



# **IP Office 3.0**

## **Avaya IP Phone Installation**



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# Avaya IP Phones

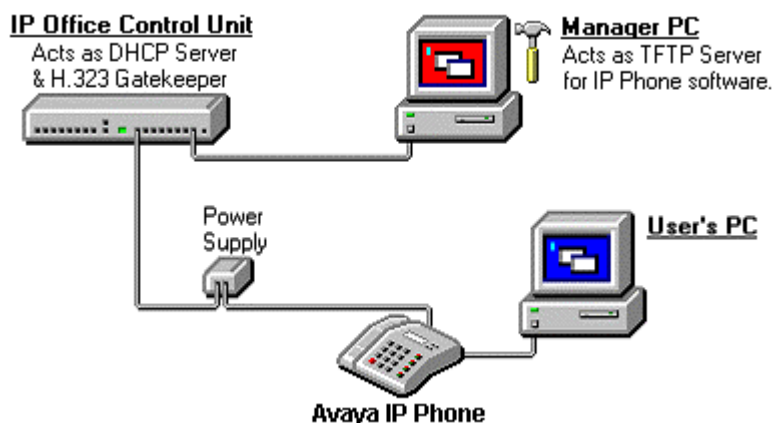
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## Introduction

This guide covers the installation of 4600 Series and 5600 Series of Avaya IP phones on the IP Office. Currently the following Avaya IP phones are supported on IP Office 3.0:

- **4601, 4602, 4602SW, 4606, 4610SW, 4612, 4620, 4620SW, 4624.**
- **5601, 5602, 5602SW, 5610SW, 5620, 5620SW.**
- **3616 and 3626 wireless phones**  
(See Appendix G for installation of these phones.)

The diagram below shows the simplest installation scenario, suitable when only a few Avaya IP phones are being installed.



Please note the following:

- **IP Phone Software Version**  
Avaya IP phones on an IP Office system must use the IP Phone software supplied on the IP Office Administrator Applications CD. Versions of IP Phone software from other sources may not be intended for use with or tested with IP Office.
- **DHCP versus Static IP Installation**  
Though static IP installation of Avaya IP telephones is possible, installation using DHCP is strongly recommended. The use of DHCP eases both the installation process and future maintenance and administration. In addition, following a boot file upgrade, all static address settings are lost and must be re-entered.
- **Network Assessment**  
High quality voice transmission across an IP network requires careful assessment of many factors. We strongly recommend that Avaya IP telephone installation is only done by installers with VoIP experience. The whole customer network must be assessed for its suitability for VoIP before installation. For further details see Network Assessment.
- Full information on LAN administration and configuration is contained in the Avaya documents "**4600 Series IP Telephone LAN Administrator's Guide**" (Avaya Com Code 555-233-507).

## What's New in 3.0

The main changes to IP phone support in IP Office 3.0 is the addition of support for several new phones. These are:

- **Avaya 4600 Series IP Phones**

The following phones in the 4600 Series are now supported on IP Office.

- **4601**

A basic model IP phone with no display and only two programmable feature keys.

- **4610SW**

Similar to the existing 4620SW with 24 programmable display features but has only 6 display keys for accessing those features.

- **Avaya 5600 Series IP Phones**

This is a new range of IP phones introduced for use on IP Office only. These phones are not supported on any other Avaya telephone system. The features of the phones in this range are the same as their equivalent 4600 Series models. The 5600 Series IP phones are:

- **5601**

- **5602**

- **5602SW**

- **5610SW**

- **5620SW**

- **EU24 Add-On**

This phone add-on is now supported for use on IP Office. It can be used with 4610SW, 4620, 4620SW, 5610SW and 5620SW phones to provide an additional 24 programmable feature keys. The add-on connects directly to the phone.

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## Installation Requirements

To install an Avaya IP phone onto IP Office, the following items are required:

- **Extension Number and User Details**

A full listing of the planned extension number and user name details is required. The planned extension number must be unused and is requested by the phone during installation.
- **Power Supply:**

Each phone requires a power supply. Avaya IP phones do not draw power from the telephone switch. A number of options exist for how power is supplied to the phones, see Power Supply Options.
- **LAN Socket:**

A 10/100Mbps RJ45 Ethernet LAN connection point is required for each phone.
- **Category 5 Cabling**

All LAN cables and LAN cable infrastructure used with Avaya IP phones must be Category 5 cabling.
- **LAN Cables:**

Check that an RJ45 LAN cable has been supplied with the Avaya IP phone for connection to the power unit. You will also need an additional RJ45 LAN cable for connection from the power unit to the customer LAN.

  - A further RJ45 LAN cable can be used to connect the user's PC to the LAN via the IP telephone [not supported on 4601, 4602, 5601 and 5602 IP phones].
- **Voice Compression Module:**

The IP Office Control Unit must have voice compression channels available. The number of voice compression channels limits the number of simultaneous VoIP calls:

  - On Small Office Edition units, voice compression channels are pre-built into the unit.
  - On all other control units, voice compression channels are provided by fitting a Voice Compression Module. See Voice Compression
- **DHCP Server:**

The IP Office Control Unit can perform this role. If another DHCP server already exists this may be able to do DHCP for the Avaya IP phones, see Alternate DHCP Servers. Static IP addressing can also be used if required but is not recommended.
- **TFTP Server:**

A PC running the IP Office Manager application can perform this role. The TFTP server is only required during IP telephone installation and maintenance.
- **H323 Gatekeeper:**

The IP Office Control Unit can perform this role unless a third party gatekeeper already exists.
- **IP Office Manager PC:**

A PC running Manager is required for IP Office Control Unit configuration changes. This PC should have a static IP address.
- **IP Telephone Software:**

The software for IP telephone installation is supplied on the IP Office Administrator Applications CD and installed into the Manager program folder during Manager installation.
- **Licence Keys:**

Avaya IP telephones do not need a licence key entered on the system. An **IP End-Points** license is only required for non-Avaya IP phones.

## Network Assessment

Current technology allows optimum network configurations to deliver VoIP with voice quality close to that of the Public Switched Telephone Network (PSTN). However few networks are optimum and so care should be taken assessing the VoIP quality achievable across a customer network.

Not every network is able to carry voice transmissions. Some data networks have insufficient residual capacity for even compressed voice traffic. In addition, the usual approach of developing data networks by integrating products from many vendors makes it necessary to test all the network components for compatibility with VoIP traffic.

It is assumed that a network assessment has been performed, with or without the assistance of Avaya, before attempting to install VoIP. You must do this in order to have a high degree of confidence that the existing data network has the capacity to carry voice packet traffic and is compatible with the required technology.

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 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.

It is important to distinguish between compliance with the minimal VoIP standards and support for QoS which is needed to run VoIP on your configuration.



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## Voice Compression Channels

IP Office Voice Compression channels are used when a VoIP call goes between a device on the IP data network (LAN or WAN) and a device on the TDM telephony interface, for example a DS, DT or POT extension or a non-IP trunk.

Calls between IP extensions do not normally need a VCM channel once the call is connected but do use VCM channels for call signalling tones, music-on-hold, etc.

The VCM channels automatically use either G.723 (6k3) or G.729a (8k) compression Codecs and provide echo cancellation required for high latency circuits. Avaya IP telephones support G.711, G.729a and G.729b, thus G.729b is normally auto-negotiated when these phones are used on IP Office.

The number of available voice compression channels in an IP Office Control Unit can limit the number of VoIP calls. On IP401, IP403, IP406, IP406 V2 and IP412 control units, channels are added by installing VCM modules. The type and number of VCM modules that can be installed depends on the control unit type.

- **IP401:** Support a single VCM 5 module.
- **IP403:** Support a single VCM 5, 10 or 20 module.
- **IP406 V1:** Support a single VCM 5, 10 or 20 module.
- **IP406 V2:** Supports a single VCM 5, 10, 20 or 30 module.
- **IP412:** Supports any two modules from VCM 5, 10, 20 or 30, ie. up to 60 voice compression channels.
- **Small Office Edition:** Supplied with either 3 or 16 VCM channels pre-built into the unit. These cannot be upgraded.

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## QoS

When transporting voice over low speed links it is possible that normal data packets (1500 byte packets) can prevent or delay voice packets (typically 67 or 31 bytes) from getting across the link. This can cause a very unacceptable speech quality.

Thus it is vital that the traffic routers in the network have some form of Quality of Service mechanism (QoS). QoS routers are essential to ensure low speech latency and to maintain sufficient audible quality.

IP Office supports the DiffServ (RFC2474) QoS mechanism. This is based upon using a Type of Service (ToS) field in the IP packet header. On its WAN interfaces, the IP Office use this to prioritizes voice and voice signalling packets. It also fragments large data packets and where supported provides VoIP header compression to minimize the WAN overhead.

Note that the IP Office does not perform QoS for its Ethernet ports including the WAN Ethernet port on the Small Office Edition.

## Potential VoIP Problems

It is likely that any fault on a network, regardless of its cause, will initially show up as a degradation in the quality of VoIP operation. This is regardless of whether the fault is with the VoIP telephony equipment. Therefore in installing a VoIP solution, you must be aware that you will become the first point of call for diagnosing and assessing customer network issues.

### Potential Problems

- **End-to-End Matching Standards:**  
VoIP depends upon the support and selection of the same voice compression, header compression and QoS standards throughout all stages of the calls routing. The start and end points must be using the same compression methods. All intermediate points must support DiffServ QoS.
- **Avoid Hubs:**  
Hubs introduce echo and congestion points. If the customer network requires LAN connections beyond the capacity of the IP Office Control Unit itself, Ethernet Switches should be used. Even if this is not the case, Ethernet Switches are recommended as they allow traffic prioritization to be implemented for VoIP devices and for other device such as the Voicemail Server PC.
- **Power Supply Conditioning, Protection & Backup:**  
Traditional telephone systems provide power to all their attached telephone devices from a single source. In a VoIP installation, the same care and concern that goes into providing power conditioning, protection and backup to the central telephone system must now be applied to all devices on the IP network.
- **Multicasting:**  
In a data only network, it is possible for an incorrectly installed printer or hub card to multicast traffic without that fault being immediately identified. On a VoIP network incorrect multicasting will quickly affect VoIP calls and features.
- **Duplicate IP Addressing:**  
Duplicate addresses is a frequent issue.
- **Excessive Utilization:**  
A workstation that constantly transmits high traffic levels can flood a network, causing VoIP service to disappear.
- **Network Access:**  
An IP network is much more open to users connecting a new devices or installing software on existing devices that then impacts on VoIP.
- **Cabling Connections:**  
Technically VoIP can (bandwidth allowing) be run across any IP network connection. In practice Cat5 cabling is essential.

