IP Office Platform Solution Description

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Overview

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.

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

Edition	Platform	Business size (users)	Addresses business needs
			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.

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

What's New

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

New in Release 11.1

Desk phone mode

Avaya Workplace Client can now be used in Desk phone mode with desk phones. The Desk phone mode feature is available even when the Avaya Workplace Client and desk phones are registered on different systems within the same network.

Join two Conferences

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

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

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

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

Avaya J159

IP Office support for Avaya J159 IP Phone is an advanced SIP desk phone that supports dual displays.

- Primary display:
    - 2.8" Color display (320 x 240).
    - 24 programmable button slots for call appearance and feature buttons.
    - The button slots can be arranged in either dual-column mode single column mode.
    - 4 twin-LED (red and green) physical buttons are used to indicate the status of the programmable button slots currently in view on the display.
- Secondary display:
    - 2.3" Color display (160 x 240).
    - 24 programmable button slots for call appearance and feature buttons.
    - The button slots are arranged in 4–pages of 6.
    - 6 twin-LED (red and green) physical buttons are used to indicate the status of the programmable button slots currently in view on the display.

Avaya push notifications

Avaya 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.

Avaya cloud authorization

Using Avaya cloud authorization, you can configure the Avaya Workplace Client connection using your Google, Office 365, Salesforce account, Avaya native spaces email account, or Enterprise Account (SSO).

You can configure the Avaya Workplace Client settings automatically using your email address or the automatic configuration web address.

Consent Directive

This field is used to control the addition of a consent value to the system's SMDR output and CTI call logging outputs.

Subscription Based Licensing

Systems can now be installed in IP Office Subscription mode. This mode uses subscription based licensing, that is, licenses paid for on a per-user per-month basis.

End of Windows 7 Support

Microsoft has ended support for this operating system (other than security updates for those with extended support agreements). Therefore, support of IP Office applications on this operating system has ended.

New in Release 11.1 SP1

The following addition changes apply for R11.1 SP1 and higher systems:

911-View/Emergency View Button

IP Office R11.1 SP1 adds support for an emergency call view button. This function allows you to view details of emergency calls in progress or previously made from the system. Refer to the *IP Office Emergency Call Configuration* manual.

Vantage Connect Expansion Module Application

IP Office R11.1 SP1 adds support for the Vantage Connect Expansion Module Application (with Vantage firmware 2.2 SP3). The application displays a list of programmable button features configured for the user.

The application can be run on the same Vantage phone as the user's Vantage Connect application, or on another Vantage phone. For full details and a list of supported programmable button features, refer to the *IP Office SIP Telephone Installation Notes* manual.

Call Pickup Group Member – Status Indication

IP Office R11.1 SP1 adds support for status indication on **Call Pickup Group Member** programmable buttons. The button LED flashes when a call to any member of the group, including non-group calls, is waiting to be picked up.

On suitable phones, pressing the button displays a list of any currently ringing group members and can be used to select which to pickup.

Avaya Cloud Services URL Change

The URL for Avaya Cloud Services have changed from accounts.zang.io to accounts.avayacloud.com. The URL field is now editable, however the previous URL remains supported for existing systems. New systems will default to the new URL.

Subscription Remote Worker Option

On subscription based systems, the **Remote Worker** option is now supported for all user subscriptions.

Retain Configuration on by Default

On existing systems, when rerunning the initial configuration utility, the **Retain Configuration** option is now enabled by default.

Support for AWS and Hyper-V Virtual Server Images

IP Office R11.1 SP1 is available for installation from AWS virtual server images in addition to the existing VMware image support.

Support for Powered By IP Office

IP Office R11.1 SP1 is supported through the Powered By IP Office program.

Avaya Workplace Client CTI Control

The Avaya Workplace Client clients are now supported as a client using CTI control from other IP Office applications such as, SoftConsole, one-X Portal for IP Office, Avaya Contact Center Select.

New in Release 11.1 FP1

Avaya J189 IP Phone

Avaya J189 IP Phone is a SIP-based phone for business communications. The phone has10 line keys for programming with 48 feature keys, displayed in pages of 10 on the main display. Buttons 25-48 are directly accessible via the internal Quick Dial Display (QDD).

The following are the physical specifications of the phone:

- Two color display
    - Primary display-800 x 480 pixels
    - Secondary display-240 x 320 pixels
- Dual Port Gigabit Ethernet (10/100/1000) line with Second Ethernet and RJ45 Connectors.

- The primary display has five call appearances in full-screen mode and ten call appearances in dual screen mode.
- The phone supports Wideband audio, full-duplex speakerphone, wired handset, headset, and ergonomic hearing aid.
- The primary display has four soft keys.
- The secondary display has six programmable buttons.
- Optional 5V DC power support
- Magnetic hook switch
- The phone has ten status indicator.
- The primary display has four menu navigation buttons, and the secondary displays two navigation buttons.
  The secondary display of the phone provides additional call appearances and feature or application display. It has six lines of four-page display that provides 24 additional lines for incoming calls, outgoing calls, auto-dialing, and calling features. It displays the dedicated view for keys 25-48. You can switch between the pages using the left and right keys.

Server Edition Initial Configuration

For Server Edition (Non Select) or (Select) mode the conversion to Subscription mode can be achieved by rerunning **Initial Configuration** menu.

Security Settings

- Logging in to Web Manager: **Login History**
  When logging in, details of the users information about the last login attempt, with date and time are displayed.
- General Security Settings: For Service Users and IP Office Users, the following security setting values are increased:
  - The **Minimum Password Length** is 9 characters.
  - The **Previous Password Limit (Entries)** is 10 records.
- Application Preferences: The default values for **Inactivity Timeout** is now 10 minutes.
- Added two configuration in **Security Manager** > **Certificates**.
  - **Automatic Certificate Management**
  - **Automatic Phone Provisioning**

System Configutations

Added the following configuration settings:

- **System** > **System** > **HTTP Server URI**
- **Group** > **Fallback** > **Group No Answer Destination**

- **Group** > **Fallback** > **Group No Answer Time**

New in Release 11.1 FP2

The following new features are supported in IP Office R11.1 FP2. These are in addition to those new features in the original release and subsequent service packs.

Windows 11 Support

From R11.1 FP2 SP2, all IP Office applications supported on Windows 10 are now also supported on Windows 11.

DECT R4 Base Station Location Support

From R11.1 FP2 SP2, DECT R4 base stations can be configured with location names. When a DECT R4 extension makes an emergency call, the settings of the IP Office location matching the extension's current base station's location setting are used. Refer to the *IP Office Emergency Call Configuration* manual.

Avaya Workplace Client Cellular Direct Dialing

From R11.1 FP2 SP2, cellular direct calling can be configured for Avaya Workplace Client on mobile iOS and Android Avaya devices. When enabled, selected numbers are dialed from the device's native dialer application rather than from the Avaya Workplace Client.

The intent of this feature is to ensure calls such as emergency calls through a path for which the devices location can be determined. Refer to the *IP Office Avaya Workplace Client Installation Notes* manual.

Avaya Workplace Client Other phone mode

Avaya Workplace Client can now be used in Other phone mode when you are working from your home office or other remote location.

You can make and handle audio calls through Avaya Workplace Client, while using a separate telephone line at your remote location to speak and listen.

Opus Codec Support for Telephony

The Opus audio codec is already being used for storage of voicemail messages and recordings due to its file size advantages without lose of quality. On servers, other than IP500 V2 systems, the codec is now selectable for IP telephony. Opus is supported by J100 Series phones and Workplace clients.

Added the following configuration settings:

- **System** > **System** > **OPUS Default Payload**
- **System** > **System** > **OPUS RFC2833 Default Payload**

System Conferences

System meet-me conferences can be configured in IP Office Manager and IP Office Web Manager. These conferences can be configured with features such a multiple moderators, separate participant and moderator PINs and a range of other custom behaviors for each conference.

IP Office User Portal

The self-administration application has been replaced by the new IP Office User Portal application. This is a new browser based application through which users can access phone settings, contacts, messages and recordings, etc.

Voice Mail Pro Enhancements

From IP Office R11.1 FP2, the system supports auto-attendants provided by Voicemail Pro but configured within IP Office Web Manager (these auto-attendants cannot be configured through IP Office Manager).

Auto Attendant (EVM)

These settings cover auto-attendants provided by embedded voicemail on IP500 V2 systems. For auto-attendants provided by Voicemail Pro, see Voicemail Pro Auto-Attendant Settings.

The following configuration settings are updated:

Call Management > **Auto Attendants**

Centralized Media Manager

Centralized Media Manager is an optional service supported for subscription mode systems. When supported by a system, the Voice Recording Library option becomes available as a destination that can be selected for manual and automatic call recording.

Centralized Media Manager Audit Trail

This menu is available on subscription mode system's configured to use Centralized Media Manager as their archiving solution for call recordings.

The configuration setting is:

Applications > **Centralized Media Manager Audit Trail**

Directory Services LDAPv3/LDAPS Support

The LDAP operation for obtaining external directory information has previously used LDAP v2. On Linux-based IP Office systems it now supports LDAP v3/LDAPS. For IP500 V2 systems, LDAP v3/ LDAPS is supported when the system is supported by an IP OfficeApplication Server or UCM module.

SIP Trunk Enhancements

A number of additional options can now be configured for use with IP Office SIP trunks:
- MediaSec RFC 3329
- STIR/SHAKEN support is implemented through a set of Calling Number Verification settings and new short code characters

IP 500 V2 White List Support

The IP address white listing feature already supported by Linux-based IP Office systems is now also available on IP500 V2 based systems. This can be useful when multiple clients access the system through a single address such a Session Border Controller.

Simultaneous Client Direct Media Control

The user of direct media for simultaneous clients can now be disabled it required. For some customer's this is useful in scenarios where they are using remote simultaneous clients.

Call Reporting

The user can access the call reporting menus through Web Self-Administration.

MS Teams Support

The IP Office can be configured as the telephony service for calls made to and from Microsoft Teams.

The IP Office system can use MS Teams user synchronization to create new user (and extension) records, update existing user records and delete user records. This is done by mapping MS Teams fields onto IP Office user configuration fields. In addition to this field mapping, for new user creation, a 'user provisioning rule' (UPR) is used to define the extension type and extension template.

New in Release 11.1 FP2 SP4

The following new features have been added in IP Office R11.1.2.4:

Avaya Workplace Client Features

The following features are supported using IP Office R11.1.2.4 and the Avaya Workplace Client R3.30 and higher.

- **46xxspecials.txt File Supported** - IP Office now supports the use of the 46xxspecials.txt file with Avaya Workplace Client clients. This allows custom settings to be applied to the clients whilst still using the auto-generated 46xxsettings.txt file for the main IP Office settings.

- **User Self-Avatar** - Previously for the user's self-avatar, Avaya Workplace Client just displayed the user's initials. Now, for user's logged in using Avaya Spaces or SSO, Avaya Workplace Client can use the user's avatar from the Avaya Spaces or SSO account (Gmail, Office365, Salesforce) used to login. Alternatively, it can use their avatar for Microsoft Exchange if using Exchange Web Services (EWS) integration.
- **Auto-Answer** - Avaya Workplace Client users can now enable an **Incoming Call Features** setting to automatically answer calls. When on, all calls (audio, video and group) that would have rung on the client device are auto-answered.

B199 Conference Phone

The following new B199 feature is supported using IP Office R11.1.2.4:

- **B199 R1.0 FP8 Firmware** - IP Office R11.1.2.4 supports B199 running this firmware and assumes that release in its auto-generated avayab199_fw_version.xml file.
- **B199 Firmware Source Number** - The NoUser source number
  `SET_B199_FW_VER=`
  <nnnn> can be used to change the version of firmware indicated in the auto-generated avayab199_fw_version.xml file to
  `firmware-nnnn-release.kt`
  .
- **HTTP Redirection** - IP Office R11.1.2.4 now support redirection of HTTP firmware requests from B199 phones running B199 R1.0 FP6 or higher firmware.

J100 Series Phones

- **J139 Phone IP Office Feature Restrictions Removed** - J139 phones have previously only supported a sub-set of the IP Office features supported on other J100 Series phones. For example, J139 phones did not support bridged call appearance buttons or display the Do Not Disturb Exceptions menu. Those restrictions have now been removed.

System Configuration

- **Remote Extension Configuration Settings** - Various settings for remote extensions previously configured using
  `NoUser`
  source numbers (prefixed with
  `RW_`
  and
  `WEBRTC_`
). These have now been replaced with configuration settings on the **System** > **LAN** > **Network Topology** menus within IP Office Manager and IP Office Web Manager.
  - Note: On systems upgraded to R11.1.2.4, existing remote extension

```
NoUser
```
source numbers are not automatically migrated to configuration settings. The settings must be migrated manually.

Operating Systems Support Changes

- **Hypervisor 2022 Supported** - Virtualized IP Office systems are now supported in Hypervisor on Microsoft 2022 servers.
- **End of Support** - The following have reached or are about to reach end of support by their providers, and therefore are no longer supported for IP Office and IP Office applications:
    - **Windows 8.1** - This release of Windows has reached end of support by Microsoft and so is no longer supported for IP Office applications. Existing customer must upgrade to Windows 10 or 11.
    - **VMware ESxi 5.0 and 5.7** - These versions of ESxi have reached end of support by VMware and so are no longer supported for virtual IP Office systems. Existing customers must upgrade to EXsi 7.0.
    - **Microsoft Exchange 2013** - This version of Exchange will no longer be supported from April 2023. Existing customer must upgrade to Exchange 2016 or higher.

