

Avaya Solution & Interoperability Test Lab

Application Notes for Easy On Hold® Streaming Queue Music™ with Avaya Aura® Media Server 10.1 and Avaya Aura® Communication Manager 10.1 – Issue 1.1

Abstract

These Application Notes describe the procedures for configuring Avaya Aura® Media Server 10.1 and Avaya Aura® Communication Manager 10.1 to interoperate with the Easy On Hold® Streaming Queue MusicTM service.

Easy On Hold® Streaming Queue Music™ is a cloud based media streaming service connecting call center platforms to a continuous stream of scheduled and randomized content (music and/or messages). Single or multiple simultaneous streams can be supported, providing customized content and unique caller experience. These Application Notes update previously published Application Notes with newer versions of Avaya Aura® Media Server and Avaya Aura® Communication Manager.

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 DevConnect Program at the Avaya Solution and Interoperability Test Lab.

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1. Introduction

These Application Notes describe the procedures for configuring Avaya Aura® Media Server 10.1 (Media Server) and Avaya Aura® Communication Manager 10.1 (Communication Manager) to interoperate with the Easy On Hold® Streaming Queue MusicTM service.

Easy On Hold® Streaming Queue MusicTM is a cloud based media streaming service, built to enhance & maintain quality customer experiences in the contact center queue. Streaming in-queue audio music & messaging can be aligned with caller profiles at various stages of the customer experience. Authorized users manage messaging and music in the customer portal. Individual topics are each scheduled to play only when needed, eliminating out-of-date messaging. Messages, including pre-recorded emergency or standby announcements, can be turned on/off via the customer portal.

The Avaya Media Server supports continuous streaming audio from the Easy On Hold® cloud using HTTP/MP3 or HTTP Live Streaming (HLS) formats.

Integration between Avaya and Easy On Hold® is performed via the provided URL(s) of the Streaming Queue Music service, configured in the Avaya Media Server. The Media Server access the streams and make them available to Communication Manager.

The Media Server automatically records 15 minutes of streaming content, which provide a backup when the streaming server is unreachable. Other features include live monitoring of the status of music streaming providers, as well as providing controls for volume adjustments of the music level. The Media Server supports up to 64 music streams across all the supported providers, making possible to create many unique caller experiences using targeted streaming content.

Communication Manager access the provisioned music streams in the same way that it access an announcement for playback, using the case-insensitive Stream Key configured in the Media Server for the stream to identify the required music source.

2. General Test Approach and Test Results

A simulated enterprise site containing the Avaya Media Server and Communication Manager was installed at the Avaya Solution and Interoperability Lab. HTTP Internet connectivity via is required to connect the Media Server to the Easy On Hold® Streaming Queue MusicTM service, via the provided URLs of the streaming sources in the cloud.

Other components present in the reference architecture, but not directly related to the integration with the Easy On Hold® Streaming Queue MusicTM service are Avaya Aura® System Manager (System Manager), Avaya Aura® Session Manager (Session Manager) and Avaya Session Border Controller for Enterprise (Avaya SBCE). Session Manager acted as a Registrar for Avaya SIP endpoints on the enterprise, also providing a centralized dial-plan for least-cost and time-of-day based routing. The Avaya SBCE was used to provide connectivity to a simulated PSTN SIP trunk used during the tests.

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.

This test was conducted in a lab environment simulating a basic customer enterprise network environment. The testing focused on the standards-based interface between the Avaya solution and the third party solution. The results of testing are therefore considered to be applicable to either a premise-based deployment or to a hosted or cloud deployment where some elements of the third party solution may reside beyond the boundaries of the enterprise network, or at a different physical location from the Avaya components.

Readers should be aware that network behaviors (e.g., jitter, packet loss, delay, speed, etc.) can vary significantly from one location to another, and may affect the reliability or performance of the overall solution. Different network elements (e.g., session border controllers, soft switches, firewalls, NAT appliances, etc.) can also affect how the solution performs.

If a customer is considering implementation of this solution in a cloud environment, the customer should evaluate and discuss the network characteristics with their cloud service provider and network organizations, and evaluate if the solution is viable to be deployed in the cloud.

The network characteristics required to support this solution are outside the scope of these Application Notes. Readers should consult the appropriate Avaya and third party documentation for the product network requirements. Avaya makes no guarantee that this solution will work in all potential deployment configurations.

The configuration shown in **Figure 1** was used to exercise the features and functionality tests listed in **Section 2.1**.