## Power Supply Options

Avaya IP telephones can be powered using a number of options. The main characteristic is to power the phones either via the spare wires in the network cable or on the same wires as the data signals (802.3.af Power over Ethernet).

### Spare Wire Power Options

The following power supplies use the spare pin 7 & 8 connections in the CAT5 network cable.

- **Avaya 1151B1 Power Supply Unit (PSU)**

A power supply unit for a single Avaya IP phone. Has a **LINE** port for the LAN cable from the IP Office, and a **PHONE** port for the LAN cable to the Avaya IP phone. Power into the PSU requires a 90 to 264V AC, 47 to 63HZ mains supply. A green LED indicates when power is available.



- **Avaya 1151B2 Power Supply Unit**

Same as the 1151B1 above but with integral battery backup. When AC mains supply is removed, the battery will power the Avaya IP telephone for between 8 hours at light load (2 Watts) and 15 minutes at full load (20 Watts). A green LED indicates when power is available. A yellow LED indicates when the backup is charging. The green LED flashes when the phone is running from the backup battery.



- **Avaya 1152A1 Power Distribution Unit (Mid-Span Power Unit)**

This is a 1U high 19-inch rack mountable unit. It can support up to twenty-four Avaya IP telephones. It provides 24 RJ45 LAN data in ports and 24 RJ45 LAN data and power out ports. It can support a maximum of 200 Watts or a peak of 16.8 Watts per port.



## 802.3af Power over Ethernet Options

IEEE 802.3af is a standard, commonly known as Power over Ethernet (PoE), that allows network devices to receive power via the network cable. All the Avaya IP telephones supported on IP Office also support this standard.

### Power of Ethernet (POE) Switch

The Avaya P333T-PWR Switch is a Ethernet LAN switch which also provides PoE input for up to 24 devices including Avaya IP phones.



- **IP Phone Inline Adaptor**

This adaptor allows 4602, 4602SW and 4620 IP phones and equivalent 5600 Series models to be powered from a Cisco Catalyst power blade. Up to 24 Avaya IP phones have been supported on a single power blade using these adaptors. Note however that the phones do not provide the Catalyst switch with information on their power requirements and future changes to Catalyst switch software may affect operation



### \*4606, 4612 and 4624

Applies to GEN2 and later models. The GEN of these phones can be determined from the label on the base of the phone. The label text giving the phone's type, for example **4624D**, is followed two digits which give its generation (GEN) number, for example **4624D01**. GEN1 4612 and 4624 phones can be Ethernet powered using an Avaya 30A Switch Upgrade Base unit.

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## User PC Connection

To simplify the number of LAN connections from the user's desk, it is possible to route their PC Ethernet LAN cable via some Avaya IP phones.

The LAN cable should be connected from the PC to the socket with a PC symbol (🖨) at the back of the Avaya IP Phone.

The PC's network configuration does not need to be altered from that which it previously used for direct connection to the LAN.

This is not supported on the 4601, 4602, 5601 and 5602 Avaya IP phones.

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# Installation

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## 1. Preparation

Check the following before beginning installation. These are essential steps and installation will fail if they are not followed.

1. **Manager PC Static Address:**

Ensure that the Manager PC has been given a static IP address.

2. **Voice Compression Module:**

The IP Office Control Unit must be fitted with a Voice Compression Module (VCM). For an Small Office Edition control unit a number of voice compression channels are preinstalled on the motherboard.

- Start the IP Office Monitor application. The initial lines of Monitor output include the item **VCOMP=** which will state the number of voice compression channels installed in the control unit.

3. **Control Unit Settings:**

Using the Manager Application, open the configuration and select the **System** form. Check the following:

a. **System Name:**

In the System tab ensure that a **Name** for the Control Unit has been entered.

b. **TFTP Server IP Address:**

In the LAN1 tab, enter the IP address of the Manager PC as the **TFTP Server IP Address**.

c. **Gatekeeper Settings:**

In the Gatekeeper tab, ensure that **Gatekeeper Enabled** and **Auto-create Extn Enable** are both selected. If you do not want to install using auto-create extension, you will need to configure the required extensions and user at this stage, see Manually Creating Extensions.

d. If you have made any changes, upload the new configuration to the Control Unit.

e. Within Manager, select **File | Preferences** and ensure that the address is 255.255.255.255, otherwise TFTP will not work.

4. **IP Phone Software:**

The software for IP telephone installation is supplied on the IP Office Administration CD. The files are copied into the Manager folder during installation of the Manager application.

- An additional file (**46xxsettings.txt**) is also required. See 1a. Creating a 46xxsettings.txt File .

5. **Manager and TFTPLog:**

Leave Manager running. It is also useful to have Manager's TFTP Log visible (select **View | TFTPLog**). This will display the progress of file requests.

6. **Extension Number and User Name Details**

A full listing of the planned extension number and user name details is required. The planned extension number must be unused and is requested by the phone during installation.

## 4601 and 5601 Installation

These two IP phones do not have a display screen to assist with installation and diagnostics.

The only method of installation supported is DHCP and this means the preparation requirements listed in 1. Preparation are essential for successful installation.

During installation the phone obtains and stores the IP addresses of the Call Server (the IP Office gatekeeper) and the TFTP server (the Manager PC). Currently we are not aware of any field method for resetting these values in order to move a 4601 or 5601 to a different IP Office system.

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### 1a. Creating a 46xxsettings.txt File

During installation, the Avaya IP phones request software by downloading and following instructions within the **46xxupgrade.scr** file (see The 46XX Upgrade Script File). This file is provided as part of the IP Office Manager software and should normally not be changed.

The last lines of the **46xxupgrade.scr** file instruct the phone to request the file **46xxsettings.scr** or **46xxsettings.txt**. If present, that file is downloaded and used to set customer site specific options for the Avaya IP phones.

#### If not present:

1. Using Windows Notepad or any other plain text editing tool, create a text file called **46xxsettings.txt**.
2. Edit the file to contain the following:

```
## 4600 Site Specific Settings
SET L2Q 2

## END OF FILE
```

  - The **SET L2Q 2** is recommended for IP Office operation.
  - For other settings, see The 46XX Settings Script File.
  - If 4610 or 4620 phones are being installed, this file is used to set the home page for their WML web browsing, see WML Server Setup.
3. Place this file in the same folder as the 4600 Series IP Phone software, normally this is the same folder as the Manager application.

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## 2. Phone Connection

1. Follow the steps in 1. Preparation. If those steps are not followed installation will fail.
2. Connect the network LAN cable to the data in socket of the power supply being used for the phone.
  - On 1151A1/1151A2 Power Supply Units the socket is marked **LINE**.
  - On the 1152A1 Power Supply Unit the lower sockets are data in.
3. Connect the LAN cable supplied with the IP telephone from the power supplies data and power out socket to the socket with a LAN port symbol (□) at the back of the IP telephone.
  - On 1151A1/1151A2 Power Supply Units the socket is marked **PHONE**.
  - On the 1152A1 Power Supply Unit the upper sockets are data and power.
4. The phone's message indicator should glow red for a few seconds. The phone will then begin its software loading.
5. After a short delay the phone should display **Initializing** and then **Loading....** The loading phase may take a few minutes.
  - If the phone displays **No Ethernet** check the connection to the LAN.
6. The phone displays **DHCP** and a timer. It is attempting to obtains IP address information from a DHCP server on the network.
  - **To continue with DHCP address installation**  
See 3a. DHCP Address Installation
  - **To switch to static address installation**  
Press \* whilst **DHCP** is shown if you want to enter static address installation. See 3b. Static Address Installation. This is not supported for the 4601 and 5601.

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## 3a. DHCP Address Installation

1. Having connected the phone (see 2. Phone Connection) it eventually displays DHCP and a timer.
  - On 4601 and 5601 phones, initially all lamps will be on as the phone initializes. All lamps on with the button **a** lamp flashing indicates attempting DHCP.
2. After a few seconds it should complete DHCP negotiation. If the timer reaches more than 60 seconds, you should suspect an error in either the network or DHCP operation.
3. The phone requests the 46xxupgrade.scr file from the TFTP server (Manager). This should be visible in the Manager's TFTP Log and on the phones display.
  - On 4601 and 5601 phones, all lamps will be on with both the button **a** and button **b** lamps flashing whilst TFTP is attempted and occurring.
4. The phone now requests additional files according to the instructions it found in the 46xxupgrade.scr file. The phone will go through a cycle of requesting files, loading files and then transferring the files into its flash memory.
5. Following file loading the phone displays **Ext. =**. See 4. Phone Registration.

## 3b. Static Address Installation

**WARNING: Static addressing is only necessary when a DHCP server is unavailable. For ease of maintenance and installation it is strongly recommended that a DHCP server is installed and that static addressing avoided. Following a boot file upgrade static address information must be reinstalled.**

**This process is not supported on 4601 and 5601 phones.**

1. Follow the steps in 2. Phone Connection.
2. Start manual address programming by doing either of the following:
  - When **DHCP** is shown on the phone press \*.
  - While the phone is on-hook and idle, press the following key sequence; **Hold 2 3 3 7 # (Hold A D D R #)**.
3. For details of entering data such as back spacing see Entering Data for Administrative Options.
4. The phone displays **Phone=**. This is the phone's IP address. Press **#** to accept the current value or enter a value and then press **#**.
  - If entering a new value, use the \* key to enter a '.' character between digits. Use the < key to backspace if necessary.
5. The phone displays **CallSv=**. This is the address of the Gatekeeper. Press **#** to accept the current value or enter a value and then press **#**.
  - If the IP Office is acting as the Gatekeeper, then this is the IP address of the IP Office Control Unit (LAN1).
6. The phone displays **CallSvPort=**. This is the Gatekeeper transport layer port number, a value between 0 and 65535. Press **#** to accept the current value or enter a value and then press **#**.
  - For IP Office Gatekeeper operation, enter 1719 and then press **#**.
7. The phone displays **Router=**. This is the address of its default gateway. Press **#** to accept the current value or enter a value and then press **#**.
  - For IP Office operation, this is the IP address of the IP Office Control Unit.
8. The phone displays **Mask=**. This is its IP Mask (also called sub-net mask). Press **#** to accept the current value or enter a value and then press **#**.
  - This should match the IP mask set for the IP Office Control Unit.
9. The phone displays **FileSv=**. This is the address of the TFTP server. Press **#** to accept the current value or enter a value and then press **#**.
  - This should match the IP address of the PC running the Manager application.
10. The phone displays **802.1Q=auto**. Press \* twice to change the setting to **802.1Q=off**, then press **#** to accept this value.
11. The phone displays **VLAN ID=0**. Press **#** to accept this value.
12. The phone displays **Save new values?**. Press **#** to save the new values you have entered. New values being saved is shown, the phone then resets.
13. Installation is now the same as from Step 3 of DHCP Address Installation, see 3a. DHCP Address Installation.

