

Avaya Solution & Interoperability Test Lab

# Application Notes for Configuring SIP Trunks among Ingate SIParator, Avaya Aura® Session Manager and Avaya Aura® Communication Manager - Issue 1.1

#### Abstract

These Application Notes describe a sample configuration for a network that uses Avaya Aura® Session Manager to connect Ingate SIParator and Avaya Aura® Communication Manager using SIP trunks.

The Ingate SIParator is a SIP Session Border Controller (SBC) that manages and protects the flow of SIP signaling and related media across an untrusted IP network. The compliance testing focused on telephony scenarios between an enterprise site, where the Ingate SIParator, Session Manager, and Communication Manager were located, and a second site.

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 a sample configuration for a network that uses Avaya Aura® Session Manager to connect Ingate SIParator and Avaya Aura® Communication Manager using SIP trunks.

The compliance testing focused on telephony scenarios between an enterprise site, where the Ingate SIParator, Session Manager, and Communication Manager were located, and a second site.

#### 2. General Test Approach and Test Results

The general test approach was to make calls between the main enterprise site and a second site using various codec settings and exercising common PBX features.

#### 2.1. Interoperability Compliance Testing

The compliance testing focused on interoperability between Ingate SIParator and Session Manager / Communication Manager by making calls between the enterprise site and a second site simulating a service provide service node that were connected through the SIParator using direct SIP trunks. The following functions and features were tested:

- Calls from both SIP and non-SIP endpoints between sites
- G.711u and G.729A codec support
- Proper recognition of DTMF transmissions by navigating voicemail menus
- Proper operation of voicemail with message waiting indicators (MWI)
- PBX features including Multiple Call Appearances, Hold, Transfer, and Conference
- Extended telephony features using Communication Manager Feature Name Extensions (FNE) such as Call Forwarding, Call Park, Call Pickup, Automatic Redial, Automatic Call Back, and Send All Calls.
- Proper system recovery after a SIParator restart and/or re-establishment of broken IP connectivity.

#### 2.2. Test Results

The Ingate SIParator passed compliance testing. The following observations were made during testing:

- The caller-ID was incorrectly displayed at the endpoints for calls flowing through Ingate SIParator.
- If a call was placed to a SIP enterprise endpoint via Ingate SIParator while there was a SIParator outage (such as an Ethernet disconnect), the called failed as expected. However, after SIParator recovered from the outage, all calls to the same SIP endpoint continued to fail. The endpoint needed to be restarted in order to successfully terminate calls to the same endpoint again.

#### 2.3. Support

Technical support for Ingate SIParator can be obtained by contacting Ingate at

- EMEA Phone: +46-13-21 08 52
- NA Phone: +1-866-809-0002
- Email: <u>support@ingate.com</u>
- Web: <u>http://www.ingate.com</u>

#### 3. Reference Configuration

**Figure 1** illustrates the test configuration. The test configuration shows two sites connected via a SIP trunk across an untrusted IP network: the main enterprise site and a second site. The Ingate SIParator Session Border Controller (SBC) is at the edge of the main site. The public side of the SIParator is connected to the untrusted network and the private side is connected to the trusted corporate LAN.

All SIP traffic between two sites flows through the SIParator. In this manner, the SIParator can protect the main site's infrastructure from any SIP-based attacks. The voice communication across the untrusted network uses SIP over TCP and RTP for the media streams.

Also connected to the LAN at the main site are:

- An Avaya S8300D Server running Avaya Aura® Communication Manager in an Avaya G450 Media Gateway. Avaya Aura® Communication Manager Messaging is also running on the Avaya S8300D Server to provide voice mail functionality.
- A Dell<sup>TM</sup> PowerEdge<sup>TM</sup> R610 Server running Avaya Aura® System Manager. System Manager provides management functions for Session Manager.
- An HP ProLiant DL360 G7 Server running Avaya Aura® Session Manager that provides SIP registrar and proxy server functions for SIP endpoints in the enterprise IP telephony network.

The Session Manager connects the SIParator and Communication Manager using SIP trunks. Endpoints include both SIP and non-SIP endpoints. An ISDN-PRI trunk connects the media gateway to the PSTN.

The 2<sup>nd</sup> site also comprises of a Communication Manager, System Manager, and Session Manager, with both SIP and non-SIP endpoints.

The SIP endpoints located at both sites are registered to the local Session Manager. Each site has a separate SIP domain: *avaya.com* for the main site and *devconnect.com* for the  $2^{nd}$  site.



Figure 1: SIParator SIP Trunking Test Configuration

# 4. Equipment and Software Validated

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

Equipment	Software
Avava S8300D Server with a Avava G450	Avaya Aura® Communication Manager 6.0.1,
Media Gateway	R016x.00.1.510.1, Patch 18621
	(Avaya Aura® System Platform: 6.0.2.1.5)
	Avaya Aura® System Manager: 6.1.0 (Build No. –
Dell <sup>TM</sup> PowerEdge <sup>TM</sup> R610 Server	6.1.0.4.5072-6.1.4.11)
	(Avaya Aura® System Platform: 6.0.2.1.5)
UD Drol iont DI 260 C7 Server	Avaya Aura® Session Manager 6.1.0 (Build No. –
HP PIOLIant DL300 G7 Server	6.1.0.0.42003-6.1.0.610012)
Avaya 9600 Series IP Telephones	
• H.323	3.1. Service Pack 1
• SIP	2.6.4
Fax Machine	-
Ingate SIParator with installed modules:	4.9.1
Standard SIP features	
SIP Trunking	
Remote SIP Connectivity (NAT	
Traversal)	
• Failover	
• VPN (IPsec and PPTP)	

# 5. Configure Communication Manager

This section describes the Communication Manager configuration at the main enterprise site to support the network shown in **Figure 1**. It assumes station administration (for both SIP and non-SIP endpoints) and the procedures necessary to support SIP and connectivity to Session Manager have been performed as described in [2] and [3].

The configuration of Communication Manager was performed using the System Access Terminal (SAT). After the completion of the configuration, perform a **save translation** command to make the changes permanent.

