



IP Office Technical Bulletin

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Region: GLOBAL

North American Region IP DECT and VPN Phone Mobility Solutions for IP OFFICE 4.0.7

IP DECT Solution

IP Office 4.0.7 introduces support for a new IP DECT solution. The solution consists of new handsets, base stations and a management system called the Avaya IP DECT Mobility Manager (ADMM).

Note: *Due to radio frequency transmission regulations, this solution can only be deployed in North American Regions and is not compatible with ROW telephones or RFPs.*

The IP DECT base stations are connected to the LAN via an Ethernet cable and communicate to the IP Office using a variant of the H.323 protocol, the X-mobile protocol. One of the base stations must be designated to run the Avaya IP DECT Mobility Manager (ADMM). This is the controller for all the base stations connected to the system.

The IP DECT telephones communicate with the base stations using the standard DECT digital protocol with additional proprietary software code. The system can also be configured to support users in different offices connected via a WAN/IP infrastructure.

Note: *Due to the base stations being connected via H.323 to the IP Office a Voice Compression Module is required in the IP Office when using this solution.*

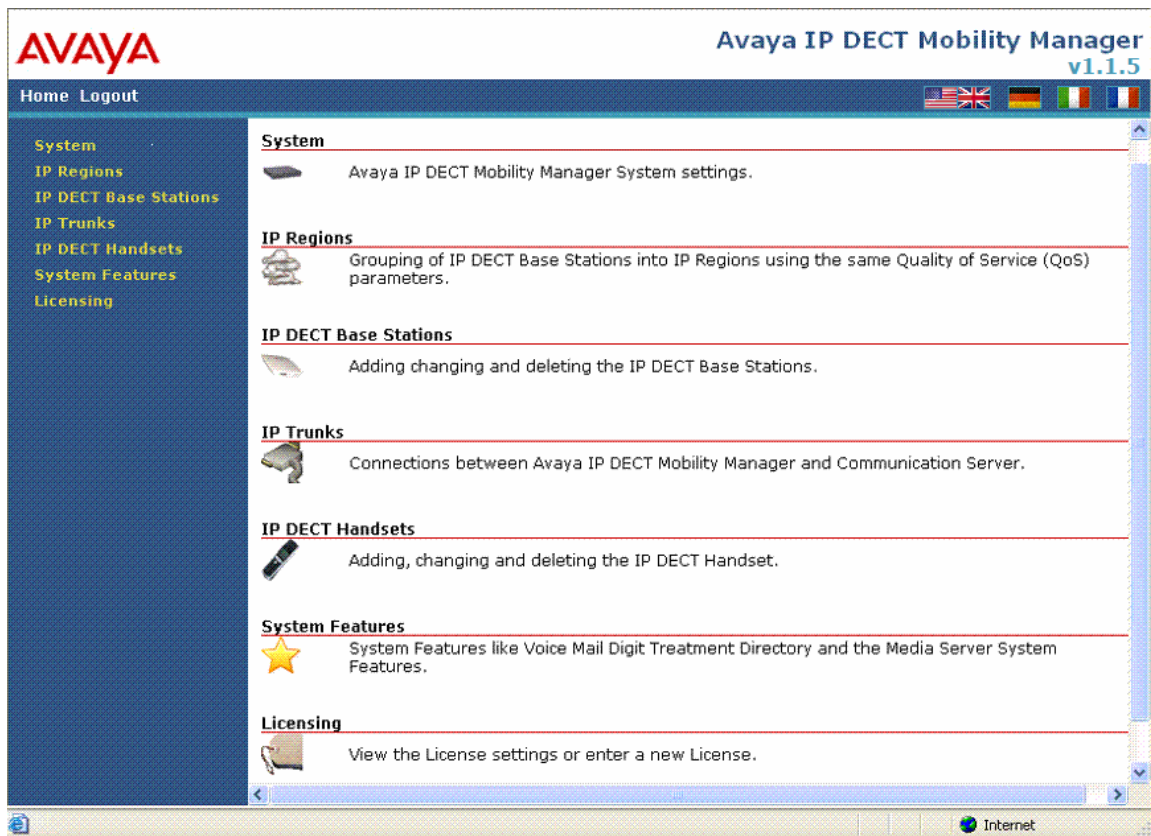
The Avaya IP DECT solution supports a network of up to 32 internal (RFP32) base stations (Radio Fixed Parts). Up to 120 DECT handsets (Portable Parts) can be registered on the system.

