



DevConnect Program

Application Notes for OpenMethods Harmony 7.1 with Avaya Aura® Application Enablement Services 10.1 and Avaya Aura® Communication Manager 10.1 - Issue 1.0

Abstract

These Application Notes describe the configuration steps required for OpenMethods Harmony 7.1 to interoperate with Avaya Aura® Application Enablement Services (AES) 10.1 and Avaya Aura® Communication Manager 10.1.

The Harmony solution consists of Harmony Integration Server (HIS), Harmony Queue Adapter (QA), and with Harmony Media Bar and PopFlow on the Oracle Service Cloud. HIS integrates with AES via JTAPI, and QA integrates with AES via DMCC .Net. The Harmony solution is hosted in the AWS cloud and a site-to-site VPN was used between the solution and the DevConnect lab.

Readers should pay attention to **Section 2**, in particular the scope of testing as outlined in **Section 2.1** as well as any observations noted in **Section 2.2**, to ensure that their own use cases are adequately covered by this scope and results.

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

1. Introduction

The Harmony solution consists of Harmony Integration Server (HIS), Harmony Queue Adapter (QA), and with Harmony Media Bar and PopFlow on the Oracle Service Cloud. HIS integrates with AES via JTAPI, and QA integrates with AES via DMCC .Net. The Harmony solution is hosted in the AWS cloud and a site-to-site VPN was used between the solution and the DevConnect lab.

The phantom call capabilities of Communication Manager are used to deliver non-voice work items to agents, including email and chat. Phantom calls for email and chat work items will be initiated by the QA component, with use of AWOH (Administration Without Hardware) stations as calling parties and the email and chat VDN/skills as destinations.

Harmony uses JTAPI/TSAPI to provide screen pop, agent states, and call control for voice work items, and uses DMCC with AWOH stations to provide screen pop and control for email and chat work items.

Harmony can support multiple work items at the agent, which is an optional feature on Harmony, and requires the Multiple Call Handling feature on Communication Manager.

2. General Test Approach and Test Results

The feature test cases were performed manually. Upon an agent log in, HIS used TSAPI to query and request monitoring on the agent station associated with the agent ID.

Incoming ACD calls were placed to available agents that were logged into the OpenMethods Web Portal to verify the usage of the events from TSAPI and Emails and Chats were placed via the OpenMethods Customer Support Portal and the multi-media items were delivered via DMCC with AWOH stations.

All test cases passed successfully but necessary workarounds are noted in **Section 2.2**.

DevConnect Compliance Testing is conducted jointly by Avaya and DevConnect members. The jointly-defined test plan focuses on exercising APIs and/or standards-based interfaces pertinent to the interoperability of the tested products and their functionalities. DevConnect Compliance Testing is not intended to substitute full product performance or feature testing performed by DevConnect members, nor is it to be construed as an endorsement by Avaya of the suitability or completeness of a DevConnect member's solution.

Avaya recommends our customers implement Avaya solutions using appropriate security and encryption capabilities enabled by our products. The testing referenced in these DevConnect Application Notes included the enablement of supported encryption capabilities in the Avaya

products. Readers should consult the appropriate Avaya product documentation for further information regarding security and encryption capabilities supported by those Avaya products.

Support for these security and encryption capabilities in any non-Avaya solution component is the responsibility of each individual vendor. Readers should consult the appropriate vendor-supplied product documentation for more information regarding those products.

For the testing associated with these Application Notes, the interface between Avaya systems and Harmony did not include use of any specific encryption features as requested by Open Methods.

2.1. Interoperability Compliance Testing

The interoperability compliance test included feature and serviceability testing.

The feature testing focused on verifying the following on Harmony:

- Use of TSAPI query services to query device information, name, agent state, and call control.
- Use of TSAPI monitoring and event report services to monitor agent stations.
- Use of TSAPI snapshot services to obtain information on agent stations and existing calls.
- Use of DMCC to deliver multi-media work items with the use of AWOH stations.

2.2. Test Results

While all test cases passed, the following observations were noted:

- While changing agent states via the Harmony Agent Portal is successful (i.e., AuxWork, After Call Work, Ready) when an agent logout is imitated via the Harmony Agent Portal the logout event is not sent to from the application to AES/CM. The agent must manually log out on the softphone / desk phone.

2.3. Support

OpenMethods Technical Support can be reached via email or phone.

- **E-mail:** care@openmethods.com
- **Phone:** 1.816.283.8965 (ext. 1)
- **Web:** www.openmethods.com

3. Reference Configuration

The configuration used for the compliance testing is shown in **Figure 1**. The detailed administration of basic connectivity between Communication Manager and Application Enablement Services, and of call center devices are not the focus of these Application Notes and will not be described.

In the compliance testing, Harmony monitored agent stations associated with the agent IDs shown in the table below.

Device Type	Extension
Agent Station	65001 (H.323), 66006 (SIP)
Agent ID	65881, 65882
Agent Password	65881, 65882
DMCC Stations – Chat	64101, 64102
DMCC Stations – Email	64103, 64104
Skills – Voice	61001
Skills – Chat	61002
Skills – Email	61003
Hunt Groups – Chat	64900
Hunt Groups – Email	63900
VDNs – Voice	44301
VDNs – Chat	44302
VDNs - Email	44303

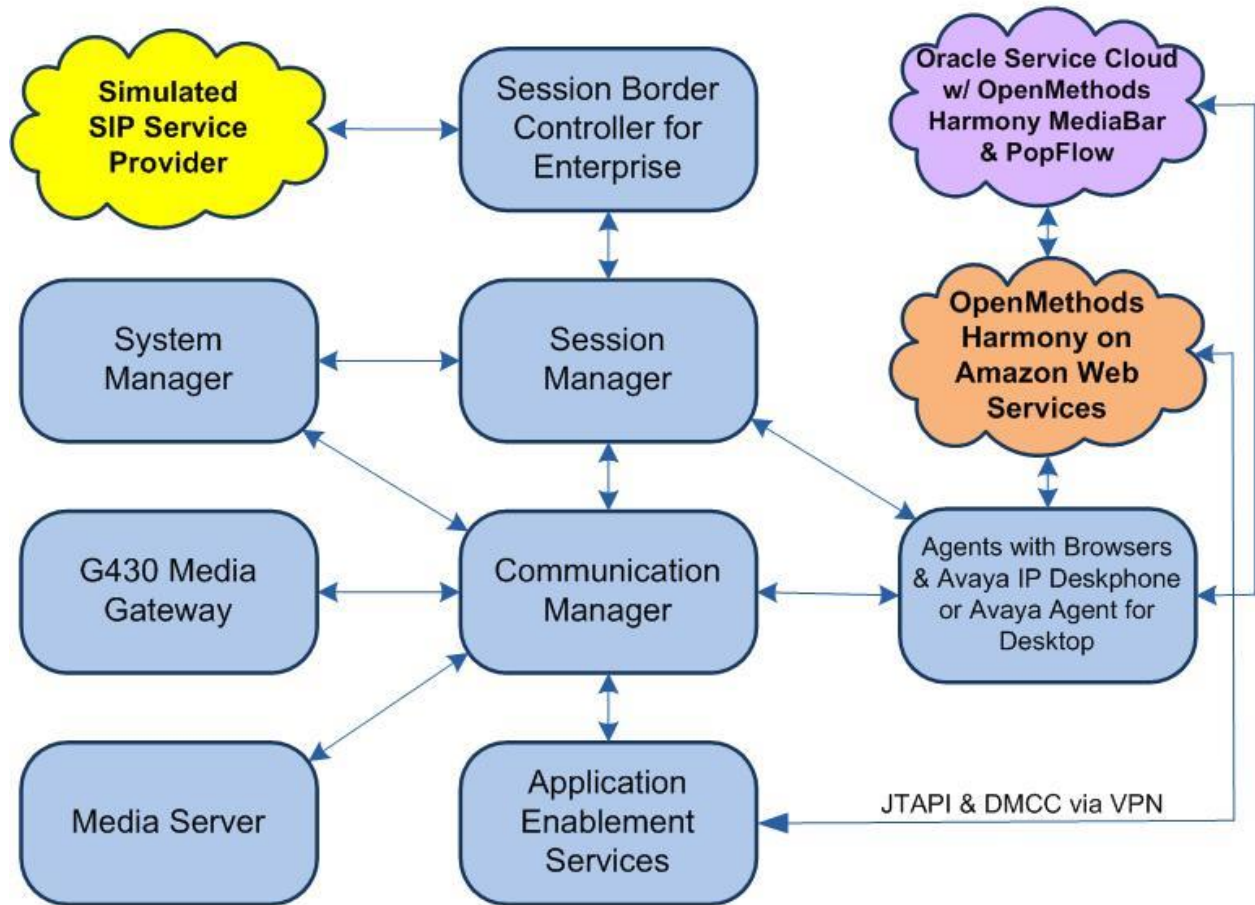


Figure 1: Test Configuration for Harmony and Avaya Aura® Environment

4. Equipment and Software Validated

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

Equipment/Software	Release/Version
Avaya Aura® Communication Manager in Virtual Environment	10.1.3 (10.1.3.0.1.974.27893)
Avaya G430 Media Gateway	42.8.0
Avaya Aura® Media Server in Virtual Environment	10.1 (10.1.0.154)
Avaya Aura® Application Enablement Services in Virtual Environment	10.1. (10.1.3.0.0.11-0)
Avaya Aura® Session Manager in Virtual Environment	10.1.3 (10.1.3.0.1013007)
Avaya Aura® System Manager in Virtual Environment	10.1.3 (10.1.3.0.0715713)
Avaya Session Border Controller in Virtual Environment	10.1 (10.1.2.0-64-23285)
Avaya Agent for Desktop (H.323 & SIP)	2.0.6.0.10
Avaya 9611G IP Desk phone (H.323)	6.8.5.3.2
Avaya J169 IP Desk phone (SIP)	4.0.13.0.6
Avaya J179 IP Desk phone (H.323)	6.8.5.3.2
Harmony Integration Server	7.1.0.202309291202
Harmony QueueAdapter	7.0.1.202308311538