Note: If a new boot program is downloaded from the TFTP server after you enter static addressing information, you will need to reenter your static addressing information.



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## 4. Phone Registration






The following will also occur following any power loss to the telephone.

1. Following file loading, the phone displays **Ext. =**. Enter the extension number you want applied to the phone and press **#**.
  - On 4601 and 5601 phones, this stage is indicated by the lamp at the top of the phone and on the MESSAGES button flashing 0.5 seconds on/off.
  - If not using auto-create extension, the extension number selected must be a pre-configure VoIP extension, see Manually Creating Extensions.
  - If the phone has been previously installed and has not been reset it will display the extension number that it last used.
  - **Wrong Set Type** is displayed if you try to use the extension number of an existing non-IP extension.
2. The phone displays **Password =**.
  - If using auto-create extension for a new extension, just enter any number and press **#**. Any digits entered for a password here are not validated or stored.
  - If not using auto-create extension for a new extension, enter the User's **Login Code** set in the IP Office Manager.
  - During subsequent phone restarts, even though the password is requested, it will only be validated if the phone's extension number is changed.
3. On display phones, the phone display the time, date and then its extension number.
4. Test that you can make and receive calls at the extension.

## 5. Extension & User Setup

If installing using auto-create extensions, you can now use IP Office Manager to open the control unit's configuration and alter the extension and user settings for the telephone.

The following process covers the minimum extension and user setup required.





1. In Manager, click on  to receive the system's configuration.
2. Click on  **Extension** to display the list of existing extensions.
3. The  icon indicates VoIP extensions. A new extension will have been created matching the extension number entered above. In the extension's **VoIP** tab, the **Compression Mode** default is **Automatic Selection**.
4. Click on  **User** to display the list of existing users. In the list of users, a new user will have been created matching the VoIP extension number above.
5. Double-click on the Avaya IP telephone extension user to display their settings.
6. In the **User** tab set the user **Name** and **Full Name** as required.
7. Click the **Digital Telephony** tab.
8. For the first three buttons, we recommend that you click on the **Action** field and select **Appearance | Call**.
9. Click **OK**.
10. When all new IP phone extension have been setup, click on  to send the new configuration back to the system. Set the **Reboot Mode** to **Immediate** or **When Free** as Extension changes cannot be merged.

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## Manually Creating Extensions

If installing without auto-create extensions enabled, then VoIP extensions and associated users must first be created in IP Office Manager.

The procedure below covers the minimum required to create a VoIP extension and associated user. Further customization is as per any extension and user.

1. In Manager, click on  to receive the system's configuration.
2. Click on  **Extension** in the left-hand panel to display the list of existing extensions. Right-click on the right-hand panel and select **New**.
3. In the **Extn** tab, set the following:
  - **Extension ID:**  
For non-VoIP extension this number is assigned automatically. For a VoIP extension enter any number so long as it is unique, ie. not already used by another extension.
  - **Extension:**  
Enter the extension number to assign to the telephone. Again this must be unique.
4. In the **VoIP** tab, the required IP Address and/or MAC Address can be set if required for additional phone security. See Phone Security.
5. Click **OK** to add the new extension.
6. Click on  **User** in the left-hand panel to display the list of existing users. Right-click on the right-hand panel and select **New**.
7. In the **User** tab set the following:
  - **Name:**  
Enter a name for the extension user. The name must be unique. If voicemail is in use, this name will be used as the basis for a new mailbox with matching name.
  - **Extension:**  
This must match the extension number set in the VoIP extension created above.
8. Click on the **Digital Telephony** tab.
9. For the first three buttons, we recommend that you click on the **Action** field and select **Appearance | Call**.
10. Click on **OK**.
11. When all new IP phone extension being added have been setup, click on  to send the new configuration back to the system. Set the **Reboot Mode** to **Immediate** or **When Free** as Extension changes cannot be merged.

## Phone Security

There are a number of methods by which additional security can be implemented to ensure that on IP phone does not adopt the identity of another.

- **Disable Auto-Create Extension**  
Following installation, disabling **Auto-Create Extn Enabled** in the IP Office Manager **System | Gatekeeper** tab stops new IP devices from assigning themselves as new extensions.
- **Restrict the IP or MAC Address**  
Entering either of these values in the Extension's VoIP tab will restrict usage to that address or device. The MAC address of an Avaya IP Telephone is printed on a label on the base of the phone.
- **Set a User Login Code**  
If a user Login Code is set, then any other IP device trying to log on as that extension must also enter the correct login code. Note that if a login code is set, the user can use hot desk to log off and log on elsewhere.

---

## Listing Registered Phones

Using TFTP, a list can be obtained from the IP Office system of all the registered RAS users which includes IP phones. For example:

```
Extn2602,2602,192.168.42.2,1720
ains600,2600,192.168.42.10,1026
Extn2601,2601,192.168.42.4,1720
New,2702,192.168.42.200,1720
```

1. In Windows select **Start | Run** and enter **cmd** for the Windows command line interpreter.
2. If necessary use **cd** commands to select the directory into which you want the list placed as the current directory.
3. Enter `tftp -i xxx.xxx.xxx.xxx get nasystem/h323_ras_list yyyyyyyy.txt` where:
  - `xxx.xxx.xxx.xxx` is the IP address of the IP Office system control unit.
  - `yyyyyyy.txt` is the name of a text file that doesn't already exist in that directory..
4. The TFTP command will confirm when the file has been successfully transferred.
5. Type **exit** to close the command line interpreter window.
6. Open the text file using Wordpad or a similar tool.

The IP Office Monitor application (Sysmon) can also show how many phones have registered and how many are currently waiting to register. This appears as lines of the form:

```
792ms PRN: GRQ from c0a82c15 --- RAS reaches the maximum capacity of 10; Endpoints reistered 41
```

The **System | Print** trace filter option must be selected to see these and other IP phone registration messages.

---

# Static Administration

---

## Static Administration Options

A number of settings can be altered through the telephone after installation. Note however that values assigned through static administration will not be changed by future upgrade scripts. They will remain active for the IP Telephone until a new boot file is downloaded.




These procedures should only be used if you are using static address installation. Do **not** use these procedures if you are using DHCP.

- To set parameters for all Avaya IP phones on a system, you can edit the 46XXsettings.scr script file. See The 46XX Settings Script File.

---

## Entering Data for Administrative Options

This section describes how to enter data for the administrative options.

1. All local procedures are started by dialing **Hold** and then a sequence of up to 7 numbers followed by #.
2. A 6-second timeout is in effect between button presses after the **Hold** button is pressed; if a valid button is not pressed within 6 seconds of the previous button, the collected digits are discarded, and no administrative option is started.
3. Attempts to enter invalid data are rejected, and the phone emits an error beep.
4. If a numeric digit is entered for a value or for a field of an IP address or subnet mask after only a zero has been entered, the new digit will replace the zero.
5. Press # to go to the next step.
6. To backspace within a field depends upon the phone type:
  - **4601, 4602, 5601, 5602:**  Speaker key.
  - **4606:**  Conference key.
  - **4612 & 4624:**  Previous key.
  - **4610, 4620, 5610, 5620:** Left-most key.


## QoS Option Settings

Administering QoS options is not mandatory, but it is highly recommended. Use the following procedure to set Quality of Service (QoS) options.


1. While the phone is on-hook and idle, press the following sequence: **Hold 7 6 7 # (Hold Q O S #)**. The current 802.1Q setting is shown.
2. The phone displays **L2 audio=**. This is the phone's current 802.1 audio parameter. Press **#** to accept the current value or enter a value (between 0 and 7) and then press **#**.
3. The phone displays **L2 signaling=**. This is the phone's 802.1 signaling parameter. Press **#** to accept the current value or enter a value (between 0 and 7) and then press **#**.
4. The phone displays **L3 audio=**. This is the phone's Differential Services audio parameter. Press **#** to accept the current value or enter a value (between 0 and 63) and then press **#**.
5. The phone displays **L3 signaling=**. This is the phone's Differential Services signaling parameter. Press **#** to accept the current value or enter a value (between 0 and 63) and then press **#**.
6. If no new values were entered during this procedure, the phone displays **No new values**. Press **#** to end the procedure.
7. If new values were entered during this procedure, the phone displays **Save new values?**. Press **\*** to end the procedure or **#** to save the new values.
8. If you press **#**, the phone displays **New values being saved** and then returns to normal operation.

---

## Secondary Ethernet (Hub)/IR Interface Enable/Disable

Use the following procedure to enable or disable the hub interface found on some Avaya IP phones (usually marked with a  symbol). The default for the hub interface is **enabled**.

The same procedure can also be used to enable or disable the IR port found on some Avaya IP phones, see Infrared Dialing for more details.

1. While the phone is on-hook and idle, press the following sequence: **Hold 4 6 8 # (Hold I N T #)**
2. The phone displays **PHY2=** and its current setting. This is the PC connection LAN socket marked as  on the telephone.
3. Press **1** or **0** to enable or disable the hub interface respectively. Press **#** to continue.
4. The phone displays **IR=** and its current setting. This is the infrared (IR) port located on the front of some Avaya IP telephones.
5. Press **1** or **0** to enable or disable the hub interface respectively. Press **#** to continue.
6. If you changed the setting, **Save new values?** is displayed. Press **\*** to end the procedure or **#** to save the new values.
7. If you press **#**, the phone displays **New values being saved** and then returns to normal operation.

---

# Appendix A: Miscellaneous

---

## Error Messages

The 4600 Series IP Telephones issue error messages in English only.

- **Checksum error:**  
Downloaded application file was not downloaded or saved correctly. The telephone automatically resets and attempts to re-initialize.
- **DHCP: CONFLICT:**  
At least one of the IP address offered by the DHCP server conflicts with another address. Review DHCP server administration to identify duplicate IP addresses.
- **Failed to set phone IP address:**  
The Avaya IP phone was originally installed on one switch with Static Addressing, and has subsequently been installed on another switch with an active DHCP server assigning dynamic IP addresses. Reset the telephone.
- **File too large Cannot save file:**  
The telephone does not have sufficient room to store the downloaded file. Verify the proper filename is administered in the TFTP script file, and that the proper application file is located in the appropriate location on the TFTP server.
- **Hardware failure:**  
Hardware failure prevented downloading of application file. Replace telephone.
- **IP Address in use by another:**  
The telephone has detected an IP address conflict. Verify administration to identify duplicate IP addresses.
- **No Ethernet:**  
When first plugged in, the IP Telephone is unable to communicate with the Ethernet. Verify the connection to the Ethernet jack, verify the jack is Category 5, verify power is applied on the LAN to that jack, etc.
- **No file server address:**  
The TFTP server IP address in the IP telephone's memory is all zeroes. Depending on the specific requirements of your network, this may not be an error. If appropriate, either administer the DHCP server with the proper address of the TFTP server, or administer the telephone locally using the ADDR option.
- **Resetting on URQ:**  
Restarting following a reboot of the IP Office Control Unit.
- **System busy:**  
The resource being called upon should be checked for its availability. If it appears operational and properly linked to the network, verify addressing is accurate and a communication path exists in both directions between the telephone and the resource.
- **Timeout Error:**  
Protocol timeout error. Retry. If failure continues, check network congestion, addresses, etc. to identify cause of timeout.
- **TFTP Error:**  
Request for file from TFTP server timed out. Check that IP Office Manager or the indicated TFTP source within the IP Office configuration are running and that the 4600 Series phone software files are available.
- **Wrong Set Type:**  
Another device is already assigned to the extension number of the IP phone.

