AudioCodes Mediant<sup>™</sup> Family of Session Border Controllers (SBC)

# Enterprise IP-PBX & Amazon Chime Voice Connector using AudioCodes Mediant<sup>™</sup> Virtual Edition (VE) SBC

Version 7.2





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#### Date Published: May-27-2020

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## **Abbreviations and Terminology**

Each abbreviation, unless widely used, is spelled out in full when first used.

## **Document Revision Record**

LTRT	Description
10850	Initial document release.
10851	Date and time configuration added.
10853	Mediant VE SBC – PAYG product and Mediant VE SBC product; Configuring the SBC section split into two.

## **Documentation Feedback**

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# **1** Introduction

This document describes how to set up connectivity between an Enterprise IP-PBX (e.g., Cisco Unified Communications / CUCM) and Amazon Chime Voice Connector, using the AudioCodes Mediant Virtual Edition (VE) Session Border Controller (hereafter, referred to as *SBC*).

## 1.1 Intended Audience

This document is intended for Engineers, or AudioCodes and Amazon partners, who are responsible for installing and configuring connectivity between an Enterprise IP-PBX and Amazon Chime Voice Connector, using AudioCodes SBC.

## **1.2 About AudioCodes SBC Product Series**

AudioCodes' family of SBC devices enables reliable connectivity and security between the Enterprise's and the service provider's VoIP networks.

The SBC provides perimeter defense as a way of protecting Enterprises from malicious VoIP attacks; mediation for allowing the connection of any PBX and/or IP-PBX to any service provider; and Service Assurance for service quality and manageability.

Designed as a cost-effective appliance, the SBC is based on field-proven VoIP and network services with a native host processor, allowing the creation of purpose-built multiservice appliances, providing smooth connectivity to cloud services, with integrated quality of service, SLA monitoring, security and manageability. The native implementation of SBC provides a host of additional capabilities that are not possible with standalone SBC appliances such as VoIP mediation, PSTN access survivability, and third-party value-added services applications. This enables Enterprises to utilize the advantages of converged networks and eliminate the need for standalone appliances.

AudioCodes SBC is available as an integrated solution running on top of its field-proven Mediant Media Gateway and Multi-Service Business Router (MSBR) platforms, or as a software-only solution for deployment with third-party hardware or in a virtualized environment, supporting the following platforms: AWS, Azure, OpenStack, Google Cloud, VMware, Hyper-V and KVM.

## **1.3 About Amazon Chime Voice Connector**

Amazon Chime Voice Connector provides SIP Trunking connectivity to over 100 countries for on-premises phone systems. Customers can purchase low-cost inbound calling, outbound calling, or both. With Voice Connector, customers can reduce voice calling costs by up to 50% by eliminating fixed telephone network costs, and simplifying voice network administration by transitioning it to Amazon Web Services (AWS).



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# 2 Component Information

# 2.1 AudioCodes SBC Version

#### Table 2-1: AudioCodes SBC Version

SBC Vendor	AudioCodes
Product	Mediant VE SBC
Software Version	7.20A.256.399 or later
Protocol	<ul> <li>SIP/TCP or SIP/TLS (to Amazon Chime Voice Connector)</li> <li>SIP/UDP, SIP/TCP or SIP/TLS (to Enterprise IP-PBX)</li> </ul>
Additional Notes	None

# 2.2 Amazon Chime Voice Connector Version

#### Table 2-2: Amazon Chime Voice Connector Version

Vendor/Service Provider	Amazon Chime
Protocol	SIP
Additional Notes	None

# 2.3 Deployment Topology

This document describes deployment using the following topology:

Figure 2-1: Deployment Topology



The SBC is deployed in AWS from the "Mediant VE Session Border Controller (SBC) – PAYG" Marketplace offer. This offer includes pay-as-you-go license that enables Customers to use SBC as much as needed and pay for actual service consumed via their AWS account billing.

Two separate subnets are used—WAN and LAN—to communicate with Amazon Chime Voice Connector and the Enterprise IP-PBX, respectively. Communication with the Enterprise IP-PBX may be performed using private IP addresses (over VPN or Direct Connect, as shown in the figure above) or public IP addresses. Communication with Amazon Chime Voice Connector is always performed using public IP addresses.

The LAN subnet is also used for accessing the management interface (Web or CLI) of the deployed SBC instance.

Two SBC instances may be deployed in different Availability Zones for improved solution reliability.

# **3 Prerequisites**

Prior to deploying the SBC instance, make sure that you meet the following prerequisites:

- You have an AWS account. If you don't have an AWS account, you can sign up for one on Amazon's website at <u>http://aws.amazon.com/</u>.
- You have created LAN and WAN subnets needed for SBC deployment. Note that these subnets must reside in the same Availability Zone.



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# 4 Deploying the SBC Instance

This section describes how to deploy the SBC instance.

- **To deploy SBC instance:**
- 1. Open the AWS Marketplace console at <u>https://console.aws.amazon.com/marketplace</u>.
- 2. In the **Discover Products** tab, search for the "Mediant VE" product.

#### Figure 4-1: Searching for Mediant VE Product in AWS Marketplace



- **3.** Two products are displayed:
  - "Mediant VE Session Border Controller (SBC)": This product includes a trial license (limited by 3 sessions) and requires purchase of production license from AudioCodes.
  - "Mediant VE Session Border Controller (SBC) PAYG": This product includes a
    pay-as-you-go license that enables Customers to use the SBC as much as
    needed and pay for the actual service consumed via their AWS account billing.

# **C**audiocodes

4. Choose the Mediant VE product that matches your licensing needs. For example, choose Mediant VE Session Border Controller (SBC) – PAYG product.

👯 aws n	narketplace					Q	Hello,
Categories 👻	Delivery Methods 👻 Solu	tions 👻 Migr	ation Mapping Assistant	Your Saved List	Partners	Sell in AWS Marketplace	Amazon Web Servio
	audiocodes	Mediant By: AudioCode AudioCodes Me assurance for V Show more Linux/Unix	VE Session Be s ে Latest Version: diant VE SBC delivers s oIP services. Connect y কের্ম্নের্ম্নর্ক ০ AWS	7.20A.256.399 eamless connectivity, r our IP PBX, unified con	ler (SBC) - PAYG robust security and voice quality nmunications solution (inc.	Continue to Sut	st
	Overview		Pricing	Usage	Support	R	eviews
	Product Over AudioCodes Mediant SBC VoIP solution (IP-PBX, uni services, such as Amazon calls. It supports Microsof VoIP platform, enabling si based solutions. AudioCodes SBCs form an networks and SIP trunks. service providers worldwir * Robust VoIP security age * Seamless connectivity an translation and media har * Assured high voice quali	Provides secure or fied communicatic Chime Voice Conn t Teams, Skype for olution coexistence our SBCs are depl de where they deli ainst attacks, fraue nd interoperability ndling ity and SLA	onnectivity between vi ons or contact center) a eetor, for incoming and r Business or any other e and simple migration ation point between en oyed in large enterpris iver: d and eavesdropping v via SIP signaling medi	tually any and SIP trunk d outgoing SIP-based a to cloud- aterprise VoIP es and Tier 1	<ul> <li>Highlights</li> <li>Secure your voice communication yourself from VoIP attacks, fraud eavesdropping</li> <li>Seamless connectivity with Amaz Connector or any other SIP trunk</li> <li>Supports Microsoft Teams, Skype other SIP-based IP-PBX, unified of contact center solution</li> </ul>	s network and protect spam and on Chime Voice service for Business and any ommunications or	

#### Figure 4-2: Mediant VE Product Page in AWS Marketplace

- 5. Click Continue to Subscribe to subscribe to the Mediant VE SBC PAYG product.
- 6. Click Continue to Configuration to proceed with SBC deployment.
  - Figure 4-3: Mediant VE Configuration Page in AWS Marketplace

🛫 aws i	marketplace					Q	Hello,
Categories 👻	Delivery Methods 👻	Solutions 👻	Migration Mapping Assistant	Your Saved List	Partners	Sell in AWS Marketplace	Amazon Web Services Ho
	audiocodes	Mediant PAYG	VE Session Bord	er Controller (SBC)	) -	Contin	ue to Launch
	< Product Detail Subs Configure Choose a fulfillment required to configure Eulfillment Option	this soft	tware to select how you wish to ent.	deploy the software, then e	enter the information	Pricing informa This is an estimate of and infrastructure co configuration. Your a each statement perio this estimate.	tion typical software sts based on your ctual charges for d may differ from
	64-bit (x86) Ama	zon Machine Ima	ge (AMI)	•		Software Pricin Mediant VE Session Border Controller (SBC) - PAYG running on r4.iorae	g \$0.001Cost/unit
	7.20A.256.399 (D	0ec 01, 2019) 🔻				Infrastructure P EC2: Monthly Estimate:	ricing 1 * r4.large \$96.00/month
	Region US East (N. Virgin	nia) 🔻	Ami Id: ami-00	153ce9f7fa96e829			

7. Choose the Region where you want to launch the SBC.



**Note:** For the **Mediant VE SBC – PAYG** product support is currently provided for installations in US regions only. For support in other regions, please contact us at <u>https://online.audiocodes.com/aws-support-cloud</u>.

