IP Office Platform Solution Description

Release 12.1
Issue 43
March 2025

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Part 1: Overview

Chapter 1: 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 modular communications solution that scales up to 3000 extensions and 150 sites in a multi-site 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.

Related links

IP Office editions on page 9
Topology on page 10

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:

- IP Office 500 V2 (IP500 V2) control unit.
- Dedicated server PC running a Linux-based suite of IP Office software.
- Virtual servers running the Linux-based suite of IP Office software.

Edition	Platform	Business size (users)	Addresses business needs
Basic Edition	IP500 V2	Less than 25	Simple telephony and messaging capabilities only. SIP trunks but no IP telephones or applications.
Essential Edition	IP500 V2 Multiple servers can be networked to support different locations.	20 – 99	Simple telephony and messaging capabilities plus IP telephony.
Preferred Edition		21– 250	Essential Edition capabilities plus unified communications and advanced voicemail (Voicemail Pro).
Server Edition	Uses a Linux-based primary server to which additional servers can be added including virtualized servers and IP500 V2.	100 – 2000	Software based Preferred Edition.
IP Office Select		100 – 3000	Server Edition with increased scale and resiliency.
IP Office Subscription	IP500 V2	21– 250	Preferred Edition using per-month subscriptions rather than permanent licenses.
	Linux Server, IP500 V2 and Linux Expansion	100 – 3000	IP Office Select using per-month subscriptions rather than permanent licenses.

Related links

Avaya IP Office™ Platform overview on page 9

Topology

There are many options for IP Office topology. For detailed information about all the deployment scenarios, refer to the Avaya IP Office™ Platform Server Edition Reference Configuration document.

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

Related links

Avaya IP Office™ Platform overview on page 9

Chapter 2: What's New

This section describes the major changes and new features supported by IP Office.

Related links

New in IP Office Release 12.0 on page 12
New in IP Office Release 12.1 on page 13
New in IP Office Release 12.1 SP1 on page 15

New in IP Office Release 12.0

The following changes apply for IP Office R12.0:

- **Change of Linux Operating System**

  The version of Linux used by Linux-based IP Office servers has changed from CentOS to Rocky Linux.

  - The new Linux is supported on 64-bit servers only. For Unified Communications Module support see the notes below.
  - For existing Linux-based IP Office systems upgrading to IP Office R12.0, you must upgrade using the processes in Upgrading Linux-based IP Office Systems to R12.0.

- **UCM support in IP Office R12.0 and higher**

  The Unified Communications Module (UCM) cannot support the 64-bit Linux used for IP Office R12.0 and higher. Therefore, you cannot upgraded a UCM to run R12.0.x software. However, Avaya supports UCM modules running R11.1.3.2 software in IP Office R12.0 and higher systems with the following caveats:

  - If the existing Unified Communications Module is running pre-R11.1 software, you must upgrade it to R11.1.3.2 using the processes in the "Upgrading Linux-based IP Office Systems to R11.1" manual.
  - The IP Office system will output a UCM version mismatch alarm each time the IP Office is restarted. You can ignore this alarm.
  - There will be no future updates to the IP Office software components provided on the UCM modules.
  - There will be no any future updates for the CentOS operating system and no security CVE patches for UCM modules.

- **Display of Web Management Version**

  For Linux-based IP Office systems, the **Control Unit** details shown in IP Office Manager now include details for the web management service.

- **End of Support**

  The following are no longer supported:

  - **Web Collaboration**

Related links

What's New on page 12

New in IP Office Release 12.1

The following changes apply for IP Office R12.1:

IPv6 support

For IP Office R12.1, IP Office systems can support IPv6 features in addition to the existing IPv4 features.

- IP Office supports IPv6 on Linux-based IP Office systems only.
- Use of IPv6 does not require any additional license or subscription.
- IPv4 remains always enabled. The IP Office does not support an IPv6 only mode.

The IPv6 features are:

- **IP Addressing**

  Avaya supports IPv6 on IP Office LAN1. Avaya also supports IPv6 on LAN2 but only when IPv6 is enabled on LAN1 also.

- **DHCPv6 Support**

  You can configure the IP Office to support DHCPv6. It can function as a DHCPv6 server or client on each IP Office LAN.

- **Stateless Address Auto Configuration (SLAAC)**

  You can configure the IP Office to use SLAAC to assign its IPv6 address on LAN1 and/or LAN2. You can also configure the IP Office to respond as an IPv6 router for other devices that are using SLAAC.

- **IPv6 Routing Support**

  You can configure the IP Office with static routes for IPv6 traffic.

- **Avaya Workplace IPv6 Support**

  You can use IPv6 for Avaya Workplace Client extension connection. That includes connection as local and remote extensions.

  - Avaya Workplace Client support for IPv6 with IP Office R12.1 requires Avaya Workplace Client R3.37 and higher.

  - The IP Office licensing and configuration requirements for remote extensions are the same for IPv6 as for IPv4. The IP Office treats any extension using an IPv6 global unicast address not issued by IP Office DHCP as a remote extension.
    - The IP Office must have an FQDN that resolves to both the IPv4 and IPv6 addresses of the IP Office.
    - You must configure the one-X Portal host domain settings (**Configuration** > **Host Domain Name**) with the FQDN of the IP Office server running the one-X Portal service.
  - Avaya Cloud Services do not support IPv6. Therefore, any Avaya Workplace Client using IPv6 cannot use features provided by Avaya Cloud Services. For example:
    - No client registration using email or SSO login.
    - No instant messaging if the IP Office uses Avaya Cloud Services as its messaging server.

- **J100 Phone IPv6 Support**

  You can use IPv6 for J100 Series phone extension connection (except J129). That includes connection as local and remote extensions.

  - IP Office support for IPv6 with J100 phones requires the phones to use J100 R4.1.6.0 or higher firmware.
  - For IPv6, IP Office supports the J100 Series phones (except J129) in dual-stack mode with the signaling address set to IPv6 and the media IP preference set to IPv6 over IPv4 (64). That is the default configuration set in the auto-generated `46xxsettings.txt` file. For Avaya does not support the use of any other combination of signaling and media address mode as that can cause unexpected call failures.
  - The IP Office licensing and configuration requirements for remote extensions are the same for IPv6 as for IPv4. The IP Office treats any extension using an IPv6 global unicast address not issued by IP Office DHCP as a remote extension.
  - The IP Office must have an FQDN that resolves to both the IPv4 and IPv6 addresses of the IP Office.

- **Certificates**

  The IP Office will include its IPv6 addresses when regenerating IP Office signed certificates.

  - If using the IP Office self-signed certificates, you must regenerate the self-signed IP Office certificates after enabling IPv6 support.

All other IP Office connections and features use IPv4 as in previous IP Office releases.

Support for KVM virtual servers

For IP Office R12.1, Avaya supports the deployment of IP Office virtual machines on the Avaya Solutions Platform 130 Appliance R6 platforms (ASP 130 R6). Avaya supplies the ASP 130 R6 with Red Hat Enterprise Linux 8.10 pre-installed and configured to support KVM based virtual machines.

J100 USB Headset support

The J100 R4.1.6 firmware installed by default with IP Office R12.1 includes support for USB HID headsets on J100 Series phones that have USB ports (J159 and J189).

Related links

What's New on page 12

New in IP Office Release 12.1 SP1

The following changes apply for IP Office R12.1 SP1.

Avaya Wireless DECT

- **Support for Avaya Wireless DECT R5**

  IP Office supports the R5 release of Avaya Wireless DECT as well as the existing R4 release.

  - To reflect this, the IP Office documentation now uses the term Avaya Wireless DECT rather than DECT R4.
  - The R5 firmware is not include in the IP Office R12.1 admin suite installer. You can download the firmware from the Avaya support website.

- **Support for 1500 DECT extensions with Avaya Wireless DECT R5**

  With Avaya Wireless DECT R5, the maximum DECT extension capacity on a Linux-based IP Office primary or secondary server has increased from 750 to 1500.

  - The total extension capacity, DECT and non-DECT, must still remain within the extension capacity of the IP Office system and the whole IP Office solution.

Capacity

- **TLS Extension Capacity**

  The restriction that TLS extensions count as two extensions for IP Office capacity planning does not apply to the Avaya ASP 110 DELL R660 SRVR A2 IPO server.

Related links

What's New on page 12

Part 2: The Platform

Chapter 3: The IP Office Platform

The following sections look at some of the different platforms, and associate hardware, used to deliver the systems.

IP Office systems can be delivered on a number of platforms:

Platform Type	Description
Physical PC Servers	The IP Office software can be installed onto a PC server. This is supported for IP Office Server Edition and IP Office Select mode of operation.
Virtual Servers	The IP Office server software is available in a number of different virtual server formats. For example; VMware, Hyper-V and Azure. These can be used to create virtual IP Office servers on the matching virtual server platforms.
Dedicated Hardware	The core IP Office service is supported on a dedicated set of modular hardware referred to as IP500 V2. This provides ports for connecting a variety of non-IP trunks and extensions.

Related links

Physical PC Servers on page 17
Virtual Platforms on page 18
Dedicated Hardware Platform on page 18

Physical PC Servers

The IP Office software can be installed onto a PC server. This is supported for IP Office Server Edition and IP Office Select mode of operation.

- The same software is used for all servers. The server's particular role in the IP Office network is selected during the software installation.
- Depending on the selected role, each server can run a number of services. For example, the core IP Office service, voicemail, one-X Portal, etc.
- Avaya supply a range of pre-built IP Office server PCs. Whilst the software is pre-installed on these PCs, the final selection of its role has not been made.

Related links

The IP Office Platform on page 17

Virtual Platforms

The IP Office server software is available in a number of different virtual server formats. For example; VMware, Hyper-V and Azure. These can be used to create virtual IP Office servers on the matching virtual server platforms.

- Once a new virtual server is launched, it behaves and is configured for its IP Office role in the same way as physical IP Office server PCs.
- Customer's can use their own virtual server platforms for their virtual IP Office servers. Though its PoweredBy program, Avaya also supports the provision of virtual IP Office servers running on its virtual server platforms.

Related links

The IP Office Platform on page 17

Dedicated Hardware Platform

The core IP Office service is supported on a dedicated set of modular hardware referred to as IP500 V2. This provides ports for connecting a variety of non-IP trunks and extensions.

- IP500 V2 systems can run in Basic Edition, Essential Edition and Preferred Edition modes.
- For services other than the core IP Office service, the IP500 V2 can be supported by another server. For example:
  - A UCM module installed in the IP500 V2. The module can run the Voicemail Pro and one-X Portal services.
  - A separate PC, called an IP Office Application server, can run the Voicemail Pro, Avaya one-X Portal and Media Manager services.
- IP500 V2 systems can also be used in a IP Office Server Edition or Select server network to provide support for non-IP extensions and lines.

For more details, see IP500 V2 Systems on page 19.

Related links

The IP Office Platform on page 17

Chapter 4: IP500 V2 Systems

IP Office IP500 V2 is a set of stackable hardware units that can be optionally 19" rack mounted or wall mounted.

The core of IP500 V2 systems is the IP500 V2 control unit. Various trunk and base cards can be added to tto connect non-IP trunks and extensions. The system can be further expanded by adding IP500 expansion modules with provide additional ports for non-IP trunks and extensions. The IP500 V2 also support connection of IP trunks and phones.

- IP500 V2 systems can run in all the supported IP Office modes. In IP Office Server Edition or Select systems, they can be added as IP Office Server Edition expansion systems, allowing non-IP phones and trunks to be incorporated into those systems.
- The newer IP500 V2A control unit has replaced the IP500 V2 control unit. They are physically and functionally the same, except where specifically stated otherwise.

Related links

IP Office IP500 V2 control unit on page 19
Feature key on page 21
Base cards on page 21
Trunk cards on page 23
External expansion modules on page 24

IP Office IP500 V2 control unit

The IP Office IP500 V2 control unit is a stackable unit with an optional 19" rack mounting kit and wall mounting kits.

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.
Voice compression channels	Up to 148 channels using up to VCM and combination cards.
Voicemail channels	Up to 250 voicemail/recording channels supported on the Primary server. For Select deployments, the Secondary server can also support up to 250 voicemail/recording channels.
Locales	Supported in the following countries: Argentina, Australia, Bahrain, Belgium, Brazil, Canada, Chile, China, Colombia, Customize, Denmark, Egypt, Finland, France, Germany, Greece, Hong Kong, Hungary, Iceland, India, Ireland, Italy, Japan, Korea, Kuwait, Malaysia, Mexico, Morocco, Netherlands, New Zealand, Norway, Oman, Pakistan, Peru, Poland, Portugal, Qatar, Russia, Saudi Arabia, Singapore, South Africa, Spain, Sweden, Switzerland, Taiwan, Turkey, United Arab Emirates, United Kingdom, United States, Venezuela.
Power supply	Internal power supply unit.
Mounting	Free-standing, rack mounted or wall mounted (requires mounting kits).
Memory	Maximum configuration file size: 2048 KB.

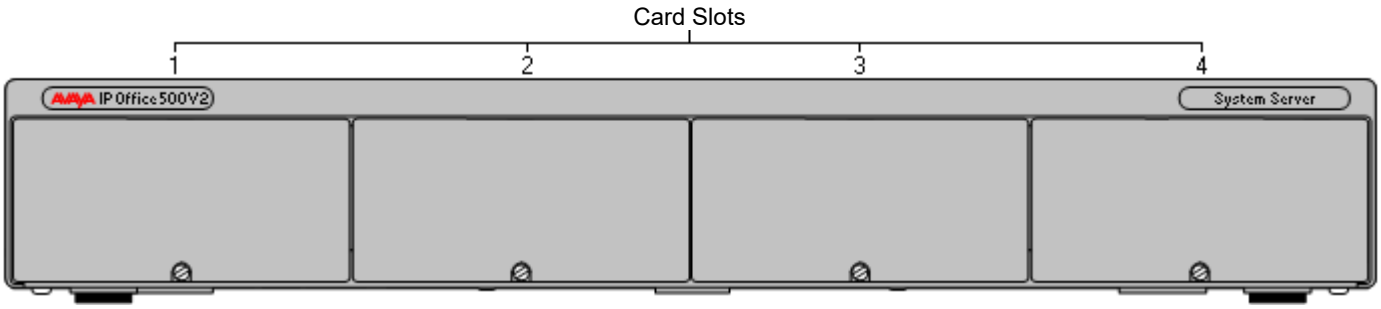


Figure 2: IP500 V2 front view

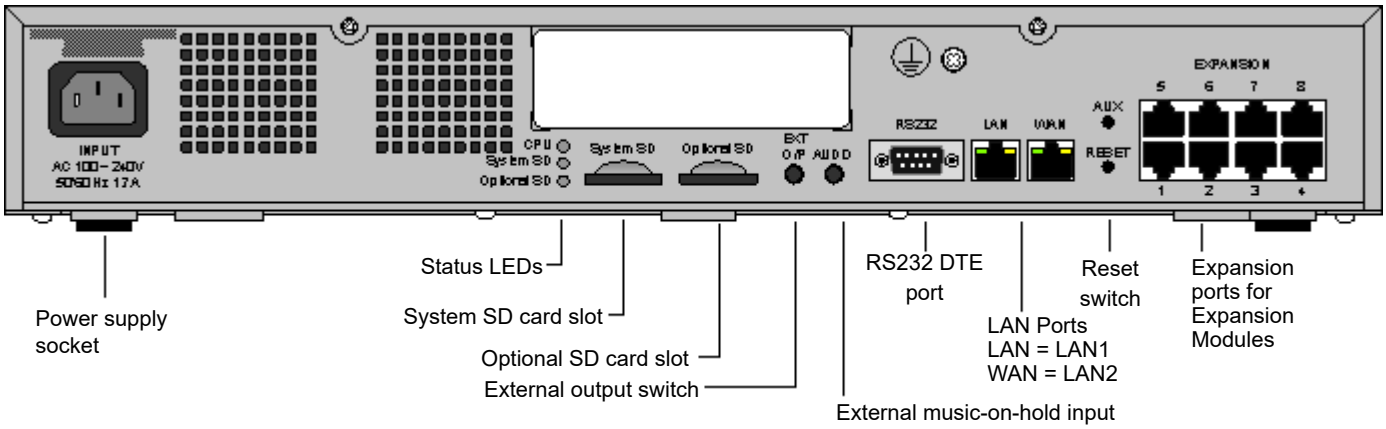


Figure 3: IP500V2 rear view

Related links

IP500 V2 Systems on page 19

Feature key

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.

The serial number is also used for the subscriptions in subscription mode IP Office systems.

Related links

IP500 V2 Systems on page 19

Base cards

The following base cards are available:

Table 1: IP500V2 base cards

Base card	Per system	Notes
Digital Station (DS8)	3	Not supported by IP500 V2A control units. • Ports 1–8: Digital stations • Ports 9–12: Trunk connections

Table continues…

Base card	Per system	Notes
Digital Station (DS8A)	4	• Ports 1–8: Digital stations • Ports 9–12: Trunk connections
Analog Phone 2	4	• Ports 1–8: Analog phones • Ports 9–12: Trunk connections
Analog Phone 8	4	• Ports 1–2: Analog phones • Ports 9–12: Trunk connections
Voice Compression Module	2	VoIP calls including IP extensions or IP trunks. • Ports 1–8: Not present • Ports 9–12: Trunk connections • 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 Combination cards.
ATM Combination	2	• Ports 1–6: Digital stations • Ports 7–8: Analog phones • Ports 9–10: 4 analog trunk ports. • 10 voice compression channels. Codec support is G.711, G722, G729a and G.723 with 64ms echo cancellation.
BRI Combination	2	• Ports 1–6: Digital stations • Ports 7–8: Analog phones • Ports 9–10: 2 BRI trunk ports (4 BRI channels) • 10 voice compression channels. Codec support is G.711, G722, G729a and G.723 with 64ms echo cancellation.
Unified Communications Module (UCM V2)	1	Supported in control units with a Preferred Edition license. • 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

Related links

IP500 V2 Systems on page 19

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.

