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Chapter 12: Troubleshooting

Implementing and Administering Avaya Aura® Media Server

September 2017

Comments on this document? infodev@avaya.com

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Chapter 1: Introduction

Purpose

Use this document to perform Avaya Aura® Media Server 7.7 configuration, troubleshooting, and system administration tasks.

This document can be used for both appliance and non-appliance versions of Avaya Aura® Media Server 7. However, when you are working with the Avaya Aura® Media Server 7.7 as an appliance in the VMware Virtualized Environment or as an appliance on Avaya Common Servers, first see Deploying and Updating Avaya Aura® Media Server 7.7 Appliance. The appliance specific document takes precedence. Only use this document when the appliance document does not have a specific procedure for the task and when the appliance document directs you to this document.

This document is intended for people who perform Avaya Aura® Media Server 7.7 configuration, troubleshooting, and system administration tasks.

Support

Go to the Avaya Support website at http://support.avaya.com for the most up-to-date documentation, product notices, and knowledge articles. You can also search for release notes, downloads, and resolutions to issues. Use the online service request system to create a service request. Chat with live agents to get answers to questions. You can also request an agent to connect you to a support team if a problem requires more expertise.

Warranty

Avaya provides a 90-day limited warranty on the Avaya Aura® MS software. For detailed terms and conditions, see the sales agreement or other applicable documentation. Additionally, for the standard warranty description of Avaya and the details of support, see Help & Policies > Policies & Legal > Maintenance and Warranty Information on the Avaya Support website at http://support.avaya.com.

For additional information, see Help & Policies > Policies & Legal > License Terms.
For more details on the hardware maintenance for supported products, see http://portal.avaya.com/ptlWeb/services/SV0452.
Chapter 2: New in this release

Audio Codecs
The Element Manager (EM) task to configure audio codecs is simplified for easier use. EM enhanced to enable administrators to configure the newly supported Opus codec. Opus is defined by the Internet Engineering Task Force (IETF) in RFC 6716. IETF adds enhanced interactive speech and music transmission capabilities to the media server.

Related links
Enabling and configuring audio codec settings on page 111

Aurix Speech Search Engine
Avaya Aura® Media Server 7.7 interfaces with Aurix SSE for speech analytics services. These services enable the system to analyze recorded voice by using phonetic speech search technology. After a recording is analyzed and indexed, the speech it contains is searchable. Aurix SSE can also monitor audio streams in real-time by using a specified query set.

Related links
Configuring Aurix Speech Search Engine on page 110

Backup using SFTP
Avaya Aura® Media Server 7.7 adds EM and command-line backup tool support for SFTP backup destinations. Previous releases only supported FTP destinations for backups.

Related links
Configuring a backup task on page 163
Using the command-line backup and restore tool on page 170
Content Store on Standard nodes

Content Store components are enabled by default on cluster servers with the Role designation of Standard. In releases before Avaya Aura® Media Server 7.7, the Content Store component is disabled by default on Standard cluster servers.

Related links
Media storage in Avaya Aura MS Content Store on page 144

Dual unicast monitoring

Avaya Aura® Media Server 7.7 supports Prognosis from Avaya DevConnect Technology Partner, Integrated Research. Prognosis performance management software monitors voice quality, availability and performance in real-time by monitoring the RTCP packets generated by Avaya Aura® MS.

Related links
Enabling dual unicast monitoring on page 111

System Manager enrollment

Some Avaya solutions which adopt Avaya Aura® MS use Avaya Aura® System Manager to provide an integrated point of management. You can use Avaya Aura® MS Element Manager (EM) to enroll media servers in Avaya Aura® System Manager.

Enrollment enables Avaya Aura® MS cluster management, single sign-on (SSO), and role-based access control (RBAC) managed by Avaya Aura® System Manager. After enrollment administrators access the Avaya Aura® MS EM using Avaya Aura® System Manager administrative accounts which have permission to use EM.

Related links
Avaya Aura System Manager enrollment overview on page 137

Music streaming (FP1)

Continuous music streaming capabilities, administration, and monitoring are enhanced in Avaya Aura® MS 7.7 Feature Pack 1:

- Administration of music streaming providers in Element manager pages is improved.
- Avaya Aura® MS Element Manager includes page for monitoring the status of music streaming providers which includes improved error reporting. Per stream statistics are displayed and include bandwidth statistics and the codec being used. Details about the current song being played, including song title and artist information, are displayed when song metadata is available.

- Avaya Aura® MS supports up to 64 music streams from any provider. The previous limit was eight, with at most one HTTP/MP3 URL, and at most one RSS URL supported.

- Avaya Aura® MS supports HTTP Live Streaming (HLS).

- HTTP/MP3 and HTTP Live Streaming (HLS) providers automatically records 15 minutes of content. The recorded content provides a backup when the streaming server is unreachable.

- The HTTP/MP3 provider supports M3U8 playlists.

- The HLS provider supports M3U8 files and nested M3U8 files.

- The HLS provider supports AAC-LC and MP3 codecs.

- The HLS provider supports live and variant playlists. Non-live playlists are looped automatically.

**Note:**

SHOUTCast and RSS URLs configured on the media server prior to updating to FP1 are not preserved during the update. The media server now supports multiple URLs. The required provider URLs must be reconfigured after updating to FP1.

---

**Certificate management enhancements (FP1)**

Certificate management is enhanced in Avaya Aura® MS 7.7 Feature Pack 1 to improve usability as follows:

- The certificate import task now supports importing trust certificate chains
- The certificate import task now supports importing multiple trust certificates at the same time.
- After making changes in the trust store, there is now an option to restart the media server services to apply the changes.
- Unused or expired key certificates can be removed.

---

**TLSv1.2 (FP1)**

TLSv1.2 is enabled by default for most Avaya Aura® MS 7.7 FP1 interfaces. Ensure the following to maintain service when upgrading to FP1:

- Browsers that you use must have TLSv1.2 enabled. Ensure that you are using the latest version of Chrome, Firefox, or Internet Explorer with TLSv1.2 enabled.
New in this release

- Any endpoints that communicate with Avaya Aura® MS 7.7 FP1 using protocols such as SIP TLS, must have TLSv1.2 support enabled.
Chapter 3: Management interface

Introduction to Element Manager

Element Manager (EM) is an optional, web-based administration tool. EM facilitates the Operation, Administration, and Maintenance (OAM) of Avaya Aura® Media Server (MS).

Some adopting products provide a different OAM management system for Avaya Aura® MS. Those systems have similar functionality though the navigation and interface are different.

The procedures in the document are based on the optional EM installed by the Avaya Aura® MS installer.

EM installation

Avaya Aura® MS installer installs EM unless you or an adopting product installer, which embeds Avaya Aura® MS, specifically decline EM installation.

Install EM to configure Avaya Aura® MS if you do not have an alternate OAM management system. The installation procedures for Avaya Aura® MS cover the EM installation option in detail.

Web browser configuration

You can gain access to EM by using a web browser. You can log in to EM locally on the server, or remotely from another computer. EM works with Internet Explorer (IE) 9 or higher, and recent versions of Chrome, and Firefox.

Monitoring active sessions, viewing system performance graphs and creating session detail reports requires support for Microsoft® Silverlight. Recent versions of browsers such as Chrome, no longer support Silverlight.

Additional configuration is required to use IE with Avaya Aura® MS EM. Perform the following procedures to configure IE 9 and later for use with EM.
Enabling SSL file downloads in IE 9

About this task
Configure IE 9 to download files from secure sites using SSL so that you can upload and download files using EM.

Procedure
1. Launch IE 9 browser.
2. From the IE menu bar, select Tools > Internet Options.
   If the menu bar is not visible, press the Alt key.
3. Click the Advanced tab.
4. In the Settings section, scroll down to Security.
5. Clear the Do not save encrypted pages to disk check box.
6. Click OK.
7. Close the browser and then relaunch the IE 9 browser.

Adding EM to the trusted sites list in IE 9

About this task
Configure IE 9 to consider Avaya Aura® MS as a trusted site so that you can gain access to EM.

Procedure
1. Launch IE 9 browser.
2. From the IE menu bar, select Tools > Internet Options.
   If the menu bar is not visible, press the Alt key.
3. Click the Security tab.
4. Click Trusted Sites.
5. Click Sites.
6. Add the site where EM resides, for example:
   https://localhost or https://server123.companyABC.com
7. Click Add.
8. Click OK.
EM overview

The EM layout includes a branding banner at the top, a task pane at the left, a content pane at the right for management activities, and a navigation bar at the top of the content pane. The upper-right corner of the EM page has Help and Sign out links and displays the user ID of the currently signed-in user.

The system displays the Home page after initial login. The content pane displays the welcome message, the version of Avaya Aura® MS installed, and a message to assist the administrator to get started.

The navigation bar is located under the branding banner. The navigation bar includes the host name, the management IP address of the component that you are managing, and the navigation history, known as breadcrumbs, reflecting the location of the current task within the task hierarchy. The navigation breadcrumbs are active links that you can use to return to previously accessed areas.

The right side of the navigation bar displays icons to alert you of the Avaya Aura® MS alarms and restart states.

EM displays a round colored icon representing the alarm state of Avaya Aura® MS. Hovering your mouse cursor over the alarm reveals the most severe active alarm. Clicking on the alarm icon displays the Alarms page with details about all the currently active alarms. EM displays the following alarm levels:

- ☢ Critical
- ⚠ Major
- ○ Minor
When configuration items that require a restart to take effect have been saved, EM displays a restart icon next to the alarm status icon to indicate that you must perform an Avaya Aura® MS restart. EM clears the icon after the Avaya Aura® MS restart.

The tasks pane on the left lists all the actions that an administrator performs for Avaya Aura® MS OAM. The actions are grouped into categories as follows:

<table>
<thead>
<tr>
<th>Actions</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>System Status</td>
<td>Presents a view of the current and historical information pertaining to the status of the system. These tasks include, element status, cluster status, alarm viewing, event log viewing, and monitoring. The monitoring task includes: performance monitoring, operational measurements, and protocol monitoring of Avaya Aura® MS. Active session monitoring includes graphical SIP message flows and SIP traces. It displays details of messages for a particular session.</td>
</tr>
<tr>
<td>Applications</td>
<td>Lists all installed applications, whether custom or packaged. Expanding an application displays all tasks specific to the operation, administration, and maintenance of that application.</td>
</tr>
</tbody>
</table>

Table continues…
<table>
<thead>
<tr>
<th>Actions</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cluster Configuration</td>
<td>Provides tasks for server designation, replication settings, clustering and high availability configuration, and load balancing settings.</td>
</tr>
<tr>
<td>System Configuration</td>
<td>Categories include, server profiles, network settings, signaling protocols, media processing, application interpreters, monitoring settings, session detail records, engineering parameters, EM settings, and SIP routing. The administrator can view and modify Avaya Aura® MS platform configuration.</td>
</tr>
<tr>
<td>Licensing</td>
<td>Provides an interface to configure and monitor the licensing services.</td>
</tr>
<tr>
<td>Tools</td>
<td>Provides utilities to view which software versions are installed. It performs a backup or restore of system and customer data, manage media, view session detail records, and collect logs.</td>
</tr>
<tr>
<td>Security</td>
<td>Provides an interface for Security related configuration.</td>
</tr>
<tr>
<td>Account Management</td>
<td>Manage administrators, roles, and permissions for Avaya Aura® MS EM users.</td>
</tr>
</tbody>
</table>

**EM interface**

The following figure illustrates the features of the EM interface:
Task navigation

You can expand categories or higher-level tasks to reveal subtasks in the menu pane. Click the expansion button that appears to the left of the category or task label. If an item contains more contents, the system displays a plus sign (+) before the item. You can click the plus sign (+) to expand the item and display its contents.

Click the minus sign (-) to collapse the expanded contents.

Click an item label in the menu pane to select and launch the associated task in the content area.

Content areas with a large amount of content are divided into sections. Using the shortcut links provided at the top of the pane, you can navigate directly to the section of your interest. These links serve as an index of the content.

You can open a task in a new browser window or browser tab by using the right-click menu of the Web browser.

Scroll bars

The system displays vertical scroll bars when the system cannot display the content in a window without vertical clipping. The system displays horizontal scroll bars when the system cannot display the content in a window without horizontal clipping. You can reduce horizontal clipping by using the vertical line separating the menu pane and the content areas to resize the menu pane horizontally.
Disabled items
Some configuration items are designed to enable or disable certain other features on the page. You cannot modify configuration items which are unavailable, until you enable the configuration items by selecting other features.

Saving configuration changes
Click **Save** in the bottom-right corner of the configuration page to save changes. No changes are made to the system configuration until you click **Save**. The system validates the input it stores the configuration in the Avaya Aura® MS database. If the system detects any errors during the validation, the system redisplay the page with an error message for each invalid entry. Correct the errors and click **Save** to save the changes. After you save the changes, the system redisplays the parent of the current page, which is often the previous page.

If you do not want to save the changes made to the configuration, click **Cancel** to discard changes. If you click **Cancel**, the system returns to the parent of the current page without saving changes to the configuration.

Undo changes
You can use the restore default icon button (🔄), next to the fields, to restore individual configuration items to the default value that Avaya provides. You can use the **Restore Defaults** button to restore all the fields on the current page to the default values. The **Restore Defaults** button is located next to the **Save** and **Cancel** buttons. Click **Save** to apply the restored default values to the system.

Avaya Aura® MS restarts
The system designates some configuration items with a restart icon (🔄).

These configuration items require an Avaya Aura® MS restart for any change to take effect. For these items, saving the change only saves the change in the system database. Restart Avaya Aura® MS so that the change is applied to system processing.

Data validation
Configuration items with data entry fields also include the valid data range in parentheses at the right of the data field. For example, you can see a data range such as (90-3600) or a limit such as (maximum: 128 characters). Sometimes, the parentheses contain a description like (Service IP address). In these cases, the system verifies whether the data is in the IP address format.

Help
In addition to the main help document available using the **Help** link in the upper-right corner next to the **Sign Out** link, the system also dynamically displays help text when you hover your mouse cursor over certain elements of the display. If available, the system displays the help text near the cursor.

---

**Setting the content pane refresh frequency**

**About this task**
An EM page that has dynamically updated content, has a user selectable refresh rate drop-down menu.
Perform the following procedure to customize the refresh rate of the content you are viewing:

**Procedure**
1. Navigate to EM > System Status > Element Status or to any task with the refresh option.
2. Click on the Refresh every drop-down menu and select the required refresh interval.
   The page you are viewing refreshes at the selected frequency.

---

**Advanced settings and engineering parameters**

Do not reconfigure the default values in the Advanced Settings and Engineering Parameters pages.

These defaults are set for optimal performance of Avaya Aura® MS. If you think these settings need to be changed, contact Avaya Technical Support to discuss the changes. Reconfigure these settings only under explicit direction from Avaya Technical Support.
Chapter 4: Basic management tasks

Signing in to EM

About this task
Use this procedure to gain access to Avaya Aura® MS EM whenever required in a task. For example, if you see EM > System Status > Element Status, follow this procedure to first gain access to EM and then, click System Status and click Element Status.

Before you begin
Signing into EM applies to systems that have the optional Avaya Aura® MS EM installed. You must first install Avaya Aura® MS with EM to perform this procedure.

Procedure
1. In a web browser, type the following URL:
   https://serverAddress:8443/em, where serverAddress is the address of Avaya Aura® MS.
   For example, https://135.60.86.209:8443/em.
2. Sign into EM by using the server admin or root user ID and password.

Related links
Element Manager troubleshooting

Observing the current operational status by using EM

About this task
Use this procedure to observe the current operational status of Avaya Aura® MS:

Procedure
1. Navigate to EM > System Status > Element Status.
2. Observe the status of the element in the content pane.

On the Element Status page, the system displays the following:
- Attributes identifying this server: Element Name, UUID (a unique identifier for the element), Server Address, and Operating System.
• **Service Status**: Indicates whether the media server is started or stopped. This state is coordinated with the **Stop**, **Start**, and **Restart** buttons on the page.

• **Operational State**: This state can be set to **Unlocked**, **Locked**, or **Pending Locked**. You can select the required state using the **More Option** drop-down menu.

• **Element Status**: Reports the most severe status of the current active alarms for the element. For example, if an element has two active alarms, one with severity Critical and the other with severity Minor, then the overall status of the element is Critical. When no active alarm exists, the element state is Normal.

• **Alarm Description**: If any alarms are raised, an explanation of the most critical alarms is noted in this field.

• **Installed Software Packages**: Lists the versions of Avaya Aura® MS and any installed software packages.

---

### Starting and stopping the media server

**About this task**

Use this procedure to Start, Stop, or Restart Avaya Aura® MS by using EM. The Start, Stop, and Restart actions for Avaya Aura® MS operate as follows:

<table>
<thead>
<tr>
<th>Action</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Start</strong></td>
<td>Starts all the necessary software processes to enable media server functionality. Ensure that Avaya Aura® MS is set to Stopped before using this function.</td>
</tr>
<tr>
<td><strong>Stop</strong></td>
<td>Ends all software processes that enable media server functionality and take the element out of service. Ensure that Avaya Aura® MS is set to Started before using this function.</td>
</tr>
<tr>
<td><strong>Restart</strong></td>
<td>Restarts Avaya Aura® MS, which is the same as stopping the media server and then starting the media server again. Ensure that Avaya Aura® MS is set to Started before using this function. The <strong>Service Status</strong> of Avaya Aura® MS must be set to <strong>Started</strong> before you can restart Avaya Aura® MS. Restarting Avaya Aura® MS is the same as stopping the media server and then starting the media server again.</td>
</tr>
</tbody>
</table>

**Before you begin**

Avaya recommends that you set the Operational State of Avaya Aura® MS to Pending Lock and then Lock before stopping or restarting a server with active sessions. This reduces the number of user sessions impacted by stopping the media server. For details, see Setting the operational state.
Procedure

1. Navigate to EM > System Status > Element Status.
2. Depending upon the current and the required state, click Start, Stop, or Restart.
3. Click Confirm.

After a few seconds, the system updates the status fields and activates or deactivates the buttons based on the new state of the media server.

Related links

Setting the operational state on page 29

---

Setting the operational state

About this task

You can specify the level of service availability for Avaya Aura® MS which is in the started state. The level of service availability is useful under certain conditions as follows:

<table>
<thead>
<tr>
<th>Operational state</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lock</td>
<td>Locks the system and ends existing sessions. The media server no longer accepts new requests, and redirects new traffic to other nodes in the cluster. You typically place the system into locked state when performing maintenance. The Operational State of Avaya Aura® MS must be set to <strong>Unlocked</strong> or <strong>Pending Locked</strong> before you can lock Avaya Aura® MS.</td>
</tr>
<tr>
<td>Unlock</td>
<td>Unlocks the media server and allows incoming session requests to be accepted by the system for processing. The Operational State of Avaya Aura® MS must be set to <strong>Locked</strong> or <strong>Pending Locked</strong> before you can unlock Avaya Aura® MS.</td>
</tr>
</tbody>
</table>
| Pending Lock      | The system does not accept new requests. It redirects new traffic to other nodes in the cluster. Unlike Lock, Pending Lock preserves existing sessions. You typically place the system into a **Pending Locked** state before transiting to a **Locked** state when you prepare for system maintenance. This allows sessions to naturally end over time, without being ended unexpectedly for users of the system. The system automatically changes to the **Locked** state after all the sessions have ended. The Operational State of Avaya Aura® MS must be set to **Table continues…**
<table>
<thead>
<tr>
<th>Operational state</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unlocked or Locked</td>
<td>before you set the system to Pending Lock.</td>
</tr>
<tr>
<td>Failover</td>
<td>Transfers all the active sessions from this media server to the peer. The peer automatically becomes the active node. All new session requests are automatically directed to the newly active peer node. The failed node enters the Standby state and is ready for maintenance or other activities while the peer continues to provide service. You can select Failover when the media server is in a High Availability configuration with another node.</td>
</tr>
</tbody>
</table>

### Procedure

1. Navigate to **EM > System Status > Element Status**.
2. Click **More Actions** and select the state from the list of applicable states.
   - The list is dynamic and dependent of the current state.
3. Click **Confirm**.
   - After a few seconds, the system updates the status fields and content of the **More Actions** drop-down menu-based on the new state of the media server.

### Managing the High Availability state

#### About this task

If you configured Avaya Aura® MS for High Availability, the system displays the High Availability state of the server on the **EM > System Status > Element Status** page. The **More Actions** drop-down menu contains state transition options, which are available only when HA is enabled. The High Availability state can be one of the following values:

<table>
<thead>
<tr>
<th>High availability state</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active</td>
<td>The server has a configured Service IP address and is providing service.</td>
</tr>
<tr>
<td>Standby</td>
<td>The server is inactive but remains synchronized with the active server.</td>
</tr>
<tr>
<td>Failed</td>
<td>The server has failed. The server will soon restart and transition to a Searching state.</td>
</tr>
<tr>
<td>Locked Active</td>
<td>The active High Availability server is Locked Active when you select <strong>Local High Availability State Lock</strong> on <strong>Cluster Configuration &gt; High Availability</strong> and the server is not shutdown.</td>
</tr>
</tbody>
</table>

*Table continues...*
### High availability state

<table>
<thead>
<tr>
<th>High availability state</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Locked Standby</td>
<td>The standby High Availability server is Locked Standby when you select <strong>Local High Availability State Lock</strong> on <strong>Cluster Configuration &gt; High Availability</strong> and the server is not shutdown.</td>
</tr>
<tr>
<td>Shutdown</td>
<td>The server is in a management shutdown state and is not providing service.</td>
</tr>
<tr>
<td>Searching</td>
<td>The server tries to determine the state of the other server in the High Availability pair. The server remains in the Searching state for less than a second before transiting to the Active or the Standby state.</td>
</tr>
</tbody>
</table>

### Procedure

1. On one of the paired High Availability servers, navigate to **EM > System Status > Element Status**.

   Servers in the High Availability mode display an additional field, **High Availability State**, on the **Element Status** page, as shown below:

   ![Element Status](image)

2. Use the **More Actions** drop-down menu to select the required High Availability state. For example, you can choose **Failover**.

   The High Availability states listed on the menu depend upon the current **High Availability State**, which is shown on the **Element Status** page.

3. Read the warning and then click **Confirm** to apply the state change.

4. On the **Element Status** page, ensure that the **High Availability State** field now displays the new state.
Viewing the software inventory

About this task
EM provides a summary of the installed Avaya Aura® MS software, applications, and patches along with the version information. The summary is called the software inventory.

Use this procedure to gain access to the software inventory:

Procedure
Navigate to EM > Tools > Manage Software > Inventory.
The system displays a list of the installed software with the version and patch level information.

Reviewing the PVI Check results

About this task
Using EM, you can review the hardware, software, and storage inspection reports generated during the Avaya Aura® MS installation.

The Platform Vendor Independent Check (PVI Check) software ensures that the server and the configured operating system meet the hardware, software, and storage requirements for Avaya Aura® MS.

PVI Check is integrated into the Avaya Aura® MS installer and produces a report that is stored in the system for reference.

Procedure
1. Navigate to EM > Tools > PVI Results.
2. Refine the scope of the result by using the **Category** drop-down menu on the **PVI Results** page. You can sort the results by clicking on any column title.

---

**System configuration and trace logs**

The Log Capture tool provides an easy way to collect all system configurations and trace logs that Avaya technical support teams might need to debug reported system issues.

When support engineers request trace logs, ensure that the debug logging is enabled. Also ensure that you capture the logs when the problem is observed on the system. The Log Capture tool is then used to collect all the required logs from the system and download the logs to your local workstation.

---

**Enabling Debug Tracing**

**About this task**

Debug logging provides advanced system trace and debug logs required by support engineers to troubleshoot your system.

Use this procedure to enable debug logging as instructed by Avaya support engineers before using the log capture tool:

**Procedure**

1. Navigate to **EM > System Configuration > Debug Tracing > General Settings**.
2. Select **Enabled** from the **Debug Logging** drop-down menu.
3. If instructed by Avaya support engineers, change **Trace File History**.
**Trace File History** defines the number of rotating trace files that the system keeps before discarding the oldest file. By increasing this value you can collect more data, but more disk space is consumed.

4. If instructed by Avaya support engineers, change **Trace File Size**.

**Trace File Size** defines the size of the trace files. By increasing this value you can collect more data, but more disk space is consumed.

5. Click **Save**.

---

### Downloading log capture by using a web browser

**About this task**
The Log Capture tool collects advanced system traces and debug logs that are required by support engineers to troubleshoot the system.

**Before you begin**
Ensure that you enable debug logging so that you can capture the traces when a problem is observed on the system.

**Procedure**
1. Navigate to **EM > Tools > Log Capture**.
2. If instructed by Avaya support engineers, select **Include trace logs**.
3. If instructed by Avaya support engineers, select **Include video capture**.
4. Click **download**.

   The system gathers all the trace files together in the form of a zip file and displays a dialog box so that you can download the zip file to the local workstation.

**Related links**
- [Element Manager troubleshooting](#)

---

### Downloading a log capture by using the command-line mode

**About this task**
The Log Capture tool collects advanced system traces and debug logs that are required by support engineers to troubleshoot the system.

**Before you begin**
Ensure that you enable debug logging so that you can capture the traces during the interval when a problem is observed on the system.

**Procedure**
1. Open a Linux® shell or Windows® Command Prompt on Avaya Aura® MS.
2. From the command-line, run the Log Capture tool by using one of the following commands as instructed by Avaya support engineers:
   • logcapture
   • logcapture -t
   The system gathers all the log files together in the form of a zip file. When the -t option is included the zip file also includes the advanced system debugging traces.

Obtaining the UUID of a media server

About this task

When you install Avaya Aura® MS, the system assigns a universally unique identification (UUID) to Avaya Aura® MS. This UUID is a required input during various cluster configuration procedures.

Perform the following procedure to gain access to the UUID:

Procedure

1. Navigate to EM > Cluster Configuration > Server Designation.
   In the content pane, under Local Server, you can see the server Name, Address, Role, and the UUID which looks similar to this: 835c8aa4-6d0b-11e0-958e-001f296491ca.

2. Highlight the UUID.
   Ensure you get all the characters. Triple-clicking on the UUID works in most browsers.

3. To copy the highlighted UUID, select Copy from the Edit menu of your browser, or press Control+C, or right-click on the highlighted UUID and select Copy.

4. Click in the target field related to the cluster configuration procedure you are following.

5. To paste the UUID in the field, select Paste from the Edit menu of your browser, or press Control+V, or right-click on the target field and select Paste.

Changing users for EM login on Linux®

About this task

You can change the users allowed to log in to EM after Avaya Aura® MS is installed. Authenticated EM users are users who are:

   • Successfully authenticated using SSH (Secure Shell).
   • Members of the groups specified in the Apache-Tomcat local-login configuration.

Use this procedure to change the Apache-Tomcat configuration for authenticated groups and users.
Note:
This procedure requires root privileges and can only be performed on non-appliance versions of Avaya Aura® MS.

Procedure

1. Using a Linux® shell on Avaya Aura® MS, change to the root user by running the following command:
   
   `su -`

2. Change to the Apache-Tomcat configuration directory by running the following command:
   
   `cd $MASHOME/../apache-tomcat/mas/conf`

3. Edit the properties file by running the following command:
   
   `vi local-accounts.properties`

4. Find the property:
   
   `locallogin.authenticable.groups`

5. If the Linux® group that the new user is a member of is not listed in the value field, add the user group, separating multiple entries with semicolons.
   
   For example, `locallogin.authenticable.groups=root;admins`

6. Configure users using the `locallogin.authenticable.users` property.
   
   You can configure specific users in a semicolon-separated list or use the wildcard asterisk (*) to allow all users of the `locallogin.authenticable.groups` to log in.
   
   For example, `locallogin.authenticable.users=*`

7. Save the changes.

8. Close all web browsers.

9. Restart the Avaya EM Service by running the following command:
   
   `/sbin/service avaya.em restart`

Related links

Element Manager troubleshooting
Chapter 5: Configuration

Configuration overview

This chapter describes how to activate a license, define translations, set protocol preferences, configure server clusters, and set up high availability configurations.

Before you use the configuration procedures, ensure you installed Avaya Aura® MS by using either the Quick Setup procedure or the installation procedures mentioned in Installing and Updating Avaya Aura® Media Server Application on Customer Supplied Hardware and OS.

N+1 Load Sharing cluster configuration

An N+1 Load Sharing cluster is a collection of Avaya Aura® Media Servers that work closely together. The cluster can be viewed as one system that is capable of providing service at an increased capacity and with redundancy. All the nodes in a cluster must be running the same application set.

An Avaya Aura® MS N+1 Load Sharing cluster must consist of a Primary and Secondary server. You can add additional servers, known as Standard servers.

Perform the following procedures to first configure the Primary, Secondary, and optional Standard servers and then connect the servers as an N+1 Load Sharing cluster.

In the following procedures, you can enable and configure a Replication Account. You must configure and enable the Replication Account by using the same user name and password on each server in the cluster. Replication is used for communication between the servers and enables configuration changes to be automatically replicated throughout the cluster when changes are made on the Primary server.

An Avaya Aura® MS cluster must use a centralized time source for clock synchronization. For more information, see Setting the network time source server.

Limitations:

- The maximum number of servers in a cluster is eight.
- N+1 Load Sharing clusters are engineered to provide the processing capacity of N servers. During normal operations, all N+1 servers are processing sessions. When one server is out of service, the cluster still provides the engineered capacity provided by N servers.
Either the Primary or Secondary server must remain in service for the cluster to remain operational. Cluster service is lost if the Primary and Secondary servers are out of service at the same time.

N+1 Load Sharing Clusters, and 1+1 High Availability clusters are two different configuration options that cannot be combined.

A cluster must not span geographical locations. Cluster members must be on the same local network.

Related links
Setting the network time source server on page 71

Configuring a Primary server for a cluster

About this task
Using EM, perform the following procedure to configure Avaya Aura® MS as the Primary server in an N+1 Load Sharing cluster.

Procedure
1. To designate a server as primary, navigate to EM > Cluster Configuration > Server Designation.
2. In the **Local Server** section, ensure that **Role** is set to **Primary**.
3. Note the Primary node IP address and the UUID.
   You will need this information later to configure other nodes in the cluster.
4. In the **Replication Account** section, ensure **Enable Replication Account** is selected.
5. In the **Username**, **Password**, and **Confirm Password** fields, enter a user name and password.
   ! **Important:**
   All servers in the cluster must use the same Replication Account user name and password.
6. Click **Save**.
7. Click **Confirm**.
Configuring a Secondary server for a cluster

About this task
Using EM, perform the following procedure to configure Avaya Aura® MS as the Secondary server in an N+1 Load Sharing cluster:

Before you begin
- Configure a separate Avaya Aura® MS as the Primary server and with an enabled Replication Account.
- Obtain the UUID and the IP address of the Primary server.
- Obtain the user name and the password of the Replication Account of the Primary server.

Procedure
1. To designate a server as Secondary, navigate to EM > Cluster Configuration > Server Designation.
2. In the Local Server section, set Role to Secondary.
   The system updates the page with fields that are specific to the Secondary server configuration.
3. Using the EM for the Primary server, copy the UUID of the Primary server.
For more information about copying the UUID, see Obtaining the UUID of a media server.

4. Using the EM for the Secondary server, paste the UUID of the Primary server in the Primary Server UUID field.

5. In the Primary Server Address field, enter the IP address of the Primary server.

6. In the Replication Account section, ensure Enable Replication Account is selected.

7. In the Username, Password, and Confirm Password fields, enter the user name and password for the Replication Account on the Primary server.

⚠️ Important:

All servers in the cluster must use the same Replication Account user name and password.

8. Click Save.

9. Click Confirm.

10. Restart Avaya Aura® MS for the changes to take effect. Navigate to EM > System Status > Element Status and click Restart.

11. Click Confirm.

Related links

- Obtaining the UUID of a media server on page 35

---

Configuring a Standard server for a cluster

About this task

Using EM, perform the following procedure to configure Avaya Aura® MS as Standard server in the N+1 Load Sharing cluster.

Add Standard nodes after you add Primary and Secondary nodes to the cluster.

Before you begin

- Configure a separate Avaya Aura® MS as a Primary server and with an enabled Replication Account.
- Configure a separate Avaya Aura® MS as a Secondary server and with an enabled Replication Account.
- Obtain the UUID and the IP address of the Primary server.
- Obtain the user name and password of the Replication Account of the Primary server.

Procedure

1. To designate a server as Standard, navigate to EM > Cluster Configuration > Server Designation.
2. In the **Local Server** section, set the **Role** to **Standard**.

   The system updates the page with fields that are specific to the Standard server configuration.

3. Using the EM for the Primary server, copy the **UUID** of the Primary server.

   For more information about copying the **UUID**, see Obtaining the **UUID** of a media server.

4. Using the EM for the Standard server, paste the **UUID** of the Primary server in the **Primary Server UUID** field.

5. In the **Primary Server Address** field, enter the IP address of the Primary server.

6. In the **Replication Account** section, ensure **Enable Replication Account** is selected.

7. In the **Username**, **Password**, and **Confirm Password** fields, enter the user credentials you entered for **Replication Account** on the Primary server.

   **Important:**

   All servers in the cluster must use the same Replication Account user name and password.

8. Click **Save**.

9. Click **Confirm**.
10. Restart Avaya Aura® MS for the changes to take effect. Navigate to EM > System Status > Element Status and click Restart.

11. Click Confirm.

12. Repeat this procedure for each additional Standard server that you need to add to the cluster.

Related links
Obtaining the UUID of a media server on page 35

---

**Configuring the replication settings for a cluster**

**About this task**
You can enable replication for certain system settings and data.

When you enable **Configuration Replication**, the system replicates changes to all of the other servers in the cluster. This provides one central place for making configuration changes in a cluster.

**Note:**
When you enable **Configuration Replication**, many configuration changes can only be performed from EM of the Primary server.

Use this procedure to configure the replication preferences in an N+1 Load Sharing cluster:

**Procedure**
1. Log on to the Avaya Aura® MS Element Manager of the Primary media server.
2. Click EM > Cluster Configuration > Replication Settings.
3. For primary servers **Configuration Replication** is selected by default.
   The system replicates any changes in the settings to all other servers in the cluster. Many configuration changes can only be performed from the EM of the primary server, providing a central place for making changes.
4. *(Optional)* Select any other items that you would like to replicate across all servers in the cluster.
5. Click Save.
6. To restart Avaya Aura® MS click EM > System Status > Element Status and click Restart.
7. Click Confirm.

---

**Configuring SIP load balancing for a cluster**

**About this task**
Use this procedure to enable algorithms that balance the load of sessions across all servers in an N+1 Load Sharing cluster:
Procedure

1. Using the EM for the Primary server, navigate to EM > Cluster Configuration > Load Balancing.

![Load Balancing](image)

2. If required by your application, configure Application Key For Load Reporting.

3. Do one of the following:
   - Select Cluster Load Balancing to distribute the load evenly across cluster members.
   - Clear Cluster Load Balancing to disable load distribution across cluster members.

4. Select Cluster Redirect In a Non Unlocked Operational State to enable SIP 300 or 302 responses to redirect calls in a non-unlocked state.

   The system redirects calls if the server is in the locked or Pending-Locked state.

5. Set Minimum Delta In Sessions Before Redirecting field to choose the difference in the number of sessions between nodes before balancing the load of sessions across all servers in a cluster.

6. Do one of the following:
   - Select Restrict Redirection List To Single Entry to limit the number of servers that the system offers for redirection to one entry in a SIP 302 response. The single entry represents the least loaded server in the cluster.
   - Clear Restrict Redirection List To Single Entry to enable the system to provide a list of alternate servers in a SIP 300 response, listing the least loaded servers first.

7. Click Save.

---

Replication of configuration settings in a cluster

After you configure an N+1 Load Sharing cluster and enable Configuration Replication, most configurable settings in EM for servers with roles other than Primary are unavailable. In a cluster, you use the Primary server EM to make changes to system settings. The system replicates the
changes you make on the Primary server to all other servers in the cluster. Use EM of each server to configure items that are server specific, such as Server Designation.

Configuration replication does not replicate settings between different clusters.

During cluster upgrades, replication only occurs between media servers running the same release of software.

1+1 High Availability cluster configuration

The 1+1 High Availability cluster configuration ensures uninterrupted availability of media processing when a media server fails. Use the High Availability configuration option when you require the service providing capacity of only a single Avaya Aura® MS.

The High Availability configuration deploys a single active Primary server with a Backup server waiting in synchronized hot standby. Both the servers have identical configuration and can provide full media processing service if one server fails. Only one server is active at a time while the other server is on standby to take over instantly.

To configure a 1+1 High Availability cluster, you must enable and configure a Replication Account with the same user name and password on each server. The system uses the Replication Account for communication between the servers. The Replication Account is also used for automatic replication of configuration changes to the Backup server when changes are made to the Primary server.

