



Avaya Voice Priority Processor
Avaya 3641/3645 Wireless IP Telephones
Handset Administration Tool

Installation, Configuration, and Administration

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About This Document

Part A explains how to configure and maintain one or more Avaya Voice Priority Processors (AVPP) (models AVPP, AVPP 20, AVPP 10) within IP telephony environments.

Part B explains how to configure and maintain the Avaya 3641/3645 Wireless IP Telephone with an Avaya Aura™ Communication Manager.

Part C explains how to install and use the Handset Administration Tool, a software utility that automates the configuration of multiple Avaya 3641/3645 Wireless IP Telephones.

Part D contains Appendices for regulatory domain information, troubleshooting information and lists status messages that may appear on the handset display.

Part E is the Index.

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This manual uses the following icons and conventions:



Caution! Follow these instructions carefully to avoid danger.



Note these instructions carefully.

NORM

This typeface indicates a key, label, or button on the AVPP, Wireless IP Telephone or Handset Administration Tool.

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A. Avaya Voice Priority Processor

AVPP

AVPP 20

AVPP 10

Installation, Configuration, and Administration

1. Avaya Voice Priority Processor Overview

The Avaya Voice Priority Processor is an Ethernet LAN device that works with access points (APs) to provide QoS on the wireless LAN. Voice packets to and from the Avaya Wireless IP Telephones are intercepted by the Avaya Voice Priority Processor and encapsulated for prioritization as they are routed to and from an IP telephony server.

1.1 Avaya Voice Priority Processor (AVPP), QoS and Security

The Avaya Voice Priority Processor (AVPP) is an Ethernet LAN device that works with the AP to provide quality of service QoS on the wireless LAN. Voice packets to and from the Avaya 3641/3645 Wireless IP Telephones are intercepted by the Avaya Voice Priority Processor and encapsulated for prioritization as they are routed to and from an IP telephony server or gateway. This mechanism is fully compatible with the IEEE 802.11a/b/g standards.



The latest software versions are required to support the features described in this document.

1.2 Avaya Voice Priority Processor Models

The AVPP is available in three models. Which model is selected for your facility depends on current and expected capacity. All AVPPs within a subnet must be the same model type.

- AVPP 100 – Serves 80 calls simultaneously.
- AVPP 20 – Serves 20 powered-on handsets.
- AVPP 10 – Serves 10 powered-on handsets.

See the following capacity tables for multiple AVPP system capacities.

All AVPP models are installed, configured and administered according to the instructions in this document. The model information is available on the Software Version screen. See section 7.3 *Software Version*.

1.3 The Timing Function

Avaya Voice Priority Processors provide the connection or "gateway" to the IP PBX for the Wireless IP Telephones and the "timing" function for active calls. This "gateway" function is distributed across the AVPPs.

The number of active AVPPs is determined dynamically. Whenever AVPPs are added to or removed from the system, the distribution of the "timing" function for active calls is affected.

1.4 Multiple Avaya Voice Priority Processors

Multiple AVPP environments are those which have more than one Avaya Voice Priority Processor. Up to four AVPP 10 models or up to two AVPP 20 models may be installed in

any one subnet. Up to 16 models of AVPP Servers may be installed in any one subnet. All AVPPs must be in the same subnet.

When more than one AVPP Servers are installed, the wireless telephone load is balanced across the available Servers, both for the communication path between the AVPP Server and the wireless telephones, and between the AVPP Server and the PBX (or other far-end device).

AVPP Server Availability

An Avaya handset registers to a single AVPP Server the first time it is powered on. Once the handset has contacted this Registration Server, it obtains a list of all AVPP Servers in the system. The handset then maintains this list in non-volatile memory and updates only when rebooted. When a handset later attempts to check in and cannot contact the ordained Registration Server, it will then fall back to its list of other Servers and attempt to check in elsewhere. After the handset has successfully checked into the system once, it never requires that the Registration Server be present unless the handset is reconfigured back to factory defaults, or the entire system of AVPP Servers is changed out. See section *Swapping/Adding/Deleting SVP Servers*.

Registration Server Identification

The handsets identify the AVPP Server in three possible ways. These are outlined in the next chapter of this document. Essentially, the AVPP Server can be identified by a static IP address in the Admin menu, by a DHCP option 151 specification, or by a DNS query of "SLNKSVP2". The address found identifies the Registration Server.

1.5 Multiple Avaya Voice Priority Processor Capacities

The system capacity of each AVPP model is shown in the below tables. Note that AVPP models may not be combined within one subnet.

AVPP 10 and AVPP 20 Server Capacity

The system capacity of the AVPP 10 and AVPP 20 is measured by number of powered-on handsets. If this number exceeds the maximum, the handset that cannot be served will display an error and will not connect to the AVPP. Other handsets will not be affected.

Number of AVPPs	Number of handsets	
	AVPP 10	AVPP 20
1	10	20
2	20	40
3	30	NA
4	40	NA

AVPP 100 Server Capacity

The capacity of the AVPP Server is determined by active calls. The table below shows the capacity of an IP gateway in a multiple-AVPP Server environment. The table shows the total possible calls at 100% active calls. However, since it is unlikely that all handsets will be in use at the same time, the table then analyzes the number of handsets that could be installed in any given system where 10%, 15% or 20% of the handsets are in active calls at any one time. The calculations are not linear due to the Erlang¹ calculation for

¹ An *Erlang* is a unit of telecommunications traffic measurement. Strictly speaking, an Erlang represents the continuous use of one voice path. In practice, it is used to describe the total traffic volume of one hour.

telephony traffic. The possible installed handsets figures are approximate and meant as a guideline and not as an absolute recommendation for any facility.

Number of AVPP Servers	Number of calls possible per Server	Total possible installed handsets @ 100% in active calls	Erlang	Possible installed handsets		
				@ 10% in active calls	@ 15% in active calls	@ 20% in active calls
1	80	80	65	500	433	325
2	64	128	111	1000	740	555
3	60	180	160	1500	1067	800
4	58	232	211	2000	1407	1055
5	57	285	262	2500	1747	1310
6	56	336	312	3000	2080	1560
7	56	392	367	3500	2447	1835
8	55	440	415	4000	2767	2075
9	55	495	469	4500	3127	2345
10	55	550	524	5000	3493	2620
11	55	605	578	5500	3853	2890
12	54	648	621	6000	4140	3105
13	54	702	674	6500	4493	3370
14	54	756	728	7000	4853	3640
15	54	810	782	7500	5213	3910
16	54	864	836	8000	5573	4180

Erlang traffic measurements are made in order to help telecommunications network designers understand traffic patterns within their voice networks. This is essential if they are to successfully design their network topology and establish the necessary trunk group sizes.

Erlang traffic measurements or estimates can be used to work out how many lines are required between a telephone system and a central office (PSTN exchange lines), or between multiple network locations.

Please visit www.erlang.com for additional information.

1.6 Notes on System Configuration



In an IP system using subnets to differentiate telephony areas, each subnet must have its own access points. Each subnet may require an AVPP to maintain voice quality, but this depends on traffic volume and router capacity.

Multiple AVPP environments are those which have more than one AVPP.

AVPP models may not be combined within one subnet. More than one AVPP model type may be used within a facility if installed on different subnets.

Wireless IP Telephones cannot roam with uninterrupted service between subnets unless specific LAN components are present. Certain AP/Ethernet switch combinations establish a layer-2 tunnel across subnets that enables the handsets to roam. Without this capability, any call in progress will be dropped when the user moves out of range and the handset must be power-cycled in order to resume functionality in the new subnet area.

Please contact your service representative for detailed configuration information when installing multiple AVPP models across several different subnets.



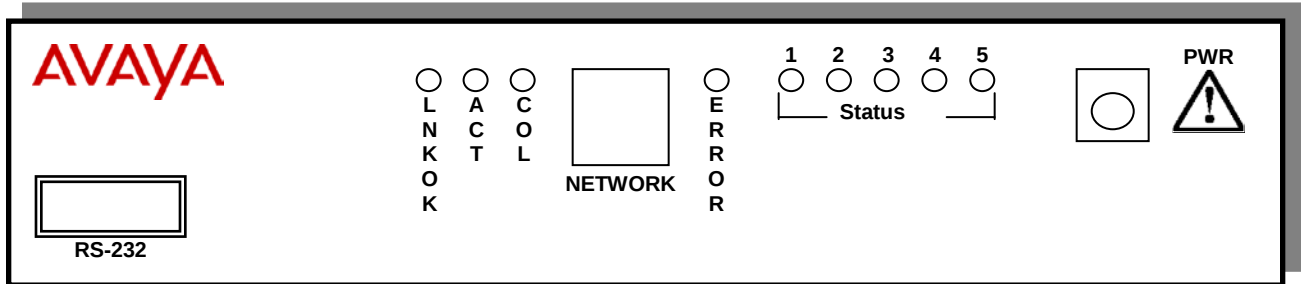
IP multicast addresses are used when the Avaya 3645 Wireless IP Telephone is installed and PTT is enabled. PTT requires that multicasting be enabled on the subnet used for the Avaya Wireless IP Telephones, AVPP, and Avaya Aura™ Communication Manager.



The Avaya Voice Priority Processor requires a Cat. 5 cable connection between its network port and the Ethernet switch. The Avaya Voice Priority Processor auto-negotiates to the type of port on the Ethernet switch and supports 10Base-T, 100Base-T, full-duplex and half-duplex port types.

1.7 The Front Panel of the Avaya Voice Priority Processor

The Avaya Voice Priority Processor's front panel contains ports to connect to power, the LAN, and to an administrative computer via an RS-232 port. Status LEDs supply information about the Avaya Voice Priority Processor's functioning.



RS-232 Port – male DB-9 connector (DTE) used for RS-232 connection to a terminal, terminal emulator, or modem for system administration.

Link LEDs:

LNKOK – Lit when there is a network connection.

ACT – Lit if there is system activity.

COL – Lit if there are network collisions.

NETWORK – Port to wired (Ethernet) LAN.

ERROR – Lit when the system has detected an error.

STATUS – Indicate system error messages and status.

1 – Heartbeat, indicates gateway is running.

2 – If active calls.

3 – SVP Server is locked.

4 – Currently unused.

5 – This SVP Server is the cluster master.

PWR (power jack) – Connects to the AC adapter supplying power to the system.



Use only the Avaya-provided Class II AC Adapter with output 24VDC, 1A.

Note that the model designation may be found on the label which is on the side of the AVPP.

2. Installing the Avaya Voice Priority Processor

As shown in the system diagram the Avaya Voice Priority Processor is connected to the Ethernet switch. The specifications covered here allow for great flexibility in physical placement of the components within stated guidelines.

See the Configuration and Administration for Avaya 3641/3645 Wireless IP Telephones for information on IP addressing.

This unit must be installed by a service person familiar with the installation of electronic equipment.

Do not power up the unit before it has been properly grounded to a protective earth. See *Grounding instructions* below.

2.1 Required Materials

The following equipment must be provided by the customer.

1. Power Outlet – Must accept Avaya-provided AC adapter.
2. Backboard space – The Avaya Voice Priority Processor is designed to be wall mounted to $\frac{3}{4}$ " plywood securely screwed to the wall.
3. Screws – Required to mount the Avaya Voice Priority Processor to the wall. Four #8 - $\frac{3}{4}$ " panhead wood screws (or similar device) are required.
4. Cat. 5 Cable – RJ-45 connector at the Avaya Voice Priority Processor. Connection to Ethernet switch.

2.2 Locate the Avaya Voice Priority Processor

The Avaya Voice Priority Processor measures approximately 4 x 12.5 x 7", and weighs about five pounds. The unit can be wall mounted, vertically or horizontally, over $\frac{3}{4}$ " plywood. The AVPP can also be rack-mounted using a rack-mount kit (sold separately).

Locate the Avaya Voice Priority Processor in a space with:

1. Sufficient backboard mounting space (for wall mount) and proximity to the LAN access device (switched Ethernet hub) and power source.
2. Easy access to the front panel, which is used for cabling.
3. A maximum distance of 325 feet (100 meters) from the Ethernet switch.

2.3 Install the Avaya Voice Priority Processor

The Avaya Voice Priority Processor may be mounted on a rack or to a wall.

Mount the AVPP on a rack

The rack-mount kit is designed for mounting equipment in a standard 19" rack and should contain the following equipment:

1. Mounting plates – Two for each AVPP to be mounted.
2. Screws – Four rack-mount screws for each AVPP to be mounted.

To rack-mount the Avaya Voice Priority Processor:

1. Remove the corner screws from the AVPP.
2. Screw the U-shaped end (round screw holes) of the two mounting plates to the AVPP.
3. Screw the other end of the two mounting plates (oblong screw holes) to the rack.
4. Repeat steps 1-3 for each additional AVPP. The mounting plate is designed to provide the correct minimum spacing between units. When mounting multiple units, stack the units in the rack as closely as possible.

Mount the Avaya Voice Priority Processor to a wall

The Avaya Voice Priority Processor can be mounted either horizontally or vertically.

To mount the Avaya Voice Priority Processor to a wall:

1. Using a 1/8" drill bit, drill four pilot holes, on 1.84" by 12.1" centers (approximately equivalent to 1-13/16" by 12-1/8").
2. Insert the #8 x 3/4" screws in the pilot holes and tighten, leaving a 1/8" to 1/4" gap from the wall.

Grounding Instructions

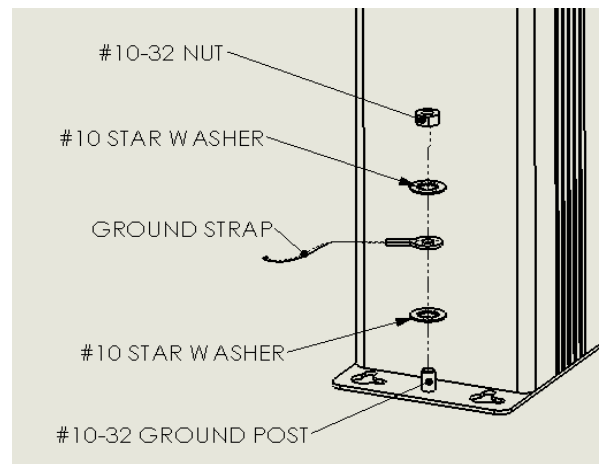


Safety Warning

The metal chassis of this unit may contain leakage currents (i.e., "touch" current) which is cumulative when multiple units are connected together to form a system. To prevent the summation of leakage currents from being present on exposed metal surfaces, the following installation procedure must be followed.

All system units must be grounded to a protective earth by means of the grounding stud located on the rear panel. Refer to the illustration below for recommended continuity connection.

No more than 15 units may be grounded through one connection to the protective earth ground. Systems involving more than 15 units must be broken up into groups of 15 or fewer units with each group provided with an independent protective earthing conductor.



Connect Avaya Voice Priority Processor to LAN

Using a Cat. 5 cable, connect the NETWORK port on the Avaya Voice Priority Processor to the connecting port on the Ethernet switch.

Connect Power

1. Once the units have been properly grounded, connect the power plug from the AC adapter to the jack labeled **PWR** on the AVPP Server.



Use only the Avaya-provided Class II AC Adapter with output 24VDC, 1A.

2. Plug the AC adapter into a wall outlet to apply power to the Avaya Voice Priority Processor.
3. Verify that leakage current ("touch" current) is below 250 μ A rms on exposed metal surfaces.
4. If leakage is excessive, power off the system and re-verify ground path continuity.
5. The system will cycle through diagnostic testing and the LEDs will blink for about one minute. When the system is ready for use:
 - The **ERROR LED** should be off.
 - **Status 1** should be blinking.

3. Configuring the Avaya Voice Priority Processor

During initial setup of the Avaya Voice Priority Processor the IP address is established and the maximum number of active calls per access point is set. Optionally, you may enter a hostname and a location for software updates via TFTP.

3.1 Connecting to the Avaya Voice Priority Processor

The initial connection to the Avaya Voice Priority Processor must be made via a serial connection to establish the Avaya Voice Priority Processor's IP address. After the IP address is established, connection to the Avaya Voice Priority Processor may be done via the network using telnet. It is recommended that the basic setup actions occur while the serial connection is made.

Connect via the Serial Port

1. Using a DB-9 female, null-modem cable, connect the Avaya Voice Priority Processor to the serial port of a terminal or PC.
2. Run a terminal emulation program (such as HyperTerminal™) or use a VT-100 terminal with the following configuration –
Bits per second – 9600
Data bits – 8
Parity – None
Stop bits – 1
Flow control – None
3. Press Enter to display the Avaya Voice Priority Processor login screen.
4. Enter the default login – **admin** and default password – **admin**. These are case sensitive.
5. The **NetLink SVP-II System** menu will display.

Connecting Via Telnet



Telnet can only be used after the Avaya Voice Priority Processor's IP address is configured.

The telnet method of connection is used for routine maintenance of the NetLink Server for both local and remote administration, depending on your network.

To connect via telnet, run a telnet session to the IP address of the Avaya Voice Priority Processor. Once you connect and log in, the **NetLink SVP-II System** menu displays.

3.2 The NetLink SVP-II System Menu

The main menu displays as shown here:

```
NetLink SVP-II System
Hostname: [SVPV2_1], Address: 10.8.0.61

System Status
SVP-II Configuration
Network Configuration
Change Password
Exit

Enter=Select      ESC=Exit      Use Arrow Keys to Move Cursor
```

System Status – Menu for viewing error messages, status of operation and software code version.

SVP-II² Configuration – Allows you to set the mode and reset the system.

Network Configuration – Allows you to set network configuration options, including IP address and hostname.

Change Password – Allows you to change the password for Avaya Voice Priority Processor access.

² SVP-II is a designation used internally by Avaya Engineering.

3.3 Network Configuration

The IP address and other network settings are established via the **Network Configuration** screen. This is also where you may optionally establish a hostname and enter the IP address of the location of any software updates you may obtain from Avaya. See section 6, the *Software Maintenance* section, of this document for more information about installing software updates via TFTP.

Scroll to **Network Configuration** and select by pressing Enter. A screen similar to the following appears:

```

                                Network Configuration
                        Hostname: [SVP020_1], Address: 10.8.0.61

Ethernet Address (fixed):      00:90:7A:02:8F:AB
IP Address:                    10.8.0.61
Hostname:                     SVP020_1
Subnet Mask:                   255.0.0.0
Default Gateway:              10.0.0.90
SVP-II TFTP Download Master:  10.0.0.3
Primary DNS Server:           NONE
Secondary DNS Server:         NONE
DNS Domain:                   NONE
WINS Server:                  10.13.0.1
Workgroup:                    WORKGROUP
Syslog Server:                10.0.0.31
Disable Telnet service:       N
Maintenance Lock:             N

Enter=Change  S=SendAll  ESC=Exit      Use Arrow Keys to Move Cursor

```

Note the navigation options at the bottom of the screen. Press Enter to change a value, ESC to exit the screen, and the arrow keys to move the cursor.

SendAll

In an IP system with multiple Avaya Voice Priority Processors, the **SendAll** option is provided to speed configuration and to ensure identical settings. The **S-SendAll** option allows you to send that configuration parameter to every Avaya Voice Priority Processor on the LAN. **SendAll** can only be used after the IP address is established on EACH Avaya Voice Priority Processor via the serial connection. If you anticipate identical settings across the LAN, set just the IP address and custom hostname (if desired) for each Avaya Voice Priority Processor using the initial serial connection. Then connect via the LAN and use **SendAll** to set identical configuration options for all Avaya Voice Priority Processors.

If **SendAll** is to be utilized in your system, all passwords must be identical.

Do not change the password at the initial configuration if the SendAll option is desired. Use the default password and change it globally if desired after a LAN connection is established for all Avaya Voice Priority Processors.

If independent administration of each Avaya Voice Priority Processor is desired, the passwords may be set at initial configuration.

The following options must be configured:

IP Address

Enter the IP address of the Avaya Voice Priority Processor, defined by your network administrator. Enter the complete address including digits and periods. **DHCP** may be entered.

The Avaya Voice Priority Processor will automatically lock for maintenance if the IP address is changed. When this Maintenance Lock occurs, the Avaya Voice Priority Processor must be reset upon exit. All active calls are terminated during a reset.

Hostname

(Optional) change the default host name, if desired. This is the name of the Avaya Voice Priority Processor to which you are connected, for identification purposes only. You cannot enter spaces in this field.

Subnet Mask

The network administrator must define the subnet mask.

Default Gateway

The IP address of a router on the local subnet.

SVP-II TFTP Download Master

This entry indicates the source of software updates for the Avaya Voice Priority Processor. See the *Software Maintenance* section for more information. Valid source location entries are:

- **NONE** – disables.
- **IP Address** – The IP address of a network TFTP server that will be used to transfer software updates to the Avaya Voice Priority Processor.

DNS server and DNS domain

These settings are used to configure Domain Name services. Consult your system administrator for the correct settings. These can also be set to **DHCP**. This will cause the DHCP client in the Avaya Voice Priority Processor to attempt to automatically get the correct setting from the DHCP server. The DHCP setting is only valid when the IP address is also acquired using DHCP.

WINS servers

These setting are used for Windows Name Services. Consult your system administrator for the correct settings. These can also be set to **DHCP**. This will cause the DHCP client in the Avaya Voice Priority Processor to attempt to automatically get the correct setting from the DHCP server. The DHCP setting is only valid when the IP address is also acquired using DHCP.



When the name services are set up correctly, the Avaya Voice Priority Processor can translate hostnames to IP addresses. Using telnet, it is also possible to access the Avaya Voice Priority Processor using its hostname instead of the IP address.

Workgroup

As set in WINS.

Syslog Server

Logging may be set to either **DHCP** (see **DNS** above), an [IP address] or **NONE**. If Syslog is set, a message is sent to the syslog server when an alarm is triggered.

Disable Telnet Service

Prevents Telnet access into the AVPP. Reset the AVPP for the change to take effect.

Upon reset the Telnet protocol server is not started.

The Avaya Voice Priority Processor must be reset in order to set the configuration options. If the Avaya Voice Priority Processor is in **Maintenance Lock**, you must manually reset it by selecting the **Reset** option in the **SVP-II Configuration** screen and then pressing Y upon exit.

3.4 AVPP Configuration

The **SVP-II Configuration** screen is where you set the mode of the Avaya Voice Priority Processor. It is also where you can lock the Avaya Voice Priority Processor for maintenance and reset the Avaya Voice Priority Processor after maintenance. The type of gateway you are using determines the mode of the Avaya Voice Priority Processor.

From the main menu, scroll to **SVP-II Configuration** and select by pressing Enter.

```

                                SVP-II Configuration
                        Hostname: [SVPII_1], Address: 10.8.0.52

SVP-II Mode:                      Netlink IP
Ethernet link:                    auto-negotiate
System Locked:                   N
Maintenance Lock:                N
Inactivity Timeout (min):        20
QoS Configuration
Reset
Reset all SVP servers

Enter=Change  S=SendAll  ESC=Exit      Use Arrow Keys to Move Cursor

```

SVP-II Mode – Defaults to **NetLink IP** for an IP environment. Press enter to select and the screen is immediately redrawn with additional options for the IP environment.

```

                                SUP-II Configuration
                        Hostname: [OJK_SUPII_050307], Address: 172.29.76.40

Phones per Access Point:         5
802.11 Rate:                    Automatic
First Alias IP Address:          172.29.76.41
Last Alias IP Address:           172.29.76.44
Enable H.323 Gatekeeper:        N
SUP-II Mode:                    Netlink IP
Ethernet link:                  auto-negotiate
Check-in throttling (0-4):       0
Missed ding limit (3-10):        3
System Locked:                  N
Maintenance Lock:               N
Inactivity Timeout (min):        19
QoS Configuration
Reset
Reset all SUP servers

Enter=Change  S=SendAll  ESC=Exit      Use Arrow Keys to Move Cursor

```

The following options must be configured:

Phones per Access Point – Access point specifications are detailed in the *Configuration Notes* for each brand and type. Refer to these notes when entering the number of simultaneous calls supported for your type.

802.11 Rate – Select **1MB/2MB** to limit the transmission rate between the Wireless IP Telephones and access points. Select **Automatic** to allow the Wireless IP Telephone to determine its rate.

First Alias IP Address/Last Alias IP Address – Alias IP Addresses are not necessary in Avaya systems.

Enable H.323 Gatekeeper – In certain H.323 protocol systems, the AVPP may function as a gatekeeper. Enter **Y** to have the AVPP function as the gatekeeper in the H.323 protocol environment.

Ethernet link – The AVPP will auto-negotiate unless there is a need to specify a link speed.

Check-in throttling – The check-in throttling option regulates the number of handsets that can check-in simultaneously. The error Maximum payloads reached is caused by a massive check-in that has overwhelmed the server. If persisting, throttling may be raised. However, a setting that is too high may slow check-in performance. The option allows for a setting from 0 to 4, with 0 being the least amount of throttling and 4 being the most. Consult with Customer Support for help in determining if throttling is advised for your system.

Missed ding limit– The Missed ding limit defaults to 3 and should be left at this setting unless advised by Customer Service to raise or lower it. The DING message is a proprietary method of communication between system elements. This setting is designed to assist service engineers in fine-tuning system performance and should not be changed without their consultation.



Load balancing enables a locked SVP Server to distribute idle handsets to other SVP Servers in the cluster. Existing calls will not be interrupted and the SVP Server will become idle once all calls are ended and idle phones are transferred to another SVP Server.

System Locked – This option is used to take the system down for maintenance. The default entry is **N** (No). Set it at **Y** (Yes) to prevent any new calls from starting. Return to **N** to restore normal operation.

Maintenance Lock – The system automatically sets this option to **Y** (Yes) after certain maintenance activities that require reset, such as changing the IP address. Maintenance Lock prevents any new calls from starting. Note that the administrator cannot change this option. It is automatically set by the system. Reset the system at exit to clear Maintenance Lock.

Inactivity Timeout (min) – Set the number of minutes the administrative module can be left unattended before the system closes it. This number can be from 1 to 100. If it is set to zero (0), the administrative module will not close due to inactivity.

QoS Configuration – Select this option to set the DSCP tags. See *QoS Configuration* section below.

Reset System – If this option is selected, you will be prompted to reset the Avaya Voice Priority Processor upon exiting this screen.

Reset All SVP Servers – If this option is selected, you will be prompted to reset all AVPPs upon exiting this screen. This is necessary if you have changed configurations on other AVPPs by using the SendAll option.



The Avaya Voice Priority Processor should be reset at the end of any maintenance procedure that requires a reset either via **Maintenance Lock** or manually via **Reset System**.



Note that resetting the Avaya Voice Priority Processor will terminate any calls in progress.

QoS Configuration

DSCP tags set packet priorities for QoS.

```

                                QoS Configuration
                        Hostname: [slnk-03e396], Address: 10.13.0.127

Traffic Class DSCP Tag
-----
Administration Default
WT (In call) Default
WT (Standby) Default
RTP Default
PBX Default
Inter-SVP2 Default

Enter=Change  S=SendAll  ESC=Exit    Use Arrow Keys to Move Cursor

```

DSCP Tag

DSCP (Differentiated Services Code Point) is a QoS mechanism for setting relative priorities. Packets are tagged with a DSCP field in the IP header. The decimal value may be set as a number from 0-63 and may be different for each traffic class listed on the screen. The default for all traffic classes is 4.

Administration tags set the priority for telnet, TFTP, and other administrative traffic. Administrative traffic can have the lowest priority because it does not require voice quality.

WT (In call) traffic requires voice quality and may be set to a higher priority than WT (Standby) traffic.

RTP traffic is the audio traffic to the IP PBX. It requires voice quality.

PBX traffic is not audio to the PBX.

Inter-SVP2 traffic is the information-passing protocol that AVPP Servers use to communicate with each other.

When forwarding packets, the AVPP Server shall always overwrite the received DSCP value. The final DSCP tag for packets in each of the traffic classes are assigned a DSCP value based on the following rules. (Please see table on next page.)

- If both **Administration** and the **Traffic Class** setting is **Default**, the **Default** value as shown in the table below will be used.
- If **Administration** is set at any number (**Value X**) other than **Default**, that setting (**Value X**) it will override the Default value of the Traffic Class.
- If any of the **Traffic Class** settings are set at any value (**Value Y**) other than **Default**, that setting (**Value Y**) will override the **Administration** setting.

Traffic Class		Administration	
		Default	Value X
WT (In call) Priority High	Default	4	X
	Value Y	Y	Y
WT (Standby) Priority Med	Default	0	X
	Value Y	Y	Y
RTP Priority High	Default	4	X
	Value Y	Y	Y
PBX Priority Med	Default	0	X
	Value Y	Y	Y
Inter-SVP2 Priority Med	Default	0	X
	Value Y	Y	Y
Administration Priority Low	Default	0	X
	Value Y	Y	Y



Note: Default DSCP settings will mark traffic for Best Effort handling under normal circumstances. Please consider changing these values based on the recommended QoS settings from your network hardware manufacturer to achieve prioritization for your voice traffic.

3.5 Change Password

If desired, the password to access the Avaya Voice Priority Processor may be changed.

A password must meet the following requirements:

1. It must be more than four characters, but cannot exceed 16 characters.
2. The first character must be a letter.
3. Numbers or letters are allowed.
4. No dashes, spaces, or punctuation marks, etc. are allowed.

Select **Change Password** from the main menu. A screen similar to the following will appear:

Change Password

Hostname: [SUPV2_1], Address: 10.8.0.61

Old Password *****

New Password *****

Confirm New Password *****

Set Password

Set Password on all SUP servers

Enter=Select

ESC=Exit

Use Arrow Keys to Move Cursor

Enter the information and either select **Set Password** or press the **S** key to set the new password.

If you forget a password, call Avaya Customer Service for assistance.

4. Swapping/Adding/Deleting AVPPs

Whenever an AVPP is removed from the system, Wireless IP Telephones that are using the AVPP will be affected and calls may be lost. If the removal of the AVPP is intentional, the administrator should lock and idle the system prior to removing an AVPP.



Load balancing enables a locked AVPP Server to distribute idle handsets to other AVPP Servers in the cluster. Existing calls will not be interrupted and the AVPP Server will become idle once all calls are ended and idle phones are transferred to another AVPP Server.

Adding an AVPP

A new AVPP is detected within two seconds of being added to the system (booted/configured/connected). When detected, any Wireless IP Telephone not active in a call will eventually be forced to reboot and check in again. Any Wireless IP Telephone in a call will immediately switch to the AVPP that should provide its "timing" function. This switch should not be noticeable to the user since it is similar to a normal handoff between access points. When the Wireless IP Telephone ends the call, it will eventually be forced to reboot and check in again. Only a few handsets at a time are rebooted to prevent excessive check in traffic on the network. Handsets scheduled to be rebooted can still make calls and will be rescheduled for reboot when the call is ended.

Removing an AVPP

The preferred method for removing an AVPP Server from an active system is to first lock the AVPP Server. When an AVPP Server is locked for removal from the system, load balancing enables the locked AVPP Server to distribute idle handsets to other AVPP Servers in the cluster. Active calls will not be interrupted. The locked AVPP Server will become idle once all calls are ended and idle handsets are registered to other AVPP Servers. Once all handsets have been moved---as evidenced by the number of **Telephones in Use** on the **Network Status** screen---the idle AVPP Server may be unplugged and removed from the system.

During this process, there is a short period where a handset registered on a locked AVPP Server may attempt to initiate a call before it is re-registered to another AVPP Server on a locked AVPP Server. In this case, if there is an unlocked AVPP Server in the cluster, the AVPP Server will tell the handset to reboot. As it reboots, the handset will check-in with an available AVPP Server and the user may then start a call. Handsets registered on unlocked AVPP Servers are not affected.

Of course if a system only has one AVPP Server, no calls will be possible until the removed AVPP Server is replaced.

AVPP Server failure

If an AVPP Server becomes unable to manage calls or fails, any handset in an active call registered to that AVPP Server loses service (and any calls) and will reboot within 30 seconds. However, upon initiating a new call, the handset will locate another Server and will be able to make new calls. After rebooting, the handset will register with another AVPP (if there is one available) and be able to make new calls. Handsets not registered on the failed AVPP may experience a few seconds of disruption in audio but are otherwise unaffected.

5. Software Maintenance

The Avaya Voice Priority Processor uses proprietary software programs written and maintained by Avaya Corporation. The software versions that are running on the system components can be displayed via the **System Status** screen.

You may obtain information about software updates from Avaya or its authorized dealer.

At startup the Avaya Voice Priority Processor uses TFTP to check the software version it is running against the version in the TFTP location. If there is a discrepancy, the Avaya Voice Priority Processor will download the version in the TFTP location.