## View Administrative Details

You can use the following procedure to view a number of telephone details. These are in addition to the other static address and local administration options which can also be used to review settings.

1. While the phone is on-hook and idle, press the following sequence: **Hold 8 4 3 9 # (Hold V I E W #)**
2. The phone displays **View** settings.
  - Press **\*** at any time during viewing to display the set of details.
  - Press **#** at any time during viewing to end the procedure and restore the user interface to its previous state.
3. The names and values displayed are:
  - **Model**  
Shows the phones model number; for example. 4624D02A.
  - **Market**  
Shows 1 for export or 0 for domestic (US).
  - **Phone SN**  
Shows the phone's Serial Number.
  - **PWB SN**  
Shows the phone's Printed Wiring Board Serial Number.
  - **PWB comcode**  
Shows the PWB's comcode.
  - **MAC address**  
Shows the phone's MAC address as paired hexadecimal numbers.
  - **filename1**  
Shows the name of the telephone application file in the phone's memory.
  - **10Mbps Ethernet or 100Mbps Ethernet**  
Shows the speed of the detected LAN connection.
  - **filename2**  
Shows the boot file name and level. Note these are values from within the boot file loaded and not the actual file name.



---

## Reset System Values

Use the following procedure to reset most of the phones values.

- If a phone has been moved from another IP Office system, it will still retain values such as the DHCP and TFTP server address. To fully reset the phone first go through a static installation setup and then reset the phone as below.
1. While the phone is on-hook and idle, press the following sequence: **Hold 7 3 7 3 8 # (Hold R E S E T #)**
  2. The phone displays Reset values?
  3. Press \* to cancel this procedure or press # to reset values to their defaults.
    - **WARNING:** As soon as you press #, all static information will be erased without any possibility of recovering the data.
  4. The phone displays **Resetting values** whilst the system values are reset to their defaults.
  5. Once the system values are reset, the phone displays **Restart phone?**
    - Press \* to end the procedure without restarting the telephone.
    - Press # to restart the telephone. The remainder of the procedure then depends on the status of the boot and application files, see Restart Scenarios.

---

## Self-Test Procedure

1. To start the Avaya IP phone self-test procedures, press the following sequence: **Hold 8 3 7 8 # (Hold T E S T #)**
2. The phone does the following:
  - Each column of programmable button LED's is lit for half a second from left to right across the telephone, in a repeating cycle. The Speaker/Mute LED and the message waiting LED are also lit in sequence.
  - Buttons (other than #) generate a click if pressed.
  - Telephones with displays display Self test #=end for 1 second after self-test is started. Then a block character (all pixels on) is displayed in all display character locations for 5 seconds. Display of the block character is used to find bad display pixels.
3. One of the following is finally displayed:
  - If self-test passes:  
**Self test passed**  
**#=end**
  - If self-test fails:  
**Self test failed**  
**#=end**
4. To end the self-test, press #. The phone returns to normal operation.

## Site Specific Option Number




The Site Specific Option Number (SSON) is used by Avaya IP phones to request information from a DHCP server. This number must be matched by a similarly numbered 'option' set on the DHCP server that define the various settings required by the phone.

- **WARNING: Do not perform this if using static addressing. Only perform this procedure if using DHCP addressing and the DHCP option number has been changed from the normal default (176).**

### Setting the SSON on an Avaya IP Phone:

1. While the phone is on-hook and idle, press the following sequence: **Mute 7 7 6 6 # (Mute S S O N #)**
2. The phone displays **SSON=** followed by the current value.
3. Enter the new setting. This must be a number between 128 and 255.
4. Press \* to cancel this procedure or press # to save the new value.

### Setting the SSON on the IP Office:

1. In IP Office Manager, click  to receive the system's current configuration.
2. Double-click  **System**.
3. Click the **Gatekeeper** tab.
4. Set the **SSON** field to the required number.
5. Click **OK**.
6. Click  to send the configuration back to the system. Select **Immediate** or **When Free** as the **Reboot Mode**.

---

## Automatic Gain Control

Automatic gain control (AGC) raises the volume when a caller is speaking quietly and lowers the volume when the caller is loud. AGC can be separately switched on or off for the phone handset, headset and speaker.

The AGC settings for all Avaya IP phones can also be set through the 46xxsetting.txt file, see The 46XX Settings Script File.

### Switching automatic gain control on/off:

1. While the phone is on-hook and idle, press the following sequence: **Mute 2 4 2 # (Mute A G C #)**.
2. The phone displays **Handset AGC =** followed by the current setting. Press the indicated key for the required setting (**0** = off and **1** = on) and then press **#**.
3. The phone displays **Headset AGC =** followed by the current setting. Press the indicated key for the required setting (**0** = off and **1** = on) and then press **#**.
4. The phone displays **Speaker AGC =** followed by the current setting. Press the indicated key for the required setting (**0** = off and **1** = on) and then press **#**.
5. The phone should return to its normal idle state.

---

# Appendix B: IP Telephone Files

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## IP Telephone Files

The files necessary to operate an Avaya IP phone with IP Office are available on the IP Office Administrator Applications CD. They are installed to the program folder of the IP Office Manager application.

The following types of file are needed:

- **Boot File:** *for example. Bbla0\_11.bin*  
Contained in the telephone when it is shipped from the factory. This file contains the software that allows the telephone to connect to the LAN and attempt to acquire necessary files and connectivity.
  - **Note:** If a new boot program is downloaded from the TFTP server after you enter static addressing information, you will need to re-enter the static addressing information.
- **Telephone Application File:** *for example. Def24r01\_1.bin*  
Contains the telephony functionality of the telephone. Different files are provided for different telephone models.
- **Upgrade Script File:** *46XXupgrade.scr*  
Tells the telephone which application files (see above) it should load and use. See The 46XX Upgrade Script File.
- **Settings Script File:** *46XXsettings.scr*  
This file is used to customize various parameters. See The 46XX Settings Script File.

## The 46XX Upgrade Script File

Following any restart, each Avaya IP phone attempts to load the **46XXUpgrade.scr** file from the TFTP server. If not found, the phone attempts to continue operation with its previous settings and software.

The **46XXUpgrade.scr** file contains a command script. The phone uses this to check the name of the boot and application files it is currently has against those the script says it should have. Where there is a difference, the phone will request the new file from the TFTP server.

Normally, no changes should be made to the 46XXUpgrade.scr file, except possibly using a # to comment out either of the last two lines which refer to 46XXsettings.

The following is an example upgrade script file, the file will change for each software release:

```
#####
#check bootApp version #
IF $MODEL4 SEQ 4602 goto BOOTAPP4602
IF $MODEL4 SEQ 4606 goto BOOTAPP46XX
IF $MODEL4 SEQ 4612 goto BOOTAPP46XX
IF $MODEL4 SEQ 4620 goto BOOTAPP4620
IF $MODEL4 SEQ 4624 goto BOOTAPP46XX
goto END
# BOOTAPP4602
IF $BOOTNAME SEQ bb4602r1_61.bin goto DEF46XX
SET APPNAME bb4602r1_61.bin
goto END
# BOOTAPP4620
IF $BOOTNAME SEQ 4620COMMON.V14 goto DEF46XX
SET APPNAME bbla20_0_14.bin
goto END
# BOOTAPP46XX
IF $BOOTNAME SEQ 46XXCOMMON.V36 goto DEF46XX
IF $BOOTNAME SEQ 46XXCOMMON.V52 goto DEF46XX
IF $BOOTNAME SEQ 46XXCOMMON.V65 goto DEF46XX
SET APPNAME bbla0_65.bin
goto END
#####
#download definity bigApp #
# DEF46xx
IF $MODEL4 SEQ 4602 goto DEF4602
IF $MODEL4 SEQ 4606 goto DEF4606
IF $MODEL4 SEQ 4612 goto DEF4624
IF $MODEL4 SEQ 4620 goto DEF4620
IF $MODEL4 SEQ 4624 goto DEF4624
goto END
#definity bigApp for 4602 model
# DEF4602
SET APPNAME ap4602r1_61.bin
goto END
#definity bigApp for 4606 model
# DEF4606
SET APPNAME def06r1_72.bin
goto END
#definity bigApp for 4620 model
# DEF4620
SET APPNAME def20r1_71.bin
goto END
#definity bigApp for 4612 & 4624 model
# DEF4624
SET APPNAME def24r1_72.bin
goto END
# END
#####
#download the 46xx Settings script #
GET 46xxsettings.scr
GET 46xxsettings.txt
```

## The 46XX Settings Script File

This file contains a range of settings used by Avaya IP phones and telephone applications. These values may require editing to suit the customer installation. See 1a. Creating a 46xxsettings.txt File . Note: Either a .scr or .txt file extension can be used. In both cases the file is a plain text file.

The **46xxsettings.txt** file can be edited using an ASCII text editor, for example Windows Notepad. To disable any setting, insert a # in front of the line.

In addition to editing the existing contents of the **46xxsetting.txt** file, additional lines can be added. Customizing the script will affect all Avaya IP phones using the TFTP server.

Note: Individual phones can be customized using static administration options on the phone, see Static Administration Options. However this is not recommended as static administration settings are lost following any upgrade of boot file software.

To modify the script, insert additional lines of the form **SET parameter value** where the possible parameters and values are listed below. For example, to switch the infrared port of all phones off, use **SET IRSTAT 0**.