р	Description
•	IP network region
	All equipment at the main site were located in a single IP network region (IP network
	region 1) using the parameters described below. Use the <b>display ip-network-region</b>
	command to view these settings. The example below shows the values used during
	compliance testing.
	Authoritative Domain: avava.com
	This field was configured to match the domain name configured on Session
	Manager The domain will appear in the "From" header of SIP messages
	originating from this IP region
	Name: Any descriptive name may be used (if desired)
	- Indine. Any descriptive name may be used (in desired).
	• Intra-region IP-IP Direct Audio. yes
	Inter-region IP-IP Direct Audio: yes
	By default, IP-IP direct audio (media shuffling) is enabled to allow audio traffic to
	be sent directly between IP endpoints without using media resources in the Avaya
	Media Gateway Shuffling can be further restricted at the trunk level on the
	Modia Oaleway. Shuffing can be further resultied at the truth level on the
	Signaling Group form.
	Signaling Group form.
	<ul> <li>Signaling Group form.</li> <li>Codec Set: 1</li> <li>The codec set contains the list of codecs available for calls within this IP network.</li> </ul>
	<ul> <li>Signaling Group form.</li> <li>Codec Set: 1 The codec set contains the list of codecs available for calls within this IP network</li> </ul>
	<ul> <li>Signaling Group form.</li> <li>Codec Set: 1 The codec set contains the list of codecs available for calls within this IP network region.</li> </ul>
	<ul> <li>Signaling Group form.</li> <li>Codec Set: 1 The codec set contains the list of codecs available for calls within this IP network region.</li> </ul>
	<ul> <li>Signaling Group form.</li> <li>Codec Set: 1 The codec set contains the list of codecs available for calls within this IP network region.</li> <li>display ip-network-region 1</li> </ul>
	Michal Gateway. Shuffing can be further restricted at the truth rever on the Signaling Group form.         • Codec Set: 1 The codec set contains the list of codecs available for calls within this IP network region.         display ip-network-region 1 Region: 1       Page 1 of 20
	Michal Gateway. Shuffing can be further restricted at the truth rever on the Signaling Group form.         • Codec Set: 1         The codec set contains the list of codecs available for calls within this IP network region.         display ip-network-region 1       Page 1 of 20         Region: 1       Location: Authoritative Domain: avaya.com
	Michal Gateway. Shuffing can be further restricted at the truther restred at the truther restricted at the truther re
	Michal Gateway. Shuffing can be further restricted at the truther restrestrestrestrestrestrestrestrestrest
	Michal Gateway. Shuffing can be further restricted at the truth rever on the Signaling Group form.         • Codec Set: 1         The codec set contains the list of codecs available for calls within this IP network region.         display ip-network-region 1       Page 1 of 20         Region: 1       IP NETWORK REGION         Region: 1       Authoritative Domain: avaya.com         Name:       Intra-region IP-IP Direct Audio: yes         Codec Set: 1       Inter-region IP-IP Direct Audio: yes         UDP Port Min: 2048       IP Audio Hairpinning? n
	Michal Gateway. Shuffing can be further restricted at the truth rever on the Signaling Group form.         • Codec Set: 1         The codec set contains the list of codecs available for calls within this IP network region.         display ip-network-region 1       Page 1 of 20         IP NETWORK REGION         Region: 1         Location:       Authoritative Domain: avaya.com         Name:         MEDIA PARAMETERS         Intra-region IP-IP Direct Audio: yes         UDP Port Min: 2048         UDP Port Min: 2048         UDP Port Max: 3329         DIFFERV/TOS PARAMETERS
	display ip-network-region 1       Page 1 of 20         IP NETWORK REGION         Region: 1         Location:       Authoritative Domain: avaya.com         Name:         MEDIA PARAMETERS         Intra-region IP-IP Direct Audio: yes         Codec Set: 1         Inter-region IP-IP Direct Audio: yes         UDP Port Min: 2048         UDP Port Min: 2048         IP Audio Hairpinning? n         UDF Port Max: 3329         DIFFSERV/TOS PARAMETERS         Call Control PHB Value: 46
	Signaling Group form. Codec Set: 1 The codec set contains the list of codecs available for calls within this IP network region. display ip-network-region 1 Region: 1 Location: Authoritative Domain: avaya.com Name: MEDIA PARAMETERS Codec Set: 1 UDP Port Min: 2048 UDP Port Min: 2048 UDP Port Min: 2048 UDP Port Max: 3329 DIFFSERV/TOS PARAMETERS Call Control PHB Value: 46 Audio PHB Value: 46
	Michal Gateway. Shuffing can be further restricted at the truthk rever on the         Signaling Group form.         • Codec Set: 1         The codec set contains the list of codecs available for calls within this IP network region.         display ip-network-region 1       Page 1 of 20         Region: 1         Location:       Authoritative Domain: avaya.com         Name:       Intra-region IP-IP Direct Audio: yes         Codec Set: 1       Inter-region IP-IP Direct Audio: yes         UDP Port Min: 2048       IP Audio Hairpinning? n         UDP Port Max: 3329       DIFFSERV/TOS PARAMETERS         Call Control PHB Value: 46       Audio PHB Value: 46         Video PHB Value: 26       Video PHB Value: 26
	Michal Gateway. Shuffing can be further restricted at the truth rever of the Signaling Group form. • Codec Set: 1 The codec set contains the list of codecs available for calls within this IP network region.          display ip-network-region 1       Page 1 of 20         Region: 1       IP NETWORK REGION         Region: 1       Authoritative Domain: avaya.com         Name:       Intra-region IP-IP Direct Audio: yes         MEDIA PARAMETERS       Intra-region IP-IP Direct Audio: yes         UDP Port Min: 2048       IP Audio Hairpinning? n         UDP Port Max: 3329       IP Audio Hairpinning? n         DIFFSERV/TOS PARAMETERS       Call Control PHB Value: 46         Audio PHB Value: 26       802.1F/Q PARAMETERS
	Media Gateway. Shuffing can be further restricted at the futfik rever of the signaling Group form. Codec Set: 1 The codec set contains the list of codecs available for calls within this IP network region.          display ip-network-region 1       Page 1 of 20         IP NETWORK REGION       Page 1 of 20         Region: 1       Location:         Location:       Authoritative Domain: avaya.com         Name:       Intra-region IP-IP Direct Audio: yes         Codec Set: 1       Intra-region IP-IP Direct Audio: yes         UDP Port Min: 2048       IP Audio Hairpinning? n         UDP Port Max: 3329       IP Audio Hairpinning? n         DIFFSERV/TOS PARAMETERS       Call Control PHB Value: 46         Audio PHB Value: 26       802.1P/Q PARAMETERS         Call Control 802.lp Priority: 6       Audio PHB value: 26
	Michae Gateway. Shuffing can be further restricted at the further test feed at the feed at the feed at test feed at
	Micha Gateway. Shuffing can be further restricted at the truth rever of the Signaling Group form. Codec Set: 1 The codec set contains the list of codecs available for calls within this IP network region.           display ip-network-region 1       Page 1 of 20         Region: 1       IP NETWORK REGION         Region: 1       Authoritative Domain: avaya.com         Name:       Intra-region IP-IP Direct Audio: yes         MEDIA PARAMETERS       Intra-region IP-IP Direct Audio: yes         UDP Port Min: 2048       IP Audio Hairpinning? n         UDP Port Max: 3329       IP Audio Hairpinning? n         DIFFSERV/TOS PARAMETERS       IP Audio Hairpinning? n         Call Control PHB Value: 46       Audio PHB Value: 26         802.1P/Q PARAMETERS       Call Control 802.1p Priority: 6         Audio 802.1p Priority: 5       AUDIO RESOURCE RESERVATION PARAMETERS         H.323 IF ENDPOINTS       RSVP Enabled? n
	Micha Oateway. Shuffing can be further restricted at the furth reversion the Signaling Group form. • Codec Set: 1 The codec set contains the list of codecs available for calls within this IP network region. display ip-network-region 1 Page 1 of 20 IP NETWORK REGION Region: 1 Location: Authoritative Domain: avaya.com Name: MEDIA PARAMETERS Intra-region IP-IP Direct Audio: yes Codec Set: 1 Intra-region IP-IP Direct Audio: yes UDP Port Min: 2048 IP Audio Hairpinning? n UDP Port Max: 3329 DIFFSERV/TOS PARAMETERS Call Control PHB Value: 46 Audio PHB Value: 26 802.1P/Q PARAMETERS Call Control 802.1p Priority: 6 Audio 802.1p Priority: 6 Audio 802.1p Priority: 5 AUDIO RESOURCE RESERVATION PARAMETERS H.323 Link Bounce Recovery? y
	<pre>Nictual Gateway. Shuffing can be further restricted at the truth rever on the Signaling Group form. Codec Set: 1 The codec set contains the list of codecs available for calls within this IP network region. display ip-network-region 1 Region: 1 Location: Authoritative Domain: avaya.com Name: MEDIA PARAMETERS Intra-region IP-IP Direct Audio: yes Codec Set: 1 Intra-region IP-IP Direct Audio: yes UDP Port Min: 2048 IP Audio Hairpinning? n UDP Port Max: 3329 DIFFSERV/TOS PARAMETERS Call Control PHB Value: 46 Audio PHB Value: 26 802.1P/Q PARAMETERS Call Control 802.1p Priority: 6 Audio 802.1p Priority: 5 AUDIO RESOURCE RESERVATION PARAMETERS H. 323 IJP ENDPOINTS RSVP Enabled? n H. 323 Link Bounce Recovery? y Idle Traffic Interval (sec): 20 The second secon</pre>
	<pre>Middla Oateway. Shuffing can be further restricted at the truth rever on the Signaling Group form. • Codec Set: 1 The codec set contains the list of codecs available for calls within this IP network region. display ip-network-region 1 IP NETWORK REGION Region: 1 Location: Authoritative Domain: avaya.com Name: MEDIA PRAMETERS Codec Set: 1 UDP Port Min: 2048 UDP Port Min: 2048 UDP Port Min: 2048 UDP Port Min: 2048 UDP Port Max: 3329 DIFFSERV/TOS PARAMETERS Call Control PHB Value: 46 Audio PHB Value: 26 802.1P/Q PARAMETERS Call Control HB Value: 26 802.1P/Q PARAMETERS Call Control 802.1p Priority: 6 Audio 802.1p Priority: 6 Nideo 802.1p Priority: 5 AUDIO RESOURCE RESERVATION PARAMETERS H.323 IJP ENDPOINTS H.323 IJP ENDPOINTS H.323 IJP ENDPOINTS H.323 IJP ENDPOINTS H.323 IJP ENDPOINTS H.323 IJP ENDPOINTS H.323 IJP ENDPOINTS H.324 IJP ENDPOINTS H.325 ILINE Bounce Recovery? y Idle Traffic Interval (sec): 5 Yeap Advector for the set of the set</pre>

