

Avaya Solution & Interoperability Test Lab

Application Notes for Configuring Dialogic Brooktrout SR140 Fax Software with Avaya IP Office 11 via a SIP Trunk Interface using Transport Layer Security (TLS) - Issue 1.0

Abstract

These Application Notes describe the procedures for configuring the Dialogic Brooktrout SR140 Fax Software with Avaya IP Office using a SIP trunk interface and Transport Layer Security (TLS).

Dialogic Brooktrout SR140 is fax software that sends and receives fax calls over an IP network. In the tested configuration, Dialogic Brooktrout SR140 interoperated with Avaya IP Office to send/receive faxes using SIP trunk facilities.

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 procedures for configuring Dialogic Brooktrout SR140 (hereafter referred SR140) with Avaya IP Office (IPO) using SIP trunks.

Dialogic Brooktrout SR140 is host-based Fax over IP that uses Dialogic Brooktrout Fax/Voice Diagnostic Test Tool (FDTool) to send and receive fax calls over an IP network. In the tested configuration, Dialogic SR140 uses a SIP trunk interface with T.38 fax from Avaya IP Office to send and receive fax.

In the compliance testing, Avaya IP Office Server Edition system consists of Avaya IP Office Primary Linux running on Virtualized Environment and a 500V2 Expansion.

2. General Test Approach and Test Results

The feature test cases were performed manually. Internal and external fax calls to and from SR140 fax software client were made. The fax calls were sent and received using the FDTool and the analog fax destination at the local and remote sites.

The serviceability test cases were performed manually by disconnecting/reconnecting the Ethernet cable to the SR140 fax software client, busyout and release SIP trunk and by rebooting the SR140 fax software client.

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

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

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

For the testing associated with these Application Notes, the interface between Avaya systems and the Dialogic Brooktrout SR140 utilizes TLS and secure media SRTP encryption features as requested by Dialogic. Operation using TCP and UDP over the SIP trunk is also supported.

2.1. Interoperability Compliance Testing

The interoperability compliance test included feature and serviceability testing. The feature testing focused on verifying the following with the SR140 fax software client:

- Proper handling of faxes via the SIP trunk including send/receive, internal fax, external fax over ISDN (PRI), simultaneous bi-directional faxes, and miscellaneous failure scenarios.
- Proper handling of faxes with different pages, complexity, format and data rates.
- No adverse impact on any internal or external calls during faxes.

The serviceability testing focused on verifying the ability of SR140 fax software client to recover from adverse conditions, such as disconnecting/reconnecting the Ethernet cable to the SR140 fax software client.

2.2. Test Results

Dialogic Brooktrout SR140 successfully passed all compliance testing with the following observations.

- The inband DTMF should be used in the SIP trunk between Dialogic SR140 and Avaya IP Office because this version of SR140 does not accept RFC2833 DTMF (supported in SDK 10.1) and it may cause the fax call to be dropped during fax transmit.
- When secure media SRTP is enabled in the configuration (Section 6.5), Dialogic SR140 does not accept regular media (RTP) in SDP of incoming INVITE message, only enforced secure media SRTP is accepted.
- The testing was completed by using TLS/SRTP but operation using TCP and UDP over the SIP trunk is also supported.

2.3. Support

North American Technical support for Dialogic Brooktrout SR140 Fax Software can be obtained by contacting Dialogic at.

- North America: 973-993-1443
- Singapore: +65 6407 7376
- Japan: +81 3-3234-2176
- EMEA: +44 1628 641 792
- Email: <u>support@dialogic.com</u>
- Website: <u>https://support.dialogic.com</u>

3. Reference Configuration

The test configuration was designed to emulate a local site and a remote site. **Figure 1** illustrates the configuration used in these Application Notes.

In the compliance testing, the Avaya IP Office Server Edition system consists of Avaya IP Office Primary Linux running on Virtualized Environment and a 500V2 Expansion. The IPO Primary was configured to connect to PSTN via a SIP trunk while the 500V2 Expansion connected to PSTN via a PRI trunk, IPO Primary and 500V2 Expansion is communicated by Small Community Network (SCN) IP Office Line. The following are typical scenarios verified during the compliance test:

- Bi-directional faxed between SR140 Fax software client and the local fax endpoint 1 that connected to an analog port in the IPO 500V2 Expansion.
- Bi-directional faxes between SR140 Fax software client and PSTN fax endpoint 2 via PRI trunk.
- Bi-directional faxes between SR140 Fax software client and PSTN fax endpoint 3 via SIP trunk.



Figure 1: Brooktrout SR140 interoperating with Avaya IP Office via SIP Trunk

4. Equipment and Software Validated

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

Equipment	Release/Version
Avaya IP Office Primary Linux running on	11.0.0.1 Build 8
Virtualized Environment	
Avaya IP Office 500V2 Expansion	11.0.0.1 Build 8
Avaya IP Office Manager	11.0.0.1 Build 8
Avaya 1140E SIP Deskphones	4.04.23
Avaya 96x1 IP Deskphones	6.6229
Dialogic Brooktrout SR140 Fax Software	v6.9.2 Build 2
running on Microsoft Windows 10	

Note: Testing was performed with Avaya IP Office Server Edition Solution that requires an Expansion IP Office 500 V2 to support analog used by fax endpoint. Compliance Testing is applicable when the tested solution is deployed with a standalone IP Office 500.

