Avaya Solution & Interoperability Test Lab

Application Note for Configuring the Ascom wireless IP-DECT SIP Solution with Avaya Communication Manager and Avaya SIP Enablement Services - Issue 1.0

Abstract

These Application Notes detail the steps for configuring connectivity to enable interoperability between the Ascom wireless IP-DECT SIP solution with Avaya Communication Manager and Avaya SIP Enablement Services. Information in these Application Notes has been obtained through Developer*Connection* compliance testing and additional technical discussions. Testing was conducted via the Developer*Connection* Program at the Avaya Solution and Interoperability Test Lab.

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1. Introduction

As wireless technologies continue to evolve and new technologies emerge, customers are presented with additional choices when deciding on which technology to implement. Regardless of the specific access technology chosen, telephony products need to interoperate with one another to meet customer demands.

These Application Notes detail the steps for creating a SIP VoIP-enabled wireless network using Digital Enhanced Cordless Telecommunications (DECT) with connectivity that enables interoperability between the Ascom wireless IP-DECT SIP solution with Avaya Communication Manager and Avaya SIP Enablement Services (SES). The specific calling features that were verified to operate correctly include transfer (attended and unattended), hold/return from hold, multiple call appearances, caller ID operation, call forwarding (unconditional, on busy/no answer and clear), pickup groups, call pickup, bridged appearances, and voicemail Message Waiting Indicator (MWI).

1.1. Network Diagram

The network diagram shown in **Figure 1** illustrates the testing environment used for compliance testing. The network consists of an Avaya Communication Manager, an Avaya SIP Enablement Services (SES), wired IP telephones, DECT telephones, software based IP telephones, a digital telephone, and the DECT infrastructure described below. Avaya IA 770 INTUITY AUDIX (IA770) is bundled with Avaya Communication Manager. Network services such as DHCP, TFTP and DNS were provided by computers in the network. Avaya IP Softphone and Avaya one-X Desktop Edition are running on two separate computers.

The wired IP telephones include the Avaya 9630, the Avaya 4621SW and the Avaya 4625SW IP Telephones. The DECT telephones include the Ascom wireless 9d24, Ascom wireless OfficeT and OfficeM DECT Handsets. An Avaya 2420 Digital Telephone is also included and is directly connected to Avaya Communication Manager.

The IP-DECT infrastructure is provided by Ascom wireless and consists of two Ascom wireless IP-DECT Base Stations. The Ascom wireless IP-DECT Base Stations were tested in two configurations. One configuration was when the Master and Standby Master base stations were on the same VLAN. The second configuration was when the Master and Standby Master base stations were on different VLANs.

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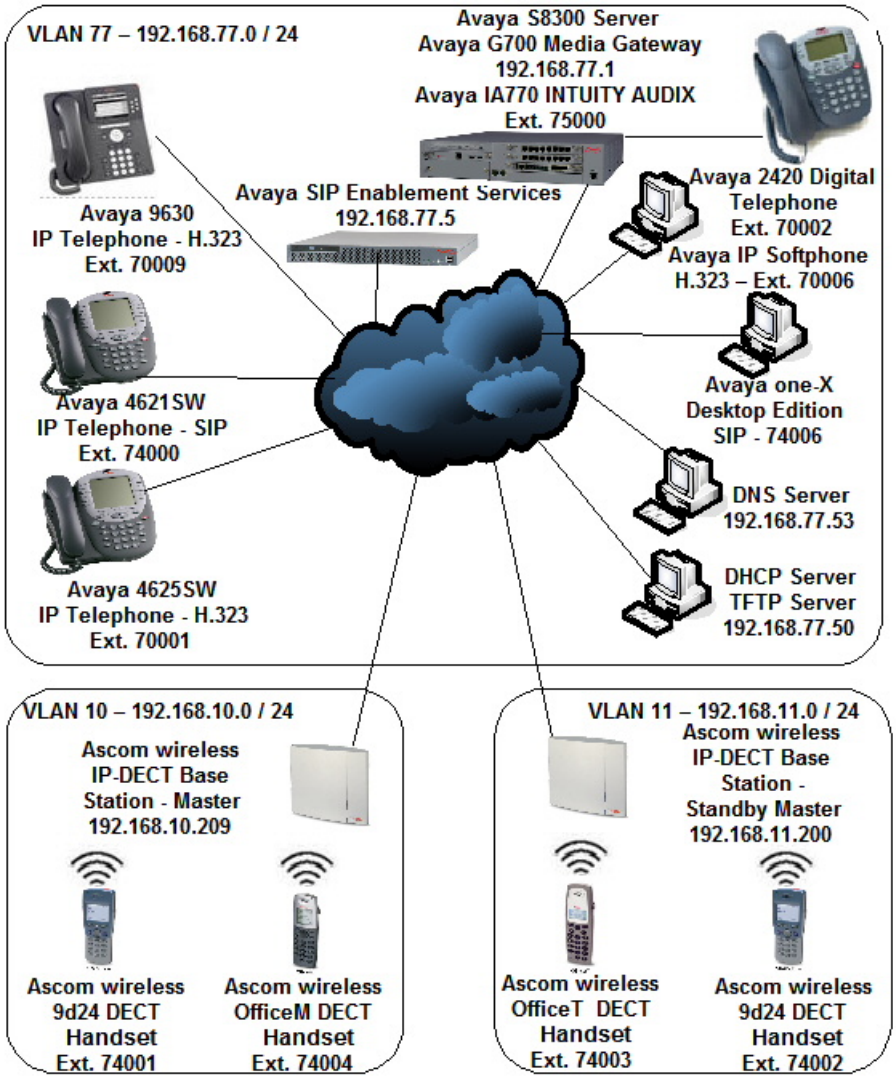

Figure 1: Sample Network Diagram

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2. Equipment and Software Validated

The following equipment and software were used for the sample configuration provided:

Equipment	Software
Avaya S8300 Server	Avaya Communication Manager 4.0 (R014x.00.0.730.5) Avaya IA 770 INTUITY AUDIX 4.0-11.0
Avaya G700 Media Gateway • MM711 Analog Media Module • MM712 DCP Media Module	26.31.0 HW04 / FW87 HW05 / FW08
Avaya SIP Enablement Services	3.1.2 (SES-3.1.2.0-309.0)
Avaya 2420 Digital Telephone	N/A
Avaya 4621SW IP Telephone (SIP)	2.2.2
Avaya 4625SW IP Telephone (H.323)	2.8
Avaya 9630 IP Telephone (H.323)	1.2.1
Avaya IP Softphone	6.0.0.25
Avaya one-X Desktop Edition	R2.1 SP1
Ascom wireless IP-DECT Base Station	2.0.10
Ascom wireless 9d24 DECT Handset	3.26
Ascom wireless OfficeT DECT Handset	1.06
Ascom wireless OfficeM DECT Handset	1.08

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3. Avaya Communication Manager, Avaya SIP Enablement Services and Avaya IA 700 INTUITY AUDIX Configuration

All of the telephones configured in the sample network in **Figure 1** were administered as stations in Avaya Communication Manager. SIP stations were administered as Off-PBX stations in Avaya Communication Manager. For information on how to administer these types of stations refer to **Section 10** [**1**].

SIP stations were administered as users Avaya SIP Enablement Services. Media server extensions were associated with these SIP users to link the SIP users to the Avaya Communication Manager stations. For information on how to administer SIP stations on Avaya SIP Enablement Services refer to **Section 10** [**2**].

Voicemail services were provided by Avaya IA 770 (IA770) INTUITY AUDIX. For information on how to administer Avaya IA770 refer to **Section 10** [**7**].

Certain Avaya Communication Manager features were tested with the Ascom wireless DECT Handsets. The configuration related to these specific features tested is included in the following section.

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3.1. Configure Avaya Communication Manager Features

Step	Description
1.	To enable the features used for testing (Call Park, Call Answer, Call Forwarding and Call Pickup), administer the configuration for Feature Access Codes (FAC) and Feature Name Extensions (FNE) on Avaya Communication Manager. In order for the FACs and FNEs to be routed through the system properly the digits used for Auto Route Selection (ARS), Auto Alternate Routing (AAR) and FACs need to be administered in the dial plan. From the System Administration Terminal (SAT) interface on Avaya Communication Manager use the "**change dialplan analysis**" command and configure the values displayed in bold below and submit the change. The values specified for the "Dialed String" field must match the ones configured in **Step 2** for **Auto Alternate Routing (AAR) Access Code** and **Auto Route Selection (ARS) - Access Code**.

```
change dialplan analysis                                    Page  1 of  12
                          DIAL PLAN ANALYSIS TABLE
                                                          Percent Full:    3

    Dialed   Total  Call    Dialed   Total  Call     Dialed   Total  Call
    String   Length Type    String   Length Type     String   Length Type
       1         3     dac
       5         5     aar
       7         5     ext
       75000     5     ext
       8         1     fac
       9         1     fac
       *         3     fac
       60        2     fac
       61        2     fac
       #         3     fac
```


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Step	Description
2.	The features implemented for SIP stations need to be paired with the features implemented for non-SIP stations, therefore, these values need to be specified even when using only SIP stations. From the SAT interface on Avaya Communication Manager use the "**change feature-access-codes**" command to configure the following values and submit the changes.

```
Change feature-access-codes                                  Page   1 of   7
                                FEATURE ACCESS CODE (FAC)
         Abbreviated Dialing List1 Access Code:
         Abbreviated Dialing List2 Access Code:
         Abbreviated Dialing List3 Access Code:
Abbreviated Dial - Prgm Group List Access Code:
                      Announcement Access Code:
                         Attendant Access Code:
                       Answer Back Access Code: #11
      Auto Alternate Routing (AAR) Access Code: 60
      Auto Route Selection (ARS) - Access Code: 61
Call Forwarding Activation Busy/DA: #15    All: #16    Deactivation: #17
                 Automatic Callback Activation:              Deactivation:
   Call Forwarding Enhanced Status:        Act:              Deactivation:
                         Call Park Access Code: #10
                       Call Pickup Access Code: #12
CAS Remote Hold/Answer Hold-Unhold Access Code:
                  CDR Account Code Access Code:
                        Change COR Access Code:
                   Change Coverage Access Code:
                   Contact Closure   Open Code:          Close Code:
```


