Avaya Solution & Interoperability Test Lab

Application Notes for Valcom VE8090R SIP Intercom Controller with Avaya IP Office Server Edition using SIP Trunk - Issue 1.0

Abstract

These Application Notes describe the configuration steps required to integrate the Valcom VE8090R SIP Intercom Controller with Avaya IP Office Server Edition. Valcom VE8090R SIP Intercom Controller provides access to Valcom VoIP audio endpoints, such as Valcom VIP-430A IP Wall Speakers, from telephone servers. For this compliance test, Valcom VE8090R SIP Intercom Controller interfaced with Avaya IP Office Server Edition via a SIP trunk. The Valcom VE8090R SIP Intercom Controller supports two-way audio intercom calls or one-way audio group paging calls.

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 the Valcom VE8090R SIP Intercom Controller with Avaya IP Office Server Edition. Valcom VE8090R SIP Intercom Controller provides access to Valcom VoIP audio endpoints, such as Valcom VIP-430A IP Wall Speakers, from telephone servers. For this compliance test, Valcom VE8090R SIP Intercom Controller interfaced with Avaya IP Office Server Edition via a SIP trunk. The Valcom VE8090R SIP Intercom Controller supports two-way audio intercom calls or one-way audio group paging calls.

When the Valcom VE8090R SIP Intercom Controller is configured in SIP trunk mode, the digits in the SIP Invite are interpreted by VE8090R to be Valcom speaker Dial Code or Group Code. For this compliance test, 5-digit numbers in the format of 414xx were dialed, where the last 3 digits (i.e., 4xx) mapped to the Dial Code or Group Code. Refer to the table below for dialing examples.

Dialed Digits	Digits Received by VE8090R	Call Type
41403	403	Intercom Call to Speaker 1
41404	404	Intercom Call to Speaker 2
41410	410	Group Call to Speaker 1 (Speaker 1 is the only group member)
41420	420	Group Call to Speaker 2 (Speaker 2 is the only group member)
41499	499	Group Call to Speaker 1 & 2

In addition, the VIP-430A IP Wall Speaker established intercom calls by pressing the call button. Pressing the call button would place a call to the specified destination in the VE8090R configuration. Pressing the call button during an active call, terminates the call.

In SIP trunk mode, multiple incoming and outgoing calls can be placed to/from the VE8090R.

Note: Valcom has indicated that other products in the SIP Intercom Controller family share the same hardware circuitry, software, SIP stack and firmware version 3.20.14, which was compliance tested; therefore, this testing also applies to those products. The differences between the products are detailed in **Attachment 1**. For additional details contact Valcom Support, as noted in **Section 2.3**.

2. General Test Approach and Test Results

The interoperability compliance test included feature and serviceability testing. The feature testing focused on establishing calls between the Valcom VE8090R SIP Intercom Controller using the Valcom VIP-430A IP Wall Speakers, Avaya SIP / H.323 IP Deskphones, and the PSTN. Two-way audio intercom calls and one-way audio group paging calls were exercised.

The serviceability testing focused on verifying that the Valcom VE8090R SIP Intercom Controller came back into service after a reboot.

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 Valcom VE8090R SIP Intercom Controller did not include use of any specific encryption features as requested by Valcom.

2.1. Interoperability Compliance Testing

Interoperability compliance testing covered the following features and functionality:

- Establishing a SIP trunk between VE8090R and IP Office Server Edition and verifying the exchange of SIP Options messages.
- Establishing two-way audio intercom calls between VIP-430A IP Wall Speaker, via VE8090R, Avaya H.323 / SIP Deskphones, and PSTN in both directions.
- Establishing one-way group paging calls from Avaya H.323 / SIP Deskphones to VIP-430A IP Wall Speakers via VE8090R.
- Verifying that higher priority group calls have precedence over active, lower priority group calls.
- Multiple simultaneous calls with VE8090R.
- Terminating active calls by pressing the call button on the VIP-430A IP Wall Speaker.
- Establishing calls between VE8090R and Avaya H.323 / SIP Deskphones registered to IP Office Server Edition and IP Office 500 V2 Expansion.
- Support of G.711 mu-law codec and UDP transport protocol.
- Support of direct IP-to-IP media, which allows IP endpoints to send audio RTP packets directly to each other without using media resources on IP Office.
- Proper system recovery after a restart of VE8090R.

2.2. Test Results

All test cases passed.

2.3. Support

For technical support and information on Valcom VE8090R SIP Intercom Controller, contact Valcom Technical Support at:

- Phone: +1 (800) 825-2661 or +1 (540) 563-2000
- Website: https://www.valcom.com/Support/techsupport.html
- Email: support@valcom.com

3. Reference Configuration

Figure 1 illustrates a sample configuration with an Avaya SIP-based network that includes the following products:

- Avaya IP Office Server Edition and Avaya IP Office 500 V2 Expansion connected via a SCN trunk and configured via Avaya IP Office Manager.
- PSTN connectivity provided by a SIP trunk on Avaya IP Office Server Edition and an ISDN-PRI trunk on Avaya IP Office 500 V2 Expansion System.
- Avaya 96x1 Series H.323 Deskphones, Avaya J129 SIP Deskphones, and Avaya 1100/1200 Series SIP Deskphones registered to Avaya IP Office Server Edition and Avaya IP Office 500 V2 Expansion.
- Valcom VE8090R SIP Intercom Controller provided connectivity to Avaya IP Office Server Edition via a SIP trunk. Valcom VIP-430A IP Wall Speakers served as the Valcom audio endpoint, and Valcom VIP-102B IP Solutions Setup Tool to configure Valcom products.

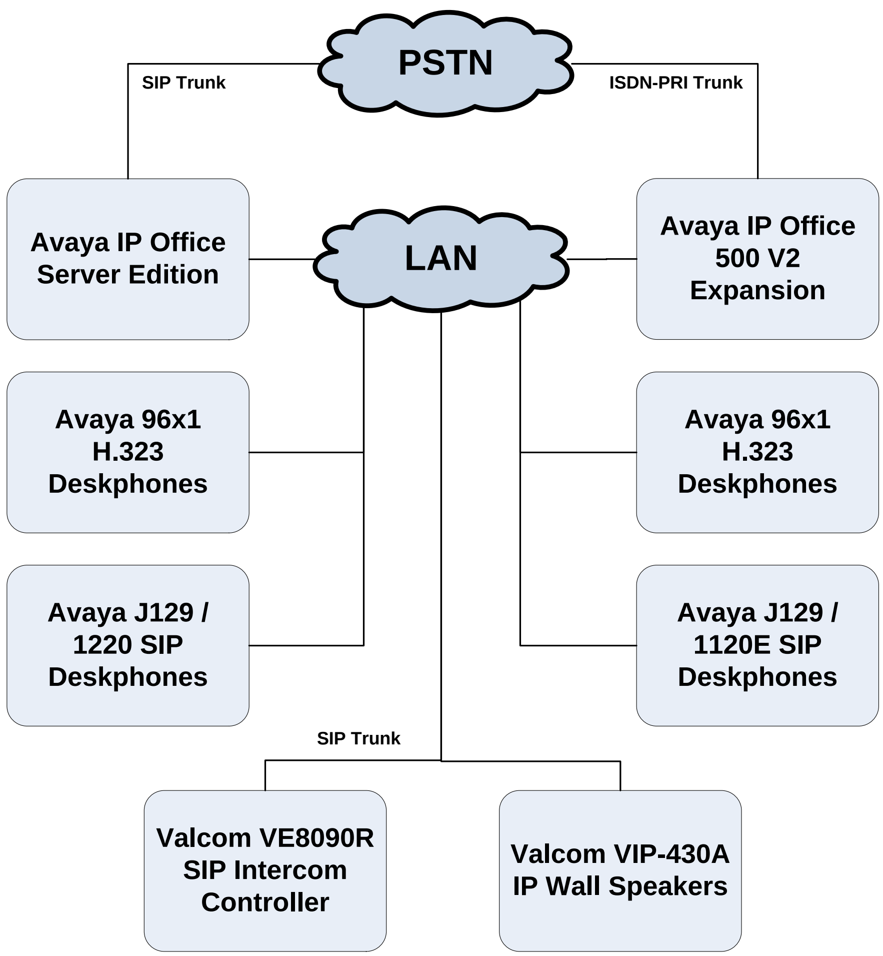


Figure 1: Avaya SIP Network with Valcom VE8090R SIP Intercom Controller and Valcom VIP-430A IP Wall Speakers

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	11.0.0.2.0 Build 23
Avaya IP Office 500 V2 Expansion	11.0.0.2.0 Build 23
Avaya 96x1 Series IP Deskphones	6.6604 (H.323)
Avaya 1100/1200 Series IP Deskphones	04.04.26.00 (SIP)
Avaya J129 SIP Deskphones	3.0.0.1.6 (6)
Valcom VE8090R SIP Intercom Controller	3.20.14
Valcom VIP-430A IP Wall Speaker	3.20.15
Valcom VIP-102B IP Solutions Setup Tool on Windows 10	7.5.0.0