New in Release 11.1 FP3

The following new features have been added in IP Office R11.1.3:

Avaya Workplace Client Features

The following features are supported using IP Office R11.1.3 and the Avaya Workplace Client R3.30 and higher.

- **Internal or Mobile Twinning Selection** - Avaya Workplace Client users can have both **Internal Twinning** and **Mobility Features** configured by the system administrator. Those users can then select which is active using their client's **Incoming Call Features** menu. Only one method of twinning can be on at any time.
- **Simultaneous Device Call Controls** - Avaya Workplace Client users with simultaneous or twinned telephone devices can move and retrieve calls between those devices and their Avaya Workplace Client device.
    - When they have answered a call on another device, they can use their Avaya Workplace Client to retrieve that call on the client (**Retrieve Call**).
    - When they have answered a call on their Avaya Workplace Client, they can move the call to their other device (**Move Call**).

New Hardware

- **VCM V3 Cards** - These new cards are supported for IP Office R11.1.3 and higher. They are functionally the same as the previous VCM V2 cards.

Security Changes

The following security enhancements have been added to IP Office R11.1.3.

- **H.323/SIP Cipher Level Settings** - The **H.323 Security Level** and **SIP Security Level** settings have been added to the certificate security settings. These control the minimum accepted GCM cipher strength for H.323/SIP phone and trunk connections. They replace the previous NUSN options added for IP Office R11.1.2.x systems.
- **Enhanced Certificate Checks** - The following enhancements have been made to received certificate checks performed by the IP Office:
    - The **Medium** and **High** certificate check levels now include the following additional checks:
        - Check that the certificate has a key usage defined.
        - If the certificate has extended key usage settings, check they match the purpose for which the certificate is being used.
        - Check that the certificate does not include any unknown critical extension.
        - Note: For systems upgraded to R11.1.3, these additional checks are not used unless the existing **Enhanced Certificate Checks** settings is changed.
    - The certificate checks can now include hostname validation, and verifying that the certificate source is authoritative for the SIP domain (RFC5922). This is done by changing the **Medium** and **High** certificate checks options to **Medium + Remote Checks** and **High + Remote Checks** respectively.
- **SIP Trunk Server Name Indication (SNI) Support** - For SIP trunks, two new SLIC entries (
`SLIC_ADD_SIP_SAN`
and
`SLIC_ADD_SAN`
) can be used to add the IP Office **ITSP Domain Name** or **ITSP Proxy Address** as an SNI value where required by the ITSP during initial TLS connection.

The Platform

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.

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.

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.

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. The systems can also be used in a network with IP Office Server Edition and IP Office Select servers.
- 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, one-X Portal and Media Manager services.

For more details, see IP500 V2 Systems.

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 IP500 V2 control unit has been replaced by the newer IP500 V2A control unit. The two types are physically and functionally similar. References to the IP500 V2 also apply to the IP500 V2A unless stated otherwise.

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.
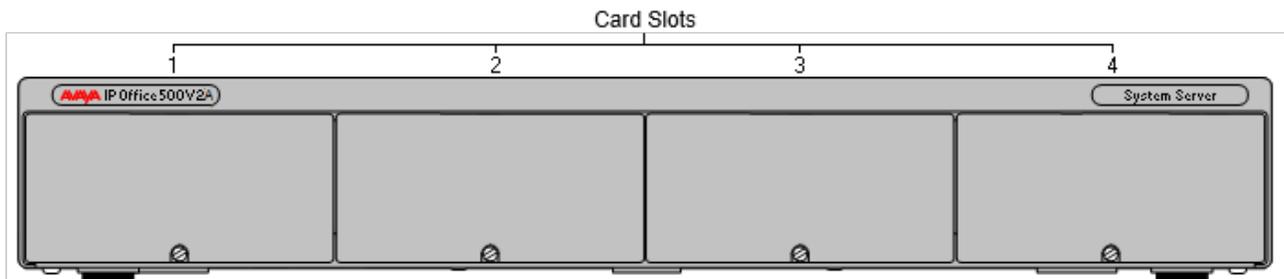
Figure : 1. IP500 V2A front view

Figure : 2. IP500 V2 front view
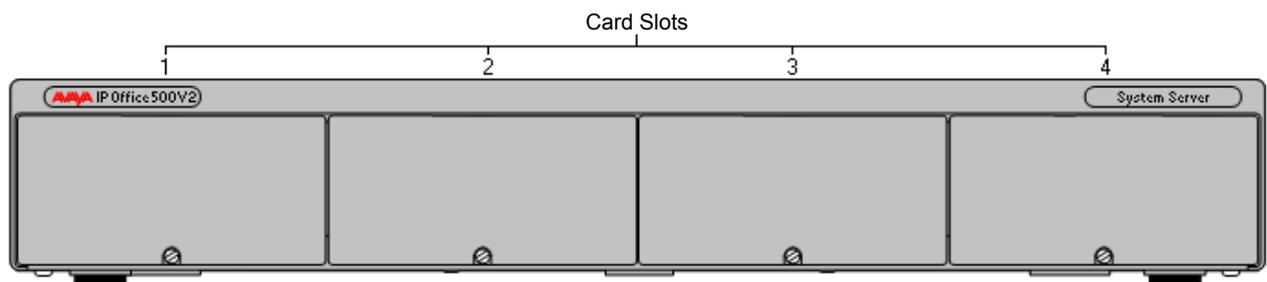
Figure : 3. IP500V2/IP500V2A rear view

Power supply socket	Status LEDs	RS232 DTE port
System SD card slot	Reset switch	LAN Ports LAN = LAN1 WAN = LAN2
Optional SD card slot	Expansion ports for Expansion Modules	
External output switch	External music-on-hold input	
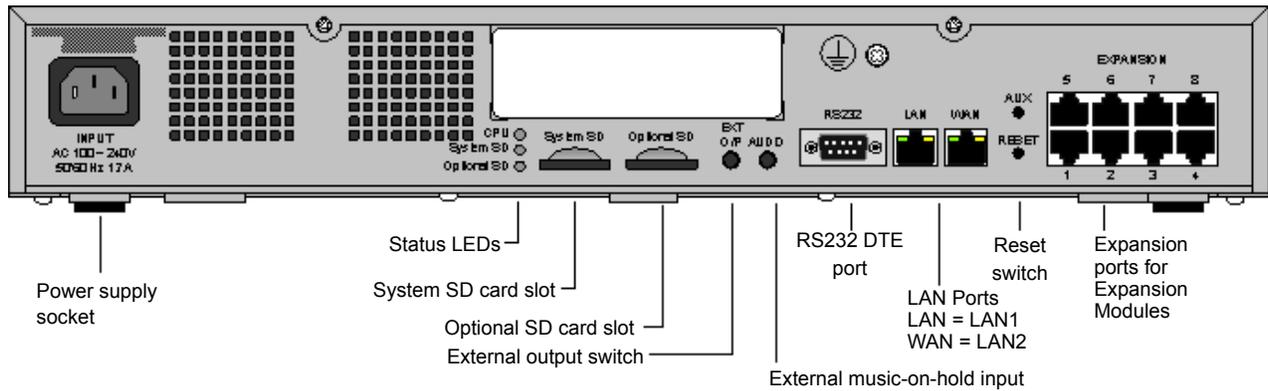
Feature key

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.

Base cards

The following base cards are available:

Table 1: IP500V2/IP500V2A base cards

Base card	Per system	Notes
Digital Station (DS8)	3	Ports 1–8: Digital stations
Digital Station (DS8A)	4	Ports 9–12: Trunk connections
Analog Phone 2	4	Ports 1–2: Analog phones
Analog Phone 8	4	Ports 9–12: Trunk connections

Base card	Per system	Notes
Voice Compression Module (VCM V2)	2	Ports 1–8: Not present Ports 9–12: Trunk connections VoIP calls including IP extensions or IP trunks. Up to 128 voice compression channels depending on the codec used. The IP500V2 control unit supports up to 148 voice compression channels, using the card plus voice compression ports on Combination cards.
ATM Combination (ATM V2)	2	Ports 1–6: Digital stations Ports 7–8: Analog phones
BRI Combination	2	Ports 9–10: 2 BRI trunk ports (4 BRI channels) or 4 analog trunk ports. 10 voice compression channels. Codec support is G.711, G722, G729a and G.723 with 64ms echo cancellation. G.722 is supported by IP Office Release 8.0 and higher.
Unified Communications Module (UCM V2)	1	Requires separate Preferred Edition license. Not supported on Server Edition. More than 200 users when running Voicemail Pro only. Up to 200 users when running Voicemail Pro and Avaya one-X® Portal for IP Office. 50 simultaneous Avaya one-X® Portal for IP Office users.

Base card	Per system	Notes
		No trunk cards

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 1: 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

Trunk card	Maximum per system	Description
		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.

Trunk card	Maximum per system	Description
		Available in 2 (4 channels) and 4 (8 channels) options.

External expansion modules

External expansion modules can be used with the IP500V2/IP500V2A control unit.

Analog phone expansion modules

On analog ports, call information is sent while the phone is ringing, and cannot be updated during a call or set on an outbound call (the phone may do a local match but this is not controlled by IP Office). The primary purpose of displays is to give information about incoming calls. Where the caller display standard chosen supports the delivery of text (extension name) as well as the number, both are delivered.

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

For installations in a rack, this module requires the IP500V2/IP500V2A 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)
Analog Phone 30	30 analog stations with calling line presentation	Time Break Recall (No Earth Recall) Message Waiting Indication (MWI): 51V Stepped, 81V, 101V and Line Reversal and Bellcore FSK

Analog trunk modules

This type of module can be used to add 16 additional analog trunks to an IP500V2/IP500V2A 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 IP500V2/IP500V2A Rack Mounting Kit.

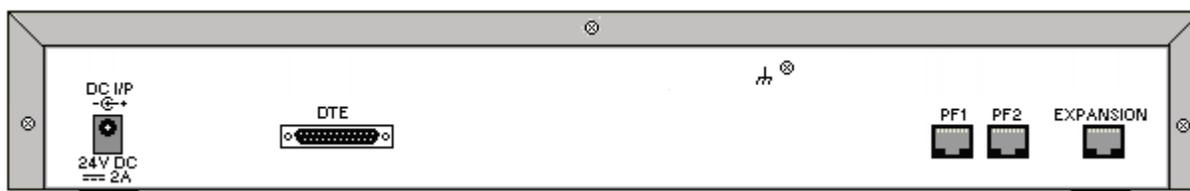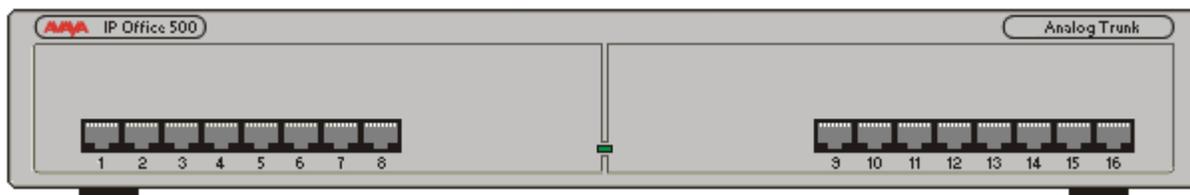| Expansion module	Description	Interfaces supported
ATM16	16 analog trunks	Loop-start Ground start

Digital station expansion modules

For installations in a rack, this module requires the IP500V2/IP500V2A Rack Mounting Kit.
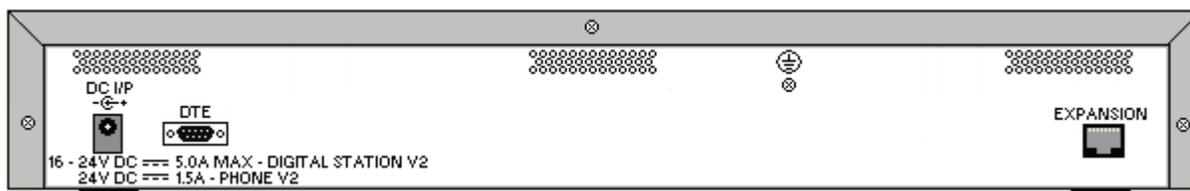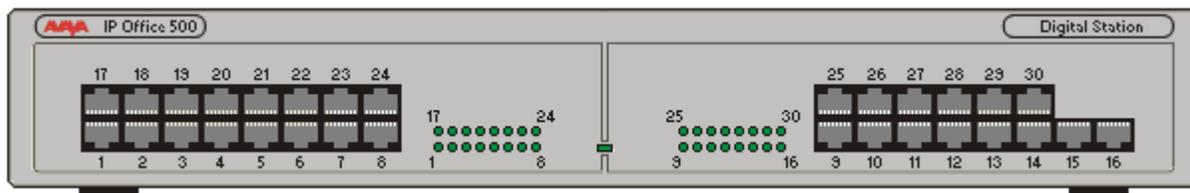
Expansion module	Telephones supported	Description
DS16B, DS16B2	Avaya telephones	16 digital station ports

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

Other Major Components

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

Application server

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

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

The IP Office Application Server hosts the following applications:

- Management Services
- one-X Portal for IP Office
- Voicemail Pro
- Web License Manager (WebLM)
- Web Manager
- Optional Services
    - Media Manager
    - Collaboration Server

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 *IP Office SIP Phones with ASBCE* manual.

