Avaya IP Office™ Platform Solution Description

Release 11.0.4
May 2019

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Contents

Chapter 1: Introduction

Purpose

This document describes IP Office from a holistic perspective focusing on the strategic, enterprise, and functional views of the architecture. This document also includes a high-level description of solution specifications and available reference configurations.

Change history

The following table describes major changes made in this document for each release.

Issue	Release date	Summary of changes
Release 11.0 FP4	February 2019	• Updated the What's new topic with the Release 11.0 FP4 features. • Updated Avaya Equinox™ topic to add content on Shared Control and Avaya Vantage™ support. • Updated Avaya one-X® Portal topic to add serviceability enhancements. • Updated the licensing information. • Updated the supported browsers section. • Updated Media Manager section to add new features supported in IP Office Release 11.0 FP4. • Listed VMWare ESXi 6.7 as a supported Hypervisor.

Table continues…

Issue	Release date	Summary of changes
Release 11.0	May 2018	• Updated the What's new topic with the Release 11.0 features. • Removed references to IP Office Integrated Contact Reporter. • Removed references to IP Office Video SoftPhone as it is not supported in Release 11.0 • Added content about the following applications: - Cloud Operations Manager - Avaya Equinox™ client for IP Office - Avaya IP Office Web Client • Updated the Web Manager section to add content about Configuration Dashboard. • Updated Media Manager section to add new features supported in IP Office Release 11.0. • Added J169 and J179 phones to the phone interoperability and availability sections.
Release 10.1, Issue 1	June 2017	• Updated the "New in this release" section. • Added information about two new applications: IP Office Integrated Contact Reporter and IP Office Media Manager • Added information about additional hypervisor support in the "Virtual environment requirements" section • Added information about two new DECT phones: 3730 and 3735 • Added information about a new Management API/SDK, and two new CTI interfaces: Centralized CTI WebService API and SSI over Web Services • Added information about two new expansion modules: DS16B2 and DS30B2 • Added granular access information in the "Web Manager" section • Added extension information in the "System Status Application (SSA)" section • Updated the "Operating system and browser support" section

Table continues…

Issue	Release date	Summary of changes
Release 10.0, Issue 1	July 2016	• Updated the “New in this release” section. • Replaced 3740 DECT handset references with 3745 DECT. • Updated Avaya Contact Center Select content. • Made the following major licensing updates: - Added more contextual information. - Updated license names and their associated codes. - Reorganized Server Edition licensing content. - Added Basic Edition licenses. - Clarified basic user license support.
Release 9.1, Issue 01.18	February 2016	This document was created to replace the *Avaya IP Office Product Description*.

Chapter 2: Avaya IP Office™ Platform overview

The Avaya IP Office™ Platform is a cost-effective telephony system that supports a mobile, distributed workforce with voice and video on virtually any device. IP Office is an integrated, modular communications solution that scales up to 3000 extensions and 150 sites in a multisite network with resiliency. Match a deployment model to infrastructure needs from simple appliances to virtualized software in a data center with options in between. Improve customer experience and contact center agent efficiency with powerful, affordable multichannel functionality for voice, email and web chat. The solution combines collaboration software plus multichannel contact centers, networking, security and video.

IP Office provides a hybrid PBX with both Time Division Multiplexing (TDM) and IP telephony with trunk support, used in either mode or both concurrently. IP Office has data capabilities built-in, providing IP routing, switching and firewall protection, between LAN and WAN (LAN2).

In addition to basic telephony services and voicemail, IP Office offers both hard phone and soft phone options. Soft phone applications are designed to provide flexibility for remote workers and to allow workers to access telephony services, such as making and receiving calls, voicemail, and call forwarding from their computer or mobile device.

IP Office editions

IP Office also offers advanced features such as audio and video conferencing and voice over IP to meet the evolving needs of small, medium, and large enterprises.

IP Office is available in many deployment models based on the size of the enterprise and the features required using one or all the following elements:

- Virtualized IP Office software running in a virtual machine
- Dedicated server
- IP Office 500 V2 (IP500 V2) control unit

Edition	Platform	Business size (users)	Addresses business needs
Basic Edition	IP500 V2	Less than 25	Simple telephony and messaging capabilities only
Essential Edition	IP500 V2	20–99	Simple telephony and messaging capabilities plus IP telephony with essential mobility
Preferred Edition	IP500 V2	21–250	Essential Edition capabilities plus unified communications with preferred mobility
Server Edition	Linux Server, IP500 V2 and Linux Expansion	100 — 2000	Preferred Edition on a software-based solution.
IP Office Select	Linux Server, IP500 V2 and Linux Expansion	100 — 3000	Preferred Edition on a software-based solution with increased scale and resiliency.
Server Edition or IP Office Select with Virtualized Software	Virtualized	100 — 2000 (or) 100 — 3000	Preferred Edition on a software-based solution with increased scale and resiliency.
Server Edition or IP Office Select hosted in Cloud	Cloud (Powered by Avaya)	100–2000 (or) 25–3000	Preferred Edition on a software-based solution with increased scale and resiliency.

IP Office Essential Edition and Preferred Edition are also referred to as IP Office Standard Mode. Each edition builds upon the next to offer additional functionality.

New in this release

IP Office™ Platform Release 11.0 Feature Pack 4 offers the following new features and capabilities:

Note:

Features are available worldwide unless otherwise specified. Not all features are supported on all platforms and phones. See the descriptions for details.

Fallback twinning

With this feature, IP Office redirects calls to the users twinned mobile number when the primary extensions are unreachable even if mobile twinning is disabled. This feature provides a mechanism for failing over to an external device such as mobile and PSTN if a customer site supporting IP Office phones, loses connectivity with the Cloud data center. The following two short codes are available for disabling and enabling mobile Fallback twinning:

- **Set Fallback Twinning Off**: To disable Fallback twinning

- **Set Fallback Twinning On**: To enable Fallback twinning

IP Office Media Manager enhancements

The following features have been added to IP Office Media Manager:

- Delete recordings
- Audit trail: Administrators can keep track of the usage of recording files in IP Office Media Manager. The following type of usage of a recording can be tracked using this feature:
  - Delete
  - Download
  - Replay
  - Search

Security enhancements for registration of SIP devices

The new security enhancements enable administrators to allow or disallow registration of SIP devices in IP Office based on their User Agent strings. Administrators can use the configuration settings to add, modify, or remove SIP User Agent strings to SIP UA Blacklist, SIP UA Whitelist, and IP Whitelist. Subsequently, the **Allowed SIP User Agents** setting can be used to select which SIP User Agents are allowed for registering with IP Office.

Automatic user synchronization with Avaya Spaces

IP Office R 11.0 FP4 system users and user details created for Avaya Equinox™ can be automatically synchronized with Avaya Spaces server. To use and receive additional Avaya Spaces features, the details of users configured for Avaya Equinox™ need matching users configured on the Avaya Spaces server. The synchronization can be done manually or automatically.

Default extension password

The default extension password or PIN is different than the user password and is much stronger with a minimum of nine digits. IP Office R11.0 FP4 deployments provide for an auto-generated default extension PIN of 10 digits, which can be viewed and modified later. An eye icon next to the **Default Extension Password** field in the user interface can be used to view the existing default extension password.

Avaya Equinox™ support on Avaya Vantage™

Avaya Equinox™ is supported on Avaya Vantage™ phones K165 and K175 in IP Office R 11.0 FP4 deployments.

Route incoming SIP trunk calls based on an optional SIP header

IP Office can be configured to use the optional **P-Called-Party** header in incoming SIP message for call routing. IP Office reads the `P-Called-Party ID` header in the SIP message and routes the incoming SIP calls based on it.

SIP and H.323 Registrars disabled by default

To secure IP Office R 11.0 FP4 from vulnerabilities, the **H.323 Gatekeeper Enable** and **SIP Registrar Enable** fields are disabled by default. Whenever a new H.323 or SIP extension is added and the corresponding registrar is not enabled, IP Office system displays an error message and prompts to enable the fields. When resiliency support is enabled on an IP Office Line in systems having IP extensions and the systems do not have the corresponding registrars enabled,

IP Office system displays an error message and prompts administrators to enable the corresponding registrars.

Avaya Equinox™ shared control

Avaya Equinox™ can now be used in shared control mode with desk phones. The shared control feature is available even when the Avaya Equinox™ client and desk phones are registered on different systems within the same network.

Conference Join

Conference Join feature allows two separate conferences to be joined into one single conference that contains all the previous participants of both the earlier conferences. Once the conferences have been joined it is not possible to revert to the two separate conferences again.

JEM 24 button module support on Avaya J169/J179 IP Phone

Avaya J169/J179 IP Phone can support up to three JEM24 button modules. Each JEM24 has 24 dual-LED buttons with adjacent button label display. The button LEDs are used to indicate the status of the button feature whilst pressing the button is used to access the feature. A single JEM24 supports 72 programmable button slots. These are arranged in 3-pages, with pages accessed using the module's page scroll button. When multiple modules are connected to a phone, each module only supports a single page of 24 programmable button slots.

The modules automatically match the display settings of the phone to which they are connected - color with Avaya J179 IP Phone or greyscale with Avaya J169 IP Phone, font size, background image, screen saver. The button modules are powered though the phone. For more information, see the *IP Office Platform R11.0 J100 Series Telephone User Guide*.

Avaya J139 IP Phone

IP Office support for Avaya J139 IP Phone. Avaya J139 IP Phone is an advanced SIP desk phone that supports IP Office interactive menus and button programming. Avaya J139 IP Phone does not support all the advanced knowledge worker and contact center features that are available in Avaya J169 IP Phone and Avaya J179 IP Phone phones. For more information, see the *IP Office Platform R11.0 J100 Series Telephone User Guide*.

Serviceability enhancements in Avaya one-X® Portal

Avaya one-X® Portal supports a number of serviceability features such as displaying count of logged-in sessions, user avatar, option to block client versions, option to track repeated failed login attempts, and option to clear all sessions of a user.

Simplified Web Self-Administration

The enhanced interface is focused on simplifying the configuration and make it easier for non-technical users and provides a three step self-guided wizard for setting up the basic account. By default the new capability, that is running the wizard, is enabled for all users but the administrator can disable the capability or modify as required.

Features

See *Avaya IP Office™ Platform Feature Description* for detailed feature descriptions.

Topology

There are many options for IP Office topology. For detailed information about all the deployment scenarios, see the related *Reference Configuration* documents for each deployment scenario.

Figure 1: IP Office systems connected to a single IP Office Manager endpoint

Networking

Private circuit switched voice networking

Where leased line circuits are used within a private networking scenario, these E1 or T1 interfaces are typically configured to use Q.SIG signaling between sites.

Q.SIG provides a level of voice feature transparency between PBXs and is the favored signaling standard within multiple vendor and international voice networks. The IP Office E1 or T1 module terminates a QSIG connection with a 120 ohm RJ45 interface.

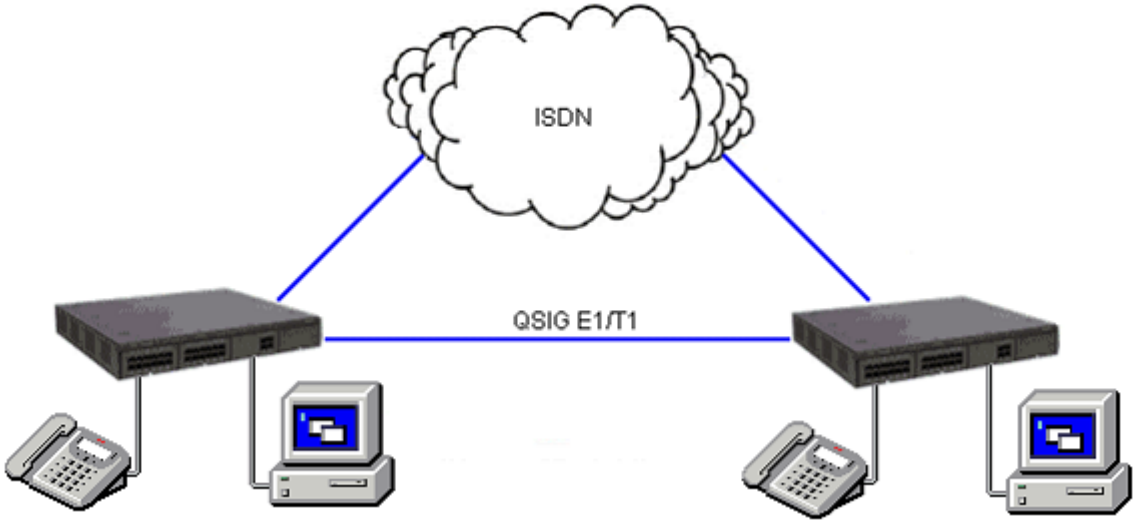


Figure 2: Circuit switched voice networking

IP Office supports the following Q.SIG services across this network:

Simple Telephony Call/Basic Call	ETS300 171/172
Circuit Switched Data Call/Basic Call	ETS300 171/172
Called/Calling Line ID Presentation	ETS300 173
Called/Calling Name Presentation	(SS-CNIP, SS-CONP, SS-CNIR) ETS300 237/238
Message Waiting	(SS-MWI) EN301 260/255
Transfer	(SS-CT) ETS 300 260/261

Public voice networking

IP Office supports a range of trunks and signaling modes for connection to the public switched telephone network (Central Office). Some of these lines are only available in certain territories; please check with your distributor for local availability. Primary rate trunks are available with either a single (24/30 channels) or dual trunk (48/60 channels).

ISDN Primary Rate (ETSI CTR4)

Service is provided by IP500V2 Universal PRI cards. ISDN Primary Rate provides 30 x 64K PCM speech channels over an E1 circuit and one signaling channel. Signaling Conforms to the ETSI Q. 931 standard with Cyclic Redundancy error Checking (CRC).

The following supplementary services are supported:

Calling Line Identification Presentation (CLIP)	Provides the telephone number of the incoming call.
Calling Line Identification Restriction (CLIR)	Prevents the telephone number of the IP Office being presented on an outbound call.
Direct Dialing In (DDI)	Where the exchange provides the last x digits of the dialed number on an incoming call. This allows IP Office to route the call to different users or services.
Sub-addressing	Allows the transmission/reception of up to 20 digits, additional to any DDI/DID or CLIP information, for call routing and identification purposes.

IP Office supports the following features on both PRI and BRI trunks.

Note:

Feature availability depends on the ISDN service provider for which there may be charges.

Malicious Call Identification (MCID)	(2400, 4600, 5400, 5600, T3, T3 IP, 9500, 9600) Short codes and button programming features are available so that users can trigger this activity at the ISDN exchange when required. This feature is NOT available on standard ISDN DSS1 telephones.
Advice of Charge (AOC)	(T3 digital and IP telephones only; Phone Manager) Advice of charge during a call (AOC-D) and at the end of a call (AOC-E) is supported for outgoing ISDN calls other than Q.SIG. The call cost is displayable on T3 telephones for call accounting purposes. IP Office allows configuration of call cost currency and a call cost mark-up for each user.
Call Completion to Busy Subscriber (CCBS)	(2400, 4600, 5400, 5600, T3, T3 IP, 9500, 9600, DECT telephones; Phone Manager) CCBS can be used where provided by the ISDN service provider. It allows a callback to be set on external ISDN calls that return busy. It can also be used by incoming ISDN calls to a busy user. This feature is not available on standard ISDN DSS1 telephones.
Partial Rerouting (PR)	(2400, 4600, 5400, 5600, T3, T3 IP, 9500, 9600, DECT telephones; Phone Manager) When forwarding a call on an ISDN channel to an external number using another ISDN channel, partial rerouting informs the ISDN exchange to perform the forward, thus freeing the channels to IP Office. This feature is not available on standard ISDN DSS1 telephones and it is not supported on Q.SIG.

Explicit Call Transfer (ECT)	(Typically used by a third-party application) ECT is supported on the S0 interface. A Call to an S0 Endpoint can be transferred to any other device such as an analog, digital or IP endpoint or to any trunk. The normal usage of this feature is by a third party application connected through one or more S0 interfaces to IP Office. One example is the VoiceDirector, an automatic call assistant.

ISDN Basic Rate (ETSI CTR3)

Service is provided by IP500 V2 BRI cards. ISDN Basic Rate provides 2 x 64K PCM speech channels and one signaling channel using Q.931 signaling and CRC error checking. Both point to point and point to multipoint operation is supported. Multipoint lines allow multiple devices to share the same line; however point-to-point is the preferred mode.

Basic Rate supports all the services that are supported on the primary rate version with the addition of Multiple Subscriber Number. This service is usually mutually exclusive with the DDI/DID service and provides up to 10 numbers for routing purposes, very similar to DDI/DID.

E1R2 channel associated signaling

Service is provided by IP500 V2 Universal PRI cards.

The IP500 Universal PRI card configured as PRI E1R2 supports a single or dual RJ45 network connection. Each card provides channels that can be configured for MFC, Pulse or DTMF dialing dependent on the requirements of the network.

North American T1 Primary Rate

Service is provided by IP500 V2 Universal PRI cards. T1 Primary Rate provides up to 24 64K channels over a 1.54M circuit. Each channel of the T1 trunk can be independently configured (channelized) to support the following signaling emulations with handshake types of immediate, delay or wink.

- Loop-Start
- Ground-Start
- E&M Tie Line
- E&M DID
- E&M Switched 56K
- DID - Channels configured for DID/DDI support incoming calls only. The carrier or Central Office will provide the last x digits that were dialed to be used for call routing.
- Wink-Start

IP Office T1 trunks support both DNIS and ANI services, where available from the central office.

Dialed Number Identification String (DNIS)	Provides a string of digits to IP Office depending on the number dialed by the incoming caller. This string can then be used to route callers to individual extensions, groups or services.
Automatic Number Identification (ANI)	Provides IP Office with a number identifying who the caller is. This may then be used for routing or computer telephony applications.

T1 trunk cards incorporate an integral CSU/DSU, eliminating the need for an external unit. The CSU function allows the trunk to be put in 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. The DSU function allows the T1 trunk to be shared between data and voice services.

North American Primary Rate Interface (PRI)

Service is provided by the IP500V2 Universal PRI cards. IP Office supports Primary Rate ISDN trunks on 5ESS or DMS100 central office switches provided by AT&T, Sprint, WorldCom and other Local Telcos. Channels can be pre-configured for the supported services or negotiated on a call-by-call basis.

Special services can be configured to route calls to local operators or pre-subscribed carriers for both national and international calls (SSS). Alternate carriers can also be selected through the configuration of IP Office Transit Network Selection (TNS) tables.

IP Office also supports the Calling Name and Number service over Primary Rate Trunks (NI2).

Analog trunks

Loop start	Loop start trunks are available on the IP Office Analog Trunk cards installed within the IP Office control unit, or on the Analog Trunk 16-port expansion modules (ATM16). The first two trunks on the ATM16 are automatically switched to power fail sockets in the event of power being interrupted. Powerfail is also available on the trunk card when fitted to a combination or phone card. They conform to the TIA/EIA-646-B standard. The loop start trunks also support incoming caller line identification (ICLID) conforming to GR-188-CORE and GR-31-CORE standards. IP Office can use this information to route calls or provide it to computer applications to display additional information about the caller.
Ground start	Ground Start trunks are only available on the ATM16, configured through IP Office Manager. The first two trunks on the module are automatically switched to power fail socket in the event of power being interrupted. They conform to ANSI T1.401 and TIA/EIA-646-B standards. Not available in all territories.

Packet-based voice and data networking

IP Office supports data network use for voice communication, called voice over IP (VoIP).

IP Office supports networked voice and data communications with the following services:

- Built-in IP router
- One link for voice and data networking
- Common access to the Internet; share files and send e-mails to other sites
- Support for RIP-2 protocol for dynamic data routing; IPSec VPN, firewall and NAT (Network Address Translation) and for security; Centralized management and proactive fault management via SNMP.

IP Office supports IP packet-based voice networking between sites through VoIP across the campus LAN or VoIP across the public network.

In a factory or campus environment, voice calls can sent over 10/100 Mbps LAN connections on systems equipped with optional Voice Compression Modules (VCM). IP Office supports Diffserve by appropriately marking both RTP packets and signalling packets to facilitate network bandwidth management.

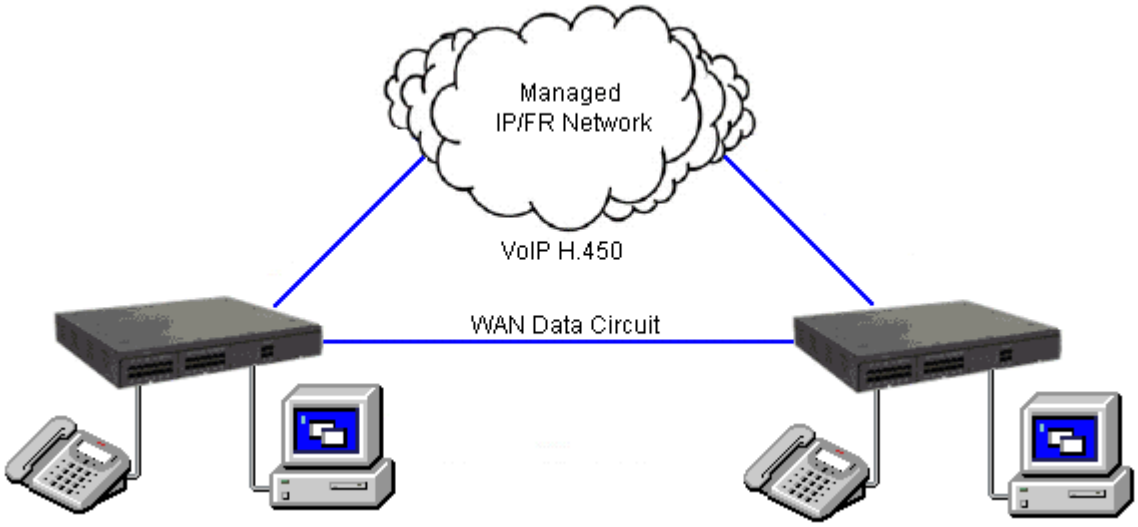


Figure 3: VoIP networking across IP network or WAN

IP Office can realize the benefits of Q.931 and H.450 supplementary service support across a public connection where an appropriate QoS connection can be established.

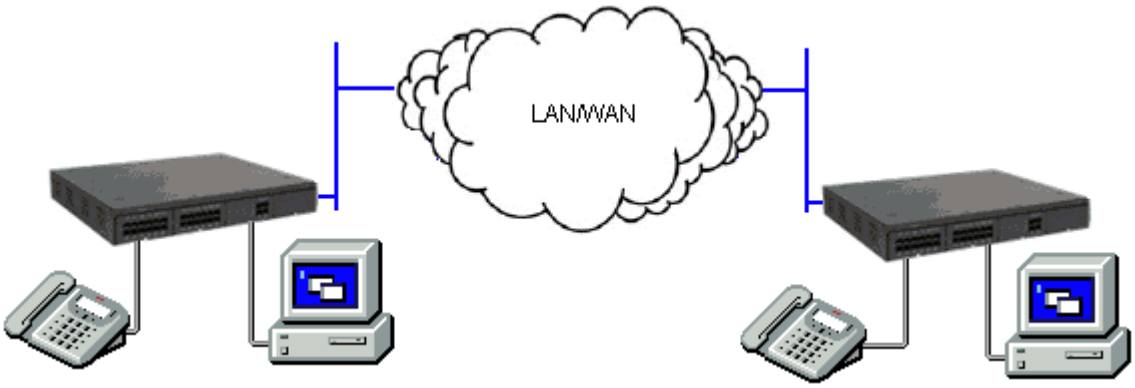


Figure 4: VoIP networking across the LAN

Internet protocol telephony

Internet Protocol (IP) refers to the type of rules that the network uses to send and receive signals. IP telephony converts voice communications into data packets. Conveniently, it runs on Ethernet LAN (local area network) technology. IP telephony unites a company's many locations, including mobile workers, into a single converged communications network.

IP Office is a converged telephony system; it combines aspects of traditional PABX telephony systems and IP data and telephony systems. IP Office supports PSTN, SIP, POTs, digital time

division multiplexed telephones and digital IP telephones all on the same system. IP Office allows all the technologies to coexist.

IP Office connects to the PSTN and to IP trunks providing a “hybrid” PABX function - where both legacy and future technologies can be used together to minimize operating costs and optimize business communications through both voice and data. The converged functionality works on multiple levels:

- Individual phone users can control the operation of their phone through applications running on their PC.
- Data traffic can be routed from the LAN interface to a telephony trunk interface.
- Voice traffic can be routed across internal and external data links. This option is referred to as voice over IP (VoIP).

Voice over IP (VoIP) and network assessments

Voice over IP (VoIP) means voice transmitted over a packet data network. VoIP is often referred to as IP telephony because it uses the internet protocols to make possible enhanced voice communications wherever IP connections exist.

The VoIP mode of operation can include external SIP trunks, IP trunks between customer systems and/or H.323 or SIP IP telephones for users. In either case the following factors must be considered:

- The IP Office control unit must be fitted with voice compression channels. These are used whenever an IP device (trunk or extension) needs to communicate with a non-IP device (trunk or extension) or to a device that uses a different codec.
- A network assessment is a mandatory requirement for all systems using VoIP. For support issues with VoIP, Avaya may request access to the network assessment results and may refuse support if those are not available or satisfactory.

A network assessment would include a determination of the following:

- A network audit to review existing equipment and evaluate its capabilities, including its ability to meet both current and planned voice and data needs.
- A determination of network objectives, including the dominant traffic type, choice of technologies, and setting voice quality objectives.
- The assessment should leave you confident that the implemented network will have the capacity for the foreseen data and voice traffic, and can support H.323, DHCP, TFTP and jitter buffers in H.323 applications.

An outline of the expected network assessment targets is:

Test	Minimum assessment target
Latency	Less than 150 ms
Packet loss	Less than 3%
Duration	Monitor statistics once every minute for a full week

Signaling protocols

In order to make use of VoIP, IP Office uses signaling protocols called H.323 and Session Initiation Protocol (SIP), to establish end-to-end connections for the voice path through an IP network. This

connection ensures that each end is able to transmit and receive voice and provides the network addressing for end-to-end packet transmission. IP Office also connects the different technologies by translating the signals they use. For example an analog telephone can connect to a VoIP destination. This connection requires both the signaling and voice transmission to be translated. IP Office makes this translation using gateways and gatekeepers.

With IP telephony you connect an IP telephone to an IP PBX through a LAN. There are two basic types of IP telephones:

- A physical telephone, which looks very similar to a standard telephone, referred to as a “hardphone”
- A software application, referred to as a “softphone”, which runs on the user’s PC, allowing them to use a headset and microphone to make and receive calls anywhere they an and IP connection.

Quality of Service considerations

When making use of IP telephony, there are a number of data centric considerations such as which data types have priority on the IP network when there is contention. This is set with IP/TCP quality of service and should not be ignored. In situations where LAN bandwidth is limited, a quality of service capable LAN switch should be used to ensure voice packets are transmitted with the required priority on the network. If not, the conversation carried over IP appears as broken up due to delays or has unacceptable delays introduced in the conversation causing latency and jitter. With IP hardphones there is the need for Power over Ethernet (PoE), or local phone power supplies to be provided to the telephones as the IP telephones are not powered by IP Office.

Voice compression channels

Calls to and from IP devices can require conversion to the audio codec format being used by the IP device. IP Office systems use voice compression channels to make the conversion. These channels support the common IP audio codecs G.711, G.723 and G.729a.

