



Application Notes for Conex 4.9.0 from Voxtronic to interoperate with Avaya Session Border Controller for Enterprise R10.1 and Avaya Aura® Application Enablement Services R10.1 for Call Recording - Issue 1.0

Abstract

These Application Notes describe the configuration steps for Voxtronic Conex to successfully interoperate with Avaya Session Border for Enterprise and Avaya Aura® Application Enablement Services. Conex integrates with Avaya Session Border Controller for Enterprise using SIP Recording and Avaya Aura® Application Enablement Services using TSAPI to record various types of calls.

Readers should pay attention to **Section 2**, in particular the scope of testing as outlined in **Section 2.1** as well as the observations noted in **Section 2.2**, to ensure that their own use cases are adequately covered by this scope and results.

Information in these Application Notes has been obtained through DevConnect compliance testing and additional technical discussions. Testing was conducted via the DevConnect Program at the Avaya Solution and Interoperability Test Lab.

1. Introduction

These Application Notes describe the configuration steps for Voxtronic Conex to successfully interoperate with Avaya Session Border for Enterprise and Avaya Aura® Application Enablement Services. Conex integrates with Avaya Session Border Controller for Enterprise using SIP Recording and Avaya Aura® Application Enablement Services using TSAPI to record various types of calls.

Conex can be configured to monitor specific local endpoints and record calls made to or from those endpoints. Calls between or among local endpoints which are each monitored produce multiple voice files, one for each monitored endpoint. Incoming calls to the Call Center via vector directory numbers (VDN) can also be recorded including any announcements that may be played before the call is routed to the dispatcher.

Conex is fully integrated into a LAN (Local Area Network) and includes easy-to-use web-based application.

Note: The term “VoIP Recorder” in this document refers to a system or unit within Conex for the purpose of recording VoIP.

2. General Test Approach and Test Results

The interoperability compliance testing evaluated the ability of Conex to carry out call recording in a variety of scenarios using SIP Recording on the Avaya Session Border Controller for Enterprise (ASBCE).

Compliance testing focused on using Implicit Users and Application Sequencing to allow calls to VDN's to be recorded from the moment the call arrives at the VDN. This is achieved by routing the call to the SBCE and back to the VDN again, basically “looping in” the Session Border Controller to allow the call to be recorded.

For compliance testing all “dispatchers” were Avaya SIP endpoints registered as Remote Workers via the Session Border Controller. Bridged Appearances were used to route the calls to the dispatchers. Each remote worker phone can have several bridged appearance buttons added. These can be the same bridged appearance extensions for all dispatchers allowing each VDN call to appear to several dispatchers at once. The Vector is programmed to route the call to bridged appearance A first and then B, then C and so on. For compliance testing two remote workers were setup with two bridged Appearance buttons each. Each dispatcher was configured with the same bridged appearance number and when the call hit that number all the dispatcher's phones rang at the same time was answered by whoever was either free or first to answer to call.

For compliance testing an announcement was played before the call was routed to the bridged appearance number, this announcement was recorded along with the conversation with the dispatcher. The connection to Application Enablement Services using TSAPI allowed Conex to make sense of the SIP Recordings using the UUI data from the initial ISDN caller and other call events that are passed from Application Enablement Services.

Recording of a call routed through a VDN:

- Call coming in at G450 (with UUI-data), VDN in CM is first touchpoint.
- Routing from CM to SM.
- Application Sequencing to ASBCE (to initiate SIPREC to the VoIP Recorder) and back to CM.
- Via AES-TSAPI monitoring, UUI-data are sent to the VoIP Recorder.
- CM Announcement and routing to SIP-Stations.
- As long as the call is active in CM, the call will be recorded via SIPREC.
- AES TSAPI delivers metadata from the call to the VoIP Recorder.

Recording of Remote Worker (SIP-Phone registered at ASBCE):

- SIPREC is set to the Remote Worker configuration at ASBCE.
- All incoming and outgoing calls from Remote Worker Station will be sent as SIPREC-Stream to the VoIP Recorder.
- Using AES, all additional call information is sent to the VoIP Recorder.
- As long as the Remote Worker Station has an active call, this will be recorded via SIPREC.
- AES TSAPI delivers metadata from the call to the VoIP Recorder.

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 these DevConnect Application Notes 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 Conex did not make use of any specific encryption features, as per the request of Voxtronic.

2.1. Interoperability Compliance Testing

The interoperability compliance test included both feature functionality and serviceability testing. The feature functionality testing focused on placing and recording calls in different call scenarios with good quality audio recordings and accurate call records. The tests included:

- **Recording of Inbound calls directly to Remote Workers** – Test call recording for inbound calls to remote workers both from other Avaya endpoints and from PSTN callers.
- **Recording of Outbound calls from Remote Workers** – Test call recording for outbound calls from remote workers both to other Avaya endpoints and to PSTN endpoints.
- **Recording of VDN calls from PSTN** - Test call recording for calls made to a VDN with an announcement played and then routed to the remote worker phones.
- **Recording of transferred/conferenced calls** - Test call recording for calls that are transferred or conferenced.
- **Serviceability testing** - The behavior of Conex under different simulated LAN failure conditions.

The serviceability testing focused on verifying the ability of Conex to recover from disconnection and reconnection to the Avaya solution.

The following Extensions and VDN's were used for compliance testing.

- Remote Worker 3172, set as Dispatcher 1.
- Remote Worker 3173, set as Dispatcher 2.
- Calls to VDN 3950 were routed to Implicit User 7253951 using Vector 50.
- Calls were routed back to VDN 3951 using an Adaptation on Session Manager.
- Calls to VDN 3951 were routed to Bridged Appearances 3050 and 3051 using Vector 51.
- Remote Workers assigned Bridged Appearances 3050 and 3051.

2.2. Test Results

All functionality and serviceability test cases were completed successfully, with the following observations.

1. The connection to Conex used UDP as the transport protocol. When an attempt was made to connect using TCP, the connection was made successfully but an issue with the SBCE meant that some messages were being sent over UDP, even though TCP was the selected protocol. Avaya are investigating this issue.
2. If a CODEC is renegotiated using REINVITE during the setup of the call, this REINVITE is not sent to the VoIP Recorder. Avaya are investigating this issue but is currently stated to be "as per design".

2.3. Support

Technical support can be obtained for Conex from Voxtronic as follows:

- Email: support@voxtronic.com
- Website: <http://www.voxtronic.com>
- Phone: +43 1 8174846 600

3. Reference Configuration

Figure 1 shows the network topology during interoperability testing. The setup shows the Remote Workers connected to the Avaya platform using the SBCE. “Dispatchers” using the Remote Worker phones have bridged appearance buttons configured on them. This is how the calls are routed to the dispatchers.

When a call comes into VDN 3950, the call is then routed to 7253951, this is routed to Session Manager where Implicit User 7253951 uses Application Sequencing to loop in the Session Border Controller and the recording starts. The call is then routed back to Communication Manager stripping the first three digits leaving the number 3951 which is a VDN on Communication Manager.

VDN 3951 then routes the call to the Bridged Appearance buttons on the Remote Workers effectively delivering the caller to the Remote Worker dispatchers all configured with the same Bridged Appearance buttons depending on the initial VDN called.

RTP is sent to Conex using SIP Recording on SBCE, the call events from the TSAPI connection to AES allows the VoIP Recorder to formulate the calls and give information on the call at hand.

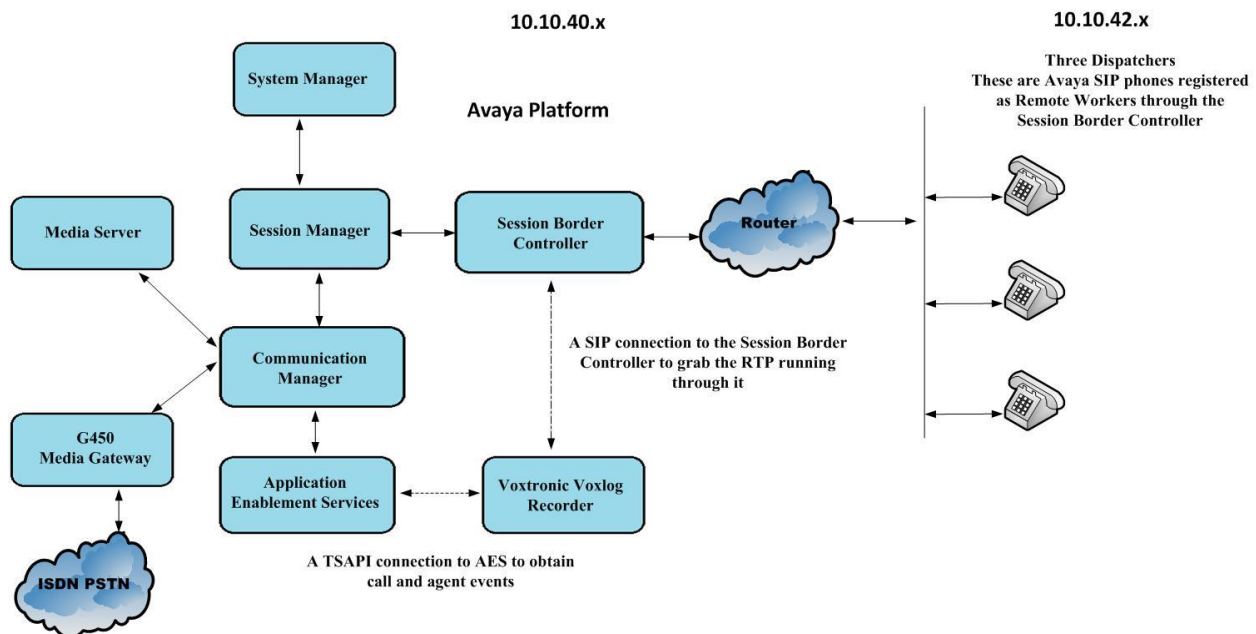


Figure 1: Avaya Session Border Controller for Enterprise R10.1 with Avaya Aura® Application Enablement Services R10.1 and Conex from Voxtronic

4. Equipment and Software Validated

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

Equipment/Software	Release/ Version
Avaya Aura® Application Enablement Services	R10.1 10.1.0.2.0.12-0
Avaya Session Border Controller for Enterprise	10.1.0.0-32-21432 10.1.0.0-34-22640-hotfix-11102022 SBCE Version 10.1.0.0-32-21432 Kernel 3.10.0-1160.76.1.el7.AV1 Config API 10.1.0.0-22609 GUI 10.1.0.0-22609 Application 10.1.0.0-22640 Database 10.1.0.0-21413 ICU 10.1.0.0-22552 PCF Module 10.1.0.0-22491
Avaya Aura® System Manager	System Manager 10.1.0.2 SP2 Build No. – 10.1.0.0.537353 Software Update Revision No: 10.1.0.2.0715160
Avaya Aura® Session Manager	Session Manager R10.1 SP2 Build No. – 10.1.0.2.1010219
Avaya Aura® Communication Manager	R10.1.0.2.0 – SP2 R020x.01.0.974.0 Update ID 01.0.974.0-27607
Avaya Media Gateway G450	42.7.0/2
Avaya J100 Series (H323)	6.8502
Avaya J100 Series (SIP)	4.0.7.0
Avaya 9408 Digital Deskphone	V2.0
Voxtronic Conex	4.9.0

Note: All equipments were running on Virtual Servers.

5. Configure Avaya Aura® Communication Manager

The configuration and verification operations illustrated in this section were all performed using Communication Manager System Administration Terminal (SAT). The information provided in this section describes the configuration of Communication Manager for this solution. For all other provisioning information such as initial installation and configuration, please refer to the product documentation in **Section 12**.

The configuration operations described in this section can be summarized as follows:

- Verify System Parameters and Features
- Configure SIP Trunk
- Configure Call Routing for Voxtronic
- Configure Connection to AES
- Configure VDNs and Vectors for Voxtronic

Note: The configuration of PSTN trunks and routes are outside the scope of these Application Notes.

5.1. Verify System Parameters and Features

Each Communication Manager system will have its own setup with different System Parameters and Features configured depending on the requirement of the customer. Here is a snapshot of some of these values that were configured on the DevConnect lab for compliance testing.

5.1.1. Verify System Parameters Customer Options

The license file installed on the system controls these attributes. If a required feature is not enabled or there is insufficient capacity, contact an authorized Avaya sales representative. Use the **display system-parameters customer-options** command to determine these values. On **Page 2**, verify that **Maximum Administered SIP Trunks** has sufficient capacity. Each call uses a minimum of one SIP trunk. Calls that are routed back to stations on Communication Manager or calls that are routed back to Communication Manager to access the PSTN will use two SIP trunks.

display system-parameters customer-options		Page	2 of 12
OPTIONAL FEATURES			
IP PORT CAPACITIES		USED	
Maximum Administered H.323 Trunks:		12000	10
Maximum Concurrently Registered IP Stations:		2400	11
Maximum Administered Remote Office Trunks:		12000	0
Max Concurrently Registered Remote Office Stations:		2400	0
Maximum Concurrently Registered IP eCons:		128	0
Max Concur Reg Unauthenticated H.323 Stations:		100	0
Maximum Video Capable Stations:		36000	1
Maximum Video Capable IP Softphones:		1150	3
Maximum Administered SIP Trunks:		12000	65
Max Administered Ad-hoc Video Conferencing Ports:		12000	0
Max Number of DS1 Boards with Echo Cancellation:		688	0

On **Page 4**, ensure that both **ARS/AAR Partitioning** are set to **y**.

display system-parameters customer-options	Page 4 of 12
OPTIONAL FEATURES	
Abbreviated Dialing Enhanced List? y	Audible Message Waiting? y
Access Security Gateway (ASG)? y	Authorization Codes? y
Analog Trunk Incoming Call ID? y	CAS Branch? n
A/D Grp/Sys List Dialing Start at 01? y	CAS Main? n
Answer Supervision by Call Classifier? y	Change COR by FAC? n
ARS? y	Computer Telephony Adjunct Links? y
ARS/AAR Partitioning? y	Cvg Of Calls Redirected Off-net? y
ARS/AAR Dialing without FAC? n	DCS (Basic)? y
ASAI Link Core Capabilities? y	DCS Call Coverage? y
ASAI Link Plus Capabilities? y	DCS with Rerouting? y
Async. Transfer Mode (ATM) PNC? n	
Async. Transfer Mode (ATM) Trunking? n	Digital Loss Plan Modification? y
ATM WAN Spare Processor? n	DS1 MSP? y
ATMS? y	DS1 Echo Cancellation? y
Attendant Vectoring? y	

On **Page 6**, ensure that **Uniform Dialing Plan** is set to **y**.

display system-parameters customer-options	Page 6 of 12
OPTIONAL FEATURES	
Multinational Locations? n	Station and Trunk MSP? y
Multiple Level Precedence & Preemption? y	Station as Virtual Extension? y
Multiple Locations? n	
Personal Station Access (PSA)? y	System Management Data Transfer? n
PNC Duplication? n	Tenant Partitioning? y
Port Network Support? y	Terminal Trans. Init. (TTI)? y
Posted Messages? y	Time of Day Routing? y
	TN2501 VAL Maximum Capacity? y
	Uniform Dialing Plan? y
Private Networking? y	Usage Allocation Enhancements? y
Processor and System MSP? y	
Processor Ethernet? y	Wideband Switching? y
	Wireless? n
Remote Office? y	
Restrict Call Forward Off Net? y	
Secondary Data Module? y	

5.1.2. Configure System Features

For the testing, **Trunk-to Trunk Transfer** was set to **all** on **Page 1** of the **system-parameters features** page. This is a system wide setting that allows calls to be routed from one trunk to another and is usually turned off to help prevent toll fraud. An alternative to enabling this feature on a system wide basis is to control it using COR (Class of Restriction). See **Section 12** for supporting documentation.

display system-parameters features	Page 1 of 19
FEATURE-RELATED SYSTEM PARAMETERS	
Self Station Display Enabled? n	
Trunk-to-Trunk Transfer: all	
Automatic Callback with Called Party Queuing? n	
Automatic Callback - No Answer Timeout Interval (rings): 3	
Call Park Timeout Interval (minutes): 10	
Off-Premises Tone Detect Timeout Interval (seconds): 20	
AAR/ARS Dial Tone Required? y	
Music (or Silence) on Transferred Trunk Calls? no	
DID/Tie/ISDN/SIP Intercept Treatment: attd	
Internal Auto-Answer of Attd-Extended/Transferred Calls: transferred	
Automatic Circuit Assurance (ACA) Enabled? n	
Abbreviated Dial Programming by Assigned Lists? n	
Auto Abbreviated/Delayed Transition Interval (rings): 2	
Protocol for Caller ID Analog Terminals: Bellcore	
Display Calling Number for Room to Room Caller ID Calls? n	

5.2. Configure SIP Trunk

In the **Node Names IP** form, note the IP Address of the processor interface of Communication Manager (**procr**) and the Session Manager (**sm101x**). The host names will be used throughout the other configuration screens of Communication Manager and Session Manager. Type **display node-names ip** to show all the necessary node names.

display node-names ip	Page 1 of 2
IP NODE NAMES	
Name	IP Address
sm101x	10.10.40.12
aespri101x	10.10.40.16
aessec101x	10.10.40.46
g450	10.10.40.15
procr	10.10.40.13

In the **IP Network Region** form, the **Authoritative Domain** field is configured to match the domain name configured on Session Manager in **Section 6.1.1**. In this configuration, the domain name is **greanep.sil6.avaya.com**. The **IP Network Region** form also specifies the **IP Codec Set** to be used. This codec set will be used for calls routed over the SIP trunk to Session manager as **ip-network region 1** is specified in the SIP signaling group.

display ip-network-region 1		Page 1 of 20
IP NETWORK REGION		
Region: 1		
Location: 1	Authoritative Domain: greanep.sil6.avaya.com	
Name: Default region		
MEDIA PARAMETERS		
Codec Set: 1	Intra-region IP-IP Direct Audio: yes	
UDP Port Min: 2048	Inter-region IP-IP Direct Audio: yes	
UDP Port Max: 3329	IP Audio Hairpinning? n	
DIFFSERV/TOS PARAMETERS		
Call Control PHB Value: 46		
Audio PHB Value: 46		
Video PHB Value: 26		
802.1P/Q PARAMETERS		
Call Control 802.1p Priority: 6		
Audio 802.1p Priority: 6		
Video 802.1p Priority: 5	AUDIO RESOURCE RESERVATION PARAMETERS	
H.323 IP ENDPOINTS	RSVP Enabled? n	
H.323 Link Bounce Recovery? y		
Idle Traffic Interval (sec): 20		
Keep-Alive Interval (sec): 5		
Keep-Alive Count: 5		

In the **IP Codec Set** form, select the audio codecs supported for calls routed over the SIP trunk. The form is accessed via the **change ip-codec-set n** command. Note that IP codec set 1 was specified in IP Network Region 1 shown above. Multiple codecs may be specified in the **IP Codec Set** form in order of preference; the example below includes **G.711A** (a-law), which is supported by Voxtronic Conex. Note the **Media Encryption** includes a setting of **none** to allow for unencrypted media.

change ip-codec-set 1		Page 1 of 2
IP MEDIA PARAMETERS		
Codec Set: 1		
Audio Codec	Silence Suppression	
Frames Per Pkt	Packet Size (ms)	
1: G.711A	n 2 20	
2: G.711MU	n 2 20	
3: G.722-64K	n 2 20	
4:		
Media Encryption		
Encrypted SRTCP: enforce-unenc-srtcp		
1: 1-srtp-aescm128-hmac80		
2: none		
3:		

Prior to configuring a SIP trunk group for communication with Session Manager, a SIP signaling group must be configured. Configure the Signaling Group form shown below as follows:

- Set the **Group Type** field to **sip**.
- Set the **Transport Method** to the appropriate setting, in this case it was set to **tls**.
- The **Peer Detection Enabled** field should be set to **y** allowing the Communication Manager to automatically detect if the peer server is a Session Manager.
- Specify the node names for the procr and the Session Manager node name as the two ends of the signaling group in the **Near-end Node Name** field and the **Far-end Node Name** field, respectively. These values are taken from the **IP Node Names** form shown above.
- Set the **Near-end Node Name** to **procr**. This value is taken from the **IP Node Names** form shown above.
- Set the **Far-end Node Name** to the node name defined for the Session Manager (node name **sm101x**).
- Ensure that the recommended TLS port value of **5062** is configured in the **Near-end Listen Port** and the **Far-end Listen Port** fields.
- In the **Far-end Network Region** field, enter the IP Network Region configured above. This field logically establishes the **far-end** for calls using this signaling group as network region 1.
- **Far-end Domain** was set to the domain used during compliance testing.
- The **DTMF over IP** field should remain set to the default value of **rtp-payload**. This value enables Communication Manager to send DTMF transmissions using RFC 2833.
- The **Direct IP-IP Audio Connections** field is set to **y**.
- **Initial IP-IP Direct Media** is set to **n**.
- The default values for the other fields may be used.

change signaling-group 1		Page 1 of 2
SIGNALING GROUP		
Group Number: 1	Group Type: sip	
IMS Enabled? n	Transport Method: tls	
Q-SIP? n		
IP Video? n	Enforce SIPS URI for SRTP? n	
Peer Detection Enabled? y	Peer Server: SM	
Prepend '+' to Outgoing Calling/Alerting/Diverting/Connected Public Numbers? y		
Remove '+' from Incoming Called/Calling/Alerting/Diverting/Connected Numbers? n		
Alert Incoming SIP Crisis Calls? n		
Near-end Node Name: procr	Far-end Node Name: sm101x	
Near-end Listen Port: 5062	Far-end Listen Port: 5062	
	Far-end Network Region: 1	
Far-end Domain: greaney.sil6.avaya.com		
Incoming Dialog Loopbacks: eliminate	Bypass If IP Threshold Exceeded? n	
DTMF over IP: rtp-payload	RFC 3389 Comfort Noise? n	
Session Establishment Timer(min): 3	Direct IP-IP Audio Connections? y	
Enable Layer 3 Test? Y	IP Audio Hairpinning? n	
	Initial IP-IP Direct Media? n	
	Alternate Route Timer(sec): 6	

Configure the **Trunk Group** form as shown below. This trunk group is used for calls to and from Session Manager. Enter a descriptive name in the **Group Name** field. Set the **Group Type** field to **sip**. Enter a **TAC** code compatible with the Communication Manager dial plan. Set the **Service Type** field to **tie**. Specify the signaling group associated with this trunk group in the **Signaling Group** field and specify the **Number of Members** supported by this SIP trunk group. Accept the default values for the remaining fields.

change trunk-group 1		Page 1 of 4	
TRUNK GROUP			
Group Number: 1	Group Type: sip	CDR Reports: y	
Group Name: SIP TRK	COR: 1	TN: 1	TAC: *801
Direction: two-way	Outgoing Display? y	Night Service:	
Dial Access? n			
Queue Length: 0			
Service Type: tie	Auth Code? n		
		Member Assignment Method: auto	
		Signaling Group: 1	
		Number of Members: 10	

On **Page 2** of the trunk-group form the **Preferred Minimum Session Refresh Interval (sec)** field should be set to a value mutually agreed with Voxtronic to prevent unnecessary SIP messages during call setup. Session refresh is used throughout the duration of the call, to check the other side has not gone away, for the compliance test a value of **120** was used.

change trunk-group 1		Page 2 of 4	
Group Type: sip			
TRUNK PARAMETERS			
Unicode Name: auto			
Redirect On OPTIM Failure: 5000			
SCCAN? n	Digital Loss Group: 18		
Preferred Minimum Session Refresh Interval(sec): 120			
Disconnect Supervision - In? y Out? y			
XOIP Treatment: auto		Delay Call Setup When Accessed Via IGAR? n	

Settings on **Page 3** can be left as default. However, the **Numbering Format** in the example below is set to **private**.

change trunk-group 1	Page 3 of 4
TRUNK FEATURES	
ACA Assignment? n	Measured: none
	Maintenance Tests? y
Suppress # Outpulsing? n	Numbering Format: private
	UII Treatment: service-provider
	Replace Restricted Numbers? n
	Replace Unavailable Numbers? n
	Modify Tandem Calling Number: no
Show ANSWERED BY on Display? y	

Settings on **Page 4** are as follows.

change trunk-group 1	Page 4 of 21
PROTOCOL VARIATIONS	
	Mark Users as Phone? n
Prepend '+' to Calling/Alerting/Diverting/Connected Number? n	
	Send Transferring Party Information? y
	Network Call Redirection? y
Build Refer-To URI of REFER From Contact For NCR? n	
	Send Diversion Header? n
	Support Request History? y
	Telephone Event Payload Type: 101
	Convert 180 to 183 for Early Media? n
	Always Use re-INVITE for Display Updates? n
	Identity for Calling Party Display: P-Asserted-Identity
Block Sending Calling Party Location in INVITE? n	
	Accept Redirect to Blank User Destination? n
	Enable Q-SIP? n
Interworking of ISDN Clearing with In-Band Tones: keep-channel-active	
	Request URI Contents: may-have-extra-digits

5.3. Configure Call Routing for Voxtronic

For compliance testing, all callers were initially routed to 7253951 to allow the call to be recorded by the SBCE. When calls come into the VDN 3950 from the PSTN, the Vector associated with this VDN routes the call to Session Manager and on to the SBCE to allow calls to be recorded. Automatic alternate routing (aar) was used to route the calls to Session Manager.

