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Avaya Solution & Interoperability Test Lab

Application Notes for Spectralink IP-DECT Server 400 with Avaya IP Office Server Edition - Issue 1.0

Abstract

These Application Notes describe the configuration steps required to integrate Spectralink IP-DECT Server 400 with Avaya IP Office Server Edition. Spectralink IP-DECT Server 400 is a wireless solution that can be deployed as a standalone system or operate/manage external Spectralink base stations. Spectralink IP-DECT Server 400 controls the traffic in the air from Spectralink handsets and works as the link between the handsets and Avaya IP Office Server Edition. The Spectralink handsets used for the compliance test included the Spectralink 7202, 7622, and Butterfly Handsets. In addition, an optional Spectralink Base Station was also used to verify roaming. Spectralink IP-DECT Server 400 interfaces to Avaya IP Office Server Edition via SIP (as SIP endpoints). These Application Notes also apply to the Spectralink IP-DECT Server 6500, which is similar to the IP-DECT Server 400 and only differ in their scalability.

Readers should pay attention to **Section 2**, in particular the scope of testing as outlined in **Section 2.1** as well as the observations noted in **Section 2.2**, to ensure that their own use cases are adequately covered by this scope and results.

Information in these Application Notes has been obtained through DevConnect compliance testing and additional technical discussions. Testing was conducted via the DevConnect Program at the Avaya Solution and Interoperability Test Lab.

1. Introduction

These Application Notes describe the configuration steps required to integrate Spectralink IP-DECT Server 400 with Avaya IP Office Server Edition. Spectralink IP-DECT Server 400 is a wireless solution that can be deployed as a standalone system or operate/manage external Spectralink base stations. Spectralink IP-DECT Server 400 controls the traffic in the air from Spectralink handsets and works as the link between the handsets and Avaya IP Office Server Edition. The Spectralink handsets used for the compliance test included the Spectralink 7202, 7622, and Butterfly Handsets. In addition, an optional Spectralink Base Station was also used to verify roaming. Spectralink IP-DECT Server 400 interfaces to Avaya IP Office Server Edition via SIP (as SIP endpoints). These Application Notes also apply to the Spectralink IP-DECT Server 6500, which is similar to the IP-DECT Server 400 and only differ in their scalability.

2. General Test Approach and Test Results

The interoperability compliance test included feature and serviceability testing. The feature testing focused on establishing calls between Spectralink 7000 Series and Butterfly Handsets and Avaya SIP/H.323 telephones and exercising basic telephony features, such as hold, mute, and transfer. The Spectralink handsets gained network access via the Spectralink IP-DECT Server 400. Additional telephony features, such as call forward, follow me, call park/unpark, and call pickup were also verified using Avaya IP Office Shortcodes.

The serviceability testing focused on verifying that Spectralink IP-DECT Server 400 came back into service after re-connecting the Ethernet connect or rebooting the Spectralink handsets.

DevConnect Compliance Testing is conducted jointly by Avaya and DevConnect members. The jointly-defined test plan focuses on exercising APIs and/or standards-based interfaces pertinent to the interoperability of the tested products and their functionalities. DevConnect Compliance Testing is not intended to substitute full product performance or feature testing performed by DevConnect members, nor is it to be construed as an endorsement by Avaya of the suitability or completeness of a DevConnect member's solution.

Avaya recommends our customers implement Avaya solutions using appropriate security and encryption capabilities enabled by our products. The testing referenced in this DevConnect Application Note included the enablement of supported encryption capabilities in the Avaya products. Readers should consult the appropriate Avaya product documentation for further information regarding security and encryption capabilities supported by those Avaya products.

Support for these security and encryption capabilities in any non-Avaya solution component is the responsibility of each individual vendor. Readers should consult the appropriate vendor-supplied product documentation for more information regarding those products.

For the testing associated with these Application Notes, the interface between Avaya systems and Spectralink IP-DECT Server 400 included TLS, but not SRTP, which is currently not supported with Avaya IP Office.

2.1. Interoperability Compliance Testing

Interoperability compliance testing covered the following features and functionality:

- SIP registration of Spectralink handsets with Avaya IP Office Server Edition and Avaya IP Office 500 V2 Expansion. Spectralink IP-DECT Server 400 controls the traffic in the air and works as the link between the Spectralink handsets and Avaya IP Office.
- Calls between Spectralink handsets and Avaya SIP/H.323 telephones with Direct IP Media (Shuffling) enabled and disabled. Direct IP Media was supported between Spectralink handset and Avaya SIP deskphones.
- Calls between the Spectralink handsets and the PSTN.
- UDP and TLS transport protocol.
- Support of G.711 and G.729 codecs.
- Proper recognition of DTMF tones.
- Basic telephony features, including hold, mute, redial, multiple calls, blind/attended transfer and long duration calls.
- Extended telephony features using Avaya IP Office Shortcodes for Call Forward, Follow Me, Call Park/Unpark, and Call Pickup.
- Voicemail coverage, MWI support, and logging into voicemail system to retrieve messages.
- Roaming of Spectralink handsets from Spectralink IP-DECT Server 400 to Spectralink Base Station.
- Proper system recovery after a restart of Spectralink IP-DECT Server 400 and Spectralink handsets and loss of IP connectivity.

2.2. Test Results

All test cases passed with the following observations noted:

- Spectralink 7000 Series Handsets do not support the initiation of 3-party conference calls.
- SRTP is currently not supported between Spectralink IP-DECT Server 400 and Avaya IP Office.
- Avaya IP Office supports Direct Media between Spectralink handsets and other SIP endpoints while SRTP is disabled on Avaya IP Office. Direct Media for Spectralink calls to H.323 endpoints is not supported.