## 46XX Settings

- **AGCHAND**  
Switch handset automatic gain control on/off. 0 = off, 1 = on (default).
- **AGCHEAD**  
Switch headset automatic gain control on/off. 0 = off, 1 = on (default).
- **DNSSRVR**  
Text string containing the domain to be used when DNS names in system values are resolved to IP addresses.
- **DOMAIN**  
Text string containing the IP address of one or more DNS servers. At least one address must be a dotted decimal address.
- **DSCPAUD**  
Differentiated Services Code Point for Audio. Range 0 to 63. Default 40.
- **DSCPSIG**  
Differentiated Services Code Point for Signaling. Range 0 to 63. Default 40.
- **IRSTAT**  
Infrared port status. 0 = off, 1 = on default.
- **L2Q**  
802.1Q framing. 0 = auto (default), 1 = on, 2=off. The recommended setting for IP Office operation is 2 (off).
- **L2QAUD**  
Layer 2 audio priority. Range 0 to 7. Default = 6.
- **L2QSIG**  
Layer 2 signaling priority. Range 0 to 7. Default = 6.
- **L2QVLAN**  
VLAN identifier. Range 0 to 4095. Default = 0.
- **VLANTEST**  
Defines how long the phone should attempt to register on a non-zero VLAN before defaulting back to VLAN 0. Default = 60 seconds. Setting VLANTEST to 0 sets the phone to attempt registering on the non-zero VLAN indefinitely.
- **MCPOR**  
Gatekeeper transport layer port number. Range 0 to 65535. Default = 1719.
- **PHY2STAT**  
Secondary Ethernet interface status. 0 = off, 1 = on (default).
- **PORTAUD**  
Telephone's transport layer port number for audio. Range 0 to 65535. Default = 5004.

---

# Appendix C: Scenarios for the Restart Process

---

## 4600 Restart Scenarios

The sequence of the restart process depends on the status of the boot and application files on the TFTP server and those already downloaded to the phone. This appendix explains the different scenarios possible.

All of the following start-up processes involve the same initial steps as the phone negotiates with the DHCP and the TFTP server.

1. After power is applied the phone displays **Restarting...**
2. The phone then displays **Initializing**.
3. The phone displays **Loading** whilst either the application file (if there is one) or the boot code is uncompressed into RAM. Since this takes a while, asterisks, then periods, then asterisks are displayed on the second line to indicate that something is happening.
4. When control is passed to the code in RAM, the phone displays **Starting**.
5. The phone detects and displays the speed of the Ethernet interface in Mbps (that is 10 or 100). The message **No Ethernet** is the LAN interface speed cannot be determined.
  - The Ethernet speed indicated is the LAN interface speed for both the telephone and any attached PC.
6. The phone displays DHCP whilst it obtains IP address and other information from the LAN's DHCP server. The number of elapsed seconds is incremented until DHCP successfully completes.
  - If the phone has been setup using static addressing (by pressing \* when DHCP is shown), it will skip DHCP and use the static address settings it was given.
  - Note that uploading a new boot file at any time erases all static address information.
7. The phone displays **TFTP** whilst it waits for a response from the TFTP server. The phone then displays **46XXUPGRADE.SCR** whilst download the upgrade script TFTP server.
  - The phone displays **TFTP Error: Timed Out** if it cannot locate TFTP server or upgrade script file. If the phone has been previously installed it will continue with the existing files in its memory.
8. After the upgrade script is loaded, the sequence depends on the status of the files currently held in the phones memory compared to those listed in the upgrade script.
  - Boot File Need Upgrading.
  - No Application File or Application File Needs Upgrading.
  - Correct Boot File and Application File Already Loaded.

## Boot File Needs Upgrading

Having processed the upgrade script file, the software determines that the name of the boot code file in the telephone does not match that in the upgrade script. The script specifies the name of the new file to load.

1. The phone displays the file name and the number of kilobytes loaded.
2. The phone displays **Saving to flash** while the new boot file is stored in its flash memory. The percentage of file stored and the number of seconds that have elapsed are shown. This will usually take longer than it took to download the file.
3. The phone displays **Restarting** as it prepares to reboot using the new boot file.
4. The phone displays **Initializing**.
5. While the new boot file is uncompressed into RAM, the phone displays **Loading**. Since this takes a while, asterisks, then periods, then asterisks are displayed on the second line to indicate that something is happening.
6. When control is passed to the software that was just loaded, the phone displays **Starting**.
7. The phone displays **Clearing** whilst the flash memory is erased in preparation for rewriting the code. The percentage of memory erased and number of elapsed seconds are also shown.
8. Updating is displayed whilst the boot code is rewritten. The percentage of boot code rewritten and number of elapsed seconds are also shown.
9. When the new boot code has been successfully written into the flash memory, the phone resets so that the status of the telephone application files can be checked.
10. Continue with the next procedure; No Application File or Application File Needs Upgrading.



## No Application File or Application File Needs Upgrading

This happens with normal application file upgrades. Having processed the upgrade script file, the software determines that the name of the boot file in the telephone is the correct version. It next determines that the name of the application file does not match that stored in the phone.

1. The phone displays the required file name as it downloads the file from the TFTP server. It also displays the number of kilobytes downloaded.
2. The phone displays **Saving to flash**. It also displays the percentage of file stored and the number of seconds that have elapsed. This will usually take longer than it took to download the file.
3. The phone is reset so that the new system-specific application file can be executed.
4. Continue with the next procedure; Correct Boot File and Application File Already Loaded.

---

## Correct Boot File and Application File Already Loaded

This happens with most normal restarts. Having processed the upgrade script file, the software determines that the name of the boot file in the telephone and the telephone application file match those specified in the upgrade script.

1. System-specific registration with the switch is started. The phone request the extension number it should use and the password.
  - By default the phone displays the last extension number it used and the user can accept that by pressing #.
  - Whilst a password request is shown, password verification is not performed except if the user changes the extension number.
  - The password checked against is the User's **Login Code** stored in the IP Office Manager.
2. Upon completion of registration, dial-tone is available on the telephone.



---

# Appendix D: Infrared Dialing

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## Infrared Dialing

Several Avaya IP phones include an infrared (IR) port at the front of the phone. This includes the 4606, 4612, 4624 and 4620.

- The port appears as a dark plastic window on the front edge of the phone, just below the normal dialing keys.



You can use the IR port in the following ways:

- **Dial a Number to Start a Call:**  
This can be done by beaming the contact information held in a personal organizers address book.
- **Swap Text Files During a Call:**  
If calling another Avaya IP phone extension that has an IR port, text files can be beamed between extensions.

When using infrared beaming the following must be remembered:

- The device beaming or receiving must be IrDA compatible. This is the case for most computer and personal organizer IR ports.
- The range of transmission is typical a maximum of 5 feet (1.5 meters) and with a 5° degree spread. (This is unlike IR devices used for remote controls which typically beam over a long range and much wide angle spread).
- For details of enabling and using IR beaming from your personal organizer or PC refer to the manufacturer's information. Note that some personal organizers can be set to beam to modems and mobile phones which use different transmission formats. The personal organizer may need to be set to beaming to another PC/personal organizer for dialing to work.
- **Important Note**  
Though we have tested these features with several devices as indicated, this is not a commitment to continually test or support those devices against future levels of software.

## Enabling the IR Port

By default, where fitted the IR port on Avaya IP phones is enabled. If necessary it can be disabled.

1. With the phone on-hook and idle, press **Hold 4 6 8 # (Hold I N T #)**.
2. The phone displays **PHY2=** and the current status. This is the setting for the phone's pass-through Ethernet port.
3. Press **#** to continue.
4. The phone displays **IR=** and the current status.
5. Change the status if required by following the displayed prompts. Then press **#**.
6. The phone will restart.

## Dialing Phone Numbers

You can use the IR port to receive telephone numbers beamed from an IR enabled PC or pocket organizer device. Any device that can beam contacts in the VCard format (.vcf) can be used.

If you are unsure of the file format used by your IR device, you can try beaming a contact anyway. The display on the Avaya IP phone will display the name of the file it received. If that ends in .vcf then the phone should dial the number in the VCard file.

You will need to remember the following:

- The phone will only dial the first phone number in the VCard file.
- If your IP Office system has been setup to need a prefix for external dialing, that prefix must be in the VCard phone number.

In addition to dialing the telephone number digits, the following additional characters can be included in the phone number:

- m = Mute.
- c = Conference.
- h = Hold.
- t = Transfer.
- , (comma) = 2-second pause.

The following sections contains examples of dialing contacts by beaming from various different devices.

---

## Palm Organizer

The following was tested using a Palm Vx and M505. The connection setting (found through **Prefs | Connection**) must be **Ir to PC/Handheld**.

1. Click on phone button or icon to enter the address book.
2. Locate person or organization that you want to dial.
3. Click on the entry to go to **Address View**.
4. On the letters area of the graffiti pad, make a sweep from the bottom-left to the top-right. A set of icons should appear. Click on the beam icon.
  - Alternatively click on the menu icon and select **Beam Address**.

---

## Psion Revio

The following was tested using a Psion Revio.

1. In **Contacts**, select the entry you want to dial.
2. Click on the beam icon at the left-hand edge of the display.
  - **Note**  
The above also works for Contacts accessed via the Phone application but does not work for Phone application entries.

## Windows Pocket PC

The following was tested using a Compaq iPAQ Pocket PC.

1. In **Contacts** select the entry you want to dial.
2. Click on **Tools** and select **Beam Contact**.
3. The Pocket PC will search for and then display the IR enabled devices it could find. The Avaya IP phone should appear on the list.
4. Select the Avaya IP phone and the contact information will be beamed to it.

---

## Beaming Files During a Call

During a call between two IR enabled extensions on the same system, you can also beam files between IR devices at each end.

The types of file sendable and receivable will depend on those supported by the devices sending and receiving, as if they were face to face.

VCard files can be exchanged without being interpreted as a number to dial.

---

## Palm Organizer

The following was tested using a Palm Vx and M505.

1. Inform the caller that you want to beam them a file and to have their Palm positioned in front of their extensions IR port ready to receive.
2. Locate the file that you want to send.
3. On the letters area of the graffiti pad, make a sweep from the bottom-left to the top-right. A set of icons should appear. Click on the beam icon.
  - Alternatively click on the **Menu** icon and select the displayed **Beam** option.
4. The phones should display the first eight characters and the file extension of the file being transferred.

---

# Appendix E: Alternate DHCP Setup

---

## Alternate DHCP Servers for Avaya IP Phone Installation

The recommended installation method for Avaya IP phones uses a DHCP server. With IP Office the DHCP server can be the IP Office Control Unit itself.

However in some installations the customer may already have a DHCP server or may want to use a different DHCP server. Additionally, use of a separate DHCP server allows configuration of advanced features such as specifying alternate gatekeepers.

This document outlines as an example the basic steps for using a Windows 2000 Server as the DHCP server for Avaya IP phone installation.

Only one DHCP server should be used on any LAN. Multiple DHCP servers will lead to unpredictable results. Therefore this document assumes that the IP Office's DHCP server features have been disabled.

You will need the following information from the customer's network manager:

- The IP address range and subnet mask the Avaya IP phones should use.
- The IP Gateway address.
- The DNS domain name, DNS server address and the WINS server address.
- The DHCP lease time.
- The IP address of the IP Office control unit
- The IP address of the PC running Manager (this PC acts as a TFTP server for the Avaya IP phones during installation).