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.

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.

Applications

User applications

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

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.

Avaya Workplace Client

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

Device	Supported
Desktop PC	Windows and macOS
Mobile phone	Android and iOS
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:
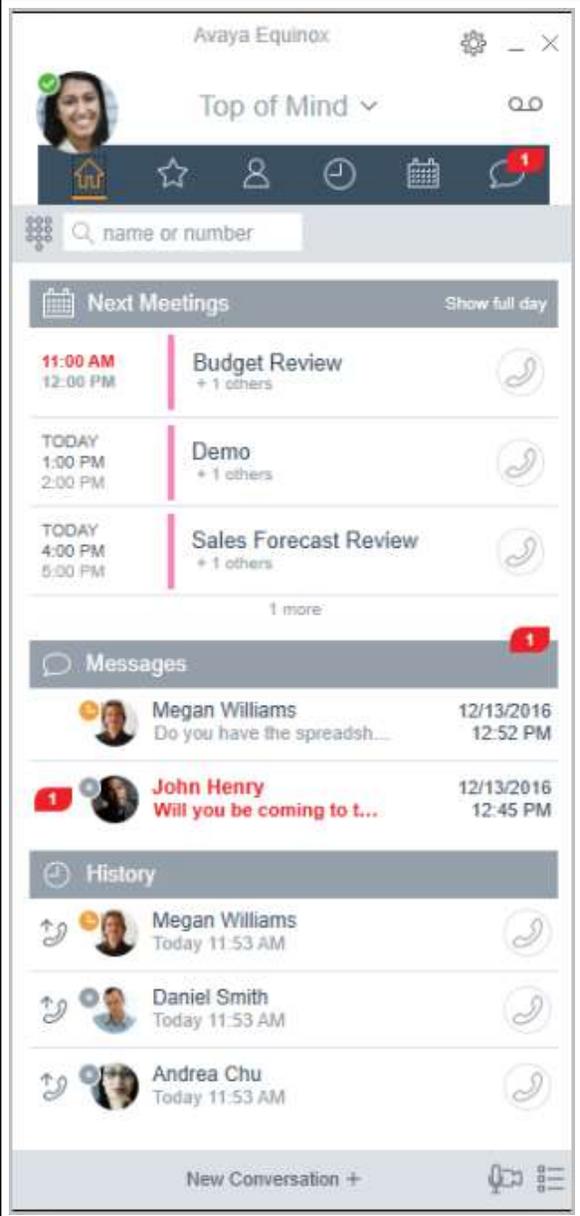
- Top of Mind Home Screen
    - Next meetings showing local calendar schedule or Exchange Web Service/Office 365
    - Local Call History
    - Messages
    - Start Meetings/Launch Spaces dashboard
- IP Office directory and local contacts
- Messaging through Avaya Spaces
- Presence through IP Office server
- 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 for IP Office requires either Avaya Spaces or Avaya one-X® Portal for IP Office.
- 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.

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.

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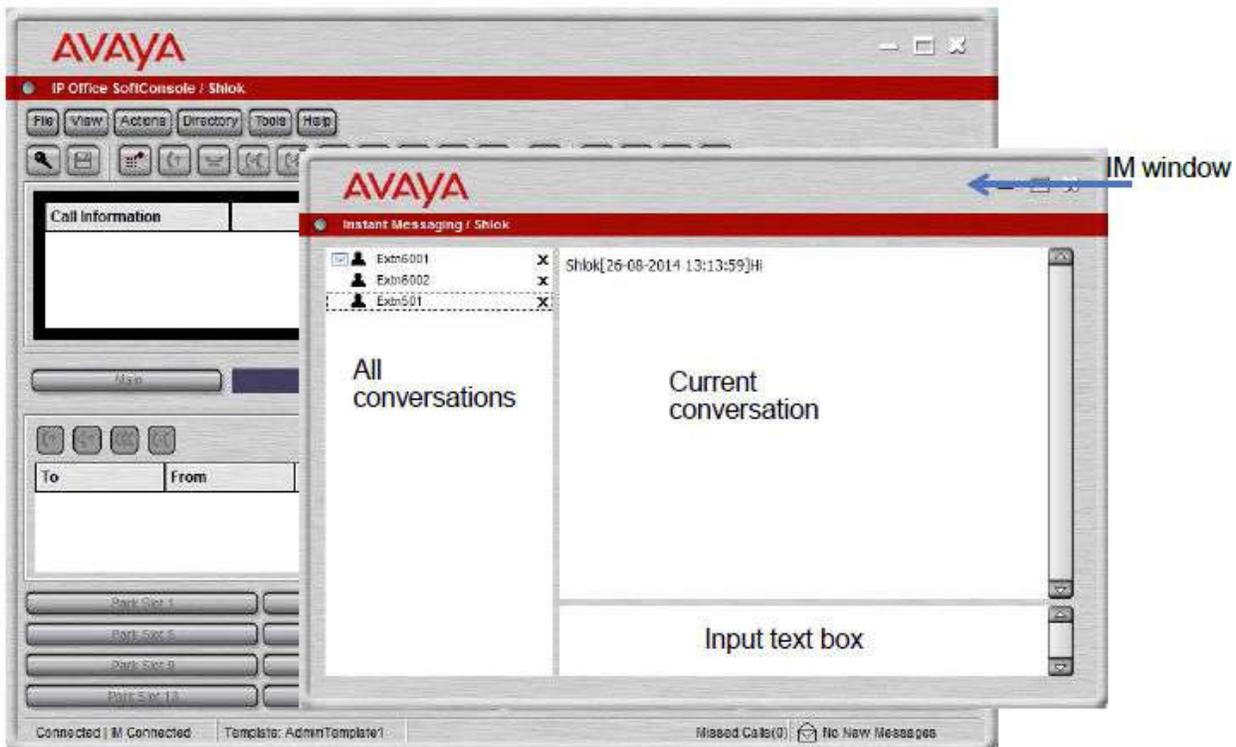
WebSocket communication allows SoftConsole clients to communicate with IP Office and Avaya one-X® Portal. The WebSocket protocol is bidirectional between the client and the server. As the communication is done over port 80 or 443 (same port used for HTTP), there are no issues with firewall traversal.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

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.

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.

Voicemail Pro

Voicemail Pro is a voicemail server that provides both basic voicemail features as default but is highly customisable 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 PC running as 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 in order to support addition features such as voicemail resilience.

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.

IP Office Conferencing

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 R240	128	128	414
	HP DL360	256	256	825
	Dell R640	256	256	1650
	OVA	256	256	1650
IP Office Select IP Office Subscription	Dell R640	512	256	1650
	OVA	512	256	1650

IP500 V2/V2A and Linux Expansion System

Each IP500 V2/V2A 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/V2A	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.

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 ![icon] **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.

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

Video collaboration

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

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

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

The following diagram shows the topology of IP Office deployed with video endpoints.
Figure : 1. Video endpoints
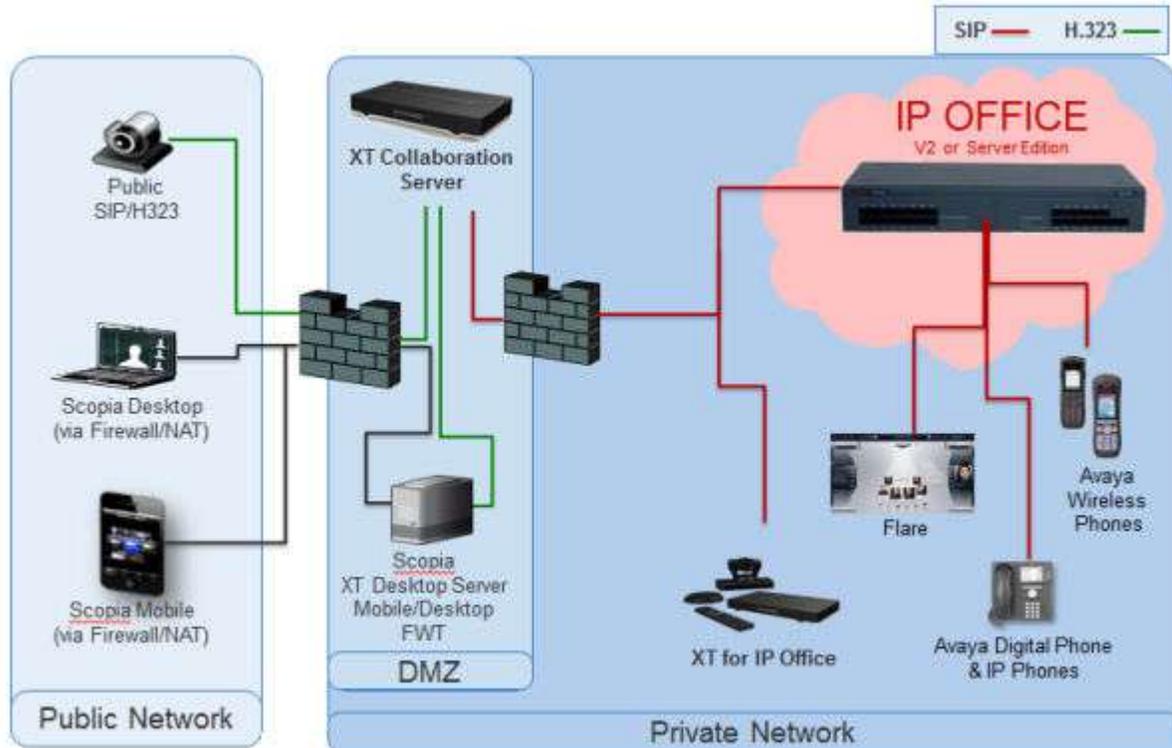
Avaya Spaces

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

- Creation of Spaces for managing ongoing projects: You can use the Spaces area in the dashboard to start a new conversation. In fact, the first time you start using Avaya Spaces, you can view the option to create your own Space. You can invite participants to your Space by entering their email addresses. You can set different permissions for each participant based on the type of actions you want them to be able to take within your Space. If you have many Spaces, you can categorize the frequently used ones as favorites.

- VoIP audio confererencing with up to five participants.
- Limited file sharing (up to 1–GB)
- Point to point video calls, escalate your chats with audio or video.
- Exchange instant messages with other users by using Avaya Spaces Direct Messaging.

- Join a Spaces meeting.

Administration applications

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

IP Office Manager

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

IP Office has a built-in audit trail that tracks changes to the system configuration, and who has made them. Manager can display the audit trail to assist with problem resolution. The audit trail records the last 15 changes in the configuration and records the following elements:
- Configuration Changed - For configuration changes, the log will report at a high level on all configuration categories (users, hunt group...) that have been changed.
- Configuration Erased
- Configuration merged
- Reboot - user instigated reboot
- Upgrade
- Cold Start
- Warm Start
- Write at HH:MM - This is when the administrator saved the configuration via the schedule option
- Write with Immediate Reboot
- Write with Reboot When Free

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

Server Edition Manager

Applications

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

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.

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.

Item	Description
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.

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.

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

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).

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 : 1. Typical contact center solution using voice and multimedia Avaya Contact Center Select and the Avaya IP Office voice phone system
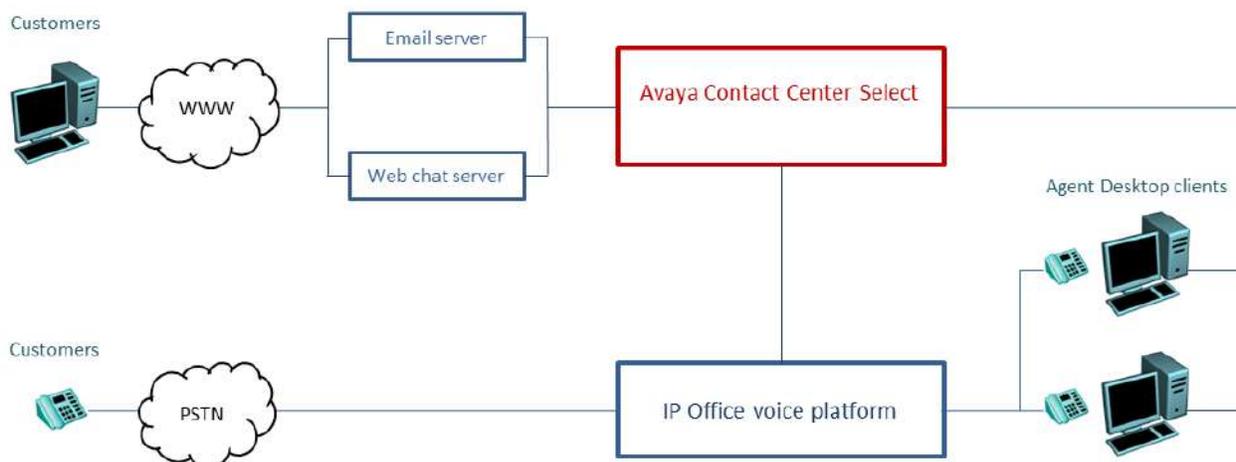
Avaya Contact Center Select provides a feature-rich voice and multimedia solution with integrated routing and reporting for small to midsize enterprises. Avaya Contact Center Select provides unified contact center and IP Office phone user account management for agents and supervisors. Voice-enabled agents 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.