5.3.1. Administer Dial Plan

It was decided for compliance testing that all calls beginning with 725 with a total length of 7 digits were to be sent across the SIP trunk to Session Manager. Type **change dialplan analysis**, to make changes to the dial plan. Ensure that **725** is added with a **Total Length** of **7** and a **Call Type** of **udp**.

change dialplan analysis						Page 1 of 12			
DIAL PLAN ANALYSIS TABLE									
Location: all						Percent Full: 2			
Dialed String	Total Length	Call Type	Dialed String	Total Length	Call Type	Dialed String	Total Length	Call Type	
1	4	udp							
2	4	udp							
3	4	ext							
4	4	ext							
725	7	udp							
8	1	fac							
9	1	fac							
*	3	fac							

5.3.2. Administer Route Selection for Voxtronic Calls

As digits **725xxxx** were defined in the dial plan as udp (**Section 5.3.1**), use the **change uniform-dialplan** command to configure the routing of the dialed digits. In the example below calls to numbers beginning with **725** that are **7** digits in length will be matched. No further digits are deleted or inserted. Calls are sent to **aar** for further processing.

change uniform-dialplan 725							Page 1 of 2		
UNIFORM DIAL PLAN TABLE									
							Percent Full: 0		
Matching				Insert			Node		
Pattern	Len	Del		Digits	Net	Conv	Num		
725	7	0			aar	n			
						n			

Use the **change aar analysis x** command to further configure the routing of the dialed digits. Calls to Session Manager begin with **725** and are matched with the **aar** entry shown below. Calls are sent to **Route Pattern 1**, which contains the outbound SIP Trunk Group.

change aar analysis 4							Page	1 of	2
AAR DIGIT ANALYSIS TABLE									
Location: all							Percent Full: 1		
Dialed	Total		Route	Call	Node	ANI			
String	Min	Max	Pattern	Type	Num	Reqd			
725	7	7	1	aar		n			

Use the **change route-pattern n** command to add the SIP trunk group to the route pattern that AAR selects. In this configuration, **Route Pattern Number 1** is used to route calls to trunk group (**Grp No**) 1. This is the SIP Trunk configured in **Section 5.2**.

change route-pattern 1										Page	1 of	4
Pattern Number: 1 Pattern Name: SIPTRK												
SCCAN? n Secure SIP? n												
Grp	FRL	NPA	Pfx	Hop	Toll	No.	Inserted	DCS/ IXC				
No			Mrk	Lmt	List	Del	Digits	QSIG				
								Intw				
1:	1	0						n	user			
2:									n	user		
3:									n	user		
4:									n	user		
5:									n	user		
	BCC	VALUE	TSC	CA-TSC	ITC BCIE			Service/Feature	PARM	No.	Numbering	LAR
	0	1	2	M	4	W	Request			Dgts	Format	
1:	y	y	y	y	y	n	n	unre			lev0-pvt	none
2:	y	y	y	y	y	n	n	rest				none
3:	y	y	y	y	y	n	n	rest				none
4:	y	y	y	y	y	n	n	rest				none
5:	y	y	y	y	y	n	n	rest				none
6:	y	y	y	y	y	n	n	rest				none

5.4. Configure Connection to Avaya Aura® Application Enablement Services

It is assumed that a connection to AES is already in place and that the TSAPI connection and switch connection between Communication Manager and AES is fully working. The following section outlines the connection that was setup for compliance testing.

5.4.1. Note procr IP Address for Avaya Aura® Application Enablement Services Connectivity

Display the IP addresses by using the command **display node-names ip** and noting the IP address for the **procr** and the AES.

display node-names ip		Page	1 of	2
		IP NODE NAMES		
Name	IP Address			
sm101x	10.10.40.12			
aespri101x	10.10.40.16			
aessec101x	10.10.40.46			
g450	10.10.40.15			
procr	10.10.40.13			

5.4.2. Configure Transport Link for Avaya Aura® Application Enablement Services Connectivity

To administer the transport link to AES, use the **change ip-services** command. On **Page 1** add an entry with the following values:

- **Service Type:** Should be set to **AESVCS**
- **Enabled:** Set to **y**
- **Local Node:** Set to the node name assigned for the procr in **Section 5.4.1**
- **Local Port:** Retain the default value of **8765**

change ip-services				Page	1 of	3
				IP SERVICES		
Service Type	Enabled	Local Node	Local Port	Remote Node	Remote Port	
AESVCS	y	procr	8765			

Go to **Page 3** of the **ip-services** form and enter the following values:

- **AE Services Server:** Name obtained from the AES server, in this case **aespri101x**.
- **Password:** Enter a password to be administered on the AES server.
- **Enabled:** Set to **y**.

Note: The password entered for **Password** field must match the password on the AES server in **Section 8.2**. The **AE Services Server** must match the administered name for the AES server; this is created as part of the AES installation and can be obtained from the AES server by typing **uname -n** at the Linux command prompt.

change ip-services				Page	3 of 3
AE Services Administration					
Server ID	AE Services Server	Password	Enabled	Status	
1:	aespri101x	*****	y	idle	
2:					
3:					

5.4.3. Configure CTI Link for TSAPI Service

Add a CTI link using the **add cti-link n** command, where n is the n is the cti-link number as shown in the example below this is **1**. Enter an available extension number in the **Extension** field. Enter **ADJ-IP** in the **Type** field, and a descriptive name in the **Name** field. Default values may be used in the remaining fields.

add cti-link 1		Page	1 of 3
CTI LINK			
CTI Link: 1			
Extension: 1990			
Type: ADJ-IP			
COR: 1			
Name: aespri101x			

5.5. Configure VDNs and Vectors for Voxtronic

There are two VDNs and two Vectors added to route calls to the SBCE and Remote Workers. The Vector associated with VDN 3950 routes the call to Session Manager, when the call is routed back into Communication Manager again to the second VDN 3951, the call is then routed to the dispatcher via Bridged Appearance buttons that are added on each Remote Workers phone.

5.5.1. Adding VDNs

VDN 3950 is added as the initial number that is called by the PSTN caller, **Vector 50** is associated with the VDN. This Vector is used to route the caller out to Session Manager.

```
add vdn 3950                                     Page 1 of 3
                                         VECTOR DIRECTORY NUMBER
      Extension: 3950                               Unicode Name? n
      Name*: Voxtronic-PSTN
      Destination: Vector Number                    50
      Attendant Vectoring? n
      Meet-me Conferencing? n
      Allow VDN Override? n
      COR: 1
      TN*: 1
      Measured: none      Report Adjunct Calls as ACD*? n
      VDN of Origin Annc. Extension*:
      1st Skill*:
      2nd Skill*:
      3rd Skill*:
SIP URI:
```

Same command is used to **add VDN 3951** and this will use Vector **51**.

```
add vdn 3951                                     Page 1 of 3
                                         VECTOR DIRECTORY NUMBER
      Extension: 3951                               Unicode Name? n
      Name*: Voxtronic-Implicit
      Destination: Vector Number                    51
      Attendant Vectoring? n
      Meet-me Conferencing? n
      Allow VDN Override? n
      COR: 1
      TN*: 1
      Measured: none      Report Adjunct Calls as ACD*? n
      VDN of Origin Annc. Extension*:
      1st Skill*:
      2nd Skill*:
      3rd Skill*:
SIP URI:
* Follows VDN Override Rules
```

5.5.2. Adding Vectors

VDN 3050 on the previous page uses **Vector 50** to route the call out to the Implicit User configured in **Section 6.2.3**. This will then loop in the SBCE and allow the call to be recorded before being routed back into Communication Manager and onto VDN 3951.

change vector 50			Page 1 of 6		
CALL VECTOR					
Number: 50		Name: Voxtronic Route Implicit			
Multimedia? n	Attendant Vectoring? n	Meet-me Conf? n	Lock? n		
Basic? y	EAS? y	G3V4 Enhanced? y	ANI/II-Digits? y	ASAI Routing? y	
Prompting? y	LAI? y	G3V4 Adv Route? y	CINFO? y	BSR? y	Holidays? y
Variables? y	3.0 Enhanced? y				
01 wait-time	1 secs hearing ringback				
02 route-to	number 7253951		cov n if unconditionally		
03 wait-time	60 secs hearing ringback				
04					
05					
06					
07					
08					
09					
10					

VDN 3951 uses the following **Vector 51** which plays the announcement and then routes the call to the Bridged Appearance numbers that are assigned to the Remote Workers phones, as shown in **Section 6.4**.

change vector 51			Page 1 of 6		
CALL VECTOR					
Number: 51		Name: Voxtronic-Routing			
Multimedia? n	Attendant Vectoring? n	Meet-me Conf? n	Lock? n		
Basic? y	EAS? y	G3V4 Enhanced? y	ANI/II-Digits? y	ASAI Routing? y	
Prompting? y	LAI? y	G3V4 Adv Route? y	CINFO? y	BSR? y	Holidays? y
Variables? y	3.0 Enhanced? y				
01	announcement 3331				
02	route-to	number 3050	cov n if unconditionally		
03	wait-time	5 secs hearing ringback			
04	route-to	number 3051	cov n if unconditionally		
05	wait-time	60 secs hearing ringback			
06					
07					
08					
09					
10					

6. Configure Avaya Aura® Session Manager

This section provides the procedures for configuring Session Manager to add SIP Entities, Application Sequence, Implicit User and Call Routing to allow VDN calls to be recorded. Configuration is required to route calls to Session Border Controller for Enterprise using Implicit User, looping back into Session Manager, and then routing back to Communication Manager. This looping of the call into the SBCE allows the call to be recorded using SIP Recording on the SBCE. Session Manager is configured via System Manager. The procedures include the following areas:

- Domains and Locations
- Configure Routing to ASBCE
- Configure Routing to Communication Manager
- Configure Remote Workers

To make changes on Session Manager a web session is established to System Manager. Log into System Manager by opening a web browser and navigating to `https://<System Manager FQDN>/SMGR`. Enter the appropriate credentials for the **User ID** and **Password** and click on **Log On**.

System Manager

Not secure | <https://10.10.40.10/network-login/>

Recommended access to System Manager is via FQDN.
[Go to central login for Single Sign-On](#)

If IP address access is your only option, then note that authentication will fail in the following cases:

- First time login with "admin" account
- Expired/Reset passwords

Use the "Change Password" hyperlink on this page to change the password manually, and then login.

Also note that single sign-on between servers in the same security domain is not supported when accessing via IP address.

This system is restricted solely to authorized users for legitimate business purposes only. The actual or attempted unauthorized access, use, or modification of this system is strictly prohibited.

Unauthorized users are subject to company disciplinary procedures and or criminal and civil penalties under state, federal, or other applicable domestic and foreign laws.

The use of this system may be monitored and recorded for administrative and security reasons. Anyone accessing this system expressly consents to such monitoring and recording, and is advised that if it reveals possible evidence of criminal activity, the evidence of such activity may be provided to law enforcement officials.

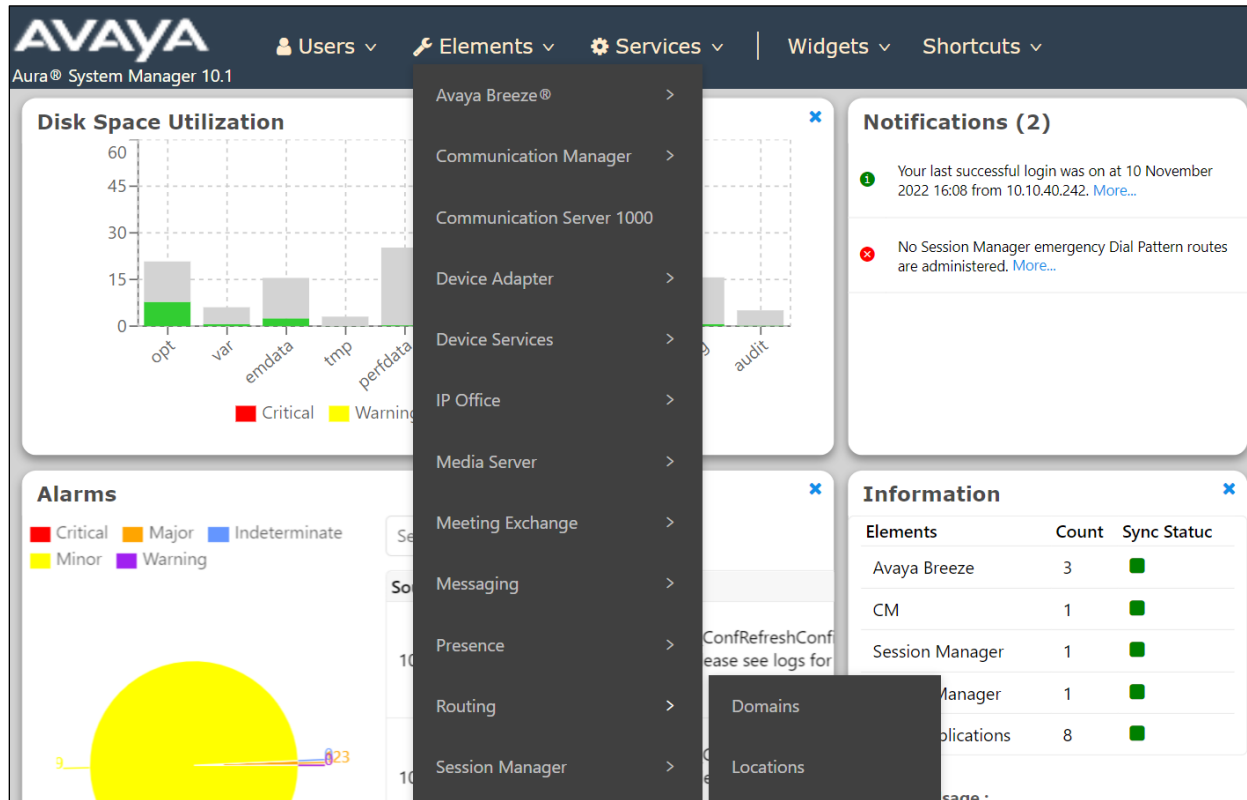
User ID:

Password:

[Change Password](#)

Supported Browsers: Firefox (minimum version 93.0), Chrome (minimum version 91.0) or Edge (minimum version 93.0).

Once logged in navigate to **Elements** and click on **Routing**, as shown below.

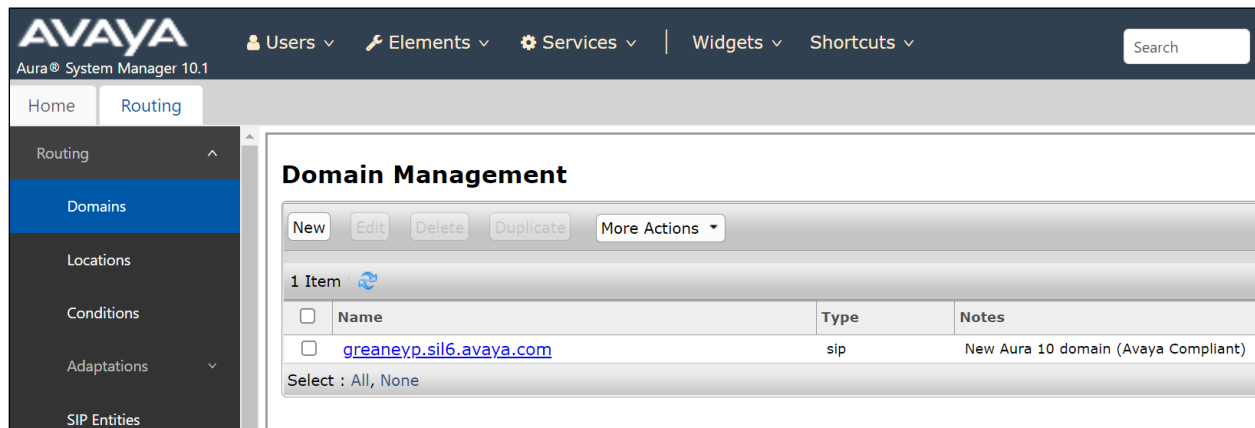


6.1. Domains and Locations

Note: It is assumed that a domain and a location have already been configured, therefore a quick overview of the domain and location that was used in compliance testing is provided here.

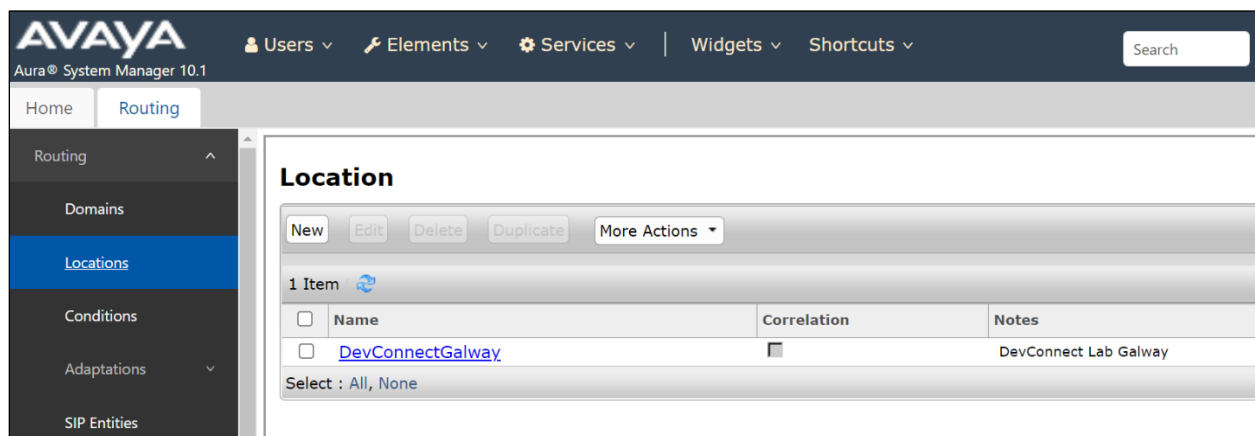
6.1.1. Display the Domain

Select **Domains** from the left window. This will display the domain configured on Session Manager. For compliance testing this domain was **greanep.sil6.avaya.com** as shown below. If a domain is not already in place, click on **New**. This will open a new window (not shown) where the domain can be added.



6.1.2. Display the Location

Select **Locations** from the left window and this will display the location setup. The example below shows the location **DevConnectGalway** which was used for compliance testing. If a location is not already in place, then one must be added to include the IP address range of the Avaya solution. Click on **New** to add a new location.

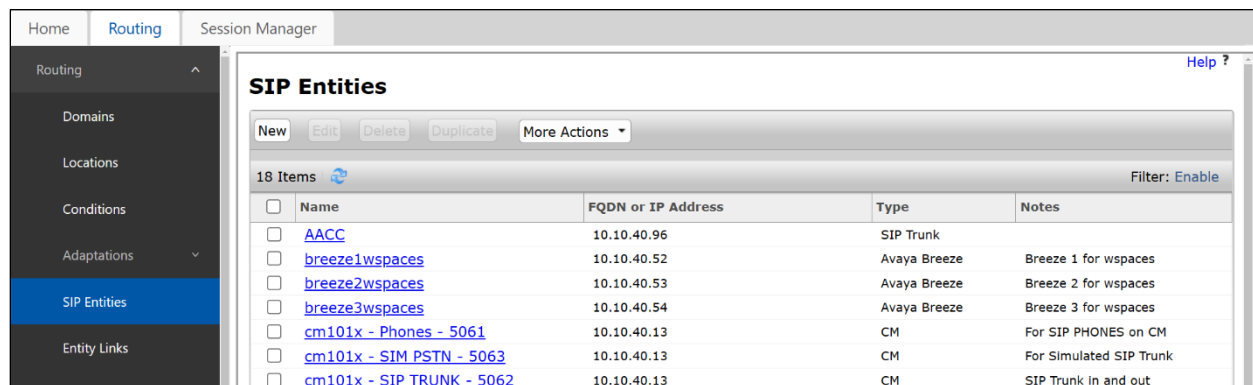


6.2. Configure Routing to Avaya Session Border Controller for Enterprise

Calls must be routed to the SBCE to allow them to be recorded. Calls made to and from Remote Worker's phones are recorded by the SBCE without the need for any extra setup on Session Manager. However, calls to VDN's that involve announcements and options before the call lands on the Remote Workers phones will not be recorded by default as the call is not yet routed through the SBCE. In order to record such calls, the call will need to loop in the SBCE, which involves the call being routed from Communication Manager to the SBCE and back again into Communication Manager, thus creating a loop. The various setups illustrated in the sections following may refer to this as the "Voxtronic Loop".

6.2.1. Configure SIP Entity for Avaya Session Border Controller for Enterprise

Navigate to **SIP Entities** in the left window and click on **New** in the main window. This will add a new SIP Entity for the SBCE to allow calls to be routed to it.



	Name	FQDN or IP Address	Type	Notes
<input type="checkbox"/>	AACC	10.10.40.96	SIP Trunk	
<input type="checkbox"/>	breeze1wspaces	10.10.40.52	Avaya Breeze	Breeze 1 for wspaces
<input type="checkbox"/>	breeze2wspaces	10.10.40.53	Avaya Breeze	Breeze 2 for wspaces
<input type="checkbox"/>	breeze3wspaces	10.10.40.54	Avaya Breeze	Breeze 3 for wspaces
<input type="checkbox"/>	cm101x - Phones - 5061	10.10.40.13	CM	For SIP PHONES on CM
<input type="checkbox"/>	cm101x - SIM PSTN - 5063	10.10.40.13	CM	For Simulated SIP Trunk
<input type="checkbox"/>	cm101x - SIP TRUNK - 5062	10.10.40.13	CM	SIP Trunk in and out

The inside address for the SBCE is used. This can be obtained from **Section 7.4**. Once the information below is filled in, scroll down to add the Entity Link.