#### 8. Click Continue to Launch.

#### Figure 4-4: Mediant VE Launch Page in AWS Marketplace

🛫 aws marketplace		
Categories - Delivery Methods - Solutions -	Migration Mapping Assistant Your Saved List Pa	ntners Sell in AWS Marketplace
audiocodes Mediant VE S	ession Border Controller (SBC)	
<pre>&lt; Product Detail Subscribe Configure Launch Launch this software Review your configuration and choose how</pre>	v you wish to launch the software.	
Configuration Details       64         Fulfillment Option       64         Me       run         Software Version       7.2         Region       US         Usage Instructions       1	-bit (x86) Amazon Machine Image (AMI) ediant VE Session Border Controller (SBC) ning on r4.large 20A.252.274 East (N. Virginia)	
Choose Action Launch through EC2	<ul> <li>Choose this action to launch your configuration through the Amazon EC2 console.</li> </ul>	nch

**9.** From the 'Choose Action' drop-down list, select **Launch through EC2**, and then click **Launch**; the Choose Instance Type page appears:

a 1. Choo	Services V F	Resource Group	os 🗸 🛠	l Storage 5. Add	I Tags 6. Configure S	Cecurity Group 7. Review	• N. Virginia 👻	Support 👻
Step	2: Choose an Insta	ance Type						
0	Memory optimized	r5.metal	96	768	EBS only	Yes	25 Gigabit	Yes
	Memory optimized	r4.large	2	15.25	EBS only	Yes	Up to 10 Gigabit	Yes
	Memory optimized	r4.xlarge	4	30.5	EBS only	Yes	Up to 10 Gigabit	Yes
	Memory optimized	r4.2xlarge	8	61	EBS only	Yes	Up to 10 Gigabit	Yes
0	Memory optimized	r4.4xlarge	16	122	EBS only	Yes	Up to 10 Gigabit	Yes
0	Memory optimized	r4.8xlarge	32	244	EBS only	Yes	10 Gigabit	Yes
				с	ancel Previous	Review and Launch	Next: Configure In	stance Details

#### Figure 4-5: Choose Instance Type Page

**10.** Choose the instance type as follows:

- If the Enterprise IP-PBX supports the G.711 U-law coder, choose the r4.large instance type. This instance type is recommended for deployments that do not require transcoding and/or other DSP capabilities.
- Otherwise, choose the c4.2xlarge instance type. This instance type is recommended for deployments that require transcoding and/or other DSP capabilities.

Refer to the *SBC Series Release Notes* for a complete list of instance types supported by Mediant VE SBC, their capacities and capabilities.

**11.** Click **Next**; the Configure Instance page appears:

#### Figure 4-6: Configure Instance Page

aws Services - F	Resource	e Groups 🗸	*					<b>Д</b> •	N. Virginia	•	Support 👻	
1. Choose AMI 2. Choose Instance Type	3. Con	nfigure Instance	4. Add Storage	5. Add Tags	6. Conf	figure	Security Group	7. Review				
Step 3: Configure Instar Configure the instance to suit your require access management role to the instance,	ements. Ye	etails 'ou can launch mu e.	Itiple instances	from the same Al	/II, reque	st Sp	oot instances to	) take advanta	ge of the low	er pri	cing, assign an 🔺	
Number of instances	()	1		Launch into Aut	o Scaling	g Gro	oup (j)					
Purchasing option	(j)	Request Spot	instances									
Network	i	vpc-f8b7159d   0	default (default)		ŧ	С	Create new VF	PC				
Subnet	(i)	subnet-cc8e83e	4   Default in us	-east-1a	ŧ		Create new su	bnet				
Auto-assign Public IP	()	Disable			\$							
Placement group	i	Add instance	to placement gr	oup								
Capacity Reservation	i	Open			\$	С	Create new C	apacity Reser	vation			
IAM role	(j)	The AMI you hav requires an IAM software usage.	re selected (ami role with the awa Learn more.	-07fffbb3d7c12ff( s-marketplace:M	1) suppo eterUsag	orts m e pei	netered pricing rmission to reco	and ord				
		Automatically	create an IAM r	role with the requ	red perm	nissio	on and the nam	e below				
		metering-role	asung IAM role I	from your account	t	С	Create new IAI	M role manual	ly			
Shutdown behavior		Stop			ŧ							
Enable termination protection	() ()	Protect agains	st accidental ten	mination	•							
Monitoring	(i)	Enable Cloud	Watch detailed i es apply.	monitoring								
Tenancy	()	Shared - Run a Additional charge	shared hardwar es will apply for	e instance dedicated tenand	<b>¢</b>						Ŧ	
					Car	ncel	Previous	Review an	d Launch	Nex	t: Add Storage	

**12.** Configure network devices and IP addresses:

- For **Network**, select the VPC where SBC should be deployed.
- For **Subnet**, select the LAN Subnet. This subnet is used to communicate with the Enterprise IP-PBX and for accessing the SBC management interface (Web or CLI).
- For IAM role:
  - If you are deploying the Mediant VE SBC PAYG product, select 'Automatically create an IAM role with the required permission and the name below', and then enter the IAM role name (e.g., "metering-role").
  - If you are deploying the Mediant VE SBC product, leave the IAM role empty.