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.
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.

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.

Ordering Subscriptions

Subscription for an IP Office subscription mode system are ordered from the Avaya Channel Marketplace, using the ID number of the IP Office system SD card installed in the system.

Once ordered, details of the customer number and address of the subscription server are supplied in an email. Those details are then used during the initial system configuration.

Trial Mode

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

- The trial mode system indicates that it is in 30-day grace mode in the System Status Application and through system alarms.
- Before the 30-day trial period ends, the orderer can return to Avaya Channel Marketplace and request a conversion to paid-subscriptions mode.

  > **Important:**
  > - To avoid any interruptions to customer telephony services, the request to convert to paid-subscriptions must be made before the end of the 30-day trial period. That request should include allowance for working time in order to implement the request.

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	–	–	✓
Telecommuter options	–	–	✓
UMS Web Services	–	–	✓
TTS for Email Reading	–	–	✓

Feature	Subscription Mode		
	Telephony User	**Telephony Plus User**	**Unified Communications User**
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).

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.

Subscription	Description
Avaya Contact Center Select	This subscription enables support the Avaya Contact Center Select (ACCS) service hosted on a separate server.
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.

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

Feature	Description
	includes access to non-IP Office servers and services subject to their own authentication.

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 system goes into a 30-day license grace period with daily alarms.
    - During the grace period, all operations and features are unaffected.
    - Successful subscription reconnection clears the alarm and grace period.
    - If the grace period expires, all subscription features and telephony are deactivated.

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.

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:

Feature	Description
Subscription details	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.
Internet access	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>

Feature	Description
	• 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.
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.

Feature	Description
	This account is created by default on new and default systems.

Subscription Mode Ports

The following schematic shows the ports used for connections to and from the subscription service running on COM.
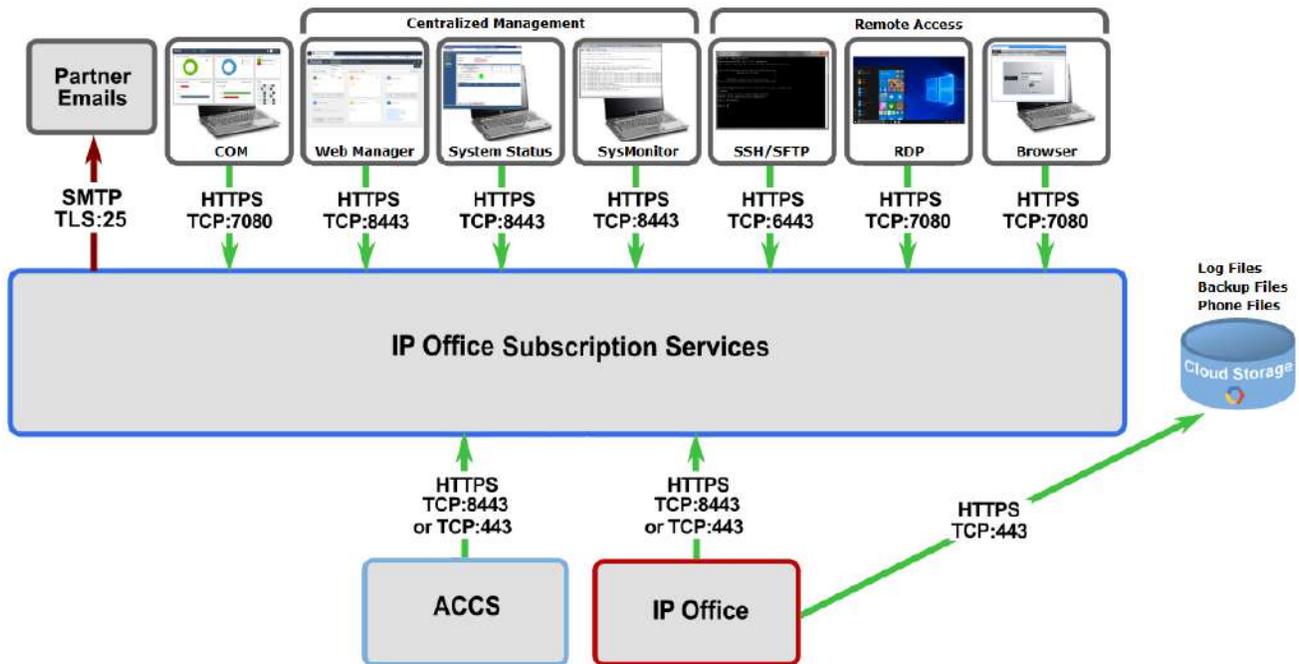
Migrating Existing IP Office Systems to Subscription Mode

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	

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.

License Consumption

Some licenses enable a number of ports, channels, or users. Depending on the particular license:

- Each supported instance is consumed either when it is configured for use or when it is actually being used.
- When no further instances of a license are available, further use of the licensed feature is not allowed.

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

PLDS licensing

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

PLDS license files

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

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

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

PLDS host ID

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

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

System Type	Description
	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".

Web License Manager (WebLM)

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

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

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

Migration of ADI licenses

ADI licenses are no longer supported 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*.

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.

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	✕	✓
Additional voicemail ports [3]	✓	✕

License	Primary server	Server-specific
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.
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).

Mode	Description
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

Configuration was changed to WebLM
and IP Office successfully acquired all
required licenses from WebLM server

License Normal

WebLM Normal

Configuration was changed to WebLM but the WebLM server is not available

Configuration was changed to WebLM but WebLM server doesn't have enough licenses to support existing IP Office over-configuration

Connectivity to WebLM server was lost, or previously-acquired required license(s) are no longer available from WebLM server

Network connection recovered and/or all license errors were fixed

License Server Error

WebLM Error

WebLM server reached but doesn't have enough licenses to support existing IP Office over-configuration

IP Office successfully acquired all required licenses from WebLM server

License error(s) not resolved for 30 days and grace period ended

License Configuration Error

WebLM Restricted

Configuration of License Source was changed from WebLM to Local

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.

Basic Edition license for new systems

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

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

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

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

⭐ **Note:**

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

Essential Edition and Preferred Edition licenses

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

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

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

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

Order code	License	Description
396476	IP OFFICE R11 PREFERRED VOICEMAIL PRO MIG UPG LIC:DS	ADI migrations to PLDS and upgrades to R11.0 Preferred Edition

Server Edition licenses

A Server Edition license includes:

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

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

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

Order code	License	Description
IP Office PLDS upgrades		
396519	IPO-SL 11 SE/VRTLZD UPG PLDS LIC	Paid Upgrade Code

Branch licenses

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

Display name	Description
Avaya WebLM Model	This license is required by IP Office in branch deployments in order to connect to the WebLM server and use WebLM centralized licensing.
Branch System	This license is required for IP Office in branch deployments. It is used for tracking purpose only.
IP Office Centralized Endpoints license	One license is required for each Centralized user configured on the IP Office with a SIP extension or an analog extension. **❗ Important:** In addition to this IP Office license, each centralized user also requires a license on the central Avaya Aura® system.
SM Trunk Channel	This license is required with sufficient quantity to allow for the maximum number of concurrent SM Line calls to be enabled on the system. The total number of SM Trunk Channel licenses requirements depend on the expected traffic patterns in the particular deployment.

Display name	Description
	⭐ **Note:** IP Office also supports SM Line connections to Avaya Aura® Session Manager in other IP Office Server Edition deployments. These connections are not limited to branch deployments.

Small Community Network licenses

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

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

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

- Power users
- Teleworkers
- Mobile workers
- Office workers

Trunk licenses

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

SIP trunk sessions

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

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

IP500 Universal PRI additional channels

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

IP500 Universal PRI additional E1 channels

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

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

IP500 Universal PRI additional E1R2 channels

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

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

IP500 V2 Universal PRI additional T1 channels

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

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

IP500 V2 Voice Networking

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

consumed for each simultaneous outgoing call. On a Q.SIG trunk, the number of calls is limited by the trunk type rather than available licenses.

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

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

User licenses

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

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

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

Non-licensed user

A non-licensed user:

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

Basic users

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

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

Office Worker licenses

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

An Office Worker license enables Avaya 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.

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

Teleworker licenses

This option is targeted at users who are working from home or elsewhere with Internet connection to the office. They are provided with the ability to leverage the PLDS or ISDN using Telecommuter mode, without incurring any remote phone charges.

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

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

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

Mobile Worker licenses

This option is targeted at users with mobile devices. For example, field sales and service staff who are often on the road. These users are provided with features, such as one number access and call control as if in the office, enabling them to never miss a call.

Power User licenses

This option is targeted at key knowledge workers with the need for both Mobile Worker and Teleworker functionality. A Power User license enables Avaya Workplace Client (desktop and mobile) and Avaya Communicator for IP Office for Web.

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

The license instances are consumed for each user being configured.

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

Receptionist licenses

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

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

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

Centralized User license

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

IP endpoint licenses

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

Avaya IP endpoint licenses

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

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

Third-party IP endpoint licenses

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

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

Order code	License	Description
383072	IPO R10+ 3RD PTY IP ENDPT 1 LIC	1 endpoint

Trial licenses

Order code	License	Description
396446	IP OFFICE R11 ESSENTIAL EDITION TRIAL LIC	Essential Edition
396448	IP OFFICE R11 PREFERRED VOICEMAIL PRO TRIAL LIC	Preferred Edition
383123	IPO R10+ WEB COLLAB 5 TRL LIC	5 Web Collaboration licenses
396504	IP OFFICE-SELECT R11 POWER USER 5 TRIAL LIC	5 Power User license — Select
396317	IP OFFICE R11 POWER USER 5 TRIAL LIC	5 Power User licenses
383103	IPO R10+ TELEWORKER 5 TRL LIC	5 Teleworker licenses
383105	IPO R10+ MOBILE WORKER 5 TRL LIC	5 Mobile Worker licenses
307347	IPO-SL R10+ OFFICE WORKER 5 TRL LIC	5 Office Worker licenses — Select

Order code	License	Description
383107	IPO R10+ OFFICE WORKER 5 TRL LIC	5 Office Worker licenses
307319	IPO-SL R10+ RECEPTS 5 TRL LIC	5 Receptionist licenses — Select
382688	IPO R10+ RECEPTIONIST 5 TRL LIC	5 Receptionist licenses
307324	IPO-SL 10 3RD PTY IP 5 TRL LIC	Third party IP endpoint trial license — Select
383073	IPO R10 3RDPTY IPENDPT 5 TRL LIC	Third party IP endpoint trial license
382913	IPO-SL R10+ AV IP ENDPT 5 TRL LIC	5 Avaya IP endpoint licenses — Select
383111	IPO R10+ AV IP ENDPT 5 TRL LIC	5 Avaya IP endpoint licenses
383090	IPO R10+ VMPRO UMS 5 TRL LIC	5 Voicemail Pro UMS licenses
307335	IPO-SL R10+ VMPRO UMS 5 TRL LIC	5 Voicemail Pro UMS licenses – Select
383078	IPO R10+ 3RD PTY TTS TRL LIC	Voicemail Pro third party TTS license
307327	IPO-SL R10+ TTS PROLINUX TRL LIC	Voicemail Pro Linux TTS license — Select

Order code	License	Description
383080	IPO R10+ TTS PRO LINUX TRL LIC	Voicemail Pro Linux TTS license
307329	IPO-SL R10+ IPSEC VPN TRL LIC	IPSec Tunneling — Select
383082	IPO R10+ IPSEC VPN TRL LIC	IPSec Tunneling
307333	IPO-SL R10+ SIP TRNK 5 TRL LIC	SIP trunk sessions — Select
383086	IPO R10+ SIP TRNK 5 TRL LIC	SIP trunk sessions
383088	IPO R10+ IP500 VCE NTWK 4	IP500 Voice Networking
307321	IPO-SL R10+ CTI TRL LIC	CIT Link Pro — Select
383070	IPO R10+ CTI TRL LIC	CIT Link Pro

Upgrade licenses

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

⭐ Note:

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

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

Order code	License	Description
383748	IPO-SL 10+ IP500 T1 CH1 UPG PLDS LIC	Select IP500 additional channel upgrade
383709	IPO R10+ IP500 T1 CH1 UPG PLDS LIC	IP500 additional channel upgrade
383749	IPO-SL 10+ IP500 E1 CH1 UPG PLDS LIC	Select IP500 additional channel upgrade
383710	IPO R10+ IP500 E1 CH1 UPG PLDS LIC	IP500 additional channel upgrade
383752	IPO-SL 10+ IP500 E1R2 CH1 UPG PLDS LIC	Select IP500 additional channel upgrade
383713	IPO R10+ IP500 E1R2 CH1 UPG PLDS LIC	IP500 additional channel upgrade
383707	IPO R10+ IP500 VCE NTWK1 UPG PLDS LIC	IP500 voice networking upgrade
383757	IPO-SL 10+ AV IP ENDPT 1 UPG PLDS LIC	Select Avaya IP endpoint upgrade
383722	IPO R10+ SFTPH 1 PLDS UPG LIC	Soft Phone upgrade
383760	IPO-SL 10+ SMLINE SIPTRK UPG PLDS LIC	Select SM Line SIP trunk upgrade
383726	IPO R10+ SM LINE SIPTRNK UPG PLDS LIC	SM Line SIP trunk upgrade
383706	IPO R10+ SIP TRNK 1 UPG PLDS LIC	SIP trunk upgrade
383730	IPO R10 ESS ED EVM 1CH UPG PLDS LIC	Essential Edition Embedded Voicemail channel upgrade

Miscellaneous

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.