2.3. Support

For technical support on the Spectralink IP-DECT Server 400/6500, Spectralink Base Station, or Spectralink 7000 Series and Butterfly Handsets, contact Spectralink Technical Support via phone, email, or website.

- **Phone:** +1 (800) 775-5330
- **Web:** http://support.spectralink.com/
- **Email:** technicalsupport@spectralink.com

3. Reference Configuration

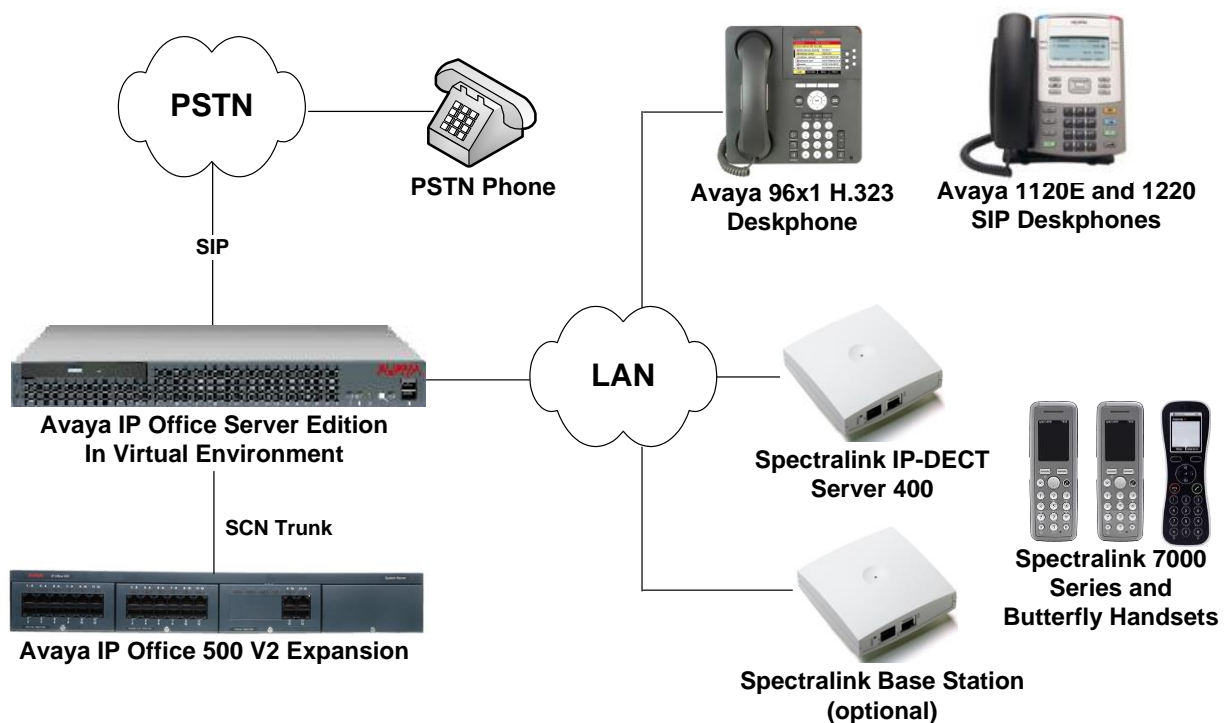**Figure 1** illustrates a sample configuration consisting of Spectralink IP-DECT Server 400, Spectralink Base Station (optional), and Spectralink 7000 Series and Butterfly Handsets with Avaya IP Office Server Edition and Avaya IP Office 500 V2 (Expansion System). The Spectralink handsets registered with Avaya IP Office via SIP through the Spectralink IP-DECT Server 400. The Spectralink Base Station is an optional component that was used to verify roaming of the Spectralink handsets. Avaya Embedded Voicemail served as the voicemail system. Avaya 96x1 Series H.323 Deskphones and an Avaya 1120E and 1220 SIP Deskphones were used for placing and receiving calls.

Figure 1: Spectralink IP-DECT Server 400, Spectralink Base Station, and Spectralink 7000 Series and Butterfly Handsets with Avaya IP Office Server Edition

4. Equipment and Software Validated

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

Equipment/Software	Release/Version
Avaya IP Office Server Edition	10.1.0.0.0 Build 237
Avaya IP Office 500 V2 (Expansion System)	10.1.0.0.0 Build 237
Avaya 96x1 Series IP Deskphone (H.323)	6.6401
Avaya 1120E Series SIP Deskphone	04.04.26.0
Avaya 1220 Series SIP Deskphone	04.04.26.0
Spectralink IP-DECT Server 400 (see note)	PCS17A
Spectralink Base Station	PCS17A
Spectralink 7202 and 7622 Handsets	17C
Spectralink Butterfly Handset	16D

Note: These Application Notes also apply to the Spectralink IP-DECT server 6500, which uses the same firmware as he Spectralink IP-DECT Server 400 and uses the same SIP stack and XML-RPC API for messaging. These two IP DECT server types differ in scalability only.

5. Configure Avaya IP Office Server Edition

This section provides the procedures for configuring Avaya IP Office Server Edition. The procedures include the following areas:

- Obtain LAN IP address
- Administer SIP registrar
- Administer SIP extension for Spectralink 7000 Series and Butterfly Handset
- Administer SIP user for Spectralink 7000 Series and Butterfly Handset

Note: This section covers the configuration of Avaya IP Office Server Edition, but the configuration of Avaya IP Office 500 V2 would be similar.