Each IP DECT base station is powered over the LAN using the Power over Ethernet (802.3af) standard. The internal base stations can also be powered using an external power adapter, which is only available in the NAR region. Any solution deployed without this power adapter must include a switch that provides Power over Ethernet.

The DECT handset supported with the IP DECT solution is the new Avaya 3711 telephone.

Within the IP Office Manager application an IP DECT line is configured along with the associated IP DECT extensions. All other programming of the system, such as defining base stations and handsets, is done using the Avaya IP DECT Mobility Manager (ADMM), which is an application that runs on one of the base stations, determined during boot up, and is programmed via a web browser interface.

The system does require a license key to operate which is programmed in the ADMM, not within the IP Office configuration. The license is created using the MAC addresses of some of the base stations connected in the system.



For the IP DECT system to boot a DHCP and TFTP server are required. The DHCP function can be provided by the IP Office or an external DHCP server. Alternatively the base stations can be statically configured using a Java configurator (needs Java Runtime Environment version 1.4 or higher) that is provided on the IP Office 4.0.X Admin CD. The TFTP function can be provided by the internal flash card on a Small Office Edition, a 406v2 or a separate TFTP server.

When a base station is powered up it does not have any firmware loaded onto it, only a small standalone application built into the flash. It will try to determine its IP address and other configuration settings from the internal flash, when no settings are available it starts a DHCP client to obtain the settings.

Once the settings have been determined the application firmware is loaded via TFTP and application is started. Each time a base station is powered up it needs to go through this process. If the DHCP client does not get an appropriate DHCP offer a new DHCP request is sent after 1 second. After 3 DHCP requests are sent the DHCP client will sleep for 60 seconds. During this time the booter will accept local configuration from the Java configurator.

The DHCP client requests the following options in the parameter request list:

- Subnet mask option (code 1)
- Router option (code 3)
- Public option 224 (code 224)
- Public option 225 (code 225)
- Public option 226 (code 226)

The DHCP client selects the DHCP server according to the following rule:

When the DHCP offer is made public option 224 should have a value equal to the string "OpenMobility". If this option is not present the DHCP offer is ignored. Public option 226 should also be set; this specifies the IP Address of the base station that will run the ADMM application. These two settings are mandatory.

There are also some optional settings that can be passed to the base station as part of the DHCP offer:

- DHCP Option 6: Domain Name Server
- DHCP Option 15: Domain Name
- DHCP Option 42: Network Time Protocol Servers. If this is not available each time the base stations are restarted the time will need to be set on the system.
- DHCP Option 66: This is the name of the PC running the TFTP Server.
- DHCP Option 67: This is the name of the boot file.

Note: The boot file is supplied on the 4.0 admin CD in the directory "IPDECT". The file is called "ADMM_RFP_1_1_7.tftp". If options 66/67 are not set the base station will attempt to send out a broadcast request for a file called "ip_rfp.bin".

- Public option 225: This is interpreted as VLAN ID. If this option is present the booter will start over and release the current lease and issue a new DHCP request, using the VLAN setting.
- Public option 227: This is interpreted as the IP address of the syslog server.
- Public option 228: This is interpreted as the port that the syslog server is listening on.

All of the above parameters can also be statically configured on the base station using the Java configurator.