Software Updates

Lock the Avaya Voice Priority Processor in the **SVP-II Configuration** screen prior to updating the software. In multiple AVPP Server systems, all AVPP Servers must be locked and upgraded at the same time.

Downloads for the Avaya Voice Priority Processor are available from your service representative.

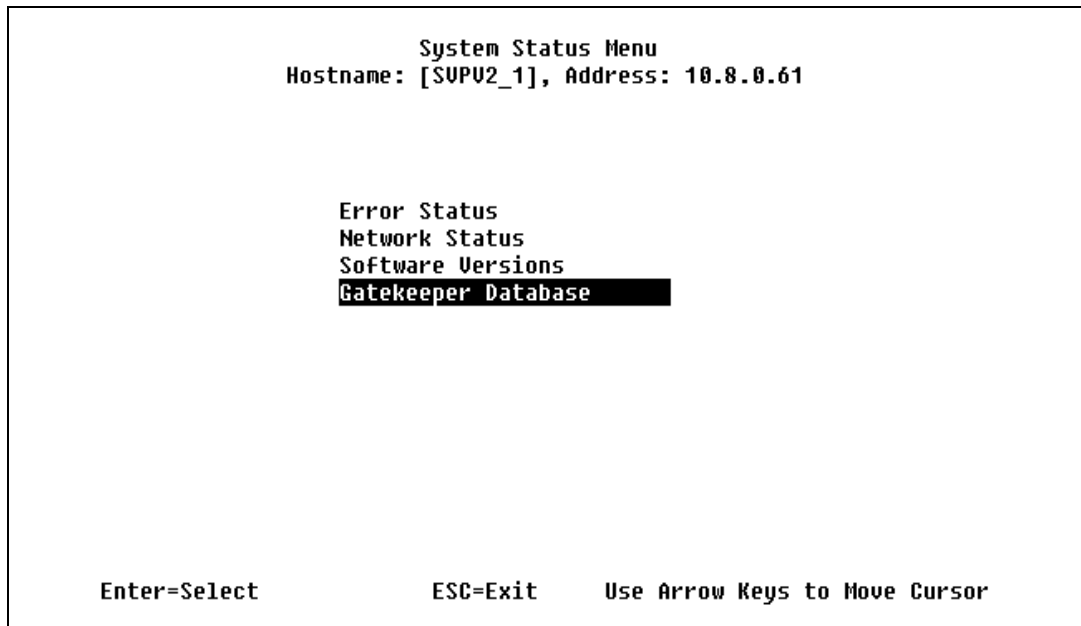
After software updates are obtained from Avaya, they must be transferred to the TFTP location in the LAN to update the code used by the Avaya Voice Priority Processor(s).



Note that locking the Avaya Voice Priority Processor will prevent new calls from starting. All calls in progress will be terminated when the Avaya Voice Priority Processor is reset.

6. Troubleshooting via System Status Menu

Information about system alarms, and network status displays on various screens accessed through the **System Status Menu** screen, which is opened from the main menu of the Avaya Voice Priority Processor. See the previous sections for directions on how to connect to the Avaya Voice Priority Processor and navigate to the **System Status Menu**.



Error Status – Displays alarm and error message information.

Network Status – Displays information about the Ethernet network to which the Avaya Voice Priority Processor is connected.

Software Versions – Lists the software version for each Avaya component.

Gatekeeper Database – not used.

Options on the System Status menu provide a window into the real time operation of the components of the system. Use this data to determine system function and to troubleshoot areas that may be experiencing trouble.

6.1 Error Status

The **Error Status** screen displays any alarms that indicate some system malfunction. Some of these alarms are easily remedied and others require a call to Avaya's Customer Support Department.

From the **System Status Menu**, select **Error Status**. The screen displays active alarms on the Avaya Voice Priority Processor.

The following table displays the list of alarms and a description of the action to take to eliminate the alarm.

Alarm Text	Action
Maximum payload usage reached	Reduce usage, clear alarm ³
Maximum telephone usage reached	Reduce usage, clear alarm
Maximum access point usage reached	Reduce usage, clear alarm
Maximum call usage reached	Reduce usage, clear alarm
SRP audio delayed	Reduce usage, clear alarm
SRP audio lost	Reduce usage, clear alarm
No IP address	Configure an IP address
AVPP Server(s) lost	Reduce usage or replace lost AVPP Server. Clear alarm

Press C to clear all clearable alarms.

³ If capacity problems persist, additional AVPP servers may need to be added to the system to improve performance.

6.2 Network Status

The Avaya Voice Priority Processor is connected to the Ethernet network, referred to as the LAN or Local Area Network. The information about that connection is provided through the **Network Status** screen.

From the **System Status Menu**, select **Network Status**. The screen displays information about the Ethernet network. This information can help troubleshoot network problems. A sample screen is displayed here.

```

Network Status
Hostname: [SUPV2_1], Address: 10.8.0.61

Ethernet Address: 00:90:7A:00:77:15      Net: 100/full
System Uptime:    6 days, 02:34          Max calls: 80

RX:  bytes    packets  errors  drop  fifo  alignment  multicast
    432891547  4112190      0      0      0          0      1321217

TX:  bytes    packets  errors  drop  fifo  carrier  collisions
    1478261799 1311194      0      0      0          0          0

SUP-II Sockets in Use      (Last / Max):    0 / 10
SUP-II Access Points in Calls (Last / Max):    0 / 2
SUP-II Telephones in Use   (Last / Max):    0 / 1
SUP-II Telephones in Calls (Last / Max):    0 / 2
SUP-II SRP Audio           (Delay / Lost):    0 / 0

ESC to Exit

```

Ethernet Address – MAC address of the Avaya Voice Priority Processor (hexadecimal).

System Uptime – The number of days, hours and minutes since the Avaya Voice Priority Processor was last reset.

Net – The type of connection to the Ethernet switch currently utilized. See AVPP Capacity for more information.



Data is transmitted over Avaya components by proprietary technology developed by Polycom, Inc. The SpectraLink Radio Protocol (SRP) packets and bytes can be differentiated from other types of transmissions and are used to evaluate system functioning by Avaya customer support and engineering personnel.

RX – Ethernet statistics concerning the received packets during System Uptime.

bytes – bytes received

packets – packets received

errors – Sum of all receive errors (long packet, short packet, CRC, overrun, alignment)

drop – packets dropped due to insufficient memory

fifo – overrun occurred during reception

alignment – nonoctet-aligned packets (number of bits NOT divisible by eight)

multicast – packets received with a broadcast or multicast destination address

TX – Ethernet statistics concerning the transmitted packets during System Uptime.

bytes – bytes transmitted

packets – packets transmitted

errors – Sum of all transmit errors (heartbeat, late collision, repeated collision, underrun, carrier)

drop – packets dropped due to insufficient memory

fifo – underrun occurred during transmission

carrier – carrier lost during transmission

collisions – packets deferred (delayed) due to collision

SVP-II Access Points in Use – Access points in use by Wireless IP Telephones, either in standby or in a call. ‘Last’ is current, ‘Max’ is the maximum number in use at one time.

SVP-II Access Points in Calls – Access points with Wireless IP Telephones in a call.

SVP-II Telephones in Use – Wireless IP Telephones in standby or in a call.

SVP-II Telephones in Calls – Wireless IP Telephones in a call.

SVP-II SRP Audio (Delay) – SRP audio packets whose transmission was momentarily delayed.

SVP-II SRP Audio (Lost) – SRP audio packets dropped due to insufficient memory resources.

6.3 Software Version

The Avaya Voice Priority Processor and Wireless IP Telephones utilize Avaya's proprietary software that is controlled and maintained through versioning. The **Software Version** screen provides information about the version currently running on the Avaya Voice Priority Processor. This information will help you determine if you are running the most recent version and will assist Avaya engineering and/or customer support in troubleshooting software problems.

This screen also displays the model type.

From the **System Status Menu**, select **Software Version**. A sample screen is displayed here.

```

                                Software Version Numbers
                                Hostname: [SVP020_1], Address: 10.8.0.61

SVP Type:                      020
Hardware Versions:              33/02
Factory Page:                   213.001
Downloader:                     213.004 (99cd73ee)
Table of Contents:              173.024 (4553d976)
Functional Code:                174.024 (f4ae1d58)
File System:                    175.024 (4bfc9a09)

                                ESC to Exit

```

Note that the software versions on your system may be different from the versions displayed in the above sample screen.

The table below shows the description, major version numbers, and filenames of the files that are provided when downloading updates.

Name	Major version number	Filename
Table of contents	173	svp100.toc
Functional code	174	zvmlinux
File system	175	flashfs

The minor version numbers for these three files must all match, as they do in the screen example (17x.024).

B. Avaya 3641/3645 Wireless IP Telephones

Configuration and Administration

1. Avaya 3641/3645 Wireless IP Telephone Overview

The Avaya 3641/3645 Wireless IP Telephone is a Wi-Fi handset for workplace IP telephone systems. The Wireless IP Telephone operates over an 802.11a/b/g/n wireless Ethernet LAN providing users a wireless voice over IP (VoIP) extension. By seamlessly integrating with an Avaya Aura™ Communication Manager, Wireless IP Telephone users are provided with high-quality mobile voice communications throughout the workplace. The Wireless IP Telephone gives users the freedom to roam throughout the workplace while providing users with all the features and functionality of an IP desk phone.

The Avaya 3641/3645 Wireless IP Telephone provides a wireless extension to the Avaya Aura™ Communication Manager. The Wireless IP Telephones reside on the wireless LAN with other wireless devices using direct-sequence spread spectrum (DSSS) radio technology. The handset radio transmits and receives packets at up to 54Mb/s using 802.11a/b/g technology.

A Wireless IP Telephone must be administered on the Avaya Aura™ Communication Manager for the specific features and lines to be accessed by the Wireless IP Telephone. After the handset is registered, it receives its configuration information from the Avaya Aura™ Communication Manager.

The Wireless IP Telephone may be administered on the Avaya IP Office Server but certain functionality described in this document will not be available. The Call Logs and corresponding Redial features are replaced by a simple Redial function that lists recently dialed numbers. See section 4.1 *The Admin Menu* and the *Avaya 3641/3645 Wireless IP Telephone User Guide* (21-601633) for more information



The latest Wireless IP Telephone and Handset Administration Tool software versions are required to support the features described in this document.

1.1 WLAN Quality of Service (QoS)

Quality of Service is provided by using SpectraLink Voice Priority (SVP), Wi-Fi Standard QoS or Cisco Compatible Extensions (CCX) version 4. These QoS modes can not be mixed within the same WLAN; all Wireless IP Telephones on the network must have the same QoS setting.

SVP

SpectraLink Voice Priority is a proprietary method of WLAN QoS, developed by Polycom, to ensure enterprise-grade voice quality, battery life and call capacity for SpectraLink Wireless IP Telephones. SVP requires the Avaya Voice Priority Processor (AVPP) Server, which is an Ethernet LAN device that works in conjunction with Wi-Fi APs to ensure QoS over the WLAN. Voice packets to and from the Wireless IP Telephones are forwarded through the AVPP Server to ensure voice prioritization as they are routed between the handset and an IP telephony server. See the *SpectraLink SVP Server: Administration Guide within IP Environments* document for detailed information about this device.

Wi-Fi Standard QoS

Avaya 3641/3645 Wireless IP Telephone support WMM, WMM Power Save and WMM Admission Control - all QoS standards from the Wi-Fi Alliance based on IEEE 802.11e. The combination of these three standards provides enterprise-class QoS in

terms of voice quality, battery life and call capacity. The WLAN must also support and enable each of these QoS mechanisms in order to ensure they are utilized. This option does not require the AVPP Server.

CCXv4

The CCX program allows WLAN client devices operating on Cisco APs to take advantage of Cisco-specific features. When the CCXv4 operating mode is selected on the handset, it operates using the required set of Cisco-specific and industry standard QoS mechanisms. This option does not require the AVPP Server.

1.2 Security

The following security methods are supported by the handset.

WPA2 Enterprise

The handset supports WPA2 Enterprise, as defined by the Wi-Fi Alliance. WPA2, which is based on the 802.11i standard, provides government-grade security by implementing the Advanced Encryption Standard (AES) algorithm. The Enterprise version of WPA2 uses 802.1X authentication, which is a port-based network access control mechanism using dynamic encryption keys to protect data privacy. Two 802.1X authentication methods are supported on the Wireless IP Telephone, EAP-FAST and PEAPv0/MSCHAPv2. Both of these methods require a RADIUS authentication server to be available on the network and accessible to the phone. Additional details are provided in Section 3.1.

Normal 802.1X authentication requires the client to renegotiate its key with the authentication server on every AP handoff, which is a time-consuming process that negatively affects time-sensitive applications such as voice. Fast AP handoff methods allow for the part of the key derived from the server to be cached in the wireless network, thereby shortening the time to renegotiate a secure handoff. The Wireless IP Telephone supports two fast AP handoff techniques: Cisco Client Key Management (CCKM) (only available on Cisco APs) and Opportunistic Key Caching (OKC). One of these methods must be configured for support on the WLAN to ensure proper performance of the handset.

WPA and WPA2 Personal

The handset supports WPA and WPA2 Personal, as defined by the Wi-Fi Alliance. WPA2, which is based on the 802.11i standard, provides government-grade security by implementing the Advanced Encryption Standard (AES) algorithm. WPA, which is based on a draft version of the 802.11i standard before it was ratified, uses Temporal Key Integrity Protocol (TKIP) encryption. The Personal version uses an authentication technique called Pre-Shared Key (PSK) that allows the use of manually entered keys to initiate security.

Cisco Fast Secure Roaming

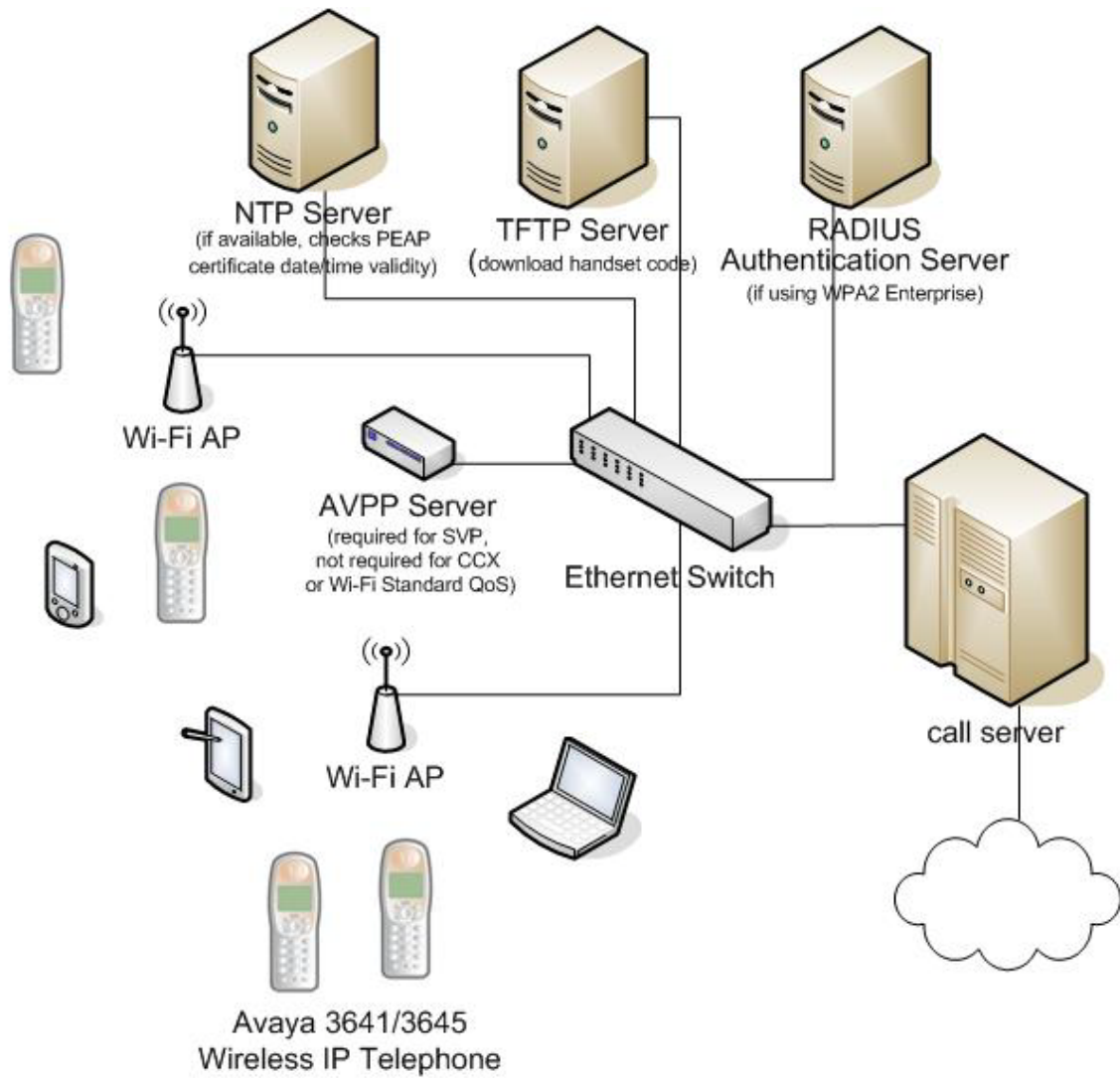
Cisco's Fast Secure Roaming (FSR) mechanism uses a combination of standards-based and proprietary security components including Cisco Client Key Management (CCKM), LEAP authentication, Michael message integrity check (MIC) and Temporal Key Integrity Protocol (TKIP). FSR provides strong security measures for authentication, privacy and data integrity on Cisco APs.

WEP

The handset supports Wired Equivalent Privacy (WEP) with both 40-bit and 128-bit encryption.

1.3 System Diagram

The following simplified diagram shows the components of a typical system.



1.4 System Components

Avaya 3641/3645 Wireless IP Telephone

The Avaya 3641 Wireless IP Telephone is a lightweight, durable handset specifically designed for mobile workplace use. The Avaya 3645 Wireless IP Telephone has the same features and function, but in a more durable design and includes push-to-talk or emergency call capability.

Handset telephony features are provided by emulating the Avaya 4612 IP Telephone. Like a wired desk phone, the handset can receive calls directly, receive transferred calls, transfer calls to other extensions, and make outside and long distance calls. The Wireless IP Telephones can only be used on-premises within the WLAN coverage area.

AVPP Server (used with SpectraLink Voice Priority QoS method)

As described in Section 1.1, the AVPP Server is a wired LAN device that is required when using SpectraLink Voice Priority for QoS.

Wi-Fi Access Points (APs)

Enterprise-grade Wi-Fi access points provide the connection between the wired LAN and the wireless client device. 802.11a/b/g/n APs must be positioned in all areas where Wireless IP Telephones will be used to ensure seamless radio coverage. The number, type and placement of access points will affect the coverage area and capacity of the wireless system. Careful planning of the WLAN is necessary to ensure good voice quality. See the *Best Practices Guide for Deploying SpectraLink 8020/8030 Wireless Telephones* for additional guidance.

Access points may use SpectraLink Voice Priority (SVP) in conjunction with an AVPP Server, CCXv4 (Cisco APs only) or Wi-Fi Standard QoS (including WMM, WMM Power Save and WMM Admission Control). **APs must be properly configured to support the corresponding QoS and security methods selected for the handset.**



Normally all APs in a given facility use the same 802.11 band. However, facility expansion, technology upgrades and other situations can result in different bands being used. Band roaming between 802.11a and 802.11b bands is possible if enabled in the Admin menu. See section 4.1 *The Admin Menu* for more information.

Ethernet Switch

One or more Ethernet switches interconnect multiple wired devices, including the AVPP Server (if used for QoS), the Avaya IP telephony system, Avaya IP phones, TFTP Server, RADIUS authentication server and WLAN access points. Enterprise Ethernet switches provide the highest performance networks, which can handle combined voice and data traffic, and are required when using the Wireless IP Telephones.

Although a single Ethernet switch network is recommended, the Wireless IP Telephones and the AVPP Server can operate in larger, more complex networks, including networks with multiple Ethernet switches, routers, VLANs, and/or multiple subnets, as long as the AVPP Server and handsets are on the same subnet. However, in such networks, it is possible for the quality of service (QoS) features of the AVPP Server to be compromised, and consequently voice quality may suffer. Any network that consists of more than a single Ethernet switch should be thoroughly tested to ensure any quality issues are addressed. See the *Best Practices Guide for Deploying SpectraLink 8020/8030 Wireless Telephones* for additional guidance.

Ensure that all your APs are attached to the same subnet for proper operation. The handset can change subnets if DHCP is enabled and the handset is powered off then back on when within range of APs on the new subnet. Note that the wireless telephones cannot “roam” across subnets, since they cannot change IP addresses while operational.

TFTP (Trivial File Transfer Protocol) Server

A TFTP server is required in the system to distribute software to the Wireless IP Telephones and AVPP Server. It may be on a different subnet than the supported Avaya IP telephony device(s) and APs.

NTP (Network Time Protocol) Server

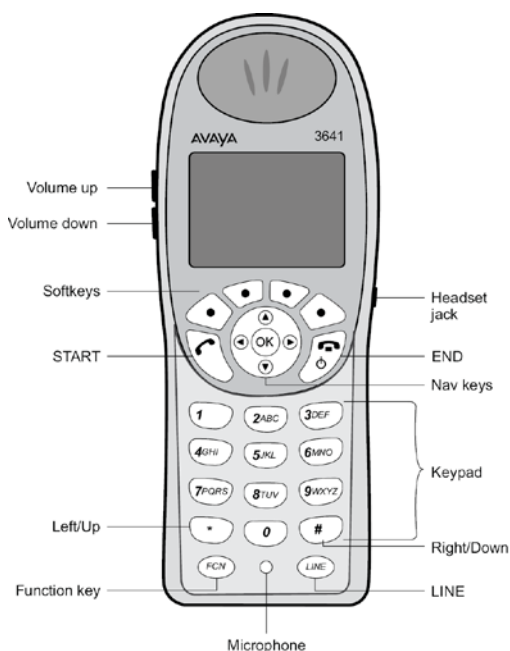
An NTP server is optional except when using WPA2 Enterprise.

If WPA2 Enterprise security with PEAP authentication is used, the handset will validate the PEAP certificate has a valid date and time. If the ACM call server specifies the current time to be used by the handset, that time will be used for PEAP certificate validation. If an NTP server is also present in the system, the handset will use the NTP time for validation until handset time is overwritten by the ACM. If an NTP Server is not available, the certificate will be deemed valid and operate accordingly.

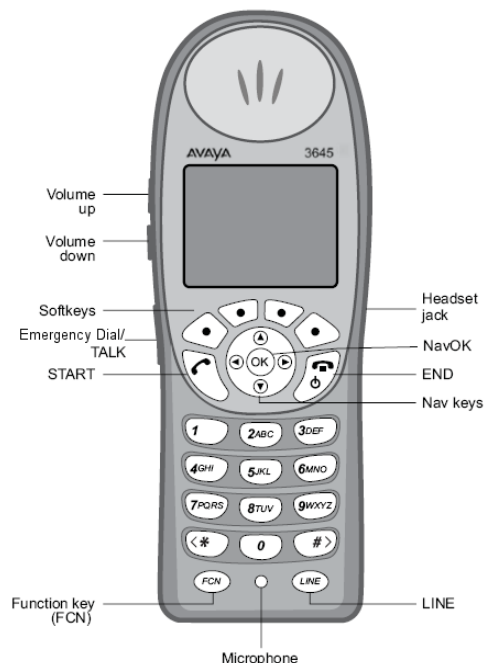
Authentication Server (if using WPA2 Enterprise)

A RADIUS authentication server must be used to provide username/password based authentication using RSA certificates for PEAPv0/MSCHAPv2 or PAC files for EAP-FAST.

2. The Avaya 3641/3645 Wireless IP Telephones



3641 Wireless IP Telephone



3645 Wireless IP Telephone

2.1 Specifications

Radio mode (selectable)	(802.11b, 802.11g) (802.11a)	2.4–2.4835 GHz 5.150–5.250 GHz 5.250–5.350 GHz 5.470–5.725 GHz 5.725–5.825 GHz
Transmission type	Direct-sequence spread spectrum (DSSS)	
Transmit data rate	up to 54 Mb/s (802.11a/g), up to 11 Mb/s (802.11b)	
WLAN QoS	Avaya Voice Priority Processor (AVPP) using SpectraLink Voice Priority (SVP) Wi-Fi Standard QoS (using WMM, WMM-Power Save and WMM-Admission Control) CCXv4	
WLAN security	Wired Equivalent Privacy (WEP), 40-bit and 128-bit; Cisco FSR WPA Personal WPA2 Personal WPA2 Enterprise: 802.1X Authentication EAP-FAST PEAPv0/MSCHAPv2 PEAP certificate sizes in DER format: 512*, 1024*, 2048, 4096 bit (*recommended) Encryption Ciphers: AES, RSA, RC4 Data Integrity: Hashed Message Authentication Code MD5 (HMAC-MD5) (RFC 2403, 2104) and Secure Hash Algorithm-1 SHA (HMAC-SHA-1) (RFC2404) Fast AP Handoff Opportunistic Key Caching (OKC) Cisco Client Key Management (CCKM)	
FCC certification	Part 15.247	
Other certifications	IP 53 certified for resistance to dust and liquid resistance MIL 810F Proc IV 516.5 for shock resistance	
Management	DHCP, TFTP	
Voice encoding	G.711μ-law, G.711a-law and G.729	
VoIP Protocols	CCMS	
Transmit power	Up to 100mW Transmit Power Control (formerly 802.11h), see Appendix A for details.	
Display	Up to five lines of text plus two icon status rows and one row for softkey labels.	
Avaya 3641 Wireless IP Telephone dimensions	5.4" x 2.0" x 0.9" (13.7 x 5.1 x 2.3 cm)	
Avaya 3645 Wireless IP Telephone dimensions	5.7" x 2.0" x 0.9" (14.5 x 5.1 x 2.3 cm)	
Avaya 3641 Wireless IP Telephone weight	3.9 oz. (110.6 g) with Standard Battery Pack	
Avaya 3645 Wireless IP Telephone weight	4.2 oz. (119.1 g) with Standard Battery Pack	
Standard Battery Pack capacity	4 hours talk, 80 hours standby	
Extended Battery Pack capacity	6 hours talk, 120 hours standby	
Ultra-Extended Battery Pack capacity	8 hours talk, 160 hours standby	

2.2 Notes on Battery Packs

- Avaya offers the following battery types with increasing capacity: Standard, Extended and Ultra-Extended.
- Battery Pack life will vary depending on handset model and features and system infrastructure.
- Batteries are shipped with a partial charge. Avaya recommends fully charging them before using them in phone operation.
- Maximum Battery Pack performance is achieved after a few charge/discharge cycles.
- If multiple Battery Packs are supplied with your handset, Polycom recommends that each be fully charged upon receipt to prolong battery life. Battery Packs will slowly lose charge if unused. To maintain battery potential, charge unused Battery Packs occasionally or alternate Battery Pack use.
- After a length of time Battery Packs will lose the ability to maintain a charge and to perform at maximum capacity and will need to be replaced. This is normal for all batteries.
- Overnight charging is best done while the handset is turned off.
- If the handset does not charge, clean Battery Pack, charger and handset contacts with an alcohol swab.
- When the handset is properly seated, the backlight comes on briefly and the handset beeps to indicate charging has begun.
- Any battery which exhibits swelling, cracking or other abnormality should be disposed of promptly and properly.

2.3 Handset Display

Display information provided by the Avaya Aura™ Communication Manager when the Wireless IP Telephone is off-hook will be passed directly to the Wireless IP Telephone display in an emulation of the Avaya 4612 IP Telephone display handling. Certain characters may be used by the Avaya Aura™ Communication Manager that are not implemented in the Wireless IP Telephone such as definable and special characters.

There are 12 programmable keys that may be allocated to line appearances or features in any combination. Pressing the **LINE** key from the active mode displays the list of line appearances extracted from the programmable keys list. The line appearances are also mapped to corresponding line icons across the top of the Wireless IP Telephone display.

Press the **FCN** key while off-hook to scroll through system features. In this mode, the display has four lines and up to 18 characters. OAI features, if assigned, will be displayed with their shortcuts. The programmable key items that appear on this list each have a state indicator in the second column of the display that shows a plus sign if the associated feature is active. This second column is blank if the associated feature is not active. The plus sign emulates a lit or blinking LED on an Avaya 4612 IP Telephone, indicating an active feature. Press the shortcut key to activate the feature. Softkeys are programmed to the fixed feature keys of the Avaya 4612 IP Telephone.

Indicator	Function
-----------	----------

Indicator	Function
	The signal-strength icon indicates the strength of the signal and can assist the user in determining if the handset is moving out of range.
	The letter “A” or “B” replaces the radio wave graphic in the signal strength icon when band roaming is active to indicate which 802.11 band is currently being used by the handset.
	The voicemail icon is activated when a new voicemail message is received if the feature is supported by the phone emulation.
	The battery icon indicates the amount of charge remaining in the Battery Pack. When only one level remains, the Battery Pack needs to be charged.
	The speakerphone icon displays when the speakerphone is active.
	The line indicators are associated with telephone line status and access.
	Up and down arrows are displayed when the menu has additional options above or below.
	Left or right arrows are displayed during editing when the cursor may be moved left or right.
	PBX ring icon. A regular telephone call is coming in.
	OAI ring icon. A call is coming in from the OAI application.
	The push-to-talk (PTT) ring icon. A PTT call is coming in.
	The priority PTT ring icon. A call is coming in on the priority PTT channel. This call will override any other.
	Location Service (RTLS) is enabled.
Muted	The muted indicator displays after the Mute softkey has been pressed. It indicates that the microphone is not transmitting sound. Press the Mute softkey again to unmute the microphone.
Locked	Locked indicates that the keypad is locked to prevent accidental activation. Use the Unlk softkey plus the # key to unlock it. Avaya 3645 only: If Emergency Dial is enabled by the system administrator an emergency call can be made while the keypad is locked.
[No Service message]	If warning tones are not disabled, an alarm will sound and a descriptive message displays when the handset cannot receive or place calls. You may be outside of the covered area. Walk back into the covered area. The in-service tone indicates that service is reestablished.
	The download icon indicates that the handset is downloading code. This icon only appears while the handset is running the over-the-air downloader. It appears to the right of the signal strength icon in the same location as the voicemail icon.
	The download failure icon indicates that the handset has failed to download code because the code is incompatible with the handset hardware. The system will also create a system log with the message: “Download aborted, code incompatible”. When this icon appears, the handset code in the TFTP server should be updated.

2.4 Startup Sequence

The Wireless IP Telephone goes through an initialization sequence at startup. The line icons 1-9 display and count down as the Wireless IP Telephone steps through this sequence. If there is difficulty at any step that prevents initialization from continuing, an error message will display and the related icon(s) will stay on. Please see the error table at the back of this document for instructions on how to handle error messages that occur during initialization.

Icon	The icon(s) shown in bold turns off when:
123 56789	The Wireless IP Telephone has located and authenticated and associated with at least one AP, and is proceeding to bring up higher-layer networking functions. Note: 4 is not used for the CCMS protocol Note: 6 is not used when QoS is set to Wi-Fi Standard
123 5678	The Wireless IP Telephone is either configured for Static IP, or if configured for DHCP the DHCP discovery process has started.
123 567	If DHCP is configured, a DHCP response was received which contains a good DNS server configuration.
123 56	Note: Used for SVP QoS only and not present when using Wi-Fi Standard or CCX QoS. Indicates one of the following possibilities: 1. Static IP configuration, or 2. AVPP address found in DHCP response, or 3. AVPP address found via DNS lookup.
123 5	All networking functions are complete (notably, DHCP) and the Wireless IP Telephone is proceeding with establishing the link to the AVPP.
123	The CCMS application has started.
12	At least one IP address for a PBX has been identified.
1	The Wireless IP Telephone has successfully registered with the PBX.
(no icons) EXT. -XXXXX # - OK New -	The Wireless IP Telephone requires verification of the extension number. See section 7.*
Password - ***** # - OK	The Wireless IP Telephone requires verification of the password. See section 7.*
Ext. XXXXX	Initialization is complete. The Wireless IP Telephone is in standby mode ready to receive and place calls.

* These prompts do not appear at every startup. They appear at first initialization and when certain conditions require them.