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

Configure Avaya IP Office Server Edition

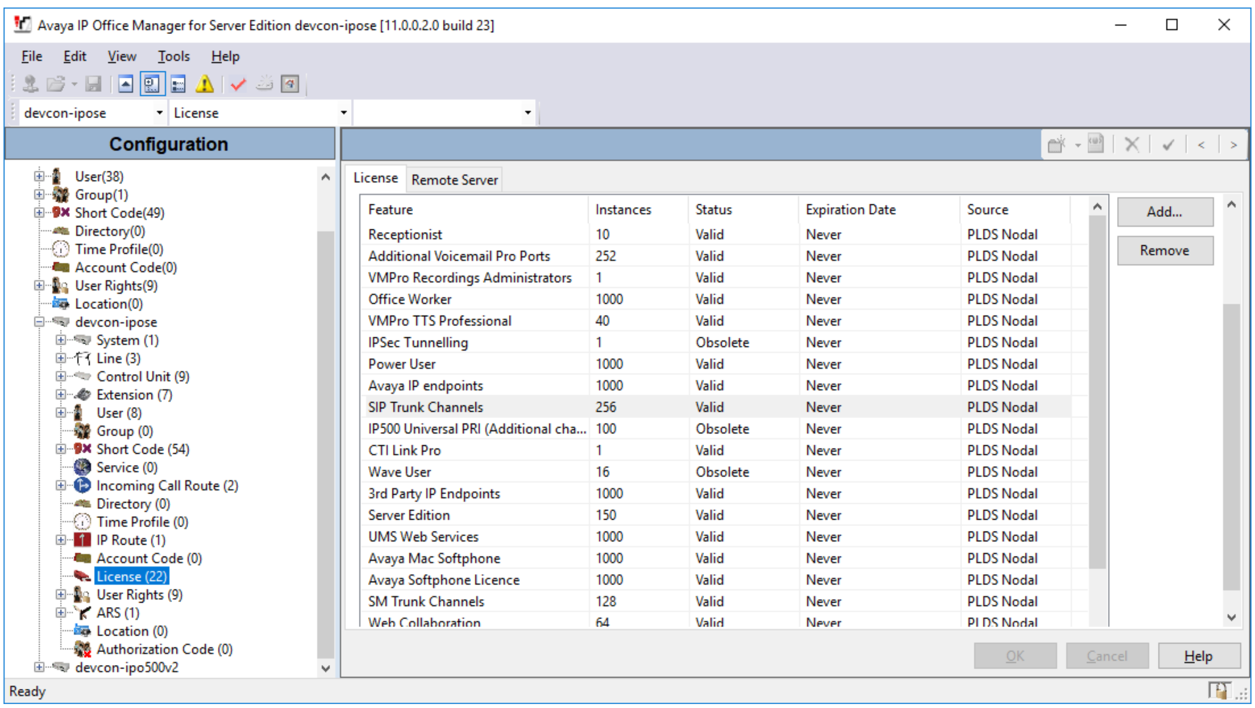
This section provides the procedure for configuring Avaya IP Office Server Edition. The procedure includes the following areas:

- Verify IP Office license
- Obtain LAN IP address
- Enable SIP trunks
- Administer SIP line
- Administer incoming call route
- Administer short code

4.1. Verify IP Office License

From a PC with Avaya IP Office Manager installed, select **Start → Programs → IP Office → Manager** to launch the Manager application. Select the proper IP Office system and log in with the appropriate credentials.

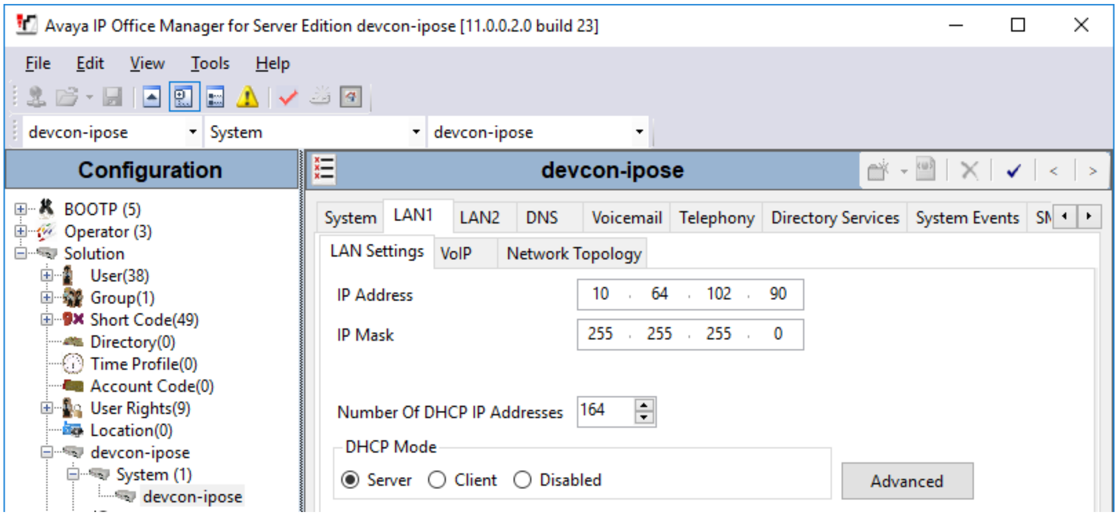
The **Avaya IP Office Manager for Server Edition** screen is displayed. From the configuration tree in the left pane, select **License**. Verify that the **SIP Trunk Channels** license is "Valid", and that the **Instances** value is sufficient for the desired maximum number of calls.



Feature	Instances	Status	Expiration Date	Source
Receptionist	10	Valid	Never	PLDS Nodal
Additional Voicemail Pro Ports	252	Valid	Never	PLDS Nodal
VMPro Recordings Administrators	1	Valid	Never	PLDS Nodal
Office Worker	1000	Valid	Never	PLDS Nodal
VMPro TTS Professional	40	Valid	Never	PLDS Nodal
IPSec Tunnelling	1	Obsolete	Never	PLDS Nodal
Power User	1000	Valid	Never	PLDS Nodal
Avaya IP endpoints	1000	Valid	Never	PLDS Nodal
SIP Trunk Channels	256	Valid	Never	PLDS Nodal
IP500 Universal PRI (Additional cha...	100	Obsolete	Never	PLDS Nodal
CTI Link Pro	1	Valid	Never	PLDS Nodal
Wave User	16	Obsolete	Never	PLDS Nodal
3rd Party IP Endpoints	1000	Valid	Never	PLDS Nodal
Server Edition	150	Valid	Never	PLDS Nodal
UMS Web Services	1000	Valid	Never	PLDS Nodal
Avaya Mac Softphone	1000	Valid	Never	PLDS Nodal
Avaya Softphone Licence	1000	Valid	Never	PLDS Nodal
SM Trunk Channels	128	Valid	Never	PLDS Nodal
Web Collaboration	64	Valid	Never	PLDS Nodal

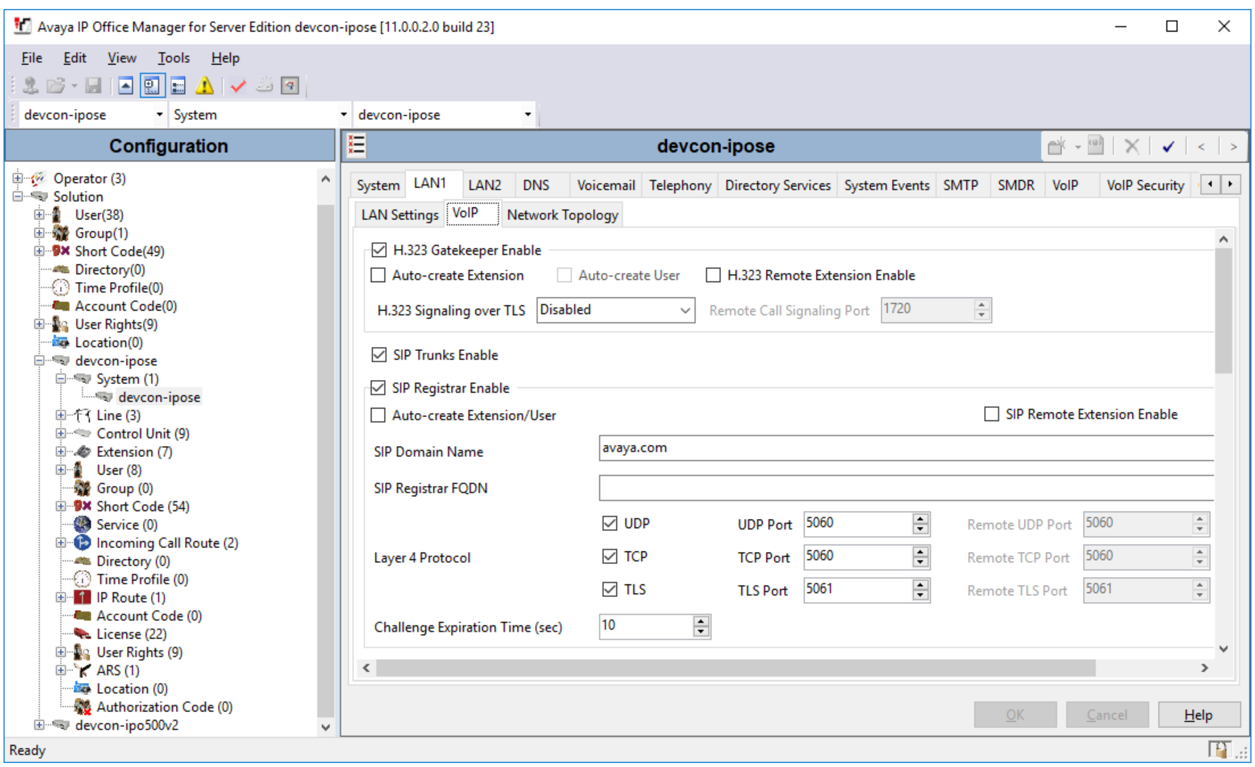
4.2. Obtain LAN IP Address

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 VE8090R.



