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Application Notes for Spectralink Versity 97 Series Enterprise Wi-Fi Smartphones with Avaya IP Office Server Edition - Issue 1.0

Abstract

These Application Notes describe the configuration steps required to integrate the Spectralink Versity 97 Series Enterprise Wi-Fi Smartphones with Avaya IP Office Server Edition 11.1. Spectralink Versity 97 Series Enterprise Wi-Fi Smartphones register with Avaya IP Office Server Edition as SIP endpoints. The following Spectralink Versity 97 Series Wi-Fi Smartphones were used for the compliance test: Versity 9740 and Versity 9753. Spectralink Versity 97 Series Enterprise Wi-Fi Smartphones communicate with Avaya IP Office Server Edition over an 802.11 wireless network.

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 Avaya DevConnect Program.

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1. Introduction

These Application Notes describe the configuration steps required to integrate the Spectralink Versity 97 Series Enterprise Wi-Fi Smartphones with Avaya IP Office Server Edition 11.1. Spectralink Versity 97 Series Enterprise Wi-Fi Smartphones register with Avaya IP Office Server Edition as SIP endpoints. The following Spectralink Versity 97 Series Wi-Fi Smartphones were used for the compliance test: Versity 9740 and Versity 9753. Spectralink Versity 97 Series Enterprise Wi-Fi Smartphones communicate with Avaya IP Office Server Edition over an 802.11 wireless network.

The Avaya IP Office Server Edition configuration consisted of two Avaya IP Office systems, a primary Linux server at the Main site and an expansion IP Office 500 V2 at the Remote site that were connected via a Small Community Network (SCN) trunk. For the compliance test, Spectralink Versity 97 Series Enterprise Wi-Fi Smartphones were registered at each site.

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 Versity, Avaya SIP / H.323 deskphones, and the PSTN, and exercising basic telephony features, such as hold, mute, transfer and conference. In addition, calls were made between the primary and expansion IP Office systems. Additional telephony features, such as call forward, call coverage, call park/unpark, and call pickup were also verified using IP Office short codes.

The serviceability testing focused on verifying that the Spectralink Versity came back into service after rebooting the access point and rebooting the phones.

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 this Application Note, the interface between Avaya systems and Spectralink Versity 97 Series Enterprise Wi-Fi Smartphones used TLS/SRTP encryption features.

2.1. Interoperability Compliance Testing

Interoperability compliance testing covered the following features and functionality:

- SIP registration of Spectralink Versity with IP Office Server Edition and IP Office 500 V2 Expansion System.
- Calls between Spectralink Versity and Avaya SIP / H.323 deskphones with Direct IP Media (Shuffling) enabled and disabled.
- Calls between Spectralink Versity and Avaya SIP / H.323 deskphones on IP Office Server Edition and IP Office 500 V2 Expansion System.
- Calls between the Spectralink Versity and the PSTN.
- G.711, G.729, and G.722 codec support.
- Support of TLS transport protocol for secure SIP signaling.
- Support of SRTP for secure media.
- Proper recognition of DTMF tones.
- Basic telephony features, including hold, mute, redial, multiple calls, blind and attended transfer, and 3-party conference.
- Call transfers and conference calls across the primary and expansion IP Office systems while Spectralink Versity was registered with the primary and expansion IP Office systems.
- Extended telephony features using Avaya IP Office short codes for wakeup calls, Do Not Disturb, Call Forward, Follow Me, Call Park/Unpark, and Call Pickup.
- Voicemail coverage, MWI support, and logging into voicemail system to retrieve voice messages.
- Use of programmable buttons on the Spectralink Versity.
- Proper system recovery after a restart of the Spectralink Versity or a reboot of the access point.

2.2. Test Results

All test cases passed.

2.3. Support

For technical support and information on Spectralink Versity 97 Series Enterprise Wi-Fi Smartphones, contact Spectralink technical support at:

- Phone: 1 (800) 775-5330
- Website: https://support.spectralink.com/s/
- Email: technicalsupport@spectralink.com

3. Reference Configuration

Figure 1 illustrates a sample configuration consisting of Spectralink Versity 97 Series Enterprise Wi-Fi Smartphones with Avaya IP Office Server Edition at the Main site and an Avaya IP Office 500 V2 Expansion System at the Remote site. Spectralink Versity and Avaya H.323/SIP deskphones registered with Avaya IP Office Server Edition and Avaya IP Office 500 V2 Expansion System as SIP endpoints using TLS to secure SIP signaling. SRTP was used to secure the media. An access point was used to provide Spectralink Versity with access to the 802.11 wireless network. In addition, a DHCP server (not shown) was used to provide IP network settings to Spectralink Versity.
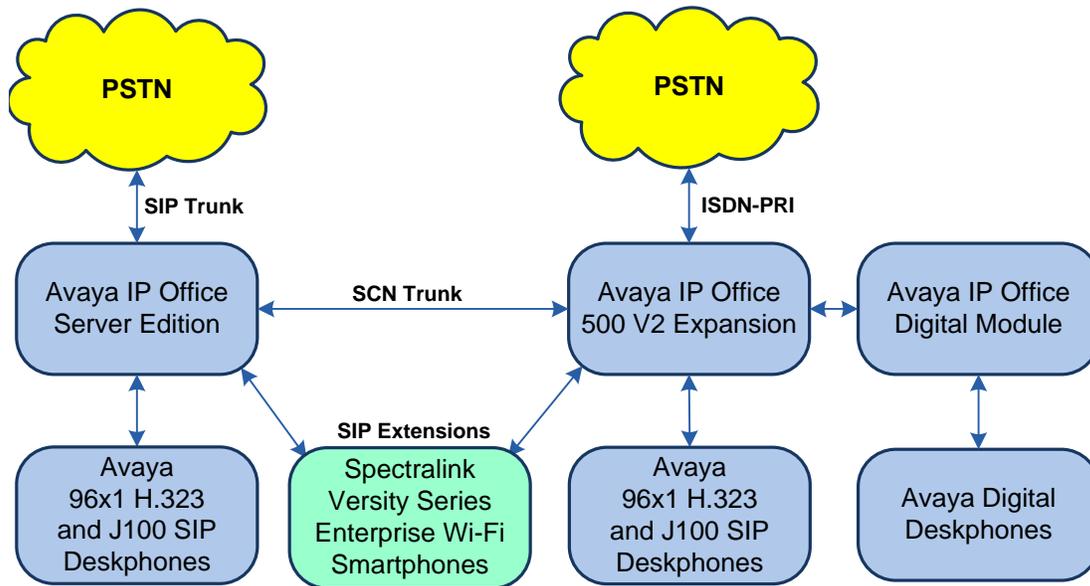
Figure 1: Spectralink Versity 97 Series Enterprise Wi-Fi Smartphones with Avaya IP Office

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	11.1.2.4.0 build 18
Avaya IP Office 500 V2 Expansion System	11.1.2.4.0 build 18
Avaya 96x1 Series IP Deskphones	6..8.5.2.3 (H.323)
Avaya J129 Deskphone	4.0.10.30.2 (SIP)
Spectralink Versity 97 Series Enterprise Wi-Fi Smartphones on Android 13	23.379684-a11 (Biz Phone Application)

Compliance Testing is applicable when the tested solution is deployed with a standalone IP Office 500 V2 and also when deployed with IP Office Server Edition in all configurations.

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 Versity
- Administer SIP user for Spectralink Versity

Note: This section covers the configuration of Avaya IP Office Server Edition, but the configuration is the same for Avaya IP Office 500 V2 Expansion System.

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 Versity.