5.1. Obtain LAN IP Address

From the configuration tree in the left pane, select **System** to display the **System** screen for the IP Office Server Edition in the right pane. Select the **LAN1** tab, followed by the **LAN Settings** sub-tab in the right pane. Make a note of the **IP Address**, which will be used later to configure Spectralink IP-DECT Server 400.

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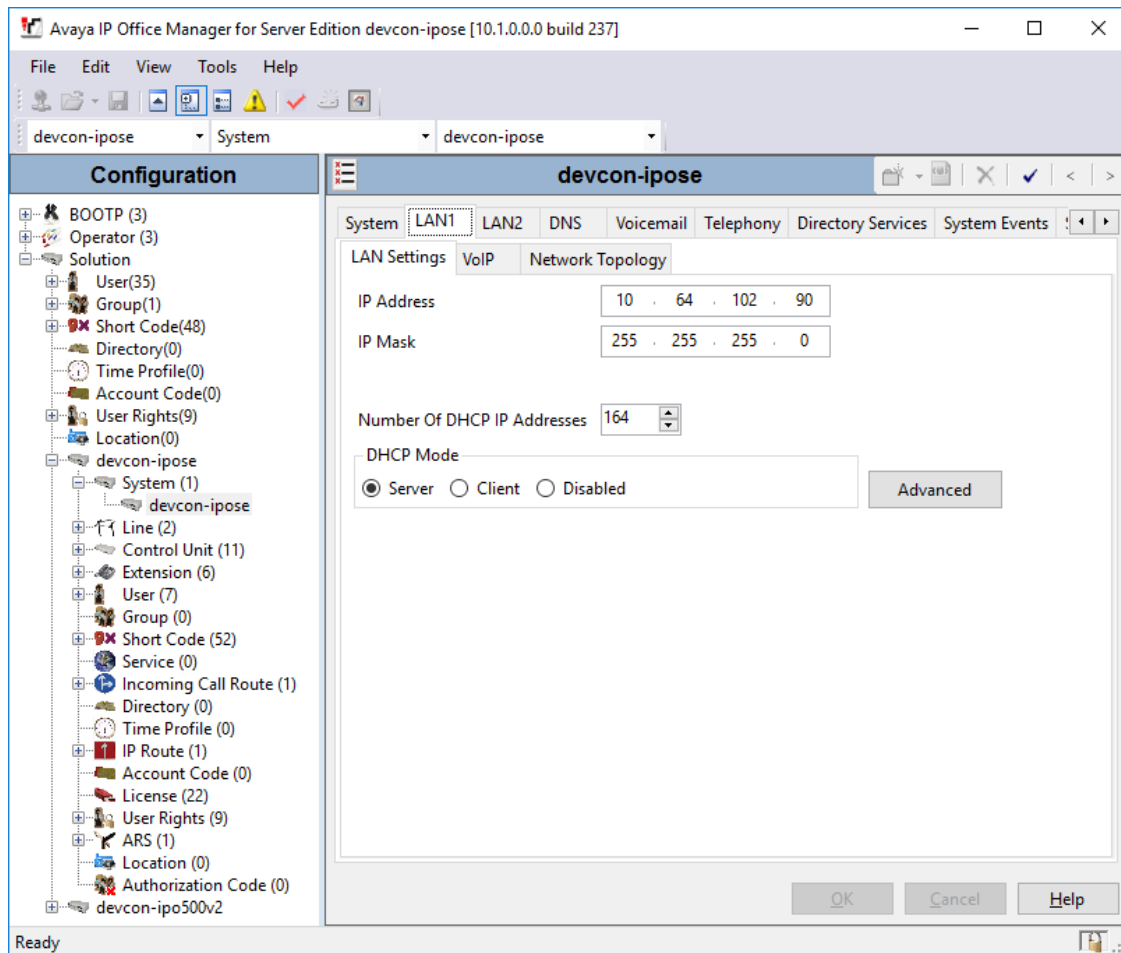
5.2. Administer SIP Registrar

Select the **VoIP** sub-tab. Ensure that **SIP Registrar Enable** is checked and enter a valid **Domain Name**. In the compliance testing, the **Domain Name** field was left blank so the LAN IP address was used. For the **Layer 4 Protocol**, enable **TLS** to use it as the transport between the Spectralink handsets and Avaya IP Office. UDP was also verified during the compliance test.

