SIP Trunking Configuration Guide: Configuring a SIP Trunk from INTELIQUENT, A Sinch Company, to Amazon Chime SDK Voice Connector and a SIP Media Application

July 2023

Document History

Rev. No.	Date	Description
1.0	July-05-2023	Initial release

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1 Audience

This document is intended for technical staff and Value-Added Resellers (VARs) with installation and operational responsibilities. This configuration guide provides steps for configuring **SIP Trunks** between operator **INTELIQUENT** and an **Amazon Chime SDK Voice Connector**. An example is provided of the trunk then connecting to a **SIP Media Application (SMA)** that is used to bridge an inbound call to a meeting.

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1.1 Amazon Chime SDK Voice Connector

Amazon Chime SDK Voice Connector is a pay-as-you-go service that enables companies to make or receive secure phone calls over the internet or AWS Direct Connect using their existing telephone system or session border controller (SBC). The service has no upfront fees, elastically scales based on demand, supports calling both landline and mobile phone numbers in over 100 countries, and gives customers the option to enable inbound calling, outbound calling, or both.

Amazon Chime SDK Voice Connector uses the industry-standard Session Initiation Protocol (SIP). Amazon Chime SDK Voice Connector does not require dedicated data circuits. A company can use their existing Internet connection or AWS Direct Connect public virtual interface for SIP connectivity to AWS. Voice connectors can be configured in minutes using the AWS Management Console or Amazon Chime API. Amazon Chime SDK Voice Connector offers cost-effective rates for inbound and outbound calls. Calls into Amazon Chime meetings, as well as calls to other Amazon Chime SDK Voice Connector customers are at no additional cost. With Amazon Chime SDK Voice Connector, companies can reduce their voice calling costs without having to replace their on-premises phone system.

SIP media applications make it easier and faster for you to create custom signaling and media instructions that you would normally build on your private branch telephone exchange (PBX).

SIP rules specify how a SIP media application can connect to an Amazon Chime SDK meeting. Calls can go to and from private phone numbers that you own, or to and from a Request URI hostname, the name assigned to an Amazon Chime SDK Voice Connector. The Amazon Chime SDK runs the SIP rules when a user places or receives a call.

You must be an AWS Lambda user before you can create SIP media applications.

2 SIP Trunking Network Components

The network for SIP Trunk reference configuration is illustrated below and is representative of call routing through **INTELIQUENT** with **Amazon Chime SDK Voice Connector** and **SMA.**

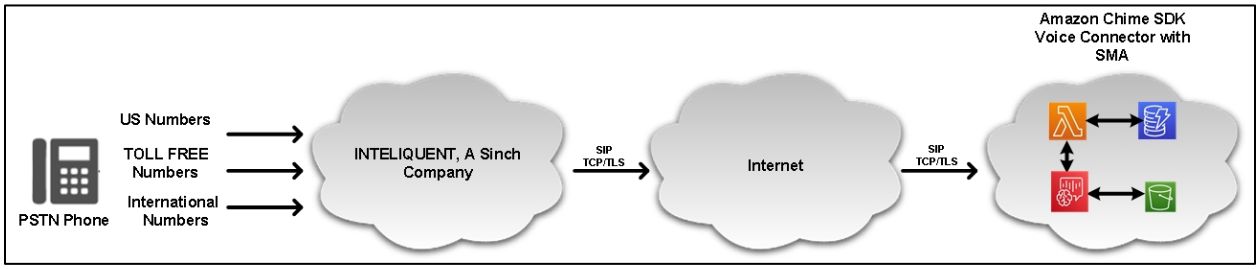

Figure 1 : Network Topology

2.1 Hardware Components

- None

2.2 Software Requirements

- None

3 Features

3.1 Features Supported

The below call scenarios are tested with TCP and TLS.

- Inbound calls to SMA using following numbers.
  * US Toll free numbers
  * US Toll numbers
  * International Numbers (UK, Netherlands, Germany)
- Calling Party Number Presentation
- DTMF-RFC 2833
- Long duration calls

3.2 Features Not Supported

- None

3.3 Features Not Tested

- None

3.4 Caveats and Limitations

- Amazon Chime SDK Voice Connector does not accept calls from source regions other than USA.