5. Configure Avaya IP Office

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

- Verify Avaya IP Office License
- Obtain LAN IP address
- Enable SIP trunks
- Administer SIP line
- Administer Incoming Call Route
- Administer Short Code
- Administer IP Office Line

5.1. Verify Avaya IP Office License

From a PC running the Avaya IP Office Manager application, select **Start** \rightarrow **Programs** \rightarrow **IP Office** \rightarrow **Manager** to launch the Manager application. Select the correct IP Office system and log in with the appropriate credentials.

The **Avaya IP Office R10 Manager** 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 simultaneous faxes.

Configuration				e - 🖻	$\times \mid \checkmark \mid < \mid >$			
BOOTP (7)	Licence Remote Server	Licence Remote Server						
 Solution User(29) Short Code(14) Directory(0) Time Profile(0) Account Code(0) User Rights(4) Location(0) System (1) T(Line (6) Control Unit (11) Extension (18) User (23) Short Code (72) Extension (18) Extension (19) Extension (19) Extension (10) Extension (10) Extension (11) Extension (10) Extension (1	Feature Mobile Worker Office Worker Avaya Softphone Licence VMPro TTS (Scansoft) VMPro TTS Professional IPSec Tunnelling Power User Customer Service Agent Customer Service Supervisor Avaya IP endpoints IP500 Voice Networking Channels SIP Trunk Channels IP500 Universal PRI (Additional cha CTI Link Pro Wave User 3rd Party IP Endpoints Centralized Endpoints Essential Edition R94 Dreferred Edition (VM Dro)	Instances 384 384 100 40 40 10 384 100 384 100 5 16 384 100 5 5 5	Status Obsolete Valid Obsolete Valid Obsolete Valid Valid Valid Valid Obsolete Valid Obsolete Valid Obsolete Valid Obsolete Valid Obsolete Obsolete Obsolete	Expiry Date Never	Source A PLDS1			
Ready	L							

6 of 28 SR140_IPO11

5.2. Obtain LAN IP Address

From the configuration tree in the left pane, select **System** to display the **System** screen for the **IPOSE110** 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 the Dialogic FDTool. Note that IP Office can support SIP trunks on the LAN1 and/or LAN2 interfaces. The compliance testing used the LAN1 interface.

Configuration	IPOSE110*	📸 - 🔤 🗙 🖌 < >
	System LAN1 LAN2 DNS Voicemail Telephony Directory Service LAN Settings VolP Network Topology VolP Vo	ces System Events SMTP S + +
	IP Address 10 10 97 110 IP Mask 255 255 192	
 	Number Of DHCP IP Addresses 16 DHCP Mode O Server O Client I Disabled	vanced

5.3. Enable SIP Trunks

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

Z		IPOS	SE110*					ď	$ \otimes$ $ $ \times $ $.	/ < >
System LAN1 LAN2 DNS	Voicemail	Telephony	Directory Se	rvices Sys	tem Events	SMTP	SMDR	VoIP	VoIP Security	Con 🔸 🕨
LAN Settings VolP Network	Topology									
🖂 H323 Gatekeeper Enable										^
🗌 Auto-create Extn	Au	ito-create U	ser] H323 Rem	ote Extn	Enable			
H.323 Signalling over TLS	Disabled	`	/	F	lemote Call	Signalling	g Port 1	720	A V	
SIP Trunks Enable										
🗹 SIP Registrar Enable										
Auto-create Extn/User						C	SIP Rei	note Ex	tn Enable	
SIP Domain Name	ipocc.co	om								
SIP Registrar FQDN										
	🗹 UDP	1	UDP Port	5060	▲ ▼	Ren	note UDP	Port 5	060	*
Layer 4 Protocol	🗹 TCP		TCP Port	5060	-	Ren	note TCP	Port 5	060	*
	🗹 TLS		TLS Port	5061	-	Ren	note TLS I	ort 5	061	*
Challenge Expiry Time (secs)	10	•								
<										>
							<u>O</u> k	:	<u>C</u> ancel	<u>H</u> elp
										F

5.4. Administer SIP Line

From the configuration tree in the left pane, right-click on Line and select New \rightarrow SIP Line from the pop-up list to add a new SIP line. Select the **Transport** tab in the right pane. For **ITSP Proxy** Address, enter the IP address of client which FDTool and SR140 are installed. Retain the default values for the remaining fields.

Configuration	SIP Line - Line 6*	📥 - 🖻 🛛 🗙 🗸 🗸
	SIP Line Transport SIP URI VoIP SIP Credentials SIP Advanced Engineering ITSP Proxy Address 10.10.98.88 Network Configuration Layer 4 Protocol UDP Send Port 5060 Use Network Topology Info None Listen Port 5060 Explicit DNS Server(s) 0 0 0 0 0 Calls Route via Registrar Image: Separate Registrar Image: Separate Registrar Image: Separate Registrar	The second secon

Select the **SIP URI** tab, and click **Add** to display the **New Channel** section. Select "Auto" for **Local URI**. Enter the SIP line number for **Incoming Group** and **Outgoing Group**. Set **Max Calls per Channel** to the desired maximum number of simultaneous faxes allowed by the SR140 license, in this case "10". Retain the default values in the remaining fields.