2.1. Interoperability Compliance Testing

Interoperability compliance testing covered the following features and functionality:

- Testing was performed using two different Easy On Hold® Streaming Queue MusicTM streams, with the following formats:
 - o HTTP/MP3, 64kbps, mono
 - o HTTP Live Streaming (HLS), 64kbps, mono
- Verification of simultaneous playback from different music sources, by provisioning separate Tenants in Communication Manager.
- Proper playback of streaming audio content when inbound and outbound calls are placed on hold or are transferred.
- Verify that agents can repeatedly alternate between two calls, by placing them on hold, validating that the music is heard each time the call is placed on hold, and the talk path is restored when taken off hold.
- Verify that content is played during long hold times, of 10 minutes or more, without interruption.
- Proper caller treatment on inbound calls to Communication Manager vectors. Verify the caller hears music when no agent is available in the queue, and the music stops when an agent becomes available.
- Multiple hold music instances. Verify that queue music plays when several agents place calls on hold.
- Verify that the time it takes for music to play in hold state is one second or less.
- Verify that music is played continuous and uninterrupted, with no noise artifacts, pops, hum, etc.
- Verify the music volume can be altered by adjusting the provider audio levels on the Media Server.

The serviceability part of the testing focused on verifying:

- Ability of the Media Server to play pre-recorded content when the streaming service was unreachable during short periods of time (less than 15 minutes).
- Ability of the Media Server to play pre-recorded content on a loop when the streaming service was unreachable during long periods of time (more than 15 minutes).

- Verify the Media Server reverts to the primary streaming source once it comes back in service after a network outage.
- Ability to recover from adverse conditions, such as disconnecting/reconnecting the network interface on the Media Server.

2.2. Test Results

All test cases completed successfully.

2.3. Support

Technical support on the Easy On Hold® Streaming Queue Music™ solution can be obtained through the following:

Webpage: https://easyonhold.com/support/

Phone: +1 888 798 4653

Email: support@easyonhold.com

Avaya customers may obtain documentation and support for Avaya products by visiting http://support.avaya.com.

3. Reference Configuration

The configuration used for the compliance testing is shown below.

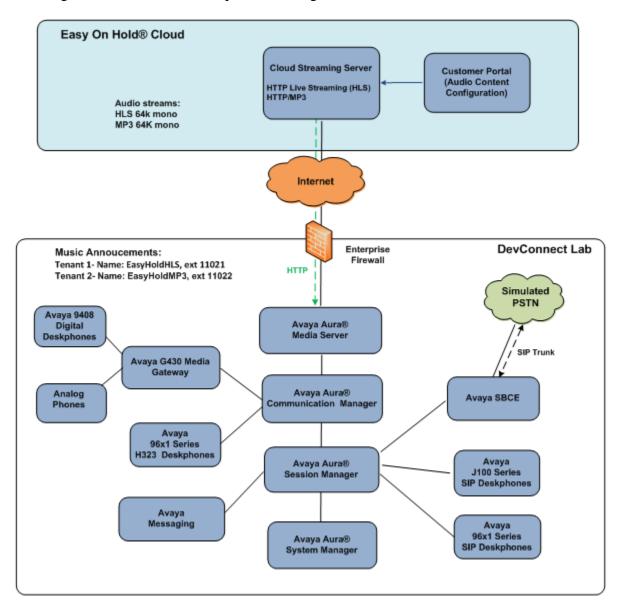


Figure 1: Test Configuration

4. Equipment and Software Validated

The following equipment and software were used in the sample configuration.

Component	Version			
Avaya				
Avaya Aura® Media Server	10.1.0.77			
Avaya Aura® Communication Manager	10.1.0.2 (Service Pack 2)			
	Update ID 01.0.974.0-27607			
Avaya Aura® System Manager	10.1.0.2.0715038 Service Pack 2			
	Hot Fix 3 (1010215424)			
Avaya Aura® Session Manager	10.1.0.2.1010219			
Avaya Messaging	10.8 SP1			
Avaya G430 Media Gateway 1	42.8			
Avaya 96x1 Series IP Deskphone (H.323)	6.8532			
Avaya J100 IP Deskphones (J169, J179)	4.1.0.0.7			
Avaya 96x1 Series IP Deskphone (SIP)	7.1.15.0.14			
Avaya 9408 Digital Deskphone	20.06			
Easy On Hold®				
Streaming Queue Music service	0.1.46			

