Avaya Aura® Messaging VMware® in the Virtualized Environment Reference Configuration

Release 7.2.0
Issue 2
June 2021

Notice

While reasonable efforts have been made to ensure that the information in this document is complete and accurate at the time of printing, Avaya assumes no liability for any errors. Avaya reserves the right to make changes and corrections to the information in this document without the obligation to notify any person or organization of such changes.

Documentation disclaimer

“Documentation” means information published in varying mediums which may include product information, operating instructions and performance specifications that are generally made available to users of products. Documentation does not include marketing materials. Avaya shall not be responsible for any modifications, additions, or deletions to the original published version of Documentation unless such modifications, additions, or deletions were performed by or on the express behalf of Avaya. End User agrees to indemnify and hold harmless Avaya, Avaya's agents, servants and employees against all claims, lawsuits, demands and judgments arising out of, or in connection with, subsequent modifications, additions or deletions to this documentation, to the extent made by End User.

Link disclaimer

Avaya is not responsible for the contents or reliability of any linked websites referenced within this site or Documentation provided by Avaya. Avaya is not responsible for the accuracy of any information, statement or content provided on these sites and does not necessarily endorse the products, services, or information described or offered within them. Avaya does not guarantee that these links will work all the time and has no control over the availability of the linked pages.

Warranty

Avaya provides a limited warranty on Avaya hardware and software. Refer to your sales agreement to establish the terms of the limited warranty. In addition, Avaya’s standard warranty language, as well as information regarding support for this product while under warranty is available to Avaya customers and other parties through the Avaya Support website: https://support.avaya.com/helpcenter/getGenericDetails?detailId=C20091120112456651010 under the link “Warranty & Product Lifecycle” or such successor site as designated by Avaya. Please note that if You acquired the product(s) from an authorized Avaya Channel Partner outside of the United States and Canada, the warranty is provided to You by said Avaya Channel Partner and not by Avaya.

“Hosted Service” means an Avaya hosted service subscription that You acquire from either Avaya or an authorized Avaya Channel Partner (as applicable) and which is described further in Hosted SAS or other service description documentation regarding the applicable hosted service. If You purchase a Hosted Service subscription, the foregoing limited warranty may not apply but You may be entitled to support services in connection with the Hosted Service as described further in your service description documents for the applicable Hosted Service. Contact Avaya or Avaya Channel Partner (as applicable) for more information.

Hosted Service

THE FOLLOWING APPLIES ONLY IF YOU PURCHASE AN AVAYA HOSTED SERVICE SUBSCRIPTION FROM AVAYA OR AN AVAYA CHANNEL PARTNER (AS APPLICABLE), THE TERMS OF USE FOR HOSTED SERVICES ARE AVAILABLE ON THE AVAYA WEBSITE, HTTPS://SUPPORT.AVAYA.COM/LICENSEINFO UNDER THE LINK “Avaya Terms of Use for Hosted Services” OR SUCH SUCCESSOR SITE AS DESIGNATED BY AVAYA, AND ARE APPLICABLE TO ANYONE WHO ACCESSES OR USES THE HOSTED SERVICE. BY ACCESSING OR USING THE HOSTED SERVICE, OR AUTHORIZING OTHERS TO DO SO, YOU, ON BEHALF OF YOURSELF AND THE ENTITY FOR WHOM YOU ARE DOING SO (HEREINAFTER REFERRED TO INTERCHANGEABLY AS “YOU” AND “END USER”), AGREE TO THE TERMS OF USE. IF YOU ARE ACCEPTING THE TERMS OF USE ON BEHALF A COMPANY OR OTHER LEGAL ENTITY, YOU REPRESENT THAT YOU HAVE THE AUTHORITY TO BIND SUCH ENTITY TO THESE TERMS OF USE. IF YOU DO NOT HAVE SUCH AUTHORITY, OR IF YOU DO NOT WISH TO ACCEPT THESE TERMS OF USE, YOU MUST NOT ACCESS OR USE THE HOSTED SERVICE OR AUTHORIZE ANYONE TO ACCESS OR USE THE HOSTED SERVICE.

Licenses

THE SOFTWARE LICENSE TERMS AVAILABLE ON THE AVAYA WEBSITE, HTTPS://SUPPORT.AVAYA.COM/LICENSEINFO, UNDER THE LINK “AVAYA SOFTWARE LICENSE TERMS (Avaya Products)” OR SUCH SUCCESSOR SITE AS DESIGNATED BY AVAYA, ARE APPLICABLE TO ANYONE WHO DOWNLOADS, USES AND/OR INSTALLS AVAYA SOFTWARE, PURCHASED FROM AVAYA INC., ANY AVAYA AFFILIATE, OR AN AVAYA CHANNEL PARTNER (AS APPLICABLE) UNDER A COMMERCIAL AGREEMENT WITH AVAYA OR AN AVAYA CHANNEL PARTNER. UNLESS OTHERWISE AGREED TO BY AVAYA IN WRITING, AVAYA DOES NOT EXTEND THIS LICENSE IF THE SOFTWARE WAS OBTAINED FROM ANYONE OTHER THAN AVAYA, AN AVAYA AFFILIATE OR AN AVAYA CHANNEL PARTNER; AVAYA RESERVES THE RIGHT TO TAKE LEGAL ACTION AGAINST YOU AND ANYONE ELSE USING OR SELLING THE SOFTWARE WITHOUT A LICENSE. BY INSTALLING, DOWNLOADING OR USING THE SOFTWARE, OR AUTHORIZING OTHERS TO DO SO, YOU, ON BEHALF OF YOURSELF AND THE ENTITY FOR WHOM YOU ARE INSTALLING, DOWNLOADING OR USING THE SOFTWARE (HEREINAFTER REFERRED TO INTERCHANGEABLY AS “YOU” AND “END USER”), AGREE TO THESE TERMS AND CONDITIONS AND CREATE A BINDING CONTRACT BETWEEN YOU AND AVAYA INC. OR THE APPLICABLE AVAYA AFFILIATE (“AVAYA”).