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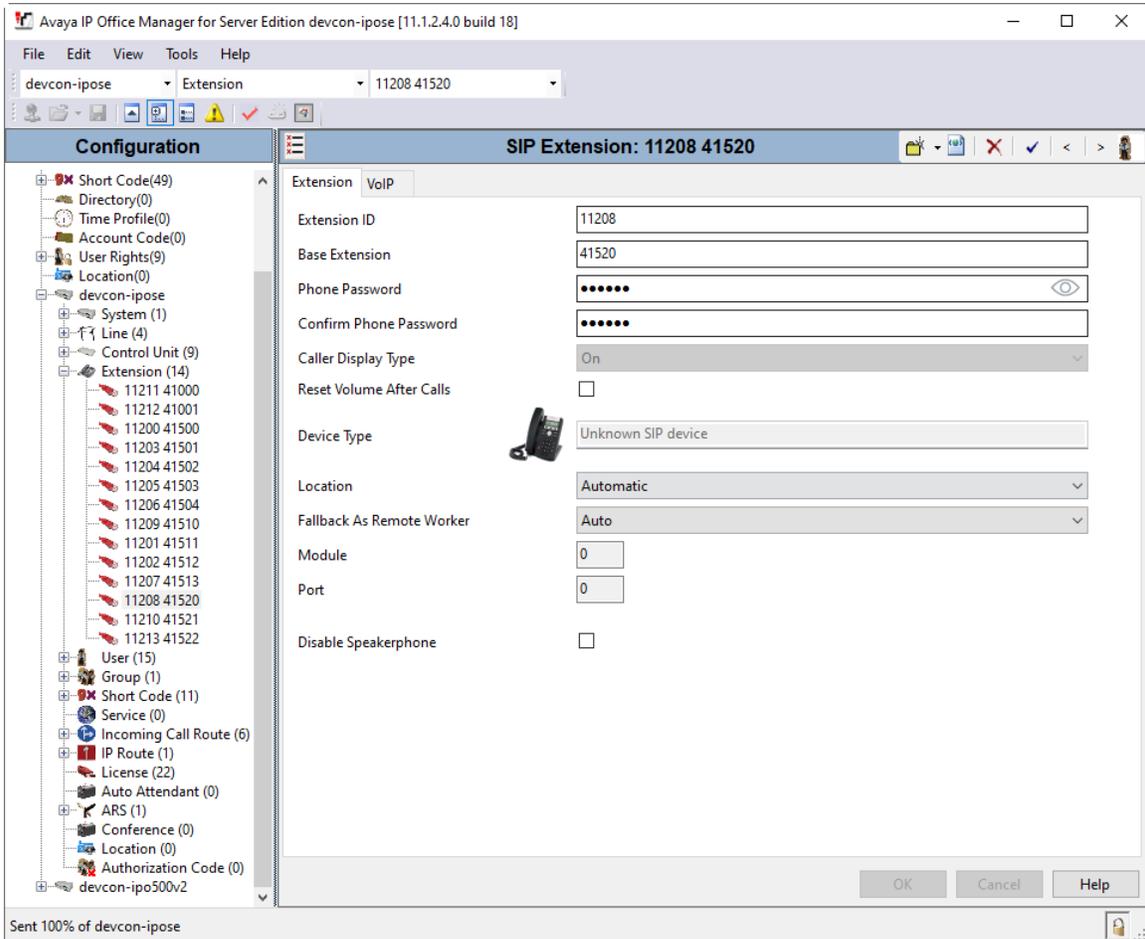
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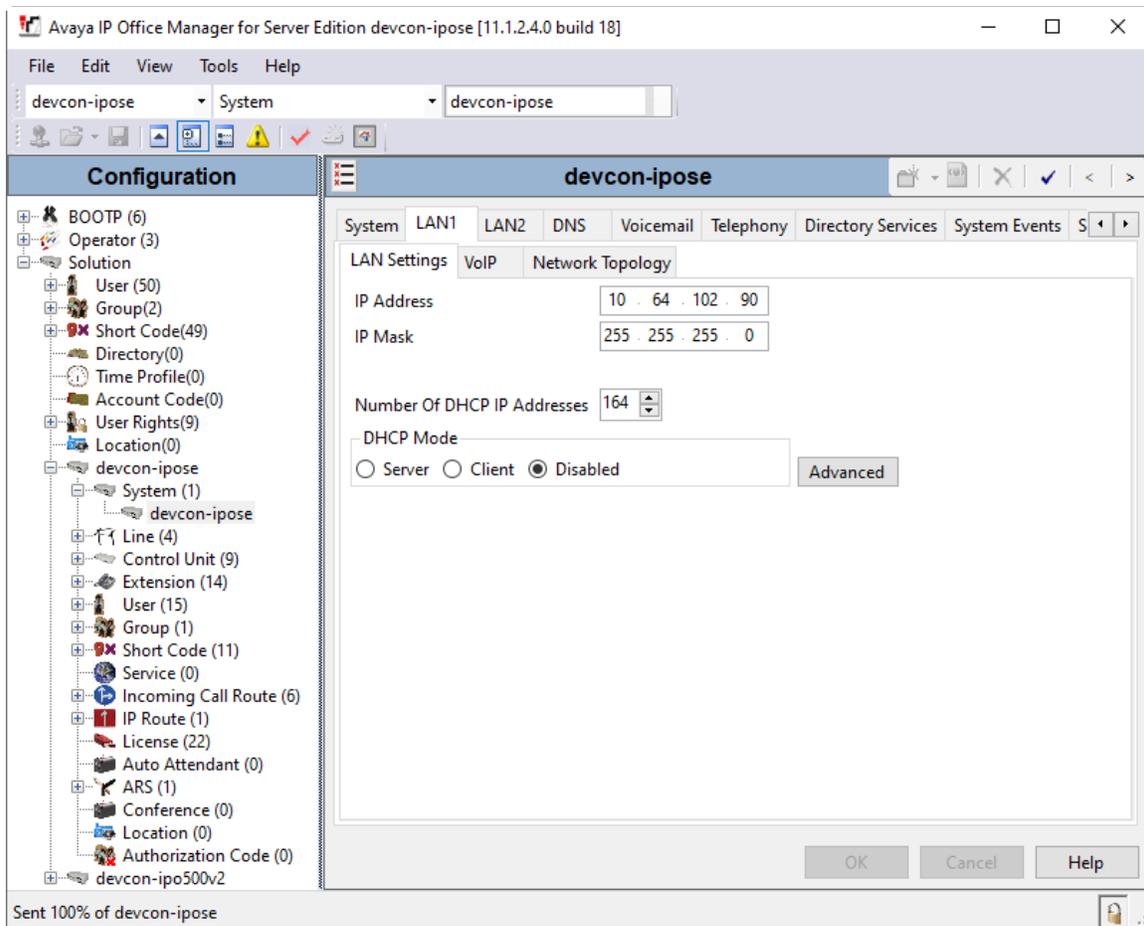
5.2. Administer SIP Registrar