Table 1: Equipment and Software Used in the Sample Configuration

5. Avaya Aura® Media Server Configuration

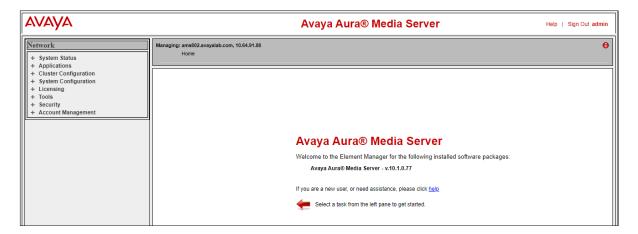
In the reference configuration, the Avaya Media Server is provisioned to provide Music on Hold to the enterprise. The Media Server is also used, along with a G430 Media Gateway, to provide local DSP resources and announcements on the enterprise.

Note – The initial installation, configuration, and licensing tasks of the Avaya Media Server are assumed to have been previously completed and are not discussed in these Application Notes.

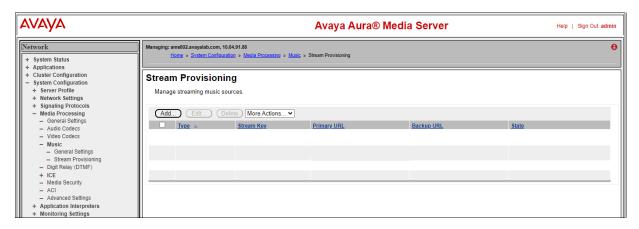
5.1. Stream Provisioning

Perform the following procedure to add the Easy On Hold® streaming music source in the Avaya Media Server.

Access the Media Server Element Manager web interface https://x.x.x.x:8443/emlogin, where x.x.x.x is the IP address of the Media Server (not shown).



On the Media Server Element Manager menu on the left side of the screen, navigate to **System Configuration** \rightarrow **Media Processing** \rightarrow **Music** \rightarrow **Stream Provisioning**. Select **Add** on the screen on the right.

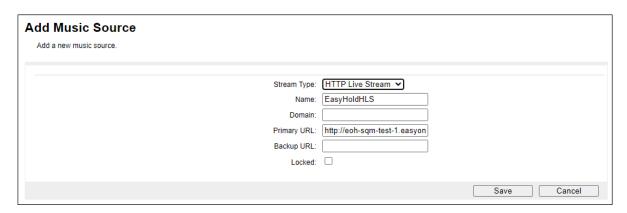


Note – For testing and demonstration purposes, two separate streaming music sources were provisioned in the reference configuration, one stream using HTTP Live Streaming (HLS) format and a second one using HTTP/MP3 format. In a real customer deployment, while one or multiple streams can be provisioned, only one of these formats will normally be used.

5.1.1. HTTP Live Streaming (HLS) Music Source

On the new **Add Music Source** screen, enter the following parameters:

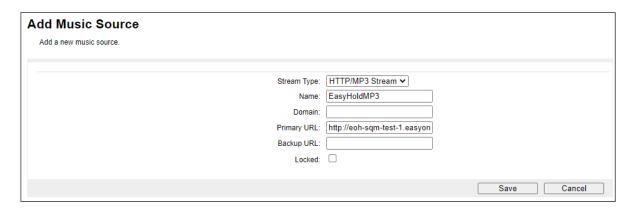
- **Stream Type**: select **HTTP Live Stream** from the drop down menu.
- Name: Enter a name for the new music source (e.g., EasyHoldHLS). The system uses this name as the Stream Key. The name is case sensitive and it should match the corresponding Communication Manager announcement name, later in Section 6.2.
- To form a stream key in the form "name@domain", enter a domain name in the **Domain** field. No domain was used in the reference configuration.
- **Primary URL**: Enter the address of the required HTTP Live Stream music source. This URL is provided by Easy on Hold®.
- The **Backup URL** field can be optionally used to provide an alternate music source. The system automatically switches to the backup music source when the primary source is unavailable. No Backup URL was provided in the reference configuration.
- Click Save.



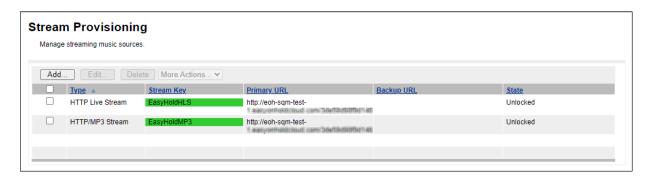
5.1.2. HTTP/MP3 Music Source

A second music source was provisioned in the reference configuration using HTTP/MP3 format. See the **Note** on **Section 5.1**. Select **Add** on the **Stream Provisioning** screen and repeat the steps on **Section 5.1.1**, with the following differences:

- **Stream Type**: select **HTTP/MP3 Stream** from the drop down menu.
- Name: Enter a name for the new music source (e.g., EasyHoldMP3). The system uses this name as the Stream Key. The name is case sensitive and it should match the corresponding Communication Manager announcement name, later in Section 6.2.
- **Primary URL**: Enter the address of the required HTTP/MP3 music source. The URL is provided by Easy on Hold®.
- Click Save.