**Note:** The **Mediant VE SBC – PAYG** product requires an IAM role with the following policy:

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Action": [
                aws-marketplace:MeterUsage
        ],
            "Effect": "Allow",
            "Resource": "*"
        }
    ]
}
mis role allows the Mediant VE SBC PAYG instance to com
}
```

This role allows the Mediant VE SBC PAYG instance to communicate with the AWS Metering API and must be assigned to the launched instance – either automatically (as described above) or manually.

• In the **Network Interfaces** section located at the bottom of the page, click **Add Device**, and then select the WAN Subnet for the **eth1** device. This subnet is used to communicate with Amazon Chime Voice Connector.



**Note:** Because you are creating multiple network devices, AWS EC2 console doesn't automatically allocate public IP addresses for the instance. These should be assigned manually as described below.

13. Click Next; the Add Storage page appears:

#### Figure 4-7: Add Storage Page

aws	Services ~ Resour	rce Groups 🗸 🔹 🛠				Å <sup>●</sup> N. Virginia	• Support •
1. Choose AMI 2. C	hoose Instance Type 3. (	Configure Instance 4. Add	Storage 5. Add Tags	6. Configure Security	Group 7. Revi	iew	
Step 4: Add S Your instance will be la edit the settings of the storage options in Ama	torage unched with the following root volume. You can also zon EC2.	storage device settings. Y attach additional EBS vol	'ou can attach additional Et umes after launching an in	3S volumes and insta stance, but not insta	ance store volum nce store volume	ies to your instance es. Learn more abo	e, or but
Volume Type (i) Device	Snapshot ()	Size (GiB) (j) Volume	Туре (ј)	IOPS (j)	Throughput (MB/s) (j)	Delete on Termination (i)	Encryption (j)
Root /dev/sda1	snap- 072cd55a8a4c3c0a2	10 Genera	Purpose SSD (gp2)	▼ 100 / 3000	N/A		Not Encrypte 🔻
Add New Volume	istomers can get up to 30	GB of EBS General Purp	ose (SSD) or Magnetic stor	age. Learn more ab	out free usage ti	er eligibility and	
				Cancel	Previous	view and Launch	Next: Add Tags

**14.** From the 'Volume Type' drop-down list, select the required volume of the instance. This setting does not affect SBC performance and may be set to any value.

**15.** Click **Next**; the Tag Instance page appears:

Figure 4-8: Tag Instance Page

aws Services - Resource Groups - 🖈	Å. N. Virginia ≁ Support ≁
1. Choose AMI 2. Choose Instance Type 3. Configure Instance 4. Add Storag	e 5. Add Tags 6. Configure Security Group 7. Review
Step 5: Add Tags A tag consists of a case-sensitive key-value pair. For example, you could define a EC2 resources.	a tag with key = Name and value = Webserver. Learn more about tagging your Amazon
Key (128 characters maximum)	Value (256 characters maximum)
Name	sbc-1
Add another tag (Up to 50 tags maximum)	
	Cancel Previous Review and Launch Next: Configure Security Group

**16.** In the 'Value' field, enter a name for your instance, and then click **Next**; the Configure Security Group page appears:

Figure 4-9: Configure Security Group Pag
--

aws	Services 🗸 Re	source Groups 🗸	*			<b>∴</b> • N. Vi	rginia 👻 Support	Ŧ
1. Choose AMI 2.	Choose Instance Type	3. Configure Instance	4. Add Storage	5. Add Tags	6. Configure Security Group	o 7. Review	N	
Step 6: Conf A security group is a sexample, if you want can create a new sec	igure Securit set of firewall rules that to set up a web serve urity group or select fi	ty Group at control the traffic for y r and allow Internet traff rom an existing one belo	our instance. On ic to reach your ir ww. Learn more a	this page, you ca istance, add rule bout Amazon EC	in add rules to allow specific s that allow unrestricted acc 2 security groups.	c traffic to rea cess to the H	.ch your instance. For TTP and HTTPS port:	: s. You
A	Assign a security gro	oup:  Create a new se	ecurity group					
		OSelect an existi	ng security group					
	Security group nar	ne: Mediant VE Se	ession Border Co	ntroller -SBC N	Metered-7-20A-252-274-Aut	togen		
	Descripti	on: This security g	roup was general	ed by AWS Mark	etplace and is based on re	comn		
Туре ()	Protocol (j)	Port Range (i)	Source (j)			Description	(j)	
SSH V	TCP	22	Custom •	0.0.0/0		e.g. SSH fo	r Admin Desktop	$\otimes$
HTTP •	TCP	80	Custom •	0.0.0/0		e.g. SSH fo	r Admin Desktop	⊗
HTTPS V	TCP	443	Custom •	0.0.0/0		e.g. SSH fo	r Admin Desktop	$\otimes$
Custom UDP I •	UDP	5060 - 5080	Custom •	0.0.0/0		e.g. SSH fo	r Admin Desktop	⊗
Custom TCP F •	TCP	5060 - 5080	Custom •	0.0.0/0		e.g. SSH fo	r Admin Desktop	⊗
Custom UDP I •	UDP	6000 - 65535	Custom •	0.0.0/0		e.g. SSH fo	r Admin Desktop	$\otimes$
Add Rule								
Warning     Rules with     addresses	) n source of 0.0.0.0/0 a s only.	llow all IP addresses to	access your insta	nce. We recomn	nend setting security group	rules to allow	access from known	IP
					Cance	Previou	IS Review and L	aunch

**17.** Configure firewall rules to allow management (SSH, HTTP, and HTTPS), signaling (SIP) and media (RTP/RTCP) traffic with your instance. Use default rules as a starting point and modify them to match your actual deployment needs.

**18.** Click **Review and Launch**; the Review page appears displaying a summary of your instance configuration:

aws	Services 🗸	Resource Groups 🐱	*			<b>↓</b> •	N. Virginia 👻	Support 👻
1. Choose AMI	2. Choose Instance Typ	e 3. Configure Instance	4. Add Storage	5. Add Tags	6. Configure Security Group	7. Review	_	
Step 7: F Please review process.	Review Instance your instance launch det	e Launch ails. You can go back to ed	it changes for ea	ch section. Click	Launch to assign a key pair	to your instance	e and complete t	he launch
A Im Au You You sec	prove your instance togenByAWSMP-1 ur instances may be acce u can also open additiona urity groups	s' security. Your security, is open to the world ssible from any IP address of ports in your security gro	urity group, N . We recommend up to facilitate ac	lediant VE Se d that you update cess to the appli	your security group rules to cation or service you're runni	er -SBC M allow access fro ng, e.g., HTTP (	letered-7-20A om known IP add (80) for web serv	resses only. ers. Edit
▼ AMI Det	ails							Edit AMI
00	Mediant VE Session	Border Controller (SBC	:) - Metered					
audiocodes	[Copied ami-0955a3f65a	ff9def4 from us-east-1] Audio	Codes SBC 7.20A	.252.274				
	Root Device Type: ebs Vir	ualization type: hvm						-
							Cancel Prev	ious Launch

#### Figure 4-10: Review Page

- **19.** Click **Launch**; the Select an existing key pair window appears.
- 20. Select a key pair to authenticate SSH connection with the SBC instance, click the I acknowledge check box, and then click Launch Instances.
- 21. Proceed to the next step to assign Elastic IPs to the launched SBC instance

## 4.1 Assigning Elastic IP Addresses to SBC Instance

The AWS EC2 environment assigns "private" IP addresses to the instances running in it. These addresses may be used for communication between the instances running inside the same network (VPC); however, they may not be used to connect to the instance over the Internet.

If the instance has only one network device, AWS EC2 may automatically assign a public IP address to it. The exact behavior depends on the VPC and/or Subnet configuration. This address however is taken from a "shared pool" and changes if you stop/start the instance. Therefore, it is not very useful for production environment.

To make SBC properly reachable over the Internet, you must allocate Elastic IP addresses and assign them to your instance. Multiple Elastic IP addresses may be assigned to the same AWS EC2 instance, depending on the number of configured private IP addresses.