Step				Description	l			
2.	Codecs IP codec set 1 priority order establishment. It should be no codec under te	was used durin to allow the co The example oted that when est was included	ng compli dec used below sh testing th d in the li	iance testing by a specifi lows the value use of each ist.	g. Multiple code c call to be nego ues used during th individual coo	ecs v otiate com lec,	vere lis ed durin plianco only th	ted in ng call e testing. e single
	display ip-code	ec-set 1			Pa	ige	1 of	2
		IP	Codec Set					
	Codec Set:	1						
	Audio Codec 1: G.711MU 2: G.729AB 3: 4: 5: 6: 7:	Silence Suppression n n	Frames Per Pkt 2 2	Packet Size(ms) 20 20				

Step		Description	
3.	Node Names Use the chang Session Manag assigned to Se	e node-names ip command to create a ger. Enter a descriptive name in the Na ssion Manager in the IP address colur	node name for the IP address of me column and the IP address nn.
	change node-nar	nes ip	Page 1 of 2
	Name CM_20_40 SM_20_31 <b>SM_21_31</b> default msgserver procr procr6	IP NODE NAMES IP Address 10.64.20.40 10.64.20.31 <b>10.64.21.31</b> 0.0.00 10.64.21.41 10.64.21.41 ::	

Step	De	scription
4.	Signaling Group	
	Signaling group 1 was used for the signa	ling group associated with the SIP trunk group
	between Communication Manager and S	ession Manager. Signaling group 1 was
	configured using the parameters highligh	ted below.
	<ul> <li>Near-end Node Name: procr This is S8300D Server. Node names are def command.</li> </ul>	node name maps to the IP address of the Avaya ined using the <b>change node-names ip</b>
	<ul> <li>Far-end Node Name: SM_21_31 T Session Manager</li> </ul>	his node name maps to the IP address of
	<ul> <li>Far-end Network Region: 1 This d</li> <li>Session Manager</li> </ul>	efines the IP network region which contains
	<ul> <li>Far-end Domain: avaya.com This of the second second</li></ul>	domain is sent in the "To" header of SIP
	<ul> <li>Direct IP-IP Audio Connections: y shuffling on the SIP trunk</li> </ul>	group. This field must be set to $y$ to enable media
	shuffing on the SH trunk.	
	display signaling-group 1 SIGNALING	GROUP
	Group Number: 1 Group Type:	sip
	IMS Enabled? n Transport Method: O-SIP? n	tls SIP Enabled LSP? n
	IP Video? n	Enforce SIPS URI for SRTP? y
	Peer Detection Enabled? y Peer Server:	SM
	Near-end Node Name: procr	Far-end Node Name: SM_21_31
	Near-end Listen Port: 5061	ar-end Network Region: 1
	Far-end Domain: avava.com	
	· · · · · · · · · · · · · · · · · · ·	Bypass If IP Threshold Exceeded? n
	Incoming Dialog Loopbacks: eliminate	RFC 3389 Comfort Noise? n
	Session Establishment Timer(min): 3	IP Audio Hairpinning? n
	Enable Layer 3 Test? y	Initial IP-IP Direct Media? n
	H.323 Station Outgoing Direct Media? n	Alternate Route Timer(sec): 6

 Description
<ul> <li>Trunk Group Trunk group 1 was used for the SIP trunk group between Communication Manager and Session Manager. Trunk group 1 was configured using the parameters highlighted below. </li> <li>Group Type: <i>sip</i> This field sets the type of the trunk group.</li> <li>TAC: 101 Enter an valid value consistent with the Communication Manager dial plan</li> <li>Service Type: <i>tie</i> Set to tie.</li> <li>Member Assignment Method: <i>auto</i> Set to Auto.</li> <li>Signaling Group: 1 This field is set to the signaling group shown in the previous step.</li> <li>Number of Members: 10 This field represents the number of trunk group members in the SIP trunk group. It determines how many simultaneous SIP calls</li> </ul>
can be supported by the configuration. Each SIP call between two SIP endpoints (whether internal or external) requires two SIP trunks for the duration of the call. Thus, a call from a SIP telephone to another SIP telephone will use two SIP trunks. A call between a non-SIP telephone and a SIP telephone will only use one trunk.
can be supported by the configuration. Each SIP call between two SIP endpoints (whether internal or external) requires two SIP trunks for the duration of the call. Thus, a call from a SIP telephone to another SIP telephone will use two SIP trunks. A call between a non-SIP telephone and a SIP telephone will only use one trunk.

Step	Description
	<ul> <li>Trunk Group – continued</li> <li>On Page 3:</li> <li>The Numbering Format field was set to <i>unk-pvt</i>. This field specifies the format of the calling party number sent to the far-end.</li> <li>The default values may be retained for the other fields.</li> </ul>
	display trunk-group 1 Page 3 of 21 TRUNK FEATURES ACA Assignment? n Measured: none Maintenance Tests? y
	Numbering Format: unk-pvt UUI Treatment: service-provider Replace Restricted Numbers? n Replace Unavailable Numbers? n
	Modify Tandem Calling Number: no Show ANSWERED BY on Display? y
6.	<b>Private Numbering</b> Private Numbering defines the calling party number to be sent to the far-end. In the example shown below, all calls originating from a 5-digit extension beginning with 5 and routed across any trunk group will be sent as a 5 digit calling number. The calling party number is sent to the far-end in the SIP "From" header.
	display private-numbering 0 Page 1 of 2 NUMBERING - PRIVATE FORMAT
	Ext Ext     Trk     Private     Total       Len Code     Grp(s)     Prefix     Len       5     5     5     Total Administered: 1       Maximum Entries: 540     540

