Avaya Aura® Messaging Overview and Specification

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Chapter 1: Introduction

Purpose

This document describes tested product characteristics and capabilities, including feature descriptions, interoperability, performance specifications, security, and licensing requirements.

Intended audience

This document is intended for people who want to gain a high-level understanding of the product features, functions, capacities, and limitations.

Change history

Issue	Date	Summary of changes
4	February 2017	Added information about the following product enhancements: • Support for using Mutare Message Mirror with an Avaya Aura® Messaging single-server configuration. • A U.S. English language pack that is recorded by the same voice talent used by other Avaya products. • The capability for the Aria TUI to recover an unsent message. • The capability for users to configure an Extended Absence Greeting (EAG) from their TUI. • The capability for administrators to: - Control when the Aria TUI marks a message as read - Customize the email notification from Notify Me - Assign a language to a Caller Application - Select the audio content that Reach Me plays to the calling party - Block users from deleting messages during playback

Issue	Date	Summary of changes
		• Improvements to the installation wizards for the outbound fax and Caller Applications Editor desktop clients • Support for silent installations of the outbound fax desktop client. • Support for Windows 8.1 and the Windows 8.1 versions of Windows-based desktop clients such as outbound fax and Caller Applications Editor. Rectified the high capacity server maximum for local users on a single-server configuration from 20,000 to 6000.

Related resources

Documentation

You can download the documents you need from the Avaya Support website at http://support.avaya.com. In addition to the documentation listed here, you can download a zip file that is a compilation of the Avaya Aura® Messaging documentation library. You can install this library on a computer or on your corporate network.

The Avaya Support website also includes the latest information about product compatibility, ports, and Avaya Aura® Messaging releases.

Security

Title	Description	Audience
Avaya Aura® Messaging Security Design	Discusses security issues to consider when designing a corporate security strategy. Topics include network security, toll fraud, and recommendations for maintaining a secure system.	Solution architects, deployment engineers, and administrators

Reference configurations

Reference configuration documents describe the performance, limitations, and capacities of specific configurations of Messaging.

Single-server configurations

Title	Description	Audience
Avaya Aura® Messaging Single Server Reference Configuration	Describes the design, capacities, interoperability, and limitations of single-server configurations.	Sales and deployment engineers, solution architects, and support personnel

Table continues…

Title	Description	Audience
Deploying Avaya Aura® Messaging for Single Server Systems	Describes an end-to-end deployment scenario including all products that must function together in a single-server configuration.	Deployment engineers and support personnel
Upgrading Avaya Aura® Messaging for Single Server Systems	Describes end-to-end upgrade scenarios for this configuration.	Deployment engineers and support personnel

You might find the following Avaya Aura® documents useful:

- *Installing and Configuring Avaya Aura® System Platform*
- *Administering Avaya Aura® System Platform*
- *Secure Access Link Gateway Implementation*

Multiserver configurations

Title	Description	Audience
Avaya Aura® Messaging Multiserver Single Location Reference Configuration	Describes the design, capacities, interoperability, and limitations of multiserver configurations deployed at one location.	Sales and deployment engineers, solution architects, and support personnel
Avaya Aura® Messaging Multiserver Dual Location Reference Configuration	Describes the design, capacities, interoperability, and limitations of multiserver configurations deployed at two locations.	Sales and deployment engineers, solution architects, and support personnel
Deploying Avaya Aura® Messaging for Multiserver Systems	Describes an end-to-end deployment scenario including all products that must function together in a multiserver configuration, checklists, and initial administration.	Deployment engineers and support personnel
Upgrading Avaya Aura® Messaging for Multiserver Systems	Describes end-to-end upgrade scenarios for this configuration.	Deployment engineers and support personnel

You might find the following Avaya Aura® documents useful:

- *Installing and Configuring Avaya Aura® System Platform*
- *Administering Avaya Aura®System Platform*
- *Secure Access Link Gateway Implementation*

VMware configurations

Title	Description	Audience
Deploying Avaya Aura® Messaging using VMware® in the Virtualized Environment	Describes an end-to-end deployment scenario including all products that must function together in systems configured for a virtualized environment, checklists, and initial administration.	Deployment engineers and support personnel
Avaya Aura® Virtualized Environment Solution Description	Describes this market solution focusing on the functional view of the solution architecture.	Sales and deployment engineers, solution architects, and support personnel

Administration

Title	Description	Audience
Administering Avaya Aura® Messaging	Explains how to use the System Management Interface (SMI) to configure your system, use reports and diagnostic tools, manage software and users, and perform routine maintenance tasks. The content is available in two formats: HTML and PDF.	Administrators
Job aid for Administering Avaya Aura® Messaging	Includes routine administration tasks. This job aid is a subset of the administration guide.	Administrators
Avaya Aura® Messaging Alarms and Events	Describes system alarms, events, and repair procedures.	Administrators and support personnel

User functions

Title	Description	Audience
Using Avaya Aura® Messaging	Explains how to set up and use User Preferences and the Messaging toolbar in your email client. The content is available in two formats: HTML and PDF.	Users
Using Avaya Aura® Messaging Job Aid	Includes the most common user tasks. This job aid is a subset of the user guide.	Users and support personnel
Avaya Aura® Messaging Quick Reference (Aria)	Describes how to use the Aria telephone user interface.	Users

Table continues…

Title	Description	Audience
Avaya Aura® Messaging Quick Reference (Audix®)	Describes how to use the Audix® telephone user interface.	Users
Avaya Aura® Messaging Quick Reference (CallPilot®)	Describes how to use the CallPilot telephone user interface.	Users

Hardware

New installations

Title	Description	Audience
Installing the Dell™ PowerEdge™ R610 server	Describes the components, specifications, and configurations for this server.	Deployment engineers and support personnel
Installing the Dell™ PowerEdge™ R620 server	Describes the components, specifications, and configurations for this server.	Deployment engineers and support personnel
Installing the HP ProLiant DL360 G7 server	Describes the components, specifications, and configurations for this server.	Deployment engineers and support personnel
Installing the HP ProLiant DL360p G8 server	Describes the components, specifications, and configurations for this server.	Deployment engineers and support personnel

Maintenance

Title	Description	Audience
Maintaining the Avaya S8800 1U Server for Avaya Aura® Messaging	Describes how to add, replace, and repair hardware components for this server.	Deployment engineers and support personnel
Maintaining and Troubleshooting the Dell™ PowerEdge™ R610 server	Describes how to add, replace, and repair hardware components for this server. Also provides information about LCD status messages.	Deployment engineers and support personnel
Maintaining and Troubleshooting the Dell™ PowerEdge™ R620 server	Describes how to add, replace, and repair hardware components for this server.	Deployment engineers and support personnel
Maintaining and Troubleshooting the HP ProLiant DL360 G7 server	Describes how to add, replace, and repair hardware components for this server.	Deployment engineers and support personnel
Maintaining and Troubleshooting the HP ProLiant DL360p G8 server	Describes how to add, replace, and repair hardware components for this server.	Deployment engineers and support personnel

Training

You can get the following Messaging courses at https://www.avaya-learning.com. Enter the course code in the **Search** field and click **Go** to search for the course.

The course titles might differ from the titles shown.

Course code	Course title
2U00230W	Avaya UC Messaging — Overview
2U00231W	Avaya UC Messaging — Heritage
2U00232W	Avaya UC Messaging — Avaya Aura® Messaging
2U00233O	Selling Avaya UC Messaging Learning Bytes
3U00141W	Designing UC Messaging — Avaya Aura® Messaging
5U00140E	Avaya Aura® Messaging Implementation and Support
5U00141E	Avaya Aura® Messaging Administration
ATI01674VEN	Avaya Aura® Messaging — Caller Applications

Viewing Avaya Mentor videos

Avaya Mentor videos provide technical content on how to install, configure, and troubleshoot Avaya products.

About this task

Videos are available on the Avaya Support website, listed under the video document type, and on the Avaya-run channel on YouTube.

Procedure

- To find videos on the Avaya Support website, go to http://support.avaya.com and perform one of the following actions:
  - In **Search**, type `Avaya Mentor Videos` to see a list of the available videos.
  - In **Search**, type the product name. On the Search Results page, select **Video** in the **Content Type** column on the left.
- To find the Avaya Mentor videos on YouTube, go to www.youtube.com/AvayaMentor and perform one of the following actions:
  - Enter a key word or key words in the **Search Channel** to search for a specific product or topic.
  - Scroll down Playlists, and click the name of a topic to see the available list of videos posted on the website.

Note:

Videos are not available for all products.

Support

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

Warranty

Avaya provides a 3-month limited warranty on Messaging. Detailed terms and conditions are contained in the sales agreement or other applicable documentation that establish the terms of the limited warranty. In addition, the standard warranty description and details for support during warranty are available on the Avaya Support website at http://support.avaya.com. See specifically *Avaya Global Software License Terms*.

Chapter 2: Messaging overview

Avaya Aura® Messaging overview

Avaya Aura® Messaging is an enterprise-class messaging solution that is flexible, scalable, and resilient. Messaging can improve your business through quick and effective communication and collaboration.

Messaging provides powerful capabilities that deliver tangible benefits such as:

- Sending important calls to the right person, at the right time
- Alerting employees to critical new messages
- Providing fast and easy access to all messages
- Lowering the cost of acquisition, deployment, and ownership through standards-based interfaces that facilitate easy integration with your networks, administrative systems, and security processes
- Providing multiple configuration choices for scalability and resiliency

You can deploy Messaging on either:

- Avaya-provided hardware that runs Linux® and Avaya Aura® System Platform or
- Customer-provided hardware using VMware® in a virtualized environment

Benefits of Messaging

The core strengths of Messaging are flexibility, compatibility, interoperability, scalability, and resilience. Together, these features improve how your organization responds to customers, enhances collaboration, and lowers the cost of ownership.

Messaging provides the following benefits to customers:

Accessibility and mobility

A key component of business agility is the capability of contacting the right person at the right time, and the right person might be another employee or your customer.

Messaging can improve communication by connecting users, enabling them to collaborate efficiently. Messaging can also streamline your business processes. Users can get voice messages from a telephone or a computer.

Telephone interfaces include the Messaging TUI, Avaya one-X® Speech, and Avaya one-X® Mobile. Hearing impaired users can use a teletypewriter device with the Audix® TUI.

Computer interfaces include an Internet Message Access Protocol 4 (IMAP4) email client such as Microsoft Outlook. From an Internet browser, users can manage personal settings and get messages when the storage destination is the Microsoft Exchange Server and when you have installed Microsoft Office Outlook Web. Computer interfaces also include Messaging Web Access, a secure visual client for creating and managing voice mail from the Internet.

Your business telephone number is a part of your corporate identity. When you activate Reach Me, Messaging preserves that business number and routes callers to your mobile phone, remote office, or virtual office. Regardless of the access method you use, one-number connectivity preserves your corporate identity.

Flexibility

Messaging offers a flexible architecture that fits many customer environments and is ideal for enterprises with telephony environments that are in transition. When you buy Messaging software licenses, you can run the software either on Avaya-provided hardware or in your VMware environment.

When you deploy Messaging with Avaya -provided hardware, you can select one easy-to-deploy server in which the application and storage roles reside on a single physical server. You can also select a fully scalable multiserver configuration with dedicated application and storage servers. The dedicated storage server can be an Avaya message store or a Microsoft Exchange message store. The same Messaging system can also use both types of storage servers.

When you deploy Messaging in a VMware virtualized environment, you do not have to buy hardware from Avaya or pay ongoing operation and maintenance expenses. Therefore, this deployment might reduce your total cost of ownership.

Compatibility

Messaging is compatible with other Avaya products and several third-party products. This compatibility can lower the total cost of ownership.

Scalability

The Messaging architecture provides scalability and growth to accommodate various telephony deployment sizes, ranging from small branch office telephony servers to larger campus-wide telephony servers. Messaging works with large-scale installations over large, global IP networks with varying levels of network quality. For example, in a scalable deployment of the Messaging system, multiple sites can contain multiple application servers that are connected to a dedicated storage server.

Resilience

The Messaging system is resilient and can remain functional even if networks or hardware fail. The Messaging architecture provides a range of high availability and system recovery options. These options range from an N+1 configuration for application servers to locally survivable application servers. These application servers can stay fully operational with locally cached messages and directory information, including greetings, recorded names, and other relevant settings.

Each application server can operate in the offline mode, thereby providing local survivability if your data network fails and the application server loses connectivity with the storage server. The offline handling of messages and directory information means that Messaging can continue to provide call-answering service, basic message review, and voice messaging capability.

Messaging also works with Mutare Message Mirror™ to achieve complete system recovery for voice messages and related information such as greetings, names, passwords, and LDAP data. Message Mirror provides 1+1 redundancy for the Avaya message store.

Remote alarming and serviceability

Messaging generates system alarms and error logs for the application server, storage server, and the AxC/Directory server. Messaging uses Secure Access Link (SAL), and SAL Gateway to send alarm notifications to multiple locations.

Interoperability

Messaging interoperates with several Avaya products and various third-party products such as AudioCodes gateways and third-party fax solutions.

User features

In addition to the accessibility and mobility features of Messaging, users benefit from:

- A browser tool for managing personal settings. Users can activate Reach Me to forward incoming calls to another phone and Notify Me to receive an alert when a new message arrives. Users can also create personal distribution lists and manage greetings.
- The option to address messages from a telephone keypad or by speaking the name of the recipient.
- The capability to convert voice messages into text using Mutare giSTT Speech-to-Text. Mutare giSTT is an optional, fee-based third-party product orderable through Avaya Solution Designer (ASD).

All user features are available in multiple languages.

Avaya Aura® overview

The Avaya Aura® platform simplifies complex multivendor, multimodal, and multilocation networks and can reduce your infrastructure costs. This platform unifies a wide array of communication applications and systems, decoupling them from the network. This unification makes it easier to provide communication services based on user need instead of user location and network capabilities.

The Avaya Aura® platform delivers voice, messaging, video, and web applications, regardless of where your users are located. This platform adds powerful session management capabilities to Communication Manager, so that multivendor hardware and software communicate across your enterprise.

The Avaya Aura® platform also supports single cross-enterprise dial plans and centralized administration to reduce operating costs and speed up rollouts of new applications. When you use

Avaya one-X® Unified Communications interfaces, you can take advantage of unified communication applications and solutions.

For additional documentation, see the Avaya Support website at http://support.avaya.com.

Avaya Aura® components

The following components provide the Avaya Aura® core communications services:

- Avaya Aura® Communication Manager. The open, reliable, and extensible IP telephony foundation on which Avaya delivers intelligent communications to large and small enterprises.
- Avaya Aura® Messaging. A part of the Avaya Aura® architecture, but you can use Messaging in other environments.
- Avaya Aura® Session Manager. A SIP routing and integration tool and the core component of the Avaya Aura® solution. Session Manager integrates the SIP entities across your entire enterprise network. You can view and manage each location, branch, and application as part of the overall corporation.
- Avaya Aura® System Manager. A product that takes a solution-level approach to network administration. IT departments can use System Manager to incorporate new components and applications under a common management umbrella, managing all elements of Avaya Aura® together as a system.

  System Manager centralizes provisioning, maintenance, and troubleshooting to simplify and reduce management complexity and solution servicing. System Manager provides a common management framework that reduces the complexity of operations for distributed multisite networks with multiple control points inherent in SIP. System Manager also increases the value of convergence through tight integration with the enterprise IT infrastructure.
- Avaya Aura®System Platform. A generic virtual environment for servers that provides a common set of features and services. This set of features and services enables preinstalled and configured virtual applications, called solution templates, to reside on a single physical server.

  System Platform features include:

  - Secure Access Link (SAL) to handle alarming and remote access
  - A consistent upgrade method for all patches and products in the solution template
  - Security that conforms to Avaya product security standards
  - WebLM, a Web license manager server that manages product licenses
  - A Network Time Protocol (NTP) clock synchronized to a customer-provided NTP server

  Avaya offers product-specific templates that define one or more applications. These templates make the task of installing different products, such as Messaging, on System Platform easy and efficient.

For more documentation, see the Avaya Support website at http://support.avaya.com.

Messaging architecture

The Messaging system consists of one or more servers that perform specific roles. At the heart of the system is a server that performs the storage role. Multiple servers can perform the application role. These servers support the server that performs the storage role. The total number of ports cannot exceed 300.

A system is a physical collection of servers that function together to provide functionality to users. A system might span multiple locations, have multiple sites, or contain multiple clusters. But a system has only one directory.

Servers

This document uses “physical server” to describe the hardware components of Messaging. Physical servers come in either standard or high capacity versions. The amount of mailbox capacity that you need and your system configuration determine which version you order.

When you first set up your Messaging system, you assign roles to the physical servers. As your business changes and grows, you can add new physical servers and reassign the server roles.

Server roles

The Messaging system performs two distinct roles:

- An application role
- A storage role

These roles are independent of the physical server on which the roles reside. You can change the role of the server. For example, you can change a single-server system into a two-server system in which each physical server plays one role, either storage or application.

Application role

The application role supports real-time telephony interaction with users and callers, including:

- Integration with your telephony system for voice and Message Waiting Indicator (MWI)
- A telephone user interface, including Auto Attendant and Caller Applications
- Local caching for the offline handling of user directory data, greetings, recorded names, and voice messages

Note:

In the offline mode, IMAP only shows messages that have reached the storage server. Messages that are only in the cache on the application servers are not accessible with IMAP during the offline mode.

The application role is the front end in front-end/back-end topologies.

Storage role

The storage role stores:

- Voice messages, when you use the Avaya message store.
- Directory data in an LDAP directory. For example, users contacts, distribution lists, Caller Applications.

The storage role also supports nonvoice interaction with users, including:

- User Preferences
- IMAP4 access to voice messages, when you use the Avaya message store
- SMTP routing of voice messages, text message notifications, and email copies
- Connectivity to:
  - The LDAP directory
  - The message store to monitor the state of user mailboxes, including the MWI status and Notify Me notifications

The storage role is the back end in front-end/back-end topologies.

Server types

All physical servers include the same Messaging software. When you configure your system, you determine the functionality of each physical server, as follows:

- Single server: A physical server in which both the application and storage roles are active.
- Dedicated storage server: A physical server that is identical to a single server except that only the storage role is active.
- Dedicated application server: A physical server that is identical to a single server except that only the application role is active. An application server can support up to 100 ports of active traffic.
- Dedicated AxC/Directory server: A physical server that manages notification capabilities and the LDAP database and provides communications between application servers and the third-party storage server. This server also stores user properties and name and greeting recordings.

  Not all configurations require a dedicated AxC/Directory server because the AxC/Directory role runs on the Avaya-provided message store. You only need a dedicated AxC/Directory server for:

  - Release 6.2 and earlier Messaging systems with a third-party storage server.
  - Release 6.3 or later systems with more than two application servers, or more than 6000 users using a third-party storage server, such as Microsoft Exchange.

Messaging displays only the System Management Interface (SMI) pages that are relevant to the server role of the physical server.

Supported hardware

Linux®-based servers

Messaging software runs on the following Avaya-provided servers:

- Dell™ PowerEdge™ R620
- Dell™ PowerEdge™ R610
- HP ProLiant DL360p G8
- HP ProLiant DL360 G7

If you already have the following servers in your network, you can use them with Messaging. However, you must first get an upgrade kit.

Server	Supporting documentation
CallPilot 1006r	*CallPilot 1006r Hardware Upgrade Instructions*
HP ProLiant DL360 G7 (when previously used with Modular Messaging)	*Maintaining and Troubleshooting the HP ProLiant DL360 G7 server*

You can download these documents from the Avaya Support website at http://support.avaya.com.

VMware®-based servers

Messaging software runs on ESXi host servers.

Avaya does not provide servers for your VMware environment. But you can get compatibility information for servers from the VMware website at: http://www.vmware.com/. This website also has information about the VMware infrastructure, including I/O, storage/SAN, backups, and interoperability.

1006r specifications

The 1006r server is only available as a standard server. The following table shows the server specifications after you apply the upgrade kit.