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 set to *avaya.com*. TLS transport protocol was enabled for the **Layer 4 Protocol**, which was used by Spectralink Versity.
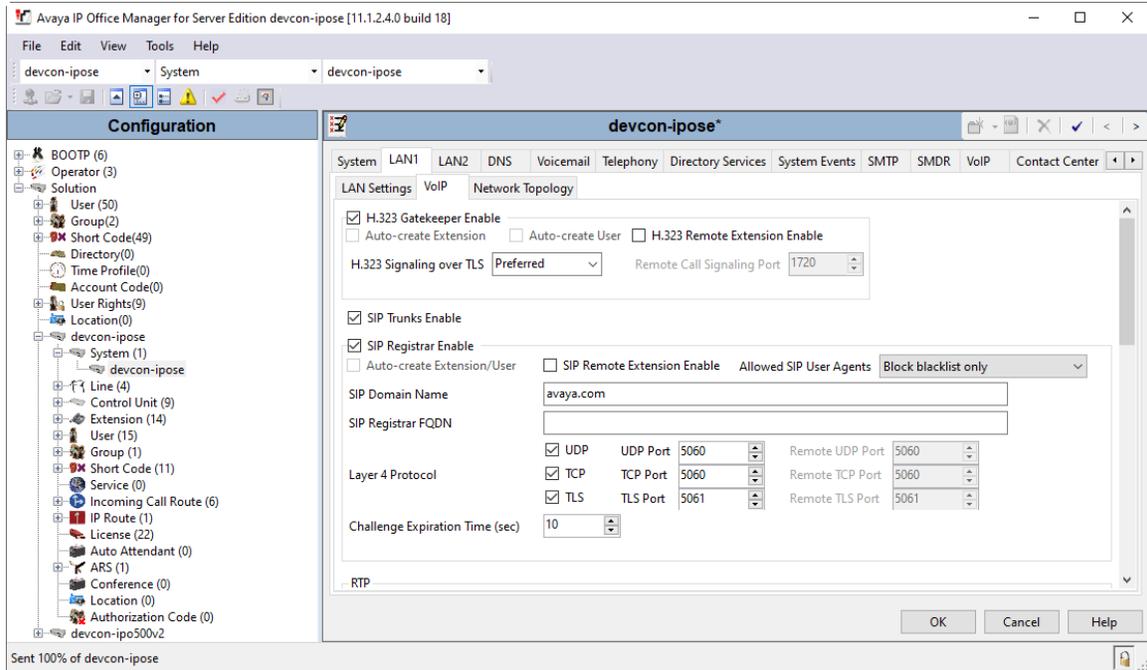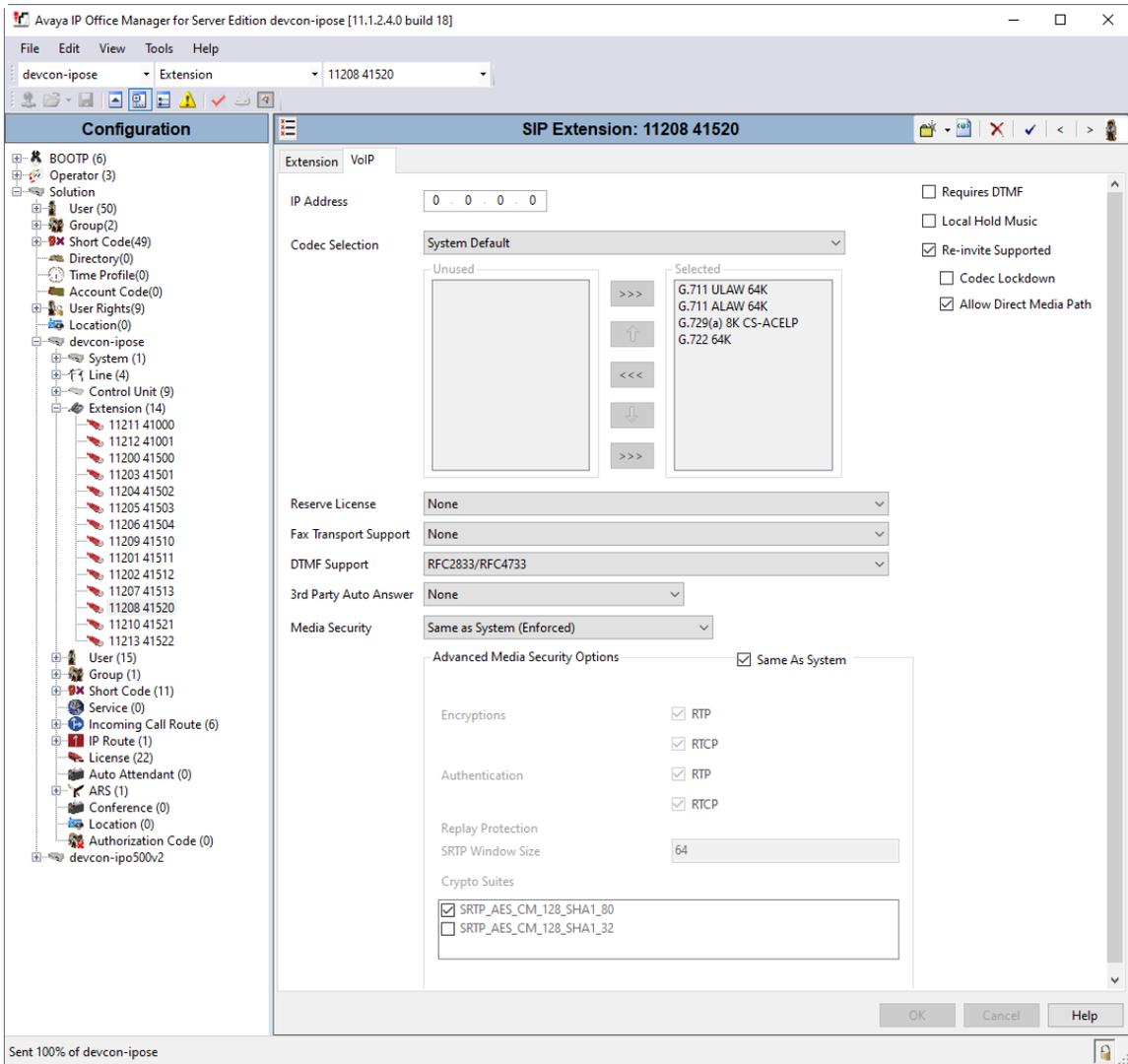
5.3. Administer SIP Extension for Spectralink Versity

From the configuration tree in the left pane, right-click on **Extension** and select **New → SIP** 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, Spectralink Versity was assigned extension *41520*, which Spectralink Versity will use to register with IP Office Server Edition. The **Phone Password** is the password that will be used by Spectralink Versity to register with IP Office Server Edition. The **Phone Password** is configured in the **Registration 1 → Password** parameter on Spectralink Versity.

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Select the **VoIP** tab. The system default was used for the codec selection. During the compliance test, Spectralink Versity was tested with G.711, G.729, and G.722 codecs. Enable **Allow Direct Media Path** so that audio/RTP flows directly between two SIP endpoints without using media resources in Avaya IP Office Server Edition. Calls to Avaya H.323 deskphones did not use a direct media path, because Avaya H.323 deskphones do not support encrypted SRTCP.

Media Security was set to *Enforced* and encrypted SRTCP was enabled in the **Advanced Media Security Options** section.