When an Elastic IP address is associated with the specific instance's private IP address, AWS EC2 environment performs NAT translation by converting the Elastic IP address to the private IP address, while preserving the port range. If the SBC needs to communicate with a SIP entity using the Elastic IP address, the latter must be configured in the NAT Translation table to ensure proper modification of SIP / SDP messages for NAT traversal.

In the deployment topology shown in Figure 2-1, you need to assign Elastic IPs to the following SBC network interfaces:

- **eth1** connected to the WAN Subnet
- (Optional) eth0 connected to the LAN Subnet. This is needed only if communication with the Enterprise IP-PBX is performed over the open Internet using public IP addresses or if you want to access the SBC management interface over the open Internet.
- > To allocate an Elastic IP address to SBC instance:
- 1. Open the EC2 console at <u>https://console.aws.amazon.com/ec2</u>.
- 2. Navigate to Elastic IPs page under NETWORK & SECURITY.

aws Services - F	Resource Groups 🗸 🔸		🎝 <sup>●</sup> N. Virginia 👻	Support 👻	
New EC2 Experience Tell us what you think	EC2 > Elastic IP addresses				
Snapshots  Lifecycle Manager	Elastic IP addresses (1/1)	C Actions V	Allocate Elastic IP	address	
VETWORK & SECURITY	<b>Q</b> Filter Elastic IP addresses		< 1	> ©	
Security Groups	Name	∇ Public IPv4 address     ∇	Allocation ID	~	
Elastic IPs New	Name	• Fublic II v+ address •	Allocation ib	Ţ,	
Placement Groups New		54.175.28.99	eipalloc-061680223d81	d0e97 i	
Key Pairs New	₹			) - F	
Network Interfaces					
V LOAD BALANCING				-	
Load Balancers	54.175.28.99				
Target Groups					
▼ AUTO SCALING	Summary Tags				
Launch Configurations					
Auto Cooling Oroung -					•

#### Figure 4-11: Elastic IPs Page

3. Click Allocate Elastic IP address; a message box appears requesting you to confirm.

4. Click **Yes**, **Allocate** to confirm; a message box appears displaying the allocated IP address:

Figure 4-12: Allocated IP Address
Allocate New Address

New address request succeeded
Elastic IP: 52:35.152:143. View Elastic IP
Close

- 5. Click **Close** to close the message box.
- 6. From the 'Actions' drop-down list, select Associate Address.

Figure 4-13: Associate Address Window

	Instance	Search instance ID or Name tag		
	Network Interface	Or Search network interface ID or Name tag		
	Private IP Address	Select instance or interface.	() ()	
Warni If you as	ng ssociate an Elastic IP address esses .	with your instance, your current public IP addres	s is released. Learn more about pub	lic

- 7. Select the instance or network interface and private IP address to which you want to associate the Elastic IP address, and then click **Associate**.
- 8. If you have configured multiple IP addresses and want to make them reachable over the Internet as well, repeat the procedure for additional IP addresses.

# 5 Configuring Amazon Chime Voice Connector

This section describes how to configure Amazon Chime Voice Connector.

- > To configure Amazon Chime Voice Connector:
- 1. Open the Amazon Chime console at <a href="https://console.chime.aws.amazon.com/">https://console.chime.aws.amazon.com/</a>.
- 2. Navigate to Calling > Phone number management screen.
- 3. Under the Orders tab, click Provision phone numbers.
- 4. Select Voice Connector product type.
- **5.** Search phone numbers by location or area code. Once found, select the phone number, and then click **Provision**.

#### Figure 5-1: Searching Phone Numbers

on phone numbers	5								×
arch by country and loca	ation to disp	lay available phone	numbers.	Learn more abo	ut Lear	rn more			
United States +1	▼ Are	a Location	•	California	•	Search by city	8	Q	
Phone number									
+17602550513									^
+17602550519									
+14157121851									
+18316094099									
+17073617993									-
number selected									
							Cancel	Previous	Provision
	n phone numbers arch by country and loc United States +1 Phone number +17602550513 +17602550519 +14157121851 +18316094099 +17073617993 number selected	n phone numbers  The phone number of the second sec	n phone numbers  The phone number of the phone number  The phone number  The phone number  The phone number  The phone number of the phone of the ph	n phone numbers  The phone numbers  The phone number  The phone nu	n phone numbers  trch by country and location to display available phone numbers. Learn more abo United States +1  Area Location  California  Phone number +17602550513 +17602550519 +14157121851 +18316094099 +17073617993 number selected	n phone numbers  united States +1  Area Location  California  California  Phone number  17602550513  17602550519  14157121851  18316094099  17073617993 number selected	n phone numbers unch by country and location to display available phone numbers. Learn more about Learn more United States +1  Area Location  Area California  Search by city Phone number +17602550513 +17602550519 +14157121851 +18316094099 +17073617993 number selected	n phone numbers  The by country and location to display available phone numbers. Learn more about Learn more  The states +1  Area Location  California  Search by city  Area Location  California  Search by city  Area Cocation California  Californi	n phone numbers  The by country and location to display available phone numbers. Learn more about Learn more  United States +1  Area Location  California  Search by city  Area California

- 6. Navigate to Calling > Voice connectors screen.
- 7. Click Create new voice connector.
- 8. Enter a name for the voice connector, select a region, enable encryption, and then click **Create**.

#### Figure 5-2: Creating New Voice Connector

Create new voice connector ×
Create an Amazon Chime Voice Connector to make phone calls using your existing SIP infrastructure
Voice connector name
connector1
AWS region
US East (N. Virginia)
Encryption
<ul> <li>Enabled (Recommended)</li> </ul>
O Disabled
Cancel Create

- 9. Click the created Voice Connector.
- **10.** Navigate to the **Termination** tab.
- **11.** Change 'Termination status' to **Enabled**, and then write down the hostname displayed in the **Outbound host name** group. You will need it in the next step.
- 12. Under Allowed hosts list, click New, and then enter the Elastic IP address assigned to the 1<sup>st</sup> interface (eth0) of the deployed SBC instance (connected to the WAN subnet), followed by the prefix "/32".

#### Figure 5-3: Configuring Termination Status and Allowed Hosts List

* Chime	Support 🔻	Contact sales							
<u>AudioCodes</u> > Calling > Voice c	connectors > alex-test-1								
AudioCodes									
Amazon Chime	alex-test-1								
Accounts Calling	General Termination Origination Streaming Phone numbers Logging								
Getting started	Enable Termination settings to control outbound calling from your SIP infrastructure. Learn more.								
Voice connector groups	Termination status <ul> <li>Enabled</li> </ul>								
Global Settings	O Disabled								
Call detail records	Outbound host name The unique hostname your SIP infrastructure uses for outbound calls.								
	Outbound host name c6lgkcb5zn7yjx6cpswjb2.voiceconnector.chime.aws								
	Allowed hosts list* IP addresses allowed to make calls using your Voice Connector. You can create up to 10 entries.								
	New Actions								
	IP or Network								
	54.175.28.99/32								

**13.** Under **Calling plan**, select countries to which outbound calls will be allowed.

14. Under **Credentials**, click **New**, and then enter a username / password to authenticate SBC with Amazon Chime Voice Connector. Write down the credentials; you will need them in the next step.

Calling plan* Allow outbound calls to selected countries.
Countries       Select a country       United States of America X
Credentials (Recommended) Create up to 10 SIP credentials to authenticate outbound calls. If no credentials are created, authentication will not be required.
New     Delete       Username
Caller ID override