2.5 Wireless IP Telephone Modes

Standby (on-hook) In the standby mode the Wireless IP Telephone is waiting for an incoming call or for the user to place an outgoing call. The extension number is shown on the display and there is no dial tone. In this mode, the Wireless IP Telephone is conserving battery power and wireless LAN bandwidth.

When an incoming call occurs the handset will ring loudly until the call is answered by pressing the **START**⁴ key, or the **END** key is pressed to silence the ringing.

Predial To place a call using predialing (cell phone dialing), dial the number while in standby mode and then press **START**. This action transitions the Wireless IP Telephone to active off-hook mode and the number is immediately called.

Active (off-hook) To place a call, press the **START** key. This transitions the Wireless IP Telephone to active off-hook mode. There is a dial tone, the Wireless IP Telephone is in communication with the PBX, and the display shows information as it is received from the PBX. The user may place a call or press the **FCN** or **LINE** key to access additional operations.

The Wireless IP Telephone is also in the active mode when a call is received.

When an incoming call occurs the handset will ring until the call is answered by pressing the **START** key, or the **END** key is pressed to silence the ringing. If **END** is pressed, the first call is terminated and the handset reverts to a full ring.

The active modes utilize the most bandwidth and battery power. To conserve these resources and allow the handset to receive new calls, return the Wireless IP Telephone to the standby mode when a call is completed by pressing the **END** key.

Configuration Menu Mode When user preferences are being configured in the Config menu, the handset is on but is not active. It cannot receive calls while in the Config menu.

Push-to-talk (PTT) Mode The Avaya 3645 Wireless IP Telephone utilizes channels for incoming and outgoing radio communication. While PTT is active, the handset is in PTT mode. It can receive regular phone calls in this mode. When a regular phone call is answered, the handset enters active mode.

Messaging Mode If text messaging functions have been programmed as in a nurse call system, the handset is able to receive text messages. While these messages are being accessed, the handset is in Messaging mode. Incoming calls will ring with the second call ringing sound.

⁴ The speakerphone softkey (**Spkr**) may be pressed instead of **START** to initiate the calling process.

3. Avaya Aura™ Communication Manager Configuration

You can configure the Avaya 3641/3645 Wireless IP Telephone as a stand-alone station or associate it with a desk station. When the Avaya 3641/3645 Wireless IP Telephone is associated with a desk station, the user can make and handle calls from either the Avaya 3641/3645 Wireless IP Telephone or the desk station.

3.1 Configuring a Standalone Station

To configure an Avaya 3641/3645 Wireless IP Telephone as a stand-alone station, you must add a station on the Avaya Aura™ Communication Manager for the Avaya 3641/3645 Wireless IP Telephone.

To administer a stand-alone station on the Avaya Aura™ Communication Manager for a Wireless IP Telephone:

1. From the Avaya Aura™ Communication Manager administration software, add a new station.
2. Set “Type” to “4612.” *
3. Administer a station security code.
4. Complete the remainder of the station form as you would for a desk station.
5. Repeat Steps 1 through 5 for each stand-alone Wireless IP Telephone.

* If the phones will be registered to an ACM with version 5.2.1 or higher, then the station type “**4612CL**” must be used instead of “4612”, in order to have a fully functional Answered Call Log and Missed Call Log.

On any older ACM version station type “4612” is used, as usual.

3.2 Configuring an Associated Station

To configure an Avaya 3641/3645 Wireless IP Telephone as an associated station, you must add a station on the Avaya Aura™ Communication Manager for the Avaya 3641/3645 Wireless IP Telephone and then associate that station with a desk station.

To administer an associated station on the Avaya Aura™ Communication Manager for a Wireless IP Telephone:

1. From the Avaya Aura™ Communication Manager administration software, add a new station.
2. Set “Type” to “4612.”
3. Set “Security Code” to the same security code used for the extension to which this Wireless IP Telephone will be associated (that is, the desk station). You can use a different security code, but to make it easier for the user it is recommended that you use the same security code as the desk station.
4. Set “Message Lamp Ext” to the extension of the associated desk station.
5. Set “Bridged Call Alerting” to “y.”
6. Set “Auto Select Any Idle Appearance” to “y.”

7. For Button Assignments, create bridged appearances to the line appearances on the desk station.
8. Add additional feature buttons to unassigned buttons, if desired.
9. Repeat Steps 1 through 8 for each Wireless IP Telephone.



When making changes to feature buttons, the phone must be power-cycled.

4. Avaya 3641/3645 Wireless IP Telephone Configuration

Each Wireless IP Telephone may be configured for site-specific requirements by opening the Admin menu and selecting options or entering specific information or by using the PC-based Handset Administration Tool (HAT). Any settings entered in the Admin menu or the HAT must conform to system settings. Only the Wireless IP Telephone being configured is affected by the Admin menu settings; therefore each handset must be configured individually with the identical settings. Configuration is vastly simplified through the use of the HAT. See Part C in this document for more information.

When WPA2 Enterprise security is used, PAC files for EAP-FAST can be provisioned wirelessly or by using the HAT. For PEAP, the HAT must be used to enroll certificates. See section 4.3 for details.

Other settings that must be configured include, but are not limited to, WLAN QoS, DSCP tagging, DHCP and regulatory domain information. If these are not selected by the administrator the handset will use the default settings.

The Wireless IP Telephone can be automatically configured for IP address by enabling DHCP.

The Wireless IP Telephone user may select several usability options from the standby or **Config** (configuration) menu, described below in the *User-defined Preferences* section. This information is also provided in the end user manual.

4.1 The Admin Menu

The Admin menu contains configuration options that are stored locally (on each Wireless IP Telephone). Every Wireless IP Telephone is independent and if the default settings are not desired, the admin options must be set in each Wireless IP Telephone requiring different settings.

Opening the Admin menu

The handset Admin menu can be accessed in one of two ways:

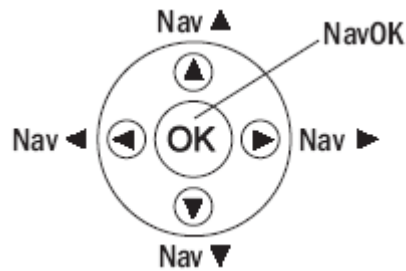
1. With the Wireless IP Telephone powered OFF, press and hold the **START** key. While holding the **START** key, press and release the **END** key. When the Admin menu appears, release the **START** key.
2. Press and release the **END** key. Press and hold the **START** key. When the **Admin** menu appears, release the **START** key.



If an admin password has been set, the display will require the user to enter the password before opening the Admin menu. The default password is 123456. If no password is set, the display will proceed directly into the Admin menu.

Navigation

The navigation keys just below the softkeys are used to navigate through and select menu options. These are referred to as **Nav▲**, **Nav▼**, **Nav◀**, **Nav▶**, and **NavOK**.



Toggle Options

Some menu items have only two options, which operate on a toggle basis. The current setting is shown below the menu heading on the info line. The other available setting is highlighted in the menu list. Press **NavOK** to activate the highlighted setting.

For example, when predial is disabled, the info line displays **Predial Disabled** and the highlighted menu item is the **Enable Predial** option. Press **NavOK** to enable predial. The info line will change to display **Predial Enabled**.

In another example, when the info line displays **Ring in Speaker**, the highlighted menu option is **Ring in Headset**. Press **NavOK** to select **Ring in Headset**. The ring will now sound in the headset and the info line will change to **Ring in Headset**.

Data Entry and Editing

An asterisk (*) next to an option on the display indicates that it is selected. Use the **Nav** keys and the softkeys to navigate and select desired options.

Enter numbers by pressing the buttons on the keypad. The blinking underscore identifies the current cursor position. When entering alphanumeric strings, the **CAPS/caps** softkey will appear and may be pressed to toggle the case. Enter letters by repeatedly pressing the corresponding key until the desired letter displays on the screen. Use the **CAPS** softkey to change the case as needed.

To edit during entry, delete the character to the left of the cursor by pressing the **Del** softkey. To replace an entry, delete it by pressing the **Clr** softkey and then enter the new data. To edit an existing entry, use **Nav◀** and **Nav▶** to move the cursor position, and then press the **Del** softkey to delete the character to the left. Insert new data by pressing the buttons on the keypad.

Alphanumeric entries:

Key	CAPS	caps
1	1	1
2	2 a b c	2 A B C
3	3 d e f	3 D E F
4	4 g h i	4 G H I
5	5 j k l	5 J K L
6	6 m n o	6 M N O
7	7 p q r s	7 P Q R S

8	8 t u v	8 T U V
9	9 w x y z	9 W X Y Z
0	0	0
*	* . - _ ! \$ % & ' () + , ; / \ - @ ~	
#	<space>	

Admin menu

The following table lists the Admin menu items. The default settings have an * prior to the option. Detailed descriptions of each item appear below the table.

Admin menu

Admin Menu Options	2nd Level	3rd Level	4 th Level	5 th Level
Phone Config	Language	*English Français Deutsch Español Italiano		
	Telephony Protocol	Type 33		
	PTT/Emerg. button	Emergency Dial	Emergency # [Enable/*Disable]	
			Emergency Number	[Enter Number] [Enter Name]
		PTT	PTT [Enable/*Disable]	
			Allowed Channels	*Channel 1 *Channel 2 *Channel 24
			Name Channels	[list]
			Priority Channel	Priority Channel On/*Off Name Channel
	Time Zone	[list] *GMT		
	Daylight Savings	*DST No Adjust DST Auto<USA> DST Auto <AUS> DST Auto <EUR>		
	Protected Speed-dial	Enter Number	Enter Name	Assign Speed-dial
	Password [Disable/*Enable]			
	[If Password is enabled] Change Password			
	Speakerphone [Disable/*Enable]			
	Clear Extension			
	IP Office [*Disable/Enable]			
	Auto Ext [Disable/*Enable]			
	Call Log Dial [Enable/Disable]			
	Dial Plan Rules [Enable/*Disable]			
		[menu if enabled] Dial Plan		
		Country Code	Enter Code	
		Internal Ext Len	Enter Len	
		Intl Access Code	Enter Code	
		LD Access Code	Enter Code	
		Natl Num Len	Enter Len	
		Outside Line Acc	Enter Code	

Admin Menu Options	2nd Level	3rd Level	4 th Level	5 th Level
	OAI [Disable/Enable] Location Service	RTLS [Enable/*Disable] Transmit Interval	15 seconds 30 seconds 1 minute 5 minutes *10 minutes	
Network Config	IP Addresses	*Use DHCP Static IP	Phone IP Default Gateway Subnet Mask TFTP Server IP Syslog Server IP Time Server IP Call Server IP Call Server Port AVPP IP OAI Server IP	
	SS ID	[enter]		
	WLAN Settings	*Custom		

4 th level	5 th level	6 th level	7 th level
Security	*None		
	WEP	Authentication	*Open System Shared Key
		WEP [Enable/*Disable]	
		Key Information	Default Key Key Length Key 1-4
		Rotation Secret	
	WPA2-PSK	*Passphrase Pre-Shared Key	
	WPA-PSK	*Passphrase Pre-Shared Key	
	Cisco FSR	Username Password	
	WPA2-Enterprise	Authentication	*EAP-FAST PEAP
		Fast Handoff	*CCKM OKC
		Username Password Delete [Cert./PAC]	
QoS	*SVP	DSCP tags	WT in call (*46)

4 th level	5 th level	6 th level	7 th level
	Wi-Fi Standard		WT standby (*46) Other (*0)
		DSCP tags	Voice (*46) Control (*46) Other (*0)
		Admission Cntrl	*Mandatory Optional

Admin Menu Options	2nd Level	3rd Level	4 th Level	5 th Level
	WLAN Settings	CCX		

4 th level	5 th level	6 th level
WPA2-Enterprise	Authentication	*EAP-FAST PEAP
	Fast Handoff	*CCKM
	Username	
	Password	
	Delete [Cert./PAC]	[Yes/No]
QoS	DSCP tags	Voice (*46)
		Control (*46)
		Other (*0)

Admin Menu Options	2nd Level	3rd Level	4 th Level	5 th Level
	Reg. Domain	01		
		02		
		03		
		04		
		05		
		06		
		07		
		08		
		→	[802.11 Config]	
			a →	[if 802.11a] † 5.150–5.250 5.250–5.350 DFS 5.470–5.650 DFS 5.470–5.725 DFS 5.725–5.825 5.725–5.850
			†b & b/g mixed g only →	[Transmit Power] 5mW (7dBm) 10mW (10dBm) 20mW (13dBm) *30mW (15dBm) 40mW (16dBm)

Admin Menu Options	2nd Level	3rd Level	4 th Level	5 th Level
				50mW (17dBm) 100mW (20dBm)
			a – b-b/g roaming+	a b & b/g mixed Preferred Band RSSI Threshold
Diagnostics	Run Site Survey Diagnostics [*Disable/Enable] Syslog Mode [Error Handling Mode] Halt on Error/ *Restart on Error	*Disabled Errors Events Full		
Restore Defaults				
Demos	Graphics Demo			

* default setting

† Only those 802.11a bands that are available in the selected domain will be listed. See Appendix A for complete information.

‡ Sub-bands have not been established for the b and b/g mixed or the g-only mode at this writing. Provision is made in the software to accommodate these ranges once established. Until added, selecting either of these two modes will immediately bring up Transmit Power options.

+ The a—b-b/g roaming option and sub-options appear only if enabled by the system administrator. Please read the band roaming text below for additional information.



Some of the options for **WLAN Settings>CCX** are identical to some of the options for **WLAN Settings>Custom**. Modification of these settings under **WLAN Settings>CCX** may not be reflected in the corresponding settings in **WLAN Settings>Custom** and vice versa. Therefore, if the **WLAN Settings** configuration is changed from one to the other, double-check all settings.

Phone Config**Language**

Per list.

Telephony Protocol

Telephony Protocol lets you select the VoIP protocol that your site is licensed to download and run. The CCMS Protocol to use for the Avaya 3641/3645 Wireless IP Telephones is **33**. Any other protocol will cause the Wireless IP Telephone to malfunction.

PTT/Emerg. Button

This option appears only on the Avaya 3645. The Push-to-talk button on the left side of the handset may be configured to either standard PTT functionality or to dial a single emergency call number specified within this option when pressed twice within two seconds. These are mutually exclusive options. Both options are disabled by default.

When using the Handset Administration Tool to configure these options, disable or enable the PTT option in the **PTT Admin** tab under **Handset type**. When PTT is disabled, you may enable the **Emergency Dial** option in the **Phone Config** tab. When **PTT** is enabled, the **Emergency Dial**-option will be grayed out.

Push-to-talk [Disable/Enable] – If enabled, the PTT options will appear on the **Config** menu for the end user to subscribe to allowed channels, etc. If disabled, the PTT options will not appear on the **Config** menu and the Emergency Dial feature may be enabled. **Allowed Channels** – All 24 PTT channels are allowed by default. To toggle the allowed status of any channel, scroll to the channel to be disallowed and press **NavOK**. Allowed channels are displayed with an asterisk (*) in the left column. Only those channels allowed in the Admin menu will appear on the config menu where they can be subscribed to by the end user. **Name Channel** – Allowed channels may be named. The name will appear instead of channel number when channel information is displayed on the handset. **Priority Channel** – The priority channel, labeled by default as channel 25, may be set and will be available to all PTT handsets. When a PTT broadcast is made on the priority channel, it will override any active PTT transmission on all other channels. The priority channel may be named.

Emergency Dial – the **Emergency Dial** option allows you to enable or disable the feature. When enabled, the handset will dial the number programmed into the **Emergency Number** option when the panic button is pressed twice within two seconds.



Caution! Emergency dial just sets up a telephone call and will be inoperable if the wireless system or the call server fails for any reason. Do not rely on it as your sole method of emergency notification.

Follow your dial plan rules when entering the emergency number to be dialed. E.g. if an outside number is to be dialed and a prefix is required to obtain an outside line, enter the prefix as part of the emergency number.

Once an Emergency Number has been entered, it can be modified, but can only be cleared by restoring the phone to defaults.

Time Zone

Not used. The handset receives date and time information from the Communication Manager.

Daylight Savings

Not used. The handset receives date and time information from the Communication Manager.

Protected Speed-dial

The protected speed-dial number is designed to be programmed to a number that should be called in emergency situations. It appears as the first item on the speed-dial list and is specially marked with a greater-than symbol (>) as the first character in its name. Only one such number can be programmed. Enter the number to be dialed, the name (e.g. **Security**), and scroll to assign to one key press. The choices for this key press are 1-9, 0, *, #, or ^. The carat represents the volume up and down buttons. This number must be programmed in every handset. This setting cannot be modified by the user. This feature is not available in a handset where the user has disabled **Pre-dial** in the **Config menu**.

Password [Disable/Enable]

The password option controls access to the Admin menu. To modify the password requirement, the default or previously set password must be entered to verify the change. The password must be set in each handset for which controlled access is desired. The **Password** option operates as a toggle between **Enabled** and **Disabled**. The info line will display the current state. Press **NavOK** to change the password protection state. **Change Password** will appear only if the password is enabled. The password is disabled by default. All alphanumeric characters as described above are permitted. A space may be entered in the password by pressing the # key twice.

Speakerphone

The speakerphone may be disabled when quiet handset operation is required. Disabling the speakerphone will remove the speakerphone softkey from the active mode display. The current speakerphone setting is shown on the info line. Press **NavOK** to toggle to the alternate setting.

Clear Extension

When the extension stored in the handset is cleared, the handset must redo the Extension and Password entry steps prior to registering with the PBX. This option is guarded with an **Are you sure?** query before being executed. Be aware that Call Logs are not cleared when the extension is cleared and the handset is registered with a new extension. To clear Call Logs press the Logs softkey from standby mode and select Clear Logs.

IP Office [Disable/Enable]

For proper display handling on the Wireless IP Telephone, enable the IP Office when using the IP Office system.



IP Office does not support Call Log functionality. If IP Office is enabled, Call Log features will not appear in the handset. Instead of opening a call log, the Redial feature is accessed by a softkey which lists the 10 most recently dialed numbers which can be redialed.

Auto Extension

This setting affects the handset extension number displayed when the handset is in standby mode. If enabled, the handset automatically displays the first extension available out of the first line appearance extension, the first bridged line extension, or the configured extension. When disabled, the handset only displays the configured extension.

Call Log Dial

In the event that users should not be allowed to directly call back numbers from the call logs stored in the handset, disable the Call Log Dial option.



Local 10-digit dialing support may not work correctly, depending on the provider network. The decision to enable or disable the call back feature needs to be made on a site specific basis.



The phone will activate missed call logs and answered call logs only when it is registered to an ACM with version 5.2.1 and higher. In this case the station type "4612CL" must be configured manually, see chapter 3.1

Dial Plan Rules

Dial plan rules enable the handset to dial in conformance with system requirements when placing calls to numbers that have been captured from the Call Server in the missed and answered call logs.



The International Access Code needs to be added in the CM.

On CM use command "change system-parameters features", page no: 8, set International CPN Prefix to the right value.



Dial plan rules according to system requirements are set in the Call Server. Any rules established in this menu must exactly replicate those already stored in the Call Server.

If **Dial Plan Rules** are disabled and **Call Log Dial** is enabled, the handset will dial the number just as it has been stored in the call log.

If **Call Log Dial** is disabled, calls cannot be made from the logs and the dial plan rules will not be used for dialing.

OAI [Disable/Enable]

The Open Application Interface (OAI) enables third-party computer applications to display alphanumeric messages on the Wireless IP Telephone display and take input from the Wireless IP Telephone keypad. Refer to the Open Application Interface (OAI) Specification (Version 1.2) documentation for information about administering the OAI Gateway and the services it can provide.

If you have an OAI Gateway installed in your system, OAI may be optionally enabled in each Wireless IP Telephone. You may select whether the Wireless IP Telephone should attempt to connect to the Avaya OAI Gateway by pressing **NavOK** to toggle to the alternate setting.

If OAI is enabled, and an OAI IP Address is available to the telephone (either via DHCP or Static IP configuration), the telephone will communicate with the OAI Server at START, and periodically while it is powered on. If you don't have an Avaya OAI Gateway installed at your site, you should disable the OAI feature to preserve network bandwidth and battery life.

Location Service

Location service may be used to enable or disable the Ekahau Real-Time Location System (RTLS), select a transmit interval, or enter a static IP address for the Ekahau Positioning

Engine (EPE). Location service capability is provided by the EPE 4.0 using Ekahau Location Protocol (ELP). See Ekahau user documentation for more information.

RTLS [Enable/Disable] – the RTLS is disabled by default. Press **NavOK** to toggle to the alternate setting. When RTLS is enabled, the handset will display the RTLS icon  in the ring indicator icon location.

The ring indicator icon will take precedence over the RTLS icon, i.e. the new icon will not be visible while the handset is ringing. When ringing has ceased and the ring indicator becomes inactive, the RTLS icon will again appear (regardless of hook state).

Transmit Interval – allows selection of 15 seconds, 30 seconds, **1 minute**, **5 minutes**, or **10 minutes** for maximum time between transmit intervals. Default transmit interval is 10 minutes. Press **NavOK** to select the desired transmit interval.



To optimize battery life, the interval between sending out ELP updates will vary based on handset state. It is expected that ELP updates will occur at most every two to six seconds and at least every few minutes. If improved tracking capability is desired, set the transmit interval for a shorter time between ELP updates. Increasing the frequency of transmissions will decrease battery life.

Location Server IP – allows the user to statically enter the IP address of the EPE. Enter the IP address and press **NavOK** to save.



Ekahau clients are not expected to find the EPE automatically. Regardless of the handset's selection of DHCP or static IP, the EPE IP address must be statically entered in the Ekahau admin menus or HAT.

ELP Port -- Allows the user to select the port number which ELP updates get sent to at the Location Server IP address. It must match the value configured in the Ekahau Positioning Engine for proper functionality. The ELP port number must be greater than zero and less than 65536. Default is 8552. Enter the port number and press **NavOK** to save.

Network Config

IP Address

There are two modes in which the Wireless IP Telephone can operate – DHCP enabled or Static IP. Select the mode for operation from the **IP Address** menu:

* **Use DHCP** – will use Dynamic Host Configuration Protocol to assign an IP Address each time the Wireless IP Telephone is turned on. If DHCP is enabled, the Wireless IP Telephone also receives all other IP Address configurations from the DHCP server.

Static IP – allows you to manually set a fixed IP Address. If selected, the Wireless IP Telephone will prompt for the IP Addresses of each configurable network component. When entering addresses, enter the digits only, including leading zeroes. No periods are required.

Regardless of the mode in which the Wireless IP Telephone is operating, the following components must be configured:



The currently-used IP address of the Call Server, the Call Server Port, and the AVPP may be displayed in the phone settings menu of the standby menu in the handset.

Phone IP – the IP Address of the Wireless IP Telephone. This is automatically assigned if DHCP is used. If using Static IP configuration, you must obtain a unique IP Address for each phone from your network administrator.

Default Gateway and Subnet Mask – used to identify subnets, when using a complex network which includes routers. Both of these must be configured either with an IP address under Static IP (not set to 000.000.000.000 or 255.255.255.255) or with DHCP for the Wireless IP Telephone to contact any network components on a different subnet. If configured on the DHCP server, use option 3 for the Default Gateway and option 1 for the Subnet Mask. Contact your network administrator for the proper settings for your network.



Note that the Wireless IP Telephones cannot “roam” across subnets, since they cannot change their IP address while operational. Ensure that all your access points are attached to the same subnet for proper operation. The Wireless IP Telephone can change subnets if DHCP is enabled and the Wireless IP Telephone is powered off then back on when within range of access points on the new subnet.

TFTP Server IP – The IP address of a TFTP server on your network which holds software images for updating the Wireless IP Telephones. If this feature is configured (not set to 0.0.0.0 or 255.255.255.255) with either Static IP configuration or using DHCP option 66 (TFTP server), or the Boot server/next server (siaddr) field, the Wireless IP Telephone will check for newer software each time it is powered on or comes back into range of your network. This check takes only a second and ensures that all Wireless IP Telephones in your network are kept up-to-date with the same version of software.

Syslog Server IP – the IP address of the syslog server. See the Diagnostics section for more information.

Time Server IP – When using WPA2 Enterprise security, a time server must be identified. Otherwise, this option is not used.

Call Server IP – the IP address of the Avaya Aura™ Communication Manager. If using Static IP configuration, this is the IP address of the Communication Manager. If DHCP is being used, the Wireless IP Telephone will try the following, in order – DHCP Option 43 (Keyword MCIPADD), DHCP Option 176 (Keyword MCIPADD), and if DHCP Option 6 (DNS Server) and Option 15 (Domain Name) are configured, DNS lookup of server names found in the above options, and finally the DNS lookup of “AvayaCallServer.DOMAIN”.

Call Server Port – the IP port address of the Avaya Aura™ Communication Manager. This port normally defaults to 1719, and is rarely changed. The port number entered must be coordinated with the administration of the Communication Manager; otherwise the wireless phone will not be able to register with the Communication Manager. If DHCP is being used, this can be changed via DHCP Option 43 (Keyword MCPOR) or DHCP Option 176 (Keyword MCPOR).

AVPP IP – the IP address of the Avaya Voice Priority Processor. Note that the Avaya Voice Priority Processor must be statically configured to have a permanent IP address. If DHCP is being used, the Wireless IP Telephone will try the following, in order: the

DHCP option 151, then a DNS lookup of “SLNKSVP2” if the DHCP options 6 (DNS Server) and 15 (Domain Name) are configured.

OAI Server IP – the IP address of the NL OAI Gateway. If using static IP configuration, this is simply the IP address of the NL OAI Gateway. If DHCP is being used, the Wireless IP Telephone will try the DHCP option 152.

SSID

Enter the SSID.

WLAN Settings

Select between **Custom** and **CCX** modes. The **Custom** mode allows explicit control of all of the **Security** and **QoS** settings. Using CCX mode automatically enables the CCXv4 features and functions, The **CCX** setting defaults the phone’s operating mode to be compatible with Cisco’s CCX V4 (Cisco Compatible Extensions) requirements, with only the 802.1X mechanism needing to be selected.

Custom-Security



Handset security setting should match exactly the settings in your WLAN. Consult the *VIEW Configuration Guide* for the APs installed in your facility for information on which of the security WPA versions methods are certified.



Encryption codes display as they are entered. For security reasons codes will not display when a user returns to the Admin menu, Encryption options.

***NONE** disables any 802.11 encryption or security authentication mechanisms.

WEP (Wired Equivalent Privacy) is a wireless encryption protocol that encrypts data frames on the wireless medium allowing for greater security in the wireless network. If WEP is required at this site, you must configure each Wireless IP Telephone to correspond with the encryption protocol set up in the access points. Select the entries from the options below to enable the Wireless IP Telephone to acquire the system.

Authentication

Select either **Open System** or **Shared Key**.

WEP [Enable/Disable]

Select either **Enable WEP** or **Disable WEP**.

Key Information

Default Key – Enter the key number specified for use by the Wireless IP Telephones. This will be 1 through 4.

Key Length – Select either **40-bit** or **128-bit** depending on the key length specified for use at this location.

Key 1-4 – Scroll to the key option that corresponds to the **Default Key** that was entered above. Enter the encryption key as a sequence of hexadecimal characters. (Use the **2** and **3** keys to access hexadecimal digits A-F, use the Right Arrow key to advance to the next digit, and the Left Arrow key to backspace.) For 40-bit keys you will need to enter 10 digits; for 128-bit keys you will need to enter 26 digits. The display will scroll as needed.

Rotation Secret – This is used for proprietary WEP key rotation. Refer to your custom document if this feature is supported in your system.

WPA2-PSK – The security features of WPA2 (Wi-Fi Protected Access) using PSK (Pre-Shared Key) are available and may be used if supported by the access points in the facility. Select either **Passphrase** and enter a passphrase between eight and 63 characters in length or **Pre-Shared Key** and enter the 256-bit key code.

WPA-PSK – The security features of WPA (Wi-Fi Protected Access) using PSK (Pre-Shared Key) are available and may be used if supported by the access points in the facility. Select either **Passphrase** and enter a passphrase between eight and 63 characters in length or **Pre-Shared Key** and enter the 256-bit key code.

Cisco FSR (Fast Secure Roaming) In order to provide the highest level of security without compromising voice quality on Cisco Aironet wireless LAN access points, Avaya and Cisco Systems have cooperated to implement the Fast Secure Roaming mechanism. FSR is designed to minimize call interruptions for Avaya 3641/3645 Wireless IP Telephone users as they roam throughout a facility. Existing Aironet 350, 1100, and 1200 APs may require a firmware upgrade to support FSR. Cisco FSR requires specific configuration of the Cisco access points in your site. See your Cisco representative for detailed documentation on configuring your access points and other required security services on your wired network. To configure Cisco FSR in your Avaya 3641/3645 Wireless IP Telephone, you must enter a Radius Server username and password into each handset.

Username – Enter a username that matches an entry on your Radius server. Usernames are alphanumeric strings, and can be entered using the alphanumeric string entry technique.

Password – Enter the password that corresponds to this Username.



Consult the *VIEW Configuration Guide* for the access points (APs) installed in your facility for information on which of the WPA versions are recommended by Avaya engineering. Configure the recommended version on the AP and select the corresponding option on the Admin menu.

WPA2-Enterprise

The **Authentication** setting can select either ***EAP-FAST** or **PEAP** as the authentication method for RADIUS server. The following authentication servers have been validated for use with R3.0:

- Juniper Networks Steel-belted Radius Enterprise Edition (formerly Funk), v6.1
- Microsoft Internet Security and Acceleration (ISA) Server 2003
- Cisco Secure Access Control Server (ACS), v4.1
- FreeRADIUS v2.0.1 and 1.1.7

Other RADIUS servers will likely work properly with the handsets, but have not been tested. Inquiries on untested servers will receive limited, “*Best Effort*”, support.

Username – Enter a username that matches an entry on your RADIUS server. Alphanumeric strings can be entered using the alphanumeric string entry technique.

Password – Enter the password that corresponds to this username.

Fast Handoff allows the use of either ***CCKM** (Cisco Centralized Key Management, for Cisco APs only) or **OKC** (Opportunistic Key Caching) to select a fast handoff mechanism. These mechanisms allow a phone to quickly and securely roam between APs with a minimum disruption of audio.

The **Delete [PAC/Cert.]** option removes expired credentials from the phone. When the authentication method is EAP-FAST the PAC on the phone is deleted. If the RADIUS server has enabled “anonymous in-band PAC provisioning”, then the phone will automatically re-acquire these credentials from the RADIUS server over the air. When the authentication method is PEAP or EAP-FAST manual provisioning, the credential on the phone is deleted and a new one needs to be downloaded through the HAT. When the authentication method is PEAP the certificate on the phone is deleted and a new certificate needs to be downloaded through the HAT. See *WPA2 Enterprise PEAP Certificate Enrollment and EAP-FAST Manual PAC Provisioning* at the end of this chapter.

“Restore Defaults” will remove the certificates from the phone.

Custom – QoS

The **Mode** may be set to either ***SVP** or **Wi-Fi Standard**. **SVP** mode uses the AVPP Server to provide enterprise-grade QoS. **DSCP tags** are used to change the priority settings for various classes of packets as they are transmitted to the network from the handset. Default values are given but may be overwritten: **WT in call = 46, WT standby = 46, Other = 0**.

Wi-Fi Standard mode uses standards-based traffic controls WMM, WMM Power Save and WMM Admission Control for QoS, in place of the AVPP Server. **DSCP tags** are used to change the priority settings for various classes of packets as they are transmitted to the network from the handset. Default values are given but may be overwritten: **Voice = 46, Control = 46, Other = 0**.

Admission Cntrl is used to enable and disable the use of WMM Admission Control by the handset for the AC_VO and AC_VI access categories. If the WLAN is using WMM Admission Control, the handset should be set to ***Mandatory**. If the WLAN is not using WMM Admission Control, the handset should be set to ***Optional**. See *Best Practices Guide for Deploying SpectraLink 8020/8030 Wireless Telephones* for a detailed explanation of the use of WMM Admission Control.

CCX

CCX settings configure the handset for operation as a CCX V4 client.

WPA2-Enterprise

The **Authentication** setting can select either ***EAP-FAST** or **PEAP** as the authentication method for RADIUS server. The following authentication servers have been validated for use with R3.0:

- Juniper Networks Steel-belted Radius Enterprise Edition (formerly Funk), v6.1
- Microsoft Internet Security and Acceleration (ISA) Server 2003
- Cisco Secure Access Control Server (ACS), v4.1
- FreeRADIUS v2.0.1 and 1.1.7

Other RADIUS servers will likely work properly with the handsets, but have not been tested. Inquiries on untested servers will receive limited, “*Best Effort*”, support. Note that for **Fast Handoff**, the only selection available is ***CCKM**.