Component name	Standard server
Chassis	2U
Processor speed	Dual E5504 2GHZ Quad Core
System memory	16GB DDR3/1066
Number of processors	2
Ethernet ports	Embedded Six 10/100/1000Mbps
RAID type	Integrated SAS Hardware RAID
Disk	2 x 300GB SAS
Standard power supply	AC Dual redundant hot swap 750W

Dell™ PowerEdge™ R620 specifications

Component name	Standard server	High capacity server
Chassis	1U	1U
Processor speed	E5-2630 2.3 GHz 6-core	E5-2630 2.3 GHz 6-core
Number of processors	1	1
Ethernet ports	6	4
RAID type	RAID 1	RAID 5
Disk	2 x 300 GB 10K	3 x 300 GB 15K
Standard power supply	1 x 495 W	2 x 495 W

Dell™ PowerEdge™ R610 specifications

Component name	Standard server	High capacity server
Chassis	1U	1U
Processor speed	E5620 2.4 GHz 4-core	E5620 2.4 GHz 4-core
System memory	12 GB	12 GB
Ethernet ports	2	2
RAID type for phase 1 and 2 servers	RAID 5	RAID 5
Disk for phase 1 servers	3 x 146 GB 10K	4 x 146 GB 15K
Disk for phase 2 servers	3 x 146 GB 15K	4 x 146 GB 15K
Standard power supply	1 x 502 W	2 x 502 W

Note:

Phase 1 servers shipped for the first half of the Dell Power Edge R610 general availability life cycle. Phase 2 servers shipped for the second half. The disk configuration for the phases are different.

HP ProLiant DL360p G8 specifications

Component name	Standard server	High capacity server
Chassis	1U	1U
Processor speed	E5-2630 2.3 GHz	E5-2630 2.3 GHz
Number of processors	1	1
Ethernet ports	6	4
RAID type	RAID 1	RAID 5
Disk	2 x 300 GB 10K	3 x 300 GB 15K
Standard power supply	1 x 460 W	2 x 460 W

HP ProLiant DL360 G7 specifications

Component name	Standard server	High capacity server
Chassis	1U	1U
Processor speed	E5620 2.4 GHz 4–core	E5620 2.4 GHz 4–core
Number of processors	1	1
System memory	12 GB	12 GB
Ethernet ports	2	2
RAID type for phase 1 servers	RAID 5	RAID 5
Disk for phase 1 servers	3 x 146 GB 10k	4 x 146 GB 15k
RAID type for phase 2 servers	RAID 1	RAID 5
Disk for phase 2 servers	2 x 300 GB 10k	4 x 146 GB 15k
Standard power supply	1 x 460 W	2 x 460 W

Note:

Phase 1 servers shipped for the first half of the HP ProLiant DL360 G7general availability life cycle. Phase 2 servers shipped for the second half. The disk configuration for the phases are different.

S8730 specifications

Component name	Standard server	High capacity server
Chassis	2U	2U
Processor speed	AMD 2352 Quad-core	AMD 2352 Quad-core
System memory	4 GB	4 GB
Number of processors	1	1
Ethernet ports	Embedded 4 – 90, depending on the installed port board	Embedded 4 – 90, depending on the installed port board
RAID type	RAID 1	RAID 5
Disk	2 x 146 GB 10k 2.5 inch SAS hot-plug hard drives	4 or 6 x 72 GB 15k 2.5 inch SAS hot-plug hard drives
Standard power supply	1 x 800 W	2 x 800 W

S8800 1U specifications

Component name	Standard server	High capacity server
Chassis	1U	1U
Processor speed	E5520 Quad-core 2.26 GHz	E5520 Quad-core 2.26 GHz
Number of processors	1	1
System memory	12 GB	12 GB

Table continues…

Component name	Standard server	High capacity server
Ethernet ports	2	2
RAID type	RAID 5	RAID 5
Disk	3 x 146 GB 10k rpm SAS hard disk drives	4 x 146 GB 15k rpm SAS hard disk drives
Standard power supply	Single power supply	Dual power supplies

Message store

The message store is the repository for voice messages. The location of this repository can be the Avaya message store or a third-party server. When the location is the Avaya message store, the repository resides on the physical server that plays the storage role.

Messaging delivers voice messages as a .WAV attachment when the Avaya message store has IMAP access or when the message store resides on a Microsoft Exchange Server.

Mixed storage

You can mix different types of storage servers on the same Messaging system. This flexible design means that you can use a third-party storage server, such as a Microsoft Exchange Server, that might already be in your network environment. This flexibility also means that you can change the product of a specific email vendor without affecting Messaging.

The AxC/Directory:

- Manages notifications and the LDAP database.
- Stores user properties and user-generated recordings of user names and greetings.

When you use a third-party server to store voice messages, the AxC/Directory server relays the messages between the application server and the third-party server. Release 6.2 and earlier Messaging systems require a dedicated, physical AxC/Directory server when the message store resides on a third-party storage server. Release 6.3 or later systems only require a dedicated AxC/Directory server if the third-party storage server must support more than 6000 users or if the system has more than two application servers.

Mixed storage examples

Messaging administrators determine the storage destination of voice messages for each user. Users, therefore, do not have to change their email server.

In a single storage configuration, the administrator configures the system so that the AxC/Directory sends all messages to one storage server. This server can be either the Avaya storage server or a third-party server.

In a dual storage configuration, the administrator configures the system so that the AxC/Directory sends some messages to the Avaya storage server and others to the third-party server.

Clustering

Clusters of application servers improve the resilience and capacity of the Messaging system because multiple servers that perform the application role function together. You can combine up to three application servers to form a cluster and add a fourth server for redundancy as long as the active traffic does not exceed 300 ports. You can use a maximum of four application servers for each system.

Clustering also replicates user data, such as passwords and greetings, in real time to ensure seamless service between each member in the cluster. However, updates to application roles within other clusters occur only at the time of the nightly maintenance routine.

Clusters are typically designed based on physical location, and each application role is configured identically. If you want to retrieve messages when either the storage role or mailbox store is unavailable, a member of a cluster combines a list of available messages from the other servers within the cluster.

Members of a cluster regularly test connectivity with other members of the same cluster. If one member becomes unavailable, prolonged delays are not encountered when trying to get a message from another server.

Your system can include multiple clusters with each cluster connected to the same storage server. However, the number of clusters in your system does not change the maximum port capacity of 300 ports.

System behavior

Each server that performs the application role can handle calls and record messages. The system caches directory information and user greetings within each application role to provide a smooth experience to external callers.

When a caller leaves a voice message, the system caches the message within the local application role. Then the system sends the message through a connector (AxC) to the appropriate message store. The AxC that the storage role provisions can communicate with each supported message store.

When a user logs on to Messaging to get messages, the system uses the AxC to fetch a definitive list of messages from the message store. The system then checks the local cache for the audio part

of the message. If the audio part of the message is in the local cache, the system plays it for the user. If the audio part of the message is not in the local cache, the system retrieves it from the message store and plays it for the user.

Cache for messages

The system caches messages on the application server and then immediately attempts to deliver the message to the storage destination of the recipient when:

- A caller leaves a message (Call Answer)
- A user sends a message (Voice messaging)

The default retention period for messages is 72 hours. After 72 hours, the system deletes the message from the cache on the application server. If the user plays a message that is older than 72 hours, the system retrieves the message from the message store. When the system is operating in offline mode, users can use the TUI to get cached messages.

If your system is a single-server configuration with more than 2500 IMAP4 clients, change the message retention period from 72 hours to 24 hours.

Messaging uses the cache mechanism to avoid delays in message retrieval. Sometimes, Messaging takes longer than 3 seconds to retrieve a message. This time interval depends on the available network bandwidth, the length of the message, and the storage server. To avoid an extended period of silence, Messaging plays a tone after 3 seconds. This tone indicates that the message retrieval is in progress and the call is alive.

Cache for fax

When the system receives an inbound fax, Messaging forwards the fax to one of the following destinations:

- The fax server that the administrator identifies in the SMI
- An email address that the user identifies in User Preference

The system only caches inbound faxes if the user has identified an email address. The system does not cache outbound faxes or inbound faxes sent to a fax server.

The system stores messages and inbound faxes in the same cache. Therefore, like messages, the default retention period for a cached fax is 72 hours.

Sites

A Messaging site is a set of properties that you define in the System Management Interface (SMI). Each Messaging system has at least one site, but each system can support 500 sites. For example,

a single-server system can support as many sites as a fully loaded system with three active application servers configured as a cluster.

Each user can be a member of only one site. For single-site systems, Messaging automatically assigns all users to that site. For multisite systems, you must make a site assignment for each user. The system compiles each list of users into a systemwide directory that Auto Attendant uses for name dialing, addressing by speaking a name, and speech look up.

Any system with multiple sites supports multiple instances of the following site-specific properties.

Sites without speech recognition

- A site identifier that includes the extension style that the telephony server requires, the country code, and the site prefix.
- Messaging access numbers, also called pilot numbers, for both internal and external callers.
- Universal addressing options. For example, local, national, global.
- Up to 15 customer-installed languages.

  Because all application servers in a cluster must have an identical set of languages, you must install the *same* languages onto clustered application servers. Then, for each site that the cluster supports, you must select a default language for the Messaging access number. You can also select two additional languages for each site.
- Auto Attendant features. You can add up to 10 Auto Attendants. Each Auto Attendant supports up to two additional languages.
- P-Asserted Identity information for enforcing network security policies.
- The host IDs of far-end SIP domains.
- Customized greetings for Auto Attendant.
- An optional, customized greeting that the system plays before playing the user greeting.
- An optional, customized Auto Attendant greeting.

Sites with speech recognition

- A site identifier that includes the extension style that the telephony server requires, the country code, and the site prefix.
- Messaging access numbers, also called pilot numbers, for both internal and external callers.
- Universal addressing options. For example, local, national, global.
- Up to two customer-installed languages.

  Because all application servers in a cluster must have an identical set of languages, you must install the *same* languages onto clustered application servers. Then, for each site that the cluster supports, you must select a default language for the Messaging access number. You can also select two additional languages for each site.

  When you configure a site to use speech recognition, do not install more than two languages onto the application servers that host the site. If you exceed this limit, you might exhaust the memory capacity that speech recognition requires. You cannot delete U.S. English. If you need more than three languages (U.S. English plus two customer-installed languages), configure your system with multiple clusters.

- Auto Attendant features including speech recognition. You can add up to 10 Auto Attendants. Each Auto Attendant supports up to two additional languages.
- P-Asserted Identity information for enforcing network security policies.
- The host IDs of far-end SIP domains.
- Customized greetings for Auto Attendant.
- An optional, customized greeting that the system plays before playing the user greeting.
- An optional, customized Auto Attendant greeting.

Messaging topology

Messaging works in many topologies in centralized and distributed environments. Messaging is a scalable solution ranging from an easy-to-deploy, single server configuration to a fully scalable multiserver configuration. You can use the flexibility of the multiserver configuration to design the topology for both single and multiple site needs. Multiple sites can contain multiple application servers connected to a dedicated storage server.

The way your organization identifies sites determines your Messaging network topology.

Typical multiserver, multisite network topologies include sites with:

- Distributed application roles
- Centralized application roles

Small organizations usually require an easy-to-deploy, single-server topology that is ready to change with the needs of the organization. Large organizations can use the examples discussed in this section as building blocks for an enterprise-wide network architecture, including:

- Conforming to an existing network topology
- Fitting into centralized data centers
- Supporting local survivability networks
- Meeting high availability requirements
- Supporting system recovery requirements

Distributed topology

The principal benefits of a distributed topology are local survivability and less voice traffic on the network. The trade-off is a slightly higher total cost of ownership.

The distributed model is more appropriate for your organization when a minimum voice traffic on WAN and local survivability are important. You can add an extra application server for redundancy at locations where local survivability is critical.

With the distributed model, if an application server at a remote location cannot reach the storage server, the caller experience at that location is the same as if the storage server was reachable. Call

answering continues to function and users can still get their most recent messages. For more information about how Messaging continues to function when the storage server is unreachable, see Local survivability on page 86. You can also use Message Mirror for complete system recovery. For more information, see Redundancy for Avaya message store servers on page 88.

Centralized topology

When you use the centralized topology, you simplify your IT management and lower your total cost of ownership compared to a distributed topology. However, when remote locations connect to Messaging servers over a WAN, your network carries a significant amount of voice traffic. During an outage in the network, users at the remote location cannot gain access to the Messaging system until you restore the network. But a centralized topology might be the solution for your organization if:

- You have a high-quality network
- Your remote locations are not prone to network outages, or
- Your WAN link is inexpensive

Reference configurations

For Messaging, Avaya has identified four standard designs called reference configurations:

- Single server
- Multiserver single location
- Multiserver dual location
- VMware® in a virtualized environment

Avaya has thoroughly tested these reference configurations.

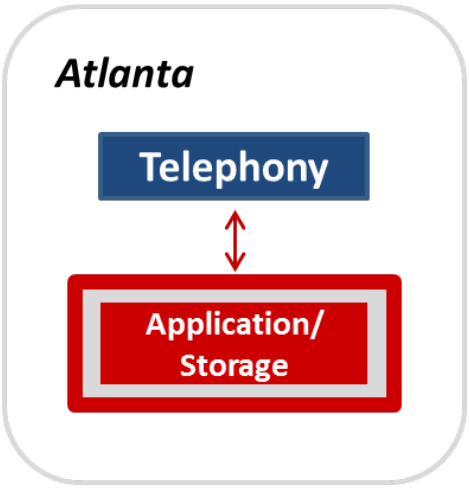
Single server

In the single-server configuration, the application and storage roles are both active within one physical server. This configuration is an ideal solution for organizations up to a maximum of 6000 users. This configuration works well for small or distributed organizations and can accommodate the growth of these organizations.

The default Avaya-provided physical server comes on standard capacity hardware.

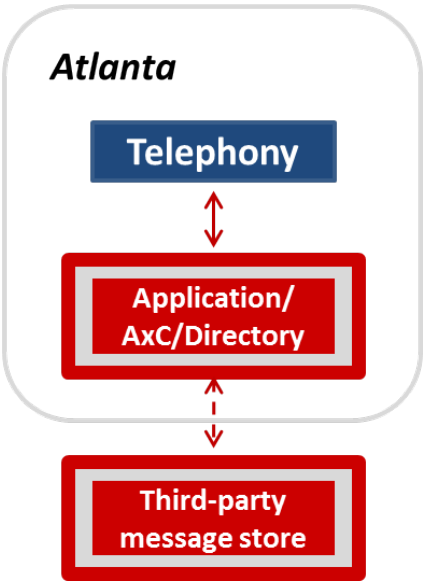
Customers with a Microsoft Exchange Server can configure their Avaya-provided physical server to send messages to their Exchange server.

Single-server example



Single-server example with a third-party message store

In this single-server configuration, the application role and the AxC/Directory reside on an Avaya-provided server. The application role connects to the telephony server and the AxC/Directory connects to the third-party message store. The third-party message store is an Exchange server. This system supports up to 6000 users and does not require a dedicated AxC/Directory server.



Single server scalability

You can easily expand your single-server configuration to other Messaging configurations.

To expand systems that use the Avaya message store:

1. Put the application and storage roles onto separate servers. Ensure that you put the storage role onto Avaya-provided, high capacity hardware.

2. Configure up to three more servers for the application role. These physical servers can be standard capacity hardware.

To expand systems that use a Microsoft Exchange Server as the message store:

1. Put the application role and the AxC/Directory onto separate servers. Ensure that you put the AxC/Directory onto Avaya-provided, high capacity hardware.
2. Configure up to three more servers for the application role. These physical servers can be standard capacity hardware.

Multiserver single location

In this reference configuration, the application and storage roles are active on different physical servers and deployed at the same location as the telephony server. This configuration does not provide redundancy for the storage role.

The server types can include any of the following:

- Up to four dedicated application servers.
- One dedicated storage server. You can choose:
  - An Avaya message store running on high capacity, Avaya-provided hardware, or
  - A Microsoft Exchange Server.
- A dedicated AxC/Directory server running on high capacity, Avaya-provided hardware. You only need this server when the message store resides on a Microsoft Exchange Server and when one of the following is true:
  - Your Messaging system must support more than 6000 users.
  - Your system configuration includes a mixture of message stores. For example, the system sends some messages to an Avaya message store and some to a Microsoft Exchange Server.

Design considerations

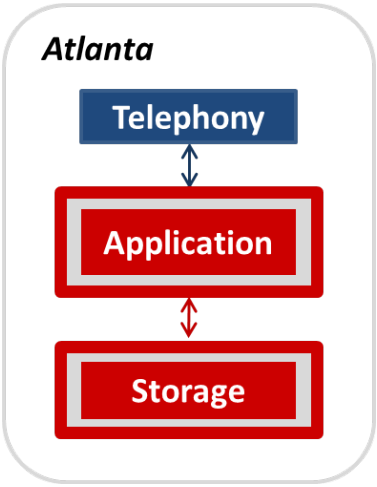
- The maximum number of ports for an application server is 100. The maximum number for the system is 300.
- The smallest multiserver system has one application server and one storage server and supports up to 6000 users. You can increase the capacity by adding application servers.
- Clustering multiple application servers provides redundancy for the application role because clustered application servers share the traffic load. For full redundancy without the interruption of service or the loss of data, the system capacity must be large enough to carry peak traffic load with one disabled application server.

  For example, when one application server provides enough system capacity, creating a cluster of two application servers provides redundancy for the application role. This configuration can use a maximum of 200 ports.

Similarly, when you require three application servers to support your capacity requirements, creating a cluster of four application server provides redundancy. Although this configuration has four application servers, the maximum port capacity is 300.

Example A: not clustered

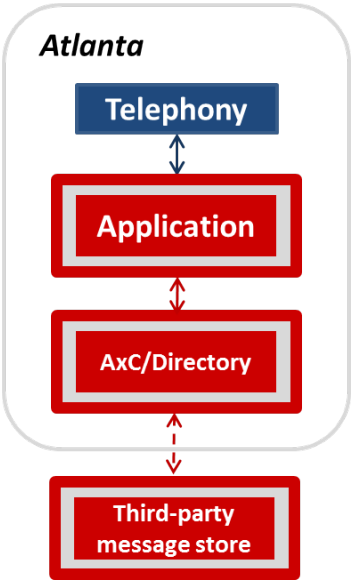
This multiserver, single-location configuration has one dedicated application server and one dedicated storage server and supports up to 6000 users. The dedicated application server communicates with the telephony server and the AxC/Directory that resides on the storage server.



Example B: not clustered

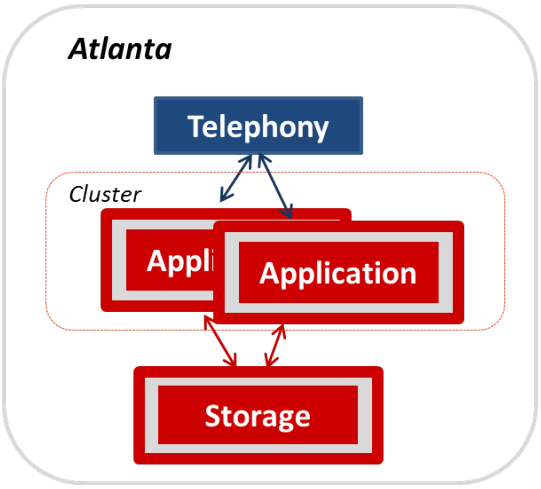
This multiserver, single-location configuration has one dedicated application server, one dedicated AxC/Directory server, and one third-party storage server. This configuration supports up to 6000 users. If your system supports fewer than 6000 users, you do not need a dedicated AxC/Directory server.

The dedicated application server communicates with the telephony server and the dedicated AxC/Directory server. The AxC/Directory server communicates with the third-party message store.