The caller ID shown for calls from this Voice Connector without caller ID. Outbound calls without a valid E.164 phone number as caller ID are blocked.  Phone number
Last options ping
The last SIP OPTIONS message received from your SIP infrastructure, if any. Last OPTIONS ping 54.175.28.99 Feb 10, 2020 at 10:00 PM
* Required Reset settings Save

Figure 5-4: Configuring Calling Plan and Credentials

- **15.** Click **Save** to save your settings.
- **16.** Navigate to the **Origination** tab.
- **17.** Change 'Origination status' to **Enabled**.
- **18.** Under **Inbound routes**, click **New**, and then configure the following:
  - Host: Elastic IP address assigned to the 1<sup>st</sup> interface (eth0) of the deployed SBC instance (connected to WAN subnet)
  - **Port:** 5061
  - Protocol: TCP
  - Priority: 1
  - Weight: 5

* Chime			Alex Agranov 🔻	Support V Contact sales
AudioCodes > Calling > Voice cor	nnectors > alex-test-1			
AudioCodes				
Amazon Chime Getting started	alex-test-1			
Accounts Calling	General Termination Orig	ination Streaming Pho	one numbers Loggi	ing
Getting started Phone number management Voice connector groups Voice connectors Global Settings Call detail records	Enable origination settings to control in Origination status Enabled Disabled Inbound routes* Configure inbound routes for your SIP hos	nbound calling to your SIP infrastru	re up to 10 routes.	
	New Actions V	P		
	54.175.28.99	5061 TCP	1	5
	* Required		Res	set settings Save

Figure 5-5: Configuring Origination Status

- 19. Click Save to save your settings.
- 20. Navigate to the Phone numbers tab.
- **21.** Click Assign from inventory.
- **22.** Select the phone number that you provisioned in the previous steps, and then click **Assign**. Write down the assigned phone number; you will need it in the next step.

#### Figure 5-6: Configuring Phone Numbers

* Chime		Alex Agranov 🔻 Support 🔻 Contact sales
AudioCodes > Calling > Voice	connectors > alex-test-1	
AudioCodes		
Amazon Chime Getting started	alex-test-1	
Accounts	General Termination Origination Streaming Phone numbers Logging	
Getting started Phone number management	Unassign	Assign from inventory
Voice connector groups	Search by full phone number 🛞 🔍	< Previous Next >
Global Settings	Phone numbers Last updated	
Call detail records	+18489001709 Feb 06, 2020 at 9:41 AM	1

# 6 Configuring the SBC

This section consists of two parts:

- Section 6.1 describes configuration of interoperability between the Enterprise IP-PBX and Amazon Chime Voice Connector.
- Section 6.2 describes configuration of the metering license for the Mediant VE SBC PAYG product

# 6.1 Configuring Interop between Enterprise IP-PBX and Amazon Chime Voice Connector

This section describes how to configure the SBC to enable connectivity between the Enterprise IP-PBX and Amazon Chime Voice Connector. The SBC Wizard interface is used because it simplifies configuration and leverages the interoperability database, which supports a wide variety of IP-PBX flavors.

#### **To configure SBC:**

1. Open the SBC Web interface.

#### Note:

- After deployment, the SBC Web interface is accessible via the 1<sup>st</sup> network interface (eth0) which is connected to the LAN subnet.
- If you assigned an Elastic IP address to the 1<sup>st</sup> network interface (eth0), you may use it to access the Web interface. Otherwise, you'll need to use the private IP address of the 1<sup>st</sup> network interface (eth0).
- **2.** Log in using the following default credentials:
  - Username: Admin
  - Password: Instance ID of the launched instance (e.g. "i-0f526bc135adc65a8")
- **3.** On the toolbar, click **Actions**, and then choose **Configuration Wizard**; the SBC Configuration Wizard welcome page appears.

# Save Reset Actions - Admin - Configuration File alue Auxiliary Files License Key Software Upgrade Configuration Wizard

#### Figure 6-1: Opening SBC Configuration Wizard

	MONITOR TROUBLESHOOT		Save	Reset	Actions <del>-</del>	4°	Admin 🗸
Mediant SW IP NETWORK SIGNALING &	MEDIA ADMINISTRATION				Ç Enti	ity, paramete	er, value
🗢 🔿 SRD All 👻							
WELCOME GENERAL SETUP	Welcome to the SBC Configuration Wizard						9
SYSTEM	INTRODUCTION	USAGE STATISTICS					
INTERFACES	The Configuration Wizard helps you with initial device configuration. The wizard will ask you to select a configuration template and a network topology.	Report Usage Statistics	2				
IP-PBX	It will then prompt you to fill in a short questionnaire to describe your setup. The wizard will conclude by generating a new configuration for your device	End Customer	Jo	ohn Doe			
REMOTE USERS	based on all your provided input.	Country		United States	5	•	·
SUMMARY		Integrator	A	T&T			
FINISH	Template Pack Version: <u>245</u>	Installer	A	T&T			
	Warning: When you have completed the witzard, its settings overwrite all of the device's existing configuration. Parameters that are not configurable by the witzard are restored to factory defaults (except basic device settings).						
	≮ Back Next > Cancel						

#### Figure 6-2: SBC Configuration Wizard Welcome Page

**4.** Fill in the information for usage statistics, and then click **Next**; the General Setup wizard page appears:

	P MONITOR TROUBLESHOOT		Save Reset	Actions -	Admin <del>-</del>
Mediant SW IP NETWORK SIGNALING	& MEDIA ADMINISTRATION			🔎 Entity, parame	ter, value
SRD All					
	Choose application	type and configuration			0
SYSTEM	PRE-DEFINED TEMPLATES	5	ARCHITECTURE DIAGRAM		
INTERFACES	Application	SIP Trunk (IP-PBX with ITSP)     SIP Normalization (two IP-PBX's)     Hosted IP-PBX (IP-PBX with Users)	LAN		
IP-PBX	IP-PBX	Remote users (IP-PBX with remote Users)     Cisco CUCM		- Amazon	
NUMBER MANIPULATION	SIP-Trunk	Amazon Chime Voice Connector 🔹	LAN Interface Inter	(DMZ) face	
REMOTE USERS(FEU)	Override template		Cisco SBC	Remote Use	rs
SUMMARY	Network setup	Two ports: LAN & WAN			
FINISH					
		✓ Back Next > Cancel			

Figure 6-3: General Setup Wizard Page

- 5. Configure the general parameters as follows:
  - For 'Application', select SIP Trunk (IP-PBX with ITSP).
  - For 'IP-PBX', select your Enterprise IP-PBX flavor. If not listed, select Generic IP-PBX.
  - For 'SIP Trunk', select Amazon Chime Voice Connector.
  - For 'Network Setup', select **Two ports: LAN & WAN**.

6. Click **Next**; the System Parameters wizard page appears:

	MONITOR TROUBLESHOOT		Sav	ve Reset	Actions 🗸	۲ <mark>۵</mark>	Admin 🗸
Mediant SW IP NETWORK SIGNALING 8	& MEDIA ADMINISTRATION				⊖ Enti	ity, paramete	er, value
🗢 🔿 SRD All 🔻							
WELCOME GENERAL SETUP	Configure system pa	arameters					0
SYSTEM	MANAGEMENT		LOCAL DNS TABLE				
INTERFACES	Web Interface	HTTP •	Enable				
IP-PBX SIP TRUNK	Enable Syslog						
NUMBER MANIPULATION	Syslog IP	0.0.0.0					
SUMMARY	TIME AND DATE						
	Time Zone Primary NTP Server Secondary NTP	GMT         •           0.0.0.0 or domain.com					
	Server	▲ Back Next > Cancel					_

Figure 6-4: System Parameters Wizard Page

- 7. Configure system parameters as follows:
  - For 'Time Zone', enter the time zone where the SBC is deployed.
  - For 'Primary NTP Server', enter **169.254.169.123**, which is the IP address of the Amazon Time Sync service.
- 8. Click Next; the Network Interfaces wizard page appears:

Figure 6-5: Network Interfaces Wizard Page

IP NETWORK SIGNALING & MED		N				Q Er	tity, parame <u>ter, v</u>
SRD All							
WELCOME GENERAL SETUP	Configure inte	erfaces					
SYSTEM	LAN INTERFACE	- DISABLED	WAN INTERFACE	E	MANAGEMEN	IT INTERFACE	
INTERFACES	Physical Port	GROUP_1 (GE_1)	<ul> <li>Physical Port</li> </ul>	GROUP_2 (GE_2)	OAM Interface	LAN	۲
IP-PBX	VLAN Tagging		VLAN Tagging				
SIP TRUNK	VLAN ID	Untagged	VLAN ID	Untagged			
SUMMARY	IP Address	172.31.12.241	IP Address	172.31.1.132			
FINISH	Subnet Mask	255.255.240.0	Subnet Mask	255.255.240.0			
	Default Gateway	172.31.0.1	Default Gateway	172.31.0.1			