Perform the High Availability configuration procedures in the following sequence:

1. Configuring the Primary server for High Availability
2. Configuring the Backup server for High Availability
3. Completing 1+1 High Availability cluster configuration
4. Enabling High Availability

1+1 High Availability cluster synchronization overview

Servers in a 1+1 High Availability cluster pair communicate with each other using a heart-beat synchronization mechanism. Interruptions in the heart-beat from the active server trigger a failover to the standby server. The failure of a critical component process on the active server also triggers a failover to the standby server. The Primary and Backup servers are identical in functionality and configuration, resulting in a seamless failover.

The system synchronizes the state of all active sessions to the Backup server in real-time. State synchronization ensures the Backup server preserves the state of each active session without interruption to the user. Scenarios where the session state synchronization might not be fully synchronized, are handled by notifying the application of the failover. The failover notification provides the application the opportunity to run proper recovery steps for the given session state, for example, re-prompting the user for digit collection.
Both the Backup and the Primary servers can become active at the same time if the servers become network isolated from each other. When the servers reconnect, the servers exchange state information. The system uses the state information to select the server that becomes the active server and the server that becomes the standby server. The system selects the server that was the last server to process a new session as the active server. If the system did not process a new session then the server that was active the longest becomes active. In most cases, the server that was active for the longest period is the server that was active before the network isolation occurred.

When the High Availability state is locked, the system prevents failovers and service redundancy is unavailable. You set the High Availability state to locked only when the 1+1 High Availability cluster is recovering from a network isolation issue. The Locked state ensures that sessions are not lost from the server that processes the sessions during the network isolation recovery.

Under normal conditions, the High Availability state must not be unlocked. After the network isolation issue is resolved and both servers are actively part of the cluster, ensure that the High Availability state is not locked. Both servers must be unlocked to provide failover redundancy.

---

**Restrictions and limitations of 1+1 High Availability clusters**

1+1 High Availability clusters have the following restrictions and limitations:

- High Availability functionality is limited to specific applications. To determine if you can configure an application with High Availability, see adopting product documentation. Do not configure High Availability unless the adopting product documentation indicates it is supported.

- High Availability can be configured only in 1+1 configuration. N+1 Load Sharing clustering and 1+1 High Availability clustering are two different configuration options that you cannot combine.

- High Availability is available only if the servers are installed on the Linux® operating system.

- High Availability peer servers must be on the same subnet and the subnet must have Layer 2 network redundancy.

- High Availability servers must be configured with network interface bonding for increased performance and network interface redundancy.

- Core file generation on High Availability servers must be disabled. If not, end-users experience temporary voice loss or loss of service when processes unexpectedly quit. For more information on configuring core file generation, see *Installing and Updating Avaya Aura® Media Server Application on Customer Supplied Hardware and OS*.

- Both the Primary and Backup Avaya Aura® MS must use a common Simple Network Time Protocol (SNTP) server for clock synchronization.

- After the Backup server is active, service falls back to the Primary server only when the Backup server fails. To restore the Primary server to the active state immediately, manually set the Backup server status to **Failover**. Select **Failover** from the **More Actions** drop-down list on **EM > Element Status**.
Configuring the Primary server for High Availability

About this task
Using EM, perform the following procedure to configure the role of Avaya Aura® MS as a Primary server in a 1+1 High Availability cluster:

Before you begin
Ensure that the system is configured with a license.

Procedure
1. To designate Linux® based Avaya Aura® MS as a Primary server, navigate to EM > Cluster Configuration > Server Designation.
2. In the Local Server section, set the Role to Primary.

3. Note the Primary node IP address and the UUID.
You need this information while configuring the Backup server.

4. In the **Replication Account** section, ensure **Enable Replication Account** is selected.

5. In the **Username**, **Password**, and **Confirm Password** fields, enter a user name and password.

   ⚠️ **Important:**
   Use the same Replication Account user name and password on both servers in the High Availability pair.

6. Click **Save**.
7. Click **Confirm**.

---

**Configuring the Backup server for High Availability**

**About this task**

Using EM, perform the following procedure to configure Avaya Aura® MS as a Backup server in a 1+1 High Availability cluster:

**Before you begin**

- Configure a separate Avaya Aura® MS as a Primary server and with an enabled Replication Account.
- Obtain the UUID and the IP address of the Primary server and the user name and password of the Replication Account.
- Ensure that the Primary and Backup servers are on the same subnet.

**Procedure**

1. To designate a Linux®-based Avaya Aura® MS as a Backup server, navigate to **EM > Cluster Configuration > Server Designation**.
2. In the **Local Server** section, set the **Role** to **Backup**.

   The system updates the page with fields specific to the Backup server configuration.

3. Using the EM for the Primary server, copy the UUID of the Primary server.

   For more information about copying the UUID, see Obtaining the UUID of a media server.

4. Using the EM for the Backup server, paste the Primary server UUID in the **Primary Server UUID** field.

5. In the **Primary Server Address** field, enter the IP address of the Primary server.

6. In the **Replication Account** section, ensure **Enable Replication Account** is selected.

7. In the **Username**, **Password**, and **Confirm Password** fields, enter the same credentials you entered for the Replication Account on the Primary server.

   **Important:**

   Use the same **Replication Account** user name and password on both servers in the High Availability cluster.

8. Click **Save**.

9. Click **Confirm**.
10. Navigate to **EM > System Status > Element Status** and click **Restart** for the changes to take effect.

11. Click **Confirm**.

**Related links**

- [Obtaining the UUID of a media server](#) on page 35

---

**Completing 1+1 High Availability cluster configuration**

**About this task**

Use this procedure to complete the High Availability server pairing:

**Before you begin**

Configure the Primary and Backup servers.

**Procedure**

1. Using the EM for the Primary server, navigate to **EM > Cluster Configuration > Server Designation**.
2. Confirm the following:
   - **Local Server Role** is set to **Primary**.
   - One server is shown in the **Server Designation** section and the server has the **Role** of **Backup**.
   - **Enable Replication Account** is selected.
3. If the Backup server is not listed in the **Server Designation** section, then do the following:
   a. Click **Add**.
   b. In the **Server Address** field, type the address of the Backup server.
   c. In the **Server UUID** field, type the UUID of the Backup server.
   d. Select **Backup** for the Role.
   e. Click **Save**.

---

**Enabling High Availability**

**About this task**

Use this procedure to configure the floating IP address on both the Primary and the Backup servers and to activate High Availability.

**Before you begin**

- Configure the Primary and the Backup servers.
- Obtain the floating IP address designated for the service provided by the media servers.
• Ensure that both the Primary and the Backup Avaya Aura® MS use a common Simple Network Time Protocol (SNTP) server for clock synchronization.

Procedure

1. Navigate to EM > Cluster Configuration > High Availability.
2. Select Enable High Availability check box.
3. In the Service IP Address field, enter the floating service IP address.
4. In the Service IP Address Mask field, enter the subnet mask for the floating IP address.
5. Clear Local High Availability State Lock check box, if selected.
6. (Optional) In the Failure Notification List area, click Add to add the address of the server in the adopting product which must be notified when a failover occurs.
   For information about the address to provide, see the documentation of the adopting product.
7. Click Save.
8. Click Confirm.
   The system restarts to activate the High Availability configuration.
9. Perform Step 1 to Step 8 using the same values, for both the Primary and the Backup Servers.
Reviewing High Availability configuration and status

About this task

After the 1+1 High Availability cluster is formed, several EM pages display new features that reflect the new High Availability state.

Use this procedure to use the new features of High Availability and to ensure High Availability is in full service:

Procedure

1. Using the EM for the Primary server, navigate to **EM > System Status > Cluster Status**.
2. Confirm the following:
   - Only two nodes are listed.
   - One **Element Role** is listed for each of the Primary and Backup server.
   - No alarms are listed in the **Alarm Description** column.

3. Navigate to **EM > System Status > Element Status**.
   The system now displays a new field, **High Availability State**, on the Element Status page.
   **High Availability State** must be **Active**.
   Ensure no alarms or service impacting states exist.
4. Using the EM for the Backup server, navigate to **EM > System Status > Element Status**. The system displays a new field, **High Availability State**, on the **Element Status** page.

The **High Availability State** must be **Standby**.

Ensure no alarms or service impacting states exist.

---

**Locking and unlocking the High Availability state**

**About this task**

When the High Availability state is locked the system prevents failovers and service redundancy is unavailable. You set High Availability to the locked state only when the 1+1 High Availability cluster is recovering from a network isolation issue. In the locked state, the sessions are not lost from the server processing the sessions during the network isolation recovery.

Under normal conditions the High Availability state must not be locked. After the network isolation issue is resolved and both servers are actively part of the cluster, ensure that the High Availability state is not locked. Both servers must be unlocked to provide failover redundancy.
Use this procedure to lock or unlock the High Availability state of Avaya Aura® MS.

**Procedure**

1. Navigate to EM > Cluster Configuration > High Availability.
2. Do one of the following:
   - To lock the High Availability state of the server in order to prevent failovers, select *Local High Availability State Lock*.
   - To unlock the High Availability state of the server and to allow failovers, clear *Local High Availability State Lock*.
3. Click **Save**.
4. Click **Confirm**.

---

**Recovering from network isolation**

**About this task**

Media servers might become network isolated for the following reasons:

- Network switch failure or misconfiguration
- Network interface card (NIC) failure
- Network cables damaged or removed

When servers that are part of a 1+1 High Availability cluster are isolated from the network, they cannot communicate with each other. Both servers then enter the active High Availability state. However, only one of the servers is actually processing sessions.

To prevent loss of user sessions when the server is recovering from a network isolation condition, you must lock the High Availability state on the server that you determine is active and processing the sessions.

After the network isolation issue is resolved and both servers are back on the network, unlock the High Availability state in both servers to provide failover redundancy.

Use this procedure to recover High Availability servers from network isolation.

**Procedure**

1. Gain access to the server with the active sessions and navigate to EM > Cluster Configuration > High Availability.
   
The server with active sessions is usually the only one you can access.
2. Lock the High Availability state of the server processing the sessions by selecting *Local High Availability State Lock*.
3. Perform the necessary hardware or network changes to recover the peer server from network isolation.
4. Unlock the High Availability state of the server processing the sessions by unselecting *Local High Availability State Lock*. 
5. Click **Save**.

6. Click **Confirm**.

**Related links**
- [Viewing current active sessions](#) on page 185
- [Locking and unlocking the High Availability state](#) on page 53
- [Managing the High Availability state](#) on page 30

---

### Changing the Service IP Address for a High Availability configuration

**About this task**

Use this procedure to update the Service IP Address for a 1+1 High Availability cluster:

**Before you begin**

Stop both High Availability server peers before changing the Service IP Address. For details, see Starting and stopping the media server.

**Procedure**

1. Navigate to **EM > Cluster Configuration > High Availability** and update the **Service IP Address**.
2. Click **Save**.
3. Click **Confirm**.
4. Repeat Step 1 to Step 3 for the peer server.
5. Start Avaya Aura® MS by navigating to **EM > System Status > Element Status**.
6. Click **Start**.
7. Click **Confirm**.
8. Check the **Operational State** by navigating to **EM > System Status > Element Status**.
9. Unlock Avaya Aura® MS nafif the **Operational State** is **Lock** or **Pending Lock**, select **Unlock** from the **More Actions** drop-down menu.
10. Click **Confirm**.
11. Repeat Step 5 and Step 10 for the peer server.

**Related links**
- [Starting and stopping the media server](#) on page 28
Disabling High Availability

About this task

When you no longer require the redundancy provided by a 1+1 High Availability cluster or you need to separate the servers for maintenance reasons, you can break-up the cluster resulting in two standalone servers, also known as simplex media servers.

Perform the following procedure to remove the configuration for a 1+1 High Availability cluster.

Procedure

1. Gain access to the Backup server and navigate to EM > Element Status.
2. If the Backup server is active then select Failover from the More Actions drop-down menu.
   The Primary server is now the active server. Wait until the alarms clear before continuing.
3. Gain access to the Primary server and navigate to EM > Cluster Configuration > High Availability.
4. Lock the High Availability state of the Primary server by selecting Local High Availability State Lock.
5. Disable High Availability on the Backup server by navigating to EM > Cluster Configuration > High Availability and clearing Enable High Availability.
6. Click Save.
7. Click Confirm.
8. Prevent new sessions from starting on the Primary server by navigating to EM > System Status > Element Status and clicking More Actions > Pending Lock.
9. Click Confirm.
10. Check for active sessions on the Primary server by navigating to EM > System Status > Monitoring > Active Sessions.
    Wait for the active sessions to end. The system automatically changes to the Locked state after all the sessions have ended.
    Perform the following steps if you want to continue before the active sessions end:
        a. Manually lock Avaya Aura® MS, by navigating to EM > System Status > Element Status and clicking More Actions > Lock. Locking the media server also ends any remaining sessions.
        b. Click Confirm.
11. Disable High Availability on the Primary server by navigating to EM > Cluster Configuration > High Availability and clearing Enable High Availability.
12. Click Save.
13. Click Confirm.
14. Gain access to the Backup server and navigate to **EM > Cluster Configuration > Server Designation**.

15. Select **Primary** for the **Role**.

16. Click **Save**.

17. Click **Confirm**.

18. Gain access to the original Primary server and navigate to **EM > Cluster Configuration > Server Designation**.

19. Remove the former Backup server from the **Server Designation** list by selecting the server and clicking **Remove**.

20. Click **Save**.

21. Click **Confirm**.

22. Unlock the original Primary server, by navigating to **EM > Element Status** and selecting **Unlock** from the **More Actions** drop-down menu.

Both of the servers are now in service as simplex media servers.

23. **(Optional)** Both servers contain data in their Content Stores that was synchronized when the servers were configured as a High Availability cluster. You can remove the data from one or both of the servers by deleting the namespaces or content groups that you no longer need as follows:

   a. Navigate to **EM > Tools > Media Management**.

   b. Select the application related namespaces that you want to remove from the **Content Namespaces** list.

   c. Click **Delete**…

   d. Click **Confirm**.

---

### Replication of configuration settings in a High Availability cluster

After configuring the 1+1 High Availability cluster, the system displays most configurable settings in EM as unavailable for the Backup server.

The 1+1 High Availability cluster requires that you make most of the changes using the Primary server EM. The system replicates the changes you make on the Primary server to the Backup server so that you only have to change the settings in one place. Items that are server specific, for example, server designation, require you to use the Backup server EM.

Configuration replication does not replicate settings between different clusters.

During cluster upgrades, replication only occurs between media servers with the same release of software.
Replication of Content Store data between clusters

Configuring replication of Content Store data between clusters

Before you begin

- Configure one Avaya Aura® MS cluster to function as the master cluster.
- Configure one Avaya Aura® MS cluster to function as the replica cluster.
- Obtain the UUID and the IP address of the Primary server.
- Obtain the user name and the password of the Replication Account.

About this task

Perform the following procedure to use EM to enable replication of Content Store data between clusters:

Content Store replication is a one-way data copy that only flows from the master cluster to the replica clusters. No changes are required on the master cluster to enable replication. Replica clusters connect to the master cluster using the Replication Account for authentication.

Content Store replication between clusters provides the following capabilities:

- Single point provisioning: Many clusters with common data, for example, announcement recordings, can be provisioned from a single designated master cluster. Replication ensures the data is copied from the master cluster to the replica clusters.
- Geographic-redundancy: A duplicate cluster at an alternate location can be maintained as a contingency cluster to receive traffic when the primary location becomes unavailable. The contingency cluster is a replica of the master cluster and receives all the Content Store application data in real-time so that it is ready to take over with the latest content. A contingency cluster must not receive traffic or provisioning changes when in standby.

Procedure

1. Gain access to EM for the Primary server in the replica cluster and navigate to EM > Cluster Configuration > Replication Settings.
2. Enter the address of the Primary server of the master cluster in the Master Cluster Primary Node Address field.
3. Click Save.

The system activates replication immediately. All of the content data on the master cluster is copied to the replica cluster.

If the system raises any critical mirror connection alarms, ensure that you have used the correct address and the Replication Account user name and password are the same for all of the clusters.

If you have not enabled Configuration Replication within the cluster, you must repeat Step 1 to Step 3 for each node in the replica cluster.
Disabling replication of Content Store data between clusters

About this task
Perform the following procedure to disable the replication of Content Store data between clusters:

Procedure
1. Using the EM for the Primary server in the replica cluster, navigate to EM > Cluster Configuration > Replication Settings.
2. Clear the Master Cluster Primary Node Address field.
3. Click Save.
   The system disables replication immediately.
   The system does not delete the content on the replica. The replica can use the local content the replica has, but will no longer receive updates from the master cluster. If required, use the EM Media Management tool to remove content data.
   If you have not enabled Configuration Replication within the cluster, repeat Step 1 to Step 3 for each node in the replica cluster.

Returning servers to a cluster

Special consideration must be made when returning certain media servers back to a cluster after they have been out of service for some time. There are two master Content Stores in every cluster. Servers with the role of Primary, Secondary and Backup contain master Content Stores. It is necessary to delete the content from a master Content Store that has been removed from service, before it is returned as a member of an active cluster. This prevents the re-appearance of deleted content that can still be present on the Content Store of a Primary, Secondary, or Backup server that was removed from service for some time.

You can use one of the following methods to delete content from an out-of-service Content Store before returning it to a cluster. Ensure that the server is isolated and not connected to the active cluster while performing these procedures.

- Uninstall the media server without preserving data, and then reinstall the media server. You can use a backup file to restore the Configuration Data, but do not restore the Application Content data. The newly installed media server has an empty Content Store.
- Use the Element Manager Media Management tool to remove all the application Namespaces. Restart the media server to run the deletion audit and remove the content.
- Use another provisioning interface that interfaces with the Content Store Web Services to remove all the application Namespaces. Restart the media server to run the deletion audit and remove the content.
Removing servers from a cluster

Procedure

1. To remove a server from a cluster, access EM for the server to be removed. Navigate to EM > Cluster Configuration > Server Designation.
2. Set the Role to Primary.
   This puts the server in standalone, simplex mode.
3. Click Save.
4. Click Confirm.
5. Restart the media server for the change to take effect. Navigate to EM > System Status > Element Status and click Restart.
6. Click Confirm.
7. You can remove the server from the list of cluster members on the Primary server of the cluster. Access EM for the Primary server. Navigate to EM > Cluster Configuration > Server Designation.
8. In the Server Designation area, select the server to be removed and click Remove.
9. Click Save.
10. Click Confirm.
11. Restart the media server for the change to take effect. Navigate to EM > System Status > Element Status and click Restart.
12. Click Confirm.

License configuration

Licensing configuration shows how to enter your license keycodes, which enable the purchased features on your system.

You can configure Avaya Aura® MS licensing in the following three ways. Only one of the licensing schemes is active at a time:
<table>
<thead>
<tr>
<th>License type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>License Server</td>
<td>License Servers are used for both cluster and standalone server configurations. A single license is shared by all nodes in a cluster.</td>
</tr>
<tr>
<td>Nodal Licensing</td>
<td>A Nodal License is bound to a particular Avaya Aura® MS server and is not shared across Avaya Aura® MS nodes. In this node-locked configuration, you must configure each Avaya Aura® MS node with its own license key.</td>
</tr>
<tr>
<td>WebLM Server</td>
<td>WebLM Servers use the Avaya WebLM Web-based licensing management system.</td>
</tr>
</tbody>
</table>

Choose the licensing configuration procedure based on the type of license provided.

### Configuring License Server keys

**About this task**

License Servers provide licensing for both cluster and standalone server configurations. In a cluster, the License Servers reside only on the Primary and Secondary servers in the cluster.

If you have a License Server key, then perform the following procedures to apply the key and configure the License Server:

**Procedure**

1. Using the EM for the Primary server, navigate to EM > Licensing > General Settings.
2. From the **Licensing** drop-down menu, select **License Server**.

3. Apply the license key:
   - If you are licensing a cluster configuration, copy and paste all the license keys in the **Add License Keys** or the **Replace License Keys** field.
   - If you are licensing a standalone server, copy and paste the single license key in the **Add License Keys** or the **Replace License Keys** field.

4. Click **Display Licenses** to ensure the license keys are valid and to see the features included with the license keys.
   The features are listed in the **License Details** section.

5. Click **Save**.
   The system displays a confirmation page.

6. Click **Confirm**.

7. If you are licensing a cluster configuration, restart the License Server on the Secondary, Backup, and Standard nodes:
   a. Navigate to **EM > Licensing > License Server Status**.
   b. Click **Restart**.
      The system displays a confirmation page.
   c. Click **Confirm**.
Configuring License Server chunk size

About this task

Avaya Aura® MS allocates licenses in chunks to minimize session setup delays, which is especially important during peak traffic times. A license chunk is released to the cluster when the platform detects that the cluster is idle for a specific period of time.

First determine the chunk size required for the system. For peak performance, change the license chunk size based on the number of nodes in the cluster and the expected capacity for each node. You must purchase sufficient licenses so that the licenses can be evenly distributed based on the license chunk size. For example, suppose you have a cluster with three active nodes. Assume that each of them have a peak capacity of 200 sessions, and a recommended chunk size of 100. Each node then requires two chunks (200 / 100 = 2) for peak capacity and the cluster must have at least 600 licenses (3 x (2 x 100) = 600).

The following table provides recommended chunk size based on expected node peak capacity:

<table>
<thead>
<tr>
<th>Node peak capacity</th>
<th>Recommended chunk size</th>
</tr>
</thead>
<tbody>
<tr>
<td>200 or greater</td>
<td>100</td>
</tr>
<tr>
<td>51-100</td>
<td>25</td>
</tr>
<tr>
<td>31-50</td>
<td>10</td>
</tr>
<tr>
<td>30 or fewer</td>
<td>2</td>
</tr>
</tbody>
</table>

Procedure

1. Gain access to EM of the Primary server and navigate to EM > System Configuration > Engineering Parameters > License.
2. Enter the recommended chunk size in the License Provider PLIC Minimum Chunk field. Retain the default values for the other license properties.
3. Click Save.
4. To confirm your license configuration, verify there are no active licensing alarms raised on EM > System Status > Alarms.
5. To check the License Server status, navigate to EM > Licensing > Server Status.

Updating License Server keys

About this task

If you have a new License Server key, then perform the following procedure to update an existing key:
**Procedure**

1. Gain access to EM of the Primary server and navigate to **EM > Licensing > General Settings**.
2. Remove all old license keys by clicking in the **Replace License Keys** field and pressing **Control+A** to select all the text.
   Additionally, select only the individual license key to replace.
3. Press the **Delete** or **Backspace** key.
4. Copy and paste the new license keys in the **Replace License Keys** field.
5. Click **Display Licenses** to ensure that the license keys are valid and to see the features included with the license keys.
   The features are listed in the **License Details** section.
6. Click **Save**.
   The system displays a confirmation page.
7. Click **Confirm**.
8. If you are licensing a cluster configuration, restart the License Server on the Secondary, Backup, and Standard nodes:
   a. Navigate to **EM > Licensing > License Server Status**.
   b. Click **Restart**.
   The system displays a confirmation page.
   c. Click **Confirm**.

---

**Configuring Nodal Licensing**

**About this task**

In the Nodal Licensing configuration, the system configures each Avaya Aura® MS with a node-locked key that enables features only for that server. The key is based on the unique MAC addresses of each server and does not work on any other server.

Perform the following procedure to configure a nodal license:

**Procedure**

1. Gain access to EM for each of the servers and click **EM > Licensing > General Settings**.
2. From the **Licensing** drop-down menu, select **Nodal Licensing**.
3. Apply the license key generated specifically for this server by copying and pasting the license key into the **Keys** field.

4. Click **Save**.
   
The system displays a confirmation page.

5. Click **Confirm**.

6. Navigate to **EM > System Status > Element Status** and click **Restart** to apply the new license.

7. Click **Confirm**.

8. To confirm the license configuration, verify that there are no active licensing alarms raised on **EM > System Status > Alarms**.

9. Repeat Step 1 to Step 8 for each media server in the cluster.

---

### Updating Nodal Licensing keys

**About this task**

If Avaya provides you with a new Nodal License key, then perform the following procedure to update an existing key:

**Procedure**

1. Gain access to the EM for each of the servers and navigate to **EM > Licensing > General Settings**.

2. Remove the old license key by clicking **Keys** field and then pressing Control+A to select the old key.

3. Press the **Delete** or the **Backspace** key.

4. Copy and paste the new license keys into the **Keys** field.

5. Click **Save**.
   
The system displays a confirmation window.
6. Click **Confirm**.

7. Navigate to **EM > System Status > Element Status** and click **Restart** to apply the new license.

8. Click **Confirm**.

9. To confirm your license configuration, verify that there are no active licensing alarms raised on **EM > System Status > Alarms**.

10. Repeat Step 1 to Step 9 for each media server in the cluster.

---

### Configuring WebLM Server licensing

**About this task**

In the WebLM configuration, you install licenses on the Avaya Web License Manager server.

Each Avaya Aura® MS is configured with the URL of the WebLM server, in order to acquire licenses from the WebLM server.

**Before you begin**

Install Avaya WebLM server.


**Procedure**

1. Gain access to the EM for each of the servers and navigate to **EM > Licensing > General Settings**.

2. From the **Licensing** drop-down menu, select **WebLM Server**.
3. Enter the address of the WebLM server you plan to use in the **Server Host Name or IP Address** field.

4. Enter the port to use with the WebLM server in the **Server Port** field.
   
   The WebLM server processes license requests from the port you configure in the **Server Port** field. The default port is 53322.

5. Enter the **URL Suffix** used to identify the WebLM server.
   
   The default **URL Suffix** is `/WebLM/LicenseServer`.

6. In the **License Details** area, set the **Maximum Number** and **Minimum Number** based on the number of sessions the cluster supports.

7. Click **Save**.
   
   The system displays a confirmation page.

8. Click **Confirm**.

9. Restart Avaya Aura® MS to apply the new license. Navigate to **EM > System Status > Element Status** and click **Restart**.

10. Click **Confirm**.

11. To confirm your license configuration, verify that there are no active Licensing alarms raised on **EM > System Status > Alarms**.

12. After you configure the WebLM licensing properties, use the **Open WebLM Server** button on the **License General Settings** page to access to the WebLM server.

13. Repeat Steps 1 to 12 for each media server in the cluster.
License utilization alarm threshold configuration

The system raises utilization threshold alarms after a license reaches or exceeds the provisioned license utilization threshold percentage.

Setting license server alarm thresholds

About this task
Performs the following procedure when you have selected the License Server option.

License utilization threshold alarms and license exhausted alarms generated by the License Server can be either enabled or disabled. The alarms are enabled by default.

Procedure

1. Navigate to EM > Licensing > Utilization Threshold.
2. Select Enable License Exhausted Alarms to generate alarms when a license is 100 percent utilized.
3. Select Enable License Utilization Threshold Alarms to generate alarms when license utilization exceeds the percentage specified in License Utilization Threshold.
4. In the License Utilization Threshold field, enter the threshold percentage.
   You can modify the License Utilization Threshold field only when license utilization threshold alarms are enabled.
5. Click Save.

Setting nodal licensing alarm thresholds

About this task
Performs the following procedure when you have selected the Nodal Licensing option.

You cannot disable License utilization threshold alarms while using Nodal Licensing. However, you can configure the alarm threshold.

Procedure

1. Navigate to EM > Licensing > Utilization Threshold.
2. In the Nodal License Utilization Threshold field, enter the threshold percentage for the alarm.
3. Click Save.
Server profile configuration

Setting the capacity profile

About this task
Avaya Aura® MS automatically selects a capacity profile that matches the performance limits of the physical or virtual hardware that the system is installed on. The selected profile restricts the maximum number of sessions Avaya Aura® MS concurrently supports. You can select a capacity profile that lowers the maximum number of sessions to conserve system resources, such as CPU and memory. Restricting resources is useful when Avaya Aura® MS is deployed co-resident with other software.

Note:
The processor affinity configuration can limit the options available for the Avaya Aura® MS capacity profile configuration on EM.

Perform the following procedure to limit the server resource use and the processing capacity of Avaya Aura® MS:

Procedure
1. Navigate to EM > System Configuration > Server Profile > General Settings > Capacity Profile.
2. To select the required size, assign the required processing capability to Avaya Aura® MS by using the Capacity Profile drop-down menu.
   The system updates the Maximum Sessions field to indicate the highest number of sessions Avaya Aura® MS supports with the selected Capacity Profile.
3. Click Save.
4. For the changes to take effect, restart Avaya Aura® MS.

Related links
Setting the processor affinity configuration on page 70

Setting the media server function

About this task
Perform the following procedure to enable the required media processing functions for Avaya Aura® MS. Optional media processing software components provide the services for each function. The components that you enable are available for processing after you restart Avaya Aura® MS.

Procedure
2. **(Optional)** To enable firewall network address translation (NAT) tunneling services to Internet Connectivity Establishment (ICE) enabled endpoints, select **Firewall NAT Tunneling Media Processor**.

3. **(Optional)** To enable video processing and routing services, select **Video Media Processor**.

4. **(Optional)** To enable VoiceXML application services, select **VoiceXML Interpreter**.

5. Click **Save**.

6. For the changes to take effect, restart Avaya Aura® MS.

---

### Viewing the server hardware properties

**About this task**

Perform the following procedure to view the server CPU and memory details of the server.

**Procedure**

Navigate to **EM > System Configuration > Server Profile > Processor Affinity > CPU and Memory Details**.

---

### Setting the processor affinity configuration

**About this task**

The processor affinity configuration provides a mechanism to restrict the CPU-intensive media processing on the media server to a subset of logical processors you designate. Certain deployments require changes to the processor affinity configuration to maximize performance.

For example, a Windows®-based dual eight-core server has two CPU sockets each with a processor containing eight cores, for sixteen logical processors. Hyper-threading doubles the number of available logical processors. With hyper-threading enabled, the number of logical processors is 32. Avaya Aura® MS performance on this particular Windows® system is optimized when the media processing components are assigned to the sixteen logical processors of the processor in socket one. In this case, socket one is preferred for Avaya Aura® MS processing because packet interrupt handling is assigned to socket zero. This reduces the processing capacity available to Avaya Aura® MS in socket zero.

**Note:**

Reducing the number of processor cores that are available for the media processing components can impact system capacity. It also limits the options available for the Avaya Aura® MS capacity profile configuration on EM.

The following media processing components adhere to the processor affinity settings:

- Conference Media Processor
- Interactive Voice Response Media Processor
- Video Media Processor
• Firewall NAT Tunneling Media Processor

Perform the following procedure to enable or disable media processing for each logical processor on the system:

Procedure

1. Navigate to EM > System Configuration > Server Profile > Processor Affinity.
2. Configure the processors to use for media processing by selecting the required logical processors in the Allow Execution column.
3. Click Save.
4. For the changes to take effect, restart Avaya Aura® MS.

Related links
Viewing the server hardware properties on page 70
Setting the capacity profile on page 69

Network settings configuration

Setting the administrative name and description

About this task
Perform the following procedure to assign a unique name and description to each media server:

Procedure

2. To assign a unique name to the media server, enter a name of your choice in the Element Administrative Name field.
3. To assign a description to the media server, enter the description in the Element Administrative Description field.
4. Click Save.

Setting the network time source server

About this task
All the Avaya Aura® MS clusters must use a common network time source server so that the time across the nodes is synchronized. The system might encounter problems if the servers do not have the synchronized time.
Perform the following procedure to configure the network time source server for each Avaya Aura® MS:

**Procedure**

1. Navigate to **EM > System Configuration > Network Settings > General Settings > General.**
2. In the **Network Time Source Server** field, enter the IP address or hostname of a network time source server.
   Separate multiple server addresses with semicolons (;).
3. Click **Save.**

---

**Enabling SNMP traps**

**About this task**

Avaya Aura® MS uses the Simple Network Management Protocol (SNMP) protocol to provide logs and events which might need administrative attention to a central management system.

Avaya Aura® MS reports the SNMP traps to the management system when a corresponding event triggers. For example, Avaya Aura® MS reports an SNMP trap when an alarm is raised. By default, the SNMP service is disabled on Avaya Aura® MS.

Perform the following procedure to enable and configure SNMP reporting:

**Procedure**

1. Navigate to **EM > System Configuration > Network Settings > General Settings > SNMP Traps.**
2. To enable reporting of alarms and events to a management system, select **SNMP Alarm Delivery Traps** and **SNMP Event Log Delivery Traps.**
3. After one of the delivery options is selected, the **SNMP Network Manager Address** becomes configurable.
4. In the **SNMP Network Manager Address** field, enter the address and the port number of the SNMP server that receives the reports.
   The format of the address and port number must be address:port. The default port number is 162.
5. Specify the community string shared with the SNMP management server in the **Community String** field.
   The SNMP management server rejects reports that do not match the expected community string.
6. Click **Save.**
7. Restart Avaya Aura® MS.
Configuring the Avaya Aura® MS SNMP agent when Net SNMP is installed after Avaya Aura® MS is installed

About this task

If you install Net-SNMP after the media server is installed, then you must manually reconfigure the system for proper SNMP processing. This procedure reconfigures the native SNMP of the operating system so that the Avaya Aura® MS can process SNMP requests. When configured, all SNMP requests are sent to the Avaya Aura® MS SNMP Agent. This SNMP agent processes all the media server specific SNMP requests. Avaya Aura® MS SNMP Agent acts as a proxy for other SNMP requests. These requests are forwarded to the native SNMP agent of the operating system.

Procedure

Using a Linux® shell, enter the following command to reconfigure the SNMP agent:

```
snmpconf.sh -install
```

Next steps

Configure the Avaya Aura® MS SNMP agent.

Related links

- [Configuring the Avaya Aura MS SNMP agent](#) on page 73

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Configuring the Avaya Aura® MS SNMP agent

About this task

Avaya Aura® MS uses the Simple Network Management Protocol (SNMP) to provide logs and events which might need administrative attention to a central management system.

The management system can raise a query for SNMP specific information. The SNMP agent on Avaya Aura® MS receives these queries and sends a response to the management system with the requested information.

Perform the following procedure to configure the Avaya Aura® MS SNMP agent:

Procedure

1. Navigate to **EM > System Configuration > Network Settings > General Settings > SNMP Agent**.
2. Specify the community string shared with the SNMP management server in the **Community String** field.
   
   The Avaya Aura® MS SNMP agent rejects queries that do not match the expected community string.
3. Specify the SNMP agent **Port Number**.
   
   The default port is 161.
4. Click **Save**.
5. Restart Avaya Aura® MS.

---

### Gaining access to Avaya Aura® MS MIB

**About this task**

Avaya Aura® MS has a Management Information Base (MIB) file on the system. The MIB file contains the definitions of the management properties specific to Avaya Aura® MS that can be monitored by a management system using SNMP.

**Procedure**

To gain access to the Avaya Aura® MS MIB file, navigate to the following location:

**Linux®:** `/MASHOME/MIB/AVMediaServer-smi2.mib`

**Windows®:** `%MASHOME%MIB\AVMediaServer-smi2.mib`

---

### Configuring SOAP

**About this task**

Avaya Aura® MS uses Simple Object Access Protocol (SOAP) to provide various Web services and administrative tasks to clients.

Perform the following procedure to configure Avaya Aura® MS SOAP attributes:

**Procedure**

1. Navigate to **EM > System Configuration > Network Settings > General Settings > SOAP**.
2. (Optional) Set the **Server Private Key**.
   
   If you use this key, ensure the key matches on the client as well as the server side of the SOAP interface.
3. Select **Enable Trusted SOAP Nodes** if you want to restrict the SOAP connections to Avaya Aura® MS.
4. In the **Trusted Nodes** field, enter the addresses of the nodes that can gain access to the SOAP services offered by Avaya Aura® MS.

   Separate multiple addresses with semicolons.

   The **Trusted Nodes** field needs to be populated only if **Enable Trusted SOAP Nodes** is selected.
5. (Optional) Configure **Enable HTTP Digest Authentication**.

   If you choose to enable HTTP Digest Authentication, configure the following:

   • HTTP Digest Authentication Domain
• HTTP Digest Authentication User Name
• HTTP Digest Authentication Password

6. Select **Enable SOAP TLS Transport** to use TLS for SOAP connections to Avaya Aura® MS.

⚠️ Important:
If you select **Enable SOAP TLS Transport**, ensure that mutual authentication is properly set up between the SOAP client and the Avaya Aura® MS SOAP service.

7. Click **Save**.

8. Restart Avaya Aura® MS for the changes to take effect. Navigate to **EM > System Status > Element Status** and click **Restart**.

9. Click **Confirm**.

---

**Configuring connection security options**

**Procedure**

1. Navigate to **EM > System Configuration > Network Settings > General Settings > Connection Security**.

2. For the system to verify that the subject name and the target host name match in certificates, select **Verify Host Name**.

3. To configure TLS for all external media server connections, select **Enable TCP TLS Transport**.

   This does not enable TCP TLS Transport for remote database connections.