Username: Enter a username that matches an entry on your RADIUS server. Alphanumeric strings can be entered using the alphanumeric string entry technique.

Password: Enter the password that corresponds to this username.

The **Delete [PAC/Cert.]**: Option removes expired credentials from the phone. When the authentication method is EAP-FAST the PAC on the phone is deleted. If the RADIUS server has enabled “anonymous in-band PAC provisioning”, then the phone will automatically re-acquire these credentials from the RADIUS server over the air. When the authentication method is PEAP or EAP-FAST manual provisioning, the certificate on the phone is deleted and a new certificate needs to be downloaded through the HAT. See additional details in *WPA2 Enterprise PEAP Certificate Enrollment and EAP-FAST Manual PAC Provisioning* section later in this chapter.

QoS – DSCP tags are used to change the priority settings for various classes of packets (**Voice**, **Control**, and **Other**) as they are transmitted to the network from the handset. Default values are given but may be overwritten. **Voice = 46, Control = 46, Other = 0.**

Regulatory Domain/802.11 Config/Transmit Power

Regulatory domain, 802.11 configuration and transmit power are interdependent. See *Appendix A: Regulatory Domains* for regulatory domain setting specifications. Polycom recommends that you check with local authorities for the latest status of national regulations for both 2.4 and 5 GHz wireless LANs.

FCC requirements dictate that the menu for changing the regulatory domain be available by password, which in our case is the **LINE** key. Press **LINE** and then navigate to the desired domain. Press **NavOK** to set the domain.

- 01** - North America
- 02** - Europe
- 03** – Japan
- 04** – Singapore
- 05** – Korea
- 06** – Taiwan
- 07** – Hong Kong
- 08** – Mexico, India

802.11 config

Once the regulatory domain is set, the **802.11 Config** modes are displayed. Only one may be chosen. **802.11(b & b/g mixed)** is the default. Press **NavOK** to set the mode. If the mode has subbands, the **Subband** list will open. If the mode does not have subbands, the **Transmit Power** list will open.



Use **g only** mode if all of your infrastructure and client devices will use only 802.11g. The handsets will operate up to 54 Mb/s in this mode. If any 802.11b capable clients or infrastructure are used in your wireless LAN then do not use **g only** mode, instead use **802.11b and b/g mixed** mode for optimum performance.

Use **b & b/g mixed** if some of your infrastructure components only understand 802.11b. The handsets will operate up to 11 Mb/s.

Use **a-- b-b/g roaming** only if the wireless handset must be able to roam between APs using these different bands. See band roaming notes below.

Band roaming

The **a—b-b/g** roaming option is not visible on the **802.11 Config** menu until the key sequence ***#8** (asterisk-pound-eight) is pressed. Once this sequence is pressed, a confirmation appears and when the **Yes** softkey is pressed the **a—b-b/g roaming** option is visible and enabled as indicated by the asterisk beside it. Select it to open the sub menu and set the additional roaming options.



This feature should only be activated when the handsets and network have been configured specifically for this feature.

When the **a -- b-b/g roaming** option is selected, a submenu appears so that you can set the channels for 802.11a and the transmit power for both 802.11a and b-b/g as described above. The additional settings are **Preferred Band** and **RSSI Threshold**. The **Preferred Band** is the band which the handset should use unless the signal strength of the current AP drops below the threshold setting, at which point the handset will roam to the non-preferred band. The **Preferred Band** options are **a** or **b & b/g mixed** or **no preference**. Only one selection may be made. **No preference** is the default and does not require a threshold setting. If **a** or **b & b/g mixed** are selected, the threshold may be set. The **RSSI Threshold** setting allows you to set the signal strength at which the handset will band roam from the preferred band to the non-preferred band. The info line shows the permitted range for the threshold entry. The default is -65.

Once made visible, the **a—b-b/g roaming** option remains visible on the menu and may be selected or not, as above. The roaming option may again be hidden by pressing the secret key sequence and pressing the **No** softkey when the confirmation screen appears. The roaming option is also hidden when the **Restore Defaults** option is initiated.

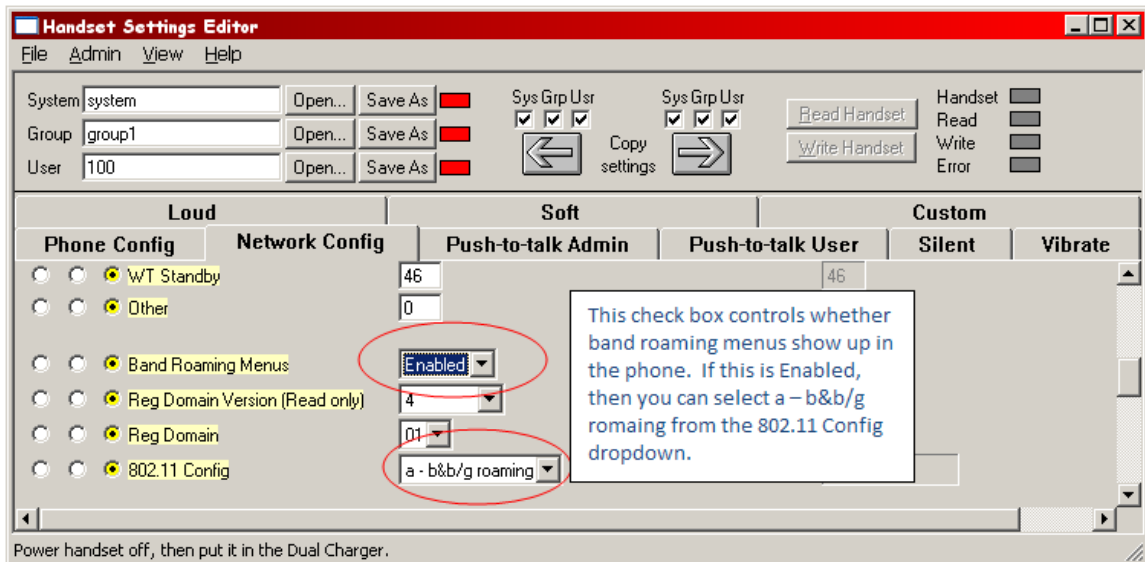
Band roaming notes

- Use **a-- b-b/g roaming** only if the wireless handset must be able to roam between APs using these different bands because band roaming can cause lapses in audio and slightly degraded battery life.
- All APs must use the same subnet, security and SSID.
- Due to excessive gaps in audio when roaming, band roaming should not be used with WPA-Enterprise security types such as PEAP and EAP-FAST.
- The first band the handset checks when powering up in **No preference** mode is the B-band. If no B-band is detected, then the phone switches bands and checks the A-band.
- The roam time from B to A will increase proportionally to the number of A channels enabled. Additionally, passive scan requirements for DFS increase roam delay. Minimizing the number of enabled A bands is therefore recommended.
- The letter **A** or **B** replaces the radio wave graphic in the signal strength icon on the handset display when band roaming is active to indicate which 802.11 band is currently being used by the handset. e.g. 
- The handset will beep when it band roams while in a call. This setting may be disabled/enabled on the **Config** menu. It is enabled by default.

Setting band roaming parameters using the Handset Administration Tool

The Handset Administration Tool (HAT) can be used to configure band roaming. However, the band roaming options do not appear on the **Network** tab unless the .ini file is modified. Follow these steps to modify the .ini file and display the band roaming options:

1. Download and install HAT per the instructions in the HAT section of this document. If HAT is already installed, ensure it is updated to version 02.08.22.00 or later. See the HAT section for more information on updating the software.
2. Exit the HAT program and close it.
3. Navigate to the program file where HAT is installed and open the **HandsetAdmin** folder.
4. Locate and open the .ini file.
5. Under **Miscellaneous settings**, locate the third item, **Band_roaming_menus**. The default setting is 0 (zero). Set this to 1 (one) to display band roaming options. Set it back to 0 to hide band roaming options.
6. Save and close the .ini file. Open HAT through the Start Menu.
7. Navigate to the **Settings Editor**, **Network Config** tab. The **Band Roaming Menus** option allows you to enable or disable the band roaming options in the Admin menu. If enabled, they are visible on the handset and you can select the **a-- b-b/g roaming** option in the **802.11 Config** dropdown box as shown below.



Subband



Subbands have not been established for the **b** and **b/g mixed** or the **g only** mode at this writing. Provision is made in the software to accommodate these ranges once established. Newly added subbands may not appear in the above table.

Once a mode is set the subband list will display, if applicable. Only those ranges which are allowed in the set regulatory domain and that pertain to the set mode are displayed. Multiple subbands may be set. Navigate to the desired subband and set with **NavOK**. The **Transmit Power** menu will open. Once the **Transmit Power** setting is done, you will be returned to the subband list.

To deselect a subband, navigate to it and press **NavOK**.

Once the subband settings are as desired, press the **Done** softkey to exit to the **Network Setup** menu.

Note that for 802.11a the bands labeled **DFS** will vary depending on the set regulatory domain.



In order to use a channel that is DFS protected; the handset must passively listen for beacons from an AP on that channel and treat that AP as a DFS Master. Before the handset can trust the AP as a reliable Master, the spectrum management bit set in the AP's beacon must be configured to operate on DFS channels. Consult the documentation for your AP for instructions on how to set this parameter.

Transmit power

For subbands: The **Transmit Power** list opens when **NavOK** is pressed from the **Subband** menu. A transmit power setting is required for each subband. Only one level may be set per subband. Only those power levels which apply to the regulatory domain and 802.11 mode are listed. Navigate to the desired level and press **NavOK** to set and return to the subband list. Another subband may be selected which repeats the process.

If the highlighted power transmit level is legal on all of the subbands for the set mode, an **All** softkey will appear. Press the **All** softkey to apply that level to all subbands and return to the subband menu where all subbands will now be selected. **All** overrides any previously set power transmit levels.

Without subbands: When the 802.11 mode has no subbands, the **Transmit Power** list opens when **NavOK** is pressed to set the mode. Only those power levels which apply to the domain and 802.11 mode are listed. Navigate to the desired level and press **NavOK**. This sets the transmit power level and exits the **Regulatory Domain** menus. The **Network Setup** menu will again display.



The power setting selected here specifies the maximum for that band/subband. When Transmit Power Control (TPC) is enabled in the infrastructure, the AP may instruct the handset to use a lower value to match its own transmit power.

Diagnostics

Run Site Survey

The Site Survey mode is activated by selecting this option. Site survey starts running immediately upon selecting this option. See the Diagnostic Tools section for more information about site survey.

Diagnostics [Disable/Enable]

See the *Diagnostic Tools* section for a detailed explanation of the Diagnostics option.

Syslog Mode

See the *Diagnostic Tools* section for a detailed explanation of the syslog mode options.

Error Handling Mode

The error handling mode determines how the handset will behave when an error occurs. The **Halt on Error** option will cause the handset to stop operating if an error message is received. Unless the error is a fatal one, normal operation may be resumed by power-cycling the handset. The **Restart on Error** option will cause the handset to make every effort to reboot quietly and quickly to standby mode. In either scenario, a call in progress will be lost.

Error detail may be shown on the display, captured by the syslog server, and may also be available for downloading with the Handset Administration Tool.

Restore Defaults

The Restore Defaults option will set all user and administrative parameters to their factory defaults except **Telephony Protocol**. “Restore Defaults” will also remove the WPA2-Enterprise certificates from the phone.

Demos

The **Graphics Demo** option starts a demonstration of the handset’s OAI graphical capabilities immediately upon selection.

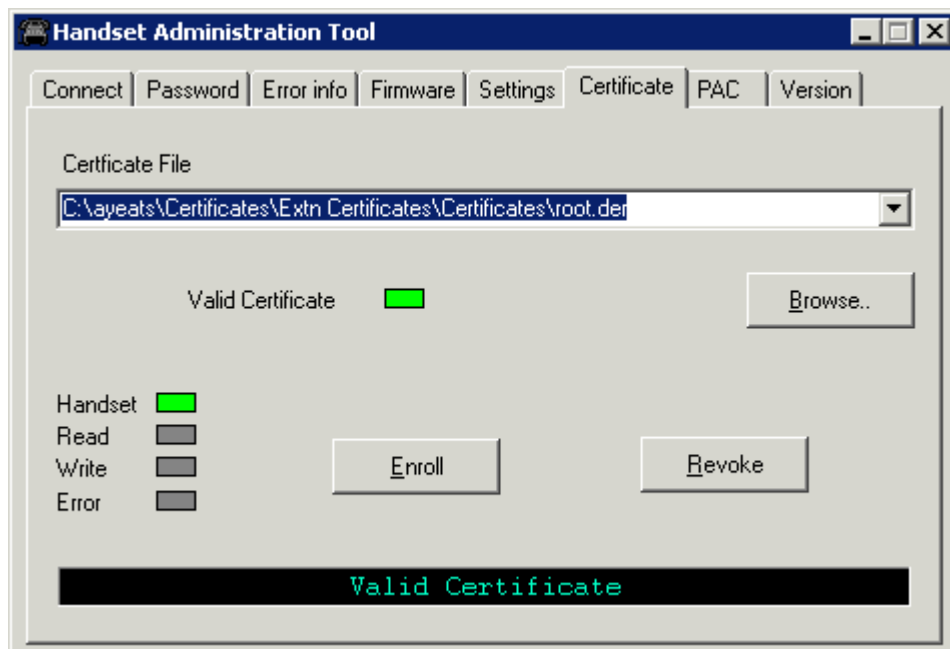
4.2 WPA2 Enterprise PEAP Certificate Enrollment and EAP-FAST Manual PAC Provisioning

The Handset Administration Tool (HAT) is used for enrolling a handset with a PEAP certificate or manually provisioning PAC files.

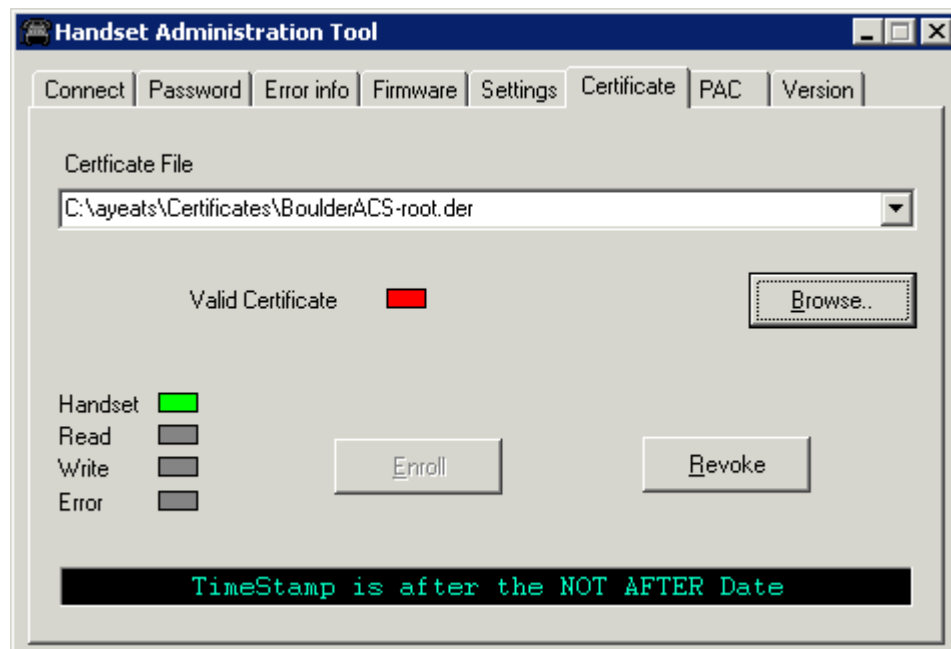
PEAP

The Handset Administration Tool (HAT) is used for enrolling a handset with a PEAP certificate in DER format. Only the DER certification format is supported. All other certificate formats need to be converted into the DER format prior to enrolling the handset. Choose the **Certificate** tab and use the file browser to identify the certificate to be loaded. Once chosen, HAT will perform a rudimentary check on the file to make sure the format is DER and that the certificate date is valid. If these tests pass, HAT will indicate that it is valid and enable the **Enroll** button. Click **Enroll** to install the certificate onto the handset.

The screen below shows a valid certificate that has been identified with the file browser.



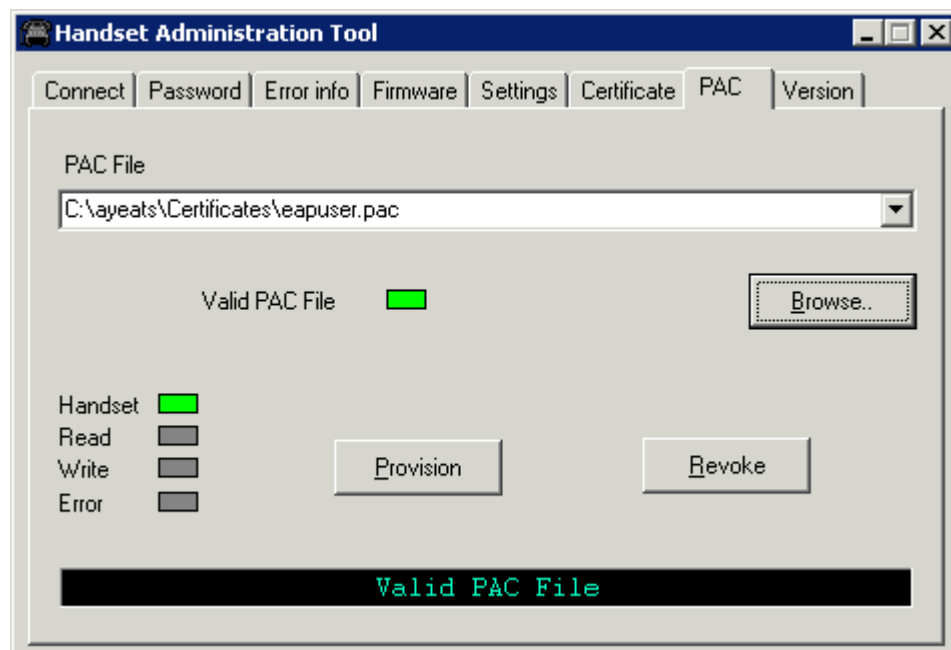
The screen below shows a certificate chosen with the file browser, but found to be invalid because it has expired.



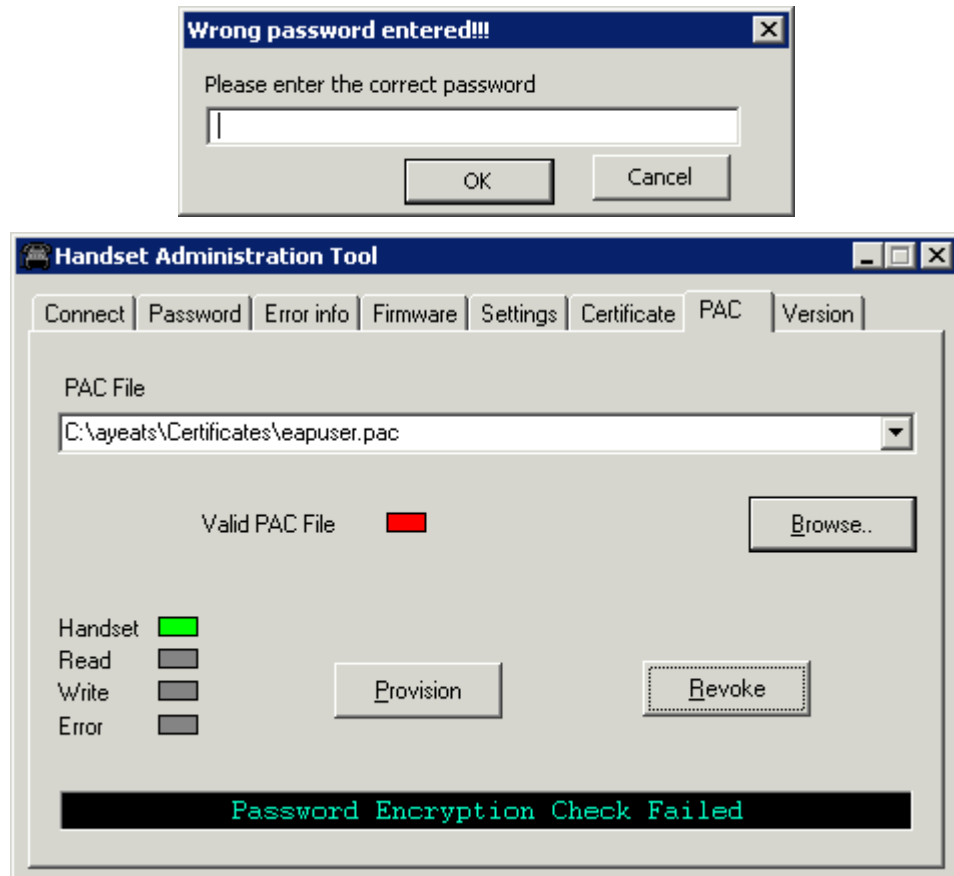
EAP-FAST

For EAP-FAST, HAT must be used for manual provisioning a handset with a Protected Access Credential (PAC). Choose the PAC file with the file browser. The user will be prompted to enter the password used to generate the PAC as part of its validation process. Once the PAC is considered to be valid, the Provision button will be available for installing the PAC onto the handset.

The screen below shows a valid PAC identified with the file browser after a valid password has been entered.



The two screens below show the result of entering the wrong password.



If anonymous in-band PAC provisioning is enabled on the RADIUS server, then it is not necessary to download PAC files through HAT. The phone will automatically re-acquire credentials from the RADIUS server over the air.

4.3 Admin Menu Default Table

When the **Restore Defaults** option is selected, administrative parameters will be reset to their factory defaults as shown in the table below. The **Telephony Protocol** setting will not change. User parameters will be reset per the table below.

Menu option	Setting	Sub-option	Sub-sub-option	Default
Phone Config	Language			English
	Telephony Protocol			Type 33
	PTT/Emerg. Button	Emergency Dial		Disabled
		PTT		Disabled
			Allowed Channels	[all]
			Name Channels	[none set]
			Priority Channel	Off
	Time Zone			GMT

Menu option	Setting	Sub-option	Sub-sub-option	Default
	Daylight Saving			DST No Adjust
	Protected Spd Dial			[none set]
	Password			Enabled
	Change Password			[n/a]
	Clear Extension			[n/a]
	IP Office			Disabled
	Speakerphone			Enabled
	Call Log Dial			Enabled
	Dial Plan Rules			Disabled
	OAI			Disabled
	Location Services			Disabled
Network Config	IP Addresses			Use DHCP
	SSID*			[None set]
	WLAN Settings	Custom/Security		None
			WEP Key Length	40-bit
		Custom/QoS	Mode	SVP
			DSCP tags	WT in call =46 WT standby =46 Other=0
	Reg. Domain*			[none set]
		[if set]		b & b/g mixed
		Transmit Power		30mW (15dBm)
Diagnostics	Run Site Survey			[n/a]
	Diagnostics			Disabled
	Syslog Mode			Disabled
	[Error Handling Mode]			Restart on Error
Restore Defaults				

*Minimum requirements to restore functionality after Restore Defaults:
Set SSID to an available AP; set Regulatory Domain to 01.

4.4 Configuration (Config) Menu

The Avaya 3641/3645 Wireless IP Telephone features a Config (configuration) menu that allows the end user to configure user preferences and display handset information. The Config menu is opened by pressing the **Cfg** softkey from standby mode. See the end user guide 21-601633.

The diagram below shows the options on the Config menu.

Config Menu Options	2 nd Level	3 rd Level	4 th Level	5 th Level	6 th Level
Lock Keys					
User Profiles	Silent Vibrate Loud Soft Custom				
		Set as Active			
		Ring Settings	Telephone Message Alert 1 Message Alert 2		
				Ring Cadence	Off PBX Continuous Short Pulse Long Pulse
				Ring Tone	Tones 1-10
				Ring Volume	Volume ■■■■■■■■
				Vibrate Cadence	Off PBX Continuous Short Pulse Long Pulse
				Ring Delay	No Delay 5 Second Delay 10 Second Delay
		Noise Mode ⁵	Normal High Severe		
		Ring in Headset Ring in Speaker			
		Warning Tones Disable/Enable			
		Key Tones Disable/Enable			
		PTT ⁶ Disable/Enable			

⁵ High and Severe noise modes increase microphone, speaker, and ring volume settings above Normal mode baseline. All measures are approximate.

	Microphone	In-ear speaker	Ring volume
High	+12dB	+6dB	+3dB
Severe	+18dB	+12dB	+6dB

⁶ PTT will not appear on the Config menu if it has been disabled by the system administrator.

Config Menu Options	2 nd Level	3 rd Level	4 th Level	5 th Level	6 th Level
Phone Settings	Keypad Autolock	Disable 5 seconds 10 seconds 20 seconds			
	Language	*English Français Deutsch Español Italiano			
	Display Contrast	Set Contrast			
	Use Hearing Aid Use No Hearing Aid				
	Startup Song Play/Inhibit				
	Predial ⁷ Disable/Enable				
	Roam Beep Play/Inhibit				
Push to talk ⁸	Default Channel	Channel 1 Channel 24			
	Subscribed Channels	Channel 1 Channel 2 Channel 3 Channel 4 Channel 24			
	PTT Audio Volume	Audio Volume ■■■■■■■■			
	PTT Tone Volume	Tone Volume ■■■■■■■■			
	PTT Vibrate Disable/Enable				
User Name	Enter Name				
System Info	Phone IP Address				
	AVPP IP Address [only if QoS = SVP]				
	OAI IP Address				
	Call Server IP				
	Call Server Port				
	Firmware Version				
	Emergency Dial ⁹	Emergency Number Emergency Name			

⁷ If Predial is disabled, speed dial calls cannot be made from standby mode.

⁸ ⁸ Avaya 3645 wireless IP Telephone only. Push-to-talk must be enabled by the system administrator before it can be activated by the user. If it is not enabled, then it will not appear on the Config menu

⁹ Avaya 3645 wireless IP Telephone only. Emergency Dial will appear if it has been enabled by the system administrator. The Emergency Number option allows you to check the number that is dialed when the Emergency Button is pressed.

Default Settings:

The profile options on the standby menu may be reset to their default values by the **Restore Defaults** option in the Admin menu. These are the default settings:

Setting/profile	Silent	Vibrate	Soft	Loud	Custom
Ring Cadence	Off	Off	PBX	PBX	PBX
Ring Tone	Tone 1	Tone 1	Tone 1	Tone 1	Tone 1
Ring Volume	1	1	3	7	5
Vibrate Cadence	Off	PBX	Off	Off	PBX
Ring Delay	0	0	0	0	5
Noise Mode	Normal	Normal	Normal	Normal	Normal
Headset/Speaker	Speaker	Speaker	Speaker	Speaker	Speaker
Key Tones	Off	Off	On	On	On
Warning Tones	Off	Off	Off	Off	Off
¹⁰ Push-to-talk	Off	Off	On	On	On
¹¹ PTT Vibrate	Disabled	Disabled	Disabled	Disabled	Disabled
¹² Emergency Dial	On	On	On	On	On

¹⁰ Push-to-talk must be enabled by the system administrator before it can be activated by the user. If it is not enabled, then it will not appear on the Config menu and will not be “On” for any profile.

¹¹ ¹¹ PTT Vibrate is available only when Push-to-talk has been enabled by the system administrator.

¹² Emergency Dial must be enabled by the system administrator. If enabled, it will be “On” (or available for use) in every profile.

5. Software License and Protocol Management

The Avaya 3641/3645 Wireless IP Telephone System supports a number of different IP protocol integrations. All Avaya 3641/3645 Wireless IP Telephones are shipped from Avaya with the correct software. However it may be necessary to update the software. Please see section *Software Maintenance* for more information.

The following details the process to properly configure Avaya 3641/3645 Wireless IP Telephones and download software via over-the-air file transfer.

5.1 Minimum System Requirements

1. A wireless LAN must be properly configured and operational through the use of 802.11a/b/g/n wireless access points. Consult the *VIEW Configuration Guide* for the appropriate make/model of WLAN.
2. The Avaya Aura™ Communication Manager must also be connected to your network and completely operational.
3. A TFTP Server must be available on the network in order to load the appropriate software into the Wireless IP Telephones. The current handset software must be installed in the proper TFTP download directory.
4. If SVP is used for QoS, the AVPP Server is installed and properly configured.
5. Software versions required:

Component	Version
AVPP	17x.028 or higher
OAI Server MOG 600	54.032 or higher
OAI Server MOG 700	82.017 or higher

6. If Wi-Fi Standard QoS is used, then each AP must be configured for such features as WMM-Power Save; WMM-Admission Control; proper EDCA parameters; DSCP mapping for voice and control traffic; call admission control and Proxy ARP. Consult the appropriate *VIEW Configuration Guide* for settings.
7. If WPA2-Enterprise is used, then all portions of the Public Key Infrastructure (PKI) need to be installed and configured properly in order to acquire the network.
8. Finally, ensure that the Battery Pack on the Wireless IP Telephone is fully charged.

5.2 Minimum Configuration Process

Follow these steps to configure the Wireless IP Telephone.

1. Contact your service representative for information about downloading the latest Avaya 3641/3645 Wireless IP Telephone – IP software.

Load the latest version of the Avaya 3641/3645 Wireless IP Telephone code and place it on the TFTP Server and ensure the TFTP Server is started. The following files must have the filenames shown and are downloaded in this order:

Description	Filename
Configuration file ¹³	slnk_cfg.cfg
PHINTL (language translation)	pi1400cc.bin
Over-The-Air Downloader (OTADL)	pd14odcc.bin
OTADL Shim	pd14shim.bin
USB downloader	pd14udcc.bin
Functional (telephony protocol)	pd14ccc.bin

2. Use the Handset Administration Tool to set up the configuration of each handset to meet all essential requirements. If not using the HAT, ensure the following parameters are correctly set in the Admin menu for each handset: See *Avaya 3641/3645 Wireless IP Telephone Configuration* for detailed configuration instructions.
 - If statically assigning IP addresses, ensure that the **Phone IP**, **Subnet Mask**, and **Default Gateway** information are accurate. If using a DHCP Server, ensure that the DHCP option is set.
 - Ensure the handset has properly configured **SSID** and **Reg Domain** information.
 - Ensure the **Telephony Protocol** menu option is set to **33**. This ensures the handset will check for the proper files each time it powers on.
 - Configure handset security settings to match AP configuration and RADIUS server settings. If WPA2-Enterprise security is used, credentials will need to be installed onto the handset. For EAP-FAST, the PAC file needs to be provisioned and for PEAP the handset will need to be enrolled with a certificate (requires use of the HAT). See the *WPA2 Enterprise PEAP Certificate Enrollment and EAP-FAST Manual PAC Provisioning* section in this guide for details.
3. Configure QoS mode to match the AP and site QoS plan. Follow the *VIEW Configuration Guide* for the appropriate make/model of WLAN.
4. Power-cycle the Wireless IP Telephone.
5. The code will now download to the handset. The status bar will increment fully across the display for each function that is being performed in the download process and the filename will display. Upon completion of the update process, the handset will re-boot with the new firmware.

¹³ Always use the slnk_cfg.cfg file that is provided with the current release. Although the filename does not change from release to release, the file is release-specific and using a .cfg file that came with an earlier release may cause improper handset function.

6. After code has been downloaded for the first time, the Wireless IP Telephone will ask for an extension and password. Once these have been entered, the phone will register with the Avaya Aura™ Communication Manager.



For future software upgrades, simply update the files that are stored on the TFTP Server. Each time the Wireless IP Telephone is powered up, it will check with the TFTP Server to ensure it has the proper software version. If a new version of code is downloaded, the currently-entered extension and password will be preserved.

Rules and recommendations for software downgrades:

- When downgrading to a former release using TFTP, use the slnk_cfg.cfg file provided with the older release.
- When upgrading and downgrading with HAT, we recommend updating all of the files, even if the version looks correct as data within a file can change while retaining the same filename.
- If you perform repeated downgrades and upgrades you may notice that the TFTP server does not always send all five files. This is correct. For example, the pd14shim.bin does not need to be deleted during downgrade to an older version.
- After a downgrade is completed, we recommend resetting the handset to factory defaults.

6. Avaya Aura™ Communication Manager Integration Factors

This section describes the mapping between the emulated Avaya 4612 IP Telephone (use 4612CL on CM5.2.1 and later) and the Avaya 3641/3645 Wireless IP Telephone.

Voice Messaging Access

Voicemail is accessed on the Wireless IP Telephone as **FCN** + a character that corresponds to the administered button.