Avaya grants You a license within the scope of the license types described below, with the exception of Heritage Nortel Software, for which the scope of the license is detailed below. Where the order documentation does not expressly identify a license type, the applicable license will be a Designated System License. The applicable number of licenses and units of capacity for which the license is granted will be one (1), unless a different number of licenses or units of capacity is specified in the documentation or other materials available to You. “Software” means computer programs in object code, provided by Avaya or an Avaya Channel Partner, whether as stand-alone products, pre-installed on hardware products, and any upgrades, updates, patches, bug fixes, or modified versions thereto. “Designated Processor” means a single stand-alone computing device. “Server” means a Designated Processor that hosts a software application to be accessed by multiple users. “Instance” means a single copy of the Software executing at a particular time: (i) on one physical machine; or (ii) on one deployed software virtual machine (“VM”) or similar deployment.

Licence types

Designated System(s) License (DS). End User may install and use each copy or an Instance of the Software only on a number of Designated Processors up to the number indicated in the order. Avaya may require the Designated Processor(s) to be identified in the order by type, serial number, feature key, Instance, location or other specific designation, or to be provided by End User to Avaya through electronic means established by Avaya specifically for this purpose.

Concurrent User License (CU). End User may install and use the Software on multiple Designated Processors or one or more Servers, so long as only the licensed number of Units are accessing and using the Software at any given time. A “Unit” means the unit on which Avaya, at its sole discretion, bases the pricing of its licenses and can be, without limitation, an agent, port or user, an e-mail or voice mail account in the name of a person or corporate function (e.g., webmaster or helpdesk), or a directory entry in the administrative database utilized by the Software that permits one user to interface with the Software. Units may be linked to a specific, identified Server or an Instance of the Software.

Named User License (NU). You may: (i) install and use each copy or Instance of the Software on a single Designated Processor or Server per authorized Named User (defined below); or (ii) install and use each copy or Instance of the Software on a Server so long as only authorized Named Users access and use the Software. “Named User”, means a user or device that has been expressly authorized by Avaya to access and use the Software. At Avaya’s sole discretion, a “Named User” may be, without limitation, designated by name,

corporate function (e.g., webmaster or helpdesk), an e-mail or voice mail account in the name of a person or corporate function, or a directory entry in the administrative database utilized by the Software that permits one user to interface with the Software.

Shrinkwrap License (SR). You may install and use the Software in accordance with the terms and conditions of the applicable license agreements, such as “shrinkwrap” or “clickthrough” license accompanying or applicable to the Software (“Shrinkwrap License”).

Heritage Nortel Software

“Heritage Nortel Software” means the software that was acquired by Avaya as part of its purchase of the Nortel Enterprise Solutions Business in December 2009. The Heritage Nortel Software is the software contained within the list of Heritage Nortel Products located at https://support.avaya.com/LicenseInfo under the link “Heritage Nortel Products” or such successor site as designated by Avaya. For Heritage Nortel Software, Avaya grants Customer a license to use Heritage Nortel Software provided hereunder solely to the extent of the authorized activation or authorized usage level, solely for the purpose specified in the Documentation, and solely as embedded in, for execution on, or for communication with Avaya equipment. Charges for Heritage Nortel Software may be based on extent of activation or use authorized as specified in an order or invoice.

Copyright

Except where expressly stated otherwise, no use should be made of materials on this site, the Documentation, Software, Hosted Service, or hardware provided by Avaya. All content on this site, the documentation, Hosted Service, and the product provided by Avaya including the selection, arrangement and design of the content is owned either by Avaya or its licensors and is protected by copyright and other intellectual property laws including the sui generis rights relating to the protection of databases. You may not modify, copy, reproduce, republish, upload, post, transmit or distribute in any way any content, in whole or in part, including any code and software unless expressly authorized by Avaya. Unauthorized reproduction, transmission, dissemination, storage, and or use without the express written consent of Avaya can be a criminal, as well as a civil offense under the applicable law.

Virtualization

The following applies if the product is deployed on a virtual machine. Each product has its own ordering code and license types. Note that each Instance of a product must be separately licensed and ordered. For example, if the end user customer or Avaya Channel Partner would like to install two Instances of the same type of products, then two products of that type must be ordered.