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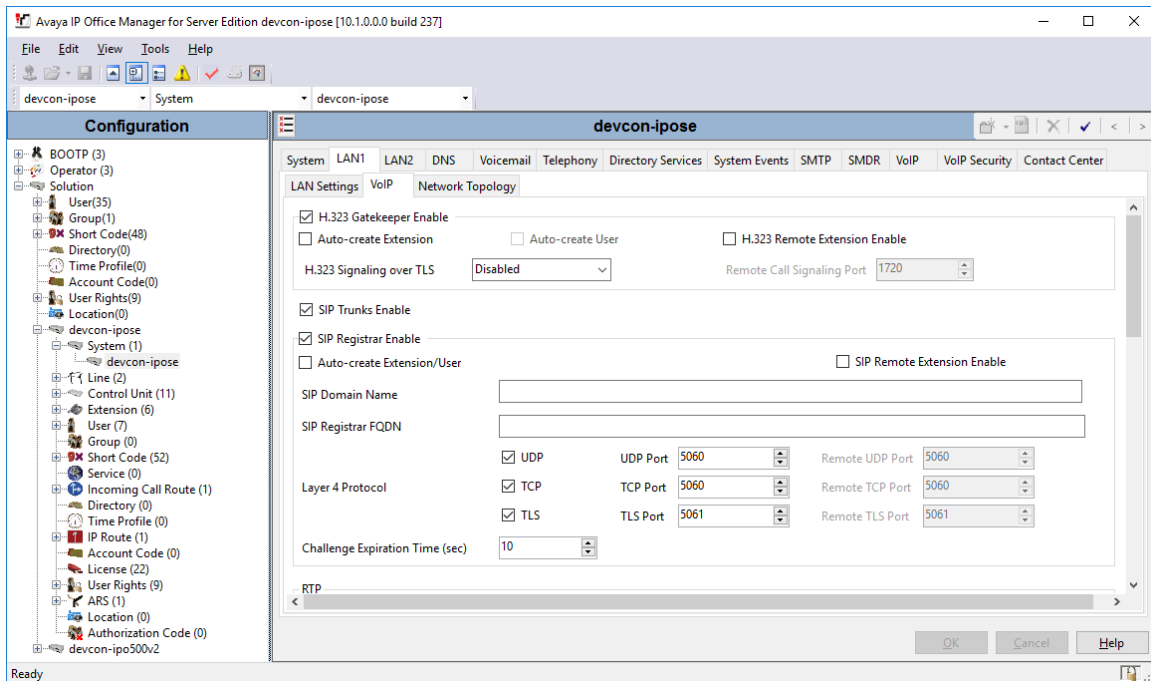
5.3. Administer SIP Extension for Spectralink 7000 Series or Butterfly Handset

From the configuration tree in the left pane, right-click on **Extension** and select **New → SIP Extension** (not shown) from the pop-up list to add a new SIP extension. Enter the desired extension for the **Base Extension** field as shown below. In this example, the Spectralink handset was assigned extension **41510**. This is the extension that the Spectralink handset will use to register with IP Office Server Edition.

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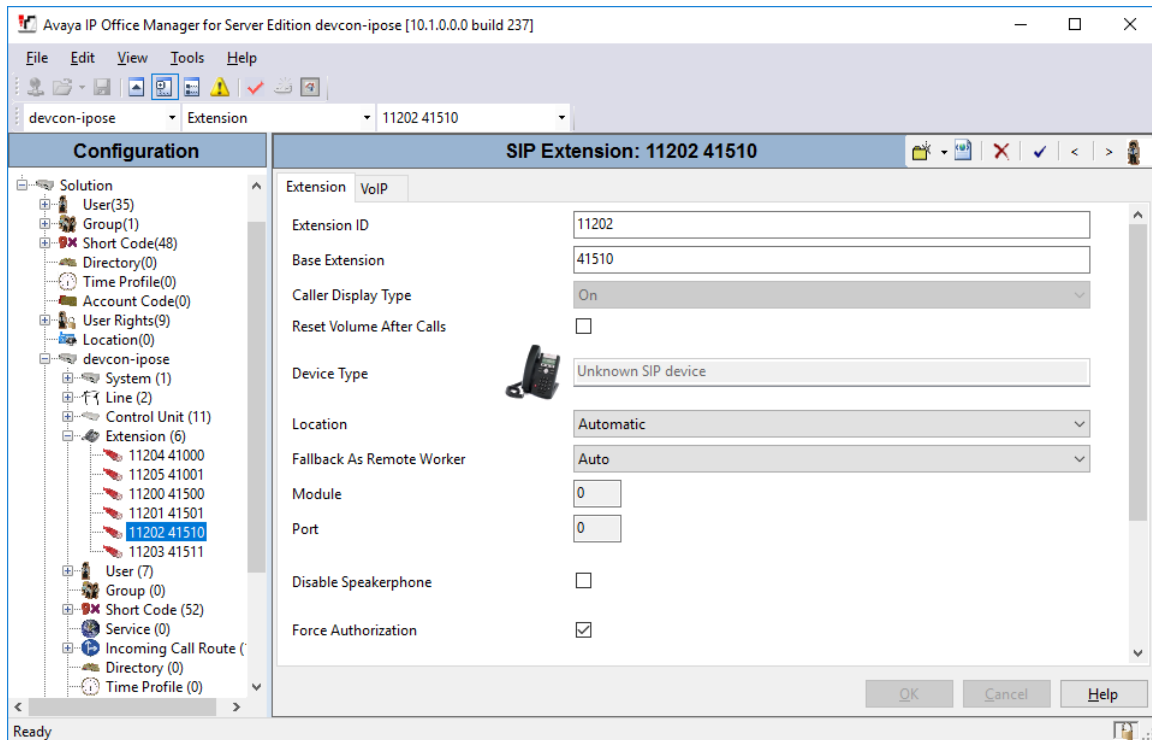
Select the **VoIP** tab and retain the default values in the all fields. During the compliance test, Spectralink 7000 Series and Butterfly handsets were tested using G.711 and G.729 codecs. Enable **Allow Direct Media Path** so that audio/RTP flows directly between two SIP endpoints without using media resources in Avaya IP Office.
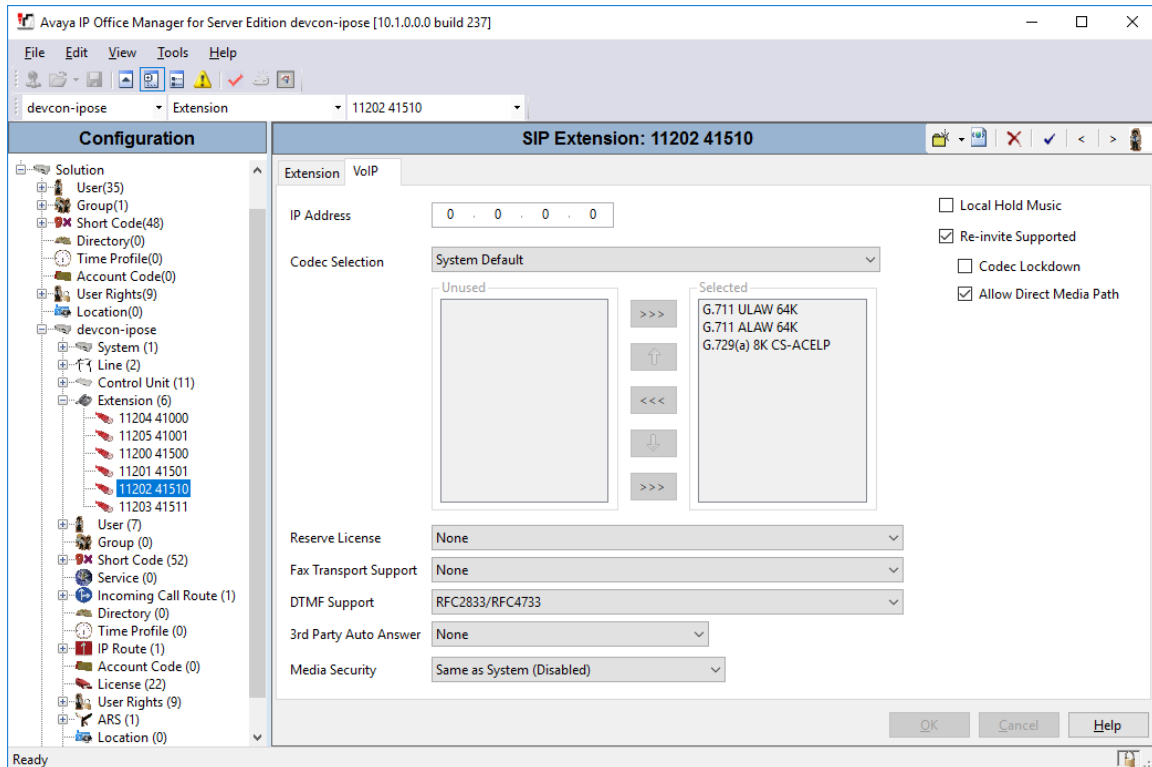
5.4. Administer SIP User for Spectralink 7000 Series or Butterfly Handset