CODECs

The Avaya 3641/3645 Wireless IP Telephone is compatible with the G.711 μ -law, G.711a-law and G.729 codecs. There is no setting required on the Wireless IP Telephone. If an incompatible codec is specified, there will be no voice path.

DHCP

Dynamic Host Configuration Protocol (DHCP) is a standardized protocol that enables clients to be dynamically assigned with various configuration parameters, such as an IP address, subnet mask, default gateway, and other critical network configuration information. DHCP servers centrally manage such configuration data, and are configured by network administrators with settings that are appropriate for a given network environment. The Wireless IP Telephone will use the following DHCP options if DHCP use is enabled:

Option	Meaning
1	Subnet mask
3	Default gateway
6	DNS server
7	Syslog server logging
15	Domain name
43	Avaya-specific options
60	Vendor class ID
66	TFTP server
151	Avaya Voice Priority Processor
152	SpectraLink OAI Gateway
176	Avaya-specific options
siaddr	Boot server or next server

TFTP

The Wireless IP Telephone uses TFTP to update its software over the 802.11 wireless LAN.

DNS

Domain Name System (DNS), an industry-standard protocol, locates computers on an IP-based network. IP networks rely on number-based addresses to move information on the network. However, users are better at remembering friendly names than number-based addresses, so, it is necessary to translate user-friendly names into addresses that the

network can recognize. The Wireless IP Telephone will use DNS to automatically translate names into IP addresses for these components – TFTP Server, Avaya Voice Priority Processor, and Avaya Aura™ Communication Manager.

Entering an Extension and Password

Several conditions (new phone, Restore Defaults, Extension Error, Password Error, and Extension in use) can result in the Wireless IP Telephone asking the user for a new extension and password. The entry process is described below. When a new extension or password is being entered, the asterisk (*) key can be used to back up and correct an error.

The Wireless IP Telephone will display:

Ext.–XXX

#–OK New –

At this point, a new extension can be entered, or if the # key is pressed, the Wireless IP Telephone will retain the current extension.

After a new extension is entered, press # to continue.

The Wireless IP Telephone will then display:

Password – *****

– OK

A new password can be entered at this time, or if the # key is pressed, the Wireless IP Telephone will continue with its current password.

After a new password is entered, press # to continue.

Extension Error

If the Communication Manager (or all Communication Managers if there are more than one) does not recognize the extension the phone is trying to register with, the Wireless IP Telephone will display:

Extension Error

This will last 5 seconds, and then the Wireless IP Telephone will ask the user to enter a new extension and password.

Password Error

If the Wireless IP Telephone has an incorrect password, the display will show:

Password Error

to continue

Press # to continue on to enter a new extension and password.

Extension Override

The Avaya Aura™ Communication Manager will detect when a Wireless IP Telephone tries to register with the same extension as any telephone that is already registered to that extension. If this happens, the Wireless IP Phone will display:

Extension in use

to continue

Press # to continue.

If the user chooses to continue on with the override information, the Wireless IP Telephone will register with the override bit set. Any telephone currently registered with

the given extension will be unregistered, and any activity on the currently-registered telephone will be stopped. If that telephone is in a call, the call will be dropped.

If the user does not want to override the existing extension, either enter a different extension and password, or simply END the Wireless IP Telephone.



If two Wireless IP Telephones are assigned to the same extension, the Avaya Aura™ Communication Manager will not properly resolve the registration conflict due to the presence of the Avaya Voice Priority Processor. Both Wireless IP Telephones may fail to operate properly.

Retry / Restart

Some errors will result in the following display, once # is pressed to continue:

* to retry

to restart

Press * to immediately retry registering with the Communication Manager. Press # to restart the Wireless IP Telephone, which will take about 20 seconds.

6.1 Downgrading Software Code

When downgrading code to a software version below 117.052 (R3.0), certain conditions apply. Please study the following bullets before downgrading code.

- If you change R3.0 specific settings (such as new security types or WMM types), then you ***might*** run into problems doing a downgrade. We recommend doing a Restore Default in this case and reprogramming the phone using HAT. This will get rid of any R3.0 settings that might confuse the pre- R3.0 code.
- If you didn't change any settings when you upgraded, then you should be able to downgrade without doing a Restore Defaults.
- If the phone has never had pre-R3.0 code on it and is configured with R3.0 settings, and then the user tries to downgrade to a pre-R3.0 release, the phone will default to pre-R3.0 configuration settings (for example, security will be None).
- In general, if you upgrade to R3.0 and enable R3.0 features and then you downgrade the phone, the phone will not be able to connect to the network without changing the network (unless you are running multiple APs/ AP configurations with different security/ WMM settings).
- The issue of doing a Restore Defaults generally only applies when downgrading from R3.0 to pre- R3.0 code. For example, downgrading from 117.053 to 117.052 should not require a Restore Defaults.

7. Feature Programming

The Avaya 3641/3645 Wireless IP Telephone emulates the Avaya 4612 IP Telephone (use 4612CL on CM5.2.1 and later).



The 12 programmable keys for line appearances and features are emulated in the Wireless IP Telephone **LINE** and **FCN** menus. The dedicated Transfer, Conference, Hold, Mute, Speakerphone and Redial buttons are emulated by the Wireless IP Telephone softkeys.

All telephone functions and messaging features are supported if possible. Functions that require the use of the volume keys are not supported.

The **Menu**, **◀**, **▶**, **Exit** and softkeys on the 4612 IP Telephone are not supported.

Detailed explanation of the Avaya 3615/3645 Wireless IP Telephone functionality is explained in the User Guide (21-601633).

7.1 Softkey Assignment

Active Mode

The dedicated buttons on the Avaya 4612 IP Telephone appear while in a call or during active mode and are assigned to the softkeys in two sets:



The **More** softkey toggles the screen to the other set. Pressing the softkey activates the feature.

Standby Mode

The softkeys that appear while in standby mode and are assigned in two sets:



Nav▶ and Nav◀ toggle the screen to the other set. Pressing the softkey activates the feature.



When using IP Office, the **Logs** softkey is absent and the **Redl** (Redial) softkey is between the **Prof** and **Spdl** softkeys. The **Redl** softkey displays a list of the 10 most recently dialed numbers for redialing.

See the *Handset Operation* section for more information on how these softkeys work.

7.2 Function Assignment

The keypad mapping for each Avaya 3641/3645 Wireless IP Telephone is administered through the Avaya Aura™ Communication Manager administration software (for example, Avaya Site Administration). Programmable keys are accessed by pressing the **LINE** or **FCN** key on the Wireless IP Telephone, followed by the appropriate digit key. The line appearances assigned to any of the twelve programmable feature keys on the Avaya 4612 IP Telephone are emulated by the **LINE** menu on the Wireless IP Telephone. The features are emulated by the **FCN** menu. Lines and features may be assigned in any combination.

Lines and features are automatically assigned to shortcut keys which may be used to expedite access. The Wireless IP Telephone receives line and feature information from the Communication Manager and places it on the appropriate menu for access by the end user.

Line Appearances

Any of the 12 programmable keys on the Avaya 4612 IP Telephone may be assigned to lines. Typically, three line appearances are assigned. These line appearances may be displayed on the **LINE** menu. While off-hook, press the **LINE** key to view the shortcut keys and assigned extensions for line appearances. There are nine possible line appearances which correspond to the nine indicators at the top of the Wireless IP Telephone display. When a line is in use, the indicator converts to the line number. Press the **LINE** key again to display the second page of the list if more than four line keys have been programmed. To use an extension, press the corresponding shortcut key. Use the **Nav** buttons to

navigate and activate the line appearances on this list. Up and down arrows on the display indicate additional items may be viewed.

Feature List

Any of the 12 programmable keys on the Avaya 4612 IP Telephone may be assigned to features. Typically, three line appearances are assigned and the remaining nine keys are programmed to features. These features may be accessed through the **FCN** menu on the Wireless IP Telephone. When **FCN** is pressed, the display lists the first four features. Press **Nav▼** or **FCN** to display additional features. Features may be programmed to appear in any order. In the example below, features “A” and “B” appear as the first two options on the list. The system directory option– **Directory**– and the ability to place calls to numbers in the system directory– **Call Disp**– are the next two options. Program these two options as a pair if the handsets should be able to access the system directory and place calls to numbers stored in it.

Feature A (as locally programmed)
Feature B (as locally programmed)
Directory
Call Disp

A plus sign (+) may appear to indicate that the corresponding feature is turned on. Pressing **FCN** repeatedly will display the remaining items on the list. Shortcuts programmed to OAI features will preempt programming assigned to other keys.

Activate the fixed features by pressing **FCN** + the shortcut key while on or off-hook. You may also use the **Nav** buttons to navigate and activate the features on this list. Up and down arrows on the display indicate that additional items may be viewed.



Changes to feature programming in the Communication Manager will take effect after the Wireless IP Telephone is powered off and back on again.



If an Open Application Interface (OAI) is operational, one or more function key sequences will be assigned in the OAI configuration and they will override any function sequence established here.



The Wireless IP Telephone relies on the PBX's response to a Button Request message to allocate **LINE** and **FCN** keys to the appropriate list, as well as to supply correct labels for the keys. If the PBX fails to respond, or if the response cannot be properly parsed, the following default behavior is applied:

Six keys labeled L/F 07 through L/F 12 are assigned under the **FCN** key, and send the same key codes as P7 through P12 of the 4612 terminal.

8. Testing a Wireless IP Telephone

Verify proper registration and operation of each Wireless IP Telephone by performing the following tests on each Wireless IP Telephone in an active wireless area.

1. Power on the Wireless IP Telephone by pressing the **END** key. You will see a series of messages displayed as the Wireless IP Telephone acquires the system. The Wireless IP Telephone should display the user extension. Any error messages should clear.
2. Press the **START** key. The extension number should be replaced by information from the Avaya Aura™ Communication Manager and you should hear a dial tone. Place a call and listen to the audio quality. End the call by pressing the **END** key.
3. Place a call to the Wireless IP Telephone and verify ring, answer, clear transmit and clear receive audio.
4. Press the **START** key.
5. Use the softkeys and the **FCN** key to verify all programmed features on the Wireless IP Telephone, and press **END** when finished.
6. Use the **LINE** key to verify the programmed line appearances, and press **END** when finished.
7. Press the **END** key. Any line indicators should turn off and the extension number display will return.
8. Diagnostic Tools

Run Site Survey, Diagnostics Enabled and **Syslog Mode** are three diagnostic tools provided to assist the WLAN administrator in evaluating the functioning of the Wireless IP Telephone and the system surrounding it. Diagnostic Tools are enabled in the Admin menu.

9. Diagnostic Tools

Run Site Survey, **Diagnostics Enabled** and **Syslog Mode** are three diagnostic tools provided to assist the wireless LAN administrator in evaluating the functioning of the Avaya 3641/3645 Wireless IP Telephone and the system surrounding it. Diagnostic Tools are enabled in the Admin menu.

The **Halt on Error** option in the Admin menu is a diagnostic tool that will cause the handset to stop operating if an error message is received. Error detail may be shown on the display, captured by the syslog server, and may also be available for downloading with the Handset Administration Tool. Unless the error is a fatal one, normal operation may be resumed by power-cycling the handset.

9.1 Run Site Survey

Site survey is used to evaluate the facility coverage before certifying that an installation is complete. It can also be used at any time to evaluate coverage by testing signal strength, to gain information about an AP, and to scan an area to look for all APs regardless of SSID. The information available through site survey includes:

- SSID
- Beacon Interval
- AP information regarding support of 802.11d, 802.11g, 802.11h, and other 802.11 amendment standards as required.
- Current security configuration

START the site survey by selecting **Run Site Survey** from the Admin menu. The mode starts immediately.

When the test is started, it is by default in “single SSID” mode. When the **Any** soft key is pressed (softkey A) all APs, regardless of SSID, are displayed and the softkey changes to say **MyID**. Pressing the **MyID** soft key will revert the display to the “single SSID” mode and change the softkey back to **Any**.

The display would look like the following for the single AP mode.

1	1	1	1	1	1	-	2	2	3	3	4	4	4
1	1	1	1	1	1	-	2	2	3	3	4	4	4
1	1	1	1	1	1	-	2	2	3	3	4	4	4
1	1	1	1	1	1	-	2	2	3	3	4	4	4
A n y						D e t a i l							

Where:

- 111111 – The last three octets of the on-air MAC address for a discovered AP.
- 22 – The signal strength for the specified AP.
- 33 – The channel number of the specified AP.
- 444 – The beacon interval configured on the specified AP.
- Any/MyID – Softkey to toggle between “single SSID” and “any SSID” mode.
- Detl/Smry – Softkey to toggle between the multiple AP (summary) display and the single (detail) displays for each AP.

The following screen shows how the display would look when there are three APs configured with an SSID that matches that of the Wireless IP Telephone. The first has a signal strength of -28 dBm, is configured on channel 2, with a beacon interval of 100ms. The second has a signal strength of -48 dBm, is configured on channel 6, with a beacon interval of 200ms. The third has a signal strength of -56 dBm, is configured on channel 11 with a beacon interval of 100ms.

```

a b 7 b c 8 - 2 8 0 2 1 0 0
2 a e 5 7 8 - 4 8 0 6 2 0 0
2 a e 5 9 6 - 5 6 1 1 1 0 0
A n y D e t l

```

When the **Any** SSID mode is selected, the summary display contains the first six characters of the APs SSID instead of the beacon interval as in the example below.

```

a b 7 b - 2 8 0 2 A L P H A
2 a e 5 - 4 8 0 6 W S M T E S
2 a e 5 - 5 6 1 1 v o i c e
M y l D D e t l

```

In the **Detl** (detail) mode the display would appear as follows. The Left/Right arrow keys will move between AP indices.

```

i : b b b b s n c h b c n
e e e e e e e e e e D G H I
r r r r r r r r r r r r +
Q ; x P C : v c s s s s s s s
A n y S m r y

```

Where:

- i – Index of selected AP (value will be from 0 to 3 inclusive)
- bbbb – The last three octets of the BSSID for a discovered AP.
- sn – Signal strength in -dBm
- ch – Channel
- bcn – Beacon interval
- eeeeeeeee – SSID (Up to first 11 characters)
- DGHI – Standards supported i.e. 802.11d, 802.11g, etc. in addition to 802.11a and 802.11b.
- rrrrrrr – Rates supported. Basic rates will have a “b” following the rate.
- + – more rates are supported than those displayed
- Q:XP

X is a Hexadecimal representation of the access categories configured with admission control mandatory (ACM). Bit3 = voice, Bit2 = video, Bit1 = background, Bit0 = best effort. For example, if an AP advertises voice and video as ACM then X=c. If all the ACs are set as ACM then X=f. If AP does not have WMM support, this character space will be blank.

P is displayed when the AP advertises WMM-PS. If the AP does not advertise WMM-PS then this character space will be blank.

- C:vC
v is a decimal number indicating the CCX version advertised by the AP.
C is displayed when AP advertises CCKM. If the AP does not advertise CCKM then this character space will be blank.
- ssssssss – Security modes: “None”, “WEP”, “WPA-PSK”, “WPA2-PSK”, “WPA2-Ent”
- Any/MyID – Softkey to toggle between “single SSID” and “any SSID” modes.
- Detl/Smry – Softkey to toggle between the multiple AP display (summary), and the single AP display (detail).

Numbers racing across the Wireless IP Telephone display indicate AP information is being obtained. A **Waiting** message indicates the system is not configured properly and the Wireless IP Telephone cannot find any APs.

Solving Coverage Issues

Coverage issues are best resolved by adding and/or relocating access points.

Overlap issues may be resolved by reassigning channels to the access points or by relocating the access points. See the *Troubleshooting* section *Access Point Problems* for more information.

9.2 Diagnostics Enabled

The **Diagnostics** option is used to evaluate the overall quality of the link between the Wireless IP Telephone, AP, and infrastructure side equipment, such as PBX, AVPP, and gateways. Unlike Site Survey, the Diagnostics mode is used while the functional code is running, and during a call.

When **Diagnostics** is enabled in the Admin menu, the Wireless IP Telephone can display diagnostic screens any time it is active (in a call).

The display of information is instigated when in a call by pressing the **Nav◀** or **Nav▶** key. Only one of the six diagnostic screens listed below can be shown at a time. Pressing the **Nav** keys multiple times will cycle through the various diagnostic screens and the normal off-hook (IP PBX) display. The numeric icon at the top of the display indicates what screen number is being displayed. For example: the first time the **Nav** key is pressed, the **1** icon is shown, and the first of six diagnostic screens are displayed. The next time it is pressed, the **2** icon is shown, and the next of six diagnostic screens is displayed. The counters will be cycled through in this fashion until there are no more counters to be displayed. After all the diagnostic screens have been displayed, the screen returns to the normal off-hook IP PBX screen.

The information provided when **Diagnostics** is enabled includes:

Screen 1

- Missed receive packet count since power up (MissedRcvCnt)
- Missed transmit packet count since power up (MissedXmtCnt)
- Receive retry count since power up (RxRetryCount)
- Transmit retry count since power up (TxRetryCount)

M	i	s	s	e	d	R	c	v	C	n	t		n	n	n	n	n
M	i	s	s	e	d	X	m	t	C	n	t		n	n	n	n	n
R	x	R	e	t	r	y	C	o	u	n	t		n	n	n	n	n
T	x	R	e	t	r	y	C	o	u	n	t		n	n	n	n	n

Screen 2

- Jitter – average error or “wobble” in received packet timing, in microseconds
- Last successful transmit data rate (LastRate)
- Gateway type (GatewayType)
- TX Power (dBm)

J	i	t	t	e	r							n	n	n	n	n
L	a	s	t	R	a	t	e					n	n	n	n	n
G	a	t	e	w	y	T	y	p	e			m	n	e	m	o
T	X	P	o	w	e	r	(	D	B	M	)	r	r	r	r	r

Where:

- mnemo – A mnemonic that indicates what type of gateway is being used
- rrrrr -- TX Power configured in dBm

Screen 3

- Screen 3 contains a list of the APs that are heard and the following parameters from each AP:
 - Indicator as to whether this is the current AP or an index into the list of other APs heard
 - Last two octets of the MAC address of the AP
 - Channel number
 - Signal strength
 - Either the 802.11 Association ID from the current AP or a mnemonic for the reason code indicating why the Wireless IP Telephone didn't hand off to this other AP.

m	m	m	m	c	h	-	s	s	a	i	d	
m	m	m	m	c	h	-	s	s	m	n	e	m
m	m	m	m	c	h	-	s	s	m	n	e	m
m	m	m	m	c	h	-	s	s	m	n	e	m

Where:

- mmmm – This hexadecimal number is the last 2 octets of this AP's MAC address

- ch – Channel number the AP is configured on
- -ss – Signal strength for the AP in dBm
- aid – The Association ID for the currently associated AP
- mnem – A mnemonic indicating the reason code:
 - Unkn – Reason unknown
 - Weak – Signal strength too weak
 - Rate – One or more basic rates not supported
 - Full – AP can not handle bandwidth requirements
 - AthT – Authentication timeout
 - AscT – Association timeout
 - AthF – Authentication failure
 - AscF – Association failure
 - SecT – Security handshake timeout
 - SecF – Security handshake failure
 - Cnfg – AP not configured correctly for security, QoS mode or infrastructure network.
 - CCX – AP is not CCX complaint.
 - CCKM – AP does not support CCKM.
 - WMM – AP does not meet the WMM requirements. Probable reason could be that the admission control access categories AC_VO and AC_VI, used for voice and control traffic respectively, might not be marked as mandatory or WMM-PS might be disabled.

Screen 4

- Association count since power-up (AssocCount)
- Re-association count since power-up (ReAssocCount)
- Association failures since power-up (AssocFailure)
- Re-association failures since power-up (ReAssocFail)

A	s	s	o	c	C	o	u	n	t		n	n	n	n	n
R	e	A	s	s	o	c	C	o	u	n	t		n	n	n
A	s	s	o	c	F	a	i	l	u	r	e		n	n	n
R	e	A	s	s	o	c	F	a	i	l		n	n	n	n

Screen 5

- WEP only security error count since power up (Sec-ErrCount)
- MAC sequence number of frame with last security error (LstSecErrSeq)

- (Re)Association failures due to QoS (QoSFailCnt). Usually attributed to insufficient available bandwidth on an AP.

S	e	c	-	E	r	r	C	o	u	n	t		n	n	n	n	n
L	s	t	S	e	c	E	r	r	S	e	q		n	n	n	n	n
Q	o	S	F	a	i	l	C	n	t				n	n	n	n	n

Screen 6 – EAP Information

- “xxxxx” in Line 1 is a 5-digit decimal value displaying the EAP authentication failure/error count.
- “xxxxx” in Line 2 is a 5-digit decimal value displaying the error code/sequence for the last EAP authentication reason, listed just below. Line 2 will be blank if the count for Line 1 is zero.
- 1 = Unknown error
- 2 = Mismatch in EAP type. The phone is configured with an EAP type (Cisco FSR, PEAP or EAP-FAST) that is not supported by the AP.
- 3xxx = Certification failure. The certificate presented by the server is found as invalid. “xxx” when having a non-zero value, is the standard TLS alert message code. For example, if a bad/invalid certificate (on the basis of its signature and/or content) is presented by the server “xxx” will be 042. If the exact reason for the certificate being invalid is not known, then the generic certificate error code would be xxx=000. [Refer <http://www.ietf.org/rfc/rfc2246.txt> , section 7.2 for further TLS alert/error codes].
- 4xxx = Other TLS failures. This is due to TLS failure other than certification related errors. The reason code (the TLS alert message code) is represented by “xxx”. For example, if the protocol version presented by the server is not supported by the phone then xxx will be 70, and the EAP error code would be 4070. [Refer <http://www.ietf.org/rfc/rfc2246.txt> , section 7.2 for further TLS alert/error codes].
- 5xxx = Credential Failure. This is due to an invalid username and/or password produced by the phone. xxx when non-zero, presented the 3-digit error code sent by the server in response to phone’s credential. For example, if the server has sent the error code as “691”, then the EAP error code would be 5691. If the server does not send the error code message, then xxx is defaulted to 000, i.e., EAP error code would be 5000. Refer [1]) <http://www.ietf.org/rfc/rfc2759.txt> section 6, [2] <http://ietfreport.isoc.org/all-ids/draft-zhou-emu-fast-gtc-02.txt>

E	A	P	E	r	r	C	n	t					x	x	x	x	x
L	a	s	t	E	A	P	E	r	C	o	d	e		x	x	x	x

9.3 Syslog Mode

A syslog server must be present on the network in order for the Wireless IP Telephone to send the log messages and have them saved. The syslog server will be found with DHCP option 7 if the Wireless IP Telephone is using DHCP. If static addresses are configured, the syslog server's IP address can be configured statically in the Admin menu.



If the syslog server address is blank (000.000.000.000 or 255.255.255.255) or the Wireless IP Telephone is using DHCP and no option 7 is received from the DHCP server, the Wireless IP Telephone will not send any syslog messages.

Admin menu options:

***Disabled** turns syslog off.

Errors causes the Wireless IP Telephone to log only events that we consider to be an error (see below).

Events logs all errors plus some other interesting events (see below).

Full logs all the above plus a running stream of other quality information (see below).

The table below lists the syslog messages and which level of logging will produce them:

Message type	Errors	Events	Full
Failed Handoff	Yes	Yes	Yes
Successful Handoff	No	Yes	Yes
Security Error	Yes	Yes	Yes
Call START/End	No	Yes	Yes
Audio stats	No	No	Yes (every 5 secs)
Audio error threshold exceeded	Yes	Yes	Yes
Radio stats	No	No	Yes (every 5 secs)
Radio error threshold exceeded	Yes	Yes	Yes
Error Handling Mode	Yes	Yes	Yes
[SW ERROR]	Yes	Yes	Yes
CHARGER-Placed in charger	No	Yes	Yes
CHARGER-Removed from charger	No	Yes	Yes
Checked in to server [IP addresses]	No	Yes	Yes
Download aborted code incompatible. Error=####	Yes	Yes	Yes
DCA unknown MgmtAction category code=###	Yes	Yes	Yes
CHARGER-Vbat: ##mV	No	No	Yes
CHARGER-Battery temp out of range	Yes	Yes	Yes

All syslog messages will include:

1. Date and time (to 1/100th of second) since handset START (currently set to Jan-1 00:00.00)
2. Wireless IP Telephone's MAC address
3. Wireless IP Telephone's IP address

4. Sequence number

The table below lists the additional items in each message type:

Failed Handoff (Sent whenever the Wireless IP Telephone attempted handoff, but failed trying.)	Failed AP MAC Failed AP signal strength Current AP MAC Current AP signal strength Failure reason Wireless IP Telephone Transmit Power to Old AP Wireless IP Telephone Transmit Power to New AP FCKM [‡] – Failed to use CCKM for fast handoff FOCK [‡] – Failed to use OKC for fast handoff
Successful Handoff	New AP MAC New AP signal strength Old AP MAC Old AP signal strength Reason for handoff Other candidate APs: MAC Signal strength Reason not used Wireless IP Telephone Transmit Power to Old AP Wireless IP Telephone Transmit Power to New AP FCKM [‡] – Failed to use CCKM for fast handoff FOCK [‡] – Failed to use OKC for fast handoff
Security Error	AP MAC AP signal strength Security mode Error details (mode-dependent)
Call START	Call type (telephony, OAI, PTT) AP MAC AP signal strength
Call End	AP MAC AP signal strength
Audio stats	AP MAC AP signal strength Payload size (in msec) Payloads sent Payloads received Payloads missed (not received) Payloads missed rate (over last 5 seconds) Payloads late Payloads late rate (over last 5 seconds) Average jitter
Audio error threshold exceeded (Sent if payloads missed rate or payloads late rate exceeds 2%, or if the average jitter is over 2 msec)	Same as audio stats
Radio stats	AP MAC AP signal strength Directed packets sent Directed packets received Multicast packets sent

	Multicast packets received Broadcast packets sent Broadcast packets received TX dropped count TX drop rate (over last 5 seconds) TX retry count TX retry rate (over last 5 seconds) RX retry count RX retry rate (over last 5 seconds)
Radio error threshold exceeded (Sent if TX drop rate exceeds 2% or TX or RX retry rate exceeds 5%)	Same as radio stats
Probe Recovery	Probe Recovery Count
LockUpRecovery	Lockup Recovery Count
DCA initiated radio reset	Reset count when Reset occurred Reset count at the time when the syslog was sent
[SW ERROR] Assert message	Parameters are "file name", "line number", "proprietary parameter 1", "proprietary parameter 2", OTADL firmware version, Functional Firmware version, Phintl version, and phone license type.
Checked in to server [IP addresses]	Handset checked into AVPP. Parameters are AVPP IP address, OTADL firmware version, Functional Firmware version, and Phintl version.
DCA unknown MgmtAction category code=###	Unexpected management action from access point.
CHARGER-Vbat: ##Mv	current battery voltage.

[‡] Present only when the specific fast handoff method (CCKM, OKC) has been enabled.

Messages are formatted like the following example:

```
Jan 1 00:01:26.72 0090.7a02.2a1b (172.16.0.46)
[001a] RStat: AP 00:40:96:48:1D:0C (-56 dBm),
Sent 783523, Recvd 791342, MSnt 245, MRcd 5674,
BSnt 43, BRcd 10783, TX drop 43 (0.0%), TX
retry 578 (1.2%), RX retry 1217 (1.6%)
```

10. Certifying the Wireless IP Telephones

Prior to determining that an installation is complete, test the Wireless IP Telephones following the sequence given in the previous *Testing a Wireless IP Telephone* section and conduct a site survey mode test according to the directions given in the previous *Diagnostic Tools* section.

The installation may need some adjustments. Note any areas where coverage is conflicting or inadequate. Note any system difficulties and work with your wireless LAN and/or LAN system administrator to determine the cause and possible remedy. See the section *Wireless IP Telephone Problems* for clues to possible sources of difficulties. If any adjustments are made to the system, re-test the device in the same vicinity to determine if the difficulty is resolved.

These tests must be performed in typical operating conditions, especially if heavy loads occur. The testing sequence and procedure is different for every installation. Generally, you should organize the test according to area and volume, placing numerous calls to others who can listen while you perform coverage tests. Note any areas with excessive static or clarity problems and report it to an Avaya service engineer.

The coverage test will also require you to put the Wireless IP Telephone in **Site Survey** mode and walk the entire coverage area to verify all access points.

10.1 Conducting a Site Survey

Conduct a Site Survey of the installation by walking the site looking for interfering 802.11 systems, adequate coverage and channel assignment, and correct AP configuration. The site survey discussed here does not replace an RF site survey conducted by professionals who specialize in WLAN design and voice optimization implementations. Avaya and Polycom offer professional services including RF site surveys.



The handset's site survey mode is not a replacement for a professional site analysis and should be used only for testing, limited site validation, and troubleshooting.



The handset's site survey mode does not include functionality to allow for analysis or troubleshooting of 802.11n specific WLAN features.

1. Referring to section *Run Site Survey*, put a Wireless IP Telephone into Site Survey in the **Any/Smry** SSID mode. Walk throughout the site checking for any expected APs or other SSIDs.

Then, walk the site again, in **MyID/Smry** ESSID mode, this time checking that every location has adequate coverage and has good channel allocation.



There should be at least one AP stronger than -the minimum specified in the following tables.

At any point, the strongest AP shown should be on a different channel than the next best choice.

The handset configured for 802.11b requires:

- -70dBm when all 802.11b data rates are available (with only 1Mbps set Required)
- -65dBm when only 2Mbps is set Required and other higher rates enabled
- -64dBm when only 5.5Mbps is set Required with 11Mbps set enabled
- -60dBm when 11Mbps is set required and other 802.11b rates disable or enabled

802.11 Radio Standard	Minimum Available Signal Strength (RSSI)	Maximum “Mandatory” Data Rate
802.11b	-70 dBm	1 Mb/s
	-60 dBm	11 Mb/s

- The critical factor is the highest data rate set Required or Mandatory. Other 802.11b data rates can be set enabled or disabled. The highest data rate set Required or Mandatory determines the RF power available to the handset for proper operation.

The handset configured for 802.11g requires:

- -60dBm when all 802.11g data are available (with only 6Mbps set Required)
- -45dBm when 54Mbps is set Required and other 802.11g rates Required, Enabled or Disable

802.11 Radio Standard	Minimum Available Signal Strength (RSSI)	Maximum “Mandatory” Data Rate
802.11g	-60 dBm	6 Mb/s
	-45 dBm	54 Mb/s

- The critical factor is the highest data rate set Required or Mandatory. Other 802.11g data rates can be set Required, Enabled or Disabled. The highest data rate set Required or Mandatory determines the RF power available to the handset for proper operation.
- -45dBm when 54Mbps is set Required and other 802.11g rates Required, Enabled or Disable

The handset configured for 802.11a requires:

- -60dBm when all 802.11a data are available (with only 6Mbps set Required)
- -45dBm when 54bps is set Required and other data rates Required, Enabled or Disabled

802.11 Radio Standard	Minimum Available Signal Strength (RSSI)	Maximum “Mandatory” Data Rate
802.11a	-60 dBm	6 Mb/s
	-45 dBm	54 Mb/s

- The critical factor is the highest data rate set Required or Mandatory. Other 802.11a data rates can be set enabled or disabled. The highest data rate set Required or Mandatory determines the RF power available to the handset for proper operation.

2. Finally, use the single AP (**MyID/Defl**) display to check each AP, to ensure it is configured for the proper data rates, beacon interval, 802.11 options enabled, QoS method, and security method.

Make any necessary adjustments to AP locations and configurations and repeat steps 1-3 until the Site Survey shows adequate coverage and correct configuration at every location.

The installation is not complete until these certification steps have been performed. Do not hand out Wireless IP Telephones at a site that has not been certified.

11. Software Maintenance

The Avaya 3641/3645 Wireless IP Telephones use proprietary software programs maintained by Avaya. The software versions that are running on the Wireless IP Telephones may be displayed by selecting the **Firmware Version** option on the admin menu. Firmware Version is also an option on the Config menu.

Avaya or its authorized dealer will provide information about software updates and how to obtain the software (for example, downloading from a web site).

After software updates are obtained they must be transferred to the appropriate TFTP server located on the LAN to update the code used by the Wireless IP Telephone.

The handset allows over-the-air transfer of software updates from the designated TFTP server to the handsets. The download function in the Wireless IP Telephone checks its software version every time the handset is powered on, when the TFTP server is active. If there is a different version available, the handset immediately begins to download the update.