Full information on LAN administration and configuration is contained in the Avaya documents "**4600 Series IP Telephone LAN Administrator's Guide**" (*Avaya Com Code 555-233-507*).

Though written from the perspective of IP phones on Definity and MultiVantage systems, many aspects are applicable to IP Office systems.

## Using Windows 2000 Server

---

### 1. Checking for DHCP

1. On the Windows 2000 Server, select **Start | Program | Administrative Tools | Computer Management**.
2. Under **Services and Applications** in the **Computer Management Tree** you should see **DHCP**.
3. If DHCP is not present then you need to install the DHCP components for Windows 2000, refer to the Microsoft documentation.

---

## 2. Windows 2000 DHCP Setup for Avaya IP Phones

---

### 2a. Creating the Scope

A DHCP scope defines the IP addresses that the DHCP server can issue in response to DHCP requests. Different scopes may be defined for different types of devices.

1. Select **Start | Programs | Administrative Tools | DHCP**.
2. Right-click on the server and select **New | Scope**.
3. The scope creation wizard will be started, click **Next**.
4. Enter a name and comment for the scope. Click **Next**.
5. Enter the address range to use, for example from 200.200.200.1 to 200.200.200.15 (remember the host part cannot be 0).
6. Enter the subnet mask as either the number of bits used or the actual mask, for example 24 is the same as 255.255.255.0. Click **Next**.
7. You can specify addresses to be excluded. You can do this either entering a range, eg. 200.200.200.5 to 200.200.200.7 and clicking **Add**, or just enter a single address and click **Add**. Click **Next**.
  - Note: You should exclude the IP Office from this range, as the **DHCP Options** in the IP Office should be disabled. This is only a recommendation. You can also accomplish this by leaving available addresses outside of the scopes range.
8. You can now set the lease time for addresses. If set too large, addresses used by devices no longer attached will not expire and be available for reuse in a reasonable time, reducing the number of addresses available for new devices. If set too short it will generate unnecessary traffic for address renewals. The default is 8 days. Click **Next**.
9. The wizard gives the option to configure the most common DHCP options. Select **Yes** and click **Next**.
10. Enter the address of the gateway and click **Add**. You can enter several. Click **Next** when all are entered.
11. Enter the DNS domain, eg. savilltech.com and the DNS server addresses. Click **Next**.
12. Enter the WINS server addresses and click **Add**. Click **Next**.
13. You will then be asked if you wish to activate the scope. Select **No** and click **Next**.
14. Click **Finish** to the wizard.

The new scope will now be listed and the status as Inactive.



## 2b. Adding the 176 Option

In addition to issuing IP address information, DHCP servers can issue other information in response to requests for different DHCP option numbers. The settings for each Option are attached to the scope.

Avaya IP phones need the IP address of an H323 Gatekeeper (normally the IP Office) and a TFTP server (normally the PC running Manager). They do this by requesting the Option 176 settings from the DHCP server.

1. Right-click on the DHCP server.
2. Select **Predefined options** from the pop-up menu.
3. Select **Add**.
4. Enter the following information:
  - **Name:** 46xxOptions
  - **Data type:** String
  - **Code:** 176
  - **Description:** IP Phone settings
5. Click **OK**.
6. In the string value field enter the following:

```
MCIPADD=xxx.xxx.xxx.xxx,MCPORT=1719,TFTPSRVR=yyy.yyy.yyy.yyy,TFTPDIR=z,
VLANTEST=w
```

where:

- **MCIPADD=xx.xxx.xxx.xxx** is the H323 Gatekeeper (Callserver) address. Normally this is the IP Office Control Unit's LAN1 address.
    - You can enter more than one IP address, separating each by a comma with no space. This allows specification of a fallback H323 gatekeeper. Note however that the phones will wait 3 minutes before switching to the fallback and will not switch back to the first server when it recovers until the phone is rebooted.
  - **MCPORT=1719** is the RAS port address for initiating phone registration.
  - **TFTPSRVR=yyy.yyy.yyy.yyy** is the TFTP Server IP Address. Normally this is the IP address of the PC running Manager.
  - **TFTPDIR=z** is the TFTP Server directory where the Avaya IP phone files are located. This entry is not required if those files are in the TFTP server's default directory.
  - **VLANTEST=w** is the number of minutes phones should attempt to register on a specific VLAN before defaulting back to VLAN 0. This field is optional. A setting of **0** disables the fallback to registering on VLAN 0.
  - The maximum string length is 127 characters. To reduce the length the TFTP Server address can be specified through attaching an Option 66 entry to the Scope, see "Alternate Options".
7. Click **OK**.
  8. Expand the server by clicking on the **[+]** next to it.
  9. Click on the scope you just created for the 4600 phones.
  10. In the right-hand panel, right-click on the scope and select **Scope Options**.
  11. In the general tab make sure **176** is checked.
  12. Verify the **String value** is correct and click **OK**.

## 2c. Activate the Scope

The scope can be manually activated by right clicking on the scope, select **All Tasks** and select **Activate**. The activation is immediate.

You should now be able to start installing Avaya IP phones using DHCP. Ensure that Manager is running of the PC specified as the TFTP server.

---

## Alternate Options

In this document we issued all the Avaya IP phone information through the Scope and the Option 176 settings. Depending on the DHCP server other options may have to be used within the scope.

- **Option 6: DNS Server Address**

On the Windows 2000 DHCP server this is set through the scope. Other DHCP servers may allow or require it to be set through Option 6 with multiple addresses separated by a comma and no spaces. At least one address must be a dot decimal IP address.

- **Option 15: DNS Domain Name**

On the Windows 2000 DHCP server this is set through the scope. Other DHCP servers may allow or require it to be set through Option 15. This option is necessary if the TFTP server is indicated by name rather than address (not supported on Windows DHCP).

- **Option 66: TFTP Server Name**

Allows the specifying of the TFTP server address. Multiple addresses can be entered with each address separated by a comma and no spaces. Microsoft DHCP servers only support dot decimal IP addresses.

- Note that for the Avaya IP phones, any Option 66 settings will be overridden by any TFTP entry in Option 176. Using Option 66 as part of the Scope is useful if alternate Gatekeeper addresses are required in the Option 176 settings whilst keeping within the 127 character limit.

---

# Appendix F: WML Operation

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## WML Server Setup

The 4610SW, 4620, 4620SW, 5610SW, 5620 and 5620 phones can act as WAP (Wireless Access Protocol) browsers. This allows them to view WML (Wireless Markup Language) pages. WML is a page coding language similar to HTML but intended for telephone devices with small screens and no full keyboard.

To do WAP browsing, the phones need to be configured to access a home page. That home page can contain links and information appropriate to the customer installation.

This document looks at the setting up and configuration of a simple test system. The aim is to introduce the basic principles of WAP browsing operation.

---

## What WML is Supported

The phones are WML 1.2 compliant WAP browsers. However they do not support all WML 1.2 tags.

For details of those WML 1.2 tags supported refer to the 4600 Series IP Telephone LAN Administrator's Guide (555-233-507).

WTAI (Wireless Telephony Application Interface) links are supported to allow numbers embedded in WML pages to be dialed from phones.

# Testing WML Browsing Using Xitami

---

## 1. Introduction


Xitami is a small and simple web server application. We will use it here to configure one of our LAN PC's as a web server able to provide .wml pages in response to requests from an Avaya IP phone.

- **Web Server PC:**  
Any Windows PC on the IP Office LAN. Ideally this PC should have a fixed IP address.
- **Xitami Server Software:**  
Xitami can be obtained from <http://www.imatix.com>. A copy is available on the IP Office Documentation CD and through the above link.
- **Sample WML Pages:**  
A number of sample pages are provided on the IP Office Documentation CD and through the above link. They can also be downloaded from <http://support.avaya.com>.

---

## 2. Installing the Web Server

For this test we used a web server called Xitami. It is a simple, small and flexible web server for use on Windows based PC's.

1. On the server PC, run **Xitami.exe** to start installation of the web server.
2. Accept the various defaults.
3. When asked for a **User Name** and **Password** note the details entered.
4. When finished select **Run**.
5. The **Xitami** server appears as an  icon.
6. Double-click on the icon to display the web server's basic properties. Note the IP addresses.
7. Click on **Close** to close the window without stopping the web server.
8. Open the PC's web browser and enter **http://<server IP address>**. You should see the default Xitami web pages.
9. If there are other PC's on the IP Office LAN they should also be able to browse the web server's IP address.

---

### 3. Configuring the Xitami Web Server for WAP

Basic web browsing consist of requests to the web server for .htm and .html text pages and .gif and .jpg images which are then displayed by a browser program. WAP browsing uses different file types, wml for text and .wbmp for images.

The web server needs to be configured to recognize those file types, and several other, as files that might be requested by a WAP browser program. This is done by adding what many web servers refer to as MIME types.

1. On the web server PC open the folder **C:\Xitami**.
2. Using a plain text editor such as Notepad or WordPad, open the file **Xitami.cfg**.
3. Scroll down the file to the section **[MIME]**. You will see that it is a list of settings for different text, image and application files types.
4. Scroll the end of the file and add the following new set of MIME type for files that are supported by Avaya IP phones with a WAP browser.

```
# WAP MIME types
wml=text/vnd.wap.wml
```

5. Save the file.

## 4. Installing Sample WML Pages

A set of sample WML pages has been included on the IP Office Engineers Toolkit & Documentation CD.

1. On the web server PC, open the folder **C:\Xitam\webpages**.
2. Create a new sub-folder called **4620**.
3. Copy the sample .wml pages from the IP Office Engineers Toolkit into this folder.
  - If the toolkit was installed to hard disk, the sample are in **C:\Program Files\Avaya\IP Office\Toolkit\Data\Common\WML\samples**.
  - If the toolkit is on CD, the samples are in **Data\Common\WML\samples**.

---

### 4a. Creating a Simple WML Page

As an alternative to using the sample pages provided you can create a simple .wml page using an editor such as Notepad.

1. Start **Notepad**.
2. Add the following text (↵ indicates line continued below).

```
<?xml version="1.0"?>
<!DOCTYPE wml PUBLIC "-//WAPFORUM//DTD WML 1.1//EN"↵
"http://www.wapforum.org/DTD/wml_1.2.xml">
<wml>
<card id="card1" title="Hello World!">
<p>Hello world!</p>
</card>
</wml>
```

3. Save the file as **index.wml**. Note:
  - Notepad may save the file as **index.wml.txt**. If this happens, rename the file back to **index.wml**.
4. Copy the file into the folder **C:\Xitam\webpages\4620**.

---

### 4b. Dialing from a WML Page

WTAI (Wireless Telephony Application Interface) allows numbers contained in a WML page to be dialed.