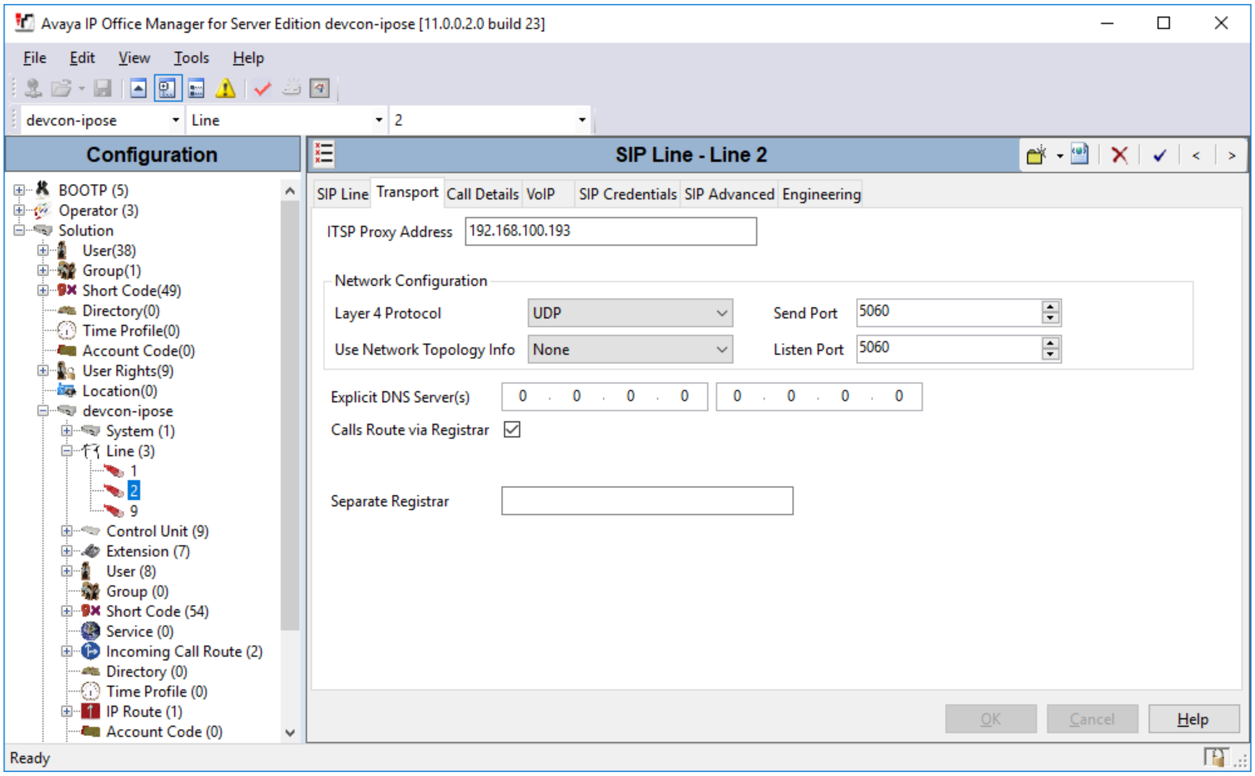
4.3. Enable SIP Trunks

Select the **VoIP** sub-tab. Ensure that **SIP Trunks Enable** is checked as shown below.

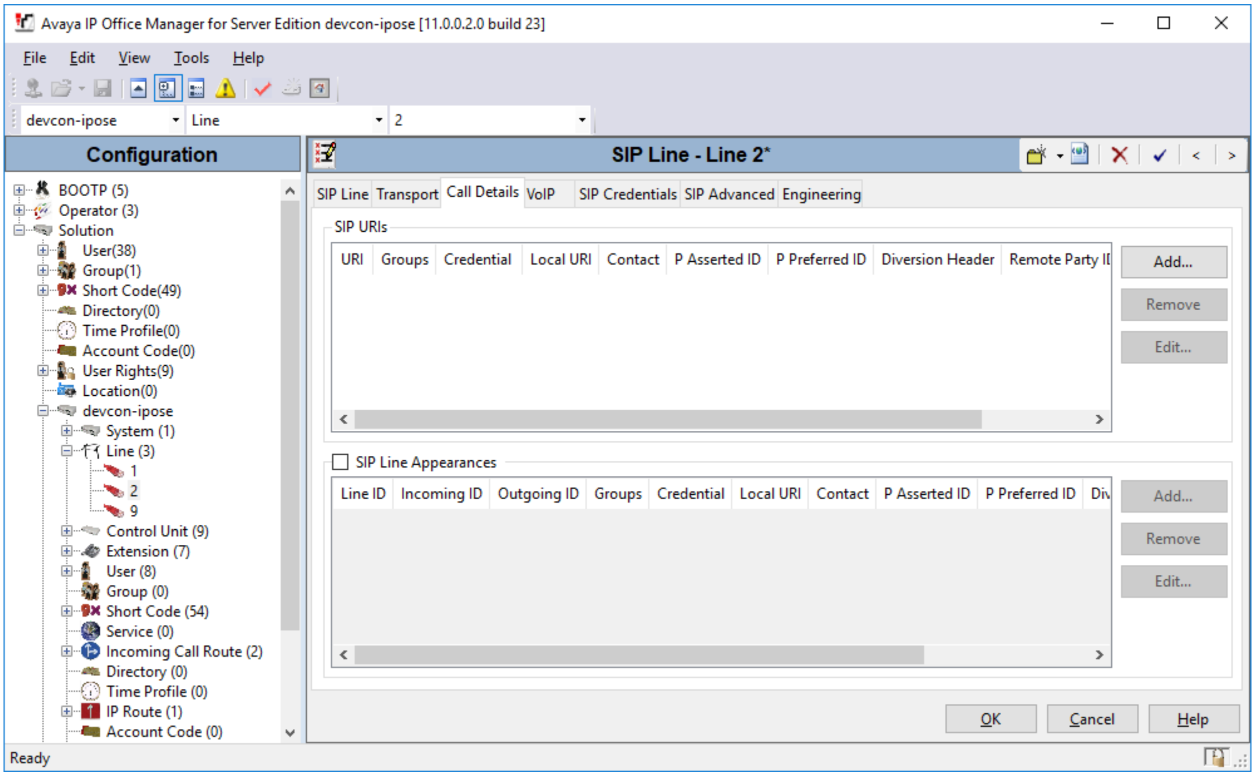


4.4. Administer SIP Line

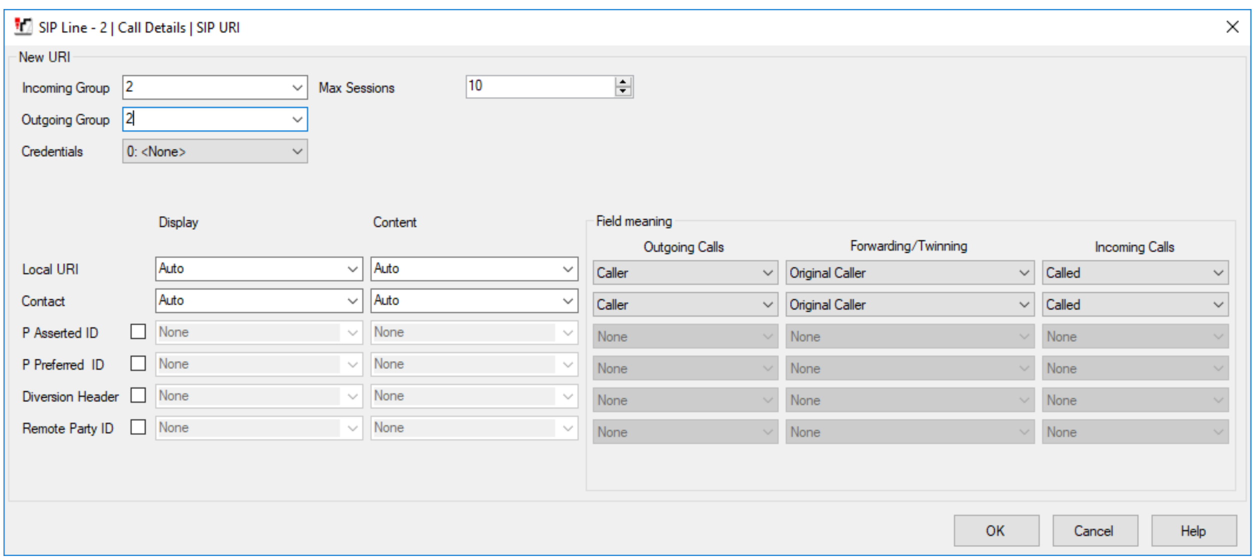
From the configuration tree in the left pane, right-click on **Line** and select **New → SIP Line** from the pop-up list (not shown) to add a new SIP line. Select the **Transport** tab in the right pane. For **ITSP Proxy Address**, enter the VE8090R IP address. Retain the default values for the remaining fields.



