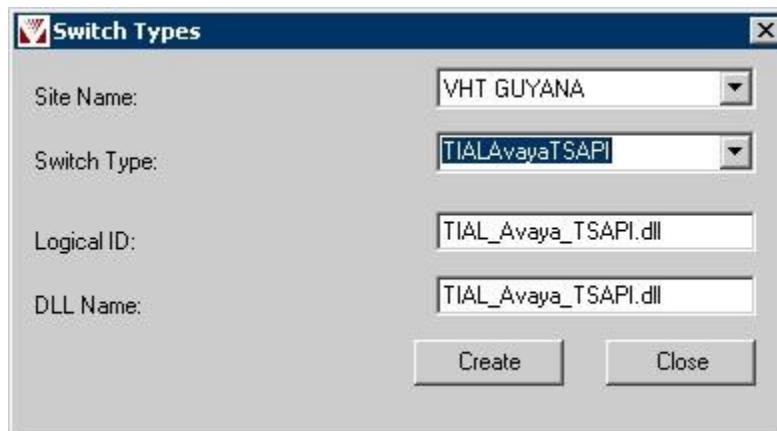
## 6.2. Administer Switch Connection

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.

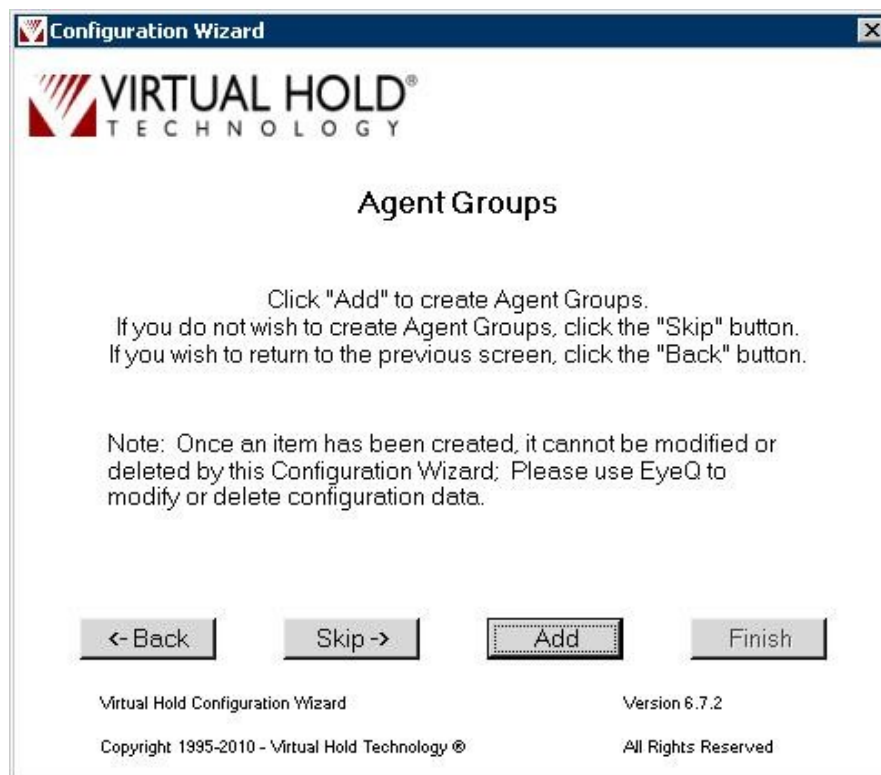
Retain the default values in the remaining fields. Click **Create**, followed by **Close**.





