



# **Implementing and Administering Avaya Aura® Media Server**

**Release 7.7**

**Issue 3**

**Design Team Master Doc**

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# Contents

<b>Chapter 1: Introduction</b>	<b>11</b>
Purpose	11
Intended audience	11
Documentation	11
Support	12
Warranty	12
<b>Chapter 2: New in this release</b>	<b>13</b>
Audio codecs	13
Aurix Speech Search Engine	13
Backup using SFTP	13
Content Store on Standard nodes	13
Dual unicast monitoring	14
System Manager enrollment	14
Music streaming (FP1)	14
Certificate management enhancements (FP1)	15
<b>Chapter 3: Management interface</b>	<b>16</b>
Introduction to Element Manager	16
EM installation	16
Web browser configuration	16
Enabling SSL file downloads in IE	17
Adding EM to the trusted sites list in IE	17
EM overview	18
EM interface	20
Setting the content pane refresh frequency	22
Advanced settings and engineering parameters	22
<b>Chapter 4: Quick setup</b>	<b>24</b>
Quick installation and configuration	24
Installing Avaya Aura® MS on Linux®	24
Installing Avaya Aura® MS on Windows®	26
Configuring Avaya Aura® MS by using EM	27
Quick call testing, monitoring, and debugging	28
Making a test call and monitoring active sessions	28
Reviewing session detail records	31
Viewing call traces for debugging	32

<b>Chapter 5: Basic management tasks .....</b>	<b>35</b>
Signing in to EM.....	35
Observing the current operational status by using EM.....	35
Starting and stopping the media server .....	36
Setting the operational state.....	37
Managing the High Availability state.....	38
Viewing the software inventory .....	39
Reviewing the PVI Check results.....	40
System configuration and trace logs .....	40
Enabling Debug Tracing .....	41
Downloading a log capture by using a web browser.....	41
Downloading a log capture by using the command-line mode.....	42
Obtaining the UUID of a media server.....	42
Changing users for EM login on Linux® .....	43
<b>Chapter 6: Configuration .....</b>	<b>45</b>
Configuration overview .....	45
N+1 Load Sharing duster configuration.....	45
Configuring a Primary server for a cluster .....	46
Configuring a Secondary server for a duster.....	47
Configuring a Standard server for a cluster .....	49
Configuring the replication settings for a duster.....	51
Configuring SIP load balancing for a cluster .....	51
Replication of configuration settings in a duster .....	53
1+1 High Availability cluster configuration .....	53
1+1 High Availability cluster synchronization overview.....	53
Restrictions and limitations of 1+1 High Availability clusters .....	54
Configuring the Primary server for High Availability.....	55
Configuring the Backup server for High Availability.....	56
Completing 1+1 High Availability cluster configuration .....	58
Enabling High Availability.....	59
Reviewing High Availability configuration and status.....	60
Locking and unlocking the High Availability state.....	62
Recovering from network isolation.....	63
Changing the Service IP Address for a High Availability configuration.....	64
Disabling High Availability.....	64
Replication of configuration settings in a High Availability cluster .....	66
Replication of Content Store data between clusters .....	66

Configuring replication of Content Store data between clusters .....	67
Disabling replication of Content Store data between dusters.....	68
Returning servers to a cluster.....	68
Removing servers from a cluster .....	69
License configuration.....	70
Configuring License Server keys .....	70
Configuring License Server chunk size .....	72
Updating License Server keys.....	73
Configuring Nodal Licensing .....	73
Updating Nodal Licensing keys .....	74
Configuring WebLM Server licensing .....	75
License utilization alarm threshold configuration.....	77
Server profile configuration.....	78
Setting the capacity profile .....	78
Setting the media server function .....	78
Viewing the server hardware properties .....	79
Setting the processor affinity configuration .....	79
Network settings configuration.....	80
Setting the administrative name and description.....	80
Setting the network time source server .....	81
Enabling SNMP traps .....	81
Configuring the Avaya Aura® MS SNMP agent when Net-SNMP is installed after Avaya Aura® MS is installed.....	82
Configuring the Avaya Aura® MS SNMP agent.....	83
Gaining access to Avaya Aura® MS MIB .....	83
Configuring SOAP.....	84
Configuring connection security options.....	85
Configuring TLS ciphers for connections.....	85
Configuring transmit prioritization .....	101
Selecting IP interface assignments.....	101
Configuring name resolution .....	103
Changing media port ranges.....	104
Changing media server component port assignments.....	105
Changing the EM server ports.....	105
Computer name and IP address modification .....	106
Changing the computer name on Linux® .....	113
Changing the computer name on Windows®.....	114

Changing the IP address on Linux® .....	115
Changing the IP address on Windows® .....	116
SIP Configuration .....	118
Configuring SIP general settings .....	118
Adding SIP domains .....	120
Adding SIP accounts .....	121
Configuring SIP trusted nodes .....	122
Configuring SIP routes .....	122
Configuring SIP route properties .....	124
Editing a SIP domain or a SIP account .....	125
Changing the SIP account password .....	126
Deleting a SIP domain or a SIP account .....	126
Editing a SIP trusted node or a SIP route .....	126
Deleting a SIP trusted node or a SIP route .....	127
MRCP Configuration .....	127
Configuring MRCP general settings .....	127
Adding an MRCP server .....	129
Adding MRCP server resources .....	131
Adding an MRCP pool .....	132
Adding a server to an MRCP pool .....	134
Adding custom MRCP vendors .....	134
Editing custom MRCP vendors .....	135
Deleting custom MRCP vendors .....	136
Editing an MRCP server or server resources .....	136
Deleting an MRCP server .....	137
Deleting MRCP server resources .....	137
Editing an MRCP pool .....	138
Changing status of MRCP pools .....	138
Deleting an MRCP pool .....	139
Removing MRCP servers from a pool .....	139
REST configuration .....	140
Enabling secure REST requests .....	140
Disabling secure REST requests .....	140
Media processing configuration .....	141
Configuring QoS monitoring settings .....	141
Configuring QoS streaming settings .....	142
Configuring silence suppression .....	143

Configuring Aurix Speech Search Engine.....	144
Enabling dual unicast monitoring.....	144
Enabling and configuring audio codec settings.....	145
Removing an audio codec.....	146
Enabling the video media processor.....	147
Enabling and configuring video codec settings.....	147
Removing a video codec.....	149
Enabling and configuring digit relay settings.....	149
Removing a digit relay method.....	150
ICE configuration.....	151
Media security configuration.....	154
Music streaming configuration.....	157
Music stream transcoding.....	160
Configuring an HTTP proxy for external music source access.....	160
Adding a streaming music source.....	161
Editing a streaming music source.....	163
Deleting a streaming music source.....	164
Locking and unlocking a streaming music source.....	164
Security configuration.....	157
Configuring the System Manager Settings.....	165
Creating a new certificate signed by System Manager in the key store.....	166
Creating a new certificate to be signed by other Certificate Authorities in the key store.....	166
Creating a new self-signed certificate in the key store.....	166
Processing a Certificate Signing Request Response in the key store.....	167
Assigning a certificate to a service profile.....	167
Importing a key certificate to the key store.....	167
Exporting a key store certificate in PEM format.....	168
Exporting a key store certificate with a key.....	168
Importing a trust certificate to the trust store.....	169
Importing a Trust Certification Revocation List.....	169
Downloading a Certification Revocation List.....	169
Deleting Certificate Authorities from the trust store.....	170
Content Store configuration.....	170
Configuring Content Store location.....	170
EM preferences configuration.....	172
Configuring time zone preferences.....	172
Setting Login security warning text.....	172

<b>Chapter 7: System Manager enrollment.....</b>	<b>173</b>
Avaya Aura® System Manager enrollment overview.....	173
Enrolling a duster in System Manager.....	173
Disenrolling a duster from System Manager.....	176
Adding a media server to an enrolled duster.....	176
Removing a media server from an enrolled duster.....	178
Assigning applications to enrolled media server clusters.....	179
<b>Chapter 8: Media file provisioning.....</b>	<b>180</b>
Media file format.....	180
Media storage in Avaya Aura® MS Content Store.....	180
Overview of the EM Media Management tool.....	181
Media provisioning.....	182
Adding a content namespace.....	182
Renaming a content namespace.....	183
Deleting a content namespace.....	183
Viewing namespace content.....	183
Adding a content group.....	184
Adding media files to a content group.....	185
Downloading media files to your computer.....	186
Renaming a content group.....	186
Deleting a content group.....	187
Batch provision media.....	187
Searching for a media file.....	189
Renaming a media file.....	190
Moving a media file.....	191
Copying a media file.....	191
Deleting a media file.....	192
<b>Chapter 9: Application management.....</b>	<b>193</b>
Enabling the VoiceXML interpreter.....	193
Adding VoiceXML custom applications.....	193
Editing VoiceXML custom applications.....	194
Application interpreter configuration.....	194
Configuring RFC5707 (MSML) interpreter.....	194
Configuring VoiceXML interpreter.....	195
Viewing or changing application operational state.....	195
Viewing or changing custom application operational state.....	196
Configuring application signaling translations.....	196

Deleting application signaling translations .....	198
Deleting a custom application .....	199
<b>Chapter 10: Backup and restore .....</b>	<b>200</b>
Backup and restore overview .....	200
Configuring a backup task .....	200
Running a backup task .....	203
Deleting a backup task .....	204
Editing a backup destination .....	204
Restoring from the local destination .....	205
Uploading a backup file for a restore .....	205
Viewing the backup and restore history log .....	206
Configuring the history log .....	207
Using the command-line backup and restore tool .....	207
<b>Chapter 11: Avaya Aura® MS monitoring .....</b>	<b>210</b>
Avaya Aura® MS monitoring overview .....	210
Element status viewing .....	210
Viewing cluster status .....	210
Monitoring alarms .....	211
Event logs .....	214
Viewing event logs .....	215
Configuring event log throttling .....	217
Configuring log filter settings .....	218
Viewing security logs .....	220
Configuring log privacy settings .....	221
Configuring SysLog settings .....	221
Configuring event log settings .....	222
Monitor active sessions .....	222
Viewing current active sessions .....	223
Viewing details for a specific session .....	224
Releasing one or more sessions .....	227
Muting and unmuting sessions .....	227
Monitoring system performance .....	228
OM monitoring .....	229
Configuring OM settings .....	229
Configuring OM delivery .....	231
Configuring OM archiving .....	231
Monitoring protocol connections .....	232



Monitoring music streams .....	233
Advanced system monitoring.....	234
Viewing component status.....	234
Viewing advanced protocols.....	234
System license monitoring .....	235
Monitoring License Server status.....	235
SDR monitoring.....	235
Reviewing SDRs.....	236
Determining peak session traffic.....	237
Summarizing daily inbound traffic.....	238
Analyzing hourly inbound traffic details.....	239
Reviewing a monitored SDR .....	240
Configuring SDR archiving.....	245
Configuring Field Promotion for SDR reports.....	245
Enabling enhanced SDRs for troubleshooting .....	247
<b>Chapter 12: Account management .....</b>	<b>249</b>
Account management overview.....	249
Account management policies.....	249
Configuring the operating system as the authentication and authorization source .....	250
Avaya Aura® MS RBAC configuration.....	251
Configuring Avaya Aura® MS as the authentication and authorization source .....	251
Configuring Avaya Aura® MS RBAC password policy.....	252
Adding roles.....	253
Modifying role properties.....	254
Deleting roles.....	254
Adding administrators.....	255
Modifying administrator properties.....	256
Deleting administrators .....	256
Changing administrator passwords.....	257
Avaya Aura® System Manager RBAC configuration .....	257
Configuring Avaya Aura® MS to use System Manager .....	258
Configuring System Manager as the authentication and authorization source .....	258
Accessing Avaya Aura® MS EM when System Manager is not available .....	259
Configuring security policies.....	259
Configuring roles.....	259
Configuring administrators.....	260
<b>Chapter 13: Troubleshooting .....</b>	<b>261</b>

Installation troubleshooting.....	261
Installer fails to launch or deploys corrupt files.....	261
Linux® installer fails to launch: Permission denied.....	262
QFE Patch troubleshooting .....	262
The QFE patch is not listed by the amspatch tool .....	262
Element Manager troubleshooting .....	263
Cannot log in to EM after installation on Linux®.....	263
Cannot log in to EM after installation on Windows® .....	265
Cannot log in to EM using a new user account on Windows®.....	266
Cannot log into EM when using Avaya Aura® System Manager for authentication and authorization.....	267
Cannot log in to EM using desktop shortcut with IE.....	267
EM cannot download files when using IE .....	269
EM cannot upload files larger than 2 GB .....	269
EM displays a blank page after login when using IE.....	270
Certificate error seen on IE when using EM.....	270
Downloading a trust certificate revocation list fails .....	273
VeriSign cannot sign a CSR generated by EM .....	274
The EM Media Management tool is slow.....	274
Call completion troubleshooting.....	275
Avaya Aura® MS rejects incoming SIP sessions .....	275
Unsupported codec response from Avaya Aura® MS .....	277
TLS connection issues.....	278
Digit collection issues .....	279
Media playback troubleshooting .....	280
Unable to playback provisioned audio file.....	280
Streaming music troubleshooting.....	280
Problems with streaming music provider status.....	280
Users do not hear streaming SHOUTCast audio.....	282
Users do not hear streaming RSS audio.....	283
High Availability troubleshooting .....	285
Cannot enable High Availability because it is disabled .....	285
Protocol troubleshooting .....	285
SNMP Traps are not getting posted on management consoles.....	285
SMTP mail delivery is not working .....	287
SOAP connection is rejected.....	287
SFTP configuration requires a fingerprint or key file.....	288

# Chapter 1: Introduction

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## 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 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.

---

## Intended audience

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

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## Documentation

Title	Use this document to:	Audience
Implementing and administering		
<i>Deploying and Updating Avaya Aura® Media Server 7.7 Appliance</i>	Deploy, update and troubleshoot Avaya Aura® Media Server appliances deployed in the VMware® virtualized environment or on Avaya Common Servers.	System administrators, implementation engineers, and support personnel
<i>Installing and Updating Avaya Aura® Media Server 7.7 Application on Customer Supplied Hardware and OS</i>	Deploy update, upgrade and patch, non-appliance versions of Avaya Aura® Media Server deployed on Platform Vendor Independent (PVI) servers.	System administrators, implementation engineers, and support personnel
<i>Performance Measurements Reference Avaya Aura® Media Server 7.7</i>	Evaluate system performance metrics. Troubleshoot events and alarms.	System administrators, implementation engineers, and support personnel

Using		
<i>Using Web Services on Avaya Aura® Media Server 7.7</i>	Develop web services to provision and manage Avaya Aura® Media Server	Avaya Professional Services and application developers

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## 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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## 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

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## 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 145](#)

---

## Aurix Speech Search Engine

Avaya Aura® MS 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 144](#)

---

## Backup using SFTP

Avaya Aura® MS 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 200](#)

[Using the command-line backup and restore tool on page 207](#)

---

## 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® MS 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 180](#)

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## Dual unicast monitoring

Avaya Aura® MS 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 144](#)

---

## 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 System Manager.

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

**Related links:**

[System Manager enrollment on page 173](#)

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## 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 a 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.

# Chapter 3: Management interface

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## 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

When performing the Avaya Aura® MS installation procedures, you choose to install Avaya Aura® MS EM for management of the system. If you do not have an alternate OAM management system, install EM to configure Avaya Aura® MS.

Avaya Aura® MS installer installs EM when operating in silent mode. EM is installed, unless you or the adopting product installer which embeds Avaya Aura® MS specifically declines EM installation.

The installation procedures for Avaya Aura® MS cover the 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 some browsers, like 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

### About this task

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

### Procedure

1. Open IE.
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 and reopen the IE browser.

---

## Adding EM to the trusted sites list in IE

### About this task

To gain access to EM, you must configure Avaya Aura®MS as a trusted site. .

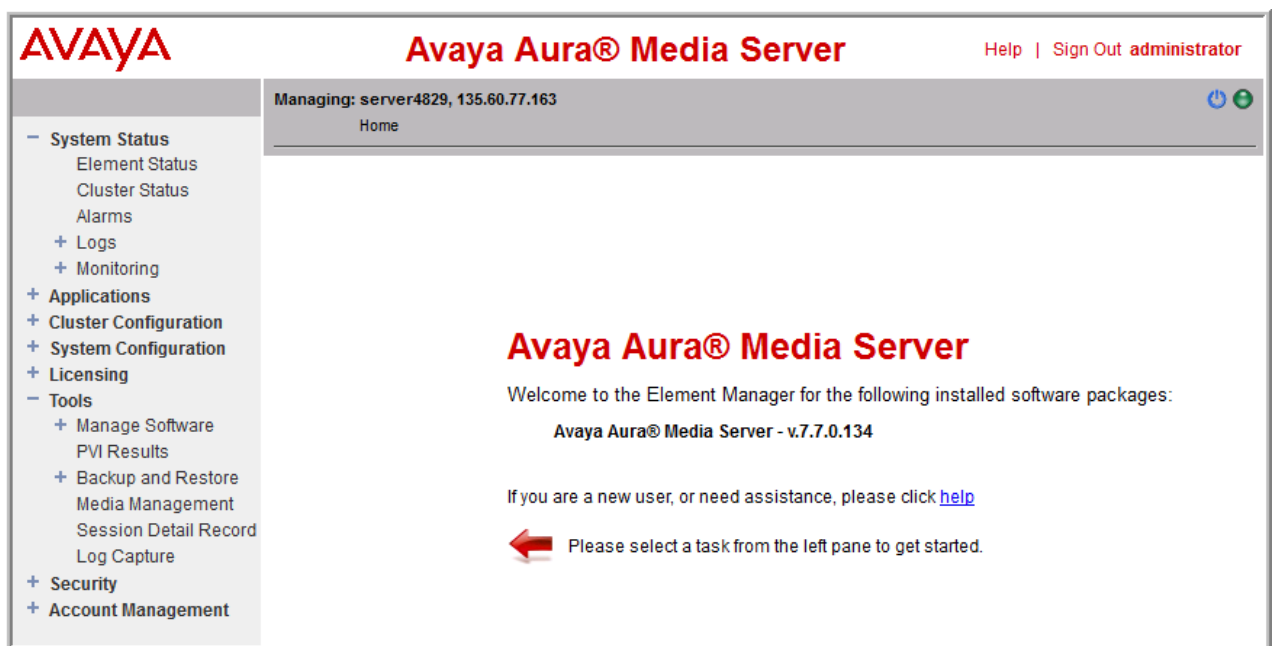
### Procedure

1. Open IE.
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. Select the **Trusted sites** zone.
5. Click **Sites**.
6. Enter the address of Avaya Aura®MS in the **Add this website to the zone** field.  
For example:  
`https://localhost`  
`https://server123.companyABC.com`
7. Click **Add**.
8. Click **Close**.
9. 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.




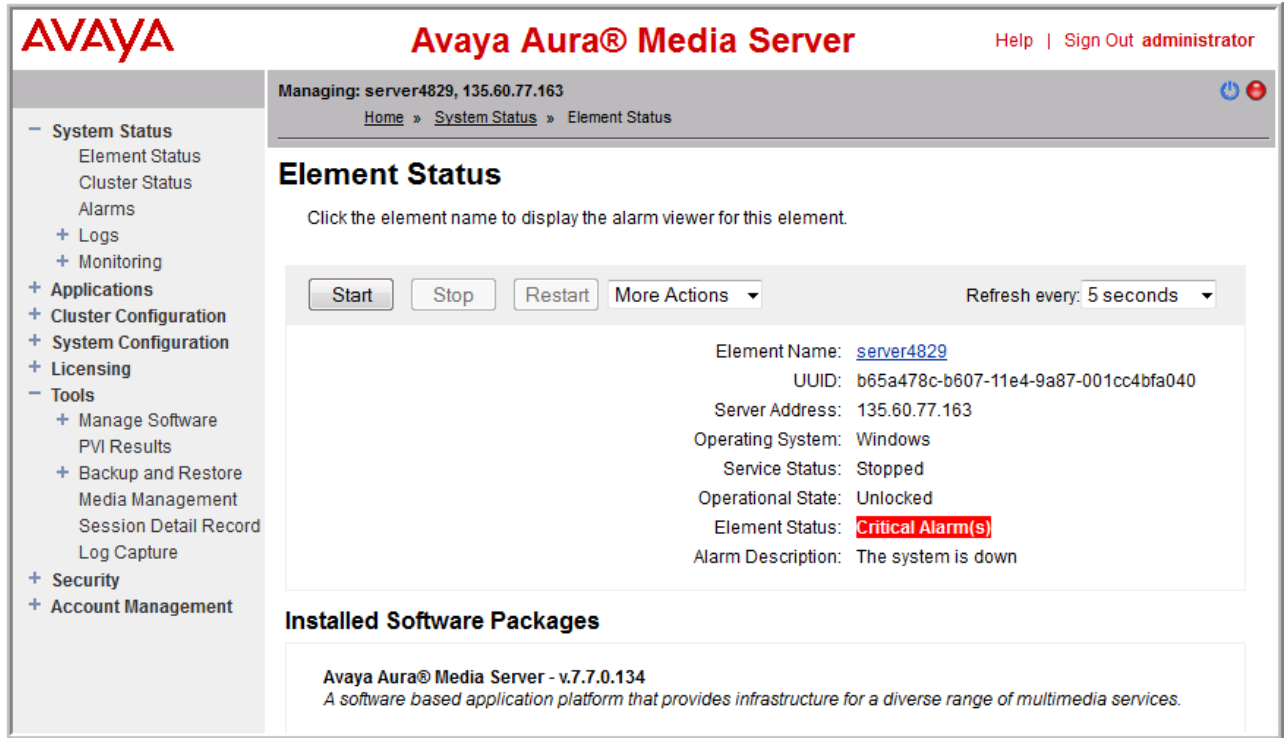
The navigation bar is located under the branding banner. The navigation bar includes the host name, the management IP address of the component that you are managing, and the navigation history, known as breadcrumbs, reflecting the location of the current task within the task hierarchy. The navigation 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
-  Normal

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.



**AVAYA** Avaya Aura® Media Server Help | Sign Out administrator

Managing: server4829, 135.60.77.163  

Home » System Status » Element Status

### Element Status

Click the element name to display the alarm viewer for this element.

Refresh every: 5 seconds

Element Name:	<a href="#">server4829</a>
UUID:	b65a478c-b607-11e4-9a87-001cc4bfa040
Server Address:	135.60.77.163
Operating System:	Windows
Service Status:	Stopped
Operational State:	Unlocked
Element Status:	<b>Critical Alarm(s)</b>
Alarm Description:	The system is down

### Installed Software Packages

Avaya Aura® Media Server - v.7.7.0.134  
*A software based application platform that provides infrastructure for a diverse range of multimedia services.*

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

Actions	Description
System Status	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, 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.
Applications	Lists all installed applications, whether custom or packaged. Expanding an application displays all tasks specific to the operation, administration, and maintenance of that application.

Cluster Configuration	Provides tasks for server designation, replication settings, clustering and high availability configuration and the load balancing settings.
System Configuration	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.
Licensing	Provides an interface to configure and monitor the licensing services.
Tools	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.
Security	Provides an interface for security related configuration.
Account Management	Manage administrators, roles, and permissions for Avaya Aura® MS EM users.