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 1: 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 2: Supported trunk cards

Basic Edition supports the following trunk cards:

Trunk card	PARTNER mode Maximum per system	NORSTAR mode Maximum per system
ATM4	4	4
PRI/T1	1	
PRI/E1		1
BRI4		4
BRI8		1

Expansion modules

Basic Edition supports the following expansion modules:

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

✳ Note:

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

IP Office Essential Edition

IP Office Essential Edition provides the same features as Basic Edition as well as the following:
- Mobile call control with one number access and simultaneous ringing on mobile devices
- Up to 4 remote workers through an internet connection and an Avaya 9600 series IP phone
- 24 hour access with customized voicemail greetings for each staff member
- Voicemail:

- Maximum of 6 concurrent calls to voicemail
- Send voicemails to email
- Up to 25 hours of voicemail storage (with 6 ports)
- Up to 40 automated attendants with a maximum of 6 concurrent calls
- Multiple language support
- Up to 128 party audio conference bridge with 64 in any one conference

😊 **Note:**

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

IP Office Preferred Edition

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

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

Components

- IP500 V2 control unit
- Ethernet attached PC configured with Application Server software
- IMAP mail client (Outlook) for voicemail synchronization in email and browser-based access to voicemail
- Digital trunks and channels to support users

- IP Office supported telephones

IP Office Server Edition

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

IP Office Server Edition Solution provides the following:
- A single Server Edition Primary server provides IP Office, Voicemail Pro, and Avaya one-X Portal for IP Office.
- A Server Edition Secondary server increases the capacity and provide resilience.
- Expansion systems, which provide additional capacity, support analog or digital interfaces, and remote locations.
- A Select IP Office Server Edition Solution provides additional capacity.
- Support for an existing IP500V2/IP500V2A 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 : 1. IP Office Server Edition topology
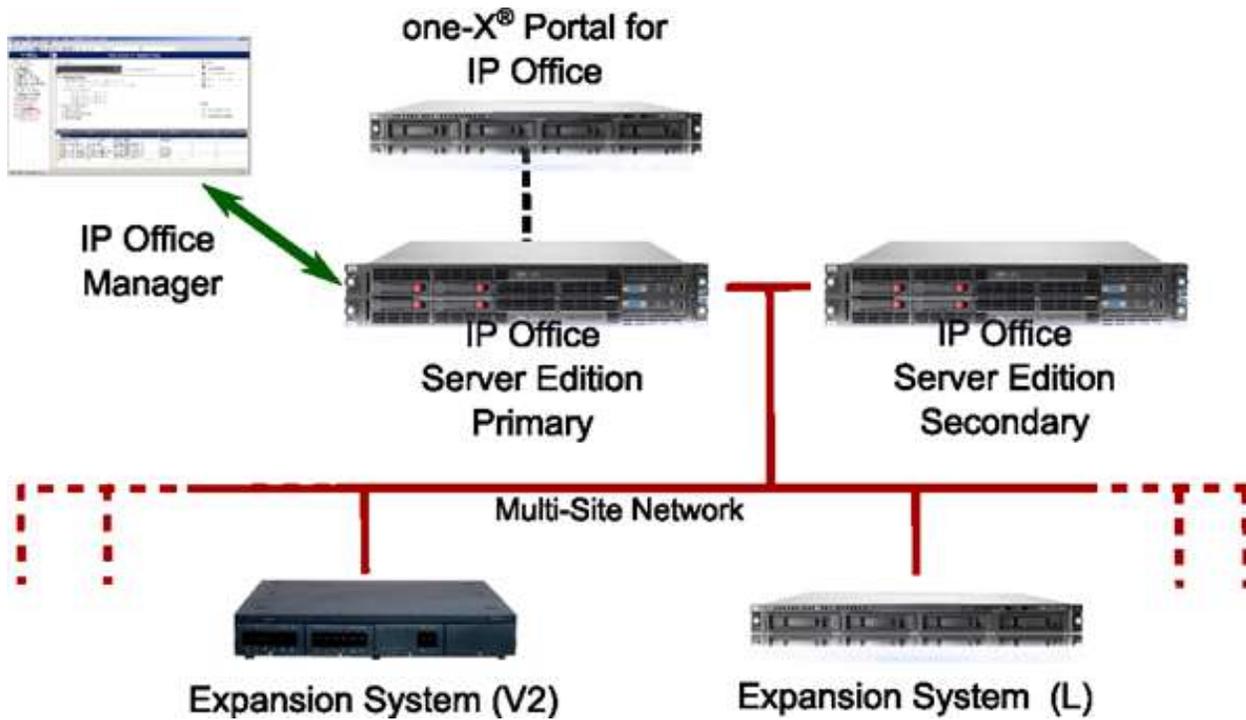
Deployment models

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

Server Edition Components

Component	Server options	Description
Server Edition Primary	Dell R640	Software distribution includes:

Component	Server options	Description
		• IP Office Server Edition • Voicemail Pro • Avaya one-X® Portal for IP Office
Server Edition Secondary	Dell R240	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	IP500V2 IP500V2A	Optional component to support remote locations and as a gateway. Can be an existing IP500V2/IP500V2A 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
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.

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.

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*.
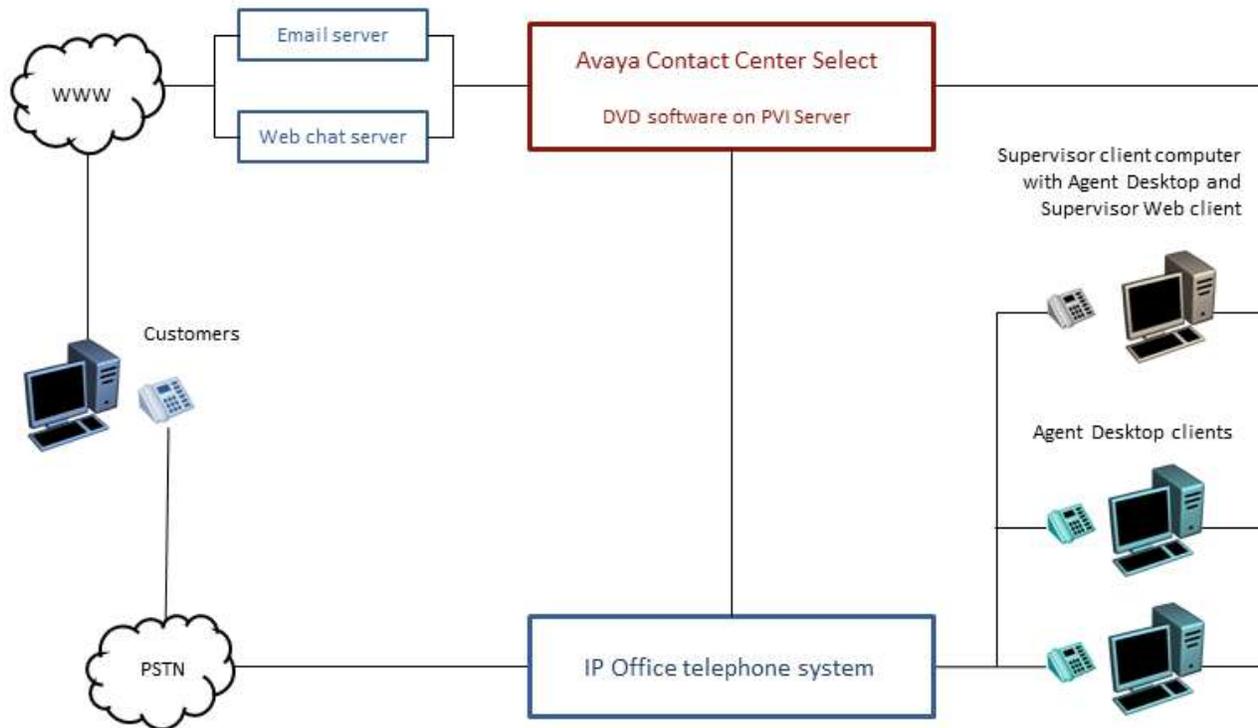
Avaya Contact Center Select DVD

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 : 1. 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.
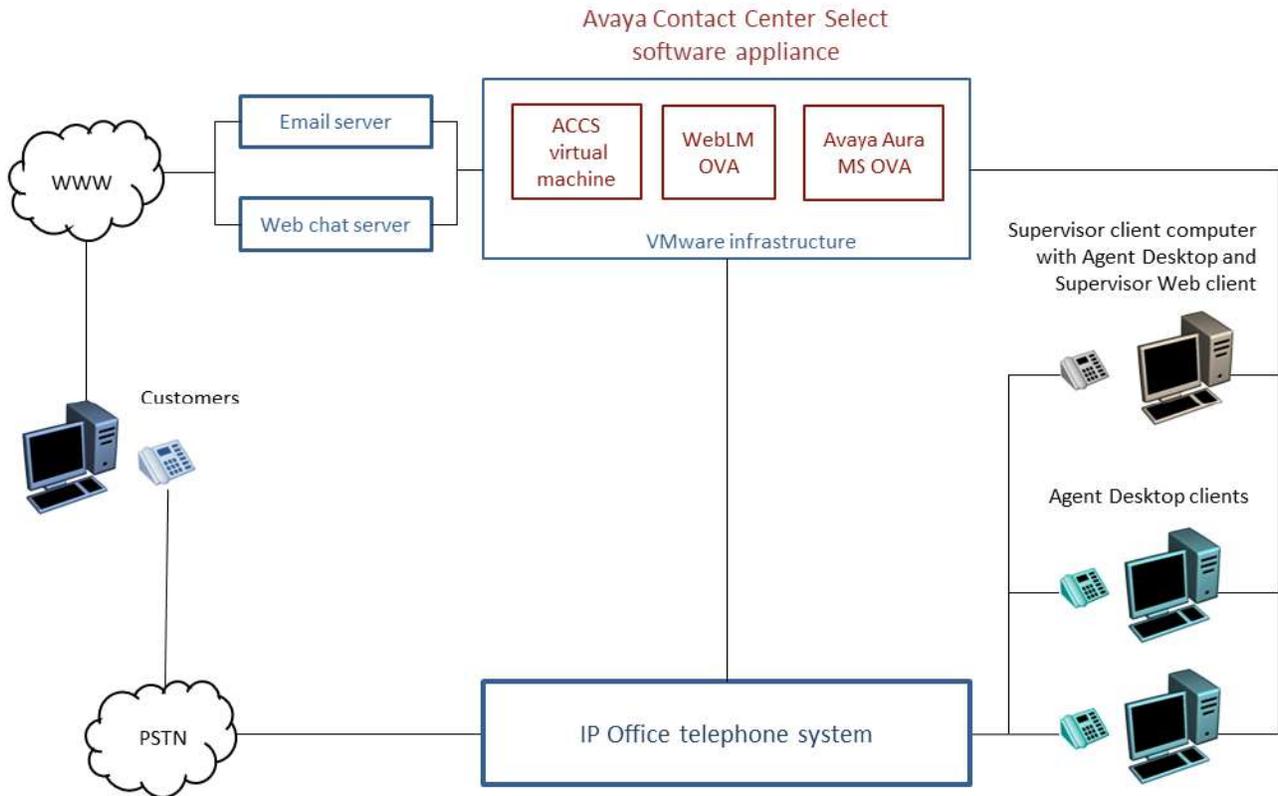
Avaya Contact Center Select offers a software appliance package that consists of the following components:

- 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 : 1. 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.
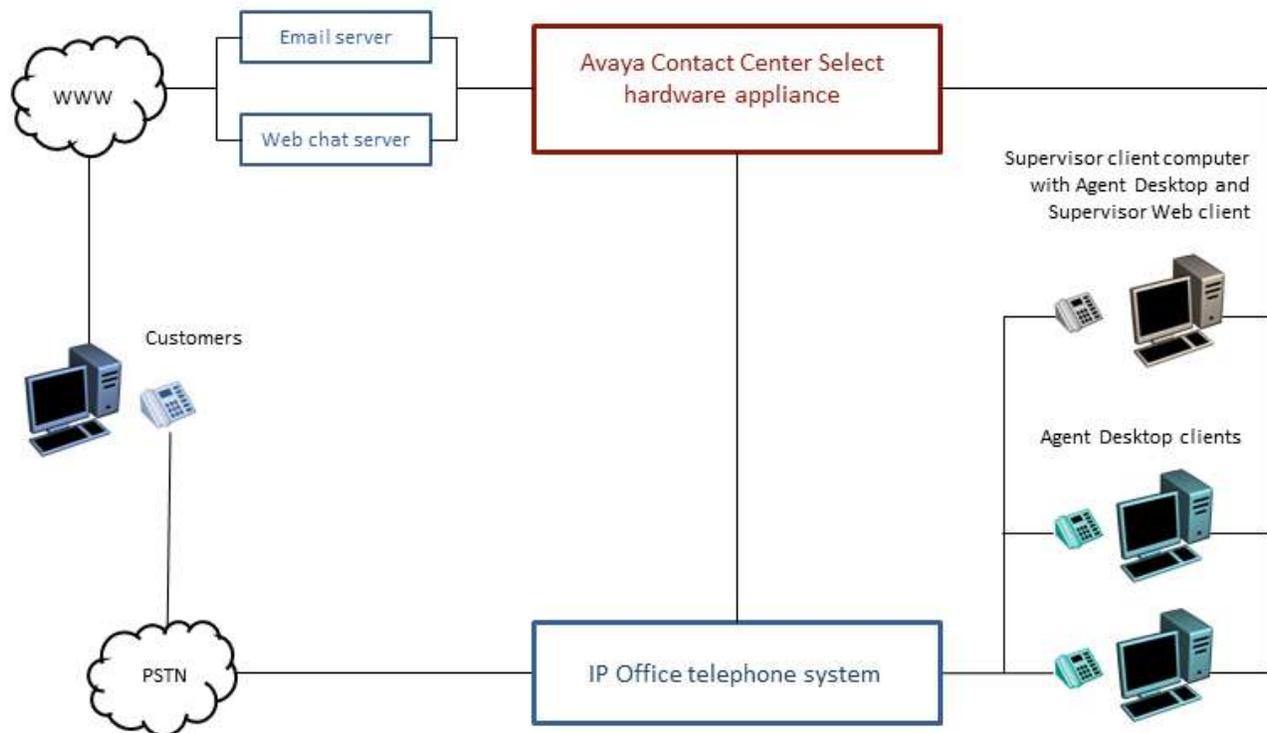
For more information about Avaya Contact Center Select and VMware, refer to *Avaya Contact Center Select Solution Description*.

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 : 1. 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.
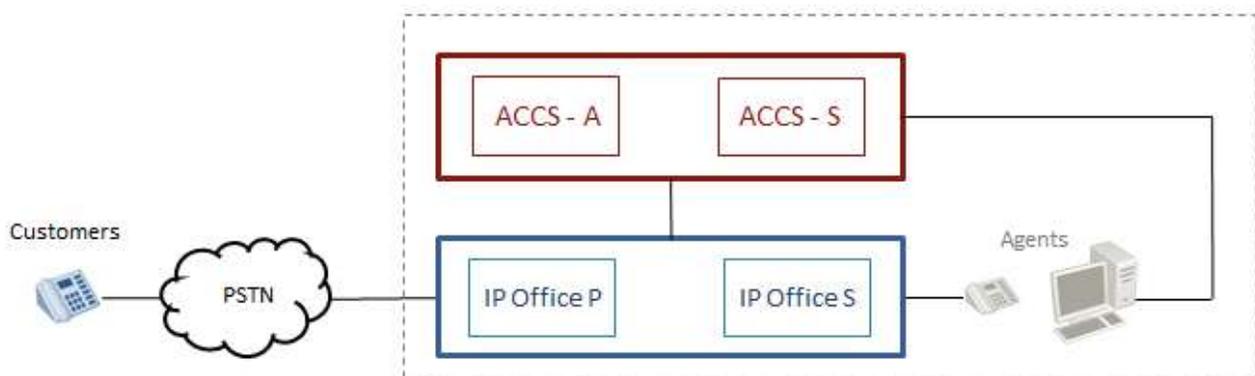
For more information about the Avaya Contact Center Select hardware appliance, refer to *Avaya Contact Center Select Solution Description*.

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 : 1. 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*.

Solution Specifications

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

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

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

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

IP400 hardware will no longer be supported, including IP400 series internal cards, expansion modules and trunk cards listed below. The following IP400 trunk and station modules continue to be supported in the current release.

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

Upgrading 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](#)*.

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

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..

Miscellaneous

- 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.

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.

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
- Avaya Experience Portal

ISDN interfaces

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

USA interfaces:
- PRI T1 service: Ground Start (GS) - Default, E&M, 56 K data for 5ESS, 56/64/64 restricted for 4ESS
- PRI ISDN switch support: 4ESS, 5ESS, DMS-100, DMS-250 (includes conformance to ANSI T1.607 and Bellcore Special Report SR4287, 1992)

- PRI ISDN Services: AT&T Megacom 800, AT&T WATS (4ESS), AT&T SDS Accunet 56 Kbps and 64 Kbps (4ESS), AT&T Multiquest (4ESS)

Phone interoperability

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

Table 1: Generally available phones

Phone	Basic Edition	Essential Edition Preferred Edition	Server Edition Select	IP Office Subscription
Analog deskphones				
POTS	Yes	Yes	Yes	Yes
1000 Series Video phones				
1010, 1020, 1030, 1040 (Lifesize)	–	Yes	–	–
1400 Series DS Digital phones – IP Office and Communication Manager				
1403, 1408, 1416	Yes	Yes	–	–
DBM32	Yes	Yes	–	–
1600 Series IP (H.323) phones – IP Office and Communication Manager				
1603, 1603SW, 1603SW–i, 1608, 1608–i, 1616, 1616–I	–	Yes	Yes	Yes
2400 Series DS Digital phones – IP Office and Communication Manager				
2402D, 2410D, 2420	Yes	Yes	–	–
EU24	Yes	Yes	–	–

Phone	Basic Edition	Essential Edition Preferred Edition	Server Edition Select	IP Office Subscription
3700 Series DECT – IP Office and Communication Manager				
3720, 3525, 3730, 3735, 3745, 3749, 3755, 3759	–	Yes	Yes	Yes
9500 Series DS digital – IP Office only				
9504, 9508	Yes	Yes	–	Yes
BM12	Yes	Yes	–	Yes
9600 Series IP H.323 – IP Office and Communication Manager				
9608, 9611, 9621, 9641	–	Yes	Yes	Yes
BM12	–	Yes	Yes	–
SBM24	–	Yes	Yes	Yes
B100 Series Conference Phones				
B149, B159	Yes	Yes	–	–
B169, B179, B199	–	Yes	Yes	Yes
D100/D160 DECT Phones				
D160	Yes	Yes	Yes	–
H100 Series Video Collaboration Stations				
H175	–	Yes	Yes	–
Avaya J100 Series IP Phones				
J129	–	Yes	Yes	–

Phone	Basic Edition	Essential Edition Preferred Edition	Server Edition Select	IP Office Subscription
J139, J159, J169, J179, J189	–	Yes	Yes	Yes
Softphone				
Avaya Workplace Client	–	Yes	Yes	Yes

Table 2: Generally available NORSTAR/BCM phones

Phone	Basic Edition	Essential Edition Preferred Edition	Server Edition Select
1100 Series SIP phones BCM Unistim migration			
1120E, 1140E	–	Yes	Yes
BM LED and paper labels	–	Yes	Yes
BM LCD	–	Yes	Yes
1200 Series SIP phones BCM Unistim migration			
1220, 1230	–	Yes	Yes
BCM paper	–	Yes	Yes
BCM LCD	–	Yes	Yes

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

Table 3: Supported Avaya phones no longer for sale

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

1. Digital and analog phones are supported with Server Edition or Select as indicated through connection to an IP500 V2 expansion server.

Phone	Basic Edition	Essential Edition Preferred Edition	Server Edition Select
ETR phonesAnalog Feature Phone, PARTNER and IP Office			
"Refreshed" 34, 18 and 6 button display	Yes	–	–
"Euro" 34 and 18 button display	Yes	–	–
"Euro" 18 and 6 button display	Yes	–	–

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.

IP Office and Avaya Aura Communication Manager interoperability

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

Supported phones include:
• Avaya IP phones (H.323)
• Avaya digital phones
• BCM 7000 series digital phones
• BCM 1100/1200 series IP phones (SIP)
• DECT R4 phones

- Analog phones

Figure : 1. VoIP networking using H.323.
These features allow for simple networking needs between IP Office remote branches to an Avaya Aura®
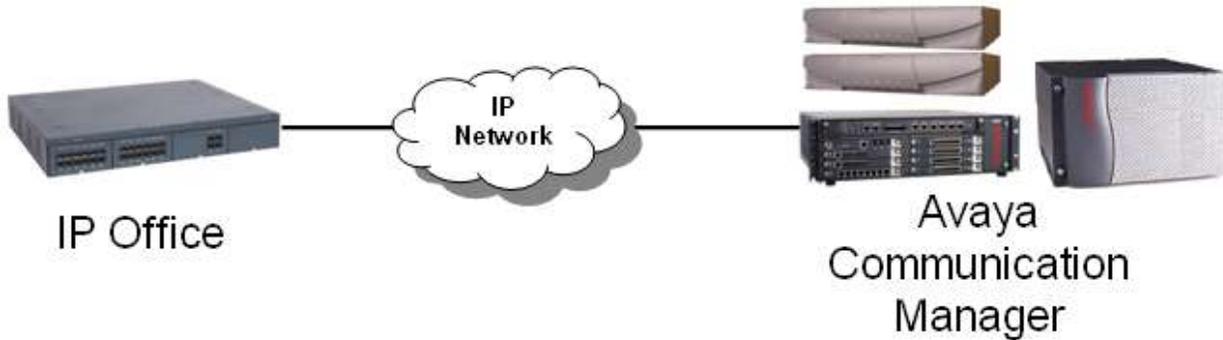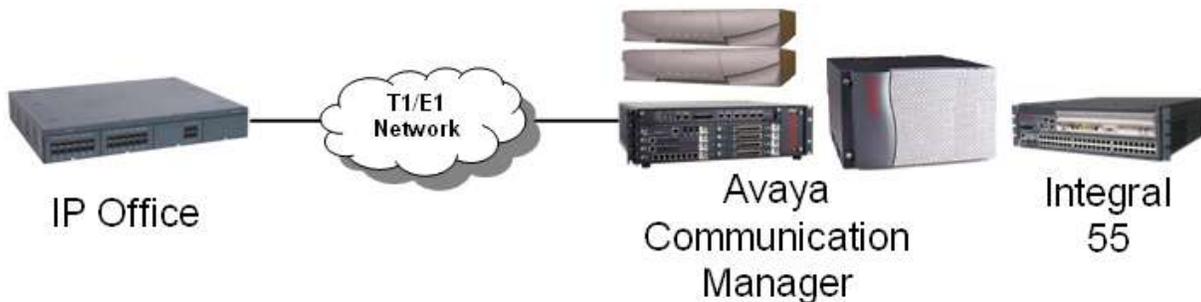Communication Manager at the main site.

Figure : 2. Q.SIG networking using T1/E1 links (TDM).
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:

BCM and IP Office interoperability

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

Protocol support

IP Office to BCM: SIP

BCM to BCM: SIP or SIP/MCDN

IP Office to IP Office H.323: SCN or SIP

⭐ **Note:**

It is not possible to connect IP Office and BCM through the MCDN or SCN protocol directly.

IP Office platform requirements
Release 8.1 or higher, Essential, Preferred or Server Editions
BCM platform requirements
BCM50 or BCM450 6.0
Centralized voicemail

IP Office with a centralized Voicemail Pro system in the SCN network

BCM with a centralized voicemail within the BCM MCDN network.

> ⭐ **Note:**
>
> Centralized Voicemail across IP Office and BCM systems is not supported.

Phones
All phones supported on the individual call servers and releases including Avaya IP Phone (H.323), Avaya Digital phones, BCM 7000 Series Digital phones, BCM1100/1200 Series IP Phones (SIP), DECT R4 and Analog phones.
Features
Advanced feature set of IP Office SCN available between the IP Office and BCM. MCDN features are also available between the IP Office and BCM. The standard SIP features are supported.

BCM with CS1000 to IP Office migration

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

Protocol support

IP Office to BCM: SIP

IP Office to CS1000: SIP

IP Office to IP Office: SIP or H323 - SCN Networking

BCM to BCM: SIP or SIP/MCDN

BCM to CS1000: SIP or SIP/MCDN

> ⭐ **Note:**
>
> Only UDP will be supported and not TCP.

IP Office to CS1000 using H.323 or PRI trunks is not supported.

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

Hardware and software options

Hardware options

Server, base card, trunk card, and expansion module hardware options are available depending on the edition required:
- Dell PowerEdge™ R210 or R620
- Hewlett Packard ProLiant DL120 G7 or DL360 G7
- Avaya IP500 V2

Software options

IP Office acts as a server for a variety of applications, including:
- Lync Integration for IP Office
- IP Office SoftConsole
- IP Office Media Manager
- Avaya Workplace Client

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

Server specifications

The following tables list the specifications of the current Avaya supplied servers used for IP Office solutions.

