



Avaya Solution & Interoperability Test Lab

Application Notes for KnoahSoft Harmony with Avaya Aura™ Communication Manager Using Avaya Aura™ Application Enablement Services – Issue 1.0

Abstract

These Application Notes describe the configuration steps required for KnoahSoft Harmony to interoperate with Avaya Aura™ Communication Manager using Avaya Aura™ Application Enablement Services. KnoahSoft Harmony is a solution that can provide monitoring, recording, quality assurance, reporting, and analytic features for contact centers. The compliance testing focused on the call recording feature.

In the compliance testing, KnoahSoft Harmony used the Telephony Services Application Programming Interface from Avaya Aura™ Application Enablement Services to monitor skill groups and agent telephone extensions on Avaya Aura™ Communication Manager, the port mirroring method to capture the media associated with the monitored agents for call recording, and the RTCP packets from the Avaya IP Telephones to map IP addresses to extensions.

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 KnoahSoft Harmony to interoperate with Avaya Aura™ Communication Manager using Avaya Aura™ Application Enablement Services. KnoahSoft Harmony is a solution that can provide monitoring, recording, quality assurance, reporting, and analytic features for contact centers. The compliance testing focused on the call recording feature.

In the compliance testing, KnoahSoft Harmony used the Telephony Services Application Programming Interface (TSAPI) from Avaya Aura™ Application Enablement Services to monitor skill groups and agent telephone extensions on Avaya Aura™ Communication Manager, the port mirroring method to capture the media associated with the monitored agents for call recording, and the RTCP packets from the Avaya IP Telephones to map IP addresses to extensions.

The TSAPI interface is used by KnoahSoft Harmony to monitor the skill groups and agent telephone extensions. When there is an active call on the monitored agent, KnoahSoft Harmony is informed of the call via event reports from the TSAPI interface. KnoahSoft Harmony starts the call recording by using the replicated media from the port mirroring method. The TSAPI event reports are also used to determine when to stop the call recordings.

1.1. Interoperability Compliance Testing

The interoperability compliance test included feature and serviceability testing.

The feature testing focused on verifying the following on KnoahSoft Harmony:

- Handling of TSAPI messages in the areas of event notification, value queries, and system status.
- Proper recording, logging, and playback of calls for scenarios involving inbound, outbound, internal, external, ACD, non-ACD, hold, reconnect, simultaneous, conference, and transfer.

The serviceability testing focused on verifying the ability of KnoahSoft Harmony to recover from adverse conditions, such as disconnecting/reconnecting the Ethernet cable to the KnoahSoft Harmony server.

1.2. Support

Technical support on KnoahSoft Harmony can be obtained through the following:

- **Phone:** (650) 385-6795
- **Email:** support@knoahsoft.com
- **Web:** <http://www.knoahsoft.com/support.html>

2. Reference Configuration

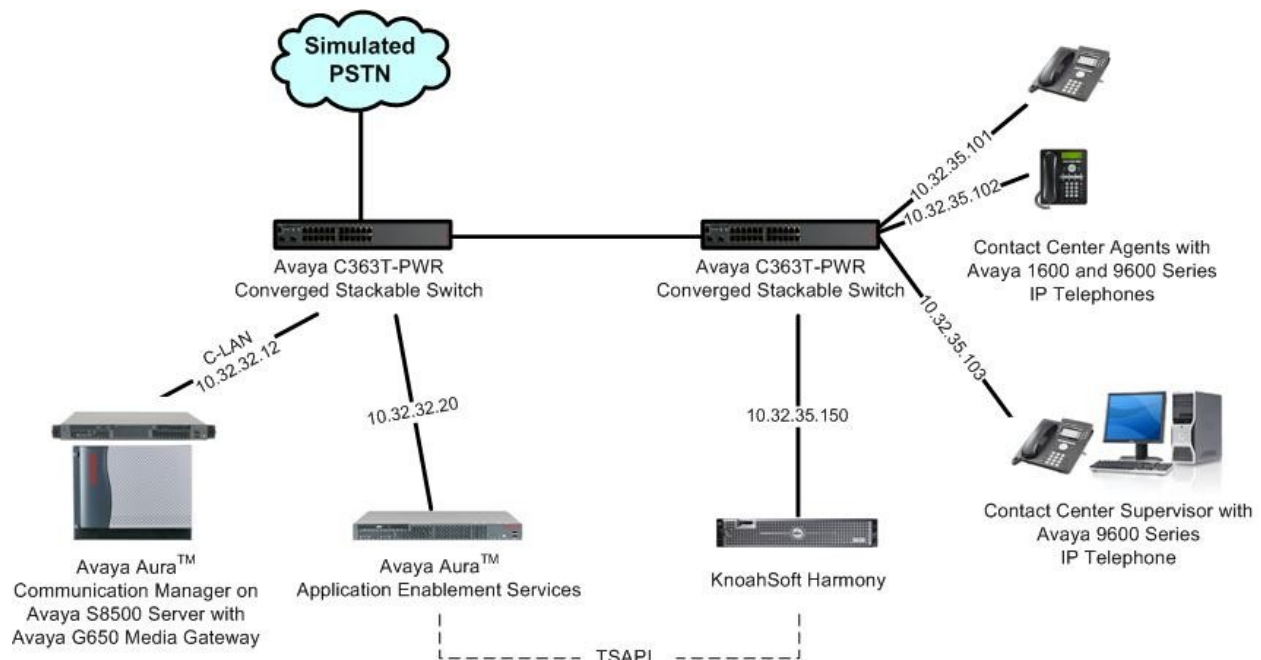
KnoahSoft Harmony can be configured on a single server or with components distributed across multiple servers. The compliance test used a single server configuration, as shown in the figure below.

In the compliance testing, the RTP stream for contact center agents with Avaya IP Telephones are mirrored from the layer 2 switch, and replicated over to the Knoahsoft Harmony server.

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. In addition, the port mirroring of the layer 2 switch is also outside the scope of these Application Notes and will not be described.

In the compliance testing, the contact center devices consisted of a skill group, a supervisor, and two agents shown in the table below. KnoahSoft Harmony used the agent IDs with TSAPI queries to obtain the agents' associated telephone extensions, and requested monitoring on the skill group and agent telephone extensions.

Device Type	Extension
Skill Group	65555
Agent IDs	65881, 65882
Agent Telephone Extensions	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.02.0.947.3
Avaya G650 Media Gateway <ul style="list-style-type: none">• TN799DP C-LAN Circuit Pack• TN2302AP IP Media Processor	HW01 FW032 HW20 FW120
Avaya Aura™ Application Enablement Services	4.2.3
Avaya 1600 Series IP Telephones (H.323)	1.21
Avaya 9600 Series IP Telephones (H.323)	3.1
KnoahSoft Harmony on Windows 2003 Server with Service Pack 2 <ul style="list-style-type: none">• AES Adapter• Web Application Server• Database Server• Avaya TSAPI Windows Client	3.0 3.0.1 with Patch 03082010_00011 Jboss 4.2.3 Microsoft SQL Server 2005 4.1.0.323

4. Configure Avaya Aura™ Communication Manager

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

- Verify Communication Manager License
- Administer system parameters features
- Administer IP codec set
- Administer IP network region
- Administer CTI link

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	
Async. Transfer Mode (ATM) PNC? n		
Async. Transfer Mode (ATM) Trunking? n	Digital Loss Plan Modification? n	
ATM WAN Spare Processor? n	DS1 MSP? y	

4.2. Administer System Parameters Features

Use the “change system-parameters features” command to enable **Create Universal Call ID (UCID)**, which is located on **Page 5**. For **UCID Network Node ID**, enter an available node ID.

```
change system-parameters features                               Page 5 of 18
                        FEATURE-RELATED SYSTEM PARAMETERS

SYSTEM PRINTER PARAMETERS
  Endpoint:                               Lines Per Page: 60

SYSTEM-WIDE PARAMETERS
                                Switch Name: S8500-SAL
      Emergency Extension Forwarding (min): 10
      Enable Inter-Gateway Alternate Routing? n
  Enable Dial Plan Transparency in Survivable Mode? n
                                COR to Use for DPT: station

MALICIOUS CALL TRACE PARAMETERS
      Apply MCT Warning Tone? n      MCT Voice Recorder Trunk Group:
      Delay Sending RElease (seconds)? 0

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

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

Navigate to **Page 13**, and enable **Send UCID to ASAI**. This parameter allows for the universal call ID to be sent to KnoahSoft Harmony.