SIP Entity Details

CommitCancel

General

* Name: SBCE - Loop -Voxtronic

* FQDN or IP Address: 10.10.40.158

Type: SIP Trunk

Notes: For Looping Voxtronic

Adaptation:

Location: DevConnectGalway

Time Zone: Europe/Dublin

* SIP Timer B/F (in seconds): 4

Minimum TLS Version: Use Global Setting

Credential name:

Securable: ☐

Call Detail Recording: egress

Loop Detection

The following Entity link was added for the connection between the SBCE and Session Manager, note that **Port 5065** was used, and this will correspond to that same port in **Section 7.4**.

Entity Links

Override Port & Transport with DNS SRV: ☐

AddRemove

1 Item

Filter: Enable

<input type="checkbox"/>	Name	SIP Entity 1	Protocol	Port	SIP Entity 2	Port
<input type="checkbox"/>	* sm101x_SBCE - Loop -V	sm101x	TLS	* 5065	SBCE - Loop -Voxtronic	* 5065

Select : All, None

SIP Responses to an OPTIONS Request

AddRemove

0 Items

Filter: Enable

<input type="checkbox"/>	Response Code & Reason Phrase	Mark Entity Up/Down	Notes
--------------------------	-------------------------------	---------------------	-------

CommitCancel

6.2.2. Configure Application Sequence

Navigate to **Elements** → **Session Manager**.

The screenshot shows the Avaya Aura System Manager 10.1 interface. The 'Elements' menu is open, displaying a list of components. 'Session Manager' is highlighted with a red box. The background shows various dashboards including Disk Space Utilization, Alarms, Notifications, and Information.

Elements	Count	Sync Status
Avaya Breeze	3	Red
CM	1	Green
Session Manager	2	Red
System Manager	1	Green
UCM Applications	8	Green

Navigate to **Application Configuration** where the **Applications** and **Application Sequences** can be configured as well as **Implicit Users**. An Application is first configured and then assigned to the Application Sequence.

The screenshot shows the 'Application Configuration' page in the Avaya Aura System Manager 10.1 interface. The 'Sub Pages' table lists various configuration options.

Action	Description	Help
Applications	Administer individual Applications for use in Application Sequences.	Applications Page Fields
Application Sequences	Administer Application Sequences for call application sequencing.	Application Sequences Page Fields
Conference Factories	Administer well known and factory URI mappings for conferencing.	Conference Factories Main Page Fields Conference Factory Set Editor Page Fields
Implicit Users	Administer dial pattern rules for call application sequencing.	Implicit Users Page Fields
NRS Proxy Users	Administer NRS proxy user rules.	NRS Proxy Users Page Fields

Click on **Applications** in the left window and then **New** in the main window.



An Application for the Session Border Controller is added as shown below. Note the **SIP Entity** created in **Section 6.2.1** was used.

*Name

Description

*SIP Entity

Application Attributes (optional)

Name	Value
Application Handle	<input type="text"/>
URI Parameters	<input type="text"/>

Application Media Attributes

Enable Media Filtering ☐

Audio	Video	Text	Match Type	If SDP Missing
YES <input type="button" value="v"/>	YES <input type="button" value="v"/>	YES <input type="button" value="v"/>	NOT_EXACT <input type="button" value="v"/>	ALLOW <input type="button" value="v"/>

Navigate to **Application Sequences** in the left window and click in **New** in the main window.

Application Sequences

This page allows you to add, edit, or remove sequences of applications.

Application Sequences

New Edit Delete

2 Items Filter: Enable

<input type="checkbox"/>	Name	Description
<input type="checkbox"/>	CM-APP-SEQ	App-SEQ for CM

Select : All, None

Under the section **Available Applications**, click on the + beside the Application created above, the new Application will then be associated with the Application Sequence being configured here. Click on **Commit** at the bottom of the screen once this is complete.

Application Sequence

*Name

Description

Applications in this Sequence

Move First Move Last Remove

1 Item

<input type="checkbox"/>	Sequence Order (first to last)	Name	SIP Entity	Mandatory	Description
<input type="checkbox"/>		SIP-REC-SBCE-Voxtronic	SBCE - Loop -Voxtronic	<input checked="" type="checkbox"/>	SIP Recording SBCE

Select : All, None

Available Applications

2 Items Filter: Enable

<input type="checkbox"/>	Name	SIP Entity	Description
<input checked="" type="checkbox"/>	CM-APP	cm101x - Phones - 5061	Application for CM
<input checked="" type="checkbox"/>	SIP-REC-SBCE-Voxtronic	SBCE - Loop -Voxtronic	SIP Recording SBCE

*Required

Commit Cancel

6.2.3. Configure Implicit User

With the Application Sequence in place, the Implicit User can be created. The Implicit user will have the same number as that number configured in **Section 5.5**, that was routed from Communication Manager to Session Manager. Click on **Implicit Users** in the left window and **New** in the main window.

The screenshot shows the Session Manager web interface. On the left is a navigation menu with options like Home, Session Manager, Global Settings, Communication Profile, Network Configuration, Device and Location, Application Configuration, Applications, Application Sequences, Conference Factors, **Implicit Users** (highlighted), and NRS Proxy Users. The main content area is titled 'Implicit Users' and includes a sub-header 'Implicit User Rules with Digit Patterns'. Below this is a table with columns: Pattern, Min, Max, SIP Domain, Origination Application Sequence, Termination Application Sequence, Emergency Origination Application Sequence, Emergency Termination Application Sequence, and Description. The table currently shows one item. There are 'New', 'Edit', and 'Delete' buttons at the top of the table. A 'Filter: Enable' button is also present.

Enter the appropriate **Pattern**, this will be the same as the routed number from **Section 5.5**. Note the **SIP Domain** from **Section 6.1.1** was chosen as well as the **Application Sequence** from **Section 6.2.2**. Click on **Commit** once the **Implicit User Rule** has been configured as shown below.

The screenshot shows the 'Implicit User Rule Editor' dialog box. It contains the following fields and options:

- *Pattern**: Text input field containing '7253951'.
- *Min**: Text input field containing '7'.
- *Max**: Text input field containing '7'.
- Description**: Text input field containing 'Voxtronic'.
- SIP Domain**: Dropdown menu with 'greaney.sil6.avaya.com' selected.
- Origination Application Sequence**: Dropdown menu with 'SIP-REC-Loop-Voxtronic' selected.
- Termination Application Sequence**: Dropdown menu with 'SIP-REC-Loop-Voxtronic' selected.
- Emergency Origination Application Sequence**: Dropdown menu with 'Select Origination Application Sequence...' selected.
- Emergency Termination Application Sequence**: Dropdown menu with 'Select Termination Application Sequence...' selected.

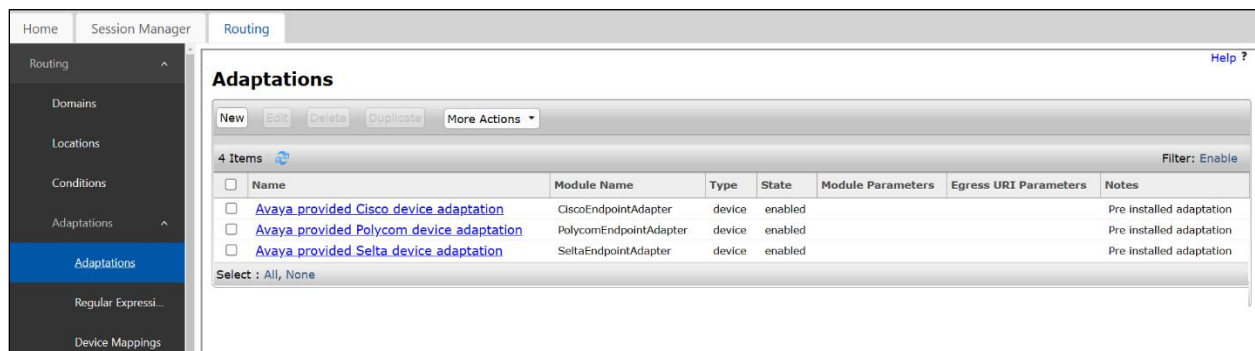
At the bottom left, there is a legend: *** Required**. At the bottom right, there are 'Commit' and 'Cancel' buttons.

6.3. Configure Routing to Communication Manager

Routing to SBCE is part one of creating the loop, part two is routing the call back to Communication Manager again and back into the VDN to allow the call to proceed and the announcements to be played.

6.3.1. Configure Adaptation for Voxtronic

An Adaptation is first configured, this will strip some digits from the number associated with the Implicit User and then use that number to route the call to Communication Manager. Navigate to **Routing → Adaptations**. Click on **New** in the main window.



The **Module Name** must be set to **DigitConversionAdapter**. The section **Digit Conversion for Outgoing Calls from SM** is used, as the calls that are being passed from Session Manager to Communication Manager are altered. In this case, there are three digits deleted from 7253951, these being **725** leaving 3951 which corresponds to the VDN in **Section 5.5.1**. When 7253951 is routed to Communication Manager the call presents to Communication Manager as 3951. Click on **Commit** (not shown) when the Adaptation is complete.

General

* **Adaptation Name:** Voxtronic-Loop

Notes: Voxtronic-Loop

* **Module Name:** DigitConversionAdapter

Type: digit

State: enabled

Module Parameter Type:

Egress URI Parameters:

Digit Conversion for Incoming Calls to SM

Add Remove

0 Items Filter: Enable

Matching Pattern	Min	Max	Phone Context	Delete Digits	Insert Digits	Address to modify	Adaptation Data	Notes
------------------	-----	-----	---------------	---------------	---------------	-------------------	-----------------	-------

Digit Conversion for Outgoing Calls from SM

Add Remove

1 Item Filter: Enable

Matching Pattern	Min	Max	Phone Context	Delete Digits	Insert Digits	Address to modify	Adaptation Data	Notes
* 725	* 7	* 7		* 3		both		

6.3.2. Configure SIP Entity with Adaptation

There was an existing **SIP Entity** already in use to route calls to Communication Manager, however a new SIP Entity can be created as per **Section 6.2.1**. This SIP Entity is then associated with the **Adaptation** created in **Section 6.3.1**. When calls are passed to this SIP Entity, they will follow the rules as per the SIP Entity in deleting 725 from 7253951.

SIP Entity Details

CommitCancel

General

* Name:

cm101x - SIP TRUNK - 5062

* FQDN or IP Address:

10.10.40.13

Type:

CM

Notes:

SIP Trunk in and out

Adaptation:

Voxtronic-Loop

Location:

DevConnectGalway

Time Zone:

Europe/Dublin

* SIP Timer B/F (in seconds):

4

Minimum TLS Version:

Use Global Setting

Credential name:

Securable:

☐

Call Detail Recording:

none

Loop Detection

Loop Detection Mode:

On

Loop Count Threshold:

5

Loop Detection Interval (in msec):

200

6.3.3. Configure Routing Policy

A **Routing Policy** is also created to allow calls to be routed to Communication Manager. This is configured as shown below. Navigate to **Routing Policies** in the left window and click on **New** in the main window (not shown). A suitable **Name** is chosen, and the **SIP Entity as Destination** is selected.

The screenshot shows the 'Routing Policy Details' window. The left sidebar has 'Routing Policies' selected. The main area has tabs for 'General', 'SIP Entity as Destination', and 'Time of Day'. The 'General' tab is active, showing fields for Name (Voxtronic Implicit User), Disabled (unchecked), Retries (0), and Notes (Implicit User). The 'SIP Entity as Destination' tab is also visible, showing a table with columns Name, FQDN or IP Address, Type, and Notes. The 'Time of Day' tab is also visible, showing a table with columns Name, Mon, Tue, Wed, Thu, Fri, Sat, Sun, Start Time, End Time, and Notes. The 'Time of Day' table has one item with Name '24/7' and Start Time '00:00'.

Name	FQDN or IP Address	Type	Notes

Name	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Start Time	End Time	Notes
24/7								00:00	23:59	Time Range 24/7

The SIP Entity shown in **Section 6.3.2** is selected to ensure that the correct Adaptation is used. Click on **Select**.

The screenshot shows the 'SIP Entities' window. The left sidebar has 'SIP Entities' selected. The main area has tabs for 'SIP Entities' and 'Time of Day'. The 'SIP Entities' tab is active, showing a table with columns Name, FQDN or IP Address, Type, and Notes. The table has 16 items, with 'cm101x - SIP TRUNK - 5062' selected. The 'Time of Day' tab is also visible, showing a table with columns Name, Mon, Tue, Wed, Thu, Fri, Sat, Sun, Start Time, End Time, and Notes. The 'Time of Day' table has one item with Name '24/7' and Start Time '00:00'.

Name	FQDN or IP Address	Type	Notes
AACC	10.10.40.96	SIP Trunk	
breeze1wspaces	10.10.40.52	Avaya Breeze	Breeze 1 for wspaces
breeze2wspaces	10.10.40.53	Avaya Breeze	Breeze 2 for wspaces
breeze3wspaces	10.10.40.54	Avaya Breeze	Breeze 3 for wspaces
cm101x - Phones - 5061	10.10.40.13	CM	For SIP PHONES on CM
cm101x - SIM PSTN - 5063	10.10.40.13	CM	For Simulated SIP Trunk
cm101x - SIP TRUNK - 5062	10.10.40.13	CM	SIP Trunk in and out
Experience Portal-MPP	10.10.40.26	Voice Portal	Experience Portal
InAttend	10.10.40.122	SIP Trunk	Mitel InAttend
IP Office - SE	10.10.40.19	SIP Trunk	IP Office Server Edition
Messaging10x	10.10.40.76	SIP Trunk	Messaging R10 on 2016
Messaging11x	10.10.40.77	SIP Trunk	Messaging R11x on Win 2016 & 2019
novaalert	10.10.40.120	SIP Trunk	novaalert
SBCE - InsiderRW - 159	10.10.40.159	SIP Trunk	SBCE - InsiderRW - 159
SBCE - InsiderTrk - 158	10.10.40.158	SIP Trunk	For Simulated PSTN

6.3.4. Configure Dial Pattern

Navigate to **Dial Patterns** in the left window and click on **New** in the main window. This creates a new Dial Pattern to route the call to Communication Manager.

The screenshot shows the 'Dial Patterns' configuration page. On the left is a navigation menu with options: Routing, Domains, Locations, Conditions, Adaptations, SIP Entities, Entity Links, Time Ranges, Routing Policies, and Dial Patterns (selected). The main area displays a table of 13 items. Each row represents a dial pattern with columns for Pattern, Min, Max, Emergency Call, Emergency Type, Emergency Priority, SIP Domain, and Notes. The patterns listed are 160, 3, 3155, 3201, 3539173, 3539184, 450, 5, 6666, 6668, and 68. The 'Emergency Call' column has checkboxes, and the 'SIP Domain' column shows 'greanep.sil6.avaya.com' for most patterns. The 'Notes' column contains various routing instructions like 'ToEP810', '3xxx route to CM101x', 'VDN for Voxtronic', 'To NovaAlert', 'To CM101x from SIM PSTN', 'To Simulated PSTN', 'To InAttend', 'To IP Office SE', 'To Messaging R10 on Win 2016', 'To Messaging R11x on 2016 & 2019', and 'To AACC'. At the bottom, there is a 'Select' dropdown set to 'All'.

Pattern	Min	Max	Emergency Call	Emergency Type	Emergency Priority	SIP Domain	Notes
160	4	4	<input type="checkbox"/>			greanep.sil6.avaya.com	ToEP810
3	4	4	<input type="checkbox"/>			greanep.sil6.avaya.com	3xxx route to CM101x
3155	4	4	<input type="checkbox"/>			greanep.sil6.avaya.com	VDN for Voxtronic
3201	4	4	<input type="checkbox"/>			greanep.sil6.avaya.com	To NovaAlert
3539173	11	11	<input type="checkbox"/>			greanep.sil6.avaya.com	To CM101x from SIM PSTN
3539184	11	11	<input type="checkbox"/>			greanep.sil6.avaya.com	To Simulated PSTN
450	4	4	<input type="checkbox"/>			greanep.sil6.avaya.com	To InAttend
5	4	4	<input type="checkbox"/>			-ALL-	To IP Office SE
6666	4	4	<input type="checkbox"/>			greanep.sil6.avaya.com	To Messaging R10 on Win 2016
6668	4	4	<input type="checkbox"/>			greanep.sil6.avaya.com	To Messaging R11x on 2016 & 2019
68	4	4	<input type="checkbox"/>			greanep.sil6.avaya.com	To AACC

The **Pattern** is the same as the Implicit User. The Implicit User is used first and then the Dial pattern follows. This Dial Pattern chooses the **Routing Policy** created above in **Section 6.3.3** which uses the **Adaptation** created in **Section 6.3.1** to route calls to the Communication Manager **SIP Entity** as per **Section 6.3.2**. Once the Dial Pattern details are filled out correctly as per the configuration shown below, click on **Commit** to complete the routing to Communication Manager.

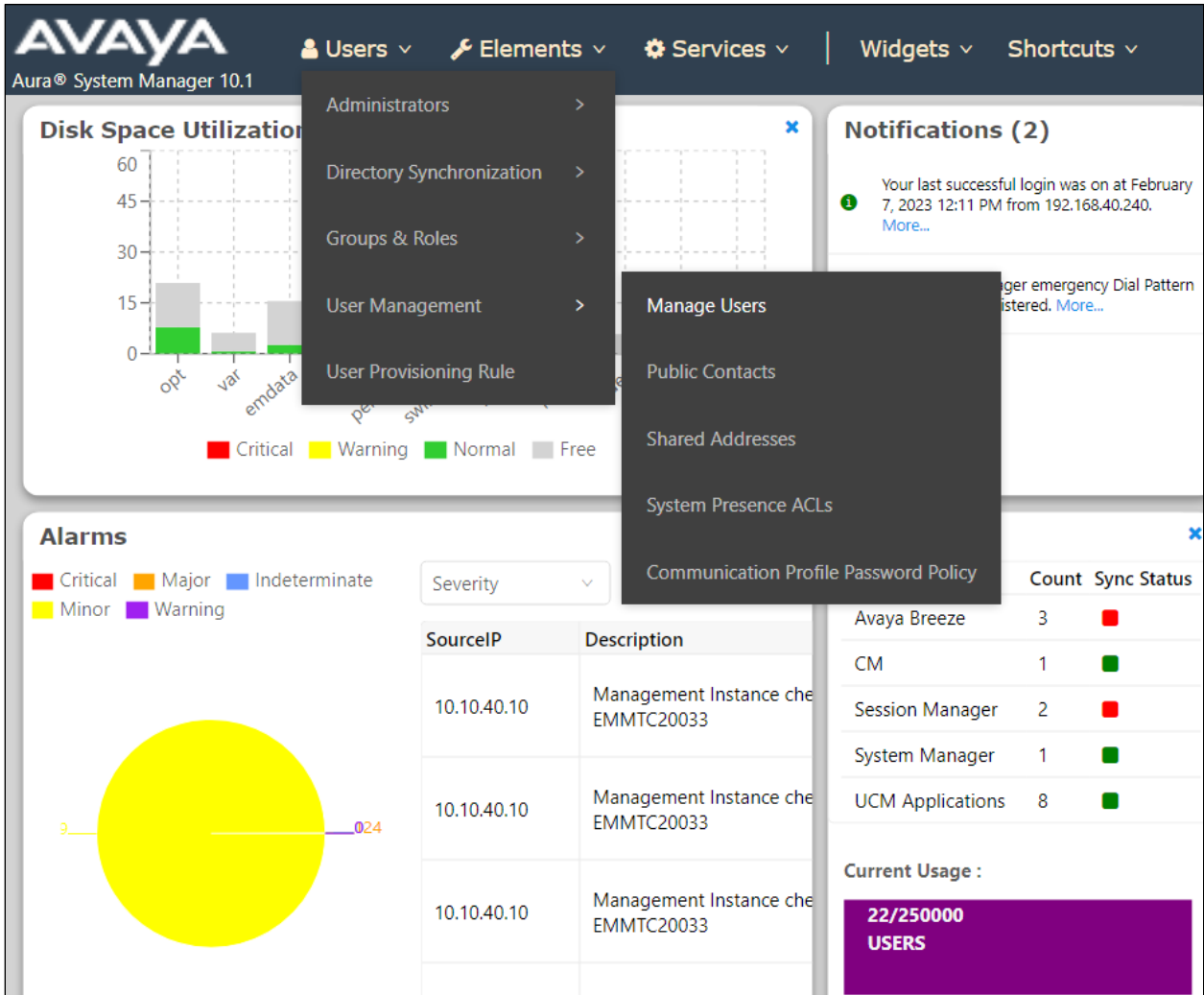
The screenshot shows the 'Dial Pattern Details' configuration page. It has a 'Commit' button and a 'Cancel' button. The 'General' section contains fields for Pattern (7253951), Min (7), Max (7), Emergency Call (checkbox), SIP Domain (greanep.sil6.avaya.com), and Notes (For SIP REC Voxtronic). The 'Originating Locations and Routing Policies' section shows a table with 1 item. The table has columns for Originating Location Name, Originating Location Notes, Routing Policy Name, Rank, Routing Policy Disabled, Routing Policy Destination, and Routing Policy Notes. The item listed is DevConnectGalway, DevConnect Lab Galway, Voxtronic Implicit User, 0, Routing Policy Disabled, cm101x - SIP TRUNK - 5062, and Implicit User. At the bottom, there is a 'Select' dropdown set to 'All'.

Originating Location Name	Originating Location Notes	Routing Policy Name	Rank	Routing Policy Disabled	Routing Policy Destination	Routing Policy Notes
DevConnectGalway	DevConnect Lab Galway	Voxtronic Implicit User	0	<input type="checkbox"/>	cm101x - SIP TRUNK - 5062	Implicit User

6.4. Configure Remote Workers

The following section shows the configuration for the Remote Workers that were used for compliance testing. Please note this may vary depending on the customer site.

All Remote Worker phones are registered as SIP endpoints through the Session Border Controller for Enterprise, but they are configured as any SIP endpoint would be configured. All SIP endpoints are configured using System Manager by navigating to **Users → User Management → Manager Users**.



Click on the **Identity** tab to ensure the **Name**, **Description**, **Title**, and **Time Zone**.

<u>Identity</u>	Communication Profile	Membership	Contacts
Basic Info			
Address			
LocalizedName			
User Provisioning <input type="text" value="Rule"/>			
<hr/>			
* Last Name :	<input type="text" value="RW 2"/>	Last Name (in Latin alphabet characters) :	<input type="text" value="RW 2"/>
* First Name :	<input type="text" value="Voxtronic"/>	First Name (in Latin alphabet characters) :	<input type="text" value="Voxtronic"/>
* Login Name :	<input type="text" value="3172@greaneyps"/>	Middle Name :	<input type="text" value="Middle Name Of U"/>
Description :	<input type="text" value="Description Of Use"/>	Email Address :	<input type="text" value="Email Address Of I"/>
Password :	<input type="text"/>	User Type :	<input type="text" value="Basic"/>
Confirm Password :	<input type="text"/>	Localized Display Name :	<input type="text" value="RW 2, Voxtronic"/>
Endpoint Display Name :	<input type="text" value="RW 2, Voxtronic"/>	Title Of User :	<input type="text" value="Title Of User"/>
Language Preference :	<input type="text" value="English (Unit..."/>	Time Zone :	<input type="text" value="(0:0)GMT : D..."/>

Click on the **Communication Profile** tab and **Communication Profile Password** in the left window. Enter a suitable password for the SIP user/phone.