Step	Description	
7.	Automatic Alternate Routing Automatic Alternate Routing (AAR) was used to route calls to Sess the example shown, dialed numbers that begin with 3 and are 5 digit pattern 1. Route pattern 1 routes calls to the trunk group defined in	ion Manager. In ts long use route Step 5.
	display aar analysis 3 Page	1 of 2
	Location: all Percent	Full: 1
	Dialed String         Total Min         Route Max         Call Pattern         Node Type         ANI Reqd           3         5         1         aar         n           4         7         7         999         aar         n           531         5         1         unku         n           532         5         5         1         unku         n           59997         5         5         99         aar         n	
8.	<ul> <li>Route Pattern</li> <li>Route pattern 1 was used for calls destined for the 2nd site through 3 and the SIParator. Route pattern 1 was configured using the paramete below.</li> <li>Pattern Name: Any descriptive name.</li> <li>Grp No: 1 This field is set to the trunk group number defined in</li> <li>FRL: 0 This field sets the Facility Restriction Level of the trunk an appropriate level to allow authorized users to access the trunk the least restrictive.</li> </ul>	Session Manager ters highlighted a <b>Step 5</b> . c. It must be set to c. The level of 0 is
	display route-pattern 1 Page Pattern Number: 1 Pattern Name: to SM_21_31	1 of 3
	Grp FRL NPA Pfx Hop Toll No. Inserted No Mrk Lmt List Del Digits Dgts	DCS/ IXC QSIG Intw
	1: <b>1 0</b> 0 2: 3: 4: 5: 6:	n user n user n user n user n user n user
	BCC VALUE TSC CA-TSC ITC BCIE Service/Feature PARM No. Num 0 1 2 M 4 W Request Dgts For Subaddress	bering LAR mat
	1: y y y y n n       rest       lev         2: y y y y n n       rest         3: y y y y n n       rest         4: y y y y n n       rest         5: y y y y n n       rest         6: y y y y n n       rest	0-pvt none none none none none none none
9.	Save Translation Use the save translation command to make the Communication Ma	anager changes
	permanent.	

# 6. Configure Session Manager

This section provides the procedures for configuring Session Manager as provisioned in the reference configuration. All provisioning for Session Manager is performed via the System Manager web interface.

The following sections assume that Session Manager and System Manager have been installed and that network connectivity exists between the two platforms. During compliance testing, the IP address assigned to Session Manager is 10.64.21.31 as specified in **Figure 1**. The Session Manager server also has a separate network interface used for connectivity to System Manager for provisioning Session Manager. The IP address assigned to the Session Manager management interface is 10.64.21.30.

The procedures described in this section include configurations in the following areas:

- SIP domain
- Logical/physical Locations that can be occupied by SIP Entities
- **SIP Entities** corresponding to the SIP telephony systems (including Communication Manager and Session Border Controller) and Session Manager itself
- Entity Links which define the SIP trunk parameters used by Session Manager when routing calls to/from SIP Entities
- Time Ranges during which routing policies are active
- Routing Policies which control call routing between the SIP Entities
- Dial Patterns which govern to which SIP Entity a call is routed



2.	Add SIP Domain The Routing menu section.	contains all the configurat	ion tasks liste	ed at the beginning of the	his
	During compliance since all SIP entitie	testing, one SIP Domain wes were located within the s	vas configured ame authorita	d on each Session Man tive domain.	ager
	Navigate to <b>Routir</b> domain with • <b>Name</b> : <i>avay</i> • <b>Notes</b> : optic	ng→Domains, and click the wa.com (as set in Section 5, onal descriptive text	e New button , Step 1)	(not shown) to add the	e SIP
	Click Commit to s	ave the configuration. Avaya Aura™ Systen 6.1	n Manager	Help   About   Change Password	Log off admin
				Routing	Home
	Routing	Home / Elements / Routing / Domains	s- Domain Managem	ent	
	Domains				Help
	Locations	Domain Management			Jancel
	Adaptations				
	SIP Entities				
	Entity Links	1 Itam   Bofrach		Filter Fr	aphla
	Time Ranges	Titem Relesh		Filler. El	lable
	Routing Policies	Name	Type Default	Notes	
	Dial Patterns	* avaya.com	sip 💙		
	Regular Expressions				
	Derduits	* Input Required		Commit	Cancel

3.	Add Location Locations identify	logical and/or physical locations whe	re SIP entities reside. Only one
	Location was conf	igured at each site for compliance test	ting.
	Navigate to <b>Routi</b> Location.	ng→Locations and click the New but	tton (not shown) to add the
	Under General: • Name: a de • Notes: opti	escriptive name onal descriptive text	
	Under Location P • IP Addres	attern, click the Add button to add a s Pattern: 10.64.21.*	new line:
	Notes: opti	onal descriptive text	
	Click Commit to s	ave the configuration. Avaya Aura™ System Manage 6 1	Help   About   Change Password   Log off admin
		0.1	Routing * Home
	Routing	Home /Elements / Routing / Locations- Location De	tails
	Domains	Location Details	Help ?
	Locations		conne concer
	Adaptations	Call Admission Control has been set to ignore SDP. All calls will be co	ounted using the Default Audio Bandwidth.
	Entity Links	see Session Manager -> Session Manager Administration -> 0	Siobal Setting
	Time Ranges	General	
	Routing Policies	* Name: .21 Subnet	
	Dial Patterns	Notes:	
	Regular Expressions	notes.	
	Defaults	Overall Managed Bandwidth	
		Managed Bandwidth Units: Kbit/sec 👻	
		Total Bandwidth:	
		Per-Call Bandwidth Parameters	
		* Default Audio Bandwidth: 80 Kbit/	/sec 💌
		Location Pattern	
		Add Remove	
		1 Item   Refresh	Filter: Enable
		IP Address Pattern	Notes
		* 10.64.21.*	
		Select : All, None	
		* Input Required	Commit Cancel

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4.	Add SIP Entities A SIP Entity must be added for Session Manager and for each SIP-based telephony system supported by it using SIP trunks. During compliance testing, a SIP Entity was added for the Session Manager itself, Communication Manager, and the Ingate SIParator.
	Navigate to <b>Routing</b> $\rightarrow$ <b>SIP Entities</b> , and click the <b>New</b> button (not shown) to add a SIP Entity. The configuration details for the SIP Entity defined for Session Manager are as follows:
	<ul> <li>Under General:</li> <li>Name: a descriptive name</li> <li>FQDN or IP Address: 10.64.21.31 as specified in Figure 1. This is the IP address assigned to the SM-100 security module installed in the Session Manager.</li> <li>Type: select Session Manager</li> </ul>
	<ul> <li>Under Port, click Add, then edit the fields in the resulting new row as shown below:</li> <li>Port: 5060. This is the port number on which the system listens for SIP requests.</li> <li>Protocol: TCP. The TCP transport protocol was used in the compliance test to send SIP requests.</li> <li>Default Domain: select the SIP Domain created in Step 2.</li> </ul>
	Default settings can be used for the remaining fields. Click <b>Commit</b> to save the SIP Entity definition.

<ul> <li>Routing</li> <li>Domains</li> <li>Locations</li> <li>Adaptations</li> <li>SIP Entities</li> <li>Entity Links</li> </ul>	Home /Elements / Routing ,     STR Entity Details	/ SIP Entiti			Routing	×
Domains Locations Adaptations SIP Entities Entity Links	SID Entity Datails		es- SIP Ent	ity Details		
Locations Adaptations SIP Entities Entity Links	SID Entity Dataile					
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SIP Entities Entity Links	General					
Entity Links	* N	ame: SM_2	21_31			
Time Devees	* FQDN or IP Add	iress: 10.64	4.21.31			
Routing Policies	-	Type: Sess	ion Manager	~		
Dial Patterns	N	lotes:				
Regular Expressions						
Defaults	Loca	ation:	*			
	Outbound P	roxy:		~		
	Time	Zone: Ame	rica/Denver	~		
	Credential n	ame.				
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	Add Remove 7 Items   Refresh				F	ilter:
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	Simple       Simple         7 Items       Refresh         SIP Entity 1       SM_21_31         SM_21_31       SM_21_31	Protocol TCP V TLS V	Port * 5060 * 5061	SIP Entity 2 AuraSBC v CM_20_40 v	F Port * 5060 * 5061	ilter:
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	Stress         7 Items   Refresh         SIP Entity 1         SM_21_31         SM_21_31         SM_21_31         SM_21_31         SM_21_31	Protocol TCP V TLS V TLS V TLS V	Port * 5060 * 5061 * 5061 * 5061 * 5061	SIP Entity 2 AuraSBC v CM_20_40 v CM_21_41 v RedSky v	F Port * 5060 * 5061 * 5061 * 5061	ilter:

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Routing	Home /Elements / Routing / SIP Entities- SIP Entity Details
Domains	
Locations	SIP Entity Details Commit C
Adaptations	General
SIP Entities	* Name: CM 21 41
Entity Links	
Time Ranges	* FQDN or IP Address: 10.64.21.41
Routing Policies	Type: CM
Dial Patterns	Notes:
Regular Expressions	
Defaults	Adaptation: 🔽
	Location:
	Override Port & Transport with DNS
	* SIP Timer B/F (in seconds): 4
	Credential name:
	Call Detail Recording: none 💌
	SIP Link Monitoring: Use Session Manager Configuration 💌
	Entity Links Add Remove
	1 Item   Refresh Filter: Er

AVAYA	Avaya Aura™ System Manager Help   Abou 6.1	It   Change Passwo
Routing	Home /Elements / Routing / SIP Entities- SIP Entity Details	
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Adaptations	General	
SIP Entities	* Name: IngateSIParator	
Entity Links		
Time Ranges	* FQDN or IP Address: 10.64.21.99	
Routing Policies	Type: Other	
Dial Patterns	Notes:	
Regular Expressions		
Defaults	Adaptation:	
	Location: .21 Subnet V	
	Time Zone: America/Denver	
	Override Port & Transport with DNS SRV:	
	* SIP Timer B/F (in seconds): 4	
	Credential name:	
	Call Detail Recording: none 💌	
	SIP Link Monitoring	
	Entity Links Add Remove	P314
		Filter
	CTD Faction 1 Death and CTD Faction 2	Dout

A SIP trunk by										
A SIP trunk between Session Manager and a telephony system is described by an										
Entity link Ty	vo Entity Links were created: one between Session Manager and									
Communication Manger: the other between Session Manager and Ingate SIDarator										
Communication Manger, the other between Session Manager and Ingate SIParator.										
Navigate to <b>Routing</b> $\rightarrow$ <b>Entity Links</b> , and click the <b>New</b> button (not shown) to add a										
new Entity Link. The screen below shows the configuration details for the Entity Link										
new Entry En	ik. The selection below shows the configuration details for the Entity Entry									
connecting Se	ssion Manager to Communication Manager.									
• Name	a descriptive name									
• SIP F	ntity 1: select the Session Manager SIP Entity									
	<b>10(1</b> The second manager of Entity.									
• Port: 3	<b><i>061.</i></b> This is the port number to which the other system sends SIP									
reques	S.									
• SIP E	<b>itity 2</b> : select the Communication Manager SIP Entity.									
Port: 5	<b><i>061.</i></b> This is the port number on which the other system receives SIP									
• <b>Port</b> : <i>5061</i> . This is the port number on which the other system receives SIP										
reques	requests.									
reques	ad: abaak this hav									
• Truste	d: check this box									
reques • Trusto • Protoc	ed: check this box eol: select <i>TLS</i> as the transport protocol.									
reques Truste Protoe Notes: Click Commi	ed: check this box eol: select <i>TLS</i> as the transport protocol. optional descriptive text t to save the configuration.									
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requess Truste Truste Protoce Notes: Click Commin	ed: check this box ed: check this box eol: select <i>TLS</i> as the transport protocol. optional descriptive text t to save the configuration. Avaya Aura <sup>™</sup> System Manager 6.1 Help   About   Change Password   Log off admin Routing × Home + Home / Elements / Routing / Entity Links Entity Links Entity Links Entity Links I tem Refresh Filter: Enable Protocol Port SIP Entity 2 Port Trusted Notes + CM_21_41 + SM_21_31 × TLS × + 5061 + CM_21_41 × + 5061 Y									
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#### Add Entity Links (continued)

The Entity Link for connecting Session Manager to Ingate SIParator was similarly defined as shown in the screen below.

Domains Locations Adaptations SIP Entities Entity Links Time Ranges Routing Policies Dial Patterns Regular Expressions Defaults • Input Required • Input Required	Routing	Home /Elements / R	outing / Entity Links-	Entity Link	s				
Locations Entity Links   Adaptations   SIP Entities   Entity Links   Time Ranges   Routing Policies   Dial Patterns   Regular Expressions   Defaults   * Input Required   Commit	Domains								
Adaptations         SIP Entities         Entity Links         Time Ranges         Routing Policies         Dial Patterns         Regular Expressions         Defaults    * Input Required	Locations	Entity Links							Commit
SIP Entities         Entity Links         Time Ranges         Routing Policies         Dial Patterns         * to IngeteSIParator * SM_21_31 w TCP w * 5060 * IngeteSIParator v * 5060 v         Defaults	Adaptations								
Entity Links   Time Ranges   Routing Policies   Dial Patterns   Regular Expressions   Defaults	SIP Entities								
Time Ranges       1 Item Refresh       Filter:         Routing Policies       Name       SIP Entity 1       Protocol       Port       SIP Entity 2       Port       Trusted       Notes         Dial Patterns       • to IngateSIParator       • SM_21_31       • TCP       • 5060       • IngateSIParator       • 5060       ✓         Defaults       • Input Required       • Input Required       • Commit       Commit       Commit	Entity Links								
Name       SIP Entity 1       Protocol       Port       Trusted       Notes         Dial Patterns       * [so IngateSIParator]       * [SM_21_31]       TCP        * [so60]       * [ingateSIParator]       * [so60]       *         Regular Expressions       Defaults       *       *       *       Sofo       *       IngateSIParator]       *       Commit	Time Ranges	1 Item   Refresh							Filter
Dial Patterns     * to IngateSIParator   * SM_21_31     TCP   * Sociolar * IngateSIParator     * IngateSIParator   * Sociolar * S	Routing Policies	Name	SIP Entity 1	Protocol	Port	SIP Entity 2	Port	Trusted	Notes
Regular Expressions         Defaults         * Input Required	Dial Patterns	* to IngateSIParator	* SM_21_31 💌	TCP 🔽	* 5060	* IngateSIParator 💌	* 5060	Image: A start of the start	
Defaults  • Input Required Commit	Regular Expressions								
* Input Required	Defaults								
		* Input Required							Commit

6.	Add Time Ran	ges												
	Before adding routing policies (configured in next step), time ranges must be defined													
	during which the policies will be active One Time Range was defined that would													
	allow routing to occur at optime													
	Navigate to <b>Routing→Time Ranges</b> , and click the <b>New</b> button to add a new Time Range:													
	<ul> <li>Name: a</li> <li>Mo thro</li> <li>Start Ti</li> </ul>	a des ough i <b>m</b> e <sup>.</sup>	criptiv Su: cł enter	ve na neck 1	me the t	oox u	ınde	r ead	ch o	f the	se headin	gs		
	• End Tir	ne: e	enter 2	23:59	-									
	Click Commit	to sa	ve this	s time	e rar	ige.	The	scre	een l	belov	w shows t	the confi	gured Time	
	Range.													
	-													
		Д	vava A	Aura™	Svs	tem I	Mana	aer (	6.1		Help	About   Change	Password   Log off admin	
			a ya y	i di d	0,0		lana	901					<b>X</b>	
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	Domains	•	e / Liement	is / Kouth	ig / iiii	ie kange	. <b>5</b> mine	. Kunge:					Help ?	
	Locations	Time R	langes											
	Adaptations	Edit	New	Duplicate	e D	elete	More	Actions	•					
	SIP Entities													
	Entity Links	1.160	m   Defrech										Filter, Epoble	
	Time Ranges	1 Ite	m Refresh										Filter: Enable	
	Routing Policies		Name	Мо	Tu	We	Th	Fr	Sa	Su	Start Time	End Time	Notes	
	Dial Patterns		24/7	$\checkmark$	~	~	$\checkmark$	$\checkmark$	~	✓	00:00	23:59	Time Range 24/7	
	Regular Expressions Defaults	Selec	t : All, None											
	1													

7.	Add Routing Policies
	Routing policies describe the conditions under which calls will be routed to the SIP
	Entities connected to the Session Manager. Two routing policies were added – one for
	routing calls to Communication Manager, and the other for routing calls to Ingate
	SIParator.
	Navigate to <b>Routing</b> $\rightarrow$ <b>Routing Policies</b> , and click the <b>New</b> button (not shown) to add
	a new Routing Policy.
	Under General:
	• Name: a descriptive name
	• Notes: optional descriptive text
	Under SIP Entity as Destination
	(not shown)
	(not shown).
	Under Time of Day
	Click Add to select the Time Range configured in the previous step (not shown).
	Default settings can be used for the remaining fields. Click Commit to save the
	configuration.