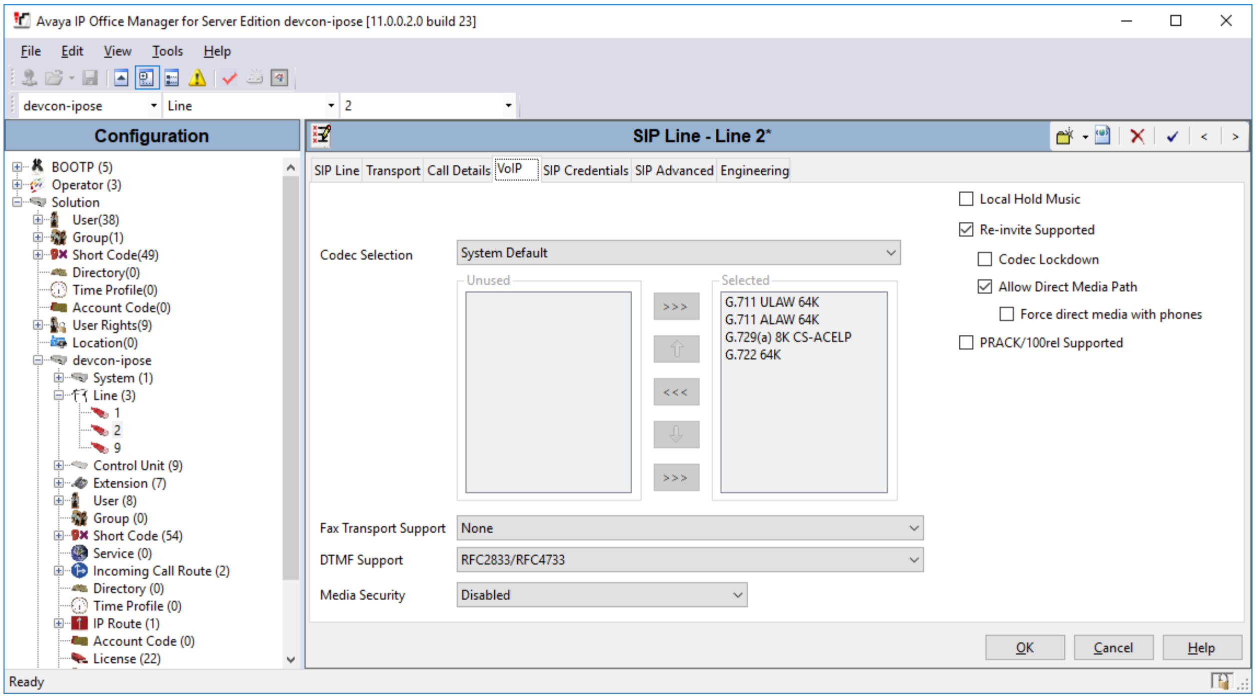
Select the **Call Details** tab to display the **SIP URIs** section as shown below.



Click **Add** to display the **New URI** section shown below. Enter the SIP line number for **Incoming Group** and **Outgoing Group**. Set **Max Sessions** to the desired maximum number of simultaneous calls allowed. Retain the default values in the remaining fields.

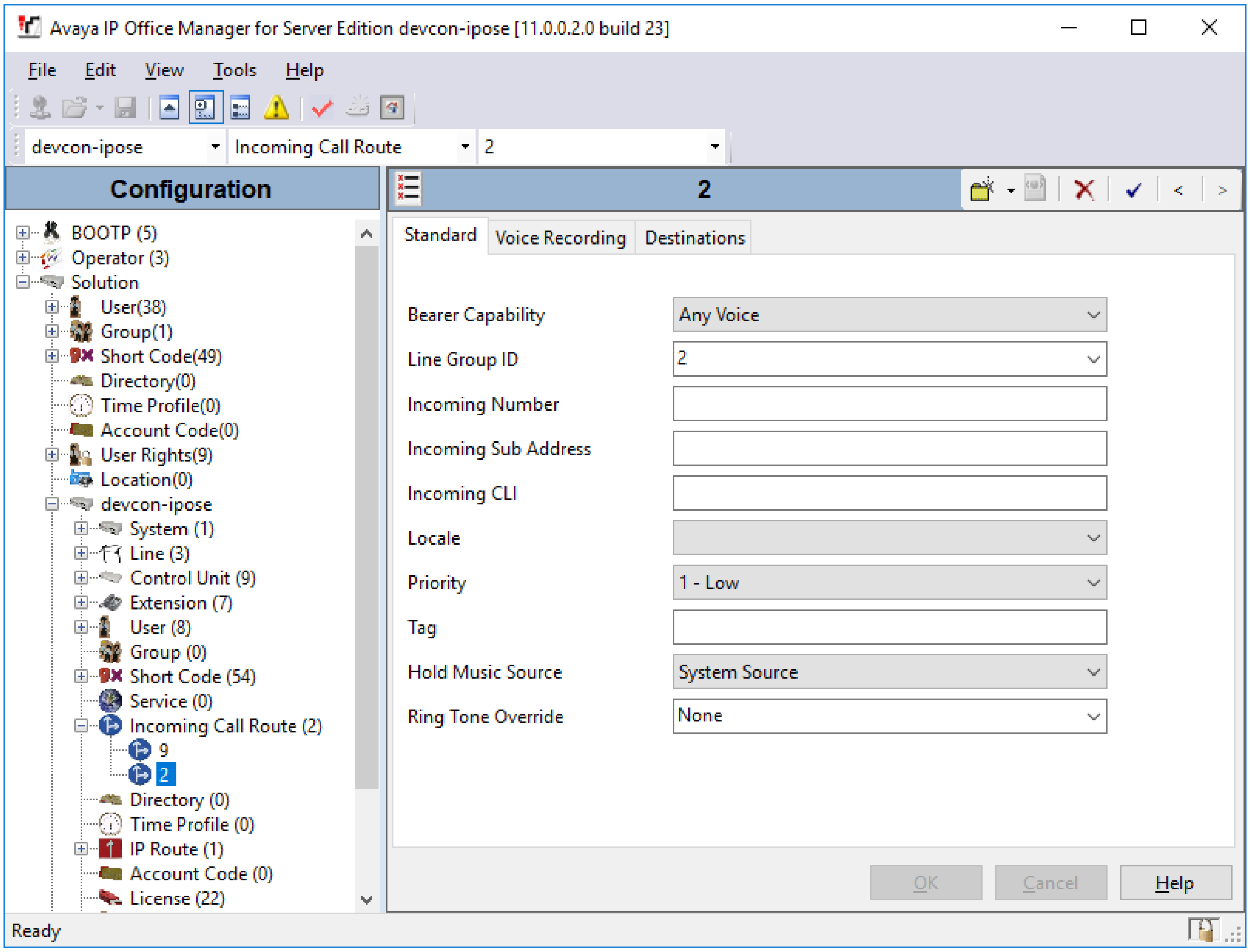


Select the **VoIP** tab to view the codecs allowed. VE8090R supports G.711 codec only. Check **Re-invite Supported**, **Allow Direct Media Path**, and retain the default values in the remaining fields.

