Avaya IP Office™ Platform Server Edition Reference Configuration

Release 9.1
Issue 02.14
February 2016

© 2014-2016, Avaya, Inc.
All Rights Reserved.

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.

For full support, please see the complete document, *Avaya Support Notices for Hardware Documentation*, document number 03–600759.

For full support, please see the complete document, *Avaya Support Notices for Software Documentation*, document number 03–600758.

To locate this document on our website, simply go to http://www.avaya.com/support and search for the document number in the search box.

Documentation disclaimer

“Documentation” means information published by Avaya in varying mediums which may include product information, operating instructions and performance specifications that Avaya may generally make available to users of its products and Hosted Services. 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 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: http://support.avaya.com 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 a 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 IF YOU PURCHASE A 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, HTTP://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. YOUR USE OF THE HOSTED SERVICE SHALL BE LIMITED BY THE NUMBER AND TYPE OF LICENSES PURCHASED UNDER YOUR CONTRACT FOR THE HOSTED SERVICE, PROVIDED, HOWEVER, THAT FOR CERTAIN HOSTED SERVICES IF APPLICABLE, YOU MAY HAVE THE OPPORTUNITY TO USE FLEX LICENSES, WHICH WILL BE INVOICED ACCORDING TO ACTUAL USAGE ABOVE THE CONTRACT LICENSE LEVEL. CONTACT AVAYA OR AVAYA’S CHANNEL PARTNER FOR MORE INFORMATION ABOUT THE LICENSES FOR THE APPLICABLE HOSTED SERVICE, THE AVAILABILITY OF ANY FLEX LICENSES (IF APPLICABLE), PRICING AND BILLING INFORMATION, AND OTHER IMPORTANT INFORMATION REGARDING THE HOSTED SERVICE.

Licenses

THE SOFTWARE LICENSE TERMS AVAILABLE ON THE AVAYA WEBSITE, HTTP://SUPPORT.AVAYA.COM/LICENSEINFO 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.

License type(s)

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.

Database License (DL). End User may install and use each copy or an Instance of the Software on one Server or on multiple Servers provided that each of the Servers on which the Software is installed communicates with no more than one Instance of the same database.

CPU License (CP). End User may install and use each copy or Instance of the Software on a number of Servers up to the number indicated in the order provided that the performance capacity of the Server(s) does not exceed the performance capacity specified for the Software. End User may not re-install or operate the Software on Server(s) with a larger performance capacity without Avaya's prior consent and payment of an upgrade fee.

Named User License (NU). You may: (i) install and use the Software on a single Designated Processor or Server per authorized Named User (defined below); or (ii) install and use 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 currently available for license from Avaya is the software contained within the list of Heritage Nortel Products located at http://support.avaya.com/LicenseInfo under the link "Heritage Nortel Products" or such successor site as designated by Avaya. For Heritage Nortel Software, Avaya grants You 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

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: http://support.avaya.com/Copyright or such successor site as designated by Avaya. You agree to the Third Party Terms for any such Third Party Components.

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.

Note to Service Provider

The product or Hosted Service may use Third Party Components subject to Third Party Terms that do not allow hosting and require a Service Provider to be independently licensed for such purpose. It is your responsibility to obtain such licensing.

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: http://support.avaya.com or such successor site as designated by Avaya. Suspected security vulnerabilities with Avaya products should be reported to Avaya by sending mail to: securityalerts@avaya.com.

Trademarks

The trademarks, logos and service marks ("Marks") displayed in this site, the Documentation, Hosted Service(s), and product(s) provided by Avaya are the registered or unregistered Marks of Avaya, its affiliates, or other third parties. Users are not permitted to use such Marks without prior written consent from Avaya or such third party which may own the Mark. Nothing contained in this site, the Documentation, Hosted Service(s) and product(s) should be construed as granting, by implication, estoppel, or otherwise, any license or right in and to the Marks without the express written permission of Avaya or the applicable third party.

Avaya is a registered trademark of Avaya Inc.

All non-Avaya trademarks are the property of their respective owners. Linux® is the registered trademark of Linus Torvalds in the U.S. and other countries.

Downloading Documentation

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

Contact Avaya Support

See the Avaya Support website: http://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: http://support.avaya.com (or such successor site as designated by Avaya), scroll to the bottom of the page, and select Contact Avaya Support.

Contents

Chapter 1: Introduction 7
Purpose 7
Intended audience 7
Document changes since last issue 7
Related resources 7
Documentation 7
Training 9
Viewing Avaya Mentor videos 10
Product compatibility 10
Additional resources 10
Support 11
Accessing Avaya DevConnect Application Notes 11
Chapter 2: IP Office Server Edition reference configuration 13
Topology 13
Components 15
Hardware components 16
Software components 30
Customer requirements 44
Business continuity 44
Remote access 44
Resilience 45
Backup and restore 47
Test strategy summary 48
Chapter 3: Design considerations 50
Caveats and limitations 50
Migration roadmap and limitations 50
IP Office Server Edition Solution versus Avaya Aura Midsize Enterprise Solution 50
IP Office Server Edition versus Preferred Edition 52
BCM and IP Office interoperability 54
BCM with CS1000 to IP Office migration 55
Platform and application security details 56
Chapter 4: Configuration details 59
Network configuration 59
Server Edition single server reference configuration 59
Server Edition dual servers reference configuration 59
Server Edition multiple servers reference configuration 60
Server Combinations and Usage 60
Packaging and order codes 60
Server order codes 60

IP500 V2 control unit order codes..... 61
DVD order codes..... 66
Licences..... 66
Port assignments..... 67
Traffic and quality of service..... 67
Glossary list..... 69

Chapter 1: Introduction

Purpose

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.

Intended audience

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

Document changes since last issue

The following changes have been made to this document since the last issue.

The server specifications have been updated for the introduction of the Dell R360 and the Dell R220. See Components on page 15 for specification details. See also Server Edition order codes on page 60.

Related resources

Documentation

See the following related documents at the Avaya Support website at support.avaya.com and at the IP Office Knowledge Base at marketingtools.avaya.com/knowledgebase.

Title	Use this document to:	Audience
Avaya IP Office™ Platform Documentation Catalog	See a list of all the documents related to the solution.	Everyone
Avaya IP Office™ Platform Solution Description	Understand the solution at a high-level.	Everyone
Avaya IP Office™ Platform Feature Description	Understand the solution features at a high-level.	Everyone
Avaya IP Office™ Platform in a Branch Environment Reference Configuration	Understand the technical specifications of and plan for IP Office in a branch environment deployment.	Sales Engineers Implementation Engineers
Avaya IP Office Contact Center Reference Configuration	Understand the technical specifications of and plan for IP Office Contact Center.	Sales Engineers Implementation Engineers
Avaya IP Office™ Platform Security Guidelines	Follow Avaya's recommended security guidelines.	Sales Engineers Implementation Engineers
Deploying Avaya IP Office™ Platform Server Edition	Deploy IP Office Server Edition.	Implementation Engineers
Deploying Avaya IP Office™ Platform Server Edition Servers as Virtual Machines	Deploy IP Office Server Edition on virtual machines.	Implementation Engineers
Deploying Avaya IP Office™ Platform as an Enterprise Branch with Avaya Aura® Session Manager	Deploy IP Office in a branch environment with Avaya Aura.	Implementation Engineers
Deploying Avaya IP Office™ Platform as an Enterprise Branch with CS1000	Deploy IP Office in a branch environment with CS1000.	Implementation Engineers
Avaya IP Office Contact Center Installation	Install and configure IP Office Contact Center.	Implementation Engineers

Finding documents on the Avaya Support website

About this task

Use this procedure to find product documentation on the Avaya Support website.

Procedure

1. Use a browser to navigate to the Avaya Support website at http://support.avaya.com/.
2. At the top of the screen, enter your username and password and click **Login**.
3. Click **Documents**.
4. In the **Enter your Product Here** search box, type the product name and then select the product from the drop-down list.

5. If there is more than one release, select the appropriate release number from the **Choose Release** drop-down list.
6. Use the **Content Type** filter on the left to select the type of document you are looking for, or click **Select All** to see a list of all available documents.

   For example, if you are looking for user guides, select **User Guides** in the **Content Type** filter. Only documents in the selected category will appear in the list of documents.
7. Click **Enter**.

Training

Avaya training and credentials are designed to ensure our Avaya Business Partners have the capabilities and skills to successfully sell, and implement, and support Avaya solutions and exceed customer expectations. The following credentials are available:

- Avaya Certified Sales Specialist (APSS)
- Avaya Implementation Professional Specialist (AIPS)
- Avaya Certified Support Specialist (ACSS)

Credential maps are available on the Avaya Learning website at www.avaya-learning.com

The following courses are available on the Avaya Learning website. After logging in to the website, enter the course code or the course title in the **Search** field and click **Go** to search for the course.

Course code	Course title
10S00005E	Knowledge Collection Access: SMB Implementation Only AIPS – Avaya IP Office (AIPS – 4000) Curriculum and Online Test
5S00004E	Knowledge Collection Access: SMB Support Only ACSS – SME Communications (ACSS – 3000) Curriculum
0S00010E	Knowledge Collection Access: SMB Implementation and Support AIPS – Avaya IP Office (AIPS – 4000) Curriculum and Online Test plus ACSS – 3000 Curriculum
2S00012W	APSS – Small and MidMarket Communications – IP Office™ Platform 9.1 and 9.1 Select – Overview
2S00013W	APSS – Small and MidMarket Communications – IP Office™ Platform 9.1 and 9.1 Select – Core Components
2S00014W	APSS – Selling IP Office™ Platform 9.1 and 9.1 Select
2S00010A	APSS – Selling IP Office Assessment

Included in all Knowledge Collection Access offers above is a separate area called IP Office Supplemental Knowledge. This floor in the Virtual Campus contains self-directed learning objects which cover IP Office 9.1 delta information. This material can be consumed by technicians well experienced in IP Office and only need this delta information to be up to date.

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.

Product compatibility

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

Additional resources

You can find information at the following additional resource websites.

Avaya

http://www.avaya.com is the official Avaya website. The front page also provides access to individual Avaya websites for different countries.

Avaya Enterprise Portal

http://partner.avaya.com is the official website for all Avaya Business Partners. The site requires registration for a user name and password. Once accessed, the portal can be customized for specific products and information types that you wish to see and be notified about by email.

Avaya IP Office Knowledge Base

http://marketingtools.avaya.com/knowledgebase provides access to an online, regularly updated version of the IP Office Knowledge Base.

Avaya maintenance, lifecycle and warranty information

Avaya support services complement standard Avaya maintenance, lifecycle and warranty policies that are posted on http://support.avaya.com. For more information, send email to support@avaya.com.

Avaya Community

http://www.aucommunity.com is the official discussion forum for Avaya product users.

Non-Avaya websites

There are several web forums that discuss IP Office. Refer to these websites for information about how IP Office is used. Some of these forums require you to register as a member. These are not official Avaya-sponsored forums and Avaya does not monitor or sanction the information provided.

- Tek-Tips: http://www.tek-tips.com
- CZ Technologies IP Office Info: http://ipofficeinfo.com
- PBX Tech: http://www.pbxtech.info/forumdisplay.php?f=8

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.

Accessing Avaya DevConnect Application Notes

The Avaya DevConnect program conducts testing with service providers to establish compatibility with Avaya products.

Procedure

1. Go to http://www.devconnectprogram.com/site/global/compliance_testing/application_notes/index.gsp.
2. Sign in or register.
3. Click a timeframe to search within.

Under **2014**, click **Q1: January — March**.

A list of all the application notes for that timeframe appears.

4. In the **Search** field, type `IP Office` and press **Enter**.

   A list of relevant Application Notes appear.

Chapter 2: IP Office Server Edition reference configuration

IP Office Server Edition provides IP Office telephony capabilities, unified communications, mobility and collaboration, provides high availability, ease of use, and low total cost of ownership (TCO). Targeted at the midsize enterprise, IP Office Server Edition supports up to 150 sites, 3000 users and comprehensive resilience.

Features

IP Office Server Edition Solution provides the following features:

- A single Server Edition Primary server provides IP Office, Voicemail Pro, and Avaya one-X® Portal for IP Office.
- A Server Edition Secondary server increases the capacity and provide resilience.
- Supports expansion systems which provides additional capacity, support analog or digital interfaces, and remote locations.
- Deploying a Select IP Office Server Edition Solution provides additional capacity.
- Use an existing IP500 V2 control unit optimized for a hybrid of analog/TDM and IP deployments or Linux server optimized for IP only deployments.
- Users and extensions can be configured on IP Office Server Edition server or Server Edition Expansion System.
- Software distribution includes the various user and administration applications such as Manager, SSA, Voicemail Pro and SoftConsole.
- Components can be in the same location or in different locations.
- Optionally configure a separate application server dedicated to Avaya one-X® Portal to provide more one-X Portal user capacity above the maximum that Server Edition Primary supports.
- Add additional servers and expansion systems any time.

.

Topology

IP Office Server Edition is based on a double star network topology that provides comprehensive features and their management, enables ease of use, installation, and administration. The overall solution provides a flexible and modular architecture starting with a single server and you can scale

up the number of users and locations by networking multiple servers. The components automatically act as a single logical unit and you can administer the components from a single console through an integrated management system.

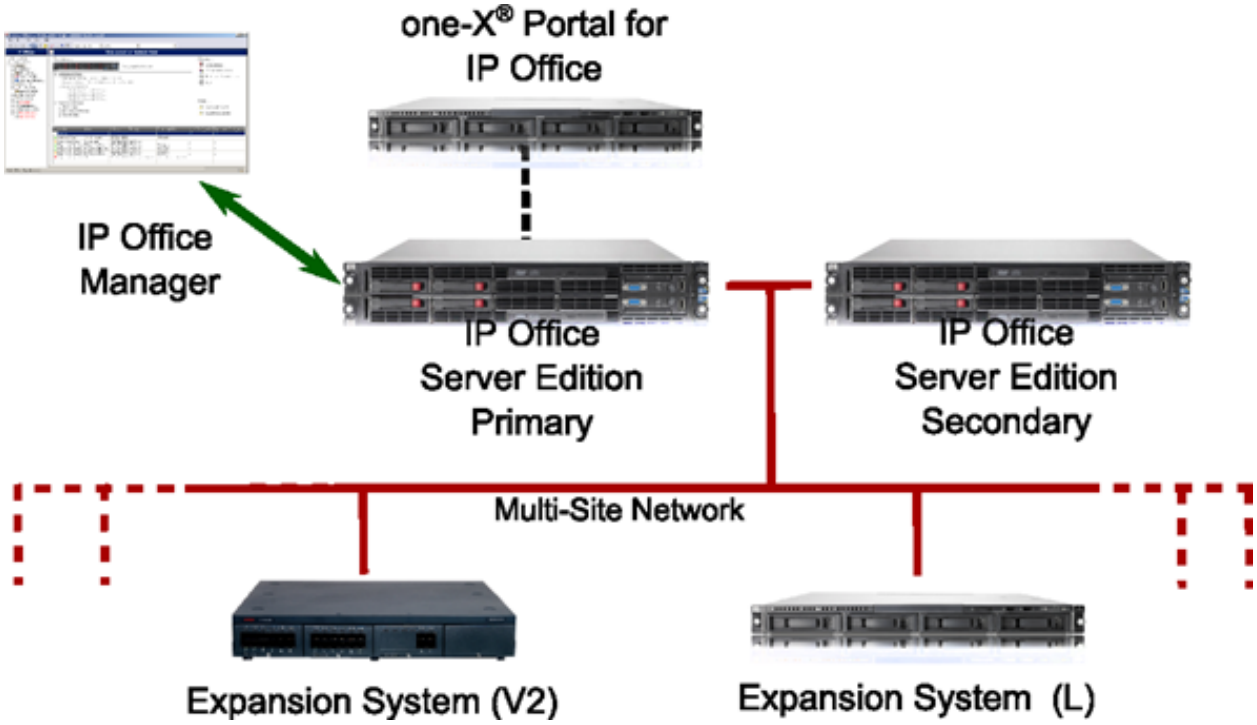


Figure 1: IP Office Server Edition topology

Deployment models

Centralized IP only	One primary server located at the customer headquarters
Centralized IP analog and digital	One primary server and one expansion server located at the customer headquarters
Distributed IP only	One primary server located at the customer headquarters and one secondary server located at a remote location
Distributed IP analog and digital	One primary server and one expansion system located at the customer headquarters and one expansion system located at each remote site
Virtualized environment	Customer-provided software and hardware VMware vSphere platform with IP Office Server Edition and application server OVA ignited as a primary, secondary, expansion or application server.