5.4. Administer SIP User for Spectralink Versity

From the configuration tree in the left pane, right-click on **User** and select **New** 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.
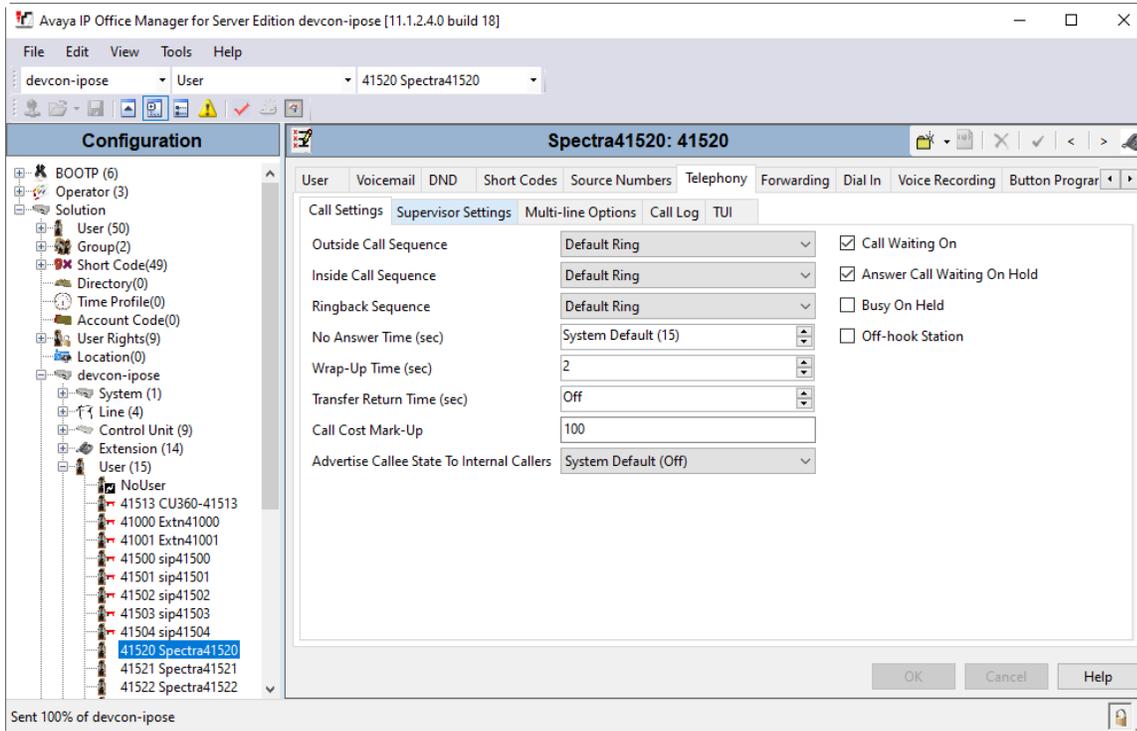
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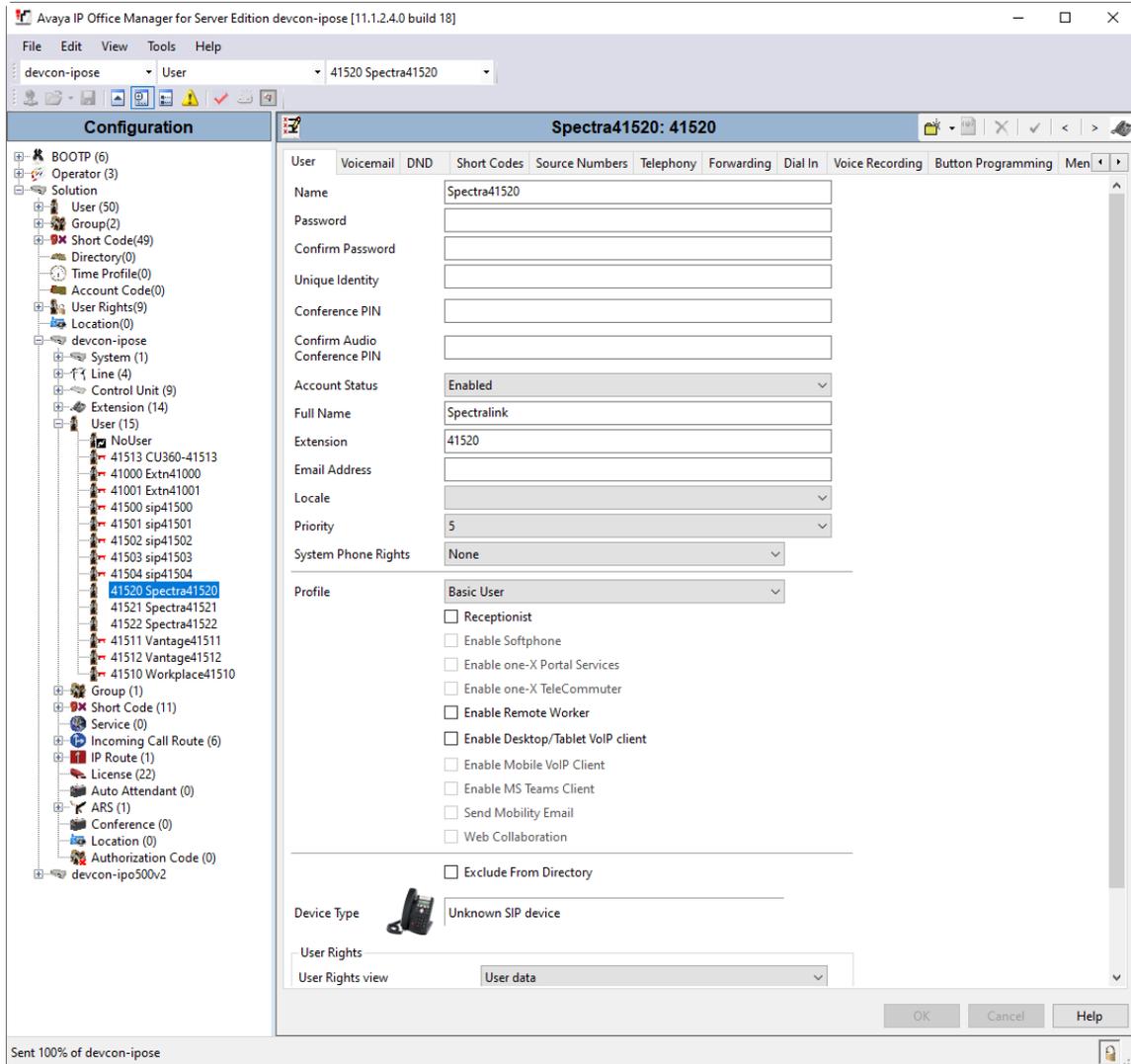
Select the **Voicemail** tab and select **Voicemail On** to enable voicemail for Spectralink Versity. Specify a **Voicemail Code**, which is required when logging into voicemail.
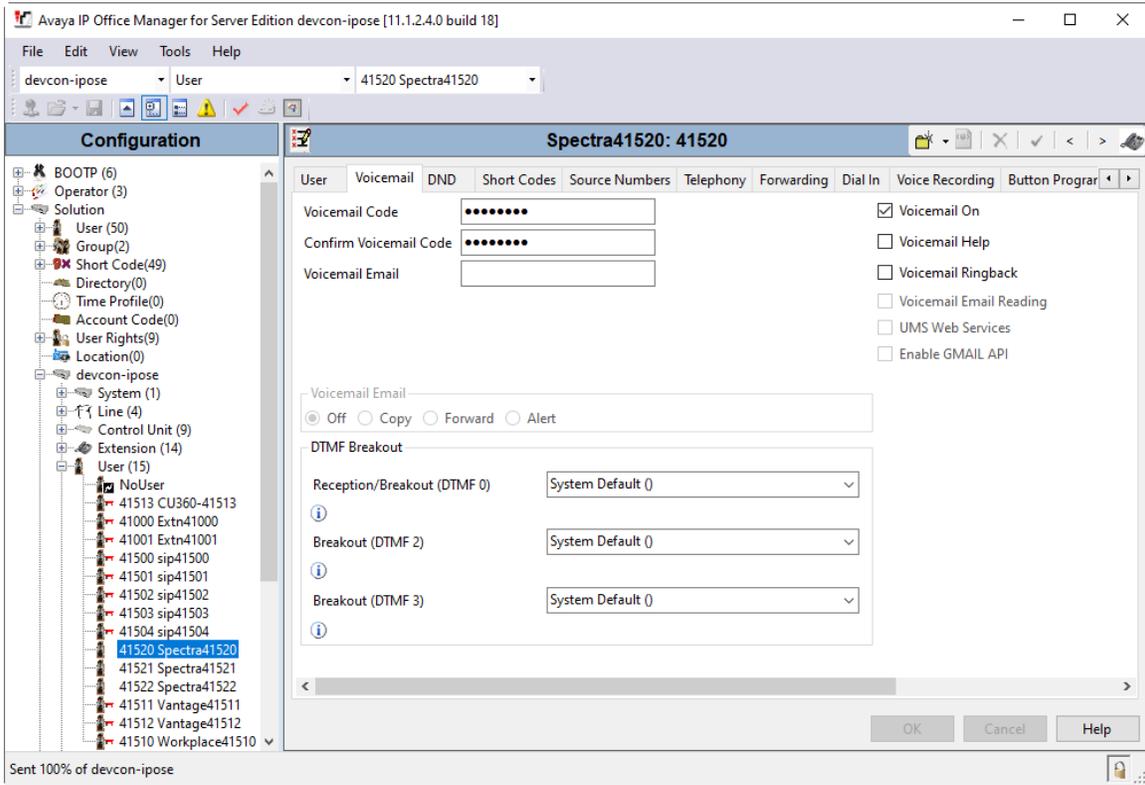
Select the **Telephony** tab followed by the **Call Settings** sub-tab. Note the settings below for the user.

Note: Call Waiting is required to allow a secondary incoming call to Spectralink Versity; otherwise, a second incoming call would be denied.

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6. Configure Avaya 96x1 and J100 Series SIP Deskphones

The `46xxsettings.txt` file is used to specify certain system parameters. It is used by Avaya H.323 and SIP Deskphones, but this section will cover four parameters that are applicable to Avaya 96x1 and J100 Series SIP Deskphones only.