1	SIP Line - Line 6	🛋 🗕 🔤 🗙 🖌 < >
SIP Line Transport SIP L	JRI VoIP SIP Credentials SIP Advanced Engineering	
Edit URI		ок
Local URI	Auto	~ Cancel
Contact	Auto	~
Display Name	Auto	~
Identity		
Identity	None	~
Header	P Asserted ID	~
Forwarding And Tv Originator Number Send Caller Id	vinning None V	
Diversion Header	None	~
Registration	0: <none></none>	~
Incoming Group Outgoing Group	6 ~ 6 ~	
Max Sessions	10	~

The screen is updated as shown below.

×××	2						SIP Li	ne - Line 6				-	$ \times \vee < >$
S	IP Line	Transpo	rt SIP URI 1	VoIP SIP	Credentials SIP	Advanced	d Enginee	ring					
	URI	Groups	Local URI	Contact	Display Name	Identity	Header	Originator Number	Send Caller ID	Diversion Header	Credential	Max Calls	Add
	1	66	Auto	Auto	Auto	None	PAI		None	None	0: <non< td=""><td>10</td><td>Remove Edit</td></non<>	10	Remove Edit

Select the **VoIP** tab. For **Codec Selection**, select "Custom" and select the applicable G.711Ulaw codec variant in the expanded list. Note that Dialogic SR140 only supports the G.711 variants.

- Fax Transport Support select "T38" from the drop-down list.
- Check **Re-invite Supported**.
- **DTMF Support** select "Inband" from the drop-down list as noted in **Section 2.2**.
- Media Security select "Disabled" if the IPO system is configured to enable this feature.

Retain the default values in the remaining fields.

12	SIP Line - Lii	ne 6*	📸 🕶 🗙 🖌 < >
SIP Line Transport SIP L	JRI VolP SIP Credentials SIP Advanced Er	ngineering	
			Local Hold Music
			🗹 Re-invite Supported
Codec Selection	Custom	~	🗌 Codec Lockdown
	Unused G.711 ALAW 64K G.722 64K G.729(a) 8K CS-ACELP	Selected G.711 ULAW 64K	 Allow Direct Media Path Force direct media with phones PRACK/100rel Supported
Fax Transport Support	Т38	~	
DTMF Support	Inband	~	
Media Security	Disabled	~	
<			>
			<u>O</u> K <u>C</u> ancel <u>H</u> elp

5.5. 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 to add a new route. For **Line Group Id** in the **Standard** tab, select the incoming group number from **Section 5.4** which corresponds to the SIP line, in this case Line Group ID is "6".

Configuration		6	📸 • 🔤 🗙 🗸 < >
	Standard Voice Recording E	Destinations	
⊡-™ Solution ⊞-1 User(29) ⊕-∰ Group(2)	Bearer Capability	Any Voice 🗸 🗸	
Short Code(14) Directory(0)	Line Group ID	6 ~	
	Incoming Number		
	Incoming CLI		
⊞	Locale	~	•
Control Unit (11) Extension (18)	Priority	1 - Low ~	
User (23)	Tag]
Broup (2) Broup (2) Broup (2) Broup (2)	Hold Music Source	System Source 🗸 🗸	•
Ervice (0) □-⊕ Incoming Call Route (8) -⊕ 2 -⊕ 6	Ring Tone Override	None ~]

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

Configuration	×		6	📸 • 🔤 🗙 • < >
BOOTP (7)	St	andard Voice Recording Destinations		
Solution		TimeProfile	Destination	Fallback Extension
🗄 📲 User(29)		Default Value	. 🗸	~
👜 🎆 Group(2)	II.			
🖶 🥬 Short Code(14)				
Account Code(0)				
User Rights(4)				
System (1)				
i				
E Control Unit (11)				
Extension (18)				
🕀 📲 User (23)				
🖶 🎆 Group (2)				
🗄 🔛 Short Code (72)				
🗐 😳 Incoming Call Route (8)				

5.6. Administer Short Code

From the configuration tree in the left pane, right-click on **Short Code** and select **New** from the popup list to add a new short code. In the compliance testing, users on IP Office are designated with fax numbers 52xx, and the fax calls are routed over the SIP trunk to the SR140 fax software client.

- **Code** enter "52N;" as the prefix started from 52.
- **Feature** select "Dial" from the list.
- **Telephone Number** enter "52N".
- Line Group Id enter the outgoing group number "6" from Section 5.4, which corresponds to the SIP line.