Example C: clustered

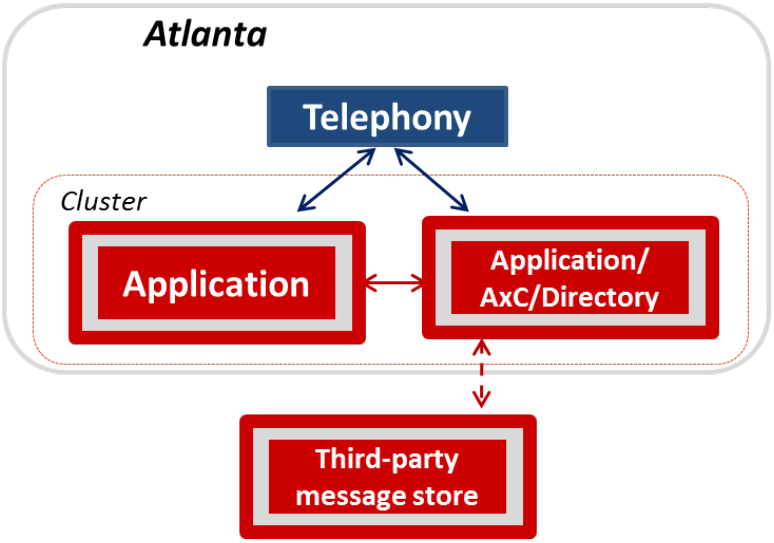
This multiserver, single-location configuration has two dedicated application servers and one dedicated storage server and supports up to 12,000 users. You can add a third application server to the cluster to increase the capacity and a fourth server for redundancy. Each application server communicates with the telephony server and the AxC/Directory that resides on the storage server.



Example D: clustered

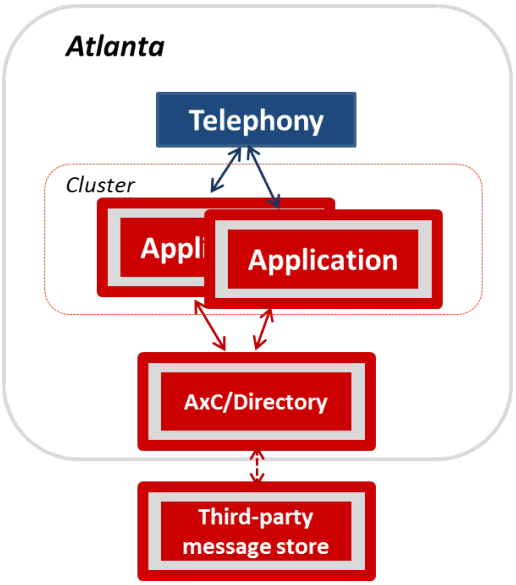
This multiserver, single-location configuration has two clustered application servers and a third-party storage server. The primary application server is dedicated to the application role. The secondary application server takes calls, provides redundancy for the primary server, and connects to the third-party message store.

The maximum number of ports for this system is 100. The secondary application server does not increase the capacity of your system.



Example E: clustered

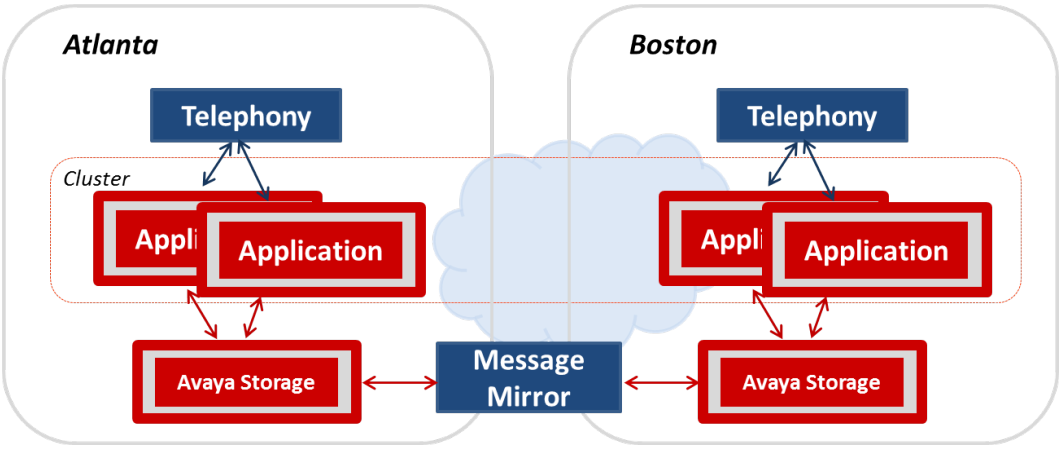
This multiserver, single-location configuration has two clustered application servers, a dedicated AxC/Directory server, and one third-party storage server. You can add a third application server to the cluster to increase the capacity and a fourth server for redundancy. Each application server communicates with the telephony server and the dedicated AxC/Directory server. The AxC/Directory server communicates with the third-party message store.



Multiserver dual location

In this reference configuration, the system capacity and choice of server types are the same as the multiserver, single-location configuration. However, you can deploy the servers at different locations.

A common deployment, shown below, locates the servers at two data centers, one in Atlanta and one in Boston.



Each data center has one telephony server, two application servers and one Avaya message store.

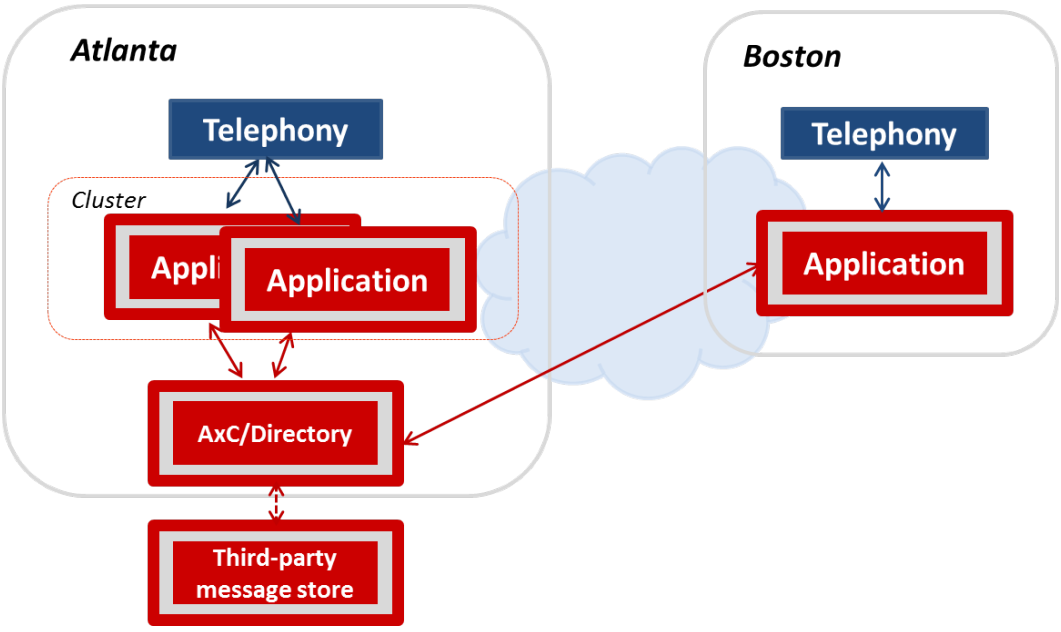
This configuration is fully redundant because:

- Four application servers are clustered over a WAN.
- Two Avaya message stores connect through a Windows server that runs Mutare Message Mirror. For more information about the proper placement and configuration of Message Mirror, see http://www.mutare.com.

This configuration supports distributed and centralized topologies.

Distributed multisite configuration

A distributed configuration for your Messaging system provides local survivability for remote application servers. You can distribute the entire network and put application servers at all locations or only those locations where you do not want the Messaging service interrupted. By putting application servers at remote sites, you can ensure continuation of messaging service if a network outage occurs between the remote site and the main location. If the local application server cannot reach the storage server at the main site, the application server operates in offline mode and Messaging continues to function. Another benefit of the distributed, multilocation configuration is that the WAN has less voice traffic. However, you might not be able to maximize the server capacity.



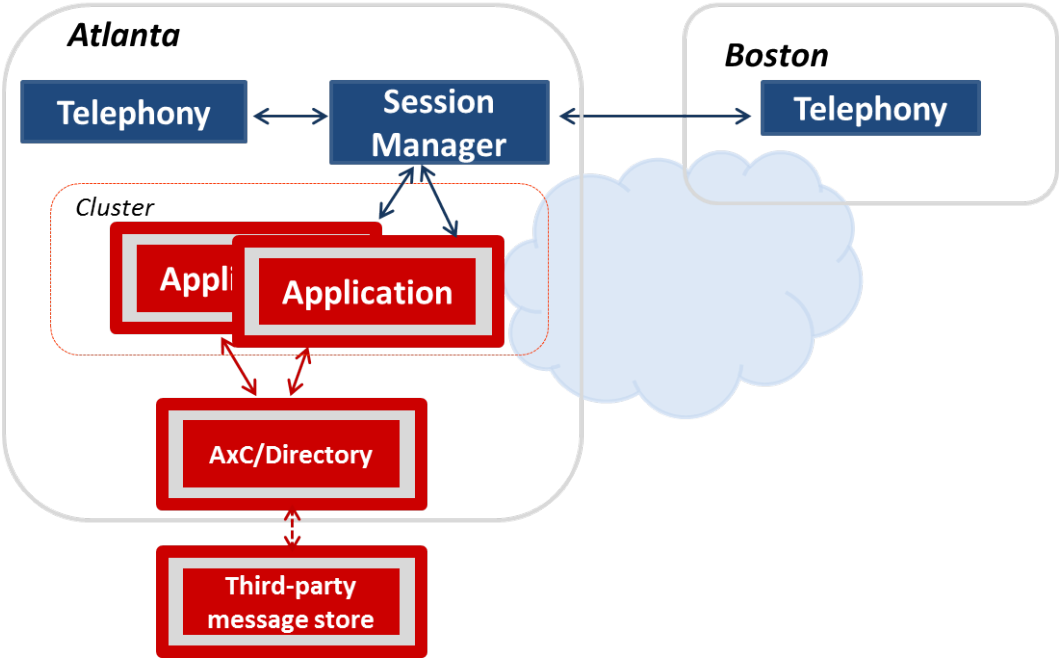
Related links

Limitations of local survivability on page 87

Centralized multisite configuration

The centralized configuration is a good option if you have some locations with fewer users than the capacity of a single application server. For example, you might have 8000 users in Atlanta and 2000 users in Boston. As the following figure shows, all application servers are in Atlanta and Session Manager connects to the telephony servers at both locations. If you have the telephony infrastructure in place in Boston, the application servers in Atlanta can handle the traffic for both locations and you maximize the capacity of your servers.

Similarly, you might have many small offices with a few hundred or a thousand users at each location. If each office requires only a fraction of the capacity of a server, you might require fewer servers than you require for a distributed configuration. By optimum utilization of the application servers, a centralized configuration lowers your total cost of ownership (TCO). The trade-off is that you have more voice traffic on WAN and no local survivability.



VMware® in a virtualized environment

The virtualized environment for Messaging leverages your VMware IT infrastructure for both equipment and ease of management. The customer provides the servers, virtual appliances, hardware, and VMware infrastructure including VMware licenses.

For more information about this configuration, see *Avaya Aura® Messaging VMware® in the Virtualized Environment Reference Configuration*.

New in this release

Avaya Aura® Messaging Release 6.3 offers the following new features and functionality that extend product capability and enhance the user experience.

Redundancy for single-server configurations

Administrators can use Mutare Message Mirror to provide redundancy for the Avaya message store in single-server configurations. In Release 6.3.2 and earlier systems, this capability is available only for multi-server configurations in which the application and storage roles reside on separate servers.

Virtualized environment

You can buy Messaging software licenses and run the software in your VMware environment. This offer reduces your total cost of ownership because you do not have to buy hardware from Avaya or pay for hardware maintenance costs.

Avaya CallPilot®

A CallPilot-like TUI with many important legacy features helps users transition to Messaging. This release also includes a System Management Interface webpage that you can use to migrate CallPilot user data. You can protect your investment in CallPilot 1006r servers by ordering hardware upgrade kits that repurpose these servers for use with Messaging.

Messaging Web Access

Messaging Web Access is a secure, visual client that allows you to get and manage your voice mail messages from the Internet. This client is ideal for customers who do not use Outlook or who do not want their voice messages in Outlook.

Multiple sites for application servers

Each Messaging system can support 500 sites. Because you can configure multiple sites on one application server, a single-server system can support as many sites as a fully loaded system with three active application servers configured as a cluster.

In previous releases, the site identifier for an E.164 environment is the combination of the access number, country code, and site prefix. In this release, the site identifier for an E.164 environment is the combination of the site prefix and the country code.

Multisite functionality for application servers supports:

- 500 SIP domains. This enhancement means that you can connect one Messaging system to multiple telephony servers and multiple Session Managers.
- Site-level broadcast messages. In addition to cluster-level broadcasts, you can send site-specific broadcasts. Administrators use Class of Service settings to control who can record and send broadcast messages.

A new report lists the site properties for each site.

Currency and interoperability

Messaging adds support for the following:

- Software: Windows 8.1, Exchange 2013, Outlook 2013, Nuance Recognizer 9, Postfix SMTP, and the G.729 and G.729A audio encoding formats. G.729 and G.729A transcode calls without a specialized gateway.
- Hardware: AudioCodes Mediant 1000B gateway and the following servers: Dell™ PowerEdge™ R620, and HP ProLiant DL360p G8.

Customers who use Exchange servers as a message store no longer need a dedicated AxC/ Directory server when Messaging supports fewer than 6000 users. Exchange customers can also use Avaya one-X® Speech, Message Networking, and Speech-to-Text provided by Mutare giSTT.

Capacity and scalability

The number of simultaneous IMAP4 sessions increases to 20,000. This capacity improvement can lower your total cost of ownership by reducing the number of Messaging systems required in a large corporation.

For multiserver configurations with the Avaya message store as the only storage server, the number of local users that Messaging supports increases from 20,000 to 30,000. The system capacity for remote users remains 100,000.

The capacity does not change for any configuration that includes a Microsoft Exchange Server as the message store. Messaging continues to support 20,000 local users for all configurations with this server, even when the configuration has both Avaya and Exchange storage servers.

Language

Multilingual support expands to include Turkish, Hebrew, Swedish, Cantonese, an English/French bilingual language pack, and a U.S. English pack recorded by the same voice talent used by other Avaya products. The Audix TUI adds new TTY prompts. The Audix and CallPilot TUIs add rapid prompts. The number of language packs that you can install on a system increases to 15.

Customers with a multilingual environment can configure each site with up to three different languages. All application servers in a cluster must have an identical set of languages, but you can select a different default language for each site. You can also delete and replace language packs as your language requirements change.

Mailbox management

Mailbox management tools expand to include:

- Variable length mailboxes
- The capability to block callers from leaving a message in a locked or blocked mailbox
- New reports that identify the mailboxes that are dormant, uninitialized, or full

Call management

Customers who use Caller Applications can transfer directly to a mailbox.

Administrators can select an audio file that the calling party hears during the Reach Me process. The default is to play nothing. Other options are the North American ring tone, music selected from a Messaging server, or music selected from a non-Messaging server. If you choose a file from a non-Messaging server, you are responsible for complying with all laws and regulations regarding the use of the content in the file.

Greetings

Aria and CallPilot TUI users can record up to nine optional greetings and then set the rules for playing those greetings. This feature was previously available only to Audix TUI users.

Users can record and manage an Extended Absence Greeting (EAG) from the TUI. Previously, users could only record and manage this greeting from User Preferences.

Administrators can record an optional system greeting that plays before Messaging gives callers the option of leaving a voice message.

Fax

Expanded fax support gives users the capability of sending a fax from any Windows desktop set up for HTTP printing. Administrators control who can send and receive a fax through a Class of Service setting. Release 6.3.3 adds support for Windows 8.1, improvements to the installation wizard for the outbound fax desktop client, and support for silent installs.

Addressing messages

Administrators can use the Enhanced List Application (ELA) to create a distribution list and then give another user privileges to manage that list. These users can use the new Enhanced Lists page in User Preferences to add and delete members from enhanced lists. This page displays only for users with management privileges. Users cannot create or delete enhanced lists.

Licensing

Licenses in Russia no longer provide for media encryption. If you upgrade from Release 6.2 and plan to use TLS/SRTP, you must install a new license with media encryption enabled.

New alarms alert you to changes in your license mode.

Basic licenses support IMAP access to the Avaya message store.

Password policy

The administration of your password policy for users moves from the System Policies SMI page to the System Administration page. Enhancements include:

- The capability to keep a history of login passwords. Administrators select the number of passwords that Messaging keeps for each user. Users cannot reuse any of the passwords in the history file.
- The capability to automatically unlock a locked mailbox. Administrators set the duration of the locked period. The default is to manually unlock mailboxes.

Changes to login passwords include:

- The minimum password length decreases from 3 characters to 1 character. The default increases from 4 to 7.
- The default for the maximum length of passwords remains at 15. But administrators can no longer change this number.
- The default for the number of failed attempts to login changes from 9 to 18.

Message playback option

Messaging offers a new playback option, *Arrange by sender*, that groups all messages from the same sender together. If administrators activate this option on the Class of Service page, User Preferences adds *Arrange by sender* choices to the My Phone page. The default playback options apply until the user changes them.

Message management

Messaging Release 6.3.x offers a variety of new ways that administrators, users, and callers can manage messages. Administrators can:

- Configure Messaging to automatically delete messages from a mailbox after the message retention period expires. Administrators can also configure Messaging to send users a deletion notification. Users hear the notification while using the TUI and can take the appropriate action.

- Configure Messaging to automatically send a read receipt notice to the sender of a message. These notices inform the sender that the recipient listened to the message. This feature is only available for users who have an account on an Avaya message store.
- Configure the Aria TUI to block users from deleting a message during playback.
- Control when the Aria TUI marks a message as read.
- Customize the content of Notify Me email notifications to meet the needs of their organization. The default content of these notifications include the external Messaging access number for the site to which the user belongs. Administrators can, for example, add an access number for each site that a multisite system supports. Administrators can also localize the content.

Aria TUI users can start recording a messaging in one TUI session and finish recording the message in a subsequent session. This capability is useful if you lose your telephone connection while you are recording a lengthy message. Administrators control who has this capability with a Class of Service setting.

Callers can mark messages *private* during a Call Answer session.

Telephony

When an incoming call includes data in the SIP header field for P-Asserted Identity, Messaging includes the data in outbound calls. Many network security policies use P-Asserted Identity to validate calls. And some applications can reject calls with unrecognized values in this field. This enhancement works with the following features: Auto Attendant transfers, Personal Operator, Caller Applications, Reach Me, Notify Me, and Call Sender.

When an incoming call includes data in the User-to-User (UUI) SIP header field, Messaging includes the data in outbound calls. If the incoming call includes more than one UUI header field, Messaging only sends the data from the first field.

System management

Enhancements to system management include:

- New reports
  - A Dormant Mailboxes report that can help you manage your mailbox licenses.
  - A Full Mailboxes report that can help you manage disk space.
  - A Site report that can help you determine if the site is inactive. The report also displays site properties and the number of supported users.
- Log improvements to help you audit and troubleshoot system problems.
- Improved diagnostics for:
  - Network, AIC, and storage server connectivity
  - Detection of an invalid cluster member
  - Cache management
  - Changes to your license mode
- Improved alarming for:
  - License mode changes
  - Application servers going offline

  - SNMP MIB queries
- A streamlined process for:
  - Identifying the role of a server: application, storage, or both
  - Changing the server role
- Caller Applications enhancements in Release 6.3.3 include support for Windows 8.1, installation improvements, and the capability to assign a language to a Caller Application.

Documentation

Avaya tested four standard configurations for Messaging systems. The Messaging library includes a reference configuration document for the following designs:

- Single server
- Multiserver single location
- Multiserver dual location
- VMware® in a virtualized environment

Feature comparison

Messaging offers two types of mailbox licenses: Mainstream and Basic. The Mainstream license offers functionality consistent with a full-featured Unified Messaging system. The Basic license provides a subset of the Mainstream features and is more like a traditional voice mail system.