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Step	Description
3.	From the SAT interface use the "**change off-pbx-stations feature-name extensions**" command to configure the following values and submit the changes. Note that the extensions used for FNEs match those used for FACs by pre-pending the FAC code with "710". Having this uniformity between FACs and FNEs is not required.

```
change off-pbx-telephone feature-name-extensions          Page  1 of   2

     EXTENSIONS TO CALL WHICH ACTIVATE FEATURES BY NAME

     Active Appearance Select:
          Automatic Call Back:
   Automatic Call-Back Cancel:
             Call Forward All: 71016
  Call Forward Busy/No Answer: 71015
           Call Forward Cancel: 71017
                    Call Park: 71010
         Call Park Answer Back: 71011
                Call Pick-Up: 71012
        Calling Number Block:
      Calling Number Unblock:
        Conference on Answer:
       Directed Call Pick-Up:
       Drop Last Added Party:
    Exclusion (Toggle On/Off):
   Extended Group Call Pickup:
       Held Appearance Select:
```


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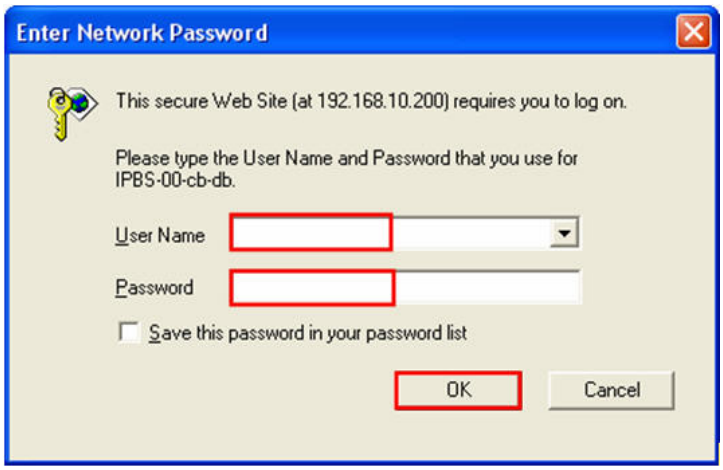
4. Ascom wireless IP-DECT SIP Solution Configuration

The following steps detail the initial configuration for the Ascom wireless IP-DECT SIP Solution. In the sample network the DHCP server was configured to register DHCP client information to a DNS server. This allows the Ascom wireless IP-DECT Base Station to be reachable via a DNS name using the following format: http://IPBS-XX-XX-XX, where XX-XX-XX are the last 3 bytes of the MAC address of the Ascom wireless IP-DECT Base Station. For example, an Ascom wireless IP-DECT Base Station with a MAC address of 00-01-3E-00-CB-DB could be accessed using http://IPBS-00-CB-DB or via the IP address assigned by DHCP.

4.1. Configure the Master IP-DECT Base Station

The Ascom wireless IP-DECT Base Stations can be configured in a Master/Standby Master scenario to provide redundancy or to extend the radius of coverage. The following configuration steps detail the configuration process used to configure an Ascom wireless IP-DECT Base Station in Master mode with one Standby Master base station.

Step	Description
1.	Launch a web browser and place either the IP address or the DNS name of the Ascom wireless IP-DECT Base Station into the URL. The user will be presented with a login screen. Refer to **Section 10** [**3**] for appropriate credentials needed to access the Ascom wireless IP-DECT Base Station. Enter the appropriate login information and then click **OK**. 

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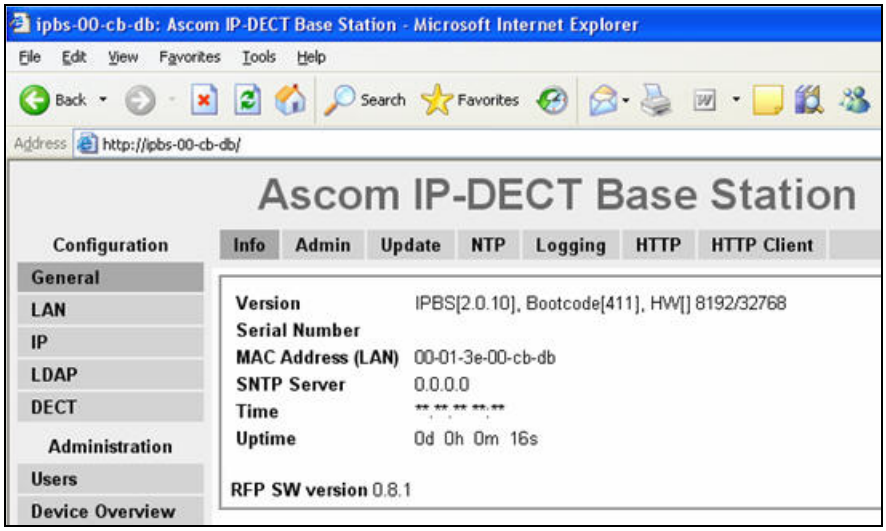
Step	Description
2.	The user is presented with the **General Info** frame where the system information for the Ascom wireless IP-DECT Base Station is displayed.



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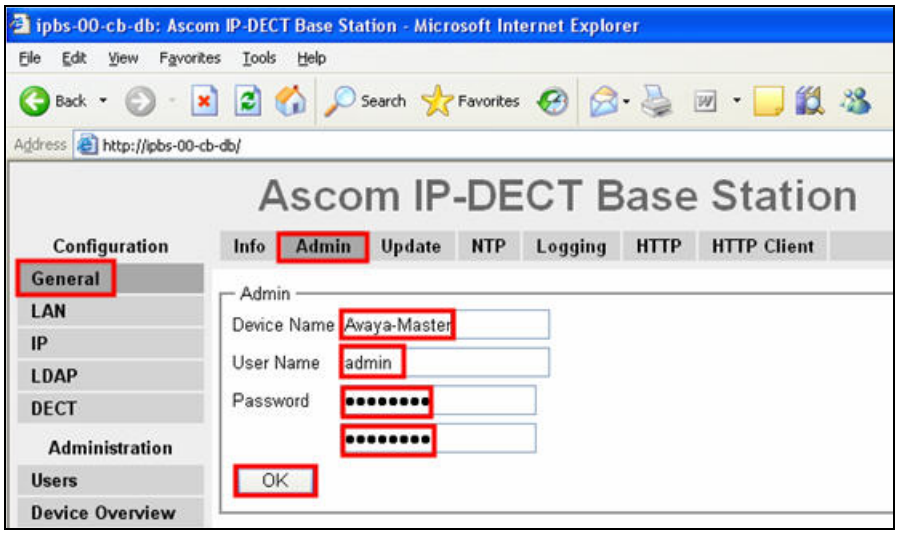
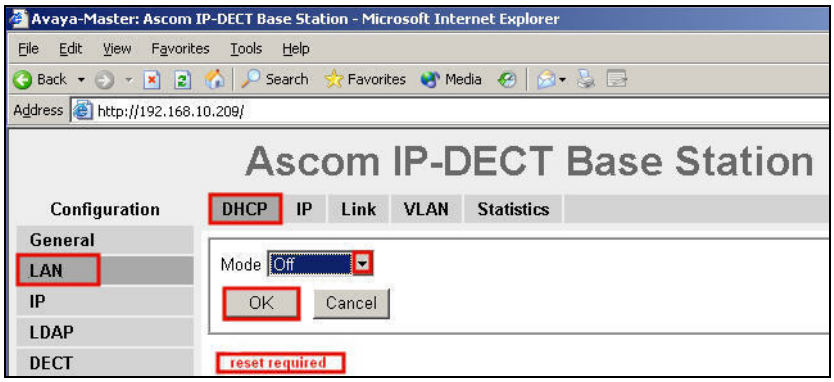
Step	Description
3.	To navigate the web interface on the Ascom wireless IP-DECT Base Station the user will navigate through a series of frames which lead to forms and web pages for configuration or to display information. The user flow is a two-click process where a category and then an option are clicked. Categories are found below **Configuration**, which is displayed in the top left portion of the frame, and options are found to the right. Navigate to the **General Admin** frame by clicking **General** and then clicking **Admin**. Configure the fields displayed below and then click **OK**. The **Device Name** can be any descriptive name that identifies this Ascom wireless IP-DECT Base Station. In the sample network the name "Avaya-Master" was chosen. The **User Name** and **Password** fields were populated using the default credentials. The box below **Password** is to confirm the password and the value entered for the **Password** field must be entered here. 
4.	Navigate to the **LAN DHCP** frame by first clicking **LAN** and then clicking **DHCP**. Using the drop-down list, set **Mode** to "Off" and then click **OK**. This will present the user with the clickable red text which reads "reset required". Click **reset required**. 