The System Status Application can be used to display voice compression channel usage. Within the **Resources** section it displays the number of channel in use. It also displays how often there have been insufficient channels available and the last time such an event occurred.

Table 1: Voice compression channels

Call type	Voice compression channel usage
IP device to non-IP device	Requires a voice compression channel for the duration of the call. If no channel is available, busy indication is returned to the caller.

Table continues…

Call type	Voice compression channel usage
IP device to IP device	Call progress tones (for example dial tone, secondary dial tone, etc) do not require voice compression channels with the following exceptions: • Short code confirmation, ARS camp on and account code entry tones require a voice compression channel. • Devices using G723 require a voice compression channel for all tones except call waiting. When a call is connected: • If the IP devices use the same audio codec no voice compression channel is used. • If the devices use differing audio codecs, a voice compression channel is required for each.
Non-IP device to non-IP device	No voice compression channels are required.
Music on hold played to IP device	Provided from the TDM bus and therefore requires a voice compression channel when played to an IP device.
Conference resources and IP devices	Managed by the conference chip which is on the TDM bus. Therefore, a voice compression channel is required for each IP device involved in a conference. This includes services that use conference resources such as call listen, intrusion, call recording and silent monitoring
Page call to IP device	Uses G729a for page calls, therefore only requiring one channel but also only supporting pages to G729a capable devices.
Voicemail services and IP devices	Treated as data calls from the TDM bus. Therefore calls from an IP device to voicemail require a voice compression channel.
Fax calls	These are voice calls but with a slightly wider frequency range than spoken voice calls. IP Office only supports fax across IP between IP Office systems with the Fax transport option selected. It does not currently support T38.
T38 fax calls	IP Office supports T38 fax on SIP trunks and SIP extensions. Each T38 fax call uses a VCM channel. Within a Small Community Network, a T38 fax call can be converted to a call across an H323 SCN lines using the IP Office Fax Transport Support protocol. This conversion uses 2 VCM channels. In order use T38 Fax connection, the Equipment Classification of an analog extension connected to a fax machine can be set Fax Machine. Additionally, a new short code feature Dial Fax is available.

Note:

T3 IP devices must be configured to 20 ms packet size for the above conditions to apply. If left configured for 10 ms packet size, a voice compression channel is needed for all tones and for non-direct media calls.

H.323 signaling protocol

IP Office IP telephony systems use open standards. Digital IP telephones, gateways and gatekeepers support the H.323 standard and it is this that allows devices from different

manufacturers to work together. IP Office also supports an optional integral gateway, Voice Compression Modules (VCMs) and gatekeeper functionality.

IP Office uses the H.323 signaling protocol using the following architectural components:

IP telephones	H.323 service endpoint devices that support audio calls. Other types of H.323 devices can support video as part of H.323.
Gateways	Provide media translation to allow calls to be made to non-H.323 devices, for instance an analog telephone or the public network to connect with a H.323 device.
Gatekeepers	Control the call processing and security for H.323 devices.
Multipoint Connection Units (MCUs)	Control conferences by adding together media streams.

These elements form an H.323 zone which is analogous to a PABX. Each zone has a single gatekeeper to control call distribution, call control and the resource management. On power-up, IP telephones, gateways and MCUs make registration requests to a gatekeeper which then authenticates (accepts or rejects) the request to become a member of the zone. Once accepted, a telephone wishing to make a call sends a call set-up message to the gatekeeper which then determines how to route the call and will then send an alert to the called telephone, or if the call is to a non-H.323 telephone establish the call via a Gateway within the zone.

Session Initiation Protocol trunking

IP Office uses Session Initiation Protocol (SIP) trunks to allow users to take advantage of telephony services offered by internet service providers (ISPs). In many cases, telephony services offer substantial savings in comparison to traditional exchange lines. To help enable the SIP Service Provider, Avaya offers a SIP Compliance Testing Program (GSSCP) that will validate the operation of IP Office with the ISPs SIP trunk offering. For more information about Avaya's SIP Compliance Testing Program (GSSCP), see https://www.devconnectprogram.com/site/global/compliance_testing/overview/index.gsp.

IP Office allows all users, regardless of their phone type, to make and receive SIP calls. SIP trunks are handled like any other line on IP Office, affording all the call routing and toll control needed to manage inbound and outbound calls.

SIP trunks require provisioning of voice compression channels through the installation of VCM modules within the control unit. A license for the maximum required number of simultaneous SIP calls is also needed. Up to 128 simultaneous calls are supported.

IP Office also supports the T38 protocol which allows Fax over IP.

There are several possible network topologies for SIP trunk systems, as shown in the following diagrams:

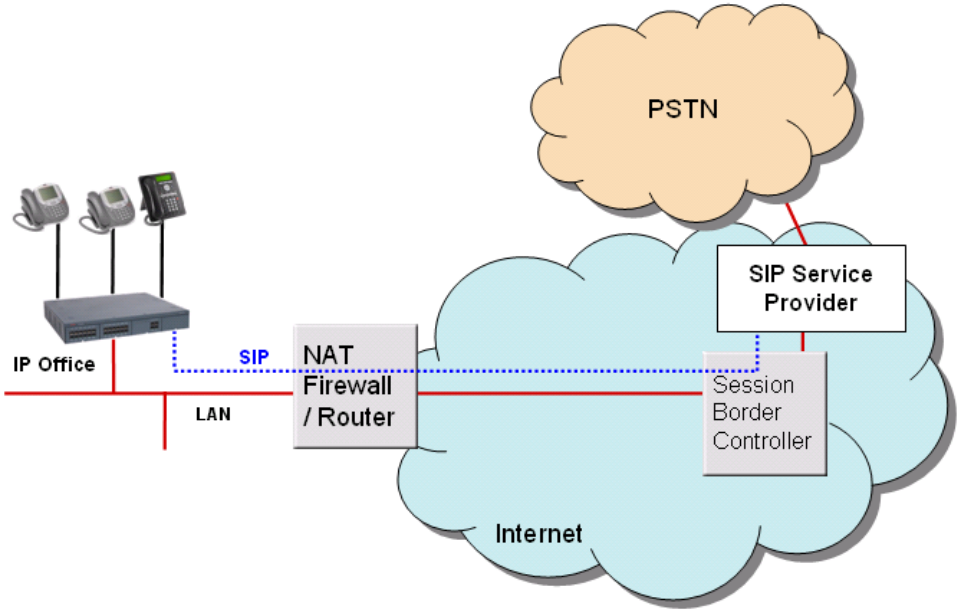


Figure 5: Service provider with Avaya Session Border Controller for Enterprise (recommended)

To make this configuration secure, the IP Office firewall is set to drop all packets except SIP.

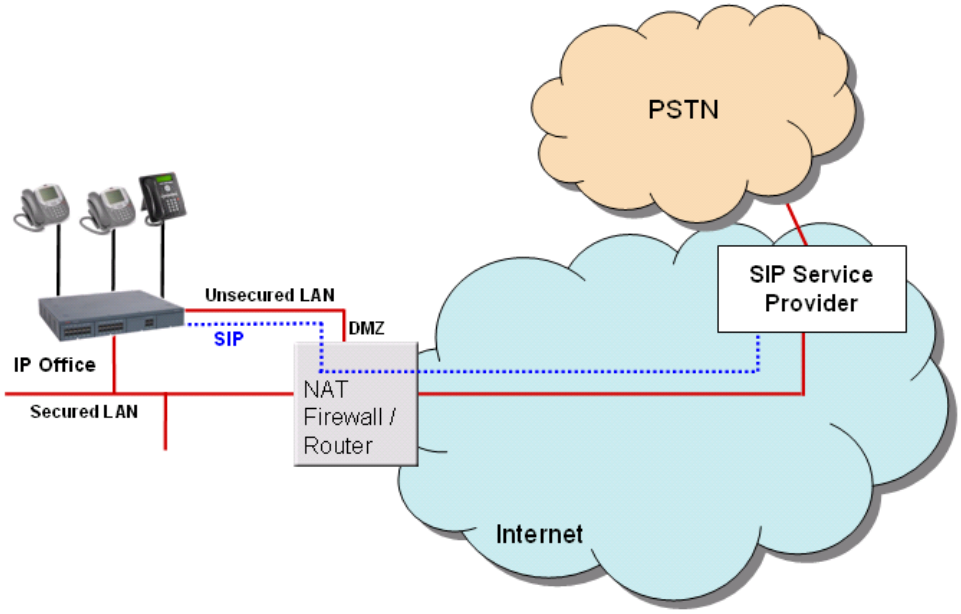


Figure 6: Direct connection from the second Ethernet port to the internet through a DMZ port on the router

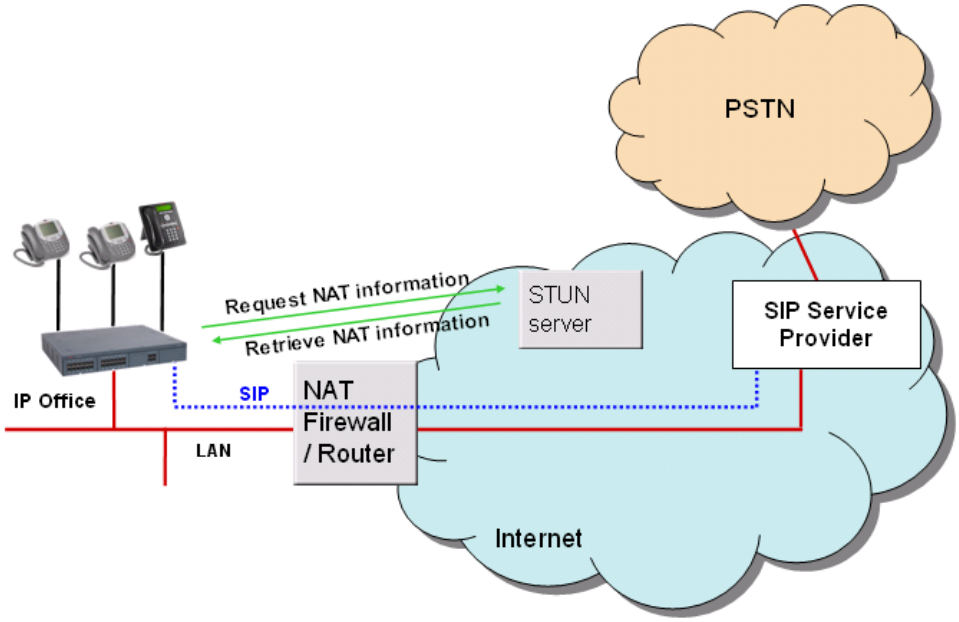


Figure 7: Connection to ITSP over NAT using third-party STUN servers

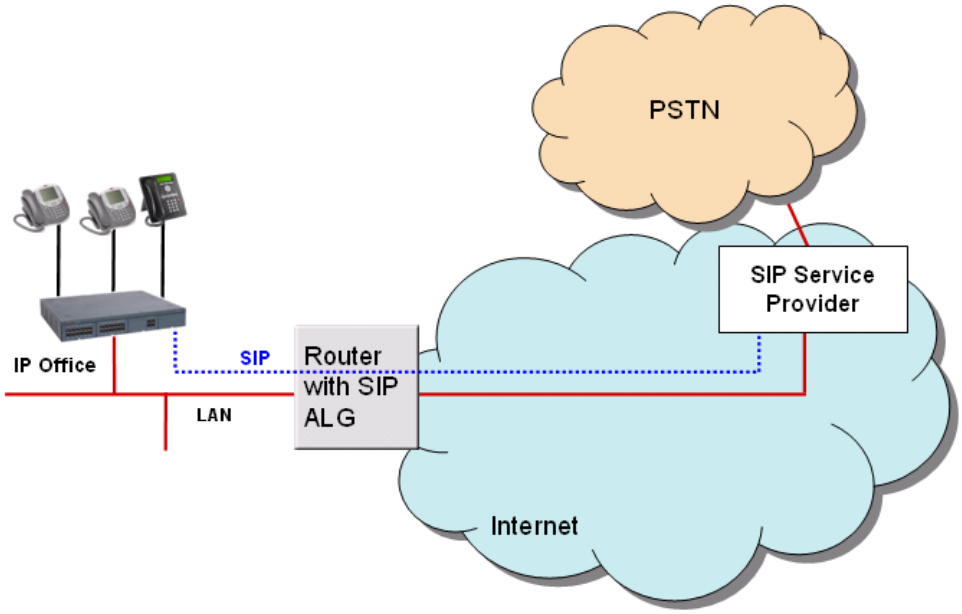


Figure 8: Connection to ITSP through router with ALG to resolves NAT issues

SIP servers

IP Office SIP endpoint implementation is built on two major SIP components: SIP server components SIP endpoint user agent applications.

SIP servers provide SIP endpoint support to allow full interoperability between SIP endpoints, other IP telephones based on H.323, digital and analog telephones as well as IP Office trunks (analog, digital or SIP-based).

SIP servers provide centralized information and enablement services in a SIP ecosystem. The core SIP servers and their functions are summarized here. IP Office provides the features of the following two servers for voice and fax communication.

- **Registrar server**

  When SIP IP telephones come online, they need to make sure that others are aware that they're available to take and make calls. The Registrar authenticates and registers the IP phone (often directly related to a specific user) when it comes online, and then stores information on the telephones logical identities.

- **Proxy server**

  A proxy server takes SIP requests, processes them, and passes them downstream while sending responses upstream to other SIP servers or devices. A proxy server may act as both a server and a client, and can modify a SIP request before passing it along. A proxy is involved only in the setup and teardown of a communication session. After user agents establish a session, communications occur directly between the parties.

Functionality of the following two SIP servers are generally available by IP Office using existing IP Office functionality. Therefore, while functionality is provided, for example, allowing hot desking in a small community network, a consistent methodology between SIP and non-SIP endpoints is used to deliver those features

- **Location service**

  As users roam, the network needs to be continually aware of their locations. The location service is a database that keeps track of users and their locations. The location service gets its input from the registrar server and provides key information to the proxy and redirect servers. IP Office provides hot desking support, delivering a similar functionality but working consistently between SIP and non SIP endpoints.

- **Redirect server**

  If users are not in their home domains, sessions bound for them needs to be redirected to them.

  The redirect server maps a SIP request destined for a user to the device closest to the user. In IP Office, call forwarding and Follow me functionality is used to provide again consistent functionality between all type of endpoints.

SIP endpoint user agents

SIP endpoints, such as SIP telephones, cell phones, PDAs, or workstations, use user agent (UA) applications to provide the interface between the users and the SIP network.

SIP endpoint support is fully integrated into IP Office. No other components are needed. SIP endpoints require VCM module capacity like any other IP phone.

SIP extensions function like any other IP Office extension. IP Office provides the following functionality:

- Make and receive calls to any other extension, independent of type of extension.

- Deliver end-to-end media. During calls between two SIP extensions or a SIP extension and an Avaya IP telephone, IP Office transmits audio end-to-end for basic telephone calls. Conferencing requires a VCM resource.
- Use short codes and authorization codes.
- Transmit in band call progress tones.
- Register endpoint using authentication with username and password.
- Support Auto-create. Successful endpoint registration uses a third-party license.
- Several extensions can register on one IP address, each using a license. This enables the connection of SIP terminal adapters with more than one analog port, giving a different extension number to each port.

Computer Telephony Integration

Computer Telephony Integration (CTI) bridges the gap between the telephone system and business applications. With IP Office, this is achieved with the IP Office CTI Link, a CTI middleware product and software developers kit (SDK).

On IP Office, CTI is delivered through adherence to open standards. This gives businesses access to a wide range of third-party solutions, addressing vertical markets, and designed to meet their requirements. For developers, migrating their offering from other platforms to IP Office is quick and easy, and the advanced CTI features that IP Office offers makes it easy to demonstrate full integration, and more business benefits.

IP Office provides two levels of CTI interoperability:

CTI Link Lite	Free of charge and provides all the functionality required to support the vast majority of applications, including screen-popping, and many third-party products.
CTI Link Pro	Provides enhanced functionality, including the ability to control multiple telephones and gives access to advanced call center operation.

Because IP networking is integrated into the IP Office system, all CTI is done through the LAN. This introduces additional points of failure, as well as relying on non-standard interfaces and handsets. On IP Office, all devices can be used with CTI.

Supported CTI interfaces

IP Office supports the following interfaces:

TAPILink Lite	Provides first-party CTI support for Microsoft TAPI 2.1 and TAPI 3.0, so each PC can control or monitor one telephone. The software components are supplied with the IP Office system on the User CD, and do not required a license key for use. The specification requires that a certain amount of core functionality is implemented, and additionally defines a series of optional functionality that switch vendors may also implemented.

TAPILink Pro	Provides third-party CTI support for TAPI 2.1 and 3.0. These components are identical to their first-party equivalent; the presence of the CTI Link Pro RFA license key (which can be purchased in the usual way for products) enables this additional functionality. TAPILink Pro provides all of the features and functionality of TAPILink Lite, but additionally provides third party CTI operation. This means that a single server can control and monitor any number of telephone devices. In addition, TAPILink Pro provides the ability to monitor and control groups. This allows an application to be notified when a call enters a queue, and can also redirect it to another location.
TAPI-WAV driver	Provides software-based support for voice processing. The TAPI-WAV driver is for use with TAPI 2.1 only; for TAPI 3.0, IP Office supports the Media Service Provider (MSP) interface, defined by Microsoft in TAPI 3.0. This functionality will only work in conjunction with CTI Link Pro and also requires TAPI-WAV licenses. Each license enables 4 ports of voice processing.
DevLink Pro	Provides a real-time event stream in addition to the SMDR interface provided in IP Office SMDR. The real-time event stream takes the form of a call record, which is issued whenever the state of any endpoint of a call changes (typically there are two end points on a call, but for some circumstances, such as conference calls, intruded calls there may be more).
IP Office SMDR	Provides an interface to obtain SMDR events. A comma-separated record is issued for each call, when the call is completed. This interface is designed for call accounting and call billing applications. The IP Office SMDR can be output direct from the IP Office control unit to a designated IP address and port.
IP Office Software Development Kit	This toolkit is delivered on a single CD, containing the developer documentation for TAPILink Lite, TAPILink Pro, DevLink Lite and DevLink pro, as well as pre-compiled programs for exploring TAPI 2.1 and 3.0. In addition, example source code is included, making it easy for developers to become familiar with IP Office CTI interfaces. The Developer Connection Program (DevConnect) is the Avaya developer partner program, and is designed for third-party companies who are creating a product for sale, and who wish to receive technical support. Membership of the program is at the sole discretion of Avaya. DevConnect members pay an annual fee, for which they receive technical support directly from Avaya. In addition, Avaya will perform interoperability testing between IP Office and the member's product, and may also create opportunities for joint marketing, including exhibitions, use of Avaya's logo, and other benefits. More information on the DevConnect program can be found at http://www.devconnectprogram.com.
Centralized CTI WebService API	Provides a more open platform to allow third-parties to add value and build out solutions. Supports distributed (SE/SCN) environment and, therefore, is not limited to nodal like TAPI. It does have a dependency on Avaya one-X® Portal access for the users. When creating a new user in IP Office, it does not require a restart.

SSI over Web Services	Provides system monitoring information of SSI over a read-only REST web service available over https only. Realtime call data and call control are not available via this interface, but they will be made available via the DevConnect program. This feature already has several areas instrumented but the data is for SSA and delivered over the Proprietary SSI interface, and there is a small set of data available on SNMP. It does not require a license.

Open APIs/SDKs

With Release 10.1, IP Office supports a new Management API/SDK to address the needs of “Easy Button” setups. Enhancements to cover more areas, specifically what the legacy "XO" Configuration Web Services covers so that the legacy API can be made End Of Life. Management API provides a REST-based API Interface to the third-party application developers for consuming IP Office configuration objects.

- Provides all capabilities of currently supported IP Office configuration services (XO services).
- Request and response are in XML and JSON format.
- Provides Read/Write access to privileged service users only.
- No separate license is required for accessing the APIs.

Components

Hardware components

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.

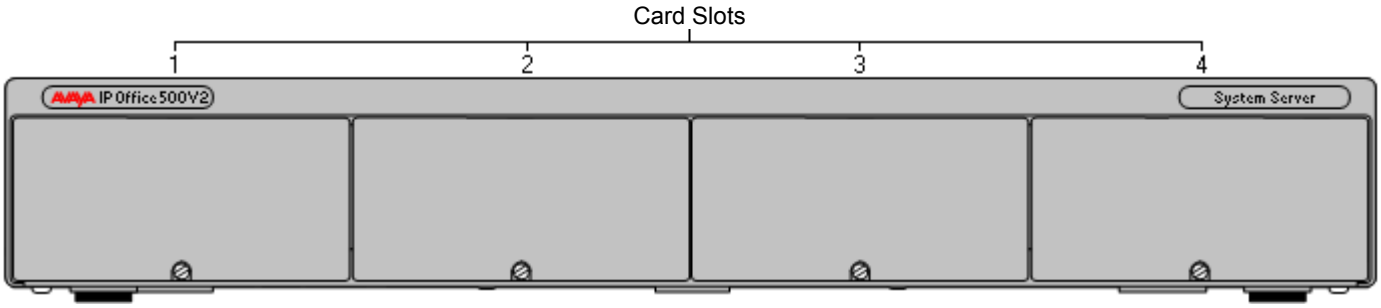


Figure 9: IP500 V2 front view

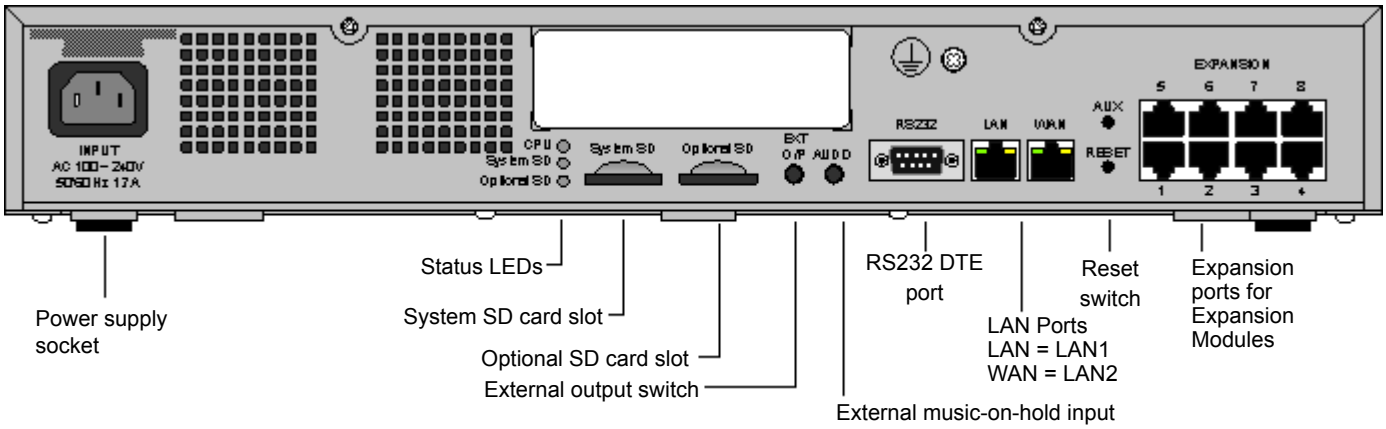


Figure 10: IP500 V2 rear view

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 2: 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.

Table continues…

Base card	Maximum per system	RJ45 port assignment description	Telephones supported
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
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

Table continues…

Base card	Maximum per system	RJ45 port assignment description	Telephones supported
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 Communications Module (UCM V2)	1		Requires separate Preferred Edition license. Not supported on Server Edition. 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 3: 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

Table continues…

Trunk card	Maximum per system	Works with these base cards	Description
Universal PRI (PRI-U)	4	ETR6 DS8 TCM8 Analog Phone 2/8 VCM	Up to 2 PRI trunk connections. The card is available in single and dual port variants. The card can be 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 phone 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.

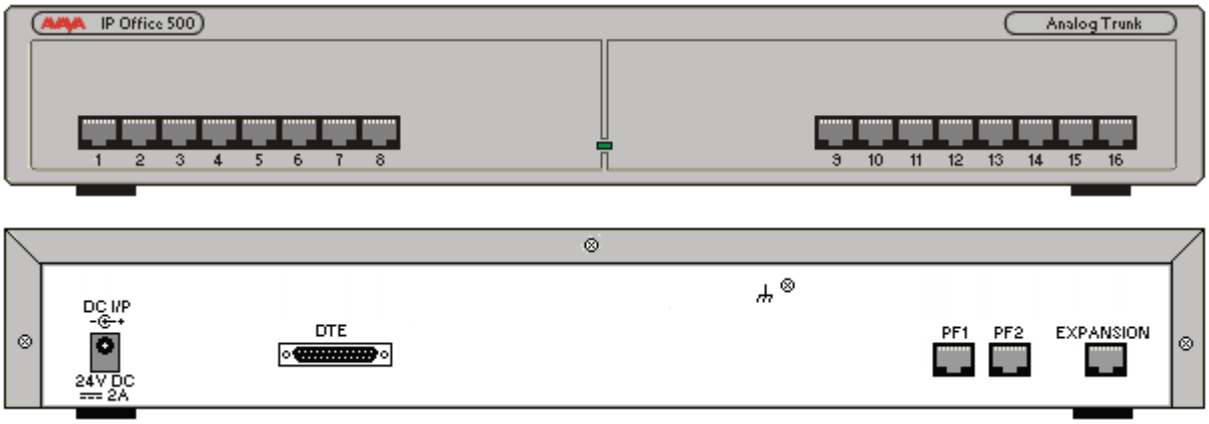
For installations in a rack, this module requires the IP500 V2 Rack Mounting Kit.

Expansion module	Telephones supported	Interfaces supported
Analog Phone 16	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
Analog Phone 30	30 analog stations with calling line presentation	

Analog trunk modules

This type of module can be used to add 16 additional analog trunks to an IP500 V2 system. The module supports both loop-start and ground-start trunks. The module also provides two powerfail ports for direct connection of analog phones to the first two analog trunks.

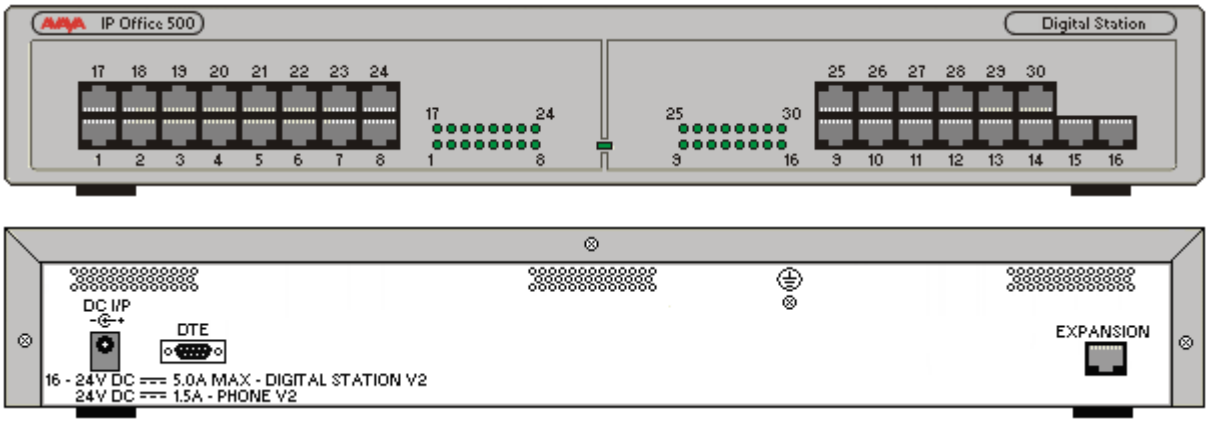
Basic Edition systems only support a single ATM16 expansion module. For installations in a rack, this module requires the IP500 V2 Rack Mounting Kit.