忆 Av	aya IP C	Iffice Ma	anager f	or Ser	ver Edit	tion IPOSE110 [10.1.0.0.0 build	7]			_
<u>F</u> ile	<u>E</u> dit	<u>V</u> iew	Tools	<u>H</u> e	lp					
IPOS	E110		▼ Sho	irt Co	de	✓ 52N;	- 🕴 🗷 - 🔙 🛛 🔤 🔝 🥼	1 🎺 🎿 💽		
	Co	nfigui	ration				52N;: Dial		- *	
		× *71*N	1#		^	Short Code				
		× *73				Code	i2N;			
	-	× *99;				Feature	Dial	~		
		X 3N; X 46N;				Telephone Number	2N			
		× 49N;				Line Group ID		~		
		× 52N;				Locale		\sim		
		X 60N;				Force Account Code				
		X 70XX X 81613	3N;			Force Authorization Code				

5.7. Administer IP Office Line

The IP Office Small Community Network (SCN) Lines in the IP Office primary and IP Office expansion were previously created during the setup of IP Office Server Edition system when a 500V2 expansion joined to IP Office Primary.

The picture below shows **Line 1 - VoIP Settings** in the IP Office Primary for the compliance test with the SR140. The **Fax Transport Support** was set to "T.38".

BOOTP (7)	Line Short Codes VolP S	ettings	
Operator (3) Solution			🗹 Out Of Band DTMF
🗄 📲 User(29)			Allow Direct Media Path
Group(2)		Contrary Default	
Short Code(14)	Codec Selection	System Default	
Time Brofile(0)		Unused Selected	
Account Code(0)		G.722 64K	
⊞-luser Rights(4)		G.711 ULAW 64K	
		G.711 ALAW 64K	
E IPOSE110		G.729(a) 8K CS-ACELP	
🖶 🖘 System (1)			
= 17 Line (6)			
• • • • • • • • • • • • • • • • • • •			
2			
3			
5		>>>	
6			
🖽 🖘 Control Unit (11)	· · · ·	700	
🗉 🛷 Extension (18)	Fax Transport Support	138 ~	
🕀 📲 User (23)	Call Initiation Timeout (s)	4	
🗉 🎇 Group (2)			
	Media Security	Same as System (Preferred) \sim	
Incoming Call Route (8)		- Advanced Media Security Ontions	
Directory (0)		Same As system	
- 🕜 Time Profile (0)			

The picture below shows **Line 17 - VoIP Settings** in the IP Office Expansion for the compliance test with the SR140. The **Fax Transport Support** was set to "T.38".

Configuration	17	IP Office Line - Line 17*	📥 🗕 📄 🛛 🗙 🗠 🖌 🗠
Configuration	Line Short Codes VoIP S Codec Selection	IP Office Line - Line 17* ettings T38 Fax System Default Unused Selected G.711 ULAW 64K G.729(a) 8K CS-ACELP G.723.1 6K3 MP-MLQ G.729(a) 72 64K	 ➡ ➡ ➡ ➡ ➡ < < > ➡ VolP Silence Suppression ➡ Out Of Band DTMF ➡ Allow Direct Media Path
1 2 17 18 Control Unit (4) Control Unit (4	Fax Transport Support Call Initiation Timeout (s) Media Security	Image: Same as System (Preferred) Advanced Media Security Options	

6. Configure Dialogic FDTool and SR140 Driver

This section describes the configuration of Dialogic FDTool and the embedded Brooktrout SR140 virtual fax board software. For instructions on installing FDTool, refer to **Section 10**.

6.1. Install Dialogic FDTool Application

The FDTool can be downloaded from Dialogic's website. From the folder where the application is saved, do a right-click on the "fdtool.exe" application and select "Run as administer". Select **Yes** when prompted to install drivers in the popup window as shown below.



After the driver is installed, the FDTool window is displayed as shown picture below with the SR140 component.

🐠 fdtool : driv	/er ∨6.9.0 Build 2		_		×
<u>F</u> ile <u>T</u> ools <u>H</u>	elp				
Configure	Initialize SR140 [41]	Dial Re:	set Dial	All Rese	et All
Channel	Status	Dialstring			
L					-
					_
Port History	Channel 1				
					_
_					
BPV: 000 CRC:	 000 FRM: 000 SLP: 000 LOS: 000 F	RAI: 000 AIS: 000		(na	

Select **Configure** button on the FDTool, the "Brooktrout Configuration Tool – Wizard Mode" window is displayed. Select **Advance Mode** button in the bottom.



The "Brooktrout Configuration Tool – Advance Mode" window is displayed as shown in the picture below.

🖓 Brooktrout Configuration Tool - Advand	ed Mode	_		×
File View Options Help				
Home Back Next Save Apply	💱 🧣 License Help			
Brocktrout (Boston Host Service - Running) Driver Parameters (All boards) BTCall Parameters (All boards) Call Control Parameters Module 0x41: SR140 P Call Control Modules SIP	Note: If you are intending to configure an SR140 only, you must first act using the License Manager. This page contains essential information to use the tool effectively. You page any time by clicking on the Home icon on the toolbar. The user in of two views: (a) the explorer view and (b) the content view. The explorer view allows you to navigate through the various configurable Brooktrout Hardware and Software. The content view contains either info content such as this page or controls that allow you to fine tune the Bro components.	ivate a can get terface compo rmatior oktrout	license t to this consists onents of nal	^

6.2. Configure IP Stack

A Configure IP Stack window is displayed on first invocation of the Brooktrout configuration tool:

Configure IP Stack
IP Enabled module(s) have been detected in your system. Would you like to configure a Brooktrout IP stack to run on this module(s)?
C None ← FIP C A923
Both (SIP and H323)
OK Cancel

Choose SIP and click OK. The following Brooktrout Configuration Tool window is displayed.