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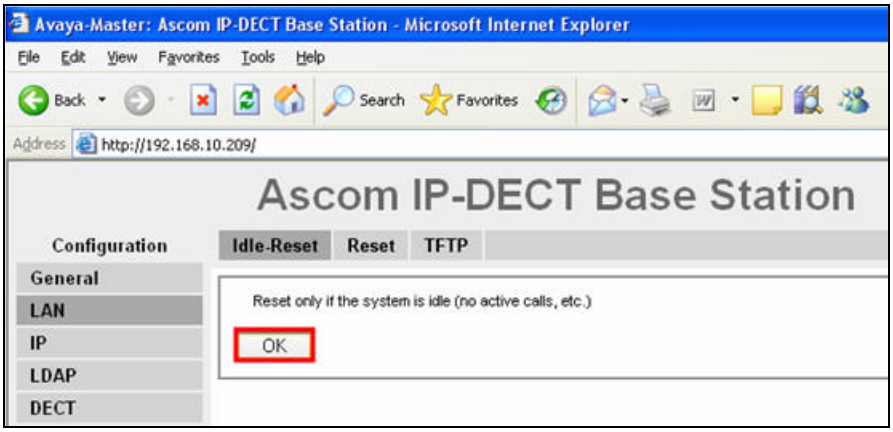
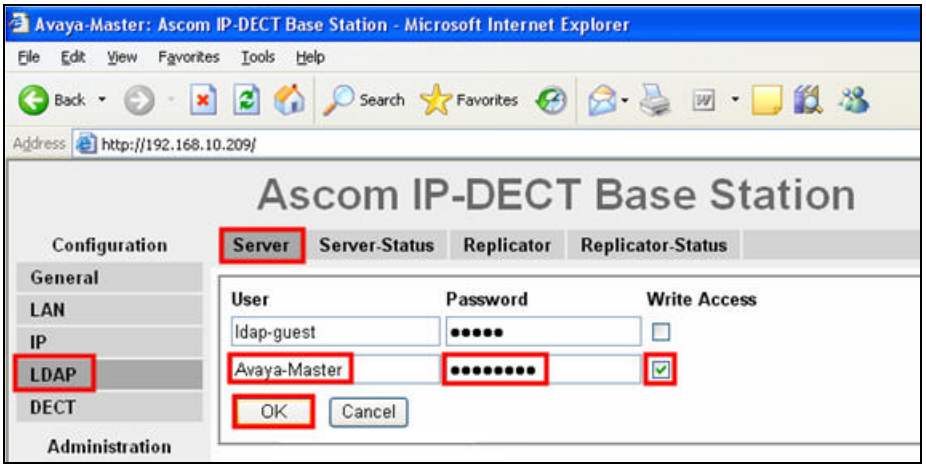
Step	Description
5.	The user is presented with the reset confirmation dialogue. Click **OK** to initiate the system reset. Many of the other changes made to the system during the configuration process require a reboot. Repeat this process whenever a reset is required. 
6.	After the Ascom wireless IP-DECT Base Station (Avaya-Master) has rebooted, navigate to the **LDAP Server** frame by clicking **LDAP** and then clicking **Server**. The “ldap-guest” account is a default system account. Configure **User** using the **Device Name** used in **Step 3**. Configure the **Password** field with the **Password** used in **Step 3.** Check the **Write Access** check box for the "Avaya-Master” user account and then click **OK**. 

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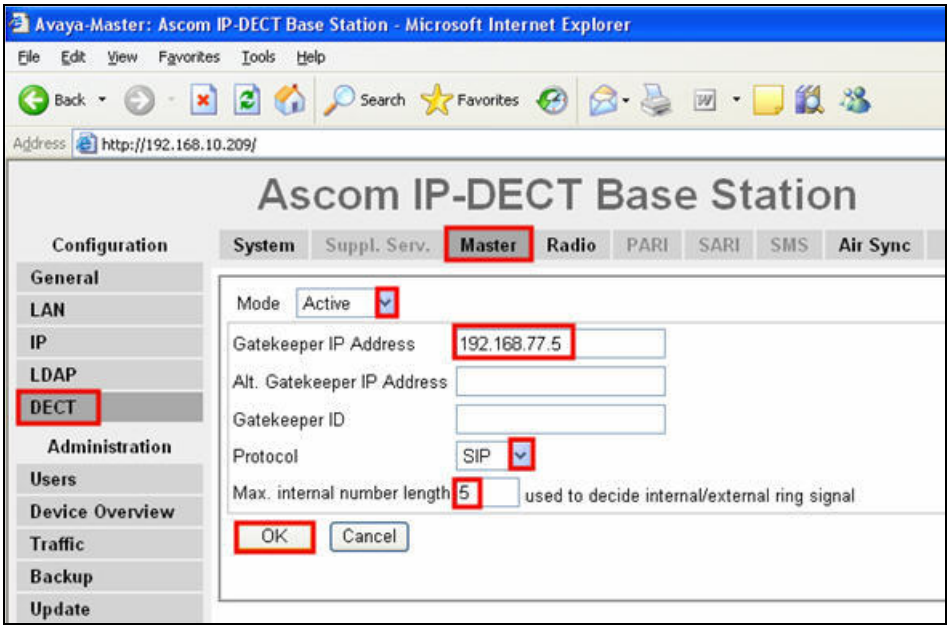
Step	Description
7.	Navigate to the **DECT Master** frame by clicking **DECT** and then clicking **Master**. Configure the fields displayed below and then click **OK**. Use the drop-down list for **Mode** and select "Active". **Gatekeeper IP Address** was set to the IP address of the Avaya SIP Enablement Services (see **Figure 1**). Use the drop-down list for **Protocol** and select "SIP". In the sample network, five digit extensions were used and **Max. internal number length** was set to "5".



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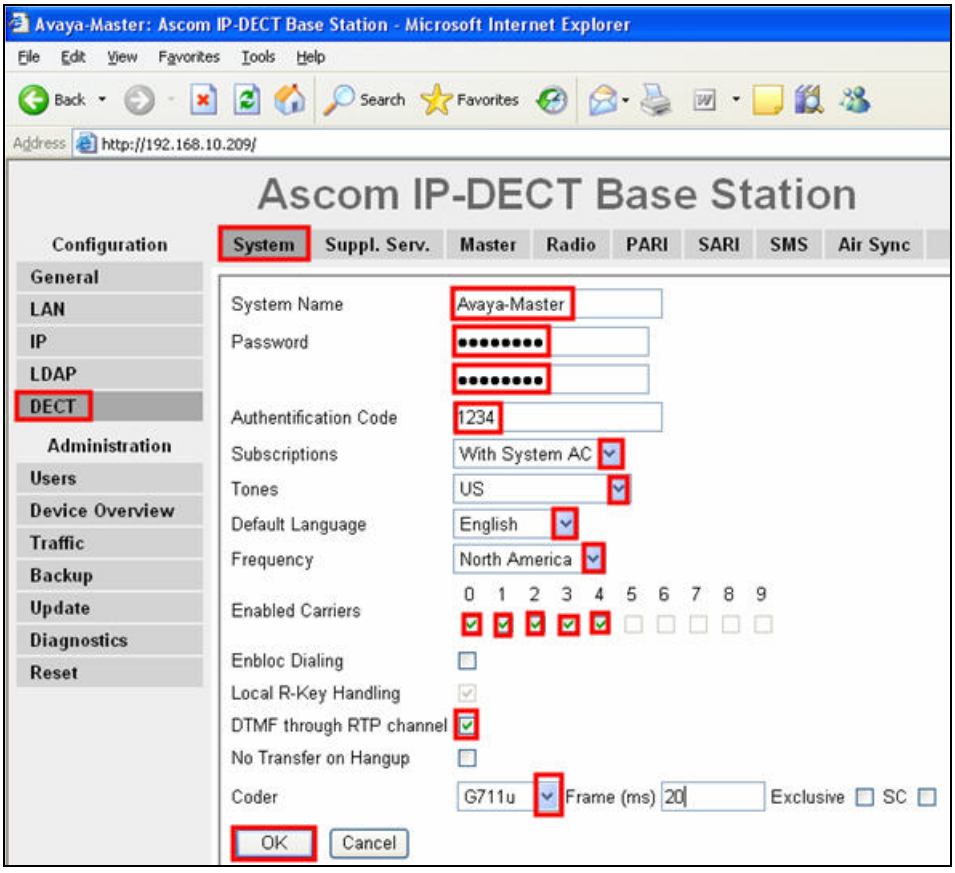
Step	Description
8.	Navigate to the **DECT System** frame by clicking **DECT** and then clicking **System**. Configure the fields displayed below and then click **OK**. **System Name** is the **Device Name** used in **Step 3**. **Password** is the **Password** used in **Step 3**. The box below **Password** is to confirm the password and the value configured for **Password** field must be entered here. The **Authentication Code** is a numerical code that every DECT handset will need to use to subscribe to this system. Using the drop-down list, **Subscriptions** can be set to "With User AC", "With System AC", or "Disable". In the sample configuration "With System AC" was used. This enables the system to use the **Authentication Code** when challenging DECT handsets during registration. Use the drop-down list for **Tones** and select "US". Use the drop-down list for **Default Language** and select "English". Use the drop-down list for **Frequency** and select "North America". Check the **0**,**1**,**2**,**3** and **4** check boxes. The **Enable Carriers** check boxes enable the DECT handsets to use different channels or frequencies when transmitting. Check the **DTMF through RTP channel** check box. Use the drop-down list for **Coder** and select "G711u". 