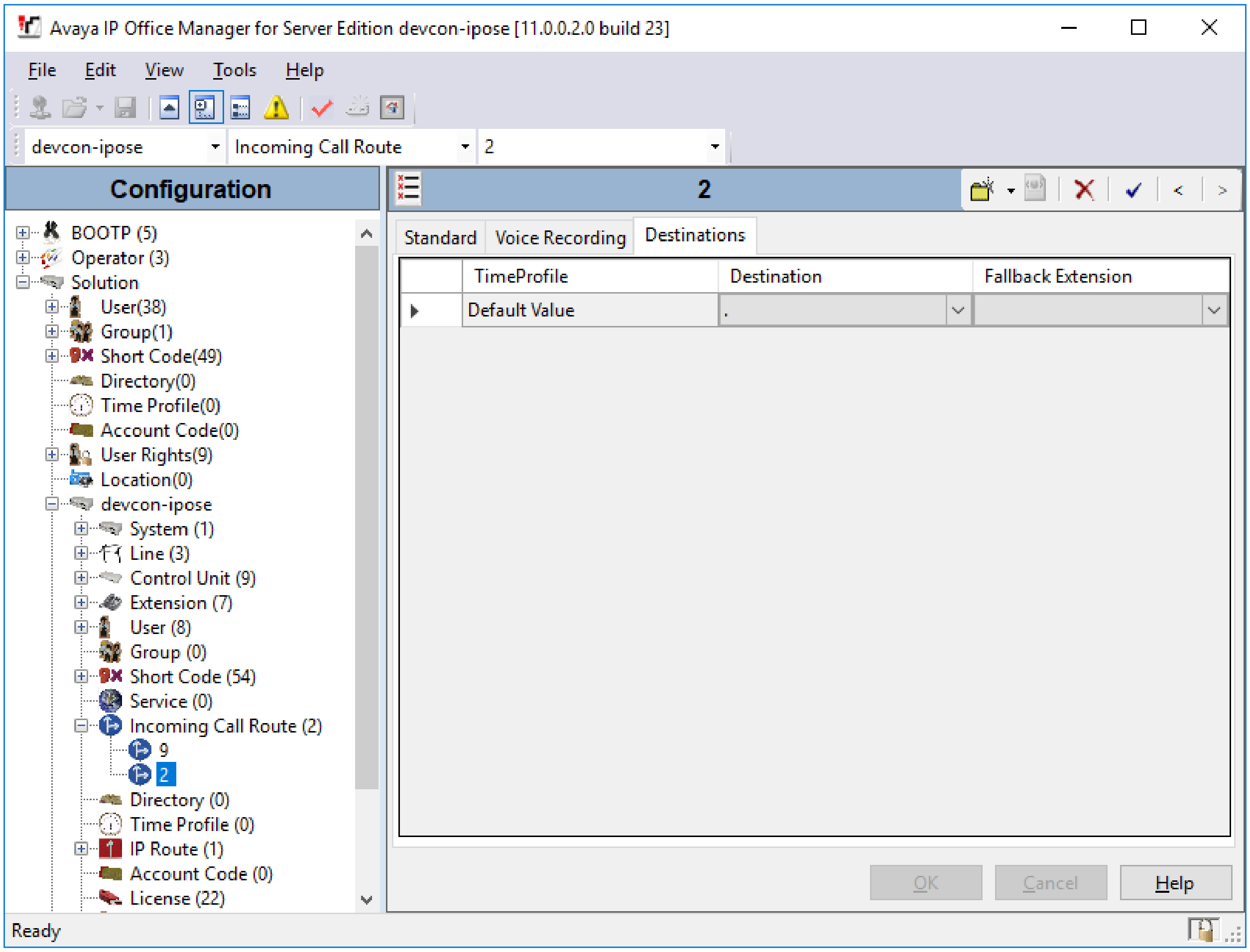


4.5. Administer Incoming Call Route

From the configuration tree in the left pane, right-click on **Incoming Call Route** and select **New** from the pop-up list (not shown) to add a new route. For **Line Group Id**, select the incoming group number from **Section 4.4**, which corresponds to the SIP line, in this case "2".



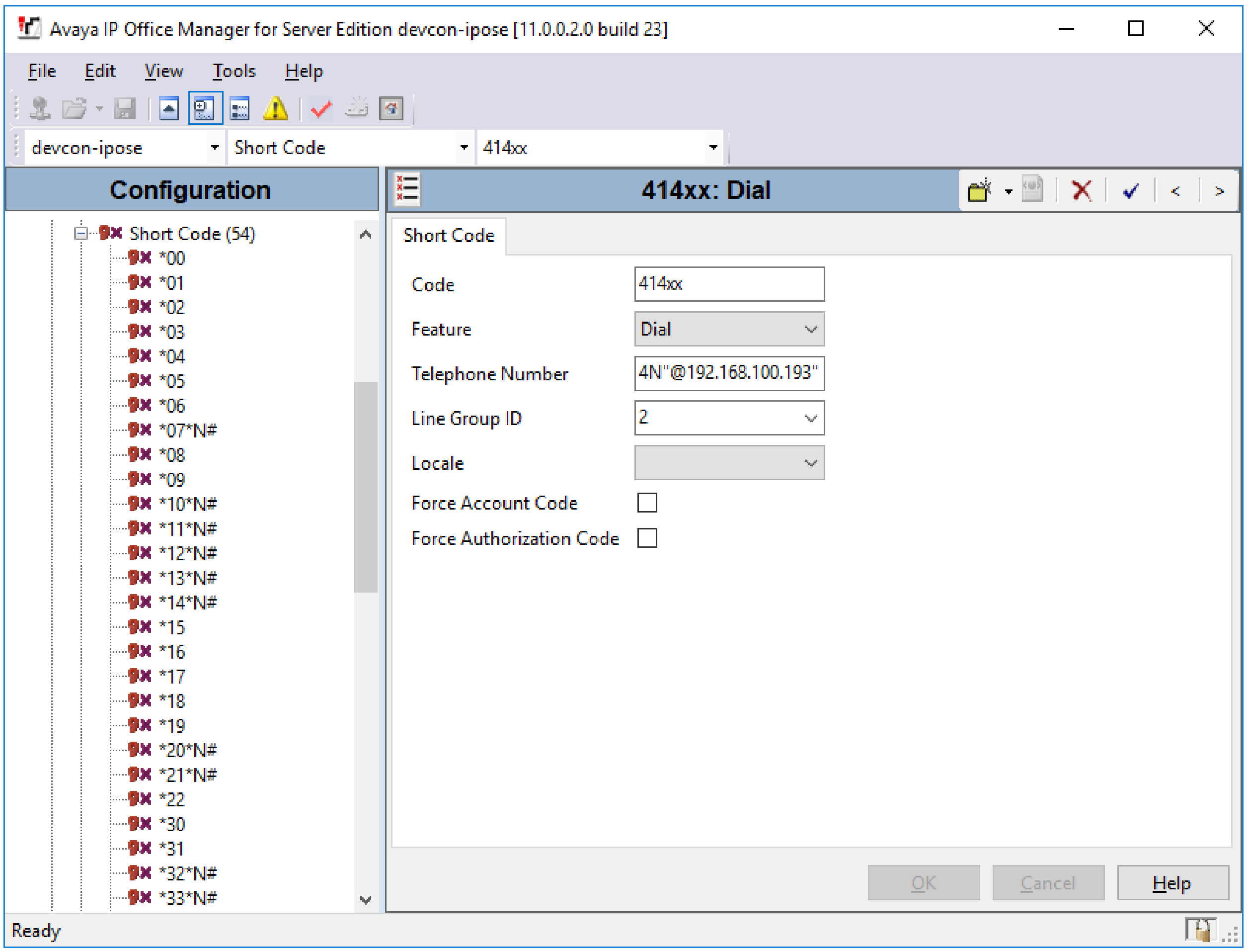
Select the **Destinations** tab. For **Destination**, enter "." to match any dialed number from VE8090R.



4.6. Administer Short Code

From the configuration tree in the left pane, right-click on **Short Code** and select **New** from the pop-up list (not shown) to add a new short code for calls to VE8090R. In the compliance test, 3-digit numbers beginning with '4' were sent to VE8090R in the SIP Invite that matched a speaker dial code or group code.

For **Code**, enter "414xx". For **Feature**, select *Dial* from the drop-down list. For **Telephone Number**, enter the value shown below where "4N" is the 3-digit dial code and "192.168.100.193" is the VE8090R IP address. For **Line Group Id**, enter the outgoing group number from **Section 4.4**, which corresponds to the VE8090R SIP trunk.



5. Configure Valcom VE8090R SIP Intercom Controller

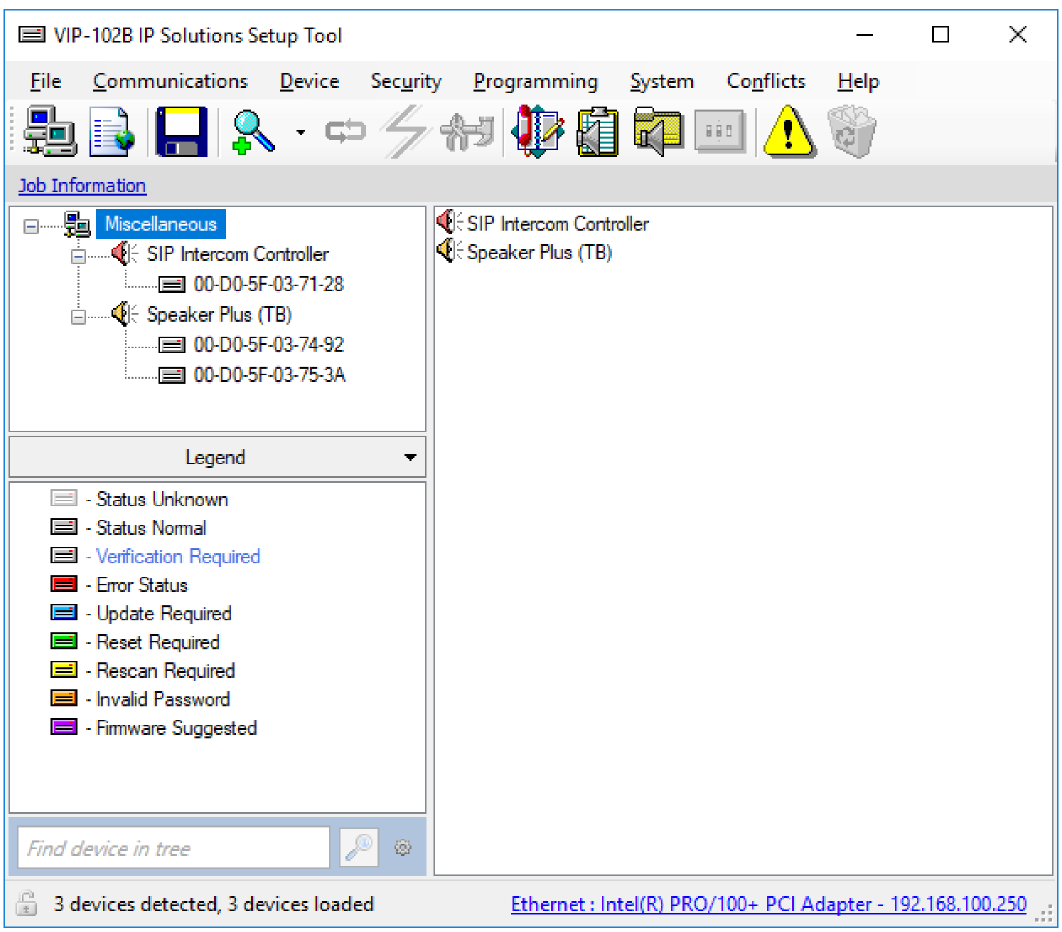
This section covers the configuration of VE8090R using the Valcom VIP-102B IP Solutions Setup Tool. The configuration covers the following areas:

- Launch the Valcom VIP-102B IP Solutions Setup Tool
- Configure the Network Settings of Valcom VE8090R SIP Intercom Controller
- Configure SIP Parameters of Valcom VE8090R SIP Intercom Controller
- Verify Codec Settings
- Update SIP Intercom Controller with the New Configuration

Note: These Application Notes do not cover the configuration of the Valcom VIP-430A IP Wall Speakers, Audio Groups, or the assignment of Dial Codes to Valcom speakers. Refer to **[2]** for details.