Server option	Large Server		Small Server
	ASP130 P3	**ASP110 P3**	**–**
SAP	700514098	700514262	700515009
Chassis	Dell R640	Dell R640	Dell R240
Rack size	1U	1U	1U
Processor	2 x 4210, 2.2GHz	2 x 4210 2.2GHz	1 x E2124, 3.3GHz
Cores per CPU	10	10	
L3 Cache		13.75MB	
Memory (RAM)	48GB	48GB	16GB
Hard disk drive	4 x 600GB	4 x 600GB	1 x 1TB, 7.2K
RAID Options	6	6	6
RAID Controller	H730	H730	Bios
Power Supplies	2 x 750W	2 x 750W	1
NICS	6 x 1GB full duplex	6 x 1GB full duplex	2
Optical Drive	1 x DVD ROM	1 x DVD ROM	None
Rail Kit	Yes	Yes	

Server Combinations and Usage

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

IP Office Manager is used to access all parts of the configuration. Different levels of access can be defined to control which parts of the configuration the IP Office Manager user can view and alter. IP Office Manager is also used to upgrade the software files on the system.

RAM
  Standard Edition: 4 GB

  Server Edition: 6 GB

  Select Server Edition: 8 GB

Hard disk free space
  1 GB

Processor
  Standard Edition: Core i3

  Server Edition: Core i5

  Select Server Edition: Core i5

Operating system
  [Operating system and browser support](#)
Additional software
  .NET Framework 4.0: Installed with the software if not already installed.

IP Office SysMonitor

RAM
  128 MB
Hard disk free space
  10 GB
Operating system
  [Operating system and browser support](#)

IP Office System Status Application

RAM
      256 MB
Hard disk free space
      1.4 GB
Operating system
      Operating system and browser support
Additional software
      Sun Java Virtual Machine

TAPI

RAM
      64 MB
Hard disk free space
      50 MB
Operating system
      See Operating system and browser support.

IP Office Operating system and browser support

Windows Operating System

Table 1: 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	–

Miscellaneous

Table 2: Windows Support – Server Components

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

Table 3: Windows Support – Thick Client Administrator Applications

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

Table 4: Windows Support – Thick Client User Applications

Application	Windows	
	10	11
IP Office SoftConsole	✓	✓

Application	Windows	
	10	11
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. Note however that the Outlook Plug-In is only supported in Citrix 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 5: 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	✓	✓	✓	✓
D100 DECT Admin	✓	✓	✓	✓
IP DECT R4 Admin	✓	✓	✓	✓
Avaya Spaces Calling	✓	-	✓	-

Operating System	Windows OS		Windows OS macOS	macOS
Application	Edge	Firefox	Chrome	Safari
IP Office User Portal	✓	✓	✓	✓

Other Apps

Table 6: Microsoft Exchange

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

1. Not supported if using EWS integration.

Table 7: 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 8: Virtualization support

Hypervisor	IP Office Server Edition
Microsoft Azure	✓
Amazon AWS	✓
Microsoft Hyper-V	
- Windows Server 2016	✓
- Windows Server 2019	✓
- Windows Server 2022	✓
VMware[1]	
- VMware ESXi 7.0	✓

Hypervisor	IP Office Server Edition
- VMware ESXi 8.0.x	✓

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

Networking

The product supported a variety of networking options.

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 : 1. Circuit switched voice networking
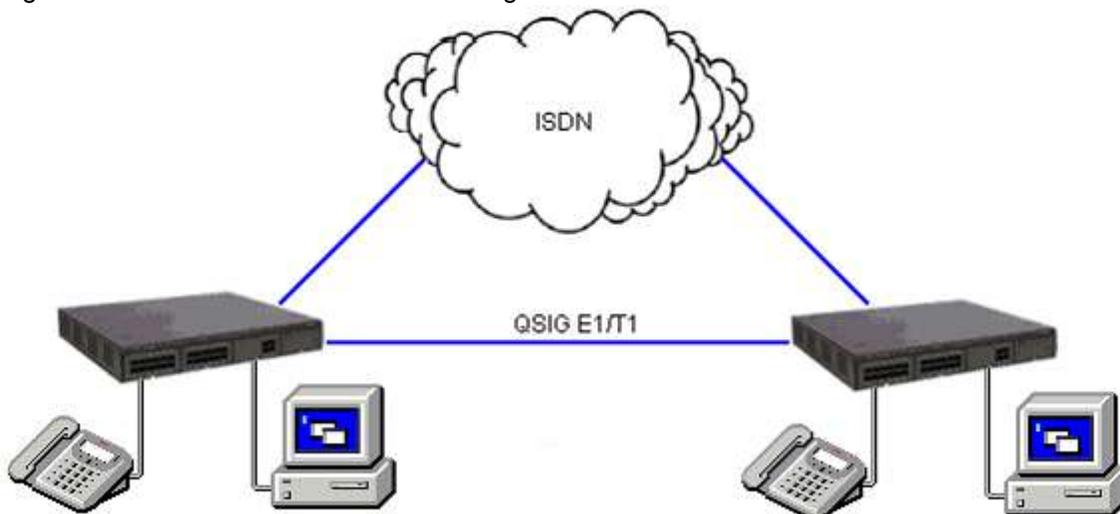
IP Office supports the following Q.SIG services across this network:

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

Public voice networking

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

ISDN Primary Rate (ETSI CTR4)

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

The following supplementary services are supported:

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

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

⭐ **Note:**

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

Malicious Call Identification (MCID)
        (2400, 4600, 5400, 5600, T3, T3 IP, 9500, 9600)

Short codes and button programming features are available so that users can trigger this activity at the ISDN exchange when required. This feature is NOT available on standard ISDN DSS1 telephones.

Advice of Charge (AOC)
(T3 digital and IP telephones only; Phone Manager)

Advice of charge during a call (AOC-D) and at the end of a call (AOC-E) is supported for outgoing ISDN calls other than Q.SIG. The call cost is displayable on T3 telephones for call accounting purposes. IP Office allows configuration of call cost currency and a call cost mark-up for each user.

Call Completion to Busy Subscriber (CCBS)
(2400, 4600, 5400, 5600, T3, T3 IP, 9500, 9600, DECT telephones; Phone Manager)

CCBS can be used where provided by the ISDN service provider. It allows a callback to be set on external ISDN calls that return busy. It can also be used by incoming ISDN calls to a busy user. This feature is not available on standard ISDN DSS1 telephones.

Partial Rerouting (PR)
(2400, 4600, 5400, 5600, T3, T3 IP, 9500, 9600, DECT telephones; Phone Manager)

When forwarding a call on an ISDN channel to an external number using another ISDN channel, partial rerouting informs the ISDN exchange to perform the forward, thus freeing the channels to IP Office. This feature is not available on standard ISDN DSS1 telephones and it is not supported on Q.SIG.

Explicit Call Transfer (ECT)
(Typically used by a third-party application)

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

ISDN Basic Rate (ETSI CTR3)

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

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

E1R2 channel associated signaling

Service is provided by IP500 V2 Universal PRI cards.

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

North American T1 Primary Rate

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

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

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

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

T1 trunk cards incorporate an integral CSU/DSU, eliminating the need for an external unit. The CSU function allows the trunk to be put in loop-back mode for testing purposes. This can be set manually, using the monitor application, or automatically from a Central Office sending a Line Loop Back (LLB) pattern. The DSU function allows the T1 trunk to be shared between data and voice services.

North American Primary Rate Interface (PRI)

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

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

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

Analog trunks

Loop start
    Loop start trunks are available on the IP Office Analog Trunk cards installed within the IP Office control unit, or on the Analog Trunk 16-port expansion modules (ATM16). The first two trunks on the ATM16 are automatically switched to power fail sockets in the event of power being interrupted. Powerfail is also

available on the trunk card when fitted to a combination or phone card. They conform to the TIA/EIA-646-B standard. The loop start trunks also support incoming caller line identification (ICLID) conforming to GR-188-CORE and GR-31-CORE standards. IP Office can use this information to route calls or provide it to computer applications to display additional information about the caller.

Ground start

Ground Start trunks are only available on the ATM16, configured through IP Office Manager. The first two trunks on the module are automatically switched to power fail socket in the event of power being interrupted. They conform to ANSI T1.401 and TIA/EIA-646-B standards. Not available in all territories.

Packet-based voice and data networking

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

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

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

Figure : 1. VoIP networking across IP network or WAN.

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.
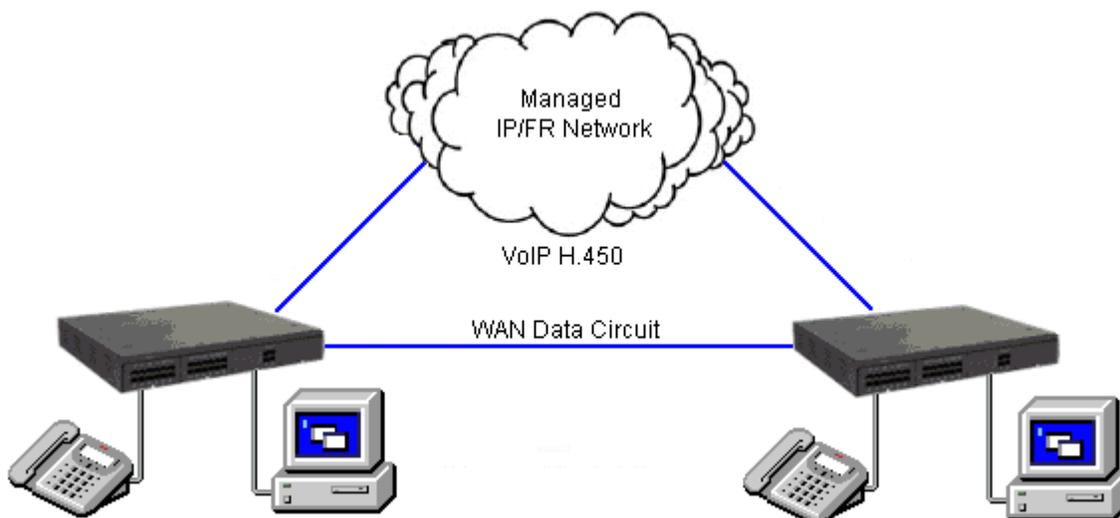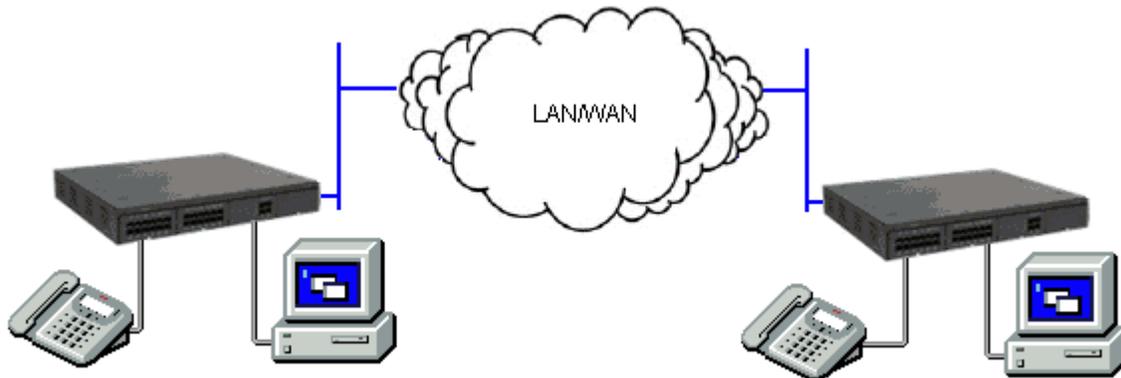
Figure : 2. VoIP networking across the LAN.

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.

Internet protocol telephony

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

IP Office is a converged telephony system; it combines aspects of traditional PABX telephony systems and IP data and telephony systems. IP Office supports PSTN, SIP, POTs, digital time division multiplexed telephones and digital IP telephones all on the same system. IP Office allows all the technologies to coexist.

IP Office connects to the PSTN and to IP trunks providing a "hybrid" PABX function - where both legacy and future technologies can be used together to minimize operating costs and optimize business communications through both voice and data. The converged functionality works on multiple levels:
- Individual phone users can control the operation of their phone through applications running on their PC.
- Data traffic can be routed from the LAN interface to a telephony trunk interface.
- Voice traffic can be routed across internal and external data links. This option is referred to as voice over IP (VoIP).

Voice over IP (VoIP) and network assessments

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

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

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

A network assessment would include a determination of the following:

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

An outline of the expected network assessment targets is:

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

Signaling protocols

In order to make use of VoIP, IP Office uses signaling protocols called H.323 and Session Initiation Protocol (SIP), to establish end-to-end connections for the voice path through an IP network. This connection ensures that each end is able to transmit and receive voice and provides the network addressing for end-to-end packet transmission. IP Office also connects the different technologies by translating the signals they use. For example an analog telephone can connect to a VoIP destination. This connection requires both the signaling and voice transmission to be translated. IP Office makes this translation using gateways and gatekeepers.

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

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

Quality of Service considerations

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

Voice compression channels

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

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

Table 1: Voice compression channels

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

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

Note:

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

H.323 signaling protocol

IP Office IP telephony systems use open standards. Digital IP telephones, gateways and gatekeepers support the H.323 standard and it is this that allows devices from different manufacturers to work together. IP Office also supports an optional integral gateway, Voice Compression Modules (VCMs) and gatekeeper functionality.