Expansion module	Description	Interfaces supported
ATM16	16 analog trunks	Loop-start Ground start

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, DS16B2[1]	Avaya telephones	16 digital station ports
DS30B, DS30B2[1]	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.

[1] DS16B2 and DS30B2 are supported on 10.1, 9.1 SP 12, and 10.0 SP5 onwards.

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
  - Media Manager
  - Web Collaboration
  - WebRTC Gateway

WebRTC gateway configuration guidelines

Use the following guidelines when configuring a WebRTC gateway:

- Define WebRTC SIP extensions on the:
  - SIP server that is part of the WebRTC gateway configuration.
  - Primary server if this is part of the deployment topology.
- With IP500 V2 deployments, WebRTC should be enabled on the Application server.

Gateway limitations

The WebRTC gateway does not support resiliency.

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*

Phones

IP Office supports multiple telephone solutions:

- IP telephones

- Digital telephones
- ETR telephones
- Analog telephones
- Wireless telephones
- Third-party SIP endpoints such as, desktop telephones, softphones and conferencing speakerphones

For detailed specifications, see specific telephone information on the Avaya Support site at http://support.avaya.com.

Related links

Remote phone support on page 39
Accessing Avaya DevConnect Application Notes on page 134
Using the Avaya InSite Knowledge Base on page 134
Phone interoperability on page 95

Remote phone support

IP phones using NAT router

IP Office supports remote 9600 Series IP phones with the H.323 FW which resides behind a NAT router to IP Office. The configuration does not require any VPN concentrator equipment. Remote 9600 H.323 IP phones can connect to IP Office even if it is located behind a NAT router. The phones are authenticated in the same way as phones in the private network. IP Office determines that a phone is located outside the private network and relays the VOIP RTP traffic to ensure it transverses the NAT router.

Note:

H.323 signaling and the media traffic is not encrypted.

To reach IP Office from the remote private network, remote H.323 IP phones need to be configured to the public IP address of the NAT router hosting the IP Office. Configurable ports need to be forwarded to IP Office. IP Office requires a valid public IP address be configured and the public IP address can be statically configured or dynamically discovered via a STUN server. The Remote Worker feature requires the Essential Edition license which provides 4 remote worker seats. Enable the Remote Worker feature using IP Office Manager. Additional remote worker capability is available with the Teleworker User or Power User licenses and a Preferred Edition license.

VPN phones

VPN phones provide secure communication over public ISP networks to IP Office at the company headquarters. It is a software-only product that runs on 5610/5620/5621 or 4610/21 IP phones. In combination with one of these phones and the most popular VPN gateway products, the software extends enterprise telephony to remote locations. VPN functionality is supported on 9600 IP phones, and does not require a separate software load. VPN phone has been tested with a number of VPN-gateways from major vendors like Cisco or Juniper as well as with smaller VPN-access devices from companies like Adtran, Kentrox, Netgear, and SonicWall. Refer to the Avaya Support website for a list of available application notes on VPN-gateways tested with each line of phones.

SIP phones using Avaya SBCE

The Avaya Session Border Controller for Enterprise (Avaya SBCE) sits on the edge of customer's network with both internal and external IP interfaces. Using these IP interfaces, Avaya SBCE functions as the gateway for SIP traffic into and out of the network. When used internally, SIP clients register to the IP Office directly. When used externally, the SIP clients connect to the Avaya SBCE. This is achieved using Split DNS, which automatically resolves the FQDNs to the internal IP address of the IP Office or the public IP address of the Avaya SBCE depending on where the clients are currently located. Apart from acting as a gateway, Avaya SBCE also provides protection against any external SIP-based attacks. For privacy over the public internet, the public side of the Avaya SBCE facing the remote workers must be configured to use the recommended values of TLS for signaling and SRTP for media encryption, as long as they are supported by the endpoints.

IP Office applications

User applications

The following sections provide an overview of the applications intended for end users.

Avaya one-X® Mobile

Avaya one-X® Mobile is an application that mobile users use to connect to IP Office.

Avaya one-X® Mobile works in call-back telephony mode. For example, when a user initiates a call from the client, IP Office initiates a call to the caller's mobile device and then dials the destination. This mode offers cost savings to users in countries where incoming voice calls are free or for users who have a cheaper unlimited voice plan as compared with a data plan.

The one-X Mobile Preferred mobility client also works in Voice over IP (VoIP) mode. In the VoIP mode, the client makes calls over Wi-Fi/3G/4G data networks. The client, using its underlying SIP stack, registers with IP Office over the data network and functions as an office extension.

Users in countries where incoming calls are charged will see a significant cost savings in the VoIP mode especially when on Wi-Fi networks. The availability of both call-back and VoIP modes on the mobility client will enable users to toggle between the modes based on their network connections. This will empower end-users to make a choice of the appropriate mode based on their voice and data plan as well as the availability and quality of their data connection (WiFi/3G/4G). For example,

- The user can choose the call-back mode when he or she doesn't have Wi-Fi access and the 3G data connection is not providing good quality for voice.
- The user can choose the VoIP mode when he or she has access to a mobile hotspot where a Wi-Fi data connection is available or when the 3G or 4G data connection is good.

One one-X Mobile Preferred mobility client supports VoIP mode on both iOS and Android devices. VoIP mode is available with the Power User profile. Users with Mobile Worker profiles can only

use call-back mode. VoIP mode does not require an IP endpoint license. The following features are available:

- Ring-tone selection
- High bandwidth or narrowband codec selection based on the network connection available
- Bluetooth headset audio control on VoIP calls
- Conference screen
- Contact phone number selection
- Voicemail priority indicator
- Swipe support for instant messaging on home screen
- Group action support
- Emoticons
- CLID lookup in contacts for calls
- Send voicemail as WAV in email
- Enable or disable mobile twinning (simultaneous ring)
- Enable or disable DND (send all calls)
- Call log combined with voicemails in the event history
- Call monitoring to see and interact with all calls
- VoIP mode dial plan
- Transfer calls as a third-party call controller (3PCC)

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 Equinox™ for IP Office

Avaya Equinox™ for IP Office is a SIP-based Unified Communications (UC) client that provides users with real time collaboration capabilities and enables business users to easily manage their day-to-day communications from a single interface. IP Office supports the following operating systems:

- Desktop:
  - Windows
  - macOS
- Mobile phone:
  - Android: From a mobile phone, tablet, or an Avaya Vantage™ device
  - iOS

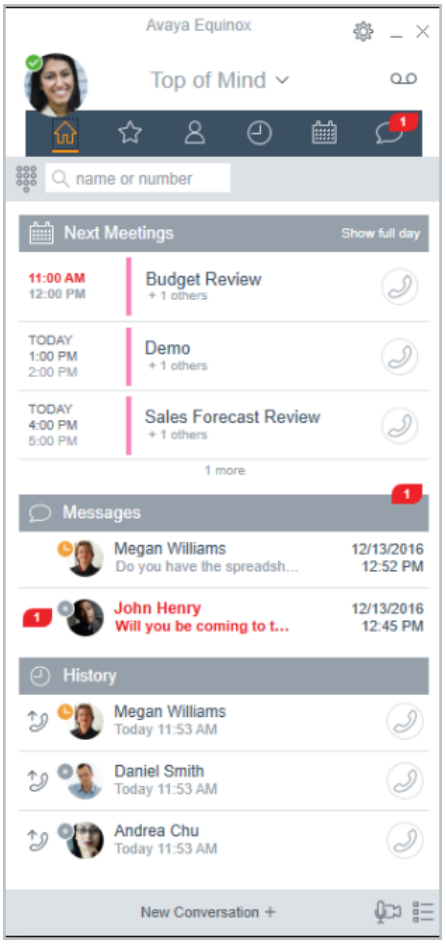
Note:

In Avaya Vantage™ Release 2.0.1, the K165 and K175 devices support the Avaya Equinox™ client. The K155 device does not support the Avaya Equinox™ client.

Avaya Equinox™ is a common cross-platform client. The client capabilities vary depending on the platform it is registered with. The supported features in Avaya Equinox™ for IP Office are:

- Top of Mind Home Screen
  - Next meetings showing local calendar schedule or Exchange Web Service/Office 365
  - Local Call History
  - Messages
  - Start Meetings/Launch Spaces dashboard
- Top of Mind Lite Option for Mobile phones
- IP Office directory and local contacts
- Messaging through Avaya Spaces

- Presence through IP Office server
- Local call history
- Dialpad with Redial
- Desktop integration with Microsoft Outlook and Browsers
- Softphone client audio and video calls
- Shared control of an associated IP Office deskphone.



Avaya Equinox™ registers with IP Office server as a SIP softphone for audio and video calling, and telephony features. The following features are supported:

- Point to point audio and video calls (make, receive, and end)
- Multiple call handling (incoming and outgoing)
- Hold and retrieve (audio and video calls)
- Transfer (blind and consultative)
- Consult conferencing
- Escalate audio to video call
- Share control with supported desk phones in the Avaya Equinox™ desktop client

- Avaya Equinox™ on Avaya Vantage™
- Presence and directory integration with Avaya Equinox™ on Avaya Vantage™
- Enter DTMFs during a call

Avaya Equinox™ client on Avaya Vantage™ supports the following features:

- Making outgoing calls.
- Handling incoming calls.
- Putting call on hold and resuming the call.
- Muting and unmuting a call.
- Transferring a call.
- Escalating an audio call to video call and de-escalating video call to audio call.
- Entering DTMF digits using the keypad.
- Access your local contacts
- Access your IP Office contacts by using IP Office directory.
- Manage your presence status and presence status messages.

Avaya Equinox™ for IP Office limitations:

- CTI Control — Avaya Equinox™ for IP Office cannot be controlled through other applications such as Avaya Contact Center Select, IP Office Contact Center, or IP Office SoftConsole.
- Branch worker — Avaya Equinox™ for IP Office does not support failover between Avaya Aura® core and IP Office Branch.
- For Instant Messaging, Avaya Equinox™ for IP Office depends on the availability of Avaya Spacesbasic account in the Cloud.
- The Avaya Equinox™ client accesses Avaya Equinox® Meetings Online using HTTPS, from within the Equinox Meetings tab of the client. The Avaya Equinox™ client can access local on-premise Equinox Conferencing in the same way using HTTPS, that is, if the access URL is configured under Equinox Meetings. However, if the Avaya Equinox™ client accesses local on-premise Equinox Conferencing through SIP trunks, audio and video will be available but not sharing or conference roster. The same applies for accessing Scopia over SIP trunks too. Even when Avaya Equinox™ client accesses local on-premise IP Office Meet Me Conferencing, audio will be available but not sharing or conference roster.

Avaya IP Office Web Client

Avaya IP Office Web Client is a WebRTC application that provides various communication capabilities. The client takes advantage of WebRTC Gateway resiliency improvements delivered in R11.0 and is supported on Server Edition and IP500 V2. Users must have Office Worker or Power User license to use the Avaya IP Office Web Client features. The client is supported in the following environments:

- Google Chrome browsers on Windows OS
- Google Chrome browsers on macOS
- Standalone client on Windows OS

Avaya IP Office Web Client provides the following features:

- Point to point audio and video calls
- Access to Voicemail access
- Call logs
- Conferencing:
  - Ad-hoc Conference by merging calls
  - Starting or joining an IP Office Meet Me Conference
  - Accessing IP Office Web Collaboration
- Point-to-point Instant Messaging and Presence by integrating with Avaya one-X® Portal for IP Office
- Click-to-call using Google Chrome extension
- Single-Sign-On (SSO) support for Avaya one-X® Portal for IP Office and IP Office Web Collaboration
- System Directory and Favorites (Personal Directory)

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

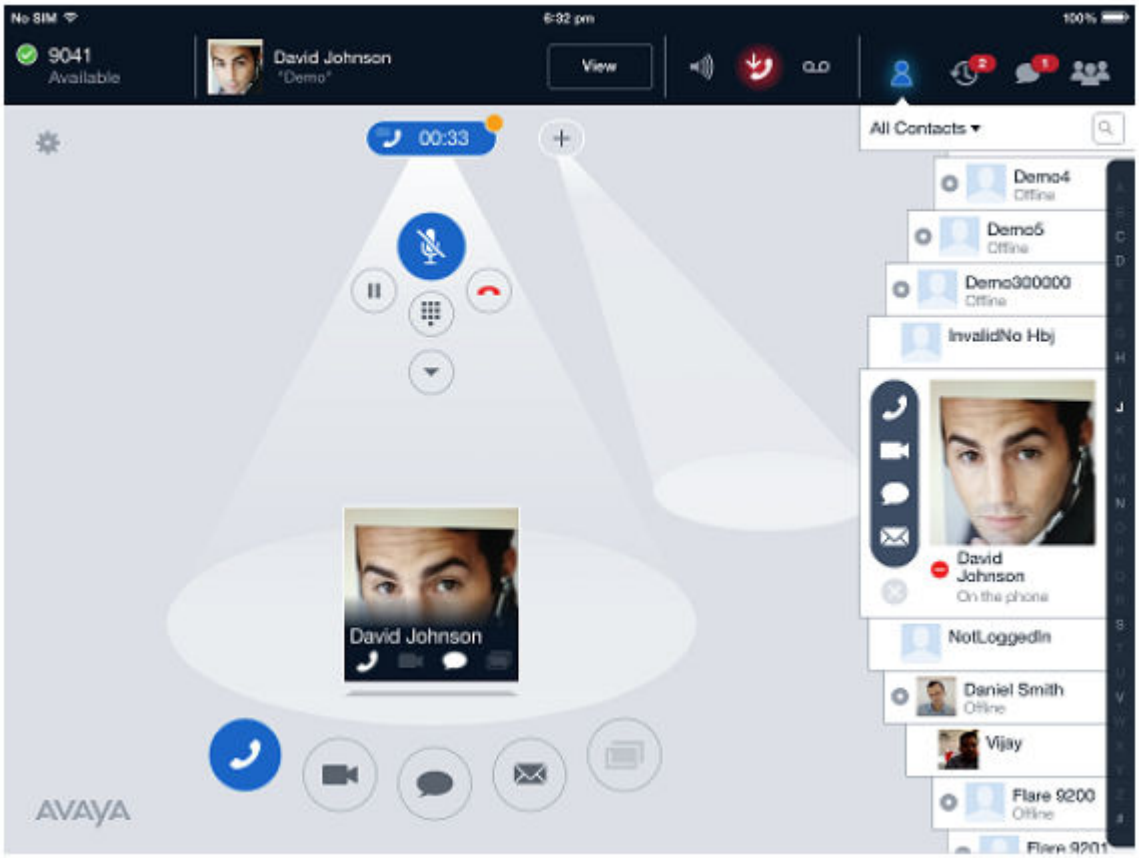


Figure 11: Avaya Communicator for iPad

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

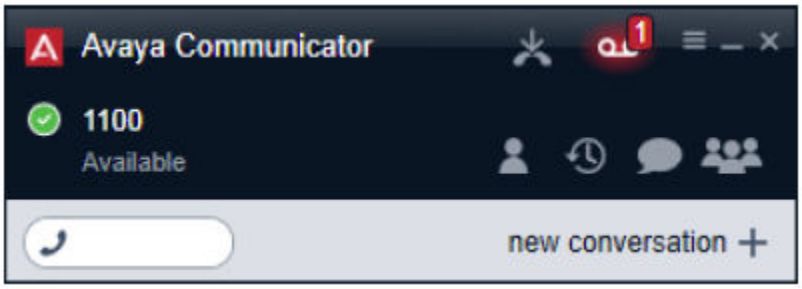


Figure 12: Avaya Communicator for Windows compact view

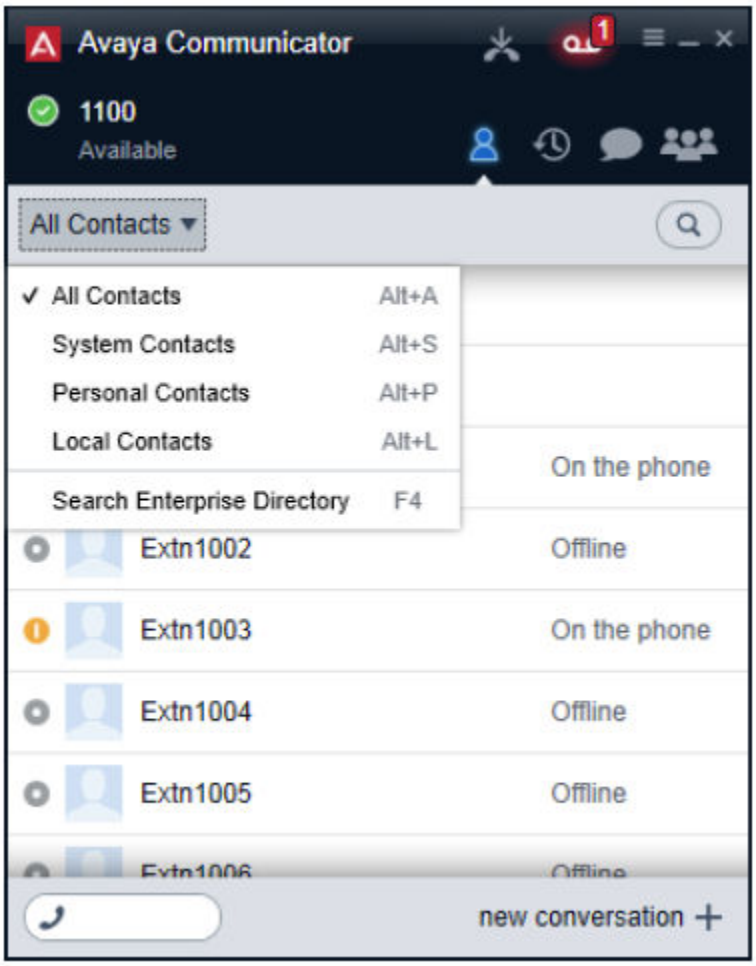


Figure 13: Avaya Communicator for Windows full view

- 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.

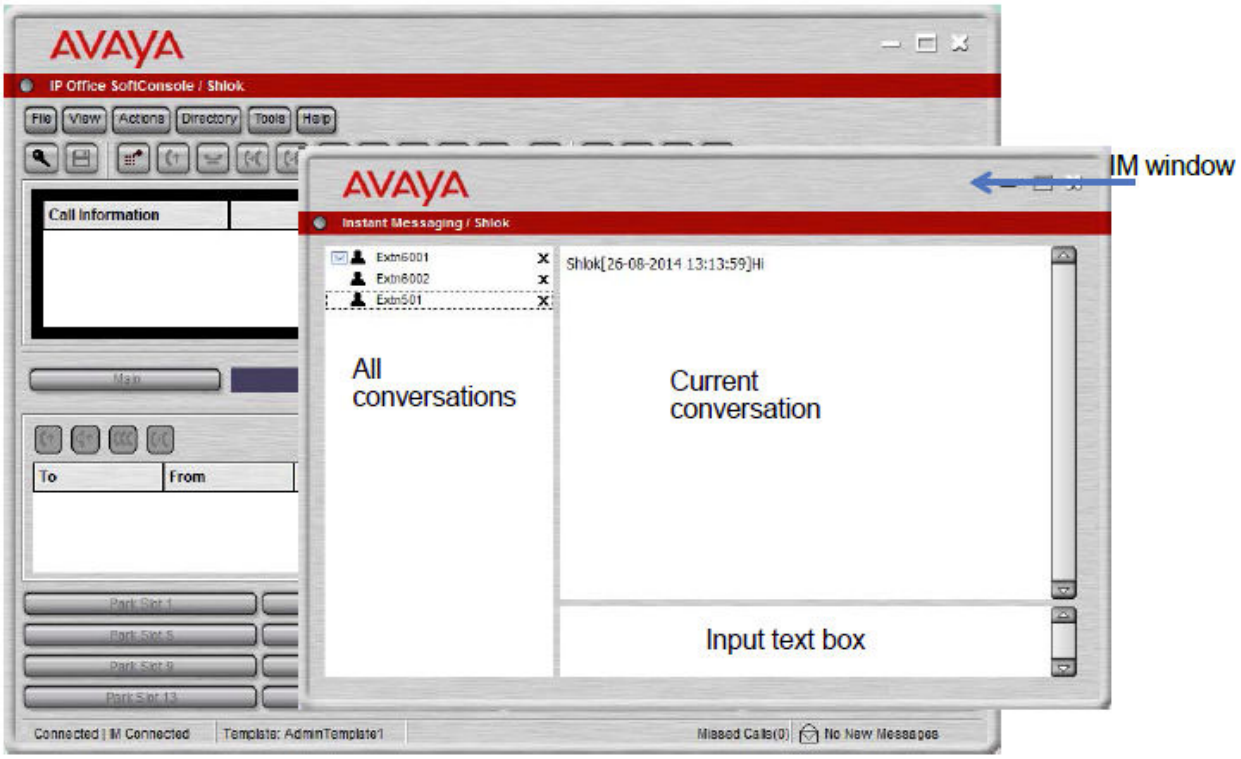


Figure 14: SoftConsole instant messaging window

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

Embedded Voicemail

In environments like retail or home office, where space, noise or cost considerations rule out using a PC for voicemail, Embedded Voicemail provides basic voicemail services. Embedded Voicemail is on the IP500 V2 control unit and does not require a separate voicemail server.

Embedded Voicemail is available with IP Office Essential Edition. No additional licenses are required.

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.

Conferencing

Users can place calls on hold and a create a conference using either the telephone or desktop applications. Additional conference members may be added, however a single conference may not have more than 64 members (with IP500 V2 only and more on Server Edition).

For ad-hoc conferencing, the system requires as many digital trunks/VoIP channels as external participants (as well as Preferred Edition for Meet-Me conferences). The system supports 128 conferencing channels on the IP500 V2, allowing multiple conferences of any size from 3 to 64 parties. The system support 42 3-party conferences, 2 64-party conferences or any combination in between. Meet-Me capabilities require Preferred Edition for direct dial into a conference bridge with PIN code security. In an SCN network, only one centralized Preferred Edition license is required to host Meet-Me conferences at any of the sites. Conference IDs are also shared across the SCN sites.

The following conference channel capacities are available:

Table 4: Conferencing channel capacities

Platform	Non-Select	Select	Avaya Contact Center Select	IP Office Contact Center
HP DL120 Dell R210	128	128	414	414
HP DL360	256	256	825	825
Dell R620	256	512	825	825

Table continues…

Platform	Non-Select	Select	Avaya Contact Center Select	IP Office Contact Center
OVA	256	512	825	825
IP500V2	128	128	128	128

To initiate a conference, users dial the direct number allocated to the conference bridge, type in the PIN (require Preferred Edition and Voicemail Pro) if required. For ad-hoc conferences with a few participants, users can easily set up immediate conferences by calling all parties and bringing them to the conference bridge. With Avaya one-X® Portal for IP Office, the originator of the conference can keep control: the Caller ID number (and the associated name if recognized) of each participant is displayed. If required, they can selectively hang-up a specific participant. The system plays a single beep on entry and a double beep on exit. The owner of the conference may use their extension number as the conference ID. The owner of the conference has control of the conference with the ability to mute and drop calls of participants. All participants will hear the system Music on Hold (MOH) until the owner joins, and will hear MOH when the owner drops. Note that any internal party has the option to view and drop participants (not just the conference originator).

Users can record a personalized greeting for a conference (requires Preferred Edition and Voicemail Pro).

Users can record the conference using Avaya one-X® Portal for IP Office, digital or IP display phone or a short code (requires Preferred Edition and Voicemail Pro). To prevent unauthorized access to the conference bridge, PIN codes, Caller ID number screening as well as time and date profiles can be set-up using Voicemail Pro. One user can manage the conferencing bridge facility from any location.

Conferencing has the following restrictions:

- Only two calls connecting through analog trunks are permitted in any single conference.
- Each external caller requires a digital trunk/VoIP channel (for example 1 T1 allows 23/24 external parties, 1 E1 allows 30 parties and a fully licensed VCM-64 allows 64 parties).
- There are no limits on the mix of internal and external calls in conference, but if all internal participants disconnect from the conference bridge, the external participants can be disconnected automatically by the system for added security (configurable system setting).
- System features such as call intrusion, call recording and silent monitoring all use conference resources, as does automatic recording if enabled. When any of these features are active the number of slots available for conference parties is reduced. For example, a conference call between 3 parties and being recorded will use 4 conference slots.

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 collaboration 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.

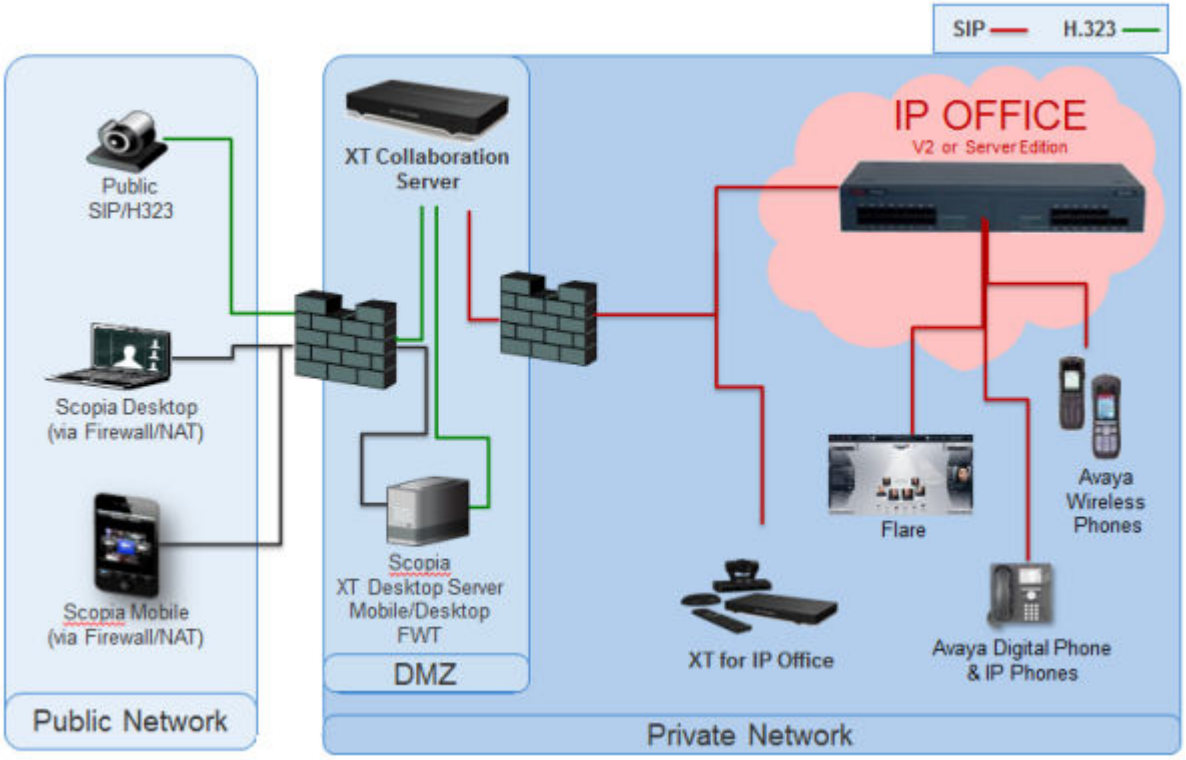


Figure 15: Video endpoints

Collaboration Agent

Collaboration Agent is an application that provides web collaboration and conferencing tools. Users with Avaya Aura® Conferencing accounts and invited guests can use the tools to manage conferences and participate and collaborate in conferences.