```
change system-parameters features                               Page 13 of 18
                        FEATURE-RELATED SYSTEM PARAMETERS

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

      Reporting for PC Non-Predictive Calls? n

                                Interruptible Aux Notification Timer (sec): 3
                                Interruptible Aux Deactivation Threshold (%): 95

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

4.3. Administer IP Codec Set

Use the “change ip-codec-set n” command, where “n” is an existing codec set number used for the agents. Enter the desired audio codec types in the **Audio Codec** fields. Note that KnoahSoft Harmony only supports the G.711MU, G.711A, and G.729 codec types.

```
change ip-codec-set 7                                     Page 1 of 2

                                IP Codec Set

Codec Set: 7

Audio      Silence      Frames      Packet
Codec      Suppression  Per Pkt    Size (ms)
1: G.711MU      n          2          20
2:
```

4.4. Administer IP Network Region

Use the “change ip-network-region n” command, where “n” is an existing network region used for the agents. Make certain that the **RTCP Reporting Enabled** field is enabled, as shown below. The RTCP packets are used by KnoahSoft Harmony to map IP addresses to agent extensions.

```
change ip-network-region 1                               Page 1 of 19

                                IP NETWORK REGION

Region: 1
Location:      Authoritative Domain: mproom18.com
Name: Main
MEDIA PARAMETERS                                Intra-region IP-IP Direct Audio: no
Codec Set: 1                                     Inter-region IP-IP Direct Audio: no
UDP Port Min: 2048                             IP Audio Hairpinning? y
UDP Port Max: 65535
DIFFSERV/TOS PARAMETERS                        RTCP Reporting Enabled? y
Call Control PHB Value: 46                     RTCP MONITOR SERVER PARAMETERS
Audio PHB Value: 46                           Use Default Server Parameters? y
Video PHB Value: 26
```

4.5. 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
Name: KnoahSoft CTI Link