The screenshot shows a web application interface with tabs: Identity, Communication Profile, Membership, and Contacts. The 'Communication Profile' tab is active. A modal dialog titled 'Comm-Profile Password' is open. It contains two password input fields. The first is labeled 'Comm-Profile Password:' and the second is labeled '* Re-enter Comm-Profile Password:'. Both fields contain masked characters (dots). A green checkmark is visible in the second field, indicating a match. Below the fields is a blue link labeled 'Generate Comm-Profile Password'. At the bottom right are 'Cancel' and 'OK' buttons.

Click on **Communication Address** in the left window. The **Type** should be set to **Avaya SIP** as shown, with the **Fully Qualified Address** in the form of ext@domain.

The screenshot shows the same web application interface. A modal dialog titled 'Communication Address Add/Edit' is open. It contains two main fields. The first is labeled '* Type:' and is a dropdown menu with 'Avaya SIP' selected. The second is labeled '*Fully Qualified Address:' and consists of two input boxes separated by an '@' symbol. The first box contains '3172' and the second box contains 'greaney.sil6.avaya...'. At the bottom right are 'Cancel' and 'OK' buttons.

Click on **Session Manager Profile** in the left window. Ensure the correct **Session Manager** is chosen as well as the appropriate **Originating Sequence** and **Terminating Sequence**.

Identity	Communication Profile	Membership	Contacts
Communication Profile Password			
PROFILE SET : Primary ▼			
Communication Address			
PROFILES			
Session Manager Profile <input checked="" type="checkbox"/>			
Avaya Breeze® Profile <input type="checkbox"/>			
CM Endpoint Profile <input checked="" type="checkbox"/>			
SIP Registration			
* Primary Session Manager : sm101x <input type="text"/>			
Secondary Session Manager : Start typing... <input type="text"/>			
Survivability Server : Start typing... <input type="text"/>			
Max. Simultaneous Devices : 1 <input type="text"/>			
Block New Registration When Maximum Registrations Active? <input type="checkbox"/>			
Application Sequences			
Origination Sequence : CM-APP-SEQ <input type="text"/>			
Termination Sequence : CM-APP-SEQ <input type="text"/>			

Click on **CM Endpoint Profile** in the left window and ensure the appropriate **Template** is chosen as well as the correct **Extension** and **Sip Trunk**.

The screenshot shows the 'Communication Profile' configuration page for a 'CM Endpoint Profile'. The left sidebar contains a 'PROFILES' section with 'CM Endpoint Profile' selected. The main area has tabs for 'Identity', 'Communication Profile', 'Membership', and 'Contacts'. The 'Communication Profile' tab is active, displaying various configuration fields:

- * System:** cm101x
- * Profile Type:** Endpoint
- Use Existing Endpoints:** ☐
- * Extension:** 3172 (with a small icon to its right)
- Template:** 9641SIP_DEFAULT_CM_10_Q
- * Set Type:** 9641SIP
- Security Code:** Enter Security Code
- Port:** S000017
- Voice Mail Number:** (empty field)
- Preferred Handle:** Select
- Calculate Route Pattern:** ☐
- SIP URI:** Select
- Enhanced Callr-Info Display for 1-line phones:** ☐
- Delete on Unassign from User or on Delete User:** ☒
- Override Endpoint Name and Localized Name:** ☒
- Allow H.323 and SIP Endpoint Dual Registration:** ☐
- Sip Trunk:** aar

Click on the icon next to **Extension**. This will open the window shown on the next page.

A close-up of the '* Extension:' field showing the value '3172'. To the right of the text input is a small icon of a document with a pencil, which is highlighted by a red rectangular box.

These are the settings under the **General Options** tab that were used for compliance testing. Again, these may vary depending on the customer requirements.

System	cm101x	Extension	3172
Template	9641SIP_DEFAULT_CM_10_1	Set Type	9641SIP
Port	S000017	Security Code	
Name	RW 2, Voxtronic		

General Options (G) *	Feature Options (F)	Site Data (S)	Abbreviated Call Dialing (A)	Enhanced Call Fwd (E)
Button Assignment (B)	Profile Settings (P)	Group Membership (M)		

* Class of Restriction (COR)	1	* Class Of Service (COS)	1
* Emergency Location Ext	3172	* Message Lamp Ext.	3172
* Tenant Number	1		
* SIP Trunk	Q aar	Type of 3PCC Enabled	Avaya
Coverage Path 1		Coverage Path 2	
Lock Message	<input type="checkbox"/>	Localized Display Name	RW 2, Voxtronic
Multibyte Language	Not Applicable	Enable Reachability for Station Domain Control	system
SIP URI			
Attendant	<input type="checkbox"/>		
Primary Session Manager			
IPv4:	10.10.40.12	IPv6:	
Secondary Session Manager			
IPv4:		IPv6:	

The **Button Assignment** tab shows the additional Bridged Appearance buttons (**brdg-appr**). Note that two buttons were added for each bridged appearance **3050** and **3051**. Click on **Done** (not shown) once all is correctly filled in and then **Commit** on the page that follows (not shown).

System	cm101x	Extension	3172
Template	9641SIP_DEFAULT_CM_10_1	Set Type	9641SIP
Port	S000017	Security Code	
Name	RW 2, Voxtronic		

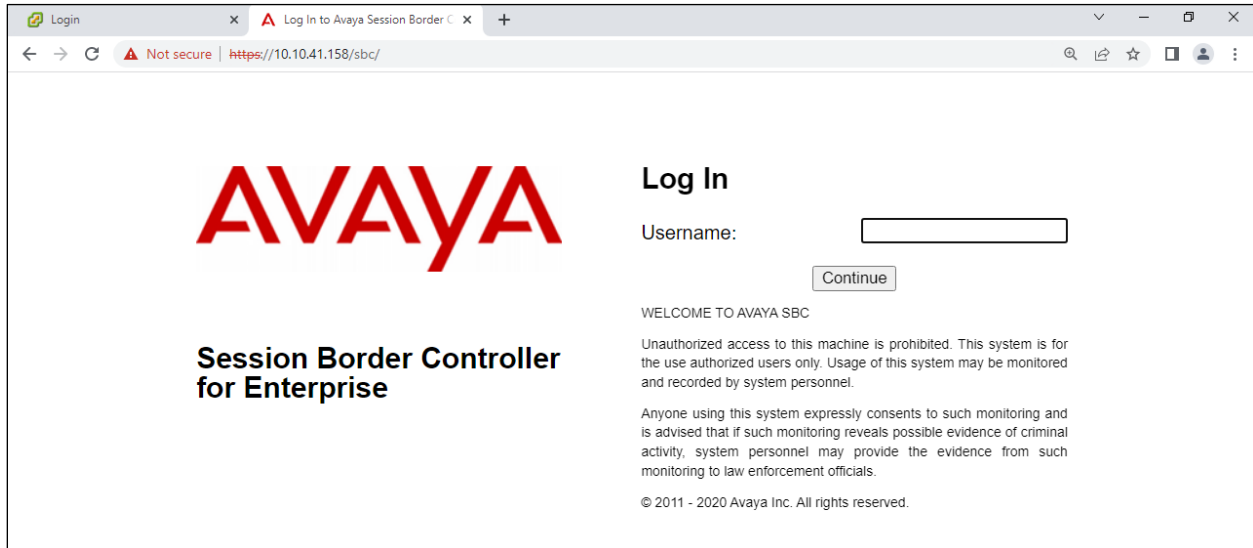
General Options (G) *	Feature Options (F)	Site Data (S)	Abbreviated Call Dialing (A)	Enhanced Call Fwd (E)
Button Assignment (B)	Profile Settings (P)	Group Membership (M)		

Main Buttons	Feature Buttons	Button Modules	Phone View
---------------------	------------------------	-----------------------	-------------------

Endpoint Configurations		Button Configurations		
Favorite	Button Label	Button Feature	Argument-1	Argument-2
1 <input type="checkbox"/>		call-appr		
2 <input type="checkbox"/>		call-appr		
3 <input type="checkbox"/>		call-appr		
4 <input type="checkbox"/>		brdg-appr	1	Ext 3050
5 <input type="checkbox"/>		brdg-appr	2	Ext 3050
6 <input type="checkbox"/>		brdg-appr	1	Ext 3051
7 <input type="checkbox"/>		brdg-appr	2	Ext 3051
8 <input type="checkbox"/>		None		

7. Configure Avaya Session Border Controller for Enterprise

Configuration for the Session Border Controller is performed by opening a web session to the Session Border Controllers management IP address. Open a URL to **https://<SBCManagementIP>/sbc** and log in using the appropriate credentials.



AVAYA

Session Border Controller for Enterprise

Log In

Username:

[Continue](#)

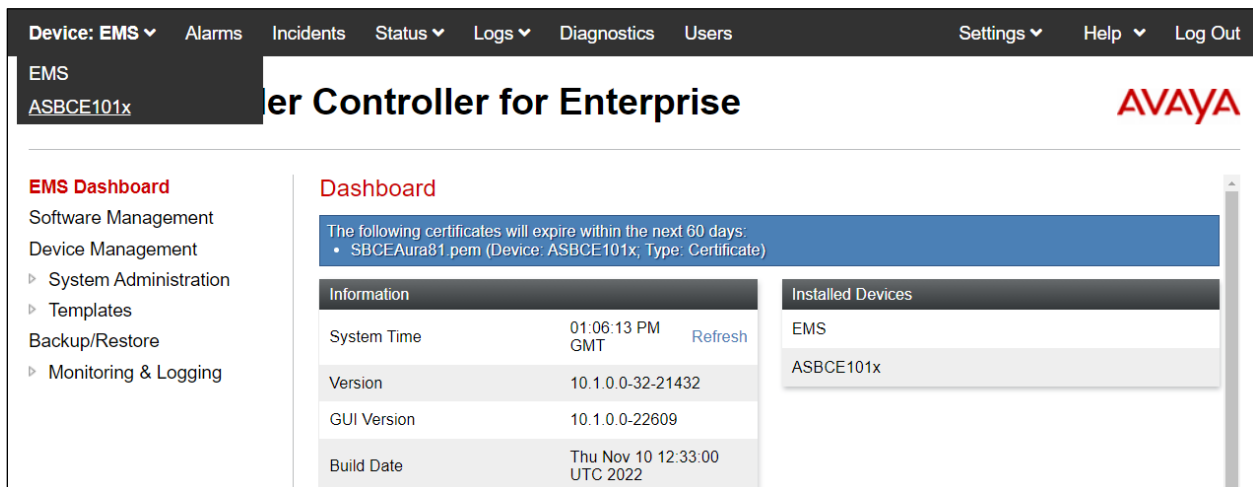
WELCOME TO AVAYA SBC

Unauthorized access to this machine is prohibited. This system is for the use authorized users only. Usage of this system may be monitored and recorded by system personnel.

Anyone using this system expressly consents to such monitoring and is advised that if such monitoring reveals possible evidence of criminal activity, system personnel may provide the evidence from such monitoring to law enforcement officials.

© 2011 - 2020 Avaya Inc. All rights reserved.

Once logged in ensure that the correct Device is chosen, as in the case below the EMS and the SBCE are coresident and therefore the SBCE must be selected.



Device: EMS | Alarms | Incidents | Status | Logs | Diagnostics | Users | Settings | Help | Log Out

Session Border Controller for Enterprise

EMS Dashboard

- Software Management
- Device Management
 - System Administration
 - Templates
 - Backup/Restore
 - Monitoring & Logging

Dashboard

The following certificates will expire within the next 60 days:

- SBCEAura81.pem (Device: ASBCE101x; Type: Certificate)

Information	
System Time	01:06:13 PM GMT Refresh
Version	10.1.0.0-32-21432
GUI Version	10.1.0.0-22609
Build Date	Thu Nov 10 12:33:00 UTC 2022

Installed Devices

- EMS
- ASBCE101x

Some of the configuration is dependent on having other parameters already set, however most of the configuration shown below will be in sequence. Note that the configuration illustrated in the section illustrates the connection to Voxtronic Conex only, for all other setups such as Remote Worker or SIP Trunk, please refer to **Section 12**. Some of the setup for the Remote Workers that were used for compliance testing can be found in **Appendix A** of these Application Notes.

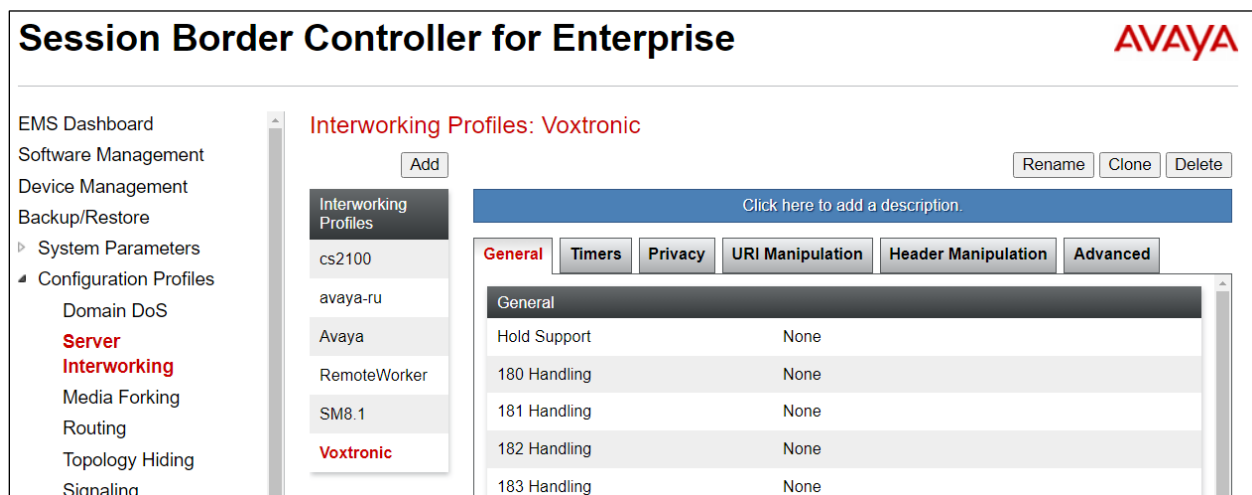
The various components can be configured by navigating the left window and adding or editing the existing Profiles/Policies/Rules. When adding a new component, a clone can be made of an existing component and then edited to suit. A new component can also be added by clicking on **Add**, rather than cloning an existing one.

Note:

1. For the purpose of illustrating the setup of the various components outlined in this section, these components, which are already configured and in place, will show as edited rather than show as added or new.
2. The connection to the Voxtronic Conex recorder will be named as Voxtronic in the screen shots in this section.
3. The following sections show the setup that was used for compliance testing but some of these settings may need to be altered to suit each customer requirement.
4. For information on the configuration and setup of any of the SBCE that is not explained in this section, please refer to **Section 12** of these Application Notes.

7.1. Setup of Configuration Profiles

Navigate to **Configuration Profiles** in the left window and **Server Internetworking**. From the main window, click on Add to create a new profile, or select an existing profile and click on Clone to create a new profile in that image. This profile can then be changed or edited to suit the connection to Conex. A profile below called **Voxtronic** was created.



These are the settings under the **General** tab for the Internetworking Profile, Voxtronic. Note that **SIPS Required** was not ticked.

General	
Hold Support	<input checked="" type="radio"/> None <input type="radio"/> RFC2543 - c=0.0.0.0 <input type="radio"/> RFC3264 - a=sendonly <input type="radio"/> Microsoft Teams
180 Handling	<input checked="" type="radio"/> None <input type="radio"/> SDP <input type="radio"/> No SDP
181 Handling	<input checked="" type="radio"/> None <input type="radio"/> SDP <input type="radio"/> No SDP
182 Handling	<input checked="" type="radio"/> None <input type="radio"/> SDP <input type="radio"/> No SDP
183 Handling	<input checked="" type="radio"/> None <input type="radio"/> SDP <input type="radio"/> No SDP
Refer Handling	<input type="checkbox"/>
URI Group	None ▾
Send Hold	<input type="checkbox"/>
Delayed Offer	<input checked="" type="checkbox"/>
3xx Handling	<input type="checkbox"/>
Diversion Header Support	<input type="checkbox"/>
Delayed SDP Handling	<input type="checkbox"/>
Re-Invite Handling	<input checked="" type="checkbox"/>
Prack Handling	<input type="checkbox"/>
Allow 18X SDP	<input type="checkbox"/>
T.38 Support	<input type="checkbox"/>
URI Scheme	<input checked="" type="radio"/> SIP <input type="radio"/> TEL <input type="radio"/> ANY
Via Header Format	<input checked="" type="radio"/> RFC3261 <input type="radio"/> RFC2543
SIPS Required	<input type="checkbox"/>
Mediasec Handling	<input type="checkbox"/>

These are the settings for the same profile, under the **Advanced** tab. These settings can be site specific, and each customer may have other requirements to those set below.

Editing Profile: Voxtronic

X

Record Routes

☐ None

☐ Single Side

☒ Both Sides

☐ Dialog-Initiate Only (Single Side)

☐ Dialog-Initiate Only (Both Sides)

Include End Point IP for Context Lookup

☒

Extensions

Avaya

Diversion Manipulation

☐

Diversion Condition

None

Diversion Header URI

Has Remote SBC

☒

Route Response on Via Port

☐

Relay INVITE Replace for SIPREC

☐

MOBX Re-INVITE Handling

☐

NATing for 301/302 Redirection

☒

DTMF

DTMF Support

☒ None>

☐ SIP Notify>

☐ RFC 2833 Relay & SIP Notify>

☐ SIP Info>

☐ RFC 2833 Relay & SIP Info>

☐ Inband>

Finish

Navigate to **Routing** in the left window. A new **Routing Profile** can be added.

EMS Dashboard

Software Management

Device Management

Backup/Restore

System Parameters

Configuration Profiles

Domain DoS

Server Interworking

Media Forking

Routing

Topology Hiding

Signaling

Manipulation

Routing Profiles: Voxtronic

Add

Routing Profiles

default

Voxtronic

sm101x-TLS

SM8.1

SM-PSTN-PG

sm101x-TCP

Rename

Clone

Delete

Click here to add a description.

Routing Profile

Update Priority

Add

Priority	URI Group	Time of Day	Load Balancing	Next Hop Address	Transport	
1	*	default	Priority	10.10.40.125:5060	UDP	<div>EditDelete</div>

The following is the setup for the **Voxtronic** Profile. Note the **SIP Server Profile** had already been setup, this is configured in **Section 7.2**. The **Next Hop Address** takes its information from this SIP Server Profile.

Device: ASBCE101x

Alarms

Incidents

Status

Logs

Diagnostics

Users

Settings

Help

Log Out

Profile : Voxtronic - Edit Rule

URI Group

*

Time of Day

default

Load Balancing

Priority

NAPTR

Transport

None

LDAP Routing

LDAP Server Profile

None

LDAP Base DN (Search)

None

Matched Attribute Priority

Alternate Routing

Next Hop Priority

Next Hop In-Dialog

Ignore Route Header

ENUM

ENUM Suffix

Add

Priority / Weight	LDAP Search Attribute	LDAP Search Regex Pattern	LDAP Search Regex Result	SIP Server Profile	Next Hop Address	Transport	
1				Voxtronic	10.10.40.125:5060	None	Delete

10.10.40.125:5060 (UDP)

Finish

Navigate to **Recording Profile** in the left window. A new profile for **Voxtronic** can be added.

Session Border Controller for Enterprise

AVAYA

Domain DCS

Server Interworking

Media Forking

Routing

Topology Hiding

Signaling Manipulation

URI Groups

SNMP Traps

Time of Day Rules

FGDN Groups

Reverse Proxy Policy

URN Profile

Recording Profile

H248 Profile

IP/URI Blocklist Profile

Recording Profiles: Voxtronic

Add

RenameDelete

Click here to add a description.

Recording Profile

Edit

Call Termination on Recording Failure

☐

Play Recording Tone

☐

Routing Profile

Recording Type

Video Recording

Voxtronic

Full Time

☐

The **Routing Profile** created earlier is used, and the **Recording Type** is set to **Full Time**.

Recording Profile

X

Call Termination on Recording Failure

☐

Play Recording Tone

☐

Add

Routing Profile

Recording Type

Video Recording

Voxtronic

Full Time

☐

Delete

Finish

7.2. Configure Services

A new **SIP Server** must be created for the connection to the VoIP Recorder. This new profile can be created by either cloning the existing Session Manager profile or by clicking on **Add**. Navigate to **Services** → **SIP Servers** in the left window to add the SIP Server called **Voxtronic**.

The screenshot shows the 'Session Border Controller for Enterprise' interface. On the left is a navigation menu with options like EMS Dashboard, Software Management, Device Management, Backup/Restore, System Parameters, Configuration Profiles, and Services. Under Services, 'SIP Servers' is selected. The main area is titled 'SIP Servers: SMvmpg 8.1' and includes an 'Add' button and 'Rename', 'Clone', and 'Delete' buttons. Below this is a 'Server Profiles' list with 'SMvmpg 8.1', 'SM-PSTN-PG', 'sm101x-TCP', 'sm101x-TLS', and 'Voxtronic'. The 'General' tab is active, showing fields for 'Server Type' (Call Server), 'TLS Client Profile' (SM81_Interface), and 'DNS Query Type' (NONE/A). Below these is a table for IP Address / FQDN, Port, and Transport. The table has one row: 10.10.40.32, 5061, TLS. An 'Edit' button is at the bottom right of the table.

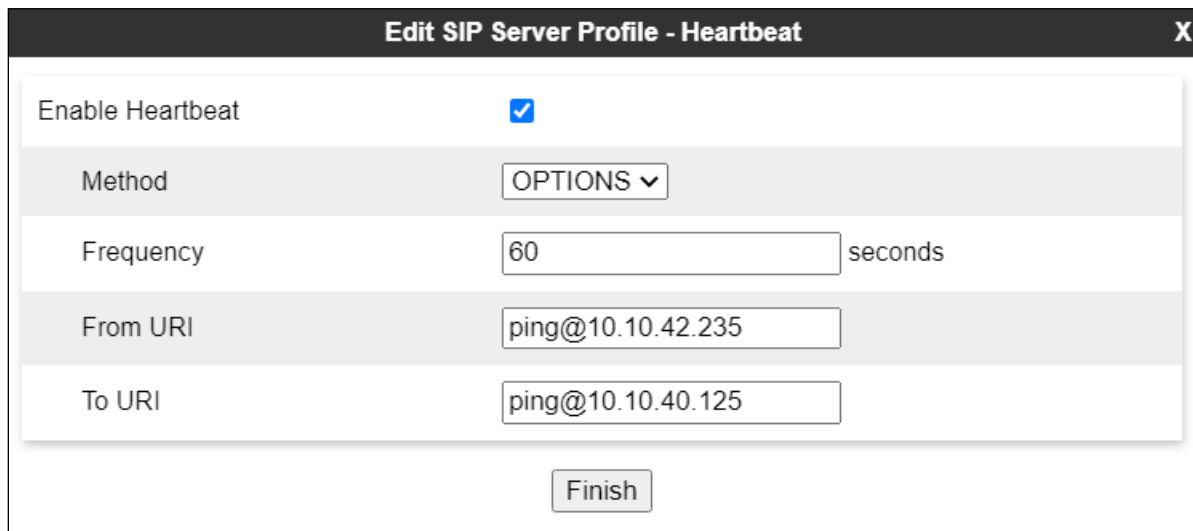
IP Address / FQDN	Port	Transport
10.10.40.32	5061	TLS

Under the **General** tab, the **Server Type** must be set to **Recording Server**. Seen as the connection is not using TLS there is no requirement for a **TLS Profile**. The **IP Address** of the VoIP Recorder is entered here along with the **Transport** Protocol and the **Port** that is being used.