Third Party Components

“Third Party Components” mean certain software programs or portions thereof included in the Software or Hosted Service may contain software (including open source software) distributed under third party agreements (“Third Party Components”), which contain terms regarding the rights to use certain portions of the Software (“Third Party Terms”). As required, information regarding distributed Linux OS source code (for those products that have distributed Linux OS source code) and identifying the copyright holders of the Third Party Components and the Third Party Terms that apply is available in the products, Documentation or on Avaya’s website at: https://support.avaya.com/Copyright or such successor site as designated by Avaya. The open source software license terms provided as Third Party Terms are consistent with the license rights granted in these Software License Terms, and may contain additional rights benefiting You, such as modification and distribution of the open source software. The Third Party Terms shall take precedence over these Software License Terms, solely with respect to the applicable Third Party Components to the extent that these Software License Terms impose greater restrictions on You than the applicable Third Party Terms.

The following applies only if the H.264 (AVC) codec is distributed with the product. THIS PRODUCT IS LICENSED UNDER THE AVC PATENT PORTFOLIO LICENSE FOR THE PERSONAL USE OF A CONSUMER OR OTHER USES IN WHICH IT DOES NOT RECEIVE REMUNERATION TO (i) ENCODE VIDEO IN COMPLIANCE WITH THE AVC STANDARD (“AVC VIDEO”) AND/OR (ii) DECODE AVC VIDEO THAT WAS ENCODED BY A CONSUMER ENGAGED IN A PERSONAL ACTIVITY AND/OR WAS OBTAINED FROM A VIDEO PROVIDER LICENSED TO PROVIDE AVC VIDEO. NO LICENSE IS GRANTED OR SHALL BE IMPLIED FOR ANY OTHER USE. ADDITIONAL INFORMATION MAY BE OBTAINED FROM MPEG LA, L.L.C. SEE HTTP://WWW.MPEGLA.COM.

Service Provider

THE FOLLOWING APPLIES TO AVAYA CHANNEL PARTNER’S HOSTING OF AVAYA PRODUCTS OR SERVICES. THE PRODUCT OR HOSTED SERVICE MAY USE THIRD PARTY COMPONENTS SUBJECT TO THIRD PARTY TERMS AND REQUIRE A SERVICE PROVIDER TO BE INDEPENDENTLY LICENSED DIRECTLY FROM THE THIRD PARTY SUPPLIER. AN AVAYA CHANNEL PARTNER’S HOSTING OF AVAYA PRODUCTS MUST BE AUTHORIZED IN WRITING BY AVAYA AND IF THOSE HOSTED PRODUCTS USE OR EMBED CERTAIN THIRD PARTY SOFTWARE, INCLUDING BUT NOT LIMITED TO MICROSOFT SOFTWARE OR CODECS, THE AVAYA CHANNEL PARTNER IS REQUIRED TO INDEPENDENTLY OBTAIN ANY APPLICABLE LICENSE AGREEMENTS, AT THE AVAYA CHANNEL PARTNER’S EXPENSE, DIRECTLY FROM THE APPLICABLE THIRD PARTY SUPPLIER.

WITH RESPECT TO CODECS, IF THE AVAYA CHANNEL PARTNER IS HOSTING ANY PRODUCTS THAT USE OR EMBED THE G.729 CODEC, H.264 CODEC, OR H.265 CODEC, THE AVAYA CHANNEL PARTNER ACKNOWLEDGES AND AGREES THE AVAYA CHANNEL PARTNER IS RESPONSIBLE FOR ANY AND ALL RELATED FEES AND/OR ROYALTIES. THE G.729 CODEC IS LICENSED BY SIPRO LAB TELECOM INC. SEE WWW.SIPRO.COM/CONTACT.HTML. THE H.264 (AVC) CODEC IS LICENSED UNDER THE AVC PATENT PORTFOLIO LICENSE FOR THE PERSONAL USE OF A CONSUMER OR OTHER USES IN WHICH IT DOES NOT RECEIVE REMUNERATION TO: (I) ENCODE VIDEO IN COMPLIANCE WITH THE AVC STANDARD (“AVC VIDEO”) AND/OR (II) DECODE AVC VIDEO THAT WAS ENCODED BY A CONSUMER ENGAGED IN A PERSONAL ACTIVITY AND/OR WAS OBTAINED FROM A VIDEO PROVIDER LICENSED TO PROVIDE AVC VIDEO. NO LICENSE IS GRANTED OR SHALL BE IMPLIED FOR ANY OTHER USE. ADDITIONAL INFORMATION FOR H.264 (AVC) AND H.265 (HEVC) CODECS MAY BE OBTAINED FROM MPEG LA, L.L.C. SEE HTTP://WWW.MPEGLA.COM.

Compliance with Laws

You acknowledge and agree that it is Your responsibility for complying with any applicable laws and regulations, including, but not limited to laws and regulations related to call recording, data privacy, intellectual property, trade secret, fraud, and music performance rights, in the country or territory where the Avaya product is used.