	Primary DNS	172.31.0.2	Primary DNS	172.31.0.2			
	Secondary DNS	0.0.0.0	Secondary DNS	0.0.0.0			
			NAT Public IP	54.175.28.99			

 In the WAN INTERFACE > 'NAT Public IP' field, enter the Elastic IP address assigned to the 2<sup>nd</sup> SBC interface (eth1).



**Note:** If you want SBC to communicate with the Enterprise IP-PBX using public IP addresses (over the Internet), you need to manually configure NAT Translation on the 1<sup>st</sup> SBC interface (eth0) in the NAT Translation table (Setup > IP Network > Core Entities) after the SBC Configuration Wizard finishes.

**10.** Click **Next**; the IP-PBX Configuration wizard page appears:

#### Figure 6-6: IP-PBX Configuration Wizard Page

	IONITOR TROUBLESHOOT			Save Re	eset Actions <del>-</del>	ل <mark>ہ</mark>	Admin <del>-</del>
Mediant SW IP NETWORK SIGNALING & MEDIA	ADMINISTRATION				,⊖ En	tity, paramete	er, value
🔄 🄄 SRD All							
WELCOME	IP-PBX configuration	n					8
GENERAL SETUP							
SYSTEM	NETWORK INTERFACE						
INTERFACES	Network Type	LAN					
ір-рвх							
SIP TRUNK	IP-PBX		SIP INTERFACE				
NUMBER MANIPULATION	Address	10.15.28.101	Transport Type	TCP			•
SUMMARY	Backup Address	0.0.0.0 or domain.com	Destination Port	5060			
FINISH	SIP Domain	0.0.0.0 or domain.com	Listening Port	5060			
	Keep Alive						
	MEDIA PORTS (REALM)						
	Media Protocol	RTP •					
	Base Port	6000					
	Number Of Sessions	100					
		Back Next > Cancel					

- **11.** Configure the IP-PBX parameters as follows:
  - For 'Address', enter the IP address or hostname of the Enterprise IP-PBX.
  - Verify that the other parameters match your Enterprise IP-PBX configuration and adjust them as needed.
- **12.** Click **Next**; the SIP Trunk Configuration wizard page appears:

Mediant SW         IP NETWORK         SIGNALING & MEDIA           (*)         (*)         SRD         All         *	ADMINISTRATION				Ç Enti	ty, paramete	r, value
SRD All							
WELCOME	SIP Trunk configura	ation					9
GENERAL SETUP							
SYSTEM	NETWORK INTERFACE		NAT				
INTERFACES	Network Type	WAN	NAT Public IP				
IP-PBX							
SIP TRUNK	SIP TRUNK		SIP INTERFACE				
NUMBER MANIPULATION	Address	c6lgkcb5zn7yjx6cpswjb2.voiceconnector.cl	Transport Type	TLS		•	3
SUMMARY	Backup Address	0.0.0.0 or domain.com	Destination Port	5061			
FINISH	SIP Domain	0.0.0.0 or domain.com	Listening Port	5061			
	Keep Alive						
	SIP ACCOUNT		MEDIA PORTS (REALM)				
	Account Type	Authentication 🔻	Media Protocol	SRTP			-
	Trunk Main Line	+18489001234	Base Port	7000			]
	Username	audc	Number Of Sessions	100			
	Password	•••••					- I
		Back Next      Cancel					

Figure 6-7: SIP Trunk Configuration Wizard Page

- **13.** Configure the SIP Trunk parameters as follows:
  - For 'Address', enter the **Outbound host name** of your Amazon Chime Voice Connector.
  - For 'Trunk Main Line', enter the phone number that is assigned to your Amazon Chime Voice Connector.
  - The 'Transport Type' and 'Media Protocol' settings depend if encryption is enabled or disabled for Amazon Chime Voice Connector:
    - Encryption enabled:
      - 'Transport Type': TLS
        - 'Media Protocol': SRTP
    - Encryption disabled:
      - 'Transport Type': TCP
      - 'Media Protocol': RTP
  - The 'Account Type', 'Username' and 'Password' settings depend if credentials are configured for Amazon Chime Voice Connector:
    - Credentials configured:
      - 'Account Type': Authentication
      - 'Username': enter configured username
      - 'Password': enter configured password
    - Credentials not used:
      - 'Account Type': **None**
      - 'Username' and 'Password': leave empty
- 14. Click Next; the Number Manipulation wizard page appears:



acaudiococ	es setup m	IONITOR TROUBLESHOOT			Sav	re Reset	Act	tions <del>-</del>	<mark>ل</mark> ها	Admin <del>-</del>
Mediant SW IP NETWO	RK SIGNALING & MEDIA	ADMINISTRATION						🔎 Entity,	parameter	, value
SRD All	v									
WELCOME		Number Manipulat	ion configuration							0
SYSTEM		OUTBOUND CALLS (IP-P	BX ➡ SIP TRUNK)		INBOUND CALLS (SIP TRU	NK 🕈 IP-PBX)				
INTERFACES		Destination Number Manipulation			Destination Number Manipulation					
IP-PBX		Source Number			Prefix	+1				
SIP TRUNK		Manipulation			Remove	2				
NUMBER MANIPULATIC	N	ADVANCED ROUTING M	ANAGER		Add					
SUMMARY		Use ARM for call			Source Number					
FINISH		routing			Manipulation					
			▲ Back Next >	Cancel						

Figure 6-8: Number Manipulation Wizard Page

- **15.** Configure number manipulation for inbound and outbound calls. The wizard allows you to configure basic number manipulation rules for source and destination numbers:
  - Prefix': Defines the number prefix for which manipulation is applied.
  - 'Remove': Defines the number of digits (or characters) to remove from the left of the number.
  - 'Add': Defines new digits to add to the left pf the number.

Note that Amazon Chime Voice Connector uses the international number format, including the "+" sign and country code (e.g., +18489001709). If your IP-PBX uses a different number format, you must configure number manipulation for both inbound and outbound calls.

For example:

- The rule 'Prefix': +1, 'Remove': 2, 'Add': <empty> converts international US numbers into a national format. For example, it changes +18489001709 to 8489001709.
- The rule 'Prefix': 00, 'Remove': 2, 'Add': + replaces the prefix 00 with +. For example, it changes 008489001709 to +18489001709.
- The rule 'Prefix': \*, 'Remove': 0, 'Add': +1848900 assumes that all IP-PBX numbers are 4 digits and converts them into an international US format. For example, it changes 1709 to +18489001709.

Additional manipulation rules may be defined through the regular SBC Web interface after you have completed initial SBC configuration.

**16.** Click **Next**; the Summary wizard page appears:

	MONITOR TROUBLESHOOT		Save	Reset	Actions <del>-</del>	۲ <mark>۵</mark>	Admin <del>-</del>
Mediant SW IP NETWORK SIGNALING & MEDI	A ADMINISTRATION				Ç Enti	ity, paramete	er, value
SRD All 🔻							
WELCOME	Conclusion & INI						0
GENERAL SETUP	Configuration Summary	INI file					
SYSTEM	Welcome	Report Usage Statistics: Yes					
INTERFACES		Country: US Integrator: AT&T					
IP-PBX		Installer: AT&T					
SIP TRUNK	General Setup	Network setup: Two ports: LAN & WAN Application: ITSP					
NUMBER MANIPULATION		IP-PBX: CISCO CUCM SIP-Trunk: Amazon Chime Voice Connector					
SUMMARY	System	Web Interface: HTTP CLI Interface: SSH					
FINISH		Syslog IP: 0.0.0.0					
	Interfaces	Physical Port: GROUP_1 (GE_1) OAM Interface: LAN					
	< Back	Next > 🛛 🛱 Save INI file Cancel					

Figure 6-9: Summary Wizard Page

**17.** Review the configuration summary, and then click **Next**; the Finish wizard page appears:

Figure 6-10: Finish Wizard Page

	MONITOR TROUBLESHOOT	Save	Reset	Actions <del>-</del>	Ц <mark>Р</mark>	Admin 🗸
Mediant SW IP NETWORK SIGNALING &	MEDIA ADMINISTRATION			,⊖ Ent	tity, paramete	er, value
SRD All     WELCOME     GENERAL SETUP     SYSTEM     INTERFACES     IP-PBX     SIP TRUNK     NUMBER MANIPULATION     SUMMARY	Congratulations! You have successfully completed the SBC Configuration wizard. Click "Apply & Reset" button to activate the new configuration. Note that device will be restarted an The generated configuration file is a good "starting point" that enables successful establishment o For complete device configuration you may need to configure additional functionality. For example, you may need to add security configuration (e.g. Firewalls, IDS) to ensure that SBC is Refer to the User Manual for more information. WARNING: Applying this configuration will overwrite all of the existing device configuration. Apply & Reset	nd it may take up to f basic calis. protected from ma	14 minutes be licious user ac	fore it completes	activation.	
FINISH	✓ Back Next > PSave INI file Cancel					