The screenshot shows the 'Edit SIP Server Profile - General' window. A blue banner at the top states: 'Server Type can not be changed while this SIP Server Profile is associated to a Server Flow.' Below this are fields for 'Server Type' (Recording Server), 'SIP Domain' (empty), 'DNS Query Type' (NONE/A), and 'TLS Client Profile' (None). An 'Add' button is at the bottom right. Below these fields is a table for IP Address / FQDN, Port, and Transport. The table has one row: 10.10.40.125, 5060, UDP. A 'Delete' button is at the bottom right of the table. A 'Finish' button is at the bottom center.

IP Address / FQDN	Port	Transport
10.10.40.125	5060	UDP

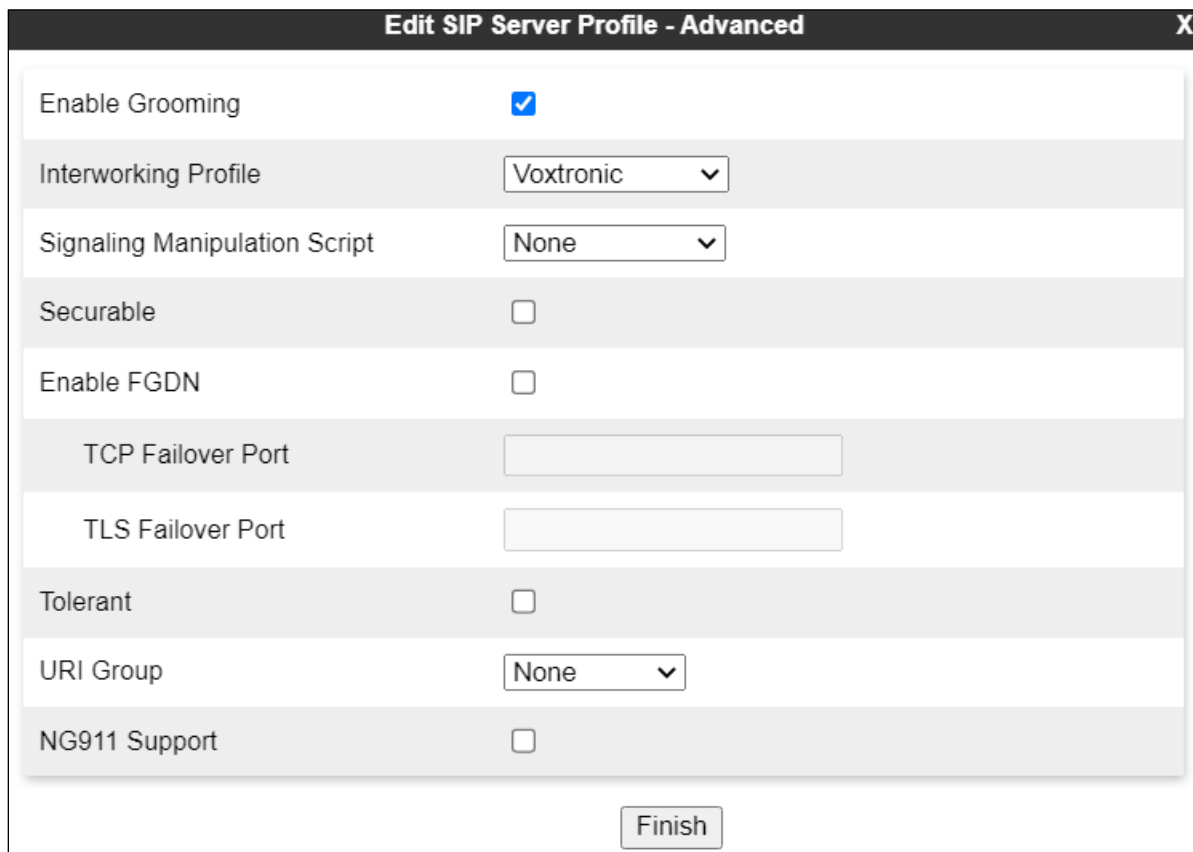
Under the Heartbeat tab, **OPTIONS** can be sent to the recorder as a keepalive or to ensure the link is setup. This is done as shown below.



The screenshot shows a dialog box titled "Edit SIP Server Profile - Heartbeat" with a close button (X) in the top right corner. The dialog contains the following fields and controls:

- Enable Heartbeat:** A checkbox that is checked.
- Method:** A dropdown menu set to "OPTIONS".
- Frequency:** A text input field containing "60", followed by the label "seconds".
- From URI:** A text input field containing "ping@10.10.42.235".
- To URI:** A text input field containing "ping@10.10.40.125".
- Finish:** A button at the bottom center of the dialog.

Under the **Advanced** tab, the following was set for compliance testing. Note, the Server **Internetworking Profile** setup in **Section 7.1** was used here.



The screenshot shows a dialog box titled "Edit SIP Server Profile - Advanced" with a close button (X) in the top right corner. The dialog contains the following fields and controls:

- Enable Grooming:** A checkbox that is checked.
- Interworking Profile:** A dropdown menu set to "Voxtronic".
- Signaling Manipulation Script:** A dropdown menu set to "None".
- Securable:** An unchecked checkbox.
- Enable FGDN:** An unchecked checkbox.
- TCP Failover Port:** An empty text input field.
- TLS Failover Port:** An empty text input field.
- Tolerant:** An unchecked checkbox.
- URI Group:** A dropdown menu set to "None".
- NG911 Support:** An unchecked checkbox.
- Finish:** A button at the bottom center of the dialog.

7.3. Configure Domain Policies

An End Point Policy Group for Voxtronic is the aim within Domain Policies, and in order to create this policy group certain rules must be created first, beginning with **Application Rules**. Like with almost all rules and policies, a new one can be either cloned from an existing one or created fresh by clicking on **Add**.

The screenshot shows the 'Session Border Controller for Enterprise' interface with the 'AVAYA' logo. On the left is a navigation menu with categories like EMS Dashboard, Software Management, Device Management, Backup/Restore, System Parameters, Configuration Profiles, Services, and Domain Policies. Under 'Domain Policies', 'Application Rules' is highlighted in red. The main area is titled 'Application Rules: Voxtronic' and includes an 'Add' button and 'Rename', 'Clone', and 'Delete' buttons. A list of application rules is shown, with 'Voxtronic' selected. The details for the 'Voxtronic' rule are displayed in a table:

Application Type	In	Out	Maximum Concurrent Sessions	Maximum Sessions Per Endpoint
Audio	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	1000	10
Video	<input type="checkbox"/>	<input type="checkbox"/>		

Below the table is a 'Miscellaneous' section with the following settings:

- CDR Support: Off
- RTCP Keep-Alive: No

An 'Edit' button is located at the bottom right of the rule details.

The information contained in the **Application Rule** below was used for compliance testing.

The 'Editing Rule: Voxtronic' dialog box shows the following configuration options:

Application Type	In	Out	Maximum Concurrent Sessions	Maximum Sessions Per Endpoint
Audio	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	1000	10
Video	<input type="checkbox"/>	<input type="checkbox"/>		


Below the table is a 'Miscellaneous' section with the following settings:

- CDR Support: ☒ Off, ☐ RADIUS, ☐ CDR Adjunct
- RADIUS Profile: None (dropdown)
- Media Statistics Support: ☐
- Call Duration: ☒ Setup, ☐ Connect
- RTCP Keep-Alive: ☐

A 'Finish' button is located at the bottom right of the dialog box.

A new Media Rule was also created, click in **Media Rules** in the left window, and either clone one or add a new Media Rule.

Session Border Controller for Enterprise



EMS Dashboard

Software Management

Device Management

Backup/Restore

▸ System Parameters

▸ Configuration Profiles

▸ Services

▾ Domain Policies

- Application Rules
- Border Rules
- Media Rules**
- Security Rules
- Signaling Rules
- Charging Rules
- End Point Policy Groups
- Session Policies

▸ TLS Management

▸ Network & Flows

▸ DMZ Services

▸ Monitoring & Logging

Media Rules: Voxtronic

Add

Media Rules

default-low-med

default-low-m...

default-high

default-high-enc

avaya-low-me...

MediaRule_S...

MediaRule_RTP

Voxtronic

Rename

Clone

Delete

Click here to add a description.

Encryption

Codec Prioritization

Advanced

QoS

Audio Encryption

Preferred Formats

RTP

Interworking

☒

Symmetric Context Reset

☒

Key Change in New Offer

☐

Video Encryption

Preferred Formats

RTP

Interworking

☒

Symmetric Context Reset

☒

Key Change in New Offer

☐

Miscellaneous

Capability Negotiation

☐

Looking at the **Encryption** tab. The connection to Conex did not avail of any security as per the wishes of Voxtronic, and so **RTP** is the preferred **Audio** and **Video Encryption**.

Audio Encryption	
Preferred Format #1	<input type="text" value="RTP"/>
Preferred Format #2	<input type="text" value="NONE"/>
Preferred Format #3	<input type="text" value="NONE"/>
Encrypted RTCP	<input type="checkbox"/>
MKI	<input type="checkbox"/>
Lifetime Leave blank to match any value.	2^ <input type="text"/>
Interworking	<input checked="" type="checkbox"/>
Symmetric Context Reset	<input checked="" type="checkbox"/>
Key Change in New Offer	<input type="checkbox"/>

Video Encryption	
Preferred Format #1	<input type="text" value="RTP"/>
Preferred Format #2	<input type="text" value="NONE"/>
Preferred Format #3	<input type="text" value="NONE"/>
Encrypted RTCP	<input type="checkbox"/>
MKI	<input type="checkbox"/>
Lifetime Leave blank to match any value.	2^ <input type="text"/>
Interworking	<input checked="" type="checkbox"/>
Symmetric Context Reset	<input checked="" type="checkbox"/>
Key Change in New Offer	<input type="checkbox"/>

Miscellaneous	
Capability Negotiation	<input type="checkbox"/>

Finish

Looking at the **Codec Prioritization** tab. **Codec Prioritization** can be left unticked as default. Below serves to show how each Codec can be chosen and prioritized, should that need arise.

The screenshot shows a 'Codec Prioritization' dialog box with two main sections: 'Audio Codec' and 'Video Codec'. Each section has checkboxes for 'Codec Prioritization', 'Allow Preferred Codecs Only', 'Transcode', and 'Transrating'. The 'Audio Codec' section is active, showing a list of available codecs and a 'P-Time (Optional)' slider. The 'Video Codec' section is inactive. A 'Finish' button is at the bottom.

Audio Codec

Codec Prioritization ☒ Allow Preferred Codecs Only ☐

Transcode ☐ Transrating ☐

Preferred Codecs

D - Dynamic
T - Transcodable (if enabled)
P - P-Time

Available	P-Time (Optional)	Selected
Reserved (1)	10	G722 (9) [T]
Reserved (2)	20	AMR Wide Band [DT]
GSM (3)	30	OPUS Wide Band [DT]
G723 (4)	60	PCMA (8) [T]
DVI4 (5)		PCMU (0) [T]
DVI4 (6)		G729 (18) [T]
LPC (7)		G729AB (18) [T]
L16 (10)		

Video Codec

Codec Prioritization ☐ Allow Preferred Codecs Only ☐

Transcode When Needed ☐ Transrating ☐

Preferred Codecs

Available	Selected
CelB (25)	
JPEG (26)	
nv (28)	
H261 (31)	
MPV (32)	
MP2T (33)	
H263 (34)	
H264 [D]	

Finish

Looking at the **QoS** tab, this was enabled and set as shown below.

Media QoS X

Media QoS Marking

Enabled ☒

☐ ToS

Audio Precedence

Routine ▾

000

Audio ToS

Minimize Delay ▾

1000

Video Precedence

Routine ▾

000

Video ToS

Minimize Delay ▾

1000

☒ DSCP

Audio

EF ▾

101110

Video

AF41 ▾

100010

Finish

Click on **Signalling Rules** in the left windows to add or clone one for Voxtronic.

Session Border Controller for Enterprise

EMS Dashboard

Software Management

Device Management

Backup/Restore

▸ System Parameters

▸ Configuration Profiles

▸ Services

▾ Domain Policies

- Application Rules
- Border Rules
- Media Rules
- Security Rules
- Signaling Rules**
- Charging Rules
- End Point Policy Groups
- Session Policies

▸ TLS Management

▸ Network & Flows

▸ DMZ Services

▸ Monitoring & Logging

Signaling Rules: Voxtronic

Add

default

No-Content-T...

Remote-Worker

Voxtronic

RenameCloneDelete

Click here to add a description.

GeneralRequestsResponsesRequest HeadersResponse HeadersSignaling QoS

UCID

Inbound

Requests	Allow
Non-2XX Final Responses	Allow
Optional Request Headers	Allow
Optional Response Headers	Allow

Outbound

Requests	Allow
Non-2XX Final Responses	Allow
Optional Request Headers	Allow
Optional Response Headers	Allow

Content-Type Policy

Enable Content-Type Checks	<input checked="" type="checkbox"/>		
Action	Allow	Multipart Action	Allow

PG; Reviewed:
SPOC 3/8/2023

Solution & Interoperability Test Lab Application Notes
©2023 Avaya Inc. All Rights Reserved.

52 of 89
Conex_SCBE101

Clicking on the **General Tab** (from the previous page), shows the default settings below which were not changed.

General Control

X

Inbound

Requests

Allow

403

Forbidden

Non-2XX Final Responses

Allow

486

Busy Here

Optional Request Headers

Allow

403

Forbidden

Optional Response Headers

Allow

486

Busy Here

Outbound

Requests

Allow

403

Forbidden

Non-2XX Final Responses

Allow

486

Busy Here

Optional Request Headers

Allow

403

Forbidden

Optional Response Headers

Allow

486

Busy Here

Next

All other tabs for the Signalling Rule were left as default, and the **Signalling QoS** tab was set as shown below.

Signaling QoS

Enabled

☒

ToS

Precedence

Routine

000

ToS

Minimize Delay

1000

DSCP

Value

AF41

100010

Finish

The **UCID** tab must be set, by ticking the **UCID** box as shown below, with a unique **Node ID** set.

Signaling Rules: Voxtronic

Add

Rename

Clone

Delete

Signaling Rules

default

No-Content-T...

Remote-Worker

Voxtronic

Click here to add a description.

General

Requests

Responses

Request Headers

Response Headers

Signaling QoS

UCID

UCID

☒

Node ID

101

Protocol Discriminator

0x00

Edit

PG; Reviewed:
SPOC 3/8/2023

Solution & Interoperability Test Lab Application Notes
©2023 Avaya Inc. All Rights Reserved.

54 of 89
Conex_SCBE101

Finally, the **End Point Policy Group** can be created using some of the previous set rules. Again, this End Point Policy Group can be added as new or cloned from an existing group and then altered to suit the Voxtronic connection to the SBCE.

Session Border Controller for Enterprise

AVAYA

EMS Dashboard
Software Management
Device Management
Backup/Restore
System Parameters
Configuration Profiles
Services
Domain Policies
Application Rules
Border Rules
Media Rules
Security Rules
Signaling Rules
Charging Rules
End Point Policy Groups
Session Policies
TLS Management
Network & Flows
DMZ Services
Monitoring & Logging

Policy Groups: Voxtronic

Add

Rename

Clone

Delete

Click here to add a description.

Hover over a row to see its description.

Policy Group

Summary

Order	Application	Border	Media	Security	Signaling	Charging	RTCP Mon Gen	
1	Voxtronic	default	Voxtronic	default-low	Voxtronic	None	Off	Edit

Below shows the various **Rules**, amply named **Voxtronic**, being used for this Policy Group.

Edit Policy Set

X

Application Rule

Voxtronic

Border Rule

default

Media Rule

Voxtronic

Security Rule

default-low

Signaling Rule

Voxtronic

Charging Rule

None

RTCP Monitoring Report Generation

Off

Finish

The final policy within **Domain Policies** set for Voxtronic was **Session Policies**.

The screenshot shows the 'Session Border Controller for Enterprise' web interface. On the left is a navigation menu with options like EMS Dashboard, Software Management, Device Management, Backup/Restore, System Parameters, Configuration Profiles, Services, and Domain Policies. Under Domain Policies, Session Policies is highlighted. The main area is titled 'Session Policies: Voxtronic' and includes buttons for Add, Rename, Clone, and Delete. A description field is present with the text 'Click here to add a description.' Below this, there are tabs for Media and URN Profile. The Media tab is active, showing a list of settings: Media Anchoring (checked), Media Forking Profile (None), Converged Conferencing (unchecked), Recording Server (checked), Recording Profile (Voxtronic), and Media Server (unchecked). An Edit button is at the bottom right of the settings list.

Setting	Value
Media Anchoring	<input checked="" type="checkbox"/>
Media Forking Profile	None
Converged Conferencing	<input type="checkbox"/>
Recording Server	<input checked="" type="checkbox"/>
Recording Profile	Voxtronic
Media Server	<input type="checkbox"/>

Below shows the Session Policy details, note that both **Media Anchoring** and **Recording Server** are both ticked, and the **Recording Profile** created in **Section 7.1** was used.

The screenshot shows a 'Media' dialog box with a close button (X) in the top right corner. It contains the following settings: Media Anchoring (checked), Media Forking Profile (None), Converged Conferencing (unchecked), Recording Server (checked), Recording Profile (Voxtronic), Media Server (unchecked), Routing Profile (None), and Call Type for Media Unanchoring (Media Tromboning Only). A Finish button is at the bottom.

Setting	Value
Media Anchoring	<input checked="" type="checkbox"/>
Media Forking Profile	None
Converged Conferencing	<input type="checkbox"/>
Recording Server	<input checked="" type="checkbox"/>
Recording Profile	Voxtronic
Media Server	<input type="checkbox"/>
Routing Profile	None
Call Type for Media Unanchoring	Media Tromboning Only

7.4. Configure Network & Flows

This is the core setup for the routing of SIP messages to Conex. Most of the settings described in the previous sections are geared towards providing a suitable server flow. When calls are made to or from Remote Workers, this must trigger the appropriate server flow and send the SIP INVITE to Conex. The “SBCE Loop” which was setup to record all VDN calls is also configured here to ensure that when the Implicit User is called and the Application Sequence is used, that the same INVITE is again triggered to Conex. The screens below will show a number of Server Flows as there are many required to route SIP messages through the SBCE, however this section focuses on those created specifically for Voxtronic.

Clicking on **Network Management** in the left window, shows the **Networks** and **IP Addresses** involved. For compliance testing and the setup to Conex, both the **A1** and **B2** interfaces are involved.

Session Border Controller for Enterprise **AVAYA**

EMS Dashboard
Software Management
Device Management
Backup/Restore
▸ System Parameters
▸ Configuration Profiles
▸ Services
▸ Domain Policies
▸ TLS Management
▾ Network & Flows
 Network Management
 Media Interface
 Signaling Interface
 End Point Flows
 Session Flows
 Advanced Options

Network Management

Interfaces **Networks**

Add

Name	Gateway	Subnet Mask / Prefix Length	Interface	IP Address	Edit	Delete
Internal A1 - SM	10.10.40.1	255.255.255.0	A1	10.10.40.158, 10.10.40.159	Edit	Delete
External B2 - SIM PSTN	10.10.42.1	255.255.255.0	B2	10.10.42.235	Edit	Delete
External B1 - Public Connections	10.17.122.1	255.255.255.128	B1	10.17.122.16	Edit	Delete

Clicking on the **Interfaces** tab, shows the **A1** and **B2** interfaces are the only ones **Enabled**.

EMS Dashboard
Software Management
Device Management
Backup/Restore
▸ System Parameters
▸ Configuration Profiles
▸ Services
▸ Domain Policies
▸ TLS Management
▾ Network & Flows
 Network Management

Network Management

Interfaces **Networks**

Add VLAN

Interface Name	VLAN Tag	Status
A1		Enabled
A2		Disabled
B1		Disabled
B2		Enabled

Clicking on the **Signalling Interface** in the left window, shows all the interfaces that are currently setup. A new Signalling Interface for the “Voxtronic-Loop” was created to allow the VDN calls to be recorded along with any and all announcements.

Session Border Controller for Enterprise

AVAYA

EMS Dashboard
Software Management
Device Management
Backup/Restore
System Parameters
Configuration Profiles
Services
Domain Policies
TLS Management
Network & Flows
Network Management
Media Interface
Signaling Interface
End Point Flows
Session Flows
Advanced Options
DMZ Services
Monitoring & Logging

Signaling Interface

Signaling Interface

Add

Name	Signaling IP Network	TCP Port	UDP Port	TLS Port	TLS Profile	
Sig-EXT-TRK-235	10.10.42.235 External B2 - SIM PSTN (B2, VLAN 0)	5060	5060	---	None	Edit Delete
Sig-EXT-RW-235	10.10.42.235 External B2 - SIM PSTN (B2, VLAN 0)	---	---	5061	ServerProfile	Edit Delete
Voxtronic-Loop	10.10.40.158 Internal A1 - SM (A1, VLAN 0)	---	---	5065	ServerProfile	Edit Delete
Sig-Int-TRK	10.10.40.158 Internal A1 - SM (A1, VLAN 0)	5060	5060	5061	ServerProfile	Edit Delete
Sig-Int-RW	10.10.40.159 Internal A1 - SM (A1, VLAN 0)	5060	5060	5061	ServerProfile	Edit Delete

For this to work, the Inside IP address of the SBCE was used, and the port to Session Manager was specifically set to match that in **Section 6.2.1**. This uses TLS as this is a connection between the two Avaya components, that being the SBCE and Session Manager. This is used however for the recording of calls but is not connected to the VoIP Recorder.

Edit Signaling Interface

Name

Voxtronic-Loop

IP Address

Internal A1 - SM (A1, VLAN 0)

10.10.40.158

TCP Port

Leave blank to disable

UDP Port

Leave blank to disable

TLS Port

Leave blank to disable

5065

TLS Profile

ServerProfile

Enable Shared Control

☐

Shared Control Port

Finish

Clicking on **End Point Flows** in the left window shows the **Subscriber Flows** and the **Server Flows**. The Subscriber Flows are setup for Remote Workers and are outside the scope of these Application Notes. However, most of the setup for Remote Workers is shown in **Appendix A**.

EMS Dashboard

Software Management

Device Management

Backup/Restore

System Parameters

Configuration Profiles

Services

Domain Policies

TLS Management

Network & Flows

Network Management

Media Interface

Signaling Interface

End Point Flows

Session Flows

Advanced Options

End Point Flows

Subscriber Flows

Server Flows

Update

Add

Modifications made to an End-Point Flow will only take effect on new registrations or re-registrations.