## EM interface

The following figure illustrates the features of the EM interface:

The screenshot displays the Avaya Aura® Media Server EM interface. The top header shows the Avaya logo, the product name "Avaya Aura® Media Server", and user information "Help | Sign Out administrator". Below the header, it indicates the managed server: "Managing: server4829, 135.60.77.163" and the current navigation path: "Home » Applications » General Settings".

The main content area is titled "General Settings" and includes a description: "This task allows administrators to view and modify the SIP general settings." Below this, there are navigation tabs for "Transport Settings", "Routing", "Access Control", "Session Audit", and "SIP Settings". The "Session Audit" section is expanded, showing the following configuration options:

- Session Audit Type: INFO Ping (with refresh and power icons)
- Session Audit Refresh Timer (s): 1800 (range: 90 - 3600)
- Session Expires Value (RFC4028): 1800 (range: 90 - 3600)
- Minimum Session Interval (RFC4028 Min-SE): 90 (range: 90 - 3600)
- Session On Hold Teardown Delay (sec): 3600 (range: 0 - 100000)

The "SIP Settings" section is partially visible, showing "Answer Delay (rings): 1 (range: 0 - 10)". At the bottom of the configuration area, there are "Save", "Cancel", and "Restore Defaults" buttons.

## 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 content, a plus sign (+) appears before the item. Click the plus sign (+) to expand the item and display its content.

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

Click on 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 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 area 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 before 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 redisplay 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 the data is in 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 move 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 now refreshes at the selected frequency.

---

# Advanced settings and engineering parameters

Do not reconfigure the default values in the Advanced Settings or 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: Quick setup

Quick Setup describes the basic, minimum procedures to quickly install and commission a standalone Avaya Aura® MS. You will also learn how to place RFC4240 calls to the server, monitor active calls, and review detailed records of the call sessions.

---

## Quick installation and configuration

This simplified procedure for installing Avaya Aura® MS includes the following tasks:

1. Installing the Avaya Aura® MS software with Element Manager.
2. Licensing and minimally configuring the server.
3. Restarting the Avaya Aura® MS software.
4. Placing and monitoring an RFC4240 call.

Before installing and configuring Avaya Aura® MS, ensure that you have an acceptable platform with both hardware and operating system software that meet the minimum requirements and prerequisites for Avaya Aura® MS installation. For detailed system information, see *Hardware and Software Requirements in Installing and Updating Avaya Aura® Media Server 7.7 Application on Customer Supplied Hardware and OS*. The document also includes additional installation methods to the following procedures.

---

## Installing Avaya Aura® MS on Linux®

### About this task

If YUM is enabled on the system, the Avaya Aura® MS installer automatically installs the required packages when the packages are not present on the system. For more information about how to enable YUM, see the YUM manual.

Perform the following procedure to interactively install Avaya Aura® MS in a Linux® shell:

### Before you begin

Complete the system requirement and preparation procedures. Perform any restarts that the system preparation procedures require before installing the software. For more information see *Installing and Updating Avaya Aura® Media Server 7.7 Application on Customer Supplied Hardware and OS*.



## Procedure

1. Change to root user by using the following command:

```
su -
```

2. Download the installer file to the server, or insert the Avaya Aura® MS installation DVD into the DVD drive.
3. Change the current directory to the location of the downloaded installer or the drive where Avaya Aura® MS installation DVD resides.

The name of the installation file is in the following format:

```
MediaServer_7.7.0.build_yyyy.mm.dd.bin.
```

For example, `MediaServer_7.7.0.231_2015.11.06.bin.`

4. Apply executable permissions to the installer file:

```
chmod 755 filename
```

5. Type the following command to run the installer:

```
./filename
```

where *filename* is the Avaya Aura® MS installer.



### Note:

If the required packages are not in the system and if YUM is not enabled, the system displays the following messages before the installer exits:

```
This system is not registered to Red Hat Subscription Management. You can use subscription-manager to register.
```

```
ERROR: Unable to install packages using yum
```

For more information about how to enable YUM, see the YUM manual.

6. If you see a list of packages to download and if the system prompts you to install the required packages, press `Y` and then press `Enter`.
7. Read the installation overview and press `Enter`.
8. Press `Enter` to read through the pages of the license agreement.
9. To accept the terms of the license agreement, type `Y` and press `Enter`.
10. **(Optional)** The EM option provides a web-based management system for Avaya Aura® MS when you do not use another management system. To install EM on Avaya Aura® MS, perform the following steps:
  - a. The system prompts you to install EM. Press `Y` and then press `Enter`.
    - The system prompts you for a Linux® group name to use for EM login. Press `Enter` to accept the default name, or type another defined Linux® group name and press `Enter`.



### Important

The Linux® group that you specify must contain users who can successfully authenticate against Secure Shell (SSH).

11. Press `Enter` to accept the default installation location. You can also specify another location for the installation destination..
12. Confirm your installation options shown in the installation summary and press `Enter` to install the Avaya Aura® MS.

---

## Installing Avaya Aura® MS on Windows®

### About this task

Perform the following procedure to install Avaya Aura® MS using the Windows® GUI.

### Before you begin

- Complete the system requirement and preparation procedures.
- Perform any restarts that the system preparation procedures require before installing the software.

### Procedure

1. Download the installer software to the server, or insert the Avaya Aura® MS installation DVD into the DVD drive of the server.
2. Using Windows® Explorer, locate the downloaded installer or the drive where the Avaya Aura® MS installation DVD resides.

The name of the installation file is in the following format:

`MediaServer_7.7.0.build_yyyy.mm.dd.exe.`

For example, `MediaServer_7.7.0.231_2015.11.06.exe.`

3. Double-click the installer file.
4. In the Overview window, click **Next**.  
The system displays the **License Agreement** window.
5. Read the license agreement and then select **I accept the terms of the License Agreement**.
6. Click **Next**.
7. Select **Install Element Manager**.
8. Click **Next**.
9. Specify where you want to install the software in the Choose Install Folder window, and then click **Next**.

10. Confirm your installation options shown in the Installation Summary window and click **Install**.
11. After the installation is complete, click **Done**.

---

## Configuring Avaya Aura® MS by using EM

### About this task

Use EM to complete the following tasks to activate Avaya Aura® MS:

- Installing a License.
- Enabling Trusted Node Access for SIP.
- Restarting the Avaya Aura® MS software.

### Procedure

1. To gain access to EM, use a web browser with the following URL:  
`https://serverAddress:8443/em`, where *serverAddress* is the address to the server. For example, `https://135.60.86.209:8443/em`
2. Log in by using the server admin or root user name and password.
3. Choose if you want to disable trusted node access for the Avaya Aura® MS, or add the SIP nodes from which you get calls to the trusted nodes list
  - To disable trusted SIP node access:
    - a. Navigate to **EM > System Configuration > Signaling Protocols > SIP > General Settings > Access Control**.
    - b. Clear **Trusted Node Access Only**.
    - c. Click **Save**.
  - To add trusted SIP nodes from which you get calls to the trusted nodes list:
    - a. Navigate to **EM > System Configuration > Signaling Protocols > SIP > Nodes and Routes > Trusted Nodes**.
    - b. Click **Add**
    - c. Enter the IP of the SIP node from where you will get the test call.
    - d. Click **Save**.
4. Navigate to **EM > Licensing > General Settings** and use one of the following methods to install the license:
  - If you use Nodal Licensing:

- a. Ensure that the **Licensing** drop-down menu is set to **Nodal Licensing**.
  - b. Copy the complete license key provided to you.
  - c. Paste the license into the **Keys** field.
  - d. Click **Save**.
- If you use License Server:
    - a. Ensure that the **Licensing** drop-down menu is set to **License Server**.
    - b. Copy the complete license key provided to you.
    - c. Paste the license into the **Add License Keys** field. If there is already a key then the field name is **Replace License Keys**.
    - d. Click **Display Licenses**.
    - e. Click **Save**.
    - f. Click **Confirm**.
  - If you use an Avaya WebLM license, see [Configuring WebLM server licensing](#).

#### **Related links:**

[Configuring WebLM Server licensing on page 75](#)

[Element Manager troubleshooting on page 263](#)

---

## **Quick call testing, monitoring, and debugging**

This section helps you perform the following simplified procedures for using Avaya Aura® MS:

- Place an RFC4240 call.
- View an active session on the management system.
- Review the session records.
- Use a SIP message trace for debugging.

---

## **Making a test call and monitoring active sessions**

### **About this task**

Use this procedure to make test calls to the media server, using the built-in RFC4240 conferencing application.

## Before you begin

To make test calls to the media server using the built-in RFC4240 conferencing application, you must have two SIP clients. You must also have an installed, licensed, and running Avaya Aura® MS.

## Procedure

1. Create a session on the licensed Avaya Aura® MS by placing a RFC4240 conference call to the built-in conference application. In a SIP client, enter an address in the following form: `conf=confname@serverIP`, where `confname` is a name of your choice for your conference and `serverIP` is the address of Avaya Aura® MS. For example, `conf=test@10.60.86.209`
2. After Avaya Aura® MS answers the call, navigate to **EM > System Status > Monitoring > Active Sessions** to monitor the active session.
3. If you have not installed Microsoft Silverlight® for the browser, follow the on-screen instructions to download and install Microsoft Silverlight.

The system displays one **Active Sessions**, one **Conference Resource**, and the session details, which are displayed at the bottom of the page.

4. You can use the **Refresh** button or the **Refresh interval** drop-down menu to refresh the current data.

### Active Sessions

(Cluster)

Active Sessions: 1	Conference Resources: 1	Session Attempts/Interval: 1
IVR Resources: 2	MRCP Resources: 0	CPU Load (%): 0

Filter:  Viewing Active Sessions Sessions Listed: 1

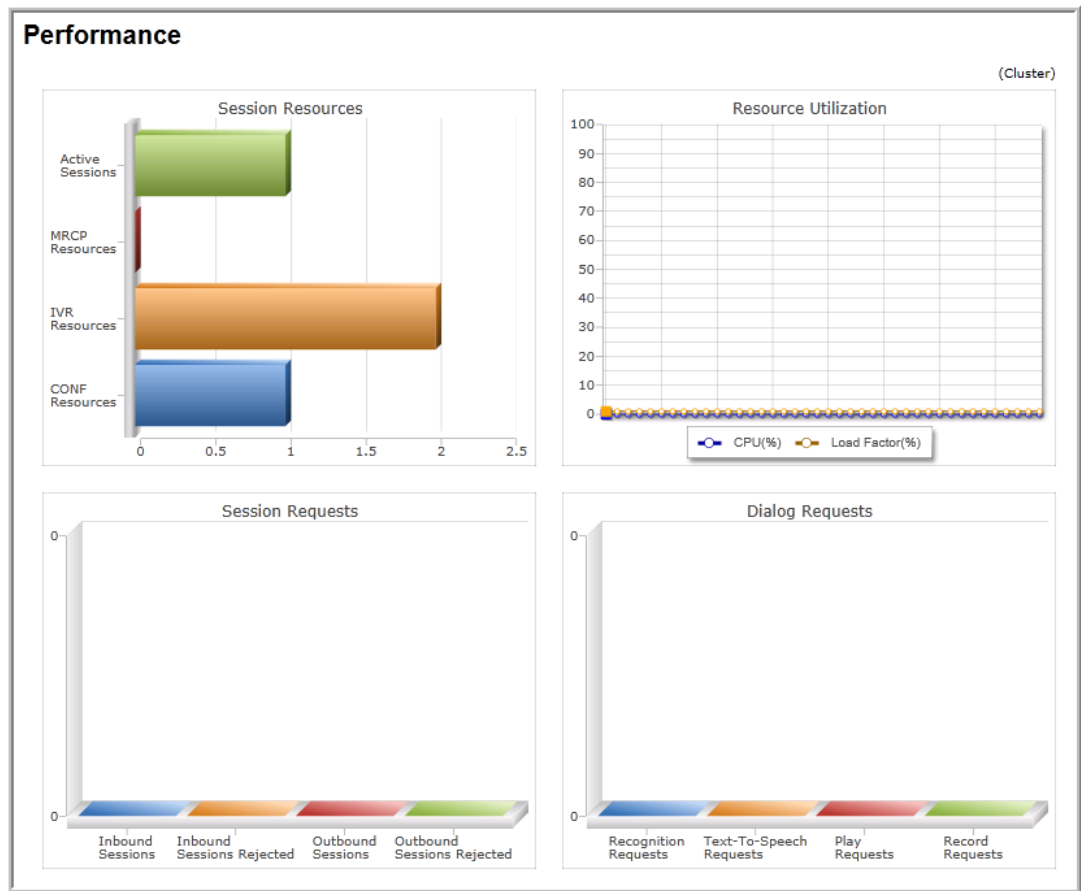
Criteria:  Filtered Sessions: 0

Select...  Every

Remote Party	Start Timestamp	Application Name	Endpoint	QOS R-Factor	QOS Round Trip Delay(msec)
"John"<sip:John@test.net>	2/19/2015 7:12:26 PM	RFC4240	X-Lite 4.7.1 74247	100	0

You can monitor system performance by comparing the number of sessions with the CPU utilization.

5. To see graphs of the current system performance, navigate to **EM > System Status > Monitoring > Performance**.



- Place a second call from another client to the same conference. For example, call `conf=test@10.60.86.209`

The system displays:

- The resources used as a result of the second call on the **Active Session** page.
  - Two **Active Sessions**, one **Conference Resource**, and the second call details listed at the bottom of the page.
- You can also see similar changes on the **Performance** page.

**Active Sessions** (Cluster)

Active Sessions: 2	Conference Resources: 1	Session Attempts/Interval: 1
IVR Resources: 3	MRCP Resources: 0	CPU Load (%): 0

---

Filter:  Viewing Active Sessions Sessions Listed: 2

Criteria:  Filtered Sessions: 0

Select... Refresh Every 30 Seconds

Remote Party	Start Timestamp	Application Name	Endpoint	QOS R-Factor	QOS Round Trip Delay(msec)
"John"<sip:John@test.net>	2/19/2015 7:20:47 PM	RFC4240	X-Lite 4.7.1 74247	100	0
"John"<sip:John@test.net>	2/19/2015 7:12:26 PM	RFC4240	X-Lite 4.7.1 74247	100	5

8. End one call and then the other while watching the **Active Sessions** page.

The system frees the resources and removes the call endpoints from the list.

### Related links:

[Element Manager troubleshooting on page 263](#)

## Reviewing session detail records

### About this task

Calls generate Session Detail Records (SDRs) that capture all the information about the session. EM has an SDR browser to review the details of any sessions processed by the media server. There are many query and filter options available to help you find particular sessions.

Use this procedure to review the SDRs for completed test calls.

### Procedure

1. To browse a Session Detail Record (SDR) for a past call, navigate to **EM > Tools > Session Detail Record Browser**.
2. Execute a query with a time range that includes the time of your test calls.

For example, advance the **Start** date back one day and the **End** date forward one day and then click **Execute**.

The system displays a list of sessions.

3. Click one of the rows in the list of sessions.

The system displays the details of the session in the **Session Detail Records** area.

### Session Detail Record Browser

**Query** (server4829)

Type:  Limit:  2/19/2015 7:30:53 PM Central Standard Time

Start:    Use Local Time

End:

Global Session Id	Start Timestamp	End Timestamp	Server	Parent Session GSLID	SDR Type
9b6f8432-d62a-3680-b3a3-887d3280eac5	2/19/2015 7:20:47 PM	2/19/2015 7:30:33 PM	server4829		2
f6f8880d-a87e-3702-837c-c975cce2e413	2/19/2015 7:12:26 PM	2/19/2015 7:30:32 PM	server4829		2
cf5d2ef5-315d-32c4-9f38-1a452df24236	2/19/2015 6:05:14 PM	2/19/2015 6:37:43 PM	server4829		2
8120199c-718a-3efd-97c3-a94b1d58a571	2/19/2015 6:09:55 PM	2/19/2015 6:09:58 PM	server4829		2
c0d62ede-6766-30db-9696-a466f2f51710	2/19/2015 6:01:32 PM	2/19/2015 6:08:14 PM	server4829		2
37e99387-2ae4-30d4-85e2-baa7e7a5afc2	2/19/2015 5:51:08 PM	2/19/2015 5:51:08 PM	server4829		2

**Result**

Session Detail Records

Filter:   Display Trace Details

Field	Value	Timestamp
Global Session Id	9b6f8432-d62a-3680-b3a3-887d3280eac5	2/19/2015 7:20:47 PM
Start Timestamp	2015-02-20 01:20:47	2/19/2015 7:20:47 PM
Server	server4829	2/19/2015 7:20:47 PM
SDR Type	2	2/19/2015 7:20:47 PM
SIP Remote User Information	"John"<sip:John@test.net>	2/19/2015 7:20:47.150 PM
SIP Audio Remote IP Address	135.60.10.137	2/19/2015 7:20:47.150 PM

## Viewing call traces for debugging

### About this task

You can debug calls using the **Active Sessions** page. Use the SIP message details, session filters, resource consumption statistics, and graphical SIP message flows to trace and troubleshoot call processing problems.

### Procedure

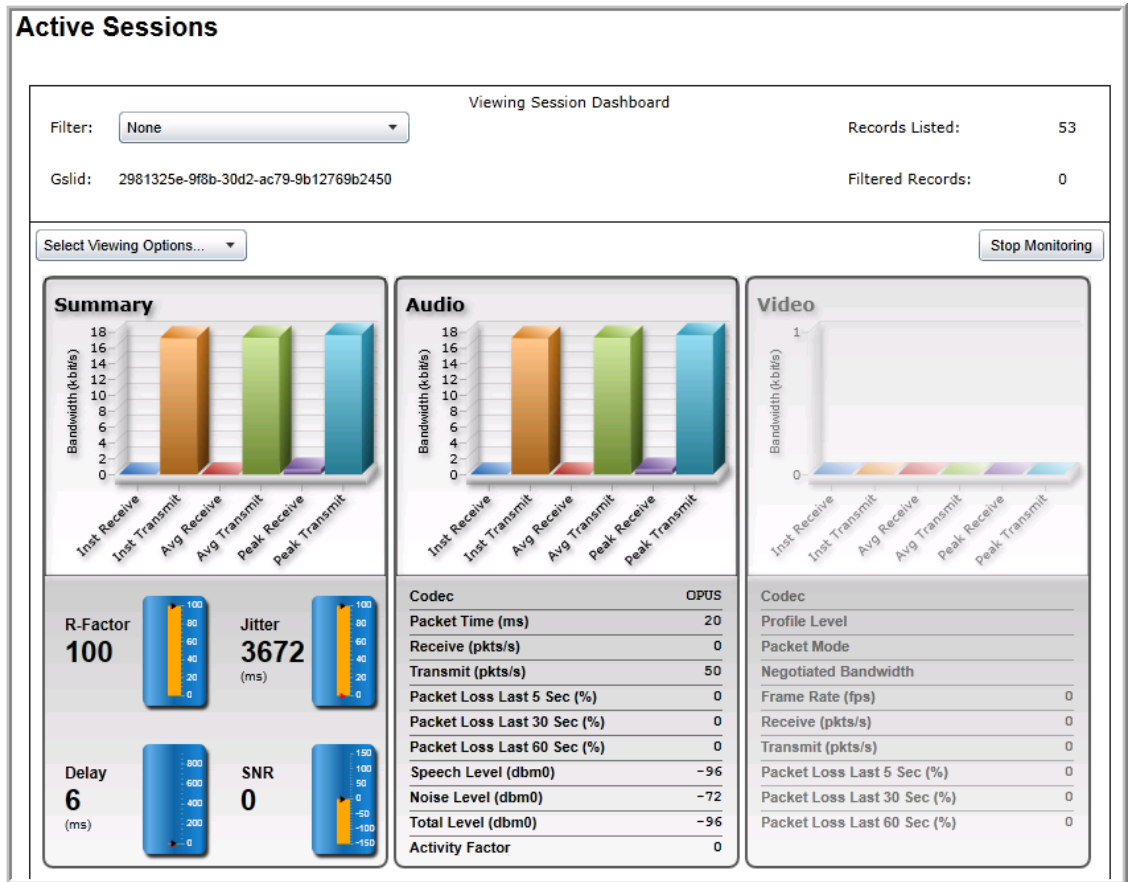
1. Navigate to **EM > System Status > Monitoring > Active Sessions**.
2. On the **Active Sessions** page, in the **Select...** field, select **Monitor Next Session**.

The system displays a message to inform you that the system is waiting for a new session to start.

3. Call the built-in conference application by using an address in the SIP client, such as `conf=confname@serverIP`, where `confname` is a name of your choice for your conference and `serverIP` is the address of Avaya Aura® MS. For example, `conf=test@10.60.86.209`



After answering the call, the system displays a detailed call performance summary on the **Active Sessions** page.



- To view session records of the call including the SIP message content, click **Select Viewing Options > Session Detail Records**.

### Active Sessions

Filter:  Viewing Session Detail Records

Records Listed: 57  
Filtered Records: 0

Gslid: 2981325e-9f8b-30d2-ac79-9b12769b2450

Select Viewing Options... Stop Monitoring

Field	Value	Timestamp
Start Timestamp	2015-02-20 01:36:02	2/19/2015 7:36:02 PM
Global Session Id	2981325e-9f8b-30d2-ac79-9b12769b2450	2/19/2015 7:36:02 PM
SIP Trace	ENG[002:A] <idle> Incoming SIP Message: INVITE sip:conf=abc@135.60.77.163 SIP/2.0  INVITE sip:conf=abc@135.60.77.163 SIP/2.0 From: "John"<sip:John@test.net>;tag=04afb354 To: <sip:conf=abc@135.60.77.163> Call-ID: OGNkZDQ5ZTI5ZGE1MGM2ZTFINTM4ZTIhY2U2YjlmMDQ CSeq: 1 INVITE Via: SIP/2.0/UDP 135.60.10.137:62232;rport=62232;branch=z9hG4bK-d8754z-7901a563f107a576-1---d8754z- Max-Forwards: 70 Supported: replaces User-Agent: X-Lite 4.7.1.74247-55f8da37-W6.1 x-nt-gslid: 2981325e-9f8b-30d2-ac79-9b12769b2450 Contact: <sip:John@135.60.10.137:62232> Allow: INVITE,ACK,CANCEL,OPTIONS,BYE,REFER,NOTIFY,MESSAGE,SUBSCRIBE,INFO Content-Type: application/sdp Content-Length: 303	2/19/2015 7:36:02 505010 PM

- To view a graphical SIP message flow, click **Select Viewing Options > View SIP Protocol Trace**.


### Active Sessions

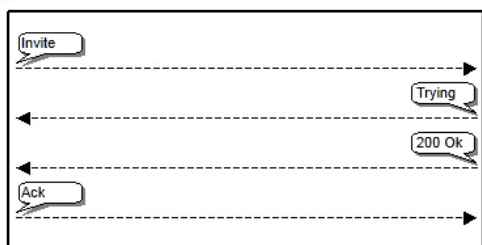
Filter:  Viewing SIP Protocol Trace

Records Listed: 57  
Filtered Records: 0

Gslid: 2981325e-9f8b-30d2-ac79-9b12769b2450

Select Viewing Options... Stop Monitoring


**AVAYA**  
Media Server



```

sequenceDiagram
    participant Phone as Avaya IP Phone
    participant Server as AVAYA Media Server
    Note over Phone: Invite
    Phone-->>Server: Invite
    Note over Server: Trying
    Server-->>Phone: Trying
    Note over Server: 200 Ok
    Server-->>Phone: 200 Ok
    Note over Phone: Ack
    Phone-->>Server: Ack
  
```

- End the call.
- Click **Stop Monitoring**.