4. To support real-time certificate revocation, enable support for Online Certificate Status Protocol (OCSP) on TLS connections. To enable this, select **Enable OCSP** and configure the following OCSP options:
   
   a. Configure the timeout interval for OCSP query responses in the **OCSP Response Timeout (ms)** field.

   b. To allow TLS connections even if no OCSP response is received, select **OCSP Permit if no Response**.

   c. Use synchronous OCSP queries by selecting **Enable OCSP Synchronous Mode**.

5. To allow either side of a TLS connection to change the parameters of the established secure session, select **TCP TLS Session Renegotiation Enable**.

6. To configure the number of minutes between TLS renegotiations, set **TCP TLS Session Renegotiation Timer (min)**.

7. To specify that the connections from other media servers or remote element managers must use a secure TLS connection to the media server database, select **Use TCP TLS Transport for Remote Database Connections**.
8. Click **Save**.

9. Restart Avaya Aura® MS for the changes to take effect. Navigate to **EM > System Status > Element Status** and click **Restart**.

10. Click **Confirm**.

---

### Configuring TLS ciphers for connections

**About this task**

Perform the following procedure to enable and rank the required TLS ciphers for each service profile on the system. For each cipher, select the service profiles that can use the cipher. For service profile descriptions, see Security configuration. Enter a rank for each cipher to define the relative preference of the ciphers for each service profile.

**Procedure**

1. Navigate to **EM > System Configuration > Network Settings > Advanced Settings > TLS Ciphers**.
2. Select the service profile and cipher configurations required for the system.
3. For each cipher with service profile selections, rank the preference for using the cipher relative to other selected ciphers for the same service profile. The rank is a number between 0 and 2147483647, where 0 represents the highest preference in the rank.

   **Tip:**
   
   You can list the ciphers by assigned rank by clicking on the **Rank** column. You can list the ciphers by name by clicking on the **Cipher Name** column.

4. Click **Save**.
5. Click **Confirm**.

   Avaya Aura® MS restarts for the changes to take effect.

**Related links**

[Security configuration](#) on page 129

---

### Configuring transmit prioritization

**About this task**

When Avaya Aura® MS is installed on a Linux® system, you can control the output priority of signaling and media packets relative to other traffic by configuring Transmit Prioritization settings. These settings configure the operating system to transmit delay sensitive media packets ahead of delay tolerant traffic, such as FTP, HTTP, and SSH. Proper Transmit Prioritization helps guarantee Avaya Aura® MS can provide the required bit rate, delay, jitter, and packet loss for media sessions.
**Note:**

If you observe the Transmit Prioritization Configuration Error alarm, then consult with Avaya support engineers before the following procedure.

**Procedure**

1. Navigate to **EM > System Configuration > Network Settings > General Settings > Transmit Prioritization**.
2. Select **Transmit Prioritization Enable**.
3. (Optional) Specify a class identifier in the **Root Traffic Control class ID** field. Alter this value to resolve Transmit Prioritization conflicts encountered with other software installed on the server.
4. (Optional) Specify a class identifier in the **High-priority Traffic Control class ID** field. Alter this value to resolve Transmit Prioritization conflicts encountered with other software installed on the server.
5. (Optional) Select **Enable Alarm Suppression for Transmit Prioritization Conflicts** to prevent the system from generating alarm notifications when Transmit Prioritization conflicts are encountered with other software installed on the server.

   Select **Enable Alarm Suppression for Transmit Prioritization Conflicts** only when conflicts are handled in a way other than changing the **Root Traffic Control class ID** or **High-priority Traffic Control class ID** fields.

6. Click **Save**.

---

**Selecting IP interface assignments**

**About this task**

Avaya Aura® MS uses the IP interface assignments to function as follows:

When **Transport** is set to **IPv4 Only**:

- The SDP offer generated by Avaya Aura® MS does not contain IPv6.
- The SDP answer from Avaya Aura® MS is always IPv4.
  - If the incoming SDP is IPv4 only, the SDP answer is IPv4 only.
  - If the incoming SDP is ANAT IPv4/IPv6, the SDP answer is ANAT with IPv4 selected.
- Preferences for remote and local offers are not used when IPv4 only is selected as the transport.

When **Transport** is set to **Dual IPv4/IPv6**:

- Avaya Aura® MS generates an SDP offer containing both IPv4 and IPv6 using ANAT. The ordering of IPv4/IPv6 is determined by using the **Preferences for Local Offers** as follows:
  - If **Preferences for Local Offers** is set to **IPv4 Preferred**, then the SDP contains ANAT with both IPv4/IPv6 and with IPv4 first in the ANAT group.
- If Preferences for Local Offers is set to IPv6 Preferred, then the SDP contains ANAT with both IPv4/IPv6 and with IPv6 first in the ANAT group.

  • Avaya Aura® MS generates SDP answer using the Preferences for Remote Offers as follows:

  - If Preferences for Remote Offers is set to the default of Use Remote Preference, then the selection of IPv4 or IPv6 is based on the received SDP preference:
    • For incoming IPv4 only SDP, IPv4 only SDP is used.
    • For incoming ANAT SDP with IP4 then IPv6 order, IPv4 is used in the ANAT response.
    • For incoming ANAT SDP with IPv6 then IPv4 order, IPv6 is used in the ANAT response.

  - If Preferences for Remote Offers is set to IPv4 Preferred, the system overwrites the remote preference and sets IPv4 is in the offer.
    • For incoming IPv4 only SDP, IPv4 only SDP is used.
    • For incoming ANAT SDP with IP4 then IPv6 order, IPv4 is used in the ANAT response.
    • For incoming ANAT SDP with IPv6 then IPv4 order, IPv6 is used in the ANAT response.

  - If Preferences for Remote Offers is set to IPv6 Preferred, the system overwrites the remote preference and sets IPv6 is in the offer.
    • For incoming IPv4 only SDP, IPv4 only SDP is used.
    • For incoming ANAT SDP with IP4 then IPv6 order, IPv6 is used in the ANAT response.
    • For incoming ANAT SDP with IPv6 then IPv4 order, IPv6 is used in the ANAT response.

Perform the following procedure to configure the IP interfaces for Avaya Aura® MS:

**Before you begin**

IPv4 is enabled by default. If your system requires IPv6, you must ensure it is enabled before proceeding with Avaya Aura® MS interface assignments. If IPv6 is not enabled, then EM only displays IPv4 options. For information about enabling IPv6 for Windows® or Linux®, see the OS documentation.

**Procedure**

1. Navigate to EM > System Configuration > Network Settings > IP Interface Assignments.
2. Under IPv4 Interfaces, select the desired IPv4 address for each interface: Signaling, Media, Cluster and OAM.
3. If IPv6 is enabled for your system, then configure the following:
   a. In the IP Configuration section, select the Transport mode as either Dual IPv4/IPv6 or IPv4 Only.
   b. In the IP Configuration section, select Preferences for Remote Offers.
   c. In the IP Configuration section, select Preferences for Local Offers.
   d. In the IPv6 Interfaces section, select the desired IPv6 address for the Media interface.
4. Click Save.
Configuring name resolution

About this task

You can use EM to view and update IP address and hostname mappings for the server. The server preserves this data in the local hosts file. The hosts file is preserved in Avaya Aura® MS backups.

⚠️ Note:
The Name Resolution page in EM does not display the localhost IP and local hostname data.

Procedure

1. Navigate to EM > System Configuration > Network Settings > Name Resolution.
2. To add a new name resolution mapping to the existing list click Add.
3. Add the IP Address and the Hostname for a new mapping or alter the values of an existing mapping.
4. To remove a mapping, click in the checkbox next to the IP address and click Remove.
5. Click Save.

Changing media port ranges

About this task

Avaya Aura® MS requires a range of dedicated ports for RTP, SRTP, RTCP, and SRTCP, media connections.

You can configure a contiguous port range for Avaya Aura® MS media ports in the basic configuration mode. You can use the advanced configuration mode to configure several ranges for Avaya Aura® MS media ports. Configuring multiple smaller ranges of ports is useful to avoid overlapping with ports that other software on the server requires.

Perform the following procedure to configure the media port range available for Avaya Aura® MS sessions.

Procedure

1. Navigate to EM > System Configuration > Network Settings > Advanced Settings > Media Port Ranges.
2. Choose the Configuration Mode:
   • To configure a contiguous media port range, select Basic.
   • To configure multiple media port ranges, select Advanced.
3. Choose one of the following:
   • If you have selected the Basic configuration mode, enter the beginning of the port range in the Start Port field. Enter the end of the port range in the End Port field.
If you have selected the Advanced configuration mode, click add to create a new range. Enter the beginning of the port range in the **Start Port** field. Enter the end of the port range in the **End Port** field.

4. Click **Save**.

5. To restart Avaya Aura® MS and to apply the port changes, click **Confirm**.

---

### Changing media server component port assignments

**About this task**

To offer media services, the software components of Avaya Aura® MS require network ports.

Perform the following procedure to change the port a component uses to avoid conflicts with other software port requirements on the server.

**Procedure**

1. Navigate to **EM > System Configuration > Network Settings > Advanced Settings > Port Assignments**.

2. Enter a new port in the **Value** field.

3. Click **Save**.

4. Click **Confirm**.

5. Restart Avaya Aura® MS for the changes to take effect. Navigate to **EM > System Status > Element Status** and click **Restart**.

6. Click **Confirm**.

---

### Changing the EM server ports

**About this task**

Use the following procedure to reassign the ports that Avaya Aura® MS EM uses.

**Procedure**

1. To change the default ports that Avaya Aura® MS EM uses, edit the HTTP and HTTPS connector port values in the following file:

   - **Linux®**
     
     \`installpath/ma/apache-tomcat/conf/server.xml\`

   - **Windows®**
     
     \`installpath\multimedia_applications\apache-tomcat\conf\server.xml\`

---

Comments on this document? infodev@avaya.com
Important:

The redirectPort value for the HTTP connector must match the Connector port of the HTTPS connector.

2. Restart the server.

---

Computer name and IP address modification

Perform the following procedures if you need to change the IP address or host name of an installed Avaya Aura® MS.

⚠️ Note:

When the IP address or host name of a server changes, you might need to replace the TLS certificates on the system. For information about configuring TLS certificates, see Security configuration.

Related links

- Security configuration on page 129

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Changing the computer name on Linux®

About this task

Perform the following procedure if you need to change the host name of a Linux® based Avaya Aura® MS:

Before you begin

Stop Avaya Aura® MS before changing the computer name.

Procedure

1. Edit the file /etc/hosts.
2. Update the host name wherever the host name appears in the file.
3. Save the file.
4. Edit the file /etc/sysconfig/network.
5. Update the host name wherever the host name appears in the file.
6. Save the file.
7. Using a Linux® shell, enter the following command to apply the host name change to the system:

   hostname newhostname

   Where newhostname is the new name for the server.
8. Restart the server to apply change system-wide.

Related links
Starting and stopping the media server on page 28

---

### Changing the computer name on Windows®

**About this task**

Perform the following procedure if you need to change the name of a Windows® based Avaya Aura® MS:

**Before you begin**

Stop Avaya Aura® MS before changing the computer name.

**Procedure**

1. Click the Windows® Start button.
2. Right-click Computer, and select Properties on the shortcut menu.
3. Click Advanced system settings.
4. In the System Properties window, click the Computer Name tab.
5. Click Change.
6. In the Computer name field, type the new computer name.
7. Click OK.
   - The system displays a message box warning you to restart the computer to apply the change.
8. Click OK.
9. In the System Properties window, click Close.
   - The system displays a message box warning you to restart the computer to apply the change.
10. Click Restart Now.

Related links
Starting and stopping the media server on page 28

---

### Changing the IP address on Linux®

**About this task**

To change the IP address of a Linux® based Avaya Aura® MS, perform the following procedure:
Before you begin

Do not use this procedure to change the Service IP address of a High Availability configuration.

Do not use this procedure to change the IP address of an Avaya Aura® MS appliance.

Stop Avaya Aura® MS before changing the IP address.

Procedure

1. Using the local Linux® console shell, edit the file /etc/hosts.
2. Update the IP address wherever the IP address appears in the file.
3. Save the file.
4. Using the local Linux® console shell, enter the following command to the list of network interfaces:
   ```bash
   ifconfig
   ```
5. Edit the required interface configuration file, for example.
   ```bash
   /etc/sysconfig/network-scripts/ifcfg-eth0
   ```
6. Update the IP address wherever the IP address appears in the file.
7. Save the file.
8. Using the local Linux® console shell, enter the following commands to apply the IP address change to the system:
   ```bash
   /etc/init.d/network stop
   /etc/init.d/network start
   ```
9. Login to EM using the new IP address in the URL for the EM login.
11. IP Interface Assignment fields show errors, as a result of the IP address change. Select valid IP addresses from the drop-down menus for each field showing Invalid.
12. Click Save.
13. Click Confirm.
14. Restart the server to apply the change system-wide.
15. If this server is a member of a cluster or High Availability pair, then navigate to EM > Cluster Configuration > Server Designation on each server. Ensure that the IP address you just changed is updated on each server. For more information, see Cluster configuration.
   To change the High Availability Service IP address, see Changing the Service IP Address for a High Availability configuration.
16. If this is a Primary server of a master cluster, then replication clusters that point to the master cluster must be updated with the new address of this server. On the Primary node in each replication cluster, navigate to EM > Cluster configuration > Replication Settings > Master Cluster Primary Node Address.
Changing the IP address on Windows®

About this task

To change the IP address of a Windows® based Avaya Aura® MS, perform the following procedure:

Before you begin

Stop Avaya Aura® MS before changing the IP address.

Procedure

1. Click the Windows® Start button.
2. Click Control Panel.
3. Click Network and Internet.
4. Click Network and Sharing Center.
5. Click Local Area Connection.
6. Click Properties, on the General tab of the Local Area Connection Status window.
   The system displays the Local Area Connection Properties window.
7. Under This connection uses the following items, select Internet Protocol Version 4 (TCP/IPv4).
8. Click Properties.
   The system displays the Internet Protocol Version 4 (TCP/IPv4) Properties window.
9. On the General tab, select Use the following IP address.
10. In the IP address field, type the IP address that you want to use.
11. (Optional) Update the Subnet mask, Default gateway, Preferred DNS server, and Alternate DNS server.
12. Click OK.
13. Click Close.
14. Click Close.
15. Restart the server to apply changes system-wide.
Note:
If you are using a remote browser to gain access to EM, use the new IP address in the URL for the EM login.

17. **IP Interface Assignment** fields show errors, as a result of the IP address change. Select valid IP addresses from the drop-down menus for each field showing Invalid.

18. Click Save.

19. Click Confirm.

20. If this server is a member of a cluster, then navigate to EM > Cluster configuration > Server Designation on each server.

Note:
Ensure that the IP address you just changed is updated on each server. See Cluster configuration.

21. If the server you just updated is the Primary server of a master cluster, then replication clusters which point to this master cluster must be updated with the new address of this server. On the Primary node in each replication cluster, navigate to EM > Cluster configuration > Replication Settings > Master Cluster Primary Node Address and update the address.

Related links
Starting and stopping the media server on page 28
N+1 Load Sharing cluster configuration on page 37

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**SIP configuration**

Session Initiation Protocol (SIP) is a signaling protocol that is used to create, modify, and end media streams containing text messaging, voice, and video.

SIP provides a standard means to establish sessions, negotiate capabilities, invoke applications, and exchange data with Avaya Aura® MS. The SIP protocol is an application layer protocol designed to be independent of the underlying transport layer. Avaya Aura® MS supports SIP on Transmission Control Protocol (TCP), User Datagram Protocol (UDP), and Transport Layer Security (TLS).

---

**Configuring SIP general settings**

**About this task**

Important:
Change only those settings that are required for your system. The default settings are sufficient for most systems.
If you enable SOAP (TLS), you must configure a SIP TLS profile and a certificate for the SIP TLS service profile.

Refer to the following definitions for descriptions of each SIP setting:

<table>
<thead>
<tr>
<th>Setting</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Always Approve SIP TLS Certificate</td>
<td>Select if you want the system to accept remote certificate over SIP TLS. The default is disabled.</td>
</tr>
<tr>
<td>Always Use SIP Default Outbound Proxy</td>
<td>Select to enable the system to route SIP requests that do not match the domain proxy configuration, through the default outbound proxy, even if an IP address is specified in the host portion of the destination URI.</td>
</tr>
<tr>
<td>Answer Delay (rings)</td>
<td>The number of rings before an incoming SIP call is answered. You can configure the duration of a ring using the Ring Interval engineering parameter. A value of 0 indicates an immediate answer. The default value is 1 ring. The range is 0 to 10 rings.</td>
</tr>
<tr>
<td>Enable SIP TCP Transport</td>
<td>Select if you want the system to accept and request SIP over TCP.</td>
</tr>
<tr>
<td>Enable SIP TLS Mutual Authentication</td>
<td>Select to enable the mutual authentication option for SIP TLS.</td>
</tr>
<tr>
<td>Enable SIP TLS Transport</td>
<td>Select to allow the system to accept and request SIP over TLS. Ensure that a certificate has been configured for the SIP TLS service profile.</td>
</tr>
<tr>
<td>Enable SIP UDP Transport</td>
<td>Select to allow the system to accept and request SIP over UDP.</td>
</tr>
<tr>
<td>Enable SIP UPDATE method</td>
<td>Select to allow session participants to modify the characteristics of the multimedia session through re-INVITE messages or UPDATE messages. Re-INVITE and UPDATE messages initiate session changes, such as hold and retrieve, codec changes, and adding or dropping media.</td>
</tr>
<tr>
<td>Enforce SIP Route Configuration</td>
<td>Select if outgoing route configuration is required. By default, the system raises an alarm if route configuration is missing. If outgoing route configuration is not required, clear the check box.</td>
</tr>
<tr>
<td>Enforce SIP TLS in Secured Media Mode</td>
<td>Select to disable the non-TLS transport in secured media mode.</td>
</tr>
<tr>
<td>Hide SIP User-Agent Header</td>
<td>Select to prevent the User-Agent header from being included in SIP messaging.</td>
</tr>
<tr>
<td>Long Call Audit Refresh Timer</td>
<td>The time period in seconds for sending a refresh request. The default is 600 seconds. The range is 90 to 3600 seconds.</td>
</tr>
</tbody>
</table>

Table continues…
### Definitions for SIP settings

<table>
<thead>
<tr>
<th>Setting</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long Call Audit Type</td>
<td>Select the preferred Long Call Method to use: Disable Audit, INFO Ping, re-INVITE, or UPDATE.</td>
</tr>
<tr>
<td>Minimum Session Interval (RFC4028 Min-SE)</td>
<td>The minimum value for the session interval that the application can accept. RFC4028 recommends a Min-SE value of 90 seconds. The default is 90 seconds. The range is 90 to 3600 seconds.</td>
</tr>
<tr>
<td>Session Expires Value (RFC4028)</td>
<td>The number of seconds before a call times out if the call is not successfully refreshed. The default is 1800 seconds. The range is 90 to 3600 seconds.</td>
</tr>
<tr>
<td>Session On Hold Teardown Delay (sec)</td>
<td>The number of seconds a session can remain on hold before the system ends the session. A value of 0 indicates the system will not end a session on hold. The default is 3600 seconds. The range is 0 to 100000 seconds.</td>
</tr>
<tr>
<td>SIP Hold Before Refer</td>
<td>The call is placed on Hold prior to REFER.</td>
</tr>
<tr>
<td>SIP Response Code When System/Application Locked</td>
<td>The SIP Response Code needed to restore service when the application is locked, out-of-service, or exceeds engineering limits. The default value is 480. The range is 400 to 699.</td>
</tr>
<tr>
<td>Trusted Node Access Only</td>
<td>Select to prevent traffic from nodes that are not trusted. If a default proxy is configured, the call is redirected with a 305 Use Proxy message. Otherwise, the call attempt is rejected with a 403 Forbidden message.</td>
</tr>
</tbody>
</table>

Perform the following procedure to change the SIP settings for your system:

**Procedure**

1. Navigate to **EM > System Configuration > Signaling Protocols > SIP > General Settings**.
2. Modify the settings listed in the categories **Transport Settings**, **Routing**, **Access Control**, **Session Audit**, and **SIP Settings**.
3. Click **Save**.

*Note:*

Some of the changes require system restart to take effect.

---

**Adding SIP domains**

**About this task**

A network provisioned SIP domain must be added only if:

- Avaya Aura® MS needs to send SIP Register to the network
Avaya Aura® MS is connected to more than one SIP domain that is controlled by different proxies. Calls can also originate from Avaya Aura® MS.

Avaya Aura® MS has an internal default domain called the wildcard domain represented by an asterisk (*). The system uses the default wildcard domain if no matching domain is found.

For most cases, SIP domain configuration is not required because Avaya Aura® MS is connected to one or more proxies or call servers that are capable of routing calls to various domains. In such cases, the default wildcard domain is sufficient.

Perform the following procedure to add a SIP domain for your system if the wildcard domain is not sufficient:

**Procedure**

1. Navigate to EM > System Configuration > Signaling Protocols > SIP > Domains and Accounts.
2. In the Domains section, click Add... to add a SIP domain.
3. In the Add SIP Domain page, enter the name of the SIP domain in the Name field.
4. Click Save.

---

### Adding SIP accounts

**About this task**

Configure SIP accounts only if you require the use of a registrar server. You use SIP accounts to register your applications in the SIP network. Avaya Aura® MS registers all accounts with the registrar servers. You do not require SIP account configuration if Avaya Aura® MS is provisioned in your network as a trusted entity.

Perform the following procedure to add a SIP account for your system:

**Procedure**

1. Navigate to EM > System Configuration > Signaling Protocols > SIP > Domains and Accounts.
2. In the Accounts area, click Add to add a SIP account.
3. On the Add SIP Account page, enter the name of the SIP account in the Name field.
4. Enter the password for the SIP account in the Password field.
5. Re-enter the password in the Confirm Password field.
6. Select the SIP domain to associate with the account from the Domain list.
7. Select the cluster node to associate with the account from the Cluster Node list.
8. Click Save.
Configuring SIP trusted nodes

About this task
Avaya Aura® MS only processes SIP traffic from trusted nodes, for example, proxies. Avaya Aura® MS rejects requests from nodes that are not trusted. All proxy servers and registrar servers that interact with Avaya Aura® MS must be trusted nodes.

Perform the following procedure to configure trusted nodes for each proxy server and registrar server:

Procedure
1. Navigate to EM > System Configuration > Signaling Protocols > SIP > Nodes and Routes.
2. In the Trusted Nodes section, click Add to add a new SIP trusted node.
3. On the Add SIP Trusted Node page, enter the address of the SIP node in the Host or Server Address field.
4. Click Save.

Configuring SIP routes

About this task
Configure SIP routes for all proxy servers and registrar servers. SIP routes define all proxy and registrar servers with which the Avaya Aura® MS node communicates.

You can configure up to 32 routes for each domain.

The system selects the routes based on the matching domain. If no domain is configured, the system uses the default wild card domain represented by an asterisk (*).

The system uses the Priority and Weight of a route for outbound call load balancing. If multiple routes are configured for a domain, the calls are attempted on the highest priority routes. If the remote server is not responsive or is out of service, the attempted calls can failover to lower priority routes. For routes which have the same priority, the system distributes the load based on the route weight.

Refer to the following parameter definitions for the descriptions of each SIP route setting:

<table>
<thead>
<tr>
<th>Setting</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enabled</td>
<td>Select to enable or disable a SIP route. Typically, routes are enabled. However, a route can be disabled to remove the route temporarily without reconfiguring the system.</td>
</tr>
</tbody>
</table>
Definitions for SIP route settings

<table>
<thead>
<tr>
<th>Setting</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domain</td>
<td>The name of the domain to which you are adding the route. The SIP route is associated with the domain.</td>
</tr>
<tr>
<td>IM Proxy</td>
<td>If there are multiple proxy routes in the domain, route IMs to the route which is enabled.</td>
</tr>
<tr>
<td>Priority</td>
<td>The priority value for the route. The default value is 0. The range is from 0 to 65535 with the lowest value having the highest priority. The highest priority routes, which have lower values, are selected first.</td>
</tr>
<tr>
<td>Proxy</td>
<td>Select to assign a proxy server role to the route. A SIP proxy server accepts Avaya Aura® MS requests and uses the SIP registrar server to obtain recipient addressing information.</td>
</tr>
<tr>
<td>Registrar</td>
<td>Select to assign a registrar server role to the route. A SIP registrar server is a database that contains the location of all user agents within a domain.</td>
</tr>
<tr>
<td>Remote Port</td>
<td>The remote port from which the route accepts SIP requests. The default port is 5060.</td>
</tr>
<tr>
<td>Transport</td>
<td>Select the appropriate SIP transport (UDP, TCP, or TLS). When you select the transport type of TLS, ensure that a certificate is configured for the SIP-TLS service profile.</td>
</tr>
<tr>
<td>Trusted Node</td>
<td>The trusted nodes associated with the route.</td>
</tr>
<tr>
<td>Weight</td>
<td>Weight is used to select routes within the same priority level. The default value is 10. The range is 0 to 65535.</td>
</tr>
</tbody>
</table>

Before you begin
You must have configured a SIP trusted node before adding any SIP routes.

Procedure
1. Navigate to EM > System Configuration > Signaling Protocols > SIP > Nodes and Routes.
2. In the Routes area, click Add... to add a new SIP route.
3. On the Add SIP Route page, in the General section, select Enabled to enable the route.
4. From the Domain list, select the desired domain.
5. From the Trusted Node list, select the trusted node to associate with the route.
6. From the Transport list, select the transport protocol that the route uses.

⚠️ Important:
If a transport type of TLS is selected, ensure that a certificate is configured for the SIP TLS service profile.
7. In the **Remote Port** field, enter the port number of the remote port.

8. In the **Priority** field, set the priority of the route by entering a value.

9. In the **Weight** field, set the weight of the route by entering a value.

10. In the **Roles** area, select whether the route is associated with the **Proxy** server, the **Registrar** server, or both by selecting **Proxy** and **Registrar**.

11. Select **IM Proxy** to route instant messages only to the route that is enabled if there are multiple proxy routes in the domain.

12. Click **Save**.

13. Restart Avaya Aura® MS for the changes to take effect. Navigate to **EM > System Status > Element Status** and click **Restart**.

14. Click **Confirm**.

---

**Configuring SIP route properties**

**About this task**

Refer to the following parameter definitions for descriptions of each property of the SIP route:

<table>
<thead>
<tr>
<th>Definitions for SIP route properties</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Property</strong></td>
</tr>
<tr>
<td>--------------</td>
</tr>
<tr>
<td>SIP Route Type</td>
</tr>
<tr>
<td>Standard SIP</td>
</tr>
<tr>
<td>CS1K GW</td>
</tr>
<tr>
<td>CS1K SRS</td>
</tr>
<tr>
<td>CS1K SPS Home</td>
</tr>
<tr>
<td>CS1K SPS Home Redirect</td>
</tr>
<tr>
<td>CS1K SPS Redirect</td>
</tr>
</tbody>
</table>

*Table continues*...
### Definitions for SIP route properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIP Server Poll Timer</td>
<td>Interval, in milliseconds, that the route is polled for status. The mechanism used to determine the status is based on the SIP Server Keepalive configuration setting. The default value is 30,000 milliseconds. The range is 30,000 to 600,000 milliseconds.</td>
</tr>
<tr>
<td>Server Keep Alive</td>
<td>The mechanism used by Avaya Aura® MS to determine the status of the route. The options include: Disabled, Keep Alive, Using OPTIONS. Route status monitoring is enabled. Route status is monitored using the SIP OPTIONS message. The route status updates based on the OPTIONS response. The OPTIONS response includes 200 (Active), 503 (Inactive), 504/No Response (Inactive or Down), and Other (Online - applies to MCS).</td>
</tr>
</tbody>
</table>

### Before you begin
You must have configured a SIP route.

### Procedure
1. Navigate to EM > System Configuration > Signaling Protocols > SIP > Nodes and Routes.
2. In Routes area, select the check box next to Route field that you want to edit.
3. Click Edit.
4. On the Edit SIP Route page, scroll down to the Properties section to make any required changes.
5. From the Server Keepalive list, select to enable route status monitoring.
6. From the SIP Route Type list, select the type of route.
7. In the SIP Server Poll Timer field, enter the polling interval for route status, in milliseconds.
8. Click Save.

### Editing a SIP domain or a SIP account

#### Procedure
1. Navigate to EM > System Configuration > Signaling Protocols > SIP > Domains and Accounts.
2. On the SIP Domains and Accounts page, select the check box next to the domain or account that you want to edit.
3. Click Edit.
4. Edit the properties of the domain or account.
5. Click Save.

---

### Changing the SIP account password

**Procedure**

1. Navigate to **EM > System Configuration > Signaling Protocols > SIP > Domains and Accounts**.
2. On the SIP Domains and Accounts page, select the check box next to the account for which you want to change the password.
3. Click Edit.
5. In the **Password** field, enter the new password.
6. In the **Confirm Password** field, re-enter the new password.
7. Click Continue.
8. Click Save.

---

### Deleting a SIP domain or a SIP account

**Before you begin**

If a SIP domain has associated accounts, you must delete the SIP accounts before you delete the domain.

**Procedure**

1. Navigate to **EM > System Configuration > Signaling Protocols > SIP > Domains and Accounts**.
2. On the **SIP Domains and Accounts** page, select the check box next to the domain or account that you want to delete.
3. Click Delete.

---

### Editing a SIP trusted node or a SIP route

**Procedure**

1. Navigate to **EM > System Configuration > Signaling Protocols > SIP > Nodes and Routes**.
2. On the **SIP Nodes and Routes** page, select the check box next to the trusted node or route.
3. Click **Edit**.
4. Edit the properties of the trusted node or route.
5. Click **Save**.

### Deleting a SIP trusted node or a SIP route

**Before you begin**

If a SIP trusted node has routes associated with the node, you must delete the routes before you delete the node.

**Procedure**

1. Navigate to **EM > System Configuration > Signaling Protocols > SIP > Nodes and Routes**.
2. On the **SIP Nodes and Routes** page, select the check box next to the trusted node or route that you want to delete.
3. Click **Delete**.

### MRCP configuration

Avaya Aura® MS uses MRCP servers to support speech recognition and to stream Text-To-Speech (TTS) as Avaya Aura® MS is synthesized in real-time.

To configure MRCP, define one or more MRCP servers and identify the resources on each server. Additionally, define one or more MRCP pools and add the MRCP servers for each pool.

In addition to the built-in Nuance and Loquendo support within Avaya Aura® MS, you can add custom MRCP vendors to allow for additional speech resources.

### Configuring an MRCP general settings

**About this task**

Refer to the following definitions for descriptions of each property of the MRCP General Settings:

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum MRCP Channels</td>
<td>The maximum number of MRCP channels or sessions for each node that can be allocated by the server.</td>
</tr>
</tbody>
</table>
### Definitions for MRCP general properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum MRCP Channels</td>
<td>server. Avaya Aura® MS uses this value to determine the maximum MRCP channels available on an MRCP server. This value is also used to initialize the MRCP stack. The Maximum MRCP Channels field is not a keycoded value. The default value is 512. The range is 0 to 2000.</td>
</tr>
<tr>
<td>Retry Limit</td>
<td>The number of retry attempts when a resource allocation fails. The system attempts to connect to the server with the smallest load first. It is followed by the server with the second smallest load, and then the server with the third smallest load. The default is 2 retry attempts. The range is 0 to 2.</td>
</tr>
<tr>
<td>MRCP Resource Ping Interval</td>
<td>The number of seconds between successive test allocations of configured MRCP resources. This value is used by Avaya Aura® MS to monitor the status of the MRCP servers. A value of 0 disables test allocations. The default value is 300 seconds. The range is 0 to 31536000 seconds.</td>
</tr>
<tr>
<td>Recognition Timeout</td>
<td>The maximum duration, in milliseconds, that a recognition session is active before Avaya Aura® MS terminates the session and generates a resource fault. The default value is 600000 milliseconds. The range is 0 to 31536000 milliseconds.</td>
</tr>
<tr>
<td>MRCP Transaction Timeout</td>
<td>The maximum duration, in milliseconds, that an MRCP transaction can last before being terminated and a resource fault generated. The default value is 10000 milliseconds. The range is 0 to 31536000 milliseconds.</td>
</tr>
<tr>
<td>MRCPv2 Control Channel Security</td>
<td>Override options for the security settings for the MRCPv2 control channel. Under normal conditions use the Default option.</td>
</tr>
<tr>
<td>MRCPv2 Media Security</td>
<td>Override options for the security settings for the MRCPv2 media channel. Under normal conditions use the Default option.</td>
</tr>
</tbody>
</table>

Perform the following procedure to change MRCP General Settings:

**Procedure**

1. Navigate to EM > System Configuration > Signaling Protocols > MRCP > General Settings.
2. In the **Maximum MRCP Channels** field, enter a value for the maximum number of MRCP channels that can be allocated.
3. In the **Retry Limit** field, enter the number of allocation retries before an allocation attempt fails.
4. In the **MRCP Resource Ping Interval** field, enter the number of seconds between successive test allocations of configured MRCP resources.

A value of 0 disables test allocations.

5. In the **Recognition Timeout** field, enter the maximum duration (in milliseconds), that a recognition session is active before Avaya Aura® MS ends it. A resource fault is generated when the system ends the session.

6. In the **MRCP Transaction Timeout** field, enter the maximum duration (in milliseconds) that an MRCP transaction can last before being ended. A resource fault is generated when the system ends the transaction.

7. **(Optional)** Override the security settings for the MRCPv2 control channel by selecting **Enforced** or **Disabled** in the **MRCPv2 Control Channel Security** drop-down menu. Under normal conditions use the **Default** option.

8. **(Optional)** Override the security settings for the MRCPv2 media channel by selecting **Enforced** or **Disabled** in the **MRCPv2 Media Security** drop-down menu. Under normal conditions use the **Default** option.

9. Click **Save**.

10. Restart Avaya Aura® MS for the changes to take effect.

---

**Adding an MRCP server**

**About this task**

Add an MRCP server to provide speech capabilities to the network of Avaya Aura® MS nodes. MRCP servers can be grouped into pools and shared across one or more Avaya Aura® MS systems in the network.

Refer to the following definitions of the new MRCP Server Properties for descriptions of each property:

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Server Name</td>
<td>The name used to identify this MRCP server. The maximum length is 128 characters.</td>
</tr>
<tr>
<td>Server description</td>
<td>A brief description of the server. The maximum length is 512 characters.</td>
</tr>
<tr>
<td>Server address</td>
<td>The IP address of the MRCP server. The maximum length is 64 characters.</td>
</tr>
<tr>
<td>Port</td>
<td>The port from which the server receives requests. The default port is based on the settings of the selected vendor. The range is 0 to 65535.</td>
</tr>
<tr>
<td>MRCP Version</td>
<td>The MRCP protocol version Avaya Aura® MS should use.</td>
</tr>
<tr>
<td>Transport Protocol</td>
<td>The transport protocol Avaya Aura® MS should use with MRCP.</td>
</tr>
</tbody>
</table>

*Table continues…*
### Definitions for MRCP server properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vendor</td>
<td>Select the appropriate MRCP vendor identifier such as Nuance, Loquendo or those added on the Custom MRCP vendors page. The default is Nuance.</td>
</tr>
<tr>
<td>Codec</td>
<td>Select the appropriate audio codec (PCMU, PCMA or L16). The default value is based on the settings of the selected vendor.</td>
</tr>
<tr>
<td>State</td>
<td>The operational state:</td>
</tr>
<tr>
<td></td>
<td>• Unlocked: The server is online and available for allocation. This is the default.</td>
</tr>
<tr>
<td></td>
<td>• Locked: The server is offline and unavailable for allocation.</td>
</tr>
<tr>
<td>Add to Default Pool</td>
<td>Select the check box to add the server to the default pool. This check box is only available when adding an MRCP Server. If no default pool exists, the system creates one pool based on the server configuration. The default pool uses the following names: speechrecog-mrcp.default or speechsynth-mrcp.default. However, if there are no default pools and the pool names (speechrecog-mrcp.default or speechsynth-mrcp.default) already exist, the operation fails. The Add to Default Pool operation can also fail, if the server and default pool attributes do not match.</td>
</tr>
</tbody>
</table>

⚠ **Important:**

An MRCP server cannot have more than two MRCP resources (LVR and TTS). The Add button is disabled after both the MRCP resources exist for a server.

If you use the host name for the server address in the following procedure, you must enable DNS on the network.

