

Avaya Solution & Interoperability Test Lab

# Applications Notes for Avaya IP Office 9.0 with AT&T IP Flexible Reach SIP Trunk Service – Issue 1.0

## Abstract

These Application Notes describe the steps for configuring Avaya IP Office with the AT&T IP Flexible Reach and IP Flexible Reach-Enhanced Features service using **AVPN** or **MIS/PNT** transport connections.

The AT&T IP Flexible Reach is one of the many SIP-based Voice over IP services offered to enterprises for their voice communication needs. The AT&T IP Flexible Reach-Enhanced Features service is a SIP based service which includes additional network based features which are not part of IP Flexible Reach service. The AT&T IP Flexible Reach service allows enterprises in the U.S.A. to place outbound local and long distance calls, receive inbound Direct Inward Dialing (DID) calls from the PSTN, and place calls between an enterprise's sites.

AT&T is a member of the Avaya DevConnect Service Provider program. Information in these Application Notes has been obtained through compliance testing and additional technical discussions. Testing was conducted via the DevConnect Program.

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# 1. Introduction

These Application Notes describe the steps for configuring Avaya IP Office with the AT&T IP Flexible Reach and IP Flexible Reach-Enhanced Features (IPFR-EF) service using  $AVPN^1$  or **MIS/PNT**<sup>2</sup> transport connections.

Avaya IP Office is a versatile communications solution that combines the reliability and ease of a traditional telephony system with the applications and advantages of an IP telephony solution. This converged communications solution can help businesses reduce costs, increase productivity, and improve customer service.

The AT&T IP Flexible Reach is one of the many SIP-based Voice over IP services offered to enterprises for their voice communication needs. The AT&T IP Flexible Reach-Enhanced Features service is a SIP based service which includes additional network based features which are not part of IP Flexible Reach service. The AT&T IP Flexible Reach service allows enterprises in the U.S.A. to place outbound local and long distance calls, receive inbound Direct Inward Dialing (DID) calls from the PSTN, and place calls between an enterprise's sites.

**Note** – The solution described in these application notes also applies to the AT&T Business in a Box service.

**Note** - References to the AT&T IP Flexible Reach service in the remainder of this document include AT&T IP Flexible Reach-Enhanced Features as well, unless otherwise specified.

# 2. General Test Approach and Test Results

The test environment consisted of:

- A simulated enterprise with IP Office, Avaya phones and fax machines (Ventafax application).
- A laboratory version of the AT&T IP Flex Reach service, to which the simulated enterprise was connected via AVPN or MIS/PNT transport.

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.

<sup>&</sup>lt;sup>1</sup> AVPN uses compressed RTP (cRTP).

<sup>&</sup>lt;sup>2</sup>.MIS/PNT does not support cRTP.

## 2.1. Interoperability Compliance Testing

The interoperability compliance testing verified basic inbound and outbound call flows along with Enhanced Features with AT&T IP Flexible Reach service. **Section 3.2** provides call flows tested for AT&T IP Flexible Reach service.

The compliance testing was based on a test plan provided by AT&T. This test plan examines the functionality required by AT&T for solution certification as supported on the AT&T network. Calls were made to and from the PSTN across the AT&T network.

- AT&T IP Flexible Reach service
  - SIP trunking.
  - Inbound and Outbound calls between AT&T IP Flex Reach service and IP Office endpoints.
  - Call and two-way talk path establishment between PSTN and IP Office phones via the AT&T Flex Reach service.
  - Inbound and outbound dialing including international calls.
  - G.729 and G.711 codecs.
  - Inbound AT&T IP Flex Reach service calls to IP Office that are directly routed to stations, and unanswered, can be covered to Voicemail Pro.
  - Inbound and Outbound T.38 and G.711 Fax using AT&T IP Flexible Reach service and IP Office Group 3 (G3) and Super Group 3 (SG3) fax endpoints.
  - DTMF tone transmission using RFC 2833 between IP Office and the AT&T IP Flex Reach service for:
    - PSTN automated access systems
    - Navigation of Voicemail, auto-attendant and meet-me conference features configured on Voicemail Pro.
  - Basic and supplementary telephony features such as hold, resume, conference and transfer.
  - Call Forward with Diversion Header.
  - Requests for privacy for inbound and outbound calls.
  - SIP OPTIONS monitoring of the health of the SIP trunk.
  - Long Duration Calls.
- AT&T Network IP Flexible Reach-Enhanced Features
  - Network based Simultaneous Ring
  - Network based Sequential Ring (Locate Me)
  - Network based Attended and Unattended Call Transfer using SIP REFER on IP Office
  - Network based Call Forwarding Always (CFA/CFU)
  - Network based Call Forwarding Ring No Answer (CF-RNA)
  - Network based Call Forwarding Busy (CF-Busy)
  - Network based Call Forwarding Not Reachable (CF-NR)

### 2.2. Test Results and Known Limitations

- 1. T.38 faxing is supported for G3 faxes but for SG3 fax, when both sides are set to SG3, the inbound calls to IP Office fail. AT&T and Avaya are investigating this issue.
- 2. IP Office ONLY supports a packet size of 20 msecs. For bandwidth optimization on AVPN, desired packet size is 30 msecs.
- 3. **IP** Office Softphone did not generate RFC2833 DTMF when attempting to navigate menus with an Auto Attendant system utilizing SIP 183 Session Progress signaling Some Auto Attendant systems send 183 Session in Progress in response to an inbound call, and do not send 200 OK until a menu selection has been made. In these cases, Avaya IP Office Softphone did not generate DTMF SIP Telephone Events when menu selection was attempted (even though appropriate SIP Telephone Event SDP signaling was sent in the initial Avaya IP Office Invite and received in the network 183).

It should be noted that if the called Auto Attendant system answers at the onset with 200 OK (prior to a menu selection), then the Avaya IP Office Softphone does generate DTMF Telephone Events during menu selection. This issue does not occur with Avaya IP Office desk phones.

- 4. When an incoming call is forwarded unconditionally by IP Office to an Auto Attendant which sends **183 Session in Progress** instead of **200 OK**, the call is not forwarded successfully.
- IP Office and RFC2833 Telephone Event Type not applied to SIP endpoints Avaya IP Office R9.0 allows the RFC2833 Telephone Event Type to be specified (*System/Codecs* tab, see Section 5.3.6). While this parameter does apply successfully to native and H.323 endpoints, it is not applied to SIP endpoints.
  - An 1120E SIP telephone and Softphone used Telephone Event Type 101
  - No issues were found during testing as a result of this behavior.
- 6. **IP Office Direct Media feature issues** During testing the following issues were found when the Direct Media option was enabled:
  - Initial audio clipping was observed when Direct Media is established (media stream redirected from the Avaya IP Office hardware to the Avaya IP Office endpoint).
  - It was found that when Direct Media was enabled, Avaya IP Office IP endpoints did not send RTP Events.
  - As a result of these issues, the recommended configuration is to have Direct Media disabled (see Section 5.4.4).
  - It should also be noted that only Direct Media *or* T.38 fax is supported on a SIP Line. The use of both features on the same SIP Line is not supported.
- 7. Attended and Unattended Call Forwarding **may** get a **603 Decline** when **Refer Support** is enabled in **Section 5.4.2**. This may be because Network based **REFER** feature is not supported in all AT&T IP Flexible Reach service areas. Calls do work but they are actually not being referred by the network, so the CPE continues to be in the middle of the call. It is advisable to disable **Refer Support** in **Section 5.4.2** to avoid additional signaling.
- 8. Emergency 911/E911 Services Limitations and Restrictions Although AT&T provides 911/E911 calling capabilities, AT&T does not warrant or represent that the equipment and software (e.g., IP PBX) reviewed in this customer configuration guide will properly operate

with AT&T IP Flexible Reach to complete 911/E911 calls; therefore, it is Customer's responsibility to ensure proper operation with its equipment/software vendor.

While AT&T IP Flexible Reach services support 911/E911 calling capabilities under certain Calling Plans, there are circumstances when that 911/E911 service may not be available, as stated in the Service Guide for AT&T IP Flexible Reach found at <u>http://new.serviceguide.att.com</u>. Such circumstances include, but are not limited to, relocation of the end user's CPE, use of a non-native or virtual telephone number, failure in the broadband connection, loss of electrical power, and delays that may occur in updating the Customer's location in the automatic location information database. Please review the AT&T IP Flexible Reach Service Guide in detail to understand the limitations and restrictions.

## 2.3. Support

AT&T customers may obtain support for the AT&T IP Flexible Reach service by calling (877) 288-8362.

Avaya customers may obtain documentation and support for Avaya products by visiting <u>http://support.avaya.com</u>. In the United States, (866) GO-AVAYA (866-462-8292) provides access to overall sales and service support menus. Customers may also use specific numbers (provided on <u>http://support.avaya.com</u>) to directly access specific support and consultation services based upon their Avaya support agreements.

# 3. Reference Configuration

The reference configuration used in these Application Notes is shown in the figure below and consists of several components:

- IP Office provides the voice communications services for a particular enterprise site. In the reference configuration, IP Office runs on an IP 500 V2. This solution is extensible to the Avaya IP Office Server Edition platform as well.
- Avaya "desk" phones are represented with Avaya 1616I, 4625 and 9630 IP Telephones running H.323 software, Avaya Digital Phones (1416, T7100 and 7316E), Avaya 6211 Analog Telephone, Avaya SIP Phones (1140E and 1230) and PC based IP Office Softphone. Fax endpoints are represented by PCs running Ventafax software connected by modem to an Avaya IP Office analog port.
- Voicemail Pro provides the voice messaging capabilities in the reference configuration and its provisioning is beyond the scope of this document.
- Outbound calls are originated from a phone or fax provisioned on IP Office. Signaling is sent between IP Office and the AT&T Border Element IP Address.
- Enterprise sites may have additional or alternate routes to PSTN using analog or digital TDM trunks. However these trunks were not used in this reference configuration.

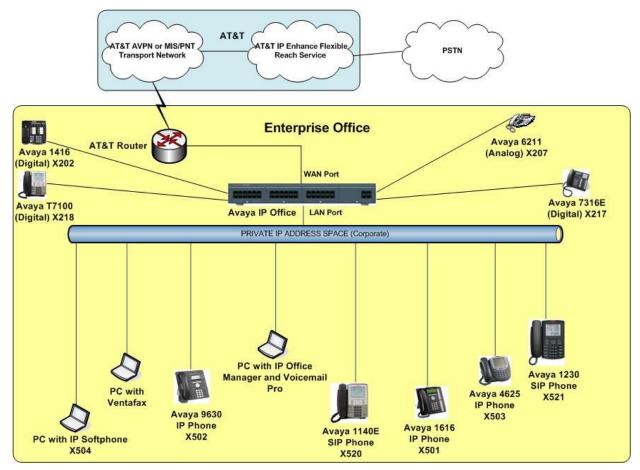


Figure 1: Reference configuration

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## **3.1. Illustrative Configuration Information**

The specific values listed in the table below and in subsequent sections are used in the reference configuration described in these Application Notes, and are **for illustrative purposes only**. Customers must obtain and use the specific values for their own specific configurations.

**Note** - The AT&T IP Flexible Reach service Border Element IP address shown in this document is an example. AT&T Customer Care will provide the actual IP addresses as part of the AT&T IP Flexible Reach service provisioning process.

Component	Illustrative Value in these Application Notes
Avaya IP Office	
Public IP Address	192.168.62.58
Private IP Address	10.80.130.58
Avaya IP Office Extensions	207 = Analog
	501,502=H323
	201,217,218=Digital
	504=Softphone
	520,521 = SIP phones
AT&T IP Flexible Reach Service	
Border Element IP Address	135.242.225.200

 Table 1: Illustrative Values Used in these Application Notes

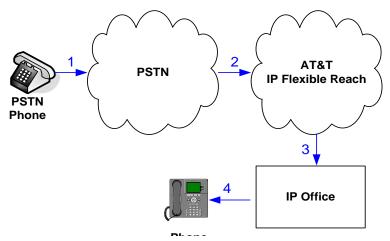
### 3.2. Call Flows

To understand how inbound and outbound AT&T IP Flexible Reach service calls are handled by IP Office, four basic call flows are described in this section.