5. Configure Avaya Aura® Communication Manager

This section contains steps necessary to configure Harmony successfully with Communication Manager.

All configurations in Communication Manager were performed via SAT terminal.

Stations	Type	Description
65001	J179 H.323	Agent station
66006	J169 SIP	Agent Station
64101, 64102	AWOH X Port stations	Chat phantom call stations
64103, 64104	AWOH X Port stations	Email phantom call stations
Call Center Agents	Skills	
65881, 65882	1, 2, 3	
Vector Directory Numbers	Media	Vector
44301	Voice	101
44302	Chat	102
44303	Email	103
Hunt Groups (Skills)	Extension	Description
1	61001	Voice
2	61002	Chat
3	61003	Email
11	64900	Chat AWOH non-acd group
12	63900	Email AWOH non-acd group

5.1. Verify Feature and License

Enter the **display system-parameters customer-options** command and ensure that the following features are enabled.

One **Page 4**, verify **Computer Telephone Adjunct Links** is set to **y**.

display system-parameters customer-options		Page	4 of	12
OPTIONAL FEATURES				
Abbreviated Dialing Enhanced List?	y	Audible Message Waiting?	y	
Access Security Gateway (ASG)?	y	Authorization Codes?	y	
Analog Trunk Incoming Call ID?	y	CAS Branch?	n	
A/D Grp/Sys List Dialing Start at 01?	y	CAS Main?	n	
Answer Supervision by Call Classifier?	y	Change COR by FAC?	n	
ARS?	y	Computer Telephony Adjunct Links?	y	
ARS/AAR Partitioning?	y	Cvg Of Calls Redirected Off-net?	y	
ARS/AAR Dialing without FAC?	y	DCS (Basic)?	y	
ASAI Link Core Capabilities?	y	DCS Call Coverage?	y	
ASAI Link Plus Capabilities?	y	DCS with Rerouting?	y	
Async. Transfer Mode (ATM) PNC?	n	Digital Loss Plan Modification?	y	
Async. Transfer Mode (ATM) Trunking?	n	DS1 MSP?	y	
ATM WAN Spare Processor?	n	DS1 Echo Cancellation?	y	
ATMS?	y			
Attendant Vectoring?	y			

5.2. Configure Stations – Call Center

Add stations for Call Center agents to answer calls. Use **add station *n*** command to add a station, where ***n*** is an available station extension. Configure the station as follows, on **Page 1**:

- In **Name** field, enter a descriptive name
- Set **Type** to the type of the telephones
- Enter a **Security Code**

add station 65001Page 1 of 5

STATION

Extension: 65001

Type: 9611

Port: S000005

Name: H323 Staff

Unicode Name? n

STATION OPTIONS

Lock Messages? n

Security Code: 123456

Coverage Path 1: 1

Coverage Path 2:

Hunt-to Station:

Time of Day Lock Table:

Personalized Ringing Pattern: 1

Message Lamp Ext: 30002

Mute Button Enabled? y

Button Modules: 0

Media Complex Ext:

IP SoftPhone? y

IP Video Softphone? n

Short/Prefixed Registration Allowed: default

BCC: 0

TN: 1

COR: 1

COS: 1

Tests? y

Loss Group: 19

Speakerphone: 2-way

Display Language: english

Survivable GK Node Name:

Survivable COR: internal

Survivable Trunk Dest? y

One **Page 4**, under **BUTTON ASSIGNMENTS**, add **auto-in**, **after-call**, **release** and **aux-work** as shown below:

add station 30002Page 4 of 5

STATION

SITE DATA

Room:

Jack:

Cable:

Floor:

Building:

Headset? n

Speaker? n

Mounting: d

Cord Length: 0

Set Color:

ABBREVIATED DIALING

List1:

List2:

List3:

BUTTON ASSIGNMENTS

1: call-appr

2: call-appr

3: call-appr

4: send-calls Ext:

5: after-call

6: release

7: auto-in

8: aux-work

Grp:

Grp:

Grp:

RC: Grp:

5.3. Configure Stations – CTI

Add CTI stations that will be used to launch Chat and Email phantom calls. Use **add station *n*** command to add a station, where *n* is an available station extension. Configure the station as follows, on Page 1:

- In **Name** field, enter a descriptive name
- Set **Type** to **6408D+**
- Set **Port** to **X**

add station 64101

Page 1 of 5

STATION

Extension: 64101

Lock Messages? n

BCC: 0

Type: 6408D+

Security Code: *

TN: 1

Port: X

Coverage Path 1:

COR: 1

Name: Harmony Chat Station

Coverage Path 2:

COS: 1

Unicode Name? n

Hunt-to Station:

STATION OPTIONS

Loss Group: 2

Time of Day Lock Table:

Personalized Ringing Pattern: 1

Data Module? n

Message Lamp Ext: 30000

Speakerphone: 2-way

Mute Button Enabled? y

Display Language: english

Survivable COR: internal

Media Complex Ext:

Survivable Trunk Dest? y

IP SoftPhone? n

Remote Office Phone? n

IP Video? n

IP Video? n

5.4. Configure Hunt Group

Use **add hunt-group *n*** command to add a hunt group, where ***n*** is an available hunt group. On **Page 1**:

- In the **Group Name** field, enter a descriptive name
- Set **ACD, Queue, Vector** to **y**
- Enter an available **Group Extension**

add hunt-group 1	HUNT GROUP	Page 1 of 4
Group Number: 1	ACD? y	
Group Name: CM Voice	Queue? y	
Group Extension: 61001	Vector? y	
Group Type: ucd-mia		
TN: 1		
COR: 1	MM Early Answer? n	
Security Code:	Local Agent Preference? n	
ISDN/SIP Caller Display:		
Queue Limit: unlimited		
Calls Warning Threshold:	Port:	
Time Warning Threshold:	Port:	

On **Page 2**, set **Skill** to **y** and **Measured** to **both**. Set **Multiple Call Handling** to either **one-per-skill** or **many-forced** to enable agents to handle more than one transaction at a time.

add hunt-group 1	HUNT GROUP	Page 2 of 4
Skill? y	Expected Call Handling Time (sec): 180	
AAS? n		
Measured: both		
Supervisor Extension:		
Controlling Adjunct: none		
Multiple Call Handling: one-per-skill		
Timed ACW Interval (sec):	After Xfer or Held Call Drops? n	

Note: During compliance testing, 3 hunt groups were created to route email, chat and voice to agents.