Hover over a row to see its description.

Priority	Flow Name	URI Group	Source Subnet	User Agent	End Point Policy Group	
1	Remote-Worker-96x1	*	*	Avaya 96x1	RW-SRTP	View Clone Edit Delete
2	Remote-Worker-JSeries	*	*	J Series	RW-SRTP	View Clone Edit Delete

Clicking on the **Server Flows** tab shows all the Server Flows in operation. There are three flows created that use the **Voxtronic SIP Server**, these are **Vox-In**, **Vox-Out** and **Vox-RW**. Another flow is created for the **Voxtronic Loop** for recording the VDN calls, and this uses the Session Manager **SIP Server**.

EMS Dashboard

Software Management

Device Management

Backup/Restore

System Parameters

Configuration Profiles

Services

Domain Policies

TLS Management

Network & Flows

Network Management

Media Interface

Signaling Interface

End Point Flows

Session Flows

Advanced Options

DMZ Services

Monitoring & Logging

End Point Flows

Subscriber Flows

Server Flows

Update

Priority	Flow Name	URI Group	Received Interface	Signaling Interface	End Point Policy Group	Routing Profile	
1	To PSTN PG from Aura 8.1	*	Sig-EXT-TRK-235	Sig-Int-TRK	SM-PSTN-RTP	SM-PSTN-PG	View Clone Edit Delete

SIP Server: Voxtronic

Update

Priority	Flow Name	URI Group	Received Interface	Signaling Interface	End Point Policy Group	Routing Profile	
1	Vox-In	*	Voxtronic-Loop	Sig-EXT-TRK-235	Voxtronic	Voxtronic	View Clone Edit Delete
2	Vox-Out	*	Sig-EXT-TRK-235	Voxtronic-Loop	Voxtronic	Voxtronic	View Clone Edit Delete
3	Vox-RW	*	Sig-Int-RW	Sig-EXT-RW-235	Voxtronic	Voxtronic	View Clone Edit Delete

SIP Server: sm101x-TLS

Update

Priority	Flow Name	URI Group	Received Interface	Signaling Interface	End Point Policy Group	Routing Profile	
1	To PSTN PG from Aura 10.1	*	Sig-EXT-TRK-235	Sig-Int-TRK	SM-PSTN-SRTP	SM-PSTN-PG	View Clone Edit Delete
2	To Remote Worker	*	Sig-EXT-RW-235	Sig-Int-RW	RW-SRTP	SM-PSTN-PG	View Clone Edit Delete
3	Voxtronic Loop	*	Voxtronic-Loop	Voxtronic-Loop	default-low	sm101x-TLS	View Clone Edit Delete

Below are the details for the **Vox-In** Server Flow.

Edit Flow: Vox-In		X
Flow Name	<input type="text" value="Vox-In"/>	
SIP Server Profile	Voxtronic ▼	
URI Group	* ▼	
Transport	* ▼	
Remote Subnet	<input type="text" value="*"/>	
Received Interface	Voxtronic-Loop ▼	
Signaling Interface	Sig-EXT-TRK-235 ▼	
Media Interface	Med-Ext-235 ▼	
Secondary Media Interface	None ▼	
End Point Policy Group	Voxtronic ▼	
Routing Profile	Voxtronic ▼	
Topology Hiding Profile	sm101x ▼	
Signaling Manipulation Script	None ▼	
Remote Branch Office	Any ▼	
Link Monitoring from Peer	<input type="checkbox"/>	
FQDN Support	<input type="checkbox"/>	
FQDN	<input type="text"/>	
<input type="button" value="Finish"/>		

Below are the details for the **Vox-Out** Server Flow.

Edit Flow: Vox-Out		X
Flow Name	<input type="text" value="Vox-Out"/>	
SIP Server Profile	<input type="text" value="Voxtronic"/>	
URI Group	<input type="text" value="*/"/>	
Transport	<input type="text" value="*/"/>	
Remote Subnet	<input type="text" value="*/"/>	
Received Interface	<input type="text" value="Sig-EXT-TRK-235"/>	
Signaling Interface	<input type="text" value="Voxtronic-Loop"/>	
Media Interface	<input type="text" value="Med-Int-158"/>	
Secondary Media Interface	<input type="text" value="None"/>	
End Point Policy Group	<input type="text" value="Voxtronic"/>	
Routing Profile	<input type="text" value="Voxtronic"/>	
Topology Hiding Profile	<input type="text" value="sm101x"/>	
Signaling Manipulation Script	<input type="text" value="None"/>	
Remote Branch Office	<input type="text" value="Any"/>	
Link Monitoring from Peer	<input type="checkbox"/>	
FQDN Support	<input type="checkbox"/>	
FQDN	<input type="text"/>	
<input type="button" value="Finish"/>		

Below are the details for the **Vox-RW** Server Flow.

Edit Flow: Vox-RW		X
Flow Name	<input type="text" value="Vox-RW"/>	
SIP Server Profile	<input type="text" value="Voxtronic"/>	
URI Group	<input type="text" value="*/"/>	
Transport	<input type="text" value="*/"/>	
Remote Subnet	<input type="text" value="*/"/>	
Received Interface	<input type="text" value="Sig-Int-RW"/>	
Signaling Interface	<input type="text" value="Sig-EXT-RW-235"/>	
Media Interface	<input type="text" value="Med-Ext-235"/>	
Secondary Media Interface	<input type="text" value="None"/>	
End Point Policy Group	<input type="text" value="Voxtronic"/>	
Routing Profile	<input type="text" value="Voxtronic"/>	
Topology Hiding Profile	<input type="text" value="sm101x"/>	
Signaling Manipulation Script	<input type="text" value="None"/>	
Remote Branch Office	<input type="text" value="Any"/>	
Link Monitoring from Peer	<input type="checkbox"/>	
FQDN Support	<input type="checkbox"/>	
FQDN	<input type="text"/>	
<input type="button" value="Finish"/>		

Below are the details for the **Voxtronic Loop** Server Flow.

Edit Flow: Voxtronic Loop X

Flow Name	<input type="text" value="Voxtronic Loop"/>
SIP Server Profile	<input type="text" value="sm101x-TLS"/>
URI Group	<input type="text" value="*/"/>
Transport	<input type="text" value="*/"/>
Remote Subnet	<input type="text" value="*/"/>
Received Interface	<input type="text" value="Voxtronic-Loop"/>
Signaling Interface	<input type="text" value="Voxtronic-Loop"/>
Media Interface	<input type="text" value="Med-Int-158"/>
Secondary Media Interface	<input type="text" value="None"/>
End Point Policy Group	<input type="text" value="default-low"/>
Routing Profile	<input type="text" value="sm101x-TLS"/>
Topology Hiding Profile	<input type="text" value="sm101x"/>
Signaling Manipulation Script	<input type="text" value="None"/>
Remote Branch Office	<input type="text" value="Any"/>
Link Monitoring from Peer	<input type="checkbox"/>
FQDN Support	<input type="checkbox"/>
FQDN	<input type="text"/>

Finish

Finally, within **Network & Flows**, the Session Flow for Voxtronic is added. Click in Session Flows in the left window and click on **Add** to add a new flow.

EMS Dashboard

Software Management

Device Management

Backup/Restore

▸ System Parameters

▸ Configuration Profiles

▸ Services

▸ Domain Policies

▸ TLS Management

▸ Network & Flows

Network Management

Media Interface

Signaling Interface

End Point Flows

Session Flows

Advanced Options

▸ DMZ Services

▸ Monitoring & Logging

Session Flows

Session Flows

Add

Modifications made to a Session Flow will only take effect on new sessions.

Hover over a row to see its description.

Priority	Flow Name	URI Group #1	URI Group #2	Subnet #1	Subnet #2	Session Policy	
1	Voxtronic	*	*	*	*	Voxtronic	Clone Edit Delete

Below are the details for the **Voxtronic** Session Flow.

Edit Flow: Voxtronic

Flow Name

Voxtronic

URI Group #1

*

URI Group #2

*

Subnet #1

Ex: 192.168.0.1/24

*

SBC IP Address

*

*

Subnet #2

Ex: 192.168.0.1/24

*

SBC IP Address

*

*

Session Policy

Voxtronic

Has Remote SBC

☒

Finish

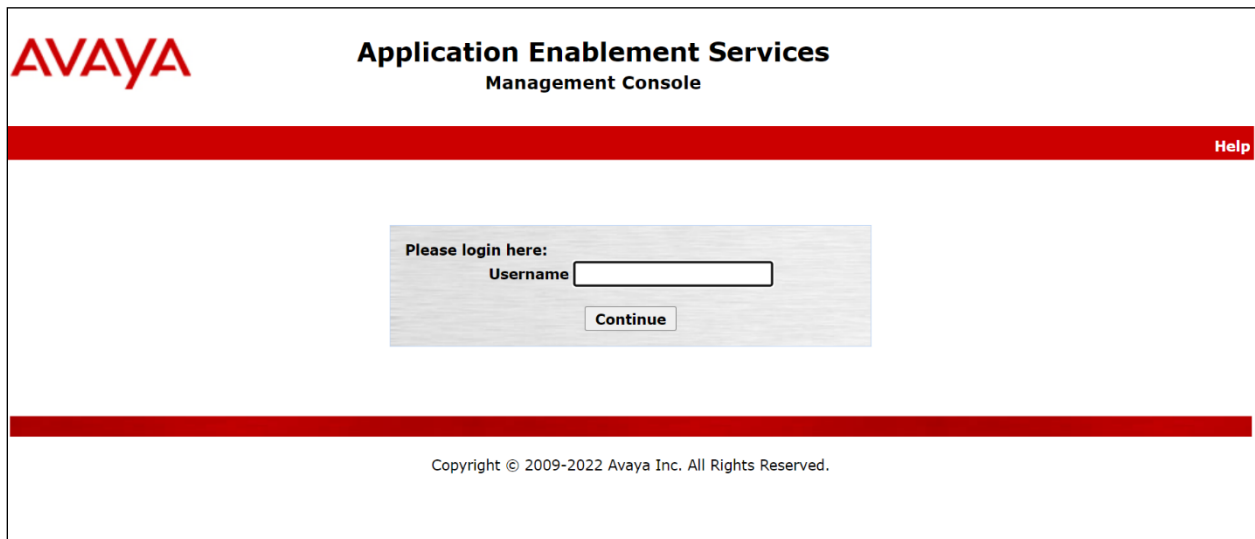
8. Configure Avaya Aura® Application Enablement Services

This section provides the procedures for configuring AES. The procedures fall into the following areas:

- Verify Licensing
- Switch Connection
- Administer TSAPI Link
- Identify Tlinks
- Enable TSAPI Ports
- Create CTI User
- Configure Security
- Restart AE Server

8.1. Verify Licensing

To access the AES Management Console, enter **https://<ip-addr>** as the URL in an Internet browser, where <ip-addr> is the IP address of AES. At the login screen displayed, log in with the appropriate credentials and then select the **Login** button.



The screenshot shows the Avaya Application Enablement Services Management Console login interface. At the top left is the Avaya logo. To its right, the text "Application Enablement Services" is displayed in a large, bold font, with "Management Console" in a smaller font below it. A thick red horizontal bar spans the width of the page, with the word "Help" in white text on the right side. In the center of the page is a light gray rectangular box containing the text "Please login here:" followed by a label "Username" and a text input field. Below the input field is a "Continue" button. At the bottom of the page, another thick red horizontal bar is present, with the copyright notice "Copyright © 2009-2022 Avaya Inc. All Rights Reserved." centered below it.

The Application Enablement Services Management Console appears displaying the **Welcome to OAM** screen (not shown). Select **AE Services** and verify that the TSAPI Services are licensed by ensuring that **TSAPI Service** is in the list of **Services** and that the **License Mode** is showing **NORMAL MODE**. If not, contact an Avaya support representative to acquire the appropriate license.

The screenshot shows the 'AE Services' management console. On the left is a navigation menu with options like CVLAN, DLG, DMCC, SMS, TSAPI, TWS, Communication Manager Interface, High Availability, Licensing, Maintenance, Networking, Security, Status, User Management, Utilities, and Help. The 'Licensing' option is selected. The main content area displays a table of services and their status.

Service	Status	State	License Mode	Cause*
ASAI Link Manager	N/A	Running	N/A	N/A
CVLAN Service	OFFLINE	Running	N/A	N/A
DLG Service	OFFLINE	Running	N/A	N/A
DMCC Service	ONLINE	Running	NORMAL MODE	N/A
TSAPI Service	ONLINE	Running	NORMAL MODE	N/A
Transport Layer Service	N/A	Running	N/A	N/A
AE Services HA	Not Configured	N/A	N/A	N/A

Below the table, there is a note: 'For status on actual services, please use [Status and Control](#)'. A footnote states: '* -- For more detail, please mouse over the Cause, you'll see the tooltip, or go to help page.' License information at the bottom indicates the system is licensed for CTI release 8.x.

The TSAPI licenses are user licenses issued by the Web License Manager to which the Application Enablement Services server is pointed to. From the left window open **Licensing** and click on **WebLM Server Access** as shown below.

The screenshot shows the 'Licensing' management console. The left navigation menu has 'Licensing' selected. The main content area provides instructions for setting up and maintaining the WebLM.

Licensing

If you are setting up and maintaining the WebLM, you need to use the following:

- WebLM Server Address

If you are importing, setting up and maintaining the license, you need to use the following:

- WebLM Server Access

If you want to administer TSAPI Reserved Licenses or DMCC Reserved Licenses, you need to use the following:

- Reserved Licenses

NOTE: Please disable your pop-up blocker if you are having difficulty with opening this page

The following screen shows the available licenses for **TSAPI** users.

Routing		Licenses																																							
<div><div>▼ Application_Enablement</div><div><div>View by feature</div><div>View by local WebLM</div><div>Enterprise configuration</div><div>▶ Local WebLM Configuration</div><div>▶ Usages</div><div>▶ Allocations</div><div>Periodic status</div></div><div>CE</div><div><div>▶ COLLABORATION_ENVIRONMENT</div><div>COMMUNICATION_MANAGER</div><div><div>▶ Call_Center</div><div>▶ Communication_Manager</div><div>Configure Centralized Licensing</div></div><div>CONTROLMANAGER</div><div><div>▶ Control_Manager</div><div>MEDIA_SERVER</div><div><div>▶ Media_Server</div></div></div><div>OL</div><div><div>▶ OL</div></div><div>SESSIONMANAGER</div><div><div>▶ SessionManager</div></div><div>SYSTEM_MANAGER</div><div><div>▶ System_Manager</div></div><div>Uninstall license</div><div>Server properties</div><div>Metering Collector Configuration</div></div></div>		<div><div>License Owner:</div> Avaya DevConnect Any Street US United States</div> <div><div>License Host:</div> greanep_V7-9C-9C-27-95-A6-01_Aura10.1</div> <div><div>Notes:</div> This production license file is for use on a production license host.</div> <div><div>License File Host IDs:</div> V7-9C-9C-27-95-A6-01, V7-9C-9C-27-95-A6-01</div>																																							
		<table><thead><tr><th>Feature (License Keyword)</th><th>License Capacity</th><th>Currently available</th></tr></thead><tbody><tr><td>Unified CC API Desktop Edition (VALUE_AES_AEC_UNIFIED_CC_DESKTOP)</td><td>1000</td><td>1000</td></tr><tr><td>CVLAN ASAI (VALUE_AES_CVLAN_ASAI)</td><td>16</td><td>16</td></tr><tr><td>High Availability Medium (VALUE_AES_HA_MEDIUM)</td><td>8</td><td>8</td></tr><tr><td>Device Media and Call Control (VALUE_AES_DMCC_DMC)</td><td>1000</td><td>990</td></tr><tr><td>AES ADVANCED SMALL SWITCH (VALUE_AES_AEC_SMALL_ADVANCED)</td><td>3</td><td>3</td></tr><tr><td>AES ADVANCED LARGE SWITCH (VALUE_AES_AEC_LARGE_ADVANCED)</td><td>3</td><td>3</td></tr><tr><td>DLG (VALUE_AES_DLG)</td><td>16</td><td>16</td></tr><tr><td>TSAPI Simultaneous Users (VALUE_AES_TSAPI_USERS)</td><td>1000</td><td>965</td></tr><tr><td>High Availability Large (VALUE_AES_HA_LARGE)</td><td>3</td><td>3</td></tr><tr><td>SmallServerTypes: s8300c;s8300d;icc;premio;tn8400;laptop;CtiSmallServer MediumServerTypes: ibmx306;ibmx306m;dell1950;xen;hs20;hs20_8832_vm;CtiMediumServer LargeServerTypes: isp2100;ibmx305;d1380g3;d1385g1;d1385g2;unknown;CtiLargeServer TrustedApplications: IPS_001, BasicUnrestricted, AdvancedUnrestricted, DMCUnrestricted; 1XP_001, BasicUnrestricted, AdvancedUnrestricted, DMCUnrestricted; 1XM_001, BasicUnrestricted, AdvancedUnrestricted, DMCUnrestricted; PC_001, BasicUnrestricted, AdvancedUnrestricted, DMCUnrestricted; CIE_001, BasicUnrestricted, AdvancedUnrestricted, DMCUnrestricted; OSPC_001, BasicUnrestricted, AdvancedUnrestricted, DMCUnrestricted; VP_001, BasicUnrestricted, AdvancedUnrestricted, DMCUnrestricted; SAMETIME_001, VALUE_AES_UNIFIED_CC_DESKTOP,, CCE_001, BasicUnrestricted, AdvancedUnrestricted, DMCUnrestricted; CSI_T1_001, BasicUnrestricted, AdvancedUnrestricted, DMCUnrestricted; CSI_T2_001, BasicUnrestricted, AdvancedUnrestricted, DMCUnrestricted; AVAYAVERINT_001, BasicUnrestricted, AdvancedUnrestricted, DMCUnrestricted; CCT_ELITE_CALL_CTRL_001, BasicUnrestricted, AdvancedUnrestricted, DMCUnrestricted, AgentEvents; ANAV_001, BasicUnrestricted, AdvancedUnrestricted, DMCUnrestricted, AgentEvents; UNIFIED_DESKTOP_001, BasicUnrestricted, AdvancedUnrestricted, DMCUnrestricted, AgentEvents; AACC_001, BasicUnrestricted, AdvancedUnrestricted, DMCUnrestricted; CE_AGENT_STATES_001, BasicUnrestricted, AdvancedUnrestricted, DMCUnrestricted, AgentEvents; TP_CLIENT_001, BasicUnrestricted, , AgentEvents; EXT_CLIENT_001, , , AgentEvents; EXT_CLIENT_002, , , AgentEvents; EXT_CLIENT_003, , , AgentEvents; EXT_CLIENT_004, , , AgentEvents; EXT_CLIENT_005, , , AgentEvents; AAWFO_SELECT_001, BasicUnrestricted, AdvancedUnrestricted, DMCUnrestricted, AgentEvents; OFFICELINX_001, BasicUnrestricted, AdvancedUnrestricted, DMCUnrestricted, AgentEvents; ACAL_001, BasicUnrestricted, , DMCUnrestricted, AgentEvents; CRA_001, BasicUnrestricted, AdvancedUnrestricted, DMCUnrestricted, AgentEvents; ECD_001, , AdvancedUnrestricted, , AgentEvents; VERINT_ESSENTIAL_001, BasicUnrestricted, AdvancedUnrestricted, DMCUnrestricted; ACI_001, BasicUnrestricted, , DMCUnrestricted, AgentEvents; CALABRIO_001, BasicUnrestricted, AdvancedUnrestricted, DMCUnrestricted;</td><td>Not counted</td></tr><tr><td>AES ADVANCED MEDIUM SWITCH (VALUE_AES_AEC_MEDIUM_ADVANCED)</td><td>3</td><td>2</td></tr><tr><td>High Availability Small (VALUE_AES_HA_SMALL)</td><td>8</td><td>8</td></tr></tbody></table>	Feature (License Keyword)	License Capacity	Currently available	Unified CC API Desktop Edition (VALUE_AES_AEC_UNIFIED_CC_DESKTOP)	1000	1000	CVLAN ASAI (VALUE_AES_CVLAN_ASAI)	16	16	High Availability Medium (VALUE_AES_HA_MEDIUM)	8	8	Device Media and Call Control (VALUE_AES_DMCC_DMC)	1000	990	AES ADVANCED SMALL SWITCH (VALUE_AES_AEC_SMALL_ADVANCED)	3	3	AES ADVANCED LARGE SWITCH (VALUE_AES_AEC_LARGE_ADVANCED)	3	3	DLG (VALUE_AES_DLG)	16	16	TSAPI Simultaneous Users (VALUE_AES_TSAPI_USERS)	1000	965	High Availability Large (VALUE_AES_HA_LARGE)	3	3	SmallServerTypes: s8300c;s8300d;icc;premio;tn8400;laptop;CtiSmallServer MediumServerTypes: ibmx306;ibmx306m;dell1950;xen;hs20;hs20_8832_vm;CtiMediumServer LargeServerTypes: isp2100;ibmx305;d1380g3;d1385g1;d1385g2;unknown;CtiLargeServer TrustedApplications: IPS_001, BasicUnrestricted, AdvancedUnrestricted, DMCUnrestricted; 1XP_001, BasicUnrestricted, AdvancedUnrestricted, DMCUnrestricted; 1XM_001, BasicUnrestricted, AdvancedUnrestricted, DMCUnrestricted; PC_001, BasicUnrestricted, AdvancedUnrestricted, DMCUnrestricted; CIE_001, BasicUnrestricted, AdvancedUnrestricted, DMCUnrestricted; OSPC_001, BasicUnrestricted, AdvancedUnrestricted, DMCUnrestricted; VP_001, BasicUnrestricted, AdvancedUnrestricted, DMCUnrestricted; SAMETIME_001, VALUE_AES_UNIFIED_CC_DESKTOP,, CCE_001, BasicUnrestricted, AdvancedUnrestricted, DMCUnrestricted; CSI_T1_001, BasicUnrestricted, AdvancedUnrestricted, DMCUnrestricted; CSI_T2_001, BasicUnrestricted, AdvancedUnrestricted, DMCUnrestricted; AVAYAVERINT_001, BasicUnrestricted, AdvancedUnrestricted, DMCUnrestricted; CCT_ELITE_CALL_CTRL_001, BasicUnrestricted, AdvancedUnrestricted, DMCUnrestricted, AgentEvents; ANAV_001, BasicUnrestricted, AdvancedUnrestricted, DMCUnrestricted, AgentEvents; UNIFIED_DESKTOP_001, BasicUnrestricted, AdvancedUnrestricted, DMCUnrestricted, AgentEvents; AACC_001, BasicUnrestricted, AdvancedUnrestricted, DMCUnrestricted; CE_AGENT_STATES_001, BasicUnrestricted, AdvancedUnrestricted, DMCUnrestricted, AgentEvents; TP_CLIENT_001, BasicUnrestricted, , AgentEvents; EXT_CLIENT_001, , , AgentEvents; EXT_CLIENT_002, , , AgentEvents; EXT_CLIENT_003, , , AgentEvents; EXT_CLIENT_004, , , AgentEvents; EXT_CLIENT_005, , , AgentEvents; AAWFO_SELECT_001, BasicUnrestricted, AdvancedUnrestricted, DMCUnrestricted, AgentEvents; OFFICELINX_001, BasicUnrestricted, AdvancedUnrestricted, DMCUnrestricted, AgentEvents; ACAL_001, BasicUnrestricted, , DMCUnrestricted, AgentEvents; CRA_001, BasicUnrestricted, AdvancedUnrestricted, DMCUnrestricted, AgentEvents; ECD_001, , AdvancedUnrestricted, , AgentEvents; VERINT_ESSENTIAL_001, BasicUnrestricted, AdvancedUnrestricted, DMCUnrestricted; ACI_001, BasicUnrestricted, , DMCUnrestricted, AgentEvents; CALABRIO_001, BasicUnrestricted, AdvancedUnrestricted, DMCUnrestricted;	Not counted	AES ADVANCED MEDIUM SWITCH (VALUE_AES_AEC_MEDIUM_ADVANCED)	3	2	High Availability Small (VALUE_AES_HA_SMALL)	8	8	<div>Product Notes (VALUE_NOTES)</div>
Feature (License Keyword)	License Capacity	Currently available																																							
Unified CC API Desktop Edition (VALUE_AES_AEC_UNIFIED_CC_DESKTOP)	1000	1000																																							
CVLAN ASAI (VALUE_AES_CVLAN_ASAI)	16	16																																							
High Availability Medium (VALUE_AES_HA_MEDIUM)	8	8																																							
Device Media and Call Control (VALUE_AES_DMCC_DMC)	1000	990																																							
AES ADVANCED SMALL SWITCH (VALUE_AES_AEC_SMALL_ADVANCED)	3	3																																							
AES ADVANCED LARGE SWITCH (VALUE_AES_AEC_LARGE_ADVANCED)	3	3																																							
DLG (VALUE_AES_DLG)	16	16																																							
TSAPI Simultaneous Users (VALUE_AES_TSAPI_USERS)	1000	965																																							
High Availability Large (VALUE_AES_HA_LARGE)	3	3																																							
SmallServerTypes: s8300c;s8300d;icc;premio;tn8400;laptop;CtiSmallServer MediumServerTypes: ibmx306;ibmx306m;dell1950;xen;hs20;hs20_8832_vm;CtiMediumServer LargeServerTypes: isp2100;ibmx305;d1380g3;d1385g1;d1385g2;unknown;CtiLargeServer TrustedApplications: IPS_001, BasicUnrestricted, AdvancedUnrestricted, DMCUnrestricted; 1XP_001, BasicUnrestricted, AdvancedUnrestricted, DMCUnrestricted; 1XM_001, BasicUnrestricted, AdvancedUnrestricted, DMCUnrestricted; PC_001, BasicUnrestricted, AdvancedUnrestricted, DMCUnrestricted; CIE_001, BasicUnrestricted, AdvancedUnrestricted, DMCUnrestricted; OSPC_001, BasicUnrestricted, AdvancedUnrestricted, DMCUnrestricted; VP_001, BasicUnrestricted, AdvancedUnrestricted, DMCUnrestricted; SAMETIME_001, VALUE_AES_UNIFIED_CC_DESKTOP,, CCE_001, BasicUnrestricted, AdvancedUnrestricted, DMCUnrestricted; CSI_T1_001, BasicUnrestricted, AdvancedUnrestricted, DMCUnrestricted; CSI_T2_001, BasicUnrestricted, AdvancedUnrestricted, DMCUnrestricted; AVAYAVERINT_001, BasicUnrestricted, AdvancedUnrestricted, DMCUnrestricted; CCT_ELITE_CALL_CTRL_001, BasicUnrestricted, AdvancedUnrestricted, DMCUnrestricted, AgentEvents; ANAV_001, BasicUnrestricted, AdvancedUnrestricted, DMCUnrestricted, AgentEvents; UNIFIED_DESKTOP_001, BasicUnrestricted, AdvancedUnrestricted, DMCUnrestricted, AgentEvents; AACC_001, BasicUnrestricted, AdvancedUnrestricted, DMCUnrestricted; CE_AGENT_STATES_001, BasicUnrestricted, AdvancedUnrestricted, DMCUnrestricted, AgentEvents; TP_CLIENT_001, BasicUnrestricted, , AgentEvents; EXT_CLIENT_001, , , AgentEvents; EXT_CLIENT_002, , , AgentEvents; EXT_CLIENT_003, , , AgentEvents; EXT_CLIENT_004, , , AgentEvents; EXT_CLIENT_005, , , AgentEvents; AAWFO_SELECT_001, BasicUnrestricted, AdvancedUnrestricted, DMCUnrestricted, AgentEvents; OFFICELINX_001, BasicUnrestricted, AdvancedUnrestricted, DMCUnrestricted, AgentEvents; ACAL_001, BasicUnrestricted, , DMCUnrestricted, AgentEvents; CRA_001, BasicUnrestricted, AdvancedUnrestricted, DMCUnrestricted, AgentEvents; ECD_001, , AdvancedUnrestricted, , AgentEvents; VERINT_ESSENTIAL_001, BasicUnrestricted, AdvancedUnrestricted, DMCUnrestricted; ACI_001, BasicUnrestricted, , DMCUnrestricted, AgentEvents; CALABRIO_001, BasicUnrestricted, AdvancedUnrestricted, DMCUnrestricted;	Not counted																																								
AES ADVANCED MEDIUM SWITCH (VALUE_AES_AEC_MEDIUM_ADVANCED)	3	2																																							
High Availability Small (VALUE_AES_HA_SMALL)	8	8																																							
<div>Shortcuts</div> <div>Help for Licensed products</div>																																									