### 3.2.1. Inbound

The first call scenario illustrated in the figure below is an inbound AT&T IP Flexible Reach service call that arrive on IP Office, which in turn routes the call to a hunt group, phone or a fax endpoint.

- 1. A PSTN phone originates a call to an AT&T IP Flexible Reach service number.
- 2. The PSTN routes the call to the AT&T IP Flexible Reach service network.
- 3. The AT&T IP Flexible Reach service routes the call to IP Office.
- 4. IP Office applies any necessary digit manipulations based upon the DID and routes the call to a hunt group, phone or a fax endpoint.

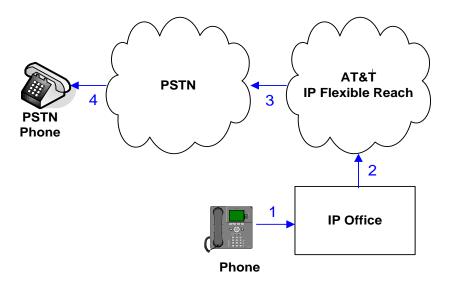


Inbound - AT&T IP Flexible Reach

### 3.2.2. Outbound

The second call scenario illustrated in the figure below is an outbound call initiated on IP Office for delivery to AT&T IP Flexible Reach service.

- 1. An IP Office phone or fax endpoint originates a call to an AT&T IP Flexible Reach service number for delivery to PSTN.
- 2. IP Office applies any necessary origination treatment (verifying permissions, determining the proper route, selecting the outgoing trunk, etc.) and routes the call to AT&T IP Flexible Reach service.
- 3. The AT&T IP Flexible Reach service delivers the call to PSTN.
- 4. PSTN delivers the call to a phone or fax endpoint.



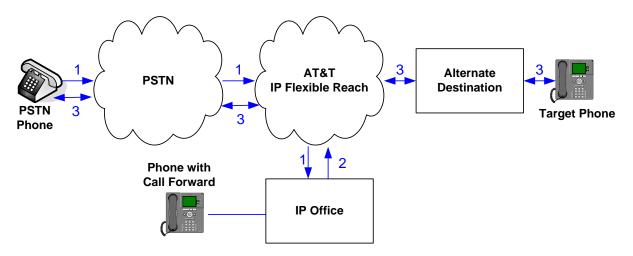
Outbound - AT&T IP Flexible Reach Service

### 3.2.3. Call Forward Re-direction (Diversion Header)

The third call scenario illustrated in the figure below is an inbound AT&T IP Flexible Reach service call destined for an IP Office station that has set Call Forwarding to an alternate destination. Without answering the call, IP Office immediately redirects the call back to the AT&T IP Flexible Reach service for routing to the alternate destination.

**Note** –AT&T requires the diversion header when a call is redirected to ATT IP Flexible Reach service telephone number. (see **Section 5.4.1**).

- 1. Same as the first call scenario in **Section 3.2.1**.
- 2. Because the IP Office phone has set Call Forward to another AT&T IP Flexible Reach service number, IP Office initiates a new call back out to the AT&T IP Flexible Reach service network.
- 3. The AT&T IP Flexible Reach service places a call to the alternate destination and upon answer, IP Office connects the calling party (PSTN Phone) to the target party (Target Phone).

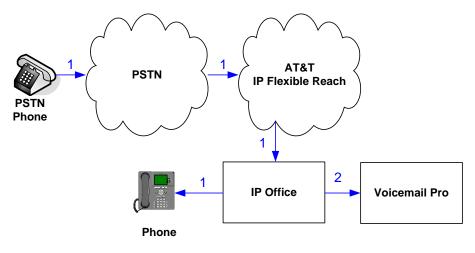


Re-directed (e.g. Call Forward) - AT&T IP Flexible Reach Call

#### 3.2.4. Coverage to Voicemail

The call scenario illustrated in the figure below is an inbound call that is covered to voicemail. In this scenario, the voicemail system is Voicemail Pro software installed on a PC.

- 1. Same as the first call scenario in Section 3.2.1.
- 2. The IP Office phone does not answer the call, and the call covers to the phone's voicemail. IP Office forwards the call to Voicemail Pro.



**Coverage to Voicemail** 

# 4. Equipment and Software Validated

The following equipment and software was used for the reference configuration described in these Application Notes.

**Note** - Testing was performed with IP Office 500 V2 R9.0, but it also applies to IP Office Server Edition R9.0. Note that IP Office Server Edition requires an Expansion IP Office 500 V2 R9.0 to support analog or digital endpoints or trunks. IP Office Server Edition does not support TAPI Wave or Group Voicemail.

Component	Version
Avaya IP Office 500 V2	Release 9.0 (829)
Avaya IP Office Manager	Release 9.0 (829)
Avaya IP Office Voicemail Pro	Release 9.0 (311)
Avaya IP Office Voicemail Pro Client	Version 9.0 (311)
Avaya 1616IP-Series Telephones (H.323)	Release 1.33
Avaya 9630 IP Telephone	Avaya one-X® Deskphone Edition
	H.323 Version S3.2
Avaya IP Office Softphone	Release 3.2.3.49 68975
Avaya 1416 Digital Telephone	-
Avaya T7100 Digital Phone	-
Avaya 7316E Digital Phone	-
Avaya 6211 Analog phone	-
Avaya 1140E SIP Telephone	04.03.18.00 (SIP1140)
Avaya 1230 SIP Telephone	04.03.18.00 (SIP1230)
Fax device	Ventafax Home Version 6.2
AT&T IP Flexible Reach Service using	VNI 26
AVPN or MIS/PNT transport service	
connections.	

**Table 2: Equipment and Software Versions** 

# 5. Configure Avaya IP Office

This section describes attributes of the reference configuration, but is not meant to be prescriptive. The configuration steps described here are only for the fields where a value was changed. For all the other fields default values are used. Additionally, the screen shots referenced in these section may not be complete at times. Consult reference [IPO-INSTALL] for more information on the topics in this section.

IP Office is configured via the IP Office Manager program. For more information on IP Office Manager, consult reference [IPO-MGR]. From the IP Office Manager PC, select **Start**  $\rightarrow$ **Programs**  $\rightarrow$ **IP Office**  $\rightarrow$ **Manager** to launch the Manager application. A screen that includes the following in the center may be displayed:

# WELCOME to IP Office Administration

## What would you like to do ?

Create an Offline Configuration Open Configuration from System Read a Configuration from File

Open the IP Office configuration, either by reading the configuration from the IP Office server, or from file. The appearance of the IP Office Manager can be customized using the **View** menu. In the screens presented in this section, the View menu was configured to show the Navigation pane on the left side, and the Details pane on the right side.

## 5.1. Physical, Network, and Security Configuration

In the reference configuration, the IP Office 500 V2 contains a VCM32 module, COMBO6210/ATM4 module, and a TCM8 module. The VCM32 is a Voice Compression Module supporting VoIP codecs. The COMBO6210/ATM4 was used in this reference configuration to support digital and analog telephones or fax machines. The TCM8 module was used to support heritage Avaya/Nortel digital phone extensions.

The following screen shows the modules in the IP Office used in the sample configuration. To access such a screen, select **Control Unit** in the Navigation pane. The modules appear in the Details pane. In the screen below, **IP 500 V2** is selected in the Navigation pane, revealing additional information about the IP 500 V2 in the Details pane.

忆 Avaya IP Office R9 Manager 00E00705C035 [9.0.0.829] [Administrator(Administrator)]							
File Edit View Tools Help							
00E00705C035   Control Unit	✓ 1 IP 500 V2	- 🕴 🗻 🖂 🖬 🖃 🖬 🔁 📰 🚣					
IP Offices		IP 500 V2					
BOOTP (1)         Operator (3)         ODE00705C035         System (1)         Image: Control Unit (5)         Image: Control Unit (5)	Unit Device Number Unit Type Version Serial Number Unit IP Address Interconnect Number	1 IP 500 V2 9.0.0.829 00∈00705c035 10.80.130.58 0					
	Module Number	Control Unit					

In this reference configuration, the IP Office LAN2 port (labeled as WAN port in Figure 1) is physically connected to the public network at the IP Office customer site. The default gateway for this network is **192.168.62.1**.

 To add an IP Route in IP Office, right-click IP Route from the Navigation pane, and select New [not shown]. To view or edit an existing route, select IP Route from the Navigation pane, and select the appropriate route from the Group pane. The following screen shows the Details pane with the relevant default route using LAN2 as configured in Destination field (Refer Section 5.3.2).

🖌 Avaya IP Office R9 Manager 00E00705C035 [9.0.0.829] [Administrator(Administrator)]						
File Edit View Tools Help						
00E00705C035 - IP Route	- 0.0.0.0 - 🗟 😂 - 🔜 💽 🖬 🛕	✓ 🍜 🏞 🚹				
IP Offices		0.0.0.0*				
	IP Route					
	IP Address	0 · 0 · 0 · 0				
⊞…≪⊽ System (1) ⊞…∕†? Line (7)	IP Mask	0 · 0 · 0 · 0				
	Gateway IP Address	192 168 62 1				
User (32)	Destination	LAN2				
🗄 🥵 Short Code (62)	Metric	0				
Service (0)     RAS (1)		Proxy ARP				
🗉 🌔 Incoming Call Route (17)						
Time Profile (0)     Time Profile (1)     Firewall Profile (1)						
IP Route (3)						
0.0.0						

2. Another route for **10.80.130.0** subnet was added for the enterprise side **LAN1** port (labeled as LAN port in Figure 1) as shown in the screen below. All the IP devices were part of this 10.80.130.x network in this reference configuration.

忆 Avaya IP Office R9 Manager 00E00705C035 [9.0.0.829] [Administrator(Administrator)]						
File Edit View Tools Help						
00E00705C035 • IP Route	- 10.80.130.0 - 🕴 🏖 🗁 - 🖃 🛛 🖬 🔔 🛹 🍛 🍝	≥ 1				
IP Offices	10.80.130	.0				
	IP Route					
⊞	IP Address	10 · 80 · 130 · 0				
⊞…≪च System (1) ⊞…री Line (7)	IP Mask	255 255 255 0				
Control Unit (5)	Gateway IP Address	10 · 80 · 130 · 1				
🗄 📲 User (32)	Destination	LAN1				
≝∰ Group (11) ⊛	Metric	0				
		Proxy ARP				
<ul> <li>Incoming Call Route (17)</li> <li>WanPort (0)</li> </ul>						
Directory (0)						
Time Profile (0)						
□ <b>1</b> IP Route (3) <b>1</b> 0.0.0.0						
10.80.130.0						

3. For use of Avaya IP Office Softphone, navigate to **File → Advanced → Security Settings** and login with proper credentials in the screen shown below.

Security Service User Login						
IP Office:	00E00705C035 - IP 500 V2					
Service User Name	security					
Service User Password	••••••					
	OK Cancel Help					

4. After logging in, navigate to Services → HTTP and verify that Service Security Level field is set to Unsecure + Secure. Note that this action may be service disrupting.

🕐 Avaya IP Office R9 Manager - Security Administration - 00E00705C035 [9.0.0.0 build 829] [security]						
File Edit View Help						
: 2. 🖃 🖙 - I 🛋 🔜 🔝 🗛 I 🖂						
Security Settings	Service: HTT	P				
E- Security	Service Details					
	Name	НТТР				
⊡	Host System	00E00705C035				
Security Administration	Service Port	80, 443				
System Status Interface Enhanced TSPI BHTTP	Service Security Level	Unsecure + Secure				

5. When complete, select **File**  $\rightarrow$  **Configuration** to return to configuration activities.

### 5.2. Licensing

The configuration and features described in these Application Notes require the IP Office system to be licensed appropriately. If a desired feature is not enabled or there is insufficient capacity, contact an authorized Avaya sales representative.