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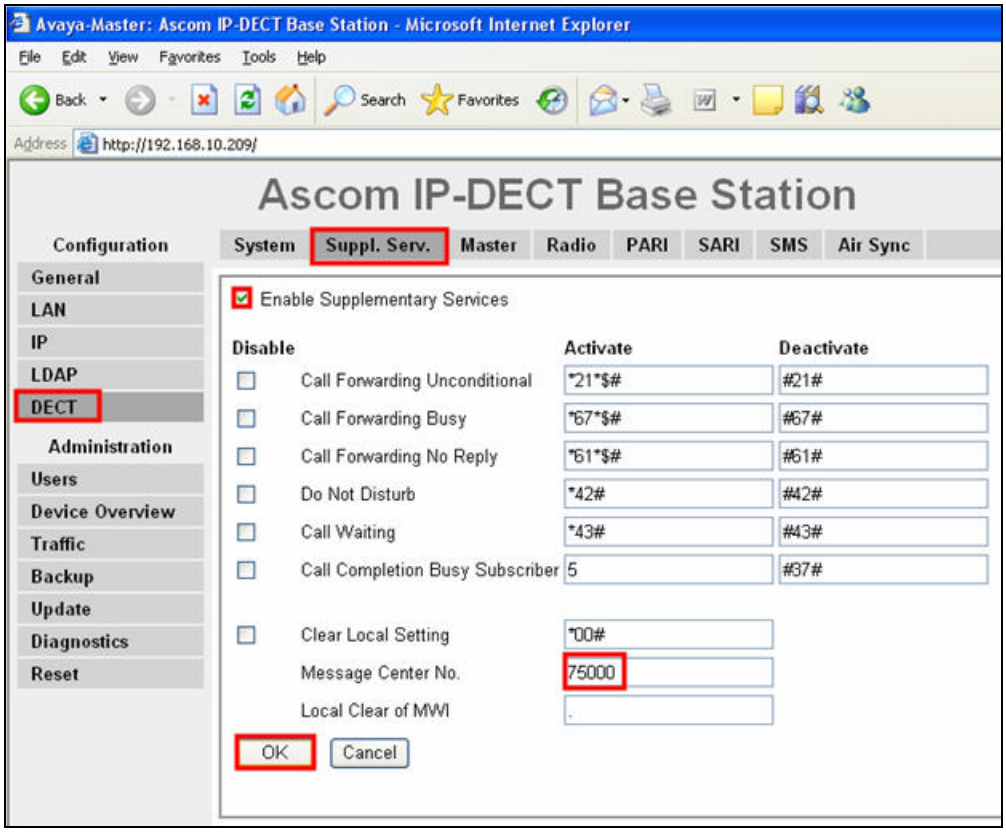
Step	Description
9.	Navigate to the **DECT Suppl. Serv.** frame by clicking **DECT** and then clicking **Suppl. Serv.**. Check the **Enable Supplementary Services** check box. Enter the extension used for Avaya IA770 in the **Message Center No.** field. Click **OK**. 

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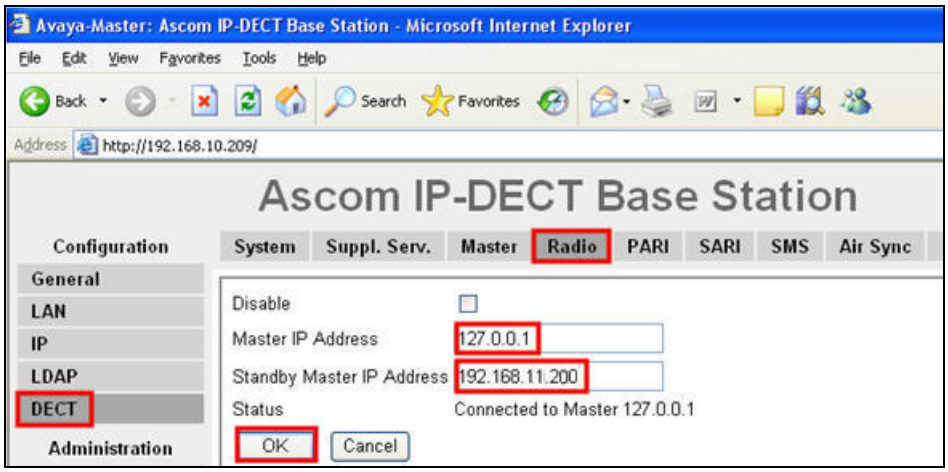
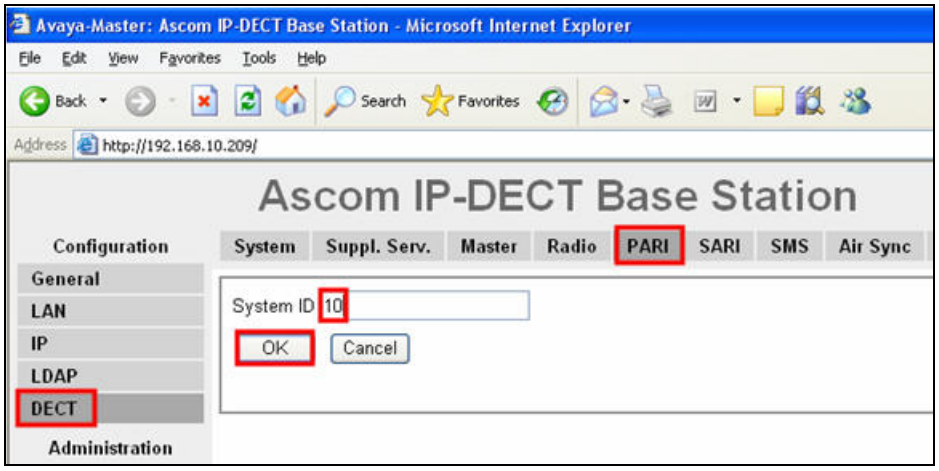
Step	Description
10.	Navigate to the **DECT Radio** frame by clicking **DECT** and then clicking **Radio**. Configure the fields displayed below and then click **OK**. **Master IP Address** can be either the loopback IP address (127.0.0.1) or the IP address assigned to the Ascom wireless IP-DECT Master Base Station. **Standby Master IP Address** is the IP address of the Ascom wireless IP-DECT Standby Master Base Station. 
11.	Navigate to the **DECT PARI** frame by clicking **DECT** and then clicking **PARI**. **PARI** is a user-defined system value and must range from 1-35. Enter any number from 1-35 and then click **OK**. 

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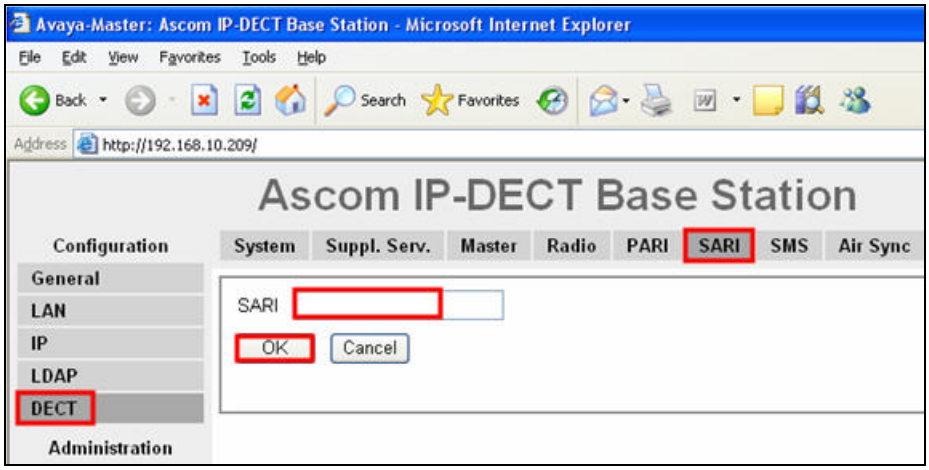
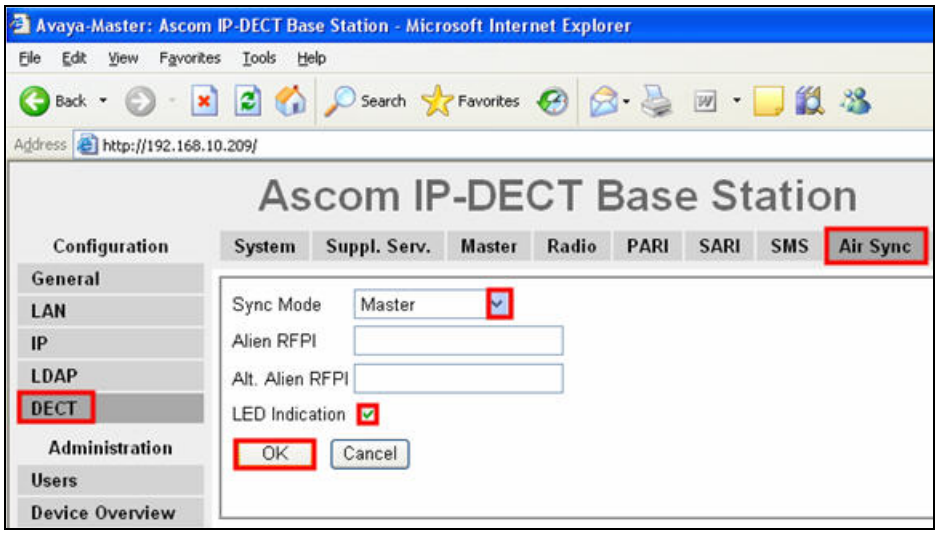
Step	Description
12.	Navigate to the **DECT SARI** frame by clicking **DECT** and then clicking **SARI**. **SARI** is an Ascom wireless provided activation code which is needed for the system to function. Contact Ascom wireless to obtain a **SARI**. Enter the **SARI** value and then click **OK**. 
13.	Navigate to the **DECT Air Sync** frame by clicking **DECT** and then clicking **Air Sync**. Use the drop-down list for **Sync Mode** and select "Master". Check the **LED Indication** check box and then click **OK.** 