An example WTAI link is shown below:

```
<a href="wtai://wp/mc;200" title="Reception">Call Reception</a>
```

The example link above will display as **Call Reception** and have an adjacent telephone icon. Pressing the adjacent display key on the phone will dial the number contained in the link.

## Setting the Home Page

WAP capable Avaya IP phones display a key option labeled **Web** when setup with a home page (press **PHONE/EXIT** if in any other menu). Press the adjacent display key will access the home page. The home page is set by editing the 46XXsetting.scr file found in the IP Office Manager applications program folder.

- **Important**

This must be the same Manager PC as used for Avaya IP phone installation. This will be the PC set as the TFTP Server IP address in the IP Office configuration, ie. the address from which the Avaya IP phones request files when restarted.

2. Open the Manager application folder (**C:\Program Files\Avaya\IP Office\Manager**).
3. Locate the file **46XXsettings.scr**.
4. The file cannot be edited as is since the .scr extension is associated by Windows with screen savers. Rename the **46XXsettings.scr** file to **46XXsettings.txt**.
5. Double-click on **46XXsettings.txt**. The file will open in Notepad.
6. The section relating to 4620 WML browsing is towards the end of the file. It will look similar to the following:

```
##### SETTINGS FOR AVAYA 4620 IP PHONE #####
## 4620 Web Launch page in WML - Default: Avaya hosted
SET WMLHOME http://192.168.42.200/4620/index.wml
## The Proxy server used for your LAN - IP address or human readable name (check
your browser settings).
# SET WMLPROXY nj.proxy.avaya.com
## The http proxy server port (check your browser settings).
SET WMLPORT 8000
## Exceptions: You must use an IP address not a DNS name
# Example: SET WMLEXCEPT 111.222.333.444
## Text coding for the web pages defaulted to ASCII.
SET WMLCODING ASCII
##### END OF AVAYA 4620 IP PHONE #####
```

6. Edit **SET WMLHOME** to be the address of the sample index.wml file on the web server. In this example <http://192.168.42.200/4620/index.wml>.
  - If DNS is being used to access the web server by IP name, the **SET DOMAIN** and **SET DNSSRVR** lines at the start of the **46XXsettings.scr** file should be edited to match the LAN settings. The preceding #'s should be removed from the lines to make them active.
7. Close and save the file.
8. Rename the file back to **46XXsettings.scr**.
9. The settings will not take effect until after the phones have restarted whilst Manager is running.
10. Start **Manager**.
11. Select **View | TFTP log**. This will allow you to see the phones request and download the 46XXsettings.scr file.
12. Either:
  - Select **File | Advanced | Reboot**. Select the system to reboot and enter the system password.
  - or manually unplug and then reattach the LAN cable from the phone.
13. Once the phone has restarted it should be displaying **Web** as one of the screen option.
14. Press the **Web** display key.

## Apache Web Server WML Configuration

Apache is an open-source web server that's available on many platforms. Basic familiarity with Unix is necessary to configure it.

The following is a step-by-step guide for configuring Apache Web-server:

1. To set MIME types in Apache, a plain text file called **httpd.conf** is used.
2. The location for this file varies depending on the individual setup, but the most usual path is **/etc/httpd/conf/httpd.conf**. If the operating system is Windows, then look for a folder called **conf** under where Apache is installed.
3. Open **httpd.conf** in a text editor such as Notepad.
4. Scroll down to the **AddType** section (usually at the bottom of the file) and add the following lines:
  - `AddType text/vnd.wap.wml wml`
5. Save the file.

---

## Microsoft IIS Web Server WML Configuration

Microsoft Internet Information Server (IIS) is a web server that can be acquired with the following operating systems to serve WML pages:

- Microsoft Windows NT 4 – IIS version 4.0 comes in the NT 4.0 option pack.
- Microsoft Windows 2000/server – IIS 5.0 is built in to Windows 2000.
- Microsoft Windows XP – IIS 5.0 is built in to Windows XP.

IIS has a graphical user interface, the Internet Service Manager, for configuring all aspects of the Web server.

The following step-by-step guide can be used to set up MIME types:

1. Select **Start | Run | MMC**.
2. Load the IIS snap-in from the **c:\winnt\system32\inet\iis** directory.
  - The Internet Services Manager can also be opened from **Start | Control Panel | Administrative Tools | Internet Services Manager**.
3. Right-click on the node that matches the name of your web server (by default: '**Default Web Site**') and choose the **Properties** option.
4. Click on the **Edit** button next to the **Master Properties** drop down box.
5. Select the **HTTP Headers** tab, and click on the **File Type** button. This will load the registered file types dialog.
6. Click on the **New Type** button and create a new file type using the parameters below:
  - **Associated extension:** **wml**
  - **Content type:** **text/vnd.wap.wml**
7. Click **OK** to close all of the open dialogs, and then close MMC or Internet Services Manager itself.
8. Click **Start | Administrative Tools | Services**. Restart the '**IIS Admin Service**' so that the newly added MIME types are picked up.



---

## Open URL Entry

This document provides sample WML code on how to develop WML pages implementing a text box-based go to a URL function. This code allows a user to enter a URL into a text entry area and link to that site.

Please note that these are examples, not an exhaustive list. All WML code is presented in italics.

---

### Case 1. Input Box Followed by an Anchor Tag

Description: User enters a URL into the text entry box and clicks on the URL to retrieve it.

```
<input name="url" title="Name" />
<anchor title="get it">
Go Get It
<go method="get" href="$ (url) ">
</go>
</anchor>
```

---

### Case 2. Input Box Followed by an A Tag

```
<input name="url" title="Name" />
<a href="$ (url) ">Go Get It</a>
```

---

### Case 3. Input Box Followed by a Submit Button

```
<input name="url" title="Name" />
<do type="submit" name="submit" label="Submit">
<go method="get" href="$ (url) ">
</go>
</do>
```

---

### Case 4. Input Box Followed by an Anchor Tag Where the Anchor Tag Already Displays HTTP://

This method displays http so that the user only has to type in the URL at the end of http://.

```
<input name="url" title="Name" value="http://" />
<anchor title="GET">
Go Get it
<go method="get" href="$ (url) ">
</go>
</anchor>
```



---

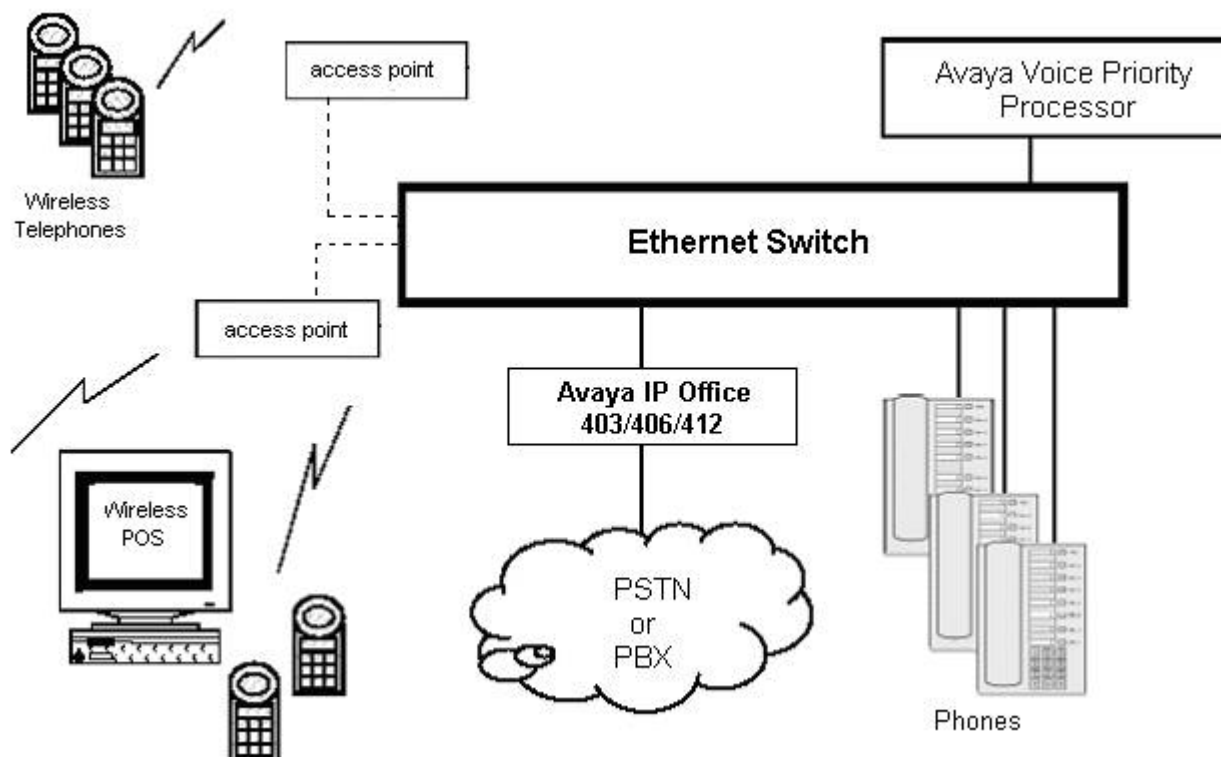
# Appendix G: 3616/3626 Installation

---

## 3616/3626 Spectralink Installation

This section contains information on the installation and configuration of the Avaya 3616/3626 wireless phones on an Avaya IP Office Control Unit.

Information is routed from these phones to the IP Office via an Avaya Voice Priority Processor (AVPP). The AVPP uses Spectralink Voice Priority (SVP) as the Quality of Service (QoS) mechanism. SVP gives preference to voice packets on the wireless medium, increasing the probability that all voice packets are transmitted efficiently. These voice packets are then re-routed through the IP Office and back to the wireless telephone.



Uses of the 3616 and 3626 via an AVPP is supported on the IP Office IP403, IP406 (V1 and V2) and IP412 control units. The Small Office Edition control unit is able to support a built-in wireless access point, but this does not provide Quality of Service (QoS) support.

---

## Related Documents

The setup for the 3616/3626 wireless telephones also requires the configuration of the AVPP and the individual wireless telephones. These instructions are provided in the following related documents:

- Avaya Voice Priority Processor Installation Manual.
- Avaya 3616/3626 Wireless IP Telephone Manual.