Preventing Toll Fraud

“Toll Fraud” is the unauthorized use of your telecommunications system by an unauthorized party (for example, a person who is not a corporate employee, agent, subcontractor, or is not working on your company's behalf). Be aware that there can be a risk of Toll Fraud associated with your system and that, if Toll Fraud occurs, it can result in substantial additional charges for your telecommunications services.

Avaya Toll Fraud intervention

If You suspect that You are being victimized by Toll Fraud and You need technical assistance or support, call Technical Service Center Toll Fraud Intervention Hotline at +1-800-643-2353 for the United States and Canada. For additional support telephone numbers, see the Avaya Support website: https://support.avaya.com or such successor site as designated by Avaya.

Security Vulnerabilities

Information about Avaya’s security support policies can be found in the Security Policies and Support section of https://support.avaya.com/security.

Suspected Avaya product security vulnerabilities are handled per the Avaya Product Security Support Flow (https://support.avaya.com/css/P8/documents/100161515).

Downloading Documentation

For the most current versions of Documentation, see the Avaya Support website: https://support.avaya.com, or such successor site as designated by Avaya.

Contact Avaya Support

See the Avaya Support website: https://support.avaya.com for product or Hosted Service notices and articles, or to report a problem with your Avaya product or Hosted Service. For a list of support telephone numbers and contact addresses, go to the Avaya Support website: https://support.avaya.com (or such successor site as designated by Avaya), scroll to the bottom of the page, and select Contact Avaya Support.

Trademarks

Contents

Chapter 1: Introduction

Purpose of this guide

This document describes network architecture, suggested deployment topologies, system capacities, and product interoperability. This document also describes the functional limitations of certain configurations. With this information, sales design specialists can make decisions about designs that meet the business needs of a customer.

This document is intended for people who determine the best design to meet a customer's business needs.

Change history

Issue	Date	Summary of changes
Release 7.2.0, Issue 2	June 2021	• Added information about vSphere Web Client and vSphere Client (HTML5) to VMware components on page 10. • Updated the list of supported VMware versions in Customer requirements on page 10 and Caveats and limitations on page 15.

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.

Chapter 2: Architecture overview

Avaya Aura® Virtualized Environment overview

Avaya Aura® Virtualized Environment integrates real-time Avaya Aura® applications with the virtualized server architecture of VMware. Virtualized Environment provides the following benefits:

- Simplifies IT management using common software administration and maintenance.
- Requires fewer servers and racks, which reduces the footprint.
- Lowers cooling requirements, which reduces power consumption.
- Enables cost savings on capital equipment.
- Lowers operational expenses.
- Uses standard operating procedures for both Avaya and non-Avaya products.
- Enables deployment of Avaya products in a virtualized environment on customer-specified servers and hardware.
- Accommodates business scalability and rapid response to changing business needs.

Security

You can use Out Of Band Management (OOBM) feature for secure management and administration of Avaya products. OOBM physically and logically separates each network connection to a customer's private IT management network from the other.

You can use **System Management Interface** to configure the system and restrict management traffic to the administered out-of-band interface.

You can configure OOBM through vCenter:

- while you are deploying the OVA, using **System Management Interface**
- after the OVA deployment, using **System Management Interface** > **Server Configuration** > **Network Configuration**

Best Practices for VMware performance and features

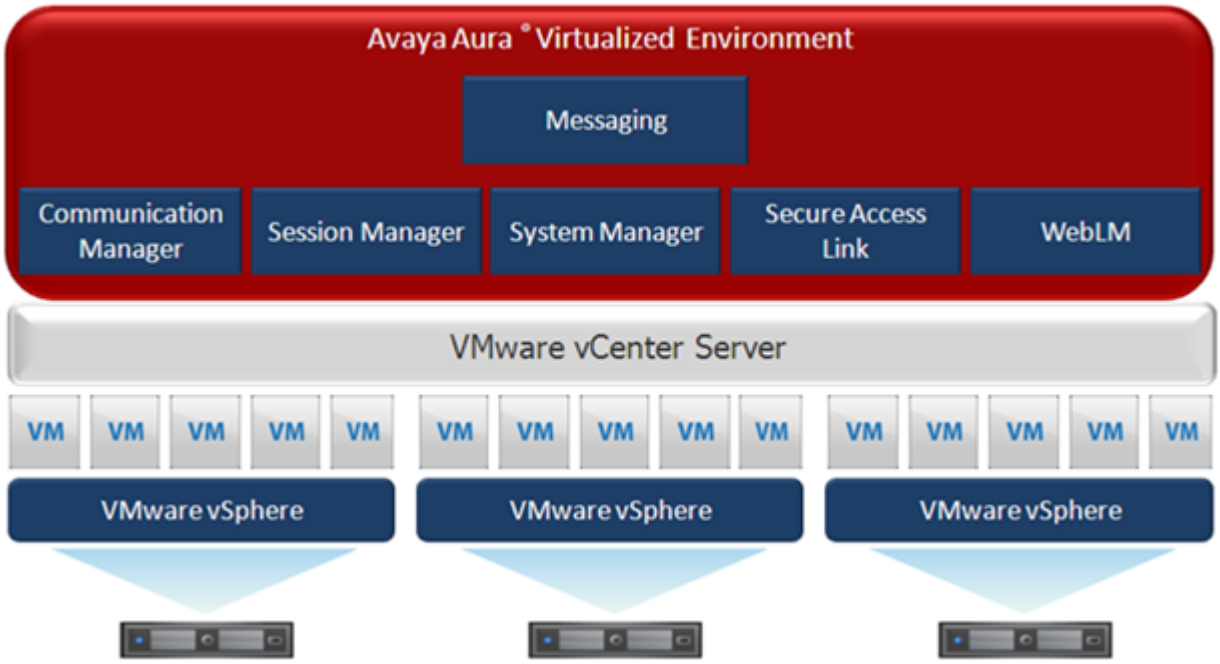
For more information about Avaya Aura® Virtualized Environment, see *Avaya Aura® Virtualized Environment Solution Description*.