In addition, two non-acd groups were created for Chat and Email AWOH stations to launch calls to the Chat and Email VDNs. These were administered with **ACD, Queue, and Vector** set to **n**,

and the AWOH stations were assigned to the respective group. The email group setup was similar to the chat group shown below.

```
add hunt-group 11                                     Page 1 of 4
                                                    HUNT GROUP

Group Number: 11                                     ACD? n
Group Name: Harmony Chat AWOH                       Queue? n
Group Extension: 64900                               Vector? n
Group Type: ucd-mia
TN: 1
COR: 1
Security Code:
ISDN/SIP Caller Display:
MM Early Answer? n
Local Agent Preference? n

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

```
add hunt-group 7                                     Page 3 of 60
                                                    HUNT GROUP

Group Number: 7      Group Extension: 31008          Group Type: ucd-mia
Member Range Allowed: 1 - 1500      Administered Members (min/max): 1 /2
Total Administered Members: 2

GROUP MEMBER ASSIGNMENTS
Ext      Name(16 characters)      Ext      Name(16 characters)
1: 64101      Harmony CHAT Sta      14:
2: 64102      Harmony CHAT Sta      15:
```

5.5. Configure Agents – Call Center

Use **add agent-loginID *n*** to add an agent that will be used by call center agents to log in, where *n* is an available agent id. On **Page 1**:

- In the **Name** field, type in a descriptive name
- Enter a **Password** and **Password (enter again)**
- Ensure **Auto Answer** is either **acd** or **all**

add agent-loginID 65881

Page1 of 2

AGENT LOGINID

Login ID: 32000Unicode Name? nAAS? n

Name: CM Agent 1

AUDIX? n

TN: 1

Check skill TNs to match agent TN? n

COR: 1

Coverage Path:

LWC Reception: spe

Security Code:

LWC Log External Calls? n

Attribute:

AUDIX Name for Messaging:

LoginID for ISDN/SIP Display? n

Password:

Password (enter again):

Auto Answer: all

AUX Agent Remains in LOA Queue: system

MIA Across Skills: system

AUX Agent Considered Idle (MIA): system

ACW Agent Considered Idle: system

Work Mode on Login: system

Aux Work Reason Code Type: system

Logout Reason Code Type: system

Maximum time agent in ACW before logout (sec): system

Forced Agent Logout Time: :

WARNING: Agent must log in again before changes take effect

WARNING:

On **Page 2**, set skill number and skill level in **SN** and **SL** fields. Skill number is the hunt group that was added in previous section.

add agent-loginID 32000

Page2 of 2

AGENT LOGINID

Direct Agent Skill: 1

Service Objective? n

Call Handling Preference: skill-level

Local Call Preference? n

SNRLSL

SNRLSL

1: 11

16:

2: 21

17:

3: 31

18:

5.6. Configure Vectors

Use **change vector *n*** to configure a Vector, where *n* is an available Vector number. These are the steps to route Voice, Email, and Chat transactions to agents.

Configure a simple vector to queue the call as follows:

change vector 101				Page 1 of 6	
CALL VECTOR					
Number: 1		Name: Harmony Voice			
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? y	G3V4 Adv Route? y	CINFO? y	BSR? y	Holidays? y
Variables? y	3.0 Enhanced? y				
01 wait-time	0 secs hearing ringback				
02 queue-to	skill 1 pri m				
03 goto step	1 if unconditionally				
04					

Repeat this for Chat and Emails.

5.7. Configure Vector Directory Number (VDN)

Use **add vdn *n*** to add a vdn, where *n* is an available vdn extension. On **Page 1**:

- In the **Name** field, enter a descriptive name
- In the **Destination** field, set **Vector Number** to the vector configured earlier in this document. i.e., Vector Number 101

add vdn 44301		Page 1 of 3
VECTOR DIRECTORY NUMBER		
Extension: 44301		Unicode Name? n
Name*: Harmony Voice		
Destination: Vector Number		101
Attendant Vectoring? n		
Meet-me Conferencing? n		
Allow VDN Override? y		
COR: 1		
TN*: 1		
Measured: none		Report Adjunct Calls as ACD*? n
VDN of Origin Annc. Extension*:		
1st Skill*:		
2nd Skill*:		
3rd Skill*:		
STP URT:		

Note: During compliance test 3 different VDNs were created to test a Voice, Email and Chat calls.

5.8. Configure AES connection

Use **change ip-services** command to add an entry for AES. On **Page 1**,

- In the **Service Type** field, type **AESVCS**
- In the **Enabled** field, type **y**
- In the **Local Node** field, type the Node name **procr** for the Processor Ethernet Interface
- In the **Local Port** field, use the default of **8765**

change ip-services					Page	1 of	3
IP SERVICES							
Service Type	Enabled	Local Node	Local Port	Remote Node	Remote Port		
AESVCS	y	procr	8765				

On **Page 3** of the IP Services form, enter the following values:

- In the **AE Services Server** field, type the name obtained from the Application Enablement Services server.
- In the **Password** field, type a password to be administered on the Application Enablement Services server.
- In the **Enabled** field, type **y**.

change ip-services				Page	3 of	3
AE Services Administration						
Server ID	AE Services Server	Password	Enabled	Status		
1:	aes	*	y	in use		

5.9. Add CTI Link

Use **add cti-link n** command, where **n** is an available CTI link number.

- In the **Extension** field, type **<station extension>**, where **<station extension>** is a valid station extension.
- In the **Type** field, type **ADJ-IP**.
- In the **Name** field, type a descriptive name.

add cti-link 1		Page 1 of 3	
CTI LINK			
CTI Link: 1			
Extension: 60111			
Type: ADJ-IP			