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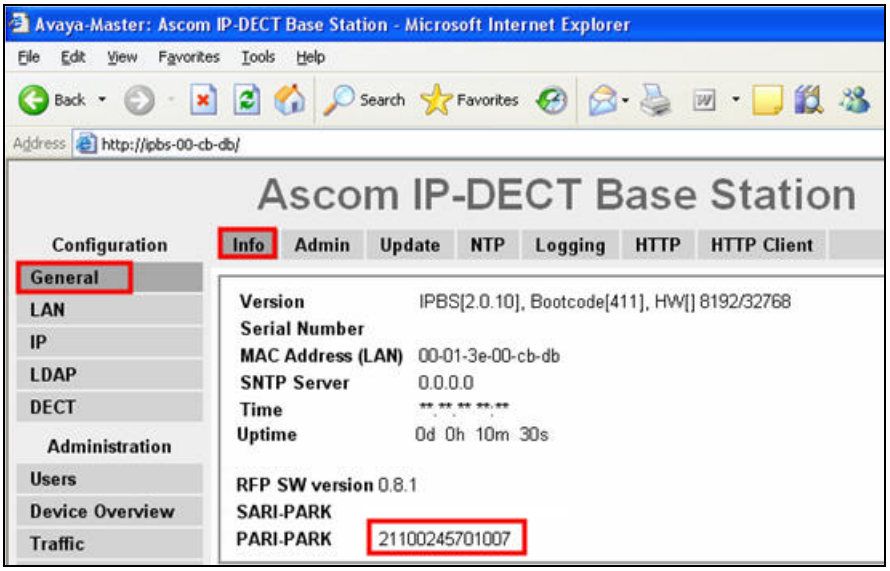
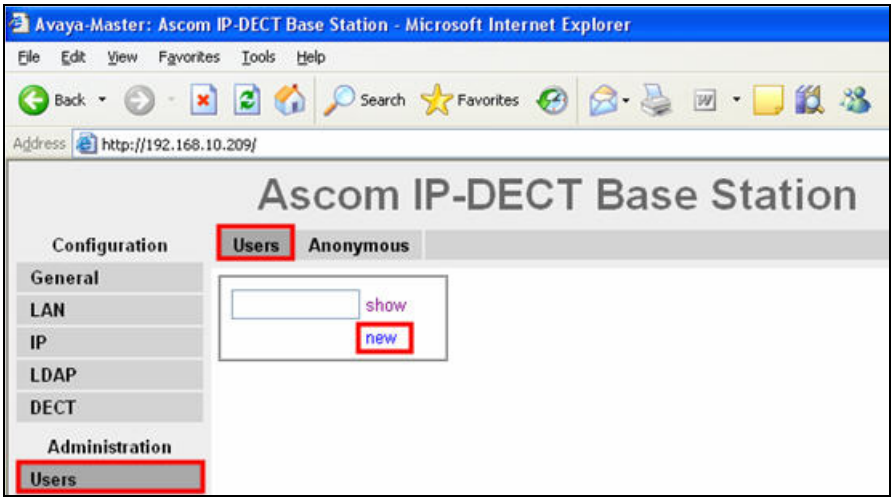
Step	Description
14.	Navigate to the **General Info** frame by clicking **General** and then clicking **Info**. The **PARI-PARK** is displayed. This value is needed when programming Ascom wireless DECT handsets. The **PARI-PARK** is similar to an SSID in an 802.11 wireless environment. 
15.	Navigate to the **Users** frame by clicking **Users** and then clicking **Users**. Click **new** to provision a new user account. 

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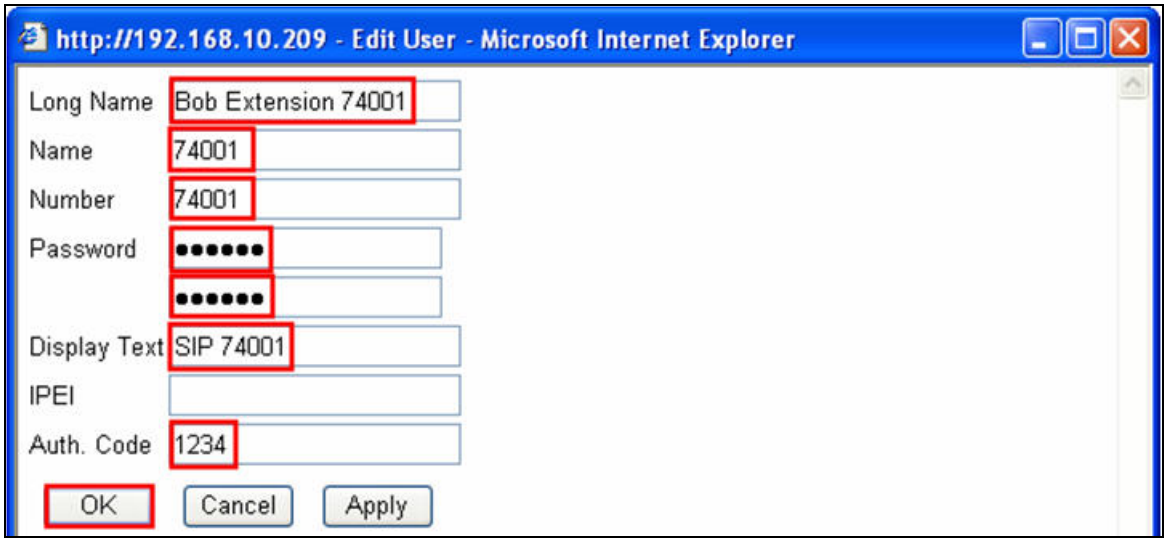
Step	Description
16.	The user is presented with the **Edit User** web page. **Long Name** and **Name** can be any descriptive name that identifies this user. The **Number** field is the extension assigned to this user. The **Password** field is the password used to register with the Avaya SIP Enablement Services. The box below **Password** is to confirm the password and the value entered for the **Password** field must be entered here. **Display Text** is the text string that will be displayed on the LCD screen of the Ascom wireless DECT Handset. **Auth. Code** is used only if **Subscriptions** in **Step 8** is set to "With User AC". Once all the user information has been configured, click **OK**. Repeat this process for each user being added to the system. 

4.2. Configure the Standby Master Ascom wireless IP-DECT Base Station

Configuring a Standby Master Ascom wireless IP-DECT Base Station is very similar to the configuration process for configuring a Master system. The following steps detail the configuration process used to configure an Ascom wireless IP-DECT Base Station in Standby Master mode.

A third mode exists for the Ascom wireless IP-DECT Station called Slave. This mode is used for Ascom wireless IP-DECT systems whose coverage requires the use of more than two IP-DECT Base Stations. For information on configuring an Ascom wireless IP-DECT Slave Base Station see **Section 10** [**3**]. An Ascom wireless IP-DECT Slave Base Station configuration was not tested as part of this solution.

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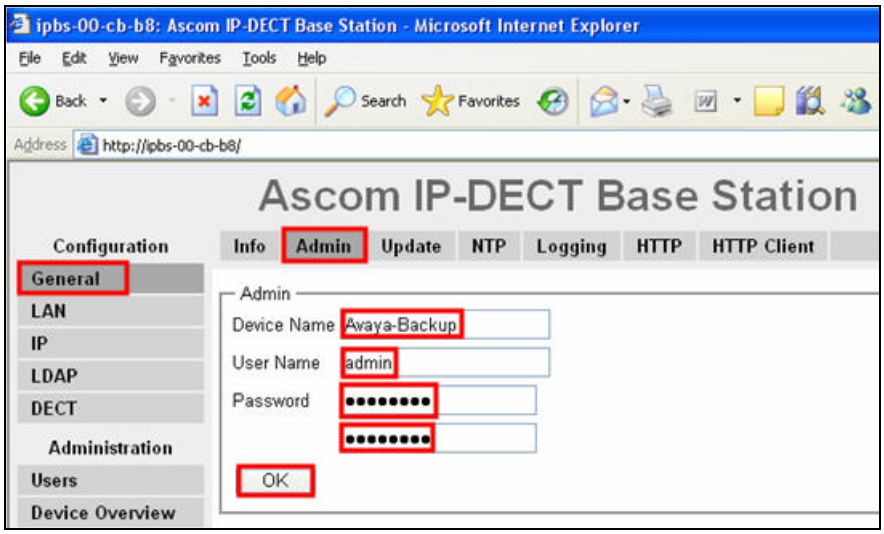
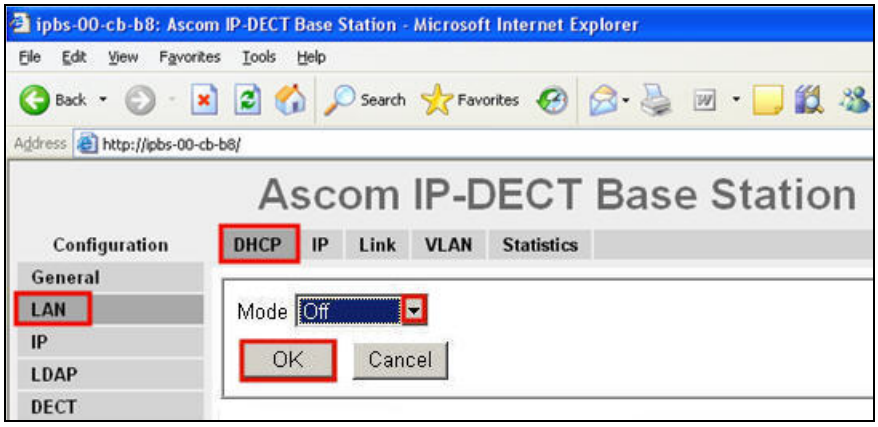
Step	Description
1.	Using a web browser open up a connection to the Standby Master Ascom wireless IP-DECT Base Station (refer to **Section 4.1 Step 1**). A login is required in order to access the system. Navigate to the **General Admin** frame by clicking **General** and then clicking **Admin**. Configure the fields displayed below and then click **OK**. The **Device Name** can be any descriptive name that identifies this particular Ascom wireless IP-DECT Base Station. In the sample network the name "Avaya-Backup" was used. The **User Name** field is the default administrator account, the **Password** field is the default administrator password and the box below **Password** is used to confirm the password. As with the Master Base Station certain changes require a reboot. Follow the same procedure as with the Master Base Station in **Section 4.1 Step 4** to conduct a reboot. 
2.	Navigate to the **LAN DHCP** frame by first clicking **LAN** and then clicking **DHCP**. Using the drop-down list, set **Mode** to "Off" and then click **OK**. 