# Chapter 5: 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 **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://10.60.86.209:8443/em`
2. Sign in to EM by using the admin or root user ID and password.

### Related links:

[Element Manager troubleshooting on page 263](#)

---

## 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 Actions** 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 with one of 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 alarm 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:

Action	Description
Start	Starts all the necessary software processes to enable media server functionality. Ensure that Avaya Aura® MS is set to Stopped before using this function.
Stop	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.
Restart	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 <b>Service Status</b> of Avaya Aura® MS must be set to <b>Started</b> before you can restart Avaya MS. Restarting Avaya MS is the same as stopping the media server and then starting the media server again.

### 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 state 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 37](#)

---

# Setting the operational state

## About this task

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

Action	Description
Lock	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 <b>Unlocked</b> or <b>Pending Locked</b> before you can lock Avaya Aura® MS.
Unlock	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 <b>Locked</b> or <b>Pending Locked</b> before you can unlock Avaya Aura® MS.
Pending Lock	The system does not accept new requests. It redirects new traffic to other nodes in the cluster. Unlike <b>Lock</b> , <b>Pending Lock</b> preserves existing sessions. You typically place the system into a <b>Pending Locked</b> state before transitioning to a <b>Locked</b> 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 <b>Locked</b> state after all the sessions have ended. The Operational State of Avaya Aura® MS must be set to <b>Unlocked</b> or <b>Locked</b> before you set the system to <b>Pending Lock</b> .
Failover	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 <b>Failover</b> when the media server is in a High Availability configuration with another node.
--	---

## 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 upon the new state of the media server.

---

## Managing the High Availability state

### About this task

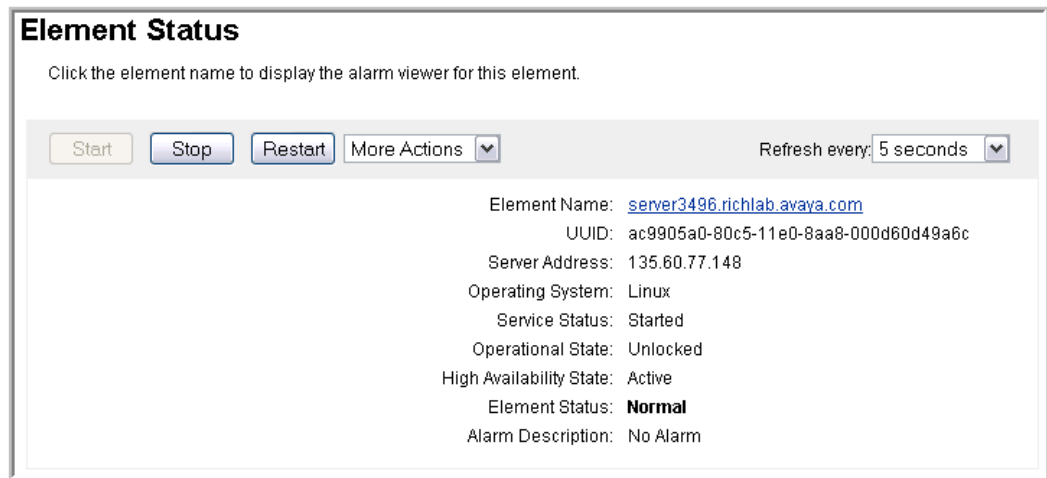
If you configured Avaya Aura® MS for High Availability, the system displays the High Availability state of the server on the **EM > System Status > Element Status** page. The **More Actions** drop-down menu contains state transition options, which are available only when High Availability is enabled.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

Action	Description
Active	The server has a configured Service IP Address and is providing service.
Standby	The server is inactive but remains synchronized with the active server.
Failed	The server has failed. The server will soon restart and transition to a <b>Searching</b> state.
Locked Active	The active High Availability server is <b>Locked Active</b> when you select <b>Local High Availability State Lock</b> on <b>EM &gt; Cluster Configuration &gt; High Availability</b> and the server is not shutdown.
Locked Standby	The standby High Availability server is Locked Standby when you select <b>Local High Availability State Lock</b> on <b>EM &gt; Cluster Configuration &gt; High Availability</b> and the server is not shutdown.
Shutdown	The server is in a management shutdown state and is not providing service.
Searching	The server is trying 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 transitioning to Active or Standby state.

## Procedure

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

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



The screenshot shows the 'Element Status' interface. At the top, it says 'Click the element name to display the alarm viewer for this element.' Below this are buttons for 'Start', 'Stop', 'Restart', and 'More Actions' (with a dropdown arrow). To the right, there is a 'Refresh every:' dropdown set to '5 seconds'. The main content area displays the following information:

- Element Name: [server3496.richlab.avaya.com](#)
- UUID: ac9905a0-80c5-11e0-8aa8-000d60d49a6c
- Server Address: 135.60.77.148
- Operating System: Linux
- Service Status: Started
- Operational State: Unlocked
- High Availability State: Active
- Element Status: **Normal**
- Alarm Description: No Alarm

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 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. This 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 version and patch level information.

---

## Reviewing the PVI Check results

### About this task

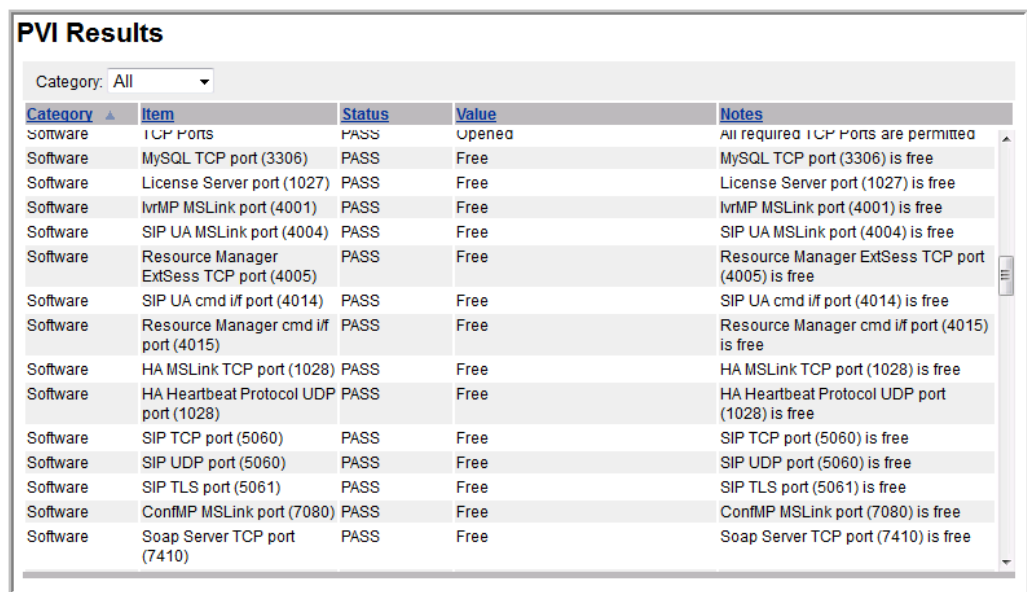
Using EM, you can review the hardware, software, and storage inspection reports generated during the Avaya Aura® MS installation.

The Platform Vendor Independent Check (PVI Check) software ensures that the server and configured operating system meet 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 on 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.



The screenshot shows the 'PVI Results' page with a 'Category' dropdown set to 'All'. Below is a table with columns: Category, Item, Status, Value, and Notes. The table lists various software components and their status, all of which are 'PASS' and 'Free'.

Category	Item	Status	Value	Notes
Software	TCP Ports	PASS	Opened	All required TCP Ports are permitted
Software	MySQL TCP port (3306)	PASS	Free	MySQL TCP port (3306) is free
Software	License Server port (1027)	PASS	Free	License Server port (1027) is free
Software	IvrMP MSLink port (4001)	PASS	Free	IvrMP MSLink port (4001) is free
Software	SIP UA MSLink port (4004)	PASS	Free	SIP UA MSLink port (4004) is free
Software	Resource Manager ExtSess TCP port (4005)	PASS	Free	Resource Manager ExtSess TCP port (4005) is free
Software	SIP UA cmd if port (4014)	PASS	Free	SIP UA cmd if port (4014) is free
Software	Resource Manager cmd if port (4015)	PASS	Free	Resource Manager cmd if port (4015) is free
Software	HA MSLink TCP port (1028)	PASS	Free	HA MSLink TCP port (1028) is free
Software	HA Heartbeat Protocol UDP port (1028)	PASS	Free	HA Heartbeat Protocol UDP port (1028) is free
Software	SIP TCP port (5060)	PASS	Free	SIP TCP port (5060) is free
Software	SIP UDP port (5060)	PASS	Free	SIP UDP port (5060) is free
Software	SIP TLS port (5061)	PASS	Free	SIP TLS port (5061) is free
Software	ConfMP MSLink port (7080)	PASS	Free	ConfMP MSLink port (7080) is free
Software	Soap Server TCP port (7410)	PASS	Free	Soap Server TCP port (7410) is free

---

## System configuration and trace logs

The Log Capture tool provides an easy way to collect all system configuration 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 your 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

3. Navigate to **EM > System Configuration > Debug Tracing > General Settings**.

4. Select **Enabled** from the **Debug Logging** drop-down menu.

5. 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.

6. 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.

7. Click **Save**.

---

## Downloading a 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**.

Avaya Proprietary and Confidential. Internal Use Only.

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 on page 263](#)

---

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

### About this task

The Log Capture tool collects advanced system traces and debug logs 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:

- a. `logcapture`
- b. `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 required input during various cluster configuration procedures.

Perform the following procedure to gain access to the UUID:  
Avaya Proprietary and Confidential. Internal Use Only.

## 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 your browser's **Edit** menu, 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 menu, 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:

### Procedure

1. Change to the Apache-Tomcat configuration directory by running the following command:

```
cd $MASHOME/./apache-tomcat/mas/conf
```

2. Edit the properties file by running the following command:

```
vi local-accounts.properties
```

3. Find the property:

```
locallogin.authenticable.groups
```

4. 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
```

5. 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=*
```

6. Save the changes.
7. Close all web browsers.
8. Restart Avaya EM Service by running the following command:

```
/sbin/service avaya.em restart
```

### **Related links:**

[Element Manager troubleshooting on page 263](#)

# Chapter 6: 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 that you installed Avaya Aura® MS using either the Quick Setup procedure or the installation procedures mentioned in *Installing and Updating Avaya Aura® Media Server 7.7 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 81.](#)

---

## 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**.

### Server Designation

The administrator may designate each server's role within the cluster. A Primary server must always be configured.

[Local Server](#) | [Server Designation](#) | [Replication Account](#)

---

**Local Server**

Name: server4835  
 Address: 135.60.77.153  
 UUID: 835c8aa4-6d0b-11e0-958e-001f296491ca  
 Role:

**Server Designation**

<input type="checkbox"/>	Server Address	Server UUID	Role
<input type="checkbox"/>			
<input type="checkbox"/>			

**Replication Account**

Enable Replication Account:

Username:  (8-16 characters)  
 Password:  (6-32 characters)  
 Confirm Password:  (6-32 characters)

2. In the **Local Server** section, ensure that **Role** is set to **Primary**.

3. Note the Primary node IP Address and 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 password of the Replication Account of the Primary server.

### Procedure

1. To designate a server as Secondary, navigate to **EM > Cluster Configuration > Server Designation**.

### Server Designation

The administrator may designate each server's role within the cluster. A Primary server must always be configured.

[Local Server](#) | [Server Designation](#) | [Replication Account](#)

---

**Local Server**

Name: server4836  
 Address: 135.60.77.154  
 UUID: 001f2964-6d0b-11e0-958e-001f835c8aa4  
 Role:

---

**Server Designation**

Primary Server UUID:   
 Primary Server Address:

---

**Replication Account**

Enable Replication Account:   
 Username:  (8-16 characters)  
 Password:  (6-32 characters)  
 Confirm Password:  (6-32 characters)

2. In the **Local Server** area, 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 of the Primary server.

 **Important:**

All servers in the cluster must use this 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 42.](#)

---

## Configuring a Standard server for a cluster

### About this task

Using EM, perform the following procedure to configure Avaya Aura® MS as a 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**.

## Server Designation

The administrator may designate each server's role within the cluster. A Primary server must always be configured.

[Local Server](#) | [Server Designation](#) | [Replication Account](#)

---

### Local Server

Name: server4837  
 Address: 135.60.77.155  
 UUID: 835c8aa4-6d0b-11e0-491c-001f296958ea  
 Role:

---

### Server Designation

Primary Server UUID:   
 Primary Server Address:

---

### Replication Account

Enable Replication Account:   
 Username:  (8-16 characters)  
 Password:  (6-32 characters)  
 Confirm Password:  (6-32 characters)

- In the **Local Server** section, set the **Role** to **Standard**. The system updates the page with fields specific to the Standard server configuration.
- 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.

- Using the EM for the Standard server, paste the UUID of the Primary server in the **Primary Server UUID** field.
- In the **Primary Server Address** field, enter the IP address of the Primary server.
- In the Replication Account section, ensure **Enable Replication Account** is selected.
- In the **Username**, **Password** and **Confirm Password** fields, enter the same user credentials you entered for the Replication Account on the Primary server.

 **Important:**

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

- Click **Save**.
- Click **Confirm**.
- 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 42.](#)

---

## 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. Navigate to **EM > Cluster Configuration > Replication Settings**.
3. Select the **Configuration Replication** checkbox.
4. **(Optional)** Select any other items that you would like to replicate across all servers in the cluster.
5. Click **Save**.
6. Restart Avaya Aura® MS for the changes to take effect. Navigate to **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


This task allows administrators to configure cluster load balancing.

Application Key For Load Reporting:    (maximum: 128 characters)

Cluster Load Balancing:  

Cluster Redirect In a Non Unlocked Operational State:  

Minimum Delta In Sessions Before Redirecting:   (1 - 100000)

Restrict Redirection List To Single Entry:  

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 in a non-unlocked state.

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

5. Set the **Minimum Delta In Sessions Before Redirecting** field to choose the difference in number of sessions between nodes before balancing the load of sessions across all servers in the 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 302 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 in cases where 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 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 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 communicate with each other using a heartbeat synchronization mechanism. Interruptions in the heartbeat 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 that 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 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 the 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 7.7 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**.

**Server Designation**

The administrator may designate each server's role within the cluster. A Primary server must always be configured.

[Local Server](#) | [Server Designation](#) | [Replication Account](#)

**Local Server**

Name: server3496.richlab.avaya.com  
 Address: 135.60.77.148  
 UUID: ac9905a0-80c5-11e0-8aa8-000d60d49a6c  
 Role: Primary

**Server Designation**

<input type="checkbox"/>	Server Address	Server UUID	Role
<input type="checkbox"/>			
<input type="checkbox"/>			

**Replication Account**

Enable Replication Account:

Username:  (8-16 characters)  
 Password:  (6-32 characters)  
 Confirm Password:  (6-32 characters)

- Note the Primary node IP Address and UUID.  
You will need this information later when configuring the Backup server.
- In the **Replication Account** section, ensure **Enable Replication Account** is selected.
- In the **Username**, **Password**, **Confirm Password** fields, enter a user name and password.



**Important:**

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

- Click **Save**.
- 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 IP address of the Primary Server and the username 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**.

The screenshot shows the 'Server Designation' configuration window. At the top, it states: 'The administrator may designate each server's role within the cluster. A Primary server must always be configured.' Below this is a breadcrumb trail: 'Local Server | Server Designation | Replication Account'. The window is divided into three sections: 'Local Server', 'Server Designation', and 'Replication Account'. In the 'Local Server' section, the 'Role' dropdown is set to 'Backup'. In the 'Server Designation' section, the 'Primary Server UUID' and 'Primary Server Address' fields are populated with 'ac9905a0-80c5-11e0-8a' and '135.60.77.148' respectively. In the 'Replication Account' section, the 'Enable Replication Account' checkbox is checked, and the 'Username', 'Password', and 'Confirm Password' fields are filled with 'amsuser' and masked characters. 'Save' and 'Cancel' buttons are at the bottom right.

Section	Field	Value
Local Server	Name	server3497.richlab.avaya.com
	Address	135.60.77.150
	UUID	e3cf0e20-80c5-11e0-8bdb-000d60d49748
	Role	Backup
Server Designation	Primary Server UUID	ac9905a0-80c5-11e0-8a
	Primary Server Address	135.60.77.148
Replication Account	Enable Replication Account	<input checked="" type="checkbox"/>
	Username	amsuser (8-16 characters)
	Password	..... (6-32 characters)
	Confirm Password	..... (6-32 characters)

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 user credentials you entered for the Replication Account on the Primary server.



**Important:**

Use this 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 42

---

# 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 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 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.

### High Availability

This task allows administrators to configure High Availability within the cluster.

[General Settings](#) | [Failure Notification List](#)

**General Settings**

Enable High Availability:

Service IP Address:  (Service IP Address)

Service IP Address Mask:  (Service IP Address Mask)

Local High Availability State Lock:

**Failure Notification List**

<input type="checkbox"/>	Protocol	Server Address	Server Port
<input type="checkbox"/>			
<input type="checkbox"/>			

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 the **Local High Availability State Lock** checkbox, 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 for information.

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 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.

### Cluster Status

Select an element name to view the alarm viewer for that element.

[System Status](#) | [System Performance Summary](#)

**System Status** Refresh every:

Element Name	UUID	Element Role	Element Status	Alarm Description
<a href="#">server3496.richlab</a>	ac9905a0-80c5-11e0-8aa8-000d60d49a6c	Primary	Normal	No Alarm
<a href="#">server3497.richlab</a>	e3cf0e20-80c5-11e0-8bdb-000d60d49748	Backup	Normal	No Alarm

**System Performance Summary** Refresh every:

Name	Value (Aggregate)
Active Sessions	0
SIP Inbound Call Attempted	0
SIP Outbound Call Attempted	0

3. Navigate to **EM > System Status > Element Status**.

The system now displays a new field, **High Availability State**, on the Element Status page.

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

Ensure no alarms or service impacting states exist.

### Element Status

Click the element name to display the alarm viewer for this element.

Refresh every:

Element Name: [server3496.richlab.avaya.com](#)  
 UUID: ac9905a0-80c5-11e0-8aa8-000d60d49a6c  
 Server Address: 135.60.77.148  
 Operating System: Linux  
 Service Status: Started  
 Operational State: Unlocked  
 High Availability State: Active  
 Element Status: **Normal**  
 Alarm Description: No Alarm

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.

### Element Status

Click the element name to display the alarm viewer for this element.

Start Stop Restart More Actions ▼ Refresh every: 5 seconds ▼

Element Name: [server3497.richlab.avaya.com](#)  
UUID: e3cf0e20-80c5-11e0-8bdb-000d60d49748  
Server Address: 135.60.77.150  
Operating System: Linux  
Service Status: Started  
Operational State: Unlocked  
High Availability State: Standby  
Element Status: **Normal**  
Alarm Description: No Alarm

---

## 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 on 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 223](#)

[Locking and unlocking the High Availability state on page 62](#)

[Managing the High Availability state on page 38](#)

---

## 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. 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. If the **Operational State** is **Lock** or **Pending Lock**, select **Unlock** from the **More Actions** drop-down menu.
10. Click **Confirm**.
11. Repeat Step 5 to Step 10 for the peer server.

### Related links:

[Starting and stopping the media server on page 36](#)

---

## 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 select **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

## About this task

Content Store replication is a one-way data synchronization from a master cluster to a replica cluster. You can use this configuration to simplify media file provisioning. Files provisioned on the master cluster are automatically synchronized to the replica clusters.

The master cluster can have up to four directly-connected replica clusters. You can create chains of replica clusters, thereby creating hierarchies that scale to greater than four replica clusters in the network. In these cascading hierarchies, intermediate replica clusters act as master clusters for replica clusters further down the hierarchy.

You must provision files on the highest-level master cluster. Do not provision files on the replica clusters. Any files you directly provision on the replica clusters will be lost the next time a synchronization audit runs.

No changes are required on the master cluster to enable replication. Replica clusters connect to the master cluster by using Replication Account credentials 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 that 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. It 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 receive provisioning changes when in standby.

Perform the following procedure to enable replication of Content Store data between N+1 Load Sharing Cluster or 1+1 High Availability Clusters.

## Before you begin

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

## Procedure

1. Using the EM for the Primary server in the replica cluster, 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 that the **Replication Account** user name and password are the same for all the clusters.

If **Configuration Replication** is not enabled within the cluster, you must repeat Steps 1 to 3 for each server 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 content on the replica. The replica can use the local content it has, but it 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, you must repeat Steps 1 to 3 for each server 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.

When the server is returned to the cluster, the latest content from the peer master Content Store synchronizes automatically.

It is not required to delete the content from an out-of-service Content Store on a server with the role of Standard. Content Stores on Standard servers are not masters and will automatically delete obsolete content when they synchronize the latest content from one of the master Content Stores in the cluster.

---

## 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 you how to enter your license keycodes, which enable the purchased features on your system.

You can configure Avaya Aura®MS licensing in three ways. Only one of the licensing schemes is active at a time:

License type	Description
License Server	License servers are used for both cluster and standalone server configurations. A single license is shared by all nodes in a cluster.
Nodal Licensing	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.
WebLM Server	WebLM Server uses the Avaya WebLM Web-based licensing management system.

Choose the licensing configuration procedure based upon which type of license you were 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**.

The screenshot shows the 'General Settings' dialog box. At the top, the 'Licensing' dropdown is set to 'License Server'. Below it, the 'Add License Keys' field contains a multi-line license key: `j1F8mgHQpLnhTwhLy6m+sraOPfGXCoviMYB  
AIDD8Ojk4uNjFHVp5sFgwrCLksmPygpLe2N  
rbG1tLQOM= # inst::auth 1.0  
00:0c:29:49:6e:d8 (10) 360 secs  
Mon Jun 18 01:00:00 2012`. A 'Display Licenses' button is located to the right of the text area. Below the text area is a 'License Details' table with the following data:

Feature	Release	MAC Address	Available	Expiration Date(CDT)
Media Server Instances	1.0	0:c:29:49:6e:d8	10	2012-06-17 19:00:00
Media Server Audio Sessions	1.0	0:c:29:49:6e:d8	10	2012-06-17 19:00:00

At the bottom of the dialog are 'Save', 'Cancel', and 'Restore Defaults' buttons.

3. Apply the license key:
  - If you are licensing a cluster configuration, copy and paste all the license keys into the **Add License Keys** or **Replace License Keys** field.
  - If you are licensing a standalone server, copy and paste the single license key into the **Add License Keys** or **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 ( $3 \times (2 \times 100) = 600$ ).