To verify that SIP Trunk Channels has sufficient capacity, navigate to **License** in the Navigation pane and confirm a valid license with sufficient Instances **SIP Trunk Channels**, **Avaya IP endpoints** and **Power User** exist in the Details pane. Power user licenses are required for IP Office softphone (Section 5.5.2).

Avaya IP Office R9 Manager 00E00705C	035 [9.0.0.829] [Administrator(Administrat	or)]				
File Edit View Tools Help	÷		1.0			A
IP Offices	00E00705C035   License	•	• j: & C	) * 🔄 🔺 🔛	≤ ✓ 🔬 🔁	
<ul> <li>₩ Operator (3)</li> <li>₩ 0000705C035</li> <li>₩ System (1)</li> <li>₩ -f 3 Line (7)</li> </ul>	License Mode License Normal PLDS Host ID 111307012163					
E Control Unit (5)	Feature	License Key	Instances	Status	Expiry Date	Source
Extension (32)	VMPro Networked Messaging	8yQcHqorLtaKamEJGc7GmnP4NoEWjLLB	255	Valid	Never	ADI No
Group (11)	VMPro Database Interface	3TTv_amx5XjEO9JDQWm@_WjQOX0KEPex	255	Valid	Never	ADI No
Short Code (62)	VMPro VB Script	Pa9l8It@PICjFyBHa5pE_HEZYiu8rRZW	255	Valid	Never	ADI No
	VMPro Recordings Administrators	byCD6UmbtOmojvmKfJeLkIPf9KmisW25	255	Valid	Never	ADI No
🖻 📲 🧸 RAS (1)	VMPro Outlook Interface	o3nT8TdpSdD@AQfznY9gLwjeAg_SP1LH	255	Valid	Never	ADI No
Incoming Call Route (17)     WanPort (0)	VMPro TTS (Scansoft)	RTaAqUdz9juUh4ET66xH6WqzKzjrpW81	255	Valid	Never	ADI No
Directory (0)	VMPro TTS (Generic)	yKmhle9sAOgrnkELQWmU6Y3_YczJwfp5	255	Valid	Never	ADI No
Time Profile (0)	IPSec Tunnelling	DtCou1t2EXjeOdY4ga_r_AE8P983rmLC	255	Valid	Never	ADI No
🗄 🕕 Firewall Profile (1)	Proactive Reporting	IvQ7yk5tLDGGXM6RJw8r9bvo9u@8wE@C	255	Valid	Never	ADI No
IP Route (3)	Report Viewer	zX9lb@hsQNGTAWwhTOxKBKvLlosoPB_c	255	Valid	Never	ADI No
Account Code (0)	Mobility Features	CtTk_8y19SHvKM54HA_5g0_OG5F_SxbH	255	Obsolete	Never	ADI No
License (65)	IP500 Voice Networking Channels	NTnHHTmNAGsOSXE7CYe@xAfWOideve9e	255	Valid	Never	ADI No ADI No
Ser Rights (8)	IP500 Voice Networking Channels	lyIIBaBgdOnsak83QvMXcqSB52sQjp81	4	Valid	Never	ADI No ADI No
ARS (2)	VCM Channel Migration	9aHz3D6@DDq5@D8PnOekmqo_IOSBd9o5	255	Valid	Never	ADI No ADI No
RAS Location Request (0)	SIP Trunk Channels	132BaSdmDUELy1PETYmfxGf2GXsRgHSz	255	Valid	Never	ADI No
bocation (0)	IP500 Universal PRI (Additional cha		255	Valid	Never	ADI No ADI No
			255	Valid	Never	ADI No ADI No
	RAS LRQ Support (Rapid Response)	wtMC@BtVgNyTN0fAQ18t_NRTXXx7rW2M	255	Valid	Never	ADI No ADI No
	IP Office Dealer Support - Standar	Ut004Mg0PV1NKf7ECLrTBBhIsJ@dwCoc		Valid		ADI No ADI No
	IP Office Dealer Support - Professi	UXXnb9OXAw1SFLGv57_13qDQEMLEw7u	255		Never	
	IP Office Distributor Support - Stan	-	255	Valid	Never	ADI No
		fvI6ZedkMjt5a3zUWy_X_rwYQVDYdCmM	255	Valid	Never	ADI No
	UMS Web Services	SGm5aMy2XsYOhGpinCoyczdKszp2Lf_x	255	Valid	Never	ADI No
	CCR SUP	FK0NFC6@gUAPV3RiJ9zjwbSIUKMEjCI5	255	Valid	Never	ADI No
	Customer Service Agent	ZKQdJD99dKqK0Cm7HJMgwvYGv2s@A77e	255	Valid	Never	ADI No
	CCR Designer	8h02Fb9@PdF5bXRYGT9VmC3ISDuyGxZ1	255	Valid	Never	ADI No
	CCR CCC UPG	3n0tnUg6StXcU3PGKzLTr6GDviiKru@e	255	Valid	Never	ADI No
	1600 Series Phones	63@xo79g9jCTsyoRQduu1A_zjOZuUYMW	255	Valid	Never	ADI No
	Third Party API	PyICnA@SvDatVOMpIQ85LRp8rtzdULDC	255	Valid	Never	ADI No
	Software Upgrade 8	E@0qu@5MSNOcSzEkHS6qfS1giTuNLXDI	1	Valid	Never	ADI No
	one-X Portal for IP Office	v4DPi9haEjvjAb1syHoPmmFPVA7Cvzue	255	Valid	Never	ADI No
	Avaya IP endpoints	hnn@3_mC5V2s3vMUfGuekbvvp100E1b9	255	Valid	Never	ADI No
	Customer Service Supervisor	dqeOuH6zQK16FTgjy8rz6hZcskNIprOJ	255	Valid	Never	ADI No
	Essential Edition Additional Voice	mXToyQy4dDEjjFj1tZMy9fhGQLszscl5	255	Valid	Never	ADI No
	Teleworker	CGaARWg8EG4nqR0CwwMAc1Z@VGbFLEE	255	Valid	Never	ADI No
	Mobile Worker	uUKaRPyx5vhkaOOxYEuVrJhvEM8Wp1Lx	255	Valid	Never	ADI No
	Power User	nKQNi6LwQNhr3nKH1Qpy1PgTdLVhAgj9	255	Valid	Never	ADI No

## 5.3. System Settings

This section illustrates the configuration of system settings. Select **System** in the Navigation pane to configure these settings. The configuration in following sections is for reference purposes only.

### 5.3.1. System Tab

With the proper system name selected in the Group pane, select the **System** tab in the Details pane. The following screen shows a portion of the **System** tab. The **Name** field is used for a descriptive name of the system. In this case, the MAC address is used as the name. The **Avaya HTTP Clients Only** and **Enable SoftPhone HTTP Provisioning** boxes are checked to facilitate IP Office Softphone usage.

Avaya IP Office R9 Manager 00E00705C0	035 [9.0.0.829] [Administrator(Administrator)]	
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00E00705C035 • System	- 00E00705C035 - 🕴 🏖 🗁 - 🔙   🛋 🖭 🔜 💉 🧈 🧉	≥ ′
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IP Offices         IP Operator (3)         IP ODE00705C035         IP ODE00705C035         IP OPERATOR (3)         IP ODE00705C035         IP OFF (1)         IP ODE00705C035         IP OFF (1)         IP ODE00705C035         IP OPERATOR         IP OPERATOR	System       LAN1       LAN2       DNS       Voicemail       Telephony       Directory Services       Syster         Name       00E00705C035       0	n Events
🗄 📲 User Rights (8)		
RAS (2)	Avaya HTTP Clients Only Enable Softphone HTTP Provisioning	[
Location (0)	Automatic Backup 🔽	
	Time Setting Config Source Voicemail Pro/Manager	

### 5.3.2. LAN Settings

In the sample configuration, LAN2 was used to connect the IP Office to AT&T Network and LAN1 was used to connect to the enterprise network.

- 1. Select the LAN2 tab followed by the LAN Settings tab and configure as follows:
  - **IP Address** Set to **192.168.62.58** which is the IP address of IP Office known to AT&T network
  - IP Mask Set to a valid value e.g 255.255.255.0
  - Primary Trans. IP Address Set to 0.0.0.0
  - **DHCP Mode** Select the **Disabled** radio button

Manager 00E00705C0	35 [9.0.0.829] [Administrator(Adminis	strator)]				
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IP Offices	12		00E00705C035*			
BOOTP (1)	System LAN1 LAN2 DNS		y Services System Events SMTP	SMDR Twinning	VCM CCR	Codecs
	LAN Settings VoIP Network	Topology				
00E00705C035	IP Address	192 · 168 · 62 · 58				
●…行了 Line (7) ●…一一 Control Unit (5)	IP Mask	255 255 255 0				
Extension (32)	Primary Trans. IP Address	0 . 0 . 0 . 0				
	Firewall Profile	<none></none>	•			
Service (0)     ASS (1)	RIP Mode	None	•			
🗉 😳 Incoming Call Route (17)		Enable NAT				
	Number Of DHCP IP Addresses	1				
	🔘 Server 🔘 Client 🔘 Diali	n 💿 Disabled	Advanced			

- 2. Select the **VoIP** tab as shown in the following screen and configure as follows:
  - SIP Trunks Enable Check this box to enable the configuration of SIP trunks
  - **RTP Port Range (Minimum)** Set to **16384** (As required by AT&T)
  - **RTP Port Range (Maximum)** Set to **32766** (As required by AT&T). Although AT&T requires the maximum value to be **32767**, IP Office needs an even number to be entered in this field

To prevent possible issues with network firewalls closing idle RTP channels, it is recommended that following be enabled in **Keepalives** section:

- Scope Select RTP
- **Periodic Timeout** Enter **30**
- Initial keepalives Select Enabled

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IP Offices Operator (3) Operator (3) ODE00705C035 ODE00705C035 ODE00705C035 ODE00705C035 ODE00705C035 ODE00705C035 ODE00705C035 ODE00705C035 ODE00705C035 ODE00705 ODE0000 ODE000705 ODE000705 ODE000705 ODE00075 ODE0005 ODE0005 ODE0005 ODE0005 ODE0005 ODE0005 ODE0005 OD	OOE00705C035*         System LANI       LAN2       DNS       Voicemail       Telephony       Directory Services       System Events       SMTP       SMDR       Twinning       VCM       CCR       Codec         LAN Settings       VoiP       Network Topology       H323 Stekeeper Enable       Auto-create User       H323 Remote Extn Enable         Auto-create Extn       Auto-create User       H323 Remote Extn Enable         SIP Trunks Enable       SIP Registrar Enable         Auto-create Extn/User       SIP Remote Extn Enable         Domain Name       UDP       UDP Port       S660       Remote UDP Port       S060       Image: Remote TCP Port       S060       Image: Remote TCP Port       S060       Image: Remote TLS Port       S061       Image: Remote TLS Port       S061
	Initial keepalives Enabled

3. Select the **Network Topology** tab as shown in the following screen and set **Firewall/NAT Type** field to **Open Internet**. With this configuration, STUN will not be used but make sure to leave **STUN Server IP Address** to its default value.