Conference participants can join conferences by logging in to Collaboration Agent and dialing in to the audio bridge assigned to the conference. Participants can also use the integrated audio and video feature of Collaboration Agent. Participants can use the Collaboration Agent tools to boost productivity and track action items even after the conference ends. Conference moderators can:

- Record all aspects of conferences.
- Record and edit meeting minutes.
- Create and distribute meeting reports based on the meeting minutes.

Collaboration Agent features

In Collaboration Agent, the participants and moderators can perform multiple tasks such as:

- View a list of other participants.
- Virtually raise a hand and seek permission to speak.
- Send messages.
- Annotate shared content.
- Record or edit minutes.
- Set the entry and exit tones.
- Dial out to other users and the users to the conference.
- Disconnect participants.
- Promote participants to the moderator role.
- Invite more participants to join an active conference.

During the conference, participants can view the following information in Collaboration Agent:

- The participants who joined only on the audio bridge
- The participants active on web collaboration
- The participant currently speaking
- The current presenter

Optional features

The following features are optional and must be enabled by the system administrator:

- Starting conferences before moderators join.
- Integrated video
- Promoting all participants to the presenter role so that all participants can share content
- Dialing out from Collaboration Agent to connect users to conferences
- Conference recording

Avaya Spaces

Avaya Spaces is a cloud-based team collaboration and meeting application. It seamlessly integrates voice, video, tasks, sharing, and more into your browser or the Spaces application. Each IP Office user is entitled to a free Avaya Spaces Basic account that includes the following team collaboration activities through Avaya Equinox™ client:

- Creation of Spaces for managing ongoing projects: You can use the Spaces area in the dashboard to start a new conversation. In fact, the first time you start using Avaya Spaces, you can view the option to create your own Space. You can invite participants to your Space by entering their email addresses. You can set different permissions for each participant based on the type of actions you want them to be able to take within your Space. If you have many Spaces, you can categorize the frequently used ones as favorites.
- VoIP audio confererencing with up to five participants.
- Limited file sharing (up to 1–GB)
- Point to point video calls, escalate your chats with audio or video.
- Exchange instant messages with other users by using Avaya Spaces Direct Messaging.
- Join a Spaces meeting.

Avaya Equinox® Meetings Online

Avaya Equinox® Meetings Online offers an optional, subscription service for multi-party Unified Communications, that is, audio, video, and web collaboration. The service provides an Over The Top (OTT) virtual meeting room with audio and video conferencing, content sharing, chat and meeting moderation. Users can access the service through desktop, mobile, and video room system as well as audio dial in; third party video room system interoperability is also supported.

Installation and administration applications

The following sections provide an overview of the installation and administration related applications.

IP Office Manager

Use the Manager to manage IP Office standalone systems or systems in a small community network (SCN). Manager tracks system configuration changes, manages upgrades, and configuration imports and exports.

IP Office has a built-in audit trail that tracks changes to the system configuration, and who has made them. Manager can display the audit trail to assist with problem resolution. The audit trail records the last 15 changes in the configuration and records the following elements:

- Configuration Changed - For configuration changes, the log will report at a high level on all configuration categories (users, hunt group...) that have been changed.
- Configuration Erased
- Configuration merged
- Reboot - user instigated reboot

- Upgrade
- Cold Start
- Warm Start
- Write at HH:MM - This is when the administrator saved the configuration via the schedule option
- Write with Immediate Reboot
- Write with Reboot When Free

IP Office Manager is also used for maintenance functions such as:

- Upgrade to the IP Office system software
- Ability to send software over an IP network link to a system and have it validated before committing to the upgrade
- Backwards compatibility with systems from Release 2.1 onwards to allow a single management application
- Importing and Exporting IP Office configuration information in ACSII-CSV files.

Server Edition Manager

Server Edition 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.

Granular access:

Web Manager provides service users with access to entire configuration objects if the service user has the configuration access. However, large customers who have multiple service users roles or customers having deployments in the cloud environment need to have granular configuration access for different service users. Hosting partners will be able to build an account for customer or re-seller with limited permissions. These permissions shall restrict the customer or re-seller from performing activities that affects service of the system.

Configuration dashboard:

The Dashboard is a simplified version of the existing IP Office Web Manager and is presented to the administrators when a fresh single-node IP Office system is installed. The Dashboard consists of minimum required set of configuration fields to set up the system. The full setup can be performed anytime afterwards.

IP Office Media Manager

IP Office Media Manager is a native IP Office application to archive, store, search, playback, download, audit, and delete IP Office call recordings. The Operation, Administration, and Management of (OAM) of the application is integrated within the IP Office solution, for example, IP Office Web Manager.

Media Manager obtains the recordings from the IP Office Voicemail Pro application through a pre-configured hand-off directory. Media Manager moves the recordings from the hand-off directory to an additional hard disk partition on the Server Edition Primary or Application Server and then archives the recordings to a storage location configured by the administrator. The archiving location can be a Network-Attached Storage (NAS), a local DVD drive, or cloud storage. For cloud storage, Media Manager supports only Google Drive in this release.

Media Manager is licensed on a system basis. Apart from a new IP Office Release 11.0 and later Media Manager license, the application also works with an earlier Contact Recorder license, for customers upgrading from an earlier IP Office version. Media Manager allows a 90–day trial period before licensing is enforced.

Contact Recorder is not supported in IP Office Release 11.0 and later and is not part of IP Office Release 11.0 and later software. However, Media Manager supports migration of Contact Recorder data to IP Office Release 11.0 and later.

Media Manager is available as part of the IP Office Server Edition and Application Server software image. The application runs on the standard Linux distribution supported by IP Office Server Edition and Application Server platforms. The software is installed as a standard Linux RPM only on the Server Edition Primary server or the Application Server in case of IP500 V2 deployments. The application is not supported on UCM or Windows platforms. The management interface is web-based and all popular browsers such as Google Chrome, Mozilla Firefox, Microsoft Edge, and Microsoft Internet Explorer are supported.

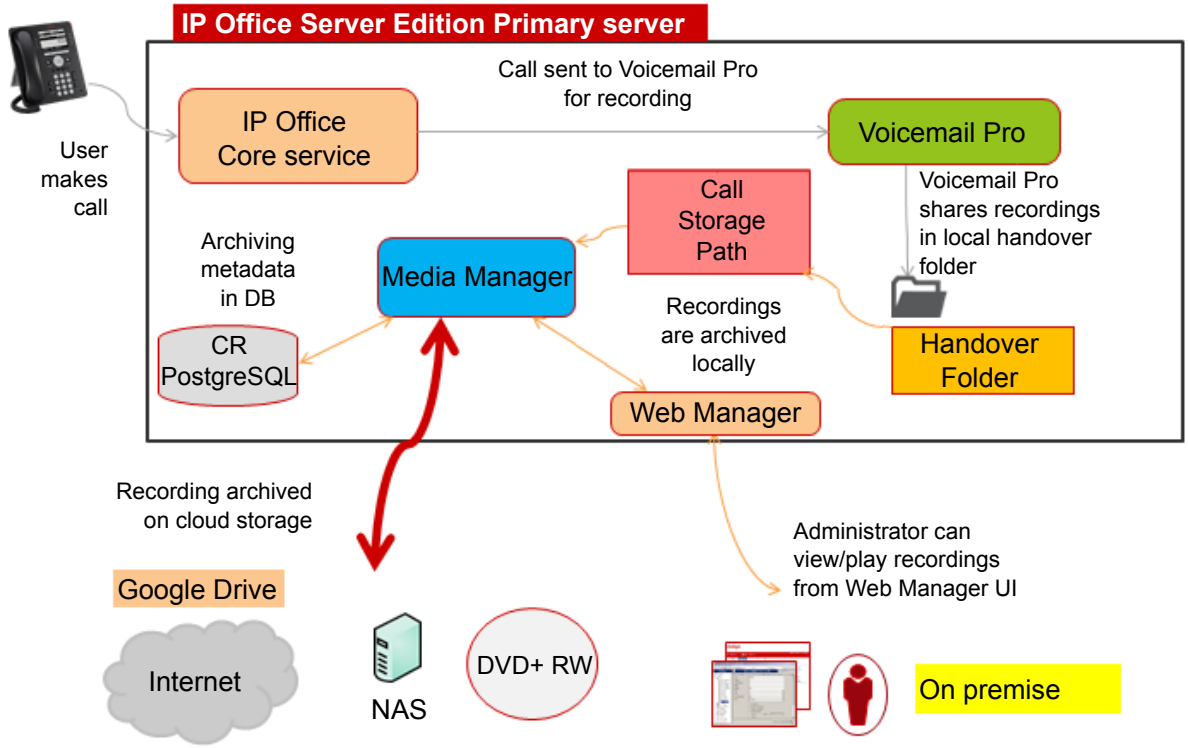
Media Manager in IP Office Release 11.0 Feature Pack 4 supports deleting or recordings and keeping track of usage of recordings through the Audit trail feature. The Audit trail feature helps you in keeping track of the activities around the recordings in the library. Using this feature, you can find out the users who have:

- Searched a recording
- Replayed a recording
- Downloaded a recording
- Deleted a recording

For each event, Media Manager displays the user name, date, time, and the type of user action. The Audit trail is maintained for a predefined number of days and can be modified. By default the Audit trail data is available for 180 days.

Media Manager is available as part of the IP Office Server Edition and Application Server software image. The application runs on the standard Linux distribution supported by IP Office Server Edition and Application Server platforms. The software is installed as a standard Linux RPM only on the Server Edition Primary server or the Application Server in case of IP500 V2 deployments. The application is not supported on UCM or Windows platforms. The management interface is web-based and all popular browsers such as Google Chrome, Mozilla Firefox, Microsoft Edge, and Microsoft Internet Explorer are supported.

A standard IP Office Server Edition deployment:



Availability of Contact Recorder features in Media Manager

The search capabilities in Media Manager has been enhanced for the administrators and the users.

Functionality	Description	Availability in Contact Recorder	Availability in Media Manager
Search by administrator	Search by administrators using Target Number, Skills, Agent, and Call ID	Yes	Yes
Search through Web Self-Admin	Search by users using the search filters Target Number, Skills, Agent, and Call ID	Yes	Yes
Web Self-Admin search results	A maximum of 100 results are displayed.	Yes	Yes
Call sets	Facility to save search results for retrieving in the future.	Yes	No
Email	Attaching recordings to emails.	Yes	No

Table continues…

Functionality	Description	Availability in Contact Recorder	Availability in Media Manager
Bulk Export	Exporting multiple recordings and the related details	Yes	Yes
Owner	Available as a search option.	No	Yes
Audit Trail	Audit can be performed to track the use of call recordings.	Yes	Yes
Windows Domain Authentication	-	Yes	No

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.

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. SSA shows IP Extensions that were registered but no longer available and IP extensions that are configured but have not been registered after last re-boot. This helps to spot phones that are Idle, disconnected, or are misconfigured. SSA also shows quarantined phones and blacklisted extensions and IP addresses.

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.

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.

Cloud Operations Manager

Cloud Operations Manager is an administration tool that allows a simplified way of multi-customer management with a focus on cloud-based systems. The tool enables management of IP Office Server Edition systems and provides the following capabilities:

- Single Unified Management portal capable of managing up to 3000 IP Office systems.
- Dashboard that displays error conditions, ongoing system activities, and system health
- Grouping of systems based on versions and tags for accessing similar systems at the click of a button
- Displays all connected systems such as Primary, Secondary, Expansions, and open applications
- Ability to centrally manage IP Office software upgrades and patching across multiple system and versions
- Role-based administration: Cloud Operations Manager has its own service users with access to complete or selective customers IP Office. No granular feature level access is available in Release 11.0.
- Provides facility to launch Native IP Office Management applications. Uses need to log in to the applications separately after the application is launched. Launching of IP Office Contact Center, Avaya Contact Center Select, and Avaya Workforce Optimization Select are not supported in Release 11.0.

- Alarms for Configuration, Services, Trunks, Link, and Security by Severity type
- Alarms for status of IP Office systems indicating whether they are online of offline
- Alarms indicating status of various applications

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

Contact center applications

The following sections provide an overview of the contact center applications.

For general information about:

- IP Office Contact Center, see *Avaya IP Office Contact Center Feature Description*.
- Avaya Contact Center Select, see *Avaya Contact Center Select Solution Description*.

IP Office Contact Center overview

Note:

IP Office Contact Center goes End of Sale for new systems in September 2019.

Avaya is the market leader in call center technology, and IP Office Contact Center can take your business to a new level. IP Office Contact Center provides integrated contact center capabilities specifically designed for businesses supporting between 5 and 250 contact center agents and supervisors.

IP Office Contact Center provides the following features and characteristics:

- All-in-one customer service solution that delivers consistent service to customers across multiple media channels and locations. IP Office Contact Center includes a user interface (UI) on Microsoft Windows and a web interface supported on various browsers.
- Fast implementation with minimum disruption to the business. IP Office Contact Center also includes an automatic synchronization feature for configuration. This feature can be enabled and disabled as needed during implementation.
- Access to Agent UI functionality, including call control, from a SalesForce (SFDC) plug-in or SAP CRM connector.
- Email and chat capabilities on the Windows and Web UI.
- Inbound and outbound voice calls with telephony and dialer capabilities.
- Skills-based routing.

- Address book access so agents can quickly find the contact information they need to make calls and send emails.
- Real time and historical reporting for all media channels.
- Interactive Voice Response (IVR) and Task Flow Editor scripts.
- User profile and agent group privilege configuration to determine which features are available to users of the interface. Administrators must assign privileges and create agent groups.
- Access to a web-based administration portal. You can use the administration portal to perform configuration, maintenance, monitoring, and management tasks. You can also upload certificates, collect logs, and download email archives and the IP Office Contact Center User Interface for Windows. Advanced administration tasks must be performed in the IP Office Contact Center User Interface for Windows. You cannot perform administration tasks with the IP Office Contact Center Web User Interface.
- Access to a wallboard that displays IP Office Contact Center statistics. For more information about Wallboard, see *Using Avaya IP Office Contact Center Wallboard*.
- Option to easily integrate chat functionality into a web page. For more information, see *Avaya IP Office Contact Center Email and Chat Services Task Based Guide*.
- Optional integration with call recording applications, such as IP Office Media Manager. Calls are recorded with Voicemail Pro and the details of the complete recording are stored in the database of the call recording application. You can search for and manage recordings using a web browser.
- Optional interoperability with Avaya Workforce Optimization Select, which is a stand-alone product that does not currently integrate with IP Office Contact Center UIs or applications.
- Media Resource Control Protocol (MRCP) integration, which provides support for text to speech (TTS) and automatic speech recognition.

Avaya Contact Center Select overview

Avaya Contact Center Select is a context-sensitive, collaborative, voice and multimedia contact center solution that allows small to midsize enterprises to anticipate, accelerate, and enhance customer interactions. Avaya Contact Center Select uses the Avaya IP Office telephone system to provide a real-time telephony platform.

Avaya Contact Center Select uses industry-standard SIP and CTI interfaces to integrate with IP Office. This integration gives Avaya Contact Center Select access to and control of a wide range of IP Office phones and features. Customers integrating Avaya Contact Center Select with IP Office gain skill-based routing, call treatments, reporting, unified agent management, and the graphical Orchestration Designer utility.

Avaya Agent Desktop is a single-interface client application used by Avaya Contact Center Select agents to assist customers. Avaya Contact Center Select agents use Agent Desktop software to respond to customer voice and multimedia contacts. Agent Desktop supports a range of IP Office phones and a wide variety of multimedia contact types.

By default, Avaya Contact Center Select connections and Web Services use secure TLS communication. The Avaya Contact Center Select Certificate Management tool makes it easier to manage security certificates.

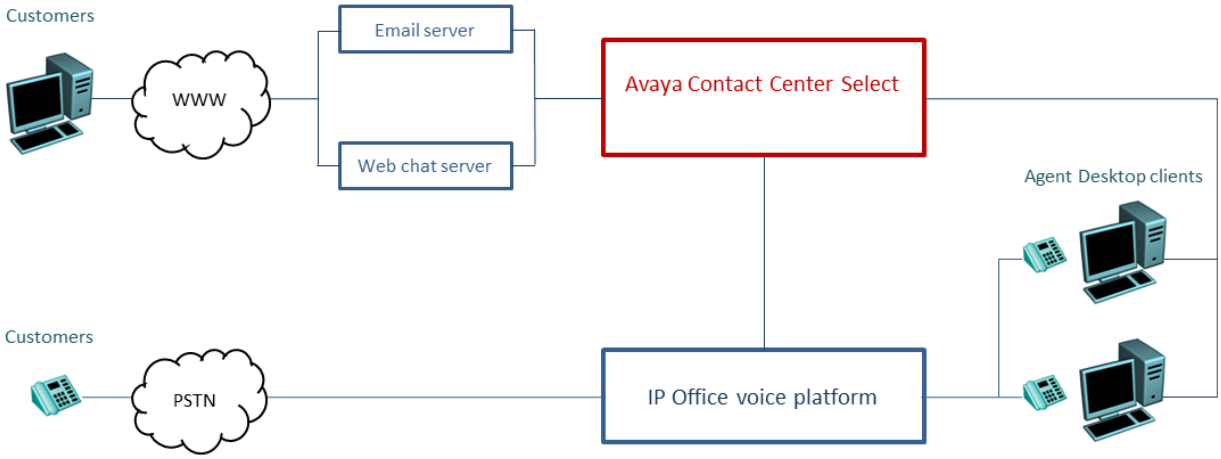


Figure 16: Typical contact center solution using voice and multimedia Avaya Contact Center Select and the Avaya IP Office voice phone system

Avaya Contact Center Select provides a feature-rich voice and multimedia solution with integrated routing and reporting for small to midsize enterprises. Avaya Contact Center Select provides unified contact center and IP Office phone user account management for agents and supervisors. Voice-enabled agents and supervisors created in Avaya Contact Center Select are automatically added to IP Office. Avaya Contact Center Select synchronizes user (agent and supervisor) information between Avaya Contact Center Select and IP Office.

Chapter 3: Solution specifications

Reference configurations

IP Office is sold in different editions, reference configurations, and deployment scenarios to meet different customer requirements. The editions build on one another to offer advanced functionality, including presence, instant messaging, web collaboration, and Microsoft software integration.

The following sections summarize IP Office editions and other configuration options. These sections do not provide complete reference configuration details for every IP Office option. Separate Reference Configuration documents are available for IP Office Server Edition, IP Office Branch, Powered by Avaya Cloud solutions, and IP Office Contact Center.

IP Office editions

IP Office Basic Edition

IP Office Basic Edition is intended for small and growing enterprises that need higher productivity with a professional touch. Businesses can increase capacity as needed.

IP Office Basic Edition provides basic telephony features such as:

- 64 trunk capacity: analog, PRI/T1, and SIP
- Key system operation
- 64 party conferencing capacity
- Automated Attendant
- Multiple language support
- Call forwarding
- Caller ID
- Dial by name
- Breakout to reception
- Integrated voicemail:
  - Maximum of 6 concurrent calls to voicemail with approximately 25 hours of storage
  - Message control including Save, Delete, Forward, Repeat, Rewind, Fast Forward, and Skip Message

- Visual voicemail
- Message time and date stamping

Modes of operation

IP500V2 control units are supplied with no installed firmware or configuration. When first powered up, the control unit loads and installs the necessary firmware from the system SD card installed in it. It creates a default configuration matching the card installed in the control unit and external expansion modules attached to it. IP500V2 control units can operate in a number of modes. The initial mode is determined by the type of system SD card.

Mode	SD card
IP Office Basic Edition Quick mode	• a-law telephony PBX system operation. • µ-law telephony key system operation.
IP Office Basic Edition - PARTNER Mode	Defaults to a-law telephony PARTNER mode operation.
IP Office Basic Edition - NORSTAR Mode	Defaults to µ-law telephony NORSTAR mode operation.

Basic Edition runs on the IP500V2 control unit. An SD is required and is installed in the rear of the control unit, providing operating software, feature keys, and licenses. An optional SD card can be installed in the optional SD card slot, providing redundant backup and system upgrade capabilities.

Table 5: Supported base cards

Basic Edition supports following base cards:

Base card	PARTNER mode Maximum per system	NORSTAR mode Maximum per system
Combination analog	4	4
Combination BRI		2
ETR6	3	
DS8	3	3
TCM8	4	4
Phone 2	4	4
Phone 8	4	4

Table 6: Supported trunk cards

Basic Edition supports the following trunk cards:

Trunk card	PARTNER mode Maximum per system	NORSTAR mode Maximum per system
ATM4	4	4
PRI/T1	1	
PRI/E1		1

Table continues…

Trunk card	PARTNER mode Maximum per system	NORSTAR mode Maximum per system
BRI4		4
BRI8		1

Expansion modules

Basic Edition supports the following expansion modules:

- DS16A
- DS16B
- DS16B2
- ATM16
- Phone 16
- Phone 30
- DS30A
- DS30B
- DS30B2

Note:

DS16B2 and DS30B2 digital station modules are supported on IP Office Release 10.1, Release 9.1 SP12, and 10.0 SP5 onwards.

IP Office Essential Edition

IP Office Essential Edition provides the same features as Basic Edition as well as the following:

- Mobile call control with one number access and simultaneous ringing on mobile devices
- Up to 4 remote workers through an internet connection and an Avaya 9600 series IP phone
- 24 hour access with customized voicemail greetings for each staff member
- Voicemail:
  - Maximum of 6 concurrent calls to voicemail
  - Send voicemails to email
  - Up to 25 hours of voicemail storage (with 6 ports)
  - Up to 40 automated attendants with a maximum of 6 concurrent calls
- Multiple language support
- Up to 128 party audio conference bridge with 64 in any one conference

Note:

Basic Edition is not a prerequisite for Essential Edition or Preferred Edition, and is not stacked under Essential Edition.

IP Office Preferred Edition

IP Office Preferred Edition provides intelligent call routing, messaging, call handling and application integration.

In addition to the features provided with Essential Edition, IP Office Preferred Edition provides the following:

- Scalable voicemail:
  - Up to 40 simultaneous calls
  - Send a voicemail to all employees, a department, or a team
  - Address messages by extension or by name
  - Voicemail messages can “find” users to alert them a message is waiting
- Secure conferencing for up to 128 parties with 64 per conference
- Automated call routing with an unlimited number of automatic attendants that can be customized for time of day, day of week or other variables as well as to recognize callers and deliver personalized messages
- Call recording for incoming and outgoing calls that can be sent to voicemail or email inboxes as WAV files

Components

- IP500 V2 control unit
- Ethernet attached PC running the supported version of Windows Server
- Ethernet attached PC configured with Application Server software
- IMAP mail client (Outlook) for voicemail synchronization in email and browser-based access to voicemail
- Digital trunks and channels to support users
- IP Office supported telephones

IP Office Server Edition

IP Office Server Edition provides IP Office telephony capabilities, unified communications, mobility, and collaboration. It also 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.

IP Office Server Edition Solution provides the following:

- 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.
- Expansion systems, which provide additional capacity, support analog or digital interfaces, and remote locations.
- A Select IP Office Server Edition Solution provides additional capacity.
- Support for an existing IP500 V2 control unit optimized for a hybrid of analog/TDM and IP deployments, or a Linux server optimized for IP only deployments.

- Users and extensions can be configured on the IP Office Server Edition server or the Server Edition Expansion System.
- Software distribution includes the various user and administration applications such as IP Office Manager, SSA, Voicemail Pro, and IP Office 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 user capacity than the 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.

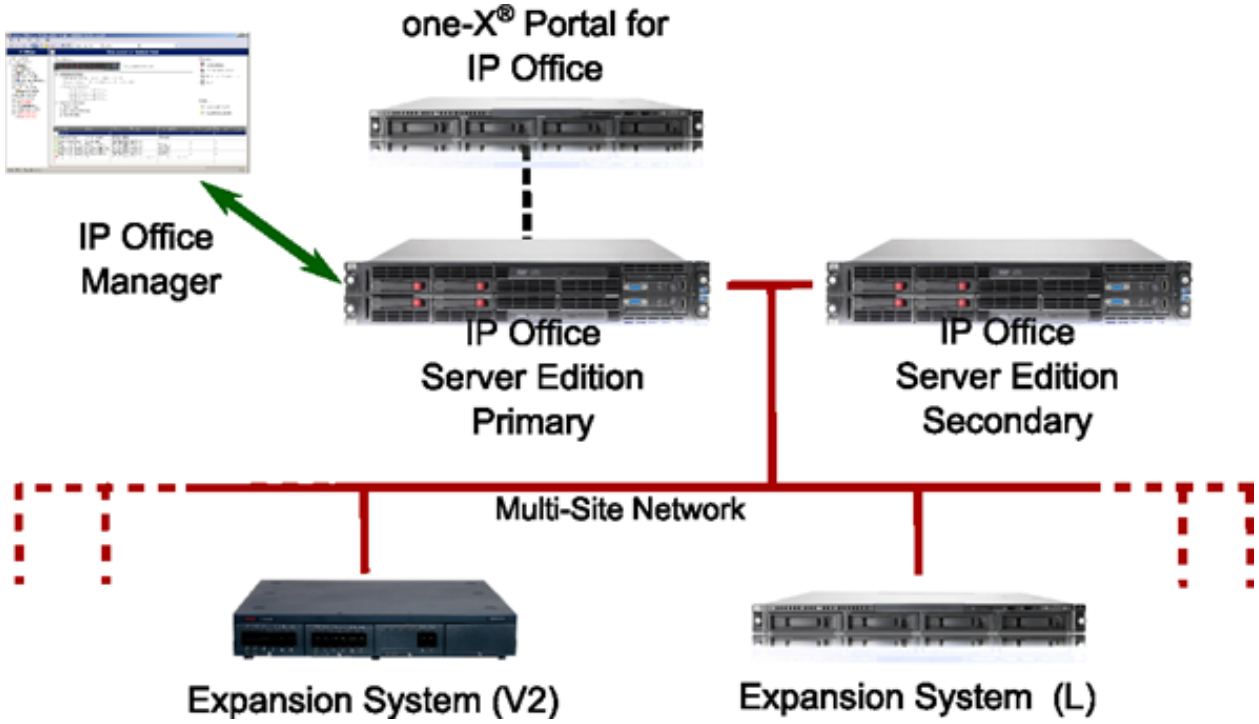


Figure 17: IP Office Server Edition topology

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	Dell R630 Dell R620 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 R630 Dell R620 HP DL360G7 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.

Table continues…

Component	Server options	Description
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	Dell R630 Dell R620 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.

Other deployment options

You can also deploy IP Office in:

- An enterprise branch environment (Centralized IP Office branch) or a Distributed Branch environment).

  You can deploy an IP Office system as a standalone branch or connect it to the Avaya Aura® network. A CS 1000 branch environment is also supported.
- A Cloud environment with the Powered by Avaya offers.

Contact center options are also available.