8.2. Create Switch Connection

Typically, the connection between the AES and Communication Manager is setup as part of the initial installation and would not usually be outlined in these Application Notes. Due to the nature of this particular setup with two connections from Communication Manager to two separate AES's the switch connection will be displayed on this section. From the AES Management Console navigate to **Communication Manager Interface → Switch Connections**, the connection to Communication Manager should be present as shown below but if one is not present one can be added by clicking on **Add Connection**.

The screenshot shows the Avaya Application Enablement Services Management Console. The top header includes the Avaya logo, the title "Application Enablement Services Management Console", and a welcome message for user "cust" with login details. The left sidebar contains a navigation menu with options like "AE Services", "Communication Manager Interface", "Switch Connections", "Dial Plan", "High Availability", "Licensing", "Maintenance", and "Networking". The main content area is titled "Switch Connections" and features a table with the following data:

Connection Name	Processor Ethernet	Msg Period	Number of Active Connections
cm101x	Yes	30	1

Below the table are buttons for "Edit Connection", "Edit PE/CLAN IPs", "Edit Signaling Details", "Delete Connection", and "Survivability Hierarchy". An "Add Connection" button is also present at the top of the table area.

In the resulting screen, enter the **Switch Password**; the Switch Password must be the same as that entered into Communication Manager AE Services Administration screen via the **change ip-services** command, described in **Section 5.4.2. Secure H323 Connection** was left unticked, as shown below. Click **Apply** to save changes.

The screenshot shows the "Connection Details - cm101x" form in the Avaya Application Enablement Services Management Console. The form includes the following fields and options:

- Switch Password: [Redacted]
- Confirm Switch Password: [Redacted]
- Msg Period: 30 Minutes (1 - 72)
- Provide AE Services certificate to switch: ☒
- Secure H323 Connection: ☐
- Processor Ethernet: ☒
- Enable TLS Certificate Validation: ☐

At the bottom of the form are "Apply" and "Cancel" buttons.

From the **Switch Connections** screen, select the radio button for the recently added switch connection and select the **Edit PE/CLAN IPs** button (not shown), see screen at the bottom of the previous page. In the resulting screen, enter the IP address of the procr as shown in **Section 5.4.1** that will be used for the AES connection and select the **Add/Edit Name or IP** button.

Communication Manager Interface | Switch Connections Home | Help | Logout

AE Services
Communication Manager Interface
Switch Connections
Dial Plan
High Availability
Licensing
Maintenance

Edit Processor Ethernet IP - cm101x

10.10.40.13

Name or IP Address	Status
10.10.40.13	In Use

Clicking on **Edit Signaling Details** below brings up the H.323 Gatekeeper page.

AVAYA Application Enablement Services Management Console

Welcome: User cust
Last login: Fri Sep 9 17:54:25 2022 from 192.168.40.240
Number of prior failed login attempts: 0
HostName/IP: aespr101x/10.10.40.16
Server Offer Type: VIRTUAL_APPLIANCE_ON_VMWARE
SW Version: 10.1.0.1.0.7-0
Server Date and Time: Tue Sep 20 15:52:43 IST 2022
HA Status: Not Configured

Communication Manager Interface | Switch Connections Home | Help | Logout

AE Services
Communication Manager Interface
Switch Connections
Dial Plan
High Availability
Licensing
Maintenance
Networking

Switch Connections

Connection Name	Processor Ethernet	Msg Period	Number of Active Connections
<input checked="" type="radio"/> cm101x	Yes	30	1

The IP address of Communication Manager is set for the **H.323 Gatekeeper**, as shown below.

Communication Manager Interface | Switch Connections

AE Services
Communication Manager Interface
Switch Connections
Dial Plan
High Availability
Licensing
Maintenance
Networking

Switch Connections

Edit H.323 Gatekeeper - cm101x

Name or IP Address

☒ 10.10.40.13

8.3. Administer TSAPI link

From the Application Enablement Services Management Console, select **AE Services** → **TSAPI** → **TSAPI Links**. Select **Add Link** button as shown in the screen below.

The screenshot shows the 'AE Services | TSAPI | TSAPI Links' page. On the left, a sidebar lists 'AE Services' (CVLAN, DLG, DMCC, SMS) and 'TSAPI' (TSAPI Links, TSAPI Properties). The main content area is titled 'TSAPI Links' and contains a table with two columns: 'Link' and 'Switch Connection'. Below the table are three buttons: 'Add Link', 'Edit Link', and 'Delete Link'.

On the **Add TSAPI Links** screen (or the **Edit TSAPI Links** screen to edit a previously configured TSAPI Link as shown below), enter the following values:

- **Link:** Use the drop-down list to select an unused link number.
- **Switch Connection:** Choose the switch connection **cm101x**, which has already been configured in **Section 8.2** from the drop-down list.
- **Switch CTI Link Number:** Corresponding CTI link number configured in **Section 5.4.3** which is **1**.
- **ASAI Link Version:** This should correspond with the Communication Manager version (the latest version available should be chosen).
- **Security:** This can be left at the default value of **both**.


Once completed, select **Apply Changes**.

The screenshot shows the 'Edit TSAPI Links' screen. The sidebar is similar to the previous screen but includes 'TWS' and 'Communication Manager Interface' under 'AE Services'. The main content area is titled 'Edit TSAPI Links' and contains the following fields: 'Link' (set to 1), 'Switch Connection' (set to cm101x), 'Switch CTI Link Number' (set to 1), 'ASAI Link Version' (set to 12), and 'Security' (set to Both). At the bottom are three buttons: 'Apply Changes', 'Cancel Changes', and 'Advanced Settings'.

Another screen appears for confirmation of the changes made. Choose **Apply**.

Apply Changes to Link

Warning! Are you sure you want to apply the changes?
These changes can only take effect when the TSAPI server restarts.

 **Please use the Maintenance -> Service Controller page to restart the TSAPI server.**

When the TSAPI Link is completed, it should resemble the screen below.

TSAPI Links				
Link	Switch Connection	Switch CTI Link #	ASAI Link Version	Security
<input checked="" type="radio"/> 1	cm101x	1	12	Both
<input type="button" value="Add Link"/> <input type="button" value="Edit Link"/> <input type="button" value="Delete Link"/>				

8.4. Identify Tlinks

Navigate to **Security** → **Security Database** → **Tlinks**. Verify the value of the **Tlink Name**.

- ▶ AE Services
- ▶ Communication Manager
- ▶ Interface
- ▶ High Availability
- ▶ Licensing
- ▶ Maintenance
- ▶ Networking
- ▼ Security
 - ▶ Account Management
 - ▶ Audit
 - ▶ Certificate Management
 - ▶ Enterprise Directory
 - ▶ Host AA
 - ▶ PAM
 - ▼ Security Database
 - Control
 - ▣ CTI Users
 - Devices
 - Device Groups
 - **Tlinks**

Tlinks

Tlink Name

☒ AVAYA#CM101X#CSTA#AESPRI101X

☐ AVAYA#CM101X#CSTA-S#AESPRI101X

8.5. Enable TSAPI Ports

To ensure that TSAPI ports are enabled, navigate to **Networking** → **Ports**. Ensure that the TSAPI ports are set to **Enabled** as shown below. Also, note the port numbers required to make a successful connection.

▶ AE Services			
▶ Communication Manager Interface			
▶ High Availability			
▶ Licensing			
▶ Maintenance			
▼ Networking			
AE Service IP (Local IP)			
Network Configure			
Ports			
TCP/TLS Settings			
▶ Security			
▶ Status			
▶ User Management			
▶ Utilities			
▶ Help			

Ports

CVLAN Ports

Unencrypted TCP Port	9999	Enabled <input checked="" type="radio"/> Disabled <input type="radio"/>
Encrypted TCP Port	<input type="text" value="9998"/>	Enabled <input checked="" type="radio"/> Disabled <input type="radio"/>

DLG Port

TCP Port	5678	
----------	------	--

TSAPI Ports

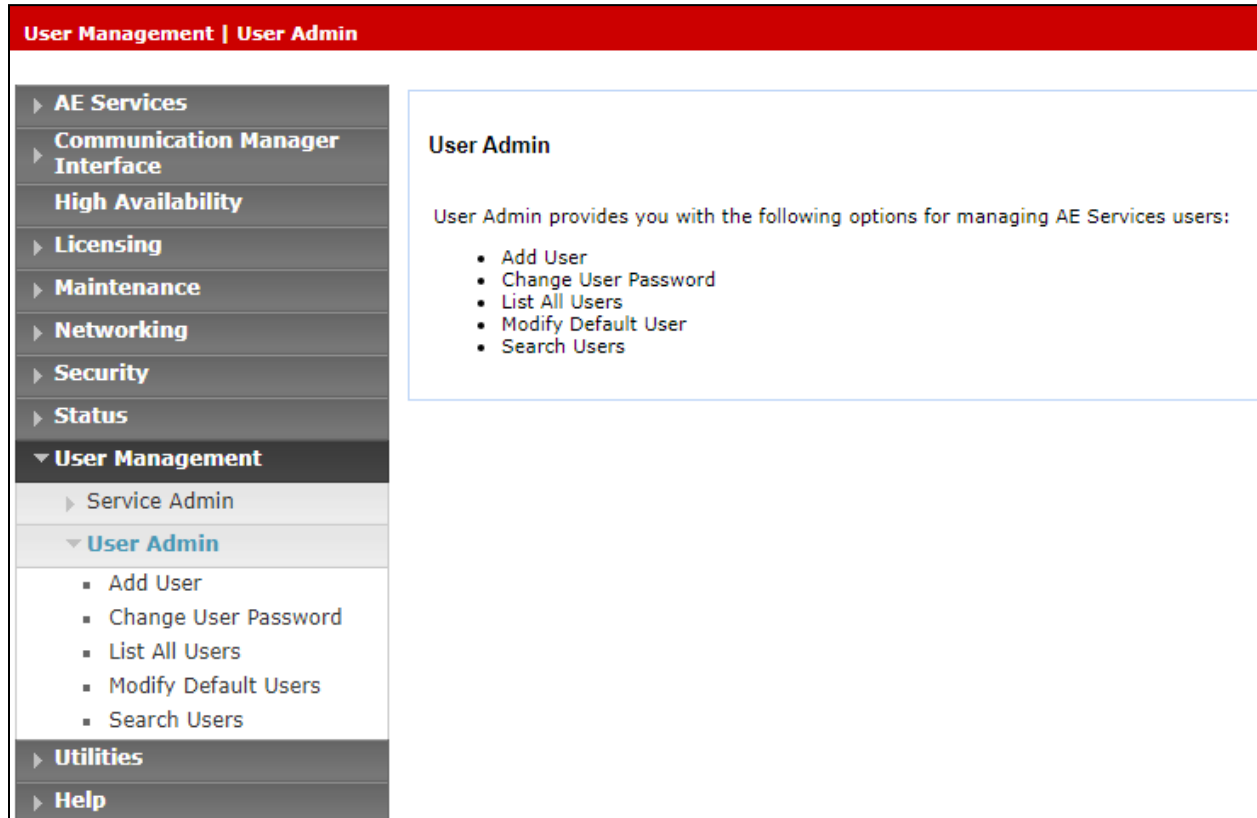
TSAPI Service Port	450	Enabled <input checked="" type="radio"/> Disabled <input type="radio"/>
Local TLINK Ports		
TCP Port Min	1024	
TCP Port Max	1039	
Unencrypted TLINK Ports		
TCP Port Min	<input type="text" value="1050"/>	
TCP Port Max	<input type="text" value="1065"/>	
Encrypted TLINK Ports		
TCP Port Min	<input type="text" value="1066"/>	
TCP Port Max	<input type="text" value="1081"/>	

DMCC Server Ports

Unencrypted Port	<input type="text" value="4721"/>	Enabled <input checked="" type="radio"/> Disabled <input type="radio"/>
Encrypted Port	<input type="text" value="4722"/>	Enabled <input checked="" type="radio"/> Disabled <input type="radio"/>
TR/87 Port	<input type="text" value="4723"/>	Enabled <input checked="" type="radio"/> Disabled <input type="radio"/>

8.6. Create Avaya CTI User

A User ID and password needs to be configured for Conex to communicate as a TSAPI client with the Application Enablement Services server. Navigate to the **User Management** → **User Admin** screen then choose the **Add User** option.



User Management | User Admin

User Admin

User Admin provides you with the following options for managing AE Services users:

- Add User
- Change User Password
- List All Users
- Modify Default User
- Search Users

In the **Add User** screen shown below, enter the following values:

- **User Id** - This will be used by the VoIP Recorder.
- **Common Name** and **Surname** - Descriptive names need to be entered.
- **User Password** and **Confirm Password** - This will be used by the VoIP Recorder.
- **CT User** - Select **Yes** from the drop-down menu.

Complete the process by choosing **Apply** at the bottom of the screen (not shown).

* User Id	<input type="text" value="voxtronic"/>
* Common Name	<input type="text" value="voxtronic"/>
* Surname	<input type="text" value="voxtronic"/>
User Password	<input type="password" value="....."/>
Confirm Password	<input type="password" value="....."/>
Admin Note	<input type="text"/>
Avaya Role	<input type="text" value="None"/> ▼
Business Category	<input type="text"/>
Car License	<input type="text"/>
CM Home	<input type="text"/>
Css Home	<input type="text"/>
CT User	<input type="text" value="Yes"/> ▼
Department Number	<input type="text"/>
Display Name	<input type="text"/>
Employee Number	<input type="text"/>

The next screen will show a message indicating that the user was created successfully (not shown).

8.7. Configure Security

The CTI user and the database security are set here under **Security Database**.

8.7.1. Configure Database Control

Open **Control** and ensure that the **SDB Control** is set as shown below.

<ul style="list-style-type: none">▶ AE Services▶ Communication Manager Interface▶ High Availability▶ Licensing▶ Maintenance▶ Networking▼ Security<ul style="list-style-type: none">▶ Account Management▶ Audit▶ Certificate ManagementEnterprise Directory▶ Host AA▶ PAM▼ Security Database<ul style="list-style-type: none">▪ ControlCTI Users	<p>SDB Control for DMCC, TSAPI, JTAPI and Telephony Web Services</p> <p><input type="checkbox"/> Enable SDB for DMCC Service</p> <p><input checked="" type="checkbox"/> Enable SDB for TSAPI Service, JTAPI and Telephony Web Services</p> <p><input type="button" value="Apply Changes"/></p>
---	---

Note: The AES Security Database (SDB) provides the ability to control a user's access privileges. The SDB stores information about Computer Telephony (CT) users and the devices they control. The DMCC service, the TSAPI service, and Telephony Web Services use this information for permission checking. Please look to **Section 12** for more information on this.

8.7.2. Associate Devices with CTI User

Navigate to **Security** → **Security Database** → **CTI Users** → **List All Users**. Select the CTI user added in **Section 8.6** and click on **Edit Users**.

▶ AE Services

▶ Communication Manager Interface

▶ High Availability

▶ Licensing

▶ Maintenance

▶ Networking

▼ Security

▶ Account Management

▶ Audit

▶ Certificate Management

Enterprise Directory

▶ Host AA

▶ PAM

▼ Security Database

▪ Control

▢ CTI Users

▪ List All Users

▪ Search Users

CTI Users

User ID	Common Name	Worktop Name	Device ID
<input type="radio"/> asc	asc	NONE	NONE
<input type="radio"/> centricity	centricity	NONE	NONE
<input type="radio"/> mitel	mitel	NONE	NONE
<input type="radio"/> nice1	nice1	NONE	NONE
<input type="radio"/> paul1	paul1	NONE	NONE
<input type="radio"/> paul2	paul2	NONE	NONE
<input type="radio"/> sytel	Sytel	NONE	NONE
<input checked="" type="radio"/> voxtronic	voxtronic	NONE	NONE

EditList All

In the main window ensure that **Unrestricted Access** is ticked. Once this is done click on **Apply Changes**.

Edit CTI User

User Profile:

User ID
Common Name
Worktop Name
Unrestricted Access

voxtronic
voxtronic
NONE ▾
☒

Call and Device Control:

Call Origination/Termination and Device Status

None ▾

Call and Device Monitoring:

Device Monitoring
Calls On A Device Monitoring
Call Monitoring

None ▾
None ▾
☐

Routing Control:

Allow Routing on Listed Devices

None ▾

Apply Changes

Cancel Changes

8.8. Restart AE Server

Once everything is configured correctly, it is best practice to restart AE Server (if possible), this will ensure that the new connections are brought up correctly. Click on the **Restart AE Server** button at the bottom of the screen.

Maintenance | Service Controller

▶ AE Services

▶ Communication Manager Interface

High Availability

▶ Licensing

▼ Maintenance

Date Time/NTP Server

▶ Security Database

Service Controller

▶ Server Data

▶ Networking

▶ Security

▶ Status

Service Controller

Service	Controller Status
<input type="checkbox"/> ASAI Link Manager	Running
<input type="checkbox"/> DMCC Service	Running
<input type="checkbox"/> CVLAN Service	Running
<input type="checkbox"/> DLG Service	Running
<input type="checkbox"/> Transport Layer Service	Running
<input type="checkbox"/> TSAPI Service	Running

For status on actual services, please use [Status and Control](#)

Start

Stop

Restart Service

Restart AE Server

Restart Linux

Restart Web Server

A message confirming the restart will appear, click on **Restart** to proceed.

Maintenance | Service Controller

▶ AE Services

▶ Communication Manager Interface

High Availability

▶ Licensing

▼ Maintenance

Date Time/NTP Server

▶ Security Database

Service Controller

▶ Server Data

Restart AE Server

Warning! Are you sure you want to restart?
Restarting will cause all existing connections to be dropped and associations lost.