11.1 Upgrading Wireless IP Telephones

After software updates are obtained from Avaya, they must be transferred to the appropriate location in the LAN to update the code used by the Wireless IP Telephones.

Avaya 3641/3645 Wireless IP Telephones allow over-the-air transfer of software updates from the designated TFTP server to the Wireless IP Telephones. The download function in the Wireless IP Telephone checks its software version every time the Wireless IP Telephone is turned on. If there is any discrepancy the Wireless IP Telephone immediately begins to download the update.

Normal Download Messages

When the Wireless IP Telephone is powered on, it displays a series of messages indicating that it is searching for new software, checking the versions, and downloading. The normal message progression is:

Message	Description
Checking Code	Wireless IP Telephone is contacting the TFTP Server to determine if it has a newer version of software that should be downloaded.
Erasing Memory	Wireless IP Telephone has determined that a download should occur and is erasing the current software from memory. This message also displays a progress bar. When the progress bar fills the display line the erase operation is complete.
Updating Code	Wireless IP Telephone is downloading new software into memory. The number icons at the bottom of the display indicate which file number is currently being downloaded. When the progress bar fills the display line the update operation is complete on that file.

When the update is complete, the Wireless IP Telephone displays the extension number and is ready for use.

Download Failure or Recovery Messages

The following display messages indicate a failure or recovery situation during the download process.

Message	Description
Server Busy	Wireless IP Telephone is attempting to download from a TFTP Server that is busy downloading other phones and refusing additional downloads. The Wireless IP Telephone will automatically retry the download every few seconds.
TFTP ERROR(x):yy	A failure has occurred during the TFTP download of one of the files. (x) – The file number which was being downloaded; yy is an error code describing the particular failure. Possible error codes are: 01 – TFTP server did not find the requested file. 02 – Access violation (reported from TFTP server). 07 – TFTP server reported "No such user" error. Check the TFTP server configuration. 81 – File put into memory did not CRC. The Wireless IP Telephone will attempt to download the file again. FF – Timeout error. TFTP server did not respond within a specified period of time.
Erase Failed	Download process failed to erase the memory in the Wireless IP Telephone. This operation will retry.
Waiting	Wireless IP Telephone has attempted some operation several times and failed, and is now waiting for a period of time before attempting that operation again.

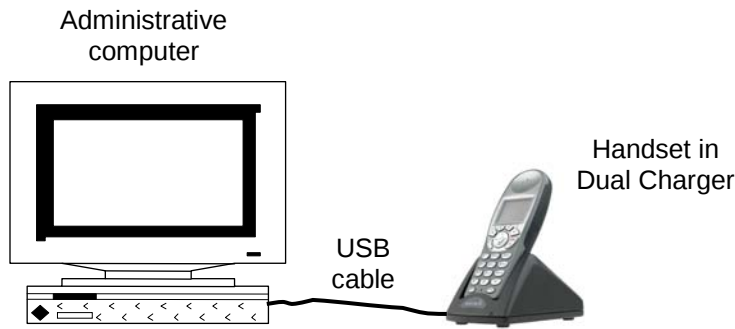
C. Handset Administration Tool

Installation

How to Use

1. Handset Administration Tool Installation

The Handset Administration Tool is a software utility installed on a PC with a USB port. It is designed as a time-saving device for rapid administration and configuration of a number of handsets. During operation, the USB cable must be connected from the PC's USB port to the Dual Charger's USB port.



Configuration options include:

1. Setting all options on the Admin menu,
2. Setting all options on the Config menu,
3. Recording error information to assist troubleshooting,
4. Upgrading handset software

The **Setup.exe** file on the CD will download and install the files for the Handset Administration Tool and download the files for the USB driver. The USB driver must be installed as a separate process after the Handset Administration Tool is installed.



The CD contains Setup.exe files for SRP and SIP. Please ensure that you have downloaded the Setup.exe program for your protocol.

Necessary components:

- PC with a USB port running Windows 2000, Windows XP, or Windows Vista,
- Dual Charger for the Avaya 3641/3645 Wireless IP Telephone,
- Power supply for the appropriate country or region,
- Avaya USB cable or comparable cable (with 5-pin “mini-B” connector).



USB cables vary in their ability to make a proper connection to the Dual Charger's USB port. Please use the USB cable available through Avaya to ensure compatibility.

1.1 Installing the Handset Administration Tool

1. Locate the Setup.exe file on the CD. You may copy this file to your local drive or install from the CD. Click the **Setup.exe** file to start the installation process.
2. The Install wizard will guide you through the setup. You will be prompted to accept the license agreement and must accept it in order to finish the setup.
3. Click **Finish** to Exit the wizard.



The Handset Administration Tool will appear in your Programs list under the **Start** menu as **HandsetAdmin** and as an icon on your desktop. It may be launched like any other program.

1.2 Installing the USB Driver

The USB driver installation allows the Dual Charger to be the communication link between the handset and the PC. The folder containing the **HandsetAdmin** file contains the two USB driver files in a folder called **USBDriver**. The files are named **slnkusb.sys** and **slnkusb.inf**.

1. Find the USB driver files on the PC.
2. Place the Dual Charger on a flat, horizontal surface. Plug the power supply into the Dual Charger and into an appropriate wall outlet.
3. Plug the USB cable into the Dual Charger and into an available USB port on the PC.
4. Power off an Avaya 3641/3645 Wireless IP Telephone, remove the Battery Pack (optional), and place the handset in the Charger. If properly seated, the handset automatically powers up in USB mode and the handset screen displays a **USB Mode** on indication.

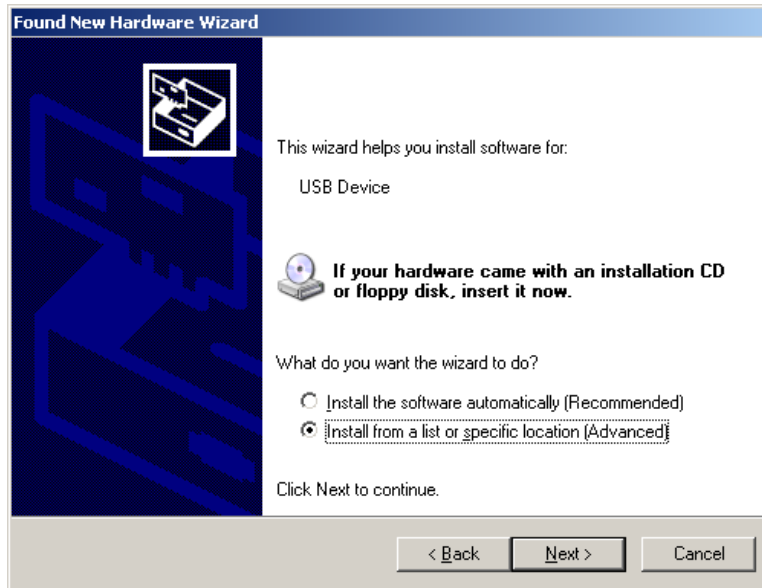


If the handset is not properly seated in the Dual Charger, the USB connection will not be made and the Battery Pack will begin charging, and the handset screen displays a **Charging...** indication. If this occurs, reseal the handset, check the connections on the USB cable, and/or remove the Battery Pack and try again.

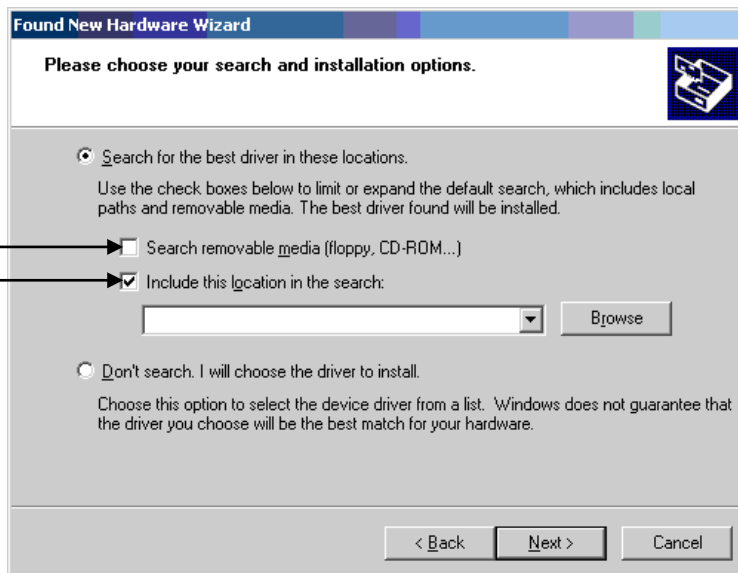
5. Microsoft Windows will start the **Found New Hardware Wizard**. There is no need to connect to Windows Update, so select **No, not this time** and click **Next**.



6. The files need to be installed from a specific location. Select **Install from a list or specific location (Advanced)** and click **Next**.



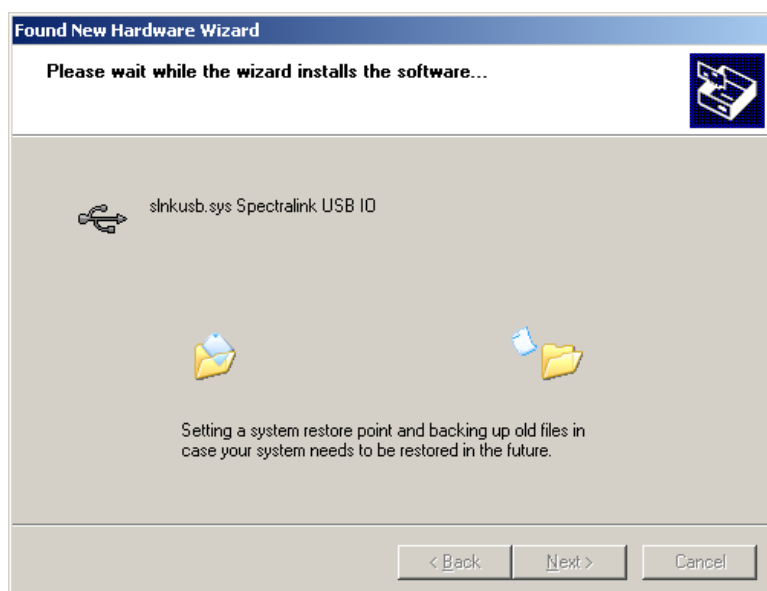
7. Select Search for the best driver in these locations.
8. Clear the check box Search removable media.
9. Select the check box Include this location in the search.
10. Browse to the **HandsetAdmin** program folder where the USB driver files have been downloaded. The default location is the Program directory. Select the **USBdriver** folder.
11. Click **Next**.



12. The following warning message from the Microsoft Wizard displays. The USB driver files are proprietary to Polycom and were not submitted to Microsoft for testing. They were fully tested in Polycom laboratories to more exacting standards and will not harm your system. Click Continue Anyway.



13. Microsoft Wizard installs the USB driver software.



14. The final screen indicates that the USB driver has been successfully installed. Click **Finish** to close the wizard and proceed with handset configuration.



2. Using the Admin Tabs

Launch the Handset Admin program from the Start menu.

The Handset Administration Tool has two separate functional areas: the Admin Tabs and the Handset Settings Editor.

The Admin Tabs are used to connect to the handset, set and change the password, retrieve error messages, update handset software, and update the Handset Administration Tool software.

The Handset Settings Editor is used to configure handsets, as well as create, save and copy Admin menu options. See Chapter 3 *The Settings Editor* for detailed instructions on using the Handset Settings Editor.

The Handset Administration Tool uses indicators to alert you to the status of the action being performed.

- Green – indicates ready status.
- Yellow – indicates caution or attention.
- Red – indicates an error
- Gray – indicates not active status.
- Blinking – indicates entry is needed or waiting on system response.

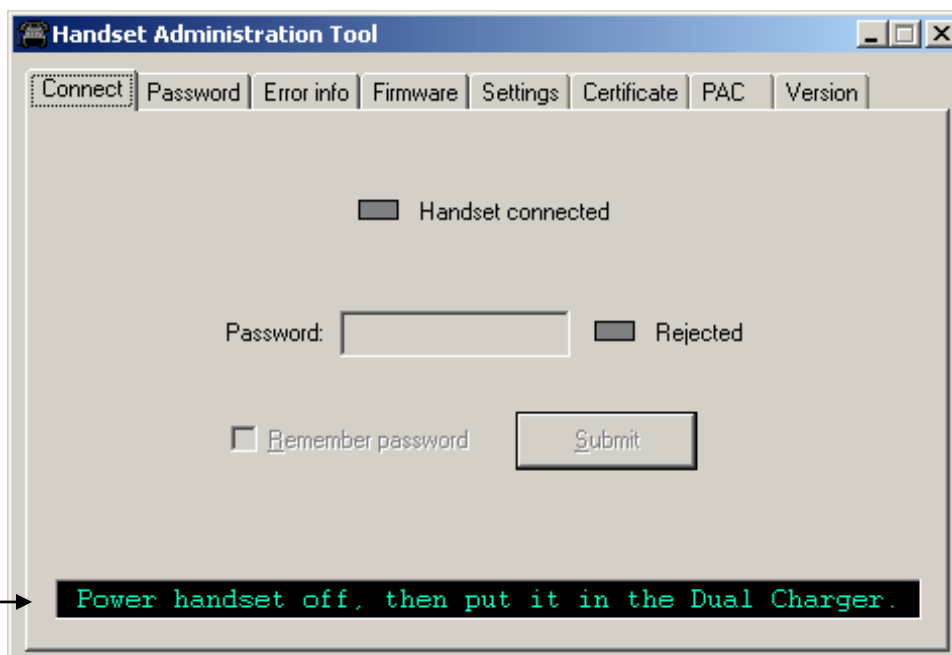


If closed, the Admin Tabs may be opened from the **Settings Editor** by selecting the **Admin** or **View** option on the **Settings Editor** menu bar.

2.1 Connecting the Handset

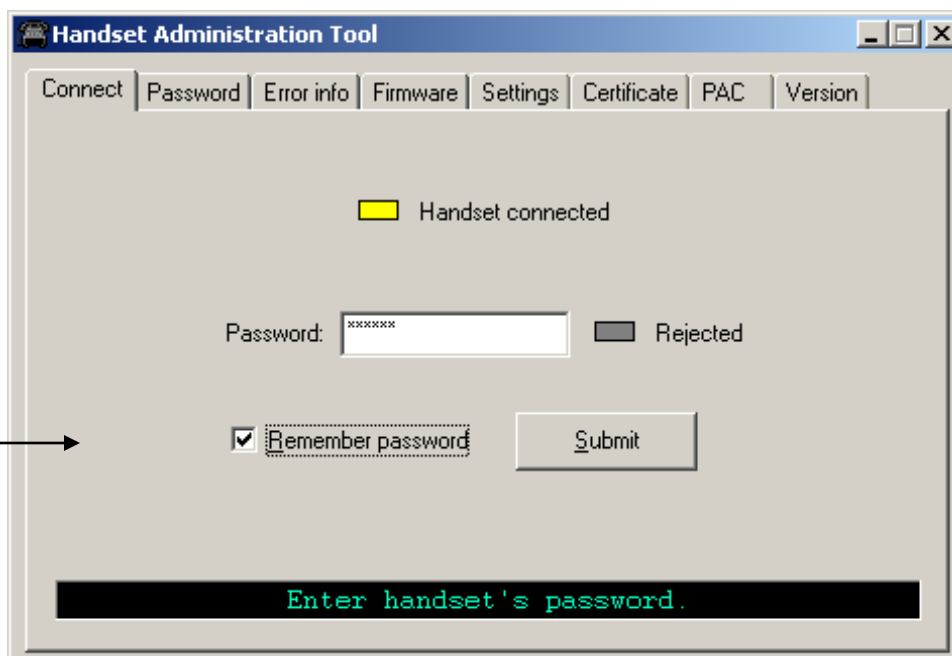
There are six tab labels that describe each of the available functions. The tab labels are: **Connect**, **Password**, **Error info**, **Firmware**, **Settings**, and **Version**.

The Connect tab has a prompt line which will state one of three messages: **Power handset off, then put it in the Dual Charger**; **Enter handset's password**; or **Connected**.



The prompt line at the bottom of the window provides information about what action should be taken or the status of the utility.

Insert the handset into the Dual Charger and enter the password.

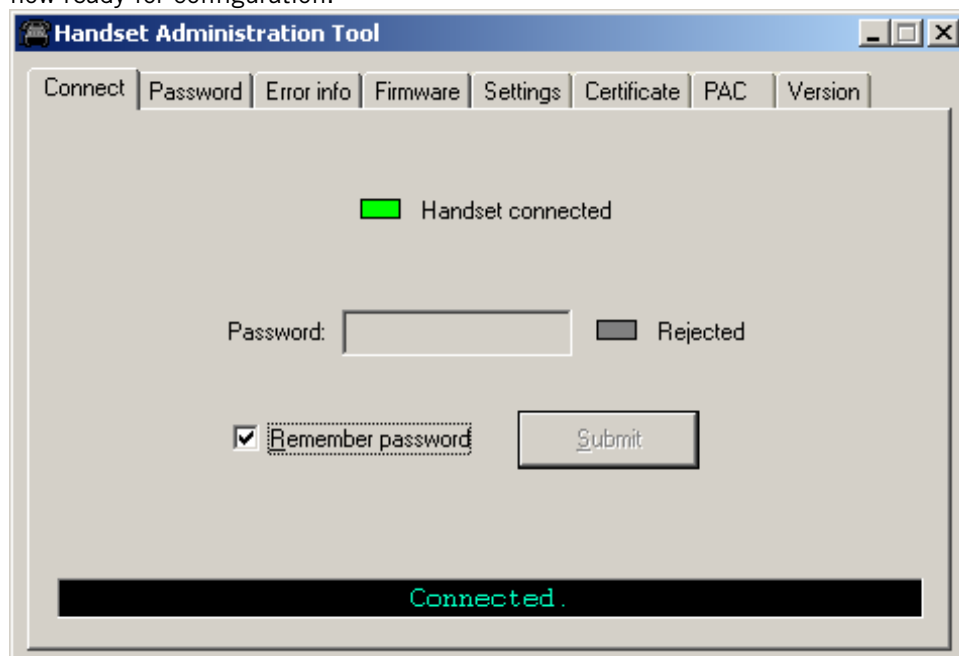


When the handset is inserted for the first time, the password must be entered. If you select the **Remember password** check box, the password is retained as the default password for all handsets. Enter the password and click **Submit**. The default password is **123456**.



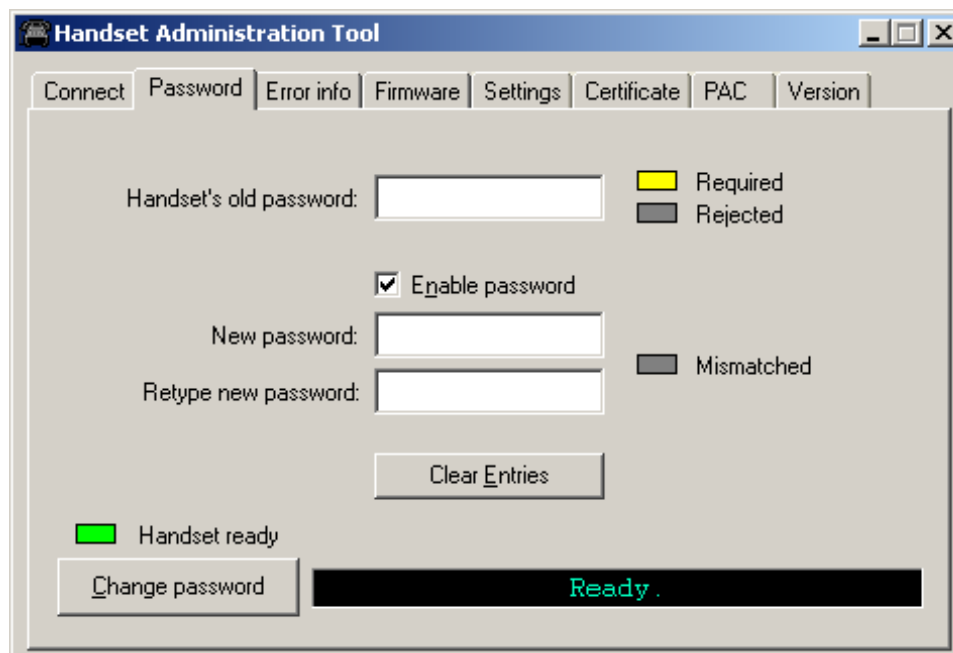
Unique passwords for each handset are not remembered.

When connection is established between the program and the handset, the **Handset connected** indicator turns green and **Connected** displays on the prompt line. The handset is now ready for configuration.



2.2 Password Configuration

The password is a security measure to restrict access to the Admin menu settings. Prior to changing a password, the existing password must be entered. The new password must be entered twice for confirmation. If a password is desired to gain access to the handset's Admin menu, select the **Enable password** checkbox. If no password is desired, clear the **Enable password** checkbox. A password may be up to 18 characters.



The image shows a screenshot of the 'Handset Administration Tool' window. It has a title bar with standard window controls and a menu bar with tabs: Connect, Password, Error info, Firmware, Settings, Certificate, PAC, and Version. The 'Password' tab is selected. The main area contains the following elements:

- 'Handset's old password:' label followed by a text input field. To the right are two status indicators: a yellow box labeled 'Required' and a grey box labeled 'Rejected'.
- A checked checkbox labeled 'Enable password'.
- 'New password:' label followed by a text input field.
- 'Retype new password:' label followed by a text input field.
- To the right of the new password fields is a grey box labeled 'Mismatched'.
- A 'Clear Entries' button below the password fields.
- A green status indicator labeled 'Handset ready'.
- A 'Change password' button.
- A black status bar at the bottom with the text 'Ready .' in green.

2.3 Character Table

The following table illustrates how numbers and letters are entered on the handset's keypad. The **CAPS/caps** softkey toggles to allow both upper and lowercase letters. Only English characters are allowed.

Key	CAPS	caps
1	1	1
2	2 a b c	2 A B C
3	3 d e f	3 D E F
4	4 g h i	4 G H I
5	5 j k l	5 J K L
6	6 m n o	6 M N O
7	7 p q r s	7 P Q R S
8	8 t u v	8 T U V
9	9 w x y z	9 W X Y Z
0	0	0
*	* - _ . ! \$ % & ' () +	, ; : / \ = @ ~
#	<space>	

2.4 Error Information

The **Error info** tab provides a utility to assist the Avaya customer service team to troubleshoot handset errors. When directed by customer service, this utility enables you to save any errors as a file, which can then be sent to Avaya for handling.

Use the **Browse** button to establish the path and enter the filename. Future saves will point to this same location as the default, so that the same file may be overwritten if desired. A drop-down list box displays the most recently used filenames.

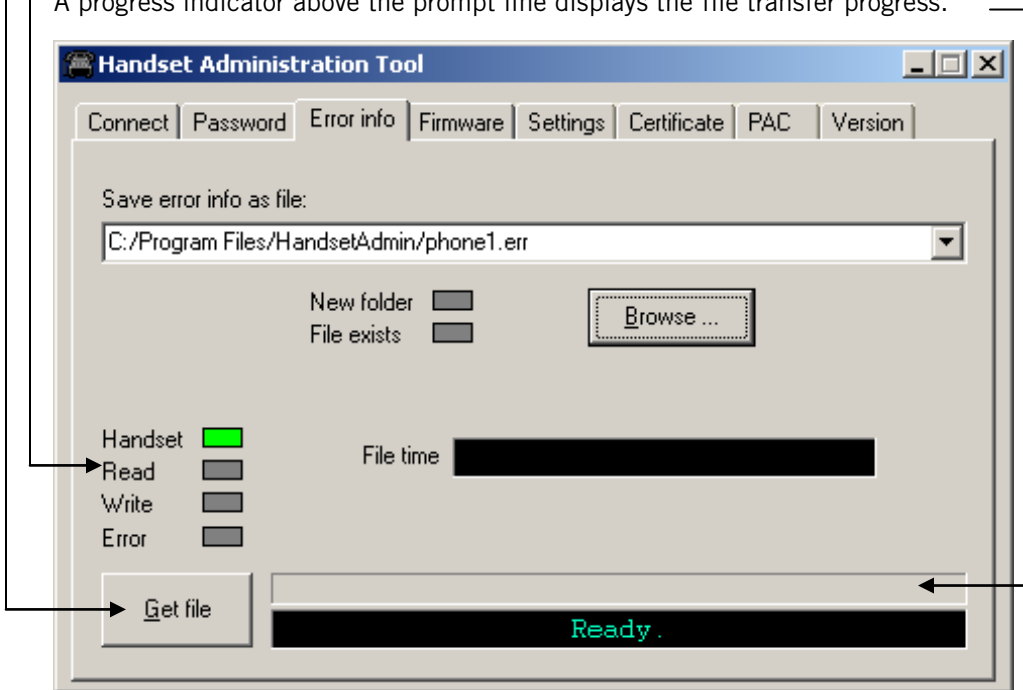
The **File time** window displays the modification timestamp of the file in the **Save error info as file** window.

Power off handset and place it in the Dual Charger.

Click the **Get file** button to save the file. The file will be copied from the handset to the location.

The **Read/Write** indicators will reflect the action as it occurs.

A progress indicator above the prompt line displays the file transfer progress.



2.5 Software Updates

The **Firmware** tab allows you to copy software updates to the handset's memory after they are downloaded from a website.

To install manual updates

1. Download Avaya 3641/3645 Wireless IP Telephone software update from the Avaya website at <http://support.avaya.com>
2. Extract the bin files from the zip file to a folder set up for this purpose. Each file must be individually downloaded into the handset.

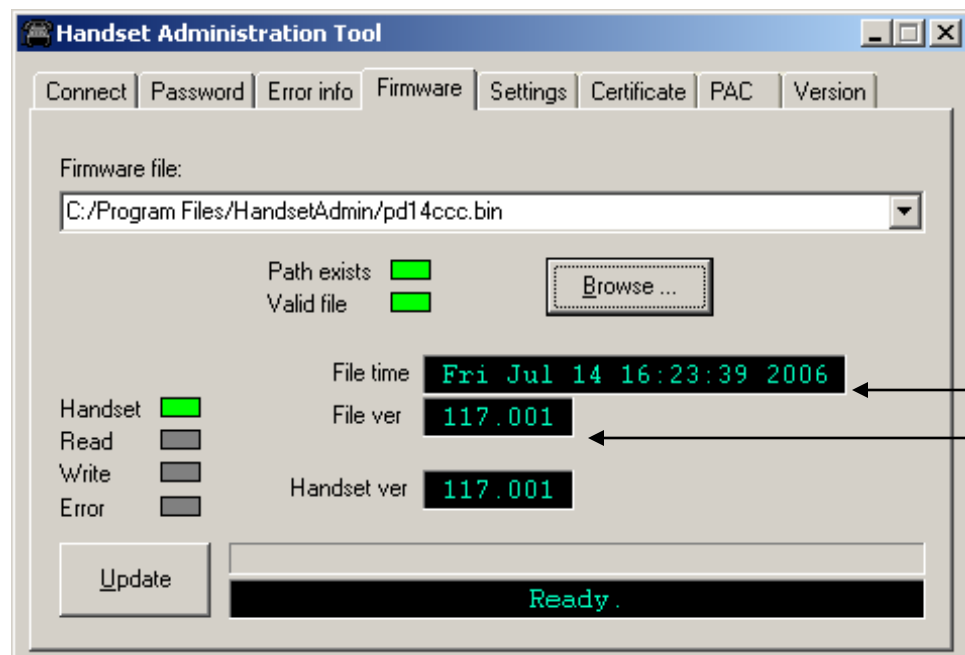


This is not an efficient method of updating any quantity of handsets, but it works for testing new code and in extremely small installations.



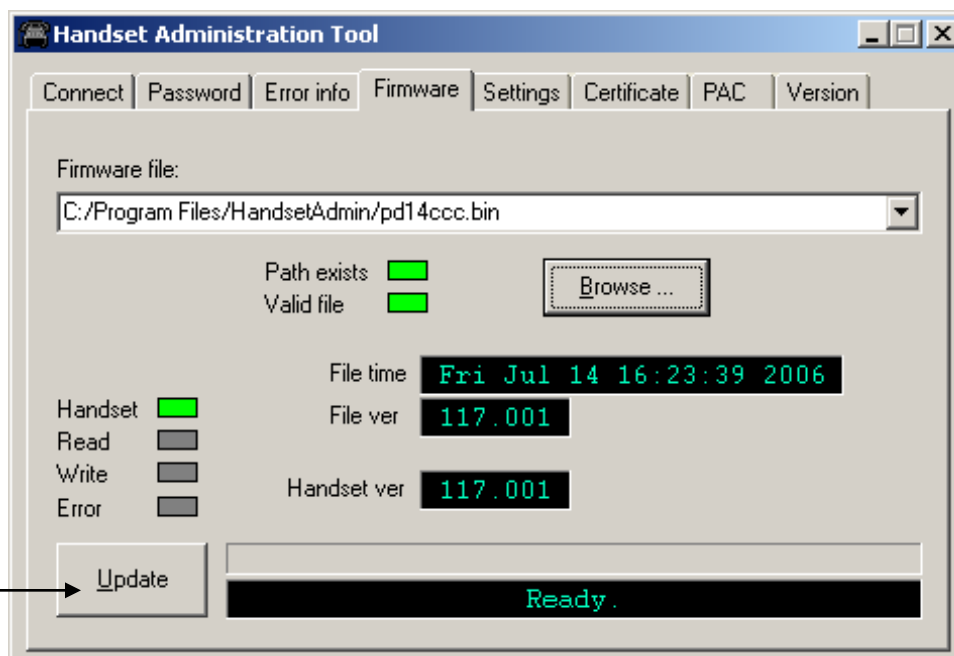
Be aware that if there is a TFTP server broadcasting a different version of the handset code, the handsets will continue to download code over the air and revert to the different version. Remove handset code from the TFTP server or disable broadcasting before relying on this update procedure.

3. Use the **Browse** button to locate the software file. The drop-down list box displays the most recently used filenames. The **File time** window displays the modification timestamp of the file in the **Firmware file** window.



4. Check the file version and handset version for comparison. Once the update is complete, the file version will have overwritten the handset version and these two file versions will match.

5. Verify that the information in the **File ver** window is the correct file to be downloaded and then click the **Update** button. This file copies from the location to the handset. The **Read/Write** indicators reflect the action as it occurs. While a firmware update is in progress, you may open other tabs and the handset indicators shown on those tables will inform you of the status of the update.
6. (Conditional) Should an **Error** indication occur, retry the update after ensuring that the handset is properly seated and that the USB cable is in good condition and connected securely. Contact Customer Service if an error persists. See *About This Guide* for contact information.



7. Note that the firmware file path, file time, file version and handset version shown in the above example screen are for illustration only.

2.6 Certificate and PAC

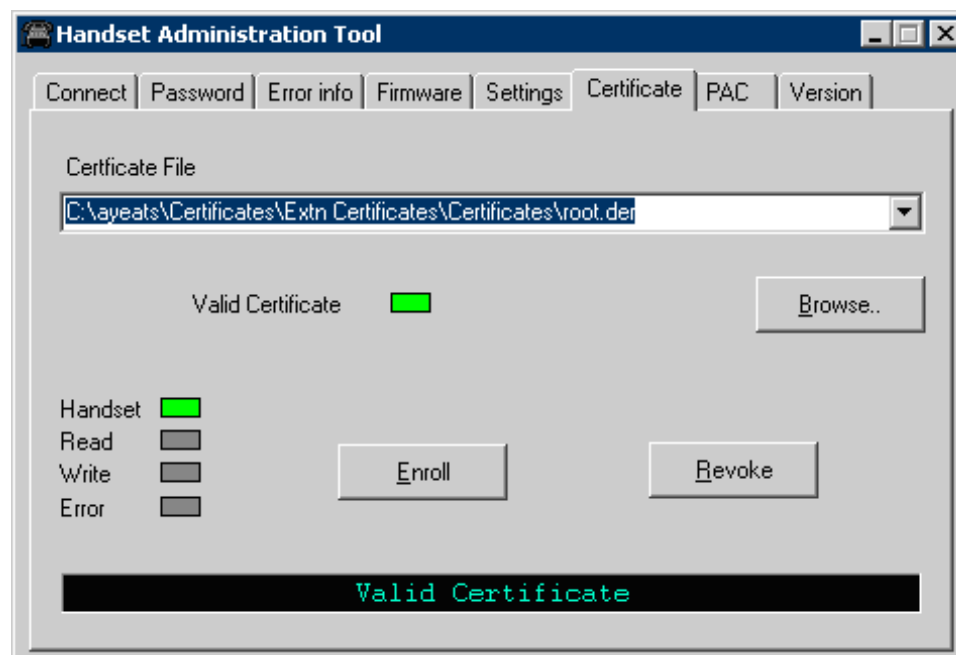
The Handset Administration Tool (HAT) is used for enrolling a handset with a PEAP certificate. Choose the **Certificate** tab and use the file browser to identify the certificate to be loaded. Once chosen, HAT will perform a rudimentary check on the file to make sure the format is DER and that the certificate date is valid. If these tests pass, HAT will indicate that it is valid and enable the **Enroll** button. Click **Enroll** to install the certificate onto the handset.