IP Office as an enterprise branch overview

You can deploy IP Office as an enterprise branch to provide a communications solution that is adaptable to meet the growing needs of an enterprise branch network while providing investment protection of the installed hardware platform and phones. You can implement an IP Office enterprise branch on an IP Office Standard Mode, Essential, or Preferred system. The IP Office system can be installed as an independent, standalone branch, or be connected to the Avaya Aura® network and migrated to a Distributed, Centralized, or Mixed enterprise branch to provide specific features and applications to meet the needs of individual employees in each branch location.

In addition to centralized SIP endpoints or centralized analog devices configured as ATA, IP Office can concurrently support other IP and TDM endpoints for a community of Centralized users and IP Office users in the same branch. Ideal for enterprises wanting applications deployed in customer

data centers or in the branch, an IP Office Branch can effectively deliver a range of communication tools without complex infrastructure and administration.

IP Office is also supported in an Avaya Communication Server 1000 (CS 1000) branch environment. Only the Distributed enterprise branch option is supported. IP Office can be deployed as a new branch in an existing CS 1000 configuration with the addition of Avaya Aura® Session Manager to which IP Office connects through the SM Line for branch connectivity. Providing phone investment protection, IP Office can also be deployed as a replacement for Business Communications Manager (BCM) or Norstar in a branch office and connect to CS 1000 through Avaya Aura® Session Manager. IP Office cannot operate as a survivable gateway to CS 1000 endpoints as similar to Survivable Remote Gateway (SRG).

Topology

The IP Office Branch solution provides the flexibility to support independent, stand-alone IP Office branches as well as IP Office branches connected to an Avaya Aura® system. The Branch solution also supports CS 1000 integration. The following deployment options are available for the solution architecture:

- **Stand-alone IP Office branch option**: Independent IP Office systems are deployed within the network. These IP Office systems are not connected to each other or to anything else in the network. With this option, IP Office Branches are not connected to an Avaya Aura® system and users cannot access any Avaya Aura® services.
- **Distributed enterprise branch deployment option**: All users in this deployment option are IP Office users. These IP Office users obtain telephony services from the local IP Office and not from Avaya Aura®. The IP Office systems in this deployment option can be connected to Avaya Aura® Session Manager and administrators can obtain Centralized management services through Avaya Aura® System Manager. The enterprise can choose to connect IP Office users in this deployment option to an IP Office voice mail system, Embedded Voicemail or Voicemail Pro, or a Centralized voice mail system, such as Avaya Aura® Messaging or Avaya Modular Messaging. IP Office users in this deployment also have access to some Centralized Avaya Aura® applications and services.

  With the Distributed branch deployment option, you can also connect CS 1000 to IP Office in the branch through Avaya Aura® Session Manager. Users still obtain telephony services from the local IP Office, but can use Avaya CallPilot® as their voice mail system. When connected to CS 1000, IP Office and CS 1000 interoperate as peers through Avaya Aura® Session Manager.
- **Centralized enterprise branch deployment option**: All users in the enterprise are Centralized users.

  Centralized users register to Avaya Aura® Session Manager and obtain telephony services from the Avaya Aura® Communication Manager Feature Server or Evolution Server in the enterprise core. If WAN connectivity to Avaya Aura® Session Manager is lost, the user automatically gets basic telephony services from the local IP Office. The telephony features provided by IP Office in survivability mode is limited compared to the features that are normally provided to the Centralized phone.

  Centralized users must be configured on the Avaya Aura® Session Manager, Communication Manager, and IP Office. A Centralized user must be configured on the Avaya Aura® Session

Manager and Avaya Aura® Communication Manager as a SIP user. On IP Office, the Centralized user must have either a SIP extension, an analog extension, or an analog fax device.

- **Mixed enterprise branch deployment option**: An enterprise branch with both Centralized users and IP Office users. Centralized users and IP Office users obtain the same telephony services described above. All users in this deployment option must use a Centralized voice mail system: Avaya Aura® Messaging or Avaya Modular Messaging.

The deployment options in the Branch solution allow you to start off with stand-alone IP Office systems and then slowly evolve the solution architecture into a Centralized environment as your enterprise grows.

The following image shows the topology of the solution architecture with the deployment options described above. This image does not show CS 1000 in the Distributed branch deployment.

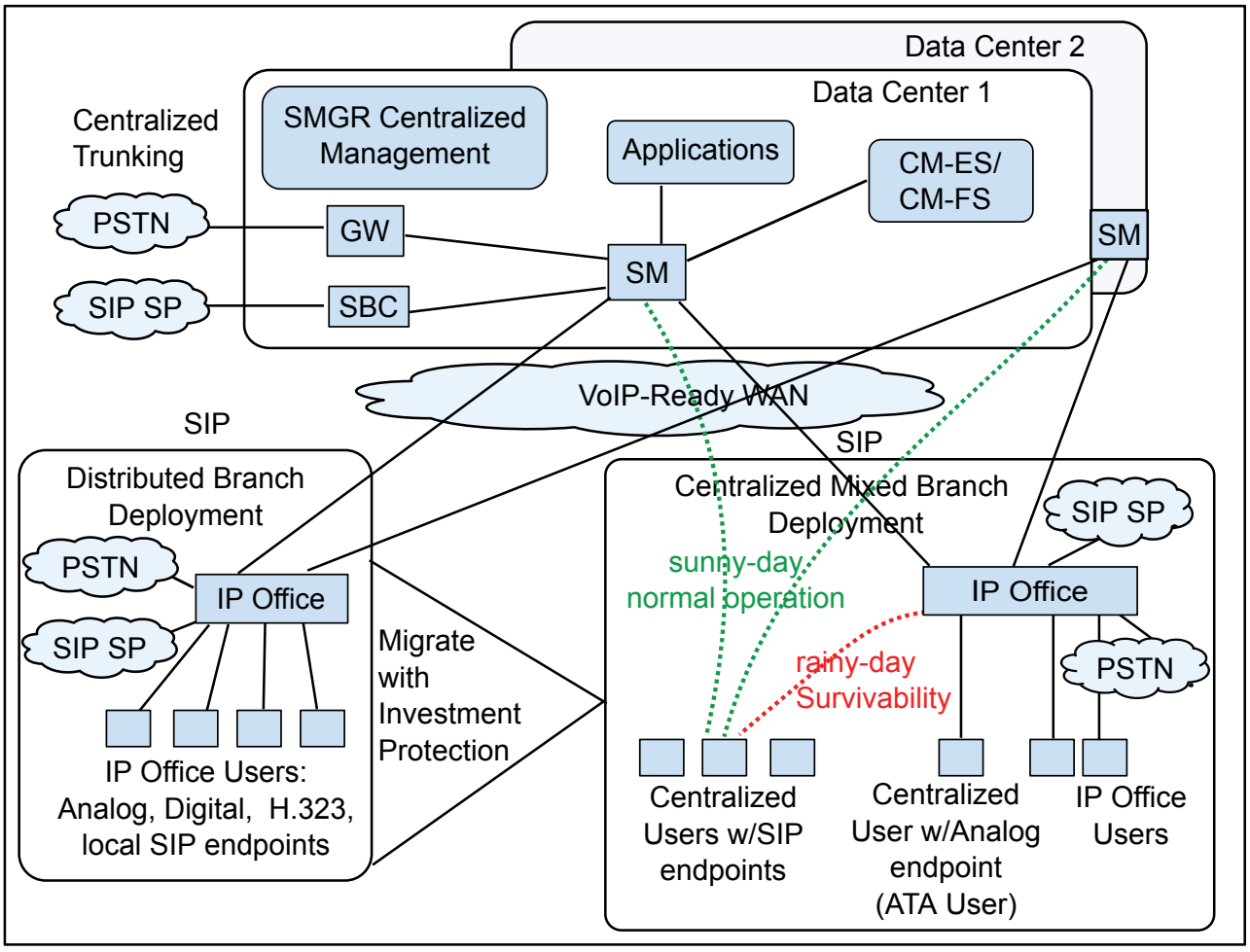


Figure 18: Topology of solution architecture

Powered by Avaya Cloud overview

The Powered by Avaya Cloud solution enables you, the BP or provider, to sell core IP Office and, optionally IP Office Contact Center or Avaya Contact Center Select, features to small and medium

enterprise users. With Powered by Avaya, you install and host the product instances in a Cloud data center at your site.

The existing Powered by Avaya Cloud solution enables you, the BP or provider, to sell core IP Office and, optionally IP Office Contact Center or Avaya Contact Center Select, Telephony and Unified Communications (UC) features to users in small and medium enterprises. With the new IP Office Cloud offer, the optional IP Office Contact Center and Avaya Contact Center Select components are not supported. Hybrid Cloud functionality, Voicemail Pro, and Media Manager are also not supported in the new IP Office Cloud offer. This offer currently uses Embedded Voicemail as its voice mail system.

With the existing Powered by Avaya offer, you install and host the product instances in a Cloud data center. The new IP Office Cloud is hosted in a Google Cloud environment with one IP Office cluster per provider.

Key benefits of the Cloud solution include the following:

- Reduction in operational costs for the enterprise by reducing the IT complexity of equipment maintenance.
- Reduction in service delivery costs for the BP through virtualization and shared infrastructure.
- Programmatic interface to support license installations, configure centralized licensing, or delete a license file.
- Automated billing with Avaya One Source Cloud Services.
- Flexibility to change your Avaya One Source Cloud Services order anytime. You can add or remove users anytime. You can update your order to add or remove the optional IP Office Contact Center and Avaya Contact Center Select programs as needed.
- Support for IP500 V2 expansion systems at the enterprise site with Hybrid Cloud. This does not apply to the new IP Office Cloud offer.
- Support for resiliency with High Availability (HA).

Powered by Avaya topology

Powered by Avaya supports the following deployment models:

- Public Network: This deployment model uses a public over-the-internet connection between the Cloud data center and the enterprise premises. All users connecting over the Public Network are considered Remote Workers.
- Private Network: This deployment model requires an MPLS or site-to-site VPN connection between the Cloud data center and the enterprise premises.

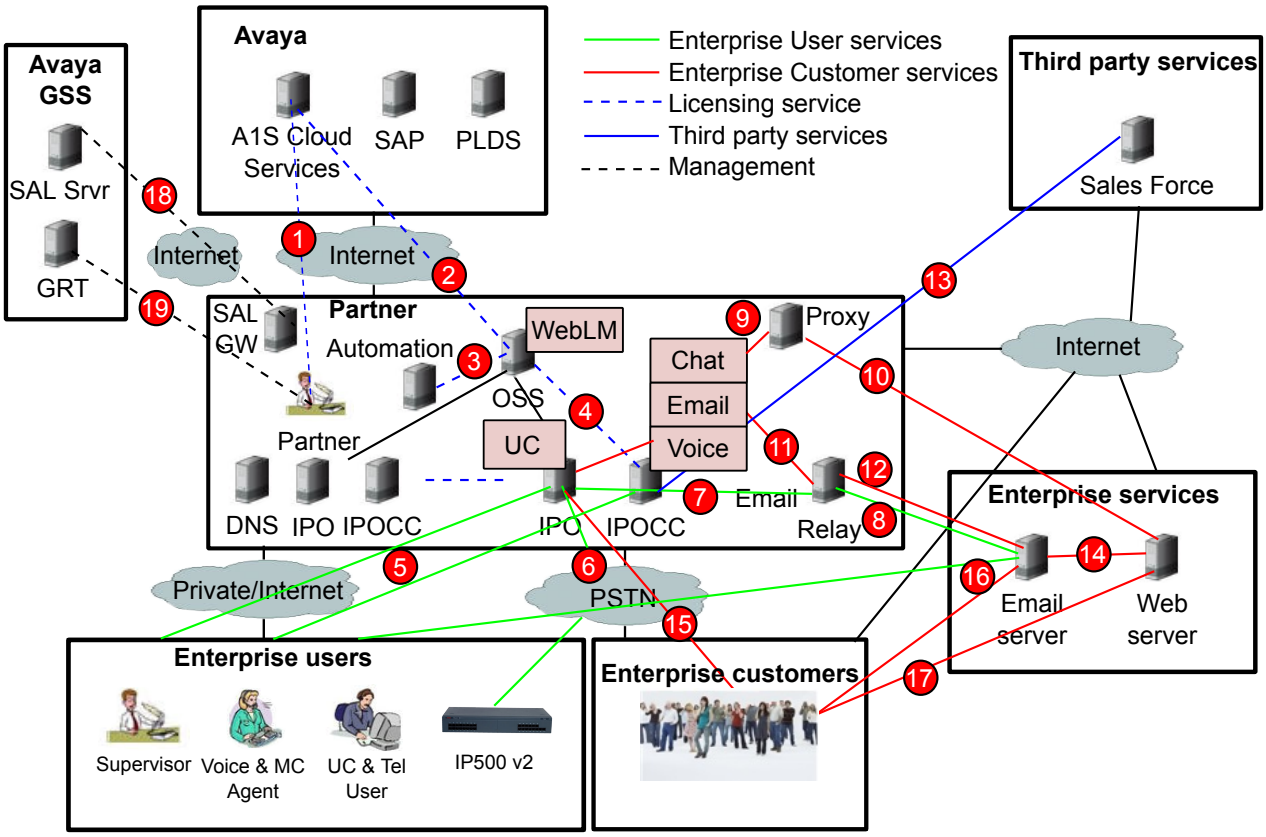


Figure 19: Powered by Avaya topology

Contact center reference configurations

IP Office Contact Center deployment options

IP Office Contact Center can be deployed using the following deployment configurations and options:

Configuration	Deployment options	Agents and trunks
IP Office Contact Center with IP500V2	IP500V2, IP Office Contact Center server, and an application server	Up to 30 agents on SIP and digital trunks.
IP Office Contact Center with IP Office Server Edition	IP Office Server Edition server and IP Office Contact Center server *and/or* a Linux expansion server (optional) *or* Hosted as a service in a cloud environment	Up to 250 agents on SIP trunks. Only 125 agents can be deployed on each Linux expansion node.

Table continues…

Configuration	Deployment options	Agents and trunks
IP Office Contact Center with IP Office Server Edition and IP500V2 expansion	IP Office Server Edition server, IP500V2 expansion server, and IP Office Contact Center server	Up to 250 agents on SIP and digital trunks. Only 30 agents can be deployed on each IP500V2 node.
IP Office Contact Center with IP Office Server Edition in a distributed environment	IP Office Server Edition server, IP500V2 expansion server, IP Office Contact Center server, and a Linux expansion in a distributed environment	Up to 250 agents on SIP and digital trunks. Up to 30 agents can be deployed on each IP500V2 node, and up to 125 agents can be deployed on each Linux expansion node. Agents and trunks are distributed on any expansion server.

Detailed IP Office Contact Center topologies are shown in the following documents:

- *Avaya IP Office Contact Center Feature Description*
- *Avaya IP Office Contact Center Reference Configuration*

Avaya Contact Center Select reference configurations

Avaya Contact Center Select is a feature-rich contact center solution that provides skill-based routing for customer voice and multimedia contacts. Avaya Contact Center Select provides extensive tools for agent management, real-time and historical reporting, and graphical tools to create contact flows and treatment rules. It provides license management, networking, and Open Interfaces Web Services. Customers integrating Avaya Contact Center Select with the IP Office platform gain skill-based routing, call treatments, reporting, unified agent management, and the graphical Orchestration Designer utility.

At deployment time, Avaya Contact Center Select automatically launches a simple configuration wizard to rapidly deploy a functional contact center solution. It is preloaded with sample users, skillsets, and contact center parameters. Use this sample data to rapidly commission the solution and make the first routed customer call and email contact.

Avaya Contact Center Select supports the following routed contact types:

- Voice
- Email
- Outbound
- Web communications (Web chat)
- SMS text messages
- Fax messages
- Scanned documents
- Voice mail messages
- Social Networking

Avaya Contact Center Select also supports peer-to-peer Instant Messaging. To support the email-based contact types, you must add an email server to your solution. To support the Web communications contact type, you must add a Web communications server to your solution.

Avaya Contact Center Select provides a simplified voice prompt management utility. The contact center supervisor can perform prompt management work without requiring administrator access to the Avaya Contact Center Select server. Avaya Contact Center Select provides a number of status monitoring utilities to monitor the integration points with IP Office.

Contact Center Manager Administration is a browser-based configuration and reporting interface for Avaya Contact Center Select. Avaya Contact Center Select supervisors use Contact Center Manager Administration to configure contact center resources, agents, skillsets, contact flows, components, and activities. Contact Center Manager Administration provides historical and real-time reporting about the contact center.

User data synchronization

Avaya Contact Center Select provides unified administration for contact center agents and IP Office users. The users (agents and agent-supervisors) that you configure in Avaya Contact Center Select are automatically mirrored to the connected IP Office.

When you create an agent in Avaya Contact Center Select, a matching user account is created in IP Office. When you modify agent details in Avaya Contact Center Select, the corresponding IP Office user details are automatically updated. However, if you delete an agent in Avaya Contact Center Select, the corresponding IP Office user is not deleted. Synchronization works in one direction — from Avaya Contact Center Select to IP Office. The IP Office administrator can manually force data synchronization from Avaya Contact Center Select.

Topology

In a contact center solution using Avaya Contact Center Select and an IP Office telephone system, the following network and connectivity topology considerations apply:

- The Avaya Contact Center Select server is supported in a workgroup or in a Windows domain.
- Each Avaya Contact Center Select connects to a single IP Office Server Edition Primary server. Alternatively, each Avaya Contact Center Select can connect to a single IP Office 500V2 Standard Mode with an Advanced Edition license.
- A Small Community Network (SCN) is a system of networked IP Office systems that can, among other features, share extension numbers and user names. Each IP Office SCN supports a single connected Avaya Contact Center Select. Avaya Contact Center Select connects to the IP Office Server Edition Primary server of the SCN. To support an IP Office SCN, Avaya Contact Center Select must connect to an IP Office Server Edition Primary server in that SCN network.
- The Avaya Contact Center Select server and the connected IP Office telephone system must be located in the same campus location.
- Each supervisor client computer communicates with the Avaya Contact Center Select server. The supervisor uses the Contact Center Manager Administration Web interface to configure agents and run reports. The agent supervisor uses the Avaya Agent Desktop software to handle customer calls, to accept emergency or supervisor calls from agents and to observe calls or Web communication contacts. Each voice-enabled supervisor with Agent Desktop requires an associated IP Office telephone.

- Each agent client computer communicates with the Avaya Contact Center Select server. The agent uses Agent Desktop to handle customer voice and multimedia contacts. Each voice-enabled agent requires an associated IP Office telephone.

Avaya Contact Center Select supports the following deployment options:

- Avaya Contact Center Select DVD
- Avaya Contact Center Select VMware
- Avaya Contact Center Select hardware appliance
- Avaya Contact Center Select Business Continuity

For more information about Avaya Contact Center Select deployment options, refer to *Avaya Contact Center Select Solution Description*.

Related links

Reference configurations on page 67
Avaya Contact Center Select DVD on page 80
Avaya Contact Center Select and VMware on page 81
Avaya Contact Center Select hardware appliance on page 82
Avaya Contact Center Select Business Continuity on page 83

Avaya Contact Center Select DVD

The Avaya Contact Center Select DVD contains the contact center application software. The DVD deployment option supports Platform Vendor Independence (PVI). PVI gives the customer the flexibility to purchase a server that meets the Avaya Contact Center Select server requirements and conforms to the customer's own corporate standards.

Avaya Contact Center Select supports a range of PVI server specifications, each specification supporting a specified maximum agent capacity and call rate. This range of PVI specifications gives the customer the flexibility to use the minimum hardware to meet their solutions requirements while allowing for future expansions.

The Avaya Contact Center Select DVD deployment option does not require VMware resources or infrastructure, which keeps Total Cost of Ownership (TCO) and solution complexity to the minimum.

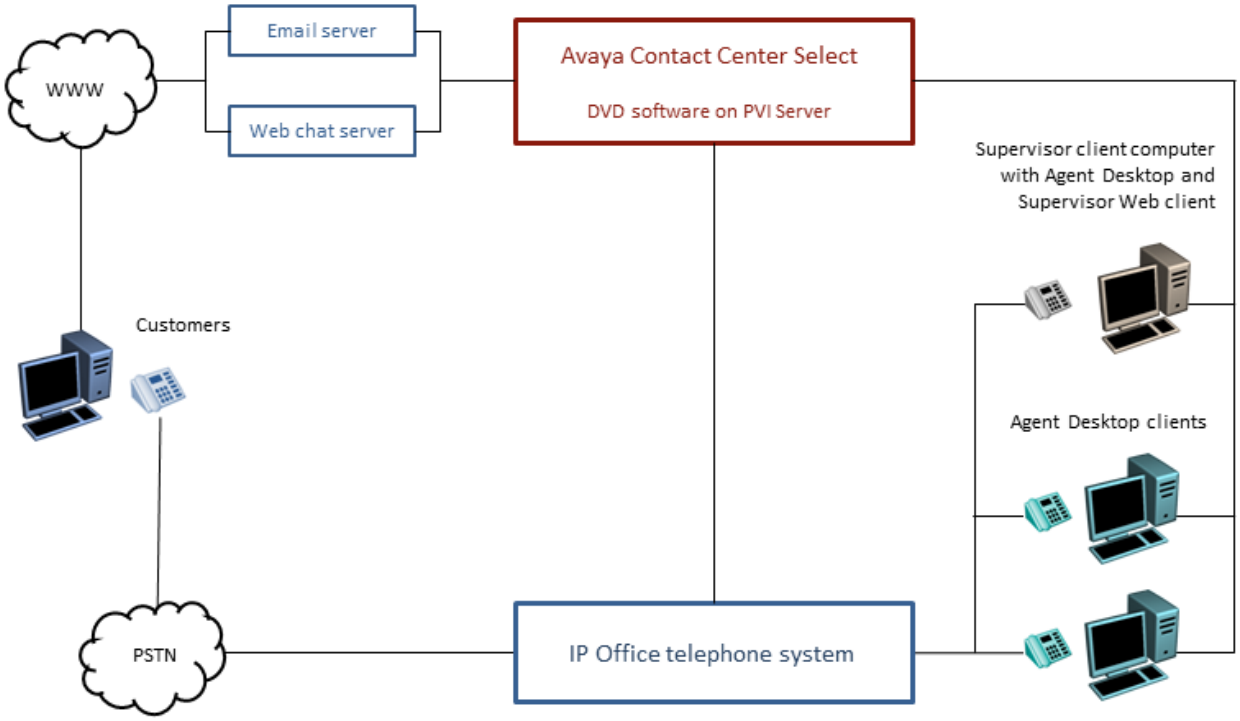


Figure 20: Typical Avaya Contact Center Select DVD deployment

To use the Avaya Contact Center Select DVD deployment option, the customer must provide the following:

- Server hardware that meets one of the Avaya Contact Center Select PVI specifications: Entry-level, Mid-range, or High-end.
- Microsoft Windows 2012 R2 Standard or Datacenter Edition operating system and license.

For more information about the Avaya Contact Center Select DVD option, refer to *Avaya Contact Center Select Solution Description*.

Avaya Contact Center Select and VMware

Avaya Contact Center Select supports VMware virtualization for increased productivity, flexibility and efficiency. All Avaya Contact Center Select deployment options support the virtualized IP Office Server Edition OVA on VMware.

Avaya Contact Center Select offers a software appliance package that consists of the following components:

- Avaya Contact Center Select virtual machine
- Avaya Aura® Media Server OVA
- Avaya WebLM OVA

Deploy these virtual machines and IP Office to build a virtualized and scalable contact center solution.

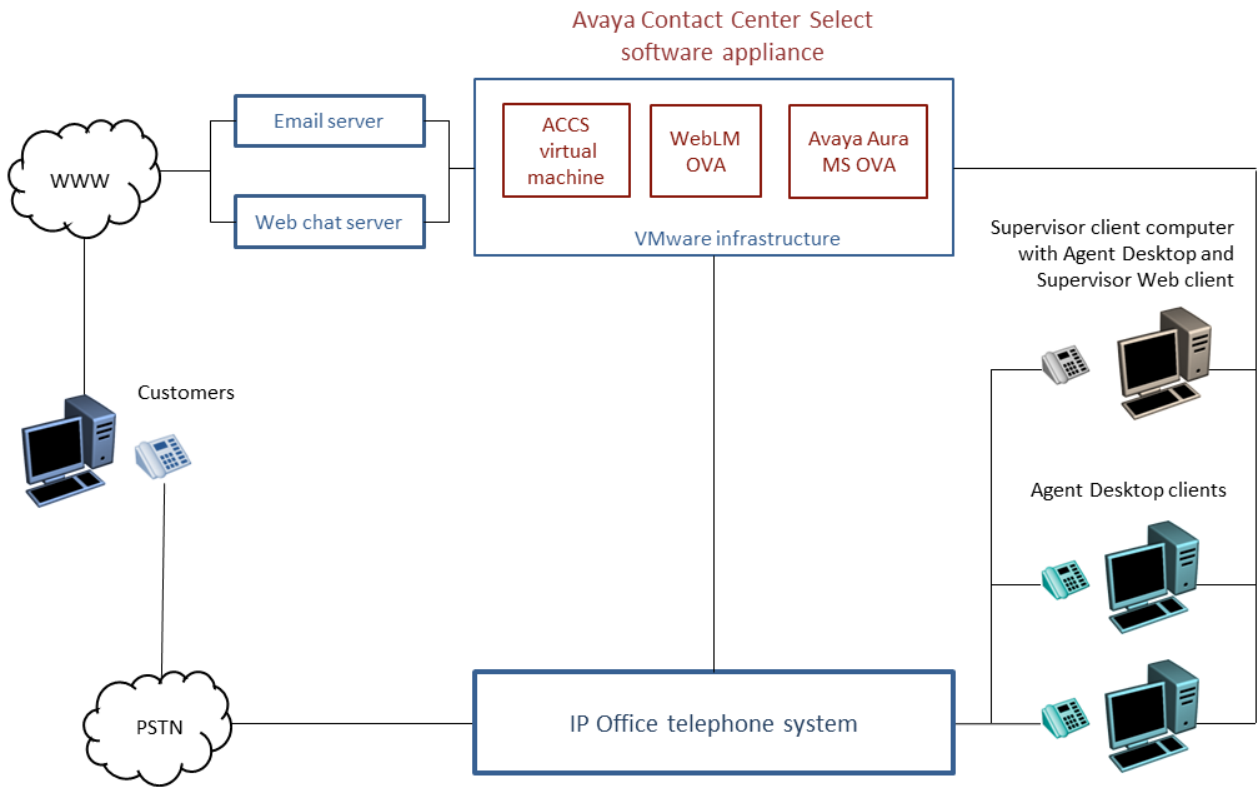


Figure 21: Typical Avaya Contact Center Select and VMware solution

Avaya Contact Center Select is a collection of applications providing real-time call control, multimedia handling, and statistical reporting. Deploy Avaya Contact Center Select on an enterprise-grade VMware virtual environment. Avaya recommends that you apply virtualization planning, engineering, and deployment with full organizational support for virtualization rather than organically growing a virtualization infrastructure.

Avaya Contact Center Select supports VMware ESXi. VMware vCenter software is not required; however it is supported and it is useful for Avaya Contact Center Select in multi-host contact center environments.

For more information about Avaya Contact Center Select and VMware, refer to *Avaya Contact Center Select Solution Description*.

Avaya Contact Center Select hardware appliance

The Avaya Contact Center Select hardware appliance is a physical rack-mount server with the Avaya Contact Center Select application software already loaded and partially preconfigured. Avaya supplies the server hardware and a license for the Microsoft Windows 2012 R2 Standard Edition operating system.