### 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**.

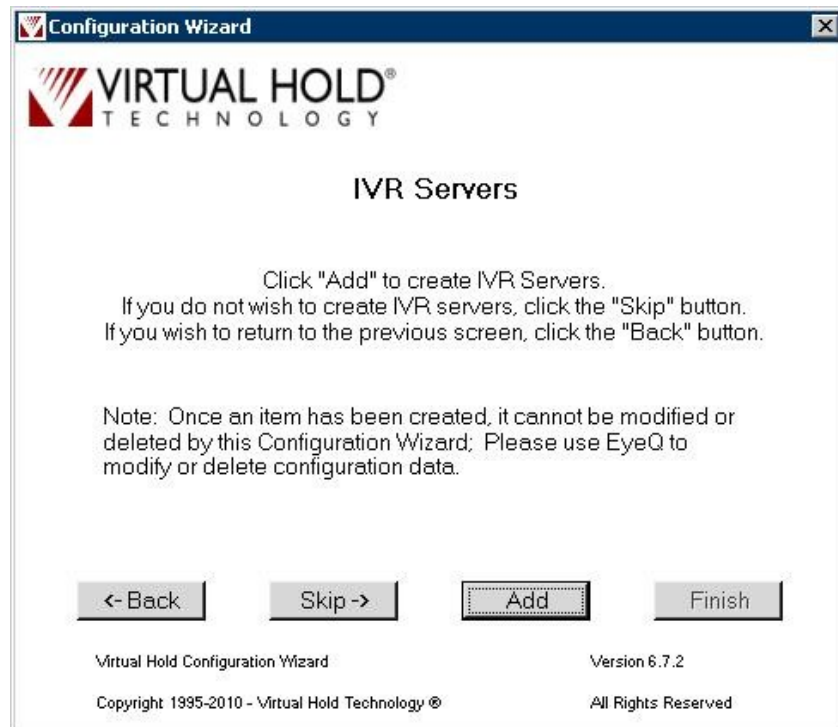


The **Agents** screen is displayed next. Click **Skip**.




## 6.4. Administer IVR Servers and Extensions

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



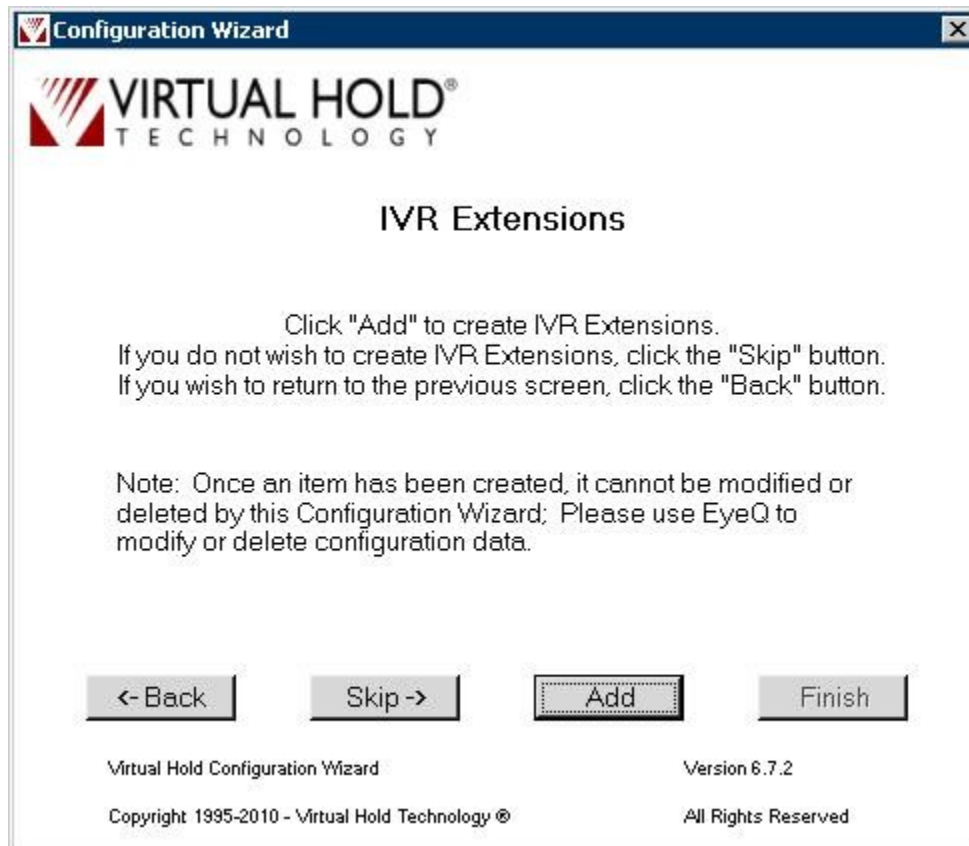


The **IVR Servers** screen below is displayed. For **Route Point**, enter the inbound DS1 hunt group extension number from **Section 4.6**. Retain the default values in the remaining fields. Click **Create**, followed by **Close**.