🚓 Brooktrout Configuration Tool - Advanc	ed Mode
File View Options Help	
Home Back Next Save Apply	Icense Icense
 Brooktrout (Boston Host Service - Running) 	 Note: If you are intending to configure an SR140 only, you must first activate a license using the License Manager. This page contains essential information to use the tool effectively. You can get to this page any time by clicking on the Home icon on the toolbar. The user interface consists of two views: (a) the explorer view and (b) the content view. The explorer view allows you to navigate through the various configurable components of Brooktrout Hardware and Software. The content view contains either informational content such as this page or controls that allow you to fine tune the Brooktrout components. In this mode you can: Edit call control configuration per module. Edit the btcall parameters. Edit the device driver parameters. Save the configuration information. And finally apply the configuration. Please note that you must apply the configuration information for the changes to take effect. The apply action is available from the toolbar as well as from the Options menu. Under normal conditions (that is, all Brooktrout hardware installed on your system has the same ship level number programmed on them), the configuration tool should come up in the Wizard Mode. It can also be launched explicitly to come up in the advanced mode by using /a oradvanced command line option. If you did not specify this option and the tool came up in in this mode, it is because hardware detected by the tool required identification as the part of the near one tune of Brooktrout bardware medale.

Note that IP Stack can be viewed/reconfigured from the Brooktrout Configuration Tool menu **Options** \rightarrow **Configure IP Stack** (not shown).

KP; Reviewed:	Solution & Interoperability Test Lab Application Notes	15 of 28
SPOC 1/15/2019	©2019 Avaya Inc. All Rights Reserved.	SR140_IPO11

6.3. Configure BTCall Parameters

Note: During the compliance testing, the following settings were retained at the default settings. In practice, these settings may not be required for full functionality.

Navigate to **Brooktrout** → **BTCall Parameters** (All boards) in the left navigation menu. Click the Show Advanced button.

😓 Brooktrout Configuration Tool - Advanced Mode				
File View Options Help				
Image: Control of the sector of the sect	📚 🥊 License Help			
⊡ ··· Brooktrout (Boston Host Service - Running) …·· <u>Driver Parameters (All boards)</u>	BTCall Parameters			
<mark>BTCall Parameters (All boards)</mark> ⊟ Call Control Parameters	Country Telephony Parameter File:	BT_CPARM.CFG		
Module 0x41: SR140	Country:	USA [0010]		
⊡ - IP Call Control Modules SIP	Maximum Timeout, sec:	<u> </u>		
	Debug			
	API Debugging:	Enabled 🗾		
	1st Debug Log File Name:	\logs\bfv.log 🔁 🏂		
	2nd Debug Log File Name:	2 %		
	Maximum Debug File Size:	10000000		
	Trace Bfv API Function Calls:	Disable		
	Advanc	ed Settings		
	Do not change these p been instr	arameters unless you have ucted to do so		
	Action Taken on Mismatches:	Horizontally and vertically scale the fax		
	Bad Line Behavior:	Replace with last good line		
	Default ID String:	· · · · · · · · · · · · · · · · · · ·		

Under Advanced Settings, leave all parameters at default values as shown below.

🏚 Brooktrout Configuration Tool - Advanced Mode			
File View Options Help			
🖆 🗢 🔿 🔚 🍪 Home Back Next Save Apply	🕄 🎖 License Help		
Brooktrout (Boston Host Service - Running) Driver Parameters (All boards) BTCall Parameters (All boards) C- Call Control Parameters	BTCall Parameters Do not change triese parameters unless you have been instructed to do so		
In Module 0x41: SR140	Action Taken on Mismatches:	Horizontally and vertically scale the fax	
SIP	Bad Line Behavior:	Replace with last good line	
	Default ID String:		
	Error Correction Mode:	ECM enabled 256-byte frames	
Rrooktrout Configuration Tool - Advance	ed Mode		
File View Options Help			
l Carlon	 Icense 		
Brooktrout (Boston Host Service - Running) Driver Parameters (All boards) BTCall Parameters (All boards) Call Control Parameters Module 0x41: SR140 P Call Control Modules SIP	BTCall Parameters Error Threshold Value: Font Files: Maximum Error Multiplication Value: Maximum Number of Pages: Maximum Page Width: Minimum Error Multiplication Value: Minimum Page Width: Minimum Number of Lines, x10 units: Permitted Compression Types: Send RTP FSK: Time to Wait for CED Tone, x10msec: V.34 Enable Send Call Indicator: V.34 High Speed Control Signaling: V.34 Modulation Capability:	3 /bfv.api/fonts/ibmpcps.fz8 0 /bfv.api/fonts/ibmpcps.fz8 255 200 1024 215mm A4 1728 Normal resolution pixels 40 0 255 MMR or MR or MH Enable 4000 Enable Enable	

6.4. Configure Call Control Parameters

Navigate to **Brooktrout** \rightarrow **Call Control Parameters** \rightarrow **Module 0x41: SR140** in the left navigation menu. Ensure the following configuration parameters in the **Parameters** tab are properly set:

- **IP Call Control Module:** SIP
- Media IP Interface for IPv4: If the SR140 fax software client contains multiple network interface cards (NICs), ensure a correct interface that is able to communicate with the IPO.
- Lowest/Highest IP Port Numbers: Ensure your RTP range matches the port range configured on the Avaya SIP infrastructure. By default, the port range for SR140 is 56000 to 56999. A maximum range of 1000 ports may be specified. When you change the Lowest IP Port Number value, the Highest IP Port Number value will adjust automatically.