**18.** Click **Apply & Reset** to apply the configuration. This may take about four minutes to complete.

- **19.** After the SBC completes its reset, you are redirected to the Web Login page. Log in using the default credentials.
- **20.** Review the SBC configuration:
  - In the TOPOLOGY VIEW page, verify that two IP Groups, representing Amazon Chime Voice Connector and the Enterprise IP-PBX were created.
  - Verify that IP Group #2, which represents Amazon Chime Voice Connector, is displayed with a check mark indicating that the SBC has successfully connected to it.
  - Verify that CORE ENTITIES and SBC sections in the configuration menu have no red dots (indicating entities with invalid configuration).

Caudiocodes	SETUP MON	ITOR TROUBLESHOOT		Save	Reset	Actions 🗸	С <mark>Р</mark>	Admin <del>-</del>
Mediant SW IP NETWORK SIGN	ALING & MEDIA	ADMINISTRATION				,⊖ Em	ity, paramete	er, value
Mediant SW     IP NETWORK     SIGN		ADMINISTRATION Classification > Number Manipulation > Routing > SBC Settings >	IP Group [Server] + #2(chine) • #2(spin + SBC		Affect #2] Mec	ta nealm (Chine) +	iy, paramete	r, value
IP Group Set (0) Manipulation SBC General Settings Call Admission Control Profile (0) Malicious Signature (12) External Media Source (0)			#1[spin+		#1[1	IP-PBX +		

#### Figure 6-11: Topology View Page

## 6.2 Configuring Metering License for Mediant VE SBC – PAYG Product

The "Mediant VE SBC – PAYG" product includes a pay-as-you-go (PAYG) license that requires a persistent connection between the SBC and the AWS Metering API. This connection is performed using public IP addresses via the network interface that is configured as described below.

This configuration is very important, as without it the SBC will be unable to communicate with the AWS Metering API and will seize its service. The PAYG license also requires that the correct system time is configured on the SBC. Therefore, it's important that you verify it as well, as described below.



**Note:** This section is applicable only to the "Mediant VE SBC – PAYG" product that uses pay-as-you-go (PAYG) license. If you deployed the "Mediant VE SBC" product that requires a production license purchased from AudioCodes, skip to the next section.

#### To configure SBC:

1. Navigate to the Time & Date page (ADMINISTRATION > TIME & DATE).

#### Figure 6-12: Time & Date Page

- 2. Verify that the 'Local Time' field displays the correct value that matches the configured time zone. If not, modify the parameters under the NTP SERVER and TIME ZONE groups.
- 3. Navigate to the Metering License page (ADMINISTRATION > LICENSE > Metering License).

<b>cc</b> audiocodes	SETUP MONITOR TROUBLESHOOT		Save	Reset	Actions <del>-</del>	4. L	Admin <del>-</del>
Mediant VE SBC IP NETWORK	SIGNALING & MEDIA ADMINISTRATION				⊖ Entit	ty, paramete	er, value
	Metering License           NETWORKING           Metering Interface Name					y, paramece	, venue
SNMP  LICENSE  LICENSE Key Floating License  Metering License  MainTENANCE		Cancel	APPLY				

#### Figure 6-13: Metering License Page

- **4.** From the 'Metering Interface Name' drop-down list, select the network interface that is associated with the Elastic IP address. In the deployment topology described in Figure 2-1: Deployment Topology, this is **eth1**.
- 5. Click **Apply** to apply your settings.
- 6. On the toolbar, click **Save** to save your settings.

# 7 Configuring the Enterprise IP-PBX

Refer to the configuration manual of your Enterprise IP-PBX for detailed instructions on how to connect it to the SBC. Configuration on the Enterprise IP-PBX depends on the IP-PBX flavor, but typically it includes the following steps:

- 1. Create a **SIP Trunk** that represents the SBC.
  - Configure the **destination address** as the IP address of the 1<sup>st</sup> SBC network interface (eth0).
    - If you want the Enterprise IP-PBX to communicate with the SBC using private IP addresses (over VPN or Direct Connect), use the private IP address of the 1<sup>st</sup> SBC network interface (eth0).
    - If you want the Enterprise IP-PBX to communicate with the SBC using public IP addresses (over the Internet), use the Elastic IP address assigned to the 1<sup>st</sup> SBC network interface (eth0).
  - Configure the **destination port** to match the SBC listening port (configured on the IP-PBX Configuration wizard page of the SBC Configuration Wizard).
  - Configure the **protocol** to match the SBC transport type (configured on the IP-PBX Configuration wizard page of the SBC Configuration Wizard).
- 2. Create a **route** to the SBC:
  - Configure the **route pattern** (e.g., "+1XXXXXXXXXX").
  - Configure the **route destination** as the **SIP Trunk** that represents the SBC.



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# 8 Deploying a Second SBC Instance for Improved Reliability

After successfully completing deployment and configuration of the first SBC instance, you can improve your solution reliability by deploying a second SBC instance in a different Availability Zone, as show in Figure 2-1: Deployment Topology.

#### > To deploy a second SBC instance:

- Deploy the second SBC instance, as described in Deploying the SBC Instance on page 13. Use different LAN and WAN subnets that reside in a different Availability Zone of the same VPC.
- 2. Configure the second SBC instance, as described in Configuring the SBC on page 27.
- 3. In the Amazon Chime Voice Connector settings:
  - Add the second SBC instance to the list of allowed hosts in Termination tab > Allowed hosts list (see Step 12 in Section Configuring Amazon Chime Voice Connector).
  - Add the second SBC instance to the inbound routes in Origination tab > Inbound routes (see Section Configuring Amazon Chime Voice Connector). Use priority and weight to create active/active or active/standby SBC deployment.
  - Amazon Chime Voice Connector routes calls first according to priority, where 1 is the highest priority. If hosts are equal in priority, calls are distributed among them based on their relative weight.
- **4.** In the Enterprise IP-PBX settings, add the second SBC to the outbound rules list. Refer to your specific IP-PBX configuration manual for detailed instructions.



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# 9 Troubleshooting SBC Deployment

This section describes typical problems with SBC deployment described in this document and corresponding solutions.

Problem	Solution
Connection cannot be established with the SBC's Web interface	The SBC's Web interface is accessible via the 1 <sup>st</sup> network interface (eth0) only. In typical deployment topology (described previously), the 1 <sup>st</sup> SBC network interface (eth0) is not assigned with a public (Elastic) IP address. Therefore, you should use one of the following means to access the SBC Web interface:
	<ul> <li>Establish a VPN / Direct Connect connection between your datacenter and the LAN subnet to which the 1<sup>st</sup> SBC network interface (eth0) is connected. Access the SBC's Web interface from a PC in your datacenter over this VPN / Direct Connect connection.</li> </ul>
	<ul> <li>Launch another AWS instance with Windows OS. Connect it to the LAN subnet and assign it with the public (Elastic) IP address. Use this instance as a "jump server". In other words, log in to it first (via the public IP address) and then access the SBC's Web interface from it (via the private IP address).</li> <li>Assign the Elastic IP address to the 1<sup>st</sup> SBC network interface (eth0) and use it to access the SBC's Web interface.</li> </ul>
SBC refuses to accept calls and displays the "No connection to Metering API" alarm	The "Mediant VE SBC – PAYG" Marketplace offer includes a pay-as-you-go license that enables Customers to use SBC as much as needed and pay for the actual service consumed via their AWS account billing. This licensing model requires a persistent connection between the SBC and AWS Metering API. The "Metering" IAM role that grants permission to use this API must be assigned to the SBC instance (see Section 4 for details).