The image shows a Windows-style dialog box titled "IVR Servers". 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 image shows a "Configuration Wizard" window for "VIRTUAL HOLD TECHNOLOGY". The title bar says "Configuration Wizard". The main content area is titled "IVR Extensions". It contains the following text: "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." Below this is a note: "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**.

**Queues Setup**

Site Name:  Queue ID:

**QueueSettings**

Op Mode:  Turn On Threshold (sec):  Call Handle Time (secs):  No Ans Period (sec):

Name:  Script Number:  Busy Attempts:  Try Again Attempts:

Mode:  Agents Staffed Override:  Busy Period (secs):  Try Again Period (secs):

Group:  Callback Threshold (secs):  No Ans Attempts:  Max Attempts:

Default Number of Agents:

**Business Hours**

Day Of Week: Sun ☒ Mon ☒ Tues ☒ Wed ☒ Thur ☒ Fri ☒ Sat ☒

Time Begin:

Time End:

**Callbacks Offered**

Day Of Week: Sun ☒ Mon ☒ Tues ☒ Wed ☒ Thur ☒ Fri ☒ Sat ☒

Time Begin:

Time End:

**Callbacks Allowed**

Day Of Week: Sun ☒ Mon ☒ Tues ☒ Wed ☒ Thurs ☒ Fri ☒ Sat ☒

Sched callbacks allowed/15 min:

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:

VH Server Switch Name:

**Callback Queues**

☒ Use VH Server Switch Name prefix

Callback Queue ID\*:

Transfer Device:

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

**Holding Queues**

☒ Use VH Server Switch Name prefix

Holding Queue ID\*:

Route Device:

Transfer Device:

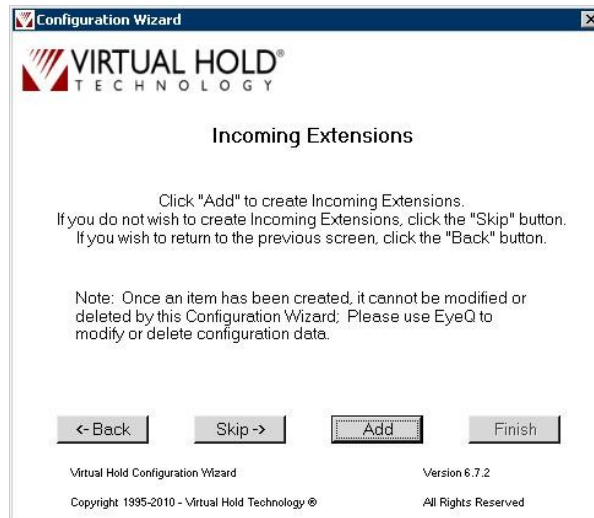
**Holding Queue "VHAESID:65902" created**