Avaya IP Office R9 Manager 00E00705C03	5 [9.0.0.829] [Adminis	strator(Administ	rator)]									
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00E00705C035 • System	▼ 00E00705	5C035	- 12	. 🖻 - 🖬 🛛	s 🖭 🖬 🔺 🕟	/ 🍐 🛹 🔞						
IP Offices	32				00E00	0705C035*						
BOOTP (1)	System LAN1 L	AN2 DNS	Voicema	il Telephony	Directory Services	System Events	SMTP	SMDR	Twinning	VCM	CCR	Codecs
Operator (3)     00E00705C035	LAN Settings Vol	P Network T	opology									
Goteono System (1)	-Network Topolog	gy Discovery										
● 「行了 Line (7) ● 一句 Control Unit (5)	STUN Server Add	dress	6	9.90.168.13		ST	'UN Port	347	8			
Extension (32)	Firewall/NAT Typ	pe	C	Open Internet		-						
ia∰ User (32) ia∰ Group (11)	Binding Refresh	Time (seconds)	3	0								
B9X Short Code (62) 	Public IP Address	s			0 . 0		Run STU	N	Cancel			
Incoming Call Route (17)	Public Port											
	UDP	0	*									
Time Profile (0)	ТСР	0	*									
IP Route (3)	TLS	0	<b>*</b>									
License (65)	Run STUN on	startup										

 Select the LAN1 tab followed by the LAN Settings tab and set IP Address of the IP Office on the enterprise side to 10.80.130.58 and IP Mask to 255.255.255.0. Check the DHCP Mode – Disabled radio button.

📶 Avaya IP Office R9 Manager 00E00705C0	35 [9.0.0.829] [Administrator(Admini	strator)]				
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00E00705C035 - System	<ul> <li>00E00705C035</li> </ul>	- 🛛 🕹 📂 - 🔙 🗖 💽 🗄	1 🔺 🛸 🗸 🚹			
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<ul> <li></li></ul>	System LAN1 LAN2 DNS	Voicemail Telephony Director	y Services System Events	SMTP SMDR	Twinning VCM	CCR Codecs
i=	IP Address	10 80 130 58				
····· Control Unit (5) ····· ◆ Extension (32) ···· ↓ User (32)	IP Mask Primary Trans. IP Address	255     255     255     0       0     0     0     0     0				
Group (11)	RIP Mode	None	•			
		Enable NAT				
Incoming Call Route (17)	Number Of DHCP IP Addresses	200				
WanPort (0)	DHCP Mode					
Time Profile (0)	🔘 Server 🔘 Client 🔘 Dial	in 💿 Disabled	Advanced			

- 5. Select the **VoIP** tab as shown in the following screen and configure as follows:
  - H323 Gatekeeper Enable Check this box to allow the use of Avaya IP Phones
  - SIP Registrar Enable Check this box to allow SIP phones and IP Office Softphone usage
  - **Domain Name** Set to **avaya.com**. This domain is used for SIP phone configuration.

ANI LAN2 DNS	v 🔒 🚨 📂	0	<mark>♪</mark>   ✔ ﷺ 孝 ' 0E00705C03					
AN1 LAN2 DNS								
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- Gatekeeper Enable create Extn			ervices System Ev				CCR	Codecs
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umber Range um umber Range (NAT) — um	10 49152 x 49152 x	TLS Port	53246	]	LS Port 5061			
	3 Gatekeeper Enable create Extn Trunks Enable Registrar Enable create Extn/User In Name Protocol uge Expiry Time (secs) umber Range num	VoIP     Network Topology       3 Gatekeeper Enable       >-create Extn       Auto-cr       Trunks Enable       Registrar Enable       >-create Extn/User       n Name       avaya.com       V UDP       Protocol       I TLS       inge Expiry Time (secs)       10	VolP       Network Topology         3 Gatekeeper Enable         >-create Extn         Auto-create User         Trunks Enable         Registrar Enable         -create Extn/User         n Name         avaya.com         V UDP       UDP Port         Protocol       V TCP         TLS       TLS Port         inge Expiry Time (secs)       10         umber Range       Maximum         umber Range (NAT)       Maximum	VoIP Network Topology 3 Gatekeeper Enable create Extn Auto-create User Trunks Enable Registrar Enable create Extn/User In Name avaya.com V UDP UDP Port 5060 V UDP UDP Port 5060 V TCP TCP Port 5060 TLS TLS Port 5061 In TLS TLS P	ngs VolP Network Topology 3 Gatekeeper Enable create Extn Auto-create User H3. Trunks Enable create Extn I Auto-create User I H3. Trunks Enable create Extn/User I SIP n Name avaya.com I UDP UDP Port 5060	Vol Network Topology     3 Gatekeeper Enable  create Extn     Auto-create User     ITrunks Enable   Registrar Enable  create Extn/User     SIP Remote Extn Extn     Name   avaya.com   IV UDP   UDP   UDP   UDP   UDP   UDP   ITLS   TLS   TLS   In Name   avage.com   Image Expiry Time (secs)   10   Image Noil   Number Range   Num   49152   Image Noil   Auto-create Maximum   53246   Image Noil   I	Vol Network Topology     3 Gatekeeper Enable  create Extn   Auto-create User   ITrunks Enable   Registrar Enable  create Extn/User     Image Contraction     VOP   VUP   VUP   Auto-create User     Image Contraction     Image	VolP Network Topology     3 Gatekeeper Enable   >-create Extn   Auto-create User   ITrunks Enable     Registrar Enable   >-create Extn/User     IName   avaya.com   IV UDP   UDP   UDP   UDP   UDP   ITCP   TCP TCP Port   5060   ITLS   TLS   ID   IN   IN Maximum   53246     In Name     Auto-create International Internati

6. The Network Topology screen is set the same as it was set in **Step 3**. Click **OK** [not shown] to commit.

### 5.3.3. Voicemail

Avaya IP Office Voicemail Pro was used in the reference configuration as the voicemail platform, running on a Windows desktop. The installation and provisioning of Avaya IP Office Voicemail Pro is beyond the scope of this document. See reference [4] & [5]for more information on installing and provisioning Avaya IP Office Voicemail Pro.

To view/change, select Voicemail tab and configure as follows:

- Voicemail Type Set to Voicemail Lite/Pro from the drop-down list
- Voicemail IP Address Set to 10.80.130.152, the IP Address of the PC running the Voicemail Pro software.

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	Voicemail Type	Voicemail Lite/Pro 🗸	📝 Messages Button Goes To Visual Voice
00E00705C035 ⊕	Voicemail Destination	· · · · · · · · · · · · · · · · · · ·	
Enter() Control Unit (5)	Voicemail IP Address	10 · 80 · 130 · 152	

### 5.3.4. System Telephony Configuration

Select the **Telephony** tab and in **Telephony** sub-tab configure as follows:

- **Companding Law** Select the **U-LAW** radio button for **Switch** field and **U-LAW Line** radio button for the **Line** field.
- **Inhibit Off-Switch Forward/Transfer** Uncheck this box so that call forwarding and call transfer to PSTN destinations via the AT&T IP Flexible Reach service can be tested.

🖌 Avaya IP Office R9 Manager 00E00705C0	035 [9.0.0.829] [Administrator(Administrator)]	
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IP Offices	<b>1</b> 2 00E007050	C035*
BOOTP (1)     Gerator (3)     ODE00705C035     Gerator (1)     Gerator (2)     Gerator (	System       LAN1       LAN2       DNS       Voicemail       Telephony       Directory Services       System         Telephony       Park & Page       Tones & Music       Ring Tones       SM       Call Log       TUI         Analogue Extensions       Extensions       Extensions       Extensions       Image: Call Sequence       Ring Type 1       Image: Call Sequence       Image: Call Sequence       Image: Call Sequence       Ring Type 1       Image: Call Sequence       Image: Call Seq	Companding Law Switch U-Law A-Law A-Law Line A-Law Line
Image: Second Secon	Dial Delay Time (secs)     4       Dial Delay Count     0       Default No Answer Time (secs)     15       Hold Timeout (secs)     120       Park Timeout (secs)     300       Ring Delay (secs)     5       Call Priority Promotion Time (secs)     Disabled       Default Currency     USD       Default Name Priority     Favor Trunk       Media Connection Preservation     Disabled	<ul> <li>DSS Status</li> <li>Auto Hold</li> <li>Dial By Name</li> <li>Show Account Code</li> <li>Inhibit Off-Switch Forward/Transfer</li> <li>Restrict Network Interconnect</li> <li>Drop External Only Impromptu Conference</li> <li>Visually Differentiate External Call</li> <li>Unsupervised Analog Trunk Disconnect Handling</li> <li>I High Quality Conferencing</li> <li>Strict SIPS</li> <li>Digital/Analogue Auto Create User</li> </ul>

### 5.3.5. System Twinning Configuration

Select the **Twinning** tab and configure as follows:

- Uncheck the Send original calling party information for Mobile Twinning box
- Calling party information for Mobile Twinning Set to blank

With this configuration, and related configuration of Diversion Header on the SIP Line (**Section 5.4.1**), the true identity of a PSTN caller can be presented to the twinning destination (e.g., a user's mobile phone) when a call is twinned out via the AT&T IP Flexible Reach service.

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IP Offices	<b>☑</b> 00E00705C035*
BOOTP (1)     Øperator (3)     Ø0E00705C035     System (1)     System (2)     Ø0E00705C035	System       LAN1       LAN2       DNS       Voicemail       Telephony       Directory Services       System Events       SMTP       SMDR       Twinning       VCM       CCR       Codecs         Send original calling party information for Mobile Twinning       Calling party information for Mobile Twinning       VCM       CCR       Codecs

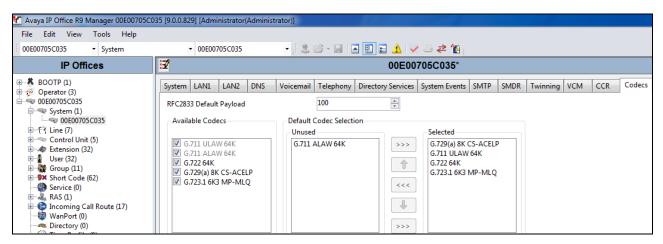
AT; Reviewed: SPOC 03/11/2014 Solution & Interoperability Test Lab Application Notes ©2014 Avaya Inc. All Rights Reserved. 27 of 56 IPO90IPFR

### 5.3.6. System Codecs Configuration

Select the **Codecs** tab and configure as follows:

- RFC28322 Default Payload Set to 100
- Codecs in **Unused** column can be moved to **Selected** column by highlighting them and pressing the >>> button. The up and down arrow buttons can be used to order the selected codecs.

Note: By default, all IP (SIP and H.323) lines and extensions will assume the system default **Selected** codec list, unless configured otherwise for the specific line or extension. Click **OK** (not shown).



### 5.4. SIP Line

The following sections describe the configuration of a SIP Line. The SIP Line terminates the CPE end of the SIP trunk to the AT&T IP Flexible Reach service.

The recommended method for creating/configuring a SIP Line is to use the template associated with the provisioning described in these Application Notes. The template is a **.xml** file that can be used by IP Office Manager to create a new SIP Line for SIP trunking with the AT&T IP Flexible Reach service. Follow the steps in **Section 5.4.1** to create a SIP Line from the template.

Some items relevant to a specific customer environment are not included in the template or may need to be updated after the SIP Line is created. Examples include the following:

- IP addresses
- SIP Credentials (if applicable)
- SIP URI entries
- Setting of the Use Network Topology Info field on the Transport tab.

Therefore, it is important that the SIP Line configuration be reviewed and updated if necessary, after the SIP Line is created via the template. The resulting SIP Line data can be verified against the manual configuration shown in **Sections** 5.4.2 - 5.4.6.

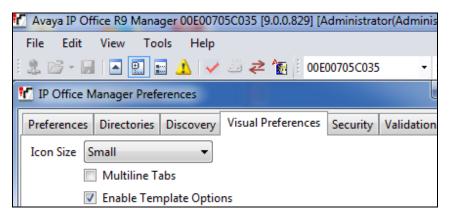
In addition, the following SIP Line settings are not supported on IP Office Basic Edition:

- SIP Line tab Originator number for forwarded and twinning calls
- Transport tab Second Explicit DNS Server
- SIP Credentials tab Registration Required

Alternatively, a SIP Line can be created manually. To do so, right-click Line in the Navigation Pane and select New  $\rightarrow$  SIP Line. Then, follow the steps outlined in Sections 5.4.2 – 5.4.5.