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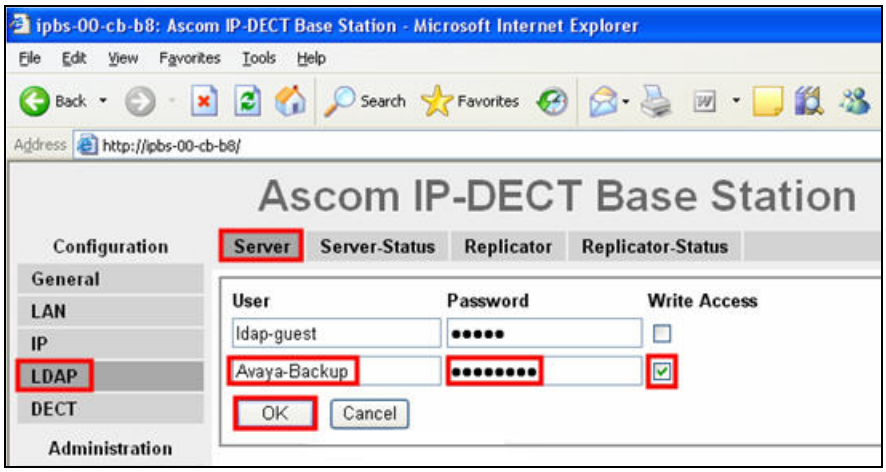
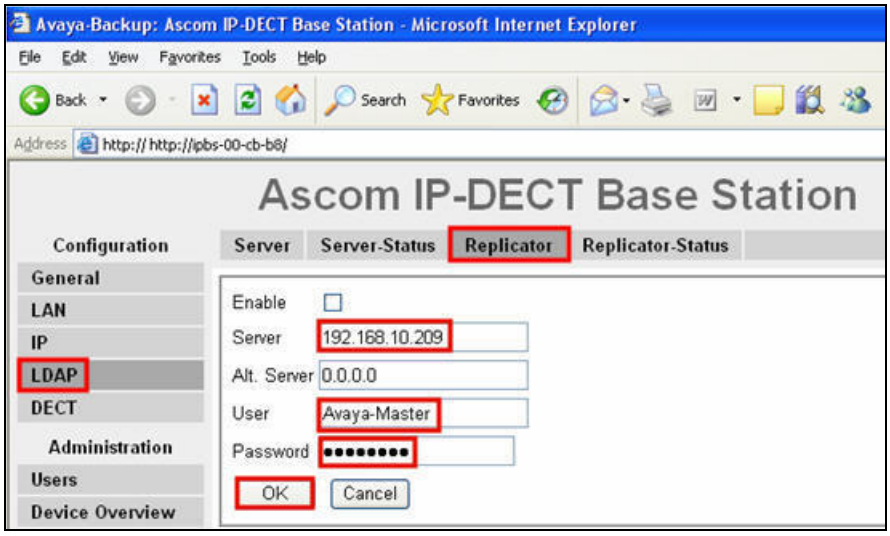
Step	Description
3.	Navigate to the **LDAP Server** frame by clicking **LDAP** and then clicking **Server**. The "ldap-guest" account is a default system account. Configure the **User** field using the **Device Name** used in **Section 4.2 Step 1**. Configure the **Password** field with the **Password** used in **Section 4.2 Step 1.** Check the **Write Access** check box for the "Avaya-Backup" user account and then click **OK**. 
4.	Navigate to the **LDAP Replicator** frame by clicking **LDAP** and then clicking **Replicator**. Configure the fields displayed below and then click **OK**. Check the **Enable** check box. The **Server** field is the IP address of the Ascom wireless IP-DECT Master Base Station and the **User** and **Password** fields are the **Device Name** and **Password** fields configured on the Ascom wireless IP-DECT Master Base Station in **Section 4.1 Step 3**. 

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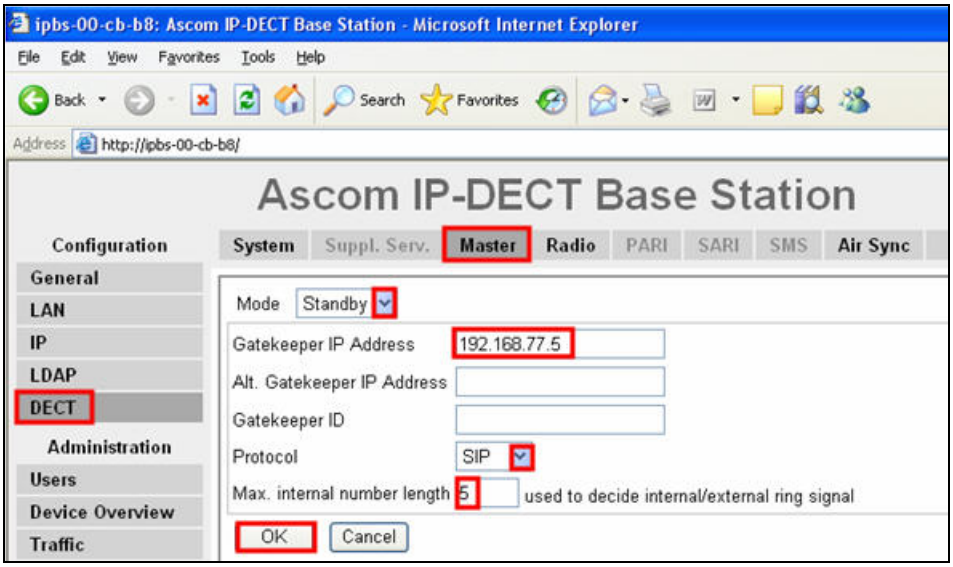
Step	Description
5.	Navigate to the **DECT Master** frame by clicking **DECT** and then clicking **Master**. Configure the fields displayed below and then click **OK**. Use the drop-down list for **Mode** and select "Standby". **Gatekeeper IP Address** was set to the IP address of the Avaya SIP Enablement Services (see **Figure 1**). Use the drop-down list for **Protocol** and select "SIP". In the sample network five digit extensions were used and **Max. internal number length** was set to "5".



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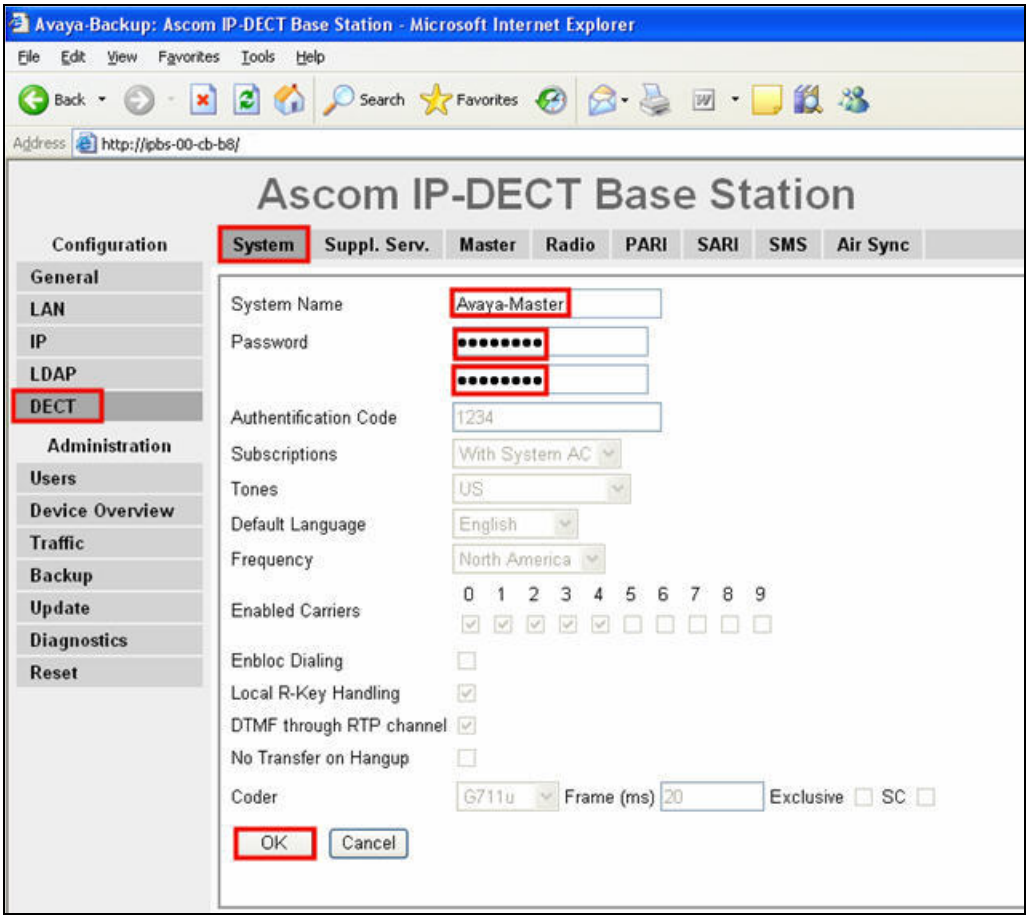
Step	Description
6.	Navigate to the **DECT System** frame by clicking **DECT** and then clicking **System**. Configure the fields displayed below and then click **OK**. The **System Name** and **Password** fields are the **Device Name** and **Password** fields used on the Ascom wireless IP-DECT Master Base Station in **Section 4.1 Step 3**. 