COR: 1
```

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
- Obtain Tlink name
- Administer KnoahSoft user
- Restart TSAPI service

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 is displayed. Select **Application_Enablement** in the left pane, to display the **Licensed Features**.

Feature (Keyword)	Expiration Date	Licensed	Acquired
Application Enablement Connections (VALUE_AEC_CONNECTIONS)	permanent	16	1
CVLAN ASAI (VALUE_CVLAN_ASAI)	permanent	50	0
CVLAN Proprietary Links (VALUE_PROPRIETARY_LINKS)	permanent	8	0
TSAPI Version (VALUE_TSAPI_VERSION)	permanent	4.2	Not counted
DMCC DMC (VALUE_DMCC_DMC)	permanent	50	0


Scroll down the screen, and verify that there is sufficient license for **TSAPI Simultaneous Users**, as shown below.

TSAPI Simultaneous Users (VALUE_TSAPI_USERS)	permanent	1000	0
Unified CC API Desktop Edition (VALUE_AEC_UNIFIED_CC_DESKTOP)	permanent	1000	0
AES ADVANCED MEDIUM SWITCH (VALUE_AEC_MEDIUM_ADVANCED)	permanent	3	0
CVLAN (VALUE_CVLAN)	permanent	1	0

5.2. Launch OAM Interface

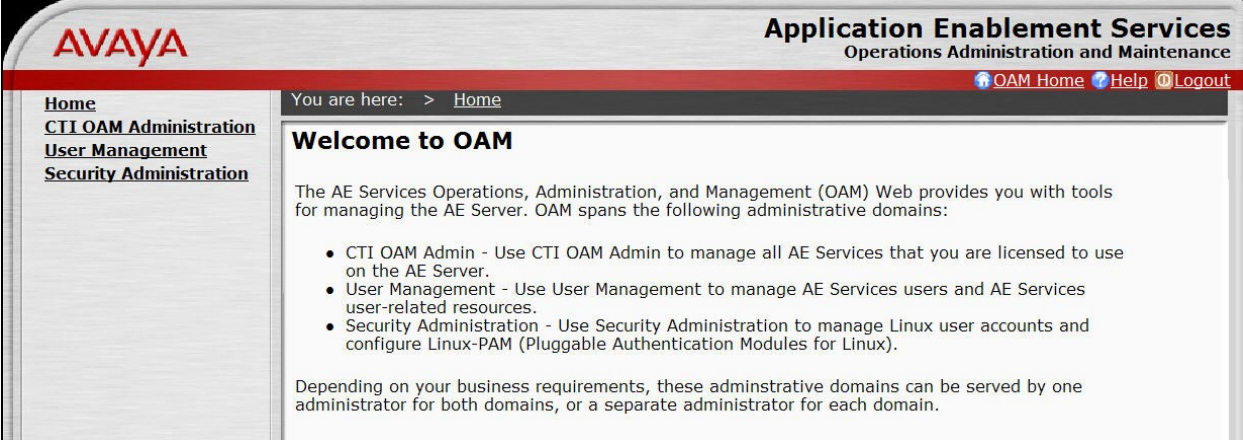
Access the OAM web-based interface by using the URL “https://ip-address/MVAP/ index.jsp” in an Internet browser window, where “ip-address” is the IP address of the Application Enablement Services server.

The **Please log on** screen is displayed. Log in using the appropriate credentials.



The image shows the login screen for the AVAYA Application Enablement Services. At the top, the AVAYA logo is in red. Below it, a red banner contains the text "Application Enablement Services" and a "? Help" link. The main content area is white and contains the text "Please log on." followed by two input fields: "Logon:" and "Password:". Below these fields is a blue "Login" button.

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



The image shows the "Welcome to OAM" screen. At the top, the AVAYA logo is in red. To the right, the text "Application Enablement Services" and "Operations Administration and Maintenance" is displayed. Below this, a red banner contains the text "You are here: > Home" and links for "OAM Home", "Help", and "Logout". On the left, a navigation pane lists the following links: "Home", "CTI OAM Administration", "User Management", and "Security Administration". The main content area is white and contains the text "Welcome to OAM" followed by 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:". Below this paragraph is a bulleted list of three items: "CTI OAM Admin - Use CTI OAM Admin to manage all AE Services that you are licensed to use on the AE Server.", "User Management - Use User Management to manage AE Services users and AE Services user-related resources.", and "Security Administration - Use Security Administration to manage Linux user accounts and configure Linux-PAM (Pluggable Authentication Modules for Linux).". At the bottom, a paragraph states: "Depending on your business requirements, these administrative domains can be served by one administrator for both domains, or a separate administrator for each domain."

The **Welcome to CTI OAM Screens** is displayed.

The screenshot shows the AVAYA Application Enablement Services (AES) Operations Administration and Maintenance (OAM) interface. The left sidebar contains a navigation menu with the following items: **CTI OAM Home**, **Administration**, **Status and Control**, **Maintenance**, **Alarms**, **Logs**, **Utilities**, and **Help**. The main content area displays the 'Welcome to CTI OAM Screens' page. At the top right, there are links for **OAM Home**, **Help**, and **Logout**. Below the header, a breadcrumb trail shows 'You are here: > CTI OAM Home'. The main content area includes a welcome message, a last login timestamp, and an important note about restarting AE Services. A table lists the status of various services, and a license information section is at the bottom.

Service	Status	State	Licenses Purchased
ASAI Link Manager	Running	N/A	N/A
DMCC Service	Running	ONLINE	Yes
CVLAN Service	Running	ONLINE	Yes
DLG Service	Running	OFFLINE	Yes
Transport Layer Service	Running	N/A	N/A
TSAPI Service	Running	ONLINE	Yes
SMS	N/A	N/A	Yes

5.3. Administer TSAPI Link

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

The screenshot shows the AVAYA Application Enablement Services (AES) Operations Administration and Maintenance (OAM) interface. The left sidebar contains a navigation menu with the following items: **CTI OAM Home**, **Administration**, **Network Configuration**, **Switch Connections**, **CTI Link Admin**, **TSAPI Links**, and **CVLAN Links**. The main content area displays the 'TSAPI Links' screen. At the top right, there are links for **OAM Home**, **Help**, and **Logout**. Below the header, a breadcrumb trail shows 'You are here: > Administration > CTI Link Admin > TSAPI Links'. The main content area includes a table with columns for 'Link', 'Switch Connection', and 'Switch CTI Link #'. Below the table, there are buttons for 'Add Link', 'Edit Link', and 'Delete Link'.