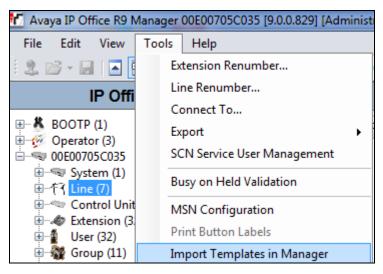
#### 5.4.1. SIP Line from Template

1. Navigate to File → Preferences. In the window that appears, verify that the box next to Enable Template Options is checked under the Visual Preferences tab.



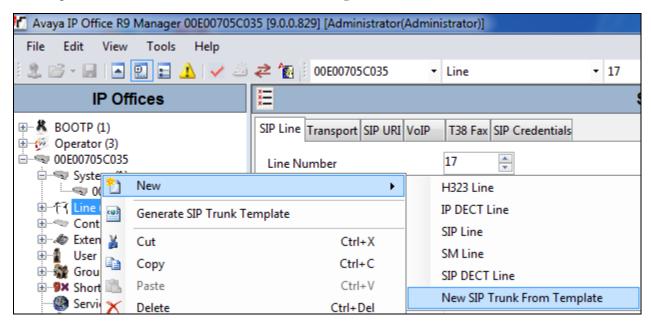
Solution & Interoperability Test Lab Application Notes ©2014 Avaya Inc. All Rights Reserved.

- 2. Copy the template file to the computer where IP Office Manager is installed. Rename the template file to **US\_AT&T\_SIPTrunk.xml**. The file name is important in locating the proper template file in **Step 5**.
- Import the template into IP Office Manager. From IP Office Manager, select Tools → Import Templates in Manager. This action will copy the template file into the IP Office template directory and make the template available in the IP Office Manager pull-down menus in Step 5. The default template location is C:\Program Files\Avaya\IP Office\Manager\Templates.



In the pop-up window (not shown) that appears, select the directory where the template file was copied in **Step 2**. After the import is complete, a final import status pop-up window (not shown) will appear stating success or failure. Click **OK** (not shown) to continue. If preferred, this step may be skipped if the template file is copied directly to the IP Office template directory.

4. To create the SIP Trunk from the template, right-click on Line in the Navigation Pane, then navigate to New → New SIP Trunk From Template.



5. In the subsequent Template Type Selection pop-up window, select United States from the Country pull-down menu and select AT&T from the Service Provider pull-down menu as shown below. These values correspond to parts of the file name (US\_AT&T\_SIPTrunk.xml) created in Step 2. Click Create new SIP Trunk to finish creating the trunk and newly created SIP Line (not shown) will appear in the navigation pane.

📶 Template Ty	pe Selection	
Locale	United States (US English)	~
Country	United States	~
Service Provider	AT&T	🔽 🗌 Display All
	Create new SI	<sup>o</sup> Trunk Cancel

- 6. Once the SIP Line is created, verify the configuration of the SIP Line with the configuration shown in Sections 5.4.2 5.4.5.
- 7. Save the configuration as shown in **Section 5.10**.

#### 5.4.2. SIP Line - SIP Line Tab

Select **SIP Line** tab as shown below for Line Number 17 used for AT&T and configure as follows:

- **ITSP Domain Name** Set to the IP Office LAN1 address (**192.168.62.58**) configured in **Section 5.3.2**, **Step 1** so that IP Office uses this IP address in the host portion of SIP headers such as the From header and Diversion header.
- **In Service** Default is checked.
- Check OOS If this box is checked, it enables IP Office to use the SIP OPTIONS method to periodically check the SIP Line and if no response is received, the SIP line is taken out of service. See Section 5.9 for additional information related to configuring the periodicity of SIP OPTIONS.
- Send Caller ID Select Diversion Header from the drop-down list which will ensure that in case alternate destination is N11, NPA-555-1212, or 8xx number, the call can be properly redirected by AT&T Flexible Reach service by inspecting the SIP Diversion header.
- **Refer Support** Check this box to enable IP Office to use Refer for Network based call transfer scenarios back to PSTN (attended & unattended).
- Call Routing Method Set to Request URI (default).

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Incoming     Auto       Incoming     Outgoing       Incoming     Auto       Incoming     Outgoing       Incoming     Outgoing		SIP Line         Transport         SIP URI         VolP           Line Number         ITSP Domain Name	T38 Fax         SIP Credentials           17	In Service URI Type Check OOS Call Routing Method Originator number for forwarded and twinning calls Name Priority Caller ID from From header Send From In Clear User-Agent and Server Headers Service Busy Response	SIP ▼ Request URI ▼ System Default ▼ System Default ▼
	License (65) User Rights (8) K ARS (2) K ARS (2) K ARS Location Request (0)	Incoming			
Session Timer (seconds) On Demand		Session Timer (seconds)	On Demand		

AT; Reviewed: SPOC 03/11/2014

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#### 5.4.3. SIP Line - Transport Tab

Select the **Transport** tab and set the **ITSP Proxy Address** to the AT&T Border Element IP Address. The **Use Network Topology Info** parameter is set to **LAN 2** which is configured in **Section 5.3.2**. Default values are used for the other fields.

Manager 00E00705C0	35 [9.0.0.829] [Administrator(Adm	ninistrator)]		
File Edit View Tools Help				
i 🎗 🖆 - 📓 🖪 🔛 🖬 🔺 🗸 🗸		▼ Line	• 17	-
IP Offices	17		SIP Lin	ie - Line 17*
BOOTP (1)     Gerator (3)     Gerator (3)     Gerator (3)     Gerator (7)     Gerator (1)     Gerator (7)	SIP Line Transport SIP URI VoII ITSP Proxy Address 135.242.2			
	Layer 4 Protocol Use Network Topology Info	UDP	Send Port     Listen Port	<b>5060</b>

### 5.4.4. SIP Line - SIP URI Tab

Select the **SIP URI** tab and click the **Add...** button [not shown] to add a new SIP URI. Configure the **New Channel** section displayed as follows:

- Local URI, Contact, Display Name and PAI Set all these fields to Use Internal Data
- Registration Set to 0: <None>
- Incoming Group and Outgoing Group Set to 100

Avaya IP Office R9 Manager 00E00705C0.	35 [9.0.0.829] [Administrator(Administrate	or)]	
File Edit View Tools Help			
		• 17	•
IP Offices	17	SIP Line -	Line 17*
BOOTP (1)	SIP Line Transport SIP URI VoIP T38	Fax SIP Credentials	
	Channel Groups Via Local	URI Contact Display Name PAI Creden	tial Max Calls Add
⊞¶ System (1) च†ि Line (7)			Remove
f75 f76			Edit
-177 -178			
<b>&gt;</b> 9 <b>&gt;</b> 10			
Extension (32)			
🗄 📲 Group (11)			
	New Channel		ОК
🖶 🖓 RAS (1) 🗄 🌐 🎦 Incoming Call Route (17)	Via	192.168.62.58	Cancel
WanPort (0)	Local URI	Use Internal Data	▼ Cancer
Time Profile (0)	Contact	Use Internal Data	<b>▼</b>
i≣… <sup>®</sup> Firewall Profile (1) ⊞… <mark>11</mark> IP Route (3)	Display Name	Use Internal Data	<b>-</b>
Account Code (0) License (65)	PAI	Use Internal Data	<b>-</b>
₩ Tunnel (0) ⊕\$_ User Rights (8)	Registration	0: <none></none>	
ARS (2) KAS Location Request (0)	Incoming Group	100	
Location (0)	Outgoing Group	100	
	Max Calls per Channel	20	

In this reference configuration, the single SIP URI shown above was sufficient to allow incoming calls for AT&T DID numbers destined for specific IP Office users via IP Office hunt groups.

### 5.4.5. SIP Line - VoIP Tab

Select the **VoIP** tab and configure as follows:

- **Compression Mode** Set to **Automatic Select** from the drop-down list.
- Fax Transport Support Select T38 from the drop-down list.
- **DTMF Support** Set to the default value **RFC2833**.
- **VOIP Silence Suppression** This box is checked as AT&T Flexible Reach service requires G729b as a preferred codec.
- **Re-invite Supported** Check to allow for codec re-negotiation in cases where the target of an incoming call or transfer does not support the codec originally negotiated on the trunk.
- Use Offerer's Preferred Codec Check this box so that the top codec offered to IP Office is used if IP Office supports that codec.

Avaya IP Office R9 Manager 00E00705C035 [9.0.0.829] [Administrator(Administrator)]								
File Edit View Tools Help								
i 🤱 🗁 - 🔜 🖪 💽 📰 🙏 🛹 🐸	2 Toto 00E00705C035	▼ Line	<b>•</b> 17	-				
IP Offices	3		SIP Line - Lir	ne 17*				
	SIP Line Transport SIP URI	/oIP T38 Fax SIP Credentials						
□ ■ 00E00705C035					VoIP Silence Suppression			
i⊞…ጫ System (1) □…乍飞 Line (7)					Allow Direct Media Path			
-175	Codec Selection Custom			•	Re-invite Supported			
		G.711 ALAW 64K	>>>         G.729(a) 8K Ct           G.711 ULAW 6         G.722 64K           G.723.1 6K3 M         G.723.1 6K3 M	54K	Codec Lockdown  PRACK/100rel Supported  Force direct media with phones  G.711 Fax ECAN			
	Fax Transport Support	T38		-				
Directory (0) Time Profile (0) IB Firewall Profile (1) IP	Location Call Initiation Timeout (s)	Cloud v						
Account Code (0)	DTMF Support	RFC2833		•				

### 5.4.6. SIP Line – T38 Fax

Select the **VoIP** tab and configure as follows:

- Unselect the Use Default Values option (not shown).
- T38 Fax Version Select 0 from the drop-down list.

🖌 Avaya IP Office R9 Manager 00E00705C035 [9.0.0.829] [Administrator(Administrator)]							
File Edit View Tools Help							
i 🚨 🛩 🚽 🖪 💽 🔜 🔺 🛹 🍏	2 🔁 👔 🕴 00E00705C035	▼ Line	• 17 •				
IP Offices			SIP Line - Line 17				
BOOTP (1)	SIP Line Transport SIP URI Vo	DIP T38 Fax SIP Credentials					
<ul> <li>⊕</li></ul>	T38 Fax Version		✓ Scan Line Fix-up				
⊟~री7 Line (7) री7 5 री7 6	Transport    UDPTL		TFOP Enhancement Disable T30 ECM				
	Low Speed 0 High Speed 0		Disable EFlags For First DIS				
10	TCF Method	Trans TCF 🔹	<ul> <li>Disable T30 MR Compression</li> <li>NSF Override</li> </ul>				
⊕…≪ Control Unit (5) ⊕…≪ Extension (32) ⊕…∰ User (32)	Max Bit Rate (bps)	14400 🔻	Country Code				
	EFlag Start Timer (msecs)	2600	Vendor Code 0				
Service (0)	EFlag Stop Timer (msecs)	2300					
🗄 📲 RAS (1)	Tx Network Timeout (secs)	150					

Since AT&T IP Flexible Reach does not require registration, the **SIP Credentials** tabs need not be visited. Click **OK** (not shown) to commit the SIP Line configuration.

### 5.5. Users, Extensions, and Hunt Groups

In this section, examples of IP Office Users, Extensions, and Hunt Groups will be illustrated. In the interest of brevity, not all users and extensions used will be presented, since the configuration can be easily extrapolated to other users. To add a User, right click on **User** in the Navigation pane, and select **New** [not shown]. To edit an existing User, select **User** and select the appropriate user in the Navigation pane.

#### 5.5.1. Digital Telephone User 217

The following screen shows the User tab for User 217. This user corresponds to a digital phone.