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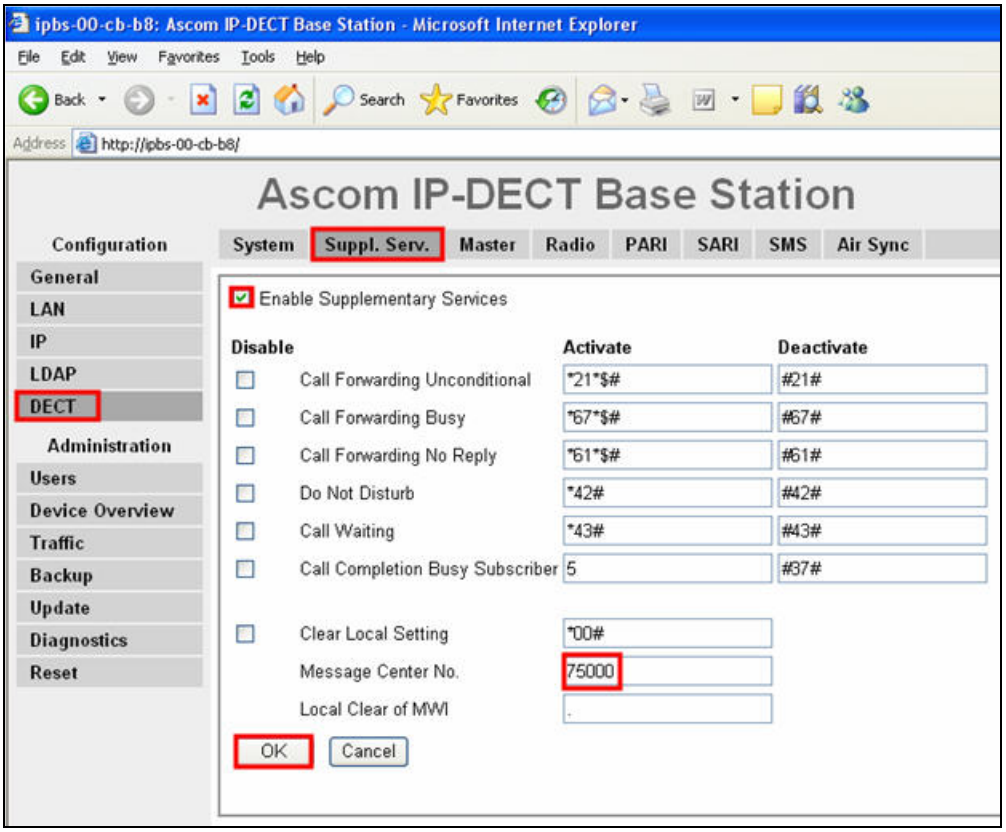
Step	Description
7.	Navigate to the **DECT Suppl. Serv.** frame by clicking **DECT** and then clicking **Suppl. Serv.**. Check the **Enable Supplementary Services** check box. Enter the extension used for Avaya IA770 in the **Message Center No.** field. Click **OK.** 

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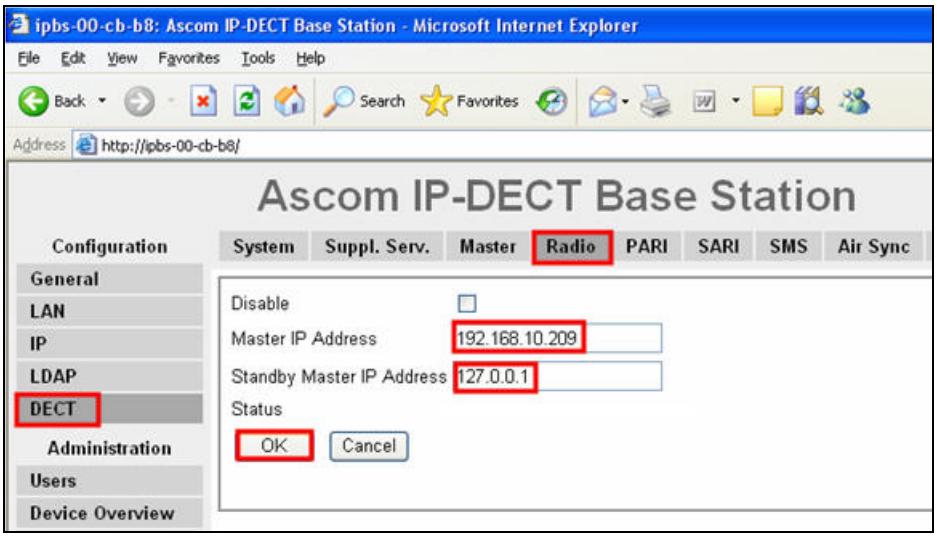
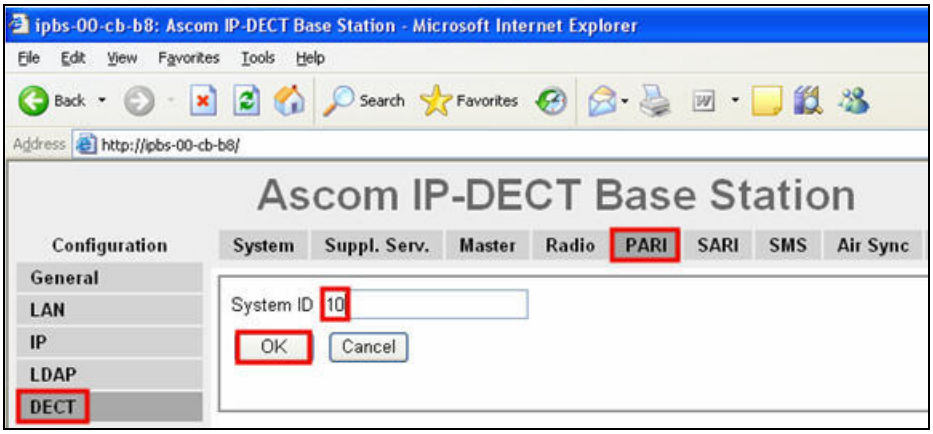
Step	Description
8.	Navigate to the **DECT Radio** frame by clicking **DECT** and then clicking **Radio**. Configure the fields displayed below and then click **OK**. **Master IP Address** is the IP address of the Ascom wireless IP-DECT Master Base Station. **Standby Master IP Address** can be either the actual IP Address assigned to the Ascom wireless IP-DECT Standby Master Base Station or the loopback IP Address of "127.0.0.1". 
9.	Navigate to the **DECT PARI** frame by clicking **DECT** and then clicking **PARI**. When configuring a Standby Master base station, the same **PARI** value should be used that was used on the Master base station. Enter the **PARI** value used in **Section 4.1 Step 11** and then click **OK**. 

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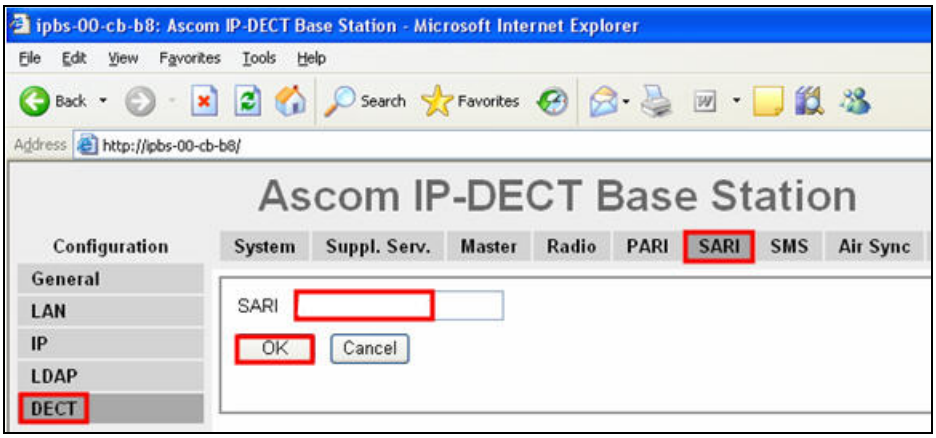
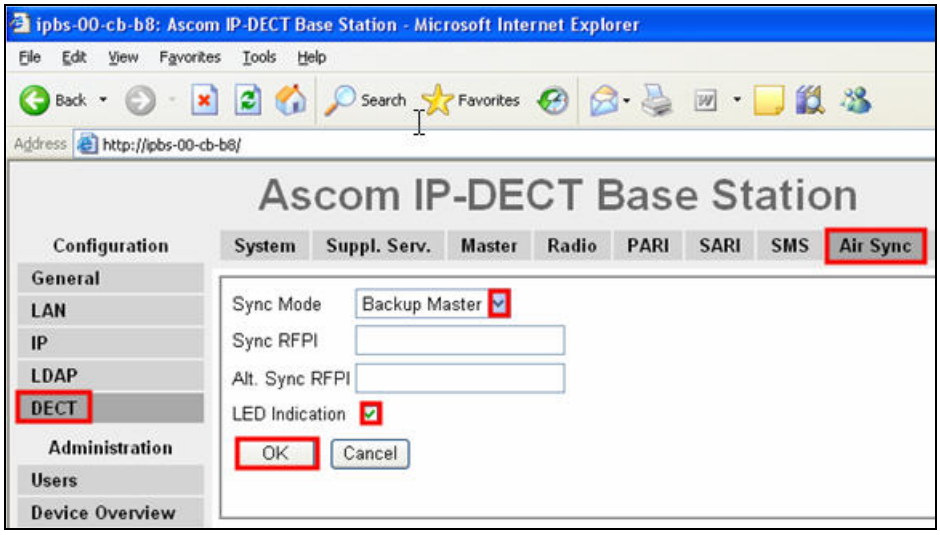
Step	Description
10.	Navigate to the **DECT SARI** frame by clicking **DECT** and then clicking **SARI**. **SARI** is an Ascom wireless provided activation code which is needed in order for the system to function. The same **SARI** value entered in **Section 4.1 Step 12** should be used on the Standby Master. Contact Ascom wireless to obtain a **SARI** value. Enter the **SARI** value and then click **OK**. 
11.	Navigate to the **DECT Air Sync** frame by clicking **DECT** and then clicking **Air Sync**. Use the drop-down list for **Sync Mode** and select “Backup Master”. Check the **LED Indication** check box and then click **OK.** 

5. Ascom wireless DECT Handset Configuration

Refer to **Section 10** [**4**], [**5**] and [**6**] to obtain information on the procedures for subscribing and registering the Ascom wireless DECT Handsets to the Ascom wireless IP-DECT Base Station.