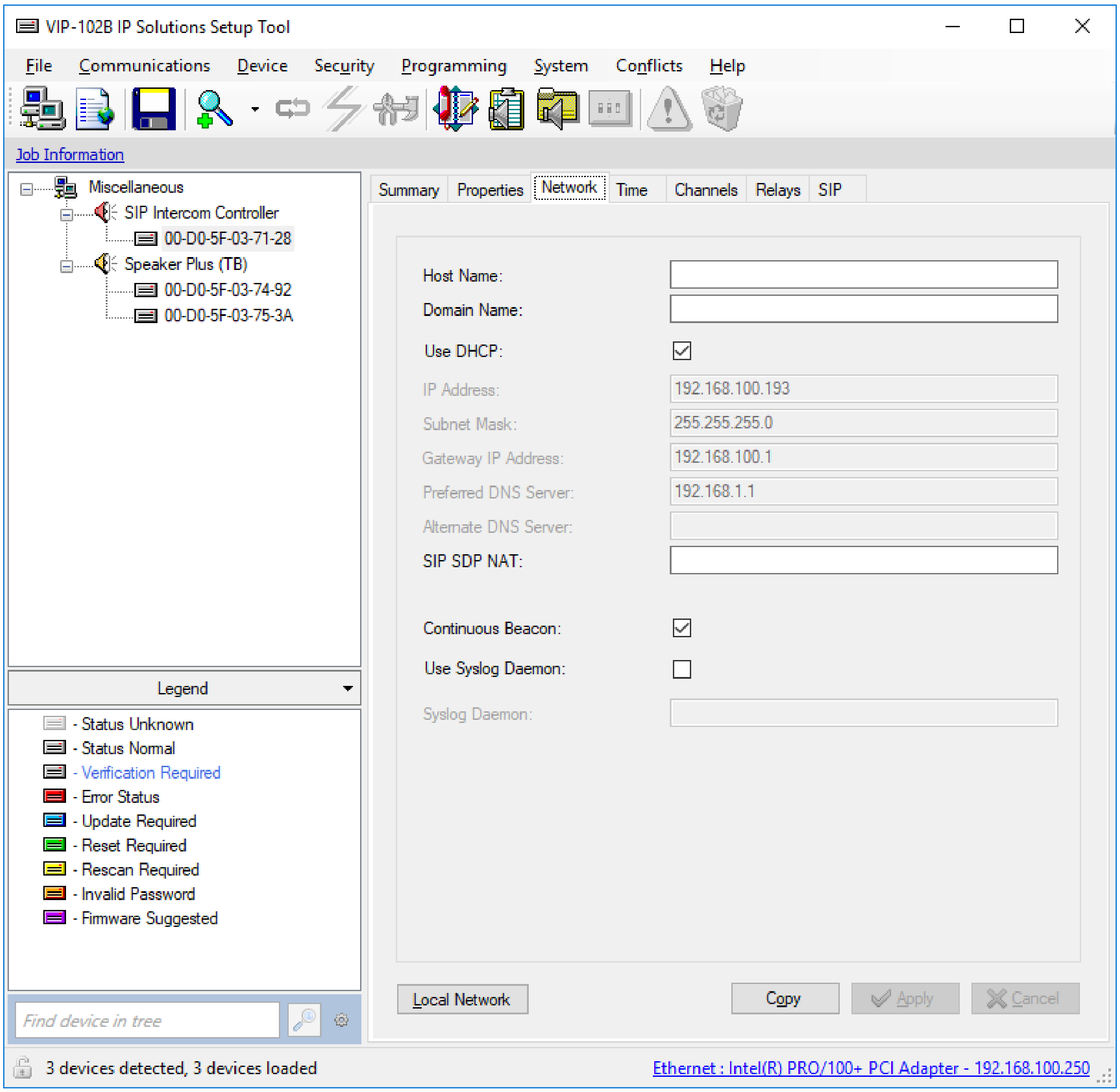
5.1. Launch Valcom VIP-102B IP Solutions Setup Tool

Launch the **VIP-102B IP Solutions Setup Tool** and follow the prompts. The main window is displayed as shown below.



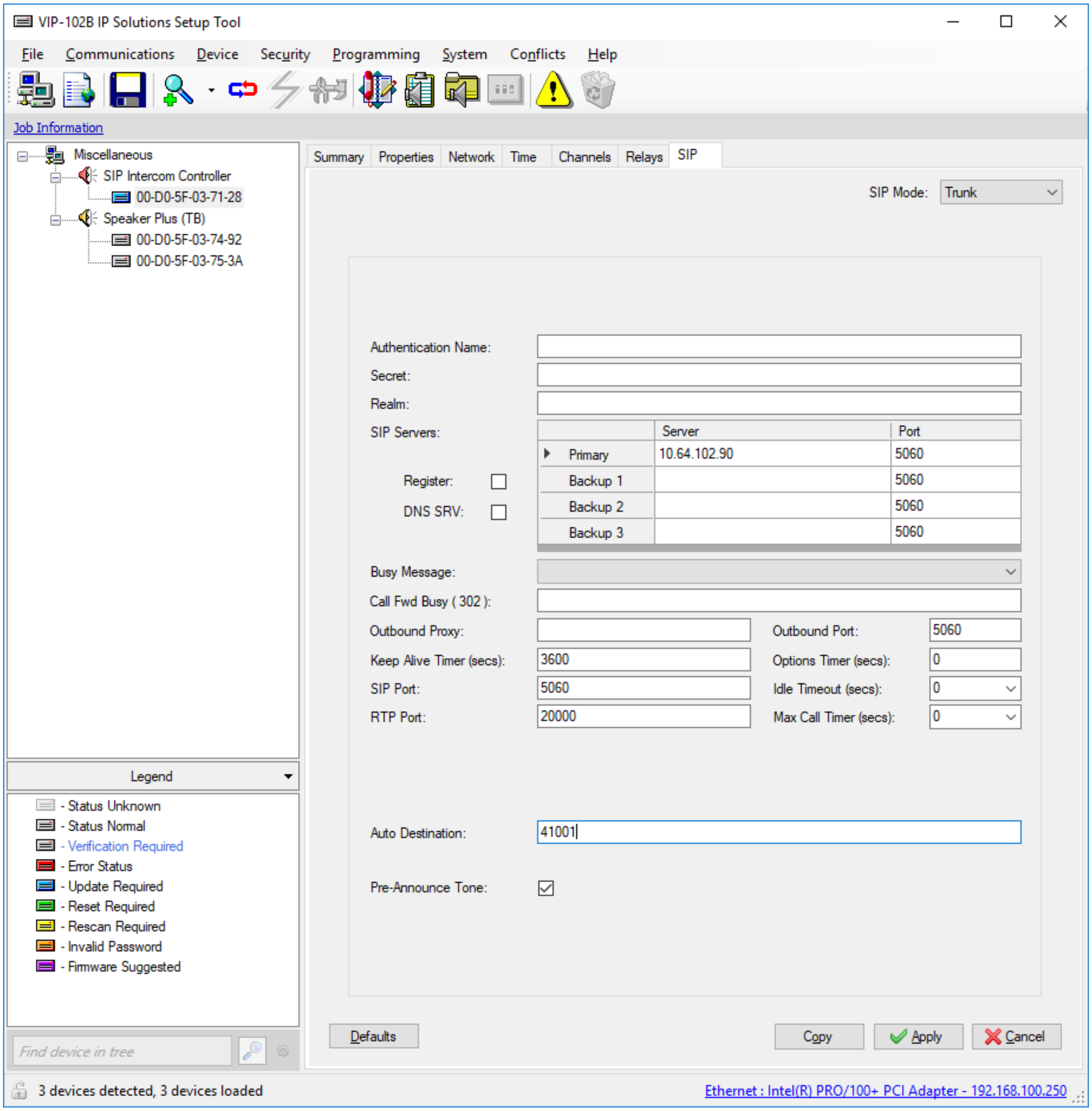
5.2. Configure the Network Settings of Valcom VE8090R SIP Intercom Controller

Click the MAC/hardware address under SIP Intercom Controller in the left pane and select the **Network** tab. VE8090R must first acquire IP network settings before proceeding with provisioning. These network settings were automatically obtained from a DHCP server as shown below. Alternatively, VE8090R could be configured with static IP addresses, but for the compliance test, a DHCP server was used.