Components

Component	Server options	Description
Server Edition Primary server	Dell R630 Dell R620 HP DL360G7 Dell R220 Dell R210 HP DL120G7	Software distribution includes: • IP Office Server Edition • Voicemail Pro • Avaya one-X® Portal for IP Office • IP Office Manager • System Status Application (SSA) • SoftConsole
Server Edition Secondary server	HP DL360G7 Dell R220 Dell R210 HP DL120G7	Optional component to support resilience either centrally or at a remote site.
Server Edition Expansion System	Dell R220 Dell R210 HP DL120G7	Optional component to support remote locations. Up to 148 expansion systems provide additional capacity, support analog or digital interfaces, and local trunks at remote sites. Can be set up either centrally or at a remote site. **Note:** In a cloud environment, the IP500 V2 expansion system provides support for analog and digital endpoints.
Server Edition Expansion System	IP500 V2	Optional component to support remote locations and as a gateway. Can be an existing IP500 V2 or IP Office Server Edition server. Can be set up either centrally or at a remote site.
Avaya one-X® Portal for IP Office application server	HP DL360G7 Dell R220 Dell R210 HP DL120G7	Optional component. You can optionally configure a separate application server dedicated to Avaya one-X® Portal to provide more Power User capacity above the maximum that Server Edition Primary supports.

Virtualized environment components

Avaya provides a virtualized equivalent to the IP Office Server Edition and applications server packaged as a single OVA ready for installation on vSphere supported host hardware from a PC. The OVA is available as a download from Avaya or on an orderable DVD. Once deployed, it can be ignited as a primary, secondary, expansion or applications server.

Hardware components

Server specifications

The following tables list the minimum server specifications for the IP Office Server Edition Solution:

Server option	Large server #1	Large server #2	Large server #3
Chassis	Dell R630 1U	Dell R620 1U	HP DL360G7 1U
Processor	2 x E5-2620v3, 2.4 GHz	2 x E5-2630, 2.3 GHz	2 x E5620, 2.4 GHz
Memory (RAM)	32 GB	32 GB	12 GB
Hard disk drive	2 x 600 GB	2 x 600 GB	2x 300 GB, 10K
RAID	RAID 1 Hot swap	RAID 1 Hot swap	RAID 1 Hot swap
RAID Controller	H730	H710	P410i
Power Supplies	2x 750W AC Hot swap	2x 495W AC Hot swap	2x 460W AC Hot swap
NICS	6x GB full duplex	4x GB full duplex	4 Port, Motherboard
Optical Drive	1x DVD +/- RW	1x DVD +/- RW	1x DVD+/-RW, SATA, INTERNAL
PCI Type	2 x8 Gen2 Slots (PCIe)	2 x8 Gen2 Slots (PCIe)	1-LP X8 PCIe & 1-FL/FH X16 PCIe Riser

Server option	Small server #1	Small server #2	Small server #3
Chassis	HP DL120G7 1U	Dell R210 1U	Dell R220 1U
Processor	1 x E3-1220, 3.1 GHz	1 x E3-1220, 3.1 GHz	1 x E3-1220, 3.1 GHz
Memory (RAM)	12 GB	12 GB	16 GB
Hard disk drive	1x 250 GB, 7.5K	1x 250 GB, 7.5K	1x 500 GB, 7.2K
RAID	RAID 0 (none)	RAID 0 (none)	RAID 0 (none)
RAID Controller	P212, 256 MB	On board	On board
Power Supplies	1 x 400 W AC	1 x 502 W AC	1 x 250 W AC
NICS	2 Port, Motherboard	2 Port, Motherboard	2 Port, Motherboard
Optical Drive	1x DVD+/-RW, SATA, INTERNAL	1x DVD+/-RW, SATA, INTERNAL	1x DVD+/-RW, SATA, INTERNAL
PCI Type	1-HL/LP X8 PCIe & 1-FL/FH X16 PCIe Riser	1 x16 Gen2 Slots (PCIe)	1 x16 Gen2 Slots (PCIe)

Note:

In some geographies, where 12 GB of RAM is not a standard Dell option use 16 GB RAM.

Server Combinations and Usage

- The Server Edition Primary and Server Edition Secondary must be on the same platform. This constraint applies equally to virtual servers. It is possible to mix native and virtual central servers, but the resources allocated to the virtual environment should match the native server.

- Virtualised and native servers can be mixed in the same Server Edition solution in any role, provided the Server Edition Primary and Server Edition Secondary are the same as indicated above.
- It is possible to use the Unified Communication / Application Server R210 / DL120 / R220 servers as this is the same hardware and software as the Server Edition R210 / DL120 / R220 servers. If the server is installed with theServer Edition software, it will be supported by Avaya.
- You cannot set up a Server Edition Expansion System(L) in the Standard IP Office mode of operation in the IP Office Server Edition Solution.
- You cannot re-provision a Server Edition server without a complete reinstall. For example, you cannot convert a primary server to a secondary or expansion system.
- You cannot set up a Server Edition Expansion System (L) in the Standard IP Office mode of operation in the IP Office Server Edition Solution. You cannot convert a Server Edition Expansion System (V2) to a Server Edition Primary or Server Edition Secondary server.
- The use of any external VMPro server (either Linux or Windows) is not supported.
- The use of an external one-X Portal server not running Server Edition software, and not running on a supported server, is not supported.

Environmental requirements

Hardware dimensions and clearance requirements

Platform	Height	Width	Depth	Weight	Clearance
Dell R210	1.7 in (4.32 cm)	17.1 in (43.45 cm)	15.5 in (39.37 cm)	15.5 lbs (7.03 kg)	
Dell R220	1.7 in (4.32 cm)	17.1 in (43.45 cm)	15.5 in (39.37 cm)	17.76 lbs (8.05 kg)	
Dell 620	42.8mm	434.0mm	682.7mm	18.6Kg	
Dell R630	1.7 in (4.32 cm)	17.1 in (43.45 cm)	27.6 in (70.10 cm)	37.0 lbs (16.78 kg)	
HP DL120 G7	44.45mm	448.1mm	700mm	10.36Kg	
HP DL360 G7	43.2mm	426.2mm	695.3mm	14.51Kg	
IP500V2	2.9 in (7.3 cm)	17.5 in (44.5 cm)	14.4 in (36.5 cm)	7.0 lbs (3.2 kg)	9 cm all sides 22 cm at front
Analog Trunk 16 Expansion Module	71mm	445mm	245mm	3.5Kg	9 cm all sides 22 cm at front
DS16A Expansion Module	71mm	445mm	245mm	3.5Kg	10 cm all sides 22 cm at front
DS30A Expansion Module	71mm	445mm	245mm	3.5Kg	11 cm all sides 22 cm at front

Table continues…

Platform	Height	Width	Depth	Weight	Clearance
DS16B Expansion Module	71mm	445mm	245mm	3.5Kg	12 cm all sides 22 cm at front
DS30B Expansion Module	71mm	445mm	245mm	3.5Kg	13 cm all sides 22 cm at front
TCM8 Extention Card	Fit's inside IP Office			0.4Kg	
Phone 8 Extension Card	Fit's inside IP Office			0.4Kg	
Phone 16 Expansion Module	71mm	445mm	245mm	3.5Kg	13 cm all sides 22 cm at front
Phone 30 Expansion Module	71mm	445mm	245mm	3.5Kg	13 cm all sides 22 cm at front

Temperature and humidity requirements

Platform	Altitude and Air Pressure	Operating temperature	Storage temperature
Dell R210	-50ft to 10,000ft	10 to 35 °C 20% to 80% RH	-40 to 65°C 5% to 95% RH
Dell R220	-50ft to 10,000ft	10 to 35 °C 20% to 80% RH	-40 to 65°C 5% to 95% RH
Dell R620	-50ft to 10,000ft	10 to 35 °C 20% to 80% RH	-40 to 65°C 5% to 95% RH
Dell R630	-50ft to 10,000ft	10 to 35 °C 20% to 80% RH	-40 to 65°C 5% to 95% RH
HP DL120	10,000ft	10 to 35 °C 10% to 90% RH	-35 to 65°C 5% to 95% RH
HP DL360	10,000ft	10 to 35 °C 10% to 90% RH	-40 to 70°C 5% to 95% RH
IP500V2	95% RH, non-condensing	0°C to +40°C (32°F to 104°F)	0°C to +40°C (32°F to 104°F)

Note: RH = Relative Humidity

Heat dissipation

For the calculation of heat dissipation, base temperature and humidity requirements on the maximum input rating of the power supplies your configuration using the following guidelines:

- Calculate the maximum amount of heat that can be generated by the system components. It is assumed that all input power is converted to heat; whether from the PSU itself, the system unit, expansion module and/or cabling.

- Heat dissipation is normally measured in British Thermal Units (BTU's). A heat value expressed in Watts can be converted to BTU/hr by multiplying by 3.41297. Use the maximum power input of 115 VA of each power supply to calculate this most accurately.
- Use the conversion factor:

  ```
  Heat Dissipation = 115 x 3.41297 = 392.5 BTU/hour
  ```

  The metric equivalent to BTU is a Joule where 1 BTU = 1,055 Joules. This calculates the BTU value per power supply. The maximum BTU per system is therefore calculated, based on total number of power supplies installed in the system.

  ```
  IP500V2 Maximum Heat Dissipation = 13 x 392.5 = 5,103 BTU/hr.
  ```

Important:

Remember to budget for the power requirements of any additional devices that are to be co-located with the system, such as server PCs used for voicemail, etc.

Physical system protection requirements

Power supply

Power supply unit	Input	Output	Description
Standard 60 W	100-240 V AC, 50/60 Hz, 81-115 VA, 2.5 maximum	24 Vdc, 1.875 A, output power 60 W maximum	All expansion units are supplied with external PSU with integral lead to the unit. Connection to switched mains supply requires separately supplied country specific IEC 60320 C13 power 31 cord (3-wire earthed cold 32 kettle lead).
IP500V2 100 W internal	100-240V AC, 50/60 Hz, 81-115 VA, 2.5 A maximum		Integral to the system unit. Connection to switched mains supply requires separately supplied country specific IEC 60320 C13 power cord (3-wire earthed cold kettle lead).

Telephone power options

Avaya supports the IEEE 802.3af, standard for Power over Ethernet (PoE) on its range of IP telephones. With PoE, both power and data are carried over one CAT 5 Ethernet cable. Deploying IP telephones utilizing PoE eliminates the need for local power supplies, AC adapters and cables, and allows power to be provided from the wiring closet/switch room where it can be easily connected to a UPS system.

There are two power options, in addition to IEEE PoE, available to customers to power their Avaya IP telephones.

Power option	Description
Avaya individual Power Supply for 1600 Series telephones	The 1600 Series telephones have a special power connector to allow the connection of a cost efficient power supply. These power supplies come in several versions for different countries and voltages.

Table continues…

Power option	Description
Avaya Power over Ethernet adapter for the 1603 telephone	The 1603 telephone does not support PoE natively. A small adapter is needed. The adapter will fit completely in the stand of the telephone, offering a cost efficient option of either using a power supply or a PoE adapter.

Telephone power consumption

Measured in watts using an IEEE 802.3 af power supply at 48 V. This table shows the power consumption of the telephones currently shipping. Older versions of telephones might have a different power requirement.

Telephone	PoE class	Power consumption (watts)		
		Conservation mode	Typical	Max power
1603/1603SW	2	4.32	3.75	5.10
1608	2	4.66	3.76	5.69
1616	2	3.17	2.83	3.65
Gig Adapter	-	3.16	N/A	5.81
9620L	1	2.1	2.2	2.7
9620C	2	4.6	4.9	5.3
9630G	2	4.6	4.9	6.1
9640	2	4.2	4.6	5.5
9640G	2	4.5	4.9	5.6
9650	2	4.6	5.2	5.6
9650C	2	4.6	5.2	5.6
BM24	n.a	0.39	0.6	0.9
9608	1	1.93	2.08	2.55
9611	1	2.64	3.12	3.78
9621	2	3.18	3.49	4.72
9641	2	3.28	3.44	4.12
BM12	n.a	0.10	0.31	0.62

Customer-provided PC requirements

The following customer-provided PC requirements for applications are the minimum required.

IP Office Manager

IP Office Manager is used to access all parts of the configuration. Different levels of access can be defined to control which parts of the configuration the IP Office Manager user can view and alter. IP Office Manager is also used to upgrade the software files on the system. IP Office Manager acts as a TFTP server from which some Avaya telephones can request new software.

RAM Standard Edition: 4 GB

	Server Edition: 6 GB Select Server Edition: 8 GB
Hard disk free space	1 GB
Processor	Standard Edition: Core i3 Server Edition: Core i5 Select Server Edition: Core i5
Operating system	Standard Edition: Windows 2012 Server 32/64 bit Server Edition: Windows 2012 Server 32/64 bit Select Server Edition: Windows 2012 Server 64 bit
Additional software	NET2: Installed with the software if not already installed.

IP Office SysMonitor

RAM	128 MB
Hard disk free space	10 GB
Processor	Pentium: PIII 800 MHz Celeron: Celeron 3 800 MHz AMD: Athlon B 650 MHz
Operating system	Server: Windows 2008 R2 Server, Windows 2012 Server Client: Windows 7, Windows 8

IP Office System Status Application

RAM	256 MB
Hard disk free space	1.4 GB
Processor	Pentium: PIII 800 MHz Celeron: Celeron 3 800 MHz AMD: Athlon B 650 MHz
Operating system	Server: Windows R2 Server, Windows 2012 Server Clicent: Windows 7, Windows 8.1
Additional software	Sun Java Virtual Machine: Installed with SSA if not already present. Web Browser: Microsoft Internet Explorer 7+, Mozilla Firefox 3.0

TAPI

RAM	64 MB
Hard disk free space	50 MB
Processor	Pentium: PIII 800 MHz Celeron: Celeron 3 800 MHz AMD: Athlon B 650 MHz
Operating system	Server: Windows R2 Server, Windows 2012 Server Clicent: Windows 7, Windows 8.1
Additional software	Sun Java Virtual Machine: Installed with SSA if not already present. Web Browser: Microsoft Internet Explorer 7+, Mozilla Firefox 3.0

IP Office control unit

IP Office control unit (IP500 V2) is a stackable unit with an optional 19" rack mounting kit and an optional wall mounting kit for smaller configurations.

The IP500 V2 control unit is compatible with all IP500 base extension and Voice Compression Module (VCM) cards as well as all external IP500 expansion modules.

The IP500 V2 control unit has 4 slots for the insertion of IP500 base cards. The slots are numbered 1 to 4 from left to right. Normally they can be used in any order, however if the capacity for a particular type of card is exceeded, the card in the rightmost slot will be disabled. Each base card includes an integral front panel with ports for cable connections. Typically the first 8 ports on the left are for connection of extension devices. The 4 ports on the left are used for connection of trunks if a trunk daughter card is added to the base card.

The control unit provides the following functionality:

Maximum extensions	Up to 384 extensions.
Conference parties	128 as standard but maximum 64 in any individual conference. Silence suppression is applied to conferences with more than 10 parties.
Trunk cards	Up to 4. Any combination of trunk daughter cards.
Voice compression channels	Up to 148 channels using up to VCM and combination cards.
Voicemail channels	Up to 250 voicemail/recording channels supported on the Primary server. For Select deployments, the Secondary server can also support up to 250 voicemail/recording channels.

Locales	Supported in the following countries: Argentina, Australia, Bahrain, Belgium, Brazil, Canada, Chile, China, Colombia, Customize, Denmark, Egypt, Finland, France, Germany, Greece, Hong Kong, Hungary, Iceland, India, Ireland, Italy, Japan, Korea, Kuwait, Malaysia, Mexico, Morocco, Netherlands, New Zealand, Norway, Oman, Pakistan, Peru, Poland, Portugal, Qatar, Russia, Saudi Arabia, Singapore, South Africa, Spain, Sweden, Switzerland, Taiwan, Turkey, United Arab Emirates, United Kingdom, United States, Venezuela.
Power supply	Internal power supply unit.
Mounting	Free-standing, rack mounted or wall mounted (requires mounting kits).
Memory	Maximum configuration file size: 2048 KB.