## Configuration

With IP 403/406/412 Office Control Units, the access point resides on the LAN and is configured based on the manufacturer's guidelines and manuals. These are the access points that are compliant with the SVP being used by the AVPP, based on SpectraLink:

### SpectraLink Voice Priority (SVP) Compliance Matrix

Manufacturer	Make/Model	FH/DS	Software Version		Calls per Access Point
			SVP Certified	Field Verified	
Alvarion	BreezeNET Pro. 11 Series <sup>1</sup>	FH	4.4.2 or 5.0.103		3
Cisco	Aironet 340	DS	10.13	11.03, 11.07, 1.10t	6
Cisco	Aironet 350 <sup>2</sup>	DS	11.03	11.07, 11.10t	7
Cisco	Aironet 4500 & 4800 Turbo DS	DS	8.12 & 8.24	8.55	5
Cisco	Aironet 3500	FH	8.12	8.24	3
Proxim	Orinoco AP 1000	DS	D3.78S6 3.83	7.4a	5
Symbol	Spectrum 24 FH	FH	4.01-S2	4.02-12	3
Telxon	Air-I/O 802FH UAP	FH	8.12	8.24	3
Telxon	802 DS & 802 DS 11	DS	8.12	8.24	5
Avaya	Wireless Access Point AP-1, AP-2	DS		3.83, 3.92	6
Avaya	Wireless Access Point AP-3	DS		1.4 (v 222)	7
Cisco	Aironet 1200	DS		11.40t	7
Enterasys	Roamabout AP2000	DS		V6.02	6
Intermec	Mobile LAN Access 2100, 2101, 2102	DS		1.51 or later	6
LXE	6250 Access Point	DS		3.83	6
Proxim	AP 2000	DS		7.4, 1.3	6
Symbol	Spectrum 24 DS	DS		2.21-23, 2.51-21, 3.50-18	6
Teklogix	9150 Wireless Gateway	DS		E301R, J041	4

<sup>1</sup> Alvarion BreezeNET Pro.11 Series software version 4.4.5 is **not** compatible with Avaya Wireless Telephones

<sup>2</sup> Cisco Aironet 350 software version 11.21T is **not** compatible with Avaya Wireless Telephones

**FH/DS:** Frequency Hopping (FH) Avaya Wireless Telephones support 1 Mb/s data rate only. Direct Sequence (DS) Avaya Wireless Telephones support up to 11 Mb/s data rates.

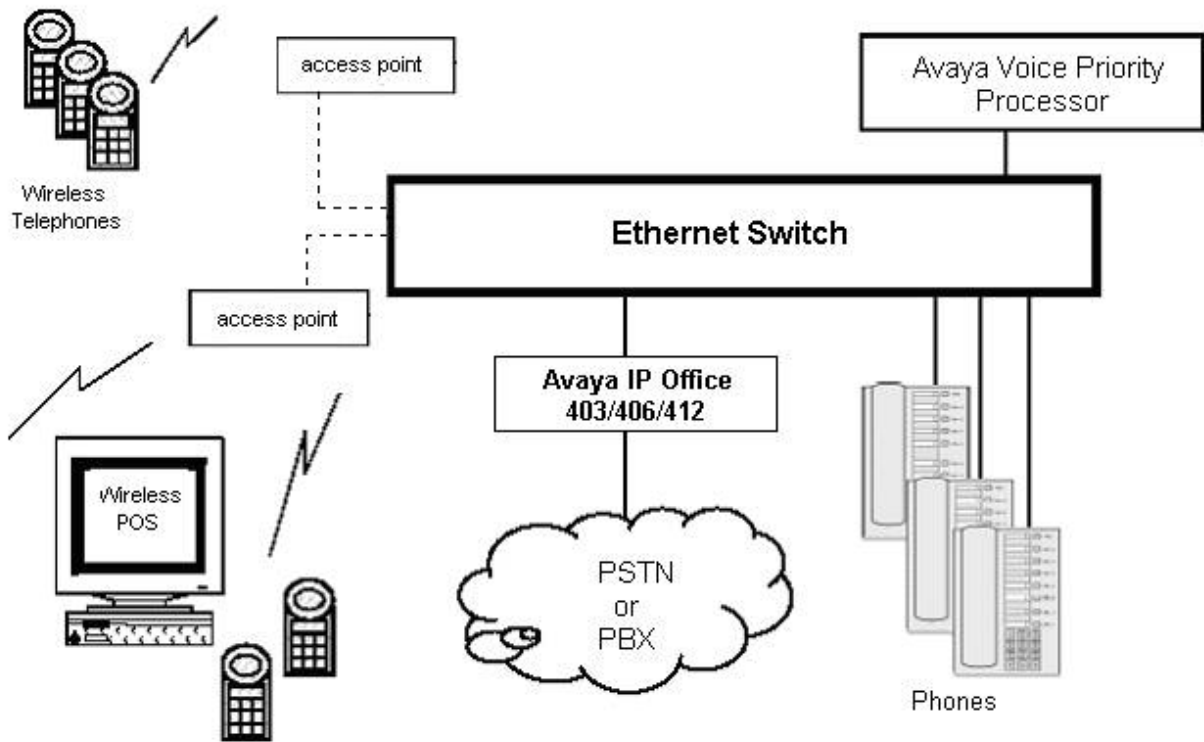
#### **Software Version:**

- **SVP Certified**  
The access point software has been fully tested and approved by SpectraLink Engineering
- **Field Verified**  
The access point software has been verified in field installations, but has not been tested by SpectraLink Engineering

**Calls per Access Point:** A conservative estimate of the number of simultaneous calls per access point at an average data rate of 2 Mb/s

## System Configuration

The following diagram shows the Avaya IP 403/406/412 Office residing on a network with a wireless LAN access point, the AVPP and 3616/3626 telephones:



(Example Only)

## Installation and Configuration

A sample configuration set-up is available following the instructions below.

If you have IP Office 403/406/412, do the following to set-up the 3616/3626 wireless telephones:

1. To create the configuration files for each phone, you must first download the following software from the SpectraLink website <http://spectralink.com/service/software.html>:
  - For the Avaya Voice Priority Processor (AVPP) software, look under **NetLink SVP Server Avaya AVPP Server** and do the following:
    - i. Download the .EXE.
    - ii. Extract the necessary files by unzipping the ZIP file.
    - iii. Place the following files into the “**Manager**” directory: **FLASHFS**, **SVP100.TOC** and **ZVMLINUX**.
  - For the Avaya Wireless Telephone software, look under **NetLink Wireless Telephone – IP Avaya 3606** and do the following:
    - i. Download the .EXE.
    - ii. Extract the necessary files by unzipping the ZIP file.
    - iii. Place the following files into the “**Manager**” directory: **pd06ccc.bin** and **slnk\_cfg.cfg**.
2. Refer to the manufacturer’s documentation to configure the access point with the following information:
  - AVPP IP Address
  - Individual telephone name
  - Frequency Channel
  - Security Key information
3. Using a network cable, connect the Avaya IP Office 403/406/412’s LAN port to the AVPP’s Network port.
4. 4. Configure the AVPP: please refer to the Avaya Voice Priority Processor Installation Manual.
5. Create a configuration file for each AVPP terminal.
  - From Program Files/.../Manager, copy and rename the configuration file for each AVPP terminal based on the last 6 digits of the MAC address. Example – copy the **slnk\_cfg.cfg** file and rename it **sl123456.cfg**, assuming the terminal’s MAC address is **xxxxxx123456**.
6. Configure the 3616/3626 telephones: Refer to the Avaya 3616/3626 Wireless IP Telephone Installation and Configuration Guide.

## Sample Set-up

Below is a sample configuration designed as a quick reference. If more detailed information is required, please refer to the appropriate manuals as referenced in the step-by-step instructions.

### Sample information

Item	IP Address
Avaya Voice Priority Processor (AVPP)	192.168.42.3
Avaya IP Office 403/406/412	192.168.42.1
PC	192.168.42.10

### AVPP Configuration Screen via Hyperterminal

Title	State	Comment
Error Status	Alarms	System error display
Network Status		Status of network
Software Versions		Current software version on the AVPP

### AVPP Configuration

Hostname: Sample1, Address: 192.168.42.3

Title	State	Comment
Phones per access point	3	Dependent on the access point
802.11 Rate:	Automatic/ 1MB 2MB only	Data rate speed
SVP-II Master:	192.168.42.3	AVPP IP address
SVP-II Mode:	Netlink IP	Leave as default
Ethernet link:	Auto-negotiate	Leave as default
System Locked:	N	Leave as default
Maintenance Lock:	N	Leave as default
Reset System	Y/N	Leave as default

**AVPP Network Configuration**

Title	State	Comment
Ethernet Address (fixed):	00:90:7A:01:24:93	Leave as default
IP Address:	192.168.42.3	The AVPP unit
Hostname:	Sample1	System host name
Subnet Mask:	255.255.255.0	Leave as default
Default Gateway:	192.168.42.1	IP Office Unit
SVP-II TFTP Download Master:	192.168.42.10	PC containing AVPP Software
Primary DNS Server:	NONE	Leave as default
Secondary DNS Server:	NONE	Leave as default
DNS Domain:	NONE	Leave as default
WINS Server:	NONE	Leave as default
Workgroup:	WORKGROUP	Leave as default
Syslog Server	NONE	Leave as default
Maintenance Lock:	N	Leave as default

**Telephone Set-up**

1. Boot up the phone by simultaneously pressing the Green and Red keys. Release the Green key while still holding down the Red key. This will display the MAC address.
2. Use 0 to Edit and Select.
3. FCN to navigate back one screen.
4. The Red button to end programming.
5. Configure the following information on the telephone

Title	State	Comment
IP Address	Static or DHCP	Select IP address mode
ESS ID (SSID)	Network Name (SSID)	SSID of the access point
License Mgmt	9	Leave as default
Encryption	Match the configuration on the access point	
Ext.	Extension Number	Use the extension created from User
Password	Extension Password	Enter password for the phone extension from User



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# Glossary

## I

**IR:** Infrared: The wavelength band between visible light (approximately 0.75 um) and short microwaves (approximately 100um).

**IrDA:** Infrared Data Association: A not-for-profit body that defines a suite of protocols for the exchange of data between devices using infrared transmission. The supported range is up to 1 metre (30 cm for low power devices). IrDA compatible IR ports are found on a range of PDA's, portable computers and printers.

## W

**WAP:** Wireless Access Protocol: A protocol for web-style content delivery intended for mobile phones and other small size wireless devices. Content would either be specifically created for WAP devices and converted from HTTP using a WAP server.

**WML:** Wireless Markup Language: A standard for the display of content on WAP devices. Typically these devices have low-resolution displays with minimal colour or image support. The standard is similar to HTML but employs many XML type conventions.

**WTAI:** Wireless Telephony Application Interface: A protocol that defines how dialable numbers should be specified with WML pages and other WAP delivered media. The Avaya 4620 can browse WML pages and when those pages contain a WTAI formatted entry, the 4620 user can dial the associated number by pressing the adjacent display key.



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Avaya  
Sterling Court  
15 - 21 Mundells  
Welwyn Garden City  
Hertfordshire  
AL7 1LZ  
England

Tel: +44 (0) 1707 392200

Fax: +44 (0) 1707 376933

Web: <http://www.avaya.com>