Important:

Do not use VMware Snapshots because Snapshot operations can adversely affect Messaging service.

Topology

The following diagram shows the high-level topology for deploying Messaging in Virtualized Environment.



The VMware virtualization platform, VMware vSphere, supports the virtual machines. Each Avaya Aura® application, including Messaging, is installed as a separate virtual machine. You can install Messaging in one or more virtual machines depending on capacity requirement. The VMware vCenter Server management system manages the applications as virtual machines and provides management and implementation features in addition to the standard System Manager features.

Components

Avaya components

The following table lists components that interwork with Avaya Aura® Messaging. For more information about interoperability and supported product versions, see the following documents:

- Compatibility matrix for Avaya Aura® Messaging Release 7.2.

  Note:

  You might need to log in to your Avaya account to see the Compatibility matrix.

- *Avaya Aura® Messaging Overview and Specification* on the Avaya Support website.

Component	Platform	Description
Avaya Aura® components		
Avaya Aura® Communication Manager	Virtualized Environment	The IP telephony foundation on which Avaya delivers intelligent communications to large and small enterprises.
Avaya Aura® Session Manager	Virtualized Environment	A SIP routing and integration tool that integrates SIP entities across the enterprise network. You can view and manage each location, branch, and application in totality, not as separate units within the enterprise.
Avaya Aura® System Manager	Virtualized Environment	A product that takes a solution-level approach to network administration. 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.
Other Avaya components		
Avaya Voice Message Form	Microsoft Exchange Server	A component that provides a toolbar for Microsoft Office Outlook and Exchange Server. The tool supports playback of voice messages on your telephone through the computer.
Avaya WebLM	Virtualized Environment	A web-based license manager that manages licenses of one or more Avaya software products.
Message Networking	Avaya server with Linux® Operating System	A component that supports interoperability with legacy voice mail products.
one-X Speech	Windows Server 2003 for one-X Speech Release 5.2 Windows Server 2012 for one-X Speech Release 6.3	A component that supports speech-based commands and text-to-speech functions for voice mail, email, calendar, and telephony functions.
Avaya service components		
Avaya Diagnostic Server with Secure Access Link	—	A component that remotely manages Messaging and sends alarms to Avaya Services.

VMware components

Component	Description
ESXi Host	The physical machine running the ESXi Hypervisor software.
ESXi Hypervisor	A platform that runs multiple operating systems on a host computer at the same time.
vSphere Client	vSphere Client is an application that installs and manages virtual machines. vSphere Client connects to a vCenter Server or directly to an ESXi host if a vCenter Server is not used. The application is installed on a personal computer or accessible through a web interface. The installable vSphere Client is not available in vSphere 6.5 and later releases.
vSphere Web Client	Using a web browser, vSphere Web Client connects to a vCenter Server or directly to an ESXi host if a vCenter Server is not used.
vSphere Client (HTML5)	vSphere Client (HTML5) is available as of vSphere release 6.5. Using a web browser, it connects to a vCenter Server or directly to an ESXi host if a vCenter Server is not used. As of vSphere release 7.0, vSphere Client (HTML5) is the only supported vSphere client administration tool.
vCenter Server	vCenter Server provides centralized control and visibility at every level of the virtual infrastructure. vCenter Server provides VMware features such as High Availability and vMotion.

Third-party components

Component	Description
AudioCodes SIP gateway	Messaging uses SIP for integration with mixed telephony server environments. With the AudioCodes Mediant 1000 and 1000B gateways, Messaging connects to third-party telephony servers that Session Manager does not support.
Nuance Loquendo Text-to-Speech	This component supports conversion of text-to-speech.
EVM Plus giSTT	This component is a unified messaging application that provides speech-to-text functions for voice mail. Using this application, you can read, listen, and control your voice mail.
Storage Area Network	SAN is a high-speed network of storage devices that also connects those storage devices with servers.