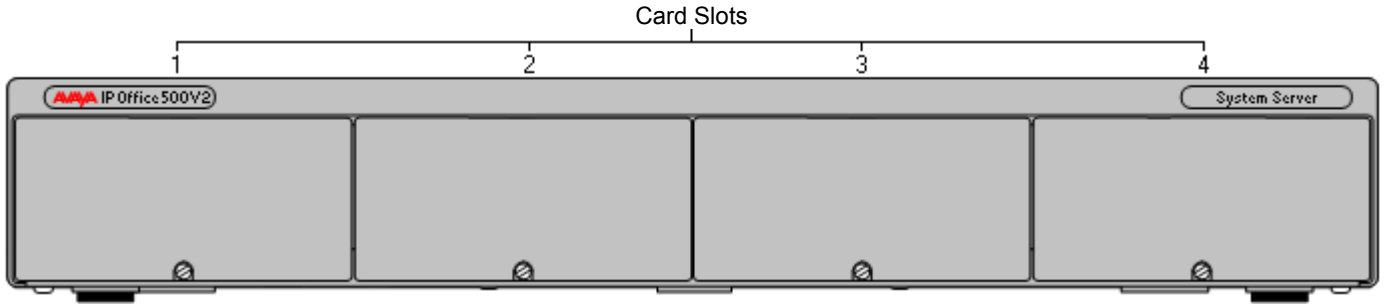


Figure 2: IP500 V2 front view

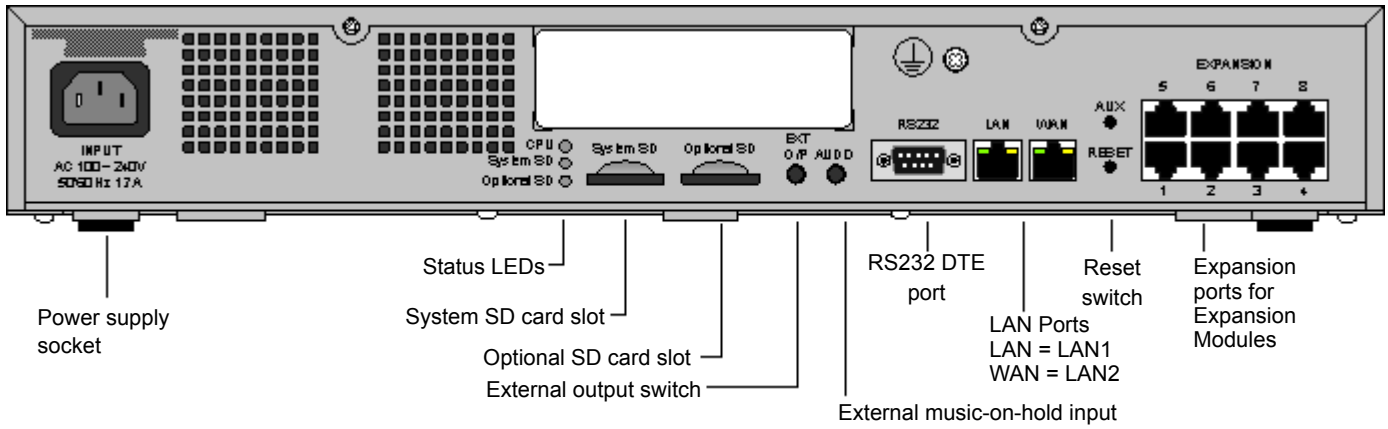


Figure 3: IP500 V2 rear view

Feature keys

The serial number of the feature key SD card fitted to the IP Office control unit is used as the basis for all licenses issued for that IP Office system and is used to regularly validate the licenses. If the feature key SD card is removed, over the next few hours licensed features will stop operating.

Pulse code modulation encoding

Pulse code modulation (PCM) is a method for encoding voice as data. In telephony, two methods PCM encoding are widely used, a-law and µ-law (also called mu-law or u-law). Typically µ-law is used in North America and a few other locations while a-law by the rest of the world. As well as setting the correct PCM encoding for the region, the a-law or µ-law setting of IP Office when it is first started affects a wide range of regional defaults relating to line settings and other values.

Base cards

The following base cards are available:

Table 1: IP500 V2 base cards

Base card	Maximum per system	RJ45 port assignment description	Telephones supported
Digital Station (DS8)	3	Ports 1–8: Digital stations With trunk card: Ports 9–12: Central Office lines	Selected Avaya 2400, 5400 and 9500 series phones T3 phones (EMEA only) 3810 wireless phones (North America only) **Note:** 4400 series phones are not supported on this card. They are supported on external expansion module DS ports. 4100, 7400, M series and T series phones use the TCM8 Digital Station card.
Analog Phone 2	4	Ports 1–2: Analog stations With trunk card: Ports 9–12: Trunk connections	Analog phones
Analog Phone 8	4	Ports 1–8: Analog stations With trunk card: Ports 9–12: Trunk connections	Analog phones
Digital Station (TCM8)	4	Ports 1–8: BST digital stations With trunk card: Ports 9–12: Central Office lines	Norstar®/BCM phones BST series phones Global M series phones Digital Mobility Controllers (DMCs) 7406e Wireless Telephones Digital Audio Conferencing Unit

Table continues…

Base card	Maximum per system	RJ45 port assignment description	Telephones supported
Voice Compression Module (VCM V2)	2	Ports 1–8: Not present With trunk card: Ports 9–12: Central Office lines	VoIP calls including IP extensions or IP trunks. Up to 128 voice compression channels depending on the codec used. The IP500V2 control unit supports up to 148 voice compression channels, using the card plus voice compression ports on the Combination card.
ATM Combination (ATM V2)	2	Ports 1–6: Digital stations Ports 7–8: Analog stations Ports 9–12: Central Office lines 10 voice compression channels. Codec support is G.711, G729a and G.723 with 64ms echo cancellation. G.722 is supported by release 8.0 and higher.	Avaya digital phones except 3800 and 4400 series phones Analog phones Preinstalled trunk cards
BRI Combination	2	Ports 1–6: Digital stations Ports 7–8: Analog stations Ports 9–10: BRI trunk ports (4 BRI channels) 10 voice compression channels. Codec support is G.711, G729a and G.723 with 64ms echo cancellation. G.722 is supported by IP Office Release 8.0 and higher.	Avaya digital phones except 3800 and 4400 series phones (DS type not TCM) Analog phones Preinstalled trunk cards
Unified Communicatio	1		Requires separate Preferred Edition license. Not supported on Server Edition.

Table continues…

Base card	Maximum per system	RJ45 port assignment description	Telephones supported
ns Module (UCM V2)			More than 200 users when running Voicemail Pro only. Up to 200 users when running Voicemail Pro and Avaya one-X® Portal for IP Office. 50 simultaneous Avaya one-X® Portal for IP Office users. No trunk cards
ETR6	3	Ports 1–6: ETR stations With ATM4: Ports 7–8: Power Failure Transfer Ports 9–12: Central Office lines	Not supported on Server Edition. PARTNER ACS phone ATM4, PRI/T1, or PARTNER mode µ-law SD cards (North America only)

Trunk cards

Trunk cards can be fitted to existing base cards to provide support for trunk ports. The trunk card uses the ports provided on the base card for cable connection. Each trunk card comes with spacer pegs for installation and port identification labels.

Note:

These cards are used for PSTN/FXS gateways with IP Office for Linux.

Tip:

In systems with both Analog Phone 8 base cards and analog trunk cards, combining the two types are recommended because it provides analog power failure support for one trunk per extension (not applicable to the Analog Phone 2 base card).

Table 2: IP500 V2 trunk cards

Trunk card	Maximum per system	Works with these base cards	Description
Analog (V2)	4	ETR6 DS8 TCM8 Analog Phone 2/8	4 analog loop start trunks V.32 modem for remote access 1 power failure extension to trunk connection on Phone 8 cards
Universal PRI (PRI-U)	4	ETR6 DS8	Up to 2 PRI trunk connections. The card is available in single and dual port variants. The card can be

Table continues…

Trunk card	Maximum per system	Works with these base cards	Description
		TCM8 Analog Phone 2/8 VCM	configured for E1 PRI, T1 robbed bit, T1 PRI or E1R2 PRI trunks. Supports primary rate digital trunks. On each card, 8 channels per interface are enabled by default. This means that the single PRI has 8 channels enabled, while the dual PRI has 8 channels enabled on each of the two circuits. Further channels may be enabled by the purchase of additional licenses in 2-channel or 8-channel increments. Available in single and dual version. The single variant can support up to 24 T1 channels or up to 30 E1 channels. The dual variant can support up to 48 T1 channels or 60 E1 channels. Configurable for T1, E1, E1R2 MFC use, depending on territory. Includes an integrated CSU/DSU: • CSU allows trunks to be put into loop-back mode for testing purposes. This can be set manually, using the monitor application, or automatically from a Central Office sending a Line Loop Back (LLB) pattern. • DSU allows the T1 trunk to be shared between data and voice services. Includes diagnostics capabilities: visual indicators to show service state and physical test points to monitor traffic. Supports mobility features: Mobile Call Control and one-X Mobile clients
BRI (Euro ISDN)	4	DS8 TCM8 Analog Phone 2/8 VCM	Up to 4 BRI trunk connections, each trunk providing 2B+D digital channels. Available in 2 (4 channels) and 4 (8 channels) options. Supports mobility features: Mobile Call Control and one-X Mobile clients.

External expansion modules

External expansion modules can be used with the IP500 V2 control unit.

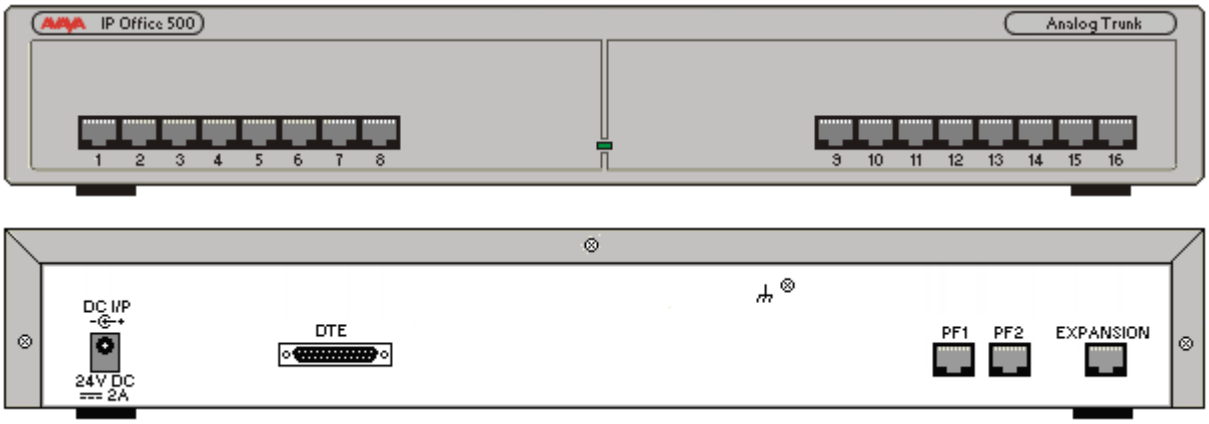
Analog station expansion modules

On analog ports, call information is sent while the phone is ringing, and cannot be updated during a call or set on an outbound call (the phone may do a local match but this is not controlled by IP

Office). The primary purpose of displays is to give information about incoming calls. Where the caller display standard chosen supports the delivery of text (extension name) as well as the number, both are delivered.

An analog extension port can be set for external paging operation. It does not operate like a normal extension and is connected to external equipment through an isolation device (can also be used as an MoH source). The port will always be busy so it cannot be called directly and can only be accessed by using a paging feature. When not receiving a page, the port will remain silent. When being paged, the page tone is sent before the speech path is opened.

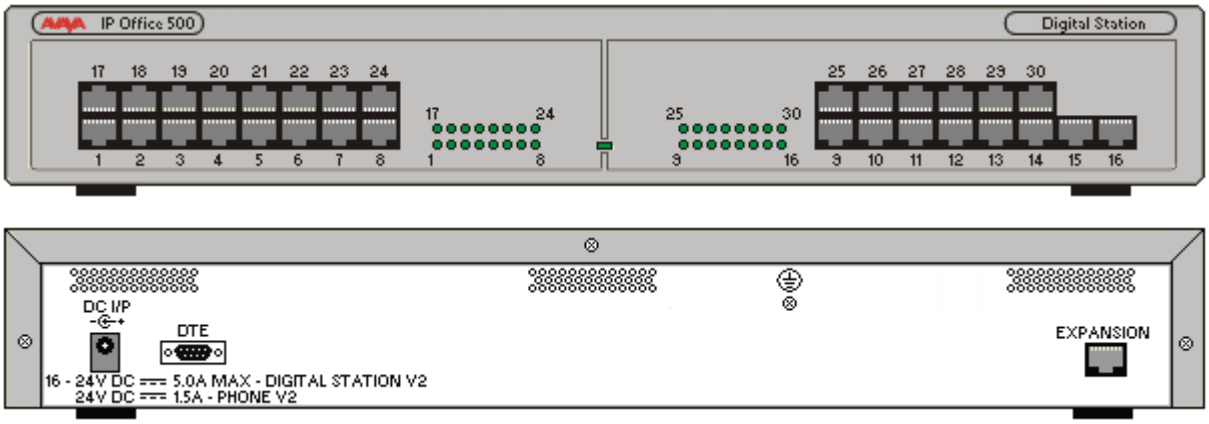
For installations in a rack, this module requires the IP500 V2 Rack Mounting Kit.



Expansion module	Telephones supported	Interfaces supported
ATM16	16 analog stations with calling line presentation	DTMF signaling (No rotary or Loop Disconnect) Time Break Recall (No Earth Recall) Message Waiting Indication (MWI): 51V Stepped, 81V, 101V and Line Reversal and Bellcore FSK
ATM30	30 analog stations with line calling presentation	

Digital station expansion modules

For installations in a rack, this module requires the IP500 V2 Rack Mounting Kit.



Expansion module	Telephones supported	Description
DS16A	Norstar®/BCM telephones	16 digital station ports
DS30A	BST series telephones Global M series telephones Digital Mobility Controllers (DMCs) 7406e Wireless Telephones Digital Audio Conferencing Unit	30 digital station ports
DS16B	Avaya telephones	16 digital station ports
DS30B	Either DS or TCM mode supporting the telephones connected to either the DS8 or the TCM8 cards.	30 digital station ports

Application server

The IP Office Application Server provides reliability, scalability and processing power for larger scale IP Office deployments. It is an external, rack mounted server that provides scalability for larger installations and multisite deployments not currently supported with the Unified Communications Module (UCM V2).

The IP Office Application Server is a single installation of selected IP Office™ Platform applications running on Linux. The Linux operating system is included as part of the installation. However, installation requires minimal Linux knowledge due to the inclusion of a web based management interface to allow the server to be managed remotely via web browser.

The IP Office Application Server hosts the following applications:

- Management Services
- one-X Portal for IP Office
- Voicemail Pro
- Web License Manager (WebLM)
- Web Manager
- Optional Services
  - Web Collaboration
  - Contact Recorder for IP Office
  - WebRTC Gateway

Avaya Session Border Controller for Enterprise

An session border controller acts a router between the enterprise and carrier service, allowing only authorized sessions to pass through the connection point (border). The Avaya Session Border Controller for Enterprise (SBCE) delivers security to a SIP-based Unified Communications network.

For information on the SBCE, see *Avaya Session Border Controller for Enterprise Overview and Specification*.

For information on deploying the SBCE with IP Office, see “Configuring the Avaya Session Border Controller for IP Office Remote Workers” in either

- *Administering Avaya IP Office™ Platform with Web Manager*
- *Administering Avaya IP Office™ Platform with Manager*

Software components

Administration applications

IP Office Manager

IP Office Manager supports complete centralized administration for Server Edition Primary, Server Edition Secondary, and Server Edition Expansion Systems. Manager also provides IP Office telephony and Unified Communications features.

Manager enables management of all the components within the solution for activities such as:

- Single point of configuration for IP Office and voicemail
- Simple initial installation wizard
- Overview of the system with inventory and status
- Common settings consolidated to the Server Edition Primary
- Integrated Voicemail Proclient, System Status Application, and Linux Platform settings access
- Supports online, offline administration, and configuring a complete solution
- Template operations
- Centralized configuration and template storage
- Administrator account management utility
- Retains existing IP Office expertise
- Context sensitive help

Even though Manager is a Windows application, Manager can be installed directly from the Web administration portal of Server Edition Primary server. This enables you to use any Windows personal computer that has any IP Office Manager that is pre-installed immediately.