		COR: 1	
Name: AES CTI Link			
Unicode Name? n			

6. Configure Avaya Aura® Application Enablement Services

- Launch OAM interface
- Verify license
- Administer TSAPI link
- Administer Harmony user
- Administer security database
- Restart service
- Obtain Tlink name
- Export CA certificate

6.1. 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 Avaya Application Enablement Services Management Console login interface. At the top left is the Avaya logo. To its right, the text "Application Enablement Services" is displayed in a large, bold font, with "Management Console" in a smaller font below it. A red horizontal bar spans the width of the page, with a "Help" link in the top right corner. In the center of the page, there is a light gray rectangular box containing the text "Please login here:" followed by a "Username" label and a text input field. Below the input field is a "Continue" button. A second red horizontal bar is located at the bottom of the page.

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

The screenshot displays the Avaya Application Enablement Services Management Console. The top right corner shows system information: "Welcome: User cust", "Last login: Tue Oct 31 14:14:44 E.S.T. 2023 from 192.168.120.35", "Number of prior failed login attempts: 0", "HostName/IP: aes/10.64.101.239", "Server Offer Type: VIRTUAL_APPLIANCE_ON_VMWARE", "SW Version: 10.1.3.0.0.11-0", "Server Date and Time: Wed Nov 01 15:21:03 EDT 2023", and "HA Status: Not Configured". The left sidebar contains a navigation menu with options: AE Services, Communication Manager Interface, High Availability, Licensing, Maintenance, Networking, Security, Status, User Management, Utilities, and Help. The main content area is titled "Welcome to OAM" and contains the following text: "The AE Services Operations, Administration, and Management (OAM) Web provides you with tools for managing the AE Server. OAM spans the following administrative domains:" followed by a bulleted list of domains and their functions. At the bottom, it states: "Depending on your business requirements, these administrative domains can be served by one administrator for all domains, or a separate administrator for each domain." The footer indicates "Copyright © 2009-2023 Avaya Inc. All Rights Reserved."

AVAYA

Application Enablement Services
Management Console

Welcome: User cust
Last login: Tue Oct 31 14:14:44 E.S.T. 2023 from 192.168.120.35
Number of prior failed login attempts: 0
HostName/IP: aes/10.64.101.239
Server Offer Type: VIRTUAL_APPLIANCE_ON_VMWARE
SW Version: 10.1.3.0.0.11-0
Server Date and Time: Wed Nov 01 15:21:03 EDT 2023
HA Status: Not Configured

Home | Help | Logout

Home

AE Services
Communication Manager Interface
High Availability
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.
- High Availability - Use High Availability to manage AE Services HA.
- 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 all domains, or a separate administrator for each domain.

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6.2. Verify License

Select **Licensing → WebLM Server Access** in the left pane, to display the applicable WebLM server log in screen (not shown). Log in using the appropriate credentials and navigate to display installed licenses (not shown).

The screenshot displays the Avaya Application Enablement Services Management Console with the "Licensing" section selected in the left sidebar. The top right corner shows the same system information as the previous screenshot. The left sidebar now highlights "Licensing" and includes sub-items: "WebLM Server Address", "WebLM Server Access", and "Reserved Licenses". The main content area is titled "Licensing" and contains instructions for setting up and maintaining the WebLM, including a note about disabling pop-up blockers. The footer indicates "Copyright © 2009-2023 Avaya Inc. All Rights Reserved."

AVAYA

Application Enablement Services
Management Console

Welcome: User cust
Last login: Tue Oct 31 14:14:44 E.S.T. 2023 from 192.168.120.35
Number of prior failed login attempts: 0
HostName/IP: aes/10.64.101.239
Server Offer Type: VIRTUAL_APPLIANCE_ON_VMWARE
SW Version: 10.1.3.0.0.11-0
Server Date and Time: Wed Nov 01 15:22:34 EDT 2023
HA Status: Not Configured

Licensing | Home | Help | Logout

AE Services
Communication Manager Interface
High Availability
Licensing
WebLM Server Address
WebLM Server Access
Reserved Licenses
Maintenance
Networking
Security
Status
User Management
Utilities
Help

Licensing

If you are setting up and maintaining the WebLM, you need to use the following:

- WebLM Server Address

If you are importing, setting up and maintaining the license, you need to use the following:

- WebLM Server Access

If you want to administer TSAPI Reserved Licenses or DMCC Reserved Licenses, you need to use the following:

- Reserved Licenses

NOTE: Please disable your pop-up blocker if you are having difficulty with opening this page

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Select **Licensed products** → **APPL_ENAB** → **Application Enablement** in the left pane, to display the **Application Enablement (CTI)** screen in the right pane.

Verify that there are sufficient licenses for **DMCC** and **TSAPI Simultaneous Users**, as shown below.

Application Enablement (CTI) - Release: 10 - SID: 10503000(Enterprise license file)

You are here: Licensed Products > Application_Enablement > View by Feature

License installed on: June 10, 2022 9:09:46 PM -04:00

License File Host IDs: V5-E1-B3-74-2B-9E-01