Restart

Cancel

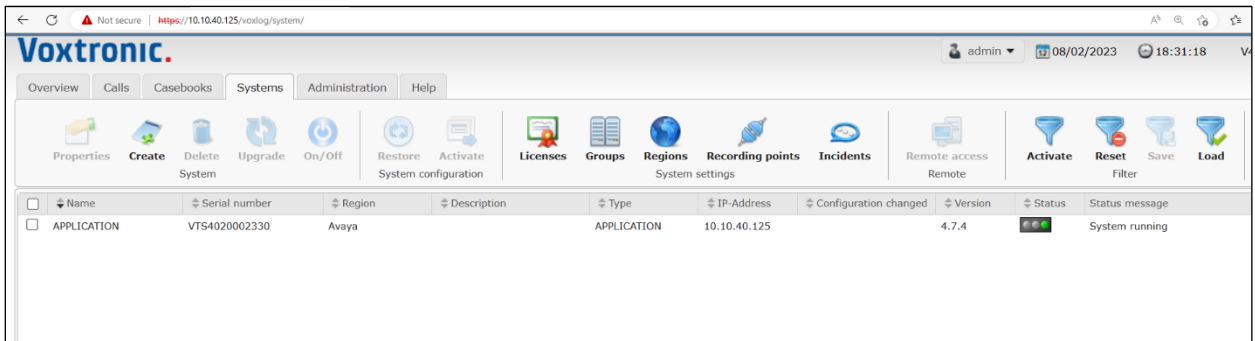
9. Configure Voxtronic Conex

The configuration of Conex can be carried out by opening a web GUI that can be used to configure the connection to AES and change the SIP settings accordingly.

Open a Web browser to **https://<ServerIP>/voxlog/login** and enter the appropriate credentials.



Navigate to the **Systems** Tab. In the main window, there should already be a system displayed that was setup during the initial installation and configuration. Double-click on this system or mark this system and click the action Properties to change the configuration of this system.



Click Configuration on the upper menu to see and change the configuration for this system. The menu on the left side shows all installed modules.

Note: An Avaya TSAPI client must be installed on the Conex server. This client contains the IP address of the AES and the port to connect. This TSAPI client was installed during the initial setup and installation of the Conex server and is outside the scope of these Application Notes.

The connection to AES is configured by selecting the module **voxAvayaTsapiRps** in the left window. This module provides all metadata like call states, numbers for recorded calls. Configure the interface to the Avaya TSAPI server using the settings **Server Name**, **User Name** and **Password**. These settings must match the configuration from Application Enablement Services. Configure the endpoints to be recorded using the setting **Monitored Devices**. Several devices can be added using a , as separator. For more details, hover the mouse over this setting. Configure the VDN numbers to be recorded using the setting **Monitored VDN Devices**. Several devices can be added using a , as separator. For more details, hover the mouse over this setting.

The screenshot shows the 'System: APPLICATION' window with the 'Configuration' tab selected. The left sidebar lists modules, with 'voxAvayaTsapiRps' highlighted. The main panel displays the configuration for 'voxAvayaTsapiRps'.

Property	Value
Enabled	<input checked="" type="checkbox"/>
Severity	Module can cause ERRORS
Server Name	AVAYA#CM101X#CSTA#AESPRI101X
User Name	voxtronic
Password	Avaya1234%
Monitored Devices	3172,3173
Monitored VDN Devices	3950

The connection to RTP is configured by selecting the module **voxVoipRps** in the left window. This module provides all audio for recorded calls. Configure the IP address and the port which should be listened and recorded using the settings **Bind address** and **Bind port**.

The screenshot shows the 'System: APPLICATION' window with the 'Configuration' tab selected. The left sidebar lists modules, with 'voxVoipRps' highlighted. The main panel displays the configuration for 'voxVoipRps - Active SIP'.

Property	Value
Enabled	<input checked="" type="checkbox"/>
Bind address	10.10.40.125
Bind port	5060
Transport Protokoll	TCP
Register allowed	<input type="checkbox"/>
Registrar address	
User name	
Password	
Maximum recording duration	10800 sec

10. Verification Steps

This section provides the tests that can be performed to verify correct configuration of the Avaya and Voxtronic solution.

10.1. Verify Avaya Aura® Communication Manager CTI Service State

The following steps can validate that the communication between Communication Manager and AES is functioning correctly. Check the AESVCS link status with AES by using the command **status aesvcs cti-link**. Verify the **Service State** of the CTI link is **established**.

status aesvcs cti-link							
AE SERVICES CTI LINK STATUS							
CTI Link	Version	Mnt Busy	AE Services Server	Service State	Msgs Sent	Msgs Rcvd	
1	12	no	aespri101x	established	865	865	

10.2. Verify TSAPI Link

This section will verify the TSAPI link between AES and Communication Manager and from Conex to AES.

10.2.1. Verify TSAPI Link

On the AES Management Console verify the status of the TSAPI link by selecting **Status** → **Status and Control** → **TSAPI Service Summary** to display the **TSAPI Link Details** screen. Verify the status of the TSAPI link by checking that the **Status** is **Talking** and the **State** is **Online**.

Status | Status and Control | TSAPI Service SummaryHome | Help | Logout

AE Services

Communication Manager Interface

High Availability

Licensing

Maintenance

Networking

Security

Status

Alarm Viewer

Logs

Log Manager

Status and Control

CVLAN Service Summary

DLG Services Summary

DMCC Service Summary

Switch Conn Summary

TSAPI Service Summary

TSAPI Link Details

☐ Enable page refresh every 60 seconds

	Link	Switch Name	Switch CTI Link ID	Status	Since	State	Switch Version	Associations	Msgs to Switch	Msgs from Switch	Msgs Period
<input checked="" type="radio"/>	1	cm101x	1	Talking	Thu Oct 27 17:28:27 2022	Online	20	6	15	15	30

OnlineOffline

For service-wide information, choose one of the following:

TSAPI Service StatusTLink StatusUser Status

10.2.2. Verify TSAPI User

The following steps are carried out on AES to validate the communication between the TSAPI client and the AES by checking the user status. From the screen on the previous page, click on **User Status**. Verify the user setup in **Section 8.6** is connected as shown below.

CTI User Status
☐ Enable page refresh every 60 seconds
CTI Users All Users Submit
Open Streams 4
Closed Streams 4
Open Streams

Name	Time Opened	Time Closed	Tlink Name
DMCCLCSUserDoNotModify	Thu 02 Feb 2023 06:15:13 PM GMT		AVAYA#CM101X#CSTA#AESPRI101X
DMCCLCSUserDoNotModify	Thu 02 Feb 2023 07:15:14 PM GMT		AVAYA#CM101X#CSTA#AESPRI101X
voxtronic	Tue 07 Feb 2023 10:38:52 AM GMT		AVAYA#CM101X#CSTA#AESPRI101X

Show Closed Streams Close All Opened Streams Back

10.3. Verify Conex services are running

Log into Conex as shown below.

Not secure | https://10.10.40.125/voxlog/login

Voxtronic.

Login

User name

Password

Login

Navigate to the **Systems** tab, select the configured system, navigate to **Module**. This will show all the various modules running and information on how they are operating.

System: APPLICATION

Overview Driver **Module** System properties Notification Hardware Configuration Incidents Logs Update history Faults License Export Restore

Properties Activate Filter Reset Save Load Adapt

Name	Version	Severity	Status	Last status check	Status from	Status message
voxAudioFileManager	4.7.4			08/02/2023 18:34:01		Service running
voxAvayaTsapiRps	1.0.0			08/02/2023 18:33:32	01/02/2023 11:37:12	Service running
voxConfigBuilder	2.0.39			01/02/2023 11:20:27	13/12/2022 17:35:46	Configuration files successfully loaded
voxHighLow						Module disabled
voxLicenseClient	4.7.4			08/02/2023 18:34:01	18/12/2022 20:50:01	Service running
voxLicenseService	1.0.3			08/02/2023 18:33:26		Service running
voxLogSender						Module disabled
voxResourceManager	7.0.2			08/02/2023 18:33:19		Service running
voxTimeSync	1.0.6			08/02/2023 18:34:17	24/01/2023 04:19:34	Synchronized with time server "0A0A2805 (Win2019DomController.de..."
voxUnitUpdater	1.0.23			13/12/2022 17:00:30	13/12/2022 17:00:30	Module disabled
voxVoipRps	2.5.8			08/02/2023 18:33:20		Service running
voxWebGrabber	7.0.0			08/02/2023 18:34:15		Service running
voxWebServices	4.7.4			08/02/2023 18:34:01		Service running

10.4. Verify Conex Capture and Playback

Navigate to the **Calls** tab. All the calls that were previously recorded should appear, something like that shown below.

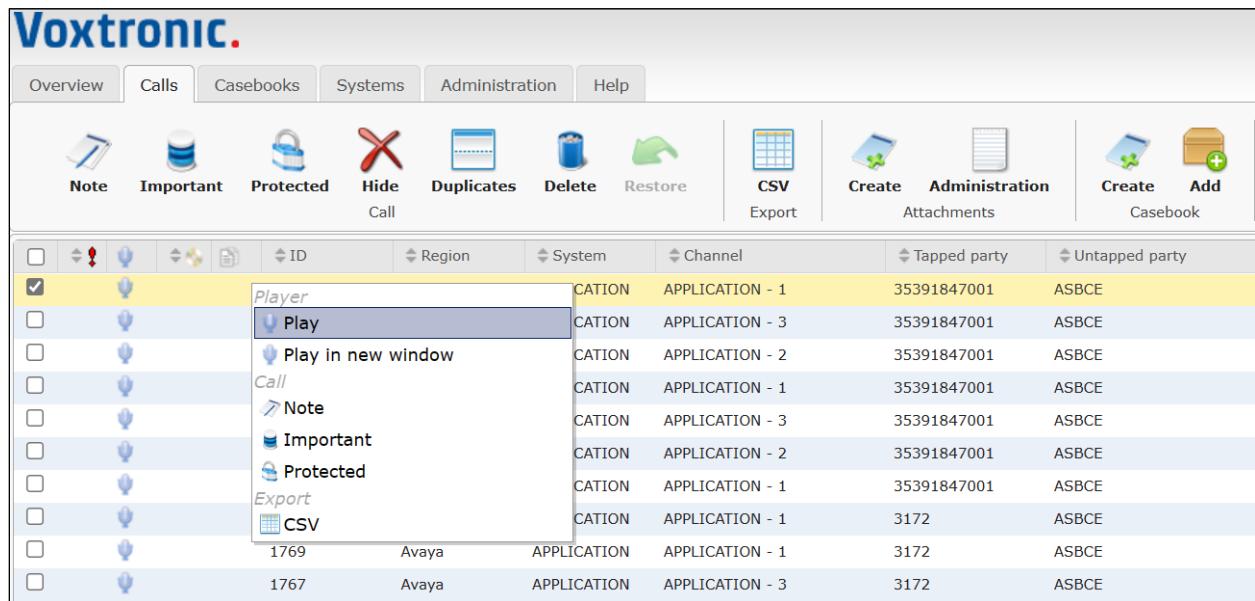
Voxtronic. admin 08/02/2023 18:29:43 V4.7.4

Overview **Calls** Casebooks Systems Administration Help

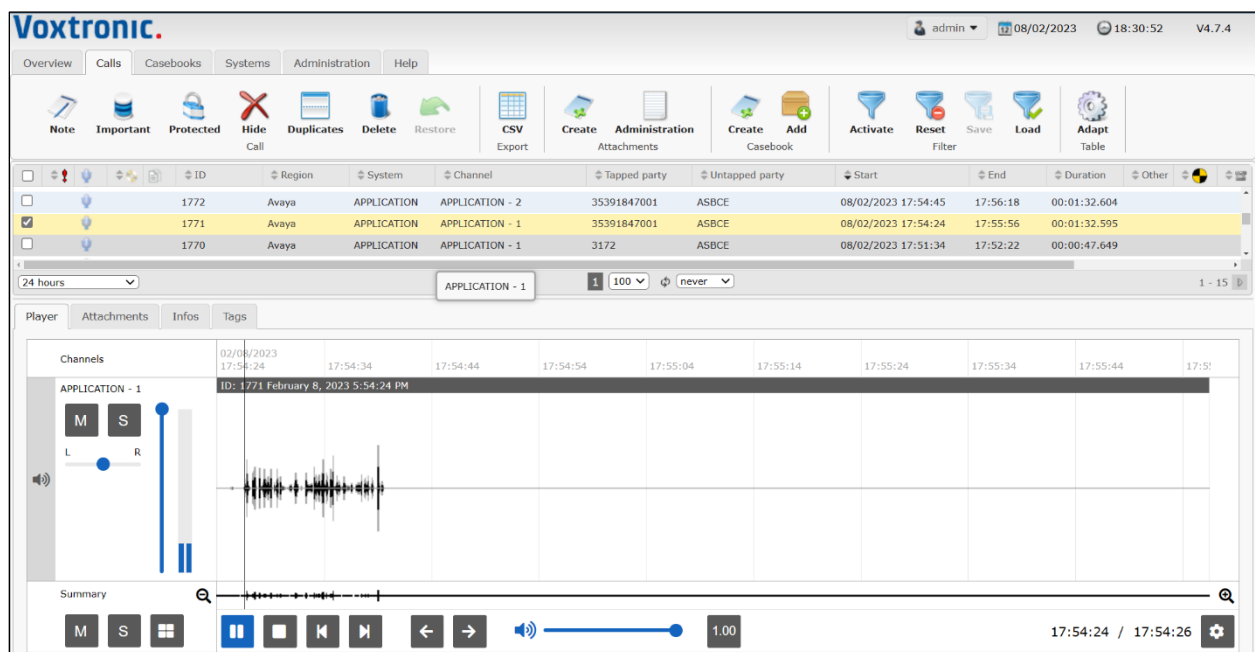
Note Important Protected Hide Duplicates Delete Restore CSV Export Create Attachments Administration Create Add Casebook Activate Reset Filter Save Load Adapt Table

	ID	Region	System	Channel	Tapped party	Untapped party	Start	End	Duration	Other
<input type="checkbox"/>	1777	Avaya	APPLICATION	APPLICATION - 1	35391847001	ASBCE	08/02/2023 18:18:42	18:20:15	00:01:32.602	
<input type="checkbox"/>	1776	Avaya	APPLICATION	APPLICATION - 3	35391847001	ASBCE	08/02/2023 17:58:05	17:59:38	00:01:32.606	
<input type="checkbox"/>	1774	Avaya	APPLICATION	APPLICATION - 2	35391847001	ASBCE	08/02/2023 17:57:48	17:58:36	00:00:47.609	
<input type="checkbox"/>	1775	Avaya	APPLICATION	APPLICATION - 1	35391847001	ASBCE	08/02/2023 17:57:28	17:59:00	00:01:32.612	
<input type="checkbox"/>	1773	Avaya	APPLICATION	APPLICATION - 3	35391847001	ASBCE	08/02/2023 17:55:09	17:56:42	00:01:32.606	
<input type="checkbox"/>	1772	Avaya	APPLICATION	APPLICATION - 2	35391847001	ASBCE	08/02/2023 17:54:45	17:56:18	00:01:32.604	
<input type="checkbox"/>	1771	Avaya	APPLICATION	APPLICATION - 1	35391847001	ASBCE	08/02/2023 17:54:24	17:55:56	00:01:32.595	
<input type="checkbox"/>	1770	Avaya	APPLICATION	APPLICATION - 1	3172	ASBCE	08/02/2023 17:51:34	17:52:22	00:00:47.649	
<input type="checkbox"/>	1769	Avaya	APPLICATION	APPLICATION - 1	3172	ASBCE	08/02/2023 17:47:28	17:49:01	00:01:32.605	
<input type="checkbox"/>	1767	Avaya	APPLICATION	APPLICATION - 3	3172	ASBCE	08/02/2023 17:43:58	17:44:45	00:00:47.607	
<input type="checkbox"/>	1766	Avaya	APPLICATION	APPLICATION - 2	3172	ASBCE	08/02/2023 17:43:45	17:44:33	00:00:47.730	
<input type="checkbox"/>	1768	Avaya	APPLICATION	APPLICATION - 1	3172	ASBCE	08/02/2023 17:43:20	17:44:52	00:01:32.605	
<input type="checkbox"/>	1765	Avaya	APPLICATION	APPLICATION - 3	3172	ASBCE	08/02/2023 17:41:06	17:42:39	00:01:32.563	
<input type="checkbox"/>	1764	Avaya	APPLICATION	APPLICATION - 2	3172	ASBCE	08/02/2023 17:40:49	17:41:37	00:00:47.626	
<input type="checkbox"/>	1763	Avaya	APPLICATION	APPLICATION - 1	3172	ASBCE	08/02/2023 17:40:34	17:41:21	00:00:47.811	

Right-click on a call and select **Play**, as shown below. Or double-click on a call to play it back also.



The call should then appear and get played back as shown below.



11. Conclusion

These Application Notes describe the configuration steps required for Conex Release 4.9.0 from Voxtronic to successfully interoperate with Avaya Session Border Controller for Enterprise R10.1 using Avaya Aura® Application Enablement Services R10.1. All feature functionality and serviceability test cases were completed successfully, with any observations shown in **Section 2.2**.

12. Additional References

This section references the Avaya and Voxtronic product documentation that are relevant to these Application Notes.

Product documentation for Avaya products may be found at <https://support.avaya.com>.

- [1] *Administering Avaya Session Border Controller for Enterprise*. Release 10.1, Issue 1.
- [2] *Administering Avaya Aura® Communication Manager*. Release 10.1, Issue 1, December 2021.
- [3] *Avaya Aura® Communication Manager Feature Description and Implementation*. Release 10.1, Issue 1
- [4] *Administering Avaya Aura® Application Enablement Services*. Release 10.1.x, Issue 4, April 2022.
- [5] *Application Notes for Configuring Remote Workers with Avaya Session Border Controller for Enterprise 10.1 on the Avaya Aura® Platform*.
- [6] *Application Notes for configuring Avaya Aura® Communication Manager R7.0.1, Avaya Aura® Session Manager R7.0.1 and Avaya Session Border Controller for Enterprise R7.1 with MiaRec*.

Product documentation for Conex can be obtained from Voxtronic as follows:

- Email: sales@voxtronic.com
- Website: <http://www.voxtronic.com>
- Phone: +43 1 8174846 0

Appendix A

The following shows the setup of the Remote Workers on SBCE. User Agents are created for the various phone types that are used as Remote Workers.

Session Border Controller for Enterprise



- EMS Dashboard
- Software Management
- Device Management
- Backup/Restore
- System Parameters
 - DoS / DDoS
 - Scrubber
 - User Agents**
- Configuration Profiles
- Services
- Domain Policies
- TLS Management
- Network & Flows
- DMZ Services
- Monitoring & Logging

User Agents

User Agents

Add

Name	Regular Expression		
Avaya Communicator	Avaya Communicator.*	Edit	Delete
Avaya one-X Communicator	Avaya one-X Communicator.*	Edit	Delete
J Series	Avaya J*.*	Edit	Delete
Avaya 96x1	Avaya one-X Deskphone.*	Edit	Delete

The example below shows the J100 Series Phone.

Edit User Agent

X

WARNING: Invalid or incorrectly entered regular expressions may cause unexpected results.

Note: This regular expression is case-sensitive.

Ex:

Avaya one-X Deskphone
Aastra.*
Cisco-CP7970G[0-9]{3}
RTC/1.1RTC/1.2

Name

J Series

Regular Expression

Avaya J*.*

Finish

Subscriber Flows must be created for Remote Workers, these are created using the User Agent details configured on the previous page.

EMS Dashboard

Software Management

Device Management

Backup/Restore

System Parameters

Configuration Profiles

Services

Domain Policies

TLS Management

Network & Flows

Network Management

Media Interface

Signaling Interface

End Point Flows

Session Flows

Advanced Options

End Point Flows

Subscriber Flows

Server Flows

Update

Add

Modifications made to an End-Point Flow will only take effect on new registrations or re-registrations.

Hover over a row to see its description.

Priority	Flow Name	URI Group	Source Subnet	User Agent	End Point Policy Group	
1	Remote-Worker-96x1	*	*	Avaya 96x1	RW-SRTP	View Clone Edit Delete
2	Remote-Worker-JSeries	*	*	J Series	RW-SRTP	View Clone Edit Delete

Below shows the J100 Series phone configured for the Subscriber Flow, note the **User Agent** and **Signaling Interfaces** are chosen based on what should be configured for this phone type.

Edit Flow: Remote-Worker-JSeries

X

Criteria

Flow Name

Remote-Worker-JSeries

URI Group

*

User Agent

J Series

Source Subnet

Ex: 192.168.0.1/24

*

Via Host

Ex: domain.com, 192.168.0.1/24

*

Contact Host

Ex: domain.com, 192.168.0.1/24

*

Signaling Interface

Sig-EXT-RW-235

Next

A **Server Flow** must also be created for Remote Workers. The Flow called **To Remote Worker** was added prior to compliance testing to allow Remote Workers to register correctly.

End Point Flows

Subscriber Flows

Server Flows

Priority	Flow Name	URI Group	Received Interface	Signaling Interface	End Point Policy Group	Routing Profile	
1	To PSTN PG from Aura 8.1	*	Sig-EXT-TRK-235	Sig-Int-TRK	SM-PSTN-RTP	SM-PSTN-PG	View Clone Edit Delete

SIP Server: Voxtronic

Update

Priority	Flow Name	URI Group	Received Interface	Signaling Interface	End Point Policy Group	Routing Profile	
1	Vox-In	*	Voxtronic-Loop	Sig-EXT-TRK-235	Voxtronic	Voxtronic	View Clone Edit Delete
2	Vox-Out	*	Sig-EXT-TRK-235	Voxtronic-Loop	Voxtronic	Voxtronic	View Clone Edit Delete
3	Vox-RW	*	Sig-Int-RW	Sig-EXT-RW-235	Voxtronic	Voxtronic	View Clone Edit Delete

SIP Server: sm101x-TLS

Update

Priority	Flow Name	URI Group	Received Interface	Signaling Interface	End Point Policy Group	Routing Profile	
1	To PSTN PG from Aura 10.1	*	Sig-EXT-TRK-235	Sig-Int-TRK	SM-PSTN-SRTP	SM-PSTN-PG	View Clone Edit Delete
2	To Remote Worker	*	Sig-EXT-RW-235	Sig-Int-RW	RW-SRTP	SM-PSTN-PG	View Clone Edit Delete
3	Voxtronic Loop	*	Voxtronic-Loop	Voxtronic-Loop	default-low	sm101x-TLS	View Clone Edit Delete

Below shows the Server Flow for the Remote Workers. Note, the **SIP Server Profile** as well as the Interfaces that were previously configured are chosen. **SRTP** and **TLS** are used for the Remote Workers as per Avaya guidelines.

Edit Flow: To Remote Worker	
Flow Name	To Remote Worker
SIP Server Profile	sm101x-TLS
URI Group	*
Transport	*
Remote Subnet	*
Received Interface	Sig-EXT-RW-235
Signaling Interface	Sig-Int-RW
Media Interface	Media-Int-159-RW
Secondary Media Interface	None
End Point Policy Group	RW-SRTP
Routing Profile	SM-PSTN-PG
Topology Hiding Profile	None
Signaling Manipulation Script	None
Remote Branch Office	Any
Link Monitoring from Peer	<input type="checkbox"/>
FQDN Support	<input type="checkbox"/>
FQDN	
Finish	

©2023 Avaya Inc. All Rights Reserved.

Avaya and the Avaya Logo are trademarks of Avaya Inc. All trademarks identified by ® and ™ 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.