See the *Administration Guide* for complete instructions.

Certificate

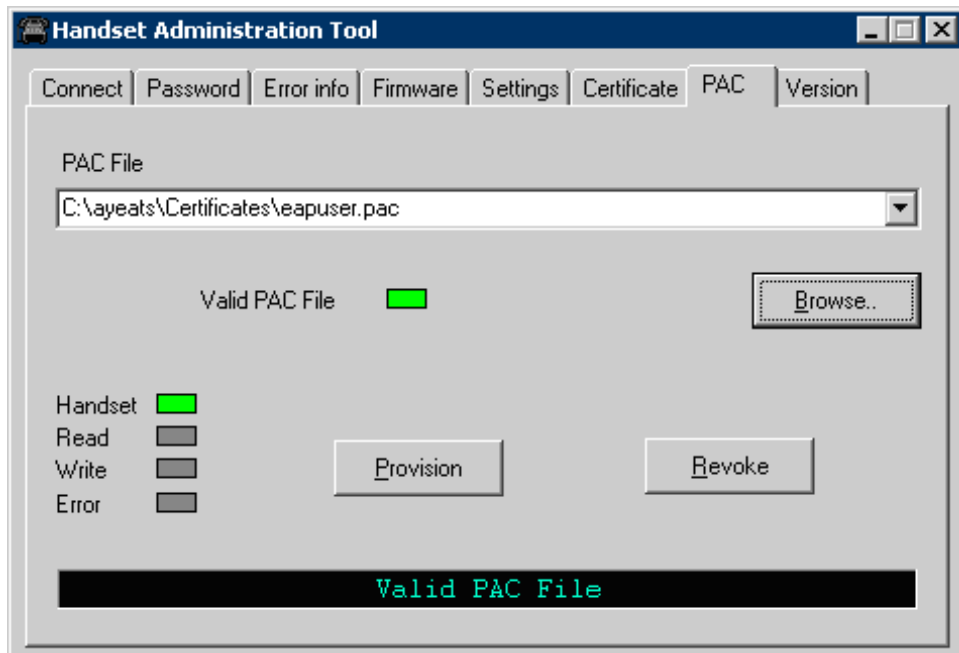
The screen below shows a valid certificate that has been identified with the file browser.



PAC

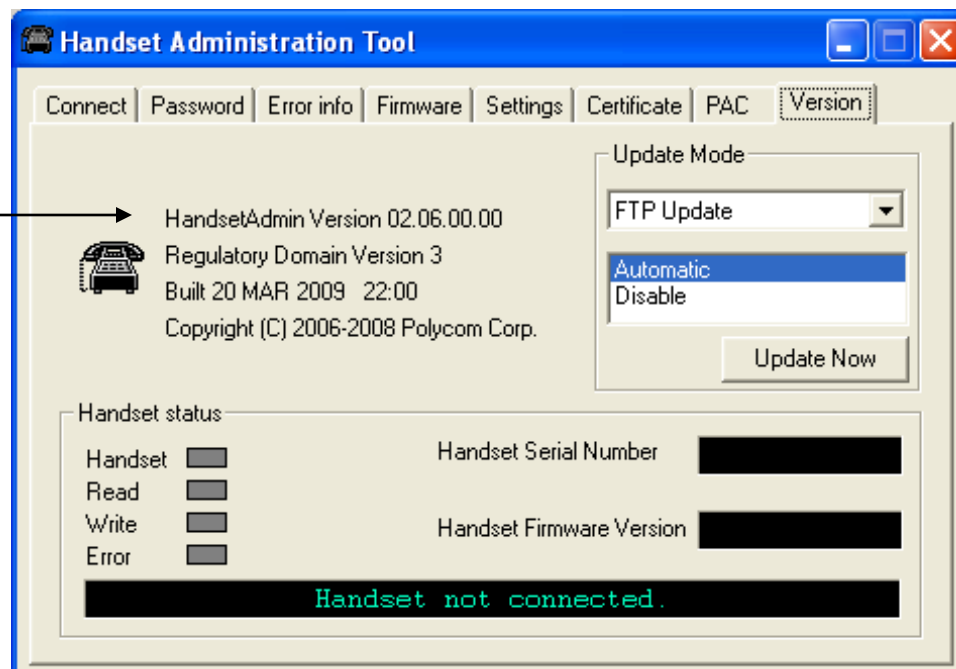
For EAP-FAST, HAT is also used for provisioning a handset with a Protected Access Credential (PAC). Choose the PAC file with the file browser. The user will be prompted to enter the password used to generate the PAC as part of its validation process. Once the PAC is considered to be valid, the **Provision** button will be available for installing the PAC onto the handset.

The screen below shows a valid PAC identified with the file browser after a valid password has been entered.



2.7 Version

The **Version** tab displays the serial number of the handset and the current version of the Handset Administration Tool software.



Update Mode allows you to select where and how you want to check for updates to the program. The program can be updated from either of two locations--FTP Update or Local File Update.

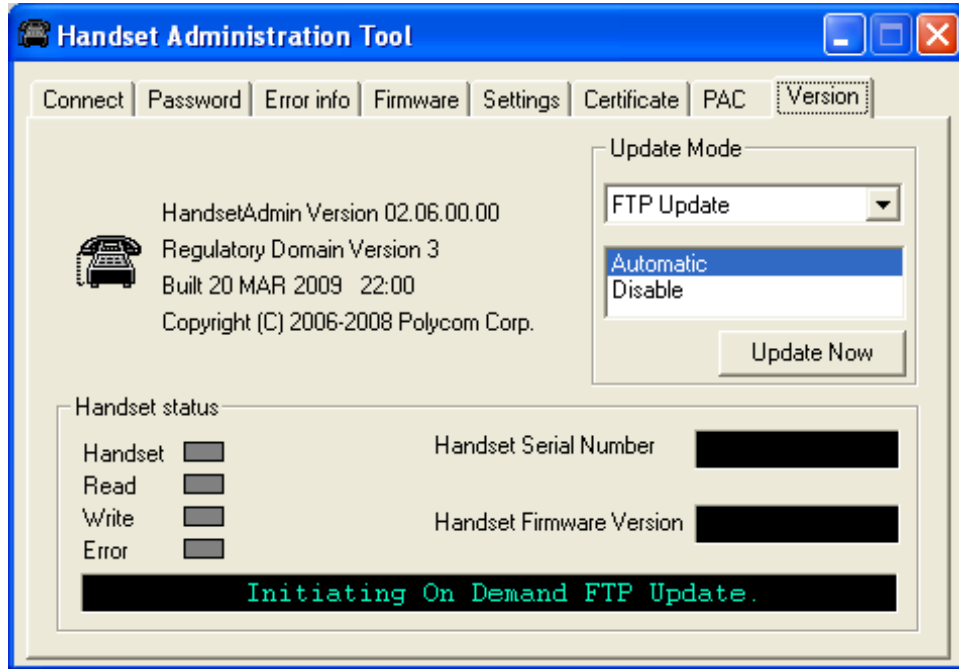
Updates may be installed either automatically or manually. The **Automatic** option sets the program to automatically check the FTP site for updates every time the HAT program is launched. The **Disable** option disables the automatic check and allows you to manually update the program by clicking the **Update Now** button. Any computer that is not connected to the internet should be set to **Disable**.

Depending on the **Update Mode** setting, the **Update Now** button can be used to check the FTP site for an update or to browse to a local location,

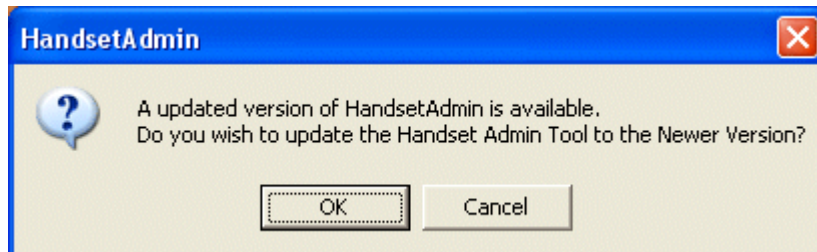
2.8 FTP Update

The **FTP Update** option retrieves the update from an FTP site. During the update process, the program is downloaded to the connected computer and that computer's version of the program is updated. In order to use this option, the computer must have access to the internet.

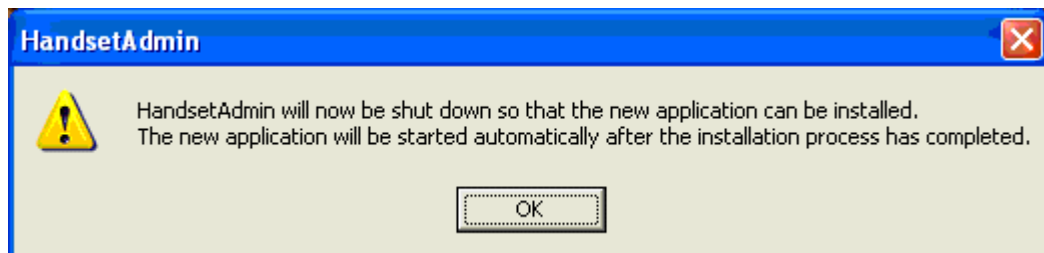
1. Click **Update Now** to start the FTP update process.



2. If the **Automatic** option is selected, the following prompt will appear before the update is installed. Click **OK** to continue.



3. The update will be installed by overwriting the previous version.



4. Once the update is downloaded, you can copy the .pkg file to a local location and update other computers using the **Local File Update** option. See below.

2.9 Local File Update

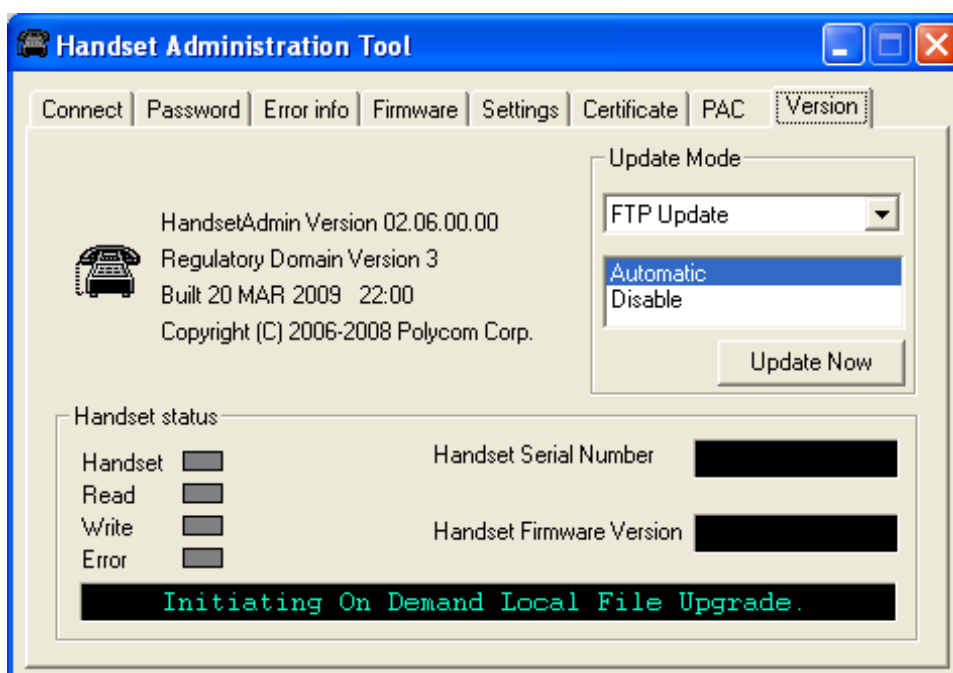
You must obtain the .pkg file to perform a local update. Use the FTP update option explained above or a service option to obtain the .pkg file. Copy the .pkg file to an accessible location.



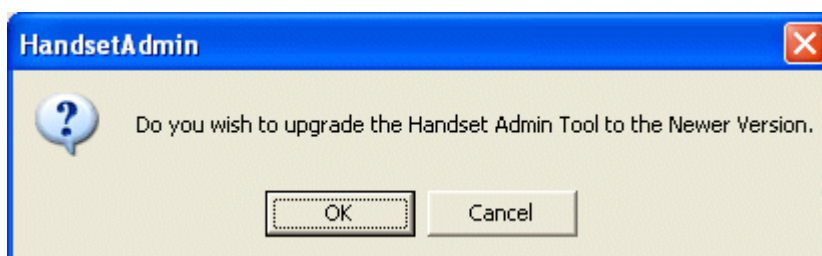
The Handset Administration Tool must already be installed on any computer that is being updated. Install the HAT software first, and then update it.

The following procedure is used for a local file update.

1. Open the Handset Administration Tool and click the **Version** tab.
2. Click the **Local File Update** option.
3. Click Update Now.



4. Browse to the location of the .pkg file and click it.
5. Click **OK** to continue.



6. Click **OK** to continue. This will install the update by overwriting the previous version.



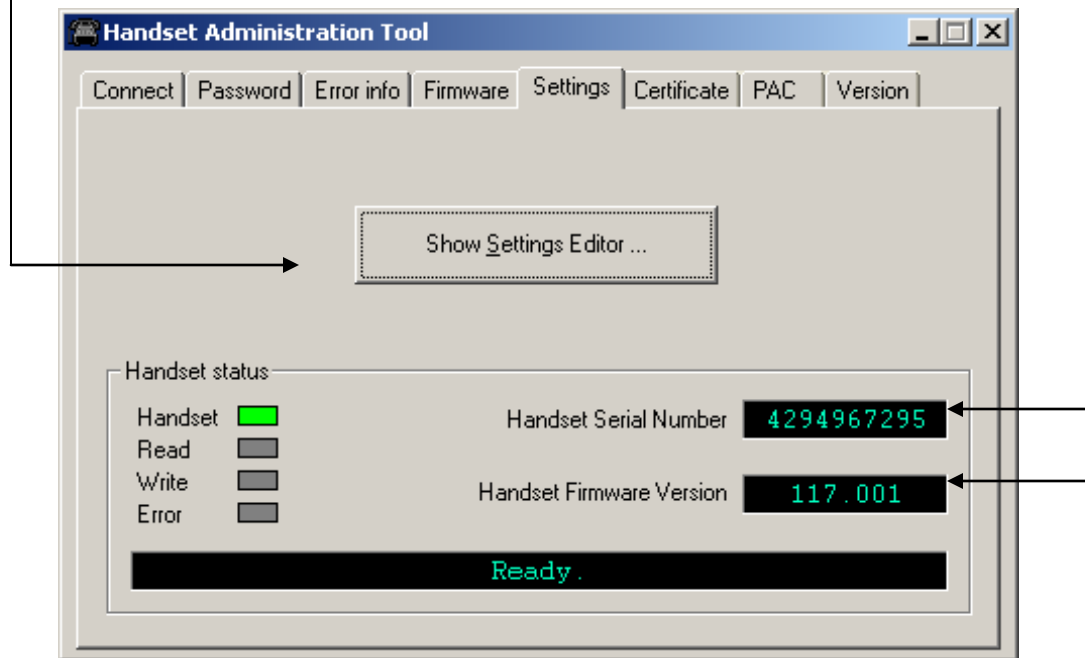
3. Using the Settings Editor

The handset has two menus with configurable options – the Admin menu and the Config menu. The Admin menu contains administrative options that can be password protected. The Config menu has options that enable the end user to customize settings for user preferences. The **Settings** tab allows you to configure both required and optional settings in the Admin and Config menus. Specific configuration requirements are detailed in the *Avaya 3641/3645 Wireless IP Telephones Configuration and Administration for CCMS* document.

3.1 Opening the Settings Editor

The **Settings** tab displays the serial number of the handset and the software version being run.

To enter and modify menu settings you will need to open the **Settings Editor**. Click the **Show Settings Editor** button.



When you have opened the **Settings Editor**, you may close the Admin Tabs.



If you plan on editing other handsets, consider selecting the **Remember Password** checkbox located in the **Connect** tab.

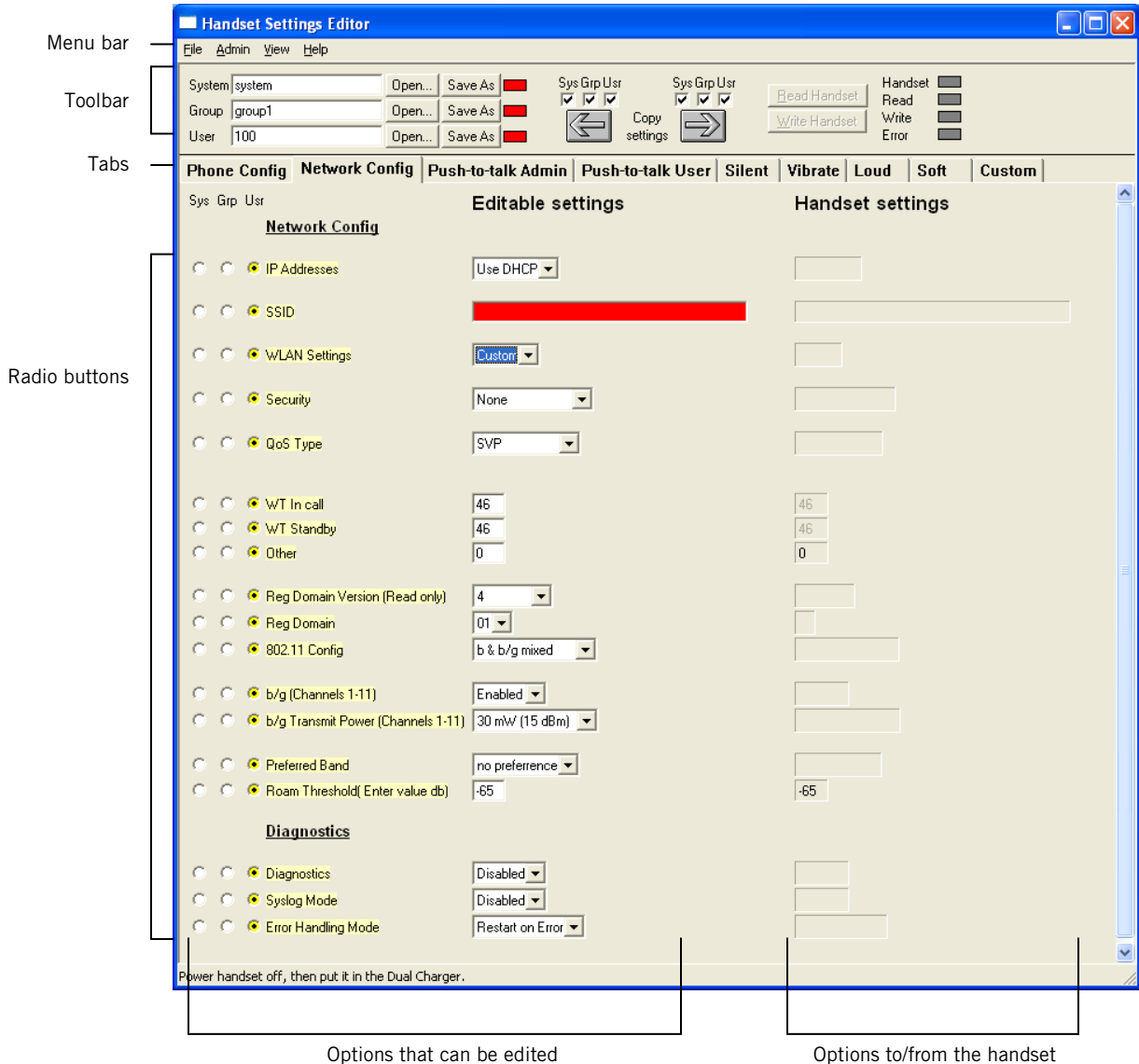
To open the Admin Tabs again, go to the **Settings Editor** menu bar and select either **View > Admin Functions**, or any of the options listed under the Admin menu item.

3.2 The Settings Editor Screen

The **Settings Editor** is a powerful utility that allows you to edit or set any Admin menu or Config menu option. The **Settings Editor** includes the following areas:

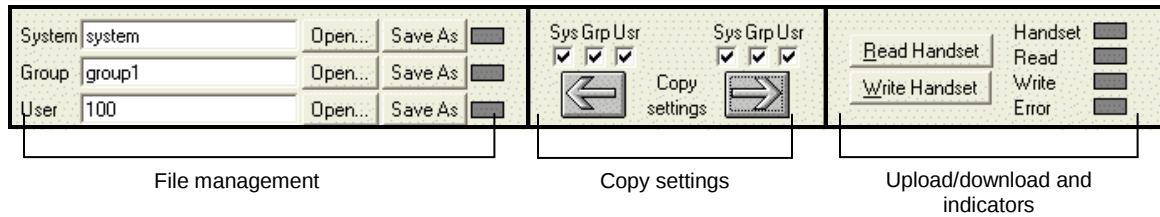
1. Toolbar to execute configurations and save files
2. Tabs to organize configuration options
3. Radio buttons to define the type of option
4. **Editable settings** that list handset options
5. **Handset settings** that have either been uploaded from a handset or have been copied from **Editable settings** options to be downloaded to a handset.

[The Handset Settings Editor screen below shows default values and is for example only and may not match the options or settings available in your version.]



3.3 The Settings Editor Toolbar

The **Settings Editor** toolbar allows you to manage configuration files and download and upload configuration settings to and from the handset in the charger.



File Management

The three filename windows, **System**, **Group** and **User** match the three columns of radio buttons along the left side of the window. The **Sys Grp Usr** radio buttons allow you to designate the option(s) for System, Group or User files. The three windows in the File management section allow you to name, open, or save setting types as separate files.

For example, system types relate to network options such as security settings and regulatory domain. Group types relate to Push-to-talk options. User types reference name, extension and profile options.

The file indicators beside the **Save As** buttons have three colors to indicate the status of the file displayed in the window:

- Red: file does not exist. The filename in the window has not been saved.
- Green: unsaved edits. Changes made in the **Editable settings** field(s) which have not been saved to a file yet.
- Gray: file up-to-date. The settings have been saved.

By default, the files will be saved in the **Application** folder under the folder where the program is stored. Use the File menu to set up your own file structure, if desired.

Copy settings

The **Copy settings** arrows and checkboxes allow you to copy between the **Handset settings** column and the **Editable setting** column. The **Sys Grp Usr** checkboxes allow you to copy just the settings you require.

Upload/download and indicators

When the **Read Handset** and **Write Handset** buttons are clicked, they initiate the transfer of configuration data from or to the handset in the charger. The handset indicators change color to indicate the state of the transfer. See page 87 for indicator color significance.

3.4 Tab Options

A tab system organizes the options.

Phone Config	Network Config	Push-to-talk Admin	Push-to-talk User	Silent	Vibrate	Loud	Soft	Custom
--------------	----------------	--------------------	-------------------	--------	---------	------	------	--------

Each tab contains options from the Admin menu and/or the Config menu. Admin menu options are password protected and usually set by the system administrator. Config menu options are available to the end user but are also offered here for initial configuration of key settings. Specific options vary by software release.

Tab	Contents - Admin Menu	Contents - Config Menu
Phone config	Ext Call Server Password Name User Language Time Zone Daylight Saving Protected Speed dial Emergency Dial [only for 3645 phone] IP Office Auto Ext Speakerphone OAI Location Service Call Log Dial Dial Plan Rules	Keypad Autolock Display Contrast Hearing Aid Startup Song Predial Band Roaming Beep Cal Logging Active User Profile
Network config	IP Addresses SSID WLAN Settings QoS Type [Security] Regulatory Domain Diagnostics	N/a
Push-to-talk Admin	Enabled/Disabled Priority Channel and Name Allowed Channels Name Channels	N/a
Push-to-talk User	N/a	PTT Audio Volume PTT Tone Volume Default Channel Subscribed Channels

Tab	Contents - Admin Menu	Contents - Config Menu	
Profiles: Silent Vibrate Loud Soft Custom	N/a	Noise Mode Ring in Speaker/Headset Warning Tones Key Tones Push-to-Talk (Ring option) Telephone Ring Message Alert 1 Message Alert 2	(Ring option settings) Ring Cadence Ring tone Ring volume Vibrate Cadence Ring Delay



For user convenience and efficiency, when the **Write Handset** button is clicked, every option set under the **Handset settings** column in all nine tabs is written at the same time. Each tab's options are NOT written separately. Be sure that you set all options before copying the configuration to the handset.



Your handsets may have different options than those available in the Handset Administration Tool. When a handset is placed in the cradle, it is checked for certain features, such as the Regulatory Domain version. The HAT will turn controls on/off based on the information that it gathers. If your handsets have options that are not yet programmed into the HAT, those options will require manual setting if the factory default is not desired.

3.5 Creating Your Configuration Plan

Although not necessary for using the Handset Administration Tool, a configuration plan can maximize its efficiency and save countless hours of handset option management. An example of a configuration plan is provided on page 107.

Organize the plan

Determine which options should be categorized as each type – system, group or user. Generally, system options are listed on the **Network** tab, group options are on the **PTT** tabs and user options are on the profile tabs. The **Phone Config** tab contains a mix of user and system types.



Do not create a plan that saves an option in two different categories. Option categories should be established and should not overlap. Example: **Speakerphone** and **Push-to-talk** settings are typically tagged as **Grp** options and saved as **Group** files.

Create the options and save the settings

Once you have established which options will be categorized as System, Group or User, enter the configuration information into the **Editable settings** fields.

Start with the System options and enter all system-level field values, such as IP addresses, security, and reg domain. Click the **Sys** radio button on the left side of the window for each option. Save these settings as a System file by entering a descriptive filename in the **System** filename field and clicking **Save As**. See the example on the next page.



Note that when a setting is changed, the option label is highlighted in green until it is saved.

In the same way, create each Group plan by entering the values in the fields designated as Group types. Click the **Grp** radio button on the left side of the window for each option. Save each plan under a different name in the **Group** filename field. You may have several groups – possibly divided by sets of PTT users.

It is recommended that you establish one generic **User** file that has the default (or desired) values for each **User** field. Click the **Usr** radio button on the left side of the window for each option and save the generic user file.

If desired, user settings can be saved for each user, if desired, as each handset is configured. If you determine that each handset configuration should be saved, it is easiest to do this during the configuration process. See *Downloading a configuration plan to a handset*, below.

Alternately, you can upload options from a correctly-configured handset; copy them to the **Editable settings** column, categorize them and save them. See *Uploading a configuration plan from a handset* below.

Configuration planning worksheet (sample)

Use this or a similar worksheet to design your configuration plan.

Plan category____System_____ Filename____System01_____

Sys	Grp	Usr	Label	Editable Setting
X			Time Zone	-7 Mountain
X			Daylight Saving	DST Auto (USA)
X			Protected Speed Dial Number	5555
X			Protected Speed Dial Name	Security
X			Assign to	1
X			Speakerphone	Enabled
X			Predial	Enabled

[The Handset Settings Editor screen shot below is for example only and may not match the options or settings in your software release.]

Handset Settings Editor

File Admin View Help

System: system Open... Save As [Red] Sys Grp Usr Sys Grp Usr Read Handset Handset [Grey]
 Group: group1 Open... Save As [Red] Copy settings Write Handset Read [Grey]
 User: 100 Open... Save As [Red] Write Error [Grey]

Phone Config | Network Config | Push-to-talk Admin | Push-to-talk User | Silent | Vibrate | Loud | Soft | Custom

Sys Grp Usr Editable settings Handset settings

Admin Menu

☐ ☐ ☒ Ext [Next] []
☐ ☐ ☒ Call Server Password []
☐ ☐ ☒ Name []
☐ ☐ ☒ User Language English []
☐ ☐ ☒ Time Zone GMT []
☐ ☐ ☒ Daylight Saving DST No Adjust []
☐ ☐ ☒ Protected Speed Dial Number []
☐ ☐ ☒ Protected Speed Dial Name []
☐ ☐ ☒ Assign to []
☐ ☐ ☒ Emergency Dial Disabled []
☐ ☐ ☒ Emergency Dial Number []
☐ ☐ ☒ Emergency Dial Name []
☐ ☐ ☒ IP Office Disabled []
☐ ☐ ☒ SpeakerPhone Disabled []
☐ ☐ ☒ QAI Disabled []
☐ ☐ ☒ Location Service Disabled []
☐ ☐ ☒ Transmit Interval 10 Minutes []
☐ ☐ ☒ Location Server IP []
☐ ☐ ☒ Location Server Port 8552 []
☐ ☐ ☒ Call Log Dial Enabled []

Dial Plan Rules

☐ ☐ ☒ Dial Plan Disabled []
☐ ☐ ☒ Country Code 1 []
☐ ☐ ☒ Internal Extension Length 5 []
☐ ☐ ☒ International Access Code 011 []
☐ ☐ ☒ Long Distance Access Code 1 []
☐ ☐ ☒ National Telephone Number Length 10 []
☐ ☐ ☒ Outside Line Access Code 0 []

Power handset off, then put it in the Dual Charger.

Downloading and Uploading Configuration Plans

Once your configuration plans are established, the settings are easily downloaded into the handsets.

Downloading a configuration plan to a handset

1. Use the Open button located in the File management section on the toolbar to open the System, Group and User cfg files for this handset.
2. In the Editable settings fields, enter the Extension and User name for this handset. Note that the Extension field has a Next button that is useful when configuring a quantity of handsets.
3. Copy the settings to the Handset settings fields using the Copy settings arrow.
4. Click **Write Handset**.
You may want to save the configuration, load new files or edit settings for the next handset (steps 1 and 2) during the download.
5. (Conditional) If you wish to save the settings unique to this handset, enter the identifying information into the filename fields, such as user name or extension number and then click Save As.
6. When the Handset indicator turns off, the download has finished and the handset may be removed from the charger.

Uploading a configuration plan from a handset

1. Click the **Read Handset** button to begin the upload.
2. You may copy these settings over to the **Editable settings** fields using the left **Copy settings** arrow to use them to create configuration plans as described above or to save them by user or extension.

3.6 Regulatory Domain Mismatch

The options that are available on the Settings Editor may not match the options currently enabled on the handset. This could happen if you update the software in the handset without also updating the Handset Administration Tool. Or you could update the Handset Administration Tool but not the handset software. In either of these situations different options may appear on the Handset Administration Tool than are available in the handset.

If the Regulatory Domains in the handset are not supported by the currently installed version of the Handset Administration Tool, a warning message will appear:

Warning: A newer version of the Regulatory Domain is supported by the handset. Upgrading this application is recommended.

This message indicates that the Handset Administration Tool software needs to be updated. Please see the section *Software Updates*.

If it is necessary to down rev the handset and Handset Administration Tool code, this message could also appear. If so, reset the handset defaults and proceed with configuration.

D. Appendices

Appendix A: Regulatory Domains

Appendix B: Troubleshooting

Appendix C: Wireless IP Telephone Status Messages

Appendix D: Cleaning the Wireless IP Telephone

1. Appendix A: Regulatory Domains

This table details the specifications for regulatory domain settings. Avaya recommends that you check with local authorities for the latest status of their national regulations for both 2.4 and 5 GHz wireless LANs.