Brooktrout Configuration Tool - Advance	ed Mode	
Hile View Options Heip	License Help	
Broaktout (boston Host Service - Hurning) Driver Parameters (All boards) BTCall Parameters (All boards) Call Control Parameters L Module 0x41: SR140 D IP Call Control Modules L SIP	General Information Parameters IP Call Control Module: Media IP Interface for IPv4: Lowest IP Port Number: Highest IP Port Number:	SIP
		Show Advanced >>

6.5. Configure SIP IP Parameters

Navigate to **Brooktrout** \rightarrow **IP Call Control Modules** \rightarrow **SIP** in the left navigation menu. Select the **IP Parameters** tab in the right pane. Configure the fields as follows:

- **Primary Gateway** Enter the LAN1 IP address of IPO.
- From Value If required by the Avaya environment, set this to an appropriate "UserInfo@sipdomain". During compliance testing this value was configured as "SR140 <5200@bvwdev>"
- **Contact Address** Enter the IP address assigned to the FDTool.
- Username Required. Default value is a dash ('-') character.

Use default values for all other fields.

🖓 Brooktrout Configuration Tool - Advanced Mode — 🗆 🗙			
File View Options Help	~ 0		
Taŭ 🕶 🕶 🖬 🗺 Home Back Next Save Apply	Cicense Help		
⊡ Brooktrout (Boston Host Service - Running)	General Information IP Parameters T.38 Parameters	RTP Parameters	
Driver Parameters (All boards) BTCall Parameters (All boards)	Maximum SIP Sessions:	256	
Call Control Parameters	Primaru Gatewau:	10 10 97 110	5061
Module 0x41: SH 140	Additional SIP Gateway #2		
I SIP	Additional SIP Gateway #3		,
	Additional SIP Gateway #4:		
	Primaru Provu Server	ور. ار	,
	Additional Provu Server #2:	ون ار	
	Additional Provi Server #2:		
	Additional Provi Server #4:		
	Primaru Benistrar Server LIBL		
	Additional Registrar Server #2:		
	Additional Registral Server #2:		
	Additional Registrar Server #4:		
	From Volue:	I FIL	
		15 14 03 50	
	Londact IP V4 Address:	10.10.97.58	
		1	_
		Ino_session_name	_
		1	_
	Description URI:		_
	Email Address:]	
	Phone Number:	1	
		Show Advance	ced >>

Click on **Show Advanced** tab to display the advanced parameters. To enable TLS connection, select highlighed values as shown in the picture.

- **TCP Enable** Select TRUE.
- **Transport Protocol** Select TLS.
- **SIP over TLS Enable** Select TRUE.
- **TLS config filename** the file "siptls.cfg" that needs to be configured for TLS, the detail of this file is shown in the next step.
- **SIP over TLS port** Enter the port 5061.
- Secure RTP Enable Select TRUE.
- Secure RTP config filename the "srtp.cfg" file that needs to be configured for secure media SRTP. The detail of this file is shown in the next step.

🙀 Brooktrout Configuration Tool - Advance	-		
File View Options Help			
Image: Constraint of the sector of the s	at a state of the		
Brooktrout (Boston Host Service - Running)	General Information IP Parameters T.38 Paramet	ters RTP Parameters	
Driver Parameters (All boards) BTCall Parameters (All boards)	Hedirect As Lalling Party:	<u> </u>	^
Call Control Parameters	T1 Timeout Retransmission:	500	
i⊷ Module 0x41: SH140 ⊡- IP Call Control Modules	Maximum INVITE Retransmissions:	7 1) 255	
IIII SIP	Redirect As Called Party:		
	TCP Enable:	TRUE	•
	User-Agent:	Brktsip/6.9.2B2 (Dialogic)	
	RFC 3325 Identity:	0 0 1 2	
	Transport Protocol:	TLS	-
	Response code for Call Not Answered:	486 400 699	
	Response code for Unsupported Media:	488 400 699	
	Response code to reject T.38 renegotiation:	488 400 —) 699	
	100 TRYING Enable:	TRUE	-
	RFC 6913 Enable:	FALSE	-
	SIP OPTIONS UP Interval:	120 60 () 3600	
	SIP OPTIONS DOWN Interval:	<u>60</u> 30 () 3600	
	SIP over TLS Enable:	TRUE	-
	TLS config filename:	siptls.cfg	
	SIP over TLS port:	5061	
	Block UDP port:	TRUE	•
	Block TCP port:	TRUE	•
	Secure RTP Enable:	TRUE	-
	Secure RTP config filename:	srtp.cfg	
	FIPS Enable:	FALSE	•
		(TT: J X	