The Avaya Contact Center Select hardware appliance server delivers speedy and simplified contact center deployment.

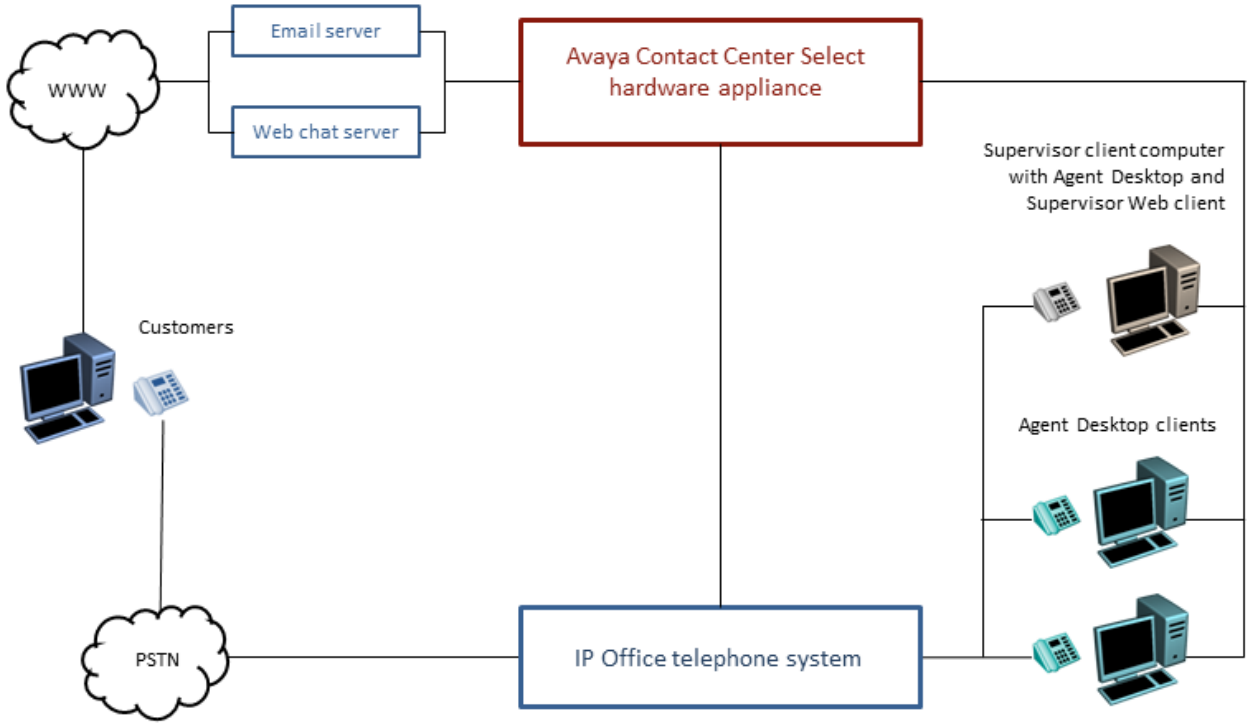


Figure 22: Typical Avaya Contact Center Select hardware appliance solution

After the basic telephony and email features are working, you can then configure more multimedia contacts, multiplicity, custom prompts, and other enhanced features and functions to improve your customer's experience.

The hardware appliance server supplied by Avaya is optimized to provide all of the real-time computational and logging resources required by Avaya Contact Center Select. The hardware appliance supports the Avaya Contact Center Select maximum agent and call rate capacity.

Avaya provides the Microsoft Windows operating system product key for the hardware appliance. The product key is displayed on a sticker attached to the top of the Avaya Contact Center Select hardware appliance server.

For more information about the Avaya Contact Center Select hardware appliance, refer to *Avaya Contact Center Select Solution Description*.

Avaya Contact Center Select Business Continuity

Business Continuity is an Avaya Contact Center Select licensed feature. Avaya Contact Center Select solutions that support Business Continuity have two Avaya Contact Center Select servers. One server, called the active server, processes customer contacts. The other server, called standby or Remote Geographic Node, shadows the active server. If the active server fails, the other Avaya Contact Center Select server can take over contact processing. This feature provides Avaya Contact Center Select redundancy, data resiliency, and disaster recovery.

To support Business Continuity resiliency, the Avaya Contact Center Select agents must each have an associated Windows domain user account in the same Windows domain as the active

and standby servers. Avaya Contact Center Select agents are also supported in domains with a two-way trust relationship with the Avaya Contact Center Select server domain.

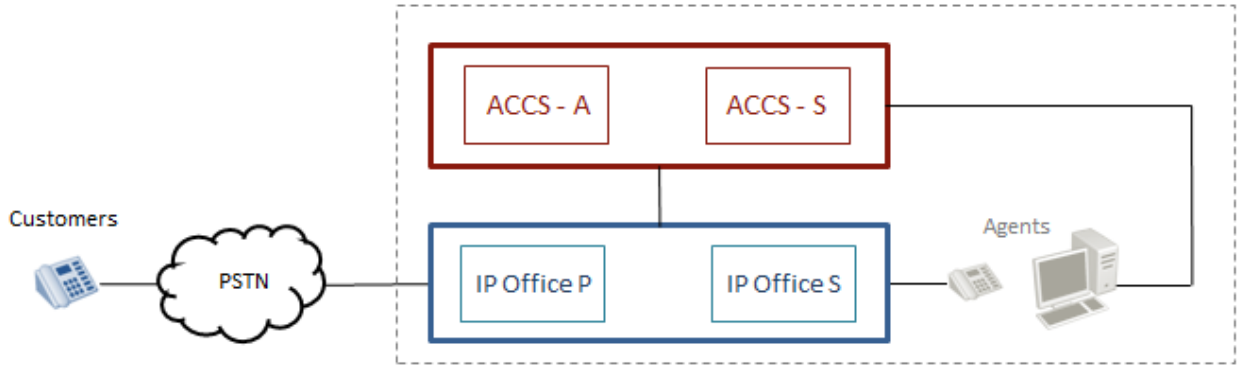


Figure 23: Avaya Contact Center Select Business Continuity with IP Office resilience

IP Office Server Edition solutions support voice platform resilience when an IP Office Secondary Server is added to the solution. Avaya Contact Center Select supports this IP Office resilience feature.

All Avaya Contact Center Select deployment options, DVD, VMware, and Hardware Appliance, support Contact Center Business Continuity and IP Office resilience. Avaya Contact Center Select Business Continuity adds additional resource requirements, topology, network connectivity, and domain layout considerations to the solution.

For more information, refer to *Avaya Contact Center Select Business Continuity*.

Hardware and software options

Hardware options

Server, base card, trunk card, and expansion module hardware options are available depending on the edition required:

- Dell PowerEdge™ R210 or R620
- Hewlett Packard ProLiant DL120 G7 or DL360 G7
- Avaya IP500 V2

Software options

IP Office acts as a server for a variety of applications, including:

- Avaya Communicator for IP Office supported on Windows and iPad devices
- Avaya one-X® Mobile for IP Office
- Avaya one-X® Portal for IP Office

- Lync Integration for IP Office
- IP Office SoftConsole
- IP Office Media Manager
- Avaya Equinox™ client for IP Office
- Avaya IP Office Web Client

IP Office can also be deployed with other components. You can deploy IP Office with Radvision or other video endpoints. You can also use IP Office Branch solution offer to connect IP Office branches to the Avaya Aura® infrastructure, allowing users to leverage core Avaya Aura® applications and services including centralized dial plans, voice mail, management, and licensing.

Related links

Accessing Avaya DevConnect Application Notes on page 134
Interoperability on page 93

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)

Table continues…

Server option	Small server #1	Small server #2	Small server #3
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 is / 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 Voicemail Pro server (either Linux or Windows) is not supported.
- The use of an external Avaya one-X® Portal server not running Server Edition software, and not running on a supported server, is not supported.

  Note:

  Salesforce (SFDC) has been removed from Avaya one-X® Portal.

Operating system and browser support

Windows Operating System

Table 7: Windows Editions and Service Packs

Operating System*	Service Pack	Edition
Windows 7	SP1	Professional, Enterprise, Ultimate
Windows 8.1	N/A	Professional, Enterprise
Windows 10	N/A	Professional (SMB), Enterprise
Windows Server 2012	N/A	Standard
Windows Server 2012 R2	N/A	Standard
Windows Server 2016	N/A	Standard, Essentials

* Windows Server 2008 R2 (64-bit) is not supported from Release 10.1.

Table 8: Windows Support – Server Components

Server	Windows 7		Windows 8.1*		Windows 10		Windows Server 2012, 2012 R2	Windows Server 2016
	32-bit	64-bit	32-bit	64-bit	32-bit	64-bit	64-bit	64-bit
Preferred Edition server (Voicemail Pro) Standalone	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Preferred Edition server with UMS	No	No	No	No	No	No	Yes	Yes
Preferred Edition server with Campaigns	No	No	No	No	No	No	Yes	Yes
Preferred Edition server with IMS	No	No	No	No	No	No	No	No
Preferred Edition server with MAPI service for Voicemail Pro on Linux	Yes	Yes	No	No	No	No	Yes	Yes
Avaya one-X® Portal for IP Office server	No	No	No	No	No	No	Yes	Yes
TAPI first-party	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
TAPI third-party	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table continues…

Server	Windows 7		Windows 8.1*		Windows 10		Windows Server 2012, 2012 R2	Windows Server 2016
	32-bit	64-bit	32-bit	64-bit	32-bit	64-bit	64-bit	64-bit
TAPI WAV[2]	Yes	No	Yes	No	Yes	No	No	No

* Windows 8.1 is the replacement/Service Pack for Windows 8.0. Therefore, we no longer support Windows 8.0.

Table 9: Windows Support – Thick Client Apps

Application	Windows 7		Windows 8.1*		Windows 10		Windows Server 2012, 2012 R2	Windows Server 2016
	32-bit	64-bit	32-bit	64-bit	32-bit	64-bit	64-bit	64-bit
Preferred Edition client	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IP Office SoftConsole	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
IP Office Manager	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SysMonitor	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
System Status Application	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
TAPI first-party	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
TAPI WAV[3]	Yes	No	Yes	No	Yes	No	No	No
Avaya Equinox™ for Windows	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Avaya Communicator for Windows	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Avaya one-X® Portal plug-in for Microsoft Outlook	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Call Assistant	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Plug-in for Microsoft Lync 2013/Skype for Business[4]	Yes	Yes	Yes	Yes	Yes	Yes	No	No

Table continues…

[2] TAPI WAV is not recommended for new designs and is not supported on a 64-bit OS.
[3] TAPI WAV is not recommended for new designs and is not supported on a 64-bit OS.
[4] Plug-in for Microsoft Lync 2010 is not supported from Release 10.1.

Application	Windows 7		Windows 8.1*		Windows 10		Windows Server 2012, 2012 R2	Windows Server 2016
	32-bit	64-bit	32-bit	64-bit	32-bit	64-bit	64-bit	64-bit
Web Conferencing [5]	Yes	Yes	Yes	Yes	Yes	Yes	No	No
IP Office Web Client	Yes	Yes	Yes	Yes	Yes	Yes	No	No

* Windows 8.1 is the replacement/service pack for Windows 8.0. Therefore, we no longer support Windows 8.0.

macOS Operating System

Table 10: macOS Support – Thick Client Apps

Application	macOS 10.8 (Mountain Lion)	macOS 10.9 (Mavericks)	macOS 10.10 (Yosemite)	macOS 10.11 (El Capitan)	macOS 10.12 (Sierra)	macOS 10.13 (High Sierra)
Web Conferencing [6]	Yes	Yes	Yes	Yes	Yes	
Avaya Equinox™ for Mac	No	No	No	Yes	Yes	Yes

Browsers

Table 11: Supported Browsers

Application	Internet Explorer 10*	Internet Explorer 11	Edge	Firefox	Chrome	Safari 8	Safari 9	Safari 10
Voicemail Pro Campaigns	Yes	Yes	Yes	No	No	No	No	No
Voicemail Pro UMS WebMail	Yes	Yes	Yes	No	No	No	No	No
Avaya one-X® Portal for IP Office client	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Web Conferencing[7]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No

Table continues…

[5] Includes Adobe Flash and Java Applet for sharing.
[6] Includes Adobe Flash and Java Applet for sharing.
[7] Includes Adobe Flash and Java Applet for sharing.

Application	Internet Explorer 10*	Internet Explorer 11	Edge	Firefox	Chrome	Safari 8	Safari 9	Safari 10
Web Manager and Web Control Page	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
D100 DECT Admin	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IP DECT R4 Admin	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Avaya Communicator for Web	No	Yes	No	No	Yes	No	No	No
IP Office Media Manager	Yes	Yes	Yes	Yes	Yes	No	No	No
Avaya IP Office Web Client	No	No	No	No	Yes	No	No	No

* Only on Windows Server 2012; however, Server 2012 R2 supports Internet Explorer 11.

Other Apps

Table 12: Microsoft Exchange

Application	Exchange 2010	Exchange 2013	Exchange 2016
Voicemail Pro UMS	Yes	Yes	Yes
Avaya one-X® Portal for IM and Presence	Yes	Yes	Yes

Table 13: Microsoft Outlook

Application	Outlook 2010	Outlook 2013	Outlook 2016
Voicemail Pro IMS	No	No	No
TAPI (for dialing)	Yes	Yes	Yes
Voicemail Pro UMS with IMAP	Yes	Yes	Yes
Avaya one-X® Portal Outlook Plug-in[8]	Yes	Yes	Yes

[8] For Outlook 2013 and later, the contact screen popping feature is not supported.

Virtualization

Table 14: Virtualization support

Hypervisor	IP Office Server Edition	IP Office Partner-Hosted
VMware ESXi 5.1	Yes	Yes
VMware ESXi 5.5 U2+	Yes	Yes
VMware ESXi 6.0	Yes	Yes
VMware ESXi 6.5	Yes	Yes
VMware ESXi 6.7	Yes	Yes
Microsoft HyperV on Server 2012 R2	Yes	Yes
Microsoft HyperV on Server 2016	Yes	Yes
KVM	No	Yes
Amazon AWS	Yes	Yes

Note:

Google KVM is supported on QEMU with CentOS version 6 and 7 in case of Powered by Avaya (hosted) solution and not supported for CPE. For more information, see *Deploying Powered by Avaya for Business Partners guide*.

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	Operating system and browser support on page 88

Additional software	.NET Framework 4.0: 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	Operating system and browser support on page 88

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	Operating system and browser support on page 88
Additional software	Sun Java Virtual Machine 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	Operating system and browser support on page 88
Additional software	Web Browser: Microsoft Internet Explorer 7+, Mozilla Firefox 3.0

Virtual environment requirements

Ensure you have the following:

- VMware vSphere client software for management (vSphere ESXi software and virtualized instances running on a single host server)

  Note:

  vCenter software is not required, however might be useful for multi-host server environments.

- Host hardware supporting VMware vSphere and IP Office Server Edition resource requirements and specifications to meet configuration needs.

VMWare ESXi support:

- IP Office Server Edition and IP Office Contact Center support VMWare ESXi 5.1 and 5.5 U2.
- IP Office Contact Center supports VMWare ESXi 6.0. IP Office Server Edition supports VMWare ESXi 6.0 for only versions 10.0 and later.

  For more information about IP Office Contact Center support and specifications, see *Avaya IP Office Contact Center Reference Configuration*.

Note:

ESXi 4.x is no longer supported.

Additional hypervisor support:

Hypervisor support is now extended to:

- Microsoft Hyper-V
- AWS (for Amazon Web Services): An AMI (Amazon Machine Image) is provided that can perform Auto Ignition and ICU based on User Data set in AWS. The AMI will behave similar to the existing Google Compute Image. Consult the instance types that Amazon EC2 supports on the Amazon AWS website.

  In Amazon Dashboard, you need to select Launch Instance under Create Instance. Select Community AMIs and search for Avaya IP Office.
- KVM (for Kernel-based Virtual Machine)

Interoperability

Interoperability means that two systems can communicate with an interface in each system to handle the communication. Compatibility means that two components in the same environment are compatible with each other if they run or reside in the environment without adversely affecting the behavior of the other.

For detailed information about IP Office interoperability and supported releases, see https://secureservices.avaya.com/compatibility-matrix/menus/product.xhtml?name=IP+Office+Platform.

Avaya product interfaces

IP Office includes an interface to the following Avaya products:

- Avaya Aura®
- Avaya Contact Center Select
- Avaya Aura® Messaging
- Avaya CallPilot®
- Avaya Cloud Video Phase
- Avaya Communicator for Windows
- Avaya Communicator for iPad
- Avaya Equinox™
- Avaya one-X® Communicator
- Avaya Session Border Controller for Enterprise
- Avaya Business Communications Manager
- Avaya Communication Server 1000
- Avaya Modular Messaging
- Avaya Scopia®
- Secure Access Link
- Avaya Aura® Experience Portal

ISDN interfaces

EU interfaces:

- BRI: RJ45 sockets. ETSI T-Bus and S-Bus interfaces to CTR3 for Pan European connection
- PRI E1: RJ45 socket. ETSI T-Bus interface to CTR4 for Pan European connection
- PRI T1/J1: RJ45 socket: FCC Part 68/JATE connection

USA interfaces:

- PRI T1 service: Ground Start (GS) - Default, E&M, 56 K data for 5ESS, 56/64/64 restricted for 4ESS
- PRI ISDN switch support: 4ESS, 5ESS, DMS-100, DMS-250 (includes conformance to ANSI T1.607 and Bellcore Special Report SR4287, 1992)
- PRI ISDN Services: AT&T Megacom 800, AT&T WATS (4ESS), AT&T SDS Accunet 56 Kbps and 64 Kbps (4ESS), AT&T Multiquest (4ESS)

Related links

Phone interoperability on page 95
IP Office and Avaya Aura Communication Manager interoperability on page 99
BCM and IP Office interoperability on page 100
Accessing Avaya DevConnect Application Notes on page 134
Product compatibility on page 133
Hardware and software options on page 84

Phone interoperability

The following table summarizes the phone interoperability comparison by IP Office edition.

Table 15: Generally available phones

Phone	Basic Edition	Essential and Preferred Editions	Server Edition Select Server Edition Virtualized
Analog deskphones:			
POTS	Yes	Yes	No
1000 Series Video phones:			
1010, 1020, 1030, 1040 (Lifesize)	No	Yes	No
1400 Series : DS Digital phones – IP Office and Communication Manager			
1403, 1408, 1416	Yes	Yes	No
DBM32	Yes	Yes	No
1600 Series : IP (H.323) phones – IP Office and Communication Manager			
1603, 1603SW, 1603SW–i, 1608, 1608–i, 1616, 1616–I	No	Yes	Yes
2400 Series: DS Digital phones – IP Office and Communication Manager			
2402D, 2410D, 2420	Yes	Yes	No
EU24	Yes	Yes	No
3600 Series: WiFi H.323 – IP Office and Communication Manager			
3641, 3645	No	Yes	Yes
3700 Series: DECT – IP Office and Communication Manager			
3720, 3525, 3730, 3735, 3745, 3749	No	Yes	Yes
9500 Series: DS digital – IP Office only			
9504, 9508	Yes	Yes	No
BM12	Yes	Yes	No
9600 Series: IP H.323 – IP Office and Communication Manager			
9620L, 9620C, 9630, 9640G, 9650, 9650C	No	Yes	Yes
SBM24 with 96x0	No	Yes	Yes
9608, 9611, 9621, 9641, J169, J179	No	Yes	Yes
BM12	No	Yes	Yes
B100 Series Conference Phones:			
B149, B159	Yes	Yes	No

Table continues…

Phone	Basic Edition	Essential and Preferred Editions	Server Edition Select Server Edition Virtualized
B179 SIP	No	Yes	Yes
D100/D160 DECT Phones:			
D160	Yes	Yes	Yes
E100 Series IP Phones:			
E129	No	Yes	Yes
E159	No	Yes	Yes
E169	No	Yes	Yes
H100 Series Video Collaboration Stations:			
H175	No	Yes	Yes
Avaya J100 Series IP Phones:			
Avaya J139 IP Phone	No	Yes	No
Avaya J169 IP Phone	No	Yes	No
Avaya J179 IP Phone	No	Yes	No
Softphone:			
Avaya Communicator Windows	No	Yes	Yes
Avaya Communicator iPad	No	Yes	Yes
Avaya Equinox™	No	Yes	Yes

Table 16: Generally available NORSTAR/BCM phones

Phone	Basic Edition	Essential and Preferred Editions	Server Edition Select Server Edition Virtualized
1100 Series SIP phones: BCM Unistim migration			
1120E, 1140E	No	Yes	Yes
BM LED and paper labels	No	Yes	Yes
BM LCD	No	Yes	Yes
1200 Series SIP phones: BCM Unistim migration			
1220, 1230	No	Yes	Yes
BCM paper	No	Yes	Yes
BCM LCD	No	Yes	Yes
NORSTAR/BCM Digital phones:			

Table continues…

Phone	Basic Edition	Essential and Preferred Editions	Server Edition Select Server Edition Virtualized
T7000, T7100, T7208, T7316, T7316E	Yes	Yes	No
T24 Key Module	Yes	Yes	No
M7100(N), M7208(N), M7310(N), M7310BLF, M7324(N)[9]	Yes	Yes	No
CAP Key Module	Yes	Yes	No
NORSTAR/BCM Digital Conference Phone	Yes	Yes	No
Nortel Digital Mobility phones:			
T7406, T7406E	Yes	Yes	No
7420, 7430, 7434, 7439, 7440, 7449	Yes	Yes	No
4135, 4136, 4145, 4146, 4145EX, 4146EX	Yes	Yes	No

Avaya has tested the following phones for interoperability with IP Office. These phones may not support all features. If the phone is past its Avaya Manufacturer Support Period, issue resolution is limited to those already fixed.

Table 17: Supported Avaya phones no longer for sale

Note:

Supported in this context means the phones have been tested by Avaya for interoperability with IP Office. Older phone models may not support new features if the phone model is outside of the Avaya Manufacturer Support period. If there is a software update related to the Release 11.0, a software fix will not be provided for Phones that are outside of the Avaya Manufacturing Support period. Phones “No Longer supported” are outside of the Avaya Manufacturing Support period and are not covered under Avaya Maintenance offers (End of Service Support and End of Maintenance Support)

1. OSX 10.9 Mavericks is last OS version supported for Video Softphone for MAC. That client is no longer available on either of 10.x or 11.0 software for same reason. Avaya Communicator for Web, Avaya IP Office Web Client, and Avaya Equinox™ are available for Mac users on IP Office Release 11.0.
2. Digital and analog phones are supported with Server Edition or Select as indicated using the IP500 V2 as an expansion module.

[9] Only the global version of the M7000 Series phones are supported. The non-global versions are not supported and can be identified by the contrast levels; the global version has 9 contrast levels and the non-global version has only 4 contrast levels.

Phone	Basic Edition	Essential and Preferred Editions	Server Edition Select Server Edition Virtualized
ETR phones: Analog Feature Phone, PARTNER and IP Office			
“Refreshed” 34, 18 and 6 button display	Yes	No	No
“Euro” 34 and 18 button display	Yes	No	No
“Euro” 18 and 6 button display	Yes	No	No

Related links

Interoperability on page 93
Phone availability on page 98
Accessing Avaya DevConnect Application Notes on page 134
Using the Avaya InSite Knowledge Base on page 134
Phones on page 38

Phone availability

Phones available worldwide

The Avaya phones listed below are the recommended phones for use with IP Office. These phones are sold worldwide in every country where IP Office is available.

For detailed specifications, see specific phone information on the Avaya Support site at http://support.avaya.com.

Digital phone models	IP phone models
1403	1603
1408	1608
1416	1616
9504	9608
9508	9611
	9621
	9641
	Avaya J169 IP Phone
	Avaya J179 IP Phone
	Avaya J139 IP Phone

Phones only available in certain countries

In addition to the phones listed above, the following Avaya phones are available in certain countries and regions.

Digital/Analog phone models	IP phones
2402	9620L/9620C
2410	9630G/9640/9640G
2420	9650/9650C
3810 Wireless	3720 DECT R4 Wireless Handset
EU24/EU24BL DSS Unit	3725 DECT R4 Wireless Handset
	3730 DECT R4 Wireless Handset
	3735 DECT R4 Wireless Handset
	3745 DECT R4 Wireless Handset
	3749 DECT R4 Wireless Handset
	3641 Wireless (WiFi) phone
	3645 Ruggedized Wireless (WiFi) phone
	D100

Related links

Phone interoperability on page 95

IP Office and Avaya Aura® Communication Manager interoperability

IP Office uses H.323 protocol for trunks between the nodes and the Avaya Aura® Communication Manager. Centralized voicemail for all IP Office systems in the SCN network and all phones are supported on the individual call servers. Advanced call handling features are available between the IP Office nodes. This interface works on Essential and Preferred Editions.

Supported phones include:

- Avaya IP phones (H.323)
- Avaya digital phones
- BCM 7000 series digital phones
- BCM 1100/1200 series IP phones (SIP)
- DECT R4 phones
- Analog phones

These features allow for simple networking needs between IP Office remote branches to an Avaya Aura® Communication Manager at the main site.

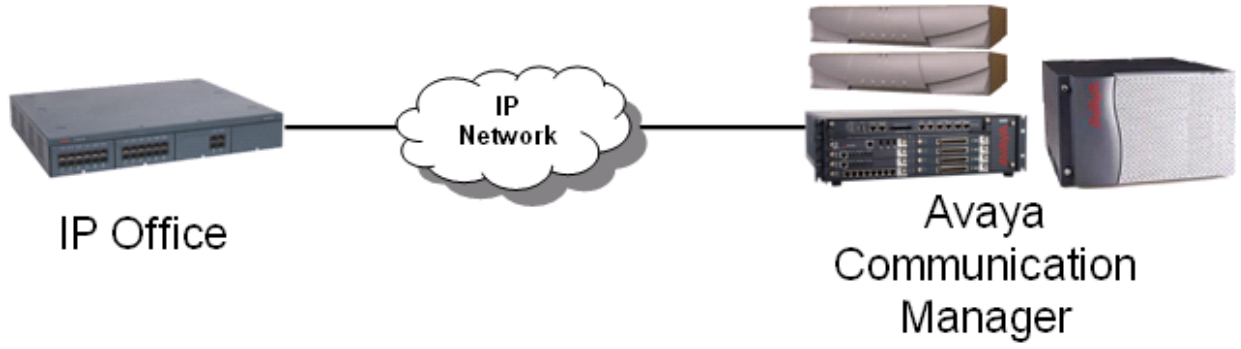


Figure 24: VoIP networking using H.323

Q.SIG provides the following supplementary services which are also available between IP Office and Avaya Aura® Communication Manager equipped with the relevant RFA licenses:

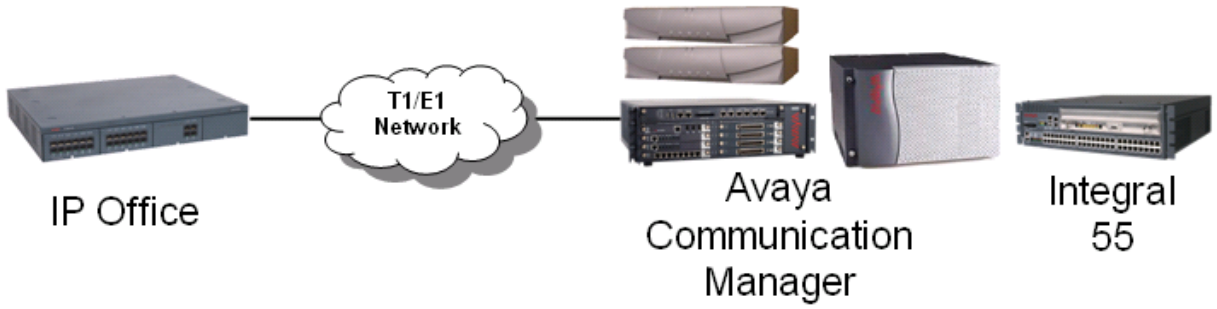


Figure 25: Q.SIG networking using T1/E1 links (TDM)

Related links

Interoperability on page 93

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.