Perform the following procedure to an MRCP server to provide speech capabilities to the network of Avaya Aura® MS nodes:

**Procedure**

1. Navigate to **EM > System Configuration > Signaling Protocols > MRCP > Servers.**
2. On the **Servers** page, click **Add…**
3. Enter the name that is used to identify the MRCP server in the **Server Name** field.
4. Enter a description of the MRCP server in the **Server description** field.
5. Enter the host name or server address of the MRCP server, in the **Server address** field.
   - **Important:**
     - You must enable the DNS on the network if the host name is used.
6. Enter the port number of the MRCP server in the **Port** field.
7. Select the required version of MRCP from the **MRCP Version** drop-down menu.
8. Select the required transport protocol from the **Transport Protocol** drop-down menu.
9. From the Vendor list, select the vendor.
10. From the Codec list, select the audio codec type.
11. From the State list, select the appropriate initial operational state, either Locked or Unlocked.
   The default value is Unlocked.
12. If you want to add the server to the default pool, select Add to Default Pool.
13. Click Save.

---

**Adding MRCP server resources**

**About this task**

Each MRCP server can have a TTS resource, LVR resource, or both associated with the server.

Refer to the following definitions for descriptions of each property of the MRCP server resource:

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Server Name</td>
<td>The name of the MRCP server.</td>
</tr>
<tr>
<td>Vendor name</td>
<td>The name of the current vendor such as Nuance, Loquendo or those added on the Custom MRCP vendors page.</td>
</tr>
<tr>
<td>Type</td>
<td>Select the appropriate resource capabilities (LVR or TTS) supported by MRCP. The default value is based on the settings of the selected vendor.</td>
</tr>
<tr>
<td>URL Suffix</td>
<td>The URL suffix used to identify the resource. This feature is enabled only when the Type is LVR or TTS. For Nuance: • LVR — media/speechrecognizer. This is the default. • TTS — media/speechsynthesizer For Loquendo: • LVR — media/recognizer • TTS — media/synthesizer The default value is based on the settings of the selected vendor.</td>
</tr>
<tr>
<td>Weight</td>
<td>The weighted value of the server. This value is used for distributing server resources within the pool. The default value is 1. The range is 0 to 65535.</td>
</tr>
</tbody>
</table>

Table continues…
### Definitions for MRCP server resource properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Sessions</td>
<td>The maximum number of sessions to be allocated by one IVR media processor (IVRMP) from the defined resource. The default value is 1 session. The range is from 0 to 65535.</td>
</tr>
<tr>
<td>Languages</td>
<td>The language options available on the MRCP server. The default value is based on the settings of the selected vendor.</td>
</tr>
</tbody>
</table>

**Note:**

An MRCP server cannot have more than two MRCP resources (LVR and TTS). The *Add…* button is disabled after both resources exist for a server.

### Procedure

1. Navigate to **EM > System Configuration > Signaling Protocols > MRCP > Servers**.
2. On the **Servers** page, select the check box next to the MRCP server to which you want to add server resources.
3. Click **Edit…**
4. On the **Edit MRCP Server** page, in **Server Resources**, click **Add…**
5. In the **Server Name** and **Vendor** field, verify the server and vendor names.
6. From the **Type** list, select the resource capabilities supported by MRCP.
7. In the **URL Suffix** field, enter the suffix to identify the resource.
   The URL suffix must match the configuration on the speech server.
8. In the **Weight** field, enter the server weight used to distribute server resources within a pool.
9. In the **Maximum Sessions** field, enter the maximum number of sessions for this server.
10. Add the required languages in one of two ways:
    - In the **Select a Language** section, select the required language from the **Languages** drop-down menu. Click **Add** to add the selected language to the list of supported languages.
    - Click **Add New**. In the text field that the system displays, type the required language.
11. Click **Continue**.
12. On the **Edit MRCP Server** page, click **Save**.
Adding an MRCP pool

About this task

Each Avaya Aura® MS can define one or more MRCP pools from which speech resources are allocated. Each pool contains one or more servers. MRCP servers within a pool must have the same attributes. Servers can be added or removed from the pool.

⚠️ Important:

All servers in the same pool must be from the same vendor and resource type, TTS or LVR.

⚠️ Important:

The servers must share at least one common language. Ensure that all servers in the pool support the language set you specify.

Refer to the following definitions for descriptions of each property of the MRCP Pool:

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Available</td>
<td>Select to make the pool available for servers.</td>
</tr>
<tr>
<td>Default pool</td>
<td>Select to make this pool the default pool for speech capability on the network of Avaya Aura® MS nodes.</td>
</tr>
<tr>
<td>Language</td>
<td>The speech capability of the network of Avaya Aura® MS nodes. Select a language from the available languages. The servers must share at least one common language. When you specify languages supported by a pool, the language set must be supported by all servers in the pool. The language list displayed is based on the MRCP server configuration, more specifically, the vendor ID and the resource type. If no servers are assigned to the pool, the language field is populated with all the languages that are common among the servers being assigned.</td>
</tr>
<tr>
<td>Pool description</td>
<td>A brief description of the pool. The description can be up to 512 characters.</td>
</tr>
<tr>
<td>Pool name</td>
<td>The name used to identify this pool. The name can be up to 128 characters. An MRCP server can be assigned to many different pools.</td>
</tr>
<tr>
<td>Pool type</td>
<td>The type of pool (LVR or TTS).</td>
</tr>
<tr>
<td>Pool weight</td>
<td>A weighted value used to determine how pool resources are prioritized. The default value of 1. The range is 0 to 65535.</td>
</tr>
<tr>
<td>Vendor name</td>
<td>The name of the current vendor, Nuance, Loquendo or those added on Custom MRCP vendors.</td>
</tr>
</tbody>
</table>
Perform the following procedure to add an MRCP pool:

**Procedure**

1. Navigate to **EM > System Configuration > Signaling Protocols > MRCP > Pools**.
2. On the **Pools** page, click **Add...**
3. In the **Pool name** field, enter a name to identify the pool.
4. In the **Pool description** field, enter a description of the pool.
5. From the **Pool type** list, select the MRCP server type.
6. From the **Vendor name** list, select the vendor.
7. In the **Pool weight** field, enter the required weight of the pool.
8. From the **Language** list, select a language.
9. Select **Default pool** to set the pool as the default pool.
10. To make the pool available, select **Available**.
11. Click **Save**.

---

**Adding a server to an MRCP pool**

**About this task**

You can assign an MRCP server to multiple pools.

Perform the following procedure to add an MRCP server to an existing MRCP server pool:

**Before you begin**

Define an MRCP server pool.

**Procedure**

1. Navigate to **EM > System Configuration > Signaling Protocols > MRCP > Pools**.
2. On the **Pools** page, select the check box next to the pool receiving the servers.
3. Click **Edit**
4. In the **Assign servers** section, select a server from the **Available** list.
5. Click **Add** to move the server to the **Assign to this pool** list.

⚠️ **Important:**

The status of the MRCP servers assigned to the pool is displayed in the **Assign to this pool** list, next to the server address.

6. Click **Save**.
Adding custom MRCP vendors

About this task
Perform the following procedure to add custom MRCP vendors for additional speech resources:

⚠ Important:
You can only add, edit, or delete custom MRCP vendors on a Primary server.

Procedure
1. Gain access to the EM for the Primary server and navigate to EM > System Configuration > Signaling Protocols > MRCP > Custom Vendors.
2. On the Custom Vendors page, click Add.
3. In the Vendor Name field, enter the name of the new vendor.
4. Select the desired Default Codec from the list.
5. In the Default Port field, enter the default port number associated with the MRCP resource.
6. In the Associated Caps heading, click Add.
   ⚠ Important:
   Only one LVR and one TTS capability can be created for each vendor.
7. On the Add Cap page, select the resource type from the Cap (capability) list.
8. In the Default Suffix field, enter the suffix that identifies the resource type.
9. In Languages, select the required languages from the Available Languages list.
10. Click Add or Add All to move the supported language(s) to the Selected Languages list.
11. Click Save on the Add Cap page.
12. Click Save on the Add Custom MRCP Vendors page.

Editing custom MRCP vendors

About this task
Perform the following procedure to edit custom MRCP vendors:

⚠ Important:
You can only add, edit, and delete Custom MRCP vendors on a Primary server.

Procedure
1. Gain access to the EM for the Primary server and navigate to EM > System Configuration > Signaling Protocols > MRCP > Custom Vendors.
2. On the Custom Vendors page, select the check box next to the MRCP vendor resource that you want to edit.

   Important:
   Click on the alias of the vendor to view the cap settings. The settings are shown at the bottom of the page.

3. Click Edit.

4. On the Edit Custom Vendors page, edit the Default Codec and Default Port.

5. In the Associated Caps section, select the check box next to the cap that you want to edit.

6. Click Edit.

7. On the Edit Cap page, edit the Cap, Default Suffix, and Selected Languages.

8. Click Save on the Edit Cap page.

9. Click Save on the Edit Custom MRCP Vendor page.

Deleting custom MRCP vendors

About this task
Perform the following procedure to delete custom MRCP vendors:

   Important:
   You can only add, edit, and delete Custom MRCP vendors on a Primary server.

Procedure

1. Gain access to the EM for the Primary server and navigate to EM > System Configuration > Signaling Protocols > MRCP > Custom Vendors.

2. On the Custom Vendors page, select the check box next to the MRCP vendor resource that you want to delete.

   Important:
   If you delete a custom MRCP vendor, it deletes all MRCP servers containing the selected vendor.

3. Click Delete.

4. Click Confirm to acknowledge the deletion of the MRCP vendor resource.

Editing an MRCP server or server resources

About this task
Perform the following procedure to edit an MRCP server or server resources:
Procedure
1. Navigate to EM > System Configuration > Signaling Protocols > MRCP > Servers.

  ! Important:
  To view the resources assigned to an MRCP server in the lower pane, click the corresponding server in the Server Name column.

2. On the Servers page, select the check box next to the MRCP server that you want to edit.
3. Click Edit…
4. Edit the General MRCP server properties.
5. To edit a particular server resource, select the check box next to the server resource to be edited and click Edit…
6. Click Save.

---

Deleting an MRCP server

About this task
Perform the following procedure to delete an MRCP server:

Procedure
1. Navigate to EM > System Configuration > Signaling Protocols > MRCP > Servers.
2. On the Servers page, select the check box next to the MRCP server.
3. Click Delete.
4. Click Confirm to acknowledge the deletion of the MRCP server.

---

Deleting MRCP server resources

About this task
Perform the following procedure to delete the server resources for an MRCP server:

Procedure
1. Navigate to EM > System Configuration > Signaling Protocols > MRCP > Servers.
2. On the Servers page, select the check box next to the MRCP server.
3. Click Edit.
4. In Server Resources on the Edit MRCP Server page, select the check boxes next to the server resources you want to delete.
5. Click Delete.
6. On the Edit MRCP Server page, click Save.
Editing an MRCP pool

About this task
Perform the following procedure to edit an MRCP pool:

⚠️ Important:
Changing the Pool Type or Vendor Name removes all assigned MRCP servers. The system displays servers which have attributes matching the pool’s current configuration in the Available list.

Procedure
1. Navigate to EM > System Configuration > Signaling Protocols > MRCP > Pools.
   ☑️ Tip:
   The system displays the status of the MRCP servers assigned to each pool in parenthesis in the Server names column.
2. On the Pools page, select the check box next to the MRCP pool or the server resource that you want to edit.
3. Click Edit.
4. Edit the MRCP pool fields.
   ☑️ Tip:
   The system displays the status of the MRCP servers assigned to the pool in the Assign to this pool list.
5. Click Save.

Changing status of MRCP pools

About this task
Perform the following procedure to change the availability status of single or multiple MRCP pools:

Procedure
1. Navigate to EM > System Configuration > Signaling Protocols > MRCP > Pools.
2. On the Pools page, select the check box next to one or more MRCP pools.
3. From the More Actions list, select the availability status for the selected pools.
4. Click Confirm to acknowledge the status change.
Deleting an MRCP pool

About this task
Perform the following procedure to delete an MRCP pool:

Procedure
1. Navigate to EM > System Configuration > Signaling Protocols > MRCP > Pools.
2. On the Pools page, select the check box next to the MRCP pool or the server resource that you want to edit.
3. Click Delete.
4. Click Confirm to acknowledge the deletion of the MRCP pool.

Removing MRCP servers from a pool

About this task
Perform the following procedure to remove an MRCP server from an MRCP pool:

Procedure
1. Navigate to EM > System Configuration > Signaling Protocols > MRCP > Pools.
2. On the Pools page, select the check box next to the MRCP pool that contains the server that you want to remove.
3. Click Edit.
4. In the Assign servers section, select the server you want to remove from the Assign to this pool list.
5. Click Remove to move the server back to the Available list.
6. Click Save.

REST configuration
Avaya Aura® MS supports Representational State Transfer (REST) for building scalable web services. Avaya Aura® MS Web UserAgent component publishes a RESTful control interface that applications can use instead of SIP for media service access.
Enabling secure REST requests

About this task
Use the following procedure to configure secure TLS transport and authentication for REST services:

Procedure
1. Navigate to EM > System Configuration > Signaling Protocols > REST > General Settings.
2. To enable TLS for REST services, select the Enable TLS Transport check box.
3. (Optional) To enable two-way authentication for an extra level of security, select the Enable TLS Mutual Authentication check box.
4. (Optional) To use plaintext usernames and passwords, select Basic Authentication. Alternatively, to include an authentication realm and encrypt the credentials before sending them over the network, select Digest Authentication.
   a. Enter the required username and password credentials in the Authentication Username and Authentication Password fields.
   b. If you selected Digest Authentication, then enter the name of the required authentication realm in the Authentication Realm field.
5. Click Save.

* Note:
Changes to the transport settings require a media server restart to take effect.

Disabling secure REST requests

About this task
Use the following procedure to disable the TLS transport and authentication for REST services:

Procedure
1. Navigate to EM > System Configuration > Signaling Protocols > REST > General Settings.
2. To disable TLS for REST services, clear the Enable TLS Transport check box.
3. (Optional) To use unencrypted HTTP authentication, clear the Digest Authentication check box.
4. Click Save.

* Note:
Changes to the transport settings require a media server restart to take effect.
Media processing configuration

Avaya Aura® MS supports text, audio, and video for most multimedia processing features. The system can stream fully synchronized real-time audio and video using a variety of codecs and formats.

Configuring QoS monitoring settings

About this task

Refer to the following definitions for descriptions of each QoS monitoring property:

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>QOS Monitoring</td>
<td>Select to enable QoS monitoring.</td>
</tr>
<tr>
<td>Alert Interval (ms)</td>
<td>The minimum time period between QoS alert monitoring, measured in milliseconds. The default value is 60 milliseconds. The range is 1 to 2147483647 milliseconds.</td>
</tr>
<tr>
<td>Critical R Threshold (%)</td>
<td>The R-factor threshold that generates a critical alert after the threshold is crossed. The default value is 70 percent. The range is 0 to 100 percent.</td>
</tr>
<tr>
<td>Maximum Alerts</td>
<td>Sets the maximum number of alerts allowed by the IVR. The maximum number of alerts that can be generated during a particular interval is known as QoS Monitoring Alert Interval. This property is used to reduce network traffic. The default value is 100 alerts. The range is 0 to 2147483647 alerts.</td>
</tr>
<tr>
<td>Refresh Interval (sec)</td>
<td>The minimum period between QoS statistic reporting, measured in seconds. On the EM, default value is 60 seconds. The range is 0 to 2147483647 seconds.</td>
</tr>
<tr>
<td>Warning R Threshold (%)</td>
<td>The R-Factor threshold that generates a warning alert after the threshold is crossed. The default value is 80 percent. The range is 0 to 100 percent.</td>
</tr>
</tbody>
</table>

Perform the following procedure to configure Quality of Service (QoS) monitoring:

Procedure

1. Navigate to EM > System Configuration > Media Processing > General Settings > QoS Monitoring.
3. Click Save.
Note:
Some of the changes require a restart to take effect.

Configuring QoS streaming settings

About this task
Avaya Aura® MS provides prioritized transport for media packets by implementing Differentiated Services Control Point (DSCP) marking as described in RFC2474, RFC3260, and RFC4594. You can configure DSCP settings separately for audio and video streams. Audio packets must receive an Expedited Forwarding (EF) marking to ensure minimum latency in the network. Video packets must receive an Assured Forwarding (AF) marking to provide network transit suitable for real-time video while still giving priority to audio packets.

Video DSCP configuration is not available on Microsoft Windows® 2012 and later.

Refer to the following definitions for descriptions of each QoS streaming property:

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Audio DSCP</td>
<td>DSCP marking value for audio. The default value is 46 (Expedited Forwarding). The range is 0 to 63.</td>
</tr>
<tr>
<td>Video DSCP</td>
<td>DSCP marking value for video. The default value is 34(Assured Forwarding). The range is 0 to 63.</td>
</tr>
</tbody>
</table>

Perform the following procedure to configure QoS streaming:

Procedure
1. Navigate to EM > System Configuration > Media Processing > General Settings > QoS Streaming.
2. Alter the properties using the Definitions for QoS Streaming Properties table as an aid.
3. Click Save.

Configuring silence suppression

About this task
Silence suppression eliminates background noise transmission over the network when a user is not speaking. Instead of transmitting actual background audio noise in the audio stream, comfort noise indications are transmitted (see RFC3389). This reduces the network bandwidth used by the user session.

Refer to the following definitions for descriptions of each QoS silence suppression property:
### Definitions for silence suppression properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silence Suppression CN Level</td>
<td>The silence suppression comfort noise (CN) level in dB as defined by RFC3389. The default is minus (–) 127 dB. The range is minus (–) 127 dB to 0 dB.</td>
</tr>
<tr>
<td>Silence Suppression Interval (ms)</td>
<td>The number of milliseconds between successive 3389 RTP SS packets. The default is Disabled. The range is 0 to 2147483647 milliseconds.</td>
</tr>
<tr>
<td>Silence Suppression Threshold (ms)</td>
<td>The number of milliseconds before transmitted RTP silence is suppressed with 3389 SS packets. The default is 20 milliseconds. The range is 0 to 2147483647 milliseconds.</td>
</tr>
</tbody>
</table>

Perform the following procedure to configure the silence suppression options:

**Procedure**

1. Navigate to **EM > System Configuration > Media Processing > Advanced Settings > Silence Suppression**.
2. Alter the properties using the Definitions for Silence Suppression Properties table as an aid.
3. Click **Save**.

**Note:**

For some of the changes to take effect, you must restart Avaya Aura® MS.

---

### Configuring Aurix Speech Search Engine

**About this task**

Avaya Aura® MS interfaces with Aurix SSE for speech analytics services. These services enable the system to analyze recorded voice by using phonetic speech search technology. After a recording is analyzed and indexed, the speech it contains is searchable. Aurix SSE can also monitor audio streams in real-time by using a specified query set.

See *Using Web Services on Avaya Aura® Media Server 7.7* for additional information and a description of the SOAP API for accessing Aurix SSE services. Available services include, indexing and searching recorded files managed by the Avaya Aura® MS Content Store.

Perform the following procedure to enable Aurix SSE analytics for Avaya Aura® MS when Aurix SSE is installed.

**Before you begin**

Aurix Speech Search Engine (SSE) is preinstalled on Avaya Aura® MS virtualized appliance installations. If you have another installation type, you must contact Avaya Support for information about adding Aurix SSE and the required language packages to the Avaya Aura® MS installation.
Procedure
1. Navigate to EM > System Configuration > Media Processing > General Settings > Aurix Speech Engine.
2. To enable real-time monitoring and indexing of audio, select Enable AURIX SSE Real-time Interfaces.
3. To enable offline searching and indexing of audio files managed by Content Store, select Enable AURIX SSE Real-Web Services Interfaces.
4. Click Save.
5. For the changes to take effect, restart Avaya Aura® MS.

Enabling dual unicast monitoring

About this task
Avaya Aura® MS supports Prognosis from Avaya DevConnect Technology Partner, Integrated Research. Prognosis performance management software monitors voice quality, availability, and performance in real-time so that you can identify and resolve issues.

Perform this task to enable Prognosis unicast monitoring of the RTCP packets generated by Avaya Aura® MS.

Before you begin
Ensure that the Prognosis monitoring system is available and configured to communicate with Avaya Aura® MS.

Procedure
1. Navigate to EM > System Configuration > Media Processing > General Settings > Dual Unicast Monitoring.
2. To enable dual unicast monitoring, select Dual Unicast Monitoring.
3. Enter the address of the destination monitoring server in the Monitoring Server IP field.
4. Enter the port to use for the destination monitoring server in the Monitoring Server Port field.
5. Click Save.
6. Restart Avaya Aura® MS for the changes to take effect.

Enabling and configuring audio codec settings

About this task
Perform the following procedure to enable the audio codecs you want to support on the media server:
The order of the codecs in the **Enabled** list defines the preference of media server for codec selection in sessions originating from the media server. For incoming sessions, the first codec in the codec offering list of the incoming session, which is enabled on the media server, is accepted.

**Procedure**

1. Navigate to **EM > System Configuration > Media Processing > Audio Codecs**.

   ![Codec Selection and Enabled List](image)

2. In the **Codec Selection** section, select one or more audio codecs from the **Available** list.

3. Click **Add** to move the codecs to the **Enabled** list.

4. To change the priority rank of a codec within the **Enabled** list, select a codec and use the **Up** or **Down** buttons to move the codec within the list.

5. If the Opus Codec is enabled, then in the **Codec Setting** section select the required Opus quality level using the **Profile** drop-down menu. Use the following profile option definitions as an aid:
   - **Constrained Narrowband @ 12Kbps**: This profile has an 8 kHz sampling rate and should be used for sessions on severely bandwidth-constrained links.
   - **Narrowband @ 16Kbps**: This profile has an 8 kHz sampling rate and can be used for sessions with bandwidth-constrained links.
   - **Wideband @ 18Kbps**: This profile has a 16 kHz sampling rate and provides high quality audio and video.

6. In the **Codec Selection** section, select **Silence Suppression** and other options for each codec as required.

7. In the **Audio Packet Time** section, select the **Default PTime** to use as the offered PTime for outgoing sessions. Avaya recommends a value of 20 ms for the best performance.

8. Click **Save**.

---

**Removing an audio codec**

**About this task**

Perform the following procedure to disable an audio codec that you no longer want to support on Avaya Aura® MS:
Procedure

1. Navigate to EM > System Configuration > Media Processing > Audio Codecs.
2. On the Audio Codecs page, select the audio codec from the Enabled list.
3. Click Remove to move the codec to the Available list.
4. Click Save.

Enabling the video media processor

About this task
The video media processor component (VidMP) is disabled by default on Avaya Aura® MS. Enable the video media processor when you require video relay and switching capabilities.

Procedure

2. Select Video Media Processor.
3. Click Save.

Enabling and configuring video codec settings

About this task
Perform the following procedure to enable and configure the video codecs you want to support on Avaya Aura® MS:

Procedure

1. Navigate to EM > System Configuration > Media Processing > Video Codecs.
2. On the Video Codecs page, select one or more audio codecs from the Available list.
3. Click Add to move the codecs to the Enabled list.
4. To change the priority rank of a codec within the Enabled list, select a codec and use the Up or Down buttons to move it within the list.
5. Use the check boxes to select the Allowed Frame Rates for the codecs you enabled.
6. Choose the desired Default Frame Rate, for each added codec.
7. Select the Preferred Format, for each enabled codec.
8. Select the Annex Profile, for each enabled codec.
   Selecting Enforce Annex X Profiles means that only prescribed sets of annexes, as described in the annex X profile list, will be accepted.
   If you do not select Enforce Annex X Profiles, then Avaya Aura® MS negotiates arbitrary sets of annexes.
9. Click Save.

---

Removing a video codec

About this task
Perform the following procedure to disable a video codec that you no longer want to support on Avaya Aura® MS:
Procedure

1. Navigate to EM > System Configuration > Media Processing > Video Codecs.
2. On the Video Codecs page, select the video codec from the Enabled list.
3. Click Remove to move the codec to the Available list.
4. Click Save.

Enabling and configuring digit relay settings

About this task
Avaya Aura® MS uses digit relay settings and the order of the enabled relay methods when negotiating digit relay with a client endpoint. These settings apply for inbound or outbound sessions.

Avaya Aura® MS also supports in-band DTMF. The system defaults to this option if no other option is configured or negotiated by Avaya Aura® MS. The preferred method of digit transmission is RFC 2833.

Perform the following procedure to enable and configure the digit relay support on Avaya Aura® MS:

Procedure

1. Navigate to EM > System Configuration > Media Processing > Digit Relay (DTMF).
2. On the Digit Relay (DTMF) page, select one or more methods from the Available list.
3. Click Add to move the methods to the Enabled list.
4. To change the priority rank of a method within the Enabled list, select a method and use the Up or Down buttons to move it within the list.
5. Choose the required payload type option:
   • If a dynamic payload type is required, select Assign RFC 2833 Format Type Dynamically.
• If a fixed payload type is required, select **Specify Type**. In the **Specify Type** field, enter the value to use in the payload type field of the RTP header when transmitting RFC2833 encoded digits.

6. Click **Save**.

---

### Removing a digit relay method

**About this task**
Perform the following procedure to disable digit relay method you no longer want to support on Avaya Aura® MS:

**Procedure**

1. Navigate to **EM > System Configuration > Media Processing > Digit Relay (DTMF)**.
2. On the **Digit Relay (DTMF)** page, select the method to disable from the **Enabled** list.
3. Click **Remove** to move the method to the **Available** list.
4. Click **Save**.

---

### ICE configuration

Setting up a media stream with WebRTC media endpoints often requires use of the RFC 5245 Internet Connectivity Establishment (ICE) protocol for network address translation (NAT) and firewall traversal. The ICE protocol uses Session Traversal for NAT (STUN) and its extension protocol, Traversal Using Relay NAT (TURN), to support media services in a variety of network environments with NAT and firewall configurations.

You can configure multiple STUN and TURN server instances for redundancy or to scale service capacity. Avaya Aura® MS supports statistical load balancing using the priority and weight you configure for each server instance.

**Important:**
WebRTC sessions are not supported in a 1+1 HA cluster.

### Enabling ICE

**About this task**
Configuring ICE requires that you first enable the **Firewall NAT Tunneling Media Processor**.

Perform the following procedure to enable ICE, and display the ICE configuration items in the EM task list:

**Procedure**

1. Navigate to **EM > System Configuration > Server Profile > General Settings > Server Function**.
2. Select **Firewall NAT Tunneling Media Processor**.
3. Click **Save**.

### Configuring ICE general settings

**About this task**

Perform the following procedure to force media through TURN servers:

**Before you begin**

You must enable Firewall NAT Tunneling Media Processor before you can configure ICE.

**Procedure**

1. Navigate to **EM > System Configuration > Media Processing > ICE > General Settings**.
2. Select **Force Media Through a Configured TURN Server**.
3. Click **Save**.

### Configuring STUN and TURN servers

**Before you begin**

You must enable the Firewall NAT Tunneling Media Processor before you can configure STUN and TURN servers.

**Procedure**

1. Navigate to **EM > System Configuration > Media Processing > ICE > STUN/TURN Servers > Servers**.
2. Click **Add**...
3. Enter a unique name for the server in the **Name** field.
4. Enter a description for the server in the **Description** field.
5. Select the type of server from the **Type** drop-down menu.
6. Select the required transport protocol from the **Transport Protocol** drop-down menu.
7. Enter the server IP address in the **Address** field.
8. Enter the server port in the **Port** field.
   - The default port is 3478.
9. Specify the priority of this server compared to other servers in the pool in the **Priority** field. A lower number represents a higher priority.
10. Specify the weight of this server compared to other servers in the pool in the **Weight** field.
11. Select one of the following **Account** options:
    - If an account is not required for the server, select **Disabled**.
    - To use an existing STUN/TURN account with this server, select the required alias and user ID from the **Use an existing account** drop-down menu.
• To create a new STUN/TURN account for this server, select Create a new account and configure the Alias, User ID and Password fields.

12. Click Save.

Locking or Unlocking STUN and TURN servers

About this task
Locking a STUN or TURN server disables the server preventing it from providing service.

Procedure
1. Navigate to EM > System Configuration > Media Processing > ICE > STUN/TURN Servers > Servers.
2. Select the servers you want to lock or unlock.
3. Select Lock or Unlock from the More Actions drop-down menu.

Deleting STUN and TURN servers

Procedure
1. Navigate to EM > System Configuration > Media Processing > ICE > STUN/TURN Servers > Servers.
2. Select the servers you want to remove.
3. Click Delete.

Adding or modifying STUN and TURN accounts

Before you begin
You must enable the Firewall NAT Tunneling Media Processor before you configure STUN and TURN accounts.

Procedure
1. Navigate to EM > System Configuration > Media Processing > ICE > STUN/TURN Servers > Accounts.
2. Click Add... to add a new account or select an existing account to modify and click Edit...
3. For new accounts, enter an Alias.
4. Enter the User ID and Password for the account.
5. Click Save.

Deleting STUN and TURN accounts

Procedure
1. Navigate to EM > System Configuration > Media Processing > ICE > STUN/TURN Servers > Accounts.
2. Select the accounts you want to remove.
Media security configuration

Configure the media security policy to use for Session Description Protocol (SDP) negotiation.

The media security configuration provides the ability to secure media streams with cryptographic protection based on RFC 3711–The Secure Real-time Transport Protocol (SRTP). SRTP is a Real-time Transport Protocol (RTP) (RFC 3550) profile with symmetrical data encryption. SRTP provides the following security services: encryption, message integrity, and replay protection.

Secure Real-time Transport Control Protocol (SRTCP) provides same security services to RTCP as SRTP does to RTP. SRTP message authentication protects the RTCP fields that keep track of membership, provide feedback to RTP sends, or maintain packet sequence counters.

Selecting a media security policy

About this task

Perform the following procedure to enable and configure the desired media security policy:

Use the Definitions for Security Policy Options table as an aid for the procedure.

<table>
<thead>
<tr>
<th>Definitions for security policy options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Property</td>
</tr>
<tr>
<td>Security Policy</td>
</tr>
<tr>
<td>Best Effort</td>
</tr>
<tr>
<td>Security Disabled</td>
</tr>
<tr>
<td>Security Enforced</td>
</tr>
<tr>
<td>Best Effort Mode</td>
</tr>
<tr>
<td>Capability</td>
</tr>
<tr>
<td>Dual M-Line</td>
</tr>
</tbody>
</table>
### Definitions for security policy options

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>for each media type. This is the default.</td>
</tr>
<tr>
<td>CAPNEG Draft</td>
<td>The SDP is formatted according to a draft version of the Capability Negotiation standard. It does not use the Attribute Capability Attribute (acap=) to convey the crypto information.</td>
</tr>
</tbody>
</table>

### Procedure

1. Navigate to **EM > System Configuration > Media Processing > Media Security.**

2. On the **Media Security** page, in the **Security Policy** area, use the **Security Policy** list to select the required method.

3. In the **Best Effort Mode** list, select the required mode.

4. Click **Save**.

### Configuring crypto suites

**About this task**

Perform the following procedure to configure cryptographic suites to provide message privacy:

Use the Definitions for crypto suite options table as an aid for the following procedure.
Definitions for crypto suite options

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AES_CM_128_HMAC_SHA1_80</td>
<td>The SRTP Advanced Encryption Standard (AES) Counter Mode (CM) cipher is used with Hash Message Authentication Code -Secure Hash Algorithm (HMACSHA1) message authentication having an 80-bit authentication.</td>
</tr>
<tr>
<td>AES_CM_128_HMAC_SHA1_32</td>
<td>The SRTP AES Counter Mode cipher is used with HMAC-SHA1 message authentication having a 32-bit authentication.</td>
</tr>
<tr>
<td>Priority</td>
<td>The preference ranking for Crypto Suites. The default is a priority of 1. A priority of 1 is the highest priority and 9 the lowest.</td>
</tr>
<tr>
<td>SRTP Master Key Lifetime</td>
<td>The exponent of the number of packets between key renegotiations. The default is $2^{31}$ for Secure RTCP (SRTCP). The range is 1 to 31.</td>
</tr>
<tr>
<td>Key Derive Rate</td>
<td>A value that sets the rate at which new keys are derived. The default is 0. The range is 0 to 24.</td>
</tr>
<tr>
<td>Master Key Index Length</td>
<td>The number of bytes in the Master Key Index, which is transmitted with each packet, to identify which master key to use for decoding. The default is 0. The range is 0 to 4.</td>
</tr>
</tbody>
</table>

RFC4568 specifies the following session parameters for modifying the default behavior for SRTP and SRTCP streams:

- UNENCRYPTED_SRTCP
- UNENCRYPTED_SRTP
- UNAUTHENTICATED_SRTP

When one or more of the negotiated session parameters are received in an incoming offer, Avaya Aura® MS uses the offered parameter by including the same session parameter in the answer. Avaya Aura® MS uses the configured default behavior if the received offer does not include one or more of the negotiated session parameters.

Definitions for negotiated parameters

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enable SRTCP Encryption</td>
<td>Select to specify that SRTCP encryption is preferred. Clear to include the UNENCRYPTED_SRTCP session parameter in outgoing offers.</td>
</tr>
<tr>
<td>Enable SRTP Encryption</td>
<td>Select to specify that SRTP encryption is preferred. Clear to include the UNENCRYPTED_SRTP session parameter in outgoing offers.</td>
</tr>
<tr>
<td>Enable SRTP Authentication</td>
<td>Select to specify that SRTP authentication is preferred. Clear to include the UNAUTHENTICATED_SRTP session parameter in outgoing offers.</td>
</tr>
</tbody>
</table>
Procedure

1. Navigate to EM > System Configuration > Media Processing > Media Security.

2. On the Media Security page, in the Crypto Suites section, select the check boxes next to the crypto suites you want to configure.

3. For each selected crypto suite, in the Priority column, select a priority number.

4. In the SRTP Master Key Lifetime column, select the optional SRTP master key lifetime to include it in outgoing offers. Then, select a value for SRTP master key lifetime.

5. In the Key Derive Rate column, select a key derivation rate.

6. In the Master Key Index Length column, select a value for the master key index length.

7. Select or clear the SRTCP Encryption, SRTP Encryption, and SRTP Authentication columns as required.

8. Click Save.

Music streaming configuration

Avaya Aura® MS supports continuous streaming of pre-transcoded audio. The media server supports the following types of music providers for streaming audio:

- Real Simple Syndication (RSS) provider
- HTTP/MP3 provider
- HTTP Live Streaming (HLS) provider

The media server supports up to 64 music streams across all of the supported providers. Each provider implements a streaming protocol or playlist scheme for music playback. Provisioning a
stream on the media server requires that you configure a provider with details about the source of the music. Configuration examples include providing URLs to RSS or HLS streaming radio servers on the internet.

Applications access provisioned music streams in the same way that they access an announcement for playback. Applications use the case-insensitive Stream Key that you configure for the stream to identify the required music.

Avaya Aura® MS Element Manager has a page for monitoring the status of music streaming providers. EM displays statistics for each stream which include bandwidth and the codec being used. When song metadata is available, EM displays details about the current song being played, including the song title and artist name.

**Real Simple Syndication (RSS) provider**

An RSS provider can be used to centrally manage music streams that have music files hosted on a remote web server. The media server downloads an RSS document specified by a URL. The media server downloads each file specified in the RSS document to a local cache.

The media server uses the RSS title element in the document as the title for the files in the cache. The files are played in alphabetical order.

The RSS provider on the media server supports audio files in WAV and MP3 formats. Avaya recommends that audio to be played by Avaya Aura® MS be encoded in G.711 or 16 bit, 8 kHz, single channel, PCM files. Codecs other than PCM or using higher sampling rates for higher quality recordings can be used, however, with reduced system performance. Multiple channels, like stereo, are not supported.

The Time To Live (TTL) element in an RSS document specifies how many minutes an RSS channel can be cached on the media server before refreshing from the source. The minimum TTL value is 1 minute.

The GUID element in an RSS document uniquely identifies an RSS item. If an RSS item title, enclosure type, URL, or the associated file changes, then the GUID must be updated. If a GUID changes, then the media server refreshes the specified content.

The media server uses cached files to provide continuous streaming service when the RSS URL becomes unreachable. If you update or delete the RSS URL, then the files in the cache are deleted.

The RSS document must be formatted correctly. The maximum RSS document size is 256 KB. The following is an example of an RSS document with correct formatting:

```xml
<?xml version="1.0" encoding="UTF-8"?>
<rss version="2.0">
  <channel>
    <title>Relaxing Music</title>
    <description>Example RSS Music Playlist</description>
    <language>en-us</language>
    <ttl>15</ttl>
    <item>
      <title>Corporate Edge - A Clear Vision</title>
      <enclosure url="http://musicserver/Music/DavenportMusic-0.wav" type="audio/wav"/>
      <guid>35942909-51f1-11e5-b4f5-00fbb0699410</guid>
    </item>
  </channel>
</rss>
```
HTTP/MP3 provider

The HTTP/MP3 provider supports SHOUTcast ICY streams and HTTP/MP3.

Most streaming radio stations on the internet stream over HTTP/MP3. Many of the stations use the SHOUTcast ICY protocol. Typically, a SHOUTcast stream provides a playlist in a .pls or .m3u file. The .pls file is known as a Winamp playlist. Winamp playlist files have HTTP URL entries that reference audio streams.