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6. Interoperability Compliance Testing

The compliance testing focused on verifying interoperability of the Ascom wireless IP-DECT SIP solution which is comprised of the Ascom wireless IP-DECT Base Station and Ascom wireless DECT Handsets with Avaya SIP Enablement Services, Avaya one-X Desktop Edition and Avaya IP Softphone. Additional testing verified proper operation with the Avaya 4621SW, the Avaya 4625SW, the Avaya 9630 IP Telephones and the Avaya 2420 Digital Telephone. Voicemail using Avaya IA770 with MWI was tested and verified to operate correctly. Network level tests included verifying seamless roaming from base station to base station with active voice calls.

Avaya's formal testing and Declaration of Conformity is provided only on the headsets/handsets that carry the Avaya brand or logo. Avaya may conduct testing of non-Avaya headsets/handsets to determine interoperability with Avaya telephones. However, Avaya does not conduct the testing of non-Avaya headsets/handsets for: Acoustic Pressure, Safety, Hearing Aid Compliance, EMC regulations, or any other tests to ensure conformity with safety, audio quality, long-term reliability or any regulation requirements. As a result, Avaya makes no representations whether a particular non-Avaya headset will work with Avaya's telephones or with a different generation of the same Avaya telephone.

Since there is no industry standard for handset interfaces, different manufacturers utilize different handset/headset interfaces with their telephones. Therefore, any claim made by a headset vendor that its product is compatible with Avaya telephones does not equate to a guarantee that the headset will provide adequate safety protection or audio quality.

6.1. General Test Approach

The general test approach was to register the Ascom wireless DECT Handsets with Avaya SIP Enablement Services through the Ascom wireless IP-DECT cordless network. Calls were made between both wired and wireless telephones and specific calling features were exercised. Network level tests included verifying roaming from one Ascom wireless IP-DECT Base Station to another.

6.2. Test Results

The Ascom wireless DECT Handsets passed all test cases. Ascom wireless DECT Handsets were verified to successfully register with Avaya SIP Enablement Services. The Ascom wireless DECT Handsets were verified to roam successfully between Ascom wireless IP-DECT Base Stations on the same network (Layer 2 roaming) and between access points on a different network (Layer 3 roaming) while maintaining active voice calls. The network diagram and configuration information show that the Standby Master Ascom wireless IP-DECT Base Station was on a different Layer 3 Network then the Master Ascom wireless IP-DECT Base Station.

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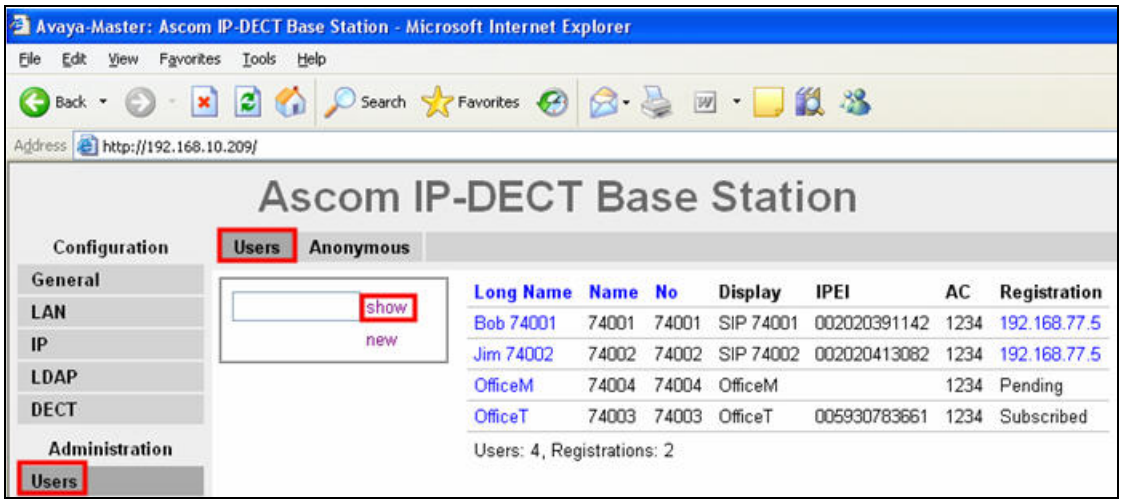
Two codecs were used for testing: G.711MU and G.729AB. Telephone calls were verified to operate correctly with the media path direct between the telephones (shuffling enabled) and with the media path centralized through Avaya Communication Manager (shuffling disabled). Calls were maintained for durations over one minute without degradation to voice quality. The telephony features verified to operate correctly included transfer (attended and unattended), hold/return from hold, multiple call appearances, caller ID operation, call forwarding (unconditional, on busy/no answer and clear), pickup groups, call pickup, bridged appearances, and voicemail MWI.

7. Verification Steps

7.1. Ascom wireless DECT Handset Registration Verification

The following steps can be used to ascertain the registration state of the Ascom wireless DECT Handsets that the Ascom wireless IP-DECT Base Station is configured to support.

From a web browser open up a connection to the Ascom wireless IP-DECT Master Base Station, refer to **Section 4.1 Step 1**. Navigate to the **Users** frame by clicking **Users** then clicking **Users** and then clicking **show**. A **Registration** state of "Pending" indicates an Ascom wireless DECT Handset has not registered to the Ascom wireless IP-DECT Base Station and requested that particular extension. A **Registration** state of "Subscribed" indicates that an Ascom wireless DECT Handset has connected to the Ascom wireless IP-DECT Base Station and requested the use of that particular extension. A **Registration** state that displays the IP Address of the Avaya SIP Enablement Services indicates the extension has successfully registered to both the Ascom wireless IP-DECT Base Station and Avaya SIP Enablement Services.



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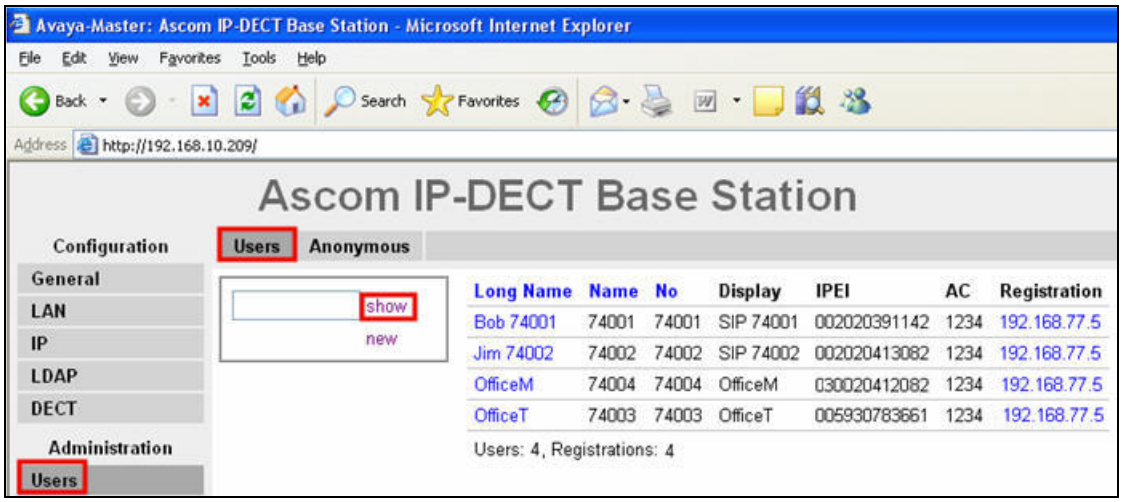

7.2. Ascom wireless DECT Handset Function Verification

The following steps can be used to verify proper operation of the Ascom wireless DECT Handsets.

- Place calls from the Ascom wireless DECT Handsets and verify two-way audio.
- Place a call to the Ascom wireless DECT Handsets, allow the call to be directed to voicemail, leave a voicemail message and verify the MWI message is received.
- Using each Ascom wireless DECT Handset that received a voicemail, connect to the voicemail system to retrieve the voicemail and verify the MWI clears.
- Place calls to the Ascom wireless DECT Handsets and exercise calling features such as transfer and hold.

8. Support

Technical support for the Ascom wireless IP-DECT Base Station and Handsets can be obtained through the following:

- **Phone:** 1-877-71ASCOM or 1-877-712-7266
- **Email:** techsupport@ascomwireless.com

9. Conclusion

These Application Notes demonstrate how to build a sample SIP VoIP-enabled wireless network using the Ascom wireless IP-DECT Base Station with the Ascom wireless DECT Handsets. These Application Notes also demonstrate how to provide interoperability between Avaya Communication Manager and Avaya SIP Enablement Services with the Ascom wireless IP-DECT Base Station and Handsets.

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10. Additional References

The documents referenced below were used for additional support and configuration information. The Avaya documentation was obtained from http://support.avaya.com. The Ascom wireless documentation was obtained from http://www.Ascomwireless.com (access to Ascom wireless documentation may require a support account).

[1] *Administrator Guide for Avaya Communication Manager,* February 2007, Issue 3.1, Document Number 03-300509

[2] *Installing and Administering SIP Enablement Services,* March 2007, Issue 2.1, Document Number 03-600768

[3] *Installation and Operation Manual IP-DECT Base Station*, January 2007 Ver. C, Document Number TD 92372GB

[4] *User Manual 9d24 MkII Cordless Handset USA*, February 2007 Ver. C, Document Number TD 92411GB

[5] *User Manual OfficeM Cordless Telephone,* May 2006 Ver. C, Document Number TD 92288GB

[6] *User Manual Cordless Telephone OfficeT*, May 2006 Ver. C, Document Number TD 92282GB

[7] *Avaya IA 770 INTUITY AUDIX Messaging Application Release 4.0 Administering Media Servers to Work with IA 770*, March 2007

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