Licenses do not control the features available to a mailbox. Instead, the features that the system administrator assigns to a user determine the type of license the mailbox uses. If the system administrator assigns one mainstream feature to a mailbox, that mailbox uses a Mainstream license.

For more information, see Mailbox licenses on page 103.

The following table compares the operational and functional changes in Avaya Aura® Messaging by release and license type. A *Y* indicates the availability of the corresponding item.

Functionality or feature	R6.0	R6.1		R6.2		R6.3	
		Basic	Main-stream	Basic	Main-stream	Basic	Main-stream
Servers and configurations							
Application server support for multiple sites						Y	Y
Avaya message store	Y	Y	Y	Y	Y	Y	Y
Microsoft Exchange		Y	Y	Y	Y	Y	Y

Table continues…

Functionality or feature	R6.0	R6.1		R6.2		R6.3	
		Basic	Main-stream	Basic	Main-stream	Basic	Main-stream
Redundancy for Avaya message store (Mutare Message Mirror)				Y	Y	Y	Y
IMAP access to Avaya message store			Y		Y	Y (6.3.2 and later)	Y
Message Networking with Avaya message store	Y	Y	Y	Y	Y	Y	Y
Message Networking with Microsoft Exchange						Y	Y
VMware virtualized environment						Y	Y
User interfaces							
Aria TUI	Y	Y	Y	Y	Y	Y	Y
Audix TUI		Y	Y	Y	Y	Y	Y
CallPilot TUI						Y	Y
Teletypewriter (TTY) with Audix TUI				Y	Y	Y	Y
Accessibility using TTY device				Y	Y	Y	Y
User Preferences	Y	Y	Y	Y	Y	Y	Y
Messaging Web Access							Y (6.3.1 and later)
Avaya one-X® Communicator	Y		Y		Y		Y
Avaya one-X® Mobile	Y		Y		Y		Y
Greetings and broadcasts							
Personal greeting	Y	Y	Y	Y	Y	Y	Y
Extended Absence Greeting	Y	Y	Y	Y	Y	Y	Y
Multiple optional greetings for Audix TUI				Y	Y	Y	Y
Multiple optional greetings for Aria and CallPilot TUIs						Y	Y
System greeting before call answer (optional)						Y	Y
Site-level broadcasts						Y	Y
Distribution lists							

Table continues…

Functionality or feature	R6.0	R6.1		R6.2		R6.3	
		Basic	Main-stream	Basic	Main-stream	Basic	Main-stream
Personal distribution list				Y	Y	Y	Y
Enhanced distribution list				Y	Y	Y	Y
Speech-based features							
Speech recognition for addressing[1]			Y		Y		Y
Basic Speech Auto Attendant[2]			Y		Y		Y
Avaya one-X® Speech with Avaya message store			Y		Y		Y
Avaya one-X® Speech with Exchange 2007/2010 message store							Y
Speech-to-Text with AMS (Mutare giSTT)					Y		Y
Speech-to-Text with Microsoft Exchange (Mutare giSTT)							Y
Enhanced Voice Mail (Mutare EVM)					Y		Y
Fax							
Detect and transfer to a fax server			Y		Y		Y
Receive and forward to an email client			Y		Y		Y
Send from a desktop fax client							Y
Automatic notices							
Notify Me			Y		Y		Y
Text message and pager			Y		Y		Y
Phone call to a telephone or mobile device			Y		Y		Y
Email copy			Y		Y		Y
Pending deletion of messages							Y

Table continues…

[1] Mailboxes with a Basic license do not appear in the speech recognition directory. Therefore, users with a Mainstream license cannot use speech recognition to address a message to users with a Basic license. If you want all users to be able to use speech recognition to address messages, all mailboxes must have a Mainstream license.

[2] See footnote 1.

Functionality or feature	R6.0	R6.1		R6.2		R6.3	
		Basic	Main-stream	Basic	Main-stream	Basic	Main-stream
Read receipt notice						Y (6.3.2 and later)	Y (6.3.2 and later)
Call management							
Reach Me			Y		Y		Y
Transfer to Messaging		Y	Y	Y	Y	Y	Y
Consultative transfers from Call Sender, Caller Application, and Auto Attendant						Y	Y
Transfer to mailbox from Caller Applications						Y	Y
Disable the audio branding				Y	Y	Y	Y
Variable length mailboxes						Y	Y
Telephony							
Record on Messaging		Y	Y	Y	Y	Y	Y
P-Asserted Identity						Y	Y
User-to-user call control (UUI)						Y	Y
Multiple SIP domains						Y	Y
Block Caller ID						Y	Y

Chapter 3: Feature description

Interfaces

Messaging users can get voice mail from:

- A telephone using a Messaging telephone user interface (TUI), Avaya one-X® Speech, or Avaya one-X® Mobile. Hearing impaired users get voice mail with a teletypewriter (TTY) device and the Audix® TUI.
- A computer, using the secure Avaya Aura® Messaging Web Access, Avaya one-X® Communicator, and an IMAP4-based email client such as Microsoft Outlook or Microsoft Office Outlook Web Access

Telephone

Caller user interface

The caller user interface is also known as the common caller interface or Call Answer prompting.

After a caller is ready to send a recorded message, the caller user interface offers the option of flagging the message as important, private, or both important and private.

Telephone user interface

You can use your telephone to log in to the Aria, Audix®, or CallPilot® TUI.

The menu structure and key press functions of each Messaging TUI closely matches the menu and key presses of their predecessors. These TUIs include all familiar play functionality, including pause and resume, rewind, skip and replay, and increase or decrease speed of play. You can call or reply to the sender, forward a message with a comment, delete or skip messages, record and configure an Extended Absence Greeting, and scan message headers. You can also create and send new messages.

After you create a personal distribution list in User Preferences, you can use the TUI to send a message to each member of the list.

Messaging blocks simultaneous logons from the TUI. When the system detects a login attempt to a mailbox that has an active TUI session, Messaging blocks the login and plays an appropriate announcement. If there is no activity in the TUI session for 2 minutes, the system permits another login.

Smartphone access

You can use Avaya one-X® Mobile to manage your voice messages from a smartphone when the Avaya message store is your storage destination.

When a Microsoft Exchange server is your storage destination, you can use the dedicated program that is available on most mobile devices to log in to Messaging. You can then view your voice mail in an email-style format.

Avaya one-X® Speech

When you use Avaya one-X® Speech, you can:

- Play voice mails.
- Send, forward, reply, and delete messages.
- Save messages to a predefined folder from any phone.
- Screen incoming calls through the Reach Me feature.
- Set reminders and schedule appointments.

For more information, see the Avaya one-X® Speech product documentation available at http://support.avaya.com.

Avaya one-X® Mobile

Avaya one-X® Mobile provides a graphical interface to Messaging voice messages. You can use Avaya one-X® Mobile to both see and hear voice messages on your mobile phone. You do not need to dial into the system because messages automatically download to the handset as sound files. Because all messages are visible in a list with the sender name and duration, you do not have to sort for important messages. Avaya one-X® Mobile does not work with Exchange.

For more information about Avaya one-X® Mobile, see the Avaya one-X® Mobile documentation at http://support.avaya.com.

Teletypewriter

Teletypewriters (TTY) are data terminals that people who are hearing or speech impaired can use to send and receive text through a telephone system. The TTY prompts make most Messaging features available to users of TTY devices.

Messaging users whose mailboxes are set up for TTY can:

- Use the TTY language for most menus, prompts, and messages.
- Answer incoming telephone calls with a TTY greeting.
- Send, receive, and respond to TTY messages with a TTY device. Users press the same telephone keys to send, receive, and respond to TTY messages and voice messages.

Callers can select either the TTY prompts or the standard voice prompts to record messages. Messaging also supports the use of TTY and voice during the same call. For example, a user can receive a prompt in the TTY language and then record a voice message. Hearing impaired people

who speak clearly can receive messages with a TTY device and send a voice message during the same call.

For more information, see *Using Avaya Aura® Messaging*.

Prerequisites

Messaging supports TTY when you:

- Use the G.711 audio encoding format
- Install the TTY language pack, available only in U.S. English.
- Use the Audix TUI.
- Administer mailboxes so that callers can select the TTY language or voice prompting from the same mailbox.

Computer

Microsoft Office Outlook

The Messaging toolbar is an Exchange form deployed on the Exchange server. You can use this toolbar to manage your voice messages from the Microsoft Office Outlook email client. You can perform the following common Messaging functions from the toolbar:

- Play the message on the personal computer or on the deskphone.
- Reply to the message.
- Forward the message with an introduction.
- Call the sender.

You can also set user preferences and get online help.

For more information about the toolbar, press the Help button on the toolbar or see *Using Avaya Aura® Messaging* at http://support.avaya.com.

Storage destination differences

The Messaging storage destination determines how Outlook integrates voice messages with email. When the storage destination is the:

- Avaya message store, users must set up a Messaging IMAP4 inbox in Outlook. Outlook places all voice messages into this inbox.
- Microsoft Exchange Server for both voice and email, users do not have to set up a separate inbox. Outlook automatically interleaves voice messages with your email messages.

The Messaging toolbar functions the same way with both storage servers.

Email notifications

You can request an email notification for new voice messages from the Notify Me page in User Preferences. You can send these notification to up to five email addresses.

User Preferences

User Preferences is a web-based tool that you can use to personalize your Messaging experience. You can open User Preferences from a browser, from Messaging Web Access, and from the Messaging toolbar within the Outlook desktop client.

The Messaging features available to users depend on:

- Whether you have a Basic or Mainstream license
- How you administer the Class of Service for the site

For more information, see *Using Avaya Aura® Messaging*.

General

The General page of User Preferences displays your Messaging access numbers and account information. You can also set:

- Your time zone. The Reach Me scheduling feature and the Notify Me feature use this setting.
- Your language preference. The choice of languages depends on which language packs the administrator installs.
- The number of your mobile phone or pager
- Options for blocking incoming messages
- Play on Phone options for the Messaging toolbar
- The telephone number Messaging forwards calls to when a caller presses zero while listening to your greeting

If the administrator has activated fax, you can specify:

- The email address to which Messaging forwards inbound faxes
- A custom transmission ID that Messaging adds to outbound faxes

Reach Me

Reach Me rules specify how Messaging forwards incoming calls when you do not answer your extension. You can:

- Create different rules for internal and external callers.
- Instruct Messaging to prompt callers to record their name so you can screen the call.
- Enter up to three forwarding numbers and the sequence in which Messaging calls the numbers.
- Create a schedule for forwarding calls.

Reach Me is available with Mainstream licenses. However, administrators can turn off this feature.

Notify Me

Notify Me rules instruct Messaging when to send you a notification for a new voice message. Messaging can send notifications to your mobile phone, pager, and email address.

If the administrator has activated fax, you can instruct Messaging to send a notification about an outbound fax to an email address. This notification has content about the success or failure of the transmission.

Notify Me is available with Mainstream licenses. However, administrators can turn off this feature.

My Phone

My Phone preferences customize telephone user interface (TUI) behavior. You can select the:

- Message playback order and speed
- Rapid prompts
- Speech recognition during message addressing

If you use the CallPilot TUI, you can also select auto play. When you activate this option, the TUI automatically begins playing your messages after you log in. You do not have to press any keys to listen to your messages.

If you have a Mainstream license, you can also use the speech recognition feature to address calls.

Personal Lists

You can create and manage multiple personal distribution lists (PDL) on the Personal Lists page. This feature is available with Basic and Mainstream licenses.

Enhanced Lists

Use enhanced lists to send messages. You can manage these lists on the Enhanced Lists page by adding or deleting list members. This page displays only if your administrator granted you rights to maintain enhanced lists. And the page only displays the lists that the administrator assigned to you.

Administrators create and delete ELA lists from the SMI.

Greetings

Messaging plays a greeting when you do not answer an incoming call. You can use the default system greeting or you can record your own greetings.

You can record personal, extended absence, and up to nine optional greetings. After you record a greeting, you can enter the playback instructions for your greetings. You can also set the expiry date and time for an Extended Absence Greeting.

Personal and Extended Absence Greetings are available with the Basic license.

Password

You can change your Messaging password on this page or from the TUI.

Advanced

When you first set up the Messaging toolbar for your Microsoft Outlook client, you enter the number that you want Messaging to call when you select the Play on Phone button. This number displays on the General page.

You delete this number on the Advanced page.

Messaging Web Access

Messaging Web Access is a secure web client with the following features:

- Play and record voice messages from a computer or a telephone.

  Your computer needs a headset or speakers, and a microphone, to play and record messages. You can also open play and record sessions on your telephone from Messaging Web Access. However, Avaya recommends that you use the telephone for these sessions only if your computer does not have this equipment.
- Create and send voices messages.
- Forward voice messages.
- Reply to voice messages.
- Call the sender of a message.
- Delete messages.

Because Messaging Web Access is a secure web client, you are unable to:

- Capture and save a copy of a voice message to another file on your computer
- Send or forward voice messages outside your organization
- Send or forward voice messages to email addresses

Avaya one-X® Communicator

You can manage your Messaging voice mail from your computer when you install Avaya one-X® Communicator. You can use the desktop interface of this software to use the same Messaging features that are available from your TUI. But Avaya one-X® Communicator also provides the following features:

- Visual voice mail.
- Voice-video calling with the capability of conducting ad hoc conferences.
- Access to your personal contacts list and the corporate directory.
- Access to your communications log. This log displays all calls, even the calls that you receive when you are logged out of Avaya one-X® Communicator.

For more information, see the Avaya one-X® Communicator documentation at http://support.avaya.com.

Caveats and limitations

Avaya one-X® Communicator is only available with the Avaya message store.

System Management Interface

System Management Interface (SMI) is the single point of access for your Messaging system and the license server. You can open SMI from any standard web browser from anywhere within the firewall of your organization.

SMI has three interfaces:

- The licensing administration interface to view the status of the server license.
- The Messaging administration interface to gain access to administration, diagnostic, and reporting tools to set up, manage, and maintain your Messaging system.

  In addition to monitoring system status, you can also use the Messaging administration interface to administer:

  - Server roles, trusted and hosted servers, sites, and topology
  - Features like Auto Attendant and Call Transfer
  - Internet Message Access Protocol 4 (IMAP)
  - Simple Mail Transfer Protocol (SMTP)
  - Users and Class of Service (CoS)
- The server administration interface to configure, maintain, and troubleshoot Messaging servers.

Note:

Some browsers might display SMI buttons differently than the buttons described in this document.

Caller Applications

Caller Applications are a collection of menus and prompts that administrators use to create simple, custom Auto Attendants. Administrators can extend the Automated Attendant to meet the requirements of the organization.

The basic functions of a Caller Application include:

- Defining a call menu structure with up to nine options
- Defining business hour and off-hour schedules
- Defining holiday schedules
- Loading previously recorded voice prompts
- Configuring Text-to-Speech prompts
- Defining call menus that support the business hours, off-hours, and holiday schedules

The graphical user interface (GUI) and online Help for Caller Applications are only available in English. However, administrators can record multilingual prompts for Caller Applications. Administrators can also assign a language to a Caller Application.

Caller Applications Editor

Caller Applications Editor is a software application that administrators use to create Caller Applications. This editor consists of Microsoft Management Console (MMC) snap-ins and extensions that run on a Microsoft platform. This platform must be able to communicate with the storage role.

After the administrator creates a Caller Application, the Microsoft platform automatically deploys the Caller Application to the storage server and the relevant application servers.

Languages

Multilingual support

U.S. English is the default language for Messaging, but you can download any of the following language packs:

- Arabic
- Brazilian Portuguese
- Canadian French with a French GUI
- Cantonese (Simplfied Chinese used in Hong Kong)
- Castilian Spanish
- Dutch
- English (U.K.) with a U.S. English GUI
- English (U.S.) TTY for Audix TUI users
- English (U.S.) Rapid prompts
- English (U.S.) / French bilingual prompts
- English (U.S.-Laurie) recorded by the same voice talent used by other Avaya products
- French
- German
- Hebrew
- Italian
- Japanese
- Korean
- Latin American Spanish
- Mandarin (Traditional Chinese used in mainland China)
- Polish
- Russian
- Swedish
- Turkish

Note:

Text-to-Speech is not available for Arabic and Hebrew language packs.

Graphical user interfaces

The graphical user interface (GUI) and online Help for User Preferences and Outlook forms are available in all of these languages. The following GUIs and online Help systems are only available in English:

- Messaging Web Access.
- The System Management Interface, but administrators can enter multilingual content.
- Caller Applications Editor, but administrators can record multilingual prompts.

Language packs

Customers with a multilingual environment can install up to 15 different language packs on servers with the application role. However, you can only assign three languages to a site. All application servers in a cluster must have an identical set of languages. But because languages are site specific, you can select a different default language for each site.

Administrators make language choices for the following:

- System language
- Default language for user interfaces such as User Preferences and Outlook forms
- Internal and external Messaging access number for each site
- Greetings
- Auto Attendant for each site

Users can change the default language for their mailbox in User Preferences.

You cannot remove a language pack until Messaging verifies that none of the above settings use the language that you want to delete.

Site limitations

If you want a site to use speech recognition, do not install more than two language packs onto the application servers that host the site. You cannot remove U.S. English from your system. Therefore, U.S. English is one of the three language packs that you can assign to a site. If you exceed this limit, you might exhaust the memory capacity that speech recognition requires.

Multilingual prompting

Multilingual prompting for Automated Attendant and user mailboxes enhances deployment in multilingual and regionally dispersed environments. Multilingual prompting increases the capability of a single server to support various geographic regions.

Administrators can assign up to three languages for Automated Attendant on the Sites page. When Automated Attendant greets callers, the callers can select a language. During the call, Messaging plays all subsequent prompts and announcements in the selected language.

When administrators activate multilingual mailboxes on the Class of Service (CoS) page, users can select a language from User Preferences. Messaging plays all call answer prompts and announcements in the selected language. Users can also record greetings in their preferred language.

TTY for Audix TUI users works the same way as other languages. However, callers and users need a TTY device.

Speech-to-Text

The Speech-to-Text (STT) feature converts Messaging voice mail messages to text and delivers that text to an email address or a mobile phone. This capability can increase personal productivity by reducing the time it takes to retrieve and play voice mail.

Messaging passes voice messages to Mutare giSTT Speech-to-Text, which transcribes the audio message into a text message.

Caveats and limitations

- Mutare giSTT Speech-to-Text only transcribes the first 60 seconds of an audio message. However, the user receives a file attachment for the full audio version of the message.
- Mutare giSTT requires a separate annual, per-user subscription and a physical or virtual server to host the software.

Greetings and broadcasts

Greetings

Greetings are prerecorded messages that the system automatically plays when a call goes to voice mail.

Call Answer greeting

When the telephony server transfers an incoming call to the Messaging system, the first thing the caller hears is a welcome greeting. This Call Answer greeting plays before the caller can leave a voice message or transfer to another extension. Callers cannot skip this greeting.

You can use the default Call Answer greeting, or you can replace it with a customized system greeting. For example, you can record an advisement, a disclaimer, or any other information. After you record a greeting, use the SMI Sites page to upload the .wav file. Then use the Class of Service page to activate the greeting.

You can create a different Call Answer greeting for each site defined for your system.

Customizing the Call Answer greeting is an ideal alternative to Caller Applications if you do not need a robust menu structure for transferring callers.

Personal greeting

The personal greeting is a standard greeting that plays when your line is busy or when you cannot answer calls. You can also use the default Messaging system greeting.

Extended Absence Greeting

You can record an Extended Absence Greeting (EAG) to tell callers that you are away from the office and cannot reply quickly to messages. You can also prevent callers from leaving a message when your EAG recording is the active greeting. If you activate this message-blocking option, Messaging plays your EAG. Then, depending on your User Preference setting, Messaging does one of the following:

- Transfers the call to a personal attendant.
- Disconnects the call.