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

\* Verify VH Server Switch Name

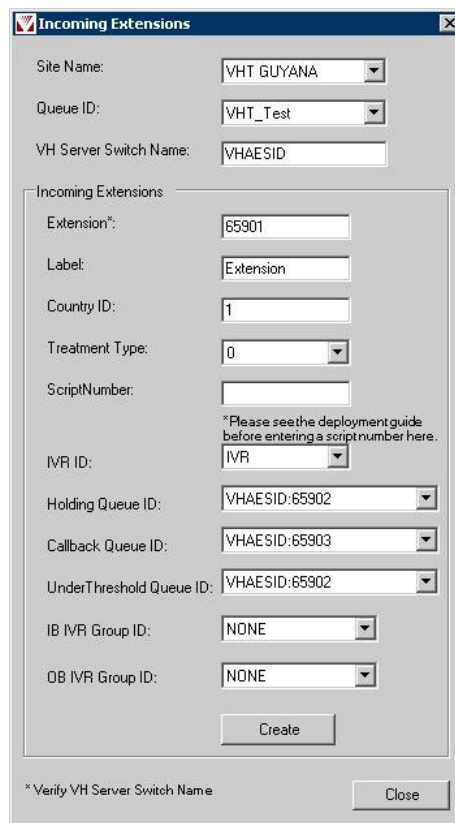
## 6.6. Administer Incoming Extensions

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



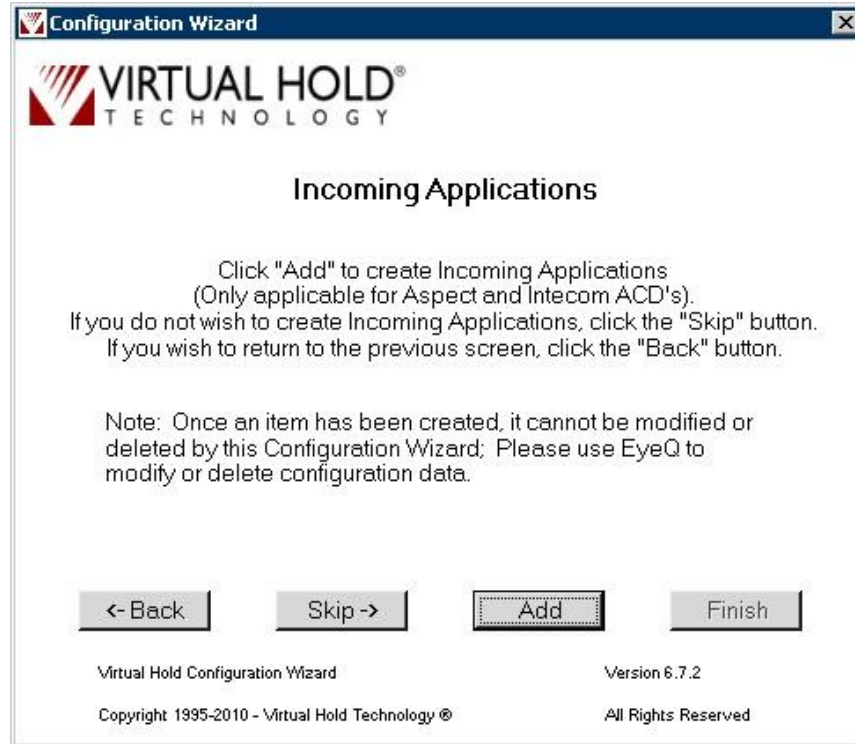
The screenshot shows a window titled "Configuration Wizard" with the Virtual Hold Technology logo. The main heading is "Incoming Extensions". Below the heading, there is instructional text: "Click 'Add' to create Incoming Extensions. If you do not wish to create Incoming Extensions, click the 'Skip' button. If you wish to return to the previous screen, click the 'Back' button." A note states: "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, there are four buttons: "<- Back", "Skip ->", "Add", and "Finish". The footer contains the text: "Virtual Hold Configuration Wizard", "Version 6.7.2", "Copyright 1995-2010 - Virtual Hold Technology ©", and "All Rights Reserved".

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 various configuration fields. The fields are: "Site Name" (dropdown menu with "VHT GUYANA" selected), "Queue ID" (dropdown menu with "VHT\_Test" selected), "VH Server Switch Name" (text field with "VHAESID"), "Incoming Extensions" section containing: "Extension\*" (text field with "65901"), "Label" (text field with "Extension"), "Country ID" (text field with "1"), "Treatment Type" (dropdown menu with "0" selected), "ScriptNumber" (text field), "IVR ID" (dropdown menu with "IVR" selected), "Holding Queue ID" (dropdown menu with "VHAESID:65902" selected), "Callback Queue ID" (dropdown menu with "VHAESID:65903" selected), "UnderThreshold Queue ID" (dropdown menu with "VHAESID:65902" selected), "IB IVR Group ID" (dropdown menu with "NONE" selected), and "OB IVR Group ID" (dropdown menu with "NONE" selected). A "Create" button is at the bottom of the form. A note at the bottom left says "\* Please see the deployment guide before entering a script number here." and a "Close" button is at the bottom right. A footer note says "\* Verify VH Server Switch Name".