From the configuration tree in the left pane, right-click on **User** and select **New** (not shown) from the pop-up list. Enter desired values for the **Name** and **Full Name** fields. For the **Extension** field, enter the SIP extension created above.

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Select the **Voicemail** tab and select **Voicemail On** to enable voicemail for the Spectralink handset. Specify a **Voicemail Code** to be used when logging into voicemail.

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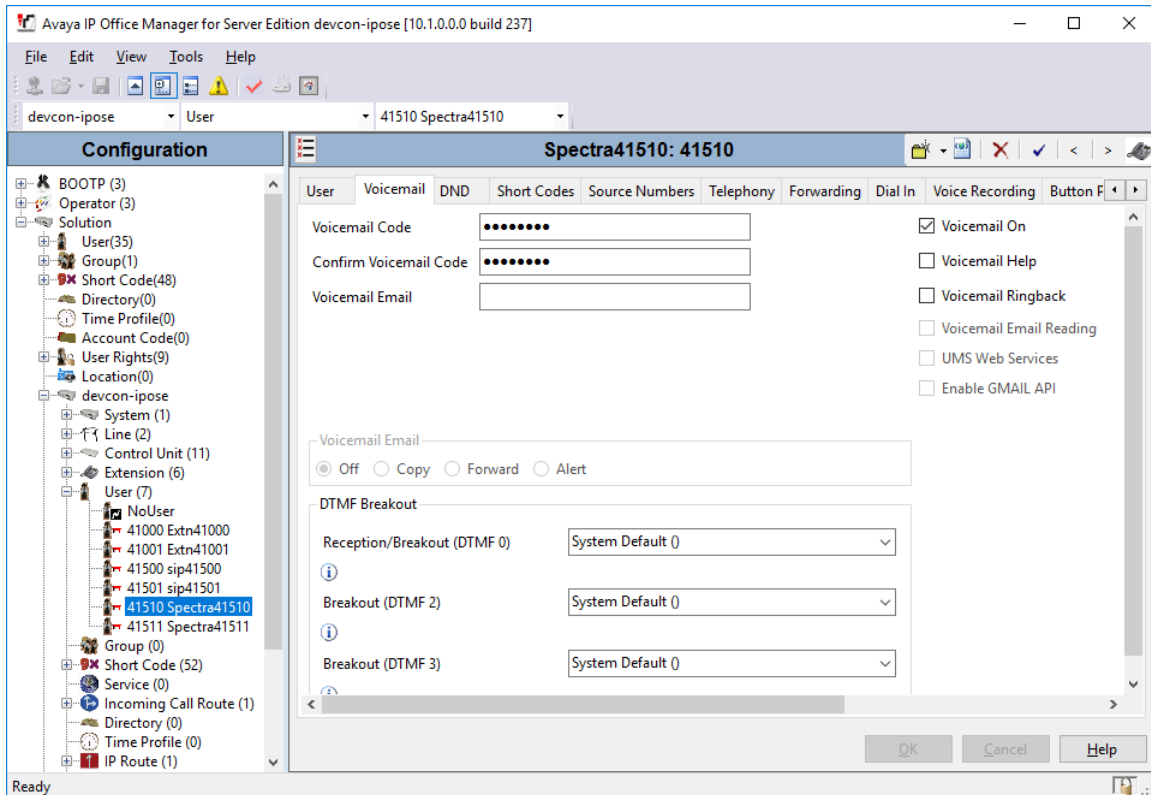