- **SDPCAPNEG**   Specifies whether SDP capability negotiation is supported. By default, it is enabled.
- **ENFORCE_SIPS_URI**   Enable this option to support SIPS URI.
- **MEDIAENCRYPTION**   Specifies the media encryption (SRTP) options supported. In the example below, *aescm128-hmac80* (option 1) is supported as specified in the **Media Security** settings of 96x1 H.323/SIP Extensions (not shown).
- **ENCRYPT_SRTCP**   Enable this option to encrypt SRTCP.

```
## SDPCAPNEG specifies whether or not SDP capability negotiation is enabled.
##  Value  Operation
##    0    SDP capability negotiation is disabled
##    1    SDP capability negotiation is enabled (default)
##  This parameter is supported by:
##      J129 SIP R1.0.0.0 and later
##      96x1 SIP R6.0 and later
##      H1xx SIP R1.0 and later
##      96x0 SIP R2.6 and later
SET SDPCAPNEG 1
##
## ENFORCE_SIPS_URI specifies whether a SIPS URI must be used for SRTP.
##  Value  Operation
##    0    Not enforced
##    1    Enforced (default)
##  This parameter is supported by:
##      J129 SIP R1.0.0.0 and later; not applicable for 3PCC environment
##      96x1 SIP R6.0 and later
##      H1xx SIP R1.0 and later
##      96x0 SIP R2.6 and later
SET ENFORCE_SIPS_URI 1
##
## MEDIAENCRYPTION specifies which media encryption (SRTP) options will be supported.
##  Up to 2 or 3 options may be specified in a comma-separated list.
##  2 options are supported by:
##     1. Prior releases to 96x1 SIP 7.0.0
##     2. H1xx SIP R1.0 and later
##     3. 96x0 SIP R1.0 to R2.6.14.1
##  3 options are supported by 96x1 SIP R7.0.0 and later, H1xx SIP R1.0.1 and later
##  and J129 SIP R1.0.0.0 and later.
##  For 96x0 SIP R2.6.14.5 and later, up to 3 options may be specified, but only the
##  first two supported options are used.
##  Options should match those specified in CM IP-codec-set form.
##     1 = aescm128-hmac80
##     2 = aescm128-hmac32
##     3 = aescm128-hmac80-unauth
##     4 = aescm128-hmac32-unauth
##     5 = aescm128-hmac80-unenc
##     6 = aescm128-hmac32-unenc
##     7 = aescm128-hmac80-unenc-unauth
##     8 = aescm128-hmac32-unenc-unauth
```

```
##      9 = none (default)
##    10 = aescm256-hmac80
##    11 = aescm256-hmac32
##  Options 10 and 11 are supported by 96x1 SIP R7.0.0 and later, H1xx SIP R1.0.1 and
##  later and J129 SIP R1.0.0.0 and later.
##  Note: The list of media encryption (SRTP) options is ordered from high (left) to
##  the low (right) options. The phone will publish this list in the SDP-OFFER
##  or choose from SDP-OFFER list according to the list order defined in
##  MEDIAENCRYPTION. Please note that  Avaya Communication Manager has the capability
##  to change the list order in the SDP-OFFER (for audio only) when the SDP-OFFER pass
##  through CM.
##  This parameter is supported by:
##      Avaya Equinox 3.1.2 and later; supported values: 1,2,9,10 and 11. The default
##      value is 1,2,9.
##      Avaya Vantage Basic Application SIP R1.0.0.0 and later; supported values:
##      1,2,9,10 and 11. The default value is 1,2,9.
##      J129 SIP R1.0.0.0 and later
##      96x1 SIP R6.0 and later
##      H1xx SIP R1.0 and later
##      96x0 SIP R1.0 and later
SET MEDIAENCRYPTION 1,9
##
## ENCRYPT_SRTCP specifies whether RTCP packets are encrypted or not. SRTCP is only
## used if SRTP is enabled using
## MEDIAENCRYTION (values other than 9 (none) are configured).
## This parameter controls RTCP encryption for RTCP packets exchanged between peers.
## RTCP packets sent to Voice Monitoring Tools are always sent unencrypted.
##  Value  Operation
##   0          SRTCP is disabled (default).
##   1      SRTCP is enabled.
##  This parameter is supported by:
##      Avaya Equinox 3.1.2 and later
##      96x1 SIP R7.1.0.0 and later
##      Avaya Vantage Basic Application SIP R1.0.0.0 and later
##      J129 SIP R1.0.0.0 and later
SET ENCRYPT_SRTCP 1
```

In IP Office, **Media Encryption** for the following extensions were set as follows:

Device	Media Security	Media Settings
96x1 Series Deskphones (H.323)	Enforced	Disabled Encrypted SRTCP
J100 Series Deskphones (SIP)	Enforced	Enabled Encrypted SRTCP
Web Socket	Enforced	Enabled Encrypted SRTCP

7. Configure Spectralink Versity 97 Series Enterprise Wi-Fi Smartphones

This section covers the SIP configuration of the Spectralink Versity 97 Series Enterprise Wi-Fi Smartphones. Refer to **[2]** for more information on configuring Spectralink Versity. The configuration was performed via the **Biz Phone Settings** menu on the smartphone. The procedure covers the following areas:

- Configure DHCP Server
- Configure SIP Phone Settings

7.1. Configure DHCP Server

Spectralink Versity must first acquire several IP network settings before proceeding with provisioning. These settings were automatically obtained from a DHCP server. Alternatively, Spectralink Versity could be configured with static IP addresses, but for the compliance test, a DHCP server was used.

In addition to obtaining IPv4 addresses from the DHCP server for each Spectralink Versity, the DHCP server also provided the following settings:

- Option 3:   Default Gateway
- Option 6:   DNS Server (optional)

7.2. Configure SIP Phone Settings

Click on the **Biz Phone** app icon on the smartphone as shown below.
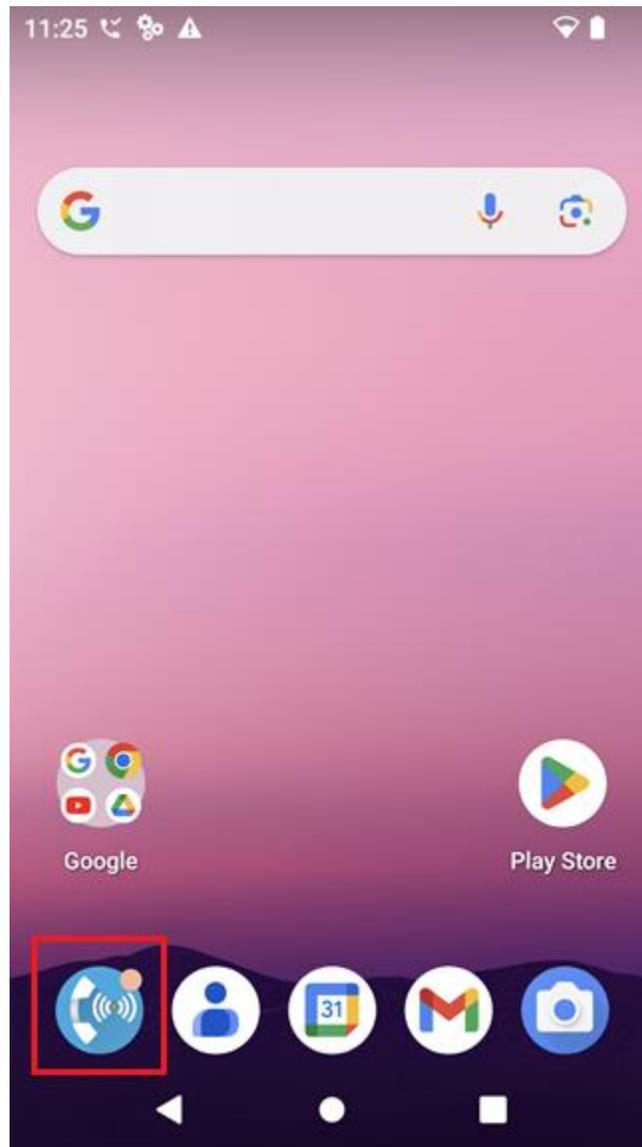
In the **Biz Phone** screen shown below, click on the overflow menu (i.e., 3 dots in upper right-hand corner).

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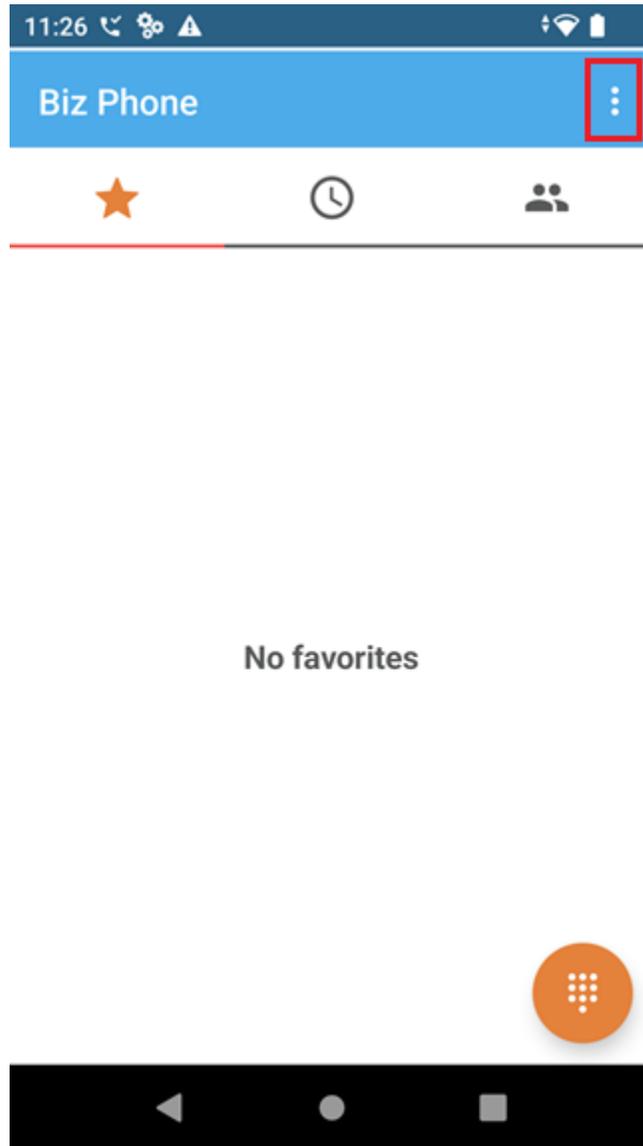
From the menu, select **Settings** to access the **Biz Phone settings**.