The **Add / Edit 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 4.5**. Retain the default values in the remaining fields, and click **Apply Changes**.

The screenshot shows the AVAYA Application Enablement Services (AES) web interface. The left navigation pane is expanded to 'CTI Link Admin' > 'TSAPI Links'. The main content area is titled 'Add / Edit TSAPI Links'. It contains the following fields and values:

- Link: 1
- Switch Connection: S8500
- Switch CTI Link Number: 1
- ASAI Link Version: 4
- Security: Unencrypted

At the bottom of the form are two buttons: 'Apply Changes' and 'Cancel Changes'.

5.4. Obtain Tlink Name

Select **Administration > Security Database > Tlinks** from the left pane. The **Tlinks** screen shows a listing of the Tlink names. A new Tlink name is automatically generated 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 KnoahSoft Harmony.

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.

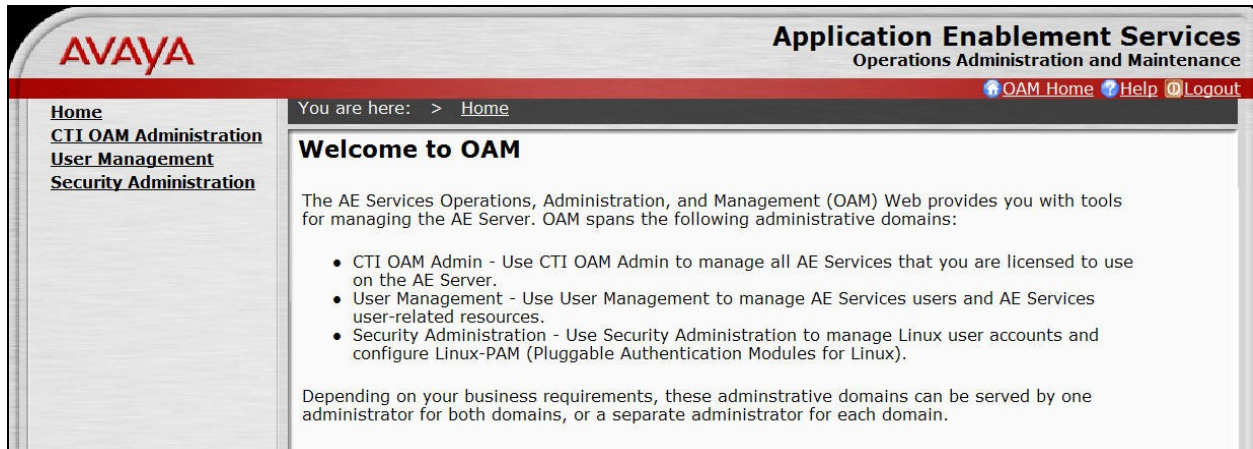
The screenshot shows the AVAYA Application Enablement Services (AES) web interface. The left navigation pane is expanded to 'Security Database' > 'Tlinks'. The main content area is titled 'Tlinks'. It displays a table with one row of Tlink information:

Tlink Name
AVAYA#S8500#CSTA#AES-TEST

Below the table are two buttons: 'Edit Tlink' and 'Delete Tlink'.

5.5. Administer KnoahSoft User

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



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



Select **User Management > Add User** from the left pane. In the **Add User** screen shown below, 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).

AVAYA **Application Enablement Services**
Operations Administration and Maintenance

[OAM Home](#) [Help](#) [Logout](#)

You are here: > [User Management](#) > [Add User](#)

Add User

Fields marked with * can not be empty.

* User Id

* Common Name

* Surname

* User Password

* Confirm Password

Admin Note

Avaya Role

Business Category

Car License

CM Home

Ciss Home

CT User

Department Number

5.6. Restart TSAPI Service

Return to the CTI OAM Administration web pages by selecting **OAM Home**, located at the upper right corner of the screen, to display the **Welcome to OAM** screen (shown in [Section 5.2](#)). Select **CTI OAM Administration** from the left pane to display the **Welcome to CTI OAM Screens** (shown in [Section 5.2](#)).

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

AVAYA **Application Enablement Services**
Operations Administration and Maintenance

[OAM Home](#) [Help](#) [Logout](#)

You are here: > [Maintenance](#) > [Service Controller](#)

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](#).

[Start](#) [Stop](#) [Restart Service](#) [Restart AE Server](#) [Restart Linux](#)

6. Configure KnoahSoft Harmony

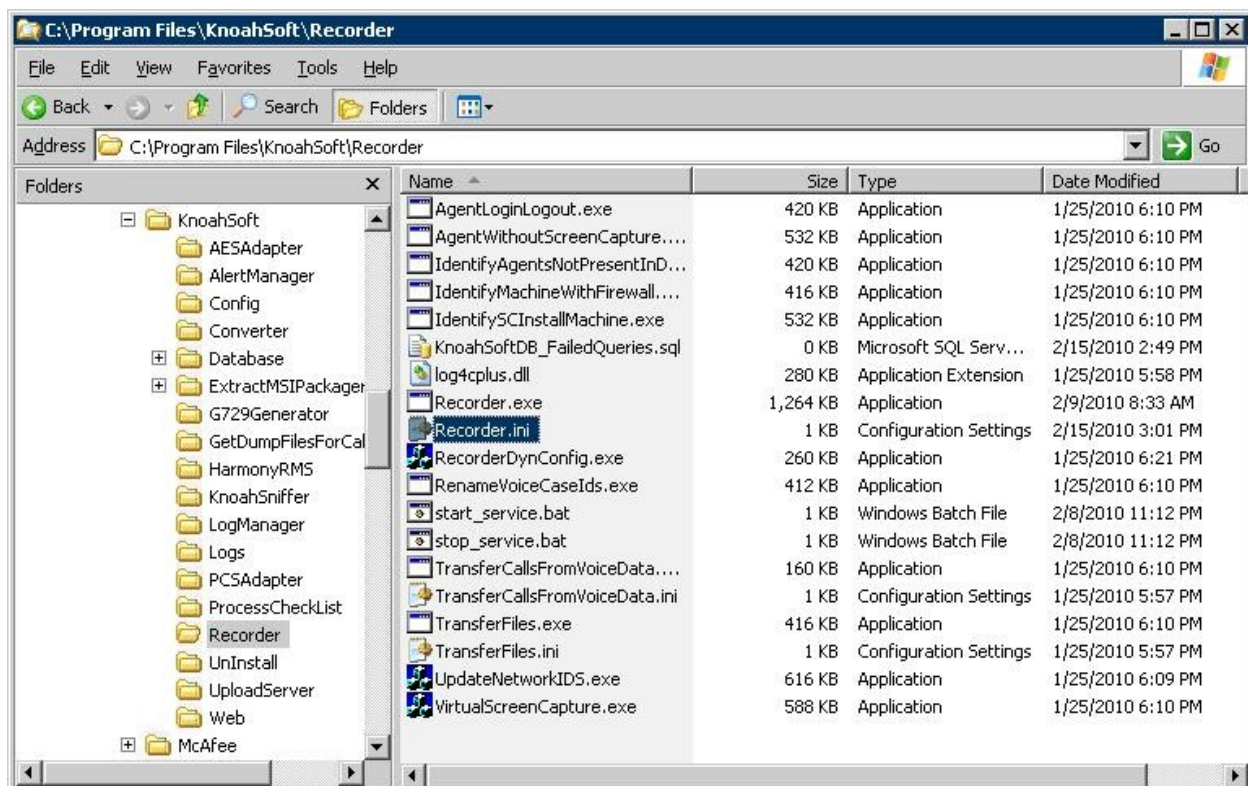
This section provides the procedures for configuring KnoahSoft Harmony. The procedures include the following areas:

- Administer Recorder.ini
- Administer AESAdapter.ini
- Administer AESAdapter
- Administer skill groups
- Administer supervisors
- Administer agents

The configuration of Harmony is performed by KnoahSoft installers and partners. The procedural steps are presented in these Application Notes for informational purposes.

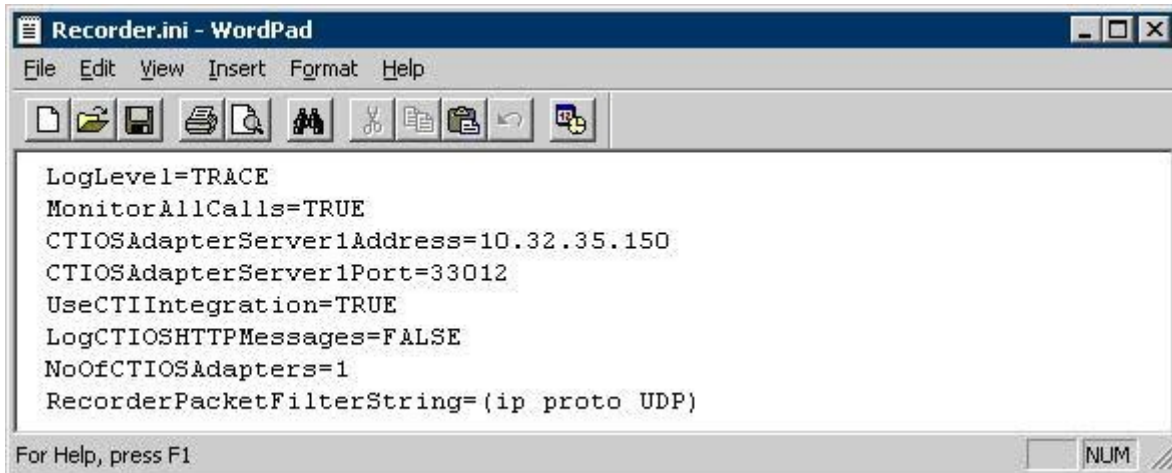
6.1. Administer Recorder.ini

From the Harmony server running the Recorder service, navigate to the **C:\Program Files\KnoahSoft\Recorder** directory to locate the **Recorder.ini** file shown below.



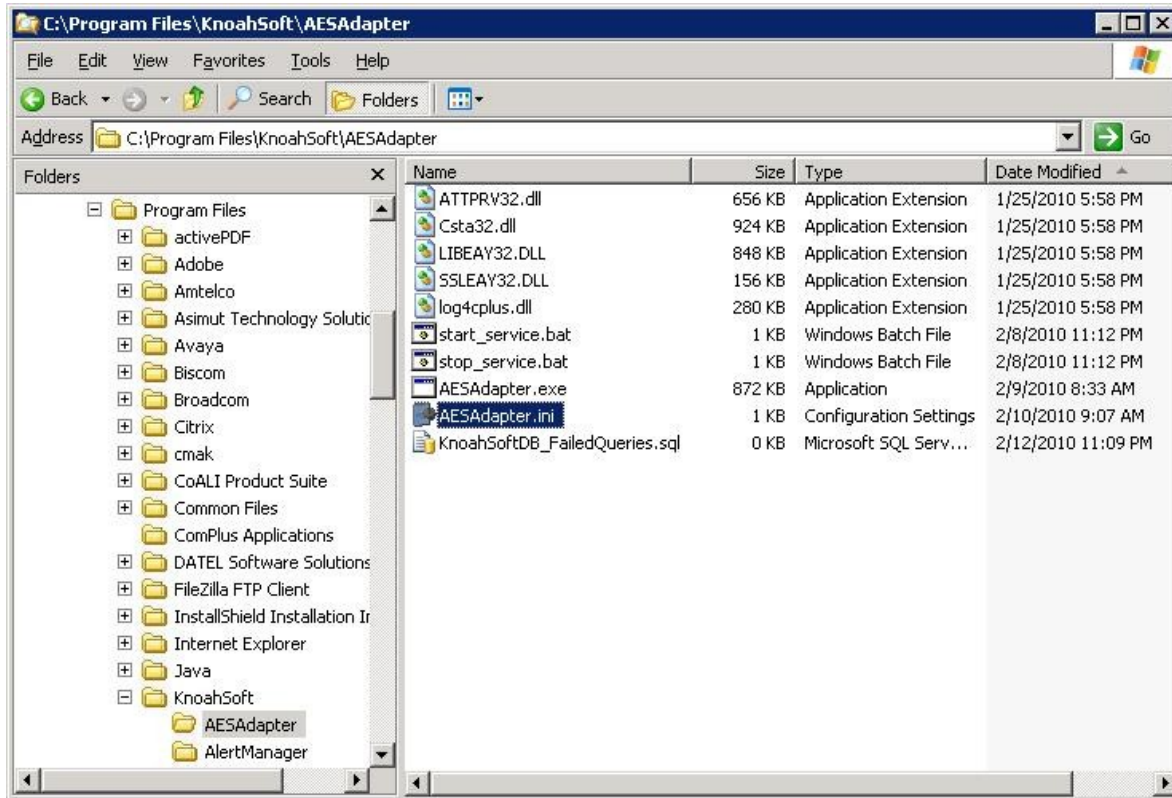
Open the **Recorder.ini** file with the WordPad application. Enter the following values for the specified fields, and retain the default values for the remaining fields.

- **CTIOSAdapterServer1Address:** IP address of server with the AES Adapter component.
- **CTIOSAdapterServer1Port:** "33012"
- **UseCTIIIntegration:** "TRUE"
- **LogCTIOSHTTPMessages:** "FALSE"
- **NoOfCTIOSAdapters:** "1"

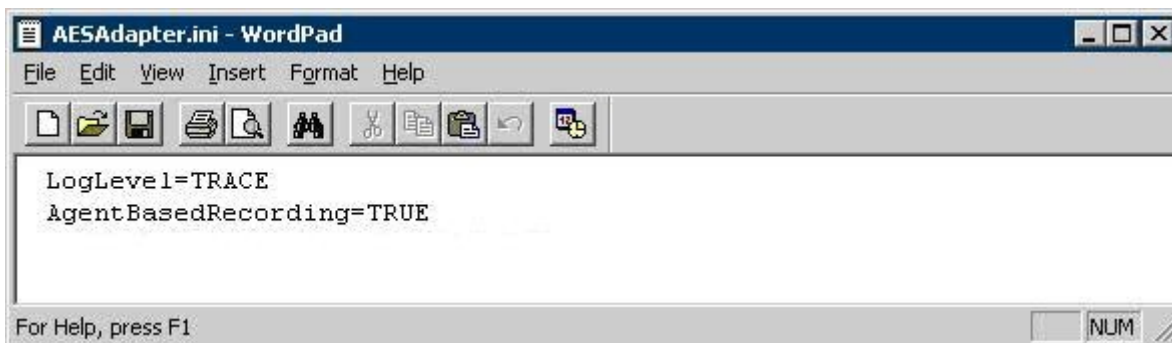


6.2. Administer AESAdapter.ini

From the Harmony server running the AES Adapter component, navigate to the **C:\Program Files\KnoahSoft\AESAdapter** directory to locate the **AESAdapter.ini** file shown below.

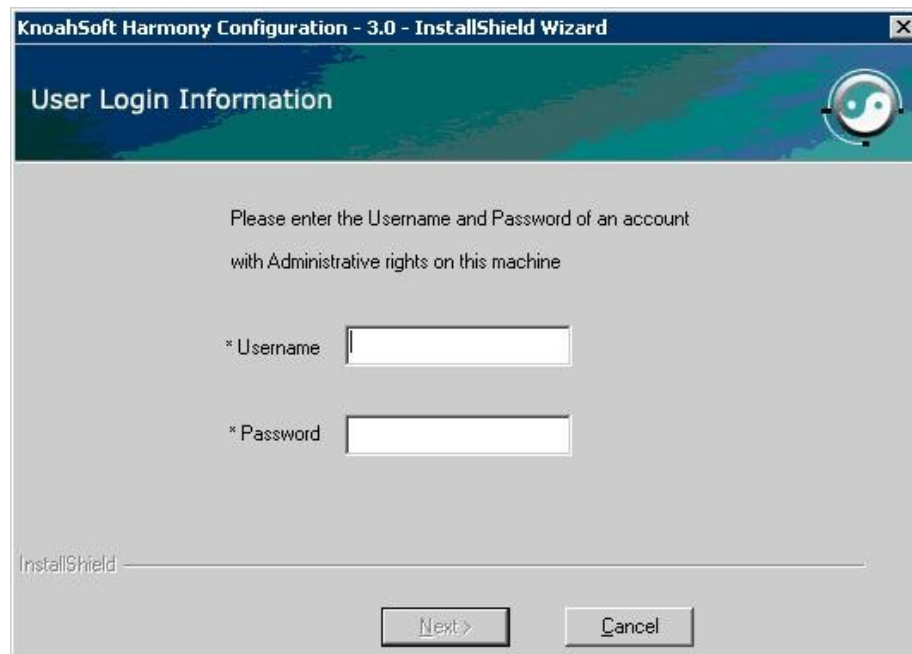


Open the **AESAdapter.ini** file with the WordPad application. Add the **AgentBasedRecording** parameter and set the value to "TRUE", as shown below.



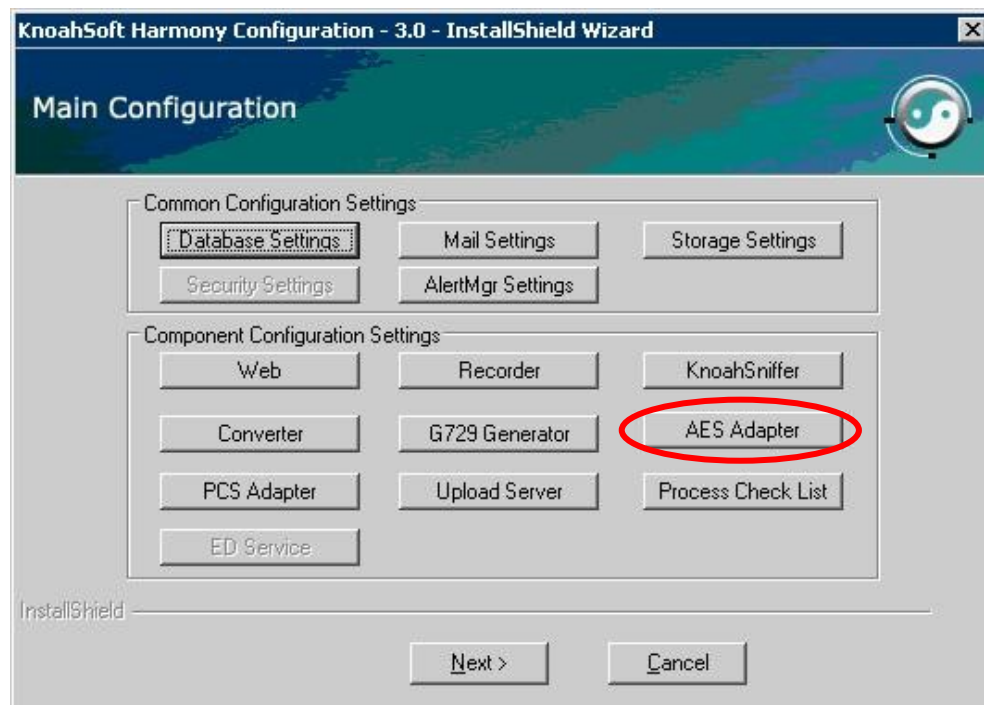
6.3. Administer AESAdapter

From the Harmony server running the AES Adapter component, select **Start > All Programs > KnoahSoft > KnoahSoft Config**, to display the **User Login Information** screen. Log in using the appropriate credentials.



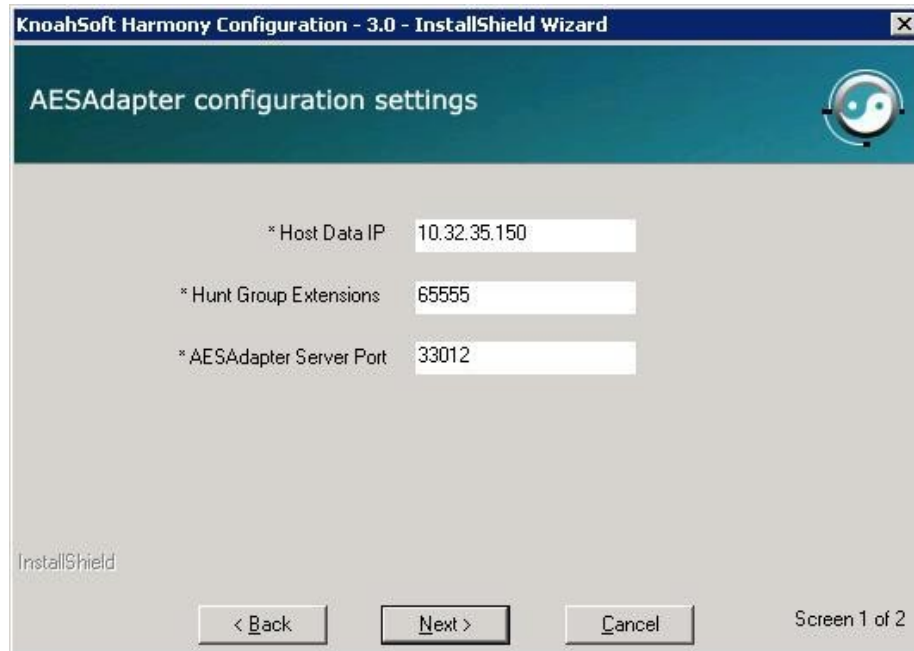