4 Configuration

The specific values listed in this guide are used in the lab configuration described in this document and are for illustrative purposes only. You must obtain and use the appropriate values for your deployment. Encryption is always recommended if supported.

4.1 Configuration Checklist

In this section we present an overview of the steps that are required for establishing an **INTELIQUENT** SIP Trunk to **Amazon Chime SDK Voice Connector** and then creating a **SIP media application** action to bridge an inbound SIP call to a meeting.

Table 1 – PBX Configuration Steps

Steps	Description	Reference
Step 1	Amazon Chime SDK Voice Connector and SIP Media Application Configuration	Section 4.2
Step 2	INTELIQUENT SIP Trunk Configuration	Section 4.3

4.2 Amazon Chime SDK Voice Connector and SIP Media Application Configuration

4.2.1 Create SIP Trunk in Amazon Chime SDK Voice Connector

To create an Amazon Chime SDK Voice Connector

1. Open the Amazon Chime console at https://console.aws.amazon.com/chime-sdk/home
2. For **SIP Trunking**, choose **Voice Connectors**.

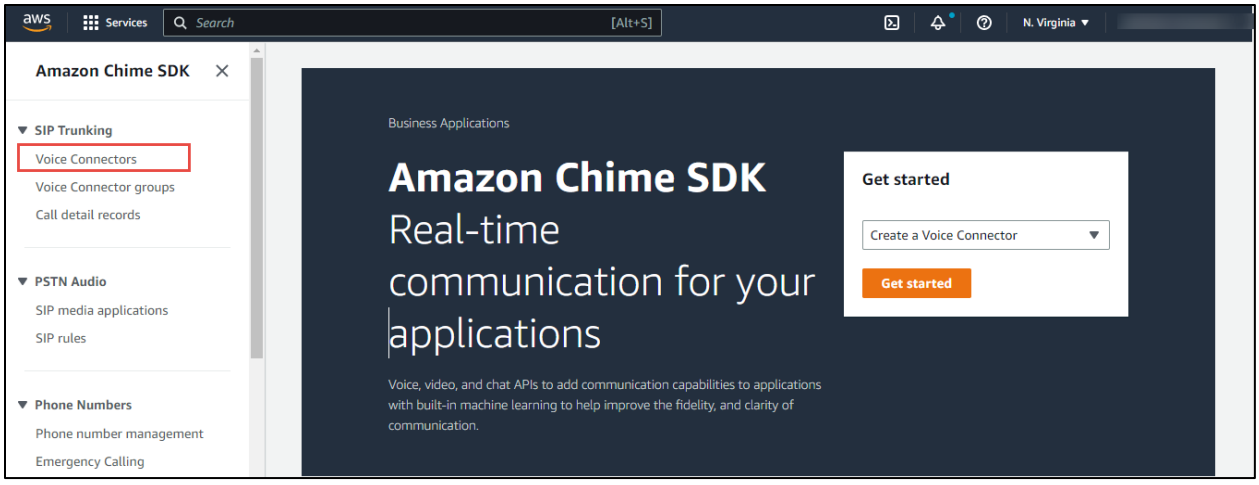

Figure 2 : Create Amazon Chime SDK Voice Connector

3. Choose **Create new voice connector**.

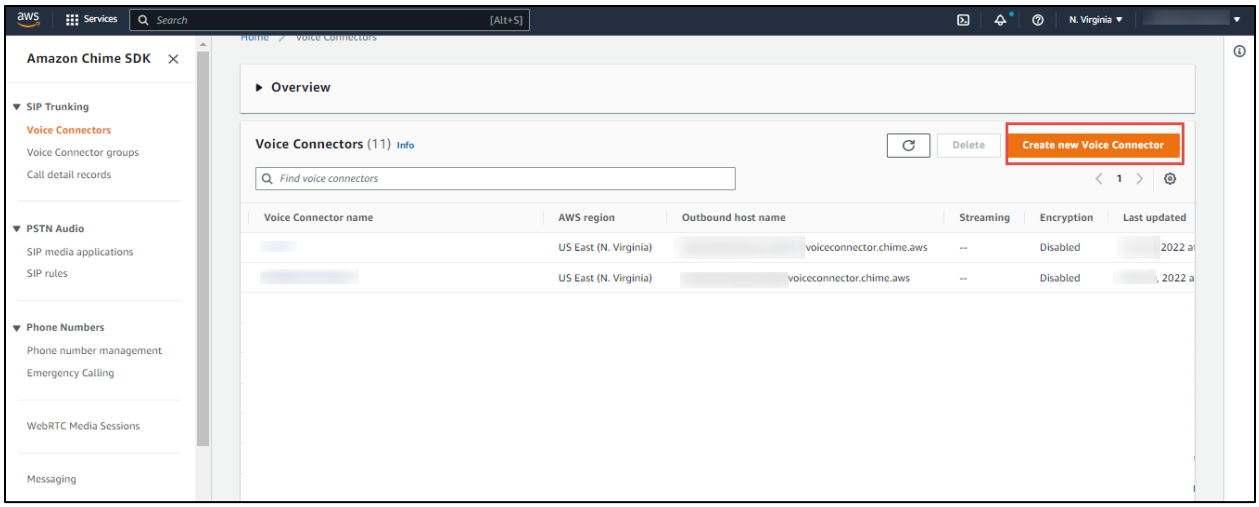

Figure 3 : Create Amazon Chime SDK Voice Connector (cont.)

4. For **Voice Connector name**, enter a name for the Amazon Chime SDK Voice Connector.
5. (Optional) For **AWS Region**, choose an AWS Region for your Amazon Chime SDK Voice Connector. The default Region is US East (N. Virginia) (**us-east-1**). Regions cannot be changed after your Amazon Chime SDK Voice Connector is created.
6. For **Encryption (TLS)** select **Enabled** or **Disabled** for **UDP/TCP**
7. Choose Create.

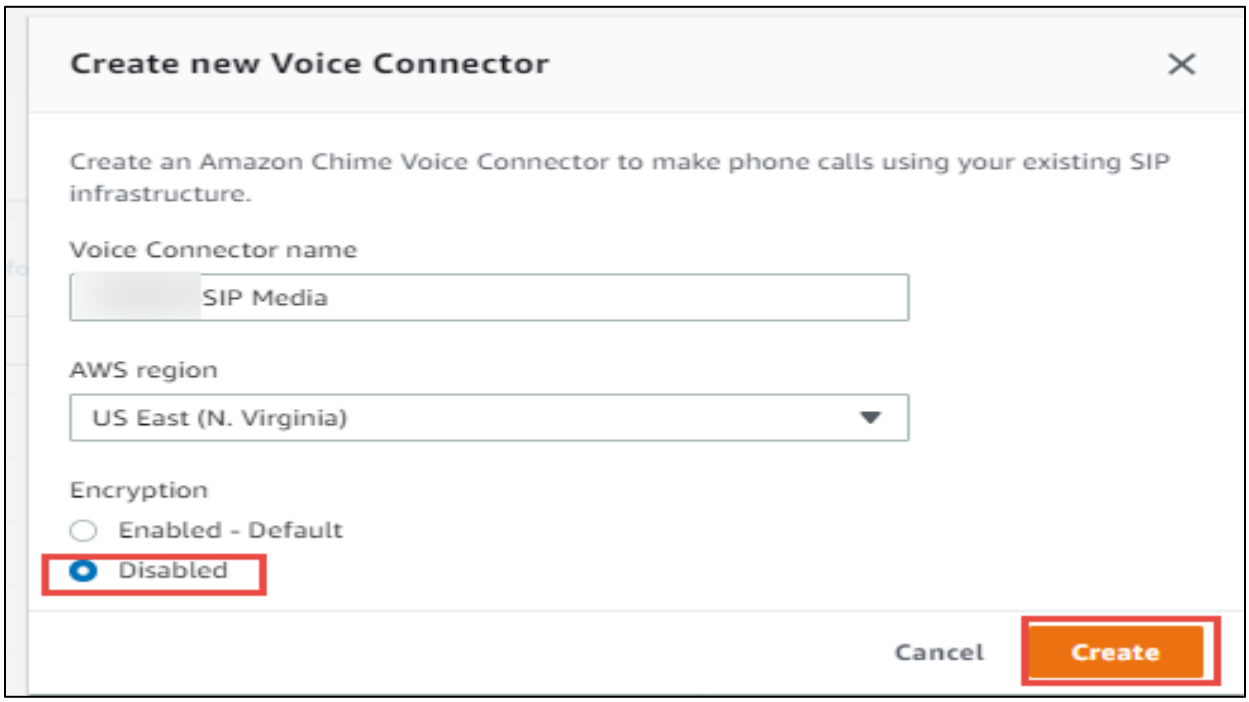

Figure 4 : Create Amazon Chime SDK Voice Connector (cont.)

Note
Enabling encryption configures your Amazon Chime SDK Voice Connector to use TLS transport for SIP signaling and Secure RTP (SRTP) for media. Inbound calls use TLS transport, and unencrypted outbound calls are blocked.

4.2.2 Access List in Amazon Chime SDK Voice Connector

1. Open the Amazon Chime console at https://console.aws.amazon.com/chime-sdk/home
2. For **Calling**, choose **Voice Connectors**.
3. Choose the name of the Amazon Chime SDK Voice Connector to edit.
4. Choose **Origination** and select **Enabled**.
5. For **Inbound routes**, choose **New**.
6. Enter the values for **Host**, **Port**, **Protocol**, **Priority**, and **Weight**.
7. Choose **Add**.
8. Choose **Save**.

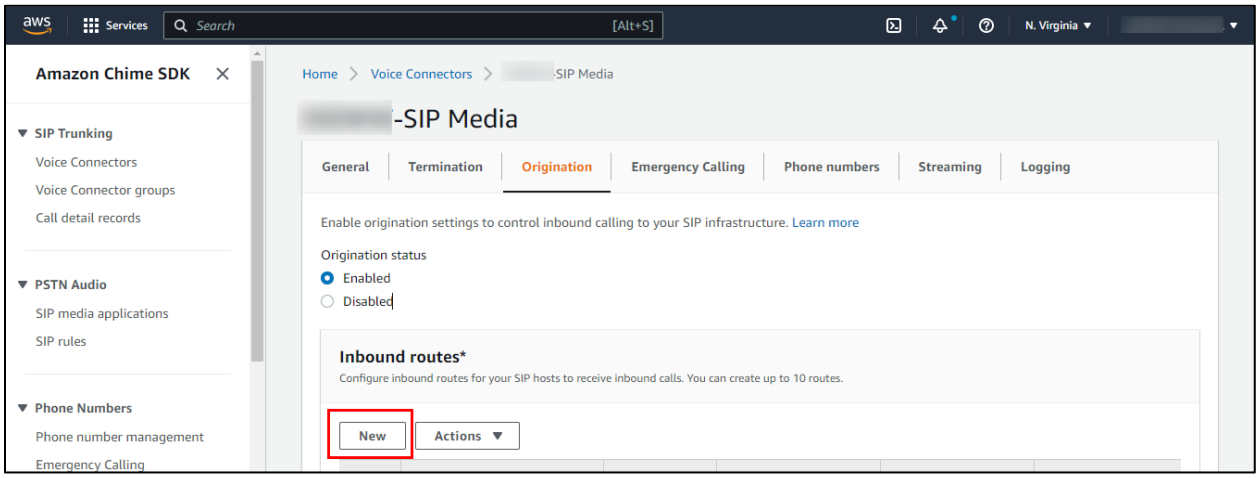

Figure 5 : Create Amazon Chime SDK Voice Connector (cont.)

9. Choose **Termination** and select **Enabled**.
10. For **Allowed hosts list**, choose **New**, enter the CIDR notations and values to allow list, and choose **Add**.