Select the **Telephony** tab followed by the **Call Settings** sub-tab. Note the settings below for the user. Note that **Call Waiting On** was enabled.
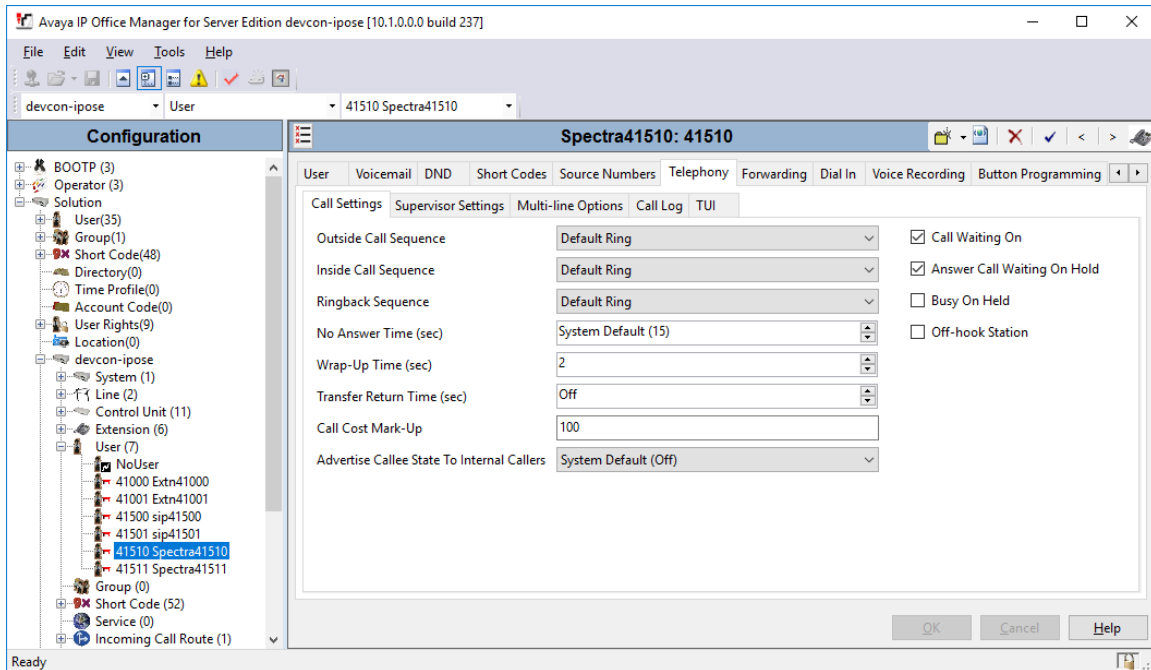
Select the **Supervisor Settings** tab and enter a desired **Login Code**. The **Login Code** is the password that will be used by the Spectralink handset to register with IP Office.
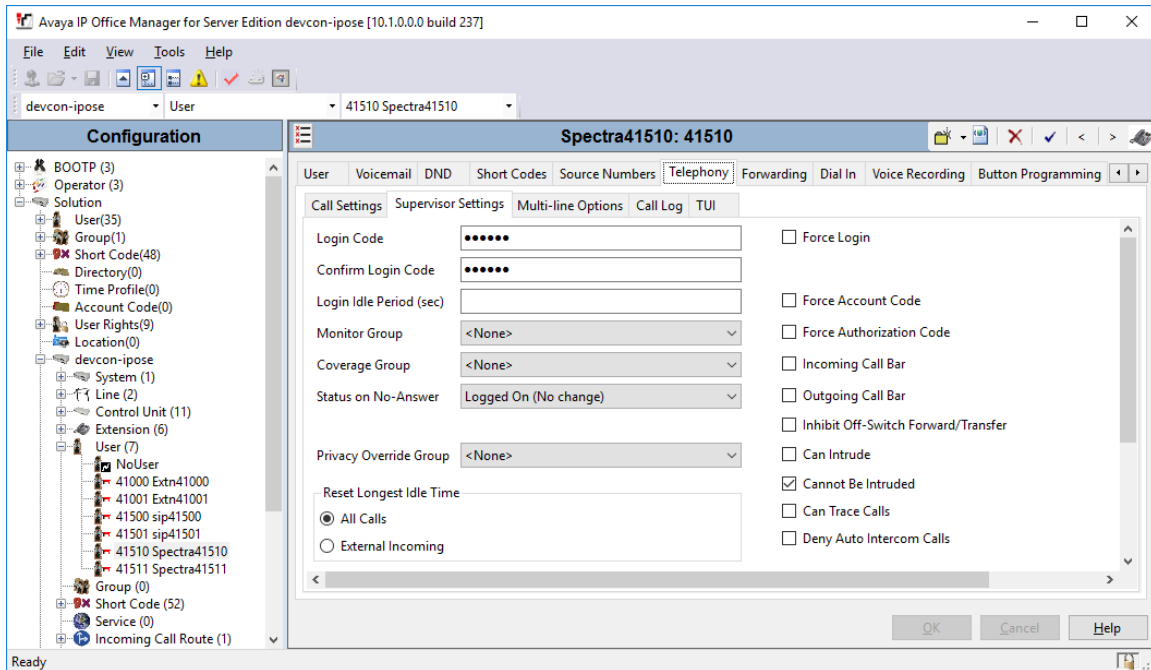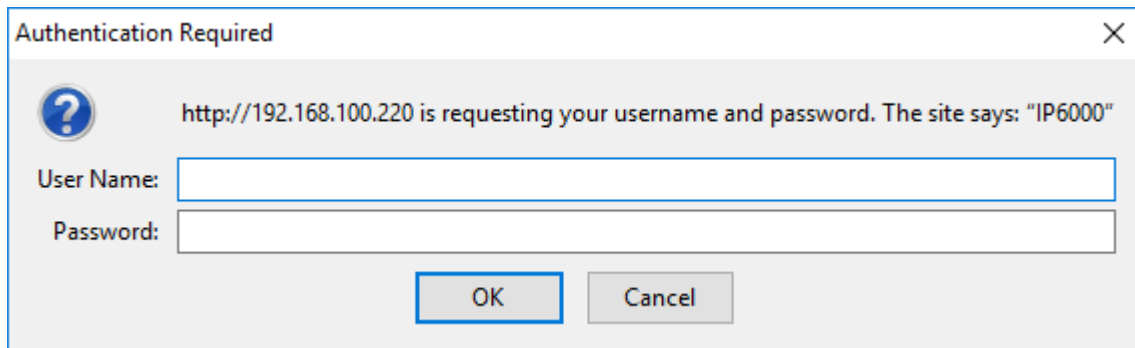
6. Configure Spectralink IP-DECT Server 400