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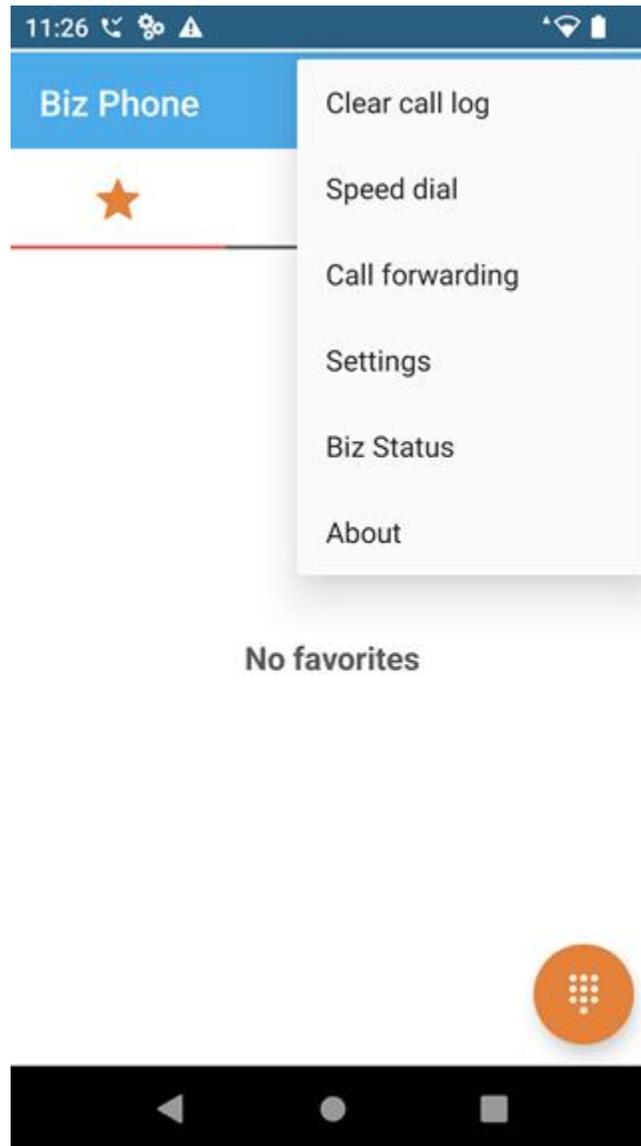
Under the **Admin settings** section, turn on the **Enable SIP** option as shown below and select the **Registration 1** option to display the SIP settings.

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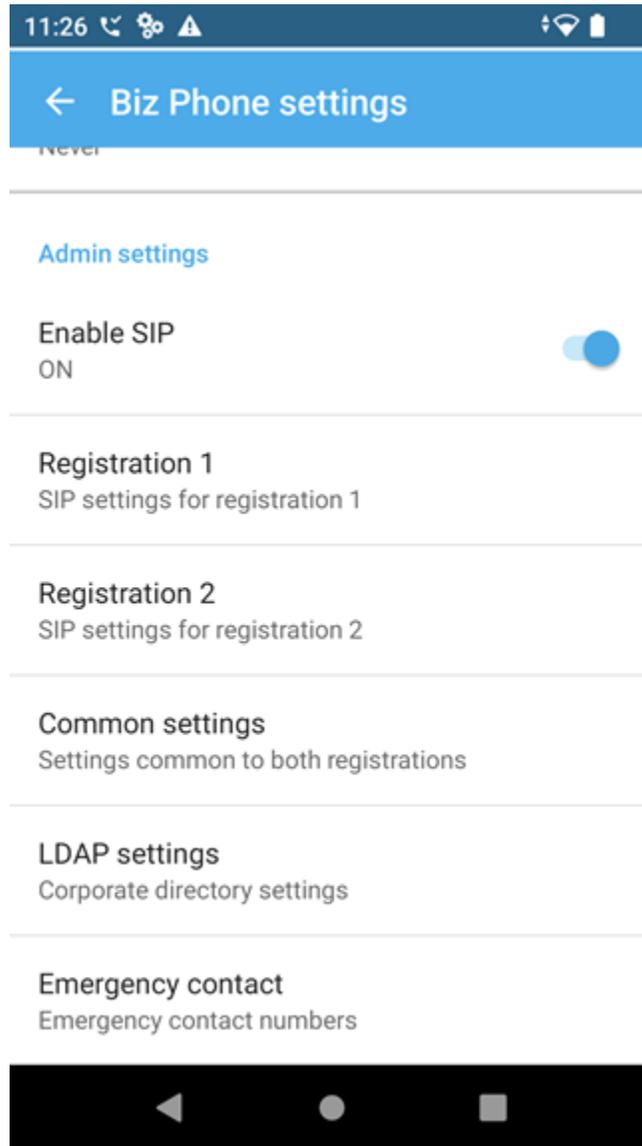
In the **Registration 1** screen, configure the following parameters:

- **SIP server:**   Set to IP Office Server Edition LAN1 IP address (e.g., *10.64.102.90*).
- **SIP server port:**   Set to appropriate SIP port (e.g., *5061*).
- **Transport:**   Set to *TLS* transport protocol. Follow **Section 7.3** on installing the TLS certificate on Android.
- **SRTP enable:**   Enable SRTP.
- **Extension number:**   Set to the SIP extension (e.g., *41520*).
- **Username:**   Set to the SIP extension (e.g., *41520*).
- **Password:**   Set to the SIP password specified as the **Phone Password** in **Section 5.3**.
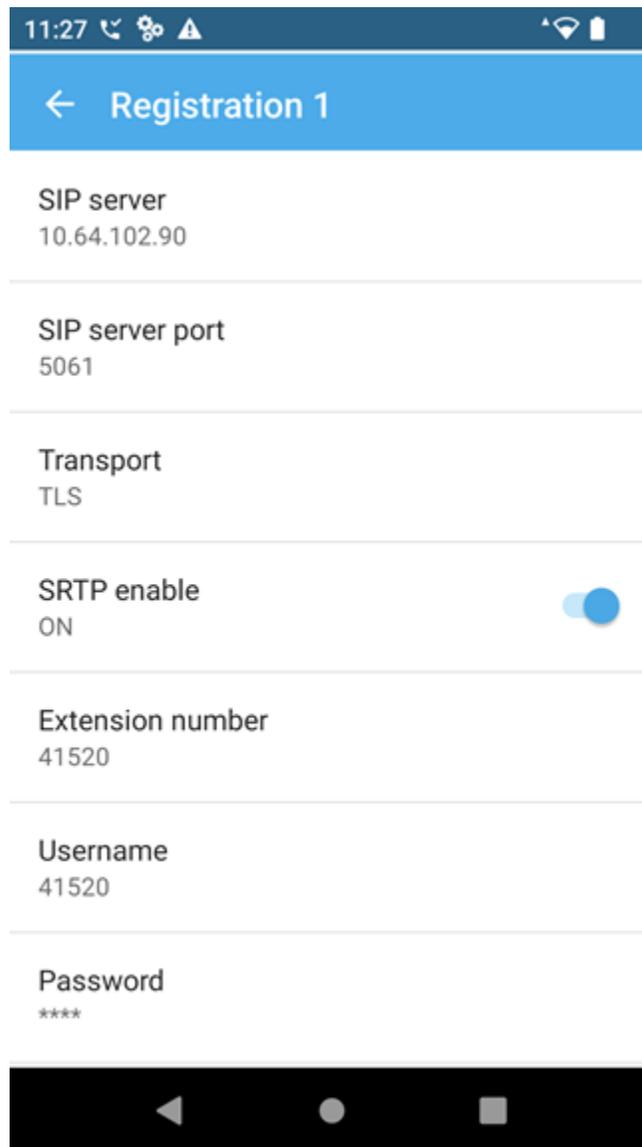
Scroll down to the bottom half of the **Registration 1** screen and configure the following parameters:

- **Voicemail retrieval address:**   Set to the Voicemail Collect shortcode on IP Office (e.g., *17*).

- **Force subscription to message Waiting notifications:**   Enable this option.
- **Disable call waiting:**   Set to *OFF*.