You can use either User Preferences or your TUI to record and configure an EAG.

Optional greetings

In addition to personal and Extended Absence Greetings, you can record up to nine optional greetings. You set the rules for playing these greetings on your User Preferences webpage. For example, the system can play one greeting to all internal callers during office hours and a different greeting to all external callers after office hours.

Callers from outside your organization hear your external greeting, while callers within your organization hear your internal greeting. If you do not record an internal greeting, all callers hear your personal greeting. If you do not record a personal greeting, all callers hear the system greeting.

Broadcast messages

A broadcast message is an announcement. Messaging does not send notifications to the recipient or light the Message Waiting Indicator on the recipient telephone. The recipient cannot forward, mark as private, or reply to the message.

Messaging supports the following types of broadcast messages:

- Cluster-level broadcast messages

  In a single-site environment, Messaging sends a cluster-level broadcast message to every user with a Messaging account. In a clustered environment, Messaging delivers the same broadcast message to each application server in the cluster. In a nonclustered environment, Messaging delivers the broadcast message to users on the application server from which the message originated.

In a multisite environment, every user receives the message, regardless of their site assignment.

- Site-level broadcast messages

  In a multisite environment, Messaging sends a site-level broadcast message to users. The message is sent based on the site assignment of a user.

The default length of broadcast messages is 120 seconds, or two minutes. Administrators can change the default in the SMI.

Recording privileges

You must have the appropriate Class of Service (CoS) privilege to record and send a broadcast message. Administrators grant recording privileges from the SMI Class of Service page. The administrator can grant a user either cluster-level or site-level recording privileges, but not both.

If your system requires both levels of recording privileges, the administrator must create two CoSs, one for each level. Next, the administer must assign a different user to each CoS.

When you upgrade from a previous Messaging release, the system automatically resets system-level privileges. You must set site-level privileges manually.

Playback privileges

All users who log in to the Messaging system through the TUI or Messaging Web Access can play broadcast messages. You cannot play broadcast messages if you log in to Messaging through an email client.

Because Messaging stores broadcast messages on the application server, users can listen to messages when the system is offline.

Playback order

Broadcast messages play in the following sequence when you log in to the TUI:

1. Cluster-level broadcast message
2. Site-level broadcast message

Override rules

Messaging stores only one cluster-level broadcast message at a time. Similarly, Messaging stores only one site-level broadcast message for each site at a time. If, for example, your system has 10 sites, Messaging stores 10 site-level broadcast messages.

Any new broadcast message that you record overrides the previous message. Recipients can only play the most recent message.

Limitations and caveats

The following limitations and caveats apply to both cluster-level and site-level broadcast messages:

- Messaging stores broadcast messages and the review status (read or unread) of each user on the application server. So users can get this data when Messaging is offline, but this data is lost during an upgrade
- This Messaging release does not include reports about broadcast messages.
- Mutare Message Mirror does not replicate broadcast messages.

Addressing messages

Distribution lists

Messaging supports the following types of distribution lists:

- Personal lists that users create and manage
- System lists that administrators use to deliver broadcast messages. The types of system lists are:
  - Enhanced list
  - Enterprise list

Personal lists

A personal list is a labeled collection of addresses that users can create and save for later use. Users who often send messages to the same group of people can create one personal distribution list for each group. Messaging sends the message to each member of the list.

Users can create a maximum of 89 personal distribution lists in User Preferences. Only the user who creates a personal distribution list can view and manage the list.

For more information, see *Using Avaya Aura® Messaging*.

Enhanced list

The Enhanced List Application (ELA) is a tool that administrators use to create a distribution list for messages. An enhanced list can include mailbox numbers, email addresses, and other enhanced lists. System mailboxes cannot be members of an enhanced list. And an enhanced list cannot be a member of itself.

When an administrator creates an enhanced list, Messaging associates the list with a shadow mailbox. Then, when you send a message to the enhanced list, Messaging distributes the message to each member on the list.

Administrators use the SMI to:

- Create and delete lists.
- Change the attributes of lists.
- Grant users management rights to lists.

Users who have management rights to enhanced lists can open the Enhanced Lists page in User Preferences. This page displays only the lists for which the user has management rights. User Preferences does not display this page for users who do not have management rights.

Users with management rights can add and delete list members. These users cannot delete an enhanced list or create a new list.

Anyone with a Messaging account can send a message to an enhanced list.

For more information, see *Administering Avaya Aura® Messaging*

Enterprise list

You can also use Message Networking enterprise lists, which are enterprisewide mailing lists for users that reside on a Message Networking system. Each enterprise list represents a specific group of potential recipients for distributing messages across the enterprise. For more information, see *Message Networking Concepts and Features Guide* on the Avaya Support website at http://support.avaya.com.

Telephone keypad

You can address a message from the telephone by using the keypad to:

- Enter the mailbox number for one or more recipient or distribution list
- Spell the name of the recipient or distribution list

Addressing in a single-site environment

In a single-site environment, you can address a message by using the local mailbox number, the telephone extension number, the numeric address, the network address, or the name of the recipient.

Addressing in a multisite environment

In a multisite environment, you can use the same methods of addressing a message that you use in the single-site environment. You can also use the full mailbox number, the short mailbox number, or a partial mailbox number.

The following addressing rules apply in a multisite environment:

- Press the pound key (#) after you finish entering addresses. The exception is when you enter 50 digits, which is the maximum number of digits, or when a timeout occurs.
- If Messaging finds multiple matches for the mailbox number, Messaging presents the matches to the user in the following order:
  1. Mailbox and extension numbers from the home site of the user
  2. Mailbox and extension numbers from other sites
- If Messaging finds more than nine matching numbers, Messaging does not present any matches to the user. Exceptions are when the match is for the mailbox number of a personal list.
- If Messaging finds multiple mailbox and personal list matches, Messaging presents the mailbox matches first. To skip the personal lists, press 3.

Speech recognition

You can speak the name of the recipient to address a message or call a user.

The basic speech Auto Attendant recognizes first name-last name combinations, for example, William DuBois. When the confidence level of the speech recognition result is low, the Auto

Attendant prompts the caller to confirm the name. The confirmation dialog box uses text-to-speech (TTS) to speak the name and prompts the caller to confirm the name. The caller has several opportunities to:

- Confirm the name using speech recognition.
- Use the telephone keypad to enter a mailbox number, an extension, or the spelling of the name.

Sometimes the correct pronunciation of a name does not follow the pronunciation rules of the primary language. To improve recognition accuracy, administrators can enter a phonetic spelling of the name, for example, doobwah for Dubois.

Speech recognition in a multisite environment

Your Auto Attendant can include sites with different default languages. However, to use speech recognition you must configure each site in Auto Attendant with the same default language.

Speech recognition in a multilingual environment

U.S. English is the default language for the system. Because you cannot remove this language from the system, U.S. English is always one of the three languages that you can assign to a site. When you design a site to support speech recognition for multiple languages, limit the number of additional languages to two.

Speech recognition and mailbox licenses

Speech recognition requires a Mainstream license. The names of users with Basic mailbox licenses do not appear in the speech recognition directory. Therefore, users with a Mainstream license cannot use speech recognition to address a message to a user with a Basic license.

Message playback options

Messaging offers the following playback options for the messages in your mailbox.

- *Play newest first* sorts messages in LIFO order. This option is the default.
- *Play oldest first* sorts messages in FIFO order.
- *Play important messages before others* puts priority messages at the beginning of the playback list.
- *Arrange by sender* groups all messages from the same sender together.

You select these options on the User Preferences My Phone page. However, the options that display on this page depend on:

- Which TUI you use
- Your Class of Service

You cannot change your playback options from your TUI.

TUI variations

The Aria and Audix TUIs flag each message as follows:

- Aria: unread, read, saved
- Audix: unread, read

CallPilot does not flag messages.

Aria and Audix users can select a different playback option for each type of flag. For example, these users can select *Play newest first* for unread messages and *Play oldest first* for read messages.

Default playback order

The default playback order is:

- *Play newest first* = on
- *Play important messages before others* = off
- *Arrange by sender* = off

The time stamp of the message determines how your TUI queues the messages.

Example

Sender	Time	Important
Mikhail	1	No
John	2	No
Olga	3	Yes
John	4	Yes
Mary	5	No
John	6	No

Important messages

When you select *Play important messages before others*, Messaging moves all messages that senders flag as important to the top of the playback list. Next, Messaging sorts each group, important or regular, by the arrival time.

Example

This example shows the playback list when:

- *Play newest first* = on
- *Play important messages before others* = on
- *Arrange by sender* = off

Sender	Time	Important
John	2	Yes
Olga	3	Yes
John	4	Yes
Mikhail	1	No
Mary	5	No
John	6	No

Arrange by sender

Your My Phone page displays this option only if your administrator has activated the option on the Class of Service page.

When you select *Arrange by sender*, Messaging sorts in the normal sequence unless your mailbox has multiple messages from the same person. When your mailbox has more than one message from the same person, Messaging groups those messages together.

If the envelope information for the message does not include the name of the sender, Messaging uses the telephone number of the sender to group messages.

CallPilot example with *Arrange by sender*

This example shows the playback order when :

- Your mailbox has one important message and two regular messages from John
- You selected the following playback options from the My Phone page:
  - *Play newest first*
  - *Play important messages before others*
  - *Arrange by sender*

Sender	Time	Important
John	2	Yes
Olga	3	Yes
Mikhail	1	No
John	4	No
John	6	No
Mary	5	No

Audix and Aria example

This example shows how *Arrange by sender* changes the playback order when your mailbox includes:

- Three unread messages, including:
  - Two important messages, one each from John and Olga

  - One regular message from Mikhail
- Three read messages, including:
  - One important message from John
  - Two regular messages, one each from John and Mary

This example also uses the following playback options for unread and read messages:

- *Play newest first*
- *Play important messages before others*

***Arrange by sender* is OFF**				***Arrange by sender* is ON**			
Sender	**Time[3]**	**Important**	**Flag**	**Sender**	**Time**	**Important**	**Flag**
John	2	Yes	Unread	John	2	Yes	Unread
Olga	3	Yes	Unread	Olga	3	Yes	Unread
Mikhail	1	No	Unread	Mikhail	1	No	Unread
John	4	Yes	Read	John	4	Yes	Read
Mary	5	No	Read	John	6	No	Read
John	6	No	Read	Mary	5	No	Read

Notice that:

- Because all unread messages are from different senders, Messaging sorts unread messages in the normal sequence. The *Arrange by sender* option does not apply.
- Mary sent her message between the first and second read messages from John. When *Arrange by sender* is off, Messaging sorts the read messages in the normal sequence. When *Arrange by sender* is on, Messaging groups the messages from John together.

Message management

Notify Me

Notify Me can alert you to the arrival of a new voice message and the transmission of an outbound fax. Select the notification options from User Preferences.

The Notify Me feature and the Message Waiting Indicator (MWI) on your deskphone do not function when the storage server is offline. When the storage server is offline, you must periodically log in to your account and check for new messages. After you log in, Messaging plays a message explaining that some features are unavailable.

Notify Me is available with Mainstream licenses. However, administrators can turn off this feature.

[3] **1 is the newest message and 6 is the oldest message.**
[3] **1 is the newest message and 6 is the oldest message.**

Voice message alerts

You can instruct Notify Me to send an alert for a new voice message to your mobile phone, pager, and email address.

The default email notification for a voice message includes the external Messaging access number for your home site. Administrators can replace the default text with custom, localized text. Administrators can, for example, add an access number for each site that a multisite system supports. A notification with multiple access numbers can help you can easily get your messages when you are at another site. Administrators can create a different email notification for each language installed on the system.

Outbound fax alerts

Notify Me can send an alert for an outbound fax to an email address.

Message retention

Administrators use the Class of Service SMI page to manage the aging algorithm that Messaging uses to determine when to delete old messages.

Messaging flags each message as either read or unread. When Aria TUI users save a message, Messaging processes the message as read. For each state, administrators can:

- Turn off the automatic deletion feature by selecting Forever. Users must then manually delete old messages.
- Enter the number of days of the retention period.

  The default is 45 days. And the range is 0 to 999 days. When the state of a message changes, for example, from unread to read, the message retention period resets.

  Messaging automatically deletes old messages during the first nightly audit after the retention period expires.

Administrators can also determine whether you can restore messages marked for deletion. If administrators select this option, you can remove the deletion status of the message. After you restore a message, the retention period restarts. You cannot restore a deleted message.

You can create folders for voice messages in an IMAP email client such as Outlook. After you move a voice message into an email folder, you can no longer manage the message from the TUI. But administrators can determine the retention period for messages in these folders.

Automatic deletion notice

While configuring the message retention period, administrators can also instruct Messaging to send users an automatic deletion notice. Administrators use the Class of Service SMI page to enter the number of days of the notification period.

The notices are TUI prompts that warn the user that the system is about to delete messages. These prompts play when at least one message is in the notification period.

Because the notices are TUI prompts, Messaging cannot send an automatic deletion notice for messages that are in email folders.

Read receipt notice

Read receipts, or Message Disposition Notifications, are email notices that tell the sender that the recipient has seen or listened to a message. Messaging sends one notification for each recipient to the email inbox of the sender if:

- The administrator has activated this feature on the Class of Service page for the sender.
- The recipient has an account on the Avaya message store.
- The message is *not* a Call Answer message.

Read receipt is available with Basic and Mainstream licenses.

Distribution lists

Messaging sends these notices if the recipient is a member of a personal distribution list (PDL). Messaging does not send these notices if the recipient is a member of an enhanced list.

Enhanced Voice Mail

Mutare Enhanced Voice Mail (EVM) monitors your voice mailbox and sends notifications to your email, mobile phone, or instant messaging environment. The notifications include links to easily manage messages without making calls into voice mail. When you add optional giSTT Speech-to-Text transcription, users can read their voice messages with simplicity.

Enhanced Voice Mail is available with configurations that use the Avaya message store.

Mutare giSTT is an optional, fee-based third-party product that you can order through the Avaya Solution Designer (ASD).

Message recovery

Messaging automatically saves your message if you lose your telephone connection while you are recording a voice message. You can recover the unfinished message and resume your recording session the next time you log in to your mailbox. This feature is available with Basic and Mainstream licenses, but requires the English version of the Aria TUI.

You can apply all normal Aria TUI functions to the recovered message, including:

- Edit. You can rewind, fast-forward, pause, play, record, address, and send the message.
- Delete.

- Skip. If you skip a recovered message, the Aria TUI reminds you about the message the next time you log in to your mailbox.
- Exit. Skips any remaining recovered messages and returns you to the main menu.

Administrators use Class of Service settings to control:

- Who can recover unfinished messages
- How long Messaging saves unfinished messages

Examples of lost connectivity

- You hang up during a recording session.
- Your mobile phone drops the call when you enter a tunnel or an elevator.

System behavior

If you lose connectivity to the telephony server while you are recording a voice message, the system automatically saves your work and puts the unfinished message in the drafts folder of your mailbox on the Messaging storage server. If your mailbox does not have a drafts folder, Messaging creates one.

Caveats and limitations

- This feature is only available in English for the Aria TUI. You cannot use another TUI or another language to recover an unfinished message.
- This feature is only available from Messaging Web Access when you use Play by Phone to record the message on a phone that uses the Aria TUI.
- If you are replying to a message, Messaging saves your voice recording and the address of the recipient. If you are recording a message that is not a reply, Messaging only saves the recording. For either scenario, Messaging does not save other delivery options or privacy settings.
- You cannot recover partially recorded greetings, Caller Application announcements, spoken names, or any other recordings.
- Messaging only saves an unfinished message when you lose connectivity to the telephony server. Messaging does not save the message if the storage server goes offline or if you exceed the amount of storage space in your mailbox during a recording session.
- You cannot recover any unfinished message if the storage server is offline.
- You can only use the Aria TUI to finish a recording session if the unfinished message is in the drafts folder. You cannot recover your message if you use an IMAP4 email client such as Outlook to move the unfinished message out of the drafts folder.
- Messages in the drafts folder do not trigger a notification alert or cause the Message Waiting Indicator to light.

Mailbox management

Messaging offers mailbox management tools that administrators can use to:

- Select whether the mailboxes are of fixed or variable length.
- Block callers from leaving messages in uninitialized or locked mailboxes.
- Monitor inactive and uninitialized mailboxes to gather data that might assist in managing mailbox licenses.
- Identify the mailboxes that are full or almost full. Mailboxes consume disk space on the storage server. And administrators need to ensure that the system has enough free disk space to perform at peak capacity. In addition, if a mailbox is full, the system might not be able to deliver a critical message to the user.
- Control when the Aria TUI marks a message as read. The Message Waiting Indicator (MWI) turns off after Messaging changes the status of the last unread message that is in your mailbox to read. For the Aria TUI, this status change happens after the user listens to the entire message or interrupts playback after listening to at least 10 seconds of the message. For the Aria TUI, administrators can change the amount of playback time needed or require that the entire message plays before Messaging changes the status.

Mailbox numbers

Each user must have a unique mailbox number. Avaya recommends the E.164 international numbering plan because E.164 ensures that each telephone extension and voice mailbox combination is unique across all sites in your enterprise. However, Messaging also supports non-E.164 numbering plans. So if each mailbox number is unique, you can continue to use your existing numbering plan.

A best practice recommendation for easy mailbox administration is to assign each user a mailbox number that matches their telephone extension.

Mailbox length

Messaging supports both fixed and variable length mailboxes from 3 to 50 digits long. Before you choose between fixed and variable mailbox lengths, you need to know the following:

- The number of sites your system will support. Each site requires a separate dial plan.
- In a multisite environment, will any site need a dial plan with different telephone extension formats and lengths? For example, will Messaging need to support both E.164 and non-E.164 formats?

Fixed length mailboxes

Use fixed length mailboxes when your system will manage:

- Only one site

- Multiple sites, each of which requires the same number of digits for their telephone extension and mailbox combination

The following example shows a multisite system that can use fixed length mailboxes:

Site	Length of telephone extension	Range of telephone extension
1	5 digits	20000 – 29999
2	5 digits	38000 – 49999
3	5 digits	87888 – 89300

Variable length mailboxes

Use variable length mailboxes when your system will manage multiple sites and at least one of the sites requires a mailbox length that is different from the other sites. The following example shows a multisite system that can use variable length mailboxes:

Site	Length of telephone extension	Range of telephone extension
1	10 digits	3522360000 - 3522369999
2	11 digits	3312345000 – 33123459999
3	12 digits	491234599999 - 491234560000

When administrators choose variable length mailboxes, they can manage multiple end-user devices the same way that they manage voice mailboxes. Deskphones and mobile phones are some end-user devices that might have varying extension lengths. However, in a networked environment, all endpoints must support variable length mailboxes. If not, administrators must create mapping rules that convert the variable length mailbox into a length that is accepted by the fixed length system.

Info Mailbox

An Info Mailbox plays greetings and provides information to a caller. A typical message includes details about directions, business hours, the weather, or human resources information. The caller cannot leave a message in the Info Mailbox.

You must have the appropriate Class of Service privilege to record a message for an Info Mailbox. The default value for the maximum length of a message in an Info Mailbox is 5 minutes. However, you can change the default value on the Class of Service page. Administrators manage Info Mailboxes on the User Management page.

After the message finishes playing, Messaging either hangs up or transfers the caller to a predetermined extension. You can use Caller Applications to give callers more options.

User management

Class of Service

A Class of Service (CoS) defines Messaging privileges and features.

Use the:

- Class of Service page to define, create, change, and rename CoSs
- User Management page to assign a previously defined CoS to a user

You can delete a feature from a CoS or move a user to a CoS with fewer features. The way Messaging reacts to these changes depends on whether the user can activate the feature. For example:

- Administrators activate speech-based message addressing for users. Therefore, when the administrator removes this feature from a CoS, the feature immediately stops functioning for users.
- Users activate Reach Me. If the user activated this feature before the administrator changed the CoS, Reach Me continues to function for that user. However, the user cannot change any Reach Me settings. If the user did not previously activate this feature, Messaging removes Reach Me from the User Preferences webpage of the user.