This section provides the procedures for configuring Spectralink IP-DECT Server 400. The procedures fall into the following areas:

- Launch web interface.
- Administer network settings.
- Administer SIP settings, including SIP port, transport protocol, Message Waiting Indicator (MWI) and audio codecs.
- Add SIP Users.
- Import TLS certificate (optional). Required to use TLS transport.

6.1. Launch Web Interface

Spectralink IP-DECT Server 400 was configured through the web interface by using the URL "https://ip-address" in an Internet browser window, where "ip-address" is the IP address of IP-DECT Server 400. Log in using the appropriate credentials and then click **OK**.
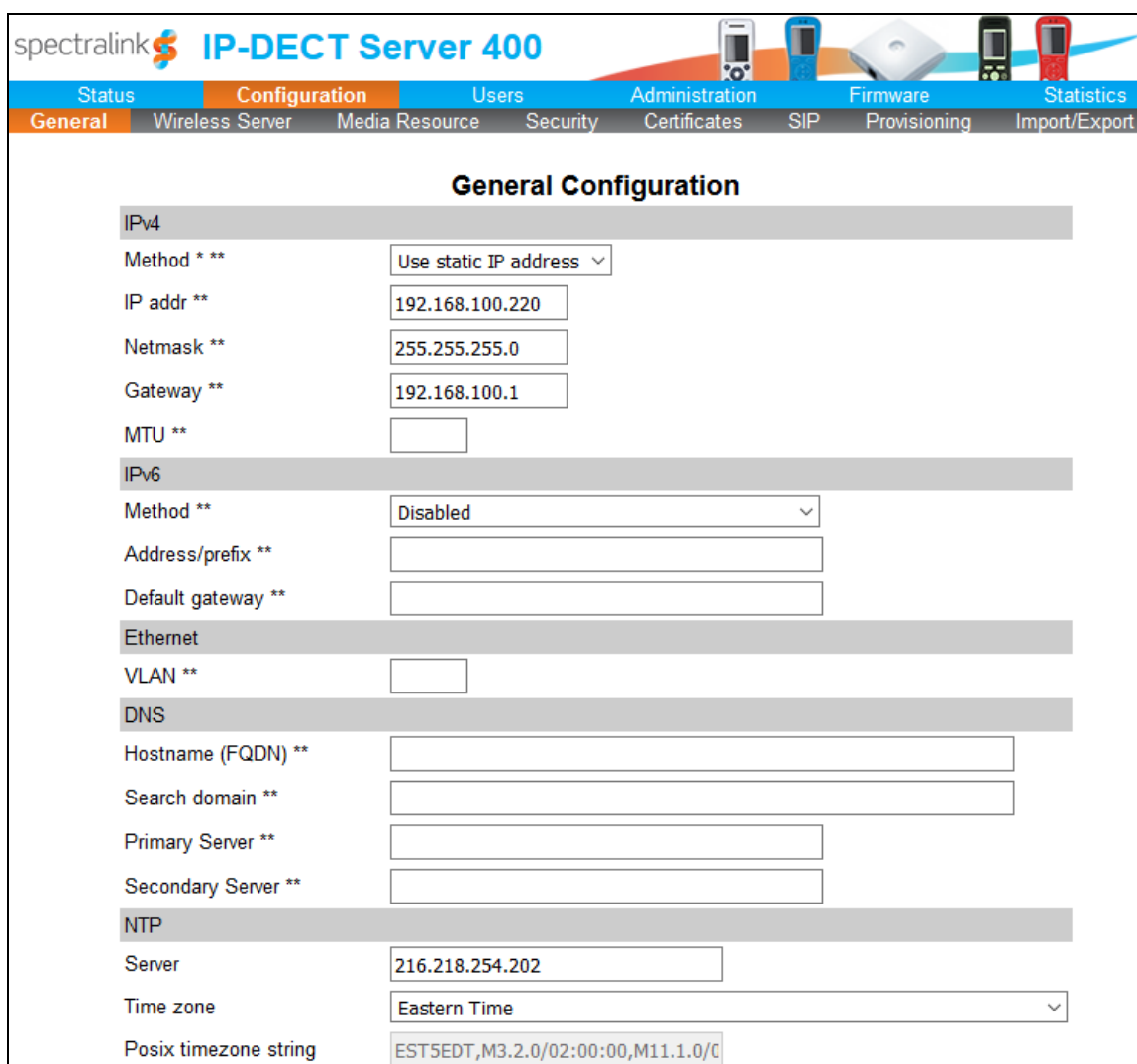
6.2. Administer Network Settings

To configure network settings, click **Configuration** and then select the **General** tab. The Spectralink IP-DECT server 400 is pre-configured to use DHCP. However, for the compliance test, a static IP address was used as shown below.