Feature (License Keyword)	Expiration date	License Capacity	Currently available
Unified CC API Desktop Edition (VALUE_AES_AEC_UNIFIED_CC_DESKTOP)	permanent	1000	1000
CVLAN ASAI (VALUE_AES_CVLAN_ASAI)	permanent	16	16
Device Media and Call Control (VALUE_AES_DMCC_DMCC)	permanent	1000	1000
AES ADVANCED SMALL SWITCH (VALUE_AES_AEC_SMALL_ADVANCED)	permanent	3	3
DLG (VALUE_AES_DLG)	permanent	16	16
TSAPI Simultaneous Users (VALUE_AES_TSAPI_USERS)	permanent	1000	1000
AES ADVANCED LARGE SWITCH (VALUE_AES_AEC_LARGE_ADVANCED)	permanent	3	3
CVLAN Proprietary Links (VALUE_AES_PROPRIETARY_LINKS)	permanent	16	16
Product Notes (VALUE_NOTES)	permanent		Not counted

SmallServerTypes: s8300c;s8300d;icc;premio;tn8400;laptop;CtiSmallServer
MediumServerTypes: ibmx306;ibmx306m;dell1950;xen;hs20;hs20_8832_vm;CtiMediumServer
LargeServerTypes: igz2100;ibmx305;dl380g3;dl385g1;dl385g2;unknown;CtiLargeServer
TrustedApplications: IPS_001, BasicUnrestricted, AdvancedUnrestricted, DMCCUnrestricted; 1XP_001, BasicUnrestricted, AdvancedUnrestricted, DMCCUnrestricted; 1XM_001, BasicUnrestricted, AdvancedUnrestricted, DMCCUnrestricted; PC_001, BasicUnrestricted, AdvancedUnrestricted, DMCCUnrestricted; CIE_001, BasicUnrestricted, AdvancedUnrestricted, DMCCUnrestricted; OSPC_001, BasicUnrestricted, AdvancedUnrestricted, DMCCUnrestricted; VP_001, BasicUnrestricted, AdvancedUnrestricted, DMCCUnrestricted; SARETIME_001, VALUE_AES_UNIFIED_CC_DESKTOP,, CCE_001, BasicUnrestricted, AdvancedUnrestricted, DMCCUnrestricted; CSI_T1_001, BasicUnrestricted, AdvancedUnrestricted, DMCCUnrestricted; CSI_T2_001, BasicUnrestricted, AdvancedUnrestricted, DMCCUnrestricted; AVAYAVERINT_001, BasicUnrestricted, AdvancedUnrestricted, DMCCUnrestricted; CCT_ELITE_CALL_CTRL_001, BasicUnrestricted, AdvancedUnrestricted, DMCCUnrestricted, AgentEvents; ANAV_001, BasicUnrestricted, AdvancedUnrestricted, DMCCUnrestricted, AgentEvents; UNIFIED_DESKTOP_001, BasicUnrestricted, AdvancedUnrestricted, DMCCUnrestricted, AgentEvents; AAC_001, BasicUnrestricted, AdvancedUnrestricted, DMCCUnrestricted; CE_AGENT_STATES_001, BasicUnrestricted, AdvancedUnrestricted, DMCCUnrestricted, AgentEvents; TP_CLIENT_001, BasicUnrestricted, , , AgentEvents; EXT_CLIENT_001, , ,

6.3. Administer TSAPI Link

Select **AE Services** → **TSAPI** → **TSAPI Links** from the left pane of the **Management Console**, to administer a TSAPI link. The **TSAPI Links** screen is displayed, as shown below. Click **Add Link**.

AVAYA

Application Enablement Services
Management Console

Welcome: User cust
Last login: Fri Oct 27 14:14:39 E.S.T. 2023 from 192.168.120.19
Number of prior failed login attempts: 1
HostName/IP: aes/10.64.101.239
Server Offer Type: VIRTUAL_APPLIANCE_ON_VMWARE
SW Version: 10.1.3.0.0.11-0
Server Date and Time: Mon Oct 30 17:01:14 EDT 2023
HA Status: Not Configured

AE Services | TSAPI | TSAPI Links

Home | Help | Logout

▼ AE Services

▶ CVLAN

▶ DLG

▶ DMCC

▶ SMS

▼ TSAPI

▪ TSAPI Links

▪ TSAPI Properties

TSAPI Links

Link	Switch Connection	Switch CTI Link #	ASAI Link Version	Security
1	cm	1	12	Both

Add Link

Edit Link

Delete Link

The **Add TSAPI Links** screen is displayed next. Set the following values for the specified fields and retain the default values for the remaining fields.

- **Link:** An available link number.
- **Switch Connection:** The relevant switch connection, in this case “cm.”
- **Switch CTI Link Number:** The CTI link number from **Section Error! Reference source not found.**
- **ASAI Link Version:** 12
- **Security:** “Encrypted” or “Both” to allow for encrypted connection.

AVAYA

Application Enablement Services
Management Console

Welcome: User cust
Last login: Fri Oct 27 14:14:39 E.S.T. 2023 from 192.168.120.19
Number of prior failed login attempts: 1
HostName/IP: aes/10.64.101.239
Server Offer Type: VIRTUAL_APPLIANCE_ON_VMWARE
SW Version: 10.1.3.0.0.11-0
Server Date and Time: Mon Oct 30 17:02:41 EDT 2023
HA Status: Not Configured

AE Services | TSAPI | TSAPI Links

Home | Help | Logout

▼ AE Services

▶ CVLAN

▶ DLG

▶ DMCC

▶ SMS

▼ TSAPI

▪ TSAPI Links

▪ TSAPI Properties

▶ TWS

▶ Communication Manager
Interface

▶ High Availability

Edit TSAPI Links

Link

1

Switch Connection

cm

Switch CTI Link Number

1

ASAI Link Version

12

Security

Both

Apply Changes

Cancel Changes

Advanced Settings

6.4. Configure User

A user was created for Harmony to communicate with AES. Navigate to **User Management** → **User Admin** → **Add User**.

Fill in **User Id**, **Common Name**, **Surname**, **User Password** and **Confirm Password**. Set the **CT User** to **Yes**, and **Apply**.

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 system information such as 'Welcome: User cust', 'Last login: Tue Oct 31 13:19:34 E.S.T. 2023 from 192.168.120.35', and 'HA Status: Not Configured'. A red navigation bar contains links for 'User Management | User Admin | List All Users' and 'Home | Help | Logout'. On the left, a sidebar menu lists various services, with 'User Management' expanded to show 'User Admin' and 'Add User'. The main content area is titled 'Edit User' and contains a form with the following fields: * User Id (harmony), * Common Name (harmony), * Surname (harmony), User Password, Confirm Password, Admin Note, Avaya Role (None), Business Category, Car License, CM Home, Csm Home, CT User (Yes), Department Number, Display Name, and Employee Number.

6.5. Administer Security Database


Select **Security → Security Database → Control** from the left pane, to display the **SDB Control for DMCC, TSAPI, JTAPI and Telephony Web Services** screen in the right pane. Make certain that both parameters are unchecked, as shown below.