Accept the default values for the remaining parameters.
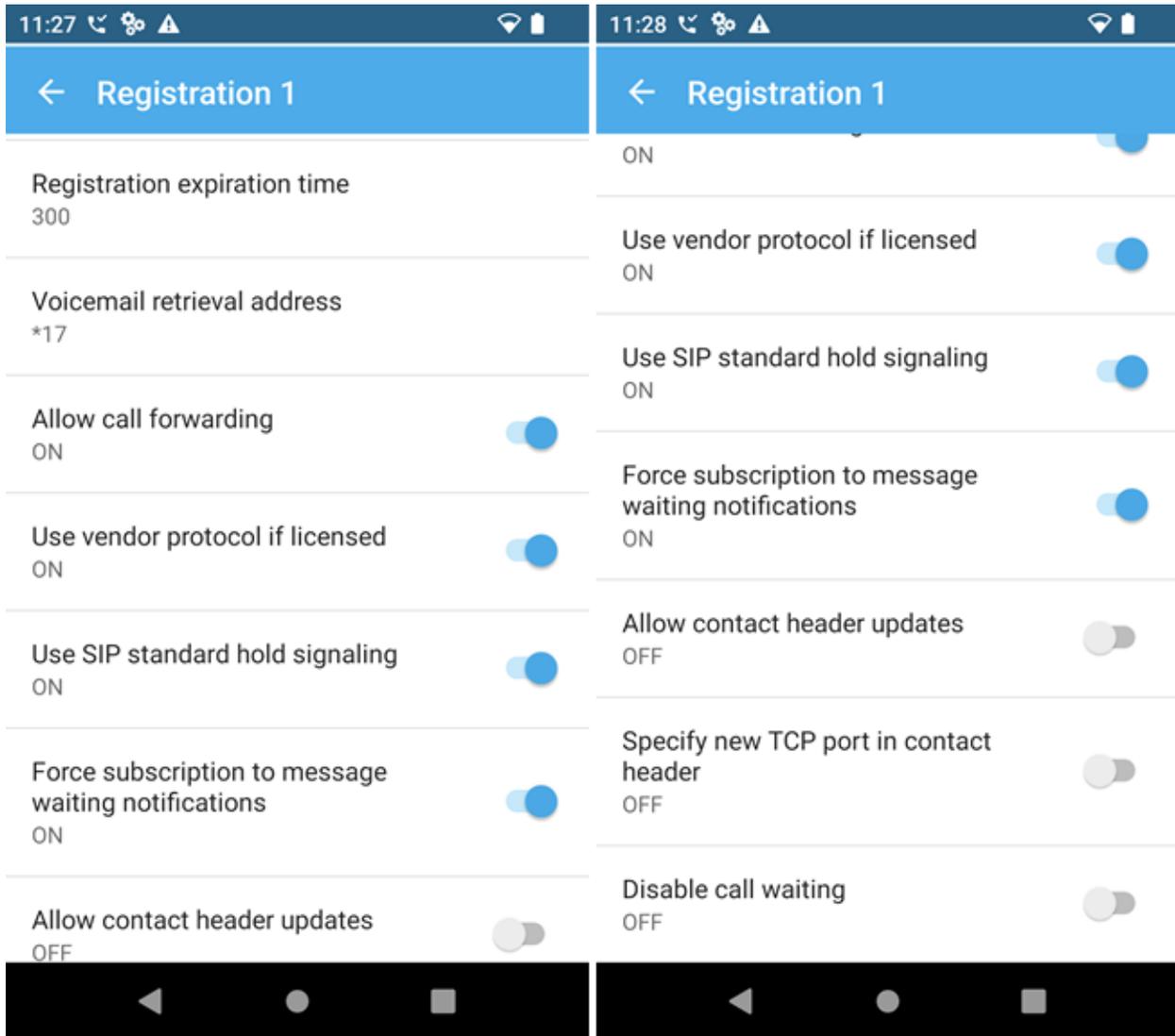
In the main screen of the **Biz Phone** application, select **Common settings** (not shown) to prioritize the codecs as needed. In this configuration, G.711 was enabled.
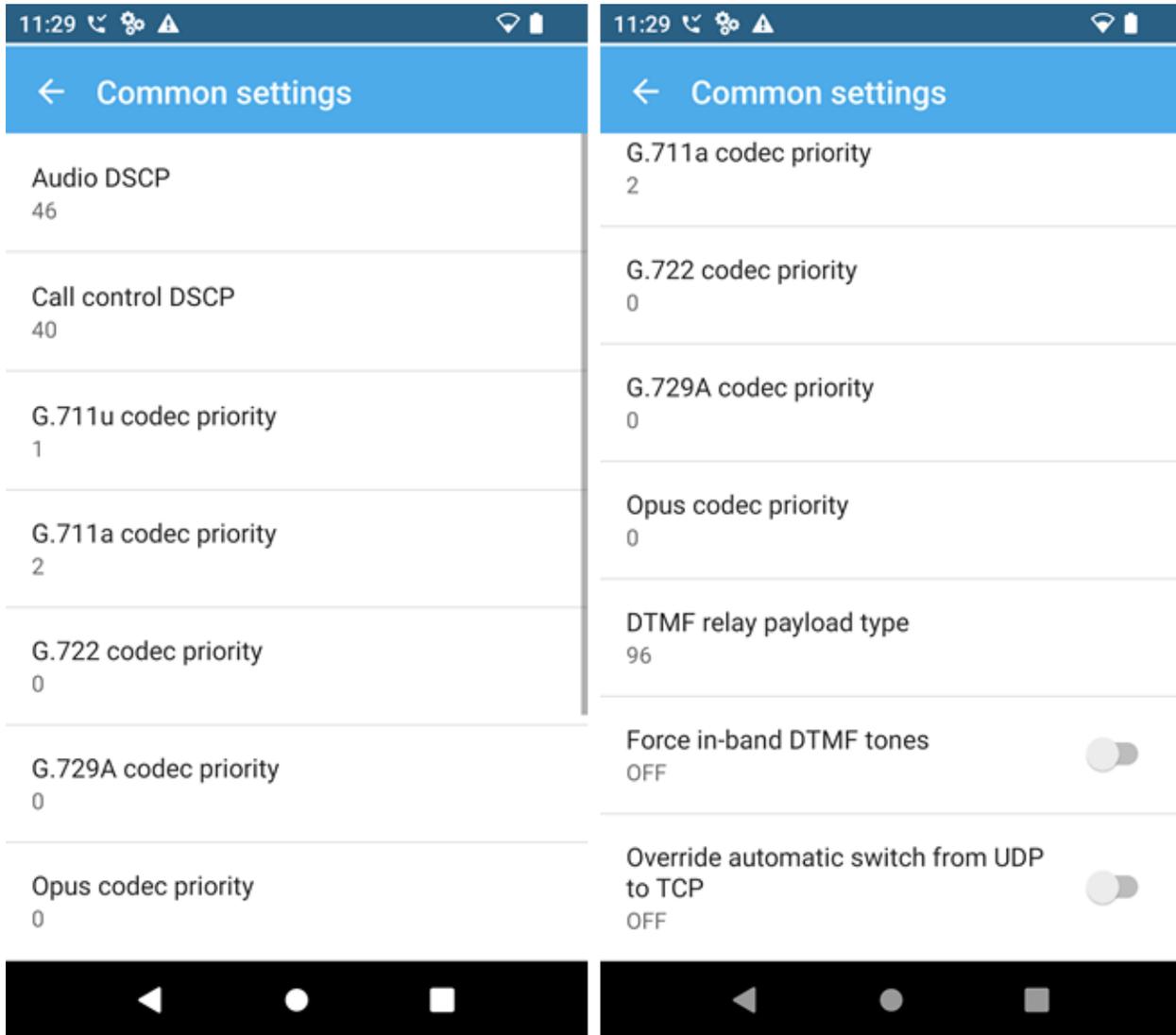
7.3. Install CA Certificate

To establish secure TLS communication, a certificate must be installed that allows Versity to trust Session Manager. For the compliance test, Avaya Aura® System Manager was used as the certificate authority (CA). Download the trusted CA certificate to the Versity smartphone, called `SystemManagerCA.pem` in this example. On the Versity smartphone, navigate to **Settings** → **Security** → **More security settings** → **Encryption & credentials** → **Trusted Certificates** → **CA certificate** → **Install a Certificate** to display the following screen. Click on **CA certificate**.