Customer requirements

This reference configuration supports the following customer requirements:

Customer requirement	Solution
Customers want to take advantage of existing VMware infrastructure to run Messaging, instead of buying hardware from Avaya.	With Virtualized Environment, customers do not have to buy new hardware.
Customers want to control large number of servers and storage devices.	Fewer racks required.
Customers want to control their hardware and data centers.	Virtualized Environment enables customer to control their own hardware and data centers.
Customers want to control the power consumption for cooling.	Less power consumption for cooling.
Customers want to control increase in cost of servers and power when new functionality is added.	Cost savings.
Customers want IPv6 support for all Avaya products to beat the bottleneck in the IP address range in customers' networks.	Adds dual-stack IPv4 and IPv6 compatibility.
Customers want to improve the virtual environment compatibility.	Adds support for VMware ESXi 6.0, 6.5, 6.7, and 7.0.

Test strategy summary

The Messaging system verification team performs multiple tests on the Messaging software to verify the performance, reliability, scalability, and the resource use of Messaging. The tests include verification of the updated functions and features, Messaging upgrade paths, and the migration of external databases to Messaging.

Test	Description
New feature test	Functioning of the new features validated and the performance of the features tested.
Regression test	Manual and automated regression tests to verify the performance of the updated functions and features.
Performance test	Performance tested to verify the responsiveness and the stability of Messaging. The tests include verifying the scalability, reliability, and the resource use of Messaging.
Upgrade test	Upgrade paths tested to verify the supported releases to upgrade Messaging. Messaging supports upgrades from Release 6.0.1 and later releases.
Interoperability testing	Compatibility tested with other products to verify how Messaging interoperates with the products. For more information about the supported products, see *Components*.
Bug fix verification	Debugging of Messaging to resolve bugs that originate during the performance testing verified.

Table continues…

Test	Description
Migration testing	Migration of external databases to Messaging tested.
Solution testing	Multiple features of Messaging tested simultaneously to emulate a customer scenario and verify the performance of Messaging.
Launch readiness testing	The final version of the Messaging software tested, which includes regression testing and testing of selected new features.

Chapter 3: Design considerations

Messaging virtual machine resource requirements

The Messaging OVA is built with configuration values that optimize performance and follow recommended best practices. After installing the OVA, adjust resource settings as needed to meet the guidelines set forth in the following table.

The following set of resources must be available on the ESXi host for deploying the Messaging virtual machines:

Resource requirements	Combined application and storage virtual machine	Two application virtual machines and one storage virtual machine	Three application virtual machines and one storage virtual machine
	Heavy traffic[1]	*Medium traffic*[2]	*Heavy traffic*[3]
Mailboxes	6000	10000	20000
Ports	100	150	300
Virtual Machines	1	3	4
Virtual CPUs	4	4	4
Minimum CPU speed based on Xeon E5620 or equivalent processor	2 GHz	2 GHz	2 GHz
Virtual CPU reservations	8 GHz	8 GHz	8 GHz
Virtual memory	8 GB	Application: 8 GB Storage: 8 GB	Application: 8 GB Storage: 8 GB
Virtual memory reservations	8GB	Application: 8 GB Storage: 8 GB	Application: 8 GB Storage: 8 GB

[1] Messaging is expecting to serve two calls per second. On average, each user receives nine voice messages every 24 hours.

[2] Messaging is expecting to serve a new call every 1 to 6 seconds. On average, each user receives three to six voice messages every 24 hours.

[3] Messaging is expecting to serve two calls per second. On average, each user receives nine voice messages every 24 hours.

Resource requirements	Combined application and storage virtual machine	Two application virtual machines and one storage virtual machine	Three application virtual machines and one storage virtual machine
	Heavy traffic[4]	*Medium traffic*[5]	*Heavy traffic*[6]
Virtual storage	174 GB (Thick Provisioned)	174 GB (Thick Provisioned)	174 GB (Thick Provisioned)
Average I/OPS	208	Application: 35 Storage: 204	Application: 106 Storage: 382
Shared Network Interface Cards	One @ 1000 Mbps	One @ 1000 Mbps	One @ 1000 Mbps
Average network usage	25 Mbps	25 Mbps per virtual machine	25 Mbps per virtual machine

For Messaging to run at full capacity, ensure that the recommended resource requirements are met.

- Values recommended in the table are for each virtual machine.
- The default value for the Messaging OVA is 4 vCPU and 8 GB memory without any reservation. To meet the acceptable performance level, change the default values and use the recommended CPU and memory reservations as shown in the table Messaging virtual machine resource requirements on page 13. You can check the CPU reservations by viewing the **Summary** tab of the virtual machine.
- Messaging might not perform adequately if the cumulative CPU or memory resources of the virtual machines co-located on the same physical ESXi host as the Messaging virtual machine exceeds 70% of the physical hardware of server. The customer assumes all risk if this threshold is exceeded.
- The recommended resource requirements are based on the following hardware configurations:
  - iSCSI SAN storage: One Dell Equallogic PS6100XV array of 24 terabytes.
  - ESXi 5.1 hosts: Six Dell R720 servers. Each server with two quad-core Xeon 2620 CPU and 2 GHz, HyperThreaded. Each host server with 32 logical vCPUand each vCPU core provides 2 GHz.
  - VCenter server and Dell SAN Headquarter: One Dell R320 server running Windows 2008R2, with a single quad-core Xeon CPU and 500 GB RAID-1 hard disk drive array.
  - LAN: A stacked pair of Avaya ERS4850GTS, dedicated and configured for each Dell Equallogic SAN requirements. Each ESXi host server has four connections to the SAN switch to take advantage of the Dell Equallogic Multi-I/O for max storage I/O performance. A fifth SAN connection is dedicated for vMotion traffic.