	seizes its operation until connection is available. The "No connection to Metering API" alarm is raised to indicate this problem.
	In the deployment topology described in Figure 2-1: Deployment Topology, the SBC should use the 2 <sup>nd</sup> network interface (eth1) to connect to the AWS Metering API. This is because this connection is performed via public IP addresses and eth1 is assigned with an Elastic IP address. The network interface used for accessing the AWS Metering API can be changed on the Metering License page (ADMINISTRATION > LICENSE).
	Typical reasons that may cause lack of connectivity between SBC and the AWS Metering API include:
	<ul> <li>No "metering" IAM role assigned to the SBC instance.</li> <li>No Public IP address on the network interface used for communication with the AWS Metering.</li> </ul>
	<ul> <li>Incorrect time configured on the SBC (ADMINISTRATION &gt; TIME &amp; DATE).</li> </ul>
	<ul> <li>A Network Security Group or some other firewall device is blocking communication between SBC and the AWS Metering API endpoint (https://metering.marketplace.<region>.amazonaws.com).</region></li> </ul>
	Use the above checklist to identify the reason why your SBC instance can't access the AWS Metering API and resolve it.

#### Table 9-1: Troubleshooting SBC Deployment

Problem	Solution
SBC doesn't forward calls to/from Amazon Chime Voice Connector	Initial configuration created by the SBC Configuration Wizard may need minor adjustments to suit your specific setup. For example, you may need to adjust number manipulation rules (SETUP > SBC > Manipulation > Outbound Manipulations) to match the number format used by your IP-PBX.
	To troubleshoot such problems, collect logs from the SBC as described in Section Collecting and Analyzing Logs from SBC, analyze them using the Syslog Viewer utility, identify the root cause of the problem, and then solve it by adjusting the corresponding SBC configuration. Refer to the <u>AudioCodes</u> <u>Mediant VE SBC User Manual</u> for detailed description of SBC capabilities and configuration.

# **10 Collecting and Analyzing Logs from SBC**

This section describes how to collect logs from the SBC and analyze them to perform advanced troubleshooting.

- To collect logs from SBC:
- Download AudioCodes Syslog Viewer from https://www.audiocodes.com/library/firmware.
- Install it on the PC that has access to the SBC management interface, through the LAN network connected to the 1<sup>st</sup> SBC network interface (eth0).
- 3. Run the Syslog Viewer tool.

#### Figure 10-1: AudioCodes Syslog Viewer Tool

😁 Syslog Viewer	- 🗆 X
<u>File Edit View Tools H</u> elp	
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10:53:35.000 172.31.12.241 local0.notice 10:53:35.000 172.31.12.241 local0.notice 10:53:35.000 172.31.12.241 local0.notice 10:53:35.000 172.31.12.241 local0.notice 10:53:35.000 172.31.12.241 local0.notice	<pre>&gt; (#114)SBCEndPoint[Initiated-&gt;Session] -&gt; (#13)SBCCall[Alerting.&gt;Connected] &gt;&gt; (#120)SIPSBCCallLeg [File:Logger.cpp Line:417] [Time:13-02@10:53:34.845] [S=55552] [SID=3f32bb:12:4293] (N 47065) SBCOfferAnswerMgnr[#120]:AddPreviousSDPTOMess; [S=55553] [SID=3f32bb:12:4293] (N 47066) ACSIPCall(#1238): HandLing CONNECT_REQ in state [S=55555] [SID=3f32bb:12:4293] (N 47066) ACSIPCall(#1238): HandLing CONNECT_REQ in state [S=55555] [SID=3f32bb:12:4293] (N 47066) ACSIPCall(#1238): HandLing CONNECT_REQ in state [S=55555] [SID=3f32bb:12:4293] SIP/2:0 200 OK Via: SIP/2.0/UDP 172.31.6.166:56218: received=172.31.6.166: rport=56218; branch=29hG4bKPjc0097: From: <sip:+18049001700@172.31.12.241>:tag=8a73c497cb0f433d9d525d869286ccbc To: <sip:+1804904444440172.31.12.241>:tag=8a73c497cb0f433d9d525d869286ccbc Contact: <sip:172.31.12.241:stag=4efomgrg1sbqh Call-ID: d4830ad76295451f9dd2lce8d281032f Cseq: 4525 INVITE Contact: <sip:172.31.12.241:5060> Supported: sdp-anat Server: Mediant SW/v.7.20A-u9001.256.393 Content-Type: application/sdp Content-Length: 256 v=0 0=Sonus_UAC 105113295 2066628126 IN IP4 172.31.12.241 sSIP Media Capabilities t=0 0 m=audio 6000 RTP/AVP 0 101 c=IN IP4 172.31.12.241 a=rtpmap:0 PCMU/8000 a=rtpmap:101 telephone-event/8000 a=rtpmap:101 telephone-event/8000 a=rtpmap:101 telephone-event/8000 a=rtpmap:101 telephone-event/8000 a=rtpmap:20 </sip:172.31.12.241:5060></sip:172.31.12.241:stag=4efomgrg1sbqh </sip:+1804904444440172.31.12.241></sip:+18049001700@172.31.12.241></pre>
10:53:35.000 172.31.12.241 local0.notice	<pre>[File:ransportobject.cpp Line:is-02010:53:54.045] [S=55557] [SID=3723bb:12:4293] (N 47069) States: (#1238)AcSIPCall[Invited-&gt;LocalAccepter (#318)SBCFeature[Deallocated] [File:Logger.cpp Line:417] [Time:13-02010:53:34.845]</pre>
10:53:35.000 172.31.12.241 local0.notice	[S=55558] [SID=3f32bb:12:4293] (N 47070) Incoming SIP Message from 172.31.6.166:562
10.33.33.000 1/2.31.12.241 totat0.Notice	Via: SIP2.0/UD 172.31.6.166:56218;rport;branch=29hG4bKPjb8b497f7a0e34fdf910cb154563245d0 Max-Forwards: 70
4	
Line: 586 Column: 0	Syslog Listener: UDP   Write Log: OFF   Web Connection: 172.31.12.241   Total: 586 Error: 0 Warning: 0

- 4. Connect to the SBC Web interface, and then log in using the default credentials.
- 5. Open the Logging Settings page (TROUBLESHOOT > Logging > Logging Settings).
- 6. Configure the following parameters:
  - From the 'Enable Syslog' drop-down list, select **Enable**.
  - In the 'Syslog Server IP' field, enter the IP address of the PC where Syslog Viewer is running.
  - From the 'VoIP Debug Level' drop-down list, select **Basic**.

- 7. Click Apply to apply your settings.
- 8. Make a few calls; detailed logs, including all the send and received SIP messages are displayed in the Syslog Viewer.



**Note:** The above procedure configures the SBC to send syslog messages to the PC where Syslog Viewer is installed. If such communication is not possible (e.g., due to a firewall or NAT devices in the middle), you may use the *Web Connect* feature in the Syslog Viewer to establish an HTTP connection with the SBC and pull logs from it. Refer to the Syslog Viewer's Help > Overview for configuration details.

#### To analyze the collected logs:

- 1. After collecting the call logs, use the *SIP Flow Diagram* feature in the Syslog Viewer
  - ( *i* button) to display a ladder diagram of the SIP call.

💮 SIP Flow Diagram - 3f32bb:12:4293								- 0	) ×
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10:53:33 INVITE (SDP)									
100 Trying									
-	INVITE (SDP)								
	100 Trying								
	401 Unauthorized								
	ACK								
	INVITE (SDP)								
	100 Trying	<<	rev Fi	nd	Next >>	Export -	🔽 Sho	w calls only Calls: 1	Other: 11
10:53:35	183 Session Progress (SDP)	Messa	ge CDR						
183 Session Progress (SDP)		10:53	:33.000	- Incomin	g SIP Mes	sage from 172.3	1.6.166:56218 to	SIPInterface #1	(sipI 🔺
	200 OK (SDP)	INVII	E sip:+18004	444444@17	2.31.12.2	241 SIP/2.0		77040-040-04-00	
200 OK (SDP)		Max-F	orwards: 70	1/2.31.0.	100:0011	s; rport; branch=2s	mG40KPJC0097300	e//949ae940a90C88	e4311
ACK		To:	sip:+1800444	4444@172.	31.12.24	241>;Cay=8a73C49. L>	000143309052508	09280CCDC	
	АСК	Conta	CT: <\$1p:+18 ID: d4830ad7	6295451f9	dd21ce8d2	281032f			
10:53:41 BYE		Allow	PRACK, INV	ITE, ACK,	BYE, CAN	ICEL, UPDATE, INF	O, SUBSCRIBE, N	DTIFY, REFER, MESS	SAGE,
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#### Figure 10-2: SIP Flow Diagram

- 2. Click the call to display its SIP ladder diagram. Click the message in the SIP ladder diagram to display its content.
- **3.** Use the main Syslog Viewer screen to view additional logs sent by the SBC; these may help you to identify the root cause of the problem.

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