The following table provides recommended settings based on expected node peak capacity.

License Chunk Sizing Recommendations	
Node Peak Capacity	Recommended Chunk Size
200 or greater	100
51-100	25
31-50	10
30 or fewer	2

### 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 the all of the old license keys by clicking in the **Replace License Keys** field and pressing **Control+A** to select all of the text.  
  
Alternatively, select only the individual license key to replace.
3. Press the **Delete** or **Backspace** key.
4. Copy and paste the new license keys into 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** area.

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 navigate to **EM > Licensing > General Settings**.
2. From the **Licensing** drop-down menu, select **Nodal Licensing**.

**General Settings**

Licensing : **Nodal Licensing** ▼

Keys :  
dj0xLjUAAACMLoL7pVPCBkzGTZ08MrE8F8Fq2  
UGOQaYXwUrzQY5BphfBat1BjkGmhzIUtW3hKE  
vlesz8Hg6r1xAJrK1E4Tta+uIvrpt8qhHJC6+  
HAZSYeQNL+mZ3rTylnrqwwBz51QMKeWE97mZY  
qjxrN6WVzK2R

Changing this field will require the system to be restarted to take effect.

Save Cancel Restore Defaults

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 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 in the **Keys** field and 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 page.

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 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, licenses are installed on the 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.

For more information, refer to the *Installing and Configuring Avaya WebLM Server* guide. See <http://www.avaya.com/support>.

### 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**.

### General Settings

Licensing :

Server Host Name or IP Address:

Server Port:

URL Suffix:

**License Details**

Feature	Maximum Number	Minimum Number
Call Progress Detection	<input type="text" value="1"/>	<input type="text" value="0"/>
Media Server Instances	<input type="text" value="1"/>	<input type="text" value="0"/>
Media Server Text-To-Speech Sessions	<input type="text" value="1"/>	<input type="text" value="0"/>
Media Server Speech Recognition Sessions	<input type="text" value="1"/>	<input type="text" value="0"/>
Media Server Audio Sessions	<input type="text" value="1"/>	<input type="text" value="0"/>
Media Server Video Sessions	<input type="text" value="1"/>	<input type="text" value="0"/>

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** section set the **Maximum Number** and **Minimum Number** based on how many 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 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 **Licensing General Settings** page to access 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

Perform 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 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

Perform 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 > General Settings**.
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 on page 79](#)

---

## 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:

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1. Navigate to **EM > System Configuration > Server Profile > General Settings > Server Function**.
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.

Processor affinity configuration is only supported on Microsoft Windows® systems.

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 79](#)

[Setting the capacity profile on page 78](#)

---

## 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:**

1. Navigate to **EM > System Configuration > Network Settings > General Settings**.
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 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 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 may 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 which 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® Media Server 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. The 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

[See Error! Not a valid bookmark self-reference. on page 82.](#)

---

## 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 may 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 back to the management system with the requested information.

All SNMP requests must be sent to the Avaya Aura® MS SNMP Agent. This SNMP agent processes all the media server specific SNMP requests. The 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.

Perform the following procedure to configure 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.

Avaya Aura® MS SNMP Agent rejects queries which 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

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---

# 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 both the client and 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 **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.

The 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 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-b4f5-00ffb0699410</guid>
    </item>
    <item>
      <title>Corporate Edge - First Impressions</title>
      <enclosure url="http://musicserver/Music/DavenportMusic-1.wav"
type="audio/wav"/>
      <guid>3edcc894-51f1-11e5-b4f5-00ffb0699410</guid>
    </item>
    <item>
      <title>Kaleidoscope - Shades of Blue</title>
      <enclosure url="http://musicserver/Music/DavenportMusic-2.wav"
type="audio/wav"/>
      <guid>47779c66-51f1-11e5-b4f5-00ffb0699410</guid>
    </item>
    <item>
      <title>Keynotes - Colors</title>
      <enclosure url="http://musicserver/Music/DavenportMusic-3.wav"
type="audio/wav"/>
      <guid>ea3dd092-51f1-11e5-b4f5-00ffb0699410</guid>
    </item>
    <item>
      <title>Kalimba</title>
      <enclosure url="http://musicserver/Music/Kalimba.mp3" type="audio/mpeg"/>
      <guid>3e789aa0-cb7b-11e5-b904-18a9051819e8</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.

The 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.

The 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.
4. Click **Save**.

---

## 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 requirements 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 233](#)

---

## Editing a streaming music source

### About this task

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

### Procedure

1. Navigate to **EM > System Configuration > Media Processing > Music > Stream Provisioning**.
2. To indicate the music source to edit, select the corresponding checkbox.
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 this music source, select or clear the **Locked** checkbox.
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 233](#)

---

## Deleting a streaming music source

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, select one 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 164

---

## 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. 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:

[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.

The 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 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"/>
    </item>
  </channel>
</rss>
```

```

    <guid>35942909-51f1-11e5-b4f5-00ffb0699410</guid>
  </item>
  <item>
    <title>Corporate Edge - First Impressions</title>
    <enclosure url="http://musicserver/Music/DavenportMusic-1.wav"
type="audio/wav"/>
    <guid>3edcc894-51f1-11e5-b4f5-00ffb0699410</guid>
  </item>
  <item>
    <title>Kaleidoscope - Shades of Blue</title>
    <enclosure url="http://musicserver/Music/DavenportMusic-2.wav"
type="audio/wav"/>
    <guid>47779c66-51f1-11e5-b4f5-00ffb0699410</guid>
  </item>
  <item>
    <title>Keynotes - Colors</title>
    <enclosure url="http://musicserver/Music/DavenportMusic-3.wav"
type="audio/wav"/>
    <guid>ea3dd092-51f1-11e5-b4f5-00ffb0699410</guid>
  </item>
  <item>
    <title>Kalimba</title>
    <enclosure url="http://musicserver/Music/Kalimba.mp3" type="audio/mpeg"/>
    <guid>3e789aa0-cb7b-11e5-b904-18a9051819e8</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.

The 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.

The 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

6. Navigate to **EM > System Configuration > Media Processing > Music > General Settings**.



7. 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.
8. In the **HTTP Proxy Port** field, enter the required port number for the internal proxy server.
9. Click **Save**.

---

## 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 requirements 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

10. Navigate to **EM > System Configuration > Media Processing > Music > Stream Provisioning**.
11. Click **Add...**
12. In the **Stream Type** field, click the music source type.
13. In the **Name** field, enter a name for the new music source. The system uses this name as the stream key.
14. **(Optional)** To form a stream key in the form `name@domain`, in the **Domain** field, enter a domain name.
15. In the **Primary URL** field, enter the address of the required music source.

16. **(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.

17. To add the music source in the locked state so that system does not use the new music source, select the **Locked** check box.
18. Click **Save**.
19. 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 233](#)

---

# Editing a streaming music source

## About this task

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

## Procedure

20. Navigate to **EM > System Configuration > Media Processing > Music > Stream Provisioning**.
21. To indicate the music source to edit, select the corresponding checkbox.
22. Click **Edit...**
23. In the **Stream Type** field, click the music source type.
24. To change the stream key name, in the **Name** field, enter a name for the new music source.
25. **(Optional)** To change the domain part of the stream key, in the **Domain** field, enter a new domain name.
26. To change the primary music source, in the **Primary URL** field, enter the new address.
27. **(Optional)** To change the alternate music source, in the **Backup URL** field, enter the new address.
28. To change the availability of this music source, select or clear the **Locked** checkbox.
29. Click **Save**.

30. 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 233](#)

---

## Deleting a streaming music source

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

31. Navigate to **EM > System Configuration > Media Processing > Music > Stream Provisioning**.
32. To indicate which music sources to delete, select one or more corresponding check boxes.
33. To delete the selected music sources, click **Delete**.

### Related links

[Locking and unlocking a streaming music source on page 164](#)

---

## 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

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

---

## 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, consult with Avaya support engineers before following the 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

The 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 IPv4 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 in the offer
    - For incoming IPv4 only SDP, IPv4 only SDP is used.
    - For incoming ANAT SDP with IPv4 then IPv6 order, IPv4 is used in the ANAT response.
    - For incoming ANAT SDP with IPv6 then IPv4 order, IPv4 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 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 Assignment**.
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

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:

6. Navigate to **EM > System Configuration > Network Settings > Advanced Settings > Media Port Ranges**.
7. Choose the **Configuration Mode**:
  - To configure a contiguous media port range, select **Basic**.
  - To configure multiple media port ranges, select **Advanced**.
8. 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`



#### 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 these procedures if you need to change the IP address or hostname of an installed Avaya Aura® MS.



**Note:**

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

## Related links:

[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.

The 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 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-b4f5-00ffb0699410</guid>
    </item>
    <item>
      <title>Corporate Edge - First Impressions</title>
      <enclosure url="http://musicserver/Music/DavenportMusic-1.wav"
type="audio/wav"/>
      <guid>3edcc894-51f1-11e5-b4f5-00ffb0699410</guid>
    </item>
    <item>
      <title>Kaleidoscope - Shades of Blue</title>
      <enclosure url="http://musicserver/Music/DavenportMusic-2.wav"
type="audio/wav"/>
      <guid>47779c66-51f1-11e5-b4f5-00ffb0699410</guid>
    </item>
    <item>
      <title>Keynotes - Colors</title>
      <enclosure url="http://musicserver/Music/DavenportMusic-3.wav"
type="audio/wav"/>
      <guid>ea3dd092-51f1-11e5-b4f5-00ffb0699410</guid>
    </item>
    <item>
      <title>Kalimba</title>
      <enclosure url="http://musicserver/Music/Kalimba.mp3" type="audio/mpeg"/>
      <guid>3e789aa0-cb7b-11e5-b904-18a9051819e8</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.

The 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.

The 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

7. Navigate to **EM > System Configuration > Media Processing > Music > General Settings**.
8. 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.
9. In the **HTTP Proxy Port** field, enter the required port number for the internal proxy server.
10. Click **Save**.

---

## 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 requirements 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

11. Navigate to **EM > System Configuration > Media Processing > Music > Stream Provisioning**.
12. Click **Add...**
13. In the **Stream Type** field, click the music source type.
14. In the **Name** field, enter a name for the new music source. The system uses this name as the stream key.
15. **(Optional)** To form a stream key in the form `name@domain`, in the **Domain** field, enter a domain name.
16. In the **Primary URL** field, enter the address of the required music source.
17. **(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.
18. To add the music source in the locked state so that system does not use the new music source, select the **Locked** check box.
19. Click **Save**.
20. 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 233](#)

---

## Editing a streaming music source

### About this task

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

## Procedure

21. Navigate to **EM > System Configuration > Media Processing > Music > Stream Provisioning**.
22. To indicate the music source to edit, select the corresponding checkbox.
23. Click **Edit...**
24. In the **Stream Type** field, click the music source type.
25. To change the stream key name, in the **Name** field, enter a name for the new music source.
26. **(Optional)** To change the domain part of the stream key, in the **Domain** field, enter a new domain name.
27. To change the primary music source, in the **Primary URL** field, enter the new address.
28. **(Optional)** To change the alternate music source, in the **Backup URL** field, enter the new address.
29. To change the availability of this music source, select or clear the **Locked** checkbox.
30. Click **Save**.
31. 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 233](#)

---

## Deleting a streaming music source

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

32. Navigate to **EM > System Configuration > Media Processing > Music > Stream Provisioning**.
33. To indicate which music sources to delete, select one or more corresponding check boxes.
34. To delete the selected music sources, click **Delete**.



## Related links

Locking and unlocking a streaming music source on page 164

---

## 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

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

[Security configuration on page 157](#)

---

## 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 hostname wherever it appears in the file.
3. Save the file.
4. Edit the file `/etc/sysconfig/network`.
5. Update the hostname wherever it 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 the change system-wide.

## Related links

[Starting and stopping the media server on page 36](#)

---

# 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 36](#)

---

## 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 it appears in the file.
3. Save the file.
4. Using the local Linux® console shell, enter the following command to list the network interfaces:  

```
ifconfig
```
5. Edit the required interface configuration file, for example `/etc/sysconfig/network-scripts/ifcfg-eth0`
6. Update the IP Address wherever it 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:  

```
/etc/init.d/network stop  
/etc/init.d/network start
```
9. Login to EM using the new IP address in the URL for the Element Manager login.
10. Navigate to **EM > System Configuration > Network Settings > IP Interface Assignment**.
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 the 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. 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**.

## Related links

[Starting and stopping the media server on page 36](#)

[N+1 Load Sharing cluster configuration on page 45](#)

[Locking and unlocking the High Availability state on page 62](#)

---

## Changing the IP address on Windows®

### About this task

Perform the following procedure if you need to change the IP address of a Windows®- based Avaya Aura® MS.

### 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 **Internet Protocol Version 4 (TCP/IPv4) Properties** window opens.

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**, **b**, and **Alternate DNS server**.
12. Click **OK**.
13. Click **Close**.
14. Click **Close**.
15. Restart the server to apply the change system-wide.
16. Navigate to **EM > System Configuration > Network Settings > IP Interface Assignment**.



**Note:**

If you are using a remote browser to access EM, use the new IP address in the URL for the Element Manager 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 the 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 36](#)

[N+1 Load Sharing cluster configuration on page 45](#)

---

# 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 protocol (TLS).

---

## Configuring SIP general settings

### About this task

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



**Important:**

Change only those settings that are required for the system. The default settings are sufficient for most systems.

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

Definitions for SIP transport settings	
Setting	Description
Enable SIP UDP Transport	Select to allow the system to accept and request SIP over UDP.
Enable SIP TCP Transport	Select if you want the system to accept and request SIP over TCP.
Enable SIP TLS Transport	Select to allow the system to accept and request SIP over TLS.
Enable SIP TLS Mutual Authentication	Select to enable the mutual authentication option for SIP TLS.
Enforce SIP TLS in Secured Media Mode	Select to disable the non-TLS transport in secured media mode.
Always Approve SIP TLS Certificate	Select if you want the system to accept remote certificate over SIP TLS. The default is disabled.
Always Use SIP default outbound Proxy	Select this option to enable the system to route SIP requests that do not match the domain proxy configuration, through the default outbound proxy. This routing happens even if an IP address is specified in the host portion of the destination URI.

Enforce SIP Route Configuration	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.
Trusted Node Access Only	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.
Always Process Requests for Media Server SIP Reports	Always process OPTIONS methods that request the media server information report or performance report, even if the system is locked or overloaded.
SIP Response Code When System/Application Locked	The SIP Response Code needed to restore service when the application is locked, out-of-service, or exceeds engineering limits. The default value is 503. The range is 400 to 699.
Session Audit Type	Select the preferred Long Call Method to use: Disable Audit, INFO Ping, re-INVITE, or UPDATE.
Session Audit Refresh Timer	The time period expressed in seconds for sending a refresh request. The default is 1800 seconds. The range is 90 to 3600 seconds.
Session Expires Value (RFC4028)	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.
Minimum Session Interval (RFC4028 Min-SE)	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.
Session On Hold Teardown Delay (sec)	The number of seconds a session can be on hold before being terminated. A value of 0 indicates no termination. The default is 3600 seconds. The range is 0 to 100,000 seconds.
Answer Delay (rings)	The number of rings before an incoming SIP call is answered. The duration of a ring is configurable 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.
Hide SIP User-Agent Header	Select to prevent the User-Agent header from being included in SIP messaging.
SIP Hold Before Refer	The call is placed on Hold prior to REFER.
Enable SIP UPDATE method	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.

Enforce SIPS for security enforced calls	Select to require sips: in the URI to negotiate to use SRTP for media transport. Clear to allow SRTP with both sip: and sips: URIs.
Use SIPS for best effort calls	Select to use sips: in the URI for outgoing best-effort offers originated from the Avaya Aura®MS. Clear to use sip: in the URI for outgoing best-effort offers.
Require SIPS for best effort calls	Select to include capability negotiation (crypto) offers when sips: is used. Do not include capability negotiation (crypto) offers when sip: is used. Clear to include capability negotiation (crypto) for both sip: and sips: URIs.
Use Contact Address For SIP REFER With Replaces	Select to replace the Refer-To address with the contact address for merged calls using REFER with replaces.
Enable GSID Handling	Select to support SIP Global Session Identifier (GSLID) processing.
Use GSID as GSLID	Select to use the SIP Global Session Identifier (GSLID) as the Global Session Logging Identifier (GSLID) is Avaya Aura® MS logging and tracing.

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 under the categories **Transport Settings**, **Routing**, **Access Control**, **Session Audit**, and **SIP Settings**.
3. Click Save.



### Note:

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

---

## 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 the 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. Under the **Domains** section, click **Add...** to add a SIP domain.
3. On 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. Under the **Accounts** section, 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

### Before you begin

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

### About this task

Configure SIP routes for all proxy servers and registrar servers. SIP routes are used to 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 routes based on matching domain. If no domain is configured, the system uses the wildcard 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:

Definitions for SIP Route Settings	
Setting	Description

Enabled	Select to enable or disable a SIP route. Typically, routes are enabled; however, a route can be disabled to remove it temporarily without reconfiguring the system.
Domain	The name of the domain to which you are adding the route. The SIP route is associated with this domain.
IM Proxy	If there are multiple proxy routes in the domain, route IMs to the route which is enabled.
Priority	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.
Proxy	Select to assign a proxy server role to this route. A SIP proxy server accepts Avaya Aura® MS requests and uses the SIP registrar server to obtain recipient addressing information.
Registrar	Select to assign a registrar server role to this route. A SIP registrar server is a database that contains the location of all user agents within a domain.
Remote Port	The remote port from which the route accepts SIP requests. The default port is 5060.
Transport	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.
Trusted Node	The trusted nodes associated with the route.
Weight	Weight is used to select routes within the same priority level. The default is 10. The range is 0 to 65535.

## Procedure

1. Navigate to **EM > System Configuration > Signaling Protocols > SIP > Nodes and Routes**.
2. Under the **Routes** area, click **Add...** to add a new SIP route.
3. On the **Add SIP Route** page, under the **General** section, select the **Enabled** check box 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. Under 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:

Definitions for SIP Route Properties	
Property	Description
SIP Route Type	<p>The type of route that indicates if product specific processing is required. The options include:</p> <p><b>Standard SIP</b> This route is fully SIP compliant and requires no special handling. You can select this option for most deployments. This is the default value.</p> <p><b>CS1K GW</b> Direct Communication Server 1000 mode.</p> <p><b>CS1K SRS</b> Communication Server 1000 configured with SIP Redirect Server (SRS).</p> <p><b>CS1K SPS Home</b> Communication Server 1000 configured with a SIP Proxy Server (SPS)</p> <p><b>CS1K SPS Home Redirect</b> Communication Server 1000 configured with SIP Proxy Server (SPS)</p> <p><b>CS1K SPS Redirect</b> Communication Server 1000 configured with SIP Proxy Server (SPS)</p>
SIP Server Poll Timer	<p>Interval (in milliseconds) that the route is polled for status. The mechanism used to determine the status is based on the SIP <b>Server Keepalive</b> configuration setting. The default value is 30,000 milliseconds. The range is 30,000 to 600,000 milliseconds.</p>

Server Keepalive	<p>The mechanism used by Avaya Aura®MS to determine the status of the route. The options include:</p> <p><b>Disabled</b>                      Route status monitoring is disabled.</p> <p>Keep Alive</p> <p><b>Using OPTIONS</b>              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).</p>
------------------	---

## 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 the **Routes** area, select the check box next to the route 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 whether route status monitoring is used.
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 checkbox 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 checkbox next to the account for which you want to change the password.
3. Click **Edit...**
4. On the Edit SIP Account page, click **Change Password**.
5. In the **Password** field, enter the new password.
6. In the **Confirm Password** field, reenter the new password.
7. Click **Continue**.
8. Click **Save**.

---

## Deleting a SIP domain or a SIP account

### Before you begin

If a 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 checkbox next to the trusted node or route that you want to edit.
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 it, the routes must be deleted before the node can be deleted.

### Procedure

1. Navigate to **EM > System Configuration > Signaling Protocols > SIP > Nodes and Routes**.
2. On the **SIP Nodes and Routes** page, select the checkbox 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 it 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 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 MRCP general settings

### About this task

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

Definitions for MRCP General Properties	
Property	Description

Maximum MRCP Channels	The maximum number of MRCP channels or sessions for each node that can be allocated by the 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 keyed value. The default value is 512. The range is 0 to 2000.
Retry Limit	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.
MRCP Resource Ping Interval	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.
Recognition Timeout	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.
MRCP Transaction Timeout	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.
MRCPv2 Control Channel Security	Override options for the security settings for the MRCPv2 control channel. Under normal conditions use the <b>Default</b> option.
MRCPv2 Media Security	Override options for the security settings for the MRCPv2 media channel. Under normal conditions use the <b>Default</b> option.

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 number of allocation retries before an allocation attempt is failed.
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:

Definitions for MRCP Server Properties	
Property	Description
Server Name	The name used to identify this MRCP server. The maximum length is 128 characters.
Server description	A brief description of the server. The maximum length is 512 characters.
Server address	The IP address of the MRCP server. The maximum length is 64 characters.
Port	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.
MRCP Version	The MRCP protocol version Avaya Aura® MS should use.
Transport Protocol	The transport protocol Avaya Aura® MS should use with MRCP.
Vendor	Select the appropriate MRCP vendor identifier (Nuance, Loquendo or those added on the Custom MRCP Vendors page). The default is Nuance.
Codec	Select the appropriate audio codec (PCMU, PCMA or L16). The default value is based on the settings of the selected Vendor.
State	The operational state: <b>Unlocked</b> The server is online and available for allocation. This is the default. <b>Locked</b> The server is offline and unavailable for allocation.

Add to Default Pool	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, one is created 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.
---------------------	--



**Important:**

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



**Important:**

If the host name is used for the server address in the following procedure, DNS must be enabled 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 server can have a TTS resource, LVR resource, or both associated with it.

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

Definitions for MRCP Server Resource Properties	
Property	Description
Server Name	The name of the MRCP server.
Vendor name	The name of the current vendor (Nuance, Loquendo or those added on the Custom MRCP Vendors page).
Type	Select the appropriate resource capabilities (LVR or TTS) supported by MRCP. The default value is based on the settings of the selected Vendor.
URL Suffix	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.
Weight	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.
Maximum Sessions	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.
Languages	The language options available on the MRCP server. The default value is based on the settings of the selected Vendor.



**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 checkbox next to the MRCP server to which you want to add server resources.
3. Click **Edit...**
4. On the **Edit MRCP Server** page, under 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:

<b>Definitions for MRCP Pool Properties</b>
---

Property	Description
Available	Select to make the pool available for servers.
Default pool	Select to make this pool the default pool for speech capability on the network of Avaya Aura® MS nodes.
Language	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.
Pool description	A brief description of the pool. The description can be up to 512 characters.
Pool name	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. Pool names cannot be changed in Edit mode. A pool name is permanent after the pool is created.
Pool type	The type of pool (LVR or TTS). The pool type cannot be changed in Edit mode. The pool type is permanent after the pool is created.
Pool weight	A weighted value used to determine how pool resources are prioritized. The default value of 1. The range is 0 to 65535.
Vendor name	The name of the current vendor, Nuance, Loquendo or those added on the Custom MRCP Vendors page.