CoS definitions

Messaging offers the following types of CoS:

- Standard or Enhanced: For local and domestic long distance dialing.
- Executive: For local and domestic long distance, and international dialing.
- Info Mailbox: To create a message for an Info Mailbox.
- Administrator: To send system broadcast messages. This CoS is unrelated to the administrative privileges handled through Server (Maintenance) RBAC administration.
- ELA: To use the Enhanced List Application (ELA) mailbox capabilities.

You can create other types of CoS, up to a total of 512. The maximum storage size for a CoS is 65536 KB.

For more information, see *Administering Avaya Aura® Messaging*.

Mailbox licenses

The features that a system administrator assigns to a user determines the type of mailbox license the user requires. If a CoS includes one mainstream feature, the user to which you assign the CoS requires a Mainstream mailbox license.

Call management

Reach Me

The Reach Me feature controls how Messaging handles unanswered calls. Users who specify their personal Reach Me rules in User Preferences can:

- Give callers who are in the internal directory priority over other callers.
- Screen calls by requiring callers to record their names.
- Enter up to three forwarding numbers and the sequence in which Messaging calls the numbers.
- Create a schedule for forwarding calls. If you create a schedule, Messaging only forwards calls between the hours you enter and on days you specify. If you do not create a schedule, Messaging always forwards calls.

Administrators can select one of the following systemwide audio options to play for the calling party.

- No audio. The default.
- The North American ring tone.
- Music that you can select from a list.
- Music that you load on to the system.

Important:

Avaya is not responsible for complying with any laws and regulations regarding the use of any file that you load on to Messaging. You are solely responsible for complying with all regulatory laws and regulations for each country or territory in which you use Messaging.

Reach Me is available with Mainstream licenses. However, administrators can turn off this feature.

Transfers

You can use your TUI to transfer your call to another telephone extension or mailbox. The action Messaging takes depends on the success of the transfer.

- The transfer is successful when a person or a voice messaging system answers. Messaging hands off the call and ends your TUI session.
- The transfer is unsuccessful when no one answers or when you get a busy signal or an error condition. Messaging returns you to your TUI session.

You hear ringback to let you know that the transfer is in progress.

This consultative transfer behavior occurs with the Call Sender, Auto Attendant, Audix TUI *T, zero-out transfers, and Caller Application features.

Attendants

Attendants can handle incoming calls in the following ways:

- If the caller presses zero while your greeting is playing, Messaging forwards a caller to a live operator. This kind of transfer is the zero-out option.
- You can configure a personal attendant to forward your calls to another telephone number.
- Depending on the system configuration, you might be able to start an Auto Attendant or Caller Application transfer.

Auto Attendant transfer

When you dial into an Auto Attendant, you have the option to transfer your call to another extension. Administrators set site-based Auto Attendant restrictions and features in the SMI.

Security alert:

When you allow callers to enter an extension, you increase the possibility of toll fraud.

Caller Application transfers

Administrators can define a call menu structure for Caller Applications that gives callers the option to transfer to any of the following destinations:

- A mailbox number. The system prompts the caller to enter a valid mailbox number.

  A mailbox can have one primary extension number and one or more secondary extension numbers.
- A specific telephone extension that the administrator defines. An example of a system prompt is: *Press 1 for Sales.*
- An unspecified telephone extension. The caller can enter any valid telephone number.

  Security alert:

  When you allow callers to enter a telephone extension, the possibility of toll fraud increases.

Transfer to Messaging

Messaging works with the Transfer to Messaging feature of Communication Manager.

When an operator or attendant uses this feature to transfer an incoming call directly to a mailbox:

- The caller does not need to dial the original telephone number a second time.
- The telephone of the originally dialed number does not ring again.

For other telephony servers, Messaging uses a Caller Application to transfer a caller directly to a mailbox.

Record on Messaging

Messaging works with the Record on Messaging feature of Communication Manager.

After you answer a call, you start this feature to record your conversation. Then, when you finish, you can store the recording as a message in your voice mailbox.

All participants on the call hear a periodic alerting tone during the recording session. This tone is a reminder that Messaging is recording the conversation. If you set the time interval for playing the tone to zero, the participants do not hear the tone. You can also play the tone for any one of the following:

- All participants on the call
- None of the participants on the call
- Only the person who activates the feature

You can record only one call at a time. Also, attendants cannot use the Record on Messaging feature.

Note:

Some countries, states, and localities have laws that determine if and under what circumstances you can record telephone conversations. Before you administer the Record on Messaging feature, you must understand and comply with these laws.

Fax

Administrators control which groups of users can send and receive faxes through a Class of Service (CoS) setting. The faxes are either PDF or TIFF files.

Inbound faxes

The Messaging system can redirect inbound faxes to a customer-provided fax server or to the email address of a user. Because Messaging does not store any faxes in the message store, users cannot get faxes from the TUI.

The maximum transmission length for an inbound fax is 90 minutes. After 90 minutes, Messaging stops the transmission and sends a report to the sending fax server. The report includes the number of successfully transmitted pages.

Outbound faxes

You can compose a document in a Windows-based program and fax it from your desktop to any destination fax number. The Messaging fax client on your desktop sends your document to the fax printer service on the Avaya storage server. This service sends the document to the application role which sends it to the destination fax number.

You manage the fax job in the same manner that you manage any print job. You can also change fax-related defaults in User Preferences. For example, you can change the email address to which Messaging sends email notifications for outbound fax jobs.

Outbound fax has the following requirements:

- Network requirements. Your telephony infrastructure must support the T.38 fax protocol.
- Messaging requirements. Your administrator must configure the Class of Service for the mailbox of the user appropriately, including dialing privileges sufficient for users to reach the desired fax machine(s).
- Computer requirements. Your computer must:
  - Run the Windows XP,Windows 7, or Windows 8.1 operating system.
  - Have HTTP and Internet Printing Protocol (IPP) printing capabilities.

    Your computer usually has these printing capabilities. However, some companies disable these capabilities for security reasons.
  - Have the Messaging fax client installed.
  - Have the fax printer service configured as a network printer.

  For information about setting up your computer to meet these requirements, see the *Fax* chapter in *Using Avaya Aura® Messaging*. If your computer does not have HTTP or IPP printing capabilities after you have followed the instructions in this guide, contact your IT representative.

Administrators can use the System Management Interface to:

- Test the outbound fax configuration.
- View the current status of an outbound fax.
- Download detailed diagnostic logs.

Fax encoding format

Messaging uses the T.38 protocol to send faxes over your VoIP network. T.38 can terminate a fax transmission at the boundary of the VoIP network so that packet loss in the IP network does not affect fax calls.

Your telephony server must support the T.38 protocol.

System management

Audio branding

Avaya audio brands consist of:

- Music or tones.
- Music or tones with a voice over. The voice over is the word Avaya.

Users hear the audio brand when they first log in to Messaging. Administrators can turn off this feature.

Alarms

The application server, storage server, and AxC generate system alarms and error logs. You can view the alarms and logs from the SMI webpages.

You can send notifications generated by alarms to any of the following recipients:

- Avaya services
- A customer through a Network Management Station (NMS)
- Avaya partners
- Avaya Fault and Performance Manager through Secure Services Gateway (SSG) or Avaya Proxy Agent

Messaging uses Secure Access Link (SAL) and SAL Gateway serviceability agents to send alarm notifications to a service organization. For information about these products, see *Administering Remote Access and Alarming for Avaya Aura® Solution for Midsize Enterprise.*

Reports

You can use the System Management Interface to generate predefined Messaging reports. These reports are useful for monitoring users and system usage, planning capacity, and tracking system security.

The storage server collects information about system settings and properties. The storage server also collects information on system usage, including data about features, users, communities, data port loads, and remote messaging traffic. The Messaging system displays this information in real-time dynamic report pages and in the Messaging traffic reports.

Messaging provides the following reports:

- Reports (Storage): Provides a summary of Users (Local), Information Mailboxes, Remote Users, Uninitialized Mailboxes, Login Failures, Locked Out Users, Dormant Mailboxes, and Full Mailboxes.

- System Evaluation Report (Storage): Provides a summary of various Messaging settings and properties. This report also shows information about dormant mailboxes. A dormant mailbox is a mailbox that the user has not accessed in 30 days or a new mailbox that has not received any message in 30 days.
- Internet Messaging Traffic (Storage): Provides a summary of the port usage on the Messaging system on a daily or hourly basis. With this report, you can determine whether the Messaging system is performing at peak efficiency. This report also provides information about outcalling ports, user traffic, and feature traffic so that you can evaluate system efficiency.
- TCP/IP Snapshot: Provides the total traffic for all servers with the specified connection type. This report also displays the total number of updates.
- Messaging Measurements: Shows daily measurements of traffic by community, feature, load, network load, and user.

When the Messaging system exhausts all attempts to deliver a voice mail to a user mailbox, the system sends a Non-delivery Report (NDR) or Delivery Status Notification (DSN) to the user. If the voice mail address is a System Distribution List (SDL), the system sends the NDRs to the postmaster mailbox. The system does not present NDRs to Exchange users.

Logs

Messaging provides system and Messaging logs.

System logs include problems related to network, security, and system restarts.

The Messaging system uses a series of logs as the central collection point for information flowing from all Messaging features and feature packages. These logs provide a systemwide view of activities, errors, and alarms. These logs range in importance from informational to critical. The logs vary based on audience (login type) and information type.

The Messaging system uses the following types of logs:

- Administration History Log: Identifies administrative events that occur in the system. These events include information about any changes to the system, such as logons, command line entries, reports that were run, or changes to software.
- Administrator's Log: Records informational messages that might require action by the Messaging system administrator. These messages might log a successful nightly backup or alert the system administrator that the system is low on disk space.
- Alarm Log: Signals a service-affecting or potentially service-affecting problem with the system. The alarm log records major, minor, and warning alarms generated by the system.
- Software Management Log: Contains information about the installation, update, and deletion of software packages.
- Maintenance Log: Records error occurrences, error resolutions, and informational events. Professional Services can use this information to troubleshoot an alarm.
- IMAP/SMTP Messaging Log: Contains information about the status of each email process.
- Enhanced-List Delivery Failure Log: Provides information about failed ELA deliveries.

- User Activity Log: Records a list of Messaging mailbox-related events, for example, logins and message creation, receipt, and deletion. This log is useful for responding to problems reported by the user.
- System Log Filter: Provides access to the full system log with advanced filtering options to zoom in on specific constraints.
- Call Records: Shows all incoming and outgoing phone activities on the application server.
- Reporting Logs. Includes the following types of logs:
  - Audit Log: The audit log is a historical log of application server cluster configurations. The audit log tracks all configuration changes made to the system.
  - Port Usage Logs: The system creates and saves Port Usage logs daily on the application server in comma-separated value (.csv) format.
- Diagnostics Results: Shows the results of application server diagnostics. The system stores all diagnostics results for a specific day in a single log file.
- Collect System Log Files: Provide call logs for the last hour or for a time duration that is specific for the application server system.

Diagnostic tools

Use the following diagnostic tools to maintain your system and resolve problems:

- Alarm origination: Verifies that the system logs alarms correctly and sends them to the proper location.
- Connectivity diagnostic: Tests connections between Messaging and:
  - Networked computers
  - Your email server (SMTP and IMAP4)
  - Your telephony server
  - Domain name servers (DNS)
- Mail delivery diagnostic: Tests the network to ensure that Messaging can send voice mail to email accounts.
- Server diagnostic: Tests the functionality of:
  - Application servers
  - Storage servers, including the Exchange Server
  - Avaya Distributed Cache Server (ADCS)

Backup capabilities

Regularly back up Messaging data over your LAN to an external FTP server. If your system fails, you can use the files stored on this server to restore your data.

Because your data can easily reach 50 Gigabytes or more, Messaging packages it into multiple files that are small enough to send over the LAN. However, these backup files can have a negative impact on the performance of your data network. You can manage the size of these backup files by:

- Limiting the size of user mailboxes to no more than 10 minutes of voice messages.
- Setting Messaging to automatically delete a voice message after a certain number of days.

Important:

If you are running Messaging with VMware in a virtualized environment, *always* use the backup and restore functions provided by the System Management Interface (SMI). Do not clone Messaging data. And do not use VMware snapshots. Snapshots can drain system resources and reduce system performance.

File transfer protocols

Messaging supports the following file transfer protocols:

- File Transfer Protocol (FTP)
- Secure File Transfer Protocol (SFTP)
- Session Control Protocol (SCP)

Upgrades

You can upgrade your Messaging system from the following releases:

- Messaging 6.1 SP3
- Messaging 6.2 SP0 and later

Migrations

Messaging supports migrations from the following products:

- Intuity Audix , Intuity AudixLX, and Intuity Audix770 using Avaya ProVision or 2nd Nature from Unimax
- Modular Messaging using Avaya ProVision or 2nd Nature from Unimax
- CallPilot® releases 4.0, 5. 0, and 5.1
- A Messaging system that runs on physical servers to a Messaging system that runs on VMware® in a virtualized environment. Your Messaging system must be at release R6.2 or later.

Chapter 4: Interoperability

Product compatibility

For the latest and most accurate compatibility information go to https://support.avaya.com/CompatibilityMatrix/Index.aspx.

Third-party product requirements

Storage destinations

Messaging supports Microsoft Exchange 2007, 2010, and 2013 servers. Messaging does not support Microsoft Exchange 2003 or Exchange 365 as message store options. However, you can use the email notification options that are native to these email environments. You can also use Mutare EVM.

Messaging supports Active Directory provisioning. You can use the Active Directory look-up tool to import user data into the Messaging directory. However, you can only import data for one user at a time. This user data includes the mailbox number, the telephone extension, and the site information.

VMware

To deploy Messaging in a VMware environment, you need:

- VMware-certified physical servers.
- ESXi Host installed on VMware-certified physical servers.
- vSphere Client installed on a personal computer running Windows Vista and later.
- An optional vCenter Server installed on a Microsoft Windows 2008 server.
- A storage device. Avaya recommends FibreChannel and iSCSI. A storage device is:
  - Optional for local storage.
  - Required for remote storage and advanced VMware features such as vMotion and high availability.
- An appropriate VMware license. To use the features of vMotion or VMware HA, you need at least the standard license.

Internet browsers

Messaging supports the following Internet browsers:

- User Preferences
  - Microsoft Internet Explorer
  - Mozilla Firefox
  - Apple Safari
  - Google Chrome
- Messaging Web Access
  - Microsoft Internet Explorer
  - Mozilla Firefox
  - Apple Safari
  - Google Chrome
- System Management Interface
  - Microsoft Internet Explorer
  - Mozilla Firefox

Email client

Messaging provides a toolbar for Microsoft Outlook 2007, 2010, and 2013.

AudioCodes gateways

Messaging uses SIP for integration with mixed telephony server environments. AudioCodes Mediant 1000 and 1000B gateways connect the Messaging system to third-party telephony servers that Session Manager does not support.

For documentation about AudioCodes gateways and the supported telephony servers, go to http://www.audiocodes.com/support.

Fax servers

You can configure Messaging to integrate with a third-party fax server. If you are adding a new fax server to your network, follow the installation and configuration instructions for that brand of fax server. Then complete the Messaging administration tasks for fax implementation.

Mutare products

Messaging works with the following Mutare products. You buy these optional, fee-based products from Mutare.

- Message Mirror recovers voice messages, greetings, names, passwords, and LDAP data in a catastrophic system failure.
- Mutare giSTT Speech-to-Text converts Messaging voice mail messages to text messages and delivers the messages through email or text messaging software.

- Mutare EVM (Enhanced Voice Mail) monitors your voice mailbox and sends text notifications to your email, mobile phone, and instant messaging environment. Speech-to-Text functionality requires Mutare EVM.

Mailbox administration

Administrators can use 2nd Nature software for mailbox administration. Contact Unimax for compatible software releases.

Operating system compatibility

Messaging application and storage servers run on the Linux® operating system.

Operating systems for client computers

To administer Messaging and Caller Application Editor, you need:

- A computer that is running one of the following operating systems:
  - Windows Server 2003
  - Windows Server 2008
  - Windows XP
  - Windows Vista
  - Windows 7
  - Windows 8.1
- Administrative permissions on the computer.

Caller Applications Editor

To use Caller Applications Editor, you also need the following software, available from the Microsoft Download Center:

- Microsoft Management Console (MMC 3.0)
- .NET 3.5

Message Networking

Avaya Message Networking uses store-and-forward message protocols that exchange messages between different types of multimedia messaging systems. You do not need Message Networking to send messages between multiple Messaging systems. However, you do need it to send messages between Messaging and legacy Avaya systems such as Audix, Aria, CallPilot, and Modular Messaging. You also need Message Networking to network Messaging with third-party messaging systems.

When your messaging environment includes different messaging systems, Message Networking updates the user database, performs user lookups, and delivers messages. In an environment that only includes Messaging systems, Message Networking does not play a role.

Messaging supports a maximum of 100,000 remote users even when Message Networking is in your network environment.

Message Networking and Messaging work together, no matter which type of message store your Messaging system uses.

Chapter 5: Performance specifications

Capacity and scalability specification

The following table describes the maximum capacity of a multiserver Messaging system. Subsequent tables describe the capacity of each application and storage server.

Feature	System maximum	Notes
Sites	500	You can configure up to 10 Auto Attendant access numbers for each site.
SIP Domains	500	
Call answer ports	300	
Call transfer ports	60	
Users: Avaya message store	30,000	
Users: Exchange message store	20,000	
Clustered application servers	4	When you cluster four application servers, limit each server to a maximum of 75 SIP sessions.
Maximum Transmission Unit (MTU) for virtual NIC card	1500 bytes	You cannot change the size.

Application server capacity

The following capacities are for each application server.

Feature	Server maximum	Notes
Call Answer ports	100	Standard and high-capacity servers have the same port capacity.
Call transfer ports	20	
Language packs (without speech recognition)	15	You can install 15 language packs on to the system, but you can only assign three languages to one

Table continues…

Feature	Server maximum	Notes
		site. The three site languages are for call answering functions.
Language packs (with speech recognition)	3	The memory requirements of speech recognition restrict the number of language packs you can install. U.S English is pre-installed and cannot be removed.
Far-end connections	25	One far-end connection can be a Communication Manager IP address or one instance of Session Manager.
Far-end domains	500	
Outbound fax queue length	500	
Simultaneous fax sessions	20	The maximum number includes both inbound and outbound fax sessions.
Simultaneous active Messaging Web Access sessions	300	Active sessions include user activities like playing, recording, or managing messages.
Simultaneous idle Messaging Web Access sessions	20,000	Idle sessions are sessions in which the user has opened the main web page but is not actively doing anything with messages.
ADCS cache size for single-server configuration	25 GB	
ADCS cache size for multiserver configuration	80 GB	
Size of an outbound fax that users can send from a desktop	150 MB	The maximum size does not apply to inbound faxes that Messaging sends to a fax server.

Storage server capacity

Avaya message store

Feature	Standard capacity server maximum	High capacity server maximum	Notes
Local users on a single-server configuration	6000	6000	Includes Avaya and Exchange storage servers. Based on the G.711 codec and 20 minutes of

Table continues…

Feature	Standard capacity server maximum	High capacity server maximum	Notes
			data storage for each mailbox.
Local users on a multiserver configuration with an Exchange storage server	6000	20,000	Includes configurations with both an Avaya and an Exchange storage server.
Local users on a multiserver configuration with the Avaya storage server	6000	30,000	Does not include configurations with both an Avaya and an Exchange storage server.
Remote networked users	100,000	100,000	The limit is independent of whether Messaging connects to Message Networking or another messaging system.
Simultaneous IMAP4 connections	6000	20,000	Single-server configurations with more than 2500 IMAP4 clients require that you change the message retention period from the default, 72 hours, to 24 hours.
Caller Applications	5000	5000	Each Caller Application requires a mailbox. Therefore, the combined number of Caller Applications and users cannot exceed the local user capacity of the server.
Length of a call answer recording	46,880 KB (100 minutes with the G.711 codec)		Configured with CoS
Length of a voice message	46,880 KB (100 minutes with the G.711 codec)		Configured with CoS
Personal distribution lists (PDL) for each mailbox	89	89	User Preferences and the TUI impose this limit.
Members in a PDL	No limit	No limit	
Enhanced List Application (ELA)	1000	1000	
Members in an ELA	1500	1500	
Classes of Service (CoS)	512	512	

Table continues…

Feature	Standard capacity server maximum	High capacity server maximum	Notes
Size of mailbox	65,536 KB (2 hours 15 minutes with the G.711 codec)	65,536 KB (2 hours 15 minutes with the G.711 codec)	Configured with Class of Service (CoS).