In some cases the URLs inside the playlist can use nonstandard HTTP ports. You must configure the HTTP proxy on the media server when the HTTP/MP3 server returns documents containing URLs on HTTP ports that are not permitted through the firewall.

The HTTP/MP3 provider on the media server supports all bitrates as well as stereo and mono MP3 streams. When the specified radio station supports metadata, the media server accepts the song title and artist information as it is received in real-time. EM displays the current song title and artist on the monitoring page.

Avaya Aura® MS only supports MP3 SHOUTCast streams. AAC is not supported.

Avaya Aura® MS HTTP/MP3 provider automatically records 15 minutes of content. The recorded content provides a backup when the streaming server is unreachable. A common SHOUTcast radio station aggregator is Tunein Radio.

HTTP Live Streaming (HLS) provider
The HTTP Live Streaming (HLS) provider implements the client side of the Apple® HLS protocol. The HLS provider on the media server supports M3U8 files and nested M3U8 playlist files. The media server only supports AAC-LC and MP3 encoded streams with no encryption.

When #EXTINF headers are provided, the media server extracts the title and artist information. If an #EXT-X-ENDLIST header is provided, the media server enables a playback loop. The HLS provider supports live and variant playlists. The media server automatically loops non-live playlists.

In some cases the URLs inside the playlist can use nonstandard HTTP ports. You must configure the HTTP proxy on the media server when the HLS server returns documents containing URLs on HTTP ports that are not permitted through the firewall.

Avaya Aura® MS HLS provider automatically records 15 minutes of content. The recorded content provides a backup when the streaming server is unreachable.

Music stream transcoding

Each music stream is transcoded one time by Avaya Aura® MS. The transcoded stream is shared across all sessions using the same codec. The media server uses the G.722 codec to encode the audio. If additional codecs are required, for example, G.729 or OPUS NB, then additional transcode operations occur on demand.

The media server provides high levels of efficiency for RSS providers by caching transcoded versions of the files received from the stream. After a file is transcoded, little CPU is required to stream the music from the media server.

Streaming providers, like HTTP/MP3 and HLS, require additional CPU resources because the media server transcodes them in real-time.

Configuring an HTTP proxy for external music source access

About this task

Some external streaming servers stream music on nonstandard HTTP ports. When nonstandard ports are used, enterprise firewalls can block outgoing HTTP connections. Perform the following procedure to configure the address and port of an internal proxy server to allow access to external streaming servers. This proxy configuration applies to streaming that uses RSS, HLS, and ICY protocols over HTTP.

Procedure

1. Navigate to EM > System Configuration > Media Processing > Music > General Settings.
2. In the HTTP Proxy Host field, enter the FQDN or IP address of the internal proxy server that provides access to the required external music servers.
3. In the HTTP Proxy Port field, enter the required port number for the internal proxy server.
Adding a streaming music source

About this task

Perform the following procedure to add a streaming music source that uses RSS, HLS, or ICY protocols over HTTP

Before you begin

The music source you configure must meet the following requirement for each provider:

RSS requirements:

- The audio must be encoded in MPEG-1 Audio Layer 3 (MP3), MPEG-2 Audio Layer 3 (MP3) or WAV.
- The maximum RSS document size is 256 KB.

HTTP/MP3 SHOUTCast and ICY requirements:

- Mono and stereo are supported.
- The audio must be encoded in MPEG-1 Audio Layer 3 (MP3) or MPEG-2 Audio Layer 3 (MP3).
- Supported MPEG-1 sample rates: 32000, 44100, and 48000 Hz.
- Supported MPEG-2 sample rates: 22050, 24000, and 16000 Hz.
- Supported bit rates: 32, 64, 96, 128, 160, 192, 256 and 320 kbps.
- The AAC codec is not supported.
- Content type for playlists must be audio/x-scpls or audio/x-mpegurl.
- Content type for audio must specify audio/mpeg, audio/x-mpeg or application/octet-stream.
- The server can respond with ICY 200 OK or standard HTTP 200 OK responses.
- The ICY MetaData update mechanism is supported. Use of this update mechanism is optional.
- VLC and Icecast streaming sources are supported as long as the codec and content type used are also supported.
- HTTP Proxy is supported. Use of an HTTP proxy is required when the HTTP/MP3 server returns documents containing URLs on non-standard HTTP ports that are not permitted through the firewall.

HLS requirements:

- The audio must be encoded in MPEG-1 Audio Layer 3 (MP3), MPEG-2 Audio Layer 3 (MP3) or AAC-LC.
- Mono and stereo are supported. Stereo sources are mixed into mono.
- AAC sampling rates are supported in the 8 kHz to 96 kHz range.
- Supported MPEG-1 sample rates: 32000, 44100, and 48000 Hz.
• Supported MPEG-2 sample rates: 22050, 24000, and 16000 Hz.
• Supported bit rates: 32, 64, 96, 128, 160, 192, 256 and 320 kbps.
• M3U8 master playlist and nested media playlist files are supported. Playlist and media URLs can be made relative to the master playlist document.
• HTTP Proxy is supported. Use of an HTTP proxy is required when the HLS server returns documents containing URLs on non-standard HTTP ports that are not permitted through the firewall.
• Content types should be application/vnd.apple.mpegurl or audio/mpegurl and document extensions must be .m3u8 or .m3u
• HLS M3U8/M3U meta-data is supported:
  #extinf:<duration>, <author - title>
• The use of encryption is not supported.
• Servers which require authentication are not supported.
• Video is not supported.

Procedure

1. Navigate to EM > System Configuration > Media Processing > Music > Stream Provisioning.
2. Click Add...
3. In the Stream Type field, click the music source type.
4. In the Name field, enter a name for the new music source. The system uses this name as the stream key.
5. (Optional). To form a stream key in the form name@domain in the Domain field, enter a domain name.
6. In the Primary URL field, enter the address of the required music source.
7. (Optional) To provide an alternate music source, in the Backup URL field, enter the address of another music source.
   The system automatically switches to the backup music source when the primary source is unavailable.
8. To add the music source in the locked state so that system does not use the new music source, select the Locked check box.
9. Click Save.
10. The system displays the Stream Provisioning page. The color of the Stream Key indicates the connection status of the music source.

🌟 Note:

The Stream Provisioning page does not automatically update the status. Manually refresh the web page to update the status or see Monitoring music streams.
Next steps

Monitoring music streams on page 196.

---

Editing a streaming music source

About this task

Perform the following procedure to update the properties of a streaming music source.

Procedure

2. To indicate the music source to edit, select the corresponding check box.
3. Click Edit...
4. In the Stream Type field, click the music source type.
5. To change the stream key name, in the Name field, enter a name for the new music source.
6. (Optional) To change the domain part of the stream key, in the Domain field, enter a new domain name.
7. To change the primary music source, in the Primary URL field, enter the new address.
8. (Optional) To change the alternate music source, in the Backup URL field, enter the new address.
9. To change the availability of the music source, select or clear the Locked check box.
10. Click Save.
11. The system displays the Stream Provisioning page. The color of the Stream Key indicates the connection status of the music source.

   Note:

   The Stream Provisioning page does not automatically update the status. Manually refresh the web page to update the status or see Monitoring music streams.

Next steps

Monitoring music streams on page 196.

---

Deleting a streaming music source

About this task

Perform the following procedure to remove a configured music stream from Avaya Aura® MS.
**Note:**
A music source can be made temporarily unavailable by locking it.

**Procedure**
1. Navigate to **EM > System Configuration > Media Processing > Music > Stream Provisioning**.
2. To indicate which music sources to delete, on or more corresponding check boxes.
3. To delete the selected music sources, click **Delete**.

**Related links**
locking and unlocking a streaming music source on page 129

---

**Locking and unlocking a streaming music source**

Music streams do not have to be deleted to prevent them from being used. You can prevent applications from using a music stream by locking the music stream. Unlocking a locked music stream makes the music stream available for application use.

**Procedure**
1. Navigate to **EM > System Configuration > Media Processing > Music > Stream Provisioning**.
2. To indicate which music sources to lock or unlock, select one or more corresponding check boxes.
3. To change the state of the streaming music source, click the **More Actions...** drop-down menu and click **Lock** or **Unlock**.

---

**Security configuration**

Avaya Aura® MS includes default certificates that are useful for demonstration purposes. To ensure production systems are not compromised, you must replace the default certificates with unique, trusted certificates. Options for certificate replacement are:

- Certificates signed by a trusted party Certificate Authority (CA).
- Certificates signed and created by you using an authoritative certificate, including root certificates generated by Avaya Aura® System Manager.

Use the following table as an aid for the security configuration procedures in this section:

<table>
<thead>
<tr>
<th>Definitions for default service profiles</th>
</tr>
</thead>
<tbody>
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<td>Service profile name</td>
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*Table continues…*
### Definitions for default service profiles

<table>
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<th>Service</th>
<th>Description</th>
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</thead>
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<td>SIP and MRCPv2 connections with Avaya Aura® MS.</td>
</tr>
</tbody>
</table>

### Configuring the System Manager settings

**Procedure**

1. Navigate to EM > Security > System Manager > Advanced Settings.
2. Enter the address of System Manager in the **Fully qualified domain name (FQDN) of System Manager server** field.
3. Enter the port used by System Manager in the **System Manager server port** field.
4. Enter the user name to be used for System Manager role-based registration and navigation in the **System Manager registration username** field.
5. Enter the password to be used for System Manager role-based registration and navigation in the **System Manager registration password** field.
6. Click **Save**.

### Creating a new certificate signed by System Manager in the key store

**Procedure**

2. In the **Key Certificates** section, click **Create New...**
3. Set the **Signing authority** field to **System Manager**.
4. Set the remaining fields as required for your system.
5. Click **Save**.
Creating a new certificate to be signed by other Certificate Authorities in the key store

Procedure

2. In the Key Certificates section, click Create New...
3. Set the Signing authority field to Other Certificate Authorities.
4. Set the remaining fields as required for your system.
5. Click Save.
   The system displays a File Save dialog window and prompts you to save the file.
6. Select a location for the file and then save the file.

Creating a new self-signed certificate in the key store

Procedure

2. In the Key Certificates section, click Create New...
3. Set the Signing authority field to Self-Signed.
4. Set the remaining fields as required for your system.
5. Click Save.

Processing a Certificate Signing Request Response in the key store

About this task
Perform the following procedure only for a certificate that is in pending state:

Procedure

2. Select the required certificate in the Key Certificates section.
3. Click Process Certificate Signing Request...
4. Click Browse… and select the file of the Certificate Signing Request response.
5. Click Process Signed Certificate.
Assigning a certificate to a service profile

Procedure
2. In the Service Profiles section, Click Assign…
3. Set the Certificate field for each profile by using the drop-down list of certificates.
4. Click Save.

Importing a key certificate to the key store

Procedure
2. In the Key Certificates section, Click Import…
3. Enter the password or private key for the import in the Password for certificate import field.
   The password is the same as the one used during the export.
4. Click Browse... and select the key certificate file to import.
   The key certificate file must be in PKCS12 or PEM format and each included certificate must have a private key.
5. To import the certificate, click Save.

Exporting a key store certificate in PEM format

About this task
Perform the following procedure to export a key certificate in PEM format that contains only the public certificate. Certificates exported using the PEM format cannot be reimported to Avaya Aura® MS because they do not contain a private key.

Procedure
2. Select the required certificate in the Key Certificates section.
3. Click Export...
4. Select Export in PEM Format for the Type field.
5. Click Export.
   The system displays a File Save dialog window and prompts you to save the file.
6. Select a location for the file and then save the file.

---

**Exporting a key store certificate with a key**

**About this task**

Perform the following procedure to export a key certificate in PKCS12 format that contains both the public certificate and the private key. Certificates exported using the PKCS12 format can be reimported to Avaya Aura® MS because they contain a private key.

**Procedure**

2. Select the required certificate in the Key Certificates section.
3. Click Export…
4. Select Export with Key for the Type field.
5. Enter a key in the Password for certificate export field.
6. Click Export.

   The system displays the File Save dialog window and prompts you to save the file.
7. Select a location for the file and then save the file.

---

**Importing a trust certificate to the trust store**

**Procedure**

2. Click Import... on the Trust Store page.
3. Click Browse… and select a file.

   **Note:**

   The trust certificate must be in PEM format.

4. Click Upload.

   The system displays the certificates.
5. Verify the certificate information.
6. Enter a name in the Trust friendly name field for each certificate.
7. Click Save.
8. To restart the media server and apply the changes, click Confirm. To restart later, click Cancel.
Importing a Trust Certification Revocation List

Procedure
2. Select a Certificate Authority from the list.
3. Click Import CRL... on the Trust Store page.
4. Click Browse… and select a file to set the Trust certification revocation list import file field.
5. Click Save.

Downloading Certification Revocation List

Before you begin
• Ensure that the CRL distribution point is available in the trust certificate.
• If the CRL distribution point uses HTTPS, ensure that the mutual authentication is set up between Avaya Aura® MS and the server hosting the CRL.
• The CRL you want to download must be in DER format.

Procedure
2. Select a Certificate Authority from the list.
3. Click Download CRL... on the Trust Store page.
   The system displays a File Save dialog window and prompts you to save the file.
4. Select a location for the file and then save the file.

Deleting Certificate Authorities from the trust store

Procedure
2. Select a Certificate Authority from the list.
3. Click Delete on the Trust Store page.
4. Click Save.
5. To restart the media server and apply the changes, click Confirm. To restart later, click Cancel.
Content Store configuration

Configuring Content Store location

The Content Store component of Avaya Aura® MS stores media and other files for hosted applications on a disk. Avaya Aura® MS also uses the disk for SDR storage, persistent database store, and file manipulation that is unrelated to Content Store file management. As a result of the many requirements Avaya Aura® MS has for the system disk, disk performance can be an issue for some applications.

The default installation places content storage in a directory within the main Avaya Aura® MS installation path. To improve the capacity and performance of the system, configure a dedicated disk for Content Store. Content Store uses this dedicated disk for applications that have large media file storage requirements.

Note:
Changing the Content Store location is a commissioning task for new systems. If you change the Content Store location later, files remain in the original location. You can remove these files manually. After the new location is configured, files stored in Content Store prior to changing the Content Store location are not included. Restore the files from a backup file if you want to include them in the new location.

About this task
Perform the following procedure to configure a dedicated disk for use by Content Store for applications that have large media file storage requirements:

Before you begin
When you use this procedure, the system removes the current content saved in Content Store and creates a new, empty Content Store. Ensure you back up the application data before you reconfigure the storage location.

You can restore the data from a backup file after the configuration is complete if you need to preserve the data. The system restores data to the configured Content Store location.

Procedure

1. Navigate to EM > System Configuration > Content Store > General Settings.
2. In the File system location for content storage field, enter the full pathname, starting from the file system root, to specify the disk that the system should use for Content Store.
   For example, enter F:/MediaFiles for Windows®, or /mediafiles for Linux®.
   Restore the default value or clear the File system location for content storage field to use the default location within the installation path.
3. Click Save.
4. Click Confirm.
5. Perform the following steps to restart Avaya Aura® MS for the changes to take effect.
   a. Navigate to EM > System Status > Element Status and click Restart.
   b. Click Confirm.

---

**EM preferences configuration**

---

**Configuring time zone preferences**

**About this task**

Perform the following procedure to configure EM to display all times and dates using either the time zone of the local server or the Greenwich Mean Time (GMT) time zone:

Avaya Aura® MS defaults to using the local time.

**Procedure**

1. Navigate to EM > System Configuration > Element Manager Settings > General Settings.
2. To configure EM to use Greenwich Mean Time for displayed times, ensure Display times using GMT is selected.
3. Click Save.

---

**Setting Login security warning text**

**About this task**

Perform the following procedure to add custom security warnings which are displayed when a user logs into EM:

**Procedure**

2. Enter the security warning text in the Security warning message on login field.
3. Click Save.
Chapter 6: System Manager enrollment

Avaya Aura® System Manager enrollment overview

Some Avaya solutions which adopt Avaya Aura® MS use Avaya Aura® System Manager to provide an integrated point of management. This chapter shows you how to use Avaya Aura® MS Element Manager (EM) to enroll media servers in System Manager. See adopting product documentation to determine if System Manager enrollment applies to your installation.

When a media server cluster is enrolled with System Manager, you must use System Manager to associate required applications to each enrolled cluster. See System Manager and adopting product documentation for detailed procedures.

Media server enrollment in System Manager assigns a System Manager-signed certificate to the media server OAM and EM service profiles. The enrollment process also assigns System Manager as the media server authentication and authorization source. These assignments enable Avaya Aura® MS to use single sign-on (SSO) and role-based access control (RBAC) services which are managed by System Manager. After enrollment administrators access the media server EM using System Manager administrative accounts which have permission to use EM.

When a media server is disenrolled from System Manager, the system assigns the authentication and authorization source to Operating System. Administrators must use the operating system administrative accounts to gain access to Avaya Aura® MS EM.

When you enroll a media server in System Manager, the system restarts the SOAP and EM services to apply the changes. When you disenroll a media server from System Manager, the system restarts the EM service to apply the changes. Users must close their current EM browser window or tab and can sign in again after the EM restart completes.

Enrolling a cluster in System Manager

About this task

Perform the following procedure to enroll an existing media server cluster in System Manager.

Before you begin

- Ensure that a media server cluster is already configured.
- Ensure that you have the following Avaya Aura® System Manager information available:
  - Fully Qualified Domain Name (FQDN) of the System Manager server.
- System Manager HTTPS server port. The default port is 443.
- System Manager administrative account username and password. The specified user account must be a member of the System Administrator groups.
- Enrollment password for System Manager Trust Management.

- Ensure that there is network access between the media server and System Manager.
- Ensure that the FQDN of each media server in the cluster can be resolved by DNS or the local hosts file.
- Ensure that the FQDN of System Manager can be resolved by DNS or the local hosts file.

Procedure

1. For the Primary node of the media server cluster, navigate to EM > Security > System Manager > Enrollment.
   EM displays a page describing the enrollment process.
2. Click Begin Enrollment.
   EM displays step one of the enrollment process.
3. In the Cluster section, type the Administrative name and Administrative description for the media server cluster.
   Administrative name is a name of your choice that helps you easily identify this cluster. This value must be unique among all media servers enrolled with System Manager. After enrollment, this value can only be updated using System Manager.
   Administrative description is a definition of your choice that helps you easily describe this cluster. After enrollment, this value can only be updated using System Manager.
4. In the Servers section, type the Element Administrative Name and Element Administrative Description for each server.
   Element Administrative Name is a name of your choice that helps you easily identify this server. This value must be unique among all media servers enrolled with System Manager. This value cannot be updated after enrollment.
   Element Administrative Description is a definition of your choice that helps you easily describe this server. This value cannot be updated after enrollment.
5. Click Next.
   EM displays step two of the enrollment process.
6. In the Server Configuration section, provide the FQDN and port for System Manager. The Secondary System Manager configuration fields are optional. The default System Manager port is 443.
7. In the Administrative Account section, provide the System Manager administrative account credentials required to register the media server.
8. In the Trust Management section, provide the System Manager trust management enrollment password. This is the enrollment password that the media server must use to acquire a System Manager-signed certificate from System Manager Trust Management.
See Administering Avaya Aura® System Manager or the System Manager web console help for additional details about this password and when it expires.

9. Click Next.

EM displays step three of the enrollment process.

**Note:**

If EM cannot validate System Manager server certificates with the media server trust store, then EM displays the certificates received from System Manager. Click **Acknowledge** to proceed with enrollment or **Decline** to end the enrollment process.

10. Configure the certificate fields to create a System Manager-signed certificate as follows:

   • Select the strength of the certificate key. Avaya recommends using strong security by selecting a **Key bit length of 2048** or higher, and a **Signature algorithm** of SHA256 or higher.

   • Type the name of the organization using the certificate in the **Organization** and **Organization Unit** fields.

   • Type an ISO-3166 country code for the **Country** field.

   • Type the full name of the state or province in the **State/Province** field.

   • Type the location name in the **City/Locality** field.

11. Click Next.

EM displays the final step of the enrollment process.

12. Verify the System Manager enrollment information. Click **Previous** if any information needs to be changed.

13. Click **Enroll**.

EM displays a progress spinner during the enrollment process. After the enrollment completes, the system restarts the media server SOAP service and EM.

14. Close the EM browser window or tab.

You can sign in again after the EM restart completes.

---

**Disenrolling a cluster from System Manager**

**About this task**

When a media server is disenrolled and removed from System Manager, the system assigns the media server authentication and authorization source to Operating System.

Perform the following procedure to disenroll and remove a media server cluster from System Manager.
Before you begin
Ensure that the media server cluster that you want to disenroll is currently enrolled in System Manager.

Procedure
1. For the Primary node of the media server cluster, navigate to EM > Security > System Manager > Enrollment.
   EM displays a page describing the disenrollment process.
2. Click Disenroll.
   EM displays a progress spinner during the disenrollment process. After the disenrollment completes, the system restarts EM.
3. Close the EM browser window or tab.
   You can sign in again after the EM restart completes.

Adding a media server to an enrolled cluster

About this task
Perform the following procedure to add a media server to a cluster which is already enrolled in System Manager.

Before you begin
• Ensure that the media server is configured as part of an enrolled cluster.
• Ensure that you have the password for System Manager Trust Management.
• Ensure that there is network access between the media server and System Manager.
• Ensure that the FQDN of the media server can be resolved by DNS or the local hosts file.

Procedure
1. For the media server that you want to add to the cluster, navigate to EM > Cluster Configuration > Server Designation.
2. Set the server Role as required and then configure the Primary Server and the Replication Account information.
3. Click Save.
4. Click Confirm.
5. Navigate to EM > System Status > Element Status and click Restart for the changes to take effect.
7. Click Begin Enrollment.
   EM displays step one of the enrollment process.
8. Type a name of your choice that helps you easily identify this server in the **Element Administrative Name** field. This value must be unique among all media servers enrolled with System Manager. This value cannot be updated after enrollment.

9. Type a definition of your choice that describes this server in the **Element Administrative Description** field. This value cannot be updated after enrollment.

10. Click **Next**.

     EM displays step two of the enrollment process.

11. In the **Server Configuration** section, provide the FQDN and port for System Manager. The Secondary System Manager configuration fields are optional. The default System Manager port is 443.

12. In the **Administrative Account** section, provide the System Manager administrative account credentials required to register the media server.

13. In the **Trust Management** section, provide the System Manager trust management enrollment password. This is the enrollment password that the media server must use to acquire a System Manager-signed certificate from System Manager Trust Management.

    See *Administering Avaya Aura® System Manager* or the System Manager web console help for additional details about this password and when it expires.

    To verify access to System Manager for enrollment.

14. Click **Test Connection**.

    If the connection test is successful then the **Next** button activates.

    If the connection test fails, resolve the problem reported in the error message and then test the connection again.

    **Note:**

    The System Manager Trust Management enrollment password is not validated by the connection test.

15. Click **Next**.

     EM displays step three of the enrollment process.

16. Configure the certificate fields to create a System Manager-signed certificate as follows:

    - Select the strength of the certificate key. Avaya recommends using strong security by selecting a **Key bit length of 2048** or higher, and a **Signature algorithm** of SHA256 or higher.
    - Type the name of the organization using the certificate in the **Organization** and **Organization Unit** fields.
    - Type an ISO-3166 country code for the **Country field**.
    - Type the full name of the state or province in the **State/Province** field.
    - Type the location name in the **City/Locality** field.
17. Click **Next**.
   EM displays the final step of the enrollment process.

18. Verify the System Manager enrollment information. Click **Previous** if any information needs to be changed.

19. Click **Enroll**.
   EM displays a progress spinner during the enrollment process. After the enrollment completes, the system restarts the media server SOAP service and EM.

20. Close the EM browser window or tab.
   You can sign in again after the EM restart completes.

---

**Removing a media server from an enrolled cluster**

**About this task**
When a media server is disenrolled and removed from System Manager, the system assigns the media server authentication and authorization source to Operating System.

Perform the following procedure to disenroll and remove a media server from a cluster that is enrolled in System Manager.

**Before you begin**
Ensure that the media server that you want to disenroll is currently enrolled in System Manager.

**Procedure**

1. For the media server that you want to remove from the cluster, navigate to **EM > Cluster Configuration > Server Designation**.
   EM displays a page describing the disenrollment process.

2. Set the local server **Role** to Primary.

3. Remove all entries from the **Server Designation** table by selecting each entry and clicking **Remove**.

4. Click **Save**.

5. Click **Confirm**.
   The system removes the media server from the cluster. When the disenrollment completes, the system restarts EM.

6. Close the EM browser window or tab.
   You can sign in again after the EM restart completes.

7. Navigate to **EM > System Status > Element Status** and click **Restart** for the server role changes to take effect.
Assigning applications to enrolled media server clusters

After you enroll Avaya Aura® MS cluster with System Manager, you must use System Manager to associate required applications to each enrolled cluster. This step is necessary to enable the required application services.

See System Manager and adopting product documentation for detailed procedures. You can also see the Avaya Aura® Media Server Help book, which is available in the System Manager web console help.
Chapter 7: Media file provisioning

Media file format
Avaya recommends that audio to be played by Avaya Aura® MS be encoded as 16 bit, 8 kHz, single channel, PCM files. Codecs other than PCM or using higher sampling rates for higher quality recordings can be used, however, with reduced system performance. Multiple channels, like stereo, are not supported.

Media storage in Avaya Aura® MS Content Store
The Content Store component of Avaya Aura® Media Server (MS) stores media and other files for hosted applications. Content Store provides a reliable, highly available, and persistent storage capability for Avaya Aura® MS. Any application with storage needs that align with the functionality of Content Store can use Content Store. However, not all applications must use the Content Store.

Content Store has an organized storage space consisting of Namespaces that include Content Groups which contain the actual content. Namespaces are the top level containers, under which Content Group containers exist. Namespaces and Content Groups can be considered analogous to folders. Actual content is stored by Content ID within each Content Group. A Content ID is analogous to a filename.

The following example shows the structure of Content Store:

```
Namespace_I
  ContentGroup_A
  Content ID1
  Content ID2
  ContentGroup_B
  Content ID1
  Content ID2
Namespace_II
  ContentGroup_A
  Content ID1
  Content ID2
```

To provide high capacity and high availability, Content Store is scaled automatically with the cluster. Content Stores are automatically enabled on each media server in a cluster. The application content in the Content Stores of a cluster is synchronized automatically.

There is a master Content Store configured on both the Primary and Secondary servers of a load sharing cluster or on the Primary and Backup servers of a High Availability cluster. The dual master
Content Store configuration provides full hardware and functionally redundancy. Standard cluster
nodes provide Content Stores which contain synchronized content for local access.

Content Stores communicate with each other when handling requests. A connection to any one
Content Store in a cluster is sufficient for any client application. Data integrity and synchronization in
a cluster are handled automatically by the Content Store peers. However, it is more efficient to
provision new media files directly to one of the master Content Stores. When a content modification
request is received at Standard node Content Store, it is first forwarded to one of the master
Content Stores in the cluster for processing.

For examples of content organization and additional information on Content Store functionality, see
Using Content Store in Using Web Services on Avaya Aura® Media Server 7.7.

---

### Overview of the EM Media Management tool

Element Manager (EM) provides a Media Management tool which is used to upload and manage
media files in Content Store. Using the Media Management tool, you can perform the operations
described in the following table to manage media files stored in Content Store.

<table>
<thead>
<tr>
<th>Scope</th>
<th>Operation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Namespace</td>
<td>Add</td>
<td>Create a new namespace.</td>
</tr>
<tr>
<td></td>
<td>Browse</td>
<td>View the content of a namespace.</td>
</tr>
<tr>
<td></td>
<td>Rename</td>
<td>Give a new name to a namespace.</td>
</tr>
<tr>
<td></td>
<td>Delete</td>
<td>Remove a namespace and its content.</td>
</tr>
<tr>
<td>Content Group</td>
<td>Add Content Group</td>
<td>Create new content groups under a namespace or another content group.</td>
</tr>
<tr>
<td></td>
<td>Add Media</td>
<td>Upload media files to a content group.</td>
</tr>
<tr>
<td></td>
<td>Delete</td>
<td>Remove the content group and its files.</td>
</tr>
<tr>
<td></td>
<td>Rename</td>
<td>Give a new name to a content group.</td>
</tr>
<tr>
<td></td>
<td>Batch File Provision</td>
<td>Upload multiple files contained in a zip archive file.</td>
</tr>
<tr>
<td>Content</td>
<td>Cut</td>
<td>Use Cut and paste together to move a media content file from one content group to another.</td>
</tr>
</tbody>
</table>

*Table continues…*
Media management operations

<table>
<thead>
<tr>
<th>Scope</th>
<th>Operation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copy</td>
<td>Use Copy and Paste together to duplicate an existing content file.</td>
<td></td>
</tr>
<tr>
<td>Paste</td>
<td>Use with Copy and Cut to move and duplicate media files.</td>
<td></td>
</tr>
<tr>
<td>Rename</td>
<td>Give a new name to a media file.</td>
<td></td>
</tr>
<tr>
<td>Download</td>
<td>Download a media file to the local computer running the browser that you use to gain access to the EM.</td>
<td></td>
</tr>
</tbody>
</table>

**Note:**
Do not alter the default system namespaces.

**Important:**
Do not use the file system to manually access or change the media files managed by Content Store. Use appropriate interfaces such as the EM Media Management tool to make any changes.

The following procedures show you how to use each of these operations to organize and manage your media on Avaya Aura® MS.

---

**Media Provisioning**

**Adding a content namespace**

**About this task**
Perform the following procedure to add a content namespace to contain a group of related media files:

**Procedure**

1. Navigate to **EM > Tools > Media Management.**
2. On the **Media Management** page, click **Add…**
3. On the **Add Content Namespace** page, type a unique name for the new namespace in the **Name** field.
   The name cannot begin with the at (@) symbol, must be less than 128 characters, must not be case-sensitive, must not contain spaces, or any of the following symbols:

```c
{}
```


4. Click **Save**.

---

**Renaming a content namespace**

**About this task**

Perform the following procedure to rename a content namespace to describe what a namespace contains:

**Procedure**

1. Navigate to **EM > Tools > Media Management**.
2. On the **Media Management** page, select the check box next to the namespace you want to rename.
3. Click **Rename**.
4. On the **Rename Content Namespace** page, type a unique name for the new namespace in the **Name** field.
   The name cannot begin with the at (@) symbol, must be less than 128 characters, is not case-sensitive, and must not contain spaces or any of the following symbols:
   ```
   {} * 
   ```
5. Click **Save**.

---

**Deleting a content namespace**

**About this task**

Perform the following procedure to remove a content namespace from the system:

**Procedure**

1. Navigate to **EM > Tools > Media Management**.
2. On the **Media Management** page, select the check box next to the namespace you want to delete.
3. Click **Delete**.
4. In the **Delete Content Namespace** dialog box, click **Confirm**.

---

**Viewing namespace content**

**About this task**

Perform the following procedure to select a content namespace that you want to manage or browse:
Procedure
1. Navigate to EM > Tools > Media Management.
2. On the Media Management page, select the check box next to the namespace that you want to manage or browse.
3. Click Browse.
4. From the left pane in the Provision Media page, select the namespace.
   Navigate the namespace using the plus sign (+) and minus sign (-) to expand and hide the content.

Adding a content group

About this task
Perform the following procedure to add content groups and to organize the media in a content namespace into logical groups:

Before you begin
Ensure that you have an existing namespace on the system.

Procedure
1. Navigate to EM > Tools > Media Management.
2. On the Media Management page, select the check box next to the namespace in which you want to add a new content group.
3. Click Browse.
4. On the Provision Media page, in the left pane, select the name of the content namespace in which you want to add a new content group.
   If applicable, navigate to a content group and click the content group to which you want to add the subcontent group.
5. Click Add Content Group.
6. In the Name field of the New Content Group dialog box, type a name for the new content group.
   
   Important:
   The name cannot begin with the at (@) symbol, must be less than 128 characters, must not be case-sensitive, and must not contain spaces or any of the following symbols:

   `{}\'`
Tip:
You can use the forward slash (/) delimiter to specify sub-content groups in the tree structure. For example, typing music/rock in the Name field creates a music content group, with a sub-content group called rock, all in one step.

7. Click Save.

Adding media files to a content group

About this task
Perform the following procedure to add media files to a content group, by uploading one media file at a time:

Note:
Many browsers have a 2GB limit for file uploads.

Note:
Avaya recommends that audio to be played by Avaya Aura® MS be encoded as 16 bit, 8 kHz, single channel, PCM files. Codecs other than PCM or using higher sampling rates for higher quality recordings can be used, however, with reduced system performance. Multiple channels, like stereo, are not supported.

Before you begin
Ensure that you have an existing namespace and content group on the system.

Ensure that the file to be uploaded is on the same system that is running the web browser you are using to navigate EM.

Procedure
1. Using a browser on the same computer where your file resides, navigate to EM > Tools > Media Management.
2. On the Media Management page, select the check box next to the namespace to which you want to add a media file.
3. Click Browse.
4. On the Provision Media page, select the content group to which you want to add a media file.
5. Click Add Media.
6. In the Add Media dialog box, click Browse and navigate to the media file you want to upload.
7. Select Always overwrite files with the same name or Do not overwrite files with the same name.
8. To remove the extension from the filename, select Cut extension.
The system keeps the actual file extension. The **Cut extension** option removes the extension from the content ID display name.

9. To use a different name for the media file that is uploaded, enter a new name in the **New Name** field.

10. Click **Upload**.

---

### Downloading media files to your computer

**About this task**

Perform the following procedure to download a media file stored on the media server to your computer:

**Procedure**

1. Using a browser on the computer where you want to download the file to, navigate to EM > **Tools** > **Media Management**.
2. On the **Media Management** page, select the check box next to the namespace that contains the media file you want to download.
3. Click **Browse**.
4. On the **Provision Media** page, select the content group that contains the media file you want to download.
5. In the **Name** column in the right pane, select the media file you want to download.
6. Right-click the file, and select **Download**, or use the **More Actions** drop-down menu, and select **Download**.
7. In the **Download Media** dialog box, click **Download**.
   The system displays a pop-up window.
8. Click **Save**.
   The procedure to save the file varies depending on the Web browser you use.

---

### Renaming a content group

**About this task**

Perform the following procedure to rename a content group:

**Procedure**

1. Navigate to EM > **Tools** > **Media Management**.
2. On the **Media Management** page, select the check box next to the namespace that contains the content group you want to rename.
3. Click Browse.
4. On the Provision Media page in the left pane, click the plus sign (+) next to the namespace.
5. Select the content group that you want to rename.
6. Right-click the content group and select Rename or use the More Actions drop-down menu, and select Rename.
7. In the New Name field of the Rename Content Group dialog box, type a name for the new content group.

**Important:**
The name cannot begin with the at (@) symbol, must be less than 128 characters, must not be case-sensitive, and must not contain spaces or any of the following symbols:

\[ \{ \} ' * \\]
8. Click Save.

---

### Deleting a content group

**About this task**
Perform the following procedure to remove a content group from the system:

**Procedure**
1. Navigate to EM > Tools > Media Management.
2. On the Media Management page, select the check box next to the namespace that contains the content group you want to delete.
3. Click Browse.
4. On the Provision Media page, in the left pane, click the plus sign (+) next to the namespace containing the content group you want to delete.
5. Select the content group that you want to delete.
6. Click Delete or right-click the content group, and select Delete.
7. In the Confirm Content Group Delete dialog box, click Confirm.

---

### Batch provision media

Perform the following procedures to batch provision media for a content namespace by using a zip file that you create and upload.

**Related links**
- Creating the zip file on page 152
- Uploading media archived in a zip file on page 153
Creating the zip file

About this task
Perform the following procedure to create a proper file structure on your local system for the zipped files:

⚠️ Important:
When you create the zip file, remember the following naming conventions:

- The namespace and content group names cannot begin with the at (@) symbol, must be less than 128 characters, must not be case-sensitive, and must not contain spaces or any of the following symbols: { } * 
- The media file names must be less than 128 characters, are case-sensitive, and must not contain any of the following symbols: { } ' * 

🌟 Note:
Many browsers have a 2GB limit for file uploads.

🌟 Note:
Avaya recommends that audio to be played by Avaya Aura® MS be encoded as 16 bit, 8 kHz, single channel, PCM files. Codecs other than PCM or using higher sampling rates for higher quality recordings can be used, however, with reduced system performance. Multiple channels, like stereo, are not supported.

Before you begin
Ensure that you have already created a namespace to contain the new media files, and know the name of that namespace.