Using Manager, the administrator can create templates for many management items such as users, extensions, Hunt Groups, and Lines. The administrator can then create any new item using the default settings or the template. You can create multiple users and extensions using one template.

Call Routing Support:

- Full IP Office ARS and dial plan support
- Default routing simplifies configuration
- Solution wide auto line group numbering
- Common incoming call routes provide resilience

- Resilient Hunt Groups

Offline Operation:

- Complete solution can be created and/or managed offline if required
- Can still manage when some deices offline
- On/offline configuration sync options to harmonize as required

Solution Management:

- Complete solution view with status and inventory
- Users and Hunt Groups are solution wide
- Centralized User Rights, feature short codes, Time Profiles, Incoming Call Routes, and Account Codes
- Permits advanced per-device configuration if desired
- All configurations stored on primary server
- Solution wide system directory
- Easy management of central and per-device licenses

Resilience management:

- You can manage every device locally for ‘rainy day’ events
- You can manage the solution through a secondary server when the primary server fails or in a split WAN setup
- On/Offline configuration sync options to harmonize as required

Add or Remove Devices:

- Single process for addition or removal of device
- Built-in Initial Configuration Utility (ICU) to simplify adding a new device
- Common configuration items from primary server is auto populated
- Can configure before you install a new device

Validation :

- Configuration validation on read and any change.
- Solution wide validations

Template:

- Create a local and centralized template from an existing Line, Extension, User, Hunt Group, Time Profile, Firewall Profile, IP Route and Service entries
- Recreate multiple Extension and Users from one template

Remote access:

- Supports access from service through SSL VPN

Security:

- Single Sign On to all except one-X Portal administration

Web Manager

Web Manager is a browser-based management tool designed to simplify the installation and maintenance process and provides access to most, but not all, IP Office configuration settings. Web Manager eliminates the need to have windows operating system because it can run on any device that supports standard browsers.

Solution Management Application

IP Office Manager and Web Manager use the Solution Management Application (SMA) to access the system configuration.

SMA resides on the primary or secondary server. Settings are available for remote access and Server Edition Central Access. Central Access communicates with the primary or secondary server rather than to each node individually. Avaya requires Central Access for a hosted environment and recommends it for non-hosted environments with more than 32 nodes.

SysMonitor

Use SysMonitor to troubleshoot IP Office from both local (LAN) and remote locations (WAN).

Select the protocols and interfaces to monitor and diagnose through a graphical interface. Capture traces directly to the screen or as a log file for later analysis. Color code different traces to improve the clarity in large files. The utility also captures system alarms and displays the activity log of the last 20 alarms that have occurred.

SoftConsole Administrator mode

System administrators can start SoftConsole in administrator mode. When run in this mode, there is no access to the telephony functions.

SoftConsole administrator mode enables users to configure the following functions:

- Create and edit user profiles
- Amend the length of call notes
- Create and edit templates
- Remove or display the interface panels

SNMP Management Console

Simple Network Management Protocol (SNMP) is an industry standard designed to allow the management of data equipment from different vendors using a single Network Manager application. The Network Manager periodically polls equipment to solicit a response, if no response is received an alarm is raised. In addition to responding to polls, IP Office monitors the state of its Extensions, Trunk cards, Expansion Modules and Media cards so that if an error is detected IP Office will notify the Network Manager.

As the IP Office platform comprises many applications, the core software notifies SNMP events from both Voicemail Pro and Embedded Voicemail to warn of approaching storage capacity limits.

IP Office sends email notifications directly to the email server; no additional PC client is needed.

On customer sites where SNMP management is not available, IP Office can email events using up to 3 email addresses each containing a different set of alarms.

The following system event categories can be chosen for email notification, if installed on the system:

- Generic
- Trunk lines
- Embedded Voicemail Card
- VCM
- Expansion modules
- Applications
- License
- Phone change
- CSU Loop-Back

IP Office has been tested against CastleRock's SNMPc-EE™ and HP's Network Node Manager (part of the OpenView application suite).

System Status Application (SSA)

The System Status Application (SSA) is a diagnostic tool for system managers and administrators to monitor and check the status of IP Office systems locally or remotely. SSA shows both the current state of an IP Office system and details of any problems that have occurred. The information reported is a combination of real-time events, historical events, status and configuration data to assist fault finding and diagnosis. SSA provides real-time status, historic utilization and alarm information for ports, modules and expansion cards on the system. SSA connects to all variants of IP Office using an IP connection that can be remote or local. Modem connections at 14.4kbps or above are supported for remote diagnostics.

SSA provides information on the following:

Alarms	SSA displays all alarms which are recorded within IP Office for each device in error. The number, date and time of the occurrence is recorded. The last 50 alarms are stored within IP Office to avoid need for local PC.
Call Details	Information on incoming and outgoing calls, including call length, call ID and routing information.
Extensions	SSA details all extensions (including device type and port location) on the IP Office system. Information on the current status of a device is also displayed.
Trunks	IP Office trunks and connections (VoIP, analog and digital) and their current status are displayed. For VoIP trunks, QoS information is also displayed (e.g. round trip delay, jitter and packet loss).
System Resources	IP Office includes central resources that are utilized to perform various functions. Diagnosing these resources is often critical to the successful

	operation of the system. This includes details on resources for VCM, Voicemail and conferencing.
QoS Monitoring	QoS Parameters from connected calls, such as jitter and roundtrip delay, are monitored.

SSA can be launched independently or from IP Office Manager and there can be up to two (2) SSA clients connected to an IP Office unit at one time.

Note: SSA is not a configuration tool for IP Office systems.

Data Migration Manager (DMM)

The Data Migration Manager (DMM) facilitates migration from BCM and Norstar systems to IP Office. There are three steps in the migration process: extract, convert and apply.

DMM migrates:

- Announcements and greetings
- Voicemail messages
- Extract Call Pilot configuration

Call handling applications

Avaya one-X® Portal for IP Office

Avaya one-X® Portal for IP Office provides users control of their telephone from a networked PC. Use this application with any extension; analog, digital or any IP telephone, wired or wireless, that is available as part of the Office Worker, Power User or Teleworker user licenses.

Avaya one-X® Portal for IP Office is a server-based application that the user accesses via web browser.

For Telecommuter mode, One-X applications require answer supervision and disconnect detection for proper functioning. As a result, the one-X applications will not work with trunks that do not support answer supervision and disconnect detection.

Note:

one-X applications function on trunk types such as PRI, BRI, and SIP, however, they will not function on E1R2, T1 RBS and analog loop start trunks.

System administrators can control if Avaya one-X® Portal for IP Office can be accessed over a secure protocol only, recommended for hosted deployments to provide “secure only” access. The other option is to allow users to access the client over a secure and unsecure protocol (HTTP/HTTPS). The client application forces users to change their passwords and voicemail passcodes to meet the complexity settings configured by the administrator.

Through gadgets, Avaya one-X® Portal for IP Office provides the following features:

- Call information
- Call and conference control
- Presence and instant messaging notifications, monitoring and archiving

- Contact import and export
- XMPP groups displayed in the **System Directory** tab
- Dial to user's own bridge and invite other users to join
- Conference call and other meeting scheduling including port reservations, email support and automatic report creation — available within the Outlook interface
- One-click web conferencing hosting and single sign-on joining web conferences as a participant

Avaya Communicator

Avaya Communicator is a collaboration software client that delivers an innovative interface for real time communications for Windows and on the iPad. It enables users to handle phone calls, instant messages, conferencing, web collaboration, presence, enterprise contacts and e-mail, all from a single interface. Avaya Communicator delivers the intuitive graphic design of spotlights, media menu, notification bar, and contact cards.

Avaya Communicator for IP Office communicates with both IP Office and Avaya one-X® Portal to provide communication and collaboration features. Telephony features such as make/receive calls, hold/unhold, mute/unmute, DTMF, MWI etc. are provided by IP500 V2 and UC features such as IM, presence, and enterprise contacts are provided by the Avaya one-X® Portal server.

If Avaya one-X® Portal server is unavailable, either due to licensing restriction or connectivity issues, the Avaya Communicator client will work in a telephony-only mode providing only telephony features. Interoperability with Avaya Session Border Controller for Enterprise allows the Flare Communicator client to be used by users with the Remote Worker profile and register with IP Office without requiring a VPN connection.

Avaya Communicator provides the following features:

- Add participants using dial-pad or drag and drop
- Mute and unmute all or a subset of participants
- Lock and unlock the conference
- Place conference in lecture mode
- Enable and disable entry and exit tones
- Drop all or some participants from the conference
- End the conference
- Enable and disable continuation to allow the conference continue after the moderator drops
- Promote participants to moderator
- Create ad-hoc conferences by merging P2P calls
- Authorization and account codes (Windows only)
- Hold timeout reminder (Windows only)
- Compact user experience
- TSL/SRTP support

- Contact filtering
- Web conferencing integration
- Unsupervised transfer
- Auto-answer
- Simultaneous mode
- Password change
- Account codes
- Auto configuration (iOS only)
- Bluetooth and headset device support and selection (iOS only)
- Interoperability with Scopia (Radvision XT5000)

Note:

Avaya Communicator does not support recording and active speaker indicator.

Avaya Communicator for iPad

Avaya Communicator for iPad integrates voice, video, presence, instant messaging, directories into one unified interface over Wi-Fi or 3G cellular and VPN connections.

Avaya Communicator is a software-only solution that can be easily downloaded from the Apple iTunes Store supporting iPad2, iPad3, iPad4, iPad Mini (with and without retina display), iPad Air both Wi-Fi and 3G models and the following iOS versions: 6.1.x, 7.0.x, 7.1.x, and 8.0.x.

Note:

Avaya Communicator is not supported on iOS 6.0.x.

With Avaya Communicator, IP Office users can use iPad devices for:

- Easy access to the real-time communications tools they rely on every day (phone, presence, IM, etc.)
- Blending real-time communications and business processes, such as mobile sales
- Taking advantage of Wi-Fi and 3G connectivity for cost-saving VoIP
- Secure signaling over TLS and secure media exchange over SRTP in cloud environments
- As a web conferencing moderator, the ability to share white board and documents
- Changing passwords
- Auto-answer support
- Unsupervised transfers
- Auto configuration services using a configuration profile hosted on a web server by email address or URL
- Bluetooth and headset device support and selection
- System directory search

- Add/delete members from a team (XMPP Group)
- Search the system directory and add to a team or personal contact
- Radvision XT5000 support for point-to-point video calls

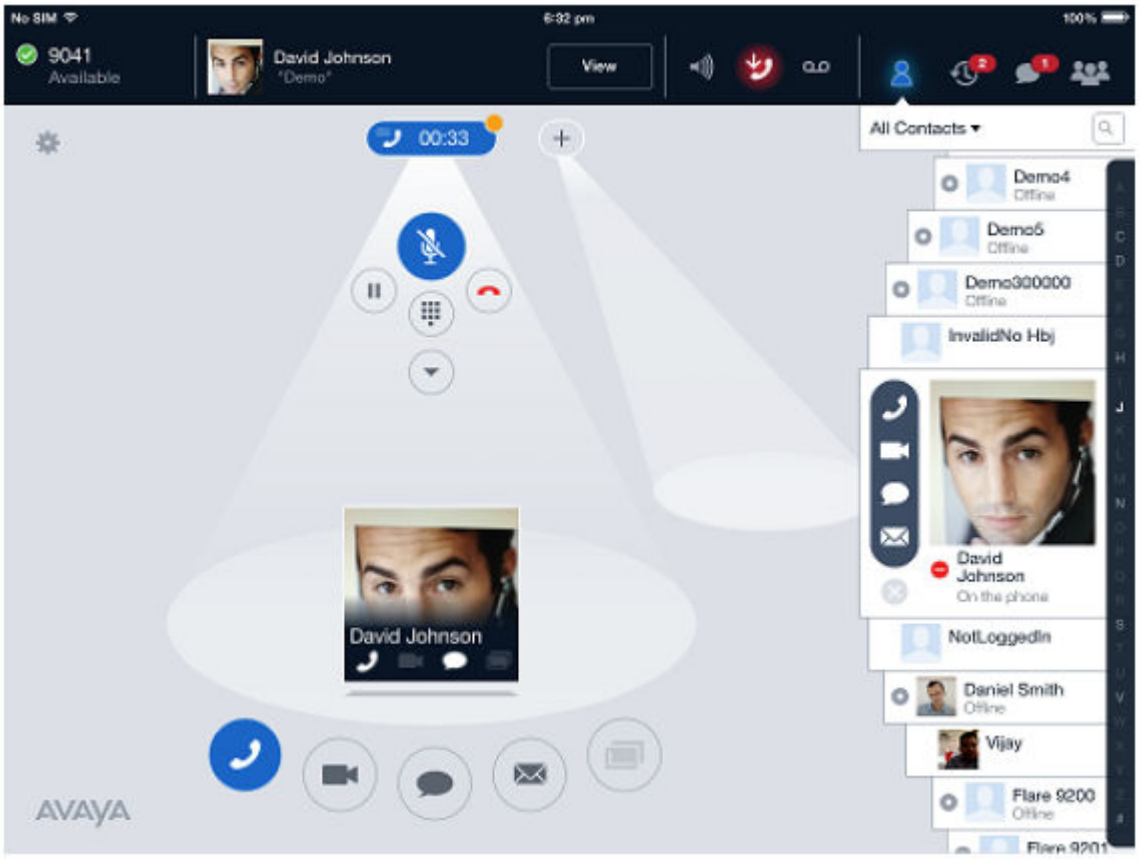


Figure 4: Avaya Communicator for iPad

Avaya Communicator for Windows

Avaya Communicator for Windows integrates voice, presence, instant messaging and directories into one unified offering for Windows laptops and desktops over a LAN connection.

Avaya Communicator provides the following features:

- Compact mode occupying less screen real estate

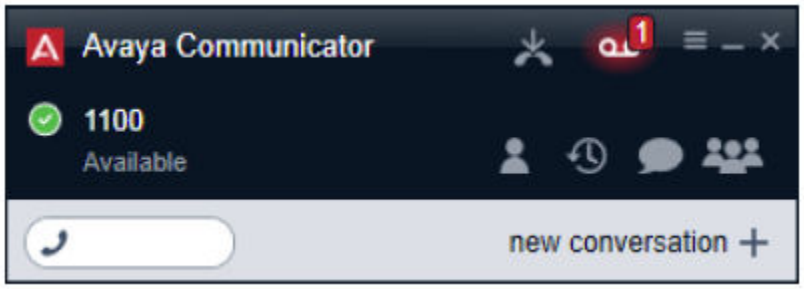


Figure 5: Avaya Communicator for Windows compact view

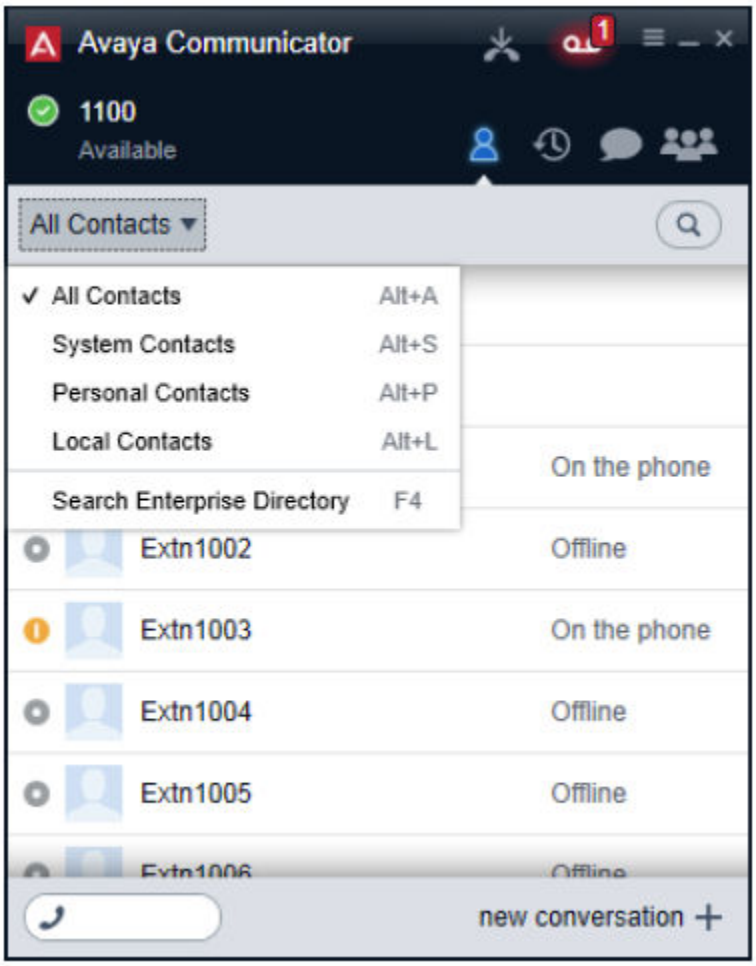


Figure 6: Avaya Communicator for Windows full view

- Secure signaling over TLS and secure media exchange over SRTP for cloud environments
- Contact filtering according to criteria and choosing to view only system, local, or personal contacts
- Web conferencing integration
- Unsupervised transfers
- Auto-answer
- Simultaneous mode for interfaces to one-X Portal, Outlook and Salesforce
- Password changing
- Account codes

SoftConsole

SoftConsole is the PC-based Windows receptionist application for IP Office. It can be purchased with the Receptionist user license.