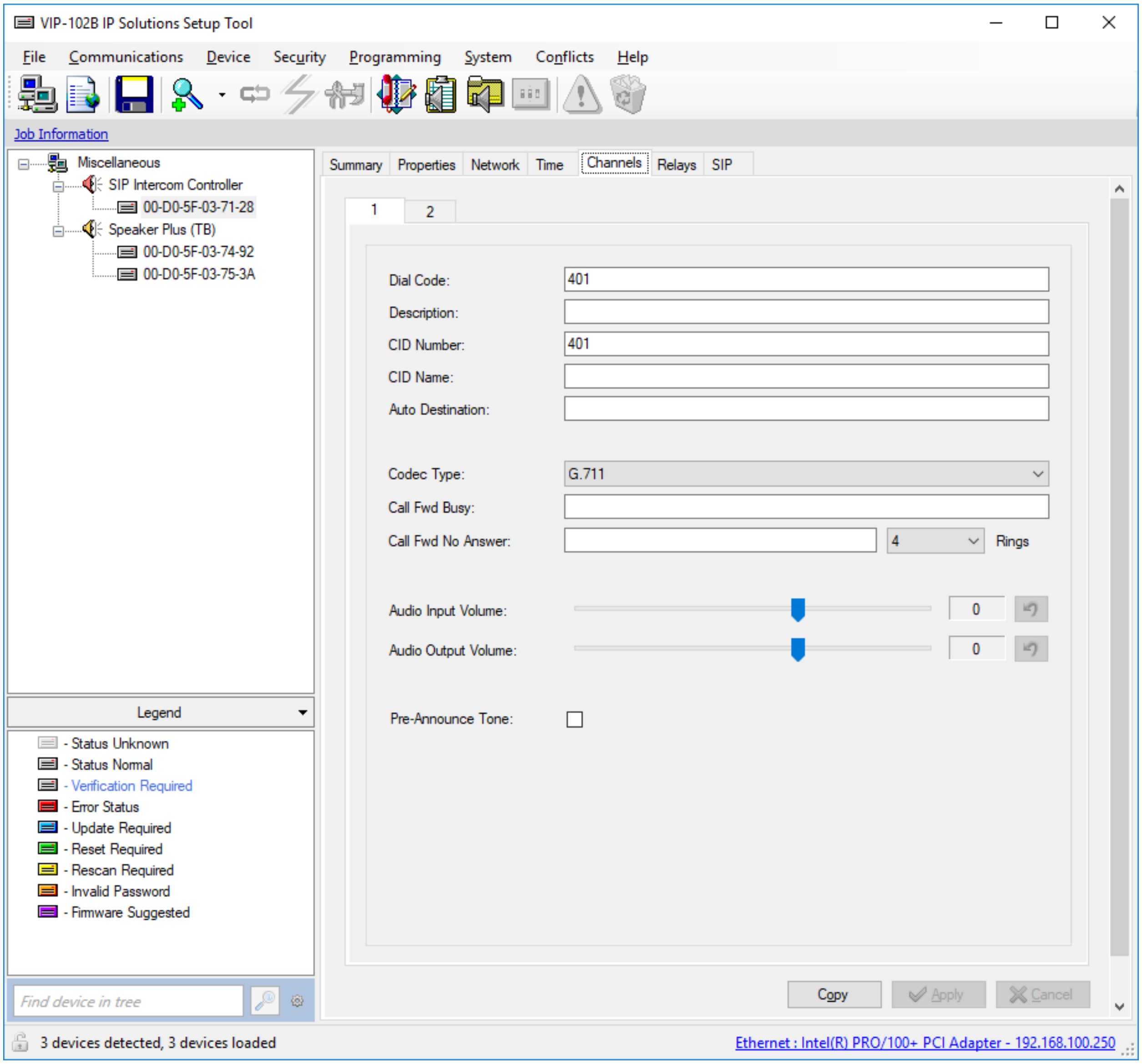
5.3. Configure SIP Parameters of Valcom VE8090R SIP Intercom Controller

From the **VIP-102B IP Solutions Setup Tool**, navigate to the **SIP** tab of the SIP Intercom Controller. Set the **SIP Mode** to *Trunk*, the **Primary Server** to the IP Office Server Edition IP address (i.e., *10.64.102.90*), and the **Auto Destination** to the number that should be dialed when the call button on the VIP-430A IP Wall Speaker is pressed as shown below. The **Register** checkbox should be unchecked and all other fields should be left at their default values. Click **Apply**.



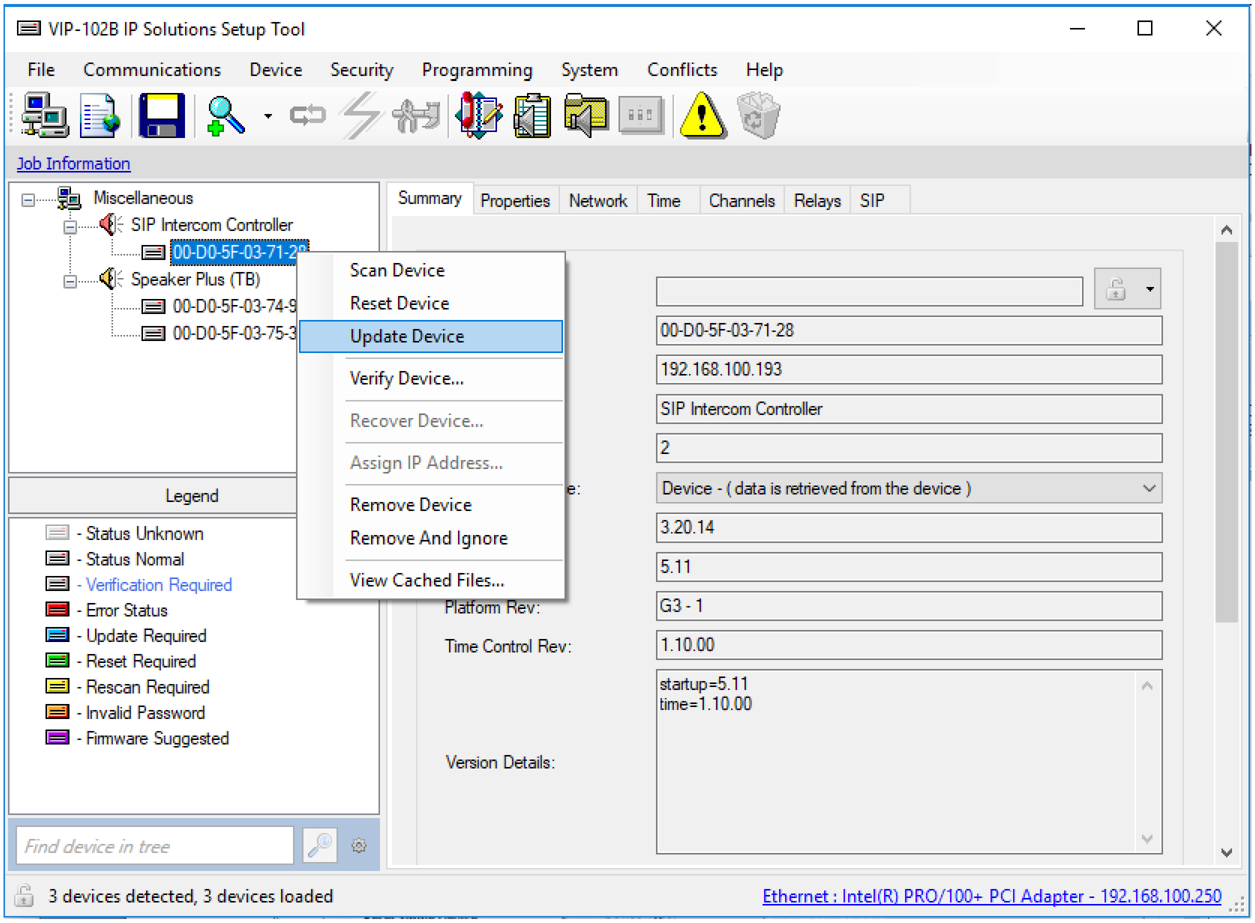
5.4. Verify Codec Settings

Navigate to the **Channels** tab shown below. The Codec Type should be set G.711, currently the only option.