Note: The TFTP server needs to support RFC 1350, TFTP Protocol (Revision 2),

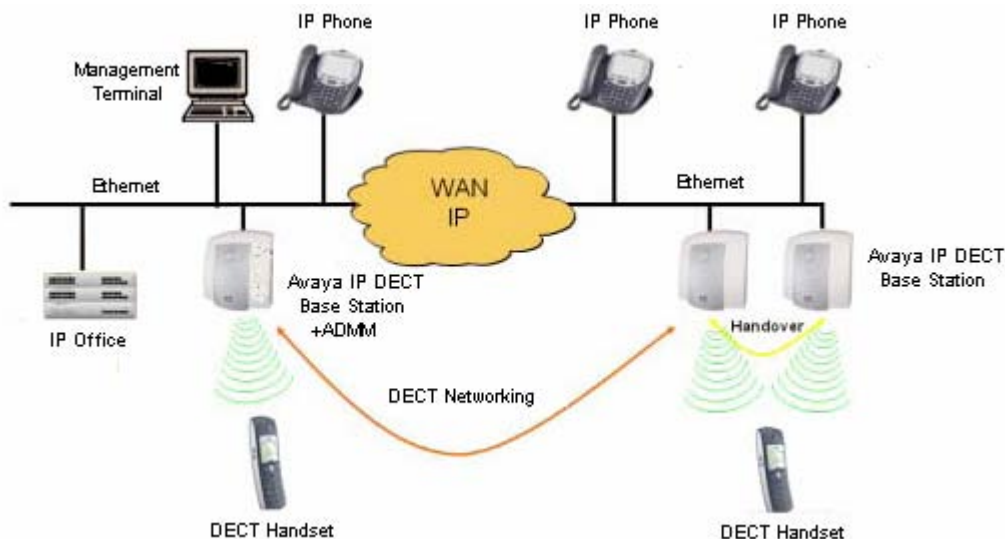
July 1992. The DHCP server needs to support RFC 2131, Dynamic Host Configuration Protocol, March 1997.

The system supports roaming, handover between synchronized IP DECT base stations and DECT Networking between Offices:

Roaming: While in motion the DECT handset performs ongoing measurements to determine which IP DECT base station has the strongest signal. The one that can be best received is defined as the active IP DECT base station. To prevent the DECT handset from rapidly switching back and forth between two IP DECT base stations that can be almost equally well received, certain threshold values are in effect.

Handover: A handover is similar to roaming, but occurs during an ongoing call. A handover normally takes place in the background without disrupting the call (seamless handover). As a caller moves from one base station coverage zone to the next the call must be transferred from one base station to the next. The base stations must be synchronized over the airwaves to support the handover of calls. For the base stations to synchronize to each other the signal strength cannot drop below -70 dBm. You must consider this requirement during the site survey.

DECT Networking: An IP DECT telephone can travel from one office to another which is connected over a wide area network (WAN) link and make and take calls. In this scenario the main IP DECT controller remains at one “headquarters” location.



Each IP DECT base station has the following technical characteristics:

- 10/100 Mbit/s IEEE 802.3 Ethernet interface
- Power over LAN™ standard IEEE 802.3af
- Frequency range: approx. 1,920 – 1,930 MHz (approx. 10 MHz bandwidth)
- 10 carrier frequencies (1,728 MHz spacing) with 12 time slots each
- Voice coding using the ADPCM method
- Net data rate per channel of 32 Kbit/s (for voice transmission using ADPCM)

- Maximum transmission power of 10mW
- 12 available airtime slots
- 8 simultaneous voice calls
- 4 slots for control signaling between the base stations and handsets
- Synchronization via air interface
- Packet handling via RTP/RCTP
- Codecs supported: G.711, G.723, G.729a
- Support of QoS via DiffServ and 802.1pq
- Jitter compensation – Maximum 4 packets (80ms)
- Echo Cancellation
- Network Boot concept, SW download and update
- DHCP / TFTP
- IPv4, SNMPv1/v2c, MIB II, read only and Traps
- Voice Activity Detection with comfort noise
- DSAA Authentication of Base and PP (DECT Standard Authentication Algorithm)
- Connection Handover according to GAP-standard

RFP32

Indoor Base Station



RFP 34

Outdoor base station
(Q42007)



Material Code	Description
700430275	IP DECT Indoor IP DECT base station (NAR)
700430283	IP DECT Outdoor IP DECT base station (NAR) *Not available as of this publication.