SoftConsole provides enterprise receptionists and operators with call information and call actions to simplify call handling and instant messaging. With SoftConsole, users see the status of other users

and adjust basic telephony settings of other users, such as forwarding numbers. Avaya recommends using phones that support Auto Answer. Users can use instant messaging features provided by Avaya one-X® Portal, if available.

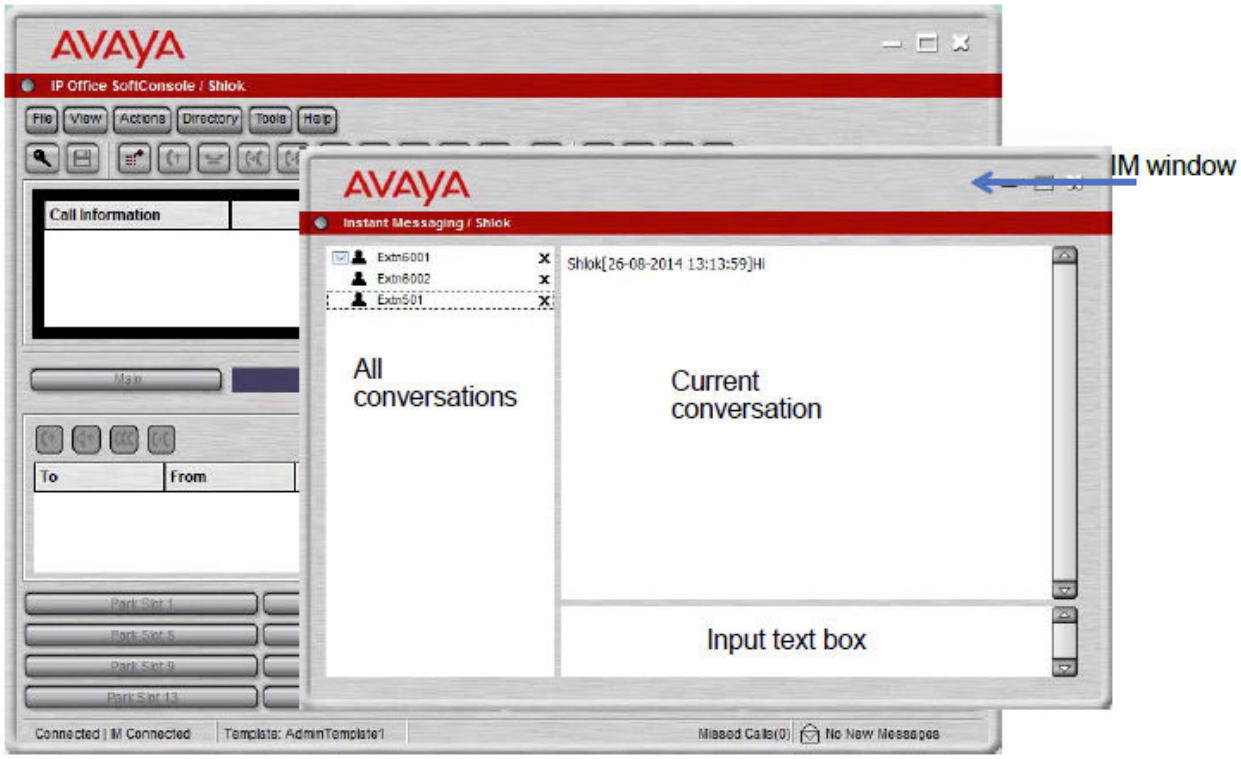


Figure 7: SoftConsole instant messaging window

WebSocket communication allows SoftConsole clients to communicate with IP Office and Avaya one-X® Portal. The WebSocket protocol is bidirectional between the client and the server. As the communication is done over port 80 or 443 (same port used for HTTP), there are no issues with firewall traversal. In a hosted environment, WebSocket communication provides security.

SoftConsole can be minimized in the Windows system tray when not in use, but will pop up on the screen when a call is received. Sound and media files can be associated with calls. If this feature is used, the PC requires a sound card and speakers.

SoftConsole supports the following features:

- Answering calls
- Making outgoing calls
- Supervised and unsupervised transfers
- Transfer calls to voicemail
- Hold and park calls
- Monitoring queues and answering queue calls
- Using and viewing conference rooms
- Conferencing held calls

- Adding users to a conference
- Adding text to a call
- Door release
- Intrude
- Sending text messages
- Paging
- Recording calls
- Sending email
- Using dial pad
- Multiple language support, users can select language

Conferencing

Meet-Me conferencing

Meet-Me conferencing enables multiple callers to talk in an audio conference. Callers can be on-site personnel as well as external parties whether field-based engineers, sales staff on the road, customers or suppliers. Conference calls can be planned in advance or established ad-hoc as and when required.

Video collaboration

IP Office provides Bring Your Own Device (BYOD) and HD room system support for video collaboration.

IP Office supports video collaboration with data sharing through Avaya Scopia® desktop and mobile applications when using Radvision MCU or Video Collaboration for IP Office. Flare clients can also participate in multiparty video conferences. Avaya Scopia® connects to IP Office as a SIP endpoint using an Avaya IP license.

Avaya Video Collaboration for IP Office provides the following features:

- Direct integration including a common dial plan with IP Office
- “Virtual conference room” for up to eight participants with click-to-join capabilities form any standards-based room system, desktop or mobile device
- Freely distributed desktop and mobile video clients for PCs, Macs and most popular iOS and Android devices, enabling people inside and outside an organization to easily join a video meeting
- Low bandwidth HD multiparty video conferencing with data collabration using native SIP/H.323
- Automatic firewall transversal to engage with participants outside the network

The following diagram shows the topology of IP Office deployed with video endpoints.

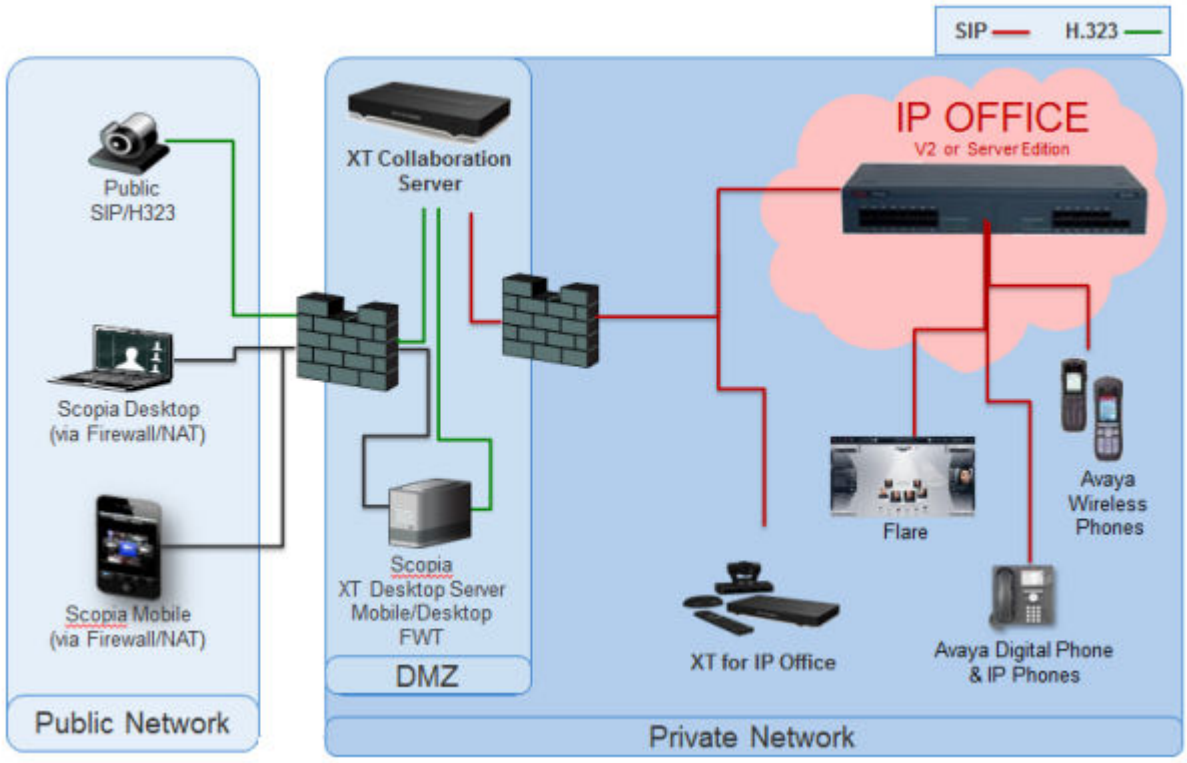


Figure 8: Video endpoints

Web Collaboration

The web collaboration feature leverages the Avaya Aura Conferencing solution. With Server Edition, web collaboration is part of the base software distribution and runs co-resident with the one-X Portal application on the primary server. It can also run on a standalone one-X server for additional scale.

Web Collaboration provides web-based conferencing and online meeting tools that enable your organization's members and invited guests to join in conference calls and group meetings on site or from remote locations.

Participants can quickly join the conference by logging in to Collaboration Agent and then dialing into the bridge number assigned for the conference call. An audio-only participant joins the conference by dialing in to the audio bridge. A conference owner can also dial out to users and add the users as participants. Additional participants can even be invited to join a conference already in progress. Then, the participants can easily perform a number of tasks, such as:

- See a list of other participants
- Raise their hands

For scheduled conferences from , after the conference time elapses, the application disconnects all participants and the conference owner from the audio call.

With web collaboration, the conference moderator or any selected participant can share:

- All or some of their desktop
- Specific applications

- Virtual whiteboards

When web collaboration is active, participants can:

- Send messages
- Annotate shared content
- Record minutes

Voicemail applications

Voicemail Pro

Voicemail Pro is provided with IP Office Preferred Edition and is an advanced messaging and call flow application for IP Office systems. Voicemail Pro can handle 40 (up to 250/500 on Server Edition/ Server Edition Select) simultaneous calls depending on license and system settings. Each user has the option of turning their voicemail on or off. When on, the system automatically answers their telephone when they are not available to take a call, plays a personal greeting, and records a message.

When a message has been left, the user will see a message-waiting lamp lit on their telephone and can press a retrieval button to collect their messages.

Voicemail Pro can also ring the user to deliver any new messages. Voicemail messages are time and date stamped and the caller's number recorded. Voicemail Pro can be configured to delete read messages automatically, unless the user chooses to save the message permanently.

Voicemails can be collected remotely by dialing into the Voicemail Pro server. If the number the user is dialing from is recognized (home number or mobile/cell phone for example), the user will listen to their voicemail straight away. If the source number is not recognized, the user will be prompted for a mailbox number and a PIN code for that mailbox, before they can listen to their voicemail. Users have the ability to set and change their own PIN codes.

When a voicemail needs to be forwarded to other users, Voicemail Pro provides many options:

- Voicemails can be forwarded to another mailbox, or group of mailboxes
- Recipients can add their comments to the voicemail before forwarding to another mailbox or mailboxes.
- Voicemails can be forwarded as email WAV attachments.

All options are available in a choice of languages; both spoken voice prompts and graphical programming interfaces and have the choice of IP Office TUI and INTUITY emulation TUI.

One Active Voicemail Pro server

Server Edition supports one active Voicemail Pro server on the primary server. A non-active Voicemail Pro server is supported on the secondary server for resiliency.

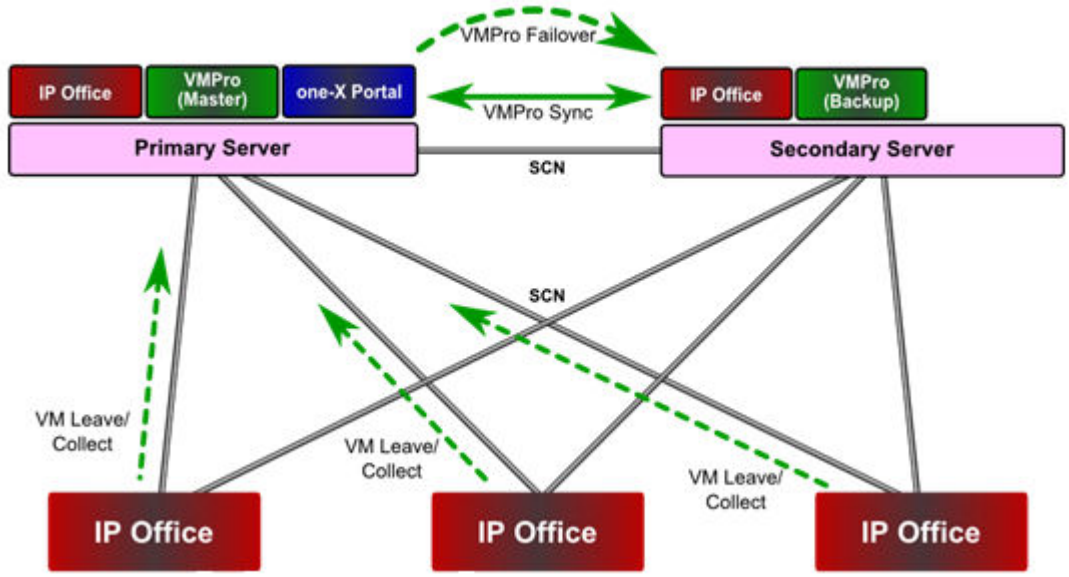


Figure 9: One active Voicemail Pro server

Dual Active Voicemail Pro servers

Server Edition Select systems support two active Voicemail Pro servers, doubling the maximum channel capacity and dual processing locations. Each expansion system and all contained users can be configured to use one or the other. Each Voicemail Pro server provides backup for the other. The two Voicemail Pro servers are both active for a configured subset of users. They share a common configuration and message store. Each can support all mailboxes, MWI and call flows under failure conditions.

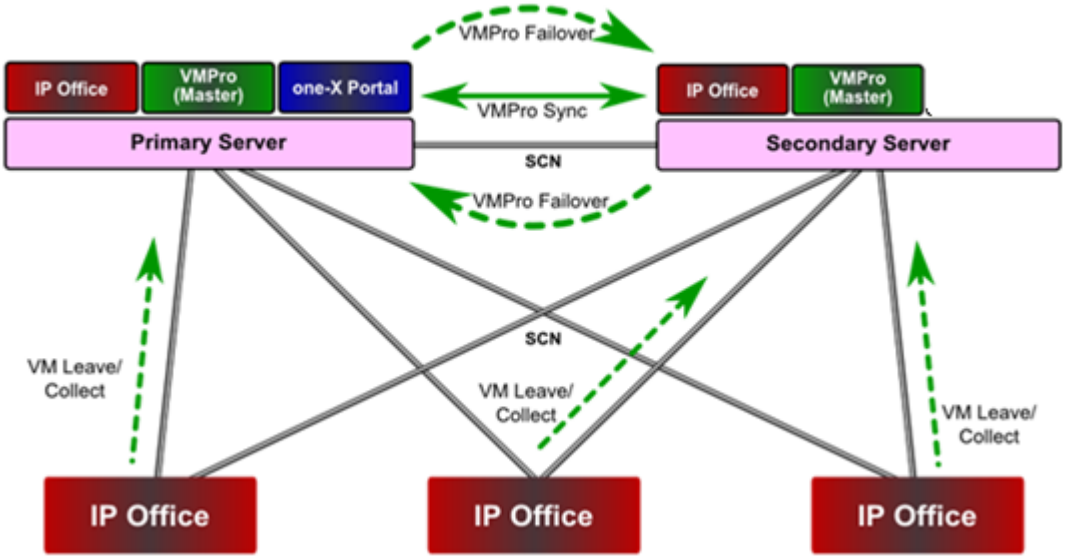


Figure 10: Dual Active Voicemail Pro servers

Customer requirements

IP Office Server Edition is provides telephony capabilities, unified communications, mobility and collaboration, provides high availability, ease of use, and low total cost of ownership (TCO). Targeted at the Midsize Enterprise, it supports up to 32 sites, 2000 users and comprehensive resilience. A Server Edition Select deployment supports up to 150 sites and 3000 users.