Voice message storage capacity

Single server configurations on a standard capacity server can support up to 933 hours of speech.

Number of users	Minutes for each user	KB for each user
1000	56	28,000
6000	9	4500

Multiserver configurations on a high capacity server can support up to 3200 hours of speech.

Number of users	Minutes for each user	KB for each user
6000	32	16,000
20,000	10	5000
30,000	6	3000

Exchange message store

Avaya does not provide capacity information for Microsoft Exchange Servers. Think about the following when you determine the amount of space to allocate to message storage:

- The Avaya message store keeps user properties, names, and greetings.
- The Exchange Server stores all voice messages of users who have an Exchange account.
- Messaging supports 20,000 users when Microsoft Exchange is the storage destination. You need a dedicated AxC/Directory server if your system supports more than 6000 users.

Messaging supports the G.711, and GSM 6.10 encoding formats. Use the formula that these codecs provide to calculate the kilobyte (KB) of disk space for each minute of recorded message.

Virtualized environment capacity

The capacity of Messaging using VMware in a virtualized environment is the same as the capacity of Messaging running in the System Platform environment.

Traffic specification

Messaging generates two types of network traffic:

- Voice traffic between Messaging and your telephony server

- Data traffic between the Messaging servers

Important:

Do not use multicast or network port mirroring to Messaging servers. These network features can generate unnecessary load and, during periods of high-volume traffic, can disrupt the operation and performance of the Messaging system.

Variables for calculating bandwidth

- Include both voice and data traffic. The calculations do not include any other activity in your network.
- Use the G.711 coding rate. If you use G.729, your bandwidth requirements are lower.
- Include the maximum traffic load for a server during peak busy hours. The server has 100 active ports that are simultaneously recording or playing voice data.

The topology of a configuration that supports multiple sites influences how data flows over your network. The placement of the following hardware, relative to each other, can affect this traffic load:

- Messaging servers
- Third-party message stores
- Telephony servers, gateways, and endpoints

In a clustered environment, ADCS caching causes less than a 250 milliseconds delay between application servers.

These topology variables are not part of the following bandwidth calculations.

Bandwidth recommendations

- Single-server system = 25 Mbs
- Multiserver system = 25 Mbs for each server

Sample calculation for a multi server system

The number of servers x 25 Mbs = Mbs needed for bandwidth

For example, a fully loaded, 300-port, four-server system requires 100 Mbs: 4 x 25 Mbs = 100 Mbs.

Redundancy and high availability

The Messaging architecture provides a range of redundancy options that minimize downtime. These options are similar for System Platform and VMware environments.

Redundancy for application servers

Local survivability

Local survivability refers to the continuation of Messaging service if an application server cannot reach the storage server. Therefore, local survivability only applies to locations in which an

application server is physically present. Local survivability does not apply to the default single-server configuration.

Local survivability is possible because each application server has a built-in Avaya Distributed Cache Server (ADCS). This rolling cache holds messages for 3 days, or 72 hours. You can change this retention period to fewer than 72 hours. Do not increase the retention period.

Third-party message stores

The AxC/Directory server provides connectivity between the application server and a third-party message store. In these configurations, local survivability applies if any combination of the following connections fail:

- The connection between the application server and the AxC/Directory server
- The connection between the AxC/Directory server and the third-party message store

Offline mode

When an application server cannot reach the storage server, the application server operates in the offline mode. The offline handling of messages, faxes, and user directory transactions is the mechanism that Messaging uses to achieve local survivability. Offline handling is session based, and an application server only uses offline handling when the application server cannot reach the storage server.

Distributed topologies

In a distributed topology, all locations have a local application server.Therefore, local survivability applies to each location. All application servers use a WAN to connect to the storage server or to the third-party message store. This connection is through the AxC/Directory server, regardless of the location of the server. If an application server loses this connection, the application server operates in the offline mode and Messaging continues to function.

Centralized topologies

In a centralized topology with multiple locations, users at locations that do not have an application server do not have local survivability. The network connection between two telephony servers connects users to Messaging. If an outage in this network connection occurs, users at the location that has no application server lose Messaging service. However, if the outage is in the connection between an application server and the storage server, the affected application server operates in the offline mode. Service then continues for all users.

When an application server operates in the offline mode, Messaging operates as the application server and acts in the same way.

Limitations of local survivability

When an application server is in the offline mode, users with an account on that server do not have access to the services provided by the storage server, including:

- Access to clients that depends on IMAP4, for example Avaya one-X®products and email clients.
- Access to make changes in User Preferences.
- Message notification features.
- The capability to send a fax.

- Access to messages not stored in the cache of the affected application server. Examples of messages that bypass the application server and go directly to the storage server are:
  - Messages sent from a networked Messaging system.
  - Messages not composed from the TUI or from Messaging Web Access. For example, messages sent from an email client.
- Access to messages sent to a personal or system list.

Users only have access to messages stored in the cache and in which the user is:

- The only recipient.
- The first recipient on a list that is *not* a personal or system list.

You must think about this information when you design your system for redundancy and survivability.

Redundancy for Avaya storage servers

Messaging administrators can set up a backup Avaya message store that provides business continuity if the primary storage server fails. Message Mirror software synchronizes the data between these storage servers. For more information about Message Mirror, see http://www.mutare.com.

Message Mirror:

- Monitors the primary storage server and copies messages, names, greetings, passwords, and mailbox and Class of Service changes to the backup server.
- Uses IMAP4 and LDAP ports to connect to the Avaya storage server. You can also use Secure IMAP4 and LDAP ports.

Failover to the backup server is a manual process.

Message Mirror caveats

Message Mirror has the following caveats:

- The Avaya message store server and the Message Mirror server synchronize with an NTP server. Use the NTP server in your network to synchronize the time of the System Platform server.
- Message Mirror increases the maximum mailbox and the message size on the backup server by 5% while copying the CoS information. With the increase in these sizes, Message Mirror can copy voice messages of the maximum length on the primary server to the backup server.
- You must restart Messaging Web Access every time the system fails over to the backup Message Mirror server or fails back to the primary server.
- Message Mirror *only* replicates user data, except PDLs and ELA members, that you administer in User Preferences and on the following SMI pages:
  - Class of Service

- User Management
- Users

Messaging does not support Message Mirror when:

- An Exchange Server is the message store
- The user deletes the mailbox in backup storage

VMware High Availability

VMware vSphere High Availability (HA) provides automatic detection of hardware failures, server failures, and operating system failures. If a physical server fails, VMware HA automatically restarts the affected virtual machines on other production servers that have spare capacity. If the operating system fails, vSphere HA restarts the affected virtual machine on the same server.

VMware HA verifies sufficient capacity is available to restart all virtual machines that are affected by a server failure. HA continuously monitors and reserves spare capacity to restart virtual machines.

Using VMware HA, VMware vSphere users can identify abnormal configuration settings within HA clusters. The VMware vSphere client interface reports relevant operating status, potential error conditions, and suggested remediation steps.

Note:

VMware HA only operates across a LAN. VMware HA does not operate across a WAN.

For more information about VMware HA, see the VMware website at http://www.vmware.com/files/pdf/VMware-High-Availability-DS-EN.pdf.

Redundancy for reference configurations

Each reference configuration offers a different level of redundancy, as summarized in the following table.

Environment	Reference configuration	Redundancy mechanism	Redundancy for application role	Redundancy for storage role
System Platform	Single server	• Hardware • High availability • Local survivability • Geographic redundancy	Yes, when the message store is an Exchange server	Yes, with Mutare Message Mirror
System Platform	Multiserver single location	• Hardware • High availability	Yes, when clustered over a LAN	Yes, with Mutare Message Mirror

Table continues…

Environment	Reference configuration	Redundancy mechanism	Redundancy for application role	Redundancy for storage role
		• Local survivability		
System Platform	Multiserver dual location	• Hardware • High availability • Local survivability • Geographic redundancy	Yes, when clustered over a WAN Local survivability only for locations with an application server	Yes, with Mutare Message Mirror
VMware	Single server	• Hardware • VMware HA	None	Yes, with Mutare Message Mirror
VMware	Multiserver single location	• Hardware • VMware HA • Local survivability	Yes, when clustered	Yes, with Mutare Message Mirror
VMware	Multiserver dual location	• Hardware • VMware HA • Local survivability • Geographic redundancy	Yes, when clustered Local survivability only for locations with an application server	Yes, with Mutare Message Mirror

Single server redundancy

The default single-server configuration does not provide product redundancy. However, the Avaya-provided hardware includes RAID disk drives that provide internal redundancy. The high capacity server includes a dual power supply for more protection.

Local survivability does not apply to the default single-server configuration.

You can, however, modify this default configuration for redundancy.

Redundancy for the storage role

You can add redundancy for the Avaya message store by adding a high capacity server and Mutare Message Mirror. Message Mirror synchronizes storage data between the storage roles on each server. Message Mirror does not synchronize application data.

Redundancy for the application role

You can add redundancy for the application role when a Microsoft Exchange Server is the message store. For redundancy of application data, you need to add a second, standard server and configure your system as follows:

- Activate the application and storage roles on the primary server. Your system requires an active storage role even when the final destination of messages is the Exchange server.
- Activate only the application role on the secondary server. Decrease the size of the Avaya Distributed Cache Server (ADCS) on the secondary server to 25 Gigabytes.
- Cluster the two application roles.

Do not use this configuration to add capacity. The capacity specifications for this configuration is the same as the capacity specifications for the default single-server configuration. If you need more capacity, use a multiserver configuration.

Multiserver, single location redundancy

The multiserver, single location reference configuration provides redundancy and high availability for the application role. This configuration does not provide redundancy for the storage role.

Consider the following when you design this reference configuration:

- A design of one application server and one storage server provides limited redundancy. If the storage server fails, the application server operates in offline mode. If the application server fails, the system cannot accept incoming calls. Users, however, can use the Outlook client to get old messages from the storage server.
- Clusters of application servers provides redundancy, high availability, and local survivability for the application role because you configure all cluster members identically.
- Clustered application servers share the traffic load. For full redundancy without service interruption or data loss, the system capacity must be adequate to carry peak traffic load with one disabled application server.
- Local survivability applies to all clustered application servers.

Multiserver, dual location redundancy

The multiserver, dual location reference configuration provides high availability and geographic redundancy for the system.

Consider the following when you design this reference configuration:

- Clustering application servers provides redundancy for the application role.
- Local survivability only applies to remote locations that have an application server on the premises.
- For geographic redundancy, you need
  - Two IP-based telephony servers distributed over two geographical locations and connected by a WAN
  - At least one application server located with each telephony server and configured in a cluster
- For redundancy for the storage role, you need
  - Two Avaya-provided servers configured as dedicated storage servers.
  - One Windows server that runs Mutare Message Mirror. This server can be a virtual server.

Redundancy with VMware

The redundancy options for Messaging systems in the VMware virtualized environment are similar to the options for systems running System Platform. How you configure your Messaging system determines which redundancy options apply. However, the infrastructure that provides redundancy is different.

The virtualized environment uses the following components to provide redundancy:

- Storage Area Network (SAN) is a data storage network that makes one virtual machine image accessible to multiple physical servers.
- ESXi hosts are physical servers that run the VMware virtualization layer. ESXi hosts can share processor, memory, storage, and networking resources among multiple virtual machines.
- vMotion is a VMware feature that migrates virtual machine disk files from one data storage location to another. vMotion also migrates one instance of a virtual machine from one ESXi host to another ESXi host.
- VMware High Availability (HA) is a VMware feature that supports automatic virtual machine failover. This feature uses vMotion to migrate the application from one ESXi host to another.

For a high-level description of solution, topology diagrams, customer requirements, and design considerations, see *Avaya Aura® Virtualized Environment Solution Description*.

Single server configurations

The redundancy options for a single server configuration running in a virtualized environment depends on how you set up your system. The following options provide redundancy for the hardware, but not for the application or storage roles.

- If you configure a Messaging virtual machine to use the local storage on an ESXi host, RAID disk drives provide redundancy for that hardware. This option is identical to the redundancy for a single server configuration running System Platform.
- If you configure your physical server as a shared resource, the virtualized environment can use SAN, ESXi host servers, and vMotion to provide redundancy for the Messaging hardware.

Multiserver configurations

You usually deploy large multiserver configurations at a data center. When you deploy Messaging in a System Platform environment, you cluster the application servers to achieve high availability. Full redundancy in this environment requires four application servers.

In a similar VMware environment, you cluster VMware ESXi hosts to achieve high availability. If one of the ESXi hosts in the cluster fails, VMware HA dynamically moves the virtual machine to another host. This process results in minimum downtime for the virtual machine so you need only three application servers to achieve full redundancy.

You can only achieve geographic redundancy over a LAN.

Telephony

Avaya Aura® Messaging is a SIP-based messaging system. However, when coupled with a SIP gateway, Messaging supports a wide variety of analog and digital telephony servers and telephones.

In large organizations with specialized administration roles, the telephony and messaging administrators might be different individuals. If this is true for your organization, you might need to coordinate integration activities because some telephony parameters must be identical on the telephony and application servers.

Avaya provides Configuration Notes with telephony-specific configuration information. You can download these Configuration Notes from the Avaya Support website at http://support.avaya.com.

Ensure that your telephony server has enough resources dedicated to the messaging functionality. The variables for calculating capacity and determining the number of SIP trunks for Messaging are:

- The amount of network traffic that flows through your Messaging system
- The number of ports reserved for Messaging
- The types of telephones that your organization uses

Telephony integration

Telephony integration is the means by which the telephony server and the Messaging system exchange control information about calls. This information includes the nature of the call, called party information, and the calling party number.

Messaging only supports Session Initiation Protocol (SIP) integrations. SIP is an important technology for establishing real-time audio and multimedia calls in a converged IP network environment.

Integration methods

You can choose one of the following integration methods for connecting Messaging to a telephony server:

- Avaya Aura® Session Manager. This SIP routing and integration tool integrates SIP entities across the enterprise network.
- Direct connection to a telephony server. This method provides SIP integration without using Avaya Aura® Session Manager.
- AudioCodes gateways. These gateways can connect Messaging to a telephony server that does not use SIP.

  You need one AudioCodes gateway for each application server, unless:

  - You create a cluster of applications servers that connect to the same telephony server. Cluster configurations might require another gateway to balance the traffic between the application servers and the telephony server.
  - Your application server must connect to several telephony servers that use different protocols.

See your ATAC or Sales Engineer representative for these types of integration.

Telephony domains

One telephony domain includes one pair of near-end and far-end SIP domains. For Messaging incoming calls:

- The near-end SIP domain is the destination domain.
- The far-end SIP domain is the origination domain.

For Messaging outgoing calls:

- The near-end SIP domain is the origination domain.
- The far-end SIP domain is the destination domain.

When you integrate Messaging and your telephony server, you create a telephony domain that connects one site to one telephony server.

Because each application server can support 500 sites, you can create 500 telephony domains.

P-Asserted Identity

Trusted networks of SIP servers use the P-Asserted Identity (PAI) header field to enforce network security policies. For example, your Session Border Controller or Communication Manager might reject an outgoing call if they cannot authenticate the contents of this field.

The default for the PAI header field is the name and the Messaging access number of the site. But administrators can use information from your service provider to change the default.

The information that displays on the called party device when Messaging makes an outbound call depends on:

- Whether the incoming call has caller ID service
- Which Messaging feature routes the call to the called party device

If the incoming call has caller ID service, then Messaging gets *caller* information from one of the following sources:

- PAI header field of the incoming call. The first choice.
- Caller information in the From header field, if the PAI header field is blank.

If the incoming call does not have caller ID services, Messaging inserts either site or user information into the PAI header field. The information that Messaging uses depends on the feature that routes the incoming call to the called party.

- *Site* information is the site name and the Messaging access number that the administrator configured on the Sites page. For example: `"AAM site 1"<sip:1000000@avaya.com`.
- *User* information is the telephone extension of the user. The administrator maintains this number on the User Management page. For example: `"Username"<sip:1234567@avaya.com`

The following table shows where Messaging gets the PAI information that the called party sees.

Messaging feature	Incoming call with caller-ID	Incoming call without caller-ID
Auto Attendant	Caller	Site
Personal Operator	Caller	Site
Reach Me	User	User

Table continues…

Messaging feature	Incoming call with caller-ID	Incoming call without caller-ID
Caller Applications	Caller	Site
Call Sender	User	User
Notify Me	N/A	User
Diagnostics	N/A	Configurable
Audix transfer (*T)	N/A	User
Play on Phone	N/A	User

Note:

Messaging does not insert P-Asserted Identity information into the PAI header field if you activate the blind transfer functionality. During blind transfers, your network gateway, and not Messaging, makes the call.

Blocked Caller ID

Customers can use Caller ID services to block caller ID information. To prevent the network from rejecting outbound calls, Messaging must insert a customized value into the PAI header field. Administrators must get the appropriate values from the service provider and then configure Messaging appropriately.

User-to-user call control

Some incoming calls include data in the User-to-user (UUI) SIP header field. Messaging sends this data during a call transfer. If the incoming call includes more than one UUI header field, Messaging only sends the data from the first field.

Messaging access numbers

A Messaging access number is the number that the Messaging system receives from the telephony server. This number is also called a pilot number. Both external and internal callers use access numbers.

The external access number is the dial string defined by the numbering plan for your region. You must dial all the numbers defined by the plan to reach the Messaging system. Messaging uses this number in notifications and User Preferences.

The internal access number is the number that you call when you are using the system. When you use an E.164 dial plan, this number can be shorter than the external access number because Messaging augments the internal access number with the appropriate prefixes.

Call data is identical for calls made to external and internal numbers.

You can assign up to three languages to each access number.

Out-of-Band DTMF using SIP

Messaging supports out-of-band Dual Tone Multi-Frequency (DTMF) using the SIP-INFO method. Out-of-band DTMF transmits DTMF tones separately from the voice channel. When the network has several telephony vendors, the network passes DTMFs using the SIP-INFO method, the lowest common denominator method.

Messaging accepts the INFO messages over SIP connections from Session Manager, AudioCodes gateway, or any telephony server that supports SIP-INFO for DTMF. Messaging interprets the INFO messages as if the messages were from the Real-Time Transport Protocol (RTP) stream using standard RFC 2833 DTMF signals. Session Manager, AudioCodes gateway, or the telephony server then routes the SIP-INFO messages with the rest of the SIP signaling messages to the dialog to which the SIP-INFO messages belong.

Messaging accepts all incoming SIP-INFO messages and interprets the messages as if the messages were in the RTP stream as RFC 2833 compliant digits. Messaging ignores all SIP-INFO DTMF digits in the signaling stream. This default process avoids the double detection of DTMF digits if the far end sends DTMF digits on both the signaling and the RTP channels.

Audio encoding formats

Messaging supports the following audio encoding formats:

- G.711 (default)
- G.729 and G.729A. Messaging does not support G.729B or G.729AB annexes.
- Global System for Mobile Communications (GSM) 6.10. Messaging uses GSM 6.10 only for storage. For transmission, Messaging uses either G.711, G.729, or G.729A.

You can administer the audio encoding format for recording messages on the System Management Interface web pages.