Procedure
1. Select a target namespace already configured on Avaya Aura® MS, for example, MyNamespace.
2. Create a directory on your system with the same name as the target content namespace name.
   The directory that you create is the root directory for your zip archive.
3. Create subdirectories in the namespace directory.
   Subdirectories represent the content groups that the system creates in the target namespace. The file structure in the uploaded zip file must match the namespace and content group structure that you want on Avaya Aura® MS.
   If the structure is not as described in the example, the upload fails.
   For example, to upload media zip files to a namespace called MyNameSpace with a content group called MyContentGroup, the zip file structure must be as follows:
   ```
   MyNameSpace\MyContentGroup\MyMediaFile1.wav
   MyNameSpace\MyContentGroup\MyMediaFile2.wav
   MyNameSpace\MyContentGroup\MyMediaFileX.wav
   ```
4. Follow the instructions of the zip archiving tool to zip up the entire MyNameSpace directory.
Uploading media archived in a zip file

About this task
Perform the following procedure to batch provision media files on Avaya Aura® MS by using a zip archive.

Before you begin
Ensure that you have a properly constructed zip file that contains the media files to be uploaded.

Procedure
1. Using a browser on the same computer where your zip file resides, navigate to EM > Tools > Media Management.
2. On the Media Management page, select the check box next to the namespace to which you want to add media files.
3. Click Browse.
4. On the Provision Media page, right-click the content namespace and select Batch File Provision. Alternatively, you can select Batch File Provision on the More Actions dropdown menu.
5. In the Batch File Provision dialog box, click Browse to navigate to the zip file to upload.
6. Select Always overwrite files with the same name or Do not overwrite files with the same name.
7. To remove the extension from the filenames, select Cut extension.
8. Click Upload.
9. Verify that the media is uploaded by browsing the namespace and content groups with the Media Management tool.

Searching for a media file

About this task
Perform the following procedure to search for a stored media file on the system:

Procedure
1. Navigate to EM > Tools > Media Management.
2. On the Media Management page, select the check box next to the namespace that you want to search.
3. Click Browse.
4. On the Provision Media page, click Search in the upper-right corner.
5. In the File Name field, type the full or partial name of the content that you want to find.
6. In the **Search In Content Group** list, select the name of the content group in which you want to search for media files.

7. Click **Search**.

   The system displays matching results.

8. To perform media file operations, select the content and right-click to select the required operation. You can also use the **More Actions** drop-down menu and select the required operation.

---

**Renaming a media file**

**About this task**

Perform the following procedure to rename a media file:

**Procedure**

1. Navigation to **EM > Tools > Media Management**.

2. On the **Media Management** page, select the check box next to the namespace that contains the content to be renamed.

3. Click **Browse**.

4. To locate the content to be removed, use the left pane of the **Provision Media** page to navigate the namespace and content groups.

   Use the plus sign (+) and the minus sign (−) to expand and hide the content as needed.

   Alternatively, you can click **Search** in the upper-right corner of the page.

5. After you locate the file on the page, right-click the content name, and select **Rename**. You can also use the **More Actions** drop-down menu and select **Rename**.

6. In the **Rename Media** dialog box, type a new name for the file in the **New Name** field.

   + **Tip:**

   The name must be less than 128 characters, is case-sensitive and must not contain any of the following symbols: { } * \

7. Click **Save**.

---

**Moving a media file**

**About this task**

Perform the following procedure to move a media file to another content group:

**Procedure**

1. Navigate to **EM > Tools > Media Management**.
2. On the Media Management page, select the check box next to the namespace that contains the content to be moved.

3. Click Browse.

4. To locate the content to be moved, use the left pane of the Provision Media page to navigate the namespace and content groups.

   Use the plus sign (+) and the minus sign (-) to expand and hide the content as needed.

5. After you locate the file you want to move, right-click the content name and select Cut. You can also use the More Actions drop-down menu and select Cut.

6. In the left pane, navigate to the new content group.

7. Right-click on the new content group and select Paste from the menu or use the More Actions drop-down menu and select Paste.

---

**Copying a media file**

**About this task**

You can duplicate media content within the same content group or duplicate the media content to a different content group. The system creates the copy with the name Copy of filename. You must give the file an appropriate name using the rename procedure.

**Procedure**

1. Navigate to EM > Tools > Media Management.

2. On the Media Management page, select the check box next to the namespace that contains the content to be copied.

3. Click Browse.

4. In the left pane of the Provision Media page, navigate the namespace and content groups to locate the content to be copied.

   Use the plus sign (+) and the minus sign (-) to expand and hide the content as needed.

5. After you locate the file to be copied, right-click the content name and select Copy or use the More Actions drop-down menu and select Copy.

6. In the left pane, navigate to the content group where you want to copy the media file.

7. Right-click on the content group and select Paste from the menu or use the More Actions drop-down menu and select Paste.

8. To rename the copied file, right-click the new copy of the file with Copy of filename format and select Rename from the menu. You can also use the More Actions drop-down menu and select Rename.
Deleting a media file

About this task

Perform the following procedure to remove a media file from the system:

Procedure

1. Navigate to EM > Tools > Media Management.

2. On the Media Management page, select the check box next to the namespace that contains the media file you want to delete.

3. Click Browse.

4. To locate the content that is to be removed, in the left pane of the Provision Media page, navigate the namespace and content groups.

   Use the plus sign (+) and the minus sign (-) to expand and hide the content. Alternatively you can click Search in the upper-right corner.

5. Select the content item that you want to remove and click Delete or right-click on the content item and select Delete.

6. In the Confirm Media Delete dialog box, click Confirm.
Chapter 8: Application management

Enabling the VoiceXML interpreter

About this task
By default, the VoiceXML application interpreter is disabled on Avaya Aura® Media Server (MS).
Perform the following procedure to enable the VoiceXML interpreter.

Procedure
2. Select VoiceXML Interpreter.
3. Click Save.

Adding VoiceXML custom applications

About this task
In addition to packaged applications, you can define custom VoiceXML applications on Avaya Aura® MS.
Perform the following procedure to add a custom application and the SIP translations for the custom application:

Before you begin
Ensure that you have enabled the VoiceXML interpreter.

Procedure
1. Navigate to EM > Applications > Custom Applications.
2. Click Add...
3. Select URL for the Application Type.
4. Enter a name for your application in the Application Name field.
5. In the URL field, specify the URL which each incoming call fetches.
6. Select the Initial Interpreter Type as VoiceXML.
7. (Optional) Select **Add SIP Translation** to specify the SIP translation **Mode**, **Algorithm**, **Pattern**, and **Rank** for this application. You can configure the SIP translation later.

⭐ **Note:**

*Sip Account Association* is currently not used.

8. Click **Save**.

---

### Editing VoiceXML custom applications

**About this task**

Perform the following procedure to edit an existing custom application:

**Procedure**

1. Navigate to EM > Applications > Custom Applications.
2. Click on the name of the application you want to edit, or select the check box next to the application and click **Edit**…
3. On the **Edit Custom Application** page, alter the fields for this application.

⭐ **Note:**

*Sip Account Association* is currently not used.

4. Click **Save**.

---

### Application interpreter configuration

---

### Configuring RFC5707 (MSML) interpreter

**About this task**

Perform the following procedure to configure the RFC5707 Media Server Markup Language (MSML) settings:

**Procedure**

1. Navigate to EM > System Configuration > Application Interpreters > RFC5707 (MSML) > General Settings.
2. Select **MSML Video Capability Negotiation** to enable video negotiation if offered by the SIP client endpoints.
3. Select **MSML HA Event Notification** to enable MSML event notification when failover occur in High Availability mode.
4. Enter the default announcement namespace in the **MSML Default Namespace** field.
5. Click **Save**.
6. Restart Avaya Aura® MS for the changes to take effect.

---

### Configuring VoiceXML interpreter

**About this task**

Perform the following procedure to configure the Voice Markup Language (VoiceXML) default interpreter settings:

If the application defines the settings, then you do not need to change the default VoiceXML settings.

**Procedure**

1. Navigate to **EM > System Configuration > Application Interpreters > VoiceXML > General Settings**.
2. Alter the fields to change the default functionality for VoiceXML applications.
3. Click **Save**.
4. Restart Avaya Aura® MS for the changes to take effect.

---

### Viewing or changing application operational state

**About this task**

Perform the following procedure to manage the operational state of installed applications:

**Procedure**

1. Navigate to **EM > Applications > Operational State**.
2. You can view the current state of each listed application in the **State** column.
3. To change application states, select the check box next to one or more listed applications and then click **Lock**, **Unlock**, or **Pending Lock**.
Viewing or changing custom application operational state

About this task
Perform the following procedure to manage the operational state of custom applications:

Procedure
1. Navigate to EM > Applications > Custom Applications.
2. You can view the current state of each listed application in the State column.
3. To change application states, select the check box next to one or more listed applications. Then select Lock, Unlock, or Pending Lock from the More Actions drop-down menu.

Configuring application signaling translations

About this task
Application signaling translations map incoming SIP INVITE requests to an application. Then the system invokes the application.

The system performs translations by using the configured comparison Algorithm to match a configured string Pattern. The configured Mode determines where in the SIP INVITE the system looks for the pattern.

If the Pattern field contains the same value for multiple translations, then the system uses the Rank of the translation to determine which application to invoke. Translations with the same Pattern must not be configured with the same Rank.

Perform the following procedure to add or modify application signaling translations.

Use the following tables as aids for configuring the translations:

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>Translations fail if Mode is set to None. The system responds with 404 Not Found.</td>
</tr>
<tr>
<td>SIP request URI</td>
<td>Translations use the entire Request URI, including arguments, from the SIP INVITE.</td>
</tr>
<tr>
<td>Called DN</td>
<td>Translations use the directory number of the called user. The system uses the SIP INVITE To header, excluding arguments, as the called DN.</td>
</tr>
<tr>
<td>Calling DN</td>
<td>Translations use the directory number of the user making the call. The system uses the SIP INVITE From header, excluding arguments, as the calling DN.</td>
</tr>
<tr>
<td>SIP request URI user</td>
<td>Translations use the user name found before the server address in the request URI of the SIP INVITE.</td>
</tr>
<tr>
<td>SIP To</td>
<td>Translations use the To header from the SIP INVITE.</td>
</tr>
<tr>
<td>SIP From</td>
<td>Translations use the From header from the SIP INVITE.</td>
</tr>
</tbody>
</table>
### Definitions for algorithm options

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>Translations fail if <strong>Algorithm</strong> is set to <strong>None</strong>. The system responds with 404 Not Found.</td>
</tr>
<tr>
<td>Substring Match</td>
<td>For successful translation to the application, the string specified by <strong>Mode</strong> must contain the string specified by <strong>Pattern</strong>.</td>
</tr>
<tr>
<td>Regular Expression</td>
<td>For successful translation to the application, the string specified by <strong>Mode</strong> must match the regular expression specified in <strong>Pattern</strong>.</td>
</tr>
<tr>
<td></td>
<td>A regular expression (regexp) is a syntax consisting of a sequence of literal characters and metacharacters that forms a match pattern. Avaya Aura® MS supports regexp V8 syntax.</td>
</tr>
<tr>
<td>Exact Match</td>
<td>For successful translation to the application, the string specified by <strong>Mode</strong> must exactly match the string specified by <strong>Pattern</strong>.</td>
</tr>
<tr>
<td>Case-Insensitive Match</td>
<td>For successful translation to the application, the string specified by <strong>Mode</strong> must match the string specified by <strong>Pattern</strong>. The system does not consider case in the comparison.</td>
</tr>
<tr>
<td>Dial Plan Notation</td>
<td>For successful translation to the application, the string specified by <strong>Mode</strong> must match the dial plan expression specified by <strong>Pattern</strong>.</td>
</tr>
<tr>
<td></td>
<td>The x character is the wild card match character in the dial plan notation. The x can be upper or lower case. Instead of using the wild card character, explicitly include characters that must exactly match, in the required position of the pattern.</td>
</tr>
<tr>
<td></td>
<td>Examples:</td>
</tr>
<tr>
<td></td>
<td>An example emergency dial plan pattern is 911. If a user dials 911, then the system translates to the emergency application.</td>
</tr>
<tr>
<td></td>
<td>An example extension dial plan contains four digits and is represented as xxxx. If a user dials any four digits or letters, for example, 3512, then translations complete successfully. Dialing only three digits would not match this dial plan.</td>
</tr>
<tr>
<td></td>
<td>A dial plan can contain a combination of explicit letters and wild card characters. For example, 972XXXXXX. Any ten digit number starting with 972 matches the dial plan and translates successfully.</td>
</tr>
</tbody>
</table>

### Procedure

1. Navigate to **EM > Applications > Signaling Translations**.
2. Click **Add...** to create a new translation, or select an existing translation from the list and click **Edit...**
3. Select an existing application for **Application name**.
4. Select the translation **Mode**.
5. Select an **Algorithm** from the options.
6. Specify a match pattern in the **Pattern** field.
7. Enter a translation **Rank**.
The lower the number, the higher the priority of the translation.

8. Click Save.

Deleting application signaling translations

About this task
Perform the following procedure to remove defined translation from the application translations listed on the Signaling Translations page:

Procedure
1. Navigate to EM > Applications > Signaling Translations.
2. Select one or more translations from the list and click Delete.

Deleting a custom application

About this task
Perform the following procedure to remove a custom application from the system:

Before you begin
Lock custom applications before deleting them.

Procedure
1. Navigate to EM > Applications > Custom Applications.
2. Select the check box next to one or more listed applications that you want to delete.
3. Select More Actions > Delete.
Chapter 9: Backup and restore

Backup and restore overview

Avaya Aura® Media Server (MS) can backup and restore system configuration data and application content stored in Content Store. You must maintain backups of your system to recover from hardware failure or to restore data to a previous point in time.

Using Element Manager (EM), you can define, manage, and schedule backup and restore tasks. Use the Avaya Aura® MS command line backup and restore tool when you use a management interface other than Avaya Aura® MS EM.

⚠️ Important:
Storing the backup file locally on the same disk does not protect data from disk drive failure.

⚠️ Important:
If you reimage your system or replace the disk drive, you must preserve the backup file in a safe location. This is required, if you have stored the backup file on the disk being replaced. Preserving the backup file ensures the backup is available for you to restore or upgrade the Avaya Aura® MS system.

⚠️ Important:
Backup data is not portable from one server to another. If you need to replace a server, you must configure the server with the same IP address and hostname so that the data is compatible. See Server replacement in *Installing and Updating Avaya Aura® Media Server Application on Customer Supplied Hardware and OS*.

Configuring a backup task

**About this task**

EM organizes backups as tasks. These tasks contain your selected backup options and specify the location where the backup is stored.

You can create an automated backup task to create backups daily, weekly, monthly or at one particular time. You can store the backup in a local destination directory. Alternatively, you can push
the backup file to a remote server by using File Transfer Protocol (FTP) or SFTP (Secure File Transfer Protocol).

You cannot change the predefined local Default Backup Destination. If the administrator chooses to create a backup using this destination, EM stores the backup files in the following predefined local directories on Avaya Aura® MS:

Linux®: $MASHOME/platdata/EAM/Backups

Windows®: %MASHOME%platdata\EAM\Backups

You can configure remote backup destinations and these destinations can be shared by multiple backup tasks. When you perform backups to remote destinations, EM uploads the backup files to the specified FTP or SFTP server. If required, EM deletes the local backup file from Avaya Aura® MS after the file transfer completes.

There are two types of content that you can include in the backups: System Configuration and Application Content. You can create one task for both the backup types or create separate tasks, each with independent schedules. Each backup type contains the following information:

<table>
<thead>
<tr>
<th>Type of content</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>System Configuration</td>
<td>Contains all the Avaya Aura® MS system settings that the Avaya Aura® MS management system has configured. For example, the settings you configure with the EM.</td>
</tr>
<tr>
<td>Application Content</td>
<td>Includes data that the Avaya Aura® MS Content Store manages. The data can either be the data that the applications generate or subscribers save. Examples of these data include, application prompts, subscriber preferences for a conferencing service or deposited recordings and user preferences for a service. The backup type does not include files stored on Avaya Aura® MS which are not stored in Content Store.</td>
</tr>
</tbody>
</table>

Perform the following procedure to define or update backup tasks and destinations using EM:

**Procedure**

1. Navigate to EM > Tools > Backup and Restore > Backup Tasks.
2. To create a new backup task either click **Add** or select an existing task from the list and click **Edit**
3. Enter a name without spaces for this backup task in the **Backup Task Name** field.

4. For a complete backup, select both **System Configuration** and **Application Content** backup types.

5. Configure the destination for your backup files by selecting one of the following options:
   - Select the **Default Backup Destination** to store the backup on the local disk. This option does not protect your system from Avaya Aura® MS disk drive failure.
   - Select **Add...** to define a new remote FTP or SFTP location for your backup file.
   - Select an existing destination and click **Modify...** to alter the remote FTP or SFTP properties.

   For SFTP configuration, the **Secure FTP Remote Server Fingerprint** field is a combination of three space-delimited tokens, for example, `ssh-rsa 1024 4b:d2:46:fd:e9:a7:da:fc:53:ee:f6:2e:5b:4a:0a:d9`. The first token is the public key format used on the SFTP server. The second token is the length of the key. The third
token is the fingerprint of the SFTP server. Alternatively, you can configure the Secure FTP Key File Name field, which specifies a file containing the private key of the SFTP server.

6. If you choose to add or modify a backup destination, then fill in the Backup Destination Properties:
   a. Enter the server properties in the fields.
   b. If you select FTP, click Test to verify whether your configuration can contact the server.
   c. Click Save.

7. Select either Manually, as needed, or Schedule depending on how you want the backup to run.

8. If you selected Schedule, then configure the Schedule Task either as Daily, Weekly, Monthly, or Once, and the date and time.

9. Click Save.
   The new backup task is included in the list of Backup Tasks.

---

### Running a backup task

#### About this task
Perform the following procedure to manually run a defined backup task:

#### Procedure

1. Navigate to EM > Tools > Backup and Restore > Backup Tasks.
2. Select the check box next to the required backup task in the list.
3. Click Run Now.
4. Click Confirm to execute the backup task.

   ⚠️ **Note:**
   The time required to complete the application content backup depends on the amount of application data.

5. Monitor the Backup and Restore History Log at Tools > Backup and Restore > History Log.
   After the backup is complete, the log shows a completed backup task entry.

6. Confirm whether the backup files were saved to the FTP or SFTP location or local default destination. If the backup files are saved to the local destination, the local backups are found in the following directories:
   - Linux®: $MASHOME/platdata/EAM/Backups
   - Windows®: %MASHOME%platdata\EAM\Backups
Deleting a backup task

**About this task**
Perform the following procedure to remove a defined backup task:

**Procedure**
1. Navigate to **EM > Tools > Backup and Restore > Backup Tasks**.
2. Select the check box next to the backup task in the list.
3. Click **Delete**.
4. Click **Confirm** to remove the backup task.

Editing a backup destination

**About this task**
Perform the following procedure to edit a backup destination to alter the FTP or SFTP settings for storing backup files:

**Procedure**
1. Navigate to **EM > Tools > Backup and Restore > Backup Destinations**.
2. Click on the name of the backup destination you want to edit.
3. Click **Edit**
4. Modify the fields on the **Backup Destination Properties** page.
5. If you selected FTP, click **Test** to verify your configuration can contact the server.
6. Click **Save**.

Restoring from the local destination

**About this task**
Perform the following procedure to reconstruct data on Avaya Aura® MS by restoring data using a backup saved in the default backup destination:

The local backups that you are able to choose from are stored in:

Linux®: `$MASHOME/platdata/EAM/Backups`
Windows®: %MASHOME%platdata\EAM\Backups

Procedure

1. Navigate to EM > Tools > Backup and Restore > Restore.
2. On the Restore page, in the Restore Source drop-down list, select Default Backup Destination.
3. In the Restore Task List, select the backups from the list which you want to use for the restore.
   
   Important:
   
   To ensure that the application data is restored to the configured location, restore the system configuration data before restoring the application data.
4. Click Restore Now.
5. On the Confirm Restore page, click Confirm to proceed with the restore.
   
   Important:
   
   Restoring a backup archive might impact running applications. After you click Confirm, the system invokes the restore task. EM and Avaya Aura® MS close the connections to all users until the system completes the restoration.

   Note:
   
   The time required to restore the application content depends on the amount of application data in the backup file.

Uploading a backup file for restore

About this task

Perform the following procedure to restore using an uploaded backup file to reconstruct data on your Avaya Aura® MS.

Important:

Backup data is not portable from one server to another. If you need to replace a server, you must configure the server with the same IP address and hostname so that the data is compatible. See Server replacement in Installing and Updating Avaya Aura® Media Server Application on Customer Supplied Hardware and OS.

Procedure

1. Navigate to EM > Tools > Backup and Restore > Restore.
2. On the Restore page, in the Restore Source drop-down list, select Upload Backup Files.
3. Click Browse to select the backup files.
You can upload a System Configuration and Application Content backup at the same time.

4. On the Confirm Restore page, click Confirm to proceed with the restore.

**Important:**

Restoring a backup archive might impact running applications. After you click Confirm, the system invokes the restore task. EM and Avaya Aura® MS close the connections to all users until the system completes the restoration.

**Note:**

The time required to restore the application content depends on the amount of application data in the backup file.

**Related links**

- Element Manager troubleshooting

---

**Viewing the backup and restore history log**

**About this task**

Each backup and restore operation, whether a success or a failure, is recorded in the backup and restore history log. You can use this log to see when the last backup and restore was executed. You can also use the log to verify when a manually executed backup or restore was completed. The logs also report the elapsed time and size of each executed task.

Perform the following procedure to view the backup and restore history log:

**Procedure**

1. Navigate to EM > Tools > Backup and Restore > History Log.
2. Use the View drop-down menu to select All, Backup, or Restore to filter the list of logs the system displays.
3. (Optional) Use the Refresh Interval to select the required update frequency of the logs, in case you are monitoring backup or restore for completion.
4. (Optional) Click Export to save the log history.
5. (Optional) Click Clear to delete the current log history.

---

**Configuring the history log**
About this task

Perform the following procedure to configure the number of days for saving backup files and
restoring history logs on the server before the files or logs are automatically removed:

Procedure

1. Navigate to EM > Tools > Backup and Restore > General Settings.
2. Enter the number of days that you want to save backup and restore history log files on the
server before the files are removed in the Store history and log files for up to field.
3. Click Save.

Using the command-line backup and restore tool

About this task

The command-line backup and restore tool backs up the same System Configuration and
Application Content data as EM does when using task based system.

The executable file name is backuprestore. The following backup and restore tool description
provides an overview of the options and the functionality.

Usage:

```
backuprestore <-b | -r> <filename> -t <taskid> [-ftp server user password
destpath [-d]] [-c]
```

```
backuprestore <-b | -r> <filename> -t <taskid> [-sftp server user
"serverfingerprint"] [-p pass] [-k severkey] [-dp destpath] [-d] [-c]
```

Backup Examples:

```
backuprestore -b /backup/SERVICE_DATA_HOSTNAME.zip -t service
backuprestore -b C:/backup/CONFIG_DATA_HOSTNAME.zip -t config -sftp
0a:d9" -p "pw1234abc" -dp /export/home/user/ -d
```

```
backuprestore -b /backup/AMS_CONFIG_DATA_HOSTNAME.zip -t config -ftp
ftpserver1 anonymous 1234 /export/home/anonymous/ -d
```

Restore Example:

```
backuprestore -r /backup/CONFIG_DATA_HOSTNAME.zip
```

Important:

- Quotation marks must be used if there are spaces in the filenames.
- The order of the parameters is important. Follow the earlier examples.
- You must include the .zip extension in your filename.
• When creating a backup destination using the SFTP protocol, you must use one of the following authentication options:
  - A password and a fingerprint.
  - A fingerprint and a private key.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-h</td>
<td>Display the help message and more examples.</td>
</tr>
<tr>
<td>-b</td>
<td>Backup indicator followed by the file name to use for the backup. The file name must include the .zip extension.</td>
</tr>
<tr>
<td>-r</td>
<td>Restore indicator followed by the file name of the file to restore. The file must be an archive with the .zip extension.</td>
</tr>
<tr>
<td>-t</td>
<td>Backup Task type: Defines what will be backed-up: config indicates System Configuration, service indicates Application Content.</td>
</tr>
<tr>
<td>-ftp</td>
<td>Transfer the resulting backup file to an FTP destination. This is optional.</td>
</tr>
<tr>
<td>-sftp</td>
<td>Transfer the resulting backup file to an SFTP destination. The -sftp switch must be followed by the server address, username and fingerprint of the SFTP destination in quotes. This is optional. For example, -sftp 10.0.12.23 sftpuser &quot;ssh-rsa 1024 4b:d2:46:fd:e9:a7:da:fc:53:ee:f6:2e:5b:4a:0a:d9&quot;</td>
</tr>
<tr>
<td>-p</td>
<td>Password for SFTP authentication. Use quotes around passwords containing special characters. Additionally, if the password contains a backslash () or a quote (&quot;) then each of these characters must be escaped by a preceding backslash (). This is optional. For example, the password 12;\33\MS&quot;pw should be entered in quotes as follows: &quot;12;\33\MS&quot;pw&quot;</td>
</tr>
<tr>
<td>-k</td>
<td>Private key for SFTP server. This is optional.</td>
</tr>
</tbody>
</table>
### Backup and Restore tool options

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-dp</td>
<td>Destination path for backup on the SFTP server. This is optional.</td>
</tr>
<tr>
<td>-d</td>
<td>Delete the local file upon successful ftp transfer or restore. This is optional.</td>
</tr>
<tr>
<td>-c</td>
<td>Direct output that is sent to the console instead of the debug file. This is optional.</td>
</tr>
</tbody>
</table>

### Procedure

1. Stop Avaya Aura® MS.
2. Open a Linux® shell or Windows® command-line console on Avaya Aura® MS.
3. Execute the `backuprestore` tool following the usage guidelines.
   
   For example:
   ```
   backuprestore -b backupfilename.zip -t config
   
   or
   
   backuprestore -r backupfilename.zip
   ```

   **Important:**
   
   To ensure that the application data is restored to the configured location, restore the system configuration data before restoring the application data.

   **Note:**
   
   The time required to complete the application content backup or restore depends on the amount of application data on the system.
4. Start Avaya Aura® MS.
5. If Avaya Aura® MS EM is installed, restart EM with the following command:
   
   **Linux®:** `/sbin/service avaya.em restart`
   
   **Windows®:** Navigate to `Start > Administrative tools > Services` and restart `Avaya EM Service`. 
Chapter 10: Avaya Aura® MS monitoring

Element Manager (EM) provides ways to monitor the processing status of Avaya Aura® MS. Administrators can view alarms, logs, protocol traces, and performance metrics of an individual element or an entire cluster using the available monitoring tasks.

In EM, the monitoring tasks are grouped under the System Status category in the left menu pane.

Element status viewing

The current operational status of a particular element, for example, the server you are administrating, is available on EM. For information on procedures to view and change the status of Avaya Aura® MS, see Chapter 5, Basic management tasks.

Viewing cluster status

About this task

The system displays the Cluster Status page with the operational state of the cluster and the member elements.

Procedure

1. Navigate to EM > System Status > Cluster Status.
2. Scroll through the **System Status** pane to view the columns and the status of each element.

   The **System Performance Summary** pane is present under the **System Status** pane. The **Key Performance Indicators** listed are an aggregate of all the cluster elements and represent the cluster as a whole.

   The **System Performance Summary** pane is available only on Primary servers and displays only the operational measurements that are configured as **Key Performance Indicators (KPIs)**.

3. Click the **Element Name** of an individual element in the **System Status** pane.

   The system displays the detailed alarm information for that particular element.

**Related links**

- [Configuring OM settings](#) on page 192

---

## Monitoring alarms

**About this task**

Avaya Aura® MS generates an active alarm any time Avaya Aura® MS detects an operational error condition that requires corrective action by the administrator.

Avaya Aura® MS contains many individual system components that perform specific functions during operation. When a component detects an error condition the component raises an alarm. The component that raises the alarm automatically clears the alarm after the administrator resolves the error condition.

The system generates an event log each time a component raises or clears an alarm. The event log provides a clear record of all state changes on Avaya Aura® MS long after the error condition is resolved.
You can view the list of active alarms in the EM alarm viewer. The system updates the alarm viewer by using a refresh interval that you select.

EM displays the following information for each alarm:

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ID</td>
<td>A unique identifier assigned to the alarm.</td>
</tr>
<tr>
<td>Severity</td>
<td>The severity rank of alarms from most severe to least severe is Critical, Major, Minor, and Warning.</td>
</tr>
<tr>
<td>Date and Time</td>
<td>The timestamp of the exact time the alarm is raised. You can configure timestamps to display as either local time or Universal Time Coordinated (UTC) time. UTC time can be useful for correlating alarms with events in other time zones.</td>
</tr>
<tr>
<td>Description</td>
<td>A description of the type of error condition encountered.</td>
</tr>
<tr>
<td>Component</td>
<td>The name of Avaya Aura® MS software component reporting the alarm.</td>
</tr>
<tr>
<td>Probable Cause</td>
<td>A description of the probable cause of this alarm.</td>
</tr>
<tr>
<td>Corrective Action</td>
<td>A suggested corrective action that can be performed to resolve the error condition.</td>
</tr>
</tbody>
</table>

Perform the following procedure to view the active alarms on Avaya Aura® MS:

**Procedure**

1. Navigate to **EM > System Status > Alarms**.
2. To set the alarm data refresh interval, use the **Refresh every** drop-down menu.
3. Select an alarm that is listed.
   The system displays the details at the bottom of the page.
   Use the vertical and horizontal scroll bars to view information.
4. Click one of the heading names, **Id**, **Severity**, **Date and Time**, or **Description**.
   The system sorts and displays alarms in ascending or descending order.
5. Click **Customize...** in the upper-right corner of the **Alarms** pane to create a filter for the displayed alarms.
6. On the **Customize Filter** page, select the **Alarm ID** and the **Severity** types to include, using the **Add** button.

7. Click **Apply** to return to the **Alarms** page with the filtered results.

8. To clear the applied filter, click **Clear** in the upper-right corner of the **Alarms** pane.

---

**Event Logs**

Event logs provide a historical view of events that occurred in the system.

If required, then you can configure Avaya Aura® MS to deliver event logs as SNMP traps or SysLog destinations. You need to perform the commissioning procedures for SNMP to deliver SNMP traps.

You can control the age of saved logs, enable or disable log throttling, and apply advanced filters based on log severity and class.

On Windows® systems, a copy of the event logs is also sent to the Microsoft Event Viewer.

EM displays the following information for each alarm:

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ID</td>
<td>A unique identifier assigned to the alarm.</td>
</tr>
<tr>
<td>Severity</td>
<td>The severity ranks events from most severe to least severe as follows: Critical, Major, Minor, and Warning.</td>
</tr>
<tr>
<td>Origin</td>
<td>The name of the server reporting the event.</td>
</tr>
<tr>
<td>Field</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Date and Time</td>
<td>The timestamp of the exact time that the event is raised. You can configure timestamps to display as either local time or Universal Time Coordinated (UTC) time. UTC time can be useful for correlating alarms with events in other time zones.</td>
</tr>
<tr>
<td>Class</td>
<td>The type of information the log is reporting. Class values include Audit, Configuration, Data, Fault, Information, Maintenance, Metrics, Security, and State.</td>
</tr>
<tr>
<td>Category</td>
<td>Always reports a value of General in this release.</td>
</tr>
<tr>
<td>Instance Count</td>
<td>The number of times this event occurred when event throttling collects repeated events.</td>
</tr>
<tr>
<td>Description</td>
<td>Provides a summary of the type of error condition encountered.</td>
</tr>
<tr>
<td>Component</td>
<td>The name of Avaya Aura® MS software component reporting the alarm.</td>
</tr>
<tr>
<td>Probable Cause</td>
<td>A description of what probably caused this event to be raised.</td>
</tr>
<tr>
<td>Corrective Action</td>
<td>Suggested corrective action that can be used to resolve the error condition.</td>
</tr>
<tr>
<td>Application Id</td>
<td>The application reporting the event.</td>
</tr>
<tr>
<td>Customer Id</td>
<td>A custom value set by an application.</td>
</tr>
<tr>
<td>Document Reference Link</td>
<td>An optional link to documentation related to the event.</td>
</tr>
</tbody>
</table>

## Viewing event logs

### About this task

The Event Logs reflect system state and alarm transitions, error conditions and system operational details.

Perform the following procedure to gain access to the saved Avaya Aura® MS Event Logs:

### Procedure

1. Navigate to **EM > System Status > Logs > Event Logs**.
2. To set the event data refresh interval, use the **Refresh every** drop-down menu.
3. Select an event that is listed.

   The system displays the details at the bottom of the page.

   Use the vertical and horizontal scroll bars to view the information.

4. Click on one of the heading names: Id, Severity, Date and Time, or Description.

   The system sorts and displays alarms in ascending or descending order.

5. To go back in the history of the Event Logs, use the Page navigation buttons.

6. Click **Customize…**, in the upper-right corner of the **Event Logs** page, to filter the logs which are displayed.
On the Customize Filter page, select the Event Id, Date and Time, Severity, and Class types to include, using the Add buttons.

Click Apply to return to the Event Logs page with the filtered results.

To clear the applied filter, click Clear in the upper-right corner of the Event Logs page.

Configuring event log throttling

About this task

You can enable and configure event log throttling for a particular event. When throttling is enabled, the system reports only the most recent event log and its contents. Log throttling prevents the event logs from being flooded with recurring identical events. When you enable throttling, the system generates an event log and its occurrence count at the end of the interval specified by Event Log Throttle Check Window (Secs).
Procedure

2. Select Event Log Throttling to enable log throttling for events.
3. Configure Event Log Throttle Check Window (Secs) to set the interval in seconds to audit the throttled logs.
4. Configure Event Log Archive Minimum Log Age (Days) to set the minimum time in days to keep an event log archive before the system deletes it.
5. Click Save.

Configuring log filter settings

About this task

Each log destination you configure on Avaya Aura® MS, whether SNMP, SysLog, or Archive, has filter settings which you can customize independently.

You can filter logs based on the severity and the class in which the logs are grouped, as described in the following tables.

<table>
<thead>
<tr>
<th>Event type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Audit</td>
<td>Audit events provide notification of very specific actions within a managed device. In isolation, an audit event provides limited data. However, a collection of audit information forms an audit trail.</td>
</tr>
<tr>
<td>Security</td>
<td>A security event happens in the interest of security. A security event occurs in the interest of security. A security event is often combined with other classes such as fault and audit to form a record or notification.</td>
</tr>
<tr>
<td>Configuration Change</td>
<td>A configuration event, also known as an inventory event, is used to notify the system that hardware, software, or a service has been added, changed, or removed.</td>
</tr>
<tr>
<td>Fault</td>
<td>The system generates a fault notification after a fault condition occurs. A fault notification can result in an alarm.</td>
</tr>
<tr>
<td>State</td>
<td>A state includes both administrative states that can be manually configured and operational states that are read-only and determined by the managed entity.</td>
</tr>
<tr>
<td>Data Dump</td>
<td>A data dump event is an asynchronous event that contains information about a system, such as the</td>
</tr>
</tbody>
</table>

Table continues…
Filter options by log class

<table>
<thead>
<tr>
<th>Event type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>configuration and the state. The system generates these events as a result of a scheduled activity. Data dump events are not intended for a traditional poll-response type interaction.</td>
<td></td>
</tr>
<tr>
<td>Metrics</td>
<td>A metrics event contains a metric or a collection of metrics, including performance metrics, for an application, platform, or another device or network element. The record can be in a number of different formats, for example, XML, CSV.</td>
</tr>
<tr>
<td>Info</td>
<td>An event of interest which requires no action but can be used for troubleshooting purposes.</td>
</tr>
<tr>
<td>Maintenance</td>
<td>A maintenance event signals the beginning, process, or end of an action generated either by a manual or an automated maintenance action. Typically, the system reports the actual action initiation and the maintenance action.</td>
</tr>
</tbody>
</table>

Filter options by log severity

<table>
<thead>
<tr>
<th>Event type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emergency</td>
<td>An unusable system.</td>
</tr>
<tr>
<td>Alert</td>
<td>An action must be taken immediately.</td>
</tr>
<tr>
<td>Critical</td>
<td>An immediate corrective action that is required due to loss of service, loss of bandwidth, outage, and loss of data or functionality.</td>
</tr>
<tr>
<td>Error</td>
<td>An error condition has occurred.</td>
</tr>
<tr>
<td>Major</td>
<td>An urgent corrective action that is required due to a pending loss of service, outage, and loss of data or functionality.</td>
</tr>
<tr>
<td>Minor</td>
<td>A corrective action is required to prevent an eventual degeneration of services.</td>
</tr>
<tr>
<td>Warning</td>
<td>A potential or impending service-affecting condition that is detected that requires some diagnostic action.</td>
</tr>
<tr>
<td>Notice</td>
<td>A normal but significant condition.</td>
</tr>
<tr>
<td>Indeterminate</td>
<td>A service-affecting condition that is detected whose impact is unknown.</td>
</tr>
<tr>
<td>Info</td>
<td>Audit-type information and configuration changes.</td>
</tr>
<tr>
<td>Debug</td>
<td>Diagnostic information.</td>
</tr>
</tbody>
</table>

Perform the following procedure to configure your log filters for each destination:
Procedure


2. Scroll down in the window to configure the filters for each destination: SNMP, SysLog, and Archive.

3. Click Save.

---

Viewing security logs

About this task

Using security logs, you can track all configuration changes to the system. Security logs contain details about changes to the system. The tracked changes include:

- Exact configuration item that was changed.
- Old and the new values.
- Time of the change.
- IP address of the user who made the change.