Business continuity

IP Office Server Edition Solution offers business continuity features to maintain a high level of service in the event of any network or device outage to ensure normal operation.

A combination of the various remote access features, resilience, and redundancy ensures business continuity.

- Avaya one-X® Portal for IP Office
- Avaya one-X® Mobile for IP Office
- Avaya Communicator
- Remote worker telephone
- The HP DL360 and the Dell R620 servers supports hot swap able hard drives and power supply units
- Components such as IP Office, IP telephones, Voicemail Pro, and hunt groups provide resilience
- Links and trunks provide resilience through network topology and PSTN backup

Remote access

You can access IP Office Server Edition Solution remotely.

Some of the components that can be accessed remotely are:

- System Status Application
  - RBAC username and password
  - Password is securely exchanged, optional TLS for security
  - SSA port can be disabled
- System Monitor
  - Role based access control (RBAC) user name and password
  - Optional HTTPS for security
- SSL VPN or IP Office Support Services
  - The system uses HTTPS and TLS channel

  - Password is securely exchanged
  - Prompts for periodic rekeying
- Mobility and Avaya one-X® Portal clients
  - User name and password is the IP Office configuration, and administered through IP Office Server Edition Manager

Resilience

A single Server Edition Primary server supports redundant hard disk drives and power supply units. You can also configure Alternate Route Selection when the trunks are busy or there is a failure of the trunk.

Add a Server Edition Secondary to provide resilience at any level.

Server Edition Secondary server provides resilience for hunt groups, messaging and all H.323 extensions or users of Server Edition Primary without any administration. Server Edition Secondary does not provide resilience forAvaya one-X® Portal for IP Office.

Adding an Server Edition Expansion System with H.323 extensions or users enables you to backup those on either the Server Edition Primary or Server Edition Secondary servers. The dual star Multi-Site Network topology when a Server Edition Secondary server is present supports diverse routing between all nodes.

At all times, no server hardware is forced to be idle, enabling you decide whether to provide true redundancy, or shared resource resilience.

IP Office Server Edition Solution provides IP extension resilience for Avaya H.323 16xx, 96xx and 96x1 phones. The Server Edition Expansion System with the integrated DHCP server enable upgrade and configuration support, installing and configuring resilient phone is a straightforward operation and can even support two systems on the same LAN subnet.

Resilient components

The following components of IP Office Server Edition Solution are resilient:

- IP Office Server Edition
- Voicemail Pro server
- IP telehones
- Hunt groups
- Interdevice links
- Trunks
- Incoming Call Routes

Multisite network

A multisite network enhances resilience by providing the following capabilities:

- Transparency for most of the features

- Resilience of users and hunt groups
- Back up system for Voicemail Pro
- Network topology provides resilience
- None of the hardware is idle
- Simple to activate resilience

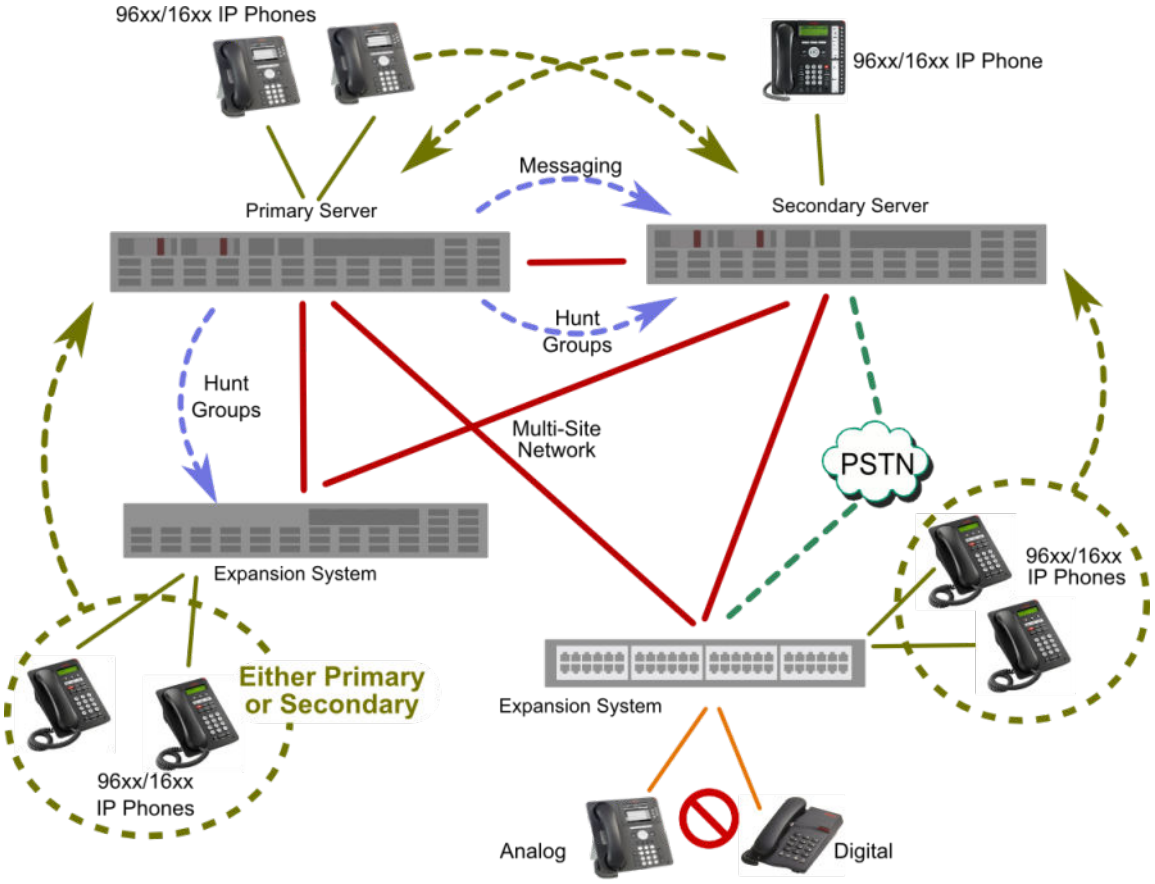


Figure 11: Resilience architecture

Resilient management

You can continue to administer and manage the failure of IP Office Server Edition server and devices in an IP Office Server Edition Solution network through the Server Edition Secondary server. This provides management without the offline capability, and a facility to realign the configuration after the outages have been resolved. The resynchronization feature highlights the time and source of configuration change and enables the administrator to decide which change set to retain. In addition, you can directly manage each device and application to allow configuration whilst isolated. You can use the resynchronization capability to realign the configurations after the devices are reconnected.

Backup and restore

IP Office Server Edition supports a variety of backup and restore features to preserve and optionally reinstate both configuration and data in the event of an equipment failure. Server Edition Primary offers a flexible and secure, manual or scheduled solution backup to an external server which can optionally be Server Edition Secondary. Each server and expansion system including Application Server with Avaya one-X® Portal for IP Office can be configured to copy configuration, mailbox, and call recordings data. In addition local daily backups are supported.

Manager

- Saves all IP Office device configuration and templates on Server Edition Primary.
- Save IP Office device configuration and templates to a local drive of a computer.
- Restore IP Office device configuration from a local drive of the computer or Server Edition Primary.

Web Manager

- Centralized back up and restore or all Server Edition components.
- Back up and restore individual Voicemail Pro mailboxes.
- Provides scheduling options for automated backup.

Server Edition Primary

- Backup or restore using solution administration web portal for each component (IP Office, Voicemail Pro, Avaya one-X® Portal for IP Office) or the whole solution. You can take a backup of up to 15 sets on a local drive or a remote SCP file server that can be another IP Office Server Edition server.
- Recover a corrupted or failed server configuration, application and user data.
- Configure each local application backup to the local drive, and use default or predefined directories.

Server Edition Expansion System (V2)

- Back up to the local SD card.
- Back up manually through phone, Manager or automated 24 hr - active by default.
- Back up configuration, security, and binary files as a single file set.
- Restore through IP Office Server Edition Manager or phone command or automatically as a result of boot failure.

Server Edition Expansion System(L)

- Back up to the local hard drive.
- Back up manually through Phone, Manager or automated 24 hr - active by default.
- Back up configuration, security, and binary files as a single file set.
- Restore through a Manager or phone command, or as a result of boot failure.

Voicemail Pro

- Back up to a local drive of Server Edition Primary server.
- Back up manually or periodically (daily, weekly, monthly) through Voicemail Pro Client.
- Options to backup content which can include configuration and messages
- Back up multiple backup file sets up to a maximum of 4 file sets.
- Restore through the Web Control Panel. The restore is a complete backup data set.

Avaya one-X® Portal for IP Office

- Back up the Avaya one-X® Portal for IP Office database, Presence and Mobility settings to a local drive or an FTP server.
- Back up manually using Avaya one-X® Portal for IP Office by logging in as a *Superuser*.
- Back up multiple backup file sets (unlimited).
- Restore using Avaya one-X® Portal for IP Office by logging in as a *Superuser*.

Test strategy summary

Solution level testing is important to provide a solution that meets the quality expectations of customers. The following test strategy descriptions are not exhaustive for all test run but highlight the areas of importance from a solution perspective.

Solution level testing

Testing and validation was conducted at the solution level and the component level to ensure performance and stability of the solution. In-depth regression testing was performed on new elements (web clients) and component interfaces.

Performance testing

Full capacity testing was conducted with call progress analysis (CPA), call recording, agents, supervisor activities enabled and run simultaneously. Performance testing also included standard PBX features for standard calls.

CPA accuracy

The CPA accuracy was tested under full load and against PRI and SIP trunks. The type of trunk or the conditions of a service provider SIP trunk can impact CPA accuracy.

Power up testing

Testing to determine if the system can be powered up without administrator intervention and in various sequences was performed.

Recovery after power outage

Testing to determine if the system becomes operational without administrator intervention after a power outage was performed.

Recovery after component outage

Testing to determine if the system becomes operational after a component failure and reboot was performed.

Staging implementation testing

The preconfigured (staged) system was tested to verify the preconfigured settings and interconnections.

Chapter 3: Design considerations

Caveats and limitations

This reference configuration functions with the following caveat and limitation:

- In a cloud environment, the IP500 V2 expansion system provides support for analog and digital endpoints.

Note:

For detailed capacity information, see *Deploying Avaya IP Office™ Platform Server Edition* .

Migration roadmap and limitations

IP Office Server Edition Solution versus Avaya Aura Midsize Enterprise Solution

The following table compares the key features ofIP Office Server Edition Solution and Avaya Aura® Midsize EnterpriseSolution:

Feature	Avaya Aura Midsize Enterprise (with no UC add-ons)	Server Edition Edition Select	Server Edition Comments
Capacity	250 locations	150 locations	
	2400 users on single server; 2400 total users	3000 users per server; 3000 total users	
Performance	BHCC	20,000 BHCC	
	2400 concurrent calls	3000 concurrent calls	Concurrent direct media IP calls
Cost/TCO	Medium	Low	
Solution Complexity	Medium	Low	Just single server for 1500 users, full UC, one Manager

Table continues…

Feature	Avaya Aura Midsize Enterprise (with no UC add-ons)	Server Edition Edition Select	Server Edition Comments
CTI	Solution wide via AES: • TAPI 2/3 • CSTA • ASAI • etc.	Per device using IP Office TAPI 2/3 CTI interfaces	Future plan to support solution CTI using REST web services via one-X Portal
Resilience	• HA (LAN only) • No Geo-resilience • Five 9s plus availability	• VMware HA • Geo-resilience • Typical Four 9s availability	Geo-redundancy for all components except one-X Portal
Security	• SRTP • 802.1x • SSO	• SRTP • No 802.1x • SSO	
IP Networking	IPv4	IPv4	IPv6 not supported
Telephony Networking	• Call Admission Control • Connection preservation	• Call Admission Control • Connection preservation	
Topology	• Star with G450/G430/ B5800 gateways • Mesh between CM core servers	• Single/double star • Mesh linked Expansions	
Existing upgrade path	Upgrade from CM/G4x0	Upgrade from IP Office	IP500 V2 can be re-provisioned as an Expansion System
Future evolution path	Full Aura	Server Edition only	Server Edition solution federation supported
Endpoint support	Mix of Avaya and 3rd party endpoints: • IP (H323+SIP) • TDM • Analog	Mix of Avaya and 3rd party endpoints: • IP (H323+SIP) • Digital • Analog • DECT	Server Edition supports more endpoint types than any other product
Administration tools	Unified Aura Manager (SMGR)	• IP Office Manager • IP Office Web Manager	
Software Only Solution	No	Yes (Controlled introduction at present)	
Virtualized environment	Yes (Xen)	Yes (VMware)	

Table continues…

Feature	Avaya Aura Midsize Enterprise (with no UC add-ons)	Server Edition Edition Select	Server Edition Comments
Integrated Contact Center	Yes – 1000 agents.	No	IPOCC or ACCS to 250 agents can be added. Requires a separate server.
Audio Conferencing	Max 6 party/2400 total channels	Max 256 party 1024 channels per server	
IP DECT	Up to 2400	Up to 384 per server or Expansion system	
Voicemail	• 36 VM channels • 2400 mailboxes	• 500 VM channels • 3000 mailboxes	

IP Office Server Edition versus Preferred Edition

The following table compares the key features of IP Office Server Edition and Preferred Edition.

Feature	Preferred Edition	Server Edition / Server Edition Select	Server Edition Comments
Capacity	32 locations	32/150 locations	Increased capacity requires Server Edition Select.
	1000 users total	2500/3000 users total	
	7200 BHCC	18000/20000 BHCC	
SCN/Multi-Site	Free from Star, mesh, chain SCN trunks anywhere SCN trunk channels licensed	Single or double star Select allows Expansion/ Expansion links Unlimited SCN trunk channel licenses	Restricted topology allows many optimizations Other H.323 trunk types still allowed
Administration	Limited centralized (SCN Manager)	Fully centralized (IP Office Manager, IP Office Web Manager)	Consolidated mode for complete centralization. Non-consolidated mode for per device configuration
Licensing	Individual or distributed	Central pool	All common licenses centralised.
			Some still distributed.
			All administered centrally
User Profile Licenses	Telecommuter	Office Worker	
	Mobile Worker	Power User	

Table continues…

Feature	Preferred Edition	Server Edition / Server Edition Select	Server Edition Comments
	Office Worker		
	Power User		
O/G Call Routing	Complex, no default assistance	Simplified	Manager and default routes allow simpler O/G call routing
I/C Call Routing	Complex, no default assistance	Simplified	Common ICRs allow simpler I/C call routing and resilience
Time	Free form/complex	Simplified by default, can still be freeform	Primary Server acts as solution time server by default
System directory	Free form/complex	Simplified by default, can still be freeform	Primary Server acts as solution directory server by default
Fax transport	IP Office T.38 fax transport	G.711 fax transport	No need to configure codec sets to enforce; G.711 fax transport used automatically
SIP Trunk Direct Media to remote device across SCN	None	Direct media supported to remote IP endpoints (H.323, SIP, IP DECT)	Includes SIP Info and RFC 2833 support. No in-band DTMF support
Hunt Groups	Freeform	Hunt groups only on primary — resilient on Secondary.	Performance optimised for Voicemail Pro location (also on Primary)
			Automatic resilience when Secondary present.
SoftConsole	Up to 4 per IP Office	Up to 10 on Primary/ Secondary. Up to 4 on V2 Expansion. Total 32/50 per solution.	Increased solution capacity requires Server Edition Select.
Add/remove device	Manual	Integrated through Manager	Auto population of Multi-Site links and common configuration
Device Status/ connectivity	Not checked	Access and interconnects checked by Manager	Immediate indication if device offline or incorrectly networked.
IP Office Initial configuration	Manual	Automated with Initial Configuration Utility (ICU)	Remote install technician without IP Office knowledge.