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 this pool available, select the **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 checkbox 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, 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, click **Add...**
3. In the **Vendor Name** field, enter the new vendor's name.
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. Under 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. Under **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 checkbox 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** as necessary.
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 its 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 checkbox next to the MRCP server that you want to edit.
3. Click **Edit...**
4. Edit the **General** MRCP server properties as required.
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 checkbox next to the MRCP server that you want to delete.
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 checkbox next to the MRCP server.
3. Click **Edit**.
4. Under **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 checkbox 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 checkbox next to one or more MRCP pools that you want to change the availability status.

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 checkbox 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 checkbox 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

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

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 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:

Definitions for QoS monitoring properties	
Property	Description
QoS Monitoring	Select to enable Quality of Service monitoring.
Alert Interval (ms)	The minimum time period between QoS alert monitoring, measured in milliseconds. The default value is 60 milliseconds. The range is 1 to 2147483647 milliseconds.
Critical R Threshold (%)	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.
Maximum Alerts	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.
Refresh Interval (sec)	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.
Warning R Threshold (%)	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.

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

## Procedure

1. Navigate to **EM > System Configuration > Media Processing > General Settings > QoS Monitoring**.
2. Alter the properties using the **Definitions for QoS Monitoring Properties** table as an aid.
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:

Definitions for QoS streaming properties	
Property	Description
Audio DSCP	DSCP marking value for audio. The default value is 46 (Expedited Forwarding). The range is 0 to 63.
Video DSCP	DSCP marking value for video. The default value is 34 (Assured Forwarding). The range is 0 to 63.

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

### Procedure

1. Navigate to **EM > System Configuration > Media Processing > General Settings > QoS Streaming**.
2. Alter the properties as desired 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	
Property	Description
Silence Suppression CN Level	The silence suppression comfort noise (CN) level in dB as defined by RFC3389. The default is -127 dB. The range is -127 dB to 0 dB.
Silence Suppression Interval (ms)	The number of milliseconds between successive 3389 RTP SS packets. The default is Disabled. The range is 0 to 2147483647 milliseconds.
Silence Suppression Threshold (ms)	The number of milliseconds before transmitted RTP silence is suppressed with 3389 SS packets. The default is 20 ms. The range is 0 to 2147483647 milliseconds.

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 as desired 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

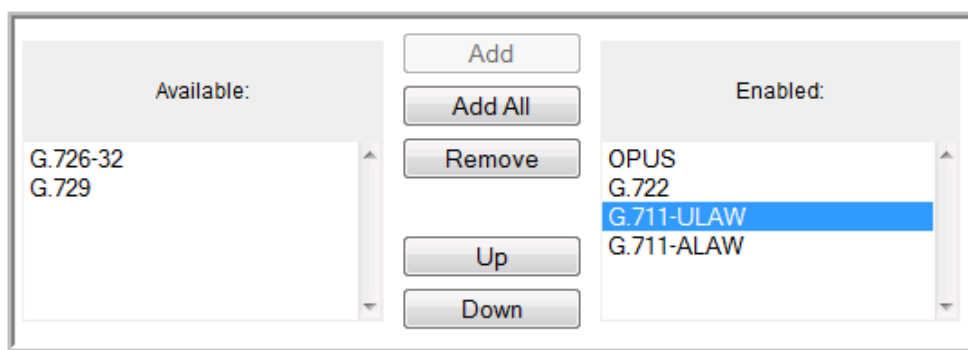
### About this task

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 media server's preference 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**.



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 it 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 Setting** 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 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

1. Navigate to **EM > System Configuration > Server Profile > General Settings > Server Function**.
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**.

### Video Codecs

Available:

- H.264

Add

Add All

Remove

Up

Down

Enabled:

- H.263++
- H.263+
- H.263
- NNVC

	Allowed Frame Rates:					Default Frame Rate:	Preferred Format:	Annex Profile:
	10	15	20	25	30			
H.263	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	15	CIF	2
H.263+	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	15	CIF	2
H.263++	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	15	CIF	2
H.264	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	15	CIF	
NNVC	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	15	LARGE	

Enforce Annex X Profiles:

Save      Cancel

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 desired **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 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 default is this option if no other option is configured or negotiated. 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 be disabled 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.

### 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 the 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 can 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.
3. Click **Delete**.

---

## 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.

Definitions for Security Policy Options		
Property	Description	
Security Policy	The media security policy to use for SDP negotiation. The options include:	
	Best Effort	Both Audio Video Profile (AVP) and Secure AVP (SAVP) sessions are offered and accepted, with preference given to negotiating to SAVP. This is the default.
	Security Disabled	Only AVP is offered or negotiated.
	Security Enforced	Only SAVP is offered or negotiated.
Best Effort Mode	The options include:	

	Capability	The SDP is formatted according to the Capability Negotiation format, using tcap/acap/pcap open parameters to negotiate AVP versus SAVP.  This is the default.
	Dual M-Line	The existing default SDP specification, containing both AVP and SAVP media stream offerings for each media type.
	CAPNEG Draft	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.

## Procedure

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

**Media Security**

[Security Policy](#) | [Crypto Suites](#)

Security Policy

Security Policy: BEST EFFORT

Best Effort Mode: CAPABILITY

Crypto Suites

	Priority	SRTP Master Key Lifetime	Key Derive Rate	Master Key Index Length	SRTP Encryption	SRTP Encryption	SRTP Authent
<input type="checkbox"/> AES_256_CM_HMAC_SHA1_80	1	<input type="checkbox"/> 2 <sup>31</sup>	0	0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/> AES_256_CM_HMAC_SHA1_32	1	<input type="checkbox"/> 2 <sup>31</sup>	0	0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> AES_CM_128_HMAC_SHA1_80	1	<input checked="" type="checkbox"/> 2 <sup>31</sup>	0	0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/> AES_CM_128_HMAC_SHA1_32	1	<input type="checkbox"/> 2 <sup>31</sup>	0	0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Save Cancel Restore Defaults

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

Configure cryptographic suites to provide message privacy.

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

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Definitions for crypto suite options	
Property	Description
AES_CM_128_HMAC_SHA1_80	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.
AES_CM_128_HMAC_SHA1_32	The SRTP AES Counter Mode cipher is used with HMAC-SHA1 message authentication having a 32-bit authentication.
Priority	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.
SRTP Master Key Lifetime	Select to enable SRTP Master Key Lifetime. Uncheck to omit the SRTP Master Key lifetime in outgoing offers. The exponent of the number of packets between key renegotiations. The default is 2 <sup>31</sup> for. The range is from 1 to 48.
Key Derive Rate	A value that sets the rate at which new keys are derived. The default value is 0. The default value omits the Key Derivation Rate from outgoing offers and indicates a single key derivation. The range is from 0 to 24.
Master Key Index Length	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 value is 0. The default value omits the Master Key Index from outgoing offers. The range is from 0 to 4.

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	
Property	Description
Enable SRTCP Encryption	Select to specify that SRTCP encryption is preferred. Clear to include the UNENCRYPTED_SRTCP session parameter in outgoing offers.
Enable SRTP Encryption	Select to specify that SRTP encryption is preferred. Clear to include the UNENCRYPTED_SRTP session parameter in outgoing offers.

Enable SRTP Authentication	Select to specify that SRTP authentication is preferred. Clear to include the UNAUTHENTICATED_SRTP session parameter in outgoing offers.
----------------------------	--

## Procedure

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

**Media Security**

[Security Policy](#) | [Crypto Suites](#)

Security Policy: BEST EFFORT  
Best Effort Mode: CAPABILITY

**Crypto Suites**

	Priority	SRTP Master Key Lifetime	Key Derive Rate	Master Key Index Length	SRTP Encryption	SRTP Enc	SRTP Auth
<input type="checkbox"/> AES_256_CM_HMAC_SHA1_80	1	<input type="checkbox"/> 2 <sup>h</sup> 31	0	0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/> AES_256_CM_HMAC_SHA1_32	1	<input type="checkbox"/> 2 <sup>h</sup> 31	0	0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> AES_CM_128_HMAC_SHA1_80	1	<input checked="" type="checkbox"/> 2 <sup>h</sup> 31	0	0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/> AES_CM_128_HMAC_SHA1_32	1	<input type="checkbox"/> 2 <sup>h</sup> 31	0	0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Save Cancel Restore Defaults

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 **SRTP Encryption**, **SRTP Enc**, and **SRTP Auth** 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.

The 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 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-b4f5-00ffb0699410</guid>
    </item>
    <item>
        <title>Corporate Edge - First Impressions</title>
        <enclosure url="http://musicserver/Music/DavenportMusic-1.wav"
type="audio/wav"/>
        <guid>3edcc894-51f1-11e5-b4f5-00ffb0699410</guid>
    </item>
    <item>
        <title>Kaleidoscope - Shades of Blue</title>
        <enclosure url="http://musicserver/Music/DavenportMusic-2.wav"
type="audio/wav"/>
        <guid>47779c66-51f1-11e5-b4f5-00ffb0699410</guid>
    </item>
    <item>
        <title>Keynotes - Colors</title>
        <enclosure url="http://musicserver/Music/DavenportMusic-3.wav"
type="audio/wav"/>
        <guid>ea3dd092-51f1-11e5-b4f5-00ffb0699410</guid>
    </item>
    <item>
        <title>Kalimba</title>
        <enclosure url="http://musicserver/Music/Kalimba.mp3" type="audio/mpeg"/>
        <guid>3e789aa0-cb7b-11e5-b904-18a9051819e8</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.

The 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.

The 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

4. Navigate to **EM > System Configuration > Media Processing > Music > General Settings**.



5. 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.
6. In the **HTTP Proxy Port** field, enter the required port number for the internal proxy server.
7. Click **Save**.

---

## 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 requirements 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

8. Navigate to **EM > System Configuration > Media Processing > Music > Stream Provisioning**.
9. Click **Add...**
10. In the **Stream Type** field, click the music source type.
11. In the **Name** field, enter a name for the new music source. The system uses this name as the stream key.
12. **(Optional)** To form a stream key in the form `name@domain`, in the **Domain** field, enter a domain name.
13. In the **Primary URL** field, enter the address of the required music source.

14. **(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.

15. To add the music source in the locked state so that system does not use the new music source, select the **Locked** check box.
16. Click **Save**.
17. 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 233](#)

---

# Editing a streaming music source

## About this task

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

## Procedure

18. Navigate to **EM > System Configuration > Media Processing > Music > Stream Provisioning**.
19. To indicate the music source to edit, select the corresponding checkbox.
20. Click **Edit...**
21. In the **Stream Type** field, click the music source type.
22. To change the stream key name, in the **Name** field, enter a name for the new music source.
23. **(Optional)** To change the domain part of the stream key, in the **Domain** field, enter a new domain name.
24. To change the primary music source, in the **Primary URL** field, enter the new address.
25. **(Optional)** To change the alternate music source, in the **Backup URL** field, enter the new address.
26. To change the availability of this music source, select or clear the **Locked** checkbox.
27. Click **Save**.

28. 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 233](#)

---

## Deleting a streaming music source

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

29. Navigate to **EM > System Configuration > Media Processing > Music > Stream Provisioning**.
30. To indicate which music sources to delete, select one or more corresponding check boxes.
31. To delete the selected music sources, click **Delete**.

### Related links

[Locking and unlocking a streaming music source on page 164](#)

---

## 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

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

---

# Security configuration

Avaya 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:

Definitions for default service profiles	
Service profile name	Interface secured
Application	Connections with applications like VXML or an application server.
Clustering	Avaya Aura® MS internode connections in clusters.
EM	Element Manager (EM) connections for administrator web browser access.
OAM	Web services, such as those accessed using SOAP with Avaya Aura® MS, and remote database access.
Signaling	SIP and MRCPv2 connections with Avaya Aura® MS.

---

## 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

1. Navigate to **EM > Security > Certificate Management > Key Store**.
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

1. Navigate to **EM > Security > Certificate Management > Key Store**.
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 box 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

1. Navigate to **EM > Security > Certificate Management > Key Store**.
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

1. Navigate to **EM > Security > Certificate Management > Key Store**.
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

1. Navigate to **EM > Security > Certificate Management > Key Store**.
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

1. Navigate to **EM > Security > Certificate Management > Key Store**.
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

1. Navigate to **EM > Security > Certificate Management > Key Store**.
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

1. Navigate to **EM > Security > Certificate Management > Key Store**.
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 a 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

1. Navigate to **EM > Security > Certificate Management > Trust Store**.
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

1. Navigate to **EM > Security > Certificate Management > Trust Store**.
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 a 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

1. Navigate to **EM > Security > Certificate Management > Trust Store**.
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

1. Navigate to **EM > Security > Certificate Management > Trust Store**.
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, which 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 this 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 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

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

### Procedure

1. Navigate to **EM > Security > General Settings**.
2. Enter the security warning text in the **Security warning message on login** field.
3. Click **Save**.

# Chapter 7: 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:
  - a. 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.
  - b. Type the name of the organization using the certificate in the **Organization** and **Organization Unit** fields.
  - c. Type an ISO-3166 country code for the **Country field**.
  - d. Type the full name of the state or province in the **State/Province** field.
  - e. 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.
6. Navigate to **EM > Security > System Manager > Enrollment**.
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.

14. To verify access to System Manager for enrollment, 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:

- a. 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.
- b. Type the name of the organization using the certificate in the **Organization** and **Organization Unit** fields.
- c. Type an ISO-3166 country code for the **Country field**.
- d. Type the full name of the state or province in the **State/Province** field.
- e. 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 change 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 8: 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® MS stores media and other files for hosted applications. Content Store provides a reliable, highly available, 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 functionality 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 the 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.

Media Management Operations		
Scope	Operation	Description
Namespace	Add	Create a new namespace.
	Browse	View the content of a namespace.
	Rename	Give a new name to a namespace.
	Delete	Remove a namespace and all its content.
Content Group	Add Content Group	Create new content groups under a namespace or another content group.
	Add Media	Upload media files to a content group.
	Delete	Remove the content group and its files.
	Rename	Give a new name to a content group.
	Batch File Provision	Upload multiple files contained in a zip archive file.
Content	Cut	Cut and paste are used together to move a media content file from one content group to another.
	Copy	Copy and paste are used together to duplicate an existing content file.
	Paste	Used with Copy and Cut to move and duplicate media files.
	Rename	Give a new name to a media file.

	Download	Download a media file to the local computer running the browser you are using to access EM.
--	----------	---



**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, and must not contain spaces or any of the following symbols:

{ } ' \* \

4. Click **Save**.

---

## Renaming a content namespace

### About this task

Perform the following procedure to rename a content namespace to describe what it contains.

### Procedure

1. Navigate to **EM > Tools > Media Management**.
2. On the **Media Management** page, select the checkbox 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, must not be 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 checkbox 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 checkbox next to the namespace you want to manage or browse.
3. Click **Browse**.
4. On the **Provision Media** page, in the left pane, 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 checkbox 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.

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 checkbox 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 checkbox 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 containing the media file you want to download.
5. In the **Name** column, 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 download 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 to better describe what it contains.

### Procedure

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

2. On the **Media Management** page, select the checkbox 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 new name for the content group.

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 checkbox 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 the **Delete** or right-click on 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.

## Creating the zip file

### About this task

Perform the following procedure to create a proper file structure on your local system for the zipped-up files.



**Important:**

When creating the zip file, keep these naming restrictions in mind:

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 for your 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 checkbox 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** drop-down menu.
5. In the **Batch File Provision** dialog box, click **Browse**, and then navigate to the zip file you want 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 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 checkbox 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 of interest 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. Navigate to **EM > Tools > Media Management**.
2. On the **Media Management** page, select the checkbox next to the namespace that contains the content to be renamed.
3. Click **Browse**.
4. To locate the content to be renamed, 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 checkbox 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 it 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 checkbox 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 contain the copy of 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 on 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 checkbox 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 (–) buttons to expand and hide the content. Alternatively you can click **Search** in the upper-right corner.
5. Select the content item to be removed and click **Delete**, or right-click on the content item and select **Delete**.
6. In the **Confirm Media Delete** dialog box, click **Confirm**.



# Chapter 9: Application management

---

## Enabling the VoiceXML interpreter

### About this task

By default, the VoiceXML application interpreter is disabled on Avaya Aura® MS.

Perform the following procedure to enable the VoiceXML interpreter.

### Procedure

1. Navigate to **EM > System Configuration > Server Profile > General Settings > Server Function**.
2. Select **VoiceXML Interpreter**.
3. Click **Save**.

---

## Adding VoiceXML custom applications

### Before you begin

Ensure that you have enabled the VoiceXML interpreter.

### 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.

### 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 not currently 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 not currently 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

5. Navigate to **EM > System Configuration > Application Interpreters > RFC5707 (MSML) > General Settings**.
6. Select **MSML Video Capability Negotiation** to enable video negotiation if offered by the SIP client endpoints.
7. Select **MSML HA Event Notification** to enable MSML event notification when failovers occur in High Availability mode.
8. Enter the default announcement namespace in the **MSML Default Namespace** field.
9. Click **Save**.
10. 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** 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:

Definitions for mode options	
Option	Description
None	Translations fail if <b>Mode</b> is set to <b>None</b> . The system responds with 404 Not Found.

SIP request URI	Translations use the entire Request URI, including arguments, from the SIP INVITE.
Called DN	Translations use the directory number of the called user. The system uses the SIP INVITE To header, excluding arguments, as the called DN.
Calling DN	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.
SIP request URI user	Translations use the user name found before the server address in the request URI of the SIP INVITE.
SIP To	Translations use the To header from the SIP INVITE.
SIP From	Translations use the From header from the SIP INVITE.

Definitions for algorithm options	
Option	Description
None	Translations fail if <b>Algorithm</b> is set to <b>None</b> . The system responds with 404 Not Found.
Substring Match	For successful translation to the application, the string specified by <b>Mode</b> must contain the string specified by <b>Pattern</b> .
Regular Expression	For successful translation to the application, the string specified by <b>Mode</b> must match the regular expression specified in <b>Pattern</b> . 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.
Exact Match	For successful translation to the application, the string specified by <b>Mode</b> must exactly match the string specified by <b>Pattern</b> .
Case-Insensitive Match	For successful translation to the application, the string specified by <b>Mode</b> must match the string specified by <b>Pattern</b> . The system does not consider case in the comparison.

Dial Plan Notation	<p>For successful translation to the application, the string specified by <b>Mode</b> must match the dial plan expression specified by <b>Pattern</b>.</p> <p>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.</p> <p><b>Examples:</b></p> <p>An example emergency dial plan pattern is 911. If a user dials 911, then the system translates to the emergency application.</p> <p>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.</p> <p>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.</p>
--------------------	---

## 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 the **Application name**.
4. Select the translation **Mode**.
5. Chose 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

### Before you begin

Lock custom applications before deleting them.

### About this task

Perform the following procedure to remove a custom application from the system.

### 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 10: Backup and restore

---

## Backup and restore overview

Avaya Aura® MS can backup and restore system configuration data and application content data, which is stored in Content Store. Maintaining backups of your system allows you to recover from hardware failures or 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 the data against 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 7.7 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 FTP (File Transfer Protocol) 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 can be included in the backups: System Configuration and Application Content. You can combine both of these backup types in one task or create separate tasks, each with independent schedules. Each backup type contains the following information:

Definitions for negotiated parameters	
Property	Description
System Configuration:	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.
Application Content:	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.

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**

## Edit Backup Task

[Option](#) | [Schedule](#)

**Option**

Backup Task Name:  (3 - 78 characters)

Backup Type:

- System Configuration
- Application Content

Backup Destination:

	Destination Name ▲	Protocol
1 <input type="radio"/>	Default Backup Destination	
2 <input checked="" type="radio"/>	RemoteBackupServer	FTP

◀  ▶

**Schedule**

All times are based on the local server time

Run Backup:  Manually, as needed.  
 Schedule.

Schedule Task:

Start Time:  :

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 you against 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 chose 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 selected FTP, click **Test** to verify 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, 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 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 which 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 that 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 may 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 a 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 7.7 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, review the information and click **Confirm** to proceed with the restore.



**Important:**

Restoring a backup archive may 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 on page 263](#)

---

# Viewing the backup and restore history log

## About this task

Each backup and restore operation, whether success or 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**.

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2. Use the **View** drop-down menu to select **All**, **Backup**, or **Restore** to filter the list of logs the system displays.
3. (Optional) If you are monitoring backup or restore for completion, use the **Refresh Interval** to select the required update frequency of the logs.
4. (Optional) Click **Export** to save the log history.
5. (Optional) Click the **Clear** to delete the current log history.

---

## Configuring the history log

### About this task

Perform the following procedure to configure the number of days that you want to save backup and restore history log files on the server before they 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 they 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 the EM does when using its 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 serverkey] [-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 sftpserver1
user "ssh-rsa 1024 4b:d2:46:fd:e9:a7:da:fc:53:ee:f6:2e:5b:4a:0a:d9" -p
"pw1234abc" -dp /export/home/user/ -d

```

```

backuprestore -b /backup/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 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.

Backup and Restore Tool Options	
Option	Description
-h	Display the help message and more examples.
-b	Backup indicator followed by the filename to use for the backup. The filename must include the .zip extension.
-r	Restore indicator followed by the filename of the file to restore. The file must be an archive with the .zip extension.
-t	Backup Task type. Defines what will be backed-up: config indicates System Configuration. service indicates Application Content.
-ftp	(Optional) Transfer the resulting backup file to an FTP destination.



-sftp	<p>(Optional) Transfer the resulting backup file to an SFTP destination. The <code>-sftp</code> switch must be followed by the server address, username and fingerprint of the SFTP destination in quotes. For example,</p> <pre>-sftp 10.0.12.23 sftpuser "ssh-rsa 1024 4b:d2:46:fd:e9:a7:da:fc:53:ee:f6:2e:5b:4a:0a:d9"</pre> <p>The fingerprint field is a combination of three space-delimited tokens, 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.</p>
-p	<p>(Optional) Password for SFTP authentication. Use quotes around passwords containing special characters. Additionally, if the password contains a backslash (\) or a quote (") then each of these characters must be escaped by a preceding backslash (\). For example, the password <code>12;;33\MS"pw</code> should be entered in quotes as follows: <code>"12;;33\\MS\\"pw"</code></p>
-k	(Optional) Private key for SFTP server.
-dp	(Optional) Destination path for backup on the SFTP server.
-d	(Optional) Delete the local file upon successful ftp transfer or restore.
-c	(Optional) Direct output to the console instead of the debug file.

## Procedure

1. Stop Avaya Aura® MS.
2. Open a Linux® shell or Windows® command prompt on Avaya Aura® MS.
3. Execute the `backuprestore` tool following the above 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 11: Avaya Aura® MS monitoring

---

## Avaya Aura® MS monitoring overview

Element Manager (EM) provides ways to monitor the processing status of Avaya Aura® Media Server (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 the EM. For information on procedures to view and change the status of Avaya Aura® MS, see [Chapter 5: Basic management tasks on page 35](#).

---

## 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**.

**Cluster Status**

Select an element name to view the alarm viewer for that element.