Tip:

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

Table 2: IP500 V2 trunk cards

Trunk card	Maximum per system	Description
Analog (V2)	4	4 analog loop start trunks V.32 modem for remote access 1 power failure extension to trunk connection on Phone 8 cards Not supported with VCM cards.
Universal PRI (PRI-U)	4	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.
BRI (Euro ISDN)	4	Up to 4 BRI trunk connections, each trunk providing 2B+D digital channels. Available in 2 (4 channels) and 4 (8 channels) options.

Related links

IP500 V2 Systems on page 19

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.

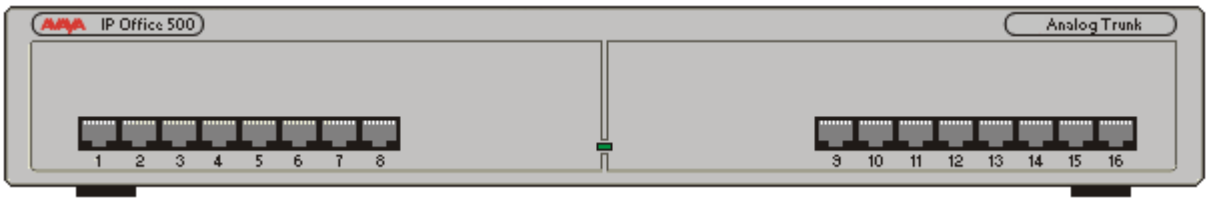
For installations in a rack, this module requires an IP500 V2 Rack Mounting Kit.

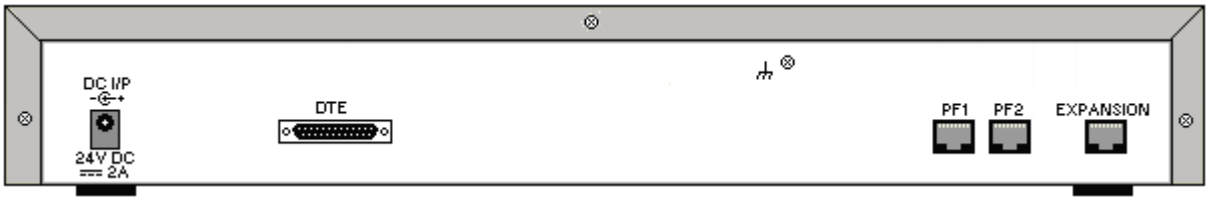
Expansion module	Telephones supported	Interfaces supported
Analog Phone 16	16 analog stations with calling line presentation	DTMF signaling (No rotary or Loop Disconnect) Time Break Recall (No Earth Recall) Message Waiting Indication (MWI): 51V Stepped, 81V, 101V and Line Reversal and Bellcore FSK
Analog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

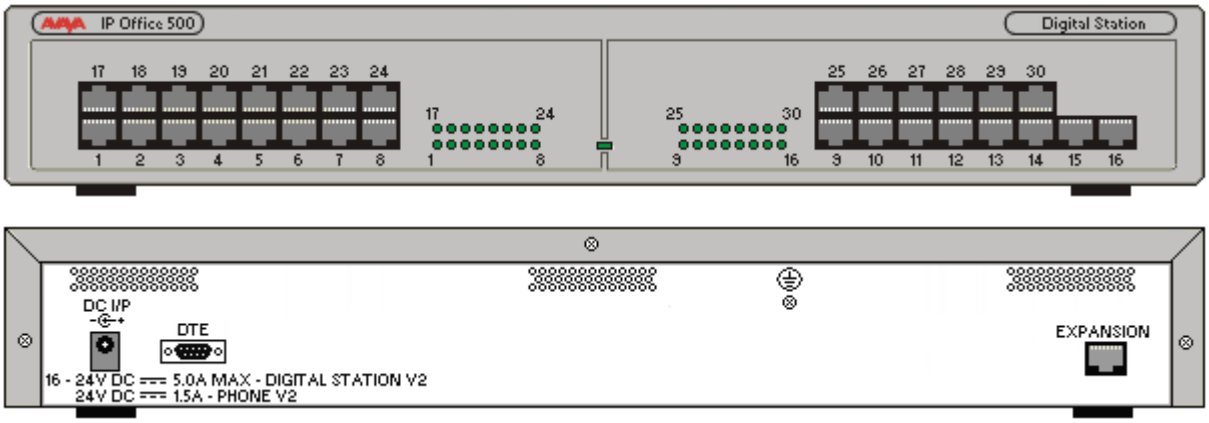




Expansion module	Description	Interfaces supported
ATM16	16 analog trunks	• Loop-start • Ground start

Digital station expansion modules

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



Expansion module	Telephones supported	Description
DS16B, DS16B2	Avaya telephones Either DS or TCM mode.	• 16 digital station ports
DS30B, DS30B2		• 30 digital station ports. Supported on 10.1, 9.1 SP 12, and 10.0 SP5 onwards.

Related links

IP500 V2 Systems on page 19

Chapter 5: Other Major Components

In addition to the IP Office platform, other major components may be required.

Related links

[Application server](#) on page 26
[Avaya Session Border Controller for Enterprise](#) on page 27
[Phones](#) on page 27
[Remote phone support](#) on page 28

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).

An IP Office Application Server can host the following applications:

- Avaya one-X Portal
- Voicemail Pro
- Web License Manager (WebLM)
- Media Manager
- Collaboration Server

Related links

[Other Major Components](#) on page 26
[WebRTC gateway configuration guidelines](#) on page 26

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 IP500V2/IP500V2A deployments, WebRTC should be enabled on the Application server.

Gateway limitations

The WebRTC gateway does not support resiliency.

Avaya Session Border Controller for Enterprise

A session border controller (SBC) 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 deploying the SBCE with IP Office, refer to the Deploying Remote IP Office SIP Phones with an ASBCE manual.

Related links

Other Major Components on page 26

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

Other Major Components on page 26

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 SBC

The Avaya Session Border Controller (Avaya SBC) sits on the edge of customer’s network with both internal and external IP interfaces. Using these IP interfaces, Avaya SBC 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 SBC. 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 SBC depending on where the clients are currently located. Apart from acting as a gateway, Avaya SBC also provides protection against any external SIP-based attacks. For privacy over the public internet, the public side of the Avaya SBC 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.

Part 3: Applications

Chapter 6: User applications

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

Related links

IP Office User Portal on page 30
Avaya Workplace Client on page 30
Avaya one-X Portal for IP Office on page 33
SoftConsole on page 34

IP Office User Portal

The IP Office user portal is a browser based application that allows users to view and change their settings and to make and answer calls. It is supported in all IP Office modes except Basic Edition.

The system administrator is able to configure which users can access the portal and which portal features they can use.

- Access various different settings such as forwarding numbers and personal contacts.
- Access voicemail messages and call recordings.
- Make and answer calls. This can be done in several ways:
  - Control of the users desk phone.
  - On systems that have been configured with a WebRTC gateway, make and answer calls using through the browser.

Related links

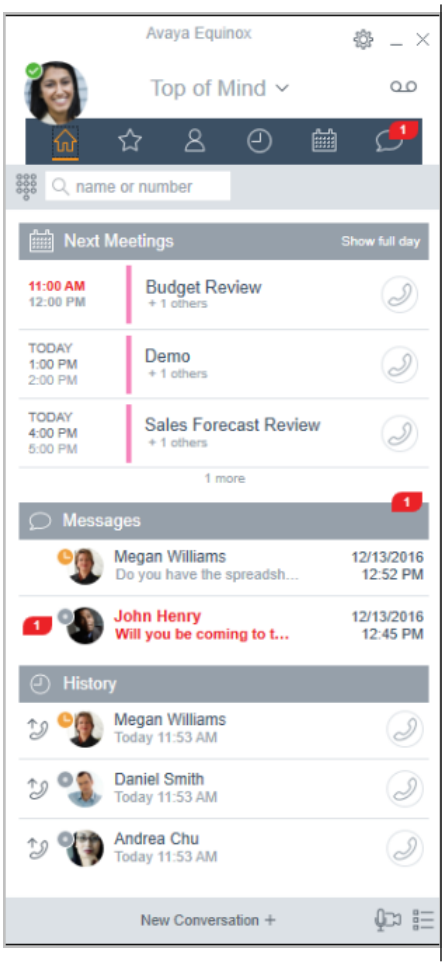
User applications on page 30

Avaya Workplace Client

Avaya Workplace Client is a SIP-based 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:

Device	Supported
Desktop PC	Windows and macOS
Mobile phone	Android and iOS. • IP Office iOS support is for iPhone and iPad devices only.
Avaya Vantage™	Yes

Avaya Workplace Client is a common cross-platform client. The client capabilities vary depending on the platform it is registered with. The supported features in Avaya Workplace Client 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
- IP Office directory and local contacts
- Instant messaging
- Presence
- Centralized call log.
- 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 Workplace Client 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 Workplace Client desktop.
- CTI Control - Avaya Workplace Client for IP Office can be controlled through other applications such as Avaya Contact Center Select, IP Office Contact Center, IP Office SoftConsole, one-X Portal, Call assistance or Outlook plugin.

  CTI is supported with Avaya Workplace Client for Windows only.
- Apple push notification service- platform notification service created by Apple Inc. With this service, third-party application developers can send notification events to applications installed on Apple devices when the application is idle in the background or is in quit state.
- Avaya Workplace Client on Avaya Vantage™
- Presence and directory integration with Avaya Workplace Client on Avaya Vantage™
- Enter DTMFs during a call

Avaya Workplace 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 Workplace Client for IP Office limitations

- Branch worker - Avaya Workplace Client for IP Office does not support failover between Avaya Aura® core and IP Office Branch.
- For instant messaging, Avaya Workplace Client requires either one-X Portal or Avaya cloud services.
- CTI control - Avaya IP Office CTI applications supports mute/unmute control, however it will not visually appear in Avaya Workplace Client.

  IP Office does not support video call controls over CTI.
- The Avaya Workplace Client accesses Workplace Meetings Online using HTTPS, from within the Workplace Meetings tab of the client. The Avaya Workplace Client can access local on-premise Equinox Conferencing in the same way using HTTPS, that is, if the access URL is configured under Workplace Meetings. However, if the Avaya Workplace 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 Workplace Client accesses local on-premise IP Office Meet Me Conferencing, audio will be available but not sharing or conference roster.

- Apple Push Notification service (APNs) is a platform notification service created by Apple Inc. This service allows iOS users of Avaya Workplace Client to receive notification of new calls, voicemail messages, and other events. They receive these notifications regardless when the Avaya Workplace Client is idle in the background or is in quit state. However, if Avaya Workplace Client is on suspension, then Avaya Workplace Client automatically starts when a new call or instant message notification arrives.

  Unlike the rest of the world, due to the restriction of CallKit in Chinese applications, Avaya Workplace Client does not display incoming call screen using CallKit. However, an incoming call notification is displayed.

Related links

User applications on page 30

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
- Support for User Avatar on Avaya one-X® Portal web client **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
- Display number of **Logged in Sessions** on Avaya one-X® Portal administrator dashboard under User Details section. This shows the number of clients a user is currently logged in. Detailed information on the Logged in sessions is displayed on the Avaya one-X® Portal under Health/Active sessions tab.
- Option to block client versions under configuration.
- Option to clear all sessions for a user.
- Option to track repeated failed login attempts.

Related links

User applications on page 30

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.

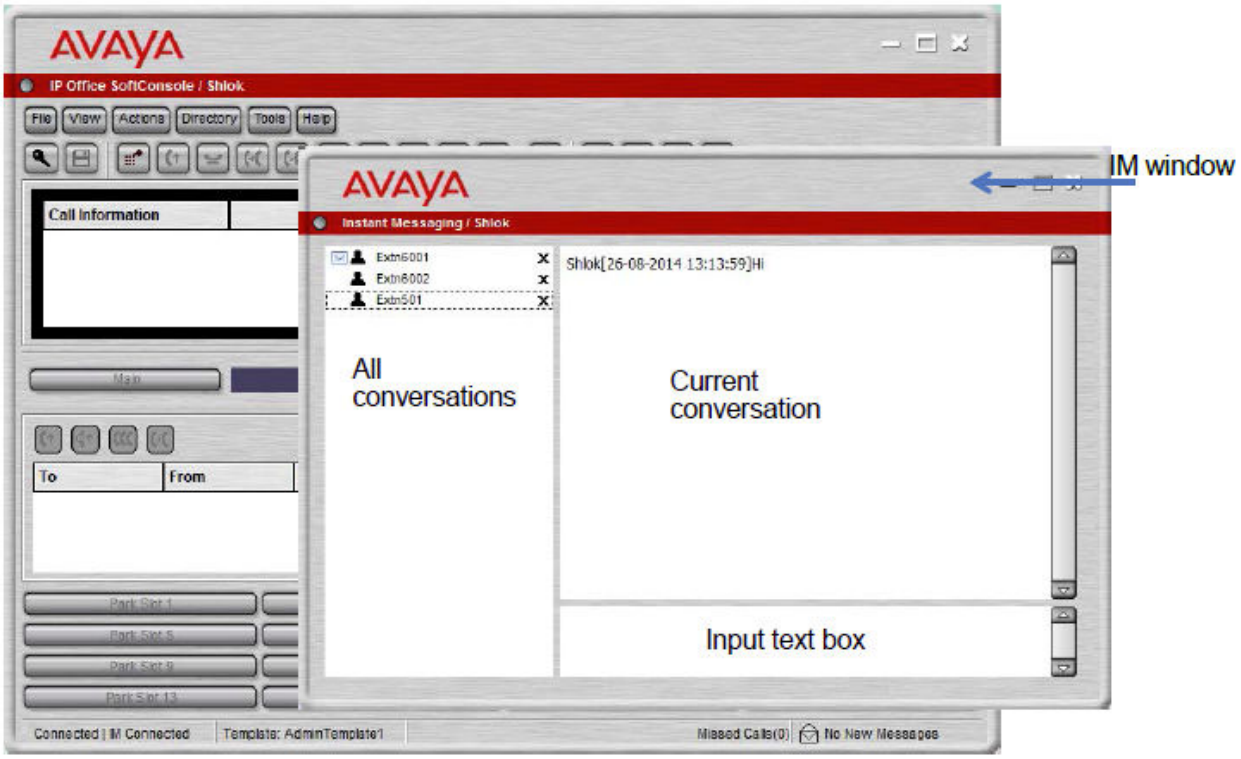


Figure 4: SoftConsole instant messaging window

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

Related links

User applications on page 30

Chapter 7: Voicemail Services

Voicemail is a standard part of all IP Office solutions. It can be provided by a number of methods, depending on the mode of operation being used by the system.

Related links

Embedded Voicemail on page 37
Voicemail Pro on page 37
IP Office Media Manager on page 38

Embedded Voicemail

Embedded Voicemail is supported for IP500 V2 controls units as a standard option without requiring a voicemail service running on another server.

Embedded Voicemail is intended for small customer sites with only basic voicemail requirements. It is suitable for environments like retail or home office, where space, noise or cost considerations rule out using a PC for voicemail.

Embedded Voicemail is supported by all IP Office modes except where the system is being used as an expansion system for a primary server (in which scenario the primary provides voicemail support).

Embedded Voicemail does not require any licenses for operation, though licenses can be used to increase the number of simultaneous voicemail connections and the amount of message storage available.

Whilst Embedded Voicemail supports recording caller messages for unanswered calls, it does not support call recording of connect calls.

Related links

Voicemail Services on page 37

Voicemail Pro

Voicemail Pro is a voicemail server that provides both basic voicemail features by default but is highly customizable to match customer requirements.

Voicemail Pro runs as a separate service from the IP Office telephony service.

- For IP500 V2 systems it is supported in IP Office Preferred Edition and IP Office Subscription modes when run on a separate server. That server can be an IP Office Application server or a UCM module installed into the IP500 V2 control unit.
- For IP Office PC-based servers, Voicemail Pro runs as a service on the primary IP Office server. If a secondary server is also present, that can also run a second Voicemail Pro service to support voicemail resilience.

Related links

Voicemail Services on page 37

IP Office Media Manager

Voicemail Pro supports call recording, either triggered automatically by IP Office configuration settings or triggered manually by a user. By default, it places those recordings into the same mailboxes as used for voicemail messages. However, with Media Manager, recordings made by Voicemail Pro can be transferred to a separate archive for longer storage and where they can be searched and played.

Local Media Manager

This version of Media Manager is supported by all IP Office systems with Voicemail Pro. It runs as a service on the same server as Voicemail Pro. However, that server requires additional storage for the call recordings. The additional storage can be:

- An additional hard-disk. The recommendation is a pair of disks configured to use Raid.
- Cloud-based storage provided by the customer.

Administrator access to Media Manager configuration and recordings is done through IP Office Web Manager. User access to recordings is through the user portal application if allowed by an administrator. The administrator also configures which recording a user is able to access whereas administrators are able to access all recordings.

In addition to using the primary storage for recordings, the application can also be configured to further archive copies of recording to a separate DVD drive, NAS drive or cloud base storage provided by the customer.

Media Manager requires a license or subscription for full operation. It allows a 90–day trial period before licensing is enforced.

Administrators are able to access a Media Manager audit trail that allows them to see who has searched, replayed and downloaded recordings. They can also delete recordings, which again is included in the audit trail. By default the Audit trail data is available for the previous 180 days.

Centralized Media Manager

Subscription mode IP Office systems can use either local Media Manager as above or centralized Media Manager. The centralized Media Manager service, and its associated storage for recordings, are provided by the same Avaya cloud-based servers that provide the IP Office system's subscriptions.