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.

**AVAYA** **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:

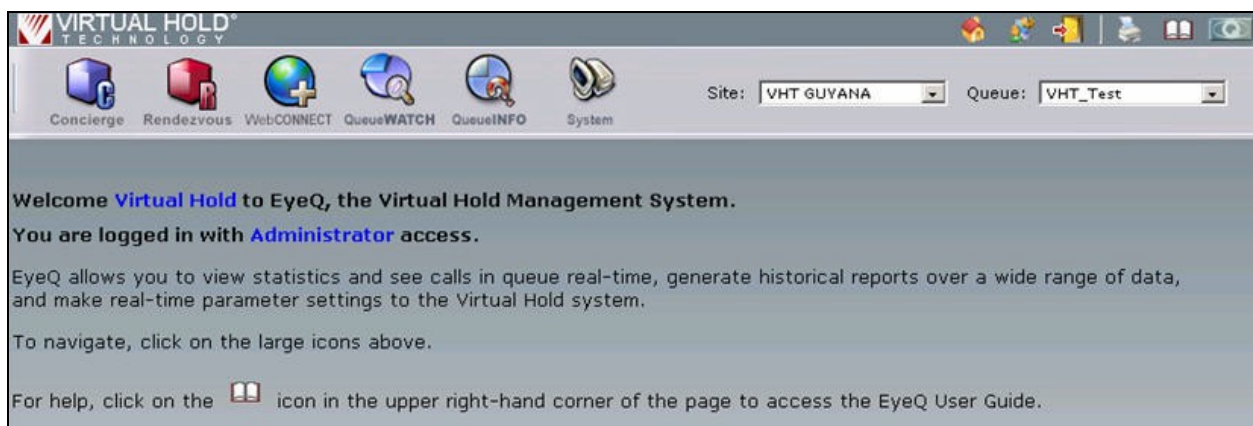
### 8.3. Verify Virtual Hold Concierge

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.

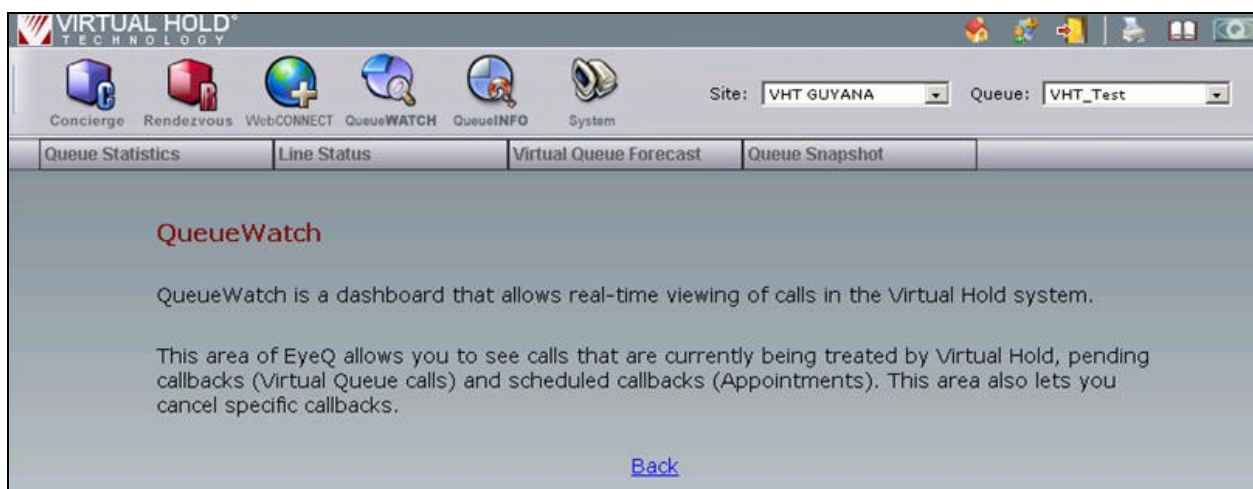


The login screen for the Virtual Hold Concierge application. It features a dark blue background with a light blue gradient. At the top, there are three input fields: 'User name', 'Password', and 'Locale' (set to 'English'). Below these fields are two buttons: 'Clear' and 'Login'. At the bottom, the 'VIRTUAL HOLD TECHNOLOGY' logo is displayed.