[System Status](#) | [System Performance Summary](#)

**System Status** Refresh every:

Element Name	UUID	Element Role	Element Status	Alarm Description
<a href="#">server3496.richlab</a>	ac9905a0-80c5-11e0-8aa8-000d60d49a6c	Primary	Normal	No Alarm
<a href="#">server3497.richlab</a>	e3cf0e20-80c5-11e0-8bdb-000d60d49748	Backup	Normal	No Alarm

**System Performance Summary** Refresh every:

Name	Value (Aggregate)
Active Sessions	0
SIP Inbound Call Attempted	0
SIP Outbound Call Attempted	0

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 only available on Primary servers. The **System Performance Summary** only displays those operational measurements which are configured as a **Key Performance Indicators** (KPI). For more information on KPIs, see [Configuring OM settings](#).

3. Click on the **Element Name** of an individual element in the **System Status** pane to display the detailed alarm information for that particular element.

### Related links:

[Configuring OM settings on page 229](#)

## 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 itself 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:

Alarm Field Descriptions	
Filed	Description
ID	A unique identifier assigned to the alarm.
Severity	The severity rank of alarms from most severe to least severe is Critical, Major, Minor, and Warning.
Date and Time	The timestamp of the exact time when 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.
Description	A description of the type of error condition encountered.
Component	The name of Avaya Aura® MS software component reporting the alarm.
Probable Cause	A description of the probable cause of this alarm.
Corrective Action	A suggested corrective action that can be performed to resolve the error condition.

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.

### Alarms

**Filter** [Hide](#)

None Customize... Clear

**Active Alarms** Refresh every: 15 seconds ▼

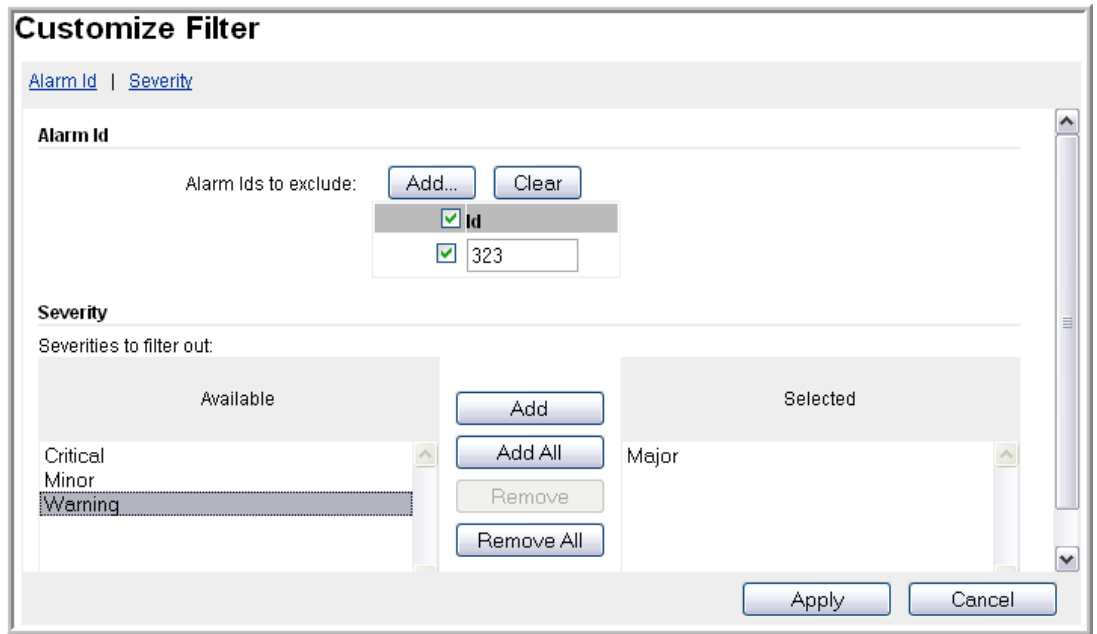
	<a href="#">Id</a>	<a href="#">Severity</a> ▲	<a href="#">Date and Time(CDT)</a>	<a href="#">Description</a>
<input type="radio"/>	318	Critical	2011-06-07 11:28:44	MAS instance is not licensed
<input checked="" type="radio"/>	390	Critical	2011-06-04 11:53:00	Missing License Key
<input type="radio"/>	323	Major	2011-06-07 11:28:47	All Configured SIP Routes Are Down

---

**Alarm Details** [Hide](#)

Alarm Id: 390      Severity: Critical      Component: MAS License Server  
 Date & Time: (CDT)2011-06-04 11:53:00  
 Description: Missing License Key  
 Probable Cause: There are no licenses keys configured.  
 Corrective Action: Configure a valid license key.

- Select an alarm that is listed.  
The system displays the details at the bottom of the page.  
Use the vertical and horizontal scroll bars view information.
- 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.
- 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 of the **Alarms** pane.

---

## Event logs

Event logs provide a historical view of events that occurred on the system.

If required, 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 upon 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.

Event Log Field Descriptions	
Filed	Description
ID	A unique identifier assigned to the alarm.
Severity	The severity ranks events from most severe to least severe are as follows: Critical, Major, Minor, and Warning.

Origin	The name of the server reporting the event.
Date and Time	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.
Class	The type of information the log is reporting. Class values include Audit, Configuration, Data, Fault, Information, Maintenance, Metrics, Security, and State.
Category	Always reports a value of General in this release.
Instance Count	The number of times this event occurred when event throttling collects repeated events.
Description	Provides a summary of the type of error condition encountered.
Component	The name of Avaya Aura® MS software component reporting the alarm.
Probable Cause	A description of what probably caused this event to be raised.
Corrective Action	Suggested corrective action that can be used to resolve the error condition.
Application Id	The application reporting the event.
Customer Id:	A custom value set by an application.
Document Reference Link	An Optional link to documentation related to the event.

---

## 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.

**Event Logs**

**Filter** [Hide](#)

None

**Events**

Refresh every:

<input type="radio"/>	<b>Id</b>	<b>Severity</b>	<b>Date and Time(CDT)</b>	<b>Class</b>	<b>Description</b>
<input type="radio"/>	18913	Info	2011-05-17 13:32:50	Info	Element Manager [ Status Monitoring
<input type="radio"/>	14600	Critical	2011-05-17 13:32:43	Info	Alarm Activated: Internal Component
<input type="radio"/>	8003	Info	2011-05-17 13:32:43	Info	ConfMP Shutdown Details: ConfMP Sha
<input checked="" type="radio"/>	14600	Major	2011-05-17 13:32:43	Info	Alarm Activated: ConfMP MSLINK Inac
<input type="radio"/>	8501	Warning	2011-05-17 13:32:43	Info	Connection Loss
<input type="radio"/>	8004	Info	2011-05-17 13:32:43	Info	Conference shutdown Details: confic

Page:   1   Of 1505

**Event Details** [Hide](#)

Event Id: 14600                      Severity: Major                      Origin: server4835

Date & Time: (CDT)2011-05-17 13:32:43

Class: Info

Category: General

Instance Count: 1

Description:

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.



**Customize Filter**

[Event Id](#) | [Date and Time](#) | [Severity](#) | [Class](#)

**Event Id**

Event Ids to exclude:

Id

**Date and Time**

Date and Time to filter in:

Start Date:  Start Time:  :  :

End Date:  End Time:  :  :

**Severity**

Severities to filter out:

Available		Selected
Alert	<input type="button" value="Add"/>	
Minor	<input type="button" value="Add All"/>	Critical
<b>Emergency</b>	<input type="button" value="Remove"/>	Major
Error	<input type="button" value="Remove All"/>	
Warning		
Info		

**Class**

Classes to filter out:

Available		Selected
Audit	<input type="button" value="Add"/>	
CfgChange	<input type="button" value="Add All"/>	
DataDump	<input type="button" value="Remove"/>	
<b>Info</b>	<input type="button" value="Remove All"/>	Fault
Maintenace		
Metrics		

7. On the **Customize Filter** page, select the **Event Id**, **Date and Time**, **Severity** and **Class** types to include using the **Add** buttons.
8. Click **Apply** to return to the **Event Logs** page with the filtered results.
9. 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 only reports 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

1. Navigate to **EM > System Configuration > Monitoring Settings > Event Logs > General Settings**.
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.

Filter Options by Log Class	
Event Type	Description
Audit	Audit events provide notification of very specific actions within a managed device. In isolation, an audit event provides very limited data. However, a collection of audit information forms an audit trail.
Security	A security event is something that happens of interest for security reasons. It is often, but not always, combined with other classes, such as fault and audit to form a record or notification. For example a security audit log is both a security event and an audit event.
Configuration Change	A configuration event, also known as an inventory event, is used to notify the system that the hardware, the software, or a service has been added, changed, or removed.
Fault	The system generates a fault notification after a fault condition occurs. A fault notification can result in an alarm.
State	A state is a condition or stage in the existence of a managed entity. A state includes both administrative states that can be manually configured and operational states that are read-only and determined by the managed entity itself.
Data Dump	A data dump event is an asynchronous event that contains information about a system, including its configuration and 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.

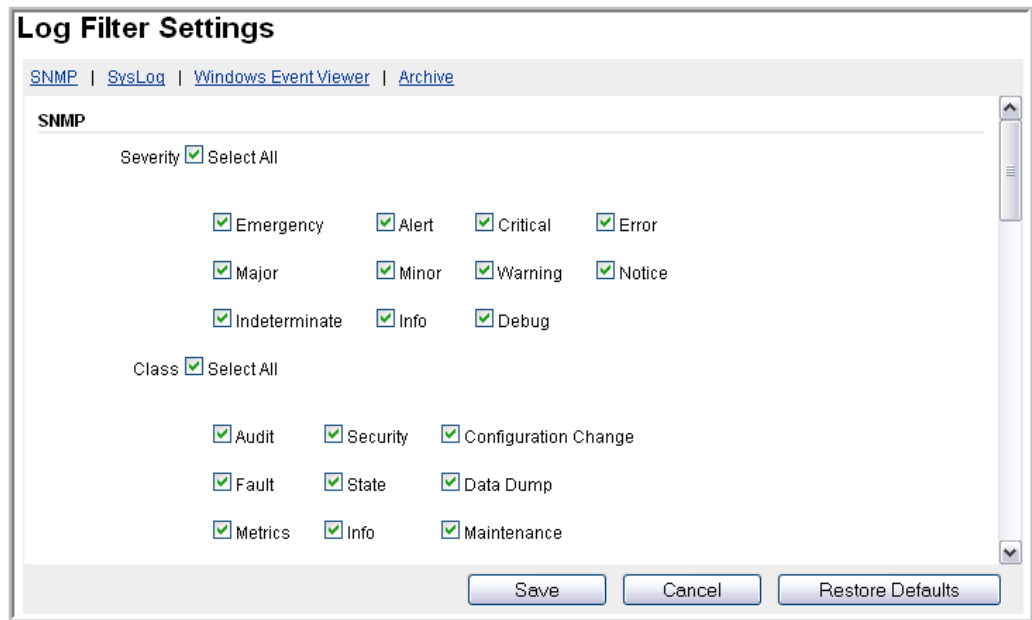
Metrics	A metrics event contains a metric or a collection of metrics (including performance metrics) for an application, platform, or another device or network element. The record can be in a number of different formats, for example, XML, CSV.
Info	An event of interest which requires no action, but can be used for troubleshooting purposes.
Maintenance	A maintenance event signals the beginning, processing, or ending 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.

Filter Options by Log Severity	
Event Type	Description
Emergency	The system is unusable.
Alert	Action must be taken immediately.
Critical	Immediate corrective action is required due to conditions such as a loss of service, loss of bandwidth, outage, and loss of data or functionality.
Error	An error condition occurred.
Major	Urgent corrective action is required due to conditions such as a pending loss of service, outage, and loss of data or functionality.
Minor	Corrective action is required to prevent eventual service-affecting degeneration.
Warning	Indicates the detection of a potential or impending service-affecting condition and that some diagnostic action is required.
Notice	Indicates a normal but significant condition.
Indeterminate	Indicates the detection of a service-affecting condition whose impact is unknown.
Info	Indicates audit-type information and configuration changes.
Debug	Indicates diagnostic information

Perform the following procedure to configure your log filters for each destination.

## Procedure

1. Navigate to **EM > System Configuration > Monitoring Settings > Event Logs > Log Filter Settings**.



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 following procedure to gain access to the saved Avaya Aura® MS Security Logs.

### Procedure

1. Navigate to **EM > System Status > Logs > Security Logs**.
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.

**Security Logs**

Refresh every: 15 seconds

Date and Time(CDT)	Effect	Action	Functional Task	Item
2011-05-17 11:04:08	Configuration Change	Delete	SystemConfig.Signaling.SIP.Nodes	TrustedN
2011-05-17 11:04:04	Configuration Change	Add	SystemConfig.Signaling.SIP.Nodes	TrustedN
2011-05-17 00:00:00	Configuration Change	Delete	Tools.Backup & Restore : History log	clear histo Date:Fri M 2011

Page: 1 of 3

**Details** [Hide](#)

Event Id:18921      Event Type:Info      Origin:server4835

Date & Time:2011-05-17 11:04:04

Effect:Configuration Change

Action:Add

Functional Task:SystemConfig.Signaling.SIP.Nodes&Routes:TrustedNodes

Task Path:SystemConfig.Signaling.SIP.Nodes&Routes:TrustedNodes

- To set the security data refresh interval, use the **Refresh every** drop-down menu.
- To move further back 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

- Navigate to **EM > System Configuration > Logging Settings > Privacy**.
- 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.
- Click **Save**.

---

## Configuring SysLog settings

### About this task

Perform following procedure to enable the delivery of SysLog events and to configure the destination server which 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 the **SYSLOG Destination Server List**.
4. Enter the IP address and port of the destination server in text boxes which appear 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 prompted, follow the on screen 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 sessions are consuming.

Use the horizontal scroll bars to see all the columns of information.

### Active Sessions (Cluster)

Active Sessions: 2	Conference Resources: 1	Session Attempts/Interval: 2
IVR Resources: 3	MRCP Resources: 0	CPU Load (%): 0

Viewing Active Sessions

Filter:  Sessions Listed: 2

Criteria:  Filtered Sessions: 0

Select...  Every

Remote Party	Start Timestamp	Application Name	Endpoint	QOS R-Factor	QOS Rou
"Paul"<sjp:pd@avaya.com>	4/27/2011 10:45:18 AV	RFC4240	Nortel PCC 7.4.40	91	66
"David"<sip:dm@avaya.com>	4/27/2011 10:45:36 AV	RFC4240	Nortel PCC 7.4.40	91	62

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 to select a filter type. Then enter the match criteria of interest in the **Criteria** field below the selected filter.

5. To disable filtering and again 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 the 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 on screen 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 arrives, the system displays the **Active Sessions** page with a detailed call performance summary.



### Active Sessions

Viewing Session Dashboard

Filter: None ▼ Records Listed: 53

Gslid: 2981325e-9f8b-30d2-ac79-9b12769b2450 Filtered Records: 0

Select Viewing Options... Stop Monitoring

#### Summary

Bandwidth (kb/s)

#### Audio

Bandwidth (kb/s)

#### Video

Bandwidth (kb/s)

<p><b>R-Factor</b> <b>100</b></p> <p><b>Jitter</b> <b>3672</b> (ms)</p> <p><b>Delay</b> <b>6</b> (ms)</p> <p><b>SNR</b> <b>0</b></p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Codec</th> <th>OPUS</th> </tr> </thead> <tbody> <tr><td>Packet Time (ms)</td><td>20</td></tr> <tr><td>Receive (pkts/s)</td><td>0</td></tr> <tr><td>Transmit (pkts/s)</td><td>50</td></tr> <tr><td>Packet Loss Last 5 Sec (%)</td><td>0</td></tr> <tr><td>Packet Loss Last 30 Sec (%)</td><td>0</td></tr> <tr><td>Packet Loss Last 60 Sec (%)</td><td>0</td></tr> <tr><td>Speech Level (dbm0)</td><td>-96</td></tr> <tr><td>Noise Level (dbm0)</td><td>-72</td></tr> <tr><td>Total Level (dbm0)</td><td>-96</td></tr> <tr><td>Activity Factor</td><td>0</td></tr> </tbody> </table>	Codec	OPUS	Packet Time (ms)	20	Receive (pkts/s)	0	Transmit (pkts/s)	50	Packet Loss Last 5 Sec (%)	0	Packet Loss Last 30 Sec (%)	0	Packet Loss Last 60 Sec (%)	0	Speech Level (dbm0)	-96	Noise Level (dbm0)	-72	Total Level (dbm0)	-96	Activity Factor	0	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Codec</th> </tr> </thead> <tbody> <tr><td>Profile Level</td></tr> <tr><td>Packet Mode</td></tr> <tr><td>Negotiated Bandwidth</td></tr> <tr><td>Frame Rate (fps)</td></tr> <tr><td>Receive (pkts/s)</td></tr> <tr><td>Transmit (pkts/s)</td></tr> <tr><td>Packet Loss Last 5 Sec (%)</td></tr> <tr><td>Packet Loss Last 30 Sec (%)</td></tr> <tr><td>Packet Loss Last 60 Sec (%)</td></tr> </tbody> </table>	Codec	Profile Level	Packet Mode	Negotiated Bandwidth	Frame Rate (fps)	Receive (pkts/s)	Transmit (pkts/s)	Packet Loss Last 5 Sec (%)	Packet Loss Last 30 Sec (%)	Packet Loss Last 60 Sec (%)
Codec	OPUS																																	
Packet Time (ms)	20																																	
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Packet Loss Last 30 Sec (%)	0																																	
Packet Loss Last 60 Sec (%)	0																																	
Speech Level (dbm0)	-96																																	
Noise Level (dbm0)	-72																																	
Total Level (dbm0)	-96																																	
Activity Factor	0																																	
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Packet Mode																																		
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Receive (pkts/s)																																		
Transmit (pkts/s)																																		
Packet Loss Last 5 Sec (%)																																		
Packet Loss Last 30 Sec (%)																																		
Packet Loss Last 60 Sec (%)																																		

- To view session records of the call including SIP message content, select **Select Viewing Options... > View Session Detail Records**.

### Active Sessions

Filter: None Viewing Session Detail Records Records Listed: 57  
 Gslid: 2981325e-9f8b-30d2-ac79-9b12769b2450 Filtered Records: 0

Select Viewing Options... Stop Monitoring

Field	Value	Timestamp
Start Timestamp	2015-02-20 01:36:02	2/19/2015 7:36:02 PM
Global Session Id	2981325e-9f8b-30d2-ac79-9b12769b2450	2/19/2015 7:36:02 PM
SIP Trace	ENG[002:A] <idle> Incoming SIP Message: INVITE sip.conf=abc@135.60.77.163 SIP/2.0  INVITE sip.conf=abc@135.60.77.163 SIP/2.0 From: "John"<sip:John@test.net>;tag=04afb354 To: <sip.conf=abc@135.60.77.163> Call-ID: OGNkZDQ5ZTI5ZGE1MGM2ZTFINTM4ZTIhY2U2YjlmMDQ CSeq: 1 INVITE Via: SIP/2.0/UDP 135.60.10.137:62232;rport=62232;branch=z9hG4bK-d8754z-7901a563f107a576-1---d8754z- Max-Forwards: 70 Supported: replaces User-Agent: X-Lite 4.7.1 74247-55f8da37-W6.1 x-nt-gslid: 2981325e-9f8b-30d2-ac79-9b12769b2450 Contact: <sip:John@135.60.10.137:62232> Allow: INVITE,ACK,CANCEL,OPTIONS,BYE,REFER,NOTIFY,MESSAGE,SUBSCRIBE,IN FO Content-Type: application/sdp Content-Length: 303	2/19/2015 7:36:02.505010 PM

- Change the view to a graphical, SIP message flow by selecting **Select Viewing Options... > View SIP Protocol Trace**.

### Active Sessions

Filter: None Viewing SIP Protocol Trace Records Listed:  
 Gslid: 2981325e-9f8b-30d2-ac79-9b12769b2450 Filtered Records:

Select Viewing Options... Stop Monitoring

SIP Client

```

sequenceDiagram
    participant Client as SIP Client
    participant Server as AVAYA Media Server
    Client->>Server: Invite
    Server-->>Client: Trying
    Server-->>Client: 200 Ok
    Client->>Server: Ack
          
```

- 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 prompted, 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 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, choose **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 and unmute active sessions only if the current application supports the option otherwise the option is unavailable

### Procedure

1. Navigate to **EM > System Status > Monitoring > Active Sessions**.

If prompted, 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 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 on the sessions you want to mute or unmute.

4. From the **Select...** drop-down menu, choose **Mute Selected Session** or **Unmute**.

---

## 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

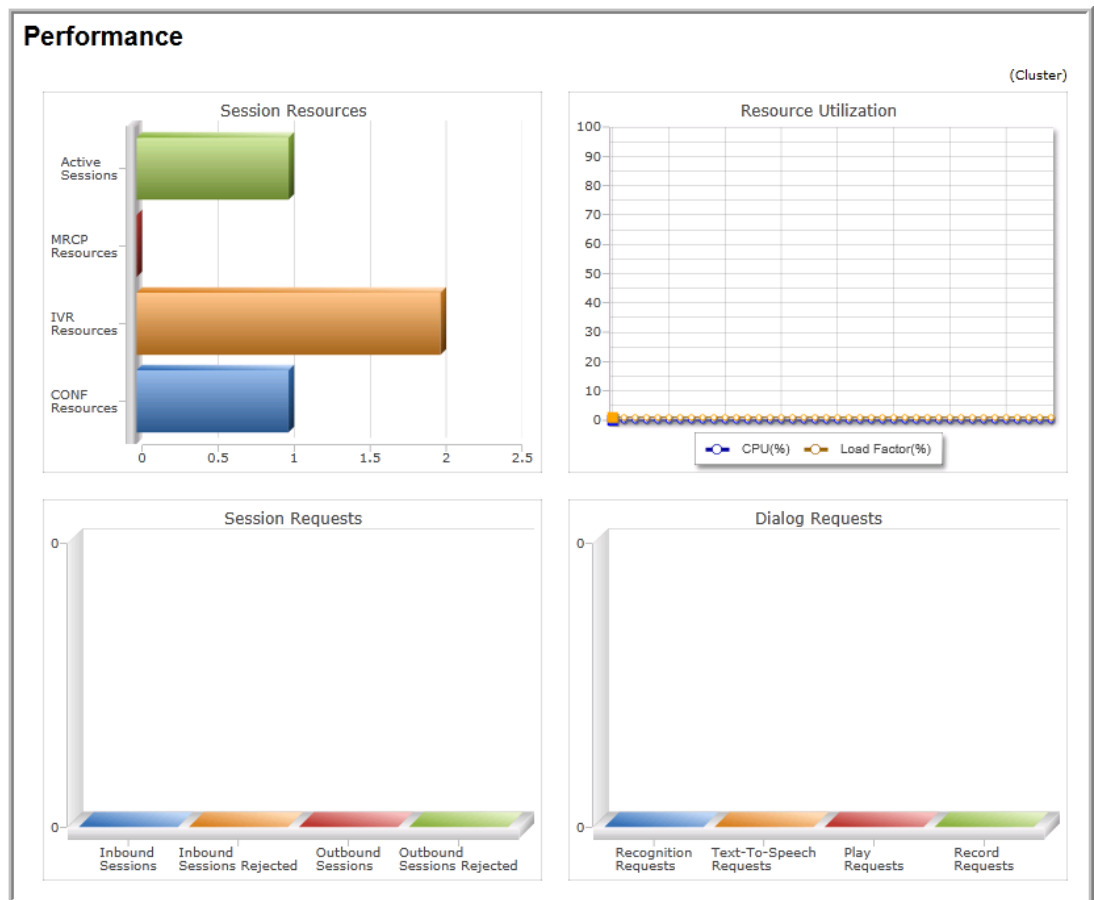
1. Navigate to **EM > System Status > Monitoring > Performance**.