Centralized Media Manager supports the storage of recordings for up to 365 days. However, administrators can moves copies of recordings to the customer's own cloud storage when required.

Related links

Voicemail Services on page 37

Chapter 8: IP Office Conferencing

Related links

Conferencing on page 40
Ad hoc conference on page 41
Meet-Me conferencing on page 42

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.

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).

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.

Primary/Secondary Server

Each Primary and Secondary supports a local audio conference capability with the following capacities:

System Mode	Primary/Secondary server	Total Conference Channels	Maximum conference size	Total Conference Channels with ACCS
IP Office Server Edition	**Dell R260**	128	128	414
	Dell R660	256	256	1650
	Virtual	256	256	1650
IP Office Select	**Dell R640**	512	256	1650
IP Office Subscription	**Virtual**	512	256	1650

IP500 V2 and Linux Expansion System

Each IP500 V2 and Linux Expansion System supports a local audio conference capability with the following capacities:

Expansion Platform	Total Conference Channels	Maximum conference size	Total Conference Channels with ACCS
Linux/OVA	128	128	128
IP500 V2	128	64	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.

Conference Restrictions

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.

Related links

IP Office Conferencing on page 40

Ad hoc conference

In an ad hoc conference, a user calls the different participants and then sets the call on a conference mode. The initiator of the ad hoc conference call is the conference host.

In desktop clients, in an ad hoc conference for Avaya Workplace Client you can do the following:

- Drag and drop multiple contacts to a new conversation and start an audio ad hoc conference.
- Add another contact to an ongoing call or conference by dragging the contact and dropping or by using **Add someone to call** option.

In mobile clients, in an ad hoc conference for Avaya Workplace Client you can add another contact with an ongoing call or meeting by using **Add contact** icon.

Note:

The conference controls are disabled in ad hoc conferences.

As a participant, when you ignore the first ad hoc conference call request and join the second call request, you will be hard muted. Since there are no conference controls, neither you nor the moderator can unmute.

Related links

IP Office Conferencing on page 40

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.

Meet-Me conferencing has moderator and participant controls.

As a moderator, you have the following controls as soon as you enter the Meet Me conference.

- View list of participants.
- Mute or unmute all participants.
- Mute or unmute a single participant.
- Add or drop a single participant.
- End meeting for everyone
- Enable/disable Lecture mode
- Enable/disable Entry Tones
- Enable/disable Continuation
- Enable/disable Lock Meeting

As a participant, you have the following controls as soon as you enter the Meet me conference.

- View list of participants
- Leave the conference

Related links

IP Office Conferencing on page 40

Chapter 9: Administration applications

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

Related links

IP Office Manager on page 44
Server Edition Manager on page 45
Web Manager on page 47
System Status Application (SSA) on page 47
SysMonitor on page 48
Customer Operations Manager on page 49
SNMP Management Console on page 49

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.

Related links

Administration applications on page 44

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.

The configuration of an existing non-Server Edition system can be converted to a Server Edition configuration, and inturn for Server Edition (Non Select) or (Select) mode the conversion to Subscription mode can be achieved by rerunning **Initial Configuration** menu.

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

Related links

Administration applications on page 44

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 PC for administration.

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.

Related links

Administration applications on page 44

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

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.

There can be up to two (2) SSA clients connected to an IP Office unit at one time.

SSA provides information on the following:

Item	Description
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 (for example roundtrip 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.

Related links

Administration applications on page 44

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.

Related links

Administration applications on page 44

Customer Operations Manager

Customer Operations Manger is an administration tool that allows multi-customer management of subscription mode IP Office systems. It is accessed by browser from the same cloud-based servers that are providing the subscriptions for systems.

The tool enables management of IP Office Server Edition systems and provides the following capabilities:

- 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 backup, restore and upgrade actions.
- Role-based administration. Customer Operations Manager has its own service users with access to complete or selective customers IP Office.
- Provides facility to launch Native IP Office Management applications. Uses need to log in to the applications separately after the application is launched.
- 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

Related links

Administration applications on page 44

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).

Related links

Administration applications on page 44

Chapter 10: 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.

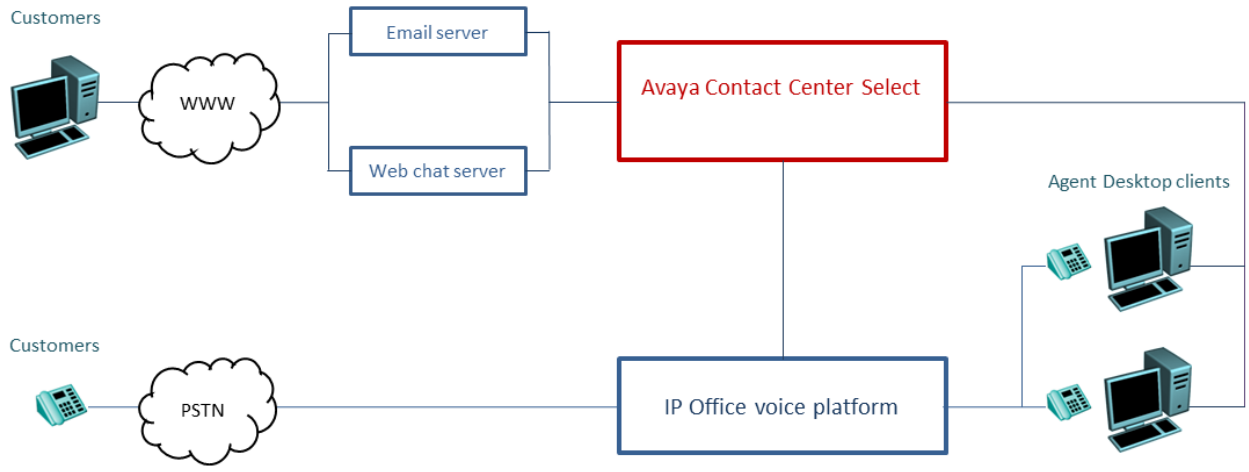


Figure 5: Typical contact center solution using voice and multimedia Avaya Contact Center Select and the Avaya IP Office voice phone system

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.

Part 4: Licenses and Subscriptions

Licenses and Subscriptions

Various features, applications and IP Office operating modes require the system to have the appropriate entitlement or entitlements. This can be done using either licenses or subscriptions.

Licenses	Licenses are purchased from Avaya and then uploaded to the IP Office system as a file. This method is supported for all IP Office modes except subscription mode. • See Licenses on page 62.
Subscriptions	For IP Office Subscription mode, the IP Office system is configured with the address of an internet subscription service provided by Avaya. The system regularly connects to the service in order to check what subscriptions have been purchased for the system. • See Subscriptions on page 54.

Chapter 11: Subscriptions

Subscriptions are monthly paid entitlements. They can be divided into two main groups;

- per-user per-month user subscriptions
- per-month application subscriptions for selected applications.

In practice, subscriptions are purchased for a specific duration. For example; 6-months, 1-year, 3-years.

During operation:

- If connection to the subscription server is lost, the IP Office system continues running with the existing subscription entitlements it has already received for 30-days.
- If when connected, any subscription expires, the feature or features associated with the expired subscriptions cease operation immediately.
  - The person responsible for ordering subscriptions must ensure that they are aware of subscription expiry dates. They must renew subscriptions in a timely manner, including time for renewal orders to be processed.

Related links

Ordering Subscriptions on page 54
Trial Mode on page 55
User Subscriptions on page 55
Application Subscriptions on page 56
Customer Operations Manager (COM) on page 57
Subscription Connection Operation on page 58
Subscription Network Requirements on page 59
Subscription Mode Ports on page 60
Migrating Existing IP Office Systems to Subscription Mode on page 61

Ordering Subscriptions

Subscription for an IP Office subscription mode system are ordered from the Avaya Channel Marketplace. The subscriptions are ordered against the PLDS ID of the IP Office system.

After ordering the subscriptions, details of the customer number and address of the subscription server are supplied in an email. Those details are required during the initial system configuration.

- The person responsible for ordering subscriptions must ensure that they are aware of subscription expiry dates. They must renew subscriptions in a timely manner, including time for renewal orders to be processed.

Related links

Subscriptions on page 54

Trial Mode

When ordering an IP Office subscription system through the Avaya Channel Marketplace, trial mode can be selected. Trial mode enables the IP Office to operate for up to 30-days using free subscriptions.

- The trial mode IP Office system indicates that it is in 30-day subscription error mode in applications such as the System Status Application and through system alarms.
- Before the 30-day trial period ends, the subscriber can return to Avaya Channel Marketplace and request a conversion to paid-subscriptions mode.

Important:

- To avoid any interruptions to customer telephony services, you must request the change to paid-subscriptions before the end of the 30-day trial period. That request must include allowance for sufficient working time to implement the request.

Related links

Subscriptions on page 54

User Subscriptions

Each user on the system requires a subscription. All subscribed users are then able to use an the system's telephone extension (analog, digital or IP) and voicemail features. The following user subscriptions can be ordered: **Telephony User**, **Telephony Plus User** and **Unified Communications User**. The subscriptions are applied to individual users through their **User Profile** setting.

Feature	Subscription Mode		
	Telephony User	Telephony Plus User	Unified Communications User
one-X Portal Services	–	–	✓

Table continues…

Feature	Subscription Mode		
	Telephony User	Telephony Plus User	Unified Communications User
Telecommuter options	–	–	✓
UMS Web Services	–	–	✓
TTS for Email Reading	–	–	✓
Remote Worker	✓	✓	✓
Avaya Workplace Client	–	✓[1]	✓
WebRTC	–	–	✓
Mobility Features	–	–	✓

- By default, users on a new or defaulted system are configured a **Telephony User** users.
- Users without a subscription are shown as **Non-licensed User** and cannot use any system features.
- If there are insufficient subscriptions for the number of users configured to a particular profile, some of those users will not receive any services. On suitable Avaya phones, they display as logged out and an attempt to log in displays a no license available warning.

1. Only supports Avaya Workplace Client basic mode (telephony and local contacts only).

Related links

Subscriptions on page 54

Application Subscriptions

The following application subscriptions can be ordered for a IP Office subscription system:

Subscription	Description
Receptionist Console	This subscription is used to enable the IP Office SoftConsole application to answer and redirect calls. The number of subscriptions allows the matching number of users to be configured as IP Office SoftConsole users. Those users still require a user subscriptions for their telephone connection (IP Office SoftConsole is not a softphone).
Avaya Call Reporter	This subscription enables support for the Avaya Call Reporter application, hosted on a separate server.
Avaya Contact Center Select	This subscription enables support the Avaya Contact Center Select (ACCS) service hosted on a separate server.

Table continues…

Subscription	Description
Media Manager	This subscription enables support for Media Manager. This can either be locally hosted on an IP Office Application Server or provided centrally by the same cloud-based servers providing the system's subscriptions. In either case: • A local Voicemail Pro service running on an IP Office Application Server is used to do the actual recording. • The recordings are then collected by the Media Manager service for archiving. • This option is not supported if using voicemail provided by a Unified Communications Module.
Third-Party CTI	This subscription enables support for CTI connections by third-party applications. This includes DevLink, DevLink3, Third-party TAPI and TAPI WAV.

Related links

Subscriptions on page 54

Customer Operations Manager (COM)

IP Office subscription services are a set of cloud-based services provided by Avaya to support IP Office subscription systems. A separate set of these services is provided for each geographic region to support Avaya business partners and their customer systems in that region.

The key service is Customer Operations Manager (COM). COM provides:

- Subscriptions to the IP Office systems.
- Displays the status of the IP Office systems and information about current alarms, type of system, software level.
- Each business partner has an account that allows them to access COM but only see their own customer's systems. They can create additional COM user accounts and control which of their customer systems those accounts can see.
- Avaya have access to COM for their support staff in order to manage the COM services and to assists business partners when required.
- COM can provide the files used to customize various features such as phone background and screen saver images. This can be configure to provide common files to all the business partner's systems or individual files to individual end-customer systems.
- COM can act as the file server for firmware files used by Vantage phones and Avaya Workplace Client.
- For full documentation of COM, refer to the Using Customer Operations Manager for IP Office Subscription Systems manual.

Additional Support Features

A number of additional support services can be enabled through settings in the IP Office system configuration.

Feature	Description
Remote Backup/ Restore	Subscription systems can automatically upload daily backups to the cloud. In addition, COM operators can perform both manual backups and restores operation
Remote Upgrade	Avaya provide COM with updated IP Office software images. COM operators can use these to perform immediate or scheduled system upgrades.
Log File Collection	Subscriptions systems can automatically upload all available log files to the cloud each day.
Centralized Management	Administrator connections for IP Office Web Manager, SysMonitor and System Status Application can be routed through COM to the customer's IP Office systems. The connects use the TLS tunnel used for the subscriptions.
Remote Access	Connections for HTTPS and SSH/SFTP connection can also be routed through COM to the customer IP Office systems. The connects use the TLS tunnel used for subscription.
Co-located Servers	When remote access is enabled, access to other servers and services on the same network as the customer IP Office system can be enabled. That includes access to non-IP Office servers and services subject to their own authentication.

Related links

Subscriptions on page 54

Subscription Connection Operation

The connection between the IP Office and COM operates are follows:

Outgoing Connection

For the connection from the IP Office to COM:

- The destination is a single static IP address resolved by DNS of the subscription server address entered during the system's initial configuration.
- The IP Office alternates between TCP ports 443 and 8443 until successful.
- The link uses the HTTP 'WebSocket' protocol and TLS 1.2 with mutual authentication.
- The link carries a regular heartbeat, subscription information and basic details of the IP Office system (type of servers and software version).
- All other traffic on the link is controlled by the IP Office system settings; there are no access controls elsewhere.
- If the link is interrupted, the IP Office system goes into a 30-day error mode with daily alarms.
  - If connection to the subscription server is lost, the IP Office system continues running with the existing subscription entitlements it has received for 30-days.
    - During the error mode period, all operations and features are unaffected. The system outputs daily alarms in the system logs.
    - Successful reconnection clears the alarms and error mode.
    - If the 30-day error mode period expires, all subscription features and telephony are deactivated.

- If when connected, any subscriptions expire, the feature or features associated with the expired subscriptions cease operation immediately.
- • The person responsible for ordering subscriptions must ensure that they are aware of subscription expiry dates. They must renew subscriptions in a timely manner, including time for renewal orders to be processed.

Incoming Connection

All incoming traffic from COM is routed to the IP Office through the existing subscription connection established above. It should not require any additional configuration on the customer network if the system has successfully obtained it subscriptions.

Related links

Subscriptions on page 54

Subscription Network Requirements

In order to obtain its subscriptions and to be remotely monitored and managed through COM , the IP Office systems requires the following:

<table>
<tr><th>Feature</th><th>Description</th></tr>
<tr><td>Subscription details</td><td>Details of the customer ID and subscription server address are provided by email. Those details are entered during the system's initial configuration.
• For an IP500 V2 SCN, each IP500 V2 requires a License Server Link.
• For a Server Edition deployment, only the Primary server has a License Server Link.</td></tr>
<tr><td>Internet access</td><td>The system needs to be able to access the external internet. This is normally achieved during initial configuration of the system by entering the default gateway address of the outgoing router on the customer network.
• That value is used to configure an default IP route in the system configuration with the following settings:
<table>
<tr><th>IP Route Setting</th><th>Value</th></tr>
<tr><td>IP Address</td><td>0.0.0.0</td></tr>
<tr><td>IP Mask</td><td>0.0.0.0</td></tr>
<tr><td>Gateway IP Address</td><td>The address of the external network router on the customer network</td></tr>
<tr><td>Destination</td><td>The IP Office LAN interface (LAN1 or LAN2) which is connected to the customer network.</td></tr>
</table>
• Maximum round trip delay 200ms.
• Minimum connection bandwidth 128kbits/s.
• If the customer firewall or router controls the ports used for outgoing internet access, ensure that outgoing HTTPS traffic on TCP ports 8443 and 443 are allowed.</td></tr>
</table>

Table continues…

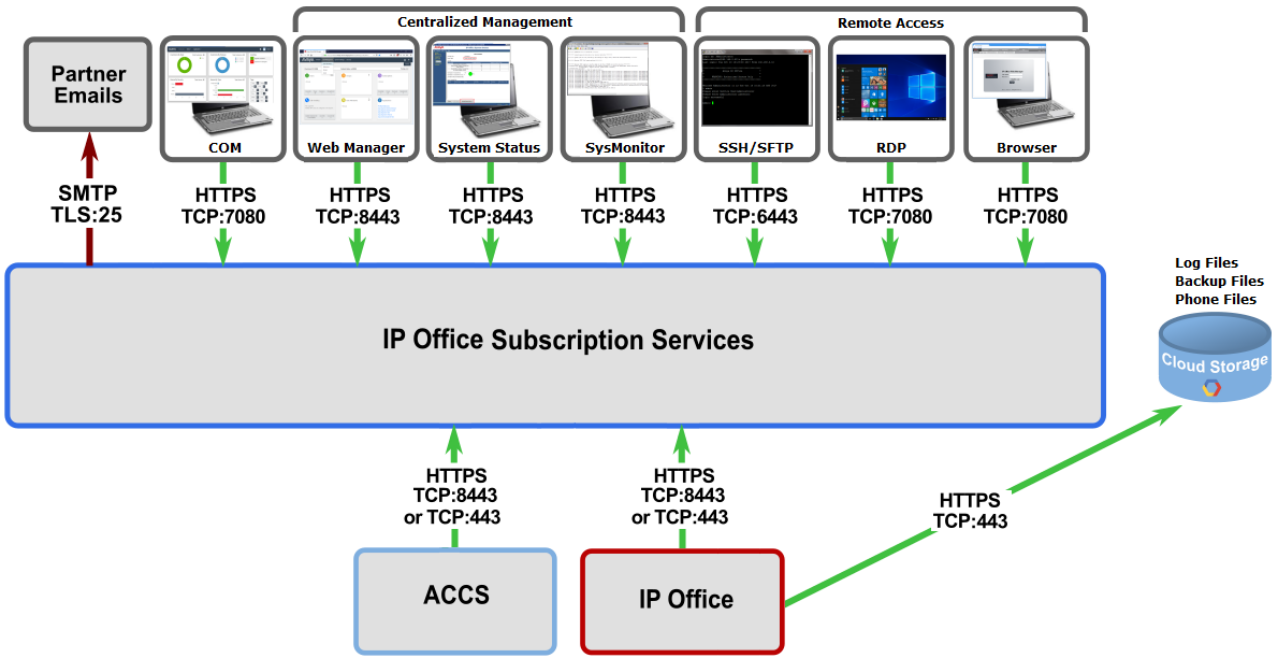
Feature	Description
DNS Service	The address of the customer's DNS server or service. If the customer does not have a specific DNS service, then use 8.8.8.8. If the customer has their own DNS server: • Ensure that it is configured to allow external access to addresses in the `avaya-sub.com` domain. That domain is used to the COM servers that support subscription systems in various geographic regions. For example: `admin.uk1.avaya-sub.com`. • Ensure that it is also configured to allow external access to storage.googleapis.com. This address is used for subscription features that require access to file storage.
Time source	Subscriptions requires an accurate time source. The recommendation is to use the Google time service at `time.google.com`. The system's time zone should also be set correctly.
COMAdmin Security User	The connection from the system to COM uses the security settings of the COMAdmin service user account in the IP Office system's security settings. This account is created by default on new and default systems.