[4] Messaging is expecting to serve two calls per second. On average, each user receives nine voice messages every 24 hours.

[5] Messaging is expecting to serve a new call every 1 to 6 seconds. On average, each user receives three to six voice messages every 24 hours.

[6] Messaging is expecting to serve two calls per second. On average, each user receives nine voice messages every 24 hours.

Note:

If the virtual CPUs on the host where the Messaging is located are more than physical CPUs, the CPU oversubscription occurs. The CPU oversubscription affects the performance of Messaging. CPU oversubscription can create *dead air* issue with *cannot create recognizer* errors. While calculating the quantity of physical CPUs on the host, do not consider the Hyperthreading feature.

Note:

- Avaya does not provide support for performance issues due to variance in the recommended settings.
- If a problem occurs with the virtual machine, Avaya Global Support Services (GSS) might not be able to assist in resolving the problem. Reset the values to the required values before starting to investigate the problem.

Caveats and limitations

- Messaging is verified to perform adequately when run on VMWare ESXi 6.0, 6.5, 6.7 or 7.0 only. Messaging does not support other releases of VMWare ESXi, such as 5.x.
- Access the ESXi host or the vCenter server by using the vSphere client from a computer running Windows Vista or a later version.
- Each instance of Messaging requires its own WebLM instance. In larger or more complex environments, customers might have multiple Messaging systems. Customers must then deploy multiple instances of WebLM.
- Messaging does not support implementation of geo-redundancy solution using vMotion.
- Messaging virtual machines must be subject to an average disk latency aligning to VMware best practice of 15 ms or less to achieve acceptable performance.
- Avaya does not provide VMware licenses on virtual appliances.
- Avaya does not ship DVDs.

Note:

For more information about Avaya Aura® Virtualized Environment, see *Avaya Aura® Virtualized Environment Solution Description*.

Capacity and scalability

The capacity of Messaging using VMware in a Virtualized Environment is the same as the capacity of Messaging running on Avaya-provided hardware.

For more information, see *Avaya Aura® Messaging Overview and Specification*.

Migration roadmap and limitations

Roadmap

The minimal software required to migrate from Messaging running on System Platform to Virtualized Environment is:

System Platform
Messaging 6.3.3 Service Pack 5 with Communication Manager 6.3 Service Pack 114.
Messaging 6.3.2 Service Pack 2 with Communication Manager 6.3.8 Service Pack 8.
Messaging 6.2 Service Pack 5 with Communication Manager 6.2 Service Pack 7– 6.2 Service Pack 07.01.

Supported data types

The system migrates the following types of data:

- Users, passwords, and profiles for System Management Interface and ssh access to Messaging virtual machine
- System password policies
- Backup schedules configured on System Management Interface
- Alarming and SNMP configuration
- System configuration, users, names, greetings, and messages

Limitations

The system does not migrate the following types of data. You must reconfigure the following data on VMware:

- Network configuration
- Time zone
- Network time protocol
- Authentication file
- Licensing configuration

Security considerations

Avaya is responsible for designing and testing its products for security. The customer is responsible for the appropriate security configurations on their data network. Customers have ultimate control over the configuration and use of the product. They are solely responsible for ensuring the security of their systems is adequate for their intended use.

Customers administer their system configuration and can tailor that system to meet their unique needs, but must also ensure to their own satisfaction that the security configuration is aligned with appropriate risk management best practices. Customers are responsible for keeping themselves informed of the latest information for configuring their systems to prevent unauthorized use.

System managers and administrators are responsible for obtaining and acting on all recommendations, installation instructions, and system administration documents provided with the product. This information can help them understand the features that might introduce risk of toll fraud and the steps they must take to reduce that risk. Responsibilities owned by system managers include (but are not limited to):

- Integration of Messaging servers into existing TCP/IP network(s) according to the corporate networking policies. In most cases, existing firewalls, and corporate security policies and practices can be implemented or adapted for the Messaging system.
- Careful consideration for the security implications when the client access to the Messaging system are enabled.
- Protection of server against unauthorized use with appropriate administrator and user passwords. Use longer and more random passwords to minimize the possibility of compromise. Ensure that you secure the passwords properly.
- Protection of the surrounding network to minimize the threat of denial of service attacks.
- Review of server logs to detect actual and attempted unauthorized use and to identify its source.

System managers are also responsible for: Physical security, password protection, password control, backups, environmental controls.

Neither Avaya nor its suppliers or business partners can guarantee that any product is immune from risk of unauthorized use of IP or telecommunications services or facilities accessed through or connected to this product. Avaya is not responsible for any damages or charges that result either from unauthorized usage or from incorrect installation of the security patches that are made available periodically. See the End-User License Agreement(s) associated with your Messaging product(s) for additional details.