The screenshot shows the 'User Login Information' screen of the 'KnoahSoft Harmony Configuration - 3.0 - InstallShield Wizard'. The window has a title bar with the text 'KnoahSoft Harmony Configuration - 3.0 - InstallShield Wizard' and a close button. Below the title bar is a header with a blue background and the text 'User Login Information' and a circular logo. The main area is light gray and contains the text 'Please enter the Username and Password of an account with Administrative rights on this machine'. There are two input fields: '* Username' and '* Password'. At the bottom, there is a progress bar labeled 'InstallShield' and two buttons: 'Next >' and 'Cancel'.

The **Main Configuration** screen is displayed. Select **AES Adapter**.

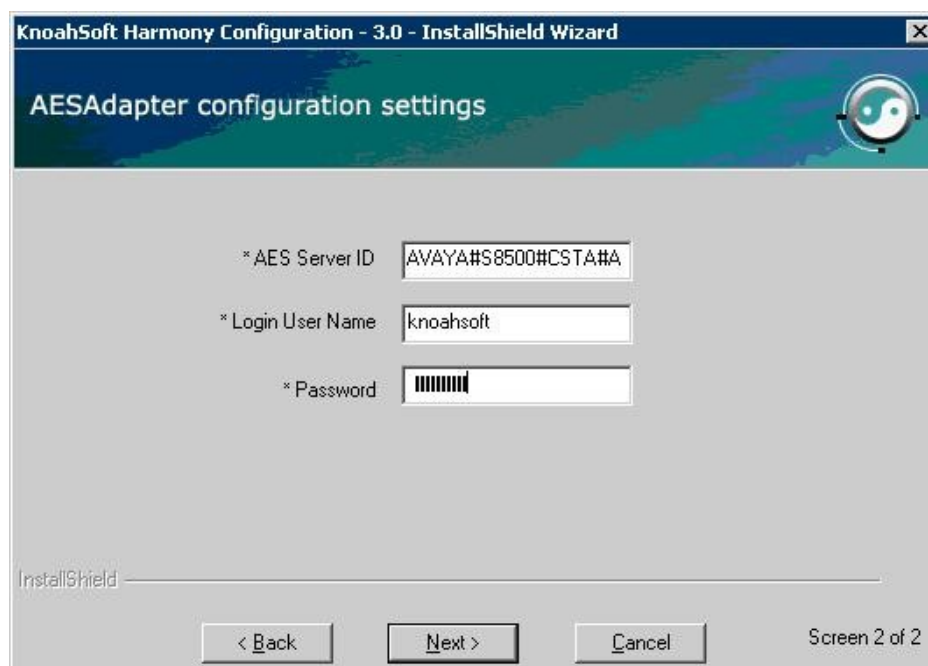


The screenshot shows the 'Main Configuration' screen of the 'KnoahSoft Harmony Configuration - 3.0 - InstallShield Wizard'. The window has a title bar with the text 'KnoahSoft Harmony Configuration - 3.0 - InstallShield Wizard' and a close button. Below the title bar is a header with a blue background and the text 'Main Configuration' and a circular logo. The main area is light gray and contains two sections: 'Common Configuration Settings' and 'Component Configuration Settings'. The 'Common Configuration Settings' section has buttons for 'Database Settings', 'Mail Settings', 'Storage Settings', 'Security Settings', and 'AlertMgr Settings'. The 'Component Configuration Settings' section has buttons for 'Web', 'Recorder', 'KnoahSniffer', 'Converter', 'G729 Generator', 'AES Adapter' (which is circled in red), 'PCS Adapter', 'Upload Server', 'Process Check List', and 'ED Service'. At the bottom, there is a progress bar labeled 'InstallShield' and two buttons: 'Next >' and 'Cancel'.

The **AESAdapter configuration settings** screen is displayed. For **Host Data IP**, enter the IP address of the Harmony server hosting the AES Adapter component. For **Hunt Group Extensions**, enter the skill group extensions from **Section 2**, separated by commas. For **AESAdapter Server Port**, enter “33012”.



The second page of the **AESAdapter configuration settings** screen is displayed next. For **AES Server ID**, enter the Tlink name from **Section 5.4**. For **Login User Name** and **Password**, enter the KnoahSoft user credentials from **Section 5.5**.



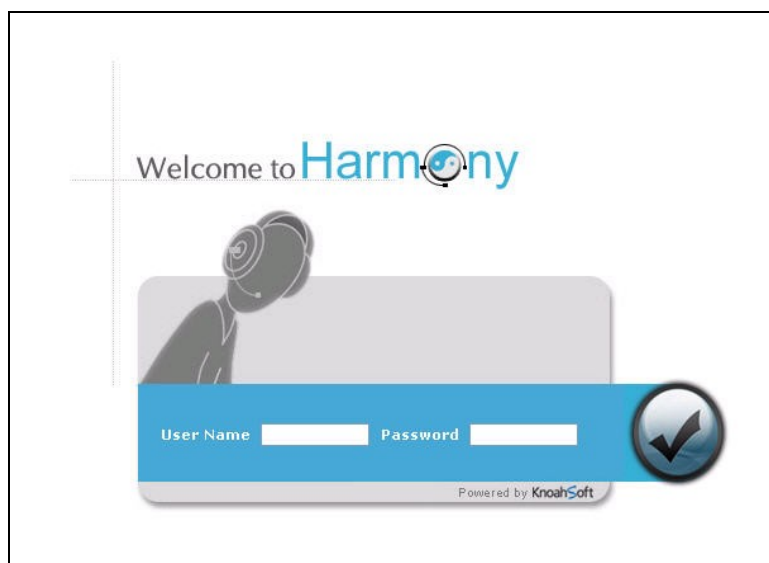
Page forward to the **Choose components you want to start** screen shown below. Check AESAdapter, and click **Finish** to complete the wizard.



6.4. Administer Skill Groups

Launch the Harmony web interface by using the URL “https://ip-address:8080/knoahsoft” in an Internet browser window, where “ip-address” is the IP address of the Harmony server running the Web Application Server component.

The **Welcome to Harmony** screen is displayed. Log in with the administrator credentials.



The **Harmony** screen is displayed next. Select the **Work Type** tab to display the screen below. Enter the first skill group extension from **Section 2** in the **Name** field, and click **Save**.

Repeat this step for all skill groups to be monitored.

The screenshot shows the Harmony Administration web interface. The top navigation bar includes the 'Harmony' logo, 'Powered by KnoahSoft', and user options like 'Broadcast', 'Change Password', and 'Log-out'. The main navigation tabs are 'Administration', 'Organization', 'Work Type', 'Employee Management', 'Voice Configuration', 'Custom Groups', and 'Message Thresholds'. The 'Work Type' tab is selected, showing a form for creating or editing a queue. The form includes a 'Name' field with the value '65555', a 'Description' text area, and a 'Status' section with 'Active' selected. Below the form are buttons for 'Save', 'Save & Add New', and 'Add New'. A 'List of Queues' table is displayed at the bottom, showing two entries: 'Inbound' and 'Outbound', both with a status of 'Active'.

Name	Status
Inbound	Active
Outbound	Active

6.5. Administer Supervisors

Select the **Employee Management** tab. Enter desired values for **Employee Code**, **Employee First Name**, **Email**, **Alias**, **Employee Last Name**, and **Network Id**. Retain the default values for **Status** and **Hire Date**, and check **Is a Harmony User**.

Select the desired values for **Location**, **Department**, and **Designation**. Check the desired boxes for **Client/Sites**, **Work Type**, and **Access to**. The screenshot below shows the settings used for the compliance testing.