Table continues…

Feature	Preferred Edition	Server Edition / Server Edition Select	Server Edition Comments
Upgrades	Individual	Centralized	All expansion systems upgraded at same time.
Backup/restore	Individual per IP Office and per application	Centralized	Security settings not backed up.
Voicemail Pro ports	40	150/500	Increased capacity requires Server Edition Select.
Voicemail Pro servers	1/2	1/2	Server Edition Select allows 2 active Voicemail Pro servers
Embedded VM/AA	Supported	Not supported	Central Voicemail Pro only
Voicemail Pro VRL, VRLA, VBA, database access, campaign web management	Supported on Windows Voicemail Pro server only	Not Supported	Campaigns are supported, but not the web access for management
CCR	Not supported	Not supported	
Software distribution	Admin DVD + Apps DVD	Single ISO distribution	Non English TTS separate DVDs
Software Only Solution	No	Yes (Controlled introduction at present)	
Single management portal	No	Yes – Web Control on Primary Server	Backup portal on Secondary Server
Templates	Line, Extension*, User*, Hunt Group, Time Profile, Firewall Profile, IP Route, Service, Tunnel, ARS. Locally stored.	Line, Extension*, User*, Hunt Group, Time Profile, Firewall Profile, IP Route, Service, Tunnel, ARS. Centrally stored.	*Multiple creation option
IP Office DevConenct/ SDKs	Supported	Supported as a set of individual IP Office devices.	No whole-solution SDK supported at present.
Unified Communications Module	Supported	Not supported	Neither UCM v1 or v2 supported.

BCM and IP Office interoperability

The SIP interoperability support between IP Office and BCM50/450 allows customers to migrate a network of BCM, step-by-step, to an IP Office SCN or Server Edition network.

Protocol support IP Office to BCM: SIP

	BCM to BCM: SIP or SIP/MCDN IP Office to IP Office H.323: SCN or SIP **Note:** It is not possible to connect IP Office and BCM through the MCDN or SCN protocol directly.
IP Office platform requirements	Release 8.1 or higher, Essential, Preferred or Server Editions
BCM platform requirements	BCM50 or BCM450 6.0
Centralized voicemail	IP Office with a centralized Voicemail Pro system in the SCN network BCM with a centralized voicemail within the BCM MCDN network. **Note:** Centralized Voicemail across IP Office and BCM systems is not supported.
Phones	All phones supported on the individual call servers and releases including Avaya IP Phone (H.323), Avaya Digital phones, BCM 7000 Series Digital phones, BCM1100/1200 Series IP Phones (SIP), DECT R4 and Analog phones.
Features	Advanced feature set of IP Office SCN available between the IP Office and BCM. MCDN features are also available between the IP Office and BCM. The standard SIP features are supported.

BCM with CS1000 to IP Office migration

This configuration allows migrating a network of BCM and CS1000 to IP Office step-by-step by adding IP Office systems to it.

Protocol support	IP Office to BCM: SIP IP Office to CS1000: SIP IP Office to IP Office: SIP or H323 - SCN Networking BCM to BCM: SIP or SIP/MCDN BCM to CS1000: SIP or SIP/MCDN **Note:** Only UDP will be supported and not TCP.

	IP Office to CS1000 using H.323 or PRI trunks is not supported.
IP Office platform requirements	Release 8.1 or higher, Essential, Preferred or Server Editions
BCM platform requirements	BCM50 or BCM450 6.0
CS1000 platform requirements	CS1000 7.5 with NRS
Centralized voicemail	Centralized Voicemail for all IP Office systems in the SCN network. BCM systems may use centralized voicemail of the CS1000. IP Office systems cannot use centralized voicemail of CS1000.
Phones	All phones supported on the individual call servers and releases including Avaya IP Phone (H.323), Avaya Digital phones, BCM 7000 Series digital phones, BCM1100/1200 Series IP phones (SIP), DECT R4 phones, and Analog phones.

Platform and application security details

For additional information on security, see *Avaya IP Office™ Platform Security Guidelines*

Platform

- The IP Office for Linux operating system is based on Red Hat Enterprise Linux that is further hardened for defaults, packages, and users.
- The operating system of Server Edition Expansion System (L) is developed for IP Office. The operating system is simple, stable, and reliable.
- The operating system of Server Edition Expansion System (V2) is developed for IP Office. The operating system is simple, stable, and reliable.
- Components that are secure:
  - Software security engine for all the components.
  - Hardware security engine for Office Server Edition Expansion System (V2).
  - Internal Access Control Engine polices for external service requests and internal applications.

Manager

- Transport Layer Security (TLS) secures the communications between IP Office Manager and IP Office and insecure ciphers are disabled.
- Provides Role based user access control (RBAC).
- Provides comprehensive user account and password controls.

- You can enable a PKI Trust domain.
- The system generates warnings messages if administrative passwords are set to default. The system sends alarms or login failure.
- The system records all the accesses in the audit trail.
- You can disable unused services and ports such as HTTP.

Administration user accounts

The administration user accounts can be controlled for:

- Password complexity
- Previous password history (administrative accounts only)
- Change password on next login
- Idle lockout and login failure lockout
- Time and date the account expires (administrative accounts only)

Single sign-on (SSO)

- Administration credentials to log in to Linux Platform settings are securely transferred to Manager, SSA,Voicemail Pro client.
- All administrative logins on all IP Office components including Voicemail Pro and Avaya one-X® Portal for IP Office use security settings of IP Office.
- Server user management feature in Web Manager synchronizes administrative user credentials with all components of IP Office including Voicemail Pro and Avaya one-X® Portal for IP Office in IP Office Server Edition Solution.

Audit trail

- Each IP Office system maintains an audit trail of access and configuration change.
- Linux Platform settings also maintains an audit trail.
- The IP Office system displays the audit trail in IP Office Server Edition Manager and SSA.
-

Public Key Infrastructure (PKI)

- IP Office supports X.509 certificates
- The Server Edition Primary and the Application server support an integrated Certificate Authority (CA)
- The Trusted Certificate Store can be configured and Identity certificate is available.
- The system performs a Certificate Signing Request (CSR) through Simple Certificate Enrollment Protocol (SCEP).
- The system creates a self-signed Identity certificate that can be copied to all HTTPS/TLS interfaces.
- Flexible controls to enforce Trust domain on specific services. Extended trust controls for PKI .
- Web Management Console,Voicemail Pro and Avaya one-X® Portal for IP Office on Linux support X.509 certificates, but not PKI.

LAN

- The servers and expansion systems are thoroughly tested for resistance to Denial of Service and other attacks
- Server Edition Expansion System (V2) supports a configure able Firewall
- Time profiles on Server Edition Expansion System (V2) only
- Static NAT and NAPT in Server Edition Expansion System (V2)
- ICMP Filtering
- L2TP/PPP VPN on Server Edition Expansion System (V2) only
- PAP or CHAP password exchange
- Idle or quota timeout
- IPSec VPN on Server Edition Expansion System (V2) only

Endpoints

- Username and PIN or password or login code are in the IP Office configuration, and you can administer these through IP Office Server Edition Manager
- You can use HTTP or HTTPS for settings and firmware upgrades
- You cannot make calls unless you are logged in

Call barring

- You can configure flexible call barring controls using login name or account code to allow internal, local, national or international calls on the basis of every user and system.
- You cannot use speed dials, transfers, forwarding, and conferences to bypass controls.
- You can enable trunk to trunk calls using IP Office Server Edition Manager. Trunk to trunk calls are disabled by default.
- SIP trunk configuration for incoming calls must match URIs..
- You can use SMDR (CDR) to create a record of all calls.

Voicemail Pro client

- You can enforce user login with Personal Identification Number (PIN) and configure complexity for the PIN.
- You can enforce PIN change when the user logs in for the first time.
- Idle timeout.

Chapter 4: Configuration details

Network configuration

Server Edition single server reference configuration

This reference configuration is for a customer who has only one location, IP telephony, and requires no resilience.

For specific capacity information, see *Deploying Avaya IP Office™ Platform Server Edition* .

In this configuration, a single Server Edition Primary server supports all telephones configured as a centralized IP Office Server Edition Solution system. The Server Edition Primary server is an integrated media, feature, messaging, productivity and mobility, and license server that also provides browser based management.

Server Edition dual servers reference configuration

This reference configuration is for a customer who has one or two locations, IP telephony, and may require resilience.

For specific capacity information, see *Deploying Avaya IP Office™ Platform Server Edition* .

In this configuration two Server Edition servers are configured:

- Server Edition Primary — You can configure trunks, users, and extensions on a primary server. You can distribute and administer all hunt groups on a primary server. The primary server offers resilience for the IP Phone and users of the secondary server.
- Server Edition Secondary — You can configure trunks, users, and extensions on a secondary server. The secondary server offers resilience for IP Phone, Voicemail Pro, and hunt group of the primary server.

For an IP only telephony

In this configuration a minimum two Server Edition servers are configured in IP Office Server Edition Solution.

For an hybrid of IP/analogue/TDM telephony

In this configuration a minimum twoServer Edition servers are configured in IP Office Server Edition Solution. To add capabilities for an analogue or digital interface network you need a Server Edition Expansion System (V2).

Server Edition multiple servers reference configuration

This reference configuration is for a customer who has more than three locations and may require resilience.

For specific capacity information, see *Deploying Avaya IP Office™ Platform Server Edition* .

You can configure a Server Edition Expansion System (V2) in a location where there are analogue or digital interfaces.

You can configure a Server Edition Expansion System (V2) or a Server Edition Expansion System (L) in a location where there are only IP interfaces.

Server Combinations and Usage

- The Server Edition Primary and Server Edition Secondary must be on the same platform. This constraint applies equally to virtual servers. It is possible to mix native and virtual central servers, but the resources allocated to the virtual environment should match the native server.
- Virtualised and native servers can be mixed in the same Server Edition solution in any role, provided the Server Edition Primary and Server Edition Secondary are the same as indicated above.
- It is possible to use the Unified Communication / Application Server R210 / DL120 / R220 servers as this is the same hardware and software as the Server Edition R210 / DL120 / R220 servers. If the server is installed with theServer Edition software, it will be supported by Avaya.
- You cannot set up a Server Edition Expansion System(L) in the Standard IP Office mode of operation in the IP Office Server Edition Solution.
- You cannot re-provision a Server Edition server without a complete reinstall. For example, you cannot convert a primary server to a secondary or expansion system.
- You cannot set up a Server Edition Expansion System (L) in the Standard IP Office mode of operation in the IP Office Server Edition Solution. You cannot convert a Server Edition Expansion System (V2) to a Server Edition Primary or Server Edition Secondary server.
- The use of any external VMPro server (either Linux or Windows) is not supported.
- The use of an external one-X Portal server not running Server Edition software, and not running on a supported server, is not supported.

Packaging and order codes

Server order codes

For server specifications and deployment options, see Components on page 15.

Avaya-supplied Servers

Table 3: Large Servers

Material Code	Description	Type
383542	R630 SRVR IPO SE PRIMARY	Dell R630
306961 **[1]**	R620 SRVR IPO SE PRIMARY	Dell R620
270393 **[1]**	DL360G7 SRVR IPO R8.1+ PRIMARY	HP DL360

1. End of sale.

The Dell R630 is a replacement for the Dell R620. The Avaya-supplied Dell R620 and Dell R630 can be considered equivalent.

Table 4: Small Servers

Material Code	Description	Type
270395 **[1]**	DL120G7 SRVR IPO R8.1+ EXP	HP DL120
302788 **[1]**	R210 II XL SRVR IPO SE EXP	Dell R210
380225	R220 II XL SERVER IP OFFICE SERVER EDITION EXPANSION	Dell R220

1. End of sale.

The Dell R220 is a replacement for the HP DL120 and Dell R210. The Avaya-supplied HP DL120, Dell R210 and Dell R220 can be considered equivalent.

Alternative Servers

Material Code	Description	Type
269810 **[1]**	DL120G7 SRVR UC IPO R8+	HP DL120
302786 **[1]**	R210 II XL SRVR IPO UC	Dell R210
380223	R220 II XL SERVER IP OFFICE UNIFIED COMMUNICATIONS	Dell R220

1. End of sale.

The Dell R220 is a replacement for the HP DL120 and Dell R210. The Avaya-supplied HP DL120, Dell R210 and Dell R220 can be considered equivalent.

IP500 V2 control unit order codes

Item	Order code	Name	Description
Control units	700476005	IPO IP500 V2 CNTRL UNIT	IP500 V2 control unit

Table continues…

Item	Order code	Name	Description
	700501510	IPO IP500 V2 CNTRL UNIT TAA	IP500 V2 Trade Agreements Act (TAA) compliant control unit
Power cords	700289762	IPO — PWR LEAD (EARTHED) EU CEE7/7	CEE7/7 (Europe)
	700289747	IPO — PWR LEAD (EARTHED) UK	BS1363 (United Kingdom)
	700289770	IPO — PWR LEAD (EARTHED) US	NEMAS-15P (America)
Miscellaneous	700429194	IP500 BLANKING PLATE KIT	IP500 blanking plate kit

Related links

Feature key SD card order codes on page 62
Mounting kit order codes on page 63
Base card order codes on page 63
Trunk card order codes on page 64
External extension module order codes on page 65
Feature key SD card order codes on page 62
Mounting kit order codes on page 63
Base card order codes on page 63
Trunk card order codes on page 64
External extension module order codes on page 65

Feature key SD card order codes

Feature key SD cards are used with IP500 V2 control units and contain all the software required including expansion modules and phone firmware binaries. The control unit must be fitted with one of these feature keys even if no licenses are being used. The serial number for licenses issued for use with this type of feature key is printed on the card label and prefixed by **FK**.

For licensing, each IP Office control unit must have its own feature key and license. The feature key associated with one IP Office system cannot be used to validate the license of another IP Office system.

Order code	Name	Description
700479702	IP OFFFICE IP500 V2 SYSTEM SD CARD A-LAW	(Outside North America) A system fitted with this type of card defaults to a-law PCM telephony.
700479710	IP OFFICE IP500 V2 SYSTEM SD CARD MU-LAW	(North America) A system fitted with this type of card defaults to µ-law pulse code modulation (PCM) telephony.

Related links

IP500 V2 control unit order codes on page 61
IP500 V2 control unit order codes on page 61

Mounting kit order codes

The following mounting kits are available:

Order code	Name	Description
700503160	IPO IP500 RACK MNTG KIT V3	Used for wall and rack mounting of an IP500V2 control unit and external expansion modules. The kits incorporates cable routing at the front and rear of the unit. For wall mounted control units it allows orientation of the control unit base card slots to the left or to the right.
700293905	BARRIER BOX RACK MOUNTING KIT	Barrier boxes must be used for out-of-building analog phone extensions. This bracket allows up to 8 IP Office barrier boxes to be rack mounted and simplifies the number of connections to the protective ground point in the rack. This kit must be used when more than 3 barrier boxes are in use and supports a maximum of 16 barrier boxes for a single external expansion module.