Related links

Subscriptions on page 54

Subscription Mode Ports

The following schematic shows the ports used for connections to and from the subscription service running on COM.



Related links

Subscriptions on page 54

Migrating Existing IP Office Systems to Subscription Mode

The process for migrating an existing IP Office Essential Edition or Preferred Edition system to IP Office system is can be performed by rerunning the initial configuration menu. The assumed mapping of existing user profiles to their subscription equivalents is as follows:

Essential/Preferred Edition Mode	Subscription Mode
Non-Licensed User	Non-Licensed User
Basic User	Telephony User
Mobile User	
Office Worker	UC User
Power User	

Related links

Subscriptions on page 54

Chapter 12: 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.

For details of license operation, see License operation on page 83.

Related links

IP Office mode licenses on page 62
IP Office trunk licenses on page 67
IP endpoint licenses on page 72
User licenses on page 73
Application licences on page 76
Trial licenses on page 81

IP Office mode licenses

Each PLDS licensed IP Office system can operate in one of a number of modes. The particular mode requires the correct mode license installed.

Related links

Licenses on page 62
Basic Edition licenses on page 62
Essential Edition licenses on page 63
Preferred Edition licenses on page 64
Server Edition licenses on page 64
IP Office Select licenses on page 65
Branch licenses on page 66

Basic Edition licenses

Basic Edition is the default mode for IP Office systems running on IP500 V2 control units.

- For users, Basic Edition supports up to 100 users using analog and digital phones only, with no IP extension and applications. IP application are supported for maintainers and administrators to manage the IP Office.

- Depending on the locale, Basic Edition supports analog, BRI, PRI and SIP trunks.
- For voicemail, Basic Edition supports embedded voicemail using the Avaya IP Office SD card installed in the IP500 V2 control unit.
- In addition to a Basic Edition licenses below, a Basic Edition system may also require additional SIP trunk and embedded voicemail licenses depending on the required capacity.
- Basic Edition licenses are not a prerequisite for running an IP500 V2 control unit in any of the other IP Office modes it can support.

Material code	License	Description
434115	*IPO R12 BASIC ED LIC*	New R12 Basic Edition
434157	*IPO R12 BASIC ED UPG LIC*	PLDS upgrade to R12 Basic Edition
434141	*IPO R12 BASIC ED MG UPG LIC*	ADI upgrade to R12 Basic Edition

To upgrade to Release 12.0, the new PLDS R11.2 upgrade license is used in combination with the R12.0 software.

Upgrading to IP Office R12.0 from releases prior to R10.0 involves a complete transition to PLDS licenses. To upgrade existing IP Office systems to IP Office R12.0, paid or transactional or entitled Edition R12.0 upgrade or migration licenses are required.

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.

Essential Edition licenses

Essential Edition mode is supported on IP500 V2 controls units.

- In Essential Edition mode, the IP500 V2 can support up to 384 users using analog, digital, and IP phones and applications.
- For voicemail, Essential Edition supports embedded voicemail using the Avaya IP Office SD card installed in the IP500 V2 control unit.
- In addition to an Essential Edition license, the Essential Edition system may also require additional trunk, IP extension and embedded voicemail licenses depending on required features and capacity.
- An Essential Edition license is a prerequisite for Preferred Edition, but not for running an IP500 V2 control unit in any of the other IP Office modes.

Order code	License	Description
434116	*IPO R12 ESSNTL ED LIC*	Essential Edition

Table continues…

Order code	License	Description
434158	*IPO R12 ESSNTL ED UPG LIC*	Essential Edition PLDS upgrade.
434143	*IPO R12 ESSNTL ED MG UPG LIC*	Essential Edition upgrade from ADI.
434117	*IPO R12 ESSNTL ED TRIAL LIC*	Trial license for Essential Edition.

Related links

IP Office mode licenses on page 62

Preferred Edition licenses

Preferred Edition mode is supported on IP500 V2 controls units. Preferred Edition builds on Essential Edition features by adding:

- Support for features controlled by user profile licenses.
- Support for voicemail provided by either embedded voicemail or Voicemail Pro.
- Essential Edition licenses are a prerequisite for Preferred Edition.
- Preferred Edition is not a pre-requisite for running an IP500 V2 control unit in any of the other IP Office modes it can support.
- In addition to a Preferred Edition licenses as below, the Preferred Edition system may also require additional trunk, IP extension, user, and voicemail licenses depending on the required capacity.
- In a multi-site 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 requires its own Preferred Edition license for Voicemail Pro operation.
- The Preferred Edition license includes support for 4 voicemail ports. The total number of messaging ports supported can be increased by adding additional voicemail port licenses.

Order code	License	Description
434118	*IPO R12 PREFRD VM PRO LIC*	Preferred Edition
434159	*IPO R12 PREFRD VM PRO UPG LIC*	Preferred Edition PLDS upgrade.
434145	*IPO R12 PREFRD VMPRO MG UPG LIC*	Preferred Edition upgrade from ADI.

- R10+ licenses can be used with R10.0 and higher systems. Other licenses are R12.0 specific licenses.

Related links

IP Office mode licenses on page 62

Server Edition licenses

Server Edition supports similar features to Preferred Edition, but using Linux-based IP Office servers.

- The first Linux-based server is configured as the primary server for the network.

- And additional Linux-based server can be configured as secondary server for the network.
- The Linux-based servers can be physical PCs or virtualized servers.
- Further servers can be added to the network as expansion servers. These can be Linux-based server and IP500 V2 control units. Using the latter allows the network to include non-IP extensions and trunks.
- Each server in a Server Edition network requires a Server Edition license. That includes licenses for the primary server, secondary server, and each expansion system including IP500 V2 expansion systems.
- In addition to a Preferred Edition licenses as below, the Preferred Edition system may also require additional trunk, IP extension, user, and voicemail licenses depending on the required capacity.

Order code	License	Description
434120	*IPO R12 SE LIC*	1 per server.
434121	*IPO R12 VRTLZD SE LIC*	1 per virtualized server.
434198	*IPO R12 SE TO VRTLZD SE UPLT LIC*	Switch existing server to virtualized.
434160	*IPO R12 SE/VRTLZD UPG LIC*	Upgrade server or virtualized server - PLDS

Related links

IP Office mode licenses on page 62

IP Office Select licenses

IP Office Select builds on Server Edition. It supports the same features but with a much higher capacity.

- In addition to a Preferred Edition licenses as below, the Preferred Edition system may also require additional trunk, IP extension, user, and voicemail licenses depending on the required capacity.

Order code	License	Description
434173	*IPO-SL R12 SE LIC*	1 per server.
434174	*IPO-SL R12 VRTLZD SE LIC*	1 per virtualized server.
434199	*IPO-SL R12 SE TO VRTLZD SE UPLT LIC*	Switch existing server to virtualized.
434181	*IPO-SL R12 SE/VRTLZD UPG LIC*	Upgrade server or virtualized server - PLDS

Uplift Server Edition to IP Office Select licenses

These licenses are used to convert existing Server Edition licenses to IP Office Select licenses.

Order code	License	Description
434165	*IPO-SL R12 SE UPLT LIC*	Switch Server Edition server to Select.
434166	*IPO-SL R12 VRTLZD SE UPLT LIC*	Switch virtualized Server Edition to Select.
383664	*IPO-SL R10+ RECEPTS UPLT LIC*	Uplift 1 Server Edition receptionist license.

Table continues…

Order code	License	Description
434164	*IPO-SL R12 OFFICE WORKER 1 UPLT LIC*	Uplift 1 Server Edition Office Worker license.
383665	*IPO-SL R10+ CTI UPLT LIC*	Uplift 1 Server Edition CTI license.
383666	*IPO-SL R10+ VMPRO 1 UPLT LIC*	Uplift 1 Server Edition Voicemail Pro channels license.
383667	*IPO-SL R10+ 3PTY IP EP1 UPLT LIC*	Uplift 1 Server Edition third-party IP phone license.
383670	*IPO-SL R10+ IPSEC VPN UPLT LIC*	Uplift 1 Server Edition IPSEC VPN license.
383672	*IPO-SL R10+ SIP TRNK 1 UPLT LIC*	Uplift 1 Server Edition SIP trunk channel license.
383673	*IPO-SL R10+ VMPRO UMS 1 UPLT LIC*	Uplift 1 Server Edition Voicemail Pro UMS license.
383674	*IPO-SL R10+ T1 ADD 1CH UPLT LIC*	Uplift 1 Server Edition T1 channel license.
383675	*IPO-SL R10+ E1 ADD 1CH UPLT LIC*	Uplift 1 Server Edition E1 channel license.
383683	*IPO-SL R10+ AV IP EDPT 1 UPLT LIC*	Uplift 1 Server Edition Avaya IP endpoint license.
383693	*IPO-SL R10+ ACCS ENBLMT UPLT LIC*	Uplift a Server Edition ACCS license.
394195	*IPO R10+ MEDIA MGR-SL UPLT LIC*	Uplift a Server Edition Media Manager license.
383686	*IPO-SL R10+ SM LINE SIPTRNK UPLT LIC*	Uplift a Server Edition SM trunk channel license.

Related links

IP Office mode licenses on page 62

Branch licenses

Branch mode allows an IP Office system to act as a branch connected to a central Avaya Aura® Session Manager.

- The IP Office is licensed as normal for local extension, trunks, users and applications.
- SM lines are used to connect the IP Office to the Avaya Aura® Session Manager and allow calls between the systems.
- Selected SIP extensions at the IP Office site can be configured as centralized users.
  - During normal operation they connect to the Avaya Aura® Session Manager as per their configuration on that system.
  - During rainy-day scenarios, the centralized users phones connect directly to the IP Office and act as local extension until able to reconnect to the Avaya Aura® Session Manager.

Material code	License	Description
434123	*IPO R12 BRANCH WEBLM LIC*	This license is required in branch deployments to use WebLM centralized licensing.
434129	*IPO R12 BRANCH WEBLM UPG LIC*	
434130	*IPO R12 BRANCH WEBLM ENTL UPG LIC*	

Table continues…

Material code	License	Description
383118	*IPO BRANCH R10+ CENTRL ENDPT LIC*	1 per Centralized user configured on the IP Office with a SIP extension or analog extension. • In addition to this IP Office license, each centralized user also requires a license on the central Avaya Aura® system.
383725	*IPO BRANCH R10+ CENTRL ENDPT UPG LIC*	
383120	*IPO R10+ SM LINE SIP TRNK LIC*	+1 SM Line session.
382917	*IPO-SL R10+ SM LINE SIP TRK LIC*	+1 SM Line session - Select.
434124	*IPO R12 IPEND-CM8 CORE STE LIC*	
434203	*IPO R12 IPEND-AURA R10 STE LIC*	
434125	*IPO R12 VM PRO TRACKING*	
434126	*IPO R12 E1/T1 TRACKING*	
434127	*IPO R12 SIP TRUNKING TRACKING*	
434128	*IPO R12 SA FOR BRANCH TRACKING*	This license is required for IP Office in branch deployments. It is used for tracking purpose only.

- R10+ licenses can be used with R10.0 and higher systems. Other licenses are R12.0 specific licenses.

IP Office trunk licenses

Depending on the trunk type, the trunk may require licenses added to the IP Office configuration.

Related links

Licenses on page 62
IP500 V2 voice networking licenses on page 67
IP500 additional E1 channel licenses on page 68
IP500 additional E1R2 channel licenses on page 69
IP500 additional T1 channel licenses on page 69
SIP trunk licenses on page 70
SM trunk licenses on page 71
IPSec VPN licenses on page 71

IP500 V2 voice networking licenses

For IP500 V2 systems, private inter-system trunks require voice networking channel licenses. These are used for:

- IP Office Small Community Network (SCN) connections to other IP500 V2 control units.

- H.323 IP trunks. Each simultaneous outgoing call uses 1 license.
- Q.SIG trunks. On Q.SIG trunks, 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.
383088	*IPO R10+ IP500 VCE NTWK 4*	Trial license for IP500 Voice Networking.

- R10+ licenses can be used with R10.0 and higher systems. Other licenses are R12.0 specific licenses.

Related links

IP Office trunk licenses on page 67

IP500 additional E1 channel licenses

The IP500 PRI Universal trunk card is available in 1-port and 2-port variants:

- Each port supports a single PRI circuit connection.
- The cards can be switched between supporting E1, E1R2, and T1 line types.
- Each port supports 8 B-channels (“Bearer”) without needing licenses. Additional B-channels need licensing. D-channels do not need licensing.
- Channels licenses are consumed by the channels configured as "in service", in order of the installed IP500 PRI-U cards.
- Trunks configured for Q.SIG operation use voice networking licenses. See IP500 V2 voice networking licenses on page 67.

These licenses 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.

Table 3: License for non-IP Office Select systems

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.

Table 4: License for IP Office Select systems

Order code	License	Description
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.

- R10+ licenses can be used with R10.0 and higher systems. Other licenses are R12.0 specific licenses.

Related links

IP Office trunk licenses on page 67

IP500 additional E1R2 channel licenses

The IP500 PRI Universal trunk card is available in 1-port and 2-port variants:

- Each port supports a single PRI circuit connection.
- The cards can be switched between supporting E1, E1R2, and T1 line types.
- Each port supports 8 B-channels (“Bearer”) without needing licenses. Additional B-channels need licensing. D-channels do not need licensing.
- Channels licenses are consumed by the channels configured as "in service", in order of the installed IP500 PRI-U cards.
- Trunks configured for Q.SIG operation use voice networking licenses. See IP500 V2 voice networking licenses on page 67.

These licenses 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.

Table 5: License for non-IP Office Select systems

Order code	License	Description
383095	*IPO R10+ IP500 E1R2 ADD 2CH 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.

Table 6: License for IP Office Select systems

Order code	License	Description
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.

- R10+ licenses can be used with R10.0 and higher systems. Other licenses are R12.0 specific licenses.

Related links

IP Office trunk licenses on page 67

IP500 additional T1 channel licenses

The IP500 PRI Universal trunk card is available in 1-port and 2-port variants:

- Each port supports a single PRI circuit connection.
- The cards can be switched between supporting E1, E1R2, and T1 line types.
- Each port supports 8 B-channels (“Bearer”) without needing licenses. Additional B-channels need licensing. D-channels do not need licensing.

- Channels licenses are consumed by the channels configured as "in service", in order of the installed IP500 PRI-U cards.
- Trunks configured for Q.SIG operation use voice networking licenses. See IP500 V2 voice networking licenses on page 67.

These licenses 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.

Table 7: License for non-IP Office Select systems

Order code	License	Description
383091	*IPO R10+ IP500 T1 ADD 2CH LIC*	+ 2 T1 channels.

Table 8: License for IP Office Select systems

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

- R10+ licenses can be used with R10.0 and higher systems. Other licenses are R12.0 specific licenses.

Related links

IP Office trunk licenses on page 67

SIP trunk licenses

These licenses are used to permit SIP channels on SIP trunks added to the IP Office system. Multiple licenses can be combined for the total number of channels required.

Table 9: Licenses for non-IP Office Select systems

Order code	License	Description
383085	*IPO R10+ SIP TRNK 1 LIC*	+1 SIP trunk session.
383086	*IPO R10+ SIP TRNK 5 TRL LIC*	Trial license for SIP trunk sessions.

Table 10: License for IP Office Select systems

Order code	License	Description
307332	*IPO-SL R10+ SIP TRNK 1 LIC*	+1 SIP trunk session – Select.
307333	*IPO-SL R10+ SIP TRNK 5 TRL LIC*	Trial license for SIP trunk sessions - Select.

- R10+ licenses can be used with R10.0 and higher systems. Other licenses are R12.0 specific licenses.

Related links

IP Office trunk licenses on page 67

SM trunk licenses

These licenses are used to permit channels on SM Lines between to the IP Office system and Avaya Aura® Session Manager. Multiple licenses can be combined for the total number of channels required. See Branch licenses on page 66.

Note:

IP Office also supports SM Line connections to Avaya Aura® Session Manager in other IP Office Server Edition deployments. They are not limited to branch deployments.