The screen below shows the configured streams. The URLs have been masked for security. Note that the Stream Provisioning page does not automatically update the status. Manually refresh the web page to update the status. The assigned Names under the Stream Key should turn green once the streams are reachable and available.



6. Communication Manager Configuration

Note – The initial installation, configuration, and licensing tasks for Avaya Communication Manager are assumed to have been previously completed and are not discussed in these Application Notes.

6.1. Verify Licensed Features

Note – This section describes steps to verify Communication Manager feature settings that are required for the reference configuration described in these Application Notes. Depending on access privileges and licensing, some or all of the following settings might only be viewed, and not modified. If any of the required features are not set, and cannot be configured, contact an authorized Avaya account representative to obtain the necessary licenses/access.

Tenant Partitioning was used in the reference configuration. With this feature, separate music sources can be assigned to each tenant partition. The tenant number that is assigned to the called Vector Directory Number (VDN), agent, extension, etc. determines the music source that the user hears. With this capability music and messages can be customized for the business needs of each tenant partition.

Enter the **display system-parameters customer-options** command. On **Page 6** of the form, verify that the **Tenant Partitioning** field is set to **y**.

```
display system-parameters customer-options
                                                                     Page 6 of 12
                                  OPTIONAL FEATURES
                                                    Station and Trunk MSP? y
                Multinational Locations? n
                                                  Station as Virtual Extension? y
Multiple Level Precedence & Preemption? n
                      Multiple Locations? n
                                              System Management Data Transfer? n
          Personal Station Access (PSA)? y

PNC Duplication? n Term
                                                             Tenant Partitioning? y
                         PNC Duplication? n
                                                    Terminal Trans. Init. (TTI)? y
                    Port Network Support? y Time of Day Routing. 7
Posted Messages? y TN2501 VAL Maximum Capacity? y
Uniform Dialing Plan? y
                                                     Uniform Dialing Plan? y
                Private Networking? y Usage Allocation Enhancements? y Processor and System MSP? y
                      Processor Ethernet? y
                                                              Wideband Switching? v
                                                                         Wireless? n
                           Remote Office? y
          Restrict Call Forward Off Net? y
                   Secondary Data Module? y
```

A detailed description of Tenant Partitioning administration is not the focus of these Application Notes, and it is not included here. If more information on Tenant Partitioning administration is needed, please consult the Communication Manager documentation on the **Additional References** Section.

6.2. Add Announcements

Enter the **add announcement X** command, where **X** is an available Communication Manager extension number, to configure the music announcements associated with the Easy On Hold® music streams. Extension **11021** was used in the reference configuration.

The screen below shows the announcement created for the **HTTP Live Stream** music source. The following parameters are configured:

- **Annc Name**: The name entered here should exactly match the Music Source Name entered in **Section 5.1.1** (e.g., **EasyHoldHLS**).
- Annc Type: Enter integ-mus.
- **Source**: Enter the Media Server or Audio Group number. In the reference configuration, Media Server 1 is used (M1).
- TN: Enter the partition number for the announcement, e.g., 1.
- **Live Stream Source**: Set to y.

Note – If an Audio Group with multiple Media Servers is selected as the **Source**, all the Media Servers in the Audio Group must have the same streams provisioned, as shown in **Section 5.1**.

```
add announcement 11021

ANNOUNCEMENTS/AUDIO SOURCES

Extension: 11021 COR: 1
Annc Name: EasyHoldHLS TN: 1
Annc Type: integ-mus Queue? b
Source: M1 Live Stream Source? y
```

The screen below shows the announcement extension number **11022** created in the reference configuration for the **HTTP/MP3** music source. The following parameters are configured:

- **Annc Name**: The name entered here should exactly match the Music Source Name entered in **Section 5.1.2** (e.g. **EasyHoldMP3**).
- Annc Type: Enter integ-mus.
- **Source**: Enter the Media Server or Audio Group number. In the reference configuration, Media Server 1 is used (M1).
- TN: Enter the partition number for the announcement, e.g. 2.
- Live Stream Source: Set to y.

```
ANNOUNCEMENTS/AUDIO SOURCES

Extension: 11022 COR: 1
Annc Name: EasyHoldMP3 TN: 2
Annc Type: integ-mus Queue? b
Source: M1 Live Stream Source? y
```

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6.3. Change Music Sources

Use the **change music-sources** command to define music sources in Communication Manager. Note that each music source defined on this screen can be used by one or more Tenant Partitions. However, a partition can have only one music source.