The screenshot displays the Harmony Employee Management interface. The top navigation bar includes 'Administration', 'Organization', 'Work Type', 'Employee Management' (selected), 'Voice Configuration', 'Custom Groups', and 'Message Thresholds'. The 'Employee Management' section shows a search bar with 'Employee Code' selected and a 'Go' button. Below this is a table with columns 'Employee Code' and 'Employee Name'. To the right, there are fields for 'Agent License' (0/90) and 'Seat License' (0/30), a 'Photo Upload' button, and a 'Browse...' button. The main form contains fields for 'Employee Code' (101), 'Employee First Name' (Supervisor), 'Email' (super@test.com), 'Status' (Active), 'Alias' (super), 'Employee Last Name' (KnoahSoft), 'Hire Date' (02/12/2010), and 'Network Id' (super). Below these fields is a section for 'Is a Harmony User?' with a checked checkbox, and buttons for 'Reset Password' and 'Release Lock'. A progress bar with four steps is shown: 1. Reporting Profile, 2. Recording Rules, 3. User Feature Permissions, and 4. Report Feature Permissions. The 'Reporting Profile' section includes fields for 'Location' (My Site), 'Department' (IT), and 'Designation' (Supervisor). The 'Client/Work Type' section has two sub-sections: 'Client/Sites' with a checked checkbox for 'My Client[My Site]', and 'Work Type' with checked checkboxes for 'INBOUND [MYCLI/MSITE]' and 'OUTBOUND [MYCLI/MSITE]'. The 'List of Groups' section has two sub-sections: 'Belongs to' and 'Access to'. The 'Access to' section has a checked checkbox for 'SUPERVISOR_GROUP'. At the bottom, there are buttons for 'Save', 'Save & Add New', and 'Add New'.

Select step 2 **Recording Rules**. Click **Delete Extension** toward the bottom of the screen, as supervisor extensions are not monitored by Harmony. Retain the default values in the remaining fields.

The screenshot shows the Harmony Employee Management interface. The top navigation bar includes 'Administration', 'Organization', 'Work Type', 'Employee Management' (selected), 'Voice Configuration', 'Custom Groups', and 'Message Thresholds'. The 'Employee Management' section is active, showing a search bar, a photo upload button, and a progress bar with four steps: 1. Reporting Profile, 2. Recording Rules (selected), 3. User Feature Permissions, and 4. Report Feature Permissions. Below the progress bar, there is a table for 'Voip Extensions and Recording Rules'.

	Extension	Enable Recording	Recording Type	No of Calls (Recording)	Enable Screen Capture	Screen Capture Type	No of Calls (Screen Capture)	Screen Capture Interval (in sec)	Call Type
Delete Extension		<input type="checkbox"/>	Continuous	All	<input type="checkbox"/>	Continuous	All	5	All

At the bottom of the table, there are buttons for 'Save', 'Save & Add New', and 'Add New'.

Select step 3 **User Feature Permissions**. Check the appropriate **Module** selections listed below, and retain the default values in the remaining fields. The screenshot below shows the settings used for the compliance testing. Click **Save** at the bottom of the screen (not shown).

Repeat this section to administer all supervisors.

The screenshot shows the Harmony Employee Management interface, now on the 'User Feature Permissions' step. The progress bar shows steps 1. Reporting Profile, 2. Recording Rules, 3. User Feature Permissions (selected), and 4. Report Feature Permissions. Below the progress bar, there is a table for 'Module' selections.

Module	Selection
Administration	<input checked="" type="checkbox"/>
Other Settings	<input checked="" type="checkbox"/>
Recorder	<input checked="" type="checkbox"/>
Reports	<input checked="" type="checkbox"/>
Monitor	<input checked="" type="checkbox"/>

6.6. Administer Agents

Select the **Employee Management** tab. Enter desired values for **Employee Code**, **Employee First Name**, **Email**, **Alias**, **Employee Last Name**, and **Network Id**. Retain the default values for **Status** and **Hire Date**, and check **Is a Harmony User**.

Select the desired values for **Location**, **Department**, **Supervisor**, and **Designation**. Check the desired boxes for **Client/Sites**, **Work Type**, **Belongs To**, and **Access to**. The screenshot below shows the settings used for the compliance testing.

The screenshot displays the Harmony web interface for managing agents. The top navigation bar includes 'Administration', 'Organization', 'Work Type', 'Employee Management' (selected), 'Voice Configuration', 'Custom Groups', and 'Message Thresholds'. The 'Employee Management' section shows a search bar with 'Employee Code' selected and a 'Go' button. Below this is a table with columns 'Employee Code' and 'Employee Name'. The main form area is titled 'Employee Management' and includes fields for 'Agent License' (0/90) and 'Seat License' (0/30). A 'Photo Upload' button is also present. The form is divided into several sections: 'Employee Information' with fields for Employee Code (201), Employee First Name (Agent1), Email (agent1@test.com), Status (Active), Alias (agent1), Employee Last Name (KnoahSoft), Hire Date (02/12/2010), and Network Id (agent1). Below this is a section for 'Is a Harmony User?' (checked), 'Reset Password', and 'Release Lock'. A progress bar shows four steps: 1. Reporting Profile, 2. Recording Rules, 3. User Feature Permissions, and 4. Report Feature Permissions. The 'Reporting Profile' section includes fields for Location (My Site), Department (IT), Supervisor (Supervisor), and Designation (Agent). The 'Client/Work Type' section has two sub-sections: 'Client/Sites' with a checked box for 'My Client[My Site]', and 'Work Type' with checked boxes for 'INBOUND [MYCLI/MSITE]' and 'OUTBOUND [MYCLI/MSITE]'. The 'List of Groups' section has two sub-sections: 'Belongs to' with a checked box for 'SUPERVISOR_GROUP', and 'Access to' with a checked box for 'SUPERVISOR_GROUP'. At the bottom, there are buttons for 'Save', 'Save & Add New', and 'Add New'.

Select step 2 **Recording Rules**. For **Extension**, enter the first agent ID from **Section 2**. Check the **Enable Recording** field, and retain the default values in the remaining fields.

The screenshot shows the Harmony Employee Management interface. The top navigation bar includes 'Administration', 'Organization', 'Work Type', 'Employee Management' (selected), 'Voice Configuration', 'Custom Groups', and 'Message Thresholds'. The 'Employee Management' section is active, showing a search bar and a list of employees. The 'Recording Rules' step is highlighted in the progress bar. The 'Voip Extensions and Recording Rules' table is displayed below the progress bar.

	Extension	Enable Recording	Recording Type	No of Calls (Recording)	Enable Screen Capture	Screen Capture Type	No of Calls (Screen Capture)	Screen Capture Interval (in sec)	Call Type
Delete Extension	65881	<input checked="" type="checkbox"/>	Continuous	All	<input type="checkbox"/>	Continuous	All	5	All

At the bottom of the screen, there are buttons for 'Save', 'Save & Add New', and 'Add New'.

Select step 3 **User Feature Permissions**. Check the appropriate **Module** selections listed below, and retain the default values in the remaining fields. The screenshot below shows the settings used for the compliance testing. Click **Save** at the bottom of the screen (not shown).

Repeat this section to administer all agents.

The screenshot shows the Harmony Employee Management interface. The top navigation bar is the same as the previous screenshot. The 'User Feature Permissions' step is highlighted in the progress bar. The 'Module' section at the bottom of the screen shows the following settings:

Module ☐ Administration ☒ Other Settings ☒ Recorder ☒ Reports ☐ Monitor

7. General Test Approach and Test Results

The feature test cases were performed both automatically and manually. Upon start of the KnoahSoft Harmony application, the application automatically queries for the agent telephone extensions and requests monitoring on the skill group and agent telephone extensions using Avaya AuraTM Application Enablement Services TSAPI.

For the manual part of the testing, each call was handled manually on the agent telephone with generation of unique audio content for the recordings. Necessary user actions such as hold and reconnect were performed from the agent telephones to test the different call scenarios. The serviceability test cases were performed manually by disconnecting/reconnecting the Ethernet cable to the KnoahSoft Harmony server.

The verification of tests included using the KnoahSoft Harmony logs for proper message exchanges, and using the KnoahSoft Harmony web interface for proper logging and playback of the calls.

All test cases were executed and passed. The following were the observations on KnoahSoft Harmony from the compliance testing.

- In the blind transfer/conference scenarios, there is an outbound recording entry associated with the transfer-from/conference-from agent that covers the period from the initiation of the transfer/conference to completion, which can be very brief.
- In the attended transfer/conference scenarios, the duration for the inbound recording entry associated with the transfer-from/conference-from agent covered the period the two agents were conversing, and the recording playback contained silence for that period.
- All outbound call recordings for the agent included the period before the outbound call was actually answered, such as ring back tones.
- After a link recovery, any call established before the outage and dropped during the outage will be recorded after a new call occurs at the agent. The call recording included the link outage period until the new call occurs at the agent, and the recording playback contained silence for these periods, which can be very long.
- After a link outage of more than 10 minutes, supervisors logging into the web application may receive the SQL error, and the problem clears up automatically after ~30 minutes. A faster workaround is to restart the KnoahSoft Harmony Web Service and the AESAdapter Service.

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 KnoahSoft Harmony.

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 4.5**, 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	29	29

8.2. Verify Avaya Aura™ Application Enablement Services

On Application Enablement Services, verify the status of the TSAPI link by selecting **Status and Control > Services Summary** from the left pane. Click on **TSAPI Service**, followed by **Details** (not shown below). The **TSAPI Link Details** screen is displayed. Verify the **Conn Status** is “Talking” for the TSAPI link administered in **Section 5.3**, as shown below.

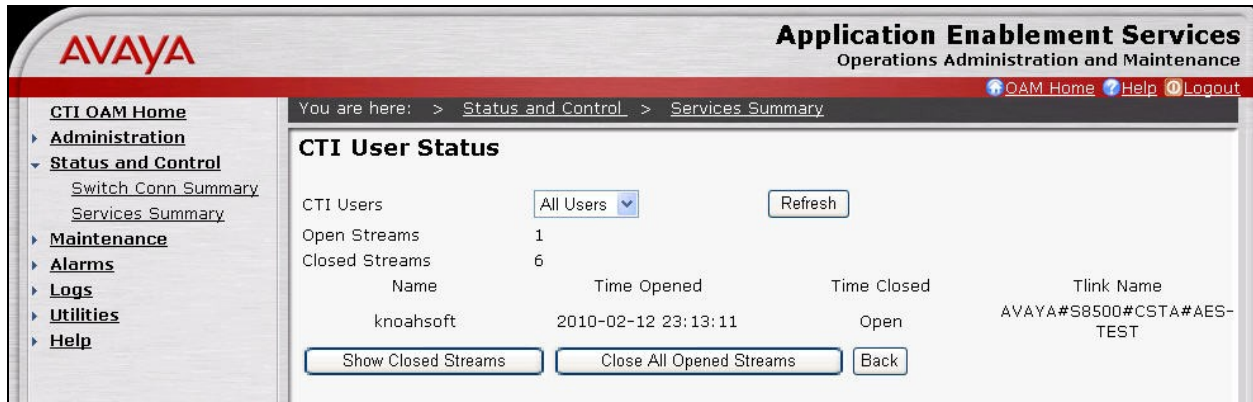
Click **User Status** from the bottom of the screen.

The screenshot displays the Avaya Application Enablement Services (AES) web interface. The top header shows the Avaya logo and the title "Application Enablement Services" with the subtitle "Operations Administration and Maintenance". A navigation bar includes links for "QAM Home", "Help", and "Logout". The left sidebar contains a tree view with categories: "CTI OAM Home", "Administration", "Status and Control" (selected), "Maintenance", "Alarms", "Logs", "Utilities", and "Help". Under "Status and Control", the sub-items are "Switch Conn Summary" and "Services Summary" (selected). The main content area is titled "TSAPI Link Details" and contains a table with the following data:

Link	Switch Conn Name	Switch CTI Link Number	Conn Status	Since	Service State	Switch Version	Number of Associations	ASAI Message Rate
1	S8500	1	Talking	2010-02-12 20:07:02.0	Online	15	3	60

Below the table, there are two buttons: "Online" and "Offline". At the bottom, a message states: "For service-wide information, choose one of the following:" followed by three buttons: "TSAPI Service Status", "TLink Status", and "User Status".

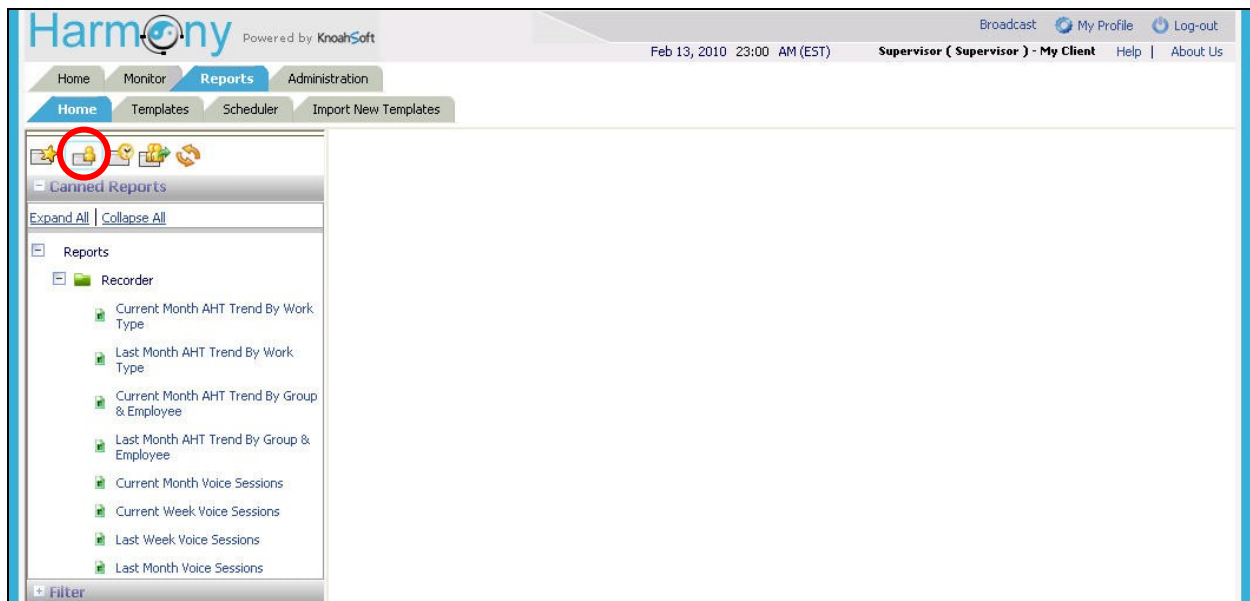
The **CTI User Status** screen is displayed. Verify that there is an open stream for the KnoahSoft user created in **Section 5.5**.



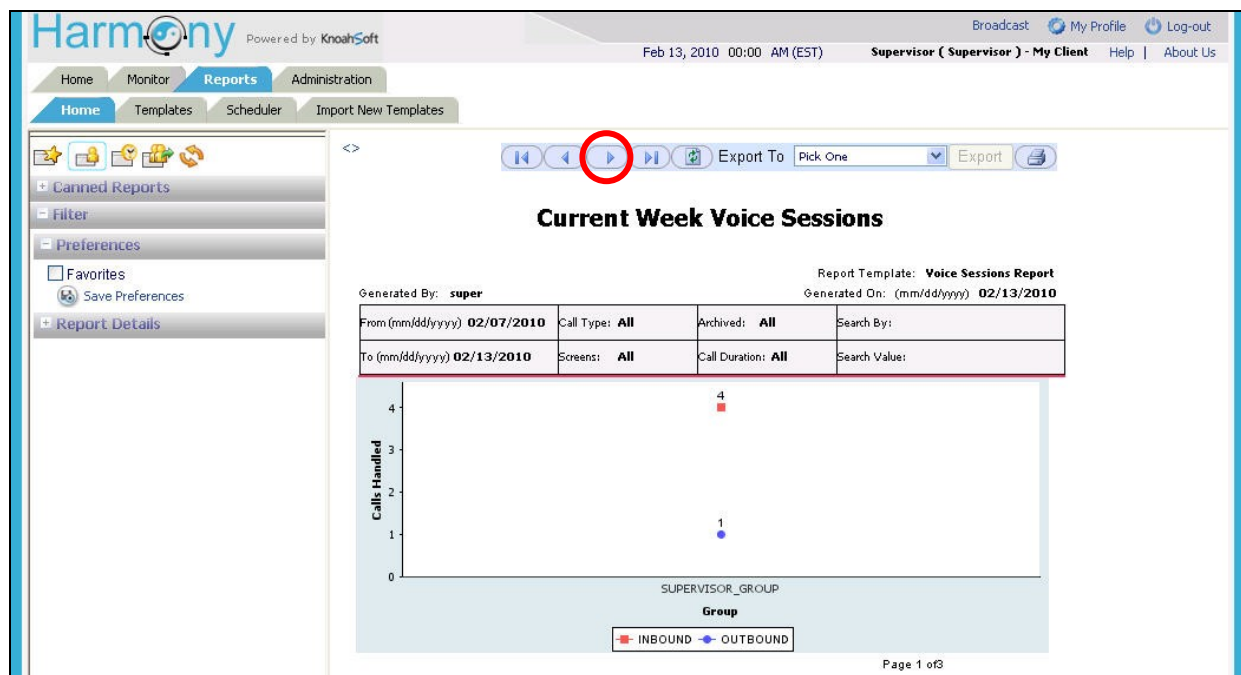
8.3. Verify KnoahSoft Harmony

Log an agent into the skill group to handle and complete an ACD call. From the supervisor PC, follow the navigation in **Section 6.4** to launch the Harmony web interface, and log in with supervisor credentials. The **Harmony** screen is displayed.

Select the **Reports** tab, and click on the **Reports** icon circled below to show the **Reports** selections. Select **Reports > Recorder > Current Week Voice Sessions**.



The **Current Week Voice Sessions** screen is displayed in the right pane. Click on the **Next Page** icon circled below.



Page forward as needed to the page that displays the inbound calls for the agent that just completed the ACD call. Verify that there is an entry reflecting the last call, with proper values in the relevant fields. Click on the associated icon in the **Play** column to bring up the detail recording entry.

Harmony Powered by KnoahSoft

Broadcast My Profile Log-out

Feb 13, 2010 00:00 AM (EST) Supervisor (Supervisor) - My Client Help About Us

Home Monitor Reports Administration

Home Templates Scheduler Import New Templates

Canned Reports Filter Preferences Favorites Save Preferences Report Details

Current Week Voice Sessions

Report Template: Voice Sessions Report
Generated On: (mm/dd/yyyy) 02/13/2010

Generated By: super

From (mm/dd/yyyy) 02/07/2010	Call Type: All	Archived: All	Search By:
To (mm/dd/yyyy) 02/13/2010	Screens: All	Call Duration: All	Search Value:

Calls Handled

SUPERVISOR_GROUP

Group

INBOUND OUTBOUND

Page 1 of 3

Verify that the **Segment Summary** screen pops up in a new browser window, and that the recording can be played back.

Segment Summary

Customer Interaction	
Start Time	02/13/2010 00:45:45
End Time	02/13/2010 00:48:19
Dialed in From(ANI)	3035335005
Dialed To(DNIS)	9088485500
Duration	00:02:34
Total No of Holds	0
Total Hold Time	00:00
Total No of Transfers	0
Total No of Conferences	0


Segment Details	
Record ID	agent1_MYCLI_MSITE_65881_02132010_004545_000234_0
Start Time	02/13/2010 00:45:45
End Time	02/13/2010 00:48:19
Duration	00:02:34
Emp Code	201
Employee Name	Agent1
Extension	65881
Location	My Site
Group	SUPERVISOR_GROUP
Supervisor	Supervisor
Channel	Voice
Screen	No
Number of Holds	0
Total Hold Time	00:00
Transfer No	-

Hold Details	
--------------	--


00:45 Total Duration: 00:02:34
00:48

Agent1 [201] 02:34

Download Email



Playing 00:06 / 02:34



9. Conclusion

These Application Notes describe the configuration steps required for KnoahSoft Harmony to successfully interoperate with Avaya Aura™ Communication Manager using Avaya Aura™ Application Enablement Services. All feature and serviceability test cases were completed with observations noted in **Section 7**.

10. Additional References

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

1. *Administrator Guide for Avaya Aura™ Communication Manager*, Document 03-300509, Issue 5.0, Release 5.2, May 2009, available at <http://support.avaya.com>.
2. *Avaya MultiVantage Application Enablement Services Administration and Maintenance Guide*, Release 4.2, Document ID 02-300357, Issue 10, May 2008, available at <http://support.avaya.com>.
3. *KnoahSoft Harmony Administration Guide*, Version 3.0, available on the Harmony server as part of installation.
4. *KnoahSoft Harmony Enterprise Edition User Guide*, Version 3.0, available on the Harmony server as part of installation.

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