Add Routing Policies (continued) The screens below show the configuration details for the two Routing Policies used during compliance testing.

Routing	Home / Elements / Routing / Routing Policies- Routing Policy Details	
Domains	Dautina Daline Dataila	Commit
Locations		Commu
Adaptations	General	
SIP Entities	* Namer to CM 21 41	
Entity Links		
Time Ranges	Disabled:	
Routing Policies	Notes:	
Dial Patterns		
Defaulte	SIP Entity as Destination	
Defaults	Select	
	Name FODN or IP Address Type	Notes
	CM 21 41 10.64.21.41 CM	Notes
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Routing Domains Locations Adaptations STE Entities	Image: Indice Indindice Indindice Indindice Indice Indice Indice Indice Indice Ind	Commit
Routing Domains Locations Adaptations SIP Entities Entity Links	Image: Indice in the indice into the indin the indinterval into the indice interval into the i	Commit
Routing Domains Locations Adaptations SIP Entities Entity Links Time Ranges	Image: Indice internet in	Commit
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Routing Domains Locations Adaptations SIP Entities Entity Links Time Ranges Routing Policies Dial Patterns	Image: Indice in the indice internation of the indice internatinternatintered internation of the indice internation	Commit
Routing Domains Locations Adaptations SIP Entities Entity Links Time Ranges Routing Policies Dial Patterns Regular Expressions	Image: Indice in the indice internation in the indice internation internation international internatinal internatinternatinternational international international int	Commit
Routing         Domains         Locations         Adaptations         SIP Entities         Entity Links         Time Ranges         Routing Policies         Dial Patterns         Regular Expressions         Defaults	Image: Indice in the indice internation in the indice internation internation internation internation internation internation international internation in	Commit
<ul> <li>Routing</li> <li>Domains</li> <li>Locations</li> <li>Adaptations</li> <li>SIP Entities</li> <li>Entity Links</li> <li>Time Ranges</li> <li>Routing Policies</li> <li>Dial Patterns</li> <li>Regular Expressions</li> <li>Defaults</li> </ul>	Image: A start of the sta	Commit
Routing         Domains         Locations         Adaptations         SIP Entities         Entity Links         Time Ranges         Routing Policies         Dial Patterns         Regular Expressions         Defaults	Image: Indice in the indice interview of the indin tend of the indice interview of the indice	Commit (Notes
<ul> <li>Routing</li> <li>Domains</li> <li>Locations</li> <li>Adaptations</li> <li>SIP Entities</li> <li>Entity Links</li> <li>Time Ranges</li> <li>Routing Policies</li> <li>Dial Patterns</li> <li>Regular Expressions</li> <li>Defaults</li> </ul>	Image: Indice in the internation of the international sectors       Image: Image	Commit Notes
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Routing         Domains         Locations         Adaptations         SIP Entities         Entity Links         Time Ranges         Routing Policies         Dial Patterns         Regular Expressions         Defaults	Image: Indice in the indice interview of the indin tend of the indice interview of the indice	1 ime     1 ime       23:59     1 ime       1 Change Password     24/7       I Change Password     *       Commit     *
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Routing         Domains         Locations         Adaptations         SIP Entities         Entity Links         Time Ranges         Routing Policies         Dial Patterns         Begular Expressions         Defaults	Avaya Aura <sup>TM</sup> System Manager 6.1          Itome / Elements / Routing / Routing Policies - Routing Policy Details         Routing Policy Details         General         * Name:         Image:         Image:         Stelect:         Stelect:         Image:         Image:         Routing Policy Details         General         Image:         Image:         Image:         Stelect:         Notes:         Stelect:         Name         FQDN or IP Address         Image:         Image: <td>1 ime     1 ime       23:59     1 ime       24/7         I Change Password         Commit         Commit         I Change Password         I Commit         I Commit         Filter:</td>	1 ime     1 ime       23:59     1 ime       24/7         I Change Password         Commit         Commit         I Change Password         I Commit         I Commit         Filter:
Routing Domains Locations Adaptations SIP Entities Entity Links Time Ranges Routing Policies Dial Patterns Regular Expressions Defaults	Avaya Aura <sup>TM</sup> System Manager 6.1 Help   About   Avaya Aura <sup>TM</sup> System Manager 6.1 Help   About   Avaya Aura <sup>TM</sup> System Manager 6.1 Help   About   Home / Elements / Routing / Routing Policies- Routing Policy Details Routing Policy Details General Name: to IngateSIParator Disabled: Notes: SIP Entity as Destination Select Name FQDN or IP Address Type IngateSIParator 10.64.21.99 Other Time of Day Add Remove View Gaps/Overlaps 1 Item Refresh Ranking 1 Name 2 Mon Tue Wed Thu Fri Sat Sun Start IngateSIParator Ingate Siper Start Inger Start In	1 ime     1 ime       23:59     1 ime       24/7         I Change Password         Commit         Commit         Filter:   Filter:       End       Ime

8.	Add Dial Patterns
	Dial Patterns define digit strings to be matched against dialed numbers for directing
	calls to the appropriate SIP Entities 5-digit extensions beginning with "5" resided on
	Communication Manager at the main enterprise site 5-digit extensions beginning with
	"3" should were routed to Ingate SIParator for onward routing to the 2 <sup>nd</sup> site
	Therefore the Disl Detterms serves anothed according to the 2 she.
	Therefore two Dial Patterns were created accordingly.
	Navigate to <b>Routing</b> $\rightarrow$ <b>Dial Patterns</b> , click the <b>New</b> button (not shown) to add a new
	Dial Pattern.
	Under General:
	• <b>Pattern</b> : dialed number or prefix
	• Min: minimum length of dialed number
	• Max: maximum length of dialed number
	• SIP Domain: select the SIP Domain created in Step 2 (or select -ALL - to be
	• SH Domain. Select the SH Domain created in Step 2 (of select -ALL- to be
	less resultive)
	• Notes: optional descriptive text
	Under Originating Locations and Routing Policies
	Click Add to select the appropriate originating Location and Douting Deliau from the
	Click Add to select the appropriate originating Location and Routing Policy from the
	list (not snown).
	Under Time of Day
	Click Add to select the time range configured in Step 6.
	Default actions and he and for the new initial fields. Click Committee and the
	Default settings can be used for the remaining fields. Click <b>Commit</b> to save the
	configuration.