G.711

G.711 is an international standard telephony encoding format on a 64-kbps channel. G.711 uses the Pulse Code Modulation (PCM) encoding scheme. G.711 has the 8-bit format used primarily for telephone quality speech. G.711 has two variants: A-law and μ-law. Typically, Europe uses A-law, and the United States uses μ-law. SIP integration supports both A-law and μ-law.

G.711 provides the best audio quality over public telephone network with minimal degradation within A-law and μ-law transcoding.

G.711 is the default encoding format in Messaging.

G.729

G.729 and G.729A use the Conjugate Structure Algebraic Code Excited Linear Predictive (CS-ACELP) voice algorithm to compress and decompress speech signals in telecommunication networks. These audio formats can have a lower total cost of ownership when compared to G.711 because they:

- Require less bandwidth over your WAN.
- Transcode calls over a SIP trunk and do not require a specialized gateway.

These formats provide audio quality that is similar to that of a cellular phone. This audio quality is a noticeable degradation when compared to G.711.

Messaging can send and receive G.729 transmissions. However, Messaging does not store voice mail in G.729 format.

Important:

Messaging does not support TTY with G.729 encoding formats.

Network considerations

- Your telephony server must be administered properly before Messaging can send or receive G.729 transmissions.
- G.729 does not affect the capability of Messaging to detect DTMF tones.

Audio encoding comparison

The following table compares the coding rates and storage requirements of each audio encoding format:

	G.711	G.729	GSM 6.10
Data rate	64 kbps	8 kbps	N/A
Storage space for 1 minute	468.8 KB	N/A	95.2 KB
Storage space for 1 hour	27.5 MB	N/A	5.6 MB

Dial plans

A Messaging dial plan defines how your Messaging system integrates with the telephony server and categorizes user-defined telephone numbers according to call types. Administrators can define a short version of the voice mailbox and the telephone extension to enhance the user experience during login and message addressing.

Even though your Messaging system arrives with one default site, you must configure the site with dial plan information. Large enterprises with multiple sites must configure one dial plan for each site.Your Messaging system supports 500 sites and, therefore, 500 dial plans. And when more than one site uses the same dial plan you can copy the dial plan to other sites.

The system stores dial plans on the storage server, which automatically applies them to the appropriate application server.

Telephony integration

The telephony integration portion of the dial plan defines the:

- Extension format that Messaging expects from an incoming call.
- Rules that Messaging applies when it formats the dial string for outbound dialing. Messaging also uses these rules to categorize user-entered phone numbers into one of the following call types: internal (on premise), local, long distance, and international. Messaging uses these categories to determine if the caller has the appropriate dial out privilege.

Messaging supports all telephony numbering plans and can, therefore, integrate with any supported telephony server. However, Avaya recommends the E.164 international numbering plan because E.164 ensures that each telephone extension and voice mailbox combination will be unique across all sites in your enterprise. Components of this plan include the country code, the national destination code, and the subscriber number. The combined length of these components cannot exceed 15 digits.

You must configure one site and one dial plan for each telephony server in your enterprise.

Internal dialing

The internal portion of the dial plan:

- Identifies the extension style of the telephony server, either E.164 or non-E.164.
- Defines how Messaging handles inbound calls from the telephony server.
- Sets the properties for universal addressing.

As mentioned previously, Avaya recommends the use of the E.164 numbering plan for assigning voice mailbox numbers and telephone extensions, and using Auto Attendant. However, dialing a long telephone number each time might be cumbersome for users. To enhance the user experience, administrators can use the internal dial plan to create a short version of the telephone and mailbox numbers. Administrators can create this short number while defining the minimum number of digits required for the system to associate users with a site.

Messaging uses universal addressing when you use the Send Message feature to send a voice message from one mailbox directly to another mailbox without ringing the phone of the recipient. Administrators use the internal dial plan to set the dialing conventions for universal addressing.

The following table is an example of the universal addressing characteristics for the North American Numbering Plan:

Type of universal addressing	Length	Dial string
Local	7	nnnnnnn
Long distance (national)	10	555nnnnnnn
	11	1555nnnnnnn
International	11	1555nnnnnnn

When the Send Message feature prompts the user to select one or more message recipients, the user can enter a mailbox number that corresponds to one of the formats shown in the dial string column.

Dial plan style

Messaging supports two dial plan styles:

- Server based. The earliest versions of Messaging supported one site with one dial plan stored on the application server. Select this style only if you are upgrading from an earlier release and have no plans to add another site or to use the E.164 numbering plan. All other customers must select the site-based dial plan. This dial plan style is the default.
- Site based. To support multiple sites, Avaya moved the dial plans to the storage server, which then applies each plan to the appropriate application server.
  Select this style to install a new system, even a single-site system. Also select this style to expand the number of sites or integrate with Avaya Aura® Session Manager.

If you want to move from a server-based system to a site-based system, you must manually reenter dial plan information. No automated tool is available for migrating dial plan data between plan styles.

Dial rules

Dial rules determine which digits Messaging prepends to a dial string before sending the number to the telephony server. For example, adding a 9 to access an outside line.

Messaging applies the dial rules when it receives a dial out request from one of the following outbound dialing features:

- Call Sender
- Reach Me
- Notify Me
- Play on Phone
- Personal Attendant
- Fax

Each site requires a set of dial rules.

Messaging does not block outgoing calls to emergency numbers. If you want to change this default behavior, contact your Avaya support representative.

Chapter 6: Security

Security specification

Before implementing a Messaging system, ensure that the customer security staff reviews and approves the Messaging deployment plan. Customers must engage the expertise of their security staff early in the implementation process. The security staff must decide how to incorporate the Messaging system into the routine maintenance for virus protection, patches, and service packs.

Privacy enforcement

Messaging enforces the following levels of privacy when IMAP4 clients retrieve messages:

- Voice: Enforces privacy from the Telephone User Interface (TUI). If a caller marks a voice message as private, Messaging:
  - Blocks the recipient from using the TUI to forward the message.
  - Retrieves messages for clients who accept voice mail privacy.
  - Blocks clients who do not accept the voice mail privacy from retrieving the message. Messaging replaces the blocked message with an informational message in the language that the user selected in User Preferences.
- Email: Requests that the recipient keeps the message private. Recipients must enforce the privacy of the message. Messaging cannot enforce privacy rules onto clients who cannot mark messages as private. Most clients do not restrict the forwarding of private messages. However, IMAP4 clients retrieve the .wav attachment of a private message.

You cannot use the System Administration webpage to make the following changes when you use a third-party message store such as Exchange:

- Changing the **Privacy Enforcement Level** field to a value other than `Email`
- Changing the **Automatic Mail Forwarding** field to a value other than `yes`

Port utilization

Your IT infrastructure needs to allow network traffic to move freely to and from the Messaging system.

Note:

You must disable multicast while configuring data switch ports.

For System Platform ports, see *Administering Avaya Aura® System Platform* on the Avaya Support website at http://support.avaya.com.

Messaging in a VMware virtualized environment does not require a dedicated VM ethernet port. See your Services representative for information about how to grant Avaya access to virtual machines for implementation and maintenance support.

For complete port matrix information, see Avaya Aura® Messaging Port Matrix available on the Avaya Support website at http://support.avaya.com.

Password policy

Each Messaging customer must create a password policy for their users. Administrators establish and maintain this policy from the System Management Interface (SMI). Policies include rules for:

- Login passwords: Administrators determine the length, composition, and the number of days before expiration.
- Reusing passwords: Administrators determine the number of passwords that Messaging stores for each user in a password history file. Users cannot reuse any password that is in this file.
- Locking mailboxes: Administrators determine how many failed login attempts can occur before Messaging automatically locks the user out of the system. Administrators can view this information in the Administrator's Log.
- Unlocking mailboxes: You can require administrators to review each locked mailbox and unlock it manually. You can also administer Messaging to unlock mailboxes automatically after a specified period. The default is to unlock mailboxes manually.

Certificate Signing Request

You can install vendor-signed certificates on your Messaging system. These certificates can reduce the number of errors that you might receive when you log in to the SMI. You must build a trusted certificate as a Certificate Authority (CA) for a particular system name, that is, a fully qualified domain name.

You can use the Certificate Signing Request (CSR) webpage to manage the CSRs present on the server. You can generate a CSR to send to your CA, that is, Entrust and VeriSign. For more information, see *Administering Avaya Aura® Messaging*.

Role-Based Access Control

You can use Role-Based Access Control (RBAC) to improve the security and administration of your Messaging system. When you use RBAC, you define administrative roles for your business. These roles control who can use the SMI webpages. Each role defines a group of users with certain privileges.

Access masks are profiles that you use to restrict access permissions. You can group the access permissions by a role name. Messaging provides the following default access masks and names: System Profile, Customer Super User Profile, and Customer Non-Super User Profile. You can also create your own access mask.

For more information, see *Administering Avaya Aura® Messaging*.

Additional security information

For security information and documentation about all Avaya products, see the Avaya Security Advisories website at http://support.avaya.com/security. The website includes information about the following topics:

- Avaya Product Security Vulnerability Response Policy
- Avaya Security Vulnerability Classification
- Security advisories for Avaya products
- Software patches for security issues
- Reporting a security vulnerability
- Automatic email notifications of security advisories

For information about Messaging security, see *Avaya Aura® Messaging Security Design*.

For additional information about security practices, see the National Security Agency Security Configuration Guides at http://www.nsa.gov/.

Chapter 7: Licensing requirements

WebLM server

WebLM is a web-based license manager that facilitates easy tracking of licenses for multiple Avaya products. WebLM requires:

- A license file from the Avaya Product Licensing and Delivery System (PLDS) website at https://plds.avaya.com.
- A WebLM server.

WebLM with System Platform

When you install System Platform onto your Messaging system, you also install the WebLM server. The installation process automatically configures the WebLM server to work with Messaging. However, you can change this configuration to a configuration for a centralized WebLM server.

WebLM with VMware

Messaging in a VMware virtualized environment requires a centralized WebLM server.

Licenses for redundant storage servers

You need one WebLM licenses when you use Message Mirror for redundancy. The primary and secondary Avaya storage servers require separate MAC addresses. You can specify dual MAC addresses in a single license file.

Multisystem environments

Each Messaging system requires a license. Therefore, large or complex environments with multiple Messaging systems require multiple licenses. Before you get any licenses from PLDS, create a plan for distributing the licenses among your systems.

Mailbox licenses

Messaging offers the following mailbox licenses:

- The Mainstream license is the full featured Messaging system that includes Reach Me, Notify Me, speech-based addressing, fax, and IMAP access to the Avaya message store.
- The Basic license provides a subset of the mainstream features.

Administrators can apply Mainstream and Basic licenses by location or systemwide.

If you assign a Class of Service (CoS) that includes at least one mainstream feature to a user, you must give that user a Mainstream license.

Mixed-license environments

You can create a mixed-license environment where some users have a Basic license and other users have a Mainstream license. However, some mainstream features do not interact with mailboxes with Basic licenses. For example, the speech recognition directory only includes users with Mainstream licenses. Therefore, you can only use speech recognition to address a message to other users with a Mainstream mailbox license.

Information mailbox licensing

Messaging does not require a mailbox license for Caller Applications or Info Mailboxes.

License needed for encryption

Anyone upgrading to Avaya Aura® Messaging Release 6.3 must generate a new license from PLDS to continue to use encryption features. Avaya does not provide a license that allows encryption to Russia.

VMware®

When you deploy Messaging in a VMware environment, you need all applicable Messaging and VMware licenses.

You need, at minimum, the standard VMware license to use the vMotion or high availability VMware features.

Avaya does not provide licenses for VMware products.

Glossary

Active Directory	The directory service for a Microsoft Windows 2000, Windows 2003 Server, or Windows 2008 Server. The Active Directory stores information about objects on the network and makes this information available for authorized administrators and users. It provides administrators with an intuitive hierarchical view of the network and a single point of administration for all network objects.
AudioCodes Gateway	A gateway that integrates the Messaging system with customer-provided telephony servers.
Bandwidth	A range of frequencies within a band. The maximum rate at which data can be transferred over a communications network.
Caller	Any person who calls into the Messaging system.
Caller Applications	Extensions to the Messaging telephone user interface (TUI) used to customize how Messaging interacts with callers.
Caller Applications Editor	A tool that customizes the Microsoft Management Console (MMC) user interface to permit the creation, editing, and deployment of Caller Applications.
Cluster	A Messaging topology in which up to three application servers are combined to increase the capacity of the Messaging system.
Codec	A device that encodes or decodes a signal.
Communication Manager	A key component of Avaya Aura®. It delivers rich voice and video capabilities and provides a resilient, distributed network for media gateways and analog, digital, and IP-based communication devices. It includes advanced mobility features, built-in conference calling, contact center applications and E911 capabilities.
Configuration	A way in which application servers, storage servers, and AxC/Directory servers are connected to each other considering single server, multi-server, single site, and multiple site needs.
Console Domain	A virtual machine that is a part of System Platform and has many platform elements, including common logging and alarming, licensing, and remote access.

CoS	Class of Service. A category that determines user access to system options and features.
Dial plan	A set of site-specific properties that are stored on the storage server, and are automatically applied to each application server associated with any given site. Dial plans define the storage server and application servers properties to make the Messaging system.
Dial rule	Rules applied to local and remote users to determine how users can respond to messages from callers. Dial-out rules define the dial strings that are sent to the telephony server for making calls.
DTMF	Dual-Tone Multifrequency. A combination of two tones that uniquely identify each button on a telephone keypad.
EAG	Extended Absence Greeting. A user-recorded greeting that Messaging plays when the user is away from the office.
ELA	Enhanced List Application. A feature that associates one mailbox to a list of members. Instead of sending the same message to individual lists members, you can send the message to the list mailbox.
Enterprise List	Message Networking Enterprise Lists are enterprise-wide mailing lists for users that reside on a Message Networking system. Each Enterprise List represents a specific group of potential recipients for enterprise distribution messages.
ESXi	A virtualization layer that runs directly on the server hardware. Also known as a *bare-metal hypervisor.* Provides processor, memory, storage, and networking resources on multiple virtual machines.
Find Me	A feature that allows a subscriber to configure a list of telephone numbers where they might be contacted, so that messaging systems can try to connect a caller to a subscriber before asking the caller to leave a message.
G.711	An audio-encoding format with a coding rate of approximately 64 kilobits per second (kbps) or 8 Kilobytes per second (KBps).
GSM 6.10	An audio-encoding format with a coding rate of approximately 13 kilobits per second (kbps) or 1.6 Kilobytes per second (KBps).
Hardware	An Avaya machine or component, including object code in the form of firmware, that is applied to components only in a manufacturing facility or repair depot.
IMAP4	Internet Messaging Access Protocol 4. A method of accessing electronic mail or bulletin board messages that are kept on an email server. Client

	email applications can use IMAP4 to access remote message stores as if the messages were local.
Info Mailbox	A mailbox that plays greetings and provides information to a caller. A typical informational message includes details about directions, business hours, or weather. Callers cannot leave a message in this mailbox.
LDAP	Lightweight Directory Access Protocol. An Internet Protocol used to retrieve and manage directory information.
Location	Location refers to the physical placement of the server, that is location in building, city, or country. While location refers to the physical destination of the server, site refers to a set of properties that are defined using SMI. See Site on page 108.
Message Mirror	A product of Mutare, Inc. that provides redundancy for the Avaya message store.
MMC	Microsoft Management Console. A presentation service for management applications.
MWI	Message Waiting Indicator. A method of alerting users when messages that meet specified criteria arrive in a mailbox. The indicator is either a lamp on the telephone or an audible tone that you hear when you pick up the receiver.
PDL	Personal Distribution List. A labeled collection of addresses that users create and save for later use. Messages that users address to the list are sent to all the list members. Users can only manage and address messages to those PDLs that they create and own.
PEL	Privacy Enforcement Level. A systemwide privacy parameter that determines the level of privacy the system enforces. The PEL setting determines which clients or interfaces have access to Messaging mailboxes, and the level of restriction imposed on recipients of private messages.
Personal greeting	A personalized prompt that greets callers when they are transferred to a user mailbox when the extension is busy or not answered.
Personal Operator	A designated extension or mailbox to which the system can transfer callers for assistance when the original call was not answered. Other terms have been used including “personal assistant”, “covering extension”, “operator”, “zero-out destination”, and so on.
Pilot number	A single number that presents a call to one of the available ports within a hunt group.
PLDS	Product Licensing and Delivery System. A tool for managing asset entitlements and electronic delivery of software and related licenses. You

	can perform activities such as license activation and deactivation, license re-host, and software downloads.
Rapid prompts	A shortened variation of the standard set of prompts for the experienced Aria TUI user. The optional language pack for rapid prompts is available only in U.S. English.
RBAC	Role-Based Access Control. A tool that defines the administrative roles for your business. You control the administrative privileges on the application and storage servers by assigning a role to a user.
SAL	Secure Access Link. An Avaya serviceability solution for support and remote management of a variety of devices and products. SAL provides remote access and alarm reception capabilities. SAL uses the existing Internet connectivity of a customer to facilitate remote support from Avaya.
SAL Gateway	A customer-installable system that provides remote access, and alarming capabilities for remotely managed devices.
SAN	Storage Area Network. A SAN is a dedicated network that provides access to consolidated data storage. SANs are primarily used to make storage devices, such as disk arrays, accessible to servers so that the devices appear as locally attached devices to the operating system.
Session Manager	A SIP routing and integration tool that is the core component within the Avaya Aura® solution.
Site	A set of properties that administrators define in the System Management Interface. Some of the properties are access number, extension length, mailbox length, language choice, and Auto Attendant features.
SMI	System Management Interface. The single point of access to the Messaging system and the license server. You can open the SMI from any standard web browser from anywhere within the firewall of the organization.
SMTP	Simple Mail Transfer Protocol. A TCP/IP protocol that sends and receives email. Most email systems that send mail over the Internet use SMTP to send messages from one server to another and to send messages from an email client to an email server.
Snapshot	The state of a virtual appliance configuration at a particular point in time. Creating a snapshot can affect service. Some Avaya virtual appliances have limitations and others have specific instructions for creating snapshots.
SNMP	Simple Network Management Protocol. A protocol for managing and monitoring networks.

System Manager	A common management framework for Avaya Aura® that provides centralized management functions for provisioning and administration to reduce management complexity.
T.38 codec	A protocol that describes how to send a fax over a computer data network. T.38 is needed because fax data can not be sent over a computer data network in the same way as voice messages.
Template	Avaya offers product-specific templates to install different products on System Platform. A template is a definition of a set of one or more applications to be installed on System Platform.
Topology	The relationship between the Messaging application servers and the sites that the servers support. You define topology properties on the storage server which then applies the properties to the associated application servers.
TTS	Text-to-Speech. Speech synthesis that converts text into speech. TTS converts message envelope information, text names, and email messages and Messaging plays the converted text over the telephone.
TTY (teletypewriter)	A typewriter-style device for communicating alphanumeric information over telephony networks. Typically used by the hearing impaired and sometimes called a telecommunication device for the deaf (TDD).
udom	User applications domain. A virtual machine that runs with a specific type or mode of High Availability protection, according to Avaya Aura® solution template requirements.
User	A person who has an account on the Messaging system.
VM	Virtual Machine. Replica of a physical server from an operational perspective. A VM is a software implementation of a machine (for example, a computer) that executes programs similar to a physical machine.
vMotion	A VMware feature that migrates a running virtual machine from one physical server to another with minimal downtime or impact to end users. vMotion cannot be used to move virtual machines from one data center to another.
VMware HA	VMware High Availability. A VMware feature for supporting virtual application failover by migrating the application from one ESXi host to another. Since the entire host fails over, several applications or virtual machines can be involved. The failover is a reboot recovery level which can take several minutes.
WebLM	Web-based license manager. A licensing solution that facilitates license management of one or more Avaya software products. WebLM also facilitates easy tracking of licenses. WebLM requires a license file. This file

contains information about the products that your organization bought, including the major release, the licensed features, and the licensed capacities of each feature.

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