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

IP telephones
> H.323 service endpoint devices that support audio calls. Other types of H.323 devices can support video as part of H.323.

Gateways
> Provide media translation to allow calls to be made to non-H.323 devices, for instance an analog telephone or the public network to connect with a H.323 device.

Gatekeepers
> Control the call processing and security for H.323 devices.

Multipoint Connection Units (MCUs)
> Control conferences by adding together media streams.

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

Session Initiation Protocol trunking

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

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

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

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

There are several possible network topologies for SIP trunk systems, as shown in the following diagrams:
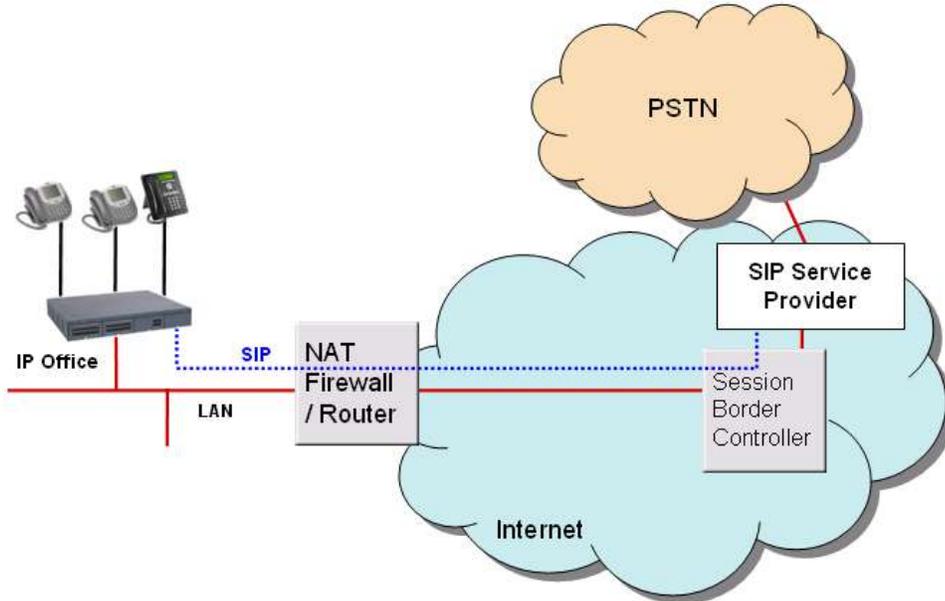
Figure : 1. Service provider with Avaya Session Border Controller (recommended)

Figure : 2. Direct connection from the second Ethernet port to the internet through a DMZ port on the router.

To make this configuration secure, the IP Office firewall is set to drop all packets except SIP.
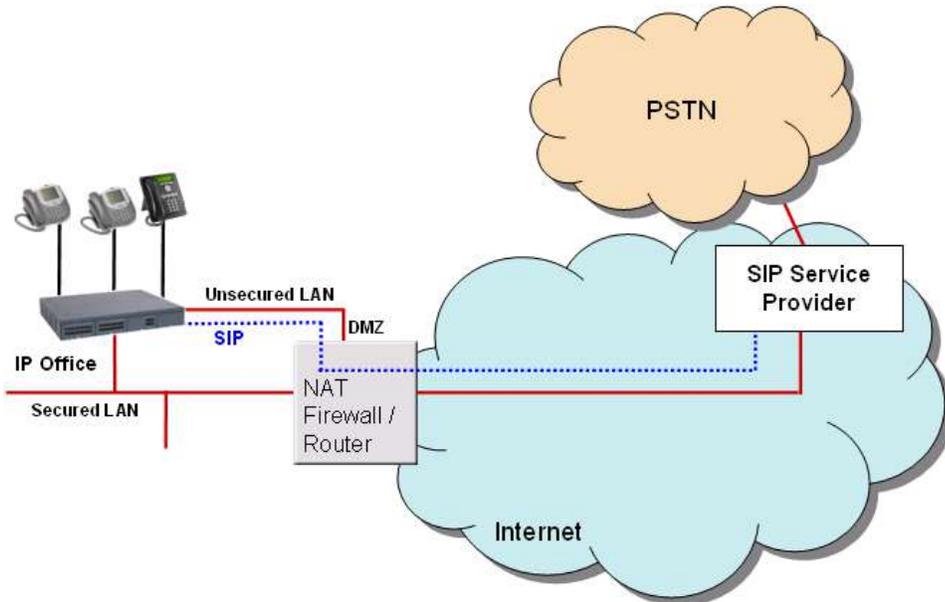
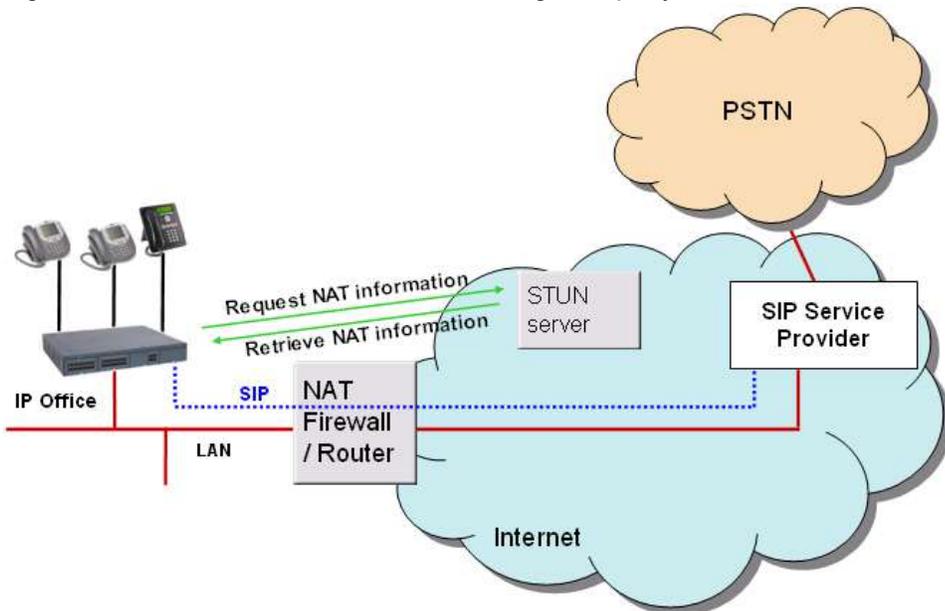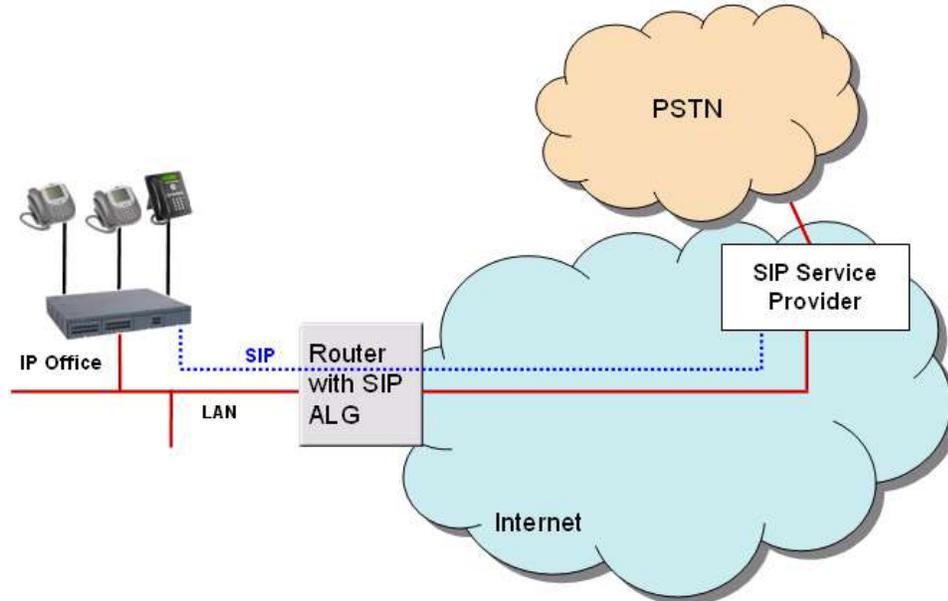Figure : 3. Connection to ITSP over NAT using third-party STUN servers

Figure : 4. Connection to ITSP through router with ALG to resolves NAT issues

SIP servers

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

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

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

- **Registrar server**

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

- **Proxy server**

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

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

- **Location service**

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

- **Redirect server**

  If users are not in their home domains, sessions bound for them needs to be redirected to them. The redirect server maps a SIP request destined for a user to the device closest to the user. In IP Office, call forwarding and Follow me functionality is used to provide again consistent functionality between all type of endpoints.

SIP endpoint user agents

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

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

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

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

Computer Telephony Integration

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

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

IP Office provides two levels of CTI interoperability:

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

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

Supported CTI interfaces

IP Office supports the following interfaces:

TAPILink Lite
    Provides first-party CTI support for Microsoft TAPI 2.1 and TAPI 3.0, so each PC can control or monitor one telephone. The software components are supplied with the IP Office system on the User CD, and do not required a license key for use. The specification requires that a certain amount of core functionality is implemented, and additionally defines a series of optional functionality that switch vendors may also implemented.
TAPILink Pro
    Provides third-party CTI support for TAPI 2.1 and 3.0. These components are identical to their first-party equivalent; the presence of the CTI Link Pro RFA license key (which can be purchased in the usual way for products) enables this additional functionality. TAPILink Pro provides all of the features and functionality of TAPILink Lite, but additionally provides third party CTI operation. This means that a single server can control and monitor any number of telephone devices. In addition, TAPILink Pro provides the ability to monitor and control groups. This allows an application to be notified when a call enters a queue, and can also redirect it to another location.
TAPI-WAV driver
    Provides software-based support for voice processing. The TAPI-WAV driver is for use with TAPI 2.1 only; for TAPI 3.0, IP Office supports the Media Service Provider (MSP) interface, defined by Microsoft in TAPI 3.0. This functionality will only work in conjunction with CTI Link Pro and also requires TAPI-WAV licenses. Each license enables 4 ports of voice processing.
DevLink Pro
    Provides a real-time event stream in addition to the SMDR interface provided in IP Office SMDR. The real-time event stream takes the form of a call record, which is issued whenever the state of any

endpoint of a call changes (typically there are two end points on a call, but for some circumstances, such as conference calls, intruded calls there may be more).

IP Office SMDR

Provides an interface to obtain SMDR events. A comma-separated record is issued for each call, when the call is completed. This interface is designed for call accounting and call billing applications. The IP Office SMDR can be output direct from the IP Office control unit to a designated IP address and port.

IP Office Software Development Kit

This toolkit is delivered on a single CD, containing the developer documentation for TAPILink Lite, TAPILink Pro, DevLink Lite and DevLink pro, as well as pre-compiled programs for exploring TAPI 2.1 and 3.0. In addition, example source code is included, making it easy for developers to become familiar with IP Office CTI interfaces. The Developer Connection Program (DevConnect) is the Avaya developer partner program, and is designed for third-party companies who are creating a product for sale, and who wish to receive technical support. Membership of the program is at the sole discretion of Avaya. DevConnect members pay an annual fee, for which they receive technical support directly from Avaya. In addition, Avaya will perform interoperability testing between IP Office and the member's product, and may also create opportunities for joint marketing, including exhibitions, use of Avaya's logo, and other benefits. More information on the DevConnect program can be found at http://www.devconnectprogram.com.

Centralized CTI WebService API

Provides a more open platform to allow third-parties to add value and build out solutions. Supports distributed (SE/SCN) environment and, therefore, is not limited to nodal like TAPI. It does have a dependency on Avaya one-X® Portal access for the users. When creating a new user in IP Office, it does not require a restart.

SSI over Web Services

Provides system monitoring information of SSI over a read-only REST web service available over https only. Realtime call data and call control are not available via this interface, but they will be made available via the DevConnect program.

This feature already has several areas instrumented but the data is for SSA and delivered over the Proprietary SSI interface, and there is a small set of data available on SNMP.

It does not require a license.

Open APIs/SDKs

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

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

Further Help

Additional Help and Documentation

The following pages provide sources for additional help.

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).

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.

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**.

Additional IP Office resources

In addition to the documentation website (see Additional Manuals and User Guides), 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 user name and password. Once accessed, the portal can be customized for specific products and information types that you wish to see and be notified about by email.
- **Avaya IP Office Knowledgebase** *(https://ipofficekb.avaya.com)*
  This site provides access to an online, regularly updated version of IP Office user guides and technical manual.
- **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 a number of forums for discussing issues.
- **International Avaya User Group** *(https://www.iuag.org)*
  This is the organization for Avaya customers. It provides discussion groups and forums.
- **Avaya DevConnect** *(https://www.devconnectprogram.com/)*
  This site provides details on APIs and SDKs for Avaya products, including IP Office. The site also provides application notes for third-party non-Avaya products that interoperate with IP Office using those APIs and SDKs.
- **Avaya Learning** *(https://www.avaya-learning.com/)*

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

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.

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 Status Application

An IP Office application that shows the status of things such as outgoing calls.

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.

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.