Αναγα	Avaya Aura <sup>™</sup> System Manager 6.1 Help   About   Change Passwor Routing ×
• Routing	Home /Elements / Routing / Dial Patterns- Dial Pattern Details
Domains	
Locations	Dial Pattern Details Commit
Adaptations	Conorol
SIP Entities	
Entity Links	Pattern: 5
Time Ranges	* Min: 5
Routing Policies	* Max: 5
Dial Patterns	Emergency Call:
Regular Expressions	SIP Domain: avaya.com 🔽
Defaults	Notes: to CM 21 41
	Originating Locations and Routing Policies
	Add Demove
	1 Item Refresh Filter:
	Originating         Routing         Routing         Routing         Routing         Routing           Originating Location Name 1         Location         Policy         Rank 2         Policy         Policy           Notes         Name         Disabled         Destination
	□ -ALL- Any Locations <sup>to</sup> <u>CM 21 41</u> 0 CM_21_41
	Select : All, None

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• Routing	Home / Elements / Routing / Dial	Patterns- Di	al Pattern Details				
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Adaptations							
SIP Entities	General						
Entity Links	* Patter	<b>n:</b> 3					
Time Ranges	* Mi	n: 5					
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	Originating Locations and Rou	ting Polici	96				
		iting Folici					
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	1 Item   Refresh					Filter:	Ena
	Originating Location Name 1 🛦	Originating Location Notes	Routing Policy Name	Rank 2 🛦	Routing Policy Disabled	Routing Policy Destination	R P N
	- ALL-	Any Locations	to IngateSIParator	0		IngateSIParator	
		2000000	ingateorraidtor				

# 7. Configure Ingate SIParator

The Ingate SIParator is configured initially with the Ingate Startup Tool. Based on the provided input, the Startup Tool will create an initial configuration that can be uploaded to the SIParator. The results of this configuration can then be viewed or expanded using the SIParator web interface. To access the web interface, enter the IP address of the SIParator as the destination address in a web browser. When prompted for login credentials, enter an appropriate user name and password.

Step	Description
1.	Launch Startup Tool The Ingate Startup Tool is a windows application which is launched from the Windows Start Menu by navigating to Start→All Programs→Shortcut to StartupTool.exe.
2.	Select Product Type The initial Ingate Startup Tool screen is shown below. Verify the PC is running on the same LAN subnet as the SIParator as shown in the diagram. This is necessary in order to assign the initial IP address to the SIParator from the Startup Tool. Select the SIParator model from the Ingate model drop-down menu. Click the Next button.
	Select Product Type Welcome to the Ingate Startup tool - this tool will assist you in setting up your new Ingate unit Setup LAN LAN LAN Connect your computer to your Ingate unit like this. Ingate model - Please Select model Ingate Firewall/SIParator
	Next

tep	Description											
3.	Select Configuration Options and Assign Private IP Select Configure the unit for the first time and the Configure SIP trunking option											
	Enter the Inside (Interface Eth0) IP address, MAC Address and Password field											
	Click the <b>Contact</b> button to establish a connection to the SIParator. For future upd											
	click the option - Change or update co	onfiguration of the	unit									
	G Ingate Startup Tool - Helps configure your Ingate u	unit										
	Ingate Startup Tool Version	Help										
	You are running the latest version of this tool.		Help									
	First select what you would like to do:	Assign IP address and pass	sword, establish contact									
	Configure the unit for the first time	Inside (Interface Eth0)										
	Change or update configuration of the unit	IP Address:	10 . 64 . 21 . 99									
	Check SIP configuration and logs	MAC Address:	00-10-f3-1c-ed-fe									
	Register this unit with Ingate											
	Upgrade this unit	Select a password										
		Password:	•••••									
	Configure SIP trunking	Confirm Password:	••••									
	Backup the created configuration	Interface of your PC										
	Create a config without connecting to a unit	Local Area Connection										
	This tool remembers passwords											
			Contact									
	Contact											
	Status											
	Ingate Startup Tool Version 2.6.5 Startup tool version available on the Ingate web: 2.6.5 You are running the latest version of the Startup tool. More information is available here: http://www.ingate.com/startuptool.php											
			<b>*</b>									

tep	Description
4.	Network Topology
	After connecting to the SIParator, the following page appears. Select the <b>Network</b> <b>Topology</b> tab. Select <i>Standalone SIParator</i> from the <b>Product Type</b> drop-down menu Enter an IP address and subnet mask for both the inside and outside interfaces as shown in <b>Figure 1</b> . The <b>Gateway</b> field is set to the IP address of the default gateway on the public side of the SIParator. A DNS server was not used during compliance testing
	Cologate Startup Tool
	Network Topology         IP-PBX         ITSP         Upload Configuration
	Product Type: Standalone SIParator  Inside (Interface Eth0) IP address: 10 . 64 . 21 . 99 Netmask: 255 . 255 . 0 Outside (Interface Eth1) Existing firewall
	Use DHCP to obtain IP         IP Address:       10 . 64 . 20 . 99         Netmask:       255 . 255 . 0         Allow https access to web interface from Internet
	Gateway: 10 . 64 . 20 . 1
	DNS server         Primary:       4       2       2       2         Secondary:       4       2       2       3
	Status Ingate Startup Tool Version 2.6.5. connected to: Ingate Firewall 1510, IG-427-051-4048-3
	Remote SIP Connectivity VPN QoS Enhanced Security 25 SIP Traversal Licenses 10 SIP User Registration Licenses Software Version: 4.9.1
	Help

Step	Description	
5.	<b>IP-PBX Settings</b> Select the <b>IP-PBX</b> tab. Select <i>Avaya Aura SM</i> from the <b>Type</b> drop-down n will instruct the Startup Tool to configure the SIP parameters on the internal to be compatible with the Avaya component (Session Manager in this case) to it through a direct SIP trunking interface. Enter the Session Manager IP a the <b>IP Address</b> field. Also check the option to <b>Use domain name</b> , then spe domain name as set on Session Manager (see <b>Section 6 Step 2</b> ).	nenu. This interface connected address in cify the
	G Ingate Startup Tool	)
	Network Topology IP-PBX ITSP Upload Configuration	
	IP-PBX (should be located on the LAN)	
	Type:     Avaya Aura SM     PBX registers at the Ingate       IP Address:     10     . 64     . 21     . 31	
	Vise domain name SIP Domain: avaya.com	
	Status Ingate Startup Tool Version 2.6.5, connected to: Ingate Firewall 1510, IG-427-051-4048-3	
	VPN QoS Enhanced Security 25 SIP Traversal Licenses 10 SIP User Registration Licenses Software Version: 4.9.1 Warning: Normally, a private IP address cannot be used on the external interface of the Standalone SIParator.	E
		Help

Step	Descrip	otion
6.	Service Provider Settings Select the ITSP_1 tab. Select <i>Generic ITSP</i> will instruct the Startup Tool to configure the to be compatible with a generic SIP service p <b>Provider address</b> section, enter the IP address site. During compliance testing, when calls v routed to a Session Manager (not shown in Fi	from the <b>Name</b> drop-down menu. This SIP parameters on the external interface rovider. In the <b>IP Address</b> field in the ss for the node to route calls to at the $2^{nd}$ vere routed to the $2^{nd}$ site, they were <b>igure 1</b> ), with an IP address 10.64.20.31.
	G Ingate Startup Tool	
	Name: Generic ITSP	DID (start of range) (user name): DID range size: 1
	Provider address IP Address: 10 . 64 . 20 . 31 Use domain name Advanced Prefix to match and remove from inbound calls Prefix: Prefix: Forward 3xx messages Enable	Account information: Use account Authentication name: (same as DID if blank) Increment authentication name for ranges Domain: Password: Use user account on incoming call PBX local numbers (advanced) Local number (start of range, use same as DID if local numbers are not used): Password (only used if PBX registers at the Ingate
	Status Ingate Startup Tool Version 2.6.5, connected to: Ingate Firewa VPN QoS Enhanced Security 25 SIP Traversal Licenses 10 SIP User Registration Licenses Software Version: 4.9.1 Warning: Normally, a private IP address cannot be used on the	e external interface of the Standalone SIParator.
		Help

Step	Description
7.	<b>Upload Configuration</b> Select the <b>Upload Configuration</b> tab to upload the configuration to the SIParator. Click the <b>Upload</b> button to begin the upload.
	Ingate Startup Tool       ▼         Network Topology IP-PBX ITSP_1 Upload Configuration       Usclaimer         Usclaimer       Werbose Logging (SIP debug)         While Ingate has made every effort to ensure interoperability with each Ingate Certified and Self-Certified vendor, every possible configuration, combination and/or software version has not been tested. For technical assistance regarding end-to-end interoperability issues, please contact support@ingate.com.       Verbose Logging (SIP debug)         Final step       ● Logon to web GUI and apply settings       ● Apply settings directly using serial interface         ■ Backup the configuration       Upload
	Status Ingate Startup Tool Version 2.6.5, connected to: Ingate Firewall 1510, IG-427-051-4048-3 QoS Enhanced Security 25 SIP Traversal Licenses 10 SIP User Registration Licenses Software Version: 4.9.1 Warning: Normally, a private IP address cannot be used on the external interface of the Standalone SIParator.