The screen below shows Music Sources 1 and 2 as defined in the test configuration, with the following parameters:

- Type: Music.
- Source Type: ext.
- The extension numbers assigned correspond to the announcements created in **Section 6.2** (e.g., **11021** for Music Source 1 / Tenant 1 and **11022** for Music Source 2 / Tenant 2).

change music-source	Page 1 of 17			
Source No.	Туре	Source		Description
1: 2: 3: 4:		Type: ext Type: ext	11021 11022	MOH Tenant 1 MOH Tenant 2

6.4. Assign Music Sources to Tenants

Use the **change tenant** command to assign music sources for Tenant Partitions.

The screen below shows **Tenant 1** in the reference configuration, which is assigned **Music Source 1**.

```
change tenant 1

TENANT 1

Tenant Description: Tenant 1

Attendant Group: 1 SIP? n

Ext Alert Port (TAAS):

Night Destination:

Music Source: 1
```

The screen below shows **Tenant 2** in the reference configuration, which is assigned **Music Source 2**.

```
change tenant 2

TENANT 2

Tenant Description: Tenant 2

Attendant Group: 1 SIP? n

Ext Alert Port (TAAS):

Night Destination:

Music Source: 2
```

7. Easy on Hold® Streaming Queue Music™ Service Configuration

Support for the Easy On Hold® Streaming Queue MusicTM service in the cloud is performed by Easy On Hold® support personnel.

Customers requiring a new Easy On Hold® account should contact <u>sales@easyonhold.com</u> or call +1-888-798-4653, M-F 8:30 am to 5:00 pm Eastern Time Zone.

Established customers may access their Customer Portal (known as Content Control Center) at https://easyonholdcloud.com, where they can actively manage and configure their own streaming content.

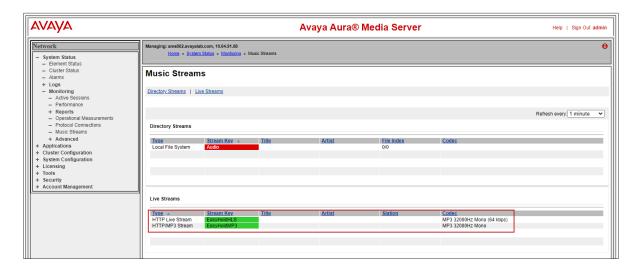
Information and instructional videos are provided at https://easyonhold.com/music-on-hold/management/. Additional Easy On Hold® support can be obtained using the links shown on Section 2.3.

8. Verification Steps

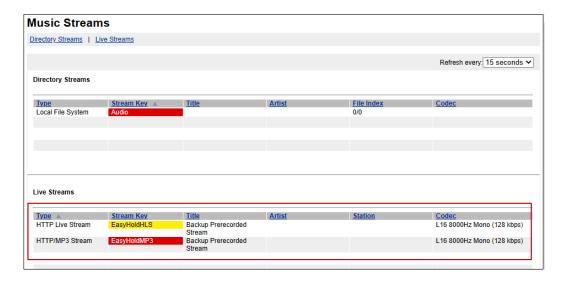
This section provides steps that can be performed to verify the configuration of the Avaya Media Server and Communication Manager with the Easy On Hold® Streaming Queue MusicTM service.

8.1. Avaya Media Server Live Stream Monitoring

On the Media Server Element Manager menu on the left side of the screen, navigate to **System Status** \rightarrow **Monitoring** \rightarrow **Music Stream**. Under **Live Streams** on the right side, verify the name under the **Stream Key** shows a green color, which means the stream is available. If the color is yellow or red, this is an indication that there are connectivity or other problems in the stream. Moving the cursor over the Stream Key will show a message with additional status information. Codec and bandwidth information is also shown.