If prompted, follow the on screen instructions to download and install Microsoft Silverlight.



**Note:**

You must install Microsoft Silverlight to use this feature.



- 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 OMs are used as Key Performance Indicators (KPI).

## Procedure

1. Navigate to **EM > System Configuration > Monitoring Settings > Operational Measurements > Settings**.

Operational Measurements Settings [Hide](#)

Category: MAS Conference Media Processor

Please enter OM's name and press find next to see this OM first in the table

	Name	<input type="checkbox"/> Archive	<input checked="" type="checkbox"/> Monitor	<input type="checkbox"/> KPI	<input type="checkbox"/> Delivery
Processor	CmdUnjoin	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Processor	Conference Cmd Error Unknown	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Processor	Conference VQMonCriticalEvents	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Processor	Conference VQMonSuppressedAlerts	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Processor	Conference VQMonWarningEvents	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Processor	ConfMP Number of dropped packets	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Processor	ConfMP NWTimer lost intervals, total	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Processor	ConfMP NWTimer lost single interval	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Processor	ConfMP NWTimer lost 2 intervals	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Processor	ConfMP NWTimer lost 3 intervals	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Processor	ConfMP NWTimer lost 4 intervals	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

### 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** drop-down menu.
  - If you know the name of the OM you want 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 checkbox in the **Archive** column next to each OM you want to archive.
  3. Select check boxes in the **Monitor** column next to each OM that you want to monitor.
  4. Select 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 over FTP or SFTP.
3. Select **Report ZIP Compression** if you want 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 Secure FTP 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 OMs are archived.

When the system initiates a cleanup, it removes 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 on the title of any column.

There are no actions that can be performed. The display is informational only.

Protocol Connections						
Display: All						Refresh Every: 15 seconds
Application Protocol	Transport Protocol	Type	IP Version	State	Status	Source Address
MRCpv1	TCP	Client	IPv4	Connected	Normal	135.60.77.150
MRCpv1	TCP	Client	IPv4	Connected	Normal	135.60.77.150



---

# 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 Simple 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 157](#)

[Streaming music troubleshooting on page 280](#)

---

# 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.

<b>Component Status</b>				
<u>Component Name</u>	<u>Type</u>	<u>States</u>	<u>Status</u>	<u>TimeStamp(CDT)</u>
MAS Resource Manager	SRP	Running	Healthy	2011-05-17 13:32:55
MAS SIP UserAgent	SRP	Running	Healthy	2011-05-17 13:32:53
MAS IVR Media Processor	SRP	Stopped	Failed Repeatedly	2011-05-17 13:32:55
MAS Conference Media Processor	SRP	Running	Healthy	2011-05-17 13:32:53
MAS Content Store	SRP	Running	Healthy	2011-05-17 13:32:53
MAS Streaming Source	SRP	Running	Healthy	2011-05-17 13:32:53
MAS Management SOAP Server	SRP	Running	Healthy	2011-05-17 13:32:53
MAS Reporting Agent	SRP	Running	Healthy	2011-05-17 13:32:53

---

## 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 Protocols Conencitons**.
2. EM displays information about the operational state of protocols on Avaya Aura® MS.
3. To set the protocol connection data refresh interval, use the **Refresh every** drop-down menu.

4. Selected the desired protocol from the **Display** drop-down list to restrict the display to certain protocols.
5. 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 following 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**.
2. View the status of the primary license server.
3. If you have already configured the secondary license server, view the status of the server.
4. To set the refresh interval, use the **Refresh every** drop-down menu.
5. 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**.
6. 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**.

**Session Detail Record Browser**

Query (server4829)

Type: Browse Records In Date Range Limit: 100 2/19/2015 8:32:04 PM Central Standard Time

Start: 2/18/2015 12:00:00 AM  Use Local Time

End: 2/20/2015 11:59:59 PM Execute

Global Session Id	Start Timestamp	End Timestamp	Server
-------------------	-----------------	---------------	--------

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.

### Session Detail Record Browser

**Query** (server4829)

Type: Browse Records In Date Range Limit: 100 2/19/2015 7:30:53 PM Central Standard Time

Start: 2/18/2015 12:00:00 AM  Use Local Time

End: 2/20/2015 11:59:59 PM Execute

Global Session Id	Start Timestamp	End Timestamp	Server	Parent Session GSLID	SDR Type
9b6f8432-d62a-3680-b3a3-887d3280eac5	2/19/2015 7:20:47 PM	2/19/2015 7:30:33 PM	server4829	2	
f6f8880d-a87e-3702-837c-c975cce2e413	2/19/2015 7:12:26 PM	2/19/2015 7:30:32 PM	server4829		2
cf5d2ef5-315d-32c4-9f38-1a452df24236	2/19/2015 6:05:14 PM	2/19/2015 6:37:43 PM	server4829		2
8120199c-718a-3efd-97c3-a94b1d58a571	2/19/2015 6:09:55 PM	2/19/2015 6:09:58 PM	server4829		2
c0d62ede-6766-30db-9696-a466f2f51710	2/19/2015 6:01:32 PM	2/19/2015 6:08:14 PM	server4829		2
37e99387-2ae4-30d4-85e2-baa7e7a5afc2	2/19/2015 5:51:08 PM	2/19/2015 5:51:08 PM	server4829		2

**Result**

Session Detail Records

Filter: None  Display Trace Details

Field	Value	Timestamp
Global Session Id	9b6f8432-d62a-3680-b3a3-887d3280eac5	2/19/2015 7:20:47 PM
Start Timestamp	2015-02-20 01:20:47	2/19/2015 7:20:47 PM
Server	server4829	2/19/2015 7:20:47 PM
SDR Type	2	2/19/2015 7:20:47 PM
SIP Remote User Information	"John"<sjp:John@test.net>	2/19/2015 7:20:47.150 PM
SIP Audio Remote IP Address	135.60.10.137	2/19/2015 7:20:47.150 PM

## Determining peak session traffic

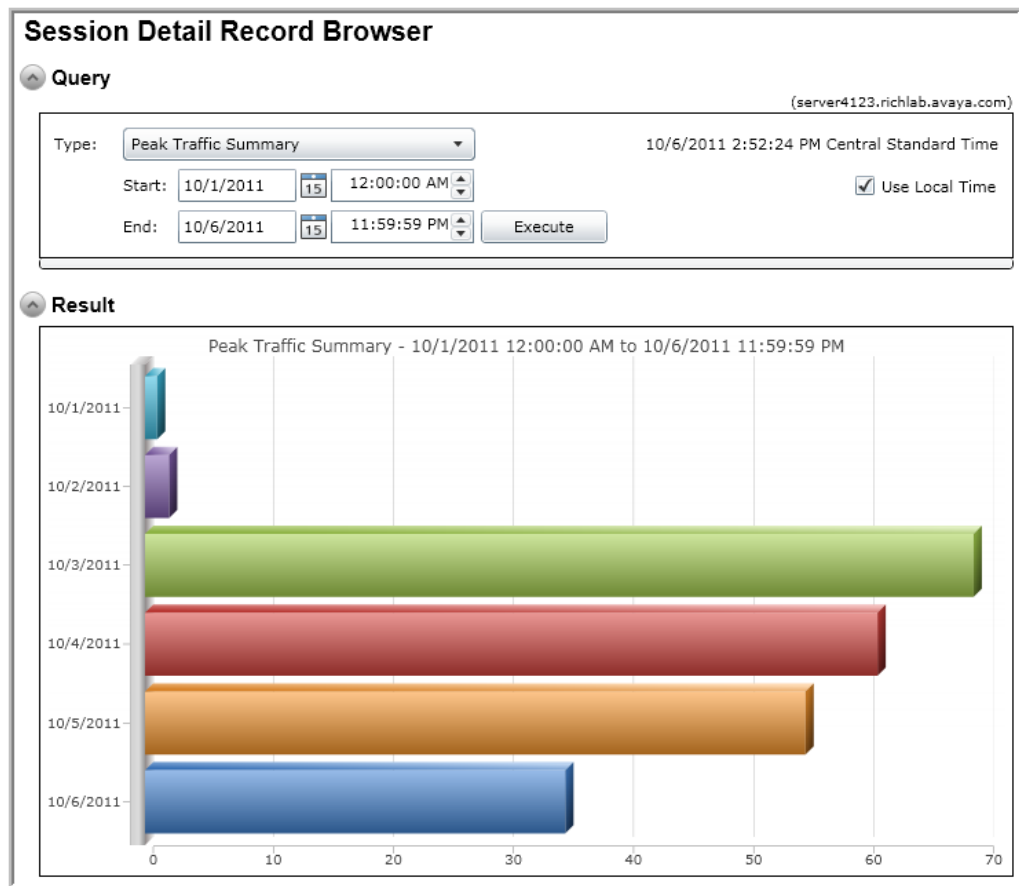
### About this task

Perform the following procedure to generate a graphical report representing the peak number of sessions processed by the Avaya Aura®MS on each day.

### Procedure

- Navigate to **EM > Tools > Session Detail Record Browser**.  
To run a query which reports the peak number of sessions processed each day, select **Peak Traffic Summary** from the **Type** drop-down menu.
- Use the **Start** and the **End** options in the **Query** panel, to define a time range for the query.
- 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.



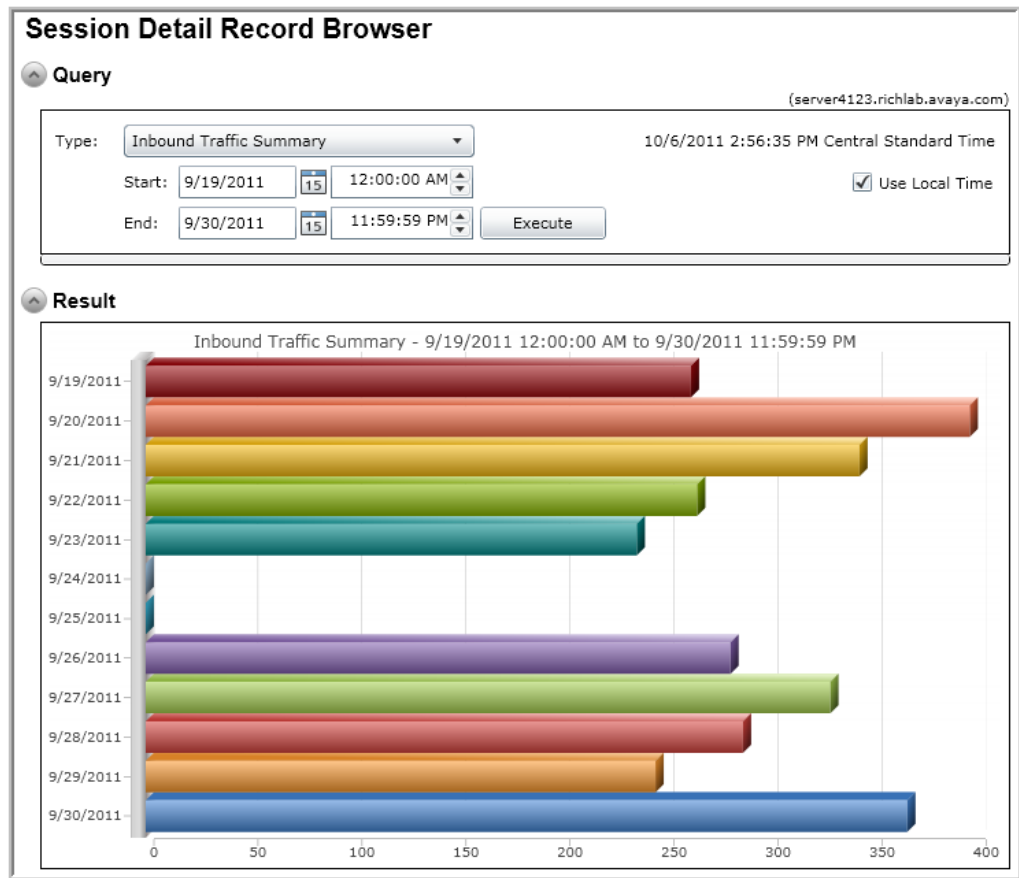
## Summarizing daily inbound traffic

### About this task

Perform the following procedure to generate graphical reports which summarize daily inbound traffic processed by the Avaya Aura® MS.

### 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.



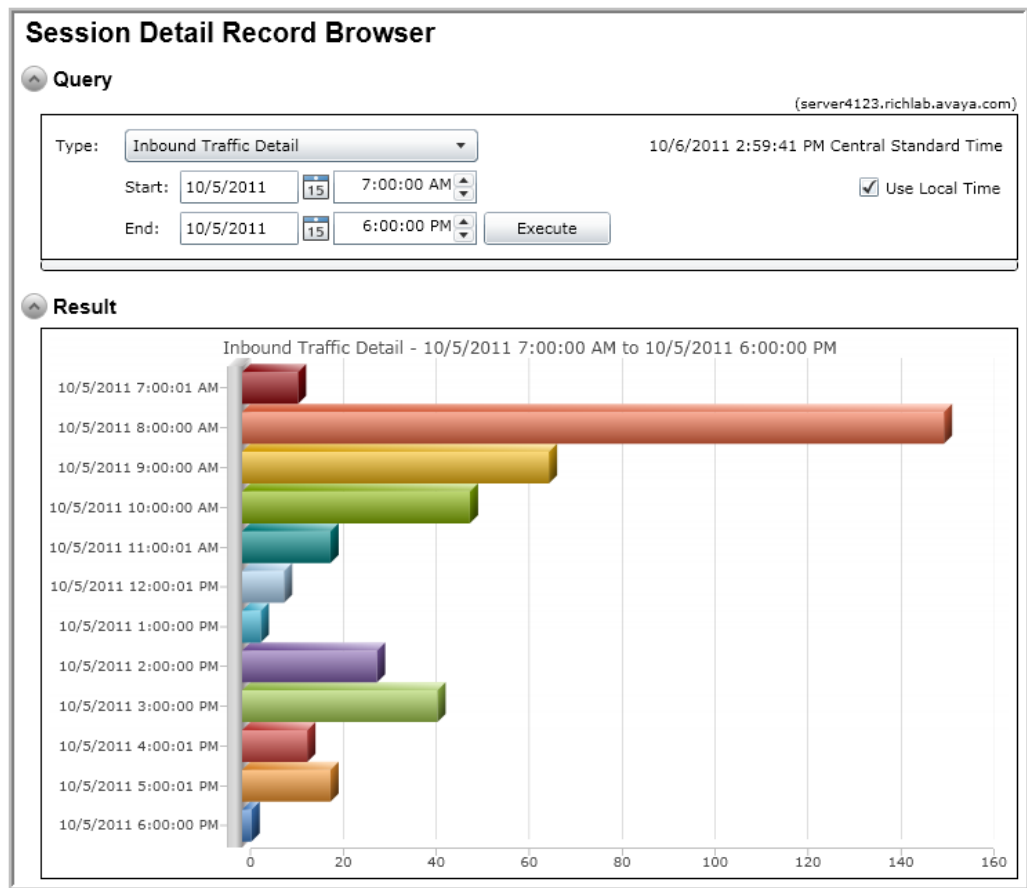
## Analyzing hourly inbound traffic details

### About this task

Perform the following procedure to generate graphical reports for determination of hourly traffic processed by the Avaya Aura® MS.

### 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.



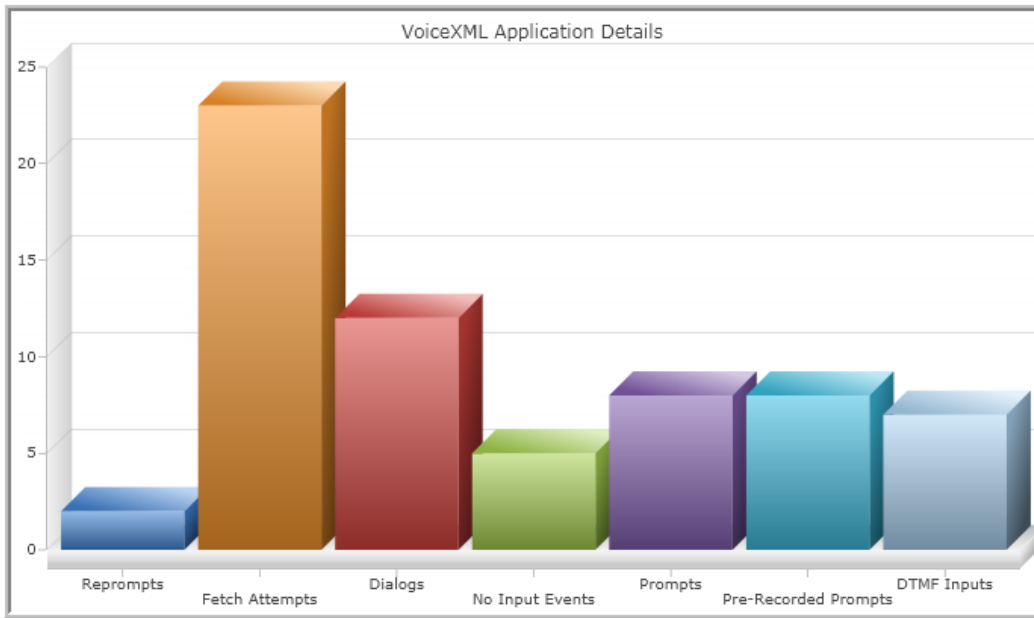
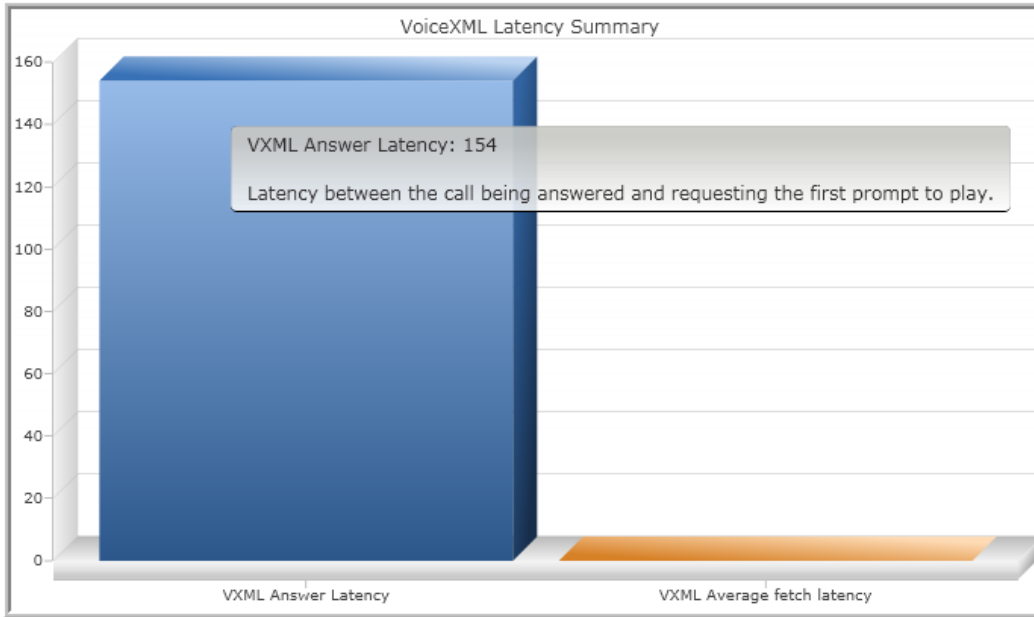
## Procedure

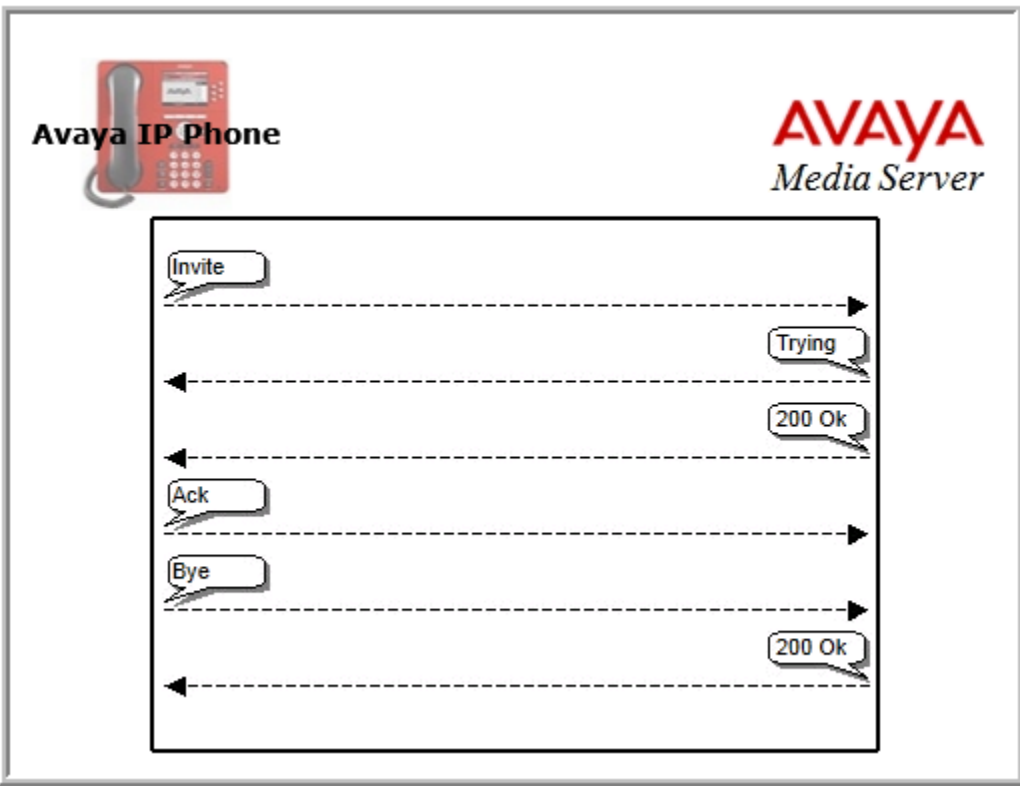
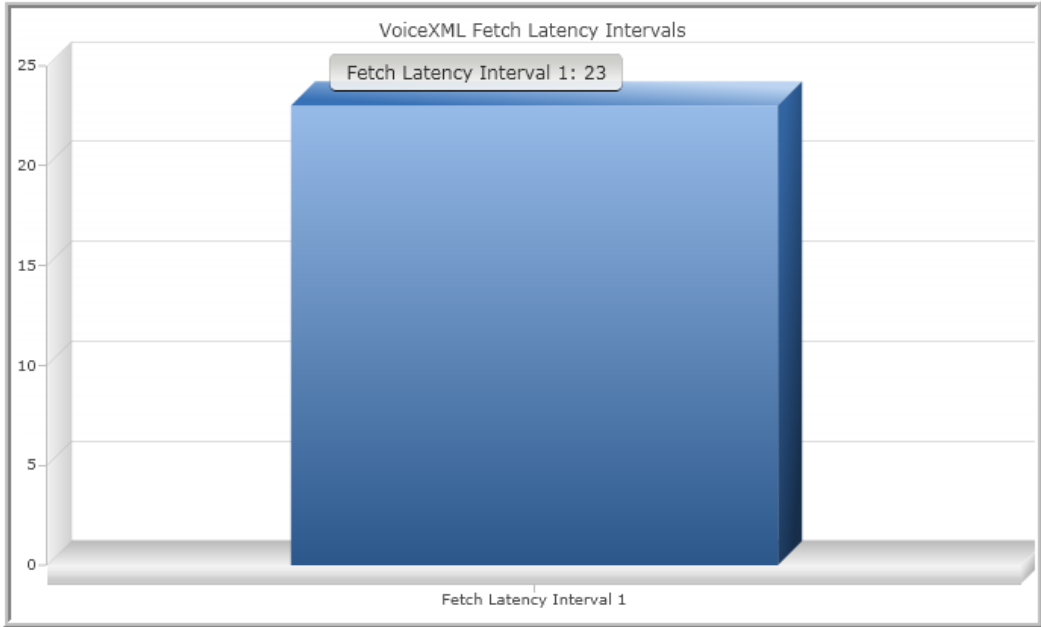
1. Navigate to **EM > Tools > Session Detail Record Browser**.
2. Select **Browse Records In Date Range** as the query type, from the **Type** drop-down menu.
3. Use the **Start** and the **End** options in the **Query** panel to define a narrow time range for the query which includes the monitored session.
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.