Below is the "siptls.cfg" file stored under the config directory of fdtool. During the compliance test, System Manager was used to sign the certificate for Dialogic SR140.

```
#### parameters for SIP over TLS
sip tls method=tlsv1.2
local_rsa_private_key_filename = C:\1917_fdtool-692\config\sr140.key
local rsa private key password = avaya123
local_rsa_cert_filename
                           = C:1917_fdtool-692\setminusconfig\sr140.pem
local_dss_private_key_filename =
local_dss_private_key_password =
local dss cert filename
                           =
ca_cert_number = 1
ca_cert_filename = C:\1917_fdtool-692\config\sr140.pem
chain_cert_number = 0
chain cert filename =
crl number = 0
crl filename =
local_cipher_suite =
dh param 512 filename =
dh param 1024 filename =
dh_param_2048_filename =
session_id =
client_cert_required=false
allow_self_signed_certs=true
```

Below is the "srtp.cfg" file that is set in the **Secure RTP config filename** field. Note that the values without the hash sign in the front are enabled .

```
#### parameters for SRTP
srtp_accept = true
#srtp_enforce = true
srtp_crypto_suite = AES_CM_128_HMAC_SHA1_80
srtp_master_key_len = 128
#srtp_salting_key_len = 112
#srtp_num_keys = 1
#srtp_mki_len = 1
#srtp_lifetime = 48
#srtcp_lifetime = 31
#srtp_kdr = 0
#srtp_window_size = 64
#srtp_unencrypted_flag = false
srtcp_unencrypted_flag = true
#srtp_unauthenticated_flag = false
```

6.6. Configure T.38 Parameters

Select the T.38 Parameters tab. Configure the fields as shown below in the screenshot.

Note: During the compliance testing, the following settings were configured at the default settings. In practice, these settings may not be required for full functionality.

- Fax Transporting Protocol select "T.38 only" from the list.
- Maximum Bit Rate, bps set to 14400, which is the default setting.

🙀 Brooktrout Configuration Tool - Advanced Mode 🛛 🚽 🗆			
File View Options Help			
Image: Constraint of the sector of the s	💱 🧣 License Help		
Brooktrout (Boston Host Service - Running) Driver Parameters (All boards)	General Information IP Parameters T.38 Parameters	RTP Parameters	
BTCall Parameters (All boards)	Fax Transporting Protocol:	T.38 only	
Here Call Control Parameters Module 0x41: SR140	Generate CED tone over RTP:	Yes	
⊡ - IP Call Control Modules	Maximum Bit Rate, bps:	14400	
	Media Passthrough Timeout Inbound, msec:	1000	
	Media Passthrough Timeout Outbound, msec:	4000	
	Media Renegotiate Delay Inbound, msec:	1000	
	Media Renegotiate Delay Outbound, msec:	-1	
	T30 Fast Notify:	No	
	UDPTL Redundancy Depth Control:	<u>5</u> 0 <u> </u>	
	UDPTL Redundancy Depth Image:	2 U J 2	
		Show Advanced >>	

6.7. Configure RTP Parameters

Select the **RTP Parameters** tab and set the **RTP codec list** value to use only a single codec, either "pcmu" or "pcma" to match the codec used in your region.

4	🕽 Brooktrout C	onfigurati	on Tool	- Advanc	ed Mode					_		×
Fil	e View Opt	ions Hel	lp									
С Но	📸 🔶 🖨 ome Back	➡ Next	🔛 Save	🍋 Apply	a License	🦿 Help						
	u me Brocktrout (Bos Imported by the second Imported by the second Impor	Next ton Host Se meters (All I Parameters Ox41: SR1- ox41: SR1-	Save source - Ri poards) sources 40	Apply unning)	License General I RTP cc Silence Frame I Jitter Bu T.38 off Voice F	Help nformation odec list: Control: Duration: affer Depth: fer as CED to irame Replace	IP Parameters Do no one: cement:	T.38 Parameters Advance t change these pa been instruct	RTP Parameters pcmu inband d Settings rameters unless you have ted to do so 20 100 — Yes Silence	e 500	Advance	

After verifying all the above parameters are properly set, click **Save** and then Apply in the button menu. Exit the Brooktrout Configuration Tool.

From the FDTool window, click on "**Initialize**" button to start the Brooktrout SR140 service, the Status shows "Waiting for call...".

Image: Index of the second											
Configure	Configure Initialize SR140 [41] Dial Rese										
Channel	Status	Dialstring									
01 - 000/000	Waiting for call										
02 - 000/000	Waiting for call										
Port History	Channel 1										
11:37:18.547	Ready.										
11:37:18.610	Resetting line										
11:37:18.625	Waiting for call										
1											
BPV: 000 CRC: 000 FRM: 000 SLP: 000 LOS: 000 RAI: 000 AIS: 000 (na)											

7. Verification Steps

The following steps may be used to verify the configuration:

• Verify that fax calls can be placed to/from the FDTool from both local and remote sites. The picture below shows the FDTool was sending fax to the local fax endpoint that is connected to the expansion 500V2.