In the case that the security database is used by the customer with parameters already enabled, then follow **reference [2]** to configure access privileges for the Harmony user from **Section Error! Reference source not found.**

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 user "cust" with login details. A red navigation bar contains "Security | Security Database | Control" and links for "Home | Help | Logout". The left sidebar lists various services, with "Security" expanded to show "Security Database" and "Control" selected. The main content area, titled "SDB Control for DMCC, WTI, TSAPI, JTAPI and Telephony Web Services", contains two unchecked checkboxes: "Enable SDB for DMCC and WTI Service" and "Enable SDB for TSAPI Service, JTAPI and Telephony Web Services", along with an "Apply Changes" button.

6.6. Restart Service

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



Application Enablement Services
Management Console

Welcome: User: cust
Last login: Fri Oct 27 14:14:39 E.S.T. 2023 from 192.168.120.19
Number of prior failed login attempts: 1
HostName/IP: aes/10.64.101.239
Server Offer Type: VIRTUAL_APPLIANCE_ON_VMWARE
SW Version: 10.1.3.0.0.11-0
Server Date and Time: Mon Oct 30 17:08:27 EDT 2023
HA Status: Not Configured

Maintenance | Service Controller

Home | Help | Logout

AE Services

Communication Manager Interface

High Availability

Licensing

Maintenance

Date Time/NTP Server

Security Database

Service Controller

Server Data

Networking

Security

Status

User Management

Utilities

Help

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
<input type="checkbox"/> WTI Service	Stopped


Note: DMCC Service must be restarted for WTI service changes to take effect.
For status on actual services, please use [Status and Control](#)

Start Stop **Restart Service** Restart AE Server Restart Linux Restart Web Server

6.7. 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 pertinent Tlink name, to be used later to share with Event Intelligence. In this case, the pertinent Tlink name for encrypted connection is “**AVAYA#CM#CSTA-S#AES**” as shown below.



Application Enablement Services
Management Console

Welcome: User cust
Last login: Fri Oct 27 14:14:39 E.S.T. 2023 from 192.168.120.19
Number of prior failed login attempts: 1
HostName/IP: aes/10.64.101.239
Server Offer Type: VIRTUAL_APPLIANCE_ON_VMWARE
SW Version: 10.1.3.0.0.11-0
Server Date and Time: Mon Oct 30 17:10:26 EDT 2023
HA Status: Not Configured

Security | Security Database | Tlinks

Home | Help | Logout

▶ AE Services

▶ Communication Manager Interface

▶ High Availability

▶ Licensing

▶ Maintenance

▶ Networking

▼ Security

▶ Account Management

▶ Audit

▶ Certificate Management

Enterprise Directory

▶ Host AA

▶ PAM

▼ Security Database

▪ Control

▣ CTI Users

▪ Devices

▪ Device Groups

▪ **Tlinks**

Tlinks

Tlink Name

☐ AVAYA#CM#CSTA#AES

☒ AVAYA#CM#CSTA-S#AES

Delete Tlink

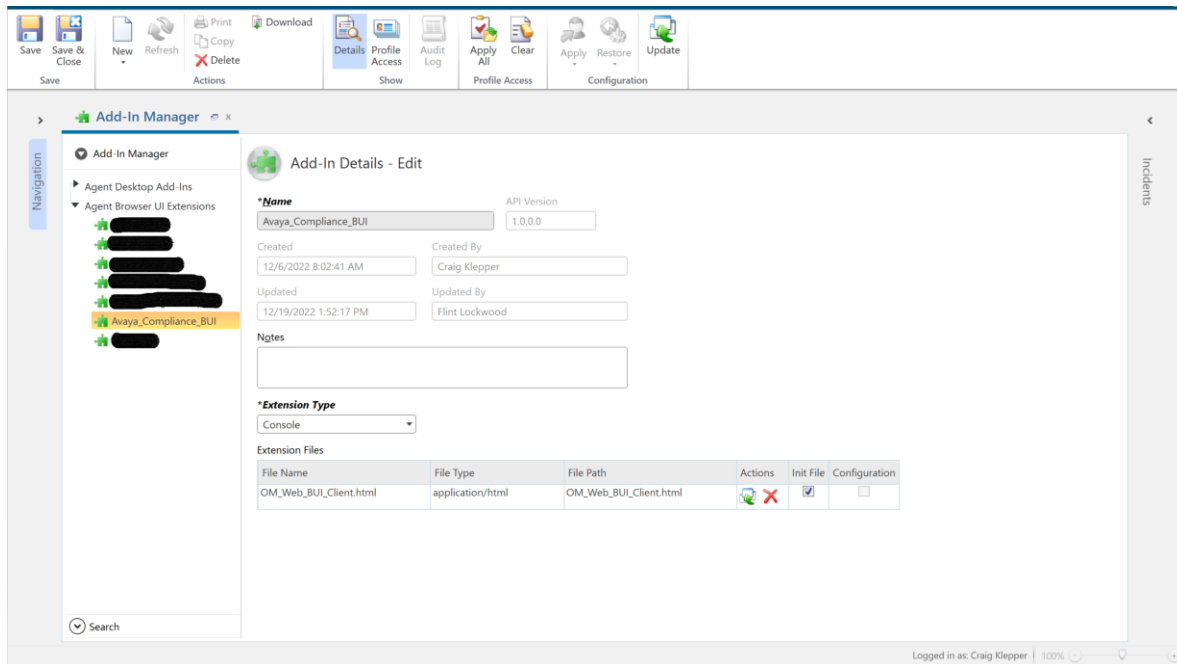
7. Configure Harmony

There are multiple OpenMethods components used in the integration with Avaya.

- **Harmony Client Browser UI Extension**– An Add-In into Oracle Service Cloud. Provides a GUI toolbar for call control functionality.
- **PopFlow** – These are Cloud Edge Services that are provided by OM and is utilized with the Oracle API(s). This includes Experience Designer (Workflow editor) and ScreenPop execution engine components.
- **Experience Cloud** - Cloud browser application that allows for the configuration of resources to be utilized for the integration with OM with Avaya
- **Harmony Integration Server** – Service that provides CTI connectivity to Avaya and communicates back to Harmony Client Add-In.
- **Harmony Queue Adapter** - Services that communicates with Oracle Service Cloud to detect new Chat and Email requests, and then submits these requests back to Avaya for routing to agents.

7.1. Harmony Client Browser UI Extension

The Harmony Client Browser UI Extension is configured and uploaded into Oracle Service Cloud. The extension allows the client to connect to the correct site in Experience Cloud and utilize the BUI Media Bar for OpenMethods. This is something the integrator would set up in advance for the entire site.



7.1.1. Harmony Client - Agent Settings

For compliance testing, two users were created using the Experience Cloud application to interact with the OpenMethods Configuration Server.

Below is the setup for an Oracle Service Cloud User “ACAgent1”, repeat for additional agents. Normally, the “Agents Available to this User” would only associate one ACD Agent ID rather than both as shown below.

The screenshot displays the 'Avaya_Compliance' configuration page. On the left sidebar, there are sections for 'CRM Instances' (showing 'Oracle_Service_Cloud' with Type: ServiceCloud and Version: 22C), 'CRM/CTI Mapping', 'Oracle_Service_Cloud', and 'User Groups' (showing '-- None --'). The main content area is titled 'CRM User and CTI Agent Mappings' and includes a breadcrumb trail: 'ORACLE_SERVICE_CLOUD > USER GROUPS/USERS > > ACAGENT1 > CRM User and CTI Agent Mappings'. Below the breadcrumb, there are radio buttons for 'Inherit' and 'Override' (selected), along with 'View Mapping' and 'Edit Mapping' buttons. A table titled 'Overridden Mapped Agents (1)' contains one entry:

#	Environment Name	Group Name	Agent Id	Agent Name
1	Avaya		65881	CM Agent 1

Config Server > Deployments

lgizzi@avaya.com