Table 11: License for non-IP Office Select systems

Order code	License	Description
383120	*IPO R10+ SM LINE SIP TRNK LIC*	+1 SM Line session.

Table 12: License for IP Office Select systems

Order code	License	Description
382917	*IPO-SL R10+ SM LINE SIP TRK LIC*	+1 SM Line session - Select.
383686	*IPO-SL R10+ SM LINE SIPTRNK UPLT LIC*	Uplift a Server Edition SM trunk channel license.

- R10+ licenses can be used with R10.0 and higher systems. Other licenses are R12.0 specific licenses.

Related links

IP Office trunk licenses on page 67

IPSec VPN licenses

These licenses allow the configuration of IPSec and L2TP tunnels on the IP Office system.

Table 13: Licenses for non-IP Office Select systems

Order code	License	Description
383081	*IPO R10+ IPSEC VPN LIC*	
383082	*IPO R10+ IPSEC VPN TRL LIC*	Trial license for IPSec Tunneling.

Table 14: Licenses for IP Office Select systems

Order code	License	Description
307328	*IPO-SL R10+ IPSEC VPN LIC*	
307329	*IPO-SL R10+ IPSEC VPN TRL LIC*	Trial license for IPSec Tunneling - Select.
383670	*IPO-SL R10+ IPSEC VPN UPLT LIC*	Uplift 1 Server Edition IPSEC VPN license.

- R10+ licenses can be used with R10.0 and higher systems. Other licenses are R12.0 specific licenses.

Related links

IP Office trunk licenses on page 67

IP endpoint licenses

All IP phones, including DECT and Wi-Fi phones, require an IP endpoint license. This does not apply to the Avaya Workplace Client.

Related links

Licenses on page 62
Avaya IP endpoint licenses on page 72
Third-party IP endpoint licenses on page 72

Avaya IP endpoint licenses

All supported Avaya IP phones require an Avaya IP Endpoint license. This does not apply to the Avaya Workplace Client.

- Avaya IP phones without a license can still register but for emergency calls only. The phone will display `No license available` and `Emergency Calls Only`.

Table 15: Licenses for non-IP Office Select systems

Order code	License	Description
383110	*IPO R10+ AV IP ENDPT 1 LIC*	+1 Avaya IP endpoint.
383111	*IPO R10+ AV IP ENDPT 5 TRL LIC*	Trial license for 5 Avaya IP endpoint licenses.

Table 16: Licenses for IP Office Select systems

Order code	License	Description
307350	*IPO-SL R10+ AV IP ENDPT 1 LIC*	+1 Avaya IP endpoint – Select
382913	*IPO-SL R10+ AV IP ENDPT 5 TRL LIC*	Trial license for 5 Avaya IP endpoint licenses - Select.

- R10+ licenses can be used with R10.0 and higher systems. Other licenses are R12.0 specific licenses.

Related links

IP endpoint licenses on page 72

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.

Table 17: Licenses for non-IP Office Select systems

Order code	License	Description
383072	*IPO R10+ 3RD PTY IP ENDPT 1 LIC*	+1 third-party IP endpoint.
383073	*IPO R10+ 3RDPTY IPENDPT 5 TRL LIC*	Trial license for third-party IP endpoint.

Table 18: Licenses for IP Office Select systems

Order code	License	Description
307323	*IPO-SL R10+ 3RD PTY IP END 1 LIC*	+1 third-party IP endpoint – Select.
307324	*IPO-SL R10+ 3RD PTY IP 5 TRL LIC*	Trial license for third-party IP endpoint - Select.

- R10+ licenses can be used with R10.0 and higher systems. Other licenses are R12.0 specific licenses.

Related links

IP endpoint licenses on page 72

User licenses

Preferred Edition, Server Edition and Select mode IP Office systems require user licenses for all users configured with a user profile other than **Basic User**. The licensed profile enables support for additional features for the user.

Related links

Licenses on page 62
Mobile Worker user licenses on page 73
Office Worker user licenses on page 74
Power User user licenses on page 75
Teleworker user licenses on page 75
Centralized User licenses on page 76

Mobile Worker user licenses

This type of license is support on IP500 V2 control units running in IP Office Preferred Edition mode.

Mobile worker 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.

Order code	License	Description
434113	*IPO R12 MOBILE WORKER 1 LIC*	1 user

Table continues…

Order code	License	Description
383105	*IPO R10+ MOBILE WORKER 5 TRL LIC*	Trial license for 5 Mobile Worker licenses.

- R10+ licenses can be used with R10.0 and higher systems. Other licenses are R12.0 specific licenses.

Related links

User licenses on page 73

Office Worker user 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 voicemail with an email client.

- An Office Worker license enables Avaya Workplace Client for Windows and Mac.
- 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.

Table 19: Licenses for non-IP Office Select systems

Order code	License	Description
434114	*IPO R12 OFFICE WORKER 1 LIC*	1 user.
307347	*IPO-SL R10+ OFFICE WORKER 5 TRL LIC*	Trial license for 5 Office Worker licenses - Select.

Table 20: Licenses for IP Office Select systems

Order code	License	Description
434172	*IPO-SL R12 OFFICE WORKER 1 LIC*	1 user - Select.
434164	*IPO-SL R12 OFFICE WORKER 1 UPLT LIC*	Uplift 1 Server Edition Office Worker license.
307347	*IPO-SL R10+ OFFICE WORKER 5 TRL LIC*	Trial license for 5 Office Worker licenses - Select.

- R10+ licenses can be used with R10.0 and higher systems. Other licenses are R12.0 specific licenses.

Related links

User licenses on page 73

Power User 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 Workplace Client desktop and mobile.

- 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.
- A license instance is consumed for each user configured.

Table 21: Licenses for non-IP Office Select systems

Order code	License	Description
434108	*IPO R12 PWR USER 1 LIC*	+1 Power User.
434110	*IPO R12 MOBILE TO PWR USR 1 UPLT LIC*	Uplift 1 Mobile Worker to Power User.
434111	*IPO R12 OFF WK TO PWR USR 1 UPLT LIC*	Uplift 1 Office Worker to Power User.
434200	*IPO R12 TLW-PWR USR 1 IPLT PLDS LIC*	Uplift 1 Teleworker to Power User.
434109	*IPO R12 PWR USER 5 TRIAL LIC*	Trial license for 5 Power User users.

Table 22: License for IP Office Select systems

Order code	License	Description
434169	*IPO-SL R12 PWR USER 1 LIC*	+1 Power User – Select.
434171	*IPO-SL R12 OFF WKR TO PWR USER 1 LIC*	Uplift an Office Worker to Power User – Select.
434170	*IPO-SL R12 PWR USER 5 TRIAL LIC*	Trial license for 5 Power User - Select users.

- R10+ licenses can be used with R10.0 and higher systems. Other licenses are R12.0 specific licenses.

Related links

User licenses on page 73

Teleworker user licenses

This type of license is support on IP500 V2 control units running in IP Office Preferred Edition mode.

Teleworker 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.

- Teleworker includes the remote worker capability with the package. An Essential Edition license provides 4 remote worker seats. Customers requiring additional seats need to purchase the Teleworker solution.
- The Teleworker license enables a user to use Avaya Workplace Client for Windows and Mac, and Avaya one-X® Portal for IP Office.
- UMS functionality for voicemail 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
434112	`IP OFFICE R12 TELEWORKER 1 LIC:CU`	1 user.
383103	*IPO R10+ TELEWORKER 5 TRL LIC*	Trial license for 5 Teleworker licenses.

- R10+ licenses can be used with R10.0 and higher systems. Other licenses are R12.0 specific licenses.

Related links

User licenses on page 73

Centralized User licenses

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. See Branch licenses on page 66.

Related links

User licenses on page 73

Application licences

The following application license are supported for IP Office.

Related links

Licenses on page 62
Receptionist user licenses on page 77
ACCS licenses on page 77
Embedded Voicemail licenses on page 78
CTI licenses on page 78
Voicemail Pro licenses on page 79
Media Manager licenses on page 80

Receptionist user licenses

The **Receptionist** license enables users to use IP Office SoftConsole, a Windows application intended for receptionists and operators. The user requires a separate IP Office phone or softphone to provide the audiopath.

- IP500 V2 control units, running in IP Office Essential Edition or IP Office Preferred Edition modes, support up to 4 IP Office SoftConsole users.
- For other systems:
  - Server Edition supports up to 32 licensed users within the network.
  - IP Office Select supports up to 50 licensed users within the network.
  - Each Linux-based IP Office system in the network supports a maximum of 10 licensed users.
  - Each IP500 V2 expansion unit in the network supports a maximum of 4 licensed users.

Table 23: Licenses for non-IP Office Select systems

Order code	License	Description
382687	*IPO R10+ RECEPTIONIST 1 LIC*	1 user.
382688	*IPO R10+ RECEPTIONIST 5 TRL LIC*	Trial license for 5 Receptionist licenses.

Table 24: License for IP Office Select systems

Order code	License	Description
307318	IPO-SL R10+ RECEPTS 1 LIC	1 user.
307319	*IPO-SL R10+ RECEPTS 5 TRL LIC*	Trial license for 5 Receptionist licenses - Select.

- R10+ licenses can be used with R10.0 and higher systems. Other licenses are R12.0 specific licenses.

Related links

Application licences on page 76

ACCS licenses

Avaya Contact Center Select (ACCS) is a contact center application supported by IP Office.

Table 25: Licenses for non-IP Office Select systems

Order code	License	Description
383134	*IPO R10+ ACCS ENABLE LIC*	Support for ACCS.

Table 26: Licenses for IP Office Select systems

Order code	License	Description
382924	*IPO-SL R10+ ACCS ENABLE LIC*	Support for ACCS.
383693	*IPO-SL R10+ ACCS ENBLMT UPLT LIC*	Uplift a Server Edition ACCS license.

- R10+ licenses can be used with R10.0 and higher systems. Other licenses are R12.0 specific licenses.

Related links

Application licences on page 76

Embedded Voicemail licenses

Embedded Voicemail is supported by IP Office IP500 V2 control units running in Basic Edition, Essential Edition, and Preferred Edition mode.

The basic service supported 2 ports and up to 15 hours of storage capacity for messages, announcements and greetings. This capacity can be increased up to 6 ports and 25 hours using the licenses below.

Table 27: Licenses for non-IP Office Select systems

Order code	License	Description
383127	*IPO R10+ ESSNTL ED EVM 2CH LIC*	Add 2 ports and 5 hours of storage capacity.

- R10+ licenses can be used with R10.0 and higher systems. Other licenses are R12.0 specific licenses.

Related links

Application licences on page 76

CTI licenses

The IP Office uses CTI licenses to allow third-party applications to connect to the IP Office API interfaces. For example: TAPI, DevLink, and MTCTI.

For IP Office networks, the number of CTI licenses must match the number of IP Office systems in the network as follows:

- Single IP Office system: 1 CTI license.
- Up to 5 IP Office systems: 2 CTI licenses.
- Up to 20 IP Office systems: 3 CTI licenses.
- More than 20 IP Office systems: 4 CTI licenses.

For SCN networks, each IP500 V2 requires a single license and MTCTI connection.

Table 28: Licenses for non-IP Office Select systems

Order code	License	Description
382689	*IPO R10+ CTI LIC*	+1 CTI license.
383070	*IPO R10+ CTI TRL LIC*	Trial license for CTI Link Pro.

Table 29: Licenses for IP Office Select systems

Order code	License	Description
307320	*IPO-SL R10+ CTI LIC*	+1 CTI connection.
307321	*IPO-SL R10+ CTI TRL LIC*	Trial license for CTI Link Pro - Select.
383665	*IPO-SL R10+ CTI UPLT LIC*	Uplift 1 Server Edition CTI license.

- R10+ licenses can be used with R10.0 and higher systems. Other licenses are R12.0 specific licenses.

Related links

Application licences on page 76

Voicemail Pro licenses

Voicemail Pro support is enabled by IP Office Preferred Edition, Server Edition and Select mode system license. The license below enable additional capacity and features:

- **Voicemail ports** - The maximum number of ports depends on the type of IP Office system and, for Linux-based servers, the server platform.
  - IP500 V2 with IP Office Application Server: 40.
  - IP Office Server Edition: 250.
  - IP Office Select: 250. 500 if using dual-active voicemail.
- **Text-to-Speech (TTS)** - Enable the use of TTS to provide voicemail prompts in customized Voicemail Pro callflows.
- **Unified Messaging Services (UMS)** - UMS services are supported for all licenses user profiles. UMS licenses are used to:
  - Add support for UMS for users set to the **Basic User** profile.
  - Add UMS services for hunt group mailboxes.

Table 30: Licenses for non-IP Office Select systems

Order code	License	Description
383071	*IPO R10+ VM PRO 2 LIC*	Support an additional 2 voicemail ports.
383089	*IPO R10+ VM PRO UMS 1 LIC*	Enable UMS features for +1 Basic user/hunt group.
434107	*IPO R12 TTS PROLINUX LIC*	+1 Text-to-Speech (TTS) session.
383080	*IPO R10+ TTS PRO LINUX TRL LIC*	Trial license for Voicemail Pro Linux TTS license.
383090	*IPO R10+ VMPRO UMS 5 TRL LIC*	Trial license for 5 Voicemail Pro UMS licenses.

Table 31: Licenses for IP Office Select systems

Order code	License	Description
307322	*IPO-SL R10+ VMPRO 2 LIC*	Support an additional 2 voicemail ports.
307334	*IPO-SL R10+ VMPRO UMS 1 LIC*	Enable UMS features for +1 Basic user/hunt group.
434168	*IPO-SL R12 TTS PROLINUX LIC*	+1 Text-to-Speech (TTS) session.
307327	*IPO-SL R10+ TTS PROLINUX TRL LIC*	Trial license for Voicemail Pro Linux TTS license - Select.
307335	*IPO-SL R10+ VMPRO UMS 5 TRL LIC*	Trial license for 5 Voicemail Pro UMS licenses – Select.
383666	*IPO-SL R10+ VMPRO 1 UPLT LIC*	Uplift 1 Server Edition Voicemail Pro channels license.
383673	*IPO-SL R10+ VMPRO UMS 1 UPLT LIC*	Uplift 1 Server Edition Voicemail Pro UMS license.

- R10+ licenses can be used with R10.0 and higher systems. Other licenses are R12.0 specific licenses.

Related links

Application licences on page 76

Media Manager licenses

Media Manager is used for storage and access to call recordings separately from using standard voicemail mailboxes. It requires the IP Office system to support Voicemail Pro. Voicemail Pro does the call recording and then transfers the recorded file and call information to Media Manager.

Important:

- An unlicensed Media Manager will operate for a 30-day trial from the time of a first recording. However, access to the recording is lost if the application is not licensed before the end of the trial period.

Table 32: Licenses for non-IP Office Select systems

Order code	License	Description
393296	*IPO R10+ MEDIA MGR LIC*	Support Media Manager.
434161	*IPO R12 CONREC TO MEDMGR UPG LIC*	Support Media Manager on a system previously licensed for Contact Recorder.

Table 33: Licenses for IP Office Select systems

Order code	License	Description
393297	*IPO-SL R10+ MEDIA MGR LIC*	Support Media Manager.
434182	*IPO-SL R12 CONREC TO MEDMGR UPGLIC*	Support Media Manager on a system previously licensed for Contact Recorder.

Table continues…

Order code	License	Description
394195	*IPO R10+ MEDIA MGR-SL UPLT LIC*	Uplift a Server Edition Media Manager license.

- R10+ licenses can be used with R10.0 and higher systems. Other licenses are R12.0 specific licenses.

Related links

Application licences on page 76

Trial licenses

License files containing trail licenses are valid for 60-days from the date of issue.

Table 34: Licenses for non-IP Office Select systems

Order code	License	Description
434117	*IPO R12 ESSNTL ED TRIAL LIC*	Trial license for Essential Edition.
434119	*IPO R12 PREFRD VM PRO TRIAL LIC*	Trial license for Preferred Edition.
434109	*IPO R12 PWR USER 5 TRIAL LIC*	Trial license for 5 Power User users.
383103	*IPO R10+ TELEWORKER 5 TRL LIC*	Trial license for 5 Teleworker licenses.
383105	*IPO R10+ MOBILE WORKER 5 TRL LIC*	Trial license for 5 Mobile Worker licenses.
383107	*IPO R10+ OFFICE WORKER 5 TRL LIC*	Trial license for 5 Office Worker licenses.
382688	*IPO R10+ RECEPTIONIST 5 TRL LIC*	Trial license for 5 Receptionist licenses.
383073	*IPO R10+ 3RDPTY IPENDPT 5 TRL LIC*	Trial license for third-party IP endpoint.
383111	*IPO R10+ AV IP ENDPT 5 TRL LIC*	Trial license for 5 Avaya IP endpoint licenses.
383090	*IPO R10+ VMPRO UMS 5 TRL LIC*	Trial license for 5 Voicemail Pro UMS licenses.
383080	*IPO R10+ TTS PRO LINUX TRL LIC*	Trial license for Voicemail Pro Linux TTS license.
383082	*IPO R10+ IPSEC VPN TRL LIC*	Trial license for IPSec Tunneling.
383086	*IPO R10+ SIP TRNK 5 TRL LIC*	Trial license for SIP trunk sessions.
383088	*IPO R10+ IP500 VCE NTWK 4*	Trial license for IP500 Voice Networking.
383070	*IPO R10+ CTI TRL LIC*	Trial license for CTI Link Pro.

- R10+ licenses can be used with R10.0 and higher systems. Other licenses are R12.0 specific licenses.