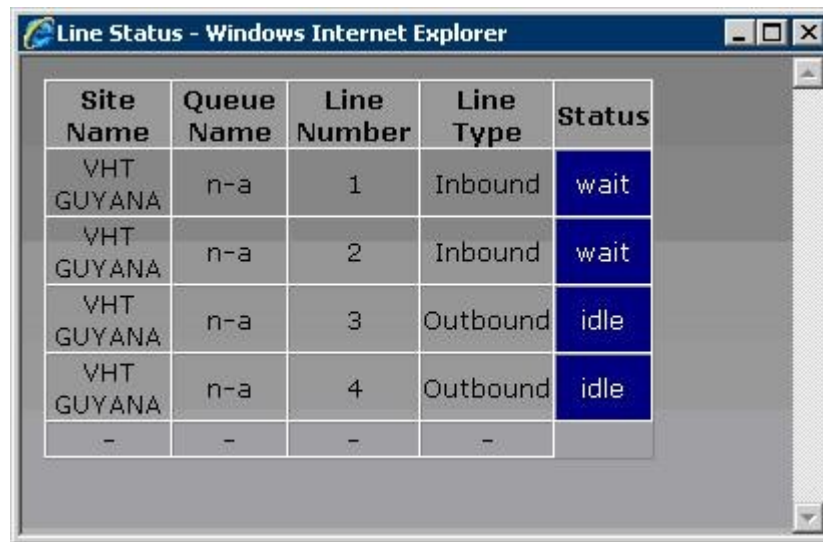
The screen below is displayed next. Click on the **QueueWATCH** icon.



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

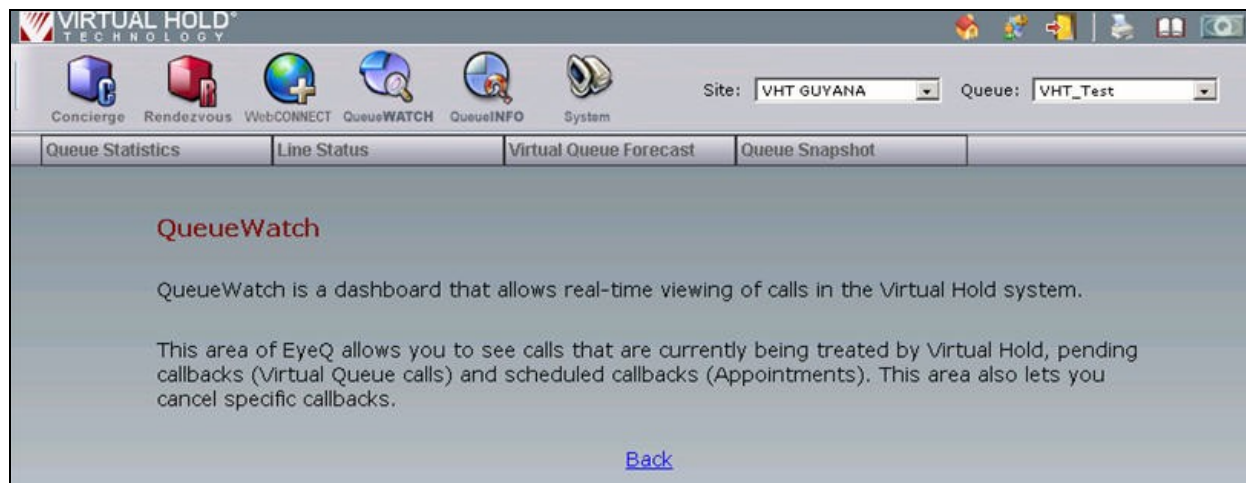


The **Line Status** pop-up window is displayed. Verify that the **Status** of the “Inbound” DS1 lines is “wait”, and that the **Status** of the “Outbound” DS1 lines is “idle”, as shown below.



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		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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