Session Detail Records		
Filter:	None	<input type="checkbox"/> Display Trace Details
Field	Value	Timestamp
Global Session Id	55ade94b-3e52-4867-8aa7-dfef5ad0f46e	10/6/2011 3:47:47 PM
Start Timestamp	2011-10-06 20:47:47	10/6/2011 3:47:47 PM
Server	server4123.richlab.avaya.com	10/6/2011 3:47:47 PM
SIP Remote User Information	"Paul Divita"<sip:pdivita@avaya.com>	10/6/2011 3:47:47.315 PM
SIP Audio Remote IP Address	135.60.69.38	10/6/2011 3:47:47.315 PM
SIP Audio Remote IP Port	50014	10/6/2011 3:47:47.315 PM
Application Name	ucomm	10/6/2011 3:47:47.316 PM
Application URL	file:///var/mcp/ma/MAS/platdata/Applications/v/xml/ucomm/msg-route/ucomm.vxml	10/6/2011 3:47:47.316 PM
SIP Remote User-Agent	Nortel IP Phone 11xx (SIP1140e.03.01.12.00)	10/6/2011 3:47:47.316 PM
SIP Locale	en_US	10/6/2011 3:47:47.316 PM
SIP Original Destination	<sip:4502@avaya.com>	10/6/2011 3:47:47.316 PM
SIP CALL ID	e6eedfad23bc74aa1745e8d8503ef29a181f45e16@135.60.77.24	10/6/2011 3:47:47.316 PM
SIP Audio Codec	PCMU	10/6/2011 3:47:47.319 PM
SIP Audio Packet Interval	20	10/6/2011 3:47:47.319 PM
SIP Audio Local IP Address	135.60.77.12	10/6/2011 3:47:47.319 PM
SIP Audio Local IP Port	6146	10/6/2011 3:47:47.319 PM
VXML Longest Fetch URL		10/6/2011 3:47:47.364 PM
VXML Worst Recognition URL		10/6/2011 3:47:47.364 PM
Application Log	Prepared Query: <soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/" xmlns:urn="http://xml.avaya.com/ws/ams/oam/v1_0/"><soapenv:Header/><soapenv:Body><urn:ListConfiguration><Gslid>55ade94b-3e52-4867-8aa7-dfef5ad0f46e</Gslid><Group>Application</Group><Locale>en_US</Locale><CategoryOrKey>497091d6-b899-102a-97fb-541673fc9806</CategoryOrKey></urn:ListConfiguration></soapenv:Body></soapenv:Envelope>	10/6/2011 3:47:47.399 PM
Application Log	configData.DEFAULT_LOCALE: en_us	10/6/2011 3:47:47.405 PM





**Related links:**

[Viewing details for a specific session on page 224](#)

---

## 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 cleanup, 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 cleanup is initiated.
5. (Optional) Click **Clear** to delete all currently archived records.
6. Click **Save**.
7. Click **Confirm**.
8. Restart the 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**.

**Field Promotion**

Available Fields

- Bad Grammar Events
- QOS R-Factor
- User Help Requests
- QOS Mean Jitter (msec)
- Bad Choice Grammar Events
- QOS Round Trip Delay (msec)
- Bad Inline Grammar Events
- QOS Local Packet Loss
- Max Speech Timeout Events
- QOS Remote Packet Loss
- No Match Events
- User Exit Requests

Selected Fields

Buttons: Add, Add All, Remove, Remove All, Up, Down

Field Name	Indexed	Field Definition	Definition Size

Buttons: Save, Cancel

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.

**Field Promotion**

Available Fields

- Bad Grammar Events
- QOS R-Factor
- User Help Requests
- Bad Choice Grammar Events
- Bad Inline Grammar Events
- QOS Local Packet Loss
- Max Speech Timeout Events
- QOS Remote Packet Loss
- User Exit Requests
- User Cancel Requests
- Number Of Recognized Utterances
- Error Record Events

Add

Add All

Remove

Remove All

Up

Down

Selected Fields

- QOS Mean Jitter (msec)
- QOS Round Trip Delay (msec)
- No Match Events
- Prompts

Field Name	Indexed	Field Definition	Definition Size
QOS Mean Jitter (msec)	No	Integer	
QOS Round Trip Delay (msec)	No	Integer	
No Match Events	Yes	Operational Measurements	

Save Cancel

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 37](#)

---

## 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 both 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 change to take effect.

To view an enhanced trace of sessions processed by Avaya Aura® MS 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:

[Reviewing session detail records on page 31](#)

[Viewing current active sessions on page 223](#)



# Chapter 12: 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:

EM authentication and authorization sources	
Source	Description
Operating System	<p>Operating system is the default option. You can log in to EM using the credentials of an operating system administrator</p> <p>Using the operating system credentials is local server specific.</p> <p>RBAC is not available with the operating system option. The administrator has access to all EM tasks.</p>
Avaya Aura® Media Server	<p>When you use the Avaya Aura® Media Server option, you enable the Avaya Aura® MS RBAC feature.</p> <p>Configuration for administrators and roles is stored locally on Avaya Aura® MS.</p> <p>Single Sign-On (SSO) is not available with the Avaya Aura® Media Server option.</p>

Avaya Aura® System Manager	<p>When you use the Avaya Aura® System Manager option, you enable the centralized Avaya Aura® System Manager RBAC feature.</p> <p>Configuration for administrators and roles is stored on Avaya Aura® System Manager.</p> <p>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.</p> <p>The Avaya Aura® System Manager option provides Single Sign-On (SSO).</p>
----------------------------	---

---

## 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 Aura® 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® MS based RBAC by configuring the system to use **Avaya Aura® Media Server** 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 the **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 256](#)

---

## Configuring Avaya Aura® MS RBAC password policy

### About this task

Perform the following procedure to update administrator password policies when you enable Avaya Aura® MS 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. 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 **Password expiration interval (d)** 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](#)

---

## 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 level table as an aid when selecting the permissions for each task in the role.

Definitions for role permission levels	
Property	Description
Deny	The system blocks the administrator from viewing or modifying the task.
View	The system allows the administrator to only view the task.
Modify	The system allows the administrator to view and modify the task.

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 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 administrator 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**.
10. Click **Save**.

---

## 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 suspended 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® MS 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](#)

---

## 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.

The System Manager system 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

To configure the media server to use System manager, see *System Manager enrollment*.

### Related links:

[System Manager enrollment on page 173](#)

---

## Configuring System Manager as the authentication and authorization source

### Before you begin

Ensure Avaya Aura® MS is configured to use System Manager.

### 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.

### 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 the 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**.
3. Navigate to **Security > Policies**.

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**.
3. Navigate to **Security > Roles**.
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 13: Troubleshooting

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## 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
```

```
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  
Mode from config file:   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



### Note:

EM works with Internet Explorer (IE) 9 or higher and recent versions of Chrome and Firefox.

---

## 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 **Password Authentication** 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.

## Procedure

1. Use a Linux® shell on Avaya Aura® MS, and change to the following directory:  

```
cd $MASHOME/./apache-tomcat/mas/conf
```
2. 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 configuration is:  
`locallogin.authenticable.groups=root.`
3. If the group to which the system login account belongs is not listed in the value, add it. Use semicolons to separate multiple values.
4. Save the change.
5. Restart Avaya EM Service by using the following command in a Linux® shell on Avaya Aura® MS:  

```
/sbin/service avaya.em restart
```

## Checking Password Authentication

### Before you begin

Ensure Password Authentication is enabled.

### Procedure

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

```
su -
```
2. Edit the appropriate file for your system:  

```
/etc/ssh/sshd_config or /etc/ssh/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 7.7 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 the required ports are in the `LISTEN` state using the following command in a Linux® shell:

```
netstat -tulpn
```

## Checking localhost configuration

### About this task

Perform the following procedure to ensure that localhost resolves to 127.0.0.1.

### Procedure

1. Test localhost by using a Linux® shell on Avaya Aura® MS with the following command:

```
ping localhost
```

2. If the output from ping does not show 127.0.0.1, then edit `/etc/hosts` and ensure localhost is associated to 127.0.0.1, as shown in the following example:

```
135.60.77.205    Server10 Server10.avaya.com
127.0.0.1       localhost.localdomain localhost
::1             localhost6.localdomain6 localhost6
```

3. Save the change.

---

## Cannot log in to EM after installation on Windows®

You cannot gain access to EM after a successful installation.

A possible cause is that there are 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

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 the **Avaya EM Service** is listed 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 7.7 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 following the onscreen instructions.
6. Restart Windows®.
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 7.7 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 in to EM with a newly created local user account which is a member of the Administrators group.

If the Microsoft User Account Control (UAC) feature is enabled it can cause this problem.

### Proposed Solution

Perform the following procedure to disable the Microsoft User Account Control (UAC) feature to allow new administrator users to login. 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.
2. In the **Local Security Policy** window, navigate to **Security Settings > Local Policies > Security Options**.
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**.
6. Restart Windows®.

---

## Cannot log into EM when using Avaya Aura® System Manager for authentication and authorization

You cannot gain access to EM when using Avaya Aura® System Manager for authentication and authorization

A possible cause is that the FQDNs (Fully Qualified Domain Names) of System Manager and Avaya Aura® MS cannot be resolved from your computer.

### Proposed Solution 1

#### Procedure

Ensure that the FQDNs of System Manager and Avaya Aura® MS can be resolved through either DNS or the local hostsfile.

### Proposed Solution 2

#### Procedure

If the FQDNs cannot be resolved using DNS or the local hosts file, then use the Avaya Aura® MS IP address to access the following specific URL for EM emergency login:

`https://mediaServerIP:8443/emlogin`

### Proposed Solution 3

#### Procedure

When System Manager is used for authentication and authorization, you must use the local operation system login credentials for EM emergency login.

---

## 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:

- Avaya Aura® System Manager Single Sign-On (SSO) settings are enabled on **EM > Security > General Settings** and **EM > Security > Certificate Management**.
- 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 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 into 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 you are going to 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 onto the Windows® Avaya Aura® MS server.
  - b. Open Internet Explorer.
  - c. Go to **Tools > Internet Options**.
  - d. Click on the **Content** tab.
  - e. In **Certificates** section, click **Certificates**.
  - f. Click **Import...**

The system displays the Certificate Import 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 a 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.

### Proposed Solution

Perform the procedure to save encrypted files in IE so that EM can download files.

#### Related links:

[Adding EM to the trusted sites list in IE on page 17.](#)

---

## EM cannot upload files larger than 2 GB

You 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.

### Proposed Solution

Perform the procedure to add the Avaya Aura® MS to the trusted sites list in IE so that EM can display the pages.

#### Related links:

[Adding EM to the trusted sites list in IE on page 17.](#)

---

## 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.

## Proposed Solutions

### Creating a self-signed certificate for EM

#### Procedure

1. Navigate to **EM > Security > Certificate Management > Key Store**.
2. In the **Key Certificates** section, click **Create New...**
3. Select **Self-Signed** from the **Signing authority** drop-down menu.

4. Configure the certificate fields, and make sure that you use Avaya Aura® MS FQDN as the **Common Name**, for example: `Server1.companyXYZ.com`.
5. Click **Save**.
6. Close all browser connections to EM and log in after EM restarts.
7. Click on the certificate error displayed in IE next to the URL.  
IE displays the Certificate Error window.
8. Click **View certificates**.  
IE displays the Certificate window.
9. On the **General** tab, click **Install Certificate...**  
IE displays the Certificate Import Wizard window.
10. Click **Next**.  
IE displays a dialog window.
11. Click **Finish**.  
IE displays a security warning.
12. Click **Yes**.  
IE displays a message that the certificate import was successful.
13. Click **OK**.
14. Click **OK**.
15. Close IE.
16. Open IE and log in to EM to verify the certificate error is not present.

## Importing a CA certificate to IE

### About this task

Import a certificate for EM HTTPS connections and import the CA certificate that signs the EM certificate into IE.

### Before you begin

Ensure that the certificate to import is in the PKCS12 format. Ensure that it uses the FQDN of Avaya Aura® MS for the common name in the certificate.

### Procedure

1. Navigate to **EM > Security > Certificate Management > Key Store**.
2. In the **Key Certificates** section, click **Import...**

EM displays the **Import Certificate** page.

3. In the **Password for certificate import** field, enter the certificate password.
4. Click **Browse...** to navigate the file system and select the certificate for import.
5. Click **Save**.
6. Click **Confirm**.
7. Close all browser connections to EM and log in after EM restarts.
8. Open IE.
9. Navigate to **Tools > Internet Options...**
10. Select the **Content** tab.
11. Click **Certificates**.  
IE displays the Certificates window.
12. Select the **Trusted Root Certificate Authority** tab.
13. Click **Import...**  
IE displays the Certificate Import Wizard window.
14. Click **Next**.
15. Click **Browse...** and select the trust certificate of Certificate Authority. The certificate must be in PKCS12 format.
16. Click **Next**.
17. Enter the password for the private key.
18. Click **Next**.
19. Select **Place all certificates in the following store**.
20. If the **Certificate store** is not set to **Trusted Root Certification Authorities**, then click **Browse...** to set the store to **Trusted Root Certification Authorities**.
21. Click **Next**.
22. Click **Finish**.  
IE displays a security warning.
23. Click **Yes**.  
IE displays a message that the certificate import was successful.
24. Click **OK**.
25. Close IE.
26. Open IE and log in to EM to verify the certificate error is not present. Ensure that you use an FQDN in the login URL, for example  
`https://amsServer1.companyXYZ.com:8443/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 Avaya Aura® MS 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:

#### Procedure

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 the 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) that 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 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 are experiencing 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.

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## Proposed Solution

If you install anti-virus software, ensure that you exclude the following directories from the scans:

Linux®:

```
$MASHOME/avaya/ma/MAScommon/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 Solutions

### Checking the License

The following procedure ensures 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 the needed licenses are installed and available.

If you need to alter the license configuration refer to the detailed procedures for [License configuration on page 70](#).

2. Restart Avaya Aura® MS to activate any installed license

## 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 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 118](#)

## Checking application installation

### About this task

If you have not installed a required application then the requests for that application fail. The following procedure ensures that you have installed and unlocked 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 checkbox next to the desired application and then clicking **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. Navigating to **EM > System Status > Element Status** to check the state of Avaya Aura® MS.
2. Set the 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:

- Avaya Aura® MS rejects incoming sessions and indicates there is no supported codec.
- Avaya Aura® MS responds with a SIP 415, Unsupported Media Type.

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 Settings**.

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 154](#)

---

## TLS connection issues

Clients using TLS (Transport Layer Security) are unable to connect to Avaya Aura® MS.

Possible causes for TLS connection issues include:

- Certificates on either side of the attempted connection are expired.
- Trust Anchor configuration incomplete.
- All nodes in a cluster are not TLS enabled.
- IP address of the server was changed.
- 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 the 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 154](#)

---

## Digit collection issues

Users are unable to log in to Avaya Aura® MS services because of problems occurring with digit collection.

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 with 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 nearby a conference user dials a number on a speakerphone. The digits can carry into the conference over the microphone of the active user.
- When users report digit collection issues, ask about their 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 clients and gateways are properly communicating digits to Avaya Aura® MS.
- Advise users in noisy surroundings that background noise may impact digit collection.

---

# Media playback troubleshooting

---

## Unable to playback provisioned audio file

### Proposed solution

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.

---

# Streaming music troubleshooting

---

## 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

Use the following table to identify solutions for each music provider error.

Status	Possible cause	Proposed solution
Stream status is unknown.	Stream is initializing after being configured.	Normal Condition. No action required.
Stream is available.	The stream is providing audio.	Normal Condition. No action required.
At least one configured URL is currently unreachable.	The primary or backup URL provider is unreachable.	Check connectivity to the configured URLs. Configure another provider if the provider cannot be reached. Configure an HTTP proxy for external music source access
Primary URL is not reachable, using backup URL.	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.	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.



All streaming servers are unreachable, currently using a pre-recorded backup file.	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.	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.
Stream status is pending.	The stream has been initialized and the connection to the provider is being attempted.	Wait for a momentary status change indicating the result of the connection attempt.
The configured stream has no files provisioned.	There are no media files in the channel folder for the stream.	MP3 or WAV files need to be added to Local Directory or Content Store provider.
The connection to a streaming server was lost.	An active connection to the provider has failed.	Verify the configured URL is correct. Determine if the provider is reachable and returns playlist documents. A provider may have gone offline based on its daily schedule. Select providers that are always available.
The RSS document has no usable or valid files for synchronization.	The RSS provider has no useable media content that can be downloaded and played.	Select an RSS provider that has native MP3 or WAV content.
The RSS document is invalid.	The RSS provider XML document cannot be parsed.	Choose another RSS provider.
Configured proxy server unreachable.	The SHOUTcast provider HTTP proxy is unavailable.	Diagnose connectivity with the SHOUTCast HTTP proxy.
Streaming server playlist invalid or unreachable.	An HLS master playlist file contains an unreachable media playlist.	Diagnose the HLS provider master playlist for media playlists that are unreachable Resolve connection issues. Configure a different HLS provider. Configure an HTTP proxy for external music source access.

For detailed steps for testing SHOUTCast and RSS connections, see [Users do not hear streaming SHOUTCast audio](#) and [Users do not hear streaming RSS audio](#).

## Related Links

[Monitoring music streams on page 233](#)

[Configuring an HTTP proxy for external music source access on page 160](#)

[Users do not hear streaming SHOUTCast audio on page 282](#)

[Users do not hear streaming RSS audio on page 283.](#)

---

## 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 SHOUT Cast providers.

The possible causes for the problem include:

- 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](#) 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
--2014-01-06 18:52:59-- 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'
2014-01-06 18:53:00 (157 KB/s) - `tunein-station.pls?id=227567.2'
saved [5080/5080]
```

The following is a successful `cURL` example:

```
curl http://yp.shoutcast.com/sbin/tunein-station.pls?id=227567

[playlist]
numberofentries=45
File1=http://95.141.24.96:80
Title1=(#1 - 44/1000) ChartHits.FM - Top 40 Radio - Mega Hot Music!
Length1=-1
File2=http://95.141.24.58:80
Title2=(#2 - 45/1000) ChartHits.FM - Top 40 Radio - Mega Hot Music!
Length2=-1
Version =2
```

## Related links:

[Music streaming configuration on page 157](#)

---

## Users do not hear streaming RSS audio

The possible causes for this problem include:

- Improper configuration.
- The configured RSS URL is unavailable or unreachable.
- The audio files specified in the RSS document are 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](#) 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 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-b4f5-00ffb0699410</guid>
    </item>
    <item>
      <title>Corporate Edge - First Impressions</title>
```

```

        <enclosure url="http://musicserver/Music/DavenportMusic-1.wav"
type="audio/wav"/>
        <guid>3edcc894-51f1-11e5-b4f5-00ffb0699410</guid>
    </item>
    <item>
        <title>Kaleidoscope - Shades of Blue</title>
        <enclosure url="http://musicserver/Music/DavenportMusic-2.wav"
type="audio/wav"/>
        <guid>47779c66-51f1-11e5-b4f5-00ffb0699410</guid>
    </item>
    <item>
        <title>Keynotes - Colors</title>
        <enclosure url="http://musicserver/Music/DavenportMusic-3.wav"
type="audio/wav"/>
        <guid>ea3dd092-51f1-11e5-b4f5-00ffb0699410</guid>
    </item>
    <item>
        <title>Kalimba</title>
        <enclosure url="http://musicserver/Music/Kalimba.mp3"
type="audio/mpeg"/>
        <guid>3e789aa0-cb7b-11e5-b904-18a9051819e8</guid>
    </item>
</channel>
</rss>

```

- 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

--2014-01-06 18:39:24-- 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

<?xml version="1.0" encoding="UTF-8" ?>
<rss xmlns:itunes="http://www.itunes.com/DTDs/Podcast-1.0.dtd"
version="2.0">
    <channel>
        . . .
    </channel>
</rss>

```

## Related links:

[Music streaming configuration on page 157](#)

---

# 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 **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 [1+1 High Availability cluster configuration on page 53](#).

---

# Protocol troubleshooting

---

## SNMP Traps are not getting posted on management consoles

SNMP Traps are not posting to the monitoring system management servers.

Possible causes for this problem include:

- Network connectivity problems.
- SNMP Service is not started on the MAS.
- SNMP Community string mismatch.
- SNMP Delivery is not enabled.
- Incorrect SNMP network manager address.

### Proposed Solutions

#### 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

The following procedure on Windows®-based servers to verify that you have installed the SNMP and that 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 the **SNMP Service** is listed and has a status of **Started**.
3. If the SNMP Service is not running, right-click and select **Properties**.
4. Click **Start**, and set the **Startup type** to **Automatic**.

## Checking the SNMP Community string

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 the 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 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 **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 network security settings are preventing access to the SMTP server.

### Proposed Solutions

- 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 have changed on one of the endpoints.

## Proposed Solutions

Perform the following procedure to verify SOAP configuration on Avaya Aura® MS and on the management system which is attempting to connect to the 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 settings of the system which is attempting to connect to the Avaya Aura® MS.
  - b. Verify the system which is attempting to connect to the 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 the 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 84](#)

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## 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 Solutions

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.



## Procedure

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:
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:

```
ssh-keygen -t rsa
```

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-openssh -o putty_id_rsa.pub
```

- c. To obtain the fingerprint of the public key, run the following command:

```
puttygen path_to_public_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.