The customer is responsible for using and configuring the following security features available on Messaging software, on firmware, on the Avaya media gateways, and firmware on IP telephones:

Security policy configuration

Security policy is configured for the following:

- Administrator accounts
- Login account
- Change password
- Server access
- Syslog server
- Authentication file
- Firewall

Role-based user access control

Role based access control (RBAC) allows businesses to assign server, gateway, and application access permissions based on job function or role of a user. Avaya implements RBAC on the Messaging server through the use of profiles for the server webpage.

Authentication and encryption

Avaya uses standard X.509 PKI to manage certificates in the enterprise in which the hierarchy of certificates is always a top-down tree, with a root certificate at the top, representing the central Certificate Authority (CA) that is integral to the trusted-party scheme and does not need third-party authentication.

Messaging conforms to the TLS standard to establish a TLS session. Digital certificates authenticate stages of the TLS session establishment to:

- Establish SIP/TLS connections between IP phones and Messaging through the customer installed, trusted third-party certificate.
- Authenticate access to the Messaging web interface.
- Manage SIP/TLS connections
  - Management
  - Signaling

Audit trail logging

Security information is logged in or notified through:

- SNMP trap receiver
- Syslog security log
- Miscellaneous logs that track security-related information

Secure backups

The Messaging server backs up Messaging data over the customer LAN to an external ftp server. The Messaging data can be backed up at the same time as the server data, or independently. In the event of a system failure, the system uses the information stored on the external server to restore the system to an operational state. Messaging supports up to 40,000MB mailboxes. Messaging data backup might easily reach 50 Gigabytes or more. Customers might be unable to support transfers of single files of this size. Hence, in Messaging, the system automatically divides large data backups into 500 MB files before transfer. Each file transfer might complete in about 5 minutes. Consequently, the network must support a minimum average transfer rate of 1.6 MBps.

Remote monitoring and maintenance

Messaging uses Secure Access Link (SAL) gateway to manage alarming and remote access. Secure Access Link (SAL) is an Avaya serviceability solution for support and remote management of a variety of devices and products. SAL provides remote access, alarm reception, and inventory capabilities. SAL uses the existing Internet connectivity of the customer to facilitate remote support from Avaya. All communication is outbound from the customer environment over port 443 using encapsulated Hypertext Transfer Protocol Secure (HTTPS).

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

Chapter 4: Configuration details

Port utilization

Ensure that network traffic moves freely to and from the Messaging system.

Note:

Messaging Virtualized Environment does not have a dedicated virtual machine Ethernet port for services access.

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

Traffic and Quality of Service

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 disrupt the operation and performance of the Messaging system during periods of high-volume traffic.

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

Chapter 5: 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.

Related links

Overview on page 21
Deployment, upgrade, and migration on page 22

Overview

Title	Description	Audience
Avaya Aura® Messaging Overview and Specification	Describes tested product characteristics and capabilities, including feature descriptions, interoperability, performance specifications, security, and licensing requirements.	Sales and deployment engineers, solution architects, and support personnel.
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.
Avaya Aura® Messaging Multiserver Single Location Reference Configuration	Describes the design, capacities, interoperability, and limitations of multi-server single location configurations.	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 multi-server dual location configurations.	Sales and deployment engineers, solution architects, and support personnel.

Table continues…

Title	Description	Audience
Avaya Aura® Messaging VMware® in the Virtualized Environment Reference Configuration	Describes the design, capacities, interoperability, and limitations of VMware® in the virtualized environment configurations.	Sales and deployment engineers, solution architects, and support personnel.

Related links

Documentation on page 21

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 Events, Alarms, and Errors Reference	Describes system alarms, events, and repair procedures.	Administrators and support personnel

Deployment, upgrade, and migration

Title	Description	Audience
Deploying Avaya Aura® Messaging using VMware® in the Virtualized Environment	Describes procedures for deploying the Avaya Aura® Messaging virtual application in the Avaya Aura® Virtualized Environment. The procedures relate to installation, configuration, initial administration, troubleshooting, and basic maintenance of the application.	Deployment engineers, solution architects, and support personnel.

Table continues…

Title	Description	Audience
Deploying Avaya Aura® Messaging using Solution Deployment Manager	Describes procedures for deploying the Avaya Aura® Messaging virtual application in the Appliance Virtualization Platform. The procedures relate to installation, configuration, initial administration, troubleshooting, and basic maintenance of the application.	Deployment engineers, solution architects, and support personnel.

Related links

Documentation on page 21

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

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
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™ R620 server	Describes the components, specifications, and configurations for this server.	Deployment engineers and support personnel.
Installing the Dell™ PowerEdge™ R630 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.
Installing the HP ProLiant DL360 G9 Server	Describes the components, specifications, and configurations for this server.	Deployment engineers and support personnel.

Maintenance

Title	Description	Audience
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 Dell™ PowerEdge™ R630 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.
Maintaining and Troubleshooting the HP ProLiant DL360 G9 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
4311W	Selling Unified Communication Messaging — Overview

Table continues…

Course code	Course title
5U00140V	Avaya Aura® Messaging Implementation, Administration, and Support Virtual Instructor Led
5U00140I	Avaya Aura® Messaging Implementation, Administration, and Support Instructor Led
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.

- 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.

Index