🖌 Avaya IP Office R9 Manager 00E00705C	035 [9.0.0.829] [Administrator(Adminis	trator)]
File Edit View Tools Help		
i 🚨 🗁 - 🖃 🔺 💽 📰 🔺 🔜 🛎	🗧 🔁 🕴 00E00705C035 🔹 🔹	User • 217 Extn217 •
IP Offices	X	Extn217: 217
BOOTP (1)	User Voicemail DND Sho	rt Codes Source Numbers Telephony Forwarding Dial In Voice Recording Butto
🗄 👰 Operator (3)		
E 00E00705C035	Name	Extn217
🗄 🖏 System (1)		
⊞ रि Line (7)	Password	
E Control Unit (5)		
Extension (32)	Confirm Password	
⊡• User (32)	Account Status	Enabled 🗸
NoUser	Account status	Enabled
RemoteManager	Full Name	
201 Extn201		
202 Extn202	Extension	217
204 Extn204	Email Address	
205 Extn205		
	Locale	
	Priority	5
208 Extn208	Flority	, ,
	System Phone Rights	None
210 Extn210		
211 Extn211	Profile	Basic User 🔹
212 Extn212		Description int
213 Extn213		Receptionist
215 Evtn215		Enable Softphone
216 Extn216		Enable one-X Portal Services
		Enable one-X TeleCommuter
		Enable Remote Worker
220 Extn220		
221 Extn221		Enable Flare
222 Extn222 223 Extn223		Enable Mobile VoIP Client
224 Extn224		Send Mobility Email
501 Extn501		
502 Extn502		Ex Directory
503 ExtriS05		
504 Extriso4	Device Type	T7316E
- 521 Extn521		
🗄 🖓 Group (11)	User Rights	
Short Code (62)		
Service (0)	User Rights view	User data 🗸 🗸
🗄 💑 RAS (1)	Working hours time profile	<none></none>
🗄 🕑 Incoming Call Route (17)		
- 🧐 WanPort (0)	Working hours User Rights	
Directory (0)     Time Destile (0)	Out of hours User Rights	×
	Out of hours User Rights	

Solution & Interoperability Test Lab Application Notes ©2014 Avaya Inc. All Rights Reserved. 37 of 56 IPO90IPFR The following screen shows the **SIP** tab for User **217**. In this sample configuration, the **SIP Name** and **Contact** parameters are the user part of the SIP URI in the **From** header for outgoing SIP trunk calls only. The **SIP Display Name** (**Alias**) parameter is configured to any descriptive name. If all outgoing calls involving this user should be considered private, then the **Anonymous** box may be checked to withhold the user's information from the network. See **Section 5.6.1** for an alternate method of using a short code (rather than static user provisioning) to place an anonymous call.

Avava IP Office R9 Manager 00E00705C0	Avaya IP Office R9 Manager 00E00705C035 [9.0.0.829] [Administrator(Administrator)]								
File Edit View Tools Help									
🙁 🗁 - 🔙 🔄 🔄 🔁 🚹 🗸 🖌 🖌 🕹 🚑 100E00705C035 🔹 User 🔹 217 Extn217 🔹									
IP Offices	12		Ext	tn217: 217*					
	Telephony Forwarding	Dial In Voice Recording	Button Programming	Menu Programming	Mobility	Group Membership	Announcements	SIP	
🗄 💯 Operator (3)	Telephony Torwarding	biar in voice Recording	button Programming	wenu Programming	woonity	oroup membership	Announcements		
i⊟≪ 00E00705C035	SIP Name	3032482317							
⊞									
● 行 Line (7)	SIP Display Name (Alias)	Extn217							
Control Unit (5)     Extension (32)	Contact	3032482317							
User (32)	Contact	5052102527							
NoUser									
RemoteManager		Anonymous							
201 Extn201									
204 Extn204									
205 Extn205									
207 Extn207									
209 Extn209									
210 Extn210 211 Extn211									
211 Extn211 212 Extn212									
212 Exth212 213 Exth213									
213 Extr213									
214 Extr214									
216 Extn216									

The following screen shows the Extension information for this user. To view, select **Extension** and the appropriate extension in the Navigation pane.

Avaya IP Office R9 Manager 00E00705C035 [9.0.0.829] [Administrator(Administrator)]							
File Edit View Tools Help							
i 🚨 🖙 - 🖬 i 🛋 💽 🖬 🔺 i 🗸 i	a 2 ▲ ▲ ▲ 00E00705C035 • Extens	ion • 73 217 •					
IP Offices	X	Digital Extension: 73 217					
■       ★       BOOTP (1)         ■       ✓       Operator (3)         ■       00E00705C035         ■       System (1)         ■       ✓         ■       ✓         System (1)       ■         ■       ✓         ●       ✓         ✓       Control Unit (5)         ■       ✓         ●       ✓         ✓       25 201         ●       ✓         ●       ✓         ✓       25 201         ●       ✓         ●       22 201         ●       ✓         ●       22 204         ●       ✓         ●       50 206         ●       ✓         ●       50 210         ●       ✓         ●       52 212         ●       53 213         ●       54 214         ●       55 215	Extn Extension Id Base Extension Caller Display Type Reset Volume After Calls Device Type Location Module Port Disable Speakerphone	73 217 On T7316E System (None) BD4 1					

#### 5.5.2. IP Telephone User 501

The following screen shows the **User** tab for User **501**. This user corresponds to an Avaya 1616 IP Telephone that is configured as Power User with IP Office Softphone features enabled as shown below.

🖌 Avaya IP Office R9 Manager 00E00705C0	)35 [9.0.0.829] [Administrator(Administra	tor)]
File Edit View Tools Help		
i 🚨 🗁 - 🔛 🖪 💽 📰 🛕 🖌 🌌	🛹 👔 🕴 00E00705C035 🔹 🔹 Use	er 🔹 501 Extn501 👻
IP Offices	×.	Extn501: 501
IP Offices	User     Voicemail     DND     Short C       Name     E       Password     *       Confirm Password     *       Account Status     E       Full Name     E       Extension     5       Email Address     E       Locale     Priority       System Phone Rights     I       Profile     F	Codes Source Numbers Telephony Forwarding Dial In Voice Recording Button Program
		Avaya 1616L
520 Extn520	S. C.	

SIP tab for the user with extension 501 was configured similar to user in Section 5.5.1.

The following screen shows the **Voicemail** tab for this user. The **Voicemail On** box is checked, and a voicemail password can be configured in the **Voicemail Code** and **Confirm Voicemail Code** fields.

Avaya IP Office R9 Manager 00E00705C0	35 [9.0.0.829] [Administrator(A	Administrator)]					
File Edit View Tools Help							
: 🌲 🗁 - 📕 🖪 💽 📰 🔺 🛹 🐸		- User	- 201 Extn20	)1	-		
IP Offices	X		E	xtn201: 2	01		
Image: Connector of a sector of a	User Voicemail DND Voicemail Code Confirm Voicemail Code Voicemail Email Off Copy Fo DTMF Breakout Reception / Breakout (DTM i Breakout (DTMF 2) i Breakout (DTMF 3)	rmf 0) S		1	Dial In G	Voice Recording Voicemail On Voicemail Help Voicemail Ringb Voicemail Email UMS Web Servic	ack Reading
1 216 Extended	1						

Select the **Telephony** tab and **Supervisor Settings** sub-tab as shown below. To allow hot desking, enter a **Login Code**.

Avaya IP Office R9 Manager 00E00705C0	35 [9.0.0.829] [Administrator(Adn	ninistrator)]	
File Edit View Tools Help			
i 🌲 📂 - 📕 i 🔤 🔜 📥 i 🛹 🐸	2 ▲ 100E00705C035	• User • 501 Extn501	•
IP Offices	E	Ext	tn501: 501
		Short Codes Source Numbers Telephony F tings Multi-line Options Call Log TUI	orwarding   Dial In   Voice Recording   Button Programming
● 一零 System (1) ● 一行 Line (7) ● 一行 Control Unit (5)	Login Code	****	Force Login
	Login Idle Period (secs)		Force Account Code
NoUser	Monitor Group	<none></none>	•
201 Extn201	Coverage Group	<none></none>	Incoming Call Bar
	Status on No-Answer	Logged On (No change)	Outgoing Call Bar
204 Extn204 205 Extn205	Reset Longest Idle Time		Inhibit Off-Switch Forward/Transfer
206 Extn206	All Calls		Can Intrude
	C External Incoming		Cannot be Intruded
209 Extn209			Can Trace Calls
210 Extn210 211 Extn211			CCR Agent
212 Extn212	After Call Work Time (secs)	System Default (10)	Automatic After Call Work
213 Extn213			Deny Auto Intercom Calls

AT; Reviewed: SPOC 03/11/2014 Solution & Interoperability Test Lab Application Notes ©2014 Avaya Inc. All Rights Reserved. Select the **Call Settings** tab as shown below. Check the **Call Waiting On** box to allow an IP Office Softphone logged in as this extension to have multiple call appearances (necessary for call transfer).

Avaya IP Office R9 Manager 00E00705C0	Avaya IP Office R9 Manager 00E00705C035 [9.0.0.829] [Administrator(Administrator)]							
File Edit View Tools Help								
i 🌲 🗁 - 属 i 🔺 💽 📰 🥼 i 🗸 🥔	≈ 1 00E00705C035	▪ User    501 Extn501	-					
IP Offices	H	Extr	n501: 501					
		Short Codes Source Numbers Telephony Fo	orwarding   Dial In   Voice Recording   Button Programming					
部一句 System (1) 部一行子 Line (7) 第一句 Control Unit (5)	Outside Call Sequence	Default Ring	Call Waiting On					
⊕⊶≪ Extension (32) ⊟⊶⊉ User (32)	Inside Call Sequence Ringback Sequence	Default Ring Default Ring	V Answer Call Waiting On Hold     Busy On Held					
RemoteManager	No Answer Time (secs)	System Default (15)	Offhook Station					

The following screen shows the Extension information for this user, simply to illustrate the **VoIP** tab available for an IP Telephone.

📶 Avaya IP Office R9 Manager 00E00705C0	035 [9.0.0.829] [Administrator(Ad	lministrator)]		
File Edit View Tools Help				
i 🌲 🗁 - 🖃 🖪 💽 📰 🔺 🛹 🐸		• Extension • 8007 50	1 -	
IP Offices	X	H323	Extension: 8007 501	
		11020		
🖶 🐇 BOOTP (1)	Extn VoIP			
🗄 🧐 Operator (3)				
	IP Address	0.0.0.0		VoIP Silence Suppression
System (1)				Enable Faststart for
⊕…作了 Line (7) ⊕…≪ Control Unit (5)	MAC Address	00 00 00 00 00 00		non-Avaya IP phones
Extension (32)				
25 201	Codec Selection	System Default	•	Out Of Band DTMF
		- Unused	Selected	Local Tones
		G.711 ALAW 64K >>>	G.729(a) 8K CS-ACELP	Allow Direct Media Path
			G.711 ULAW 64K G.722 64K	
		1	G.723.1 6K3 MP-MLQ	
			0.725.1 0K5 MIP-MILQ	
		<<<		
		÷		
- 40 53 213				
- 40 54 214		>>>		
	Reserve License	None	_	
	Reserve License	None	•	
	TDM->IP Gain	Default	•	
	IP->TDM Gain	Default	•	
	Complementary Consistent	None		
	Supplementary Services	None	•	

#### 5.5.3. SIP Telephone User 520

The following screen shows the **User** tab for User **520**. This user corresponds to an Avaya 1140E SIP Telephone.