Licenses for IP Office Select systems

Order code	License	Description
434170	*IPO-SL R12 PWR USER 5 TRIAL LIC*	Trial license for 5 Power User - Select users.
307347	*IPO-SL R10+ OFFICE WORKER 5 TRL LIC*	Trial license for 5 Office Worker licenses - Select.
307319	*IPO-SL R10+ RECEPTS 5 TRL LIC*	Trial license for 5 Receptionist licenses - Select.
307324	*IPO-SL R10+ 3RD PTY IP 5 TRL LIC*	Trial license for third-party IP endpoint - Select.
382913	*IPO-SL R10+ AV IP ENDPT 5 TRL LIC*	Trial license for 5 Avaya IP endpoint licenses - Select.
307335	*IPO-SL R10+ VMPRO UMS 5 TRL LIC*	Trial license for 5 Voicemail Pro UMS licenses – Select.
307327	*IPO-SL R10+ TTS PROLINUX TRL LIC*	Trial license for Voicemail Pro Linux TTS license - Select.
307329	*IPO-SL R10+ IPSEC VPN TRL LIC*	Trial license for IPSec Tunneling - Select.
307333	*IPO-SL R10+ SIP TRNK 5 TRL LIC*	Trial license for SIP trunk sessions - Select.
307321	*IPO-SL R10+ CTI TRL LIC*	Trial license for CTI Link Pro - Select.

- R10+ licenses can be used with R10.0 and higher systems. Other licenses are R12.0 specific licenses.

Related links

Licenses on page 62

Chapter 13: License operation

This section describes IP Office license operation.

Related links

[PLDS licensing](#) on page 83
[Web License Manager (WebLM)](#) on page 84
[Migration of ADI licenses](#) on page 85
[Server Edition Centralized and Nodal licensing](#) on page 86

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.

System Type	Description
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 Server	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. 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. In a virtual environment, the WebLM host ID is a virtual Mac address that starts with the letter “V”.

Related links

License operation on page 83

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*.

Related links

License operation on page 83

Migration of ADI licenses

ADI licenses are no longer supported from Release 10.0. To use IP Office Release 10.0, 10.1, or 11.0, 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.

Related links

License operation on page 83
Virtual licenses on page 85

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 Workplace Client for Windows is the replacement. The Teleworker license enables the use of the Avaya Workplace Client for Windows. In earlier releases, this was only available with Office Worker and Power User.

Related links

Migration of ADI licenses on page 85

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	✓	✗
Avaya IP endpoints	✓	✗
Third-party IP endpoints	✓	✗
SIP trunk channels	✓	✗
IP500 universal PRI channels	✗	✓

Table continues…

License	Primary server	Server-specific
Additional voicemail ports [3]	✓	✗
UMS Web Services [1]	✗	✓
Office Worker	✓	✗
Power User	✓	✗
Office Worker to Power User upgrade	✓	✗
Receptionist	✗	✓
CTI Link Pro	✗	✓
Messaging TTS Pro [3]	✓	✗
Voicemail Pro Recording Administrator [2] [3]	✓	✗
WAV User	✗	✓
IPSec tunneling	✗	✓

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.

License modes

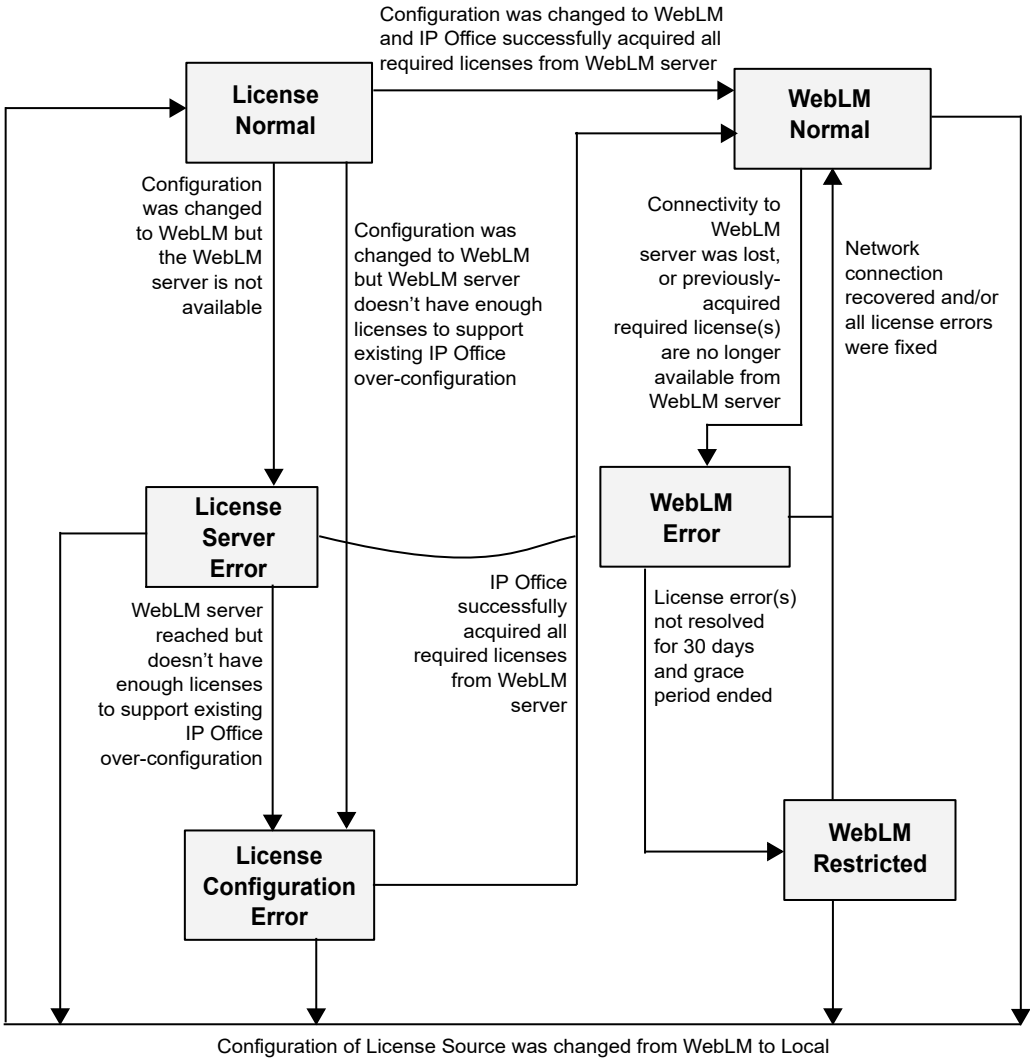
The following are the IP Office license modes when you are using WebLM licensing. The license mode is displayed in IP Office Manager, Web Manager, and System Status Application (SSA).

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.

Table continues…

Mode	Description
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 and receptionists, 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.

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.

Part 5: Miscellaneous

Chapter 14: 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, 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.

Related links

IP Office Basic Edition on page 94
IP Office Essential Edition on page 96
IP Office Preferred Edition on page 97
IP Office Select/IP Office Subscription on page 100
IP Office Subscription on page 101

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 35: 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 36: 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

Table continues…

Trunk card	PARTNER mode Maximum per system	NORSTAR mode Maximum per system
PRI/T1	1	
PRI/E1		1
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 parties in any one conference

Related links

Reference Configurations on page 94

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 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

Related links

Reference Configurations on page 94

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.

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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.

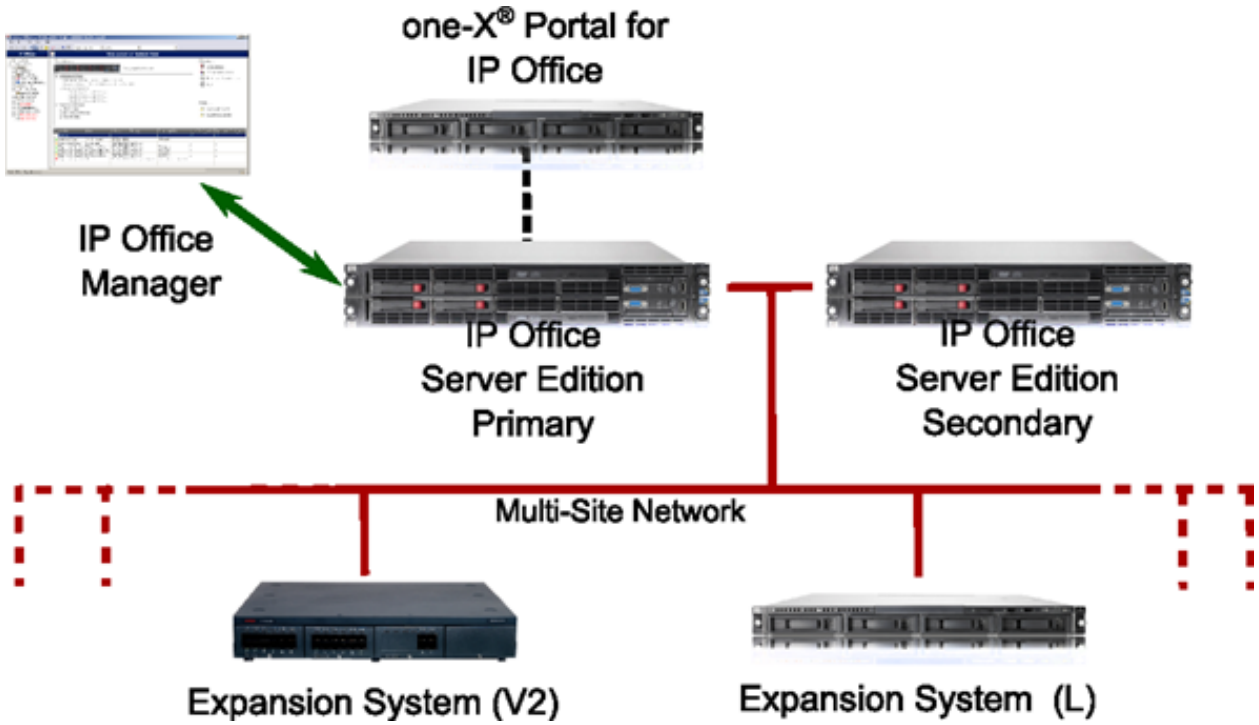

Figure 6: IP Office Server Edition topology

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.

Server Edition Components

Component	Server options	Description
Server Edition Primary	Dell R640 Dell R240	Software distribution includes: • IP Office Server Edition • Voicemail Pro • Avaya one-X® Portal for IP Office
Server Edition Secondary		Optional component to support resilience either centrally or at a remote site.
Server Edition Expansion System		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.
Application server		You can optionally configure a separate application server dedicated to Avaya one-X® Portal to provide more Power User capacity above the maximum that the Server Edition Primary supports.
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.

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.

IP Office Select/IP Office Subscription

Avaya IP Office Select is a premium IP Office Server Edition offer providing extended capacity, performance and features over basic IP Office Server Edition. The following also apply to IP Office Subscription when running on the Linux-based server platforms.

Additional Capacity

In summary, IP Office Select offers the following increased capacities. Note that the capacities are also be subject to meeting server platform requirements, refer to the individual sections on each feature.

Feature	Capacity Change
User/Extensions per server:	1500 > 3000

Table continues…

Feature	Capacity Change
Users/Extensions whole solution:	2000 > 3000
Expansion systems:	30 > 148
Power User/UC clients:	2000 > 3000
Voicemail/Attendant/Recording channels:	250 > 500
Conference channels:	256 > 512
SIP trunk calls:	512 > 1024
Inter IP Office line channels:	250 > 500
Solution SoftConsole instances:	32 > 75
Button module buttons per Linux server:	4096 > 8192
Peak call Rate:	18,000 > 20,000

Additional Features

IP Office Select also offers the following additional features:

- Expansion to Expansion Inter IP Office lines
- Location based phone resilience
- Expansion to Expansion phone and hunt group resilience
- VMware High Availability (HA) - Note: Not compatible with resilience features. Either VMware HA or resilience can be used but not both.
- Resilient Avaya one-X® Portal server on a second Avaya one-X® Portal server or Secondary Server

The decision to deploy IP Office Server Edition or IP Office Select should be made at the outset. However it is possible to convert a IP Office Server Edition to an IP Office Select solution at a later date without loss of configuration or data. Moving from IP Office Select to IP Office Server Edition requires complete reconfiguration.

Related links

Reference Configurations on page 94

IP Office Subscription

IP Office Subscription mode allows IP Office systems to obtain the system entitlements through per-user per-month subscriptions rather than permanent licenses.

- For standalone IP500 V2 systems, subscription mode can be used to enable the same feature set as Preferred Edition.
- For systems based around a Linux-based primary server, subscription mode can be used to enable the same feature set as IP Office Select.

Related links

Reference Configurations on page 94

Avaya Contact Center Select

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 94
Avaya Contact Center Select DVD on page 104
Avaya Contact Center Select and VMware on page 105
Avaya Contact Center Select hardware appliance on page 106
Avaya Contact Center Select Business Continuity on page 107

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.

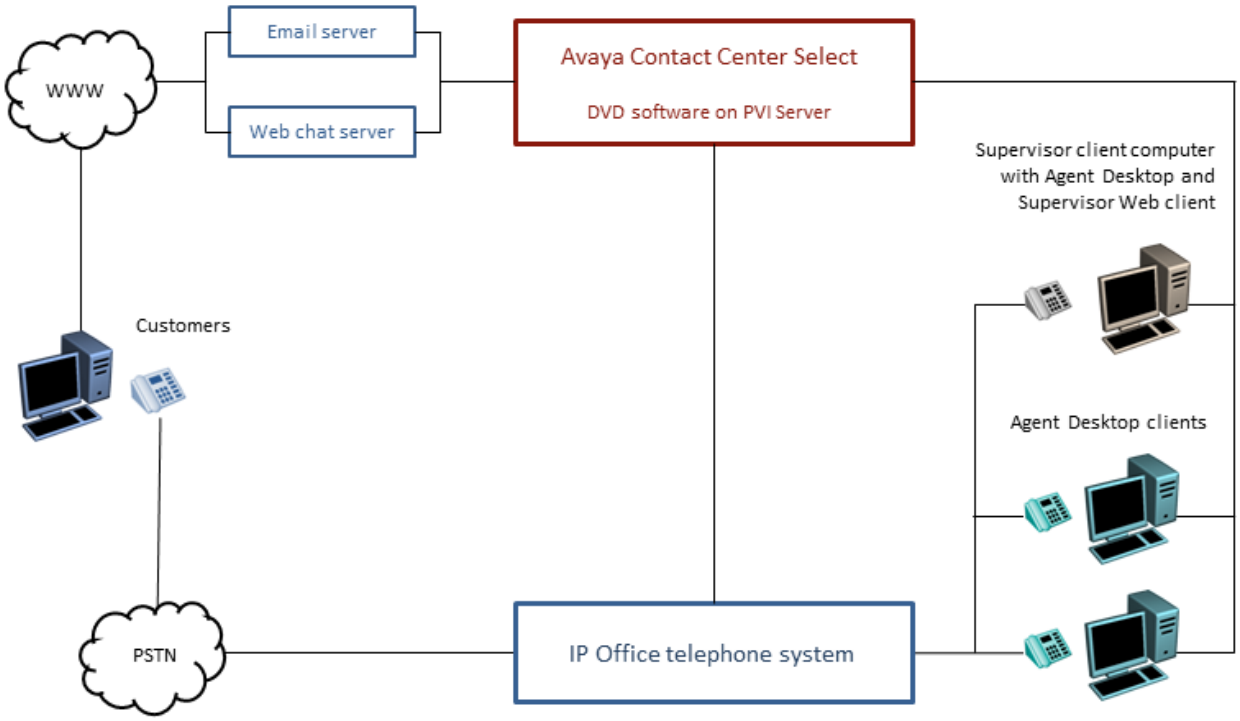

Figure 7: Typical Avaya Contact Center Select DVD deployment

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.

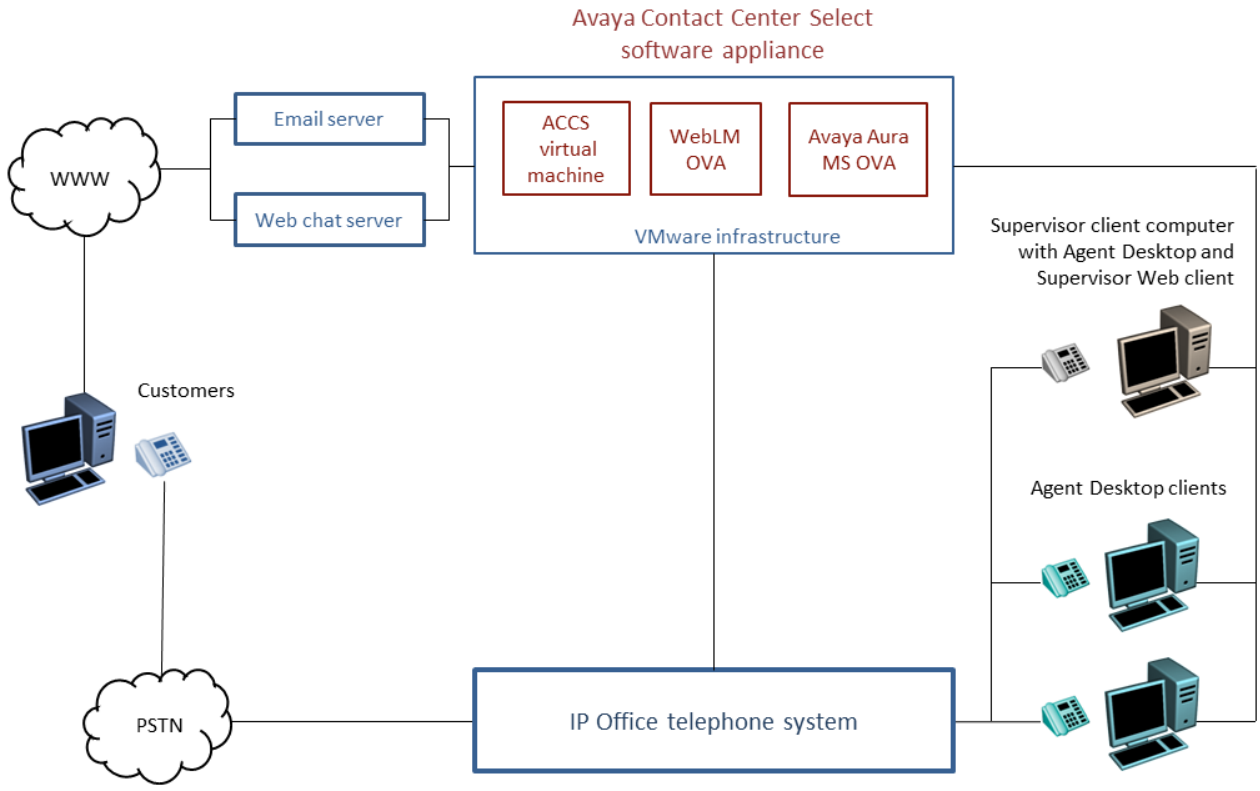

Figure 8: Typical Avaya Contact Center Select and VMware solution

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.