If TLS transport is to be used, verify that the NTP server is configured properly to avoid any issues with the TLS certificates installed in **Section 6.5**.

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6.3. Administer SIP Settings

To configure SIP settings, click **Configuration** and then select the **SIP** tab. Configure the following fields:

- **Local port**   Specify UDP port 5060 or TLS port 5061 depending on the transport protocol to be used. This also matches the ports configured on IP Office in **Section 5.2**.
- **Transport**   Specify the transport protocol, UDP or TLS.
- **TCP ephemeral port**
  in contact address   Enable this field for TLS transport; otherwise, disable it.

Retain the default values for the other fields.

Scroll down to the **Message waiting indication** and **Media** sections. In the **Message waiting indication section**, select the **Enable indication** and **Enable subscription** check boxes as shown below. This is required to support updates to the Message Waiting Indicator (MWI) lamp. In the **Media** section, allow G.711 and G.729 as shown below.

DTMF signalling	
Send as RTP (rfc2833)	☑
Offered rfc2833 payload type	96
Send as SIP INFO	☐
Tone duration(msec) *	270
Message waiting indication	
Enable indication	☑
Enable subscription **	☑
Subscription expire(sec) *	3600
Media	
Packet duration(msec) *	20 ∨
Media type of service (TOS/Diffserv) *	184
Media 802.1p Class-of-Service *	5
Port range start * **	58000
Codec priority *	1: G729/8000 ∨
	2: PCMU/8000 ∨
	3: None ∨
	4: None ∨
	5: None ∨
	6: None ∨
SDP answer with preferred codec	☐
SDP answer with a single codec	☐
Ignore SDP version	☐
Enable media encryption (SRTP) **	☑
Require media encryption (SRTP)	☐
Include lifetime in SDES offers	☐
Include MKI in SDES offers	☐
Enable ICE	☐
Enable TURN	☐
TURN server	
TURN username	
TURN password	

Use the default settings for the **Call Status** section shown below. Click **Save**.

6.4. Add SIP Users

To create a SIP user for one of the Spectralink handsets, click **Users** and then click **List Users**. Next, click on the **New** button shown below.

In the **User** page shown below, configure the following fields.

Under **DECT Device**:
- **IPEI** — Type the IPEI number of the handset.

Under **SIP**:
- **Username / Extension** — Set a user name or extension for handset.
- **Domain** — Specify the LAN1 IP address of IP Office (e.g., *10.64.102.90*) shown in **Section 5.1**.
- **Displayname** — Specify a display name for the handset (e.g., *Spectralink 1*).
- **Authentication user** — Set to the SIP extension configured in **Section 5.3**.
- **Authentication password** — Enter the password configured in the **Login Code** field in **Section 5.4**.

Retain the default values for the other fields. Click **Save**.

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6.5. Import TLS Certification (Optional)

This section is required for TLS transport and covers how to import the TLS certificate into IP-DECT Server 400. For the compliance test, Avaya Aura® System Manager was used as the certificate authority. The TLS certificate was exported from System Manager as described in Chapter 5, Managing Security, of references **[2]**.

To import the TLS certificate, click **Configuration** and then click **Certificates**. In the **CA Certificates** section, click the **Browse** button to select the TLS certificate, and then click **Import List** to import the certificate. Once imported, the certificate will be listed as shown below. Note the *SystemManager CA* certificate.

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7. Verification Steps

This section provides the tests that can be performed to verify proper configuration of Avaya IP Office Server Edition and Spectralink IP-DECT Server 400.

1. Verify that the Spectralink handset has successfully registered with IP Office Server Edition. In **IP Office System Status**, select the extension of the Spectralink handset in the left pane and verify that the **Current State** is *Idle* as shown below.

2. The registration status may also be viewed on the IP-DECT Server 400 web interface by navigating to **Users** as shown below.

3. Verify basic telephony features by establishing calls between the Spectralink handset and another phone.

8. Conclusion

These Application Notes described the configuration steps required to integrate Spectralink IP-DECT Server 400 with Avaya IP Office Server Edition. Spectralink IP-DECT 400 allowed Spectralink 7000 Series and Butterfly Handsets to register with Avaya IP Office and establish calls to H.323 stations, SIP stations, and the PSTN. In addition, basic telephony features were verified. All feature and serviceability test cases were completed successfully with observations noted in **Section 2.2**.

9. References

This section references the Avaya and Spectralink documentation relevant to these Application Notes. The Avaya product documentation is available at http://support.avaya.com and the Spectralink documentation is available at http://support.spectralink.com/products.

[1] *Administering Avaya IP Office Platform with Web Manager*, Release 10.0, September 2016.
[2] *Administering Avaya Aura® Session Manager*, Release 7.0, Issue 2, May 2016.
[3] *Spectralink IP-DECT Server 400 Installation and Configuration Guide,* 14219101 version 4.0, K005, September 2015.

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