Related links

Interoperability on page 93

Security specification

The Avaya Product Security Support Team (PSST) responds to ongoing security vulnerabilities for all Avaya Products. For more information, see *Avaya Product Security Vulnerability Response Policy* and *Avaya Security Vulnerability Classification* at the Avaya Support website at https://support.avaya.com/security.

Default security

The IP Office software security engine is supplied by Mocana Corporation. For more information, see https://www.mocana.com.

Security features are built-in into the software platform. These features consist of:

- Integrated firewall to prevent Denial of Service (DoS) attacks
- Secure connections to ensure the privacy and integrity of transmitted information including:
  - TSL on administration interfaces
  - HTTPS client
  - HTTPS server
  - IPSec
  - SIP-TLS

- SSL/VPN
- VMPro/Exchange MAPI integration (TLS)

For detailed information about SSL/VPN remote access, see *Deploying Avaya IP Office™ Platform SSL VPN Services* and *Avaya IP Office™ Platform Port Matrix* at the Avaya Support website.

Configurable security

Configurable security settings include the following features:

- Encryption and message authentication
- Configuring integrated firewall settings
- Digital certificates
- Prevention of tool fraud by restricting user privileges and using security policy configuration to manage account credentials and access control

See *Avaya IP Office™ Platform Security Guidelines* for more information.

Network security

Network security leverages resources such as VLANs and firewalls available on the enterprise network and includes:

- External firewall configuration
- Separate of network functionality by creating separate VLAN groups and security zones
- Hardening of Layer 2 (data link layer) and Layer 3 (Network layer) by configuring SNMP trap destinations, syslog entries, and an IPSec VPN.
- SSL/VPN remote access

Operational security

Ongoing operational security to maintain a secure system includes:

- Patching
- Logging and monitoring
- Virus protection

Related links

Platform and application security details on page 102

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.

Related links

Security specification on page 101

Port assignments

Details of the range of ports used by IP Office and IP Office applications are found at https://support.avaya.com/products/.

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

Typical upgrade paths

Upgrading IP500 V2 platforms

Customers can migrate to the latest release by purchasing an upgrade license or under the terms of their IP Office Support Services support contract, as applicable. Customers migrating to the latest release will be required to have an IP500 V2 control unit or supported servers with Server Edition. IP500 base cards, trunk cards and expansion modules are supported with IP500 V2 control unit and may migrate to the V2 control unit. Licenses will require a dongle swap to move from the IP500 key card to the IP500 V2 SD card.

For systems using the IP500 V2 with any software release prior to 8.1.1.0, a two-stage upgrade process is required to cope with the increased size of the 9.1 binary file. Upgrade to 8.1.1.0 or any 9.0 version before attempting the upgrade to 9.1.

Ensure that the systems do not contain unsupported hardware. Upgrade them if necessary prior to upgrading the software. Install upgrade licenses prior to the upgrade.

Use the Manager Upgrade Wizard to display the software currently present on the SD card and the new versions available for upgrade.

IP400 hardware will no longer be supported, including IP400 series internal cards, expansion modules and trunk cards listed below:

IP400 VCM cards	VCM4
	VCM8
	VCM16
	VCM24
	VCM30
IP400 modules and station cards	Digital Station V1: 16 and 30 port variants
	Phone V1: 8, 16 and 30 port variants
	So8: ETSI BRI SO support
IP400 cards	Analog Trunk Card Uni (ATM4U)
	Analog Trunk Cards (ATM4)
	BRI Trunk Cards
	T1 PRI Trunk Cards
	E1 PRI Trunk Cards
	E1R2 PRI Trunk Cards

The following IP400 trunk and station modules will continue to be supported in the current release.

IP400 expansion modules	Analog trunk 16
	Digital Station V2: 16 and 30 port variants

Phone V2: 16 and 30 port variants

Upgrading Server Edition

Upgrade Server Edition primary, secondary and expansion systems using the iso image burned to a DVD or USB. Install upgrade licenses prior to upgrading. There are two options available:

Upgrading to IP Office Select

Existing Server Edition licenses need to be migrated by purchasing a new set of Select PLDS licenses.

Upgrading Application Server

The upgrade process for the Application Server is the same as for IP Office Server Edition.

Upgrading UCM

Upgrade UCM using a USB2 memory Key with new software or the Web Manager ISO upgrade process.

Upgrading Windows server applications

Download the latest windows applications and copy to the server or burn to a DVD.

Upgrading networked systems

In previous releases, networking was achieved using H.323 lines configured with supplementary services set to SCN. From 9.1 and later, these lines will be migrated to IP Office Lines.

Replacing Customer Call Reporter

Advanced Edition and Customer Call Reporter (CCR) are no longer available for sale. Additionally, existing Advanced Edition customers will need to migrate their CCR to IP Office Contact Center via purchase of the IP Office Contact Center solution prior to upgrading. However, CCR will continue to be sold and supported on the previous release consistent with Avaya lifecycle support policy.

Avaya will provide CCR customers with a clear path to move to IP Office Contact Center. Further, as a result of this change, Preferred Edition will now come with the Voicemail Pro database and Visual Basic Scripting (these were previously part of Advanced Edition).

Ordering process

Software applications are orderable by Avaya Partners from their Avaya Authorized Distributor. Avaya Partners must contact their respective distributors directly to purchase all IP Office software applications. Each distributor implements a customized IP Office software purchasing and distribution process for its network of Avaya Partners. These distributor specific internal processes are not covered by this document.

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.

IP Office Branch migration

Migration roadmap and limitations

You can upgrade from a B5800 Branch Gateway to the current release of IP Office, or from a previous release of IP Office to the current release of IP Office. The upgrade process for the IP Office Branch solution varies depending on how the architecture is deployed.

If the B5800 Branch Gateway or IP Office release you are upgrading from is connected to the Avaya Aura® infrastructure and uses Avaya Aura® System Manager for centralized management, use Avaya Aura® System Manager to upgrade the firmware and software for the system.

If the architecture is deployed in a stand-alone IP Office branch environment with no centralization or connection to the Avaya Aura® network, you must use IP Office Manager for upgrades. From IP Office Manager, you can perform an upgrade using the upgrade wizard or the System SD card.

For procedures on how to perform System Manager or IP Office Manager upgrades for your Branch solution, see *Migrating an IP Office or B5800 Branch Gateway to an IP Office Enterprise Branch*.

Licenses

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 connected to the IP Office system.

This section describes the license requirements for IP Office features. For information and procedures on managing licenses, see “Applying Licenses” in the following documents:

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

Ports, channels, and users

Some licenses enable a number of ports, channels, or users. Depending on the particular license, each supported instance can be consumed either when it is configured for use or when it is actually being used. When no further instances of a license are available, further use of the licensed feature is not allowed.

Multiple licenses can be added to give a higher number of supported ports, channels, or users. However, licenses above the capacity supported by the particular IP Office control unit will not work.

PLDS licensing

IP Office uses the Avaya Product Licensing and Delivery System (PLDS) to manage licenses. PLDS is an online, web-based tool for managing license entitlements and electronic delivery of software and related license files. PLDS provides customers, Avaya Partners, distributors, and Avaya Associates with easy-to-use tools for managing license entitlements and electronic delivery of software and related license files. Using PLDS, you can perform operations such as license activations, license upgrades, license moves, and software downloads. You can access PLDS from http://plds.avaya.com/.

PLDS license files

Licenses are delivered from PLDS with license files. A PLDS license file is generated for installing on a specific machine. There are two deployment options:

- PLDS Nodal license files are generated for and installed on particular IP Office nodes.
- PLDS WebLM license files are generated for and installed on a WebLM server that can license multiple IP Office nodes.

WebLM centralized licensing is supported in IP Office Server Edition and in IP Office Branch deployments, but not in non-Branch deployments of IP Office Standard mode.

PLDS host ID

Each PLDS license file must be created with the PLDS host ID of the system where the license file is to be loaded. PLDS Nodal license files are machine specific and you must specify the host ID in the **PLDS host ID** field in IP Office Manager or Web Manager.

IP500 V2 systems: You can find the PLDS host ID in the **Licensing** tab of IP Office Manager and Web Manager. The PLDS host ID is made of the two digits “11”, followed by the 10 digit feature key serial number printed on the IP Office SD card. If the SD card is changed, the PLDS host ID will also change.

IP Office Linux servers: The PLDS host ID can be found on the server labeling, the server packaging label, and the system ignition Login screen. The PLDS host ID is derived from the system ID. If the system ID changes, the PLDS host ID will also change.

WebLM: The WebLM host ID is the Mac address of the WebLM server. In a virtual environment, the WebLM host ID is a virtual Mac address that starts with the letter “V”. The WebLM host ID must be used when generating a PLDS license file for the WebLM server in order to implement a centralized licensing scheme for multiple IP Office systems. The WebLM host ID can be found on the server labeling, the server packaging label, the system ignition Login screen, and through the WebLM management interface.

Web License Manager (WebLM)

The Web License Manager (WebLM) is a web-based application for managing licenses. If you use the WebLM server running on the IP Office server, then you can use IP Office Web Manager to log in to the WebLM server by selecting **Applications** > **Web License Manager**. WebLM credentials are managed separately from IP Office system passwords and are not part of single sign on (SSO).

Note:

- WebLM license management is supported for Server Edition deployments and for Enterprise Branch deployments using the System Manager WebLM server. It is not supported for Standard Mode systems.
- When upgrading from a previous release, all systems must be running the same software level. IP Office Server Edition does not support mixed versioning.

For more information on WebLM, see *Administering standalone Avaya WebLM*.

Migration of ADI licenses

ADI licenses are no longer supported as of Release 10.0. New licenses must be obtained from PLDS.

Using the One Source Configurator (OSC), all ADI licenses from previous releases are upgraded to PLDS. The **License Migration** option in IP Office Manager can be used to extract license information about the system, and this information can then be uploaded to OSC. After the information is extracted, IP Office Manager signs the file so it cannot be modified.

PLDS license creation

The PLDS license must be created with the PLDS host ID of the system where the license will be loaded. If the licenses are loaded locally on the IP Office, then the PLDS host ID is available in IP Office Manager or Web Manager. For IP500 V2, it is also the Feature Key number on the SD card, which starts with “11”. If the PLDS file is loaded on a WebLM server, then the host ID is available on the WebLM interface under **Server Properties**.

For more information about migrating IP Office licenses to PLDS, see *Administering Avaya IP Office™ Platform with Manager* or *Administering Avaya IP Office™ Platform with Web Manager*.

Virtual licenses

As part of the migration process, the following virtual licenses are provided as actual PLDS licenses only through the XML migration process:

- Virtual Essential Edition
- Virtual Preferred Edition for systems with a UCMv1 module
- Virtual Avaya IP endpoints for systems with:
  - VCM32/64 v1 modules that provided 12 Avaya IP endpoints
  - Legacy VCM channel migration licenses
- Additional virtual Voicemail Pro ports for Server Edition

  Te PLDS licensing system adds two Voicemail Pro ports to any Server Edition or Server Edition Select license.

Customers with older systems (IP500 V1 / IP406 V2 / IP412 at release 6.0 or later) can upgrade through A1S Configurator BOM upload and ADI license validation process. Any virtualized licenses on these older systems will not carry forward and must be purchased as new.

Note:

The legacy Windows soft phone is not supported in IP Office Release 11.0 and will not function. The previous virtual licenses provided when upgrading are no longer provided in release 11.0. Avaya Equinox™ for Windows is the replacement. The Teleworker license enables the use of the Avaya Equinox™ for Windows. In earlier releases, this was only available with Office Worker and Power User.

Server Edition Centralized and Nodal licensing

Before release 10, Server Edition deployments used nodal licensing. This type of licensing can still be used in release 10 and higher. However, it is expected that most deployments will prefer to centralize license management using the Avaya Web License Management (WebLM) server. The WebLM server is automatically installed on the Server Edition Primary server. For newly installed systems, centralized licensing is the default configuration.

All systems in the Server Edition solution must use the same **License Source**.

Nodal licensing

With nodal licensing, license files must be installed on each node in the system. For some licensed features, the required license can be installed on the Server Edition Primary server and

used by all nodes in the system. However, for other licensed features, the required license must be installed on the node where the feature is used.

Centralized licensing

As of release 10, you can use the WebLM server running on the Server Edition Primary server to fully centralize license management. With centralized license management, all licenses are contained in a single PLDS file uploaded to WebLM. All nodes in the solution obtain their licenses from WebLM.

The IP Office Secondary server and Expansion systems can be configured to request licenses directly from the WebLM server, or to use a proxy option. When configured to use the proxy option, the license requests are sent through the IP Office Primary server, which proxies the requests to the WebLM server. The Primary server does not allocate licenses, but only acts as a proxy.

Systems using nodal licensing can be converted to use centralized licensing. Since PLDS license files are generated using the host ID of the server where they reside, you must regenerate the license file using the host ID of the WebLM server that will host the license file.

Centralized license distribution

When the license source is WebLM, the **Reserved Licenses** read-only fields indicate licenses that are required for the currently configured features. Editable fields can be used to:

- Request additional licenses from the WebLM server.
- Remove licenses from the IP Office node to apply them elsewhere.

Important:

When reallocating licenses, always reduce the number on the IP Office node where they are currently applied before applying them on another node. If you exceed the number of licenses available, you will receive an error message.

Distribution after conversion from Nodal to Centralized licensing

- If the IP Office node needs any of the following licenses, then you must manually configure the respective **Reserved Licenses** editable fields. This will allow the IP Office node to request the licenses from the WebLM server.
  - **VMPro Recordings Administrators**
  - **VMPro TTS Professional**
  - **CTI Link Pro**

Extension Reserved license setting: When the license source is **Local**, the setting **Extension** > **VoIP** > **Reserve License** is set to **None**. Switching the license source to WebLM changes the setting to **Reserve Avaya IP endpoint license**. If required, you must manually change this setting to **Reserve 3rd party endpoint license** or **Both**.

License allocation in WebLM

You can use WebLM to view the licenses used by each node in IP Office Server Edition. In the WebLM navigation pane on the left, click **Licensed Products**. The Acquired licenses table displays information about the licenses acquired for each client ID. In IP Office, the WebLM client ID for each node is displayed on the license Remote Server page.

Nodal license distribution

When the **License Source** is **Local**, the **Reserved Licenses** read-only fields indicate licenses that are required for the currently configured features.

Nodal licensing for a Server Edition solution is based on a combination of licensing done through the Server Edition Primary server plus some server-specific licenses. All the user specific and system specific licenses can be managed from the Server Edition Primary server that also acts as a licensing server. Licenses are entered into the configuration of the Server Edition Primary server and are based on the system ID of that server.

Where a license is used to enable features, such as SIP Trunk channels, on other systems, the Server Edition Primary server only allocates those licenses to other systems after it has met its own license needs.

When another system loses connection to the Server Edition Primary server, any license requirements based on those licenses entered in the Server Edition Primary server's configuration are supported for a grace period of 30 days.

Other server specific licenses are entered into the configuration of the server requiring the feature and are based on the System ID of that system.

License	Primary server	Server-specific
Server Edition	Yes	No
Avaya IP endpoints	Yes	No
Third-party IP endpoints	Yes	No
SIP trunk channels	Yes	No
IP500 universal PRI channels	No	Yes
Additional voicemail ports [3]	Yes	No
Web Collaboration	No	Yes
UMS Web Services [1]	No	Yes
Office Worker	Yes	No
Power User	Yes	No
Office Worker to Power User upgrade	Yes	No
Receptionist	No	Yes
CTI Link Pro	No	Yes
Messaging TTS Pro [3]	Yes	No
Voicemail Pro Recording Administrator [2] [3]	Yes	No
WAV User	No	Yes
IPSec tunneling	No	Yes

1. UMS Web Service licenses are for Hunt Groups only.
2. The Voicemail Pro Recording Administrator license refers to Contact Store. Only one license is required for a Server Edition network.

3. For deployments with dual Voicemail Pro servers, Messaging TTS Pro, Voicemail Pro Recording Administrator, and Additional voicemail ports licenses must be on the Secondary Server.

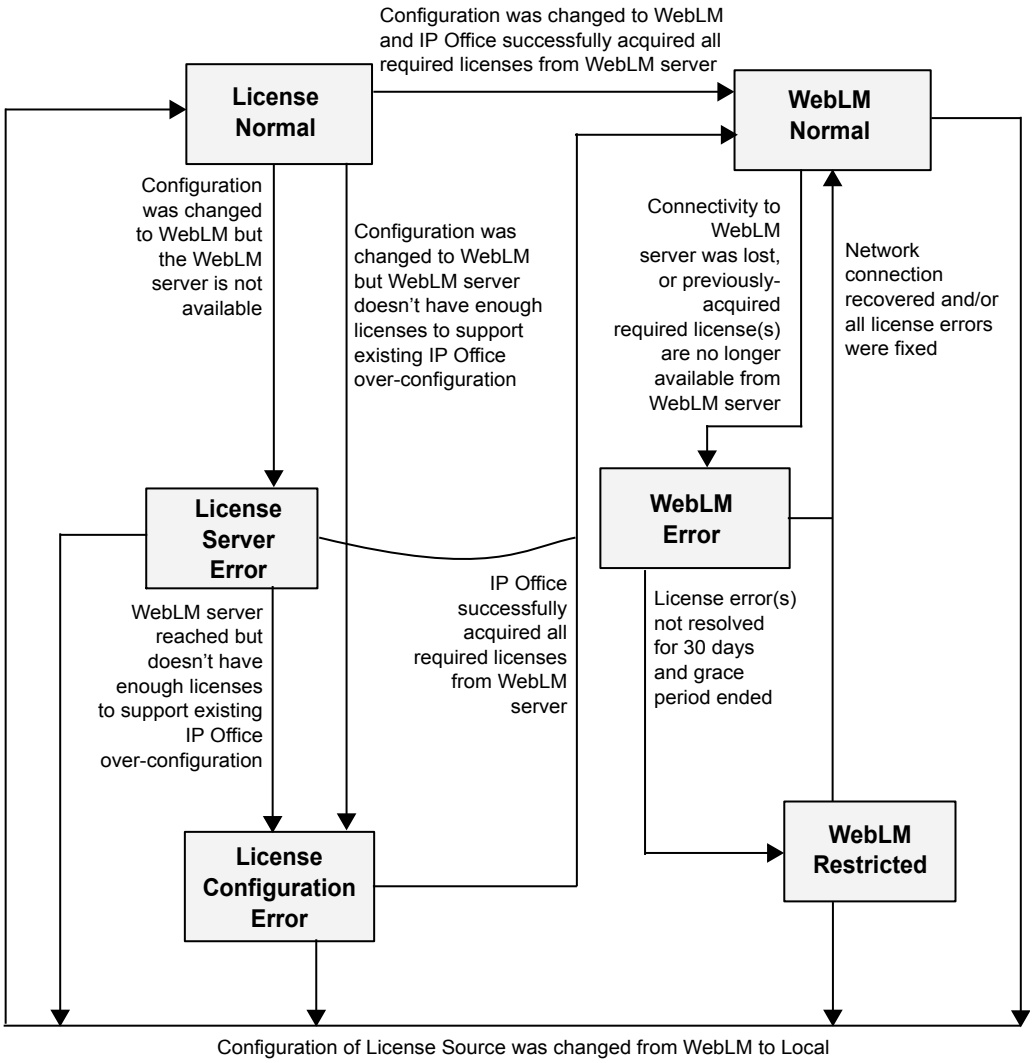
WebLM licensing

License modes

The following are the IP Office license modes when you are using WebLM licensing. The license mode is displayed in IP Office Manager, Web Manager, and System Status Application (SSA).

Mode	Description
License Normal	WebLM licensing is not configured. Traditional Nodal licensing. No grace period. Over-configuration is allowed.
License Server Error	Configuration was changed to WebLM, but the WebLM server is not available. No grace period. Until the problem is resolved, IP Office is unlicensed and unusable similar to traditional Nodal licensing if no licenses are installed.
License Configuration Error	Configuration was changed to WebLM and the WebLM server is available, but it doesn't have enough licenses to support the existing IP Office configuration. No grace period. Until the problem is resolved, IP Office is unlicensed and unusable similar to traditional Nodal licensing if no licenses are installed. Licenses must be added to the WebLM license file or IP Office configuration must be modified to correct over-configuration.
WebLM Normal	IP Office is configured for WebLM licensing, the WebLM server is available and IP Office successfully acquired all the licenses required to support all of its configured features. New licenses are acquired for newly-configured features, and over-configuration of licensed features is prevented if licenses cannot be acquired. IP Office periodically renews its acquired licenses. Failure to renew will lead to the WebLM Error mode with grace period.
WebLM Error	IP Office is configured for WebLM licensing and was previously in WebLM Normal mode. But IP Office now cannot renew or re-acquire all the licenses required to support all of its configured features. Over configuration of licensed features is prevented if licenses cannot be acquired. IP Office keeps operating for a 30-day grace period based on its existing configuration (lost licenses are replaced with virtual grace licenses).
WebLM Restricted	IP Office was in the WebLM Error mode, but the 30-day grace period has expired and the problems for this error have not been resolved. Unlicensed features will stop working (virtual grace licenses are deleted). Any configuration of IP Office is not allowed, except configuration changes that reduce the licensing errors.

License mode state transitions



WebLM licensing configuration

In WebLM licensing, licenses must fully support the IP Office configuration. Over-configuration is not allowed. IP Office, based on its configuration, requests the required licenses from the WebLM server.

For some types of licenses, such as for users, extensions, receptionists, and web collaboration, the type and quantity of required licenses is determined by the configuration of the respective items. For example, the User and Extension records in the IP Office configuration. These quantities are displayed in read-only fields in the 'Reserved Licenses' list in the IP Office Configuration License > Remote Server tab.

For other types of licenses, such as for SIP trunk sessions and Voicemail Pro ports, the quantity of required licenses must be configured explicitly. These quantities have to be configured in editable fields in the Reserved Licenses list in the IP Office Configuration License > Remote Server tab.

Licensing configuration warnings and alarms

License Configuration Error mode

- IP Office goes into the License Configuration Error mode when you change the IP Office License Source from “Local” to “WebLM” and it is under-licensed or over-configured.

  In this mode, IP Office is unlicensed and unusable. This mode is a transition error state and not supported as a steady state. Try to avoid entering into this mode and, if it happens, fix the errors immediately.
- Installed systems with traditional licensing may be under-licensed or over-configured. If they are upgraded to version 10.0 and migrated using WebLM licensing without acquiring the additional needed licenses or removing the over-configuration, then the installed systems goes into the License Configuration Error mode after migration.

  To help avoid this problem, warnings are given by the IP Office Manager License Migration Tool. If IP Office has over-configuration relative to its existing old licenses, the License Migration Tool displays a warning and also includes detailed warning information in the License Migration information file.
- If IP Office is in the License Configuration Error mode, Systems Status Application (SSA) alarms page shows alarms indicating the cause of the problem.

  If you encounter this mode, review the SSA alarm errors and resolve them by acquiring the missing required licenses or by modifying the IP Office configuration so as to not require these licenses.

Other warnings

When the administrator sets the License Source to “WebLM”, IP Office Manager and IP Office Web Manager display a warning advising the administrator to check and verify that sufficient licenses are available on the WebLM server.

WebLM user and IP Endpoint licensing

IP endpoint licenses

When IP Office uses WebLM licensing, each configured H.323 or SIP extension requires a license and IP Office requests the required licenses from the WebLM server. Sufficient licenses are required for all the configured H.323 and SIP extensions and not only for the maximum number of concurrently-registered extensions. This is consistent with WebLM licensing for users and receptionists.

Note:

With WebLM licensing, IP Office does not support configuring of a large number of extensions with a small number of licenses to cover only a subset of the extensions registering at the same time. For example, configuring three extensions with one IP endpoint license to cover only one of the three extensions registering at the same time. However, if you want support of this behavior, you can use a local PLDS license file instead of Centralized WebLM licensing, and set the **Reserve License** field for the extensions to `None`.

For each configured H.323 or SIP extension, IP Office requests from the WebLM server an Avaya or third-party IP endpoint license, as per the **Reserve License** field of the configured extension record. When IP Office uses WebLM licensing, the **Reserve License** field for each configured H.323 and SIP extension is by default set to Avaya IP endpoint license. This field is editable and the

administrator can change it to a third-party IP endpoint license or to both Avaya and third-party IP endpoints.

Note:

For the **Reserve License** field, the value `None` is not available with WebLM licensing because IP Office must request a license from the WebLM server.

User licenses

When IP Office uses WebLM licensing, sufficient User licenses are required as per the IP Office users configuration and not only for the maximum number of concurrently-registered users. This is consistent with WebLM licensing for IP endpoints and receptionists. IP Office requests from the WebLM server the required User licenses (for example, Power User licenses) as per the user profile of all configured users.

Note:

With WebLM licensing, IP Office does not support configuring of a large number of users with a small number of licenses to cover only a subset of the users registering at the same time. For example, configuring three users with one User license to cover only one of the three users registering at the same time. However, if you want support of this behavior, you can use a local PLDS license file instead of Centralized WebLM licensing.

Receptionist licenses

When IP Office uses WebLM licensing, Receptionist licenses are required for all users that are configured as Receptionist and not only for the maximum number of users that would run their IP Office SoftConsole application concurrently. This is consistent with WebLM licensing for IP endpoints and users. With WebLM, licenses are required according to the configured objects, and over-configuration and under-licensing are not allowed.

Note:

With WebLM licensing, IP Office does not support configuring of a large number of Receptionist users with a small number of licenses to cover only a subset of the users connecting at the same time using IP Office SoftConsole. For example, configuring three Receptionist users with one Receptionist license to cover only one of the three users connecting at the same time using IP Office SoftConsole. However, if you want support of this behavior, you can use a local PLDS license file instead of Centralized WebLM licensing.

Auto-create support for users and extensions

When IP Office uses WebLM licensing, you cannot auto-create users and extensions as it is not supported. The administrator must manually configure users and extensions. For DECT extensions, the “Preconfigured” method must be used.

However, auto-create for users and extensions is supported if you use local PLDS license file instead of Centralized WebLM licensing.

Basic Edition license for new systems

To upgrade to Release 11.0, the new PLDS R11.0 upgrade runtime license is used in combination with the R11.0 software. Upgrading to IP Office R11.0 from releases prior to R10.0 involves a complete transition to PLDS licenses. To upgrade existing IP Office systems to IP Office R11.0, paid or transactional or entitled Edition R11.0 upgrade or migration licenses are required.