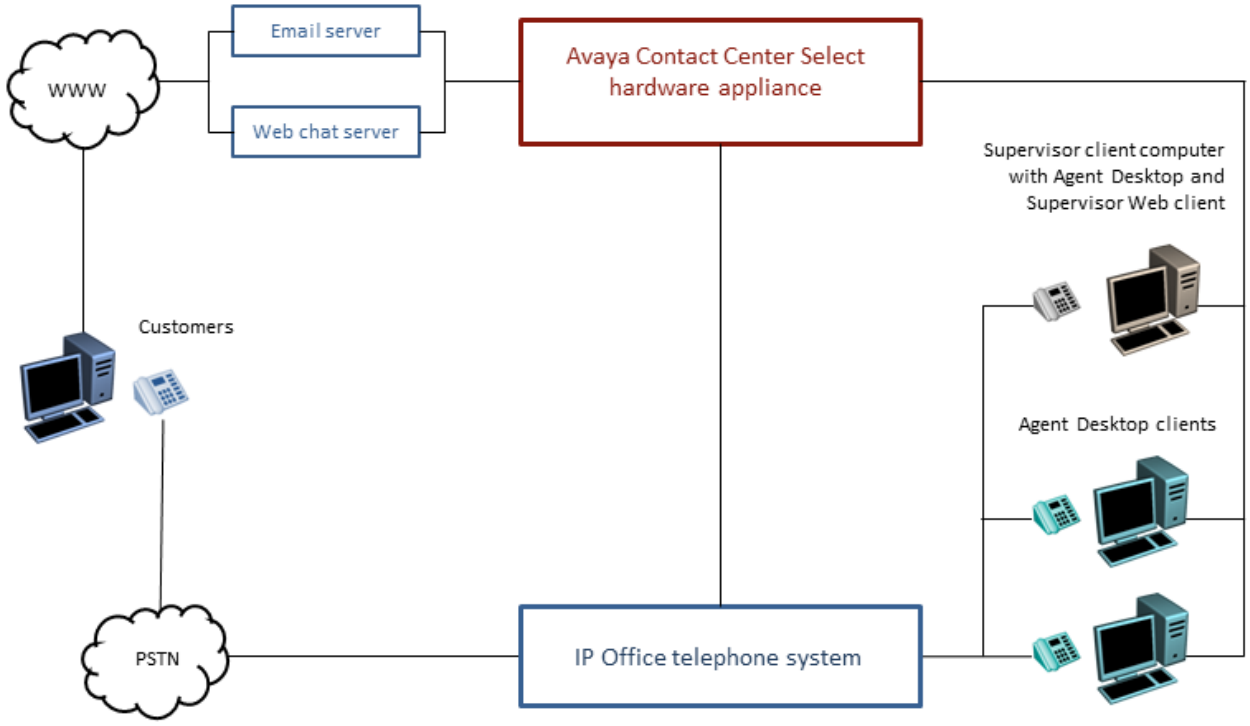

Figure 9: Typical Avaya Contact Center Select hardware appliance solution

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.

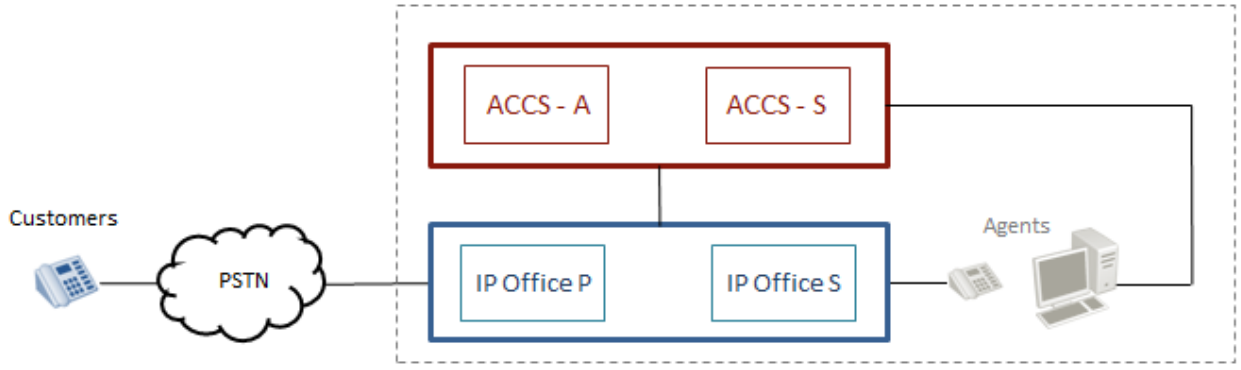

Figure 10: Avaya Contact Center Select Business Continuity with IP Office resilience

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*.

Chapter 15: Solution Specifications

The following sections outline some of the supported server and software specifications.

Related links

Migration roadmap and limitations on page 109

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.

For systems using the IP500 V2 with any software release before 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 before upgrading the software. Install the upgrade licenses before upgrading.

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

IP400 hardware, including IP400 internal cards, expansion modules, and trunk cards - is no longer supported except for the following:

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

Upgrading Linux-Based IP Office Servers

Normally, Linux-based servers are upgraded .by transferring an ISO file to the server. However, for R11.1, the system must first be upgraded to R11.0.4.3 and then upgrade to R11.1 using a special process detailed in separate documentation.

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.

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.

Related links

Solution Specifications on page 108

Chapter 16: 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)

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 111
Port assignments on page 113

Platform and application security details

For additional information on security, refer to the Avaya IP Office™ Platform Security Guidelines manual.

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 110

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	Uses space of the System SD card installed in all IP500 V2 systems.

Related links

Security specification on page 110

Chapter 17: 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 Workplace Client
- Avaya Session Border Controller
- Avaya Business Communications Manager
- Avaya Communication Server 1000
- Avaya Modular Messaging
- Avaya Scopia®
- Secure Access Link

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 116
IP Office and Avaya Aura Communication Manager interoperability on page 118

Phone interoperability

The following tables summarize the phone interoperability of IP Office.

- The tables list the phones still supported by Avaya at the time of release of the IP Office release covered by this document.
- In some cases, Avaya no longer sells the phones but still supports then for customers with a relevant Avaya support contract.
- Phones previously listed as supported with previous IP Office releases but no longer listed here may still function, but will no longer be supported by Avaya.

Phone	Basic Edition	Essential Edition Preferred Edition	Server Edition[1] Select	IP Office Subscription
Analog deskphones:				
Third-party Analog[2]	✓	✓	✓	✓
H209, H219, H229, H239, H249	✓	✓	✓	✓
1400 Series : DS Digital phones – IP Office and Communication Manager				
1403, 1408, 1416	✓	✓	–	–
DBM32	✓	✓	–	–
1600 Series : IP (H.323) phones – IP Office and Communication Manager				
1603SW, 1603SW–I, 1608–I, 1616–I	–	✓	✓	✓
3700 Series: DECT – IP Office and Communication Manager				
3730, 3735, 3745, 3749, 3755, 3759	–	✓	✓	✓
9500 Series: DS digital – IP Office only				
9504, 9508	✓	✓	-	✓
BM12	✓	✓	-	✓
9600 Series: IP H.323 – IP Office and Communication Manager				

Table continues…

[1] Digital and analog phones supported with Server Edition or Select connect to an IP500 V2 expansion server.
[2] Third-Party Analog Phones: It is the installers responsibility to test and check compatibility.

Phone	Basic Edition	Essential Edition Preferred Edition	Server Edition[1] Select	IP Office Subscription
9608G, 9611G, 9641GS	–	✓	✓	✓
BM12	–	✓	✓	–
SBM24	–	✓	✓	✓
ETR phones: - PARTNER and IP Office				
“Refreshed” 34, 18 and 6 button display	✓	–	–	–
“Euro” 34 and 18 button display	✓	–	–	–
“Euro” 18 and 6 button display	✓	–	–	–
B100 Series Conference Phones:				
B149, B159, B169 - Analog	Yes	✓	–	–
B169, B179, B199 - SIP	–	✓	✓	✓
H100 Series Video Collaboration Stations:				
H175	–	✓	✓	–
Avaya J100 Series IP Phones:				
J129	–	✓	✓	–
J139, J159, J169, J179, J189	–	✓	✓	✓
Avaya Vantage™				
K155, J165, J175	–	✓	✓	✓
Softphone:				
Avaya Workplace Client (SIP)	–	✓	✓	✓
IP Office User Portal (WebRTC)	–	–	✓	✓

Table 37: NORSTAR/BCM phones

Phone	Basic Edition	Essential Edition Preferred Edition	Server Edition Select	IP Office Subscription
1100 Series SIP phones:				
1120E, 1140E	–	✓	✓	–
BM LED and paper labels	–	✓	✓	–
BM LCD	–	✓	✓	–
1200 Series SIP phones:				

Table continues…

[1] Digital and analog phones supported with Server Edition or Select connect to an IP500 V2 expansion server.

Phone	Basic Edition	Essential Edition Preferred Edition	Server Edition Select	IP Office Subscription
1220, 1230	–	✓	✓	–
BCM paper	–	✓	✓	–
BCM LCD	–	✓	✓	–

Related links

Interoperability on page 115
Phone availability on page 118

Phone availability

The availability of phones may vary depending on the particular country. For detailed specifications, see specific phone information on the Avaya Support site at http://support.avaya.com.

Related links

Phone interoperability on page 116

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 1100/1200 series IP phones (SIP)
- Avaya Wireless DECT 3700 Series 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.

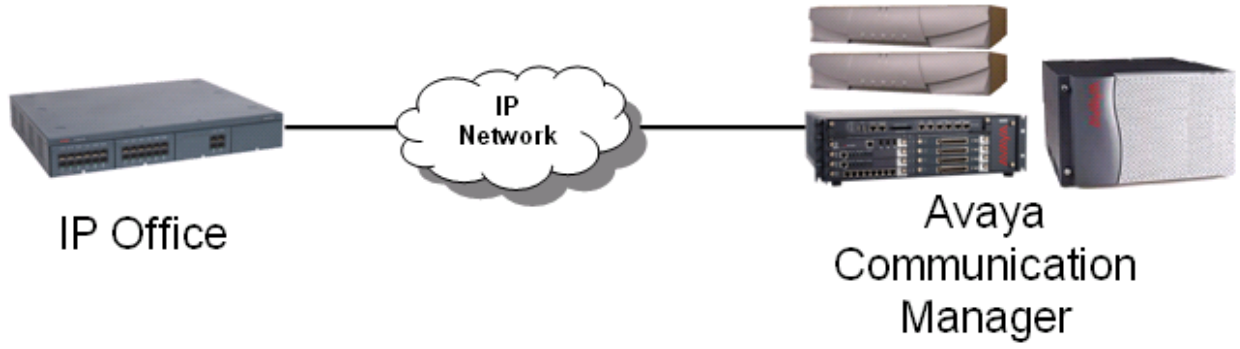

Figure 11: VoIP networking using H.323

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:

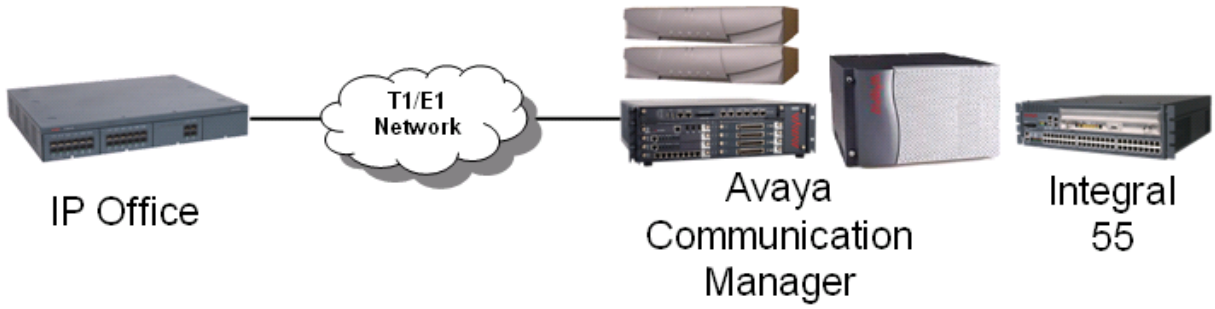

Figure 12: Q.SIG networking using T1/E1 links (TDM)

Related links

Interoperability on page 115

Chapter 18: Hardware and software options

Server specifications

- The Server Edition Primary and Server Edition Secondary must have equivalent resources. This constraint applies to physical and virtual servers. You can mix physical and virtual servers, but the resources allocated to the virtual server must match the physical server.
- You cannot re-provision a Server Edition server without a complete reinstall. For example, to 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 is not supported.

Customer-provided PC requirements

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

	IP Office Manager	SysMonitor	System Status Application	TAPI
RAM	• Standard Edition: 4 GB • Server Edition: 6 GB • Select Server Edition: 8 GB	• 128 MB	• 256 MB	• 64 MB
Hard disk free space	• 1 GB	• 10 GB	• 1.4 GB	• 50 MB
Processor	• **Basic/Essential/Preferred Edition:** Core i3 • **Server Edition:** Core i5 • **Select/Subscription:** Core i5			

Table continues…

	IP Office Manager	SysMonitor	System Status Application	TAPI
Additional software	.NET Framework 4.0: Installed with the software if not already installed.	–	Java Virtual Machine	–
Operating system	• Operating system and browser support on page 122			

Chapter 19: IP Office Operating system and browser support

Windows Operating System

Table 38: Windows

Operating System	Edition
Windows 10	Professional (SMB), Enterprise.
Windows 11	Professional, Enterprise.
Windows Server 2016	Standard, Essentials.
Windows Server 2019	Standard, Essentials.
Windows Server 2022	–
Windows Server 2025	–

Table 39: Windows Support – Server Components

Windows	Windows			Windows Server			
	10		11	2016	2019	2022	2025
32/64-bit	**32**	**64**	**64**	**64**	**64**	**64**	**64**
TAPI Link Lite (1st-Party)	-	-	-	-	-	-	-
TAPI Link Pro (3rd-Party)	✓	✓	✓	✓	-	-	-
TAPI WAV	✓	-	-	-	-	-	-

Table 40: Windows Support – Thick Client Administrator Applications

Application	Windows		Windows Server			
	10	11	2016	2019	2022	2025
Voicemail Pro client	✓	✓	✓	✓	-	-
IP Office Manager	✓	✓	✓	✓	-	-
System Monitor	✓	✓	✓	✓	-	-
System Status Application	✓	✓	✓	✓	-	-

Table 41: Windows Support – Thick Client User Applications

Application	Windows	
	10	11
IP Office SoftConsole	✓	✓
one-X Portal plug-in for Microsoft Outlook	✓	✓
Call Assistant	✓	✓

Windows Virtualized Desktop Support

The following are the only IP Office R11.2 software applications specifically supported in virtualized Windows desktop scenarios. For example: Citrix VDI.

- **one-X Portal for IP Office** - This includes the one-X Call Assistant and Outlook Plug-in. The Outlook Plug-In is supported in Citrix only if using Local profiles.
- **Avaya Workplace for Windows** - Supported from R11.1 FP2 and higher on Citrix and VMware virtual desktop infrastructure (VDI).

Browsers

Unless otherwise stated, supported browsers refers to the latest version available on each supported operating system.

Table 42: Browser Support

Operating System	Windows OS		Windows OS macOS	macOS
Application	Edge	Firefox	Chrome	Safari
one-X Portal for IP Office	✓	✓	✓	-
IP Office Web Manager	✓	✓	✓	✓
Wireless DECT Admin	✓	✓	✓	✓
Avaya Spaces Calling	✓	-	✓	-
IP Office User Portal	✓	✓	✓	✓

Other Apps

Table 43: Microsoft Exchange

Application	Exchange 2016	Exchange 2019
Voicemail Pro		
- UMS	✓	-
- EWS	✓	✓
- Email Reading[1]	–	–
Avaya one-X® Portal		
- IM Presence	✓	–

Table continues…

Application	Exchange 2016	Exchange 2019
- Calendar	–	–
Avaya Workplace Client		
- Calendar	✓	✓

1. Not supported if using EWS integration.

Table 44: Microsoft Outlook

Application	Outlook		
	2016	2019	Office 365
Voicemail Pro UMS with IMAP	✓	✓	-
TAPI (for dialing)	✓	✓	-
one-X Portal for IP Office			
- Outlook Plug-in	✓	✓	✓
- Contact Screen Popping	✓	✓	✓

1. TAPI WAV is not recommended for new installations and is not supported on 64–bit Windows.

Virtualization

Table 45: Virtualization support

Hypervisor	Supported on
Microsoft Azure	✓
Amazon AWS	✓
Microsoft Hyper-V	✓ - Windows Server 2016/2019/2022
VMware[1]	✓ - ESXi 7.0, ESXi 8.0.x
KVM	✓ - Avaya ASP130 R6 Server (Red Hat Linux 8.10).