Perform the following procedure to gain access to the saved Avaya Aura® MS Security Logs:

Procedure


2. Select a security log.

   The system displays details of the log in the lower part of the page.

   Use the vertical and horizontal scroll bars to view information.
3. To set the security data refresh interval, use the **Refresh every** drop-down menu.

4. To move back further in the history of the **Security Logs**, use the **Page** navigation buttons.

---

**Configuring log privacy settings**

**About this task**

Perform the following procedure to remove sensitive data from debug logs and SDRs.

**Procedure**

1. Navigate to **EM > System Configuration > Logging Settings > Privacy**.
2. To remove all sensitive data from debug logs and SDRs, click **Select all**.
   - To remove individual sensitive data items, select the data you want to remove.
3. Click **Save**.

---

**Configuring SysLog settings**

**About this task**

Perform the following procedure to enable the delivery of SysLog events and configure the destination server that receives the SysLog events:

**Procedure**

1. Navigate to **EM > System Configuration > Logging Settings > SysLog**.
2. Select **SYSLOG Delivery of Logs** to enable delivery of SysLogs.
3. Click **Add** to add destination server to **SYSLOG Destination Server List**.
4. Enter the IP address and the port of the destination server in text boxes in the **Server Address** and **Port** columns.
5. Click **Save**.
6. Click **Confirm**.
7. Restart Avaya Aura® MS for the changes to take effect.

---

### Configuring event log settings

**About this task**

Perform the following procedure to configure how long the system saves event logs.

**Procedure**

1. Navigate to **EM > System Configuration > Logging Settings > Event Log**.
2. Configure **Event Log Minimum Record Age** to set the minimum time in days to keep an event log before the system deletes the event log.
3. Configure **Event Log Size** to set the maximum number of megabytes of event log data to keep before the system deletes the event logs.
   - The system does not delete event logs unless the event logs are at least the age specified in **Event Log Minimum Record Age**.
4. Click **Save**.

---

### Monitor active sessions

This section describes the procedures for monitoring Active Sessions on Avaya Aura® MS and for customizing the Active Sessions monitor display.

### Viewing current active sessions

**About this task**

The active session display has several features you can use to find sessions of interest. You can also obtain detailed information related to each session, including the SIP messaging.

The default view of the **Active Sessions** pane in EM shows an unfiltered list of the active sessions. The unfiltered list can be a list of sessions only on one node or across the entire cluster. You can define a filter with very specific criteria to find sessions of interest. Additionally, you can specify a
refresh interval to define how often the system updates the display with current sessions. You can also define whether the system needs to display timestamps in GMT time or local time.

**Procedure**

1. Navigate to **EM > System Status > Monitoring > Active Sessions**.
   
   If the system prompts, follow the onscreen instructions to download and install Microsoft Silverlight.

   ✩ **Note:**
   
   You must install Microsoft Silverlight to use this feature.

2. On the **Active Sessions** page, you can see a summary of resources that any current active session is consuming.

   Use the horizontal scroll bars to view information.

   ![Active Sessions Table]

   

3. To set the session data refresh interval, use the **Refresh Every** drop-down menu.

4. To find a particular session, use the **Filter** drop-down menu to select a filter type. Then enter the matching criteria in the **Criteria** field under the selected filter.

5. To disable filtering and show all the active sessions, select **None** from the **Filter** drop-down list.

6. To display the active session timestamps using the local time, select **Display All Timestamps In Local Time** in the **Select...** drop-down menu.

7. To display the active session timestamps using Greenwich Mean Time (GMT), clear **Display All Timestamps In Local Time** in the **Select...** drop-down menu.

8. To toggle the active sessions view between cluster-wide view and nodal view, click the **(Cluster)** toggle button on the upper-right corner of the **Active Sessions** pane.

   The **(Cluster)** toggle button is present only if you have configured a cluster.
If you click (Cluster) to enter the cluster aggregated view, the button name changes to the host name of the local server.

---

Viewing details for a specific session

About this task

The Active Sessions page is a useful debugging tool to use when you encounter difficulties. There are options available to collect data for analysis. These options include graphical SIP message flows and SIP traces which show the details of the messages for a particular session.

Perform the following procedure to collect a message trace of a session:

Procedure

1. Setup trace monitoring by navigating to EM > System Status > Monitoring > Active Sessions.
   
   In the content pane of EM, the system displays the Active Sessions page.
   
   If prompted, follow the onscreen instructions to download and install Microsoft Silverlight.

   ✗ Note:

   You must install Microsoft Silverlight to use this feature.

2. From the Select... drop-down menu, select Monitor Next Session.
   
   The system displays a message that the system is waiting for a new session to start.

3. Ensure Display Trace Records is selected in the Select... drop-down menu.
   
   After the next session begins, the system displays the Active Sessions page with a detailed call performance summary.
4. To view session records of the call including SIP message content, select Select Viewing Options… > View Session Detail Records.
5. Change the view to a graphical, SIP message flow by selecting **Select Viewing Options... > View SIP Protocol Trace.**

6. Click **Stop Monitoring** to end tracing for this session.
Releasing one or more sessions

About this task
Perform the following procedure to release one or more active sessions on the server:

Procedure
1. Navigate to EM > System Status > Monitoring > Active Sessions.
   If the system prompts, follow the on screen instructions to download and install Microsoft Silverlight.
   ✪ Note:
   You must install Microsoft® Silverlight® to use this feature.
2. As described in this section, apply filters to find the session you need to release.
3. Select the session or sessions that you want to release from the list of Active Sessions that the system displays.
   Tip:
   To select multiple active sessions, hold down either the Shift key for multiple selections which are grouped together or the Control key for multiple selections which are separated and then click the sessions you want to end.
4. From the Select drop-down menu, select Release Selected Session.
   The sessions are removed from the Active Sessions display after the system releases the sessions and refreshes the display.

Muting and unmuting sessions

About this task
Perform the following procedure to mute or unmute one or more active sessions listed on the Active Sessions display page:

✪ Note:
You can mute or unmute active sessions only if the current application supports this option otherwise the option is unavailable.

Procedure
1. Navigate to EM > System Status > Monitoring > Active Sessions.
   If the system prompts, follow the on screen instructions to download and install Microsoft Silverlight.
Monitoring system performance

About this task
You can monitor system performance by comparing the number of sessions with the CPU utilization. The system displays a summary of the current system performance graphically on the Performance page of EM.

Procedure
   If prompted, follow the on screen instructions to download and install Microsoft Silverlight.

   Note:
   You must install Microsoft Silverlight to use this feature.

   Note:
   You must install Microsoft Silverlight to use this feature.

2. As described in this section, apply filters to find the sessions you need to mute or unmute.

3. Select the session or sessions that you want to mute or unmute from the list of active sessions that the system displays.

   Tip:
   To select multiple sessions, hold down either the Shift key for multiple selections which are grouped together, or the Control key for multiple selections which are separated, and then click the sessions you want to mute or unmute.

4. From the Select drop-down menu, select Mute Selected Session or Unmute.
2. To monitor the aggregated performance of the cluster or the performance of only the current server, click **(Cluster)** in the upper-right corner.

This option is available only if you have configured a cluster.

---

**OM monitoring**

**Configuring OM settings**

**About this task**

Perform the following procedure to choose the Operational Measurements (OMs) that are available for Archiving, Monitoring, Delivery and the OM that are used as Key Performance Indicators (KPI):
Procedure

1. Navigate to EM > System Configuration > Monitoring Settings > Operational Measurements > Settings.

Tip:

• You can sort the columns by clicking on the column name.
• You can filter the displayed OMs by selecting a category from the Category dropdown menu.
• If you know the name of the OM to configure, type the name in the field to the left of the Find Next button. Then press Enter or click Find Next.
• You can use the check box next to the column title to select or deselect all OMs listed in that column.

2. On the Operational Measurement Settings page, select the check box in the Archive column next to each OM to archive.

3. Select check boxes in the Monitor column next to each OM that you want to monitor.

4. Select the check boxes in the KPI column next to each OM that you want to appear in System Performance Summary. The System Performance Summary is located at EM > System Status > Cluster Status.

5. Select the check box next to the OM in the Delivery column to indicate which OMs to deliver as periodic comma-separated values (CSV) reports.

6. Click Save.
Configuring OM delivery

About this task

Perform the following procedure to configure how the system delivers OM reports using FTP (File Transfer Protocol) or SFTP (Secure FTP):

Procedure

1. Navigate to EM > System Configuration > Monitoring Settings > Operational Measurements > Delivery.
2. Select Periodic Performance Report Delivery to enable performance report delivery for FTP or SFTP.
3. Select Report ZIP Compression to create a .zip file of the OM reports.
4. Select FTP Report Delivery to deliver reports using FTP.
5. Enter the address of the destination FTP server you want to send the reports to, in the FTP Server Network Address field.
6. In the FTP Remote Directory field, enter the address of an optional remote directory to change to before uploading the report.
7. In the FTP Account Username field, enter the FTP user name to use at the destination FTP server.
8. In the FTP Account Password field, enter the FTP password to use at the destination FTP server.
9. (Optional) Select the Secure FTP (SFTP) check box and then configure the SFTP options:
   a. In the Secure FTP Remote Server Fingerprint field, enter the fingerprint of the remote server.
   b. In the Secure FTP Key File Name field, enter the file name to use as the optional SFTP key file.
10. Click Save.
11. Restart Avaya Aura® MS for the changes to take effect.

Configuring OM archiving

About this task

Perform the following procedure to archive OMs and to configure OM retention options:

Procedure

1. Navigate to EM > System Configuration > Logging Settings > OMs.
2. Select Archive Operational Measurements to enable OM archiving.
3. In the **Operational Measurement Archive Minimum Record Age** field, specify the number of days after which the system needs to archive OMs. When the system initiates a cleanup, it removes all archived OMs older than the specified days.

4. In the **Operational Measurement Archive Cleanup Threshold Size** field, enter the maximum space in bytes for OMs to use before the system initiates a cleanup.

5. In the **Operational Measurements Reset Interval** field, set the interval in minutes at which the system archives and resets OMs.

6. Click **Save**.

7. Click **Confirm**.

8. Restart Avaya Aura® MS for the changes to take effect.

---

**Monitoring protocol connections**

**About this task**

Perform the following procedure to view operational information about installed protocols:

**Procedure**

1. Navigate to **EM > System Status > Monitoring > Protocol Connections**.

2. To set the protocol connection data refresh interval, use the **Refresh every** drop-down menu.

   View the information for the installed protocols using the vertical and horizontal scroll bars. You can change the order of the connection list by clicking the title of any column.

   There are no actions that can be performed. The display is informational only.

---

<table>
<thead>
<tr>
<th>Protocol Connections</th>
</tr>
</thead>
<tbody>
<tr>
<td>Display: All RefreshEvery: 15 seconds</td>
</tr>
<tr>
<td>Application Protocol</td>
</tr>
<tr>
<td>----------------------</td>
</tr>
<tr>
<td>MRCFv1</td>
</tr>
<tr>
<td>MRCFv1</td>
</tr>
</tbody>
</table>
Monitoring music streams

About this task
You can use EM to monitor the status of the following types of music source providers:

Live streams
- Real Siimple Syndication (RSS) provider
- HTTP/MP3 provider
- HTTP Live Streaming (HLS) provider

Directory streams
- Local File System provider
- Content Store provider

Note:
The Local File System provider and Content Store provider are configured as part of an adopting product. See adopting product documentation.

Perform the following procedure to monitor the status of configured music streams.

Procedure
1. Navigate to EM > System Status > Monitoring > Music Streams.
2. To see the status text of a music source, move the mouse over the Stream Key name.
3. To set the refresh interval, use the Refresh every drop-down menu.

Related links
Music streaming configuration on page 122
Streaming music troubleshooting on page 235

Advanced system monitoring

Viewing component status

About this task
Perform the following procedure to view the operational state of individual Avaya Aura® MS components:

Procedure
Navigate to EM > System Status > Monitoring > Advanced > Component Status.
In the content pane of EM, the Component Status page displays information about the operational state of individual components of Avaya Aura® MS.
You cannot perform any actions on the listed components. The information is useful for diagnosing and isolating system problems when working with Avaya support.

### Component Status

<table>
<thead>
<tr>
<th>Component Name</th>
<th>Type</th>
<th>States</th>
<th>Status</th>
<th>TimeStamp(CDT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAS Resource Manager</td>
<td>SRP</td>
<td>Running</td>
<td>Healthy</td>
<td>2011-05-17 13:32:55</td>
</tr>
<tr>
<td>MAS SIP UserAgent</td>
<td>SRP</td>
<td>Running</td>
<td>Healthy</td>
<td>2011-05-17 13:32:53</td>
</tr>
<tr>
<td>MAS IVR Media Processor</td>
<td>SRP</td>
<td>Stopped</td>
<td>Failed Repeatedly</td>
<td>2011-05-17 13:32:55</td>
</tr>
<tr>
<td>MAS Conference Media Processor</td>
<td>SRP</td>
<td>Running</td>
<td>Healthy</td>
<td>2011-05-17 13:32:53</td>
</tr>
<tr>
<td>MAS Content Store</td>
<td>SRP</td>
<td>Running</td>
<td>Healthy</td>
<td>2011-05-17 13:32:53</td>
</tr>
<tr>
<td>MAS Streaming Source</td>
<td>SRP</td>
<td>Running</td>
<td>Healthy</td>
<td>2011-05-17 13:32:53</td>
</tr>
<tr>
<td>MAS Management SOAP Server</td>
<td>SRP</td>
<td>Running</td>
<td>Healthy</td>
<td>2011-05-17 13:32:53</td>
</tr>
<tr>
<td>MAS Reporting Agent</td>
<td>SRP</td>
<td>Running</td>
<td>Healthy</td>
<td>2011-05-17 13:32:53</td>
</tr>
</tbody>
</table>

---

### Viewing advanced protocols

**About this task**

Perform the following procedure to view the status of various media server protocol interfaces:

**Procedure**

1. Navigate to **EM > System Status > Monitoring > Advanced > All Protocol Connections**.

   The system displays information about the operational state of protocols on Avaya Aura® MS.

2. To set the protocol connection data refresh interval, use the **Refresh every** drop-down menu.

3. Select the desired protocol from the **Display** drop-down list to restrict the display to certain protocols.

   You cannot perform any action. The information is useful for diagnosing and isolating system problems when working with Avaya support.
System license monitoring

Monitoring License Server status

About this task
Perform the following procedure to start, stop, restart, or view the status of a License Server:
You can perform the procedure for systems that use License Server configurations but not for systems that use Nodal Licensing or WebLM licensing.

Procedure
1. Navigate to EM > Licensing > Server Status.
   View the status of the primary license server.
   If you have already configured the secondary license server, view the status of the server.
2. To set the refresh interval, use the Refresh every drop-down menu.
3. Change the state of the License Server as follows:
   • To start the License Server, click Start.
   • To stop the License Server, click Stop.
   • To restart the License Server, click Restart.
4. Click Confirm.

SDR monitoring

Avaya Aura® MS sessions generate Session Detail Records (SDRs) which contain detailed information about each session. EM provides an SDR Browser which you can use to review the details of any session processed by the media server.

Perform the following procedures to filter and review SDRs, generate graphical reports of sessions for traffic pattern analysis, and view peak Avaya Aura® MS traffic:

Reviewing SDRs

About this task
Perform the following procedure to filter and review the details of any sessions archived by the media server:
Procedure

1. Navigate to EM > Tools > Session Detail Record Browser.

2. Select Browse Records In Date Range query type from the Type drop-down menu.

3. To define a time range for the query, use the Start and the End options in the Query panel.

4. Enter the maximum number of results in the Limit field.

5. Click Execute to run the query.

   The system displays the list of sessions.

6. Click one of the rows in the list of sessions.

7. Scroll down to review the details of that session in the Session Detail Records panel.
Determining peak session traffic

About this task

Perform the following procedure to generate a graphical report representing of the peak number of sessions Avaya Aura® MS processes each day:

Procedure

1. Navigate to EM > Tools > Session Detail Record Browser.
2. To run a query which reports the peak number of sessions processed each day, select Peak Traffic Summary from the Type drop-down menu.
3. Use the Start and the End options in the Query panel to define a time range for the query.
4. Click Execute to run the new query and generate a graphical Peak Traffic Summary.

Move your cursor over any bar graph element to see the peak number of sessions for each day.
Summarizing daily inbound traffic

About this task
Perform the following procedure to generate graphical reports which summarize daily inbound traffic that Avaya Aura® MS processes:

Procedure
1. Navigate to EM > Tools > Session Detail Record Browser.
2. To run a query which reports the total number of sessions processed for each day, select Inbound Traffic Summary from the Type drop-down menu.
3. To define a time range for the query, use the Start and the End options in the Query panel.
4. Click Execute to run the new query and generate a graphical Inbound Traffic Summary. Move your cursor over any bar graph element to see the total number of sessions handled for each day.
Analyzing hourly inbound traffic details

About this task

Perform the following procedure to generate graphical reports for determination of hourly traffic that Avaya Aura® MS processes:

Procedure

1. Navigate to **EM > Tools > Session Detail Record Browser**.
2. To run a query which details the total number of inbound sessions processed each hour, select **Inbound Traffic Detail** from the **Type** drop-down menu.
3. To define a time range for the query, use the **Start** and the **End** options in the **Query** panel.
4. Click **Execute** to run the new query and generate a graph showing hourly inbound session totals. Move your cursor over any bar graph element to see the number of sessions recorded for that hour.
Reviewing a monitored SDR

About this task

A session which is traced using the session monitoring procedure produces a more detailed SDR. The SDR browser shows additional information for these monitored sessions which includes:

- Detailed SIP and application log records.
- Operational measurement graphs specific to the session.
- A graphical SIP message flow.

Perform the following procedure to review the detailed SDR of a monitored session.

Before you begin

See Viewing details for a specific session to add a detailed SDR to the archive and then perform the following procedure.

Procedure

1. Navigate to **EM > Tools > Session Detail Record Browser** to browse SDRs.
2. Select **Browse Records In Date Range** as the query type, from the **Type** drop-down menu.

3. Use the **Start** and the **End** options in the **Query** panel to define a narrow time range for the query which includes the monitored session.

4. In the **Limit** field, enter the maximum number of results that you want to view.

5. Click **Execute** to run the query.

The system displays the list of sessions corresponding to the monitored session.

6. Click the result row in the list of sessions.

7. Scroll down to review the details of the session as shown in the following examples.
VoiceXML Latency Summary

VXML Answer Latency: 154

Latency between the call being answered and requesting the first prompt to play.

VoiceXML Application Details

<table>
<thead>
<tr>
<th>Reprompts</th>
<th>Fetch Attempts</th>
<th>Dialogs</th>
<th>No Input Events</th>
<th>Prompts</th>
<th>Pre-Recorded Prompts</th>
<th>DTMF Inputs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Comments on this document? infodev@avaya.com
Avaya Aura® MS monitoring

![VoiceXML Fetch Latency Intervals](chart)

![Avaya IP Phone](diagram)

---

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Comments on this document? infodev@avaya.com
**Configuring SDR archiving**

**About this task**

The system creates SDRs for each session. You can review the archived SDRs using an SDR browser. You can also clear all the records in the current archive.

Perform the following procedure to enable the archiving of SDRs, configure the retention options, and clear all the records in the current archive:

**Procedure**

1. Navigate to EM > System Configuration > Logging Settings > Session Logging.
2. Select Session Detail Record Archiving to enable SDR archiving.
3. In the Session Detail Record Archive Minimum Record Age field, specify the number of days after which the system archives SDRs.
   
   When the system initiates a clean-up, the system removes SDRs older than the configured number of days.
4. In the Session Detail Record Archive Cleanup Threshold Size field, enter the maximum space, in bytes, for SDRs to use before the system initiates a cleanup.
5. (Optional) Click Clear to delete all currently archived records.
6. Click Save.
7. Click Confirm.
8. Restart Avaya Aura® MS for the changes to take effect.

**Configuring Field Promotion for SDR reports**

**About this task**

Perform the following procedure to select the fields to include in SDRs:

**Procedure**

1. Navigate to EM > Element Status and select Lock from the More Actions drop-down menu and click Confirm to lock the system.

   For more information on locking your system, see Setting the operational state.

   **Important:**

   When you lock the media server, the system ends existing sessions and does not accept new requests. The system redirects new traffic to other nodes in the cluster.

2. Navigate to EM > System Configuration > Session Detail Records > Field Promotion.
3. Select the required fields from the **Available Fields** column and then click **Add**.

The system displays the selected fields in the **Selected Fields** column and in the table on the lower part of the page.

**Tip:**

To select multiple items, press and hold down either the **Shift** key, for multiple selections which are grouped together, or the **Control** key, for multiple selections which are separated.
4. To reorder the fields in Selected Fields, select a field and then click Up or Down.

5. In the Indexed column, select Yes or No as required.

6. If you want to remove any selected field, click on the field in the Selected Fields column and then click Remove.

Related links
Setting the operational state on page 29

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Enabling enhanced SDRs for troubleshooting

About this task
You can enhance SDRs to capture additional detail to aid in system troubleshooting. When you select Enable System Diagnostic Mode, the system adds additional fields and full SIP message traces to the SDRs. The EM Active Sessions viewer and SDR browser display these additional details. Additional tracing is useful during trials and system commissioning.

⚠️ Important:
The collection of additional SDR data impacts system performance. Do not select Enable System Diagnostic Mode on live systems processing traffic. Ensure you clear Enable System Diagnostic Mode when you have finished troubleshooting.

Perform the following procedure to enable enhanced SDR tracing:

Procedure
1. Navigate to EM > System Configuration > Debug Tracing > General Settings > System Diagnostic.
2. Select Enable System Diagnostic Mode.
3. Click Save.
4. Click Confirm.
5. Restart Avaya Aura® MS for the changes to take effect.

To view an enhanced trace of sessions that Avaya Aura® MS processes after the restart, use the SDR browser as described in Reviewing session detail records. Alternatively, use the Active Sessions viewer as described in Viewing current active sessions.

Related links
Viewing current active sessions on page 185
Chapter 11: Account management

Account management overview

Avaya Aura® MS Element Manager (EM) supports several account management policies that you can customize for the required EM administrator authentication and authorization. You can configure the system to use operating system credentials, Avaya Aura® MS based authentication, or the centralized Avaya Aura® System Manager authentication.

Avaya Aura® MS also supports Role Based Access Control (RBAC) to manage the level of access that the system grants to the authorized administrators. RBAC simplifies permission management by assigning permissions to reusable roles instead of individual administrators.

Account management policies

Avaya Aura® MS provides several options for validating EM administrator login credentials. You can choose one of the following authentication and authorization sources:

<table>
<thead>
<tr>
<th>Source</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating System</td>
<td>Operating system is the default option. You can log in to EM using the credentials of an operating system administrator. Using the operating system credentials is local server specific. RBAC is not available with the operating system option. The administrator has access to all EM tasks.</td>
</tr>
<tr>
<td>Avaya Aura® Media Server</td>
<td>When you use the Avaya Aura® Media Server option, you enable the Avaya Aura® MS RBAC feature. Configuration for administrators and roles is stored locally on Avaya Aura® MS. Single Sign-On (SSO) is not available with the Avaya Aura® Media Server option.</td>
</tr>
<tr>
<td>Avaya Aura® System Manager</td>
<td>When you use the Avaya Aura® System Manager option, you enable the centralized Avaya Aura® System Manager RBAC feature. Configuration for administrators and roles is stored on Avaya Aura® System Manager. When you log in to Avaya Aura® MS EM, you see the System Manager login page. After successful login, you are redirected back to Avaya Aura® MS EM.</td>
</tr>
</tbody>
</table>

Table continues…
EM authentication and authorization sources

<table>
<thead>
<tr>
<th>Source</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Avaya Aura® System Manager option provides Single Sign-On (SSO).</td>
<td></td>
</tr>
</tbody>
</table>

## Configuring the operating system as the authentication and authorization source

### About this task

Perform the following procedure to use the operating system administrator login credentials to access EM. The administrators which log in using this method have unrestricted EM permissions. RBAC is unavailable when the operating system is configured as the authentication and authorization source.

### Procedure

1. Navigate to EM > Account Management > Policies > Sign In.
2. Select the Operating System from the Authentication and authorization source drop-down menu.
3. (Optional) Configure how long a user session can be idle before EM ends the user session. In the Element Manager session timeout interval (m) field, type the number of minutes the session can be idle.
4. Click Save.
5. Click Confirm.

The system restarts EM to apply the change. EM login sessions are ended. There is no impact to media server processing of call sessions. You can log in using operating system administrator credentials after the EM restart completes.

## Avaya Aura® MS RBAC configuration

You can use Avaya Aura® MS Role Based Access Control (RBAC) when you configure the account management policy to use Avaya Aura® Media Server as the authentication and authorization source.

Using RBAC requires that you create roles for each job function. Next, you define the permission level for each EM task in role. Finally, you can then assign roles that match the job function requirements of each administrator.

The system includes one default administrator with the name admin and with the default role of System Administrator. You cannot modify or delete the default role. You can change the password for the default administrator but you cannot delete the default administrator. The system does not
disable the default administrator account after multiple failed login attempts. However, after the configured number of failed login attempts is exceeded, the system generates warning event logs for each default administrator login failure.

In an Avaya Aura® MS cluster, administrators, roles, and permissions are configurable on the Primary media server only. If configuration replication is enabled, changes made on the Primary server are automatically replicated to the other servers in the cluster. You can view but not edit the configuration on the non-Primary servers of the cluster.

You must select Avaya Media Server as the authentication and authorization source to use Avaya Aura® MS RBAC and the procedures in this section.

### Configuring Avaya Aura® MS as the authentication and authorization source

**About this task**

Perform the following procedure to enable Avaya Aura® Media Server based RBAC by configuring the system to use Avaya Aura® MS as the authentication and authorization source for EM login.

**Before you begin**

The default EM administrator must have a password before you can select Avaya Aura® Media Server as the authentication and authorization source. Follow the procedure for modifying administrator properties to add a password to the admin user.

**Procedure**

1. Navigate to EM > Account Management > Policies > Sign In.
2. Select Avaya Aura® Media Server from the Authentication and authorization source drop-down menu.
3. *(Optional)* Configure the number of login attempt failures that disable an administrator account by selecting Number of login failures that locks the account and typing the required number of failures in the field.
   
   A value of 0 means there is no failure attempt limit.
4. *(Optional)* Configure how long a user session can be idle before EM ends the user session. In the Element Manager session timeout interval (m) field, type the number of minutes the session can be idle.
5. Click **Save**.
6. Click **Confirm**.

The system restarts EM to apply the change. EM login sessions are ended. There is no impact to media server processing of call sessions. You can log in using Avaya Aura® MS RBAC credentials after the EM restart completes.

**Related links**

[Modifying administrator properties](#) on page 216
Configuring Avaya Aura® MS RBAC password policy

About this task

Perform the following procedure to update administrator password policies when you enable Avaya Aura® Media Server based RBAC. This task is not available unless you configure the system to use Avaya Aura® MS as the authentication and authorization source for EM login.

Procedure

1. Navigate to EM > Account Management > Policies > Password.
2. Configure the minimum password length and minimum number of different characters required.
3. To restrict an administrator from reusing passwords, enter the number of previous password to track in the Number of unique passwords in the password history field.
   The system uses the password history to ensure new administrator passwords are not the same as recently used passwords.
4. To configure the number of days after which an administrator password expires, select the Password expiration interval (d) field and type the required number of days in the field.
   Value 0 indicates the password never expires.
5. To configure the minimum number of days allowed between password changes, select Minimum password age (d) and type the required number of days in the field.
   A minimum password age prevents password recycling that could otherwise defeat the password history policy.
   Value 0 disables the minimum password age restriction.
6. Click Save.

Related links

Modifying administrator properties on page 216

Adding roles

About this task

You can create roles for each administrator job function on your system. For each role you assign permission levels that define which EM tasks an administrator with that role can perform.

After you add a role, the role is available to be assigned to an administrator.

Use the Definitions for role permission levels table as an aid when selecting the permissions for each task in the role.
<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deny</td>
<td>The system blocks the administrator from viewing or modifying the task.</td>
</tr>
<tr>
<td>View</td>
<td>The system allows the administrator to only view the task.</td>
</tr>
<tr>
<td>Modify</td>
<td>The system allows the administrator to view and modify the task.</td>
</tr>
</tbody>
</table>

Perform the following procedure to add a new role to the system:

**Procedure**

1. Log in to EM by using an administrator account. The administrator account must have the permission to modify account management tasks.
2. Navigate to **EM > Account Management > Roles**.
3. Click **Add**.
4. Type a name for the new role in the **Role ID** field.
5. Type a description for the new role in the **Role Description** field.
6. Set the permissions for the role by clicking **Configure**.
7. Select the role permission level for each task by selecting the new permission level from the drop-down menu next to each of the listed tasks.
8. Click **Continue**.
9. Click **Save**.

---

**Modifying role properties**

**Procedure**

1. Log in to EM by using an administrator account. The administrator account must have the permission to modify account management tasks.
2. Navigate to **EM > Account Management > Roles**.
3. Select the role you want to modify from the list of roles.
4. Click **Edit**.
   The system displays a page with the role properties and a list of administrators currently assigned to the role. Changes to the role impact the administrators in the list.
5. Change the name of the role by typing a new name in the **Role ID** field.
6. Change the description of the role by typing a new description in the **Role Description** field.
7. Change the permissions for the role by clicking **Configure**.
8. Change the role permission level for each task by selecting the new permission level from the drop-down menu next to each of the listed tasks.
9. Click **Continue**.
Deleting roles

Procedure

1. Log in to EM by using an administrator account. The administrator account must have the permission to modify account management tasks.
2. Navigate to EM > Account Management > Roles.
3. Select the role you want to delete from the list of roles.

Tip:
You can see how many administrators are using each role by looking in the Number of Administrators column.

If you want to review a list of the administrators currently assigned to the role you are about to delete, perform the following steps:

   a. Click Edit.
   b. Review the list of administrators.
   c. Click Delete.

The system deletes the role and removes the role from each administrator assigned the role.

Adding administrators

Before you begin

Ensure the roles that are required for the new administrator are created.

Procedure

1. Log in to EM by using an administrator account. The administrator account must have the permission to modify account management tasks.
2. Navigate to EM > Account Management > Administrators.
3. Click Add.
4. Type a unique user name for the new administrator in the Administrator ID field.
5. Type a description for the new administrator in the Administrator Description field.
6. Select the required authentication source from the Authentication Source drop-down menu.
7. Select the required status of the account from the Status drop-down menu.

   If you select Disabled then the account is suspend and cannot be used to access EM.
8. Type a password for the new administrator in the Password and Confirm Password fields. 
9. If you want the administrator to enter a new password after the first login, then select Password Change Required.
10. Assign roles to the administrator by clicking Edit in the Roles section.
11. Select the required roles from the Roles list.
12. Click Continue.
13. Click Save.

---

### Modifying administrator properties

**Procedure**

1. Log in to EM by using an administrator account. The administrator account must have the permission to modify account management tasks.
2. Navigate to EM > Account Management > Administrators.
3. Select the administrator you want to modify.
4. Click Edit.
5. Change the description of the administrator by typing a new description in the Administrator Description field.
6. Select the required status of the account from the Status drop-down menu.
   - If you select Disabled then the account is suspend and cannot be used to access EM.
7. If you want to change the password, type a new password for the administrator in the Password and Confirm Password fields.
8. If you want the administrator to enter a new password after the next login, then select Password Change Required.
9. Change the roles assigned to the administrator by clicking Edit in the Roles section.
10. Select the required roles from the Roles list.
11. Click Continue.
12. Click Save.

---

### Deleting administrators

**Procedure**

1. Log in to EM by using an administrator account. The administrator account must have the permission to modify account management tasks.
2. Navigate to EM > Account Management > Administrators.
3. Select the administrator you want to remove.
4. Click **Delete**.

The administrator account is removed from the system and cannot be used to access EM.

---

**Changing administrator passwords**

**About this task**

RBAC administrators perform the following procedure to update their passwords when you enable Avaya Aura® Media Server based RBAC. This task is not available unless you configure the system to use Avaya Aura® Media Server as the authentication and authorization source for EM login.

**Procedure**

1. Log in to EM by using Avaya Aura® MS RBAC administrator credentials.
2. Navigate to **EM > Account Management > Administrator Password**.
3. Type a new password for the new administrator in the **Password** and **Confirm Password** fields.
4. Click **Save**.

**Related links**

- [Modifying administrator properties](#) on page 216

---

**Avaya Aura® System Manager RBAC configuration**

You can use Role Based Access Control (RBAC) when you configure the account management policy to use Avaya Aura® System Manager as the authentication and authorization source.

System Manager provides centralized RBAC to manage the level of access the system grants to authorized administrators. RBAC simplifies permission management by assigning permissions to reusable roles instead of individual administrators. The System Manager authentication supports Single Sign-On (SSO).

Using RBAC requires that you create roles for each job function. Next, you define the permission level for each EM task in role. Finally, you can then assign roles that match the job function requirements of each administrator.

System Manager includes one default administrator with the name *admin*, and with the default role of System Administrator. The default administrator has full access to all levels of Avaya Aura® MS EM tasks. When using System Manager for authentication and authorization, administrators, roles, and permissions are configurable only on System Manager.

If you want to use System Manager with Avaya Aura® MS, you must set up a mutual authentication between the servers. After you setup mutual authentication, you must select the Avaya Aura®
System Manager option as the authentication and authorization source to use System Manager RBAC and SSO.

Perform the procedures in this section to configure Avaya Aura® MS to use System Manager RBAC and SSO.

For information about configuring administrators and roles when using System Manager for centralized RBAC, see Administering Avaya Aura® System Manager Release 6.3.

---

**Configuring Avaya Aura® MS to use System Manager**

**About this task**

To configure the media server to use System manager, see System Manager enrollment on page 16.

**Related links**

System Manager enrollment on page 16

---

**Configuring System Manager as the authentication and authorization source**

**About this task**

Perform the following procedure to enable System Manager based RBAC and SSO by configuring the system to use Avaya Aura® System Manager as the authentication and authorization source for EM login.

**Before you begin**

Ensure Avaya Aura® MS is configured to use System Manager.

**Procedure**

1. Navigate to EM > Account Management > Policies > Sign In.
2. Select the Avaya Aura® System Manager from the Authentication and authorization source drop-down menu.
3. Click Save.
4. Click Confirm.

The system restarts EM to apply the change. EM login sessions are ended. There is no impact to media server processing of call sessions. You can login using the System Manager credentials after the EM restart completes.
Accessing Avaya Aura® MS EM when System Manager is not available

About this task
When System Manager is configured and enabled as the authentication and authorization source for EM login, but System Manager is unavailable, you can use the login credentials of the operating system administrator to access Avaya Aura® MS EM.

Procedure
Use the following URL in a web browser for emergency access to Avaya Aura® MS EM:

https://AvayaMSFQDN:8443/emlogin

Configuring security policies

Procedure
1. Gain access to System Manager that is configured to manage Avaya Aura® MS.
   If you are already logged in to Avaya Aura® MS EM, you can click on Network in the upper-left of EM to access System Manager.
2. Click Administrators.
   For detailed steps on configuring policies in System Manager, see Administering Avaya Aura® System Manager Release 6.3.

Configuring roles

Procedure
1. Gain access to System Manager that is configured to manage Avaya Aura® MS.
   If you are already logged in to Avaya Aura® MS EM, you can click on Network in the upper-left of EM to access System Manager.
2. Click Administrators.
4. Click the role you want to access from the list or click Add... to create a new role.
   Use Avaya Aura® Media Server as the element or resource type when configuring roles.
   For detailed steps on adding, deleting or modifying roles in System Manager, see Administering Avaya Aura® System Manager Release 6.3.
Configuring administrators

Procedure

1. Gain access to System Manager that is configured to manage Avaya Aura® MS.
   
   If you are already logged in to Avaya Aura® MS EM, you can click on **Network** in the upper-left of EM to access System Manager.

2. Click **Administrators**.

   For detailed steps on adding, deleting, or modifying administrators in System Manager, see *Administering Avaya Aura System Manager Release 6.3*. 
Chapter 12: Troubleshooting

Installation troubleshooting

Installer fails to launch or deploys corrupt files

When running the Avaya Aura® MS installer you see an error before the installer opens, the installer does not complete, or files deployed by the installer are corrupt.

This can be caused by an incomplete or corrupt file download.