Material code	License	Description
396490	IP OFFICE R11 BASIC EDITION MIG UPGRADE PLDS	R11 Basic Edition starting in PLDS
369472	IP OFFICE R11 BASIC EDITION MIGRATION UPGRADE	ADI or PLDS upgrade to R11 Basic Edition

Customers must also purchase SD cards, which are configured, by default, with Basic Edition.

Customers must obtain this material code, which is merchandisable and does not have to be configured, before ordering IP Office Support Services. This is especially important for customers who already have Basic Edition or for after-market IP Office Support Services purchases, including customers who set up Basic Edition without IP Office Support Services first, but then later choose to get IP Office Support Services. These customers must place a merchandise order for this material code first and then place their after-market purchase of IP Office Support Services and register their equipment for servicing.

Note:

Basic Edition is not a prerequisite for Essential Edition or Preferred Edition, and is not stacked under Essential Edition.

Essential Edition and Preferred Edition licenses

An Essential Edition license is a prerequisite on IP500 V2 systems, and includes mobile twinning for all users and four remote workers.

A Preferred Edition license is a prerequisite for any user profile licenses. In a multisite network, the Preferred Edition license of the central system is automatically shared with other systems in the network, enabling user profile licenses on those other systems. However, each system supporting a Voicemail Pro server still requires its own Preferred Edition license for Voicemail Pro operation. For a IP500 V2 system fitted with a Unified Communications Module (UCM V2), the card requires a separate Preferred Edition license.

The Preferred Edition license includes support for 4 messaging ports. The total number of messaging ports supported can be increased by adding additional messaging port licenses, at the time of purchase or later, up to the maximum supported by the particular control unit.

Order code	License	Description
396491	IP OFFICE R11 ESSENTIAL EDITION UPGRADE PLDS LIC:DS	Essential Edition (PLDS upgrades)
396474	IP OFFICE R11 ESSENTIAL EDITION MIG UPG LIC:DS	ADI migrations to PLDS and upgrades to R11.0 Essential Edition
396492	IP OFFICE R11 PREFERRED VOICEMAIL PRO UPGRADE PLDS LIC:DS	Preferred Edition (PLDS upgrades)
396476	IP OFFICE R11 PREFERRED VOICEMAIL PRO MIG UPG LIC:DS	ADI migrations to PLDS and upgrades to R11.0 Preferred Edition

Server Edition licenses

A Server Edition license includes:

- Features from Essential Edition
- Features from Preferred Edition
- Centralized Voicemail Pro
- Two ports of Voicemail Pro
- Unlimited multi-site networking channels (IP Office Lines)

A Server Edition license enables:

- Meet-me conferencing
- Advanced messaging
- Automated attendant
- Call recording
- Conditional call routing
- Queue announcements
- Mobile twinning
- Call control
- Call back

One Server Edition license is required for the primary server, the secondary server, and for each Linux or IP500 V2 expansion system. The licenses enable voice networking between systems in the Server Edition network.

Order code	License	Description
PLDS Upgrades (starting PLDS)		
396493	IPO R11 SE/VRTLZD UPG PLDS LIC	Paid Upgrade Code
ADI Migrations to PLDS and upgrade to R11.0		
396480	IP Office R11 SE ADI MIG UPG LIC	Paid Upgrade Code
396478	IPO R11 VRTLZD SE ADI Migration UPG LIC	Paid Upgrade Code
IP Office PLDS upgrades		
396519	IPO-SL 11 SE/VRTLZD UPG PLDS LIC	Paid Upgrade Code

Branch licenses

The following table describes key IP Office licenses that are of particular interest to branch deployments.

Display name	Description
Avaya WebLM Model	This license is required by IP Office in branch deployments in order to connect to the WebLM server and use WebLM centralized licensing.
Branch System	This license is required for IP Office in branch deployments. It is used for tracking purpose only.
IP Office Centralized Endpoints license	One license is required for each Centralized user configured on the IP Office with a SIP extension or an analog extension. **Important:** In addition to this IP Office license, each centralized user also requires a license on the central Avaya Aura® system.
SM Trunk Channel	This license is required with sufficient quantity to allow for the maximum number of concurrent SM Line calls to be enabled on the system. The total number of SM Trunk Channel licenses requirements depend on the expected traffic patterns in the particular deployment. **Note:** IP Office also supports SM Line connections to Avaya Aura® Session Manager in other IP Office Server Edition deployments. These connections are not limited to branch deployments.

Small Community Network licenses

In a Small Community Network (SCN), there must be at least one IP Office Preferred Edition. Two are required with resiliency.

The different types of users in an SCN have the same functionality, regardless of where the IP Office Preferred Edition is installed.

In a multisite network, if one or more IP Office Preferred Edition system is installed, then all the IP Office systems in the multisite network will automatically have Preferred licenses as prerequisites for the following user types:

- Power users
- Teleworkers
- Mobile workers
- Office workers

Trunk licenses

The tables in this section include all the net new and uplift IP Office PLDS software license material codes. The material codes with indication of R10+ are known as “ANY” codes and can be used for Release 10.0 and later system deployments. The SAP descriptions have been modified to show 10+ for this change, while the material code remains the same. Other codes are R11.0 release specific and contain R11.0 in the description.

SIP trunk sessions

These licenses are used to permit sessions on SIP trunks and SM Lines added to the system. Multiple licenses can be combined for the total number of channels required.

Order code	License	Description
383085	IPO R10+ SIP TRNK 1 LIC	SIP trunk 1 session
307332	IIPO-SL R10+ SIP TRNK 1 LIC	SIP trunk 1 session – Select
383120	IPO R10+ SM LINE SIP TRNK LIC	SM Line session
382917	IPO-SL R10+ SM LINE SIP TRK LIC	IP Office Select SM Line session

IP500 Universal PRI additional channels

The IP500 PRI Universal trunk card (UTC) is available in 1 or 2 port variants, each port supporting a single PRI circuit connection. The ports can be switched between supporting E1, E1R2, or T1 line types as required for the trunk being connected. Each port supports 8 B-channels (“Bearer”) which do not need to be licensed. If additional B-channels are required, they must be licensed through the addition of the licenses below. Multiple licenses can be added to achieve the total number of channels required. D-channels are not subject to licensing. The licenses are consumed by those channels, which are configured as being *in service*, in order of the installed IP500 PRI-U cards.

IP500 Universal PRI additional E1 channels

These licenses are used to enable additional E1 B-channels for IP500 PRI-U cards configured for E1 operation. Each port can support up to 30 B-channels in this mode.

Order code	License	Description
383092	IPO R10+ IP500 E1 ADD 2CH LIC	2 E1 channels
383093	IPO R10+ IP500 E1 ADD 8CH LIC	8 E1 channels
383094	IPO R10+ IP500 E1 ADD 22CH LIC	22 E1 channels
307337	IPO-SL R10+ IP500 E1 ADD 2CH LIC	2 E1 channels – Select
307338	IPO-SL R10+ IP500 E1 ADD 8CH LIC	8 E1 channels – Select
307339	IPO-SL R10+ IP500 E1 22CH LIC	22 E1 channels – Select

IP500 Universal PRI additional E1R2 channels

These licenses are used to enable additional E1R2 B-channels for IP500 PRI-U cards configured for E1R2 operation. Each port can support up to 30 B-channels in this mode.

Order code	License	Description
275637	IPO R10 IP500 E1R2 ADD 2CH PLDS LIC	2 E1R2 channels
383096	IPO R10+ IP500 E1R2 ADD 8CH LIC	8 E1R2 channels
383097	IPO R10+ IP500 E1R2 ADD 22CH LIC	22 E1R2 channels
307340	IPO-SL R10+ IP500 E1R2 2CH LIC	2 E1R2 channels – Select
307341	IPO-SL R10+ IP500 E1R2 8CH LIC	8 E1R2 channels – Select
307342	IPO-SL R10+ IP500 E1R2 22CH LIC	22 E1R2 channels – Select

IP500 V2 Universal PRI additional T1 channels

These licenses are used to enable additional T1 B-channels for IP500 PRI-U cards configured for T1 PRI or T1 robbed-bit operation. Each port can support up to 23 B-channels (T1 PRI) or 24 B-channels (T1 robbed bit) in this mode.

Order code	License	Description
383091	IPO R10+ IP500 T1 ADD 2CH LIC	2 T1 channels
307336	IPO-SL R10+ IP500 T1 ADD 2CH LIC	2 T1 channels – Select

IP500 V2 Voice Networking

The use of private voice networking trunks between IP500 V2 control units and other systems requires voice networking channel licenses within the IP500 V2. This applies to H.323 IP trunks configured on the IP500 V2, including IP trunks being used for an IP Office Small Community Network (SCN). A voice networking license is also required for the use of trunks configured for Q.SIG operation. On an H.323 IP trunk, a license instance is consumed for each simultaneous outgoing call. On a Q.SIG trunk, the number of calls is limited by the trunk type rather than available licenses.

Additional licenses can be added to achieve the number of voice networking channels required.

Order code	License	Description
383087	IPO R10+ IP500 VCE NTWK 4 LIC	4 voice networking channels including the Advanced Networking features (distributed groups and hot-desking across Small Community Network)

User licenses

A profile controls whether users can be configured for a number of features. Every user on the system, except users with Basic User profile and non-licensed users, requires one of the user license types.

The table below lists the different user profiles and the features accessible by each profile. Setting a user to a particular profile enables those features by default, but they can be manually disabled if necessary. The number of users that can be configured for each profile is controlled by the user licenses present in the configuration.

Except for a Basic User, a Preferred Edition system license is a prerequisite for any user profile licenses. In a multi-site network, the Preferred Edition license for the central system is automatically shared with other systems in the network, enabling user profile licenses on those other systems. However, each system supporting a Voicemail Pro server still requires its own Preferred Edition license for Voicemail Pro operation.

Feature		Standard Mode					Server Edition		
	Non-licensed User [1]	Basic User	Office Worker	Teleworker	Mobile Worker	Power User	Basic User	Office Worker	Power User
one-X Portal Services	–	–	Yes	Yes	–	Yes	–	Yes	Yes
Telecommuter options	–	–	–	Yes	–	Yes	–	–	Yes
UMS Web Services	–	–	Yes	Yes	–	Yes	–	Yes	Yes
TTS for Email Reading	–	–	–	–	Yes	Yes	–	–	Yes
Remote Worker [2]	–	–	–	Yes	–	Yes	Yes	Yes	Yes
Avaya Communicator [3]	–	–	Yes	Yes	–	Yes	Yes	Yes	Yes
WebRTC	–	–	Yes	–	–	Yes	–	Yes	Yes
Avaya Equinox™	–	–	Yes	Yes	–	Yes	–	Yes	Yes

User Profile Notes:

1. Non-licensed users can be created on both Standard Mode and Server Edition systems.
2. The system supports users using remote H.323 or SIP extensions. On non-Server Edition systems, up to 4 users are supported as remote extensions without needing to be configured and licensed for a user profile. Additional remote users are supported if licensed and configured for either a **Teleworker** or **Power User** user profile. On Server Edition systems, the remote worker is supported for all user profiles.
3. Supported for advanced Avaya Communicator for IP Office usage if one-X Portal and Voicemail Pro applications are also installed. If otherwise, only basic Avaya Communicator for IP Office usage is supported.
4. Avaya Equinox™ can be used with a Basic User or a Mobile Worker license in conjunction with IP Softphone license but in standard mode only. In such cases, Simultaneous mode, Shared control feature, and Presence support will not be available.

Non-licensed user

A non-licensed user:

- Is allowed dial in access and paging.
- Can be used as a Music on Hold or Analog paging port.
- Can be authenticated to allow remote access for remote administration.
- Can make internal and emergency calls as NoUser.
- Can forward to voice mail box for voice mail box only users.
- Can be used for internal twinning.

Basic users

New users are created as Basic users by default. Basic users can perform hot-desking, make and receive calls, forward calls, and perform mobile twinning.

Basic user licenses are no longer provisioned. For both new systems and upgrades, the **Basic Users** field is greyed out.

Basic user licenses are required only in the Cloud environment.

Office Worker licenses

This option is targeted at users who are working in the office. In conjunction with a wired or wireless Avaya phone, these users are provided with functions to control their communication with a PC. For example, these users can control audio conferences or manage voice mail with an email client (requires a Preferred Edition license).

An Office Worker license enables Avaya Communicator, Avaya Equinox™ for Windows and Mac, and Avaya Communicator for Web. The Office Worker license enables a user to use the Unified Messaging Service (UMS) and Avaya one-X® Portal for IP Office without Telecommuter functionality. The license instances are consumed for each user being configured.

Order code	License	Description
383105	IPO R10+ MOBILE WORKER 5 TRL LIC	5 licenses for Mobile workers
383107	IPO R10+ OFFICE WORKER 5 TRL LIC	5 licenses for Office workers
307347	IPO-SL R10+ OFFICE WORKER 5 TRL LIC	5 users – Select

Teleworker licenses

This option is targeted at users who are working from home or elsewhere with Internet connection to the office. They are provided with the ability to leverage the PLDS or ISDN using Telecommuter mode, without incurring any remote phone charges. Alternatively the new IP Office Video Softphone can be used if the quality of service of the local internet connection is adequate.

Teleworker includes the remote worker capability with the package. An Essential Edition license provides 4 remote worker seats. Customers requiring additional seats will need to purchase the Teleworker solution.

The Teleworker license enables a user to use Avaya Communicator, Avaya Equinox™ for Windows and Mac, and Avaya one-X® Portal for IP Office. UMS functionality for voice mail or email integration is also enabled, providing synchronization with any IMAP email client. The license instances are consumed for each user being configured.

Order code	License	Description
383103	IPO R10+ TELEWORKER 5 TRL LIC	5 users

Mobile Worker licenses

This option is targeted at users with mobile devices. For example, field sales and service staff who are often on the road. These users are provided with features, such as one number access and call control as if in the office, enabling them to never miss a call. The Mobile Worker license enables the use of the one-X Mobile Preferred client in callback mode (but not in VoIP mode).

Power User licenses

This option is targeted at key knowledge workers with the need for both Mobile Worker and Teleworker functionality. A Power User license enables Avaya Communicator, Avaya Equinox™ (desktop and mobile), Avaya Communicator for Web, and VoIP mode in one-X Mobile Preferred.

The Power User license enables a user to use Avaya one-X® Portal for IP Office, all mobility features, and UMS. A Power User license is required to enable conference scheduling in Avaya one-X® Portal for IP Office.

The license instances are consumed for each user being configured.

Order code	License	Description
396319	IP Office R11 OFFICE WORKER TO POWER USER 1 UPLIFT LIC	Upgrade from Office Worker to Power User – 1 user
396505	IP OFFICE-SELECT R11 OFFICE WORKER TO POWER USER 1 UPLIFT LIC	Upgrade from Office Worker to Power User – 1 user – Select
396318	IP Office R11 MOBILE TO POWER USER 1 UPLIFT LIC	Upgrade from Mobile Worker to Power User – 1 user
396316	IP Office R11 POWER USER 1 LIC	1 user
396503	IP Office-Select R11 POWER USER 1 LIC	1 user – Select

Receptionist licenses

This option is targeted at operators or receptionists and provides a visual computer interface for call handling and management for multiple sites. Up to 10 Receptionist users are supported on each node. Server Edition supports up to 32 Receptionist users, and Server Edition Select supports up to 50.

The Receptionist license also enables a user to use IP Office SoftConsole, a Windows application intended for receptionists and operators. Up to 4 IP Office SoftConsole clients can run at the same time and be licensed on a single IP Office system. Additional licenses can be added.

Order code	License	Description
307318	IPO-SL R10+ RECEPTS 1 LIC	1 user
382687	IPO R10+ RECEPTIONIST 1 LIC	1 user

Centralized User license

In IP Office Branch deployments, where IP Office is deployed as a branch of a central Avaya Aura® system, users with a SIP or analog extension can be configured as Centralized users. Every Centralized user requires a Centralized Endpoint license.

Web Collaboration licenses

Order code	License	Description
383122	IPO R10+ WEB COLLAB USER 1 LIC	1 user
382918	IPO-SL 10+ WEB COLLAB USR 1 LIC	1 user – Select

IP endpoint licenses

All IP endpoints, Avaya and third party, require an endpoint license.

Avaya IP endpoint licenses

All Avaya IP phones, including DECT and Wi-Fi phones, require an Avaya IP Endpoint license and will consume one instance of that license. This does not apply to the Avaya Softphone or Avaya Communicator. Avaya IP phones without a license will still be able to register but will be limited to making emergency calls only. The phone will display `No license available` and `Emergency Calls Only`. If a license becomes available, it will be assigned to any unlicensed DECT handsets first and then to any other unlicensed Avaya IP phone in the order that the phones registered.

Order code	License	Description
307350	IPO-SL R10+ AV IP ENDPT 1 LIC	1 endpoint – Select
383110	IPO R10+ AV IP ENDPT 1 LIC	1 endpoint

Third-party IP endpoint licenses

Non-Avaya IP phones, including SIP or H.323 devices, require a Third Party IP Endpoint license to register to IP Office and will consume one instance of that license.

Order code	License	Description
307323	IPO-SL R10+ 3RD PTY IP END 1 LIC	1 endpoint – Select
383072	IPO R10+ 3RD PTY IP ENDPT 1 LIC	1 endpoint

Trial licenses

Order code	License	Description
396446	IP OFFICE R11 ESSENTIAL EDITION TRIAL LIC	Essential Edition
396448	IP OFFICE R11 PREFERRED VOICEMAIL PRO TRIAL LIC	Preferred Edition

Table continues…

Order code	License	Description
383123	IPO R10+ WEB COLLAB 5 TRL LIC	5 Web Collaboration licenses
382919	IPO-SL R10+ WEB COLLAB 5 TRL LIC	5 Web Collaboration licenses — Select
396504	IP OFFICE-SELECT R11 POWER USER 5 TRIAL LIC	5Power User license — Select
396317	IP OFFICE R11 POWER USER 5 TRIAL LIC	5 Power User licenses
383103	IPO R10+ TELEWORKER 5 TRL LIC	5 Teleworker licenses
383105	IPO R10+ MOBILE WORKER 5 TRL LIC	5 Mobile Worker licenses
307347	IPO-SL R10+ OFFICE WORKER 5 TRL LIC	5 Office Worker licenses — Select
383107	IPO R10+ OFFICE WORKER 5 TRL LIC	5 Office Worker licenses
307319	IPO-SL R10+ RECEPTS 5 TRL LIC	5 Receptionist licenses — Select
382688	IPO R10+ RECEPTIONIST 5 TRL LIC	5 Receptionist licenses
307324	IPO-SL 10 3RD PTY IP 5 TRL LIC	Third party IP endpoint trial license — Select
383073	IPO R10 3RDPTY IPENDPT 5 TRL LIC	Third party IP endpoint trial license
382913	IPO-SL R10+ AV IP ENDPT 5 TRL LIC	5 Avaya IP endpoint licenses — Select
383111	IPO R10+ AV IP ENDPT 5 TRL LIC	5 Avaya IP endpoint licenses
383090	IPO R10+ VMPRO UMS 5 TRL LIC	5 Voicemail Pro UMS licenses
307335	IPO-SL R10+ VMPRO UMS 5 TRL LIC	5 Voicemail Pro UMS licenses – Select
383078	IPO R10+ 3RD PTY TTS TRL LIC	Voicemail Pro third party TTS license
383076	IPO R10+ TTS WNDWS TRL LIC	Voicemail Pro Windows TTS license
307327	IPO-SL R10+ TTS PROLINUX TRL LIC	Voicemail Pro Linux TTS license — Select
383080	IPO R10+ TTS PRO LINUX TRL LIC	Voicemail Pro Linux TTS license
307329	IPO-SL R10+ IPSEC VPN TRL LIC	IPSec Tunneling — Select
383082	IPO R10+ IPSEC VPN TRL LIC	IPSec Tunneling
307333	IPO-SL R10+ SIP TRNK 5 TRL LIC	SIP trunk sessions — Select
383086	IPO R10+ SIP TRNK 5 TRL LIC	SIP trunk sessions
383088	IPO R10+ IP500 VCE NTWK 4	IP500 Voice Networking
307321	IPO-SL R10+ CTI TRL LIC	CIT Link Pro — Select
383070	IPO R10+ CTI TRL LIC	CIT Link Pro

Upgrade licenses

To upgrade existing systems to the latest release, upgrade licenses are required. Upgrade licenses are sold separately. Customers can only upgrade to the latest equivalent of their existing Edition.

Note:

Upgrading from a previous release of Basic Edition to the latest version of Essential Edition is not a valid upgrade path.

Order code	License	Description
383738	IPO-SL R10+ RECEPTS 1 UPG PLDS LIC	Select Receptionist upgrade
383696	IPO R10+ RECEPTIONIST 1 UPG PLDS LIC	Receptionist upgrade
383739	IPO-SL 10+ CTI UPG PLDS LIC	Select CTI upgrade
383697	IPO R10+ TI UPG PLDS LIC	CTI upgrade
383740	IPO-SL 10+ MPRO 1 UPG PLDS LIC	Select Voicemail Pro upgrade
383698	IPO R10+ VM PRO 1 UPG PLDS LIC	Voicemail Pro upgrade
383741	IPO-SL 10+ 3RDPTY IPEND1 UPG PLDS LIC	Select IP third party endpoint upgrade
383699	IPO R10+ 3RDPTY IPENDPT1 UPG PLDS LIC	IP third party endpoint upgrade
383742	IPO-SL 10+ TAPI WAV 1 UPG PLDS LIC	Select TAPI WAV upgrade
383700	IPO R10+ TAPI WAV 1 UPG PLDS LIC	TAPI WAV upgrade
383702	IPO R10+ 3RD PTY TTS UPG PLDS LIC	Third party TTS upgrade
383744	IPO-SL 10+ IPSEC VPN UPG PLDS LIC	Select IPSec VPN upgrade
383704	IPO R10+ IPSEC VPN UPG PLDS LIC	IPSec VPN upgrade
383747	IPO-SL 10+ VMPRO UMS 1 UPG PLDS LIC	Select Voicemail Pro Unified Messaging Server upgrade
383708	IPO R10+ VM PRO UMS 1 UPG PLDS LIC	Voicemail Pro Unified Messaging Server upgrade
383748	IPO-SL 10+ IP500 T1 CH1 UPG PLDS LIC	Select IP500 additional channel upgrade
383709	IPO R10+ IP500 T1 CH1 UPG PLDS LIC	IP500 additional channel upgrade
383749	IPO-SL 10+ IP500 E1 CH1 UPG PLDS LIC	Select IP500 additional channel upgrade
383710	IPO R10+ IP500 E1 CH1 UPG PLDS LIC	IP500 additional channel upgrade
383752	IPO-SL 10+ IP500 E1R2 CH1 UPG PLDS LIC	Select IP500 additional channel upgrade
383713	IPO R10+ IP500 E1R2 CH1 UPG PLDS LIC	IP500 additional channel upgrade

Table continues…

Order code	License	Description
383707	IPO R10+ IP500 VCE NTWK1 UPG PLDS LIC	IP500 voice networking upgrade
383757	IPO-SL 10+ AV IP ENDPT 1 UPG PLDS LIC	Select Avaya IP endpoint upgrade
383722	IPO R10+ SFTPH 1 PLDS UPG LIC	Soft Phone upgrade
383760	IPO-SL 10+ SMLINE SIPTRK UPG PLDS LIC	Select SM Line SIP trunk upgrade
383726	IPO R10+ SM LINE SIPTRNK UPG PLDS LIC	SM Line SIP trunk upgrade
383706	IPO R10+ SIP TRNK 1 UPG PLDS LIC	SIP trunk upgrade
383761	IPO-SL 10+ WEBCOLLB USR1 UPG PLDS LIC	Select Web Collaboration user upgrade
383728	IPO R10+ WEBCOLLAB USER1 UPG PLDS LIC	Web Collaboration user upgrade
383730	IPO R10 ESS ED EVM 1CH UPG PLDS LIC	Essential Edition Embedded Voicemail channel upgrade

Chapter 4: Resources

Documentation

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

Document number	Title	Use this document to:	Audience
Overview			
16–604278	*Avaya IP Office™ Platform Start Here First*	See a list of all the documents related to the solution.	Everyone
Not numbered	*Avaya IP Office™ Platform Feature Description*	Understand the solution features at a high-level.	Everyone
Not numbered	*Avaya IP Office Contact Center Feature Description*	Understand IP Office Contact Center features and capabilities.	Everyone
Planning			
15–604135	*Avaya IP Office™ Platform Server Edition Reference Configuration*	Understand the technical specifications of and plan for IP Office Server Edition deployment.	Sales Engineers Implementation Engineers
15–604253	*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
Not numbered	*OnAvaya™ and Powered by Avaya Reference Configuration for Business Partners*	Understand the technical specifications of both IP Office Cloud solutions and plan for deployment.	Sales Engineers Implementation Engineers
Not numbered	*Avaya IP Office™ Platform Security Guidelines*	Understand and follow recommended security guidelines.	Sales Engineers Implementation Engineers
Not numbered	*Avaya IP Office Contact Center Reference Configuration*	Understand technical specifications of IP Office Contact Center and plan for deployment.	Sales Engineers 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. Put your cursor over **Support by Product**.
4. Click **Documents**.
5. In the **Enter your Product Here** search box, type the product name and then select the product from the drop-down list.
6. If there is more than one release, select the appropriate release number from the **Choose Release** drop-down list.
7. 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.
8. Click **Enter**.

Training

Avaya training and credentials are designed to ensure our Business Partners have the capabilities and skills to successfully sell, 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 http://avaya-learning.com/.

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

Course code	Course title
2S00012W	APSS – Small and MidMarket Communications – IP Office™ Platform and Select Overview

Table continues…

Course code	Course title
4601W	Avaya IP Office™ Platform — Components
4602W	Avaya IP Office™ Platform — Editions
2S00015O	Small and Midmarket Communications — IP Office — Endpoints
10S00005E	Knowledge Access: Avaya IP Office™ Platform Implementation
5S00004E	Knowledge Access: Avaya IP Office™ Platform Support

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 delta information. This material can be consumed by technicians experienced in IP Office.

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.

Additional IP Office 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 Sales & Partner Portal

http://sales.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.

International Avaya User Group

http://www.iaug.org is the official discussion forum for Avaya product users.

Product compatibility

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

Related links

Accessing Avaya DevConnect Application Notes on page 134
Interoperability on page 93

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.

Using the Avaya InSite Knowledge Base

The Avaya InSite Knowledge Base is a web-based search engine that provides:

- Up-to-date troubleshooting procedures and technical tips
- Information about service packs
- Access to customer and technical documentation
- Information about training and certification programs
- Links to other pertinent information

If you are an authorized Avaya Partner or a current Avaya customer with a support contract, you can access the Knowledge Base at no extra cost. You must have a login account and a valid Sold-To number.

Use the Avaya InSite Knowledge Base to look up potential solutions to problems.

1. Go to http://www.avaya.com/support.
2. Log on to the Avaya website with a valid Avaya User ID and password.

   The Support page appears.
3. Under **Support by Product**, click **Product-specific support**.
4. Enter the product in **Enter Product Name** text box and press Enter.
5. Select the product from the drop down list and choose the relevant release.
6. Select the **Technical Solutions** tab to see articles.
7. Select relevant articles.

Related links

Phones on page 38
Phone interoperability on page 95

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.

   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.

Related links

[Phones](#) on page 38
[Phone interoperability](#) on page 95
[Product compatibility](#) on page 133
[Hardware and software options](#) on page 84
[Interoperability](#) on page 93

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.

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