3711 – IP DECT Telephone

This telephone is only supported on the Avaya IP DECT system. Avaya 3711 IP DECT telephone features include:

- Speakerphone
- Illuminated keypad
- Illuminated display (Amber)
- Serial connection (mini USB socket) for data transfer and managing local phone book (note that this hardware capability is not supported with IP Office R4.0)
- Headset connection (2.5 mm jack)
- Vibrating alarm
- SOS (emergency) key for speed dialing an emergency number
- Information key that can be used for phone number lists and voice mail indication (Information and speaker key flash when active)
- Personal phone book with 100 entries, independent of the system phone book
- Access to IP Office system Directories
- Mute Capability
- Voice Mail indication
- Missed call indication
- 60 possible ring tones
- Different ring tones for internal, external and priority calls
- 4-level connection field strength display
- Speaker and Telephone volume, 7-levels
- Automatic call pick-up
- Key lock
- Temporary ring tone muting
- Silent charging
- 10 menu languages:
 - Danish, Dutch, English, Finnish, French, German, Italian, Portuguese, Spanish and Swedish
- Illuminated 5-line graphic display, (96 x 60 pixels), variable 7-level contrast
- Stand-by time: up to 200 hrs
- Talk time: up to 20 hrs
- Batteries: 3 AAA (NiMH) included with phone
- Charging time: max. 6 hours for empty batteries
- Weight: 138g incl. batteries
- Dimensions (L x B X H): 146 x 55 x 28 mm



Material Code	Description
700430267	IP DECT 3711 Telephone
700346828	IP DECT Charger for 3711

For a complete list of available system configurations and material codes please refer to the IP Office 4.0 Product Update.

Note: In the event the 3711 handset needs to be upgraded, the required driver “*DECT Phone USB Driver.ms*” can be obtained from: <http://support.avaya.com> . The GA version on the handset should be 91.24.31.3.

IP DECT System Limits

Due to a limited amount of VCM channels available on certain versions of the IP Office Small Office Edition, the Avaya IP DECT system is only certified to work on the 16 VCM version of the IP Office Small Office Edition. Avaya does not support using the Avaya IP DECT system on a Small Office edition that does not have 16 VCM channels. The above constraint does not apply to any other version of IP Office.

Maximum IP DECT telephones registered	120
Maximum IP DECT telephones simultaneously active	100
Maximum concurrent calls between IP Office and each individual IP DECT base station	8
Maximum number of IP DECT base stations	32
Maximum number of concurrent calls into the IP DECT solution on an IP406v2	30
Maximum number of concurrent calls into the IP DECT solution on an IP412	60
Maximum number of concurrent calls into the IP DECT solution on an IP500	100
Number of conferenced parties	1 per VCM port

The following gives some indication of maximum calls under a specific scenario:

- Direct media on (the default setting)
- 60 IP phones
- 60 DCP or Analog telephones
- 60 VCM channels
- At least 16 IP DECT base stations
- All 120 IP DECT Telephones in range

The maximum number of concurrent IP DECT calls in this scenario 100.

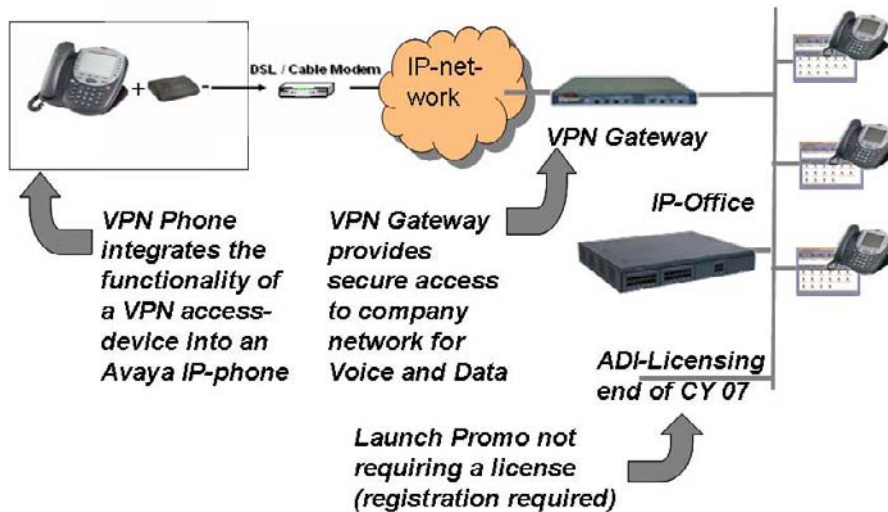
Note: If set to "ON" (default setting) the direct media setting has an effect:

1. Active calls between IP DECT Telephones and IP Phones will not take a VCM resource.
2. Active calls between IP DECT Telephones on differing IP DECT base stations will not use a VCM channel.
3. Calls between IP DECT telephones on the same IP DECT base station will only use a VCM channel for special system functions such as call waiting.

VPN Phone Solution (North American Region Only)

IP Office 4.0.7 introduces support for a new VPN Phone solution. The VPN Phone solution consists of an IP Office VPN Phone license (using the normal ADI process) and special firmware that is used to convert Avaya 4610/20/21 and 5610/20/21 IP telephones. The current version of this firmware is 2.3.249. Once downloaded to an IP telephone, the special firmware will provide full-feature phone connectivity from any high speed IP network using proven and secure VPN technology.

Note: VPN software for 4625 is **not** supported.



The following components are needed to set up a remote IP telephone:

Remote Site:

- IP telephone (either 4610, 4620, 4621, 5610, 5620 or 5621)
- VPN remote software
- Broadband internet access

Main Site:

- IP Office running (at least) Release 4.0.7
- Internal IP extension configured (representing the remote IP telephone noted above)
- VPN gateway to provide access to the company network.
- Licenses for running the desired number of VPN Phones. (See below for Introductory details.)

The VPN Phone will be supported on software version 4.0.7 on all compatible IP Office platforms. The VPN Phone does require VPN access to the customer network. To ensure acceptable quality of service, the VPN Phone supports voice-ready VPN gateways, not the internal VPN gateway of IP Office. In Addition to the supported VPN

gateways tested and supported, **application notes** are available for the following VPN gateways:

- *VPN Remote IP Phone with Netgear FVS338 VPN Router* - IP Office Technical Tip 184
- *VPN Remote IP Phone with Kentrox Q2300 VPN Router* – IP Office Technical Tip 185
- *VPN Remote IP Phone with Adtran Netvanta 3305 Router* – IP Office Technical Tip 186

Voice quality over a unmanaged IP network is unpredictable. While great care has been given to make the VPN Phone highly reliable, Avaya has no influence and therefore cannot guarantee the quality of the IP network used. Avaya therefore cannot assume responsibility for voice quality problems incurred.

For further information please refer to the Technical Tips for the devices listed above at: <http://support.avaya.com> .

Note: *While Avaya has tested these gateways, these are not products of Avaya and, therefore, are sourced through third parties and are not directly supported by Avaya.*

VPN Phone Introductory Offer (North American region only)

For a period of 180 days there will a “free introductory period”. During that period, the VPN Phone can be installed without requiring a license on IP Office software version 4.0.7. Customers wishing to use the solution beyond the 180-day free introductory period will be required to install IP Office 4.1 software in order to obtain the needed number of licenses.

Prerequisites for this 180 day “free introductory period” are:

- Registration of customer (done by their Business Partner) on the Avaya web-site: <https://portal.avaya.com/ptlWeb/products/P0160/Demos>
- Readiness to install a software-upgrade controlling the license in the end of calendar year 2007 using IP Office 4.1 software.
- Purchase of the needed number of licenses if customer wants to use this solution beyond this time-frame.

Pricing is consistent with the SMB market. Please see details in the pricing/licensing in the offer announcement. For details of license prices beyond the introductory time period please refer to the Offer Announcement.

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