💠 fdtool : driver v6.9.0 Build 2 — 🗆 X												
Configure	Initialize SR140 [41]	•	Dial	Reset	Dial All	Reset All						
Channel	Status	Dialstring										
01 - 000/000	Waiting for send complete	5200@10.10.97.110										
02 - 000/000	Receiving page											
-												
		-										
Port History	Channel 1											
11:11:37.835	Connected											
11:11:37.835	Sending "send.tif"											
11:11:37.851	Local ID is "fdtool"					_						
11:11:37.851	Start Sending Fax											
11:11:37.866	Getting Remote ID	Getting Remote ID										
11:11:47.960	Remote ID is "rdtool"											
11:11:40.273	Fax Training Details											
11:11:48 288	= > Besolution = 200 Hy 200 V (Fine)											
11:11:48 304	Sending hage 1											
11:11:48.304 Waiting for send complete												
						~						
BPV: 000 CRC;	000 FRM: 000 SLP: 000 LOS: 000 R	AI: 000 AIS:	000			(na) 🔘						

From the Avaya IP Office R10 Manager screen shown in Section 5.1, select File \rightarrow Advanced \rightarrow 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 5.4**, in this case the SIP trunk line number is "6".

Verify that the **SIP Trunk Summary** screen shows an active channel with a **Current State** of "Connected", and that the sender fax number is displayed in the **Caller ID or Dialed Digits** field.

AVAYA							I	P Offi	ce Sys	sten	stati	IS		
Help Snapshot LogOff Exit	About													
 System Alarms (10) Extensions (7) 	Status Utilization Summary Alarms													
Trunks (6)	SIP Trunk Summary													
Line: 1	Line Servio	e State	э:		In Service									
Line: 2	Peer Domain Name:				bvwdev.com									
Line: 3	Resolved Address:				10.10.97.	.58								
Line: 4 Line: 5	Line Number:				6									
Line: 6	Number of Administered Channels:				10									
Active Calls	Number of Channels in Use:				1									
E Resources	Resources Administered Compression:					G729 A								
Voicemail ID Networking	Enable Faststart:			Off										
L ocations	Silence Sup	pressi	on:		Off									
Loodions	Media Stream:				SRTP									
	Layer 4 Protocol:			TLS										
	SIP Trunk (SIP Trunk Channel Licenses:			512	0.2%								
	SIP Trunk Channel Licenses in Use:			1	0.2 %									
	SIP Device Features:													
	Channel	URI	Call	Current	Time in State	Remote Media	Codec	Connection	Caller ID or	Other P	arty on Call	Direction of	Round Trip	Receive
	1	1	13	Connected	00:02:47	10,10,97,58	T38	SRTP Relay	5200@13	Line: 1	IP Office 139	Incomina	Oms	Oms
	2	-		Idle	17:47:58			,				,		
	3			Idle	17:47:58									
	4			Idle	17:47:58									
	5			Idle	17:47:58									
	7			Idle Idla	17:47:58									
	Irace	Tr <u>a</u>	ce All	Pause	Ping	Call Details		iraceful <u>S</u> huti	down	Force Ou	ut of Service	Print	. <u>S</u> ave	As

8. Conclusion

These Application Notes describe the procedures required to configure Dialogic Brooktrout SR140 Fax Software to interoperate with Avaya IP Office using SIP trunks. Please refer to **Section 2.2** for any exceptions or observations.

9. Additional References

This section references the documentation relevant to these Application Notes. The following and additional Avaya product documentation is available at <u>http://support.avaya.com</u>.

- 1. Avaya IP OfficeTM Platform Server Edition Reference Configuration, September 2018
- 2. IP Office[™] Platform 11, Deploying Avaya IP Office[™] Platform Servers as Virtual Machines, Jun 2018
- 3. IP Office[™] Platform 11, Deploying Avaya IP Office[™] Platform IP500 V2, Jun2018.
- 4. *IP Office™ Platform 11, Installing and Maintaining the Avaya IP Office™ Platform Application Server*, Document number 15-601011, Aug 2018.
- 5. Administering Avaya IP Office[™] Platform with Web Manager, Release 11, September 2018.
- 6. Administering Avaya IP OfficeTM Platform with Manager, Release 11, September 2018.

Dialogic Brooktrout SR140 Fax Software product information may be found at <u>https://www.dialogic.com/sr140.</u>

Brooktrout manuals can be found at https://www.dialogic.com/manuals/brooktrout/brooktrout

©2019 Avaya Inc. All Rights Reserved.

Avaya and the Avaya Logo are trademarks of Avaya Inc. All trademarks identified by \mathbb{R} and TM are registered trademarks or trademarks, respectively, of Avaya Inc. All other trademarks are the property of their respective owners. The information provided in these Application Notes is subject to change without notice. The configurations, technical data, and recommendations provided in these Application Notes are believed to be accurate and dependable but are presented without express or implied warranty. Users are responsible for their application of any products specified in these Application Notes.

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.