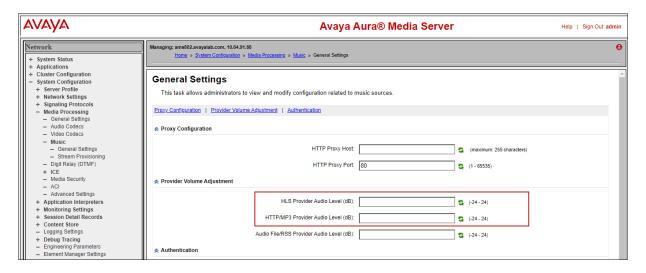


On the example screen below, the primary sources for the two streams are unreachable due to a network outage, and the Media Server is playing the internal 15 minutes backup of pre-recorded content.



8.2. Avaya Media Server Music Volume Adjustment

The volume level of the provider streaming source can be adjusted on the Media Server if necessary. On the Media Server Element Manager menu on the left side of the screen, navigate to **System Configuration** \rightarrow **Media Processing** \rightarrow **Music** \rightarrow **General Settings**. Under the **Provider Volume Adjustment** section, the level can be decreased or increased on a range of -24 dB to +24dB, for each provider type.



8.3. Communication Manager Verification

The following steps can be performed to verify the configuration:

- From an enterprise user, dial the extension number of the announcement provisioned as the music source. Verify the audio is the proper content provided by Easy On Hold®.
- Establish an active call to an enterprise user and place it on hold. Verify that the held party hears the proper audio content provided by Easy On Hold®.
- The **list trace** command can be used to verify the correct announcement is being played, like in the example below.

The following edited Communication Manager **list trace tac** trace output shows a call incoming on trunk group 1. Session Manager maps the number received from the simulated PSTN to the VDN extension (10000), corresponding to Tenant 1. The VDN is associated to a call vector (call vector 4). The vector answers the call, plays an announcement (11001) and collects a digit from the caller. Then it routes the call to agent skill 1. Since no agents were available at the time, the caller listens to music on hold announcement 11021, created in **Section 6.2**.

```
list trace tac *01
                                                                            1
                                                                      Page
                              LIST TRACE
08:29:50 TRACE STARTED 03/03/2023 CM Release String cold-01.0.974.0-27607
08:29:58 SIP<INVITE sips:10000@avayalab.com SIP/2.0
08:29:58 4 1 vdn e10000 bsr appl 0 strategy 1st-found override n
08:29:58 SIP>SIP/2.0 183 Session Progress
cid 0x29c
           rgn:2 [10.64.91.50]:35080
           rgn:1 [10.64.91.88]:6090
08:30:00 4 3 # Play greeting and collect 1 d...
08:30:00 4 4 collect 1 digits after anno 11001 for none
08:30:00 SIP>SIP/2.0 200 OK
08:30:00 4 4 announcement: board M1:00 ann ext: 11001
08:30:00 Connected party not in public table 08:30:00 active announcement 11001 cid 0x29c 08:30:00 hear annc source M1 ext 11001 cid 0x29c
08:30:00 SIP<ACK sips:10.64.91.87:5081;transport=tls;asm=1 SIP/2.0
08:30:04 4 5 digits = [1]
08:30:04 4 7 # Simple queue to skill with re...
08:30:04 4 8 queue-to
08:30:04 4 8 queuing to skill 1 pri m
08:30:09 4 10 wait 30 secs hearing music
08:30:09 4 10 music announcement: board M1:00 ann ext: 11021
08:30:09 active announcement 11021 cid 0x29c 08:30:09 hear anno source M1 ext 11021 cid 0x29c
08:30:12 TRACE COMPLETE trunk-group 1 cid 0x29c
```

9. Conclusion

The sample configuration presented in these Application Notes describe the procedures necessary to configure Avaya Media Server 10.1 and Avaya Communication Manager 10.1 to interoperate with the Easy On Hold® Streaming Queue MusicTM service.

Testing was performed to verify the functionality described in Section 2.1. All test cases completed successfully.

10. Additional References

Avaya:

- [1] Implementing and Administering Avaya Aura® Media Server. Release 10.1.x Issue 3 February 2023
- [2] Avaya Aura® Communication Manager Feature Description and Implementation. Release 10.1.x Issue 7 February 2023
- [3] Administering Avaya Aura® Communication Manager. Release 10.1.x Issue 4 February 2023
- [4] Avaya Aura® Communication Manager Screen Reference. Release 10.1.x Issue 5 February 2023

Easy on Hold®:

- https://easyonhold.com/integrations/avaya/
- https://easyonhold.com/knowledgebase/Introduction-to-Avaya-Aura-Media-Server-Streaming-Easy-On-Hold.pdf

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