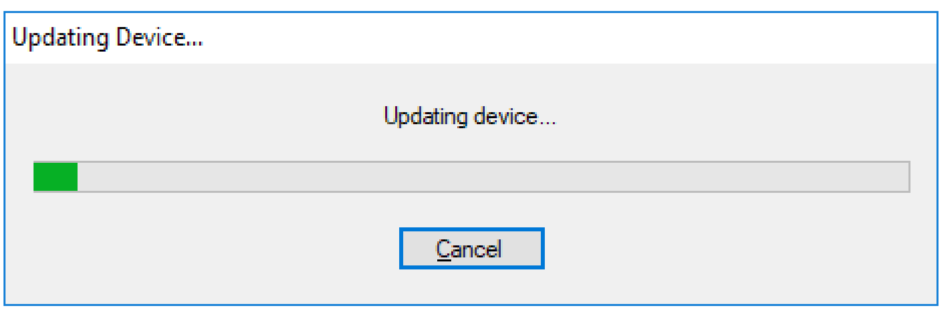


5.5. Update SIP Intercom Controller with the New Configuration

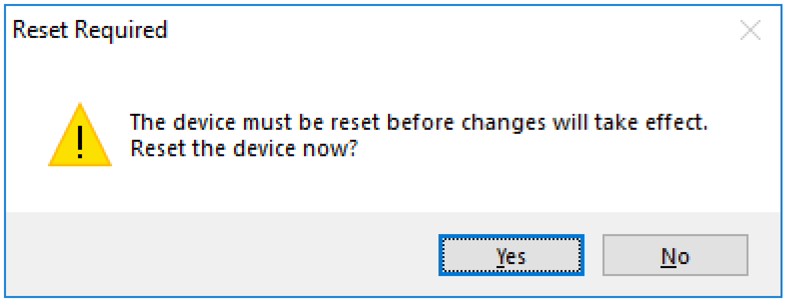
From the **VIP-102B IP Solutions Setup Tool**, right-mouse click on the MAC/hardware address of the SIP Intercom Controller and select **Update Device** from the pop-up menu as shown below.



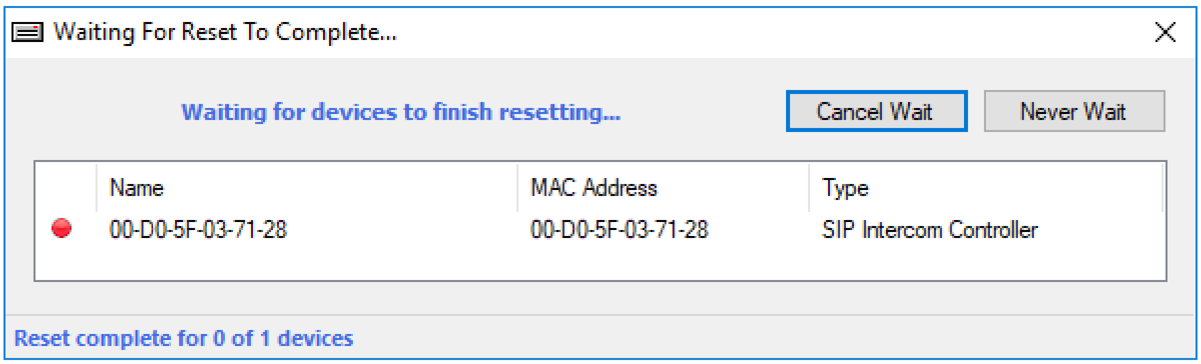
The following window is displayed indicating that the device is being updated.



A device reset is required so respond with **Yes** when prompted.



The following window will be displayed while the device is being reset. When the reset is complete, the window will disappear.



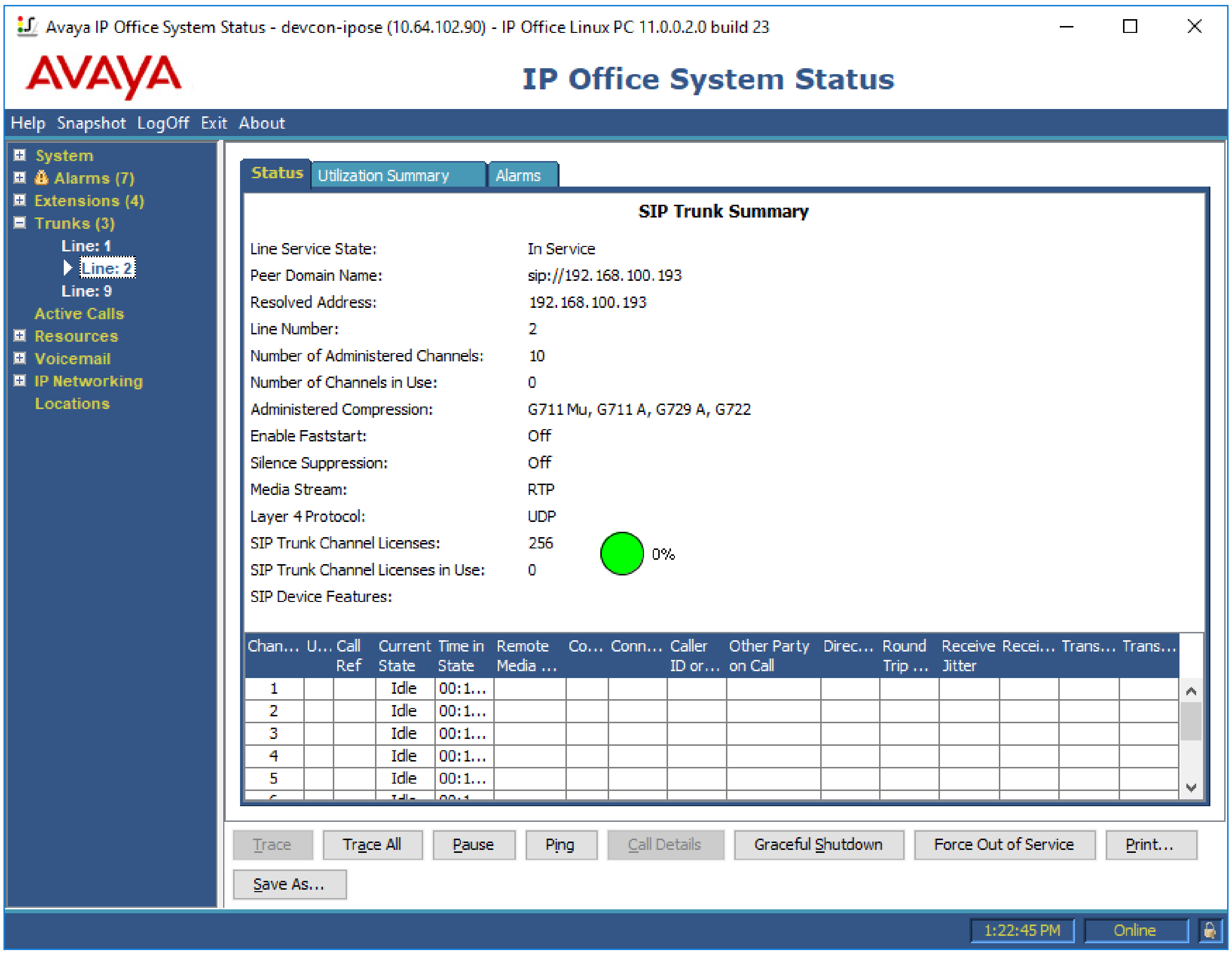
6. Verification Steps

This section provides the tests that may be performed to verify proper configuration of Valcom VE8090R SIP Intercom Controller with Avaya IP Office.

1. From **Avaya IP Office for Server** Edition, select **File → Advanced → System Status** to launch the **System Status** application, and log in using the appropriate credentials.

   The **IP Office System Status** screen is displayed. Expand **Trunks** in the left pane and select the SIP line from **Section 4.4**, in this case "2".

   Verify that the **SIP Trunk Summary** screen shows that the **Line Service State** is *In Service*.



2. Dial a speaker dial code to place an intercom call from an Avaya IP Deskphone to a Valcom speaker. Verify two-way audio. Terminate the call from the Avaya IP Deskphone or by pressing the call button on the speaker.

3. Dial a group code to place a group call from an Avaya IP deskphone to a group of Valcom speakers. Verify one-way audio. Terminate the call from the Avaya IP Deskphone.

4. Place an intercom call by pressing the call button on a Valcom speaker. Verify two-way audio to the call destination. Terminate the call.

7. Conclusion

These Application Notes described the configuration steps required to integrate Valcom VE8090R SIP Intercom Controller with Avaya IP Office Server Edition. Intercom and group calls were established with Valcom VE8090R SIP Intercom Controller, Valcom VIP-430A IP Wall Speakers, Avaya H.323 / SIP deskphones, and the PSTN. All feature and serviceability test cases were completed successfully.

8. References

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

[1] *Administering Avaya IP Office Platform with Manager*, Release 11.0 FP4, February 2019, available at http://support.avaya.com.

[2] *Valcom VIP-102B IP Solutions Setup Tool Version 7.5.0.0 Reference Manual,* Revision 7 – 10/4/18, available at http://www.valcom.com/vipsetuptool.

Please e-mail any questions or comments pertaining to these Application Notes along with the full title name and filename, located in the lower right corner, directly to the Avaya DevConnect Program at devconnect@avaya.com.

VALCOM®

Declaration of Conformance

March 4, 2019

Jeff Gartner
Senior Manager
DevConnect Program
Avaya

Dear Jeff Gartner:

We, Valcom Inc, declare under sole responsibility that product series named SIP Intercom Controller all share the same hardware circuitry, software, SIP stack and firmware version. Therefore, the products are expected to behave in the same manner. The differences between the different models in the series are detailed in the table below.

Sincerely,

David Ellison

David Ellison
Technical Support Manager
Valcom Inc
dellison@valcom.com

Model	Software Rev.	Description
VE8090	3.20.14	SIP Intercom Controller, wall mount, sold direct
VE8090R	3.20.14	SIP Intercom Controller, rack mount, sold direct
VIP-890	3.20.14	SIP Intercom Controller, wall mount, sold through distributors
VIP-890R	3.20.14	SIP Intercom Controller, rack mount, sold through distributors