Related links

IP500 V2 control unit order codes on page 61
IP500 V2 control unit order codes on page 61

Base card order codes

Item	Order code	Name	Description
4–Port Expansion	700472889	IPO IP500 EXP CARD 4PT	Includes 4 yellow meter interconnect cables
	700472871	IPO EXP CABLE RJ45/RJ45 2M YELLOW	Only for use with the 4–port expansion card
Phone 2	700431778	IPO 500 EXTN CARD PHONE 2	IP500 Phone 2 extension card
Phone 8	700417231	IPO 500 EXTN CARD PHONE 8	IP500 Phone 8 extension card
ATM4 Combination	700476013	IPO IP500 V2 COMB CARD ATM4	IP500V2 ATM combination card
	700501513	IPO IP500 V2 COMB CARD ATM4 TAA	IP500V2 ATM TAA-compliant combination card
	700504556	IPO IP500 V2 COMB CARD ATM4 V2	IP500V2 ATMV2 combination card
BRI Combination	700476021	IPO IP500 V2 COMB CARD BRI	IP500V2 BRI combination card
Digital Station	700417330	IPO 500 EXTN CARD DGTL STA 8	IP500 DS8 extension card

Table continues…

Item	Order code	Name	Description
	700501512	IPO 500 EXTN CARD DGTL STA 8 TAA	IP500 DS8 TAA-compliant extension card
Legacy card carrier	700417215	IPO 500 LEGACY CARD CARRIER	IP500 carrier card
TCM8 digital station	700500758	IPO 500 TCM 8 EXTN CARD ASSY	IP500 TCM8 card
Voice Compression Module (VCM)	700417389	IPO IP500 MC VCM 32	IP500 media card voice coding module 32
	700501518	IPO IP500 VCM 32 TAA	IP500 TAA-compliant media card voice coding module 32
	700417397	IPO IP500 MC VCM 64	IP500 media card voice coding module 64
	700504031	IPO IP500 MC VCM 32 V2	IP500 media card voice coding module 32 V2
	700504033	IPO IP500 MC VCM 32 TAA V2	IP500 TAA-compliant media card voice coding module 32 V2
	700504032	IPO IP500 MC VCM 64 V2	IP500 media card voice coding module 64 V2

Related links

IP500 V2 control unit order codes on page 61
IP500 V2 control unit order codes on page 61

Trunk card order codes

Item	Order code	Name	Description
Analog trunk	700417405	IPO 500 TRUNK ANLG 4 UNI	IP500 Analog 4 universal trunk card
	700503164	IPO IP500 TRUNK CARD ANLG 4 V2	IP500 Analog 4 universal trunk card V2
BRI trunk	700417413	IPO 500 TRNK BRI 4 UNI	IP500 Basic Rate 4 universal trunk card
	700501515	IPO 500 TRNK BRI 4 UNI TAA	IP500 TAA-compliant Basic Rate 4 universal trunk card
	700417421	IPO 500 TRNK BRI 8 UNI	IP500 Basic Rate 8 universal trunk card
	700458649	IPO IP500 BRI S0 CONVTR CBL	IP500 BRI So converter cable
PRI trunk	700417439	IPO 500 TRNK PRI UNVRSL SNGL	IP500 Primary Rate 1 universal trunk card

Table continues…

Item	Order code	Name	Description
	700501514	IPO IP500 TRNK PRI UNVRSL SNGL TAA	IP500 TAA-compliant Primary Rate 1 universal trunk card
	700417462	IPO 500 TRNK PRI UNIVRSL DUAL	IP500 Primary Rate 2 universal trunk card
	700501517	IPO IP500 TRNK PRI UNVSL DUAL TAA	IP500 TAA-compliant Primary Rate 2 universal trunk card
PRI/T1 trunk	700509377	IP OFFICE IP500 TRUNK CARD T1(J) PRI DUAL	IP500 T1/PRI card

Related links

IP500 V2 control unit order codes on page 61
IP500 V2 control unit order codes on page 61

External extension module order codes

All expansion modules are supplied with a base software level and should be upgraded to match the core software of the control unit in the IP Office system. Expansion modules include an external power supply unit (PSU) and an appropriate interconnect cable. They do not include a locale specific power cord for the external PSU or any phone extension cables.

Item	Order code	Name	Description
Analog Trunk 16	700449473	IPO IP500 EXP MOD ANLG TRUNK 16	16 port analog trunk expansion module (America)
	700501511	IPO IP500 EXP MOD ANLG TRUNK 16 TAA	16 port TAA-compliant analog trunk expansion module (America)
Digital Station 16/30	700449499	IPO IP500 EXP MOD DGTL STA 16	16 port digital station extension module (All countries)
	-	IPO IP500 EXP MOD DGTL STA 16 TAA	16 port TAA-compliant digital station extension module (All countries)
	700426216	IPO IP500 EXP MOD DGTL STA 30	30 port digital station extension module (All countries)
Digital Station 16A/30A	700500699	IPO 500 DIGITAL STATION 16A RJ21 UNIT ASSY	16 port RJ21 digital station extension module (All countries)
	700500698	IPO 500 DIGITAL STATION 30 A RJ21 UNIT ASSY	30 port RJ21 digital station extension module (All countries)
Digital Station 16B/30B	700501585	IPO IP500 EXP MOD DGTL STA 16	16 port digital station extension module (All countries)
	700501586	IPO IP500 EXP MOD DGTL STA 30	30 port digital station extension module (All countries)
Phone 16/30	700449507	IPO IP500 EXP MOD PHONE 16	16 port extension module (All countries)

Table continues…

Item	Order code	Name	Description
	700426224	IPO IP500 EXP MOD PHONE 30	30 port extension module (All countries)
Power cords	700289762	IEC60320 C13 POWER CORD	CEE7/7 power cord (Europe)
	700289747	IEC60320 C13 POWER CORD	BS1363 power cord (United Kingdom)
	700289770	IEC60320 C13 POWER CORD	NEMA5–15P (North America)
	700213390	IEC60320 C7 POWER CORD	NEMA1–15 power cord (America) for Analog Trunk 16 expansion module

Related links

IP500 V2 control unit order codes on page 61
IP500 V2 control unit order codes on page 61

DVD order codes

Avaya supplies DVD media to Avaya Authorized Distributors with current contacts. Avaya does not supply DVDs directly to reseller Partners. Partners should contact their Avaya Authorized Distributors for more information.

Item	Order code	Name	Description
IP Office User/ Admin (Windows)	700508797	IP OFFICE R9.1 USER/ADMIN DVD	Administration applications and Voicemail Pro including documentation.
IP Office Server Edition and Application Server (Linux)	700508798	IP OFFICE/IP OFFICE SL R9.1 LX INSTALL DVD	Server Edition, Select and Application Server Linux images. Software selection is done as part of the ignition process during installation.
	700508799	IP OFFICE/IP OFFICE R9.1 VRTLZDLX DVD	Server Edition, Select and Application Server software for deployment on a VMware server.

Licences

Many solutions, applications and features on IP Office systems are licensed and only operate when a valid license is detected. This includes features within IP Office applications running on PCs connected to the IP Office system.

For information on IP Office licenses, see *Avaya IP Office™ Platform Solution Description*.

Port assignments

Details of the range of ports used by IP Office and IP Office applications are found at https://support.avaya.com/helpcenter/getGenericDetails?detailId=C201082074362003.

Most PC firewalls requests the user to allow various exceptions when a newly installed application first runs. However this is not always the case, especially if the firewall is located elsewhere than the user's PC. The file `avayafw.bat` can be used to open up the necessary firewall exceptions for IP Office applications. The file can be downloaded from http://marketingtools.avaya.com/knowledgebase/tools/firewall.

DTE port	9 way D-type D-Type female connector: V.24/V.28
Analog trunk ports	RJ45 sockets: Loop Start/Ground Start (regionally dependant)
Power fail ports	RJ45 sockets: 2x sockets for ATM16 and 1x sockets for ATM4
ISDN data rates	BRI: B-channel 64 Kbps or 56 Kbps, D-channel 16 Kbps
Analog phone ports	• RJ45 sockets • REN: 2. (External Bell via POT port: REN = 1) • Off Hook Current: 25 mA. • Ring Voltage: 40 V (nominal) RMS.
LAN	RJ45 sockets. Auto-negotiating 10/100 BaseT Ethernet (10/100 Mbps)
Audio	• 3.5 mm stereo jack socket. Input impedance 10 K/channel. • Maximum AC signal - 200 mV rms.
External output port	• 3.5 mm stereo jack socket. Switching capacity 0.7 A. • Maximum Voltage - 55V DC. On state resistance 0.7. • Short circuit current 1 A. Reverse circuit current capacity 1.4 A.
Embedded voice memory	IP500V2: 512 MB compact flash memory (SD) card for voicemail

Traffic and quality of service

Busy Hour Call Complete (BHCC) is a measure used to test the systems under a high call load. For BHCC tests, each incoming call rings for 5 seconds, is answered and stays connected for 6 seconds. The BHCC figures for the different IP Office control units are listed below. The BHCC figure achievable is limited by the number of incoming trunks supported.

Server model	Non-Select	Select
Dell R620/OVA With no Avaya one-X® Portal active users	18000	20000
Dell R620/OVA With Avaya one-X® Portal active users	9000	10000
HP DL360 With no Avaya one-X® Portal active users	18000	18000
HP DL360 With Avaya one-X® Portal active users	9000	9000
Dell R210 or HP DL120 With or without Avaya one-X® Portal active users	7200	7200
IP500V2	7200	7200

Glossary list

Automatic Route Selection	A feature of some telephone systems in which the system automatically chooses the most cost-effective way to send a toll call.
Busy Hour Call Completions	A measure of dynamic traffic calls that can be completed in an average busy hour.
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.
Computer Supported Telecommunications Application (CSTA)	A standard interface for Computer Telephony Integration (CTI) applications, such as voice mail and auto-attendant, to interact with telephony equipment.
Digital Communications Protocol	A proprietary protocol that is used to transmit both digitized voice and digitized data over the same communications link. A Digital Communications Protocol (DCP) link consists of two 64-kbps information (I) channels, and one 8-kbps signaling (S) channel. The DCP protocol supports two information-bearing channels and two telephones or data modules.
Directory Enabled Management	An interface that uses Avaya Directory Server to facilitate administration of Modular Messaging from a centralized location.
Distributed Communications System	A proprietary inter-networking protocol from Avaya with which you can configure two or more Avaya-based private communication networks to operate as one, large network.
Domain Name System (DNS)	An Internet Engineering Task Force (IETF) standard for ASCII strings to represent IP addresses. The DNS is a distributed internal directory service used mostly to translate between domain names and IP addresses. Avaya 9600 Series IP Telephones can use DNS to resolve names into IP addresses. In DHCP, TFTP, and HTTP files, DNS names can be used whenever IP addresses are available as long as a valid DNS server is identified first.

Dynamic Data Exchange (DDE)	An interprocess communication (IPC) method.
Dynamic Host Configuration Protocol (DHCP)	An Internet Engineering Task Force (IETF) protocol used to automate IP address allocation and management.
Ethernet Routing Switch (ERS)	The Avaya stackable chassis system that provides high-performance, convergence-ready, secure, and resilient Ethernet switching connectivity.
Expansion Interface	A port circuit pack in a port network (PN) that provides the interface between a time-division multiplex (TDM) bus or a packet bus on the PN and a fiber-optic link. Expansion interface (EI) carries circuit-switched data, packet-switched data, network control, timing control, and digital signal-1 (DS1) control. EI in an expansion port network (EPN) also communicates with the master maintenance circuit pack to provide the environmental status and the alarm status of the EPN to the switch processing element (SPE).
Expansion port network	In Intuity Audix Server configurations, a port network (PN) that is connected to the time-division multiplex (TDM) bus and the packet bus of a processor port network (PPN). Control is achieved by indirect connection of the EPN to the PPN by way of a port network link (PNL).
Extension to Cellular access number	The phone number dialed to connect to the Avaya server that is running Communication Manager. The Extension to Cellular access number initiates the process of enabling or disabling Extension to Cellular or changing the station security code.
Federal Communications Commission (FCC)	A United States federal agency that regulates communications such as wire-line communications and the Internet.
Global Technical Services	An Avaya team that answers customer calls about products in Avaya Integrated Management.
Internet Protocol	A connectionless protocol that operates at Layer 3 of the Open Systems Interconnect (OSI) model. Internet Protocol (IP) is used for Internet addressing and routing packets over multiple networks to a final destination. IP works in conjunction with Transmission Control Protocol (TCP), and is identified as TCP/IP.
Local Survivable Processor	A configuration of the S8300 media server in which the server acts as an alternate server or gatekeeper for IP entities such as IP telephones and G700 media gateways. These IP entities use the Local Survivable Processor (LSP) when the IP entities lose connectivity with the primary server.

Media gateway	An application-enabling hardware element that is part of a family of such elements. This family includes intra-switch connectivity, control interfaces, port interfaces, and cabinets. Avaya media gateways support both bearer traffic and signaling traffic that is routed between packet-switched networks and circuit-switched networks to deliver data, voice, fax, and messaging capabilities. Media gateways provide protocol conversion, such as IP to ATM to TDM, conferencing, presence, such as on-hook or off-hook, connectivity to private networks and public networks, such as IP, ATM, TDM, and networking, such as QSIG, DCS, ISDN. Media gateways support optional form factors.
Network Address Port Translation	A network routing technique. Network Address Port Translation (NAPT) is used to access systems on the same subnet as an IP Office.
Network Routing Policy	An application for centrally managing SIP routing for Session Manager instances. A routing policy describes how a call is routed: where it comes from, where it's going, what its dial pattern is, what time of day it is routed, and its cost for a particular route.
Novell® eDirectory™	An X.500-compatible directory service software product initially released in 1993 by Novell® for centrally managing access to resources on multiple servers and computers within a given network. Novell® eDirectory™ was formerly known as Novell® Directory Services. It is sometimes referred to as Netware Directory Services. Novell® eDirectory™ is a hierarchical, object-oriented database used to represent certain assets in an organization in a logical tree, including people, positions, servers, workstations, applications, printers, services, and groups.
OFCOM	The United Kingdom Office of Communication for the regulation of telecommunications.
PARTNER® Contact Closure Adjunct	A device that is connected to the chassis of a media gateway and provides contact closures. Contact Closure Adjunct (CCA) closes a relay in response to a dial-in command from the media gateway to operate a door or perform a similar action.
Product Information Presentation System	The Product Information Presentation System (PIPS) reports provide data from the Product Information Expert (PIE), a data mining tool that extracts Avaya customer switch and adjunct configuration information and stores it in a database.
Product Licensing and Delivery System (PLDS)	The Avaya licensing and download website and management system. Avaya Business Partners and customers use this site to obtain ISO image files and other software downloads.
Public Switched Telephone Network (PSTN)	A telephone network that includes many communication technologies such as microwave transmission, satellites, and undersea cables.

Remote Feature Activation	A Web-based Avaya application to remotely activate features and increase capacities on the system of a customer by delivering a new license file.
System Manager	A common management framework for Avaya Aura® that provides centralized management functions for provisioning and administration to reduce management complexity.
System Status Application	An IP Office application that shows the status of things such as outgoing calls.
Telecommuter	The configuration where Communication Manager establishes the voice connection to a circuit-switched telephone. Requires two connections: a TCP/IP connection for signaling control and a circuit-switched connection for voice.
Telephony Application Program Interface (TAPI)	A Microsoft® Windows API that enables computers running Windows to use telephony services. TAPI is used for data, FAX, and voice communications. Applications can use TAPI to control telephony functions, such as dial, answer, and hang up.
Telephony Service Provider Interface (TSPI)	A Microsoft-defined interface to the telephony service provider (TSP). Microsoft® Windows comes with an H.323 TSP, an IP conference TSP, a kernel-mode device driver TSP, and a unimodem TSP.

Index

A

a-law PCM 23, 62
application notes 11
architecture 13
Avaya Communicator 35
    iPad 36
    Windows 37

B

backup 47
base cards 24, 63
BCM migration 54, 55
BHCC 67
business continuity 44

C

CA 32
caveats and limitations 50
Central Access 32
clearance requirements 17
components 15
control unit 22
customer-provided PC requirements 20

D

DevConnect 11
DMM 34
document changes 7
dual 59
DVDs 66

E

edition 52
external expansion modules 27
external extension module 65

F

feature keys 23, 62

H

hardware dimensions 17
humidity requirements 18

I

interfaces 67
IP500V2
    SD cards 62
IP500 V2 22
IP500 V2 control unit 61
iPad 36

L

licenses 66

M

Meet-Me conferencing 40
mounting kits 63
multi 60

O

one-X Portal for IP Office 34
order codes
    base cards 63
    DVDs 66
    external extension module 65
    IP500 V2 control unit 61
    servers 60
    trunk cards 64

P

PCM 23, 62
physical system protection 19
ports 67
power requirements 19
product compatibility 10
pulse code modulation 23, 62

Q

QoS 67

R

Radvision 40
related documentation 7
remote access 44
requirements 44
    humidity 18
    physical system protection 19

requirements *(continued)*
temperature 18
resilience 45
resource websites 10
restore 47

S

Scopia 40
SD cards 23, 62
security 56
server combinations 60
Server Edition 13
Server Edition Manager 30
servers 60
single 59
SMA 32
SNMP Management Console 32
SoftConsole 38
SoftConsole administration 32
software DVDs 66
Solution Management Application 32
solution specification 16
specifications
call capacity 67
port interfaces 67
SSA 33
support 11
SysMonitor 32

T

temperature requirements 18
test strategy 48
topology 13
training 9
trunk cards 26, 64

V

Video Collaboration Solution 40
video conferencing 40
videos 10
Voicemail Pro 42

W

web collaboration 41
Web Manager 32