Proposed solution

As a quick initial check, compare the file size of the downloaded installer to the source installer file size. Next, use the available SHA1 or SHA2 checksum to ensure that the installer you downloaded is complete and not corrupt.

Perform the following procedure to verify the integrity of the installer file using the SHA1 or SHA2-512 checksum:

Procedure

1. Gain access to the downloaded installer file on the server.
2. Issue one of the following Linux® commands to produce a checksum result of the downloaded file:
   
   ```
   sha1sum MediaServer_7.7.0.1077_2015.04.23.bin
   sha512sum MediaServer_7.7.0.1077_2015.04.23.bin
   ```
3. Compare the hash string generated by the command in Step 2 to the hash string provided by Avaya for the same version of the installer.
   
   If the hash strings do not match, re-download the installer and verify the checksum on the new download.

Linux® installer fails to launch: Permission denied

When running the Linux® Avaya Aura® MS installer you see the following error:

```
Launching installer...
Error: dl failure on line 864
```
Troubleshooting

Error: failed
/tmp/install.dir.6180/Linux/resource/jre/lib/i386/server/libjvm.so, because
/tmp/install.dir.6180/Linux/resource/jre/lib/i386/server/libjvm.so: cannot restore
segment prot after reloc: Permission denied

The permission error happens because the installer uses Java 7 and SE Linux is enabled for the
system.

Proposed solution

Use the sestatus command to determine the SE Linux status on the system:

```
sestatus
```

```
SELinux status: enabled
SELinuxfs mount: /selinux
Current mode: enforcing
Policy version: 21
Policy from config file: targeted
```

If the SE Linux current mode is set to enforcing, as in the example, then issue the following
command prior to running the installer, to temporarily set system permissions for the installer to run:

```
setenforce 0
```

After running the installer, you can restore the SE Linux protection mode with the following
command:

```
setenforce 1
```

QFE Patch troubleshooting

The QFE patch is not listed by the amspatch tool

When you use the amspatch list all command you do not see the patch you downloaded in the list of
available patches.

The patch file must be present in the patch repository so that the tool can find it.

The patch is not listed if the file permissions are set to read-only on the file that was downloaded to
Avaya Aura® MS.

Proposed solution

Ensure that the QFE file is present in the QFE directory of the Avaya Aura® MS installation:

- Linux®: `installpath/ma/MAS/QFE`
- Windows®: `installpath/multimedia-applications/MAS/QFE`

Ensure the file permissions on the QFE file are not set to read-only.
Element Manager troubleshooting

Cannot connect to EM

After installing or upgrading to Avaya Aura® MS 7.7 FP1 or later, you cannot connect to Element Manager (EM).

A possible cause for this problem is that the web browser you are using does not have TLSv1.2 enabled.

Solution

Beginning with Avaya Aura® MS 7.7 FP1, the web browsers that you use to access EM must support TLSv1.2. Ensure that you are using the latest version of Chrome, Firefox, or Internet Explorer with TLSv1.2 enabled. If you are using an older web browser, like Internet Explorer 8, you can manually enable TLSv1.2.

You can determine if your web browser supports TLSv1.2 by referencing the table titled TLS/SSL support history of web browsers at the following URL: [https://en.wikipedia.org/wiki/Transport_Layer_Security#Web_browsers](https://en.wikipedia.org/wiki/Transport_Layer_Security#Web_browsers).

Cannot log in to EM after installation on Linux®

After installation on a Linux® system, you cannot log in to Element Manager (EM) using the system login account.

Possible causes include:

- You did not properly configure the local login settings for EM during the installation.
- If you see the EM login error message shown below, then the PasswordAuthentication in the SSH configuration might be disabled.

```
Login error. Could not authenticate through SSH server!
```
- The firewall is blocking the TCP ports which EM requires.
- Localhost is not configured as 127.0.0.1.

Proposed Solutions

Checking the user group

About this task

Perform the following procedure to ensure that the group the user belongs to is included in the authenticable groups list:

Note:

This procedure requires root privileges and can only be performed on non-appliance versions of Avaya Aura® MS.
Procedure

1. Using a Linux® shell on Avaya Aura® MS, change to the root user by running the following command:
   
   su -

2. Change to the following directory:

   cd $MASHOME/../apache-tomcat/mas/conf

3. Edit the `local-accounts.properties` file and check the `locallogin.authenticable.groups` settings.
   
   For example, if the group for the system login account is `root`, the settings is as follows:

   `locallogin.authenticable.groups=root`

4. If the group to which the system login account belongs is not listed in the value, add the group.
   
   Use semicolons to separate multiple values.

5. Save the change.

6. Restart Avaya Aura® MS Service by using the following command in a Linux® shell on Avaya Aura® MS:

   `/sbin/service avaya.em restart`

Checking PasswordAuthentication

About this task

Ensure PasswordAuthentication is enabled.

*Note:*

This procedure requires root privileges and can only be performed on non-appliance versions of Avaya Aura® MS.

Procedure

1. Use a Linux® shell on Avaya Aura® MS to change to the root user by running the following command:

   su -

2. Edit the appropriate file for your system:

   `/etc/ssh/sshd_config` or `/etc/sshd/sshd_config`

3. Change the value of PasswordAuthentication to `yes`.

4. Save the change to the file.

5. Restart SSHD using the appropriate command for your system:

   `/etc/init.d/sshd restart` or `/etc/init.d/ssh restart`.
Checking firewall rules

About this task
Perform the following procedure to ensure that the Linux® firewall is properly configured:

Procedure
1. See Configuring the Linux® firewall in Installing and Updating Avaya Aura® Media Server Application on Customer Supplied Hardware and OS.
   The default TCP ports required for EM are: 8005, 8009, and 8443.
2. After you configure the firewall, you can verify whether the required ports are in the LISTEN state using the following command in a Linux® shell:
   netstat -tulpn

Cannot log in to EM after installation on Windows®

You cannot gain access to EM after a successful installation.
A possible cause for this problem is the multiple JDK or JRE Java installations on the system.
Another possible cause is that the firewall is blocking the TCP ports which EM requires.

Proposed solution

About this task
Perform the following procedure to remove multiple JDK or JRE installations from the system:

Procedure
1. To open Windows® Services, navigate to Start > Run and then type services.msc in the Open field.
2. Verify that Avaya EM Service is in the list and has a status of Started.
   If Avaya EM Service is not in the list, continue with the following steps. Otherwise, check the troubleshooting topics for another possible cause.
3. To uninstall Avaya Aura® MS, follow your parent product documentation. You can also see Uninstalling Avaya Aura® MS from Windows® in Installing and Updating Avaya Aura® Media Server Application on Customer Supplied Hardware and OS.
4. After you uninstall Avaya Aura® MS and restart Windows®, navigate to Start > Control Panel > Programs > Uninstall a program.
5. To uninstall any JDK or JRE installations, double-click the installation item and follow the onscreen instructions.
7. Reinstall Avaya Aura® MS following your parent product documentation. You can also see Installing Avaya Aura® MS on Windows® in Installing and Updating Avaya Aura® Media Server Application on Customer Supplied Hardware and OS.

If the problem still exists after reinstalling Avaya Aura® MS, contact Avaya Technical Support.

---

**Cannot log in to EM using a new user account on Windows®**

You cannot log into EM with a newly created local user account which is a member of the Administrators group.

The Microsoft User Account Control (UAC) feature can cause this problem when it is enabled.

**Proposed solution**

**About this task**

Perform the following procedure to disable the Microsoft User Account Control (UAC) feature to allow new administrator users can log in. If changing the security level in Windows® is not acceptable with site security policy, use only the primary Windows® administrator login credentials for EM login.

**Procedure**

1. Open the Local Security Policy window by going to Start > Run and typing secpol.msc in the Open field.
3. Scroll down in the Policy list the system displays in the right pane and double-click User Account Control: Run all administrators in Admin Approval Mode.
4. Select Disabled.
5. Click OK.

---

**Cannot log in to EM using desktop shortcut with IE**

Using the EM Windows® desktop shortcut, you cannot log in to EM in the following conditions:

- Internet Explorer is the default browser on the Windows® system where you have installed Avaya Aura® MS.

This issue can happen when Internet Explorer validation fails for the certificates used by web servers. This includes the certificates served by Avaya Aura® System Manager web server and Avaya Aura® MS web server.
Proposed Solution

Procedure

1. Perform the following steps to obtain the Certificate Authority certificate for the Avaya Aura® System Manager:
   a. Log on to the Windows® Avaya Aura® MS server.
   b. Open a browser and connect to the associated System Manager server that you use for Single Sign-On.
   c. Log in to System Manager.
   d. In the Services area on the Home tab, click the Security link.
   e. On the Security tab, click Certificates.
   f. Click Authority under Security > Certificates.
   g. On the Certificate Authority page, click Download to Internet Explorer.
   h. Save the default.cacert.crt file somewhere on the Avaya Aura® MS server.
      This is the CA certificate that you import to Internet Explorer.

2. Perform the following steps to add the Certificate Authority certificate in Internet Explorer for Trusted Root Certification Authorities:
   a. Log on to the Windows® Avaya Aura® MS server.
   b. Open Internet Explorer.
   c. Go to Tools > Internet Options.
   d. Click the Content tab.
   e. In the Certificates section, click Certificates.
   f. Click Import.
      The system displays the Certificate Import Wizard window.
   g. Click Next.
   h. Click Browse to select default.cacert.crt, the System Manager CA certificate file, that you have saved earlier on Avaya Aura® MS.
   i. Click Next.
   j. Select Place all certificates in the following store.
   k. Click Browse
   l. Select Trusted Root Certification Authorities.
   m. Click OK.
   n. Click Next.
   o. Click Finish.
      The system displays the security warning message.
p. Click Yes.

The system displays, The import was successful.

q. Click OK.

r. Go to the Trusted Root Certification Authorities tab by clicking on the small arrows in the top right corner.

s. Ensure a certificate with default in the Issued To and Issued By fields is listed.

t. Click Close.

u. Click OK.

---

EM cannot download files when using IE

You are unable to download any files from EM. IE can block encrypted files from being downloaded.

---

EM cannot upload files larger than 2 GB

You can encounter errors when using EM to upload large files because many browsers have a 2 GB limit on file upload.

Proposed Solutions

- Use the latest versions of Chrome or Firefox. These browsers support file uploads greater than 2GB.
- Use an alternate upload procedure, such as using a tool like sftp or scp to transfer the file to the server. After the file is on the server, move it to the correct location. For example, a backup file must be placed in the backups folder, as follows:

  Linux®: $MASHOME/platdata/EAM/Backups
  Windows®: %MASHOME%platdata\EAM\Backups

---

EM displays a blank page after login when using IE

After logging on to EM with valid credentials, you see a blank page. IE can block access to servers that are not in the trusted sites list. If the server you are connecting to is not in the trusted sites list, the browser does not display the EM pages.

---

Certificate error seen on IE when using EM

You see a certificate error message next to the URL field when using IE to access EM.
Downloading a trust certificate revocation list fails

Condition

After clicking Download CRL on the EM > Security > Certificate Management > Trust Store page, you see an error that the system could not download the certificate revocation list (CRL) from the trust store.

Cause

Possible causes for this problem include:

- A connection failure because of incomplete mutual authentication configuration between Avaya Aura® MS EM and the server hosting the CRL
- An import failure has occurred after the CRL is downloaded. CRL formats other than DER are not supported and cannot be imported.

Proposed Solutions

Resolving a connection failure:

Ensure that there is correct mutual authentication configuration between Avaya Aura® MS EM and the server hosting the CRL by performing the following imports:

- Import the CA Certificate that signs the key certificate for the server hosting the CRL into the Avaya Aura® MS trust store.
- Import the CA Certificate that signs the key certificate for the AMS Clustering service into the trust store of the CRL server.

Resolving import failures:

Perform the following procedure to ensure that the CRL distribution point URI and CRL format are correct:

1. Determine the CRL distribution point URI in the CA certificate. You can do so by using the following OpenSSL command to view the certificate contents and obtain the URI:
   
   openssl x509 -text -noout -in certfilename

2. Copy the CRL distribution point URI from the certificate and paste it into the URL field of a browser.
   
   The CRL downloads if the CRL distribution point URI is valid. If the download fails, the CRL distribution point URI is invalid or obsolete.

3. If the CRL distribution point URI downloads, then verify the format of CRL. DER files are binary. PEM files are Base64 encoded.

4. Avaya Aura® MS supports the DER format. If the file is in PEM format, you can convert the PEM file to DER format by using the following OpenSSL command:
   
   openssl crl -in inputfile -outform DER -out outputfile

   For example:
   
   openssl crl -in crl.pem -outform DER -out crl.der
5. Perform the following procedure to manually import the DER formatted:
   a. Navigate to **EM > Security > Certificate Management > Trust Store.**
   b. Select the required trust store certificate authority from the list.
   c. Click **Import CRL**
   d. Click **Browse** and select a file to set the **Trust certification revocation list import file** field.
   e. Click **Save.**

---

**VeriSign cannot sign a CSR generated by EM**

**Condition**

VeriSign reports an error when you try to sign a certificate signing request (CSR) which was generated by Avaya Aura® MS EM.

VeriSign rejects a CSR as improperly formatted when the CSR contains a Subject Alternative Name extension. VeriSign considers an included Subject Alternative Name extension as a separate certificate and requires fees to for each additional Subject Alternative Name extension included.

**Proposed solutions**

- If you do not require a Subject Alternative Name extension in the CSR, then generate the CSR in EM without specifying a Subject Alternative Name extension.
- If you require a Subject Alternative Name extension in the CSR, use the VeriSign website to add the Subject Alternative Name extensions required.

---

**The EM Media Management tool is slow**

You can experience slow system response times when browsing media using **EM > Tools > Media Management.**

A possible cause for this problem is that you have installed anti-virus software on the system and that Avaya Aura® MS related directories are not in the scan exclusion list.

**Proposed solution**

If you install anti-virus software, ensure that you exclude the following directories from the scans:

- **Linux®:**
  ```
  $MASHOME/avaya/ma/MAS/common/log
  $MASHOME/avaya/ma/MAS/platdata
  ```
- **Windows®:**
  ```
  %MASHOME%\Avaya\multimedia_applications\MAS\common\log
  %MASHOME%\Avaya\multimedia_applications\MAS\platdata
  ```
Call completion troubleshooting

Avaya Aura® MS rejects incoming SIP sessions

Avaya Aura® MS rejects SIP sessions in the following manner:

- Avaya Aura® MS rejects incoming SIP sessions for one or more service types. Use the Log Viewer to identify attempts to launch an uninstalled or unlicensed service.
- Avaya Aura® MS rejects incoming SIP sessions. You see SIP failure responses such as 305 Use Proxy, or 403 Forbidden, in the message traces or logs.

Possible causes for these problems include:

- Calls to services on Avaya Aura® MS that are not licensed, receive a SIP final response indicating that the service is unavailable.
- The proxy configuration is incomplete.
- The target service application is not installed.
- Avaya Aura® MS is in the Pending Lock state.

Proposed solution

Checking the license

About this task

Perform the following procedure to ensure that the required licenses are configured:

Procedure

1. To check the number and variety of installed licenses, navigate to EM > Licensing > General Settings > Licensing Details.

   Ensure that the required licenses are installed and available.

   If you need to alter the license configuration, see License configuration for detailed procedures.

2. Restart Avaya Aura® MS to activate any installed license.

Related links

License configuration on page 60

Checking proxy configuration

About this task

Perform the following procedure to verify whether the required SIP proxy nodes and routes are configured:

Procedure

1. Navigate to EM > System Configuration > Signaling Protocols > SIP > Nodes and Routes.
2. Ensure that you have configured the required **Trusted Nodes**.
3. Ensure that you have configured the required **SIP Routes**.

If you need to add trusted SIP nodes or SIP routes, see the procedures for SIP configuration.

**Related links**
- [SIP configuration](#) on page 85

**Checking application installation**

**About this task**

If you have not installed a required application then the requests for that application fail.

Perform the following procedure to ensure that you have installed and unlocked the required applications:

**Procedure**

1. Navigate to **EM > Applications > Packaged Applications**, and ensure that the target service is installed.
   
   If necessary, install the application using the application installer.

2. Navigate to **EM > Applications > Operational State** and ensure that the target service is unlocked.
   
   If necessary, unlock the application by selecting the check box next to the desired application and then click **Unlock**.

**Checking if Avaya Aura® MS is in Pending Lock state**

**About this task**

Avaya Aura® MS in the Pending Lock state rejects new service requests. If this state is not required, then you can resolve the issue by unlocking Avaya Aura® MS as described in the following procedure:

**Procedure**

1. Navigate to **EM > System Status > Element Status** to check the state of Avaya Aura® MS.

2. Set Avaya Aura® MS state to the Unlocked state by selecting **More Actions > Unlock**.

---

**Unsupported codec response from Avaya Aura® MS**

Avaya Aura® MS sends the following unsupported codec responses:

- Rejects incoming sessions and indicates there is no supported codec.
- Responds with a SIP 415, Unsupported Media Type.

The possible causes of these problems include:

- The session request does not offer a supported audio codec.
• When you configure Avaya Aura® MS with SECURITY ENFORCED security policy, Avaya Aura® MS does not accept sessions from clients offering insecure media.

Proposed solution

About this task
Perform the following procedure to set the security policy to BEST EFFORT so that Avaya Aura® MS can process sessions from clients offering insecure media:

Procedure
1. Navigate to EM > System Configuration > Media Processing > Media Security.
2. Select BEST EFFORT for the Security Policy mode, and adjust the Best Effort Mode and Crypto Suites.

For more information, see Media security configuration.

If the security settings are not the cause, then the session incoming to Avaya Aura® MS is not offering a supported audio codec.

Related links
Media security configuration on page 119

TLS connection issues

Clients using Transport Layer Security (TLS) are unable to connect to Avaya Aura® MS.

The possible causes for TLS connection issues include:

• The certificates on either side of the attempted connection have expired.
• The Trust Anchor configuration is incomplete.
• All the nodes in a cluster are not TLS enabled.
• The IP address of the server is changed.
• The configuration is incomplete or pending a restart.
• A backup file containing expired certificates or incorrect TLS configuration settings was restored.

Proposed solution

See proper security configuration documents and ensure that all settings are implemented correctly.

Some common solutions for these problems include:

• Ensure that certificates on either side of the attempted connection did not expire.
• Ensure that the Trust Anchor is in the Trust Store on all cluster nodes.
• Ensure that all nodes in a cluster are TLS enabled for every interface.
• When the IP address of a server changes, new certificates may be required if subject alt name is used.
• If a restoration, using a backup file containing expired certificates or outdated TLS configuration settings was used, then fix the TLS configuration.
• Some TLS changes require an Avaya Aura® MS restart for the changes to take effect.
• Confirm that the media security settings meet the requirements. For more detailed information, see Media security configuration.

Related links
Media security configuration on page 119

Digit collection issues
Users are unable to log in to Avaya Aura® MS services because of problems with digit connection.

The possible reasons for digit collection issues include:
• The client may connect to Avaya Aura® MS through a PSTN or other form of internet gateway device. In this case you must configure the gateway device to properly translate digits in a format that negotiates with Avaya Aura® MS. The following are the supported digit signaling formats:
  - In-band DTMF tones
  - RFC 2833 telephone events
  - SIP INFO digits
• To communicate digits, the client and the gateway device must use the same digit signaling formats.
• Some gateways that translate in-band digits into events, such as telephone-event or INFO digits, fail to completely clamp the received tones. These tones are heard by Avaya Aura® MS and can trigger unexpected behavior.
• If necessary, collect SIP messaging to resolve the nature of digit communication issue between the client, gateway, and Avaya Aura® MS.
• In some cases, such as conferencing, clients unintentionally send digits into the conference through their microphone. The system detects these digits as conference controls in the conference. For example, a person near a conference user dials a number on a speakerphone. The digits can carry in the conference over the microphone of the active user.
• When users report digit collection issues, ask about the client type and surroundings to identify the cause of any unexpected conference behaviors.

Proposed solutions
• Configure the mode of digit transport from the clients or gateways or both for your installation. Digit translating gateway devices might require adjustments in order to fully clamp in-band DTMF tones.
• Analyze traces to ensure that clients and gateways are properly communicating digits to Avaya Aura® MS.
• Advise users in noisy surroundings to ensure minimal background noise as the background noise might impact digit collection.
Media playback troubleshooting

Unable to playback provisioned audio file

Proposed solution

Avaya recommends that audio to be played by Avaya Aura® Media Server be encoded as 16 bit, 8 kHZ, single channel, PCM files. Codecs other than PCM or using higher sampling rates for higher quality recordings can be used, however, with reduced system performance. Multiple channels, like stereo, are not supported.

Streaming music troubleshooting

Users do not hear streaming RSS audio

The possible causes for this problem are:

- Improper configuration.
- The configured RSS URL is unavailable or unreachable.
- The audio files specified in the RSS document not in MP3 or WAV audio format.

Proposed Solution

Check the RSS configuration:

- Ensure that the RSS URL and channel key are correct.
- Ensure that the audio files specified in the RSS document are in either MP3 or WAV audio format and that all of the other requirements are met. See Adding a streaming music source on page 126 for a complete list of requirements.
- Ensure that the RSS document is formatted correctly. The following is an example of an RSS document with correct formatting:

```xml
<?xml version="1.0" encoding="UTF-8"?>
<rss version="2.0">
  <channel>
    <title>Relaxing Music</title>
    <description>Example RSS Music Playlist</description>
    <language>en-us</language>
    <ttl>15</ttl>
    <item>
      <title>Corporate Edge - A Clear Vision</title>
      <enclosure url="http://musicserver/Music/DavenportMusic-0.wav" type="audio/wav"/>
      <guid>35942909-51f1-11e5-b4f5-00ff0699410</guid>
    </item>
    <item>
      <title>Corporate Edge - First Impressions</title>
    </item>
  </channel>
</rss>
```
Troubleshooting

The following is a successful wget example:

```
wget http://xyz.com/audio/rss/feed.xml
Resolving webproxy.avaya.com... 8.28.150.65
Connecting to webproxy.avaya.com|8.28.150.65|:80... connected.
Proxy request sent, awaiting response... 200 OK
Length: 1025790 (1002K) [text/xml]
Saving to: `feed.xml'
2014-01-06 18:39:27 (2.85 MB/s) - `feed.xml' saved [1025790/1025790]
```

The following is a successful cURL example:

```
curl http://xyz.com/audio/rss/feed.xml
BBB?xml version="1.0" encoding="UTF-8" ?>
BBBrss xmlns:itunes="http://www.itunes.com/DTDs/Podcast-1.0.dtd" version="2.0">
BBBchannel>
 . . .
BBB/channel>
BBB/rss>
```

Proposed solution

Check the RSS configuration:

- Ensure that the RSS URL and channel key are correct.
- Adjust the continuous streaming source volume level on the media server.
- Ensure that the audio files specified in the RSS document are in either MP3 or wav audio format.
- Ensure the RSS URL is reachable from the media server by attempting to resolve the URL from the media server. To do this, you can use wget or cURL with the configured RSS URL.

The following is a successful wget example:

```
wget http://xyz.com/audio/rss/feed.xml
Resolving webproxy.avaya.com... 8.28.150.65
Connecting to webproxy.avaya.com|8.28.150.65|:80... connected.
Proxy request sent, awaiting response... 200 OK
Length: 1025790 (1002K) [text/xml]
Saving to: `feed.xml'
2014-01-06 18:39:27 (2.85 MB/s) - `feed.xml' saved [1025790/1025790]
```
Users do not hear streaming SHOUTCast audio

Users do not hear audio from the configured SHOUTCast source or you see the following alarm:

Alarm ID 361: There is a problem communicating with the SHOUTCast providers.

The possible causes for the problem are:

- Improper configuration.
- The configured SHOUTCast URL is unavailable or unreachable.
- The RSS document is incorrectly formatted.
- The audio provided by the configured SHOUTCast URL is not in MP3 or WAV audio format.

Proposed solution

Check the SHOUTCast configuration:

- Ensure that the SHOUTCast URL and channel key are correct.
- Ensure that the SHOUTCast proxy server host and port configuration are correct.
- Ensure that the streaming source is in either MP3 or WAV audio format and that all of the other requirements are met. See Adding a streaming music source on page 126 for a complete list of requirements.
- Ensure that the SHOUTCast URL is reachable from the media server by attempting to resolve the URL from the media server. To do this, you can use wget or cURL with the configured SHOUTCast URL.

The following is a successful wget example:

wget http://yp.shoutcast.com/sbin/tunein-station.pls?id=227567
Resolving webproxy.avaya.com... 8.28.150.65
Connecting to webproxy.avaya.com [8.28.150.65]:80... connected.
Proxy request sent, awaiting response... 200 OK
Length: 5080 (5.0K) [audio/x-scpls]
Saving to: 'tunein-station.pls?id=227567.2'
Problems with streaming music provider status

The EM page for monitoring music stream status indicates problems with a music provider. The color of the Stream Key for a music provider indicates the status of the provider. If the status is a color other than green and has a status other than Stream is available, then there is a potential problem with the stream.

Proposed solution

User the following table to identify solutions for each music provider error.

<table>
<thead>
<tr>
<th>Status</th>
<th>Possible cause</th>
<th>Proposed solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stream status is unknown</td>
<td>Stream is initializing after being configured</td>
<td>Normal Condition. No action required.</td>
</tr>
<tr>
<td>Stream is available</td>
<td>The stream is providing audio.</td>
<td>Normal Condition. No action required.</td>
</tr>
<tr>
<td>At least one configured URL is currently unreachable.</td>
<td>The primary or backup URL provider is unreachable.</td>
<td>Check connectivity to the configured URLs. Configure another provider if the provider cannot be reached. Configure an HTTP proxy for external music source access</td>
</tr>
<tr>
<td>Primary URL is not reachable, using backup URL.</td>
<td>The primary URL failed and the backup URL is being used. The media server does switch back to the primary URL until the media server is restarted or the backup URL fails.</td>
<td>Check that the primary URL can be reached. If it cannot then consider using a different primary provider URL. Configure an HTTP proxy for external music source access.</td>
</tr>
</tbody>
</table>

Table continues…
<table>
<thead>
<tr>
<th>Status</th>
<th>Possible cause</th>
<th>Proposed solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>All streaming servers are unreachable, currently using a pre-recorded backup file.</td>
<td>The provider URLs are unreachable. Up to 15 minutes of audio recorded from the provider is being played in a loop. At least 30s of audio must have been previously captured from the provider to enable recorded audio playback as a backup.</td>
<td>Check the connection to the provider URLs and consider using a different provider if the connection cannot be established. Configure an HTTP proxy for external music source access.</td>
</tr>
<tr>
<td>Stream status is pending.</td>
<td>The stream has been initialized and the connection to the provider is being attempted.</td>
<td>Wait for a momentary status change indicating the result of the connection attempt.</td>
</tr>
<tr>
<td>The configured stream has no files provisioned.</td>
<td>There are no media files in the channel folder for the stream.</td>
<td>MP3 or WAV files need to be added to Local Directory or Content Store provider.</td>
</tr>
<tr>
<td>The connection to a streaming server was lost.</td>
<td>An active connection to the provider has failed.</td>
<td>Verify the configured URL is correct.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Determine if the provider is reachable and returns playlist documents.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A provider may have gone offline based on its daily schedule. Select providers that are always available.</td>
</tr>
<tr>
<td>The RSS document has no usable or valid files for synchronization.</td>
<td>The RSS provider has no useable media content that can be downloaded and played.</td>
<td>Select an RSS provider that has native MP3 or WAV content.</td>
</tr>
<tr>
<td>The RSS document is invalid.</td>
<td>The RSS provider XML document cannot be parsed.</td>
<td>Choose another RSS provider.</td>
</tr>
<tr>
<td>Configured proxy server unreachable.</td>
<td>The SHOUTcast provider HTTP proxy is unavailable.</td>
<td>Diagnose connectivity with the SHOUTCast HTTP proxy.</td>
</tr>
<tr>
<td>Streaming server playlist invalid or unreachable.</td>
<td>An HLS master playlist file contains an unreachable media playlist.</td>
<td>Diagnose the HLS provider master playlist for media playlists that are unreachable</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Resolve connection issues. Configure a different HLS provider.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Configure an HTTP proxy for external music source access</td>
</tr>
</tbody>
</table>

For detailed steps for testing SHOUTCast and RSS connections, see Users do not hear streaming SHOUTCast audio on page 237 and Users do not hear streaming RSS audio on page 235.

Related links
- Monitoring music streams on page 196
- Configuring an HTTP proxy for external music source access on page 125
High Availability troubleshooting

Cannot enable High Availability because it is disabled

When you navigate to EM > Cluster Configuration > High Availability > General Settings, you cannot select Enable High Availability.

You can select Enable High Availability only if the prerequisite High Availability configuration is complete, that is, a Primary and Backup server must be configured.

Proposed Solution

Perform the prerequisite High Availability configuration procedures in the correct order. For detailed information, see The 1+1 High Availability cluster configuration.

Related links

1+1 High Availability cluster configuration on page 45

Protocol troubleshooting

SNMP Traps are not getting posted on management consoles

SNMP Traps are not posting to the monitoring system management servers.

The possible causes for this problem include:

• Network connectivity problems.
• SNMP Service is not started on Avaya Aura® MS.
• SNMP Community string mismatch.
• SNMP Delivery is not enabled.
• An incorrect SNMP network manager address.
Proposed solution

Checking the network

About this task
Perform the following procedure to confirm there are no network problems between the monitoring system and Avaya Aura® MS:

Procedure
1. Verify that the monitoring system and Avaya Aura® MS can ping each other.
2. If the ping test fails, troubleshoot the network connection between the monitoring system and Avaya Aura® MS.

Checking the SNMP service

About this task
Perform the following procedure on Windows®-based servers to verify that you have installed the SNMP and the service is running:

Procedure
1. Navigate to Start > Run and then type services.msc in the Open field to open the Windows® Services.
2. Verify SNMP Service is in the list and has a status of started.
3. If SNMP Service is not running, then right-click and select Properties.
4. Click Start, and set Startup type to Automatic.

Checking the SNMP community string

About this task
The following procedure verifies that the SNMP Community string on the monitoring system and on Avaya Aura® MS are the same.

Procedure
1. Check the configured community string on the monitoring system.
2. Check SNMP community string on Avaya Aura® MS by navigating to EM > System Configuration > Network Settings > General Settings > SNMP Trap > Community String.
   If the community string on the monitoring system does not match the one on Avaya Aura® MS, then change one string to match the other.
3. If you change the community string on Avaya Aura® MS, then restart Avaya Aura® MS for the change to take effect.
SNMP delivery is not enabled

Procedure
1. Ensure that Delivery of Alarms via Traps is selected on Avaya Aura® MS by navigating to EM > System Configuration > Network Settings > General Settings > SNMP Traps.
2. If you change Avaya Aura® MS, then restart Avaya Aura® MS for the change to take effect.

Incorrect SNMP network manager address

Procedure
1. Ensure that SNMP Network Manager Address is configured with the correct address on Avaya Aura® MS by navigating to EM > System Configuration > General Settings > SNMP Traps.
2. If you change Avaya Aura® MS, then restart Avaya Aura® MS for the change to take effect.

SMTP mail delivery is not working

Avaya Aura® MS does not deliver recorded conferences or other e-mails sent by applications on the media server as expected, using Simple Mail Transport Protocol (SMTP).

Configuration, provisioning, or SMTP server availability are the typical causes for this problem. Sometimes, the network security settings prevent access to the SMTP server.

Proposed solution
• Ensure that an SMTP server address is configured for the service. You can configure these settings on the provisioning system connected to Avaya Aura® MS. In some cases, you need to provision and save a destination e-mail address for each user in Avaya Aura® MS.
• Ensure that the SMTP server address configured refers to a valid in service mail server.
• Ensure that the network settings are configured in such a way that Avaya Aura® MS can gain access to the SMTP server configured as the e-mail server.

SOAP connection is rejected

A provisioning or management system cannot connect to Avaya Aura® MS SOAP interface.

Possible causes for this problem include:
• The SOAP configuration is not complete.
• The remote server is not in the SOAP Trusted Nodes list when you enable the use of Trusted SOAP Nodes on Avaya Aura® MS.
• The SOAP server address or port used is incorrect or are changed in one of the endpoints.
Proposed solution

About this task
Perform the following procedure to verify SOAP configuration on Avaya Aura® MS and on the management system which is attempting to connect to Avaya Aura® MS.

Procedure

1. For basic SOAP configuration details, see Configuring SOAP and then perform the following checks:
   a. Verify that each setting of the SOAP configuration on Avaya Aura® MS is compatible with the settings of the system which is attempting to connect to Avaya Aura® MS.
   b. Verify that the system which is attempting to connect to Avaya Aura® MS is in the SOAP Trusted Nodes list. This is required when you select Enable Trusted SOAP Nodes.
2. Check that the ports configured for SOAP on Avaya Aura® MS match the SOAP ports configured on the system which is attempting to connect to Avaya Aura® MS.
   a. Navigate to EM > System Configuration > Network Settings > Advanced Settings > Port Assignments.
   b. Scroll down to Management SOAP Server.
   c. Verify the admin_soap_tls port value.
   d. Verify the admin_soap port value.

Related links
Configuring SOAP on page 74

SFTP configuration requires a fingerprint or key file
Avaya Aura® MS requires you to configure a Secure FTP Remote Server Fingerprint and Secure FTP Key File Name. This is common for OM delivery, backup destinations, or other file transfer related tasks which use SFTP.

Proposed Solution
Use the following procedure to create the required data for configuring Secure FTP Remote Server Fingerprint and Secure FTP Key File Name on the media server.

1. Open a Linux® shell for the server that hosts the SFTP server.
2. To create public and private keys without a passphrase, run the following command:
   `ssh-keygen -t rsa`
3. Copy private and public keys to the local SSH directory. For example, copy the keys to `/etc/ssh`.
4. Perform the following steps to convert the private and public keys:
   a. To convert the private key to putty format, run the following command:
      `puttygen path_to_private_key -o converted_private_key`
For example, `puttygen id_rsa -o putty_id_rsa.ppk`

b. To convert the public key to OpenSSH format, run the following command:

```
puttygen path_to_public_key -O public-openssh -o converted_public_key
```

For example, `puttygen id_rsa -O public-opensssh -o putty_id_rsa.pub`

c. To obtain the fingerprint of the public key, run the following command:

```
puttygen path_to_private_key -O fingerprint -o path_to_fingerprint_file
```

For example, `puttygen id_rsa -O fingerprint -o fingerprint.txt`

5. To configure the keys, edit file `/etc/ssh/sshd_config` as follows:

a. To complete the AuthorizedKeysFile configuration uncomment or add the following line:

```
AuthorizedKeysFile ~/.ssh/authorized_keys
```

b. Locate the following records in the file:

```
#HostKey /etc/ssh/ssh_host_rsa_key
#HostKey /etc/ssh/ssh_host_dsa_key
```

c. Add a new HostKey entry. Which specifies the private key generated on in Step 2:

```
HostKey /etc/ssh/id_rsa
```

d. Save the changes.

6. To add the new identifier, edit file `~/.ssh/authorized_keys`, and add the content of the `putty_id_rsa.pub` file.

7. To restart the secure shell service, run the following command:

```
service sshd restart
```

8. Obtain the **Secure FTP Remote Server Fingerprint** for use in media server SFTP configuration from the file `fingerprint.txt`.

9. Transfer the file `putty_id_rsa.ppk` to the media server and save it in `$MASHOME/platdata/ssl`. Specify this file as the **Secure FTP Key File Name** when configuring SFTP on the media server.
Chapter 13: Related resources

Documentation

See the following related documents at http://support.avaya.com.

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</tr>
</thead>
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</tr>
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<td></td>
<td></td>
</tr>
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<td>engineers</td>
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<tr>
<td></td>
<td>Media Server</td>
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</tr>
</tbody>
</table>

Viewing Avaya Mentor videos

Avaya Mentor videos provide technical content on how to install, configure, and troubleshoot Avaya products.

About this task

Videos are available on the Avaya Support website, listed under the video document type, and on the Avaya-run channel on YouTube.
Procedure

• To find videos on the Avaya Support website, go to http://support.avaya.com and perform one of the following actions:
  - In Search, type Avaya Mentor Videos to see a list of the available videos.
  - In Search, type the product name. On the Search Results page, select Video in the Content Type column on the left.

• To find the Avaya Mentor videos on YouTube, go to www.youtube.com/AvayaMentor and perform one of the following actions:
  - Enter a key word or key words in the Search Channel to search for a specific product or topic.
  - Scroll down Playlists, and click the name of a topic to see the available list of videos posted on the website.

  Note:
  Videos are not available for all products.

Support

Go to the Avaya Support website at http://support.avaya.com for the most up-to-date documentation, product notices, and knowledge articles. You can also search for release notes, downloads, and resolutions to issues. Use the online service request system to create a service request. Chat with live agents to get answers to questions. You can also request an agent to connect you to a support team if a problem requires more expertise.
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