Manager 00E00705C	035 [9.0.0.829] [Administrator(Admini	istrator)]
File Edit View Tools Help		
: 2. 🗁 - 🖃 🖪 💽 🖬 🔺 🛹 🐸	🗧 之 👔 🕴 00E00705C035 🔹 🔹	User • 520 Extn520 •
IP Offices	E	Extn520: 520
	User Voicemail DND Sho	ort Codes Source Numbers Telephony Forwarding Dial In Voice Recording Butto
Operator (3)		
	Name	Extn520
⊞…≪ब System (1) ⊞…री Line (7)	Password	*****
Control Unit (5)	Password	
	Confirm Password	*****
User (32)		
	Account Status	Enabled 👻
RemoteManager	Full Name	
201 Extn201	Full Name	
	Extension	520
204 Extn204	Email Address	
205 Extn205		
206 Extn206	Locale	<b>•</b>
207 Extn207	Priority	5 🗸
208 Extn208		
209 Extn209	System Phone Rights	None 👻
210 Extra10		
212 Extn212	Profile	Basic User 🔹
213 Extn213		Receptionist
214 Extn214		
215 Extn215		Enable Softphone
		Enable one-X Portal Services
217 Extn217		Enable one-X TeleCommuter
		Enable one-X TeleCommuter
219 Extn219		Enable Remote Worker
220 Extn220		Enable Flare
221 Extn221 222 Extn222		Enable Flare
222 EXII222		Enable Mobile VoIP Client
224 Extn224		
		Send Mobility Email
		Ex Directory
	Device Type	Avaya 1140E SIP (Language: ****ENGLISH****)
		Avaya 1140E Sir (Edingdage: ErroEisi'r )
🗄 📲 Group (11)	User Rights	
Short Code (62)	User Rights view	User data 🔹
Service (0)		
⊕	Working hours time profile	<none>  *</none>
WanPort (0)	Working hours User Rights	
Directory (0)	Working hours user kights	•
Time Profile (0)	Out of hours User Rights	v

The following screen shows the Extension information for this user. Note that for a SIP telephone, the IP Address configured for the phone needs to be specified. In this example, **10.80.130.51** was assigned to the Avaya 1140E telephone. All other screens are configured the same way as in **Section 5.5.2**.

Avaya IP Office R9 Manager 00E00705C035 [9.0.0.829] [Administrator(Administrator)]							
File Edit View Tools Help							
i 🚨 🖻 - 🛃 🖪 💽 📰 🛕 🛹 🐸	≈ 100E00705C035	<ul> <li>▼ Extension</li> <li>▼ 8000 520</li> <li>▼</li> </ul>					
IP Offices		SIP Extension: 8000 520					
IP Offices            • ★ BOOTP (1)           • ◆             • ♥ Operator (3)           • ♥ Operator (3)             • ♥ Operator (7)           • ♥ System (1)             • ♥ Control Unit (5)           • ♥ Extension (32)             • ● 25 201           • ● 27 203             • ● 29 205           • ● 30 206             • ● 31 207           • ● 32 208             • ● 50 210           • ● 50 210             • ● 52 212           • ● 52 212             • ● 52 212           • ● 52 212             • ● 52 213           • ● 52 212             • ● 52 213           • ● 52 213             • ● 56 216           • ● 52 217	Extn VoIP T38 Fa IP Address Codec Selection Reserve License Fax Transport Support						
	TDM->IP Gain	Default					
	IP->TDM Gain	Default					
	DTMF Support	RFC2833					

#### 5.5.4. Hunt Groups

Hunt groups were used in this reference configuration to make sure all different endpoints could be exercised for incoming calls on a SIP Trunk from AT&T Flexible Reach service. To configure a new hunt group, right-click **HuntGroup** from the Navigation pane, and select **New** (not shown). To view or edit an existing hunt group, select **HuntGroup** and choose the appropriate hunt group from the Navigation pane.

The following screen shows the **Hunt Group** tab for hunt group 2317. This hunt group was configured to contain some of the endpoints used in this reference configuration. Since the **Ring Mode** field is set to **Longest Waiting**, this will enable the telephones to ring in a round robin fashion with the priority given to the longest waiting member of the hunt group. **Edit** button can be used to add additional extensions to the **User List**.

🕼 Avaya IP Office R9 Manager 00E00705C0	035 [9.0.0.829] [Administrator(Admini	strator)]		
File Edit View Tools Help				
i 🚨 🗸 🖬 🖪 🖪 🖬 🕰 🗸 🗸		Group • 2317 Prod231	7 •	
IP Offices	32	Longest Waiting	Group Prod2317: 231	7*
BOOTP (1)           Operator (3)           OBE00705C035           System (1)           Total (1)           Time (1)		Iback Voicemail Voice Recording Annou Prod2317 2317 LongestWaiting No Change None None Vone Vone Vone Vone Vone Vone Vone Vone Vone V		Standard Hunt Group
License (65)				Edit Remove

The following screen shows the **SIP** tab for hunt group **2317**. The **SIP Name** and **Contact** are configured with AT&T DID **2482317**. Refer to **Section 5.7** where an incoming call route is mapped to this hunt group for the calls to be delivered to the members of this group.

🖞 Avaya IP Office R9 Manager 00E00705C035 [9.0.0.829] [Administrator(Administrator)]									
File Edit View Tools Help									
i 🚨 🛩 📕 🖪 💽 🖬 🔺 🛹 🛎	≈ 🌆	00E00705	C035	- Grou	ıp	<ul> <li>▼ 2317</li> </ul>	Prod2317	-	
IP Offices	1					Longest Wa	iting Group P	rod23	17: 2317*
BOOTP (1)	Group	Queuing	Overf	low Fallback	Voicemail	Voice Recording	Announcements	SIP	
Operator (3)     OE00705C035	SIP Nan	ne		2482317					
⊞…≪च System (1) ⊞…रीने Line (7)	SIP Disp	olay Name (	(Alias)	Prod2317					
⊞≪ Control Unit (5) ⊞	Contact	t		2482317					
User (32)     Group (11)     13 Billing				Anonym	DUS				
- 4 CustomerService - 4 200 Main - 4 12 Payables - 4 2317 Prod2317									

If required, additional hunt groups can be configured.

### 5.6. Short Codes

In this section, various examples of IP Office short codes will be illustrated. To add a short code, right click on **Short Code** in the Navigation pane, and select **New.** To edit an existing short code, click **Short Code** and select the code to be edited in the Navigation pane.

#### 5.6.1. ARS Code

In this reference configuration, the Automatic Route Selection (ARS) feature was used for outgoing calls. A short code was configured as follows:

- Code Set to 9N for access to ARS
- Feature Select Dial from the drop-down list
- **Telephone Number** Set to **N**. If this value is set to **WN**, then the calls sent via this route will be sent as Anonymous.
- Line Group Id Set to 50:Main configured in Section 5.8.

So, when an IP Office user dials **9-1-303-538-1760** IP Office identifies it as an ARS call and refers to the line group setup in this short code. Refer to **Section 5.8** for how the call is handled after it get to the ARS group.

Avaya IP Office R9 Manager 00E00705C0.	35 [9.0.0.829] [Administra	rator(Administrator)]
File Edit View Tools Help		
i 🤱 🗁 - 🚂 i 🖪 💽 🔜 🙏 🖌 🌽	2 To 00E00705C03	035 • Short Code • 9N; •
IP Offices		9N;: Dial
IP Offices         -9x *31         -9x *32*N#         -9x *32*N#         -9x *33*N#         -9x *35*N#         -9x *35*N#         -9x *35*N#         -9x *38*N#         -9x *38*N#         -9x *41         -9x *42         -9x *43         -9x *44         -9x *45*N#         -9x *46         -9x *47         -9x *48         -9x *49         -9x *50         -9x *51         -9x *52         -9x *53*N#		9N;: Dial       9N;       Dial       V       S0: Main       V       United States (US English)
- Dx *55 - Dx *57*N# - Dx *70*N# - Dx *90 - Dx *900* - Dx *91N; - Dx *92N; - Dx *93 - Dx *55N - Dx *		

#### 5.6.2. Meet-me Conference and Auto-attendant Codes

Features like Meet-me Conference and Auto-attendant are configured on Voicemail Pro and are beyond the scope of this document. In order to access those features, short codes can be used. In this reference configuration, for meet-me conference and auto-attendant **Conference** was configured on Voicemail Pro. The following screens show the short code set for these features. **Conference** module configured in Voicemail Pro handles both the conferencing and auto attendant features and is beyond the scope of this document.

📶 Avaya IP Office R9 Manager 00E00705C	035 [9.0.0.829] [Administr	ator(Administrator)]		
File Edit View Tools Help				
i 🎗 🗁 - 🖬 i 🖪 💽 🖬 🔺 🛹 🖉	a < 👔 🕴 00E00705C03	Short Code	<b>-</b> *90	-
IP Offices	×=		*90: Voice	mail Collect
<b>9x</b> *31	Short Code			
<b>9x</b> *33*N# <b>9x</b> *34N;	Code	*90		
<b>9×</b> *35*N#	Feature	Voicemail Collect		
<b>9×</b> *36 <b>9×</b> *37*N#	Telephone Number	"Conference"		
<b>9×</b> *38*N# <b>9×</b> *39	Line Group ID	0		
<b>9x</b> *40 <b>9x</b> *41	Locale			
••• <b>9</b> × *42	Force Account Code			

#### 5.6.3. Voicemail Retrieval Code

To retrieve voicemails left in individual mailboxes, this code was configured in this reference configuration. When a user enters, \*17, they can retrieve the messages in their mailbox. Additionally, this short code can be also in the Incoming Call Route configured in Section 5.7.

Kaya IP Office R9 Manager 00E0070	5C0	35 [9.0.0.829] [Administra	ator(Administrator)]			
File Edit View Tools Help						
i 🚨 🗁 - 🔚 🖪 💽 📰 🔔 🖌	24	2 Table 00E00705C03	5 • Short Code	-	*17	-
IP Offices					*17: Voi	cemail Collect
<b>9×</b> *06 <b>9×</b> *07*N#	*	Short Code				
<b>9x</b> *08 <b>9x</b> *09		Code	*17			
<b>9×</b> *10*N#		Feature	Voicemail Collect			
9× *11*N# 9× *12*N#		Telephone Number	?U			
<b>9×</b> *13*N# <b>9×</b> *14*N#		Line Group ID	0			
••• <b>9×</b> *15 ••• <b>9×</b> *16		Locale				
•••• <b>9</b> × 10		Force Account Code				

### 5.7. Incoming Call Routes

In this section, IP Office Incoming Call Routes are illustrated. Each Incoming Call Route will map a specific AT&T IP Flexible Reach DID number to a destination user, group, or function on IP Office. To add an incoming call route, right click on **Incoming Call Route** in the Navigation pane, and select **New** [not shown]. To edit an existing incoming call route, select **Incoming Call Route** and the appropriate route in the Navigation pane.

The screen shown below matches the AT&T IP Flexible Reach DID **7323684893** in the **Incoming Number** field on the **Line Group Id** (100). The **Line Group Id** matches the **Incoming Group** field configured in the **SIP URI** tab for the SIP Line to AT&T IP Flexible Reach service in **Section 5.4**.

🖌 Avaya IP Office R9 Manager 00E00705C035 [9.0.0.829] [Administrator(Administrator)]						
File Edit View Tools Help						
i 🌲 📂 - 📕 🖪 💽 🔜 🔺 🛹 🛎	2 100E00705C035	Incoming Call Route     100 2482317				
IP Offices	×	100 2482317				
BOOTP (1)         Image: Control (3)         Image: Control (3)         Image: Control (3)         Image: Control Unit (5)         Image: Cont C	Standard     Voice Recording     Description       Bearer Capability     Line Group ID     Incoming Number       Incoming Sub Address     Incoming CLI       Locale     Priority       Tag	Any Voice				
110 00004153571057     110 00004153581058     110 00004153591059	Hold Music Source Ring Tone Override	System Source    None				

Select the **Destinations** tab and a value can be either selected from the drop-down list or manually entered. In the screen shown below, the hunt group configured in **Section 5.5.4** was selected.