Domain Identifier	802.11 Mode	Band	Channels	DFS Required?	Max. Power Limit (peak power)	Countries
01	g only b & b/g mixed		1 – 11	n/a	100mW (+20dBm)	US Canada Brazil
	a	5.1500 – 5.2500 GHz	36 – 48	No	50mW (+17dBm)	
		5.2500 – 5.3500 GHz	52 – 64	Yes	100mW (+20dBm)	
		5.4700 – 5.7250 GHz	100 – 140	Yes		
		5.7250 – 5.8250 GHz	149 – 161	No		
02	g only b & b/g mixed		1 – 13	n/a	100mW (+20dBm)	Europe Australia New Zealand
	a	5.1500 – 5.2500 GHz	36 – 48	No		
		5.2500 – 5.3500 GHz	52 – 64	Yes		
		5.4700 – 5.7250 GHz	100 – 140	Yes		
03	g only b & b/g mixed		1 – 13	n/a	100mW (+20dBm)	Japan
	a	5.1500 – 5.2500 GHz	36 – 48	No		
		5.2500 – 5.3500 GHz	52 – 64	Yes		
04	g only b & b/g mixed		1 – 13	n/a	100mW (+20dBm)	Singapore
	a	5.1500 – 5.2500 GHz	36 – 48	No		
		5.2500 – 5.3500 GHz	52 – 64	Yes		
05	g only b & b/g mixed		1 – 13	n/a	100mW (+20dBm)	Korea
	a	5.1500 – 5.2500 GHz	36 – 48	No		
		5.2500 – 5.3500 GHz	52 – 64	Yes		
		5.4700 – 5.6500 GHz	100 – 124	Yes		
		5.7250 – 5.8250 GHz	149 – 161	No		
06	g only b & b/g mixed		1 – 11	n/a	100mW (+20dBm)	Taiwan
	a	5.2500 – 5.3500 GHz	52 – 64	Yes		
		5.4700 – 5.7250 GHz	100 – 140	Yes		
		5.7250 – 5.8500 GHz	149 – 165	No		

Domain Identifier	802.11 Mode	Band	Channels	DFS Required?	Max. Power Limit (peak power)	Countries
07	g only b & b/g mixed		1 – 13	n/a	100mW (+20dBm)	Hong Kong
	a	5.1500 – 5.2500 GHz	36 – 48	No	50mW (+17dBm)	
		5.2500 – 5.3500 GHz	52 – 64	Yes	100mW (+20dBm)	
		5.4700 – 5.7250 GHz	100 – 140	Yes		
		5.7250 – 5.8250 GHz	149 – 161	No		
08	g only b & b/g mixed		1 – 11	n/a	100mW (+20dBm)	Mexico India
	a	5.1500 – 5.2500 GHz	36 – 48	No	50mW (+17dBm)	
		5.2500 – 5.3500 GHz	52 – 64	Yes	100mW (+20dBm)	
		5.7250 – 5.8500 GHz	149 – 161	No		

2. Appendix B: Troubleshooting

Most, but not all, Wireless IP Telephone audio problems have to do with access point range, positioning and capacity. Performing a Site Survey as described in the *Diagnostics* section can isolate the AP causing these types of problems. If the Wireless IP Telephone itself is suspected, conduct a parallel Site Survey with a Wireless IP Telephone that is known to be properly functioning.

- In-range/Out-of-range – service will be disrupted if a user moves outside the area covered by the wireless LAN access points. Service is restored if the user moves back within range. If a call drops because a user moves out of range, the Wireless IP Telephone will recover the call if the user moves back into range within a few seconds.
- Capacity – in areas of heavy use, the call capacity of a particular AP may be filled. If this happens, the user will hear three chirps from the Wireless IP Telephone. The user can wait until another user terminates a call, or move within range of another AP and try the call again. If a user is on a call and moves into an area where capacity is full, the system attempts to find another AP. Due to range limitations, this may be the same as moving out of range.
- Transmission Obstructions –prior to system installation, the best location for APs for optimum transmission coverage was determined. However, small pockets of obstruction may still be present, or obstructions may be introduced into the facility after system installation. This loss of service can be restored by moving out of the obstructed area, or by adding APs.

If the Avaya Aura™ Communication Manager registration fails, note any error messages on the display including which line icons are active. This information will help with problem resolution.

3. Appendix C: Wireless IP Telephone Status Messages

Wireless IP Telephone status messages provide information about the Avaya 3641/3645 Wireless IP Telephone's communication with the AP and host telephone system. The following table summarizes the status messages, in alphabetical order.

Message	Description	Action
	Download failure icon	Update handset code in the TFTP server and power cycle the handset.
3 chirps	Wireless IP Telephone is not able to communicate with the best AP, probably because that AP has no bandwidth available.	None. This is only a warning, the call will hand-off to the best AP once it becomes available.
802.1X Failure XXXXXXXXXX XXX	When WPA2-Enterprise or Cisco FSR is selected, the handset failed to connect because the user credentials are restricted based on the user account properties. In the case of EAP-FAST, the PAC ID may not match the username. The second line of the error message contains the twelve digits of the AP MAC address and three digits that indicate the error code as defined in RFC2759.	Verify and resolve if the user account has any restrictions such password expired, account restricted/ disabled, or in case of EAP-FAST, the handset PAC and username matching the authentication server.
Address Mismatch	Wireless IP Telephone software download files are incorrect or corrupted.	Download new software from the Avaya site per <i>Software Maintenance</i> .
Assoc Failed XXXXXXXXXXXX	x...x – AP MAC address Wireless IP Telephone association was refused by AP; displays MAC of failing AP.	Check Wireless IP Telephone and AP security settings and certificated. Check network settings. Ensure AP is configured per <i>Configuration Note</i> . Try another AP.
Assoc Timeout XXXXXXXXXXXX	x...x – AP MAC address Wireless IP Telephone did not receive association response from AP; displays MAC of failing AP.	Check Wireless IP Telephone and AP security settings. Ensure AP is configured per <i>Configuration Note</i> . Try another AP.
Auth Failed XXXXXXXXXXXX	x...x – AP MAC address Wireless IP Telephone authentication was refused by AP; displays MAC of failing AP.	Check Wireless IP Telephone and AP security settings. Ensure AP is configured per <i>Configuration Note</i> . Try another AP.
Auth Timeout XXXXXXXXXXXX	x...x – AP MAC address Wireless IP Telephone did not receive authentication response from AP; displays MAC of failing AP.	Check Wireless IP Telephone and AP security settings. Ensure AP is configured per <i>Configuration Note</i> . Try another AP.
Bad Code Type xx Expected Code Type yy	xx, yy – software license types Wireless IP Telephone software does not match current handset license selection.	Download new software from the Avaya site per <i>Software Maintenance</i> .
Bad Config	Some needed configuration parameter has not	Check all required Wireless IP Telephone

Message	Description	Action
	been set.	configuration parameters for valid settings.
Bad SSID	The Wireless IP Telephone has not had an SSID entered.	Statically configure an SSID in the Admin menu.
Bad Phintl File	Wireless IP Telephone software download files are incorrect or corrupted.	Download new software from the Avaya site per <i>Software Maintenance</i> .
Bad Program File	Wireless IP Telephone software download files are incorrect or corrupted.	Download new software from the Avaya site per <i>Software Maintenance</i> .
Bad Term, Type	Gatekeeper rejected registration request from the Wireless IP Telephone.	Verify the gatekeeper or PBX's configuration
(battery icon), Battery Low, beep (audio)	Low battery.	In call: the battery icon displays and a soft beep will be heard when the user is on the Wireless IP Telephone and the battery charge is low. User has 15–30 minutes of battery life left. The Battery Pack can be changed while the call is still in progress. Do not press END. Place call on Hold or Park. Quickly remove the discharged battery and replace with a charged battery, START the Wireless IP Telephone, and press START to resume the call in progress. Not in call: The battery icon displays whenever the battery charge is low The message Battery Low and a beep indicate a critically low battery charge when user is not on the Wireless IP Telephone. The Wireless IP Telephone will not work until the Battery Pack is charged.
Battery Failure	The Battery Pack is not functioning.	Replace the Battery Pack with a new or confirmed Avaya Battery Pack. Any non-Spectra-Link Battery Packs will not work.
Battery Failed	Battery Pack is damaged or incompatible with Wireless IP Telephone.	Replace the Battery Pack with a new or confirmed Avaya Battery pack. Any non-Avaya Battery Packs will not work.
CalSig Addr Bad	Gatekeeper rejected registration request from the Wireless IP Telephone.	Check the H.323 gatekeeper configuration in the Wireless IP Telephone. Verify the gatekeeper or PBX's configuration. Verify the handset has been assigned the correct extension and that no other H.323 devices share that extension.
Can't Renew DHCP yyy.yyy.yyy.yyy	y...y – DHCP server IP address DHCP server is not responding to initial renewal attempt.	Configuration problem. Check the IP address configuration in the DHCP server.

Message	Description	Action
Cert Expired	When WPA2-Enterprise with PEAP authentication is selected, the handset failed to connect due to an expired certificate on the handset or authentication server.	Verify that the NTP server is properly configured with the correct time. Verify that the certificates loaded on the handset and authentication server have valid start/end dates by looking at “valid to” field from “validity” data in certificates. If any of the certificates have expired replace them with new certificates.
Cert Invalid	When WPA2-Enterprise with PEAP authentication is selected, the Wireless IP Telephone failed to connect to the network because the certificate start date is in the future.	Verify that the NTP server is properly configured with the correct time. Verify that the certificates loaded on the handset and authentication server have valid start/end dates by looking at “valid from” field from “validity” data in certificates. If any of the certificates have expired replace them with new certificates.
Charge Complete	The Wireless IP Telephone is now fully charged.	No action needed.
Charger Error	The Wireless IP Telephone as detected a problem with the charging circuitry.	Allow the charger and battery to cool. If the problem persists, try a new or confirmed battery. If the problem still persists, contact technical support and report the error.
Charging ...	The Wireless IP Telephone is charging in the Desktop Charger.	No action needed.
Checking Code	Wireless IP Telephone is contacting the TFTP Server to determine if it has a newer version of software that should be downloaded.	None, this message should only last for approximately one second. If message remains displayed, END and contact customer support for a replacement handset.
Checking DHCP IP	The Wireless IP Telephone is retrieving DHCP information from the DHCP server.	None. This is informational only.
CRC Code Error	The software which has been TFTP downloaded has a bad redundancy code check.	Try the download again; it is possible the software was corrupted during download. If the error repeats, check that the download image on the TFTP server is not corrupted.
Code Mismatch!	The software loaded into the Wireless IP Telephone is incorrect for this model handset.	Verify that the License Management value is correct. Replace the software image on the TFTP server with software that is correct for the handset model.
DCA Timeout	The Wireless IP Telephone has detected a fault for which it cannot recover, possibly due to a failure to acquire any network.	Turn the Wireless IP Telephone off then on again. If error persists, contact Avaya Technical Support and report the error.
Dest Unreachable	Unable to establish network connectivity with the gatekeeper	Verify gatekeeper is running and has network connectivity to WLAN infrastructure.
DHCP Error (1-5)	DHCP Error 1.	The Wireless IP Telephone cannot locate a DHCP server. It will try every 4 seconds until a server is located.

Message	Description	Action
	DHCP Error 2. DHCP Error 3. DHCP Error 4. DHCP Error 5.	The Wireless IP Telephone has not received a response from the server for a request to an IP address. It will retry until a server is found. The server refuses to lease the Wireless IP Telephone an IP address. It will keep trying. The server offered the Wireless IP Telephone a lease that is too short. The minimum lease time is 10 minutes but Avaya engineers recommend at least one hour minimum lease time. The Wireless IP Telephone will stop trying. Reconfigure the server and power-cycle the Wireless IP Telephone. Failure during WEP Key rotation process (proprietary feature).
DHCP Lease Exp yyy.yyy.yyy.yyy	y...y – DHCP Server IP address. DHCP is not responding to renewal attempts (at least one renewal succeeded).	The Wireless IP Telephone failed to renew its DHCP lease, either because the DHCP server is not running, or because the configuration has been changed by the administrator. The Wireless IP Telephone will attempt to negotiate a new lease, which will either work or change to one of the above DHCP errors (1-4).
DHCP NACK error yyy.yyy.yyy.yyy	y...y – DHCP server IP address. DHCP server explicitly refused renewal.	The DHCP lease currently in use by the Wireless IP Telephone is no longer valid, which forces the Wireless IP Telephone to restart. This problem should resolve itself on the restart. If it does not, the problem is in the DHCP server.
Discov. Required	Gatekeeper rejected registration request from the Wireless IP Telephone.	Check the H.323 gatekeeper configuration in the Wireless IP Telephone. Verify the gatekeeper or PBX's configuration.
DL Not On Sector	Wireless IP Telephone software download files are incorrect or corrupted.	Download new software from the Avaya site per <i>Software Maintenance</i> .
DO NOT POWER OFF	The Wireless IP Telephone is in a critical section of the software update.	None. Do not remove the Battery Pack or attempt to END the handset while this is displayed. Doing so may require the handset to be returned to Avaya to be recovered.
Duplicate Addr/#	Gatekeeper rejected registration request from the Wireless IP Telephone.	Check the H.323 gatekeeper configuration in the Wireless IP Telephone. Verify the gatekeeper or PBX's configuration. Verify the handset has been assigned the correct extension and that no other H.323 devices share that extension.

Message	Description	Action
Duplicate IP	The Wireless IP Telephone has detected another device with its same IP address.	If using DHCP, check that the DHCP server is properly configured to avoid duplicate addresses. If using Static IP, check that the Wireless IP Telephone was assigned a unique address.
Erase Failed	Download process failed to erase the memory in the Wireless IP Telephone.	Operation will retry but may eventually report the error "int. error: 0F" Power cycle the handset.
Erasing Memory	Wireless IP Telephone has determined that a download should occur and is erasing the current software from memory. This message also displays a progress bar. When the progress bar fills the display line the erase operation is complete.	None. When the progress bar fills the display line the erase operation is complete. Do not turn the Wireless IP Telephone off during this operation.
Error!...	A fatal software error is detected. All handset operation is halted and any call is lost.	This message appears during Halt on Error mode. An error message displays. Note the message details and power cycle the handset.
Extension Error	Displayed for 5 seconds when all of the Communication Managers contacted indicate that they do not recognize the current extension as valid.	The user will be asked to enter a valid extension and password.
Extension in Use	The phone is trying to register with an extension that is already registered on the Communication Manager.	See Avaya Aura™ Communication Manager Integration Factors section.
Fatal Error Err Code #####	The handset has detected a fault from which it cannot recover.	Record the error code so it can be reported. Turn the handset off then on again. If error persists, try registering a different handset to this telephone port. If error still persists, contact Polycom technical support and report the error.
Files Too Big	Wireless IP Telephone software download files are incorrect or corrupted.	Download new software from the Avaya site per <i>Software Maintenance</i> .
Flash Config Error	Wireless IP Telephone internal configuration is corrupt.	Perform "Restore Defaults" operation via administrator menus [or reprogram with Configuration Cradle].
Gatekeeper REJ	Gatekeeper rejected Discovery Request from the Wireless IP Telephone.	Check the H.323 gatekeeper configuration in the Wireless IP Telephone. Verify the gatekeeper or PBX's configuration.
H225 Listen Fail	Wireless IP Telephone cannot communicate with the AP or the AVPP.	This message may display with another diagnostic message. Follow diagnostic actions for the second message (such as No Net Found).
H245 Listen fail	Wireless IP Telephone cannot communicate with the AP or the AVPP.	This message may display with another diagnostic message. Follow diagnostic actions for the second message (such as No Net Found).

Message	Description	Action
Incompatible	The switch is rejecting the software version presented by the phone.	If this condition persists, contact the Avaya system administrator.
Initializing ...	The Wireless IP Telephone is performing START initialization.	None. This is informational only.
Internal Err. # #	The Wireless IP Telephone has detected a fault from which it cannot recover. OE – Error while writing the Flash (return Wireless IP Telephone to factory). OF – No functional code (contact Avaya Technical Support).	Record the error code so it can be reported. Turn the Wireless IP Telephone off then on again. If error persists, try registering a different Wireless IP Telephone to this telephone port. If error still persists, contact Avaya Technical Support and report the error.
Invalid Revision	Gatekeeper rejected registration request from the Wireless IP Telephone.	Verify the gatekeeper or PBX's configuration. Ensure the gatekeeper and PBX will support version 2 of the H.323 protocol.
Invalid Usr/Pwd	When WPA2-Enterprise or Cisco FSR is selected, the handset failed to connect due to incorrect device credentials or unavailability of authentication server. If the error is because of the incorrect device credentials then the username or password doesn't match with those configured on the authentication server.	Verify that the required credentials {username, password} are created on the authentication server and should match the handset. This may also happen when the authentication server is not reachable while doing the EAP authentication. Make sure the authentication server is active and reachable from the WLAN access points/controller at all times.
Multiple GW Reg yyy.yyy.yyy.yyy	y...y – Gateway IP address. Wireless IP Telephone received responses from multiple gateways; displays IP address of one responding gateway.	Check each NetLink Telephony Gateway for the Wireless IP Telephone's MAC address on the Telephone Line Configuration screen. Delete any duplicate entries, leaving only one entry on the correct Telephone Gateway and port for this Wireless IP Telephone.
Multiple AVPP Reg yyy.yyy.yyy.yyy	y...y – AVPP IP address. Wireless IP Telephone received responses from multiple AVPPs; displays IP address of one responding AVPP.	This can happen if the Wireless IP Telephone has been re-configured to use a different AVPP and then powered-up before the previous server has had time to determine that the Wireless IP Telephone is no longer connected to it. The problem should go away after about 30 seconds.
Must Upgrade SW!	Wireless IP Telephone software is incompatible with hardware.	Download new software from the Avaya site per <i>Software Maintenance</i> .
Net Busy xxxxxxxxxxx	x...x – AP MAC address. Wireless IP Telephone cannot obtain sufficient bandwidth to support a call; displays MAC of failing AP.	Try the call again later.
No 802.11a Sub-bands Enabled	'a' radio selected but no sub-bands are enabled	Configure 'a' radio sub-bands from Admin menus
No 802.11 Sub-bands Enabled	'b/g' radio selected but no sub-bands are enabled	Configure 'b/g' radio sub-bands from Admin menus
No Answer	Called party did not answer the Wireless IP Telephone.	No action. Not an error.

Message	Description	Action
No APs Heard	The handset is unable to hear beacons/probes from any AP in the network in site survey mode.	Verify that network is properly configured and the handset is able to hear beacons from the AP.
No AVPP IP	The Wireless IP Telephone is configured for “static IP” (as opposed to “use DHCP”) and no valid AVPP address has been entered.	Enter a valid AVPP IP address in the configuration setting or change to “use DHCP.”
No AVPP Response yyy.yyy.yyy.yyy	y...y – AVPP IP address. Wireless IP Telephone has lost contact with the AVPP.	This may be caused by bad radio reception or a problem with the AVPP. The Wireless IP Telephone will keep trying to fix the problem for 20 seconds, and the message may clear by itself. If it does not, the Wireless IP Telephone will restart. Report this problem to the system administrator if it keeps happening.
No AVPP Server	Wireless IP Telephone can't locate AVPP. AVPP is not working. No LAN connection at the AVPP.	IP address configuration of AVPP is wrong or missing. Check error status screen on AVPP. Verify AVPP connection to LAN.
No AVPP Server No DNS Entry	Wireless IP Telephone unable to perform DNS lookup for AVPP, server had no entry for AVPP.	The network administrator must verify that a proper IP address has been entered for the AVPP DHCP option.
No AVPP Server No DNS IP	Wireless IP Telephone is unable to perform DNS lookup for AVPP, no IP address for DNS server.	The network administrator must verify proper DHCP server operation.
No Call Server (The No Call Server message may include an error indication)	This indicates that while a Communication Manager has responded to the Gatekeeper Request message, it is not responding to the Registration Request message.	Check that the Wireless IP Telephone is contacting the correct Communication Manager, and that the Communication Manager is correctly configured for the extension in question.
No Call Server IP	The Wireless IP Telephone cannot obtain an IP address for an Avaya Aura™ Communication Manager.	Assure that the Wireless IP Telephone is administered properly for its environment. Refer to the section on Wireless IP Telephone Configuration and Communication Manager Integration Factors for details on configuring the Wireless IP Telephone.
No DHCP Server	Wireless IP Telephone is unable to contact the DHCP server.	Check that DHCP is operational and connected to WLAN or use Static IP configuration in the Wireless IP Telephone.
No Extension	All Wireless IP Telephones require an Extension for H.323.	Enter a valid Extension in the configuration settings.
No Func Code	Wireless IP Telephone software download files are incorrect or corrupted.	Reconfigure the handset to gain access to the WLAN and download new code.
No Gatekeeper	The Wireless IP Telephone has not received a response from the gatekeeper.	Verify that the gatekeeper is running and has network connectivity to WLAN infrastructure.
No Gatekeeper IP	The Wireless IP Telephone is configured for static IP addresses and no valid unicast IP address is assigned for gatekeeper configuration.	Configure a valid IP address in Admin menus.

Message	Description	Action
No Gateway IP	The Wireless IP Telephone is configured for static IP addresses and no valid unicast IP address is assigned for gateway configuration.	Configure a valid IP address in Admin menus.
No Host IP (Addr)	The Wireless IP Telephone is configured for “static IP” (as opposed to “use DHCP”) and no valid host IP address (the Wireless IP Telephone’s IP address) has been entered.	Enter a valid IP address in the configuration settings or change to “use DHCP”.
No IP Address	Invalid IP.	Check the IP address of the Wireless IP Telephone and re-configure if required.
No Net Access	Cannot authenticate / associate with AP.	Verify the AP configuration. Verify that all the WEP settings in the Wireless IP Telephone match those in the APs.
No Net Found No APs	Wireless IP Telephone cannot find any APs and has no additional information to display as to why. Possible problems are enumerated below. No radio link. No SSID – Incorrect SSID. AP does not support appropriate data rates. Out of range. Incorrect security settings	Verify that the AP is turned on. Verify the SSID of the wireless LAN and enter. Check the AP configuration against configuration document for AP. Try getting closer to an AP. Check to see if other Wireless IP Telephones are working within the same range of an AP. If so, check the SSID of this Wireless IP Telephone. Verify that all the Security settings in the Wireless IP Telephone match those in the APs.
No Net Found No CCX APs	The Wireless IP Telephone is configured for CCX compatible operation, but cannot find an access point that is advertising CCX capability.	Check the AP configuration against <i>VIEW Configuration Guide</i> for AP.
No Net Found No CCKM APs	The Wireless IP Telephone is configured to use CCKM for fast and secure handoffs, but cannot find an access point that is configured appropriately.	Check the AP configuration against <i>VIEW Configuration Guide</i> for AP.
No Net Found No WMM APs	The Wireless IP Telephone is configured to use Wi-Fi Standard QoS, but cannot find an AP configured appropriately.	Check the AP configuration against <i>VIEW Configuration Guide</i> .
No Net Found xxxxxxxxxx yy	x...x – AP MAC address. yy – AP signal strength. Wireless IP Telephone cannot find a suitable access point; displays MAC and signal strength of “best” non-suitable AP found.	Check AP and handset network settings such as SSID, Security, Reg domain and Tx power. Ensure APs are configured per <i>VIEW Configuration Guide</i> . Try Site Survey mode to determine more specific cause.

Message	Description	Action
No Reg Domain	Regulatory Domain not set.	Configure the Regulatory Domain of the Wireless IP Telephone.
No Server IP	In the case of static IP configuration, the handset failed to find the call server IP.	Verify that call server info is properly configured on the handset.
No SSID	Attempted to run site survey application without an SSID set.	Let Wireless IP Telephone come completely up. Statically configure an SSID in the Admin menu.
No SW Found	A required software component has not been identified.	Check that the Wireless IP Telephone license type has a corresponding entry in the slnk_cfg.cfg file. Check that the pd14ccc.bin and pi1400.bin entries exist in under this license type in the slnk.cfg.cfg file.
No TFTP Response	The handset could not get the TFTP server to respond.	The handset will continue to boot without checking if its current code is the latest available. Check that the TFTP server is operational. If the Wireless IP Telephone is using DHCP, check that the DHCP options are set correctly.
No WPA PassPhrase	This error only appears when the Admin Menus are exited. The handset is configured for WPA-PSK or WPA2-PSK and no pass phrase or shared key has been entered.	Enter the pass phrase or pre-shared key and restart the handset
Not Installed!	A required software component is missing.	Check that all required software files are on the TFTP server, if over-the-air downloading is being used. If the error repeats, contact Avaya Technical Support.
Password Error	The phone is not encrypting the challenge string correctly. This indicates that the password set in the phone disagrees with the password administered in the Communication Manager.	Enter the correct password in the phone. See Avaya Aura™ Communication Manager Configuration section.
Press END	The far end of a call has hung up.	Hang up the near end.
Prom Bad Length	Wireless IP Telephone software downloaded files that are incorrect or corrupted.	Download new software from the site per <i>Software Maintenance</i> .
RAS Addr Bad	Gatekeeper rejected registration request from the Wireless IP Telephone.	Check the H.323 gatekeeper configuration in the Wireless IP Telephone. Verify the gatekeeper or PBX's configuration.
Registration REJ	Gatekeeper rejected registration request from the Wireless IP Telephone.	Check the H.323 gatekeeper configuration in the Wireless IP Telephone. Verify the gatekeeper or PBX's configuration.
Resource Unavailable	Gatekeeper rejected registration request from the Wireless IP Telephone.	Check the H.323 gatekeeper configuration in the Wireless IP Telephone. Verify the gatekeeper or PBX's configuration.

Message	Description	Action
Retarting...	The Wireless IP Telephone is in the process of rebooting. There will be a 20-second delay in an attempt to let potential network/system errors clear.	None.
Retry / Restart	The Wireless IP Telephone is waiting for user input prior to retrying the registration process, or restarting after a delay.	See Avaya Aura™ Communication Manager Integration Factors section.
Select License	The correct protocol has not been selected from the license set.	Using the administrative menus, select one license from the set to allow the Wireless IP Telephone to download the appropriate software.
Server Busy	Wireless IP Telephone is attempting to download from a TFTP Server that is busy downloading other devices and refusing additional downloads.	None, the Wireless IP Telephone will automatically retry the download every few seconds.
Service Unavailable. Restarting ...	An error has caused the handset to lose the call. It is now making its best effort to restart and return to standby mode.	Occurs during Restart on Error mode. The handset is attempting to register with the PBX and resume normal operation. Error details may be available through the syslog server and by download with the Handset Administration Tool.
SKT Open Failed	Socket open fail. Occurs when the Wireless IP Telephone tries to connect to the PBX but there is no response. If resiliency is active, the Wireless IP Telephone will keep trying.	If the PBX is inoperative and resiliency is not active or the Wireless IP Telephone cannot locate a backup PBX, turn off the Wireless IP Telephone and repair the primary PBX. Note that it may be advisable to reconfigure the backup PBX to be the primary PBX if the repair is more time-consuming than the reconfiguration.
Socket Failure	Wireless IP Telephone cannot communicate with the AP or the AVPP.	This message may display with another diagnostic message. Follow diagnostic actions for the second message (such as No Net Found).
Storing Config	Wireless IP Telephone is storing changes to handset configuration.	None. Informational only. The handset may display this briefly following a configuration change or software download.
AVPP Service Rej.	The AVPP has rejected a request from the Wireless IP Telephone.	The Wireless IP Telephone will restart and attempt to re-register with the AVPP, which should fix the problem. Report to your administrator if it keeps happening.
System Busy yyy.yyy.yyy.yyy	y...y – AVPP IP Address. AVPP has reached call capacity.	All call paths are in use, try the call again in a few minutes.
System Busy	Avaya Voice Priority Processor is busy or out of resources.	All call paths are in use, try call again in a few minutes.
System Error	An internal failure has occurred in the Avaya Aura™ Communication Manager.	If this condition persists, contact the Avaya system administrator.
System Locked (with Busy Tone)	Avaya Voice Priority Processor is locked.	Try call again later, system has been locked for maintenance

Message	Description	Action
Terminal Exclude	Gatekeeper rejected registration request from the Wireless IP Telephone.	Verify the handset has been assigned the correct extension and that no other H.323 devices share that extension.
TFTP ERROR(x):yy	A failure has occurred during a TFTP software download. (x) = The file number which was being downloaded. yy = an error code describing the particular failure. Possible error codes are: 01 – TFTP server did not find the requested file. 02 – Access violation (reported from TFTP server). 07 – TFTP server reported "No such user" error. 81 – File put into memory did not CRC. FF – Timeout error. TFTP server did not respond within a specified period of time.	Error code 01, 02 or 07 – check the TFTP server configuration. Error code 81 – the Wireless IP Telephone will attempt to download the file again. For other messages, END the Wireless IP Telephone, then turn it on again to retry the download. If the error repeats, note it and contact Avaya Technical Support.
Too Many Errors	The Wireless IP Telephone continues to reset and cannot be recovered.	Fatal error. Return handset to Avaya.
Trying xxx.xxx.xxx.xxx	The phone is attempting to register with the Avaya Aura™ Communication Manager at IP xxx.xxx.xxx.xxx.	This display is a progress indicator, and may not appear long enough to recognize during a normal check-in. If the Wireless IP Telephone appears to hang at this message, showing one or more IP addresses, it indicates that the Communication Manager(s) being contacted is not responding. Check that the Communication Manager is active, that the Wireless IP Telephone is getting the correct IP address for the Communication Manager(s), that the Wireless IP Telephone is correctly configured on the Communication Manager, and that there is a LAN connection between the AVPP and the Communication Manager. If no issues were found with the Communication Manager, then verify the key information in case of security = WEP / Open System.
Undefined Error	The system is rejecting the registration of the Wireless IP Telephone with an unrecognized error code.	If this condition persists, contact the Avaya system administrator.
Unknown xx:yy:zz	A phrase is missing from your phintl file.	Download new software from the Avaya site per <i>Software Maintenance</i> .
Unreachable	Dialed number does not exist.	Check number and try again.
Unsupp Transport	Gatekeeper rejected registration request from the Wireless IP Telephone.	Verify the gatekeeper or PBX's configuration. Ensure the gatekeeper and PBX will support version 2 of the H.323 protocol.

Message	Description	Action
Updating ...	The Wireless IP Telephone is internally updating its software images.	None. The Wireless IP Telephone may do this briefly after a download. This is informational only.
Updating Code...	Wireless IP Telephone is downloading new software into memory. The number icons at the bottom of the display indicate which file number is currently being downloaded. This message also displays a progress bar. When the progress bar fills the display line the update operation is complete on that file.	None. When the progress bar fills the display line the update operation is complete on that file. Do not turn the Wireless IP Telephone off during this operation.
Updating Options	Appears the first time the handset is powered on and upon restoring default settings.	No action needed. Allow handset to restart automatically.
Waiting...	Wireless IP Telephone has attempted some operation several times and failed, and is now waiting for a period of time before attempting that operation again.	None. The Wireless IP Telephone is waiting for a specified period of time before attempting that operation again.
Wrong Code Type	The software loaded into the Wireless IP Telephone is incorrect for this model Wireless IP Telephone.	Verify the license type is set correctly. If the license type is correct, replace the software image on the TFTP server with the software that is correct for the Wireless IP Telephone model.
Wrong Set Type	The set type administered on the Communication Manager disagrees with the set type for the Wireless IP Telephone.	Make sure that set type 4612 is used for the Wireless IP Telephone.
(No message shown)	There is no voice path.	Verify that the CODEC is G.711 or G.729a/ab.
(No message shown)	Messages are left at the principal station, but the MSG icon is not lit on the Wireless IP Telephone.	Verify that "Message Lamp Ext" on the station form for the Wireless IP Telephone is set to the extension of the principal station.

4. Appendix D: Cleaning the Wireless IP Telephone

Wireless Telephones may occasionally need to be cleaned to disinfect them and to maintain their appearance. Generally, wiping the phone's surface with a water dampened cloth and/or paper towel will remove most films or residues. If additional cleaning is necessary, Avaya recommends wiping the handset with mild detergent, Lysol®, isopropyl alcohol or a diluted bleach solution.

- Pre-treated cloths and towelettes, like those used for eyeglasses or cameras, may be used to clean the phone, however, avoid using those containing lanolin or aloe as it will leave a slippery residue.
- When cleaning with disinfectants, do not rub the keypad characters vigorously. Doing so will degrade legibility of the handset's keys.
- Do not directly spray with or immerse the phone in a disinfectant or cleaning agent. Spray the disinfectant on a soft cloth or paper towel, and then wipe the phone's surface to dry it. The following products should not be used on the SpectraLink wireless telephones.
 - Do not use cleaning products containing quaternary ammonium compounds, (also known as C12-18-alkyl [(ethylphenyl) methyl] dimethyl, chlorides and Benzyl-C12-18-alkyldimethyl ammonium chlorides) such as CaviWipes™, CaviWipes™ XL, Cavicide® or Sani- Wipes®, Sani-Cloth, Super Sani-Cloth® and Sani-Cloth® Plus. Quaternary ammonium compounds have been laboratory tested and have been proven to damage the handset plastics. Using quaternary ammonium disinfectants will reduce the life of your handset.
 - Do not use furniture polishes, waxes or plasticizer based cleaner (ArmorAll®, etc.)
 - Do not use lanolin, aloe, glycerin or other skin care type products
 - Do not apply any solvent such as acetone, mineral spirits etc.

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