The downloaded files, including the CA certificate, should be displayed. Click on the CA certificate to install it.
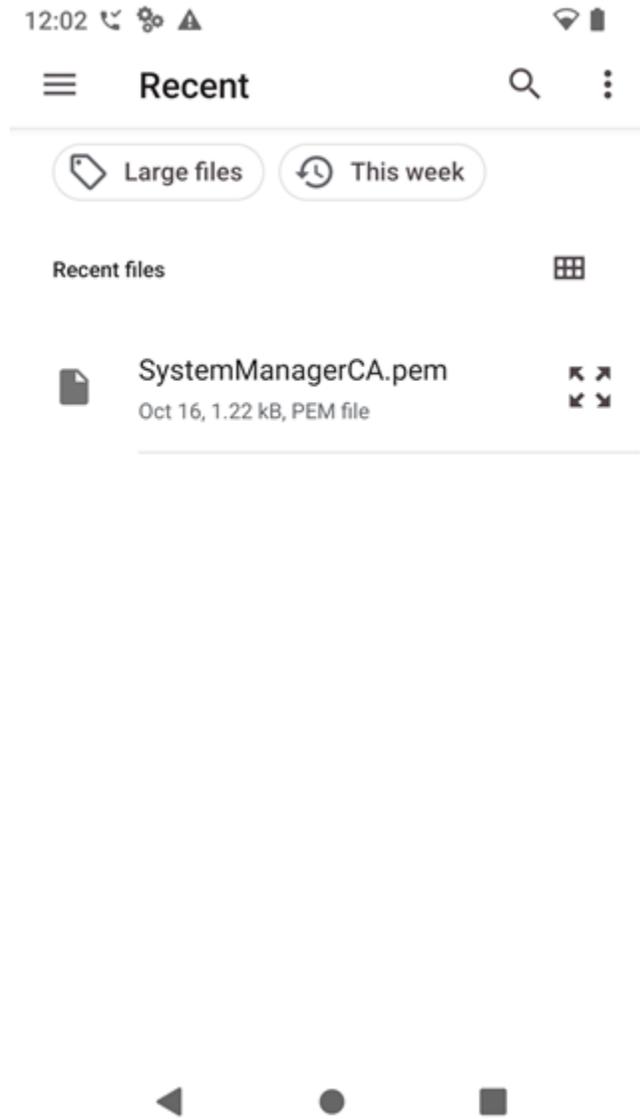
The following screen indicates that the CA certificate was installed.
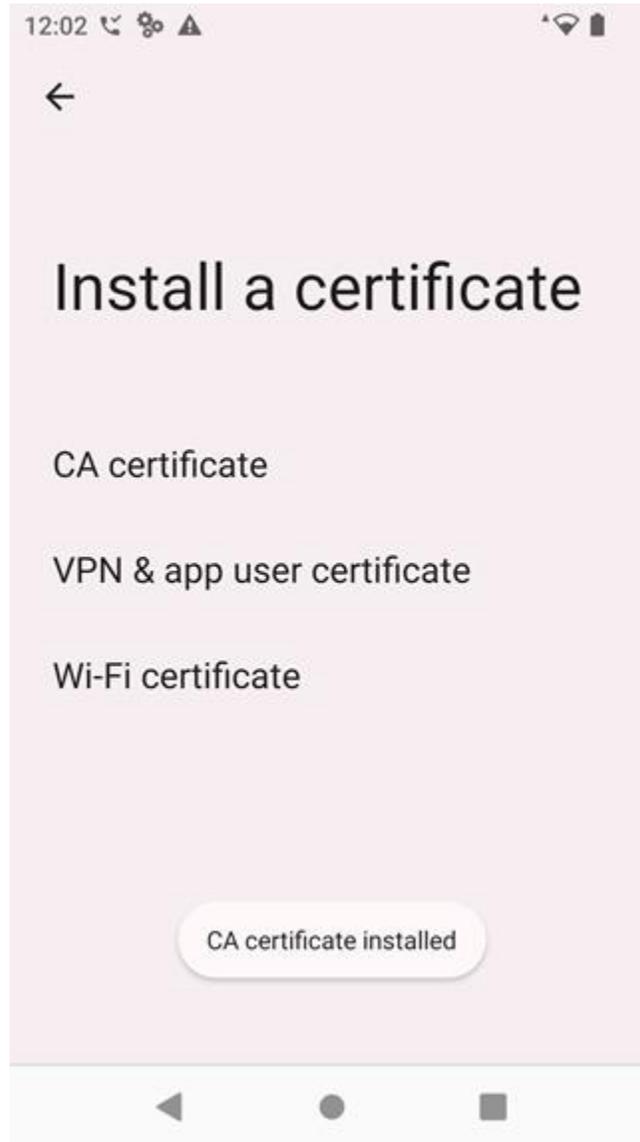
7.4. Verification Steps

This section provides the tests that can be performed to verify proper configuration of a Spectralink Versity 97 Series Enterprise Wi-Fi Smartphone with Avaya IP Office Server Edition.

1. Verify that Spectralink Versity has successfully registered with IP Office Server Edition. Launch **IP Office System Status** and navigate to **Extensions → *<SIP Extension>*,** where *<SIP Extension>* is the Spectralink Versity extension. Note that **Media Stream** and **Layer 4 Protocol** is set to *SRTP* and *TLS*, respectively. The following Extension Status shows an active call where the **Current State** is *Connected*. If there wasn't an active call the **Current State** would be *Idle*.

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2. Alternatively, the registration status can also be checked on Spectralink Versity by opening the **Biz Status** application. Note that the server status on the last line indicates an *up** status.
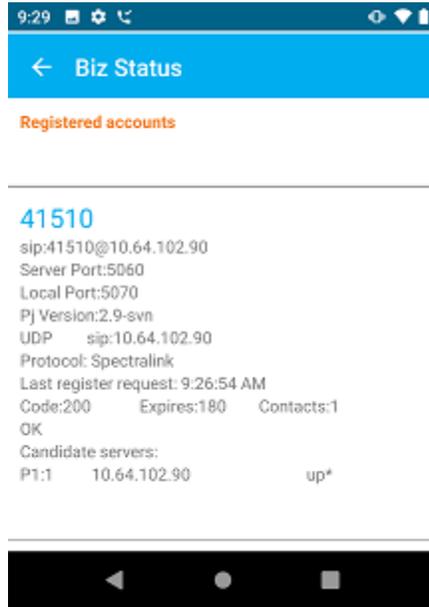
3. From the Spectralink Versity Dialer shown below, place a call to an Avaya IP Deskphone or another Spectralink Versity smartphone. While the call is active, basic telephony features can be exercised to verify proper operation.
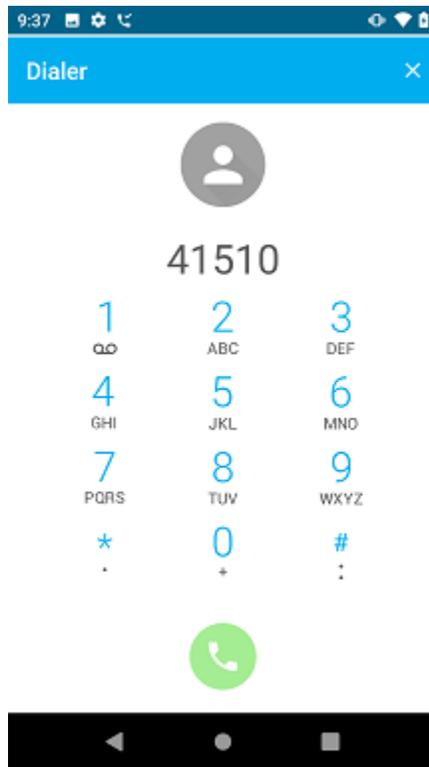
8. Conclusion

These Application Notes have described the administration steps required to integrate Spectralink Versity 97 Series Enterprise Wi-Fi Smartphones with Avaya IP Office Server Edition 11.1. Spectralink Versity 97 Series Enterprise Wi-Fi Smartphones successfully registered with IP Office Server Edition and IP Office 500 V2 Expansion System as SIP endpoints using TLS, established calls using SRTP, and basic and supplementary telephony features were verified. All feature and serviceability test cases were completed successfully.

9. Additional References

This section references the Avaya and Spectralink documentation relevant to these Application Notes.

[1] *Administering Avaya IP Office™ Platform Manager*, Release 11.1.1, Issue 29, February 2021, available at http://support.avaya.com.
[2] *Spectralink Versity 97-Series User Guide,* available at https://support.spectralink.com/s/product-documents/products?type=handsets&category=wifi