Avaya IP Office R9 Manager 00E00705C0	)35 [9.0.0	.829] [Administrator(Ad	dministrator)]				
File Edit View Tools Help							
i 🌲 🗁 - 🔜   🛋 🔝 🔜 🔺 🛹 🍛	2 🔁	00E00705C035	<ul> <li>Incoming Call Route</li> </ul>	· 100 2482317	-		
IP Offices	Z			100 248	32317*		
BOOTP (1)	Standa	ard Voice Recording	Destinations				
		TimeProfile		Destination			Fallback Extension
🗄 🖘 System (1)	1	Default Value		2317 Prod2317		•	

Similarly, in the screen below, an extension configured in Section 5.5.2 was selection.

Avaya IP Office R9 Manager 00E00705C035 [9.0.0.829] [Administrator(Administrator)]							
File Edit View Tools Help							
i 🌲 📂 - 🔜   🛋 🖭 📰 🗘   🛹 🕹	a < 👔 🕴 00E00705C035	<ul> <li>Incoming Call Route</li> </ul>	<ul> <li>100 2482317</li> </ul>	-			
IP Offices	17		100 24	82317*			
	Standard Voice Record	ing Destinations					
	TimeProfile		Destination		Fallback Extension		
🗄 🖘 System (1)	🥒 Default Value		501 Extn501		<b>~</b>		

The following screen displays how a short code can be manually assigned in the **Destination** field to route the call for voicemail retrieval. Similarly, a short code for Meet-me conference and Autoattendant features can be used in the **Destination** field to exercise those features.

Avaya IP Office R9 Manager 00E00705C035 [9.0.0.829] [Administrator(Administrator)]							
File Edit View Tools Help							
i 🚨 🖻 - 🔚 i 🖪 💽 🖬 🔺 🗹 🖄	00E00705C035 🥻	<ul> <li>Incoming Call Route</li> </ul>	· 100 2482317	-			
IP Offices	2		100 248	32317*			
<ul> <li>BOOTP (1)</li> <li></li></ul>	Standard Voice Recording	Destinations					
	TimeProfile		Destination		Fallback Extension		
System (1)	/ Default Value		*17		▼		

The following screen displays another mechanism to access the Meet-me conference and Autoattendant feature without using the short code. The Conference feature was configure in Voicemail Pro and is beyond the scope of this document.

Avaya IP Office R9 Manager 00E00705C035 [9.0.0.829] [Administrator(Administrator)]								
File Edit View Tools Help	File Edit View Tools Help							
i 🚨 🗁 - 🔜 🛛 🗖 📰 🔺 🛹 🗳	2 🚡	00E00705C035	<ul> <li>Incoming Call Route</li> </ul>	<b>-</b> 100	2482317	-		
IP Offices	Z				100 24	82317*		
BOOTP (1)	Standa	rd Voice Recording	Destinations					
⊕ <sup>6</sup> / <sub>2</sub> Operator (3) ⊡ <sup>6</sup> / <sub>2</sub> 00E00705C035		TimeProfile			Destination			Fallback Extension
⊕	•	Default Value			VM:Conferen	ce		▼[

## 5.8. ARS and Alternate Routing

While detailed coverage of ARS is beyond the scope of these Application Notes, this section includes basic ARS screen illustrations and considerations. In this reference configuration, Automatic Route Selection (ARS) was used rather than the simple short code approach. With ARS, secondary dial tone can be provided after the access code, time-based routing criteria can be introduced, and alternate routing can be specified so that a call can re-route automatically if the primary route or outgoing line group is not available. Although not shown in this section, ARS also facilitates more specific dialed telephone number matching, enabling immediate routing and alternate treatment for different types of numbers following the access code. For example, if all 1+10 digit calls following an access code should use the SIP Line preferentially, but other local or service numbers following the access code should prefer a different outgoing line group, ARS can be used to distinguish the call behaviors.

To add a new ARS route, right-click **ARS** in the Navigation pane, and select **New** [not shown]. To view or edit an existing ARS route, select **ARS** in the Navigation pane, and select the appropriate route name in the Group pane.

The following screen shows an example ARS configuration for the route named "Main". The **In Service** parameter refers to the ARS form itself, not the Line Groups that may be referenced in the form. If the **In Service** box is un-checked, calls are routed to the ARS route name specified in the **Out of Service Route** parameter. IP Office short codes may also be defined to allow an ARS route to be disabled or enabled from a telephone. The configurable provisioning of an Out of Service Route, and the means to manually activate the Out of Service Route can be helpful for scheduled maintenance or other known service-affecting events for the primary route.

🕐 Avaya IP Office R9 Manager 00E00705C0	035 [9.0.0.829] [Administrate	or(Administrator)]				
File Edit View Tools Help						
i 🤱 🗁 - 🖬   🔺 🖳 🖬 🔺 🛹 🍛	2 Tel 00E00705C035	<ul> <li>ARS</li> </ul>		-		
IP Offices	12		Ma	ain*		
BOOTP (1) Operator (3) Outportor (3) System (1) Gradient (1) Gradient (1) Gradient (1) Brite (1) Brit	ARS ARS Route Id Route Name Dial Delay Time In Service Time Profile Code 911 0N; 1N; 011N; *N; Alternate Route Priority Alternate Route Wait Tii	ļ		<ul> <li>✓ Secondary Dial tone</li> <li>SystemTone</li> <li>✓ Check User Call Barring</li> <li>→ Out of Service Route</li> <li>→ Out of Hours Route</li> <li>Line Group ID</li> <li>100</li> <li>1</li></ul>	<none></none>	Add  Remove Edit

Assuming the primary route is in-service, the number passed from the short code used to access ARS (e.g., 9N in Section 5.6) can be further analyzed to direct the call to a specific Line Group ID. Per the example screen above, if the user dialed 9-1-303-538-1760, the call would be directed to Line Group 100, configured in Section 5.4.3. If Line Group 100 cannot be used, the call can automatically route to the route name configured in the Additional Route parameter in the lower right of the screen. Since alternate routing can be considered a privilege not available to all callers, IP Office can control access to the alternate route by comparing the calling user's priority to the value in the Alternate Route Priority Level field.

# 5.9. Privacy / Anonymous Calls and SIP OPTIONS Frequency

To configure IP Office to include the caller's DID number in the P-Asserted-Identity SIP header, required by AT&T Flexible Reach service to admit an otherwise anonymous caller to the network, the following procedure may be used.

From the Navigation pane, select **User** and then select the user named **NoUser**. In the **NoUser** Details pane, select the tab **Source Numbers**. Press the **Add...** button (not shown) to the right of the list of any previously configured Source Numbers. In the **Source Number** field shown below, type **SIP\_USE\_PAI\_FOR\_PRIVACY**. Click **OK**.

Similarly SIP OPTIONS frequency was configured by adding another source number by entering **SIP\_OPTIONS\_PERIOD=2** in the **Source Number** field. This will set the frequency of the SIP OPTIONS message sent by IP Office to 2 minutes.

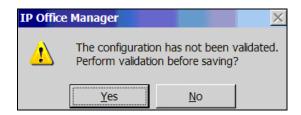
New Source Number		
		ОК
Source Number	SIP_USE_PAI_FOR_PRIVACY	
		Cancel

The following screen displays the Source Numbers configured in this reference configuration.

Avaya IP Office R9 Manager 00E00705C0	35 [9.0.0.829] [Administ	trator(Admir	istrator)]				
File Edit View Tools Help							
i 🚨 🛩 🔜 🖪 💽 🔜 🔺 🛹 🌌	2 1 00E00705C0	)35 -	User	·	NoUser		•
IP Offices						NoUser:	
BOOTP (1)     Operator (3)     OUE00705C035     System (1)     Grift Line (7)     Control Unit (5)     Extension (32)     User (32)     MoUser	User Voicemail Source Number SIP_USE_PAI_FOR_I SIP_OPTIONS_PERI	PRIVACY	ort Codes	Source Numbers	Telephony	Forwarding	Dial I

# 5.10. Saving Configuration Changes to IP Office

When desired, send the configuration changes made in IP Office Manager to the IP Office server, to cause the changes to take effect. Click the "disk" icon that is the third icon from the left (i.e., common "save" icon with mouse-over help "Save Configuration File"). Click **Yes** to validate the configuration, if prompted.



Once the configuration is validated, a screen similar to the following will appear, with either "Merge" or "Immediate" selected, based on the nature of the configuration changes made since the last save. Note that clicking OK may cause a service disruption. Click **OK** if desired.

Save Configuration	×
IP Office Settings	
00E00705C035	
Configuration Reboot Mode	
Merge	
Immediate	
💿 When Free	
◎ Timed	
Reboot Time	
21:03	
Call Barring	
Incoming Calls	
Outgoing Calls	
OK Cancel Help	

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# 6. Verification Steps

The following steps may be used to verify the configuration:

- Place an inbound call, answer the call, and verify that two-way talk path exists. Verify that the call remains stable for several minutes and disconnect properly.
- Place an outbound call, answer the call at PSTN phone and verify that two-way path exists. Verify that the call remains stable for several minutes and disconnect properly.
- Place an inbound call to an agent or phone, but do not answer the call. Verify that the call covers to Voicemail Pro and messages can be retrieved using the appropriate short codes.
- Use the **Monitor** application to monitor the activity on IP Office.
- Use the IP Office **System Status** application to verify the state of the SIP connection. Launch the application from **Start→Programs→IP Office→System Status** on the PC where IP Office Manager is installed. Select the SIP line of interest from the left pane. On the **Status** tab in the right pane, verify that the **Current State** is *Idle* for each channel (assuming no active calls at present time). Additionally, **System Status** application can also be used to verify the extension status, alarms and call status.
- Use the IP Office System Monitor application to monitor activity on IP Office including tracing a call. Launch the application from **Start→Programs→IP Office→Monitor** on the PC where IP Office Manager is installed.

# 7. Conclusion

As illustrated in these Application Notes, Avaya IP Office can be configured to interoperate successfully with the AT&T IP Flexible Reach service. This solution provides users of Avaya IP Office the ability to support inbound and outbound calls over an AT&T IP Flexible Reach SIP trunk service connection via AVPN or MIS/PNT transport. Additionally the ability of Avaya IP Office to provide SIP Diversion Header to the AT&T IP Flexible Reach service for certain out bound call scenarios was demonstrated. Also,

The reference configuration shown in these Application Notes is representative of a basic enterprise customer configuration and is intended to provide **configuration guidance** to supplement other Avaya product documentation. It is based upon formal interoperability compliance testing as part of the Avaya DevConnect Service Provider program.

# 8. References

This section references documentation relevant to these Application Notes. In general, Avaya product documentation is available at <a href="http://support.avaya.com">http://support.avaya.com</a>

[IPO-INSTALL] IP Office 9.0 Installing IP500/IP500 V2, Issue 28I, January 23, 2014 Document Number 15-601042

[IPO-MGR] IP Office Release 9.0 Manager 9.0 Issue 9.02, January 6, 2014 Document Number 15-601011

[IPO-SYSSTAT] IP Office Release 9.0 System Status Application, Issue 09c, August 15, 2013 Document Number 15-601758

[IPO-VMPRO] IP Office Release 9.0 Administering Voicemail Pro, Issue 9.01.0, September 13, 2013 Document Number 15-601063

[IPO-VMPROEXAM] IP Office Voicemail Pro Example Exercises, Issue 07c, July 6, 2009 Document Number 15-601138

[IPO-MON] IP Office System Monitor, Issue 05c, August 19, 2013 Document Number 15-60101

Additional IP Office documentation can be found at: <u>http://marketingtools.avaya.com/knowledgebase/</u>

[ATT\_IPFR] AT&T IP Flexible Reach Service Descriptions: *AT&T IP Flexible Reach* <u>http://www.business.att.com/enterprise/Service/business-voip-enterprise/network-based-voip-enterprise/ip-flexible-reach-enterprise/</u>

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