1. VMware support for Standard, Enterprise, Enterprise Plus, Essentials and Essentials Plus platforms where available.

Chapter 20: Networking

The product supported a variety of networking options.

Related links

[Private circuit switched voice networking](#) on page 125
[Public voice networking](#) on page 126
[Packet-based voice and data networking](#) on page 129
[Internet protocol telephony](#) on page 130
[Computer Telephony Integration](#) on page 139

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.

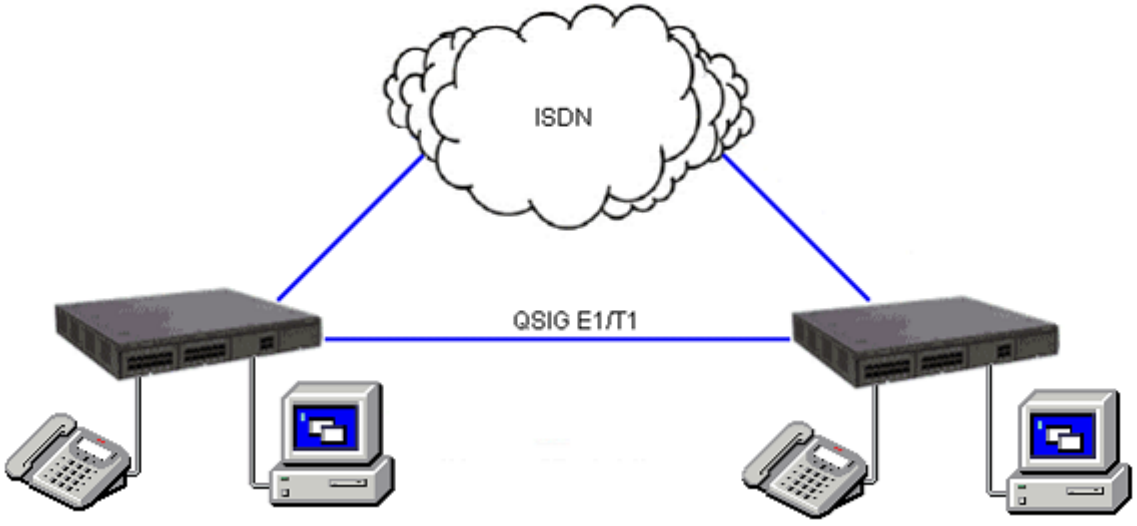

Figure 13: Circuit switched voice networking

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

Related links

Networking on page 125

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)	(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)	(IP telephones only) 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)	(9500, 9600, DECT telephones) 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)	(9500, 9600, DECT telephones) 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.

Related links

Networking on page 125

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.

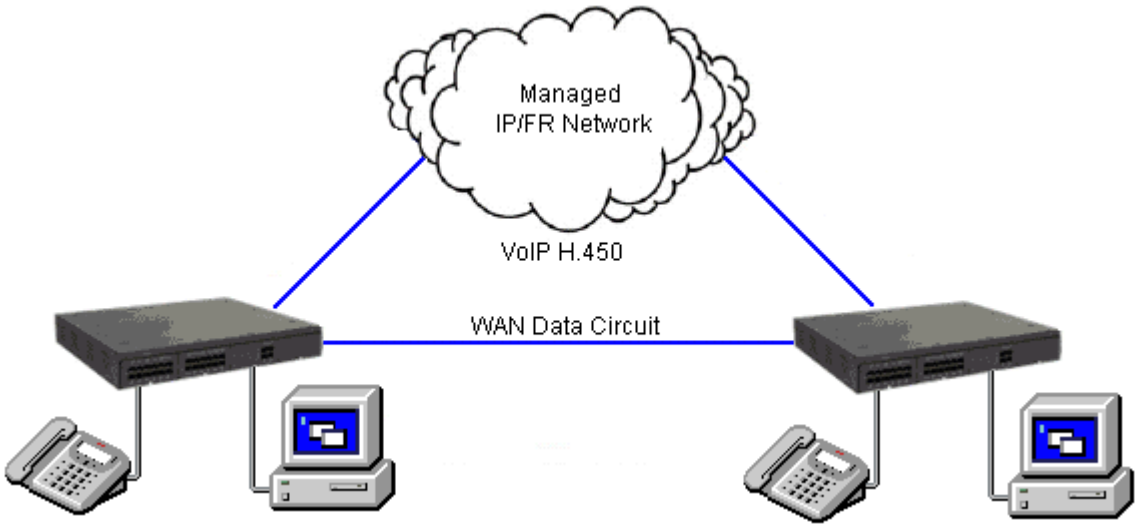

Figure 14: VoIP networking across IP network or WAN

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.

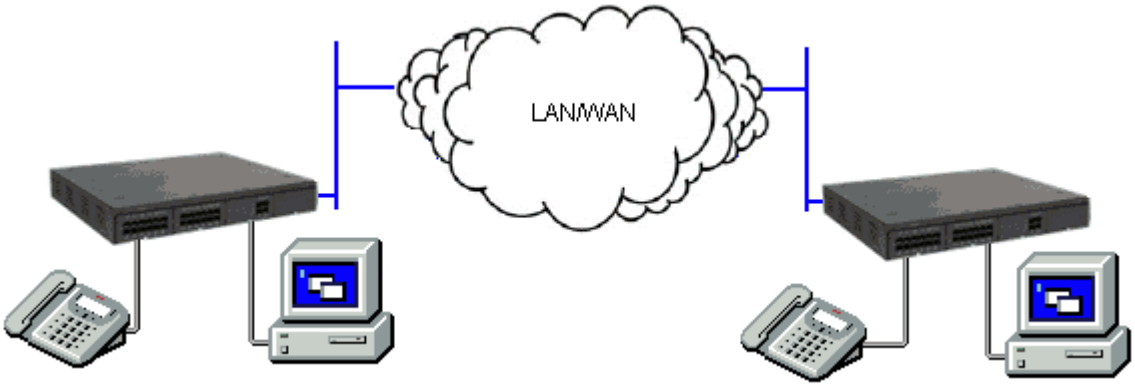

Figure 15: VoIP networking across the LAN

Related links

Networking on page 125

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 46: 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.

Related links

Networking on page 125
H.323 signaling protocol on page 134
Session Initiation Protocol trunking on page 134

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.

Related links

Internet protocol telephony on page 130

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:

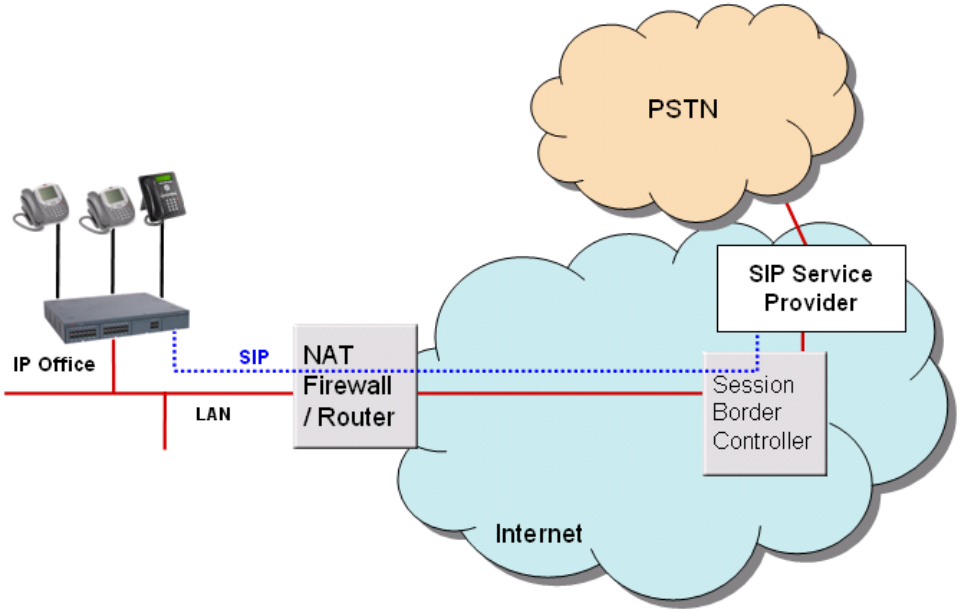

Figure 16: Service provider with Avaya Session Border Controller (recommended)

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

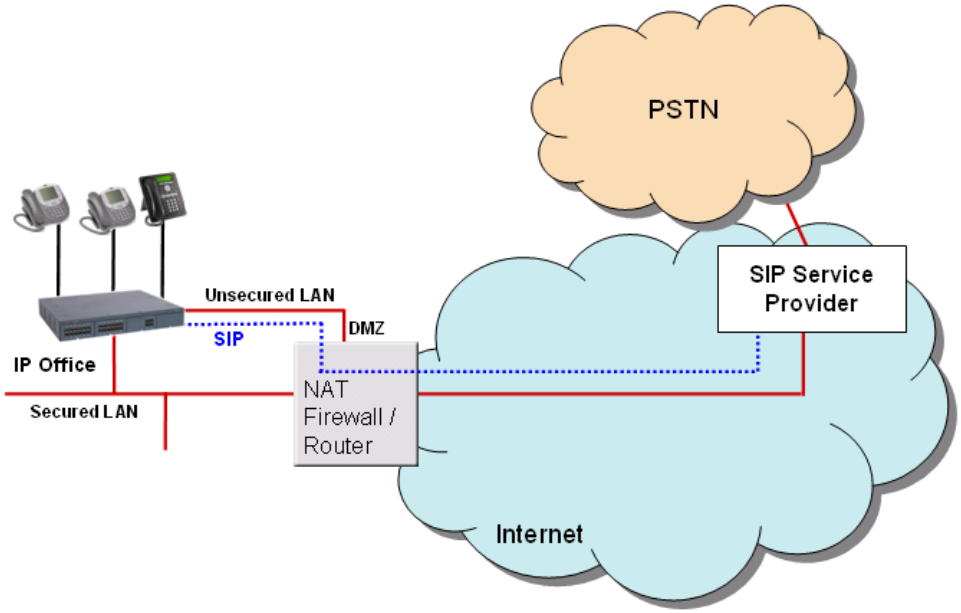

Figure 17: Direct connection from the second Ethernet port to the internet through a DMZ port on the router

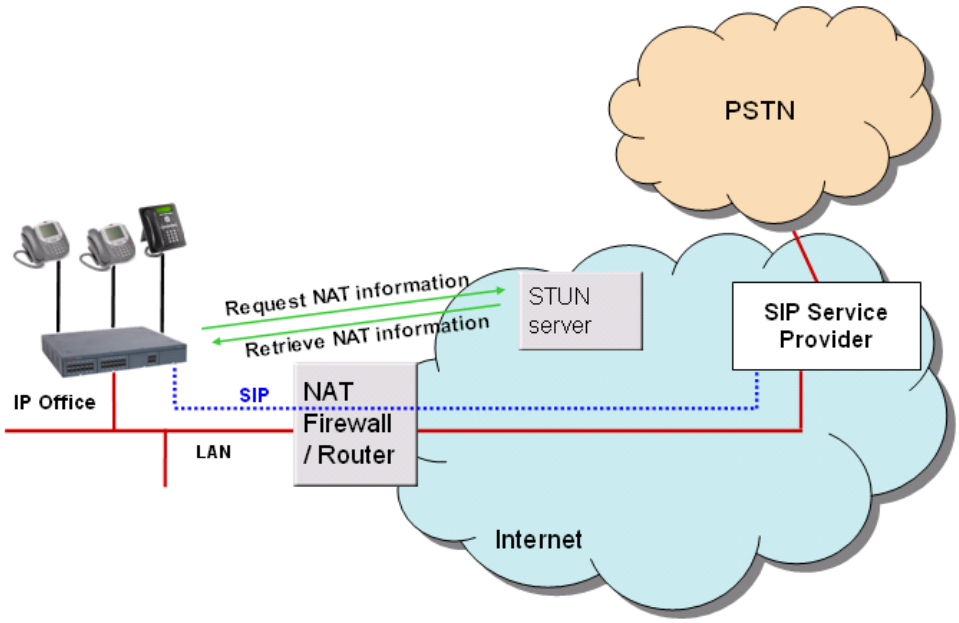

Figure 18: Connection to ITSP over NAT using third-party STUN servers

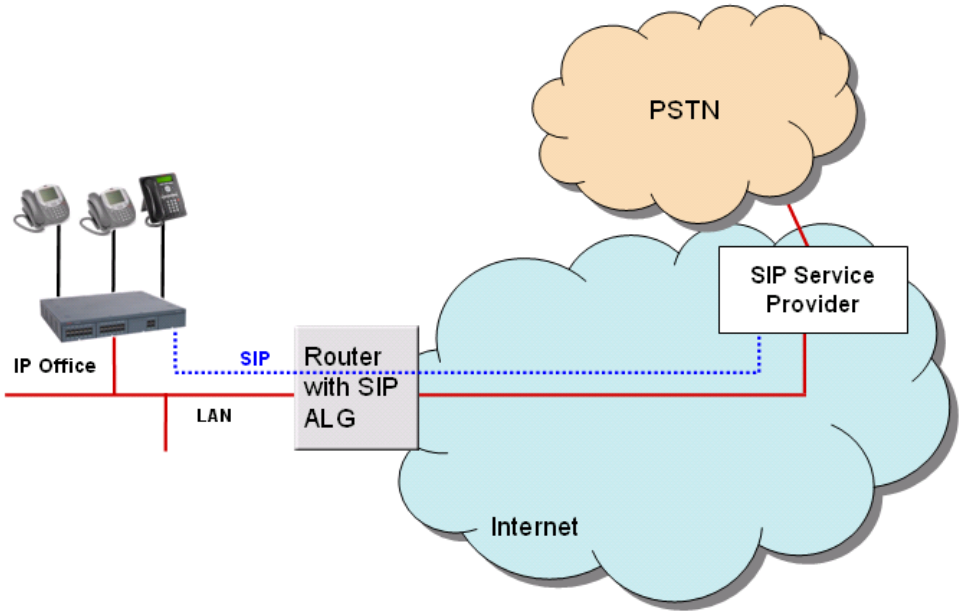

Figure 19: Connection to ITSP through router with ALG to resolves NAT issues

Related links

Internet protocol telephony on page 130
SIP servers on page 137
SIP endpoint user agents on page 138

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.

Related links

Session Initiation Protocol trunking on page 134

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.

Related links

Session Initiation Protocol trunking on page 134

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.

Related links

Networking on page 125

Part 6: Further Help

Chapter 21: Additional Help and Documentation

The following pages provide sources for additional help.

Related links

Additional Manuals and User Guides on page 143
Getting Help on page 143
Finding an Avaya Business Partner on page 144
Additional IP Office resources on page 144
Training on page 145

Additional Manuals and User Guides

The Avaya Documentation Center website contains user guides and manuals for Avaya products including IP Office.

- For a listing of the current IP Office manuals and user guides, look at the Avaya IP Office™ Platform Manuals and User Guides document.
- The Avaya IP Office Knowledgebase and Avaya Support websites also provide access to the IP Office technical manuals and users guides.
  - Note that where possible these sites redirect users to the version of the document hosted by the Avaya Documentation Center.

For other types of documents and other resources, visit the various Avaya websites (see Additional IP Office resources on page 144).

Related links

Additional Help and Documentation on page 143

Getting Help

Avaya sells IP Office through accredited business partners. Those business partners provide direct support to their customers and can escalate issues to Avaya when necessary.

If your IP Office system currently does not have an Avaya business partner providing support and maintenance for it, you can use the Avaya Partner Locator tool to find a business partner. See Finding an Avaya Business Partner on page 144.

Related links

Additional Help and Documentation on page 143

Finding an Avaya Business Partner

If your IP Office system currently does not have an Avaya business partner providing support and maintenance for it, you can use the Avaya Partner Locator tool to find a business partner.

Procedure

1. Using a browser, go to the Avaya Website at https://www.avaya.com
2. Select **Partners** and then **Find a Partner**.
3. Enter your location information.
4. For IP Office business partners, using the **Filter**, select **Small/Medium Business**.

Related links

Additional Help and Documentation on page 143

Additional IP Office resources

In addition to the documentation website (see Additional Manuals and User Guides on page 143), there are a range of website that provide information about Avaya products and services including IP Office.

- Avaya Website (https://www.avaya.com)

  This is the official Avaya website. The front page also provides access to individual Avaya websites for different regions and countries.
- **Avaya Sales & Partner Portal** *(https://sales.avaya.com)*

  This is the official website for all Avaya business partners. The site requires registration for a username and password. Once accessed, you can customize the portal to show specific products and information type that you want to see.
- **Avaya Support** *(https://support.avaya.com)*

  This site provide access to Avaya product software, documentation and other services for Avaya product installers and maintainers.
  - **Avaya Support Forums** *(https://support.avaya.com/forums/index.php)*

    This site provides forums for discussing product issues.

- **International Avaya User Group** *(*https://www.iuag.org*)*

  This is the organization for Avaya customers. It provides discussion groups and forums.

- **Avaya Learning** *(*https://www.avaya-learning.com/*)*

  This site provides access to training courses and accreditation programs for Avaya products.

Related links

Additional Help and Documentation on page 143

Training

Avaya training and credentials 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.

Related links

Additional Help and Documentation on page 143

Glossary

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.
OFCOM	The United Kingdom Office of Communication for the regulation of telecommunications.
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 Manager can also function as a self-signed Root Certificate Authority (CA) or as an intermediate CA. System Manager enables the Simple Certificate Enrollment Protocol (SCEP) application to sign certificates for Avaya deskphones.
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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