Step	Description
8.	Apply Configuration         After uploading the configuration, the Startup Tool opens a web browser to the         Administration→Save/Load Configuration page of the SIParator. Click the Apply         configuration button to apply the configuration. The Startup Tool configuration is         complete at this point. However, additional configuration was required to support all         the test cases in the compliance test. This configuration is performed using the         SIParator web interface and is covered in the remaining steps.         Administration       Basic Configuration         Network       SIP Services         SIP Traffic       Failover         Virtual Private       Quality of Service         Save/Load       Show         User       Table       Date and Change         Gonfiguration       Administration
	Test Run and Apply Conf (Help)       Show Message About Unapplied Changes         Duration of limited test mode:       Image: One every page         30       seconds         Apply configuration       On the Save/Load Configuration page         Image: Note that the second

Step			Des	criptior	ı					
9.	Configure Routi Navigate to SIP 7 Add one entry for below. The confi • Domain site( <i>devc</i>	ng Traffic→Rout the outside in gured paramet domain name connect.com)	terface and terface and ters are: tes for the n	l entries d one er nain ent	for DNS ntry for the terprise s	overrid he inside ite ( <i>ava</i> y	le for SI e interfa ya.com)	P rece a and	eque is sl l the	ests. hown e 2 <sup>nd</sup>
	<ul> <li>DNS Na connecte (Session</li> <li>Transport</li> </ul>	to the SIP Add Manager IP ad t: select <i>TCP</i>	ator on the ddress – 10	outside 0.64.21.	e (10.64.2 31)	Avaya 20.31) a	nd on th	ent le in	sid	e
	Administration Basic Configuration	ion Network Rules ar Relays	nd SIP S Services Tre	SIP SIP affic Trunks	Failover V	irtual Private Networks	Quality of Service	Logg and T	ging Fools	About
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	Administration Basic Configuration SIP Loca Methods Filtering Registre DNS Override Fo	ion Network Rules ar Relays and Accounting A	nd SIP Services Tre SIP Dial counts Plan Rou ( <u>Help)</u>	SIP affic Trunks sting Status	Failover V IDS/IPS Sta	irtual Private Networks /IPS SIP itus Test Ti	Quality of Service SIP est Status	Logg and T	ging Fools	About
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Step				]	Descripti	on				
10.	Configure Eth The Eth0 inside support endpoi SIParator is dir interface (not s	0 Inside e interfac nts on ne ectly cor hown).	Interf ce is sho tworks nected	ace own bel within , a stati	low for re the enter c route m	eferenc prise o ust be	e and c ther tha config	completer an the sul ured on th	ness. In connection of the second sec	order to which the al
	Administration Configu	sic Iration Netwo	rk Rules a Relay	nd SIP s Service	SIP SI Traffic Trur	P hks Failov hterface	ver Virtual Netw	Private Quali vorks Serv	y of Loggin ice and Too	g Is
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	General			Speed	and Duple	x				
	Physical device: et	h0		<ul><li>Auto</li></ul>	matic negotia	tion				
	This interface is: @	Active 🔘	Inactive	100	Mbit/s, full du	plex				
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				© 10 N	/lbit/s, half dup	olex				
	Directly Conn	ected Netv	vorks (	Help)						
	Name	Address Type	DNS or IP A	Name Address	IP Address	Netma	ask / Bits	Network Address	Broadca Address	st VLAN s Id
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			Descri	ption						
Configure Eth1	Outside	Interface					_			
The Eth1 outside	interface	e is shown	below fo	or refer	ence and	d com	pleteness	5.		
dministration Configuration	on Network	Rules and SIP Relays Service	SIP s Traffic Tr	unks Failo	ver Virtual P Netwo	Private Q orks	luality of Log Service and	ging Tools Abou	ut	
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-						
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inistration Configur	ation Network Relay	s Services Traffic	Trunks Failove	r Networks Se	ervice and Tools Ab	pout
works and Default	All		Interface			
omputers Gateway	s Interfaces NAT VLAN	Eth0 Eth1 Eth2 Eth	13 Status PPI	PoE Topology		
Networks and	Computers					
		LowerI	imit	Upper	Limit	
Name	Subgroup	DNCN		(for IP :	ranges)	Interface/V
		or IP Address	IP Address	or IP Address	IP Address	
+ Avaya Aura SM	-	10.64.21.31	10.64.21.31			-
• ITSP_IP	-	10.64.20.31	10.64.20.31			-
			10 64 21 0	10 64 01 055	10 64 21 255	inside (all 0 contests)
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Infigure Dial Plan         e SIP Traffic-> Dial Plan configuration is shown below for reference and pleteness.         Infigure Dial Plan	re Dial Traffi eness. loci guration Network legistror and Account n (Help) rom Header	I Plan ic→Dial k Rules and SIP Relays Service ication SIP Dia unting Accounts Pla Emergency Ni 911 (Help) Use This ne Domain • •	I Plan co	his	I Private Norks SIP SIF Test Test SI Transpor TCP TCP	on is sh uality of Logging and Tool P tatus	OWN	below lete Row	w for re	ference	and	
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# 8. Verification Steps

The following steps may be used to verify the configuration:

- Using System Manager, navigate to Session Manager→System Status→SIP Entity Monitoring, and click on the appropriate SIP Entities to verify that the Entity Links to the SIParator and Communication Manager are up.
- From the Communication Manager SAT, use the **status signaling-group** *x* command to verify that the SIP signaling group is in-service (where *x* is the signaling group number associated with the trunk between Communication Manager and Session Manager).
- From the Communication Manager SAT, use the **status trunk-group** *y* command to verify that the SIP trunk group is in-service (where *y* is the trunk group number for the trunk between Communication Manager and Session Manager).
- Verify that calls can be placed from both SIP and non-SIP endpoints between sites.

# 9. Conclusion

The Ingate SIParator passed compliance testing. These Application Notes describe the procedures required to configure the Ingate SIParator to interoperate with Session Manager and Communication Manager to support the network shown in **Figure 1** where Session Manger connects the SIParator to Communication Manager using SIP trunking interface.

#### 10. Additional References

- [1] Avaya Aura® Communication Manager Feature Description and Implementation, Doc # 555-245-205, August 2010.
- [2] Administering Avaya Aura® Communication Manager, Doc # 03-300509, August 2010.
- [3] Administering Avaya Aura® Session Manager, Doc # 03-603324, December 2010.
- [4] Installing and Configuring Avaya Aura® Session Manager, Doc # 03-603472, January 2011.
- [5] Ingate SIParator Getting Started Guide
- [6] Ingate SIParator Reference Guide.

Product documentation for Avaya products may be found at http://support.avaya.com.

Product documentation for the SIParator can be obtained from Ingate. Contact Ingate using the "Contact us" link at <u>http://www.ingate.com</u>.

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