Avaya_Compliance

CRM Instances

Oracle_Service_Cloud

Type: ServiceCloud

Version: 22C

+ Add CRM Instance

CRM/CTI Mapping

Oracle_Service_Cloud

User Groups

-- None --

Settings

User Groups and Users

CRM User and CTI Agent Mappings

ORACLE_SERVICE_CLOUD > User Groups and Users

ADVANCED USER SEARCH

CRM USER GROUPS

Search CRM User Groups

User Group Name	Actions
no items	

Total: 0

CRM USERS

Search CRM Users

	Username	Full Name	Actions
<input type="checkbox"/>	ACAgent1	AC Agent 1	
<input type="checkbox"/>	ACAgent2	AC Agent 2	

Total: 2

Add User

Add User Group

Import Users

Export Users

Delete All Users

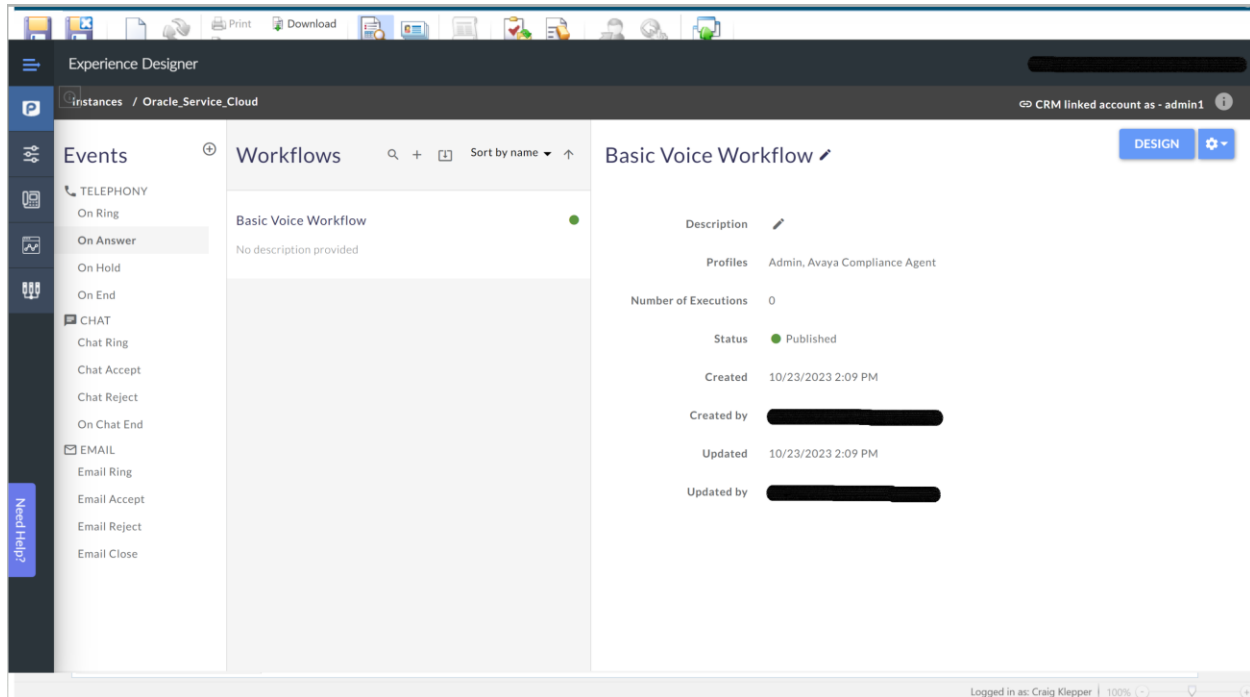
"Bulk Delete Users" will delete all the CRM Users from the list provided in the csv file. [Click here to download the template csv file.](#)

Bulk Delete Users

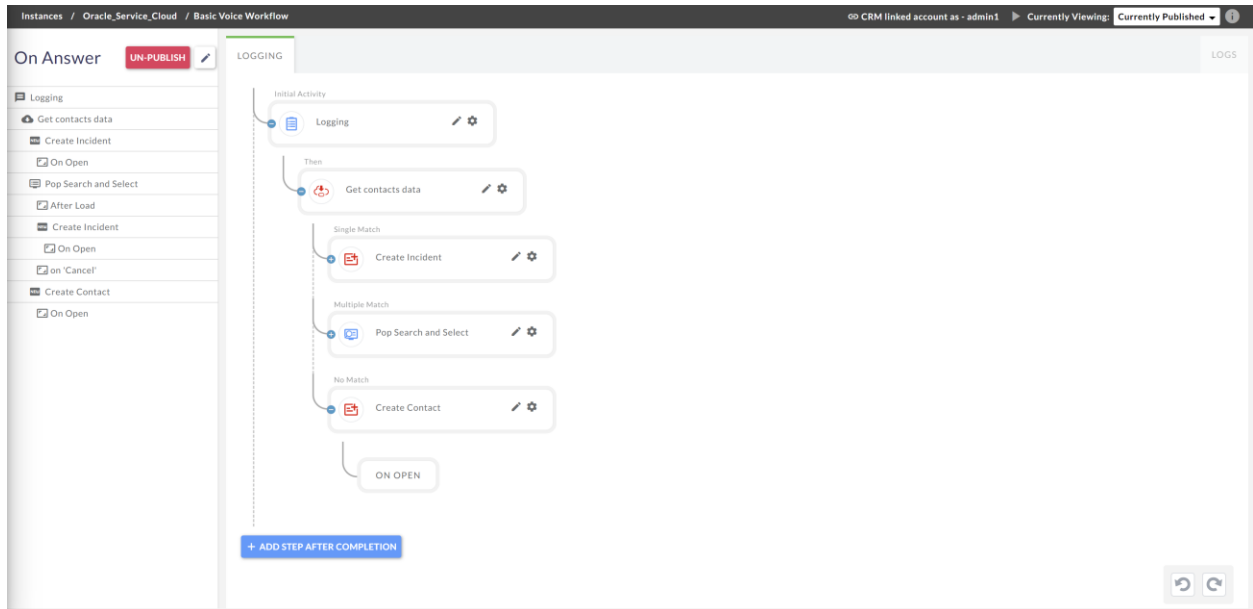
7.1.2. Harmony PopFlow – Voice

The Harmony PopFlow Workflow for voice is configured via the OpenMethods Experience Designer.

The PopFlow workflow needs to be configured and mapped to a profile against Oracle Service Cloud. For this certification, we used the "Avaya Compliance Agent" profile and the “Basic Voice Workflow” PopFlow workflow. Here is the PopFlow script published and the profiles that utilize it.



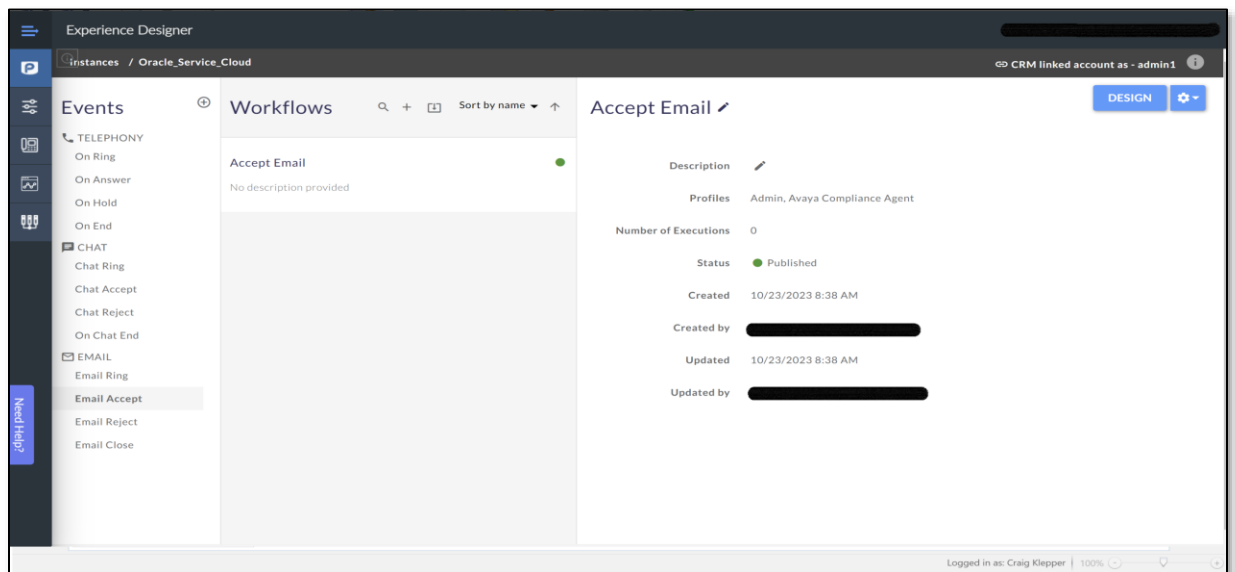
The “Basic Voice Workflow” workflow configuration is below.



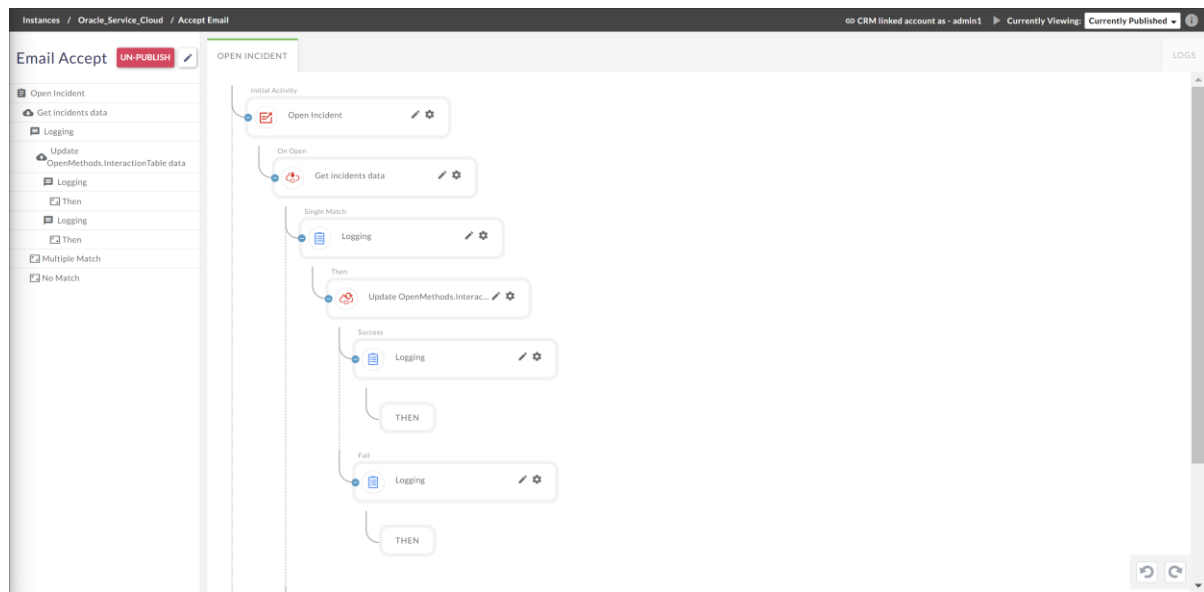
7.1.3. Harmony PopFlow - Email

The Harmony PopFlow Workflow for email is configured via the OpenMethods Experience Designer.

The PopFlow workflow needs to be configured and mapped to a profile against Oracle Service Cloud. For this certification, we used the "Avaya Compliance Agent" profile and the “Accept Email” PopFlow workflow. Here is the PopFlow script published and the profiles that utilize it.



The “Email Accept” workflow configuration is below..



7.2. Queue Adapter

Below is the master configuration for the Harmony Queue Adapter that is configured and maintained in Experience Cloud in the Network Hosts section of the site.

SETTING NAME	CURRENT VALUE
Is Enabled	<input checked="" type="checkbox"/>
Target Name *	AvayaProcessor
Display Name *	Avaya Processor
Server	
Address To Server *	10.64.101.239
Port To Server *	4721
Login Name *	harmony
Login Password *
Protocol Version *	PROTOCOL_VERSION_6_3_3
Use Secure Sockets	<input type="checkbox"/>
Enable Auto Keep Alive	<input checked="" type="checkbox"/>
Allow Certificate Name Mismatch	<input type="checkbox"/>

Left Navigation.

Avaya_Compliance

Network Hosts

Avaya-HIS1-QA

Type: Premise

OS: Windows

+ Add Network Host

Avaya-HIS1-QA

Settings

Site Interfaces

Chat/Email Processors

Data Filters/Rules Engine

Telephony Platforms

AVAYA-HIS1-QA > AVAYA-HIS1-QA > AVAYA-HIS1-QA-AVAYA-HIS1-QA > Telephony Platforms

Processor Type : Avaya Processor

SETTING NAME	CURRENT VALUE
Enable Auto Keep Alive	<input checked="" type="checkbox"/>
Allow Certificate Name Mismatch	<input type="checkbox"/>
UI Delimeter *	&
Avaya Switch Name *	CM
Make Call Timeout *	60000
Make Call Response Delay *	500
Session	
Session Name *	OpenMethods-Avaya
Session Cleanup Delay *	60
Session Duration *	180
Queue	
Queue To VDN Mapping	OMDefaultRoute=60102&Default Chat Queue=60102&Order Support=60103

Avaya-HIS1-QA

Queue

Queue To VDN Mapping

OMDefaultRoute=60102&Default Chat Queue=60102&Order Support=60103

Chat

AWOH Hunt Group Ext Chat *

64900

Capacity Retry Delay Chat *

10000

Email

AWOH Hunt Group Ext Email *

63900

Capacity Retry Delay Email *

30000

7.2.1. Reason Codes

Using Experience Cloud, configure Aux reason codes which will appear in the Agent toolbar. Note that this solution relies on agents using Auto login, and initially will log agents into aux state. For consistent call center reporting, AUX and ACW codes are mapped to labels in the following interface:

The screenshot shows the 'Reason Codes' configuration page in the Avaya Compliance interface. The left sidebar contains a 'Telephony Platforms' section with a dropdown menu set to 'Avaya', showing 'Type: Avaya' and 'Version: 7.0'. Below this is a '+ Add Telephony Platform' button. The main content area has a breadcrumb 'AVAYA > Not Ready Reason Codes' and a search bar 'Search Reason Codes'. A table titled 'REASON CODES' lists three entries: Code 1 (Meeting), Code 2 (Lunch), and Code ACW (ACW). Each entry has a checkbox, a 'Selectable' column set to 'true', and an 'Actions' column with edit and delete icons. At the bottom of the table, it says 'Total: 3'. There is a blue 'Add Reason Code' button and a red 'Delete All Reason Codes' button. The interface also includes a top navigation bar with tabs for 'Settings', 'Agent Groups/Agents', 'Reason Codes', 'Logout Reasons', 'Interaction Dispositions', 'Caller Ids', and 'Quick Dials'.

Code	Name	Selectable	Actions
<input type="checkbox"/> 1	Meeting	true	
<input type="checkbox"/> 2	Lunch	true	
<input type="checkbox"/> ACW	ACW	true	

8. Verification Steps

This section provides the tests that can be performed to verify proper configuration of Communication Manager, Application Enablement Services, and Harmony.

8.1. Verify Avaya Aura® Communication Manager

On Communication Manager, verify 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 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	Rcvd
1	12	no	aes	established	49	49

To verify Harmony is able to monitor the stations correctly, use the **list monitored-station** command. All the stations that are being monitored by Harmony are as shown below:

```
list monitored-station
```

MONITORED STATION															
Associations:		1		2		3		4		5		6		7	
Station	Ext	CTI Lnk	CRV	CTI Lnk	CRV	CTI Lnk	CRV	CTI Lnk	CRV	CTI Lnk	CRV	CTI Lnk	CRV	CTI Lnk	CRV
65001		1	0004												
		1	0009												

8.2. Verify Avaya Aura® Application Enablement Services

On Application Enablement Services, verify status of the TSAPI service by selecting **Status** → **Status and Control** → **TSAPI Service Summary** (not shown) from the left pane. The **TSAPI Link Details** screen is displayed.

Verify that the **Status** is “**Talking**” for the TSAPI link administered in **Section 6**, and that the **Associations** column reflects the number of logged in agents from **Section Error! Reference source not found.**

AVAYA

Application Enablement Services
Management Console

Welcome: User cust
Last login: Fri Oct 27 14:14:39 E.S.T. 2023 from 192.168.120.19
Number of prior failed login attempts: 1
HostName/IP: aes/10.64.101.239
Server Offer Type: VIRTUAL_APPLIANCE_ON_VMWARE
SW Version: 10.1.3.0.0.11-0
Server Date and Time: Mon Oct 30 17:22:53 EDT 2023
HA Status: Not Configured

Status | Status and Control | TSAPI Service Summary

Home | Help | Logout

▶ AE Services

▶ Communication Manager Interface

High Availability

▶ Licensing

▶ Maintenance

▶ Networking

▶ Security

▼ Status

Alarm Viewer

▶ Logs

▶ Log Manager

▼ Status and Control

■ CVLAN Service Summary

■ DLG Services Summary

■ DMCC Service Summary

■ Switch Conn Summary

■ TSAPI Service Summary

▶ User Management

TSAPI Link Details

☐ Enable page refresh every 60 seconds

	Link	Switch Name	Switch CTI Link ID	Status	Since	State	Switch Version	Associations	Msgs to Switch	Msgs from Switch	Msgs Period
<input checked="" type="radio"/>	1	cm	1	Talking	Mon Oct 23 16:03:06 2023	Online	20	0	14	14	30

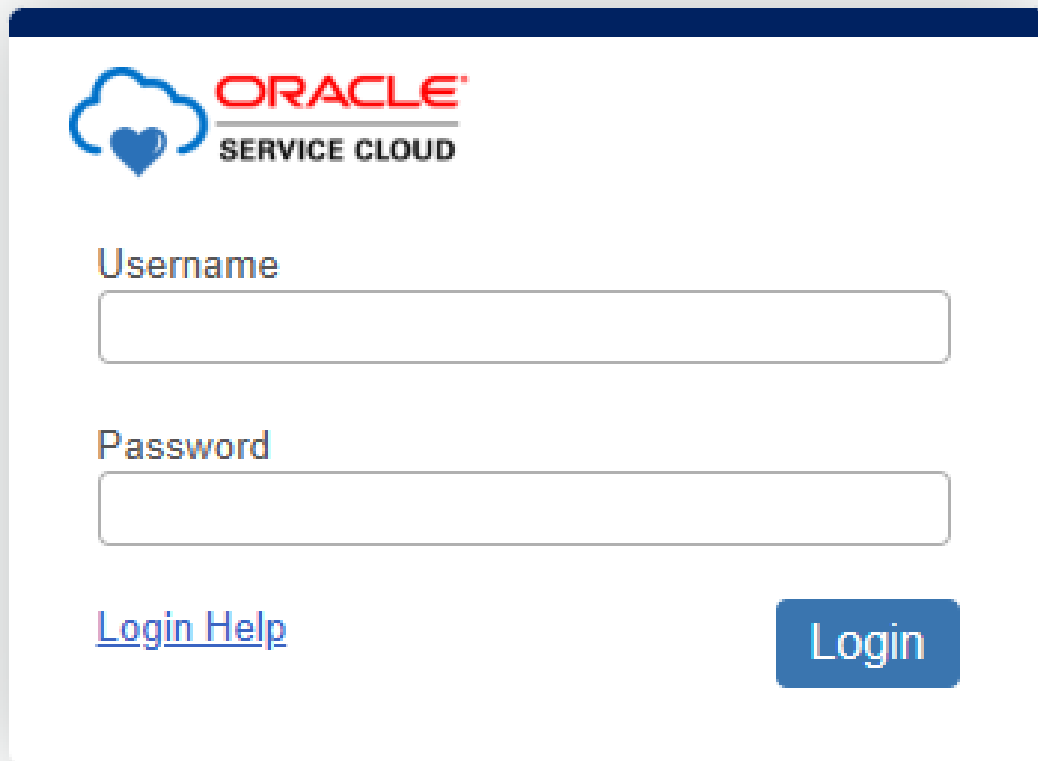
Online Offline


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

TSAPI Service Status TLink Status User Status

8.3. Verify Harmony

To verify the agent can successfully log in from one of the Agent Desktops, launch the Oracle Service Cloud BUI browser window. Log in using appropriate credentials.

The image shows a login window for Oracle Service Cloud. At the top left is the Oracle Service Cloud logo, which consists of a blue cloud icon with a heart inside, followed by the word "ORACLE" in red and "SERVICE CLOUD" in blue. Below the logo are two input fields: "Username" and "Password". At the bottom left is a blue hyperlink labeled "Login Help". At the bottom right is a blue button labeled "Login".

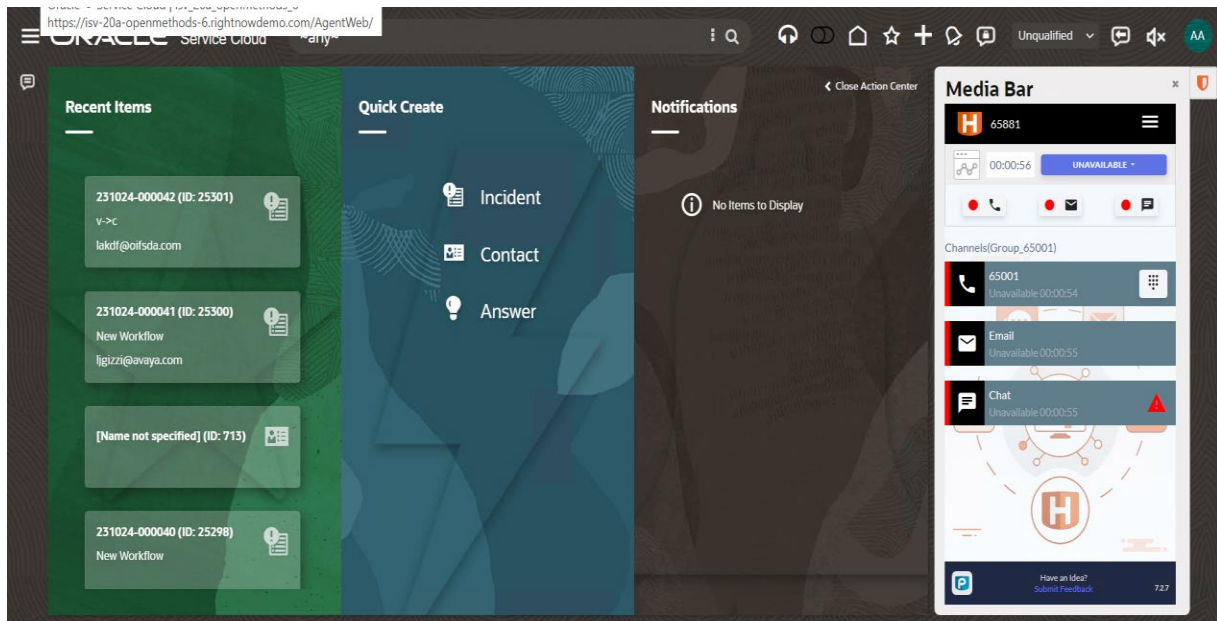
 **ORACLE**
SERVICE CLOUD

Username

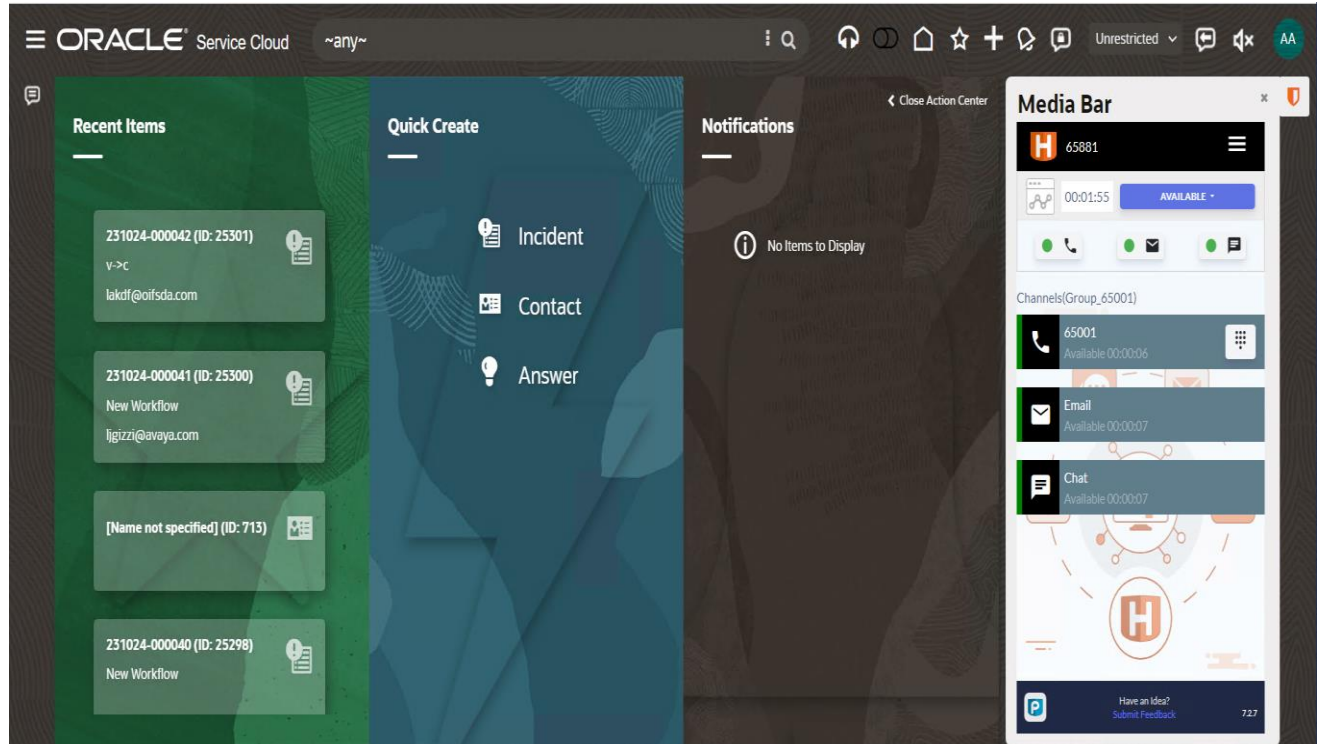
Password

[Login Help](#)

The agent will log in automatically once successfully logged into Oracle Service Cloud.



Once logged in, click on the agent state and make it Available. The following screen shows up.



Place a call to one of the VDNs configured in **Section 5.7**. Once the agent receives the call, answer it. A customer record will pop up in the workspace to the left of the media toolbar.

The screenshot displays the Oracle Service Cloud interface. The main workspace shows a customer record for reference # 231102-000001. The record includes fields for Subject (New Workflow), Assigned (OFSC Agent > AC ...), Product, Category, and Disposition. Below these fields are tabs for Messages, Incident Details, Previous Incidents, Package Tracking - Browser, and Co-Browse. The Messages tab is active, showing a list of messages with columns for Reference #, Status, Queue, and Severity. A contact information section is visible on the left, showing Contact (PSTN-703 ...), Email, and Address (12121 Grant St). On the right side of the interface, there is a Media Bar with a search icon and a list of channels. The channels list includes an Inbound Call (65001) and an Email (17037030032). The Media Bar also displays a 'HANDLING INTERACTION' button and a 'Submit Feedback' button.

9. Conclusion

OpenMethods Harmony 7.1 was able to successfully interoperate with Avaya Aura® Communication Manager 10.1 and Avaya Aura® Application Enablement Services 10.1. All executed test cases were passed.

10. Additional References

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

1. *Administering Avaya Aura® Communication Manager*, Release 10.1.x, Issue 6, May 2023, available at <http://support.avaya.com>.
2. *Administering Avaya Aura® Application Enablement Services*, Release 10.1.x, Issue 7, May 2023, available at <http://support.avaya.com>.
3. *Administering Avaya Aura® Session Manager*, Release 10.1.x, Issue 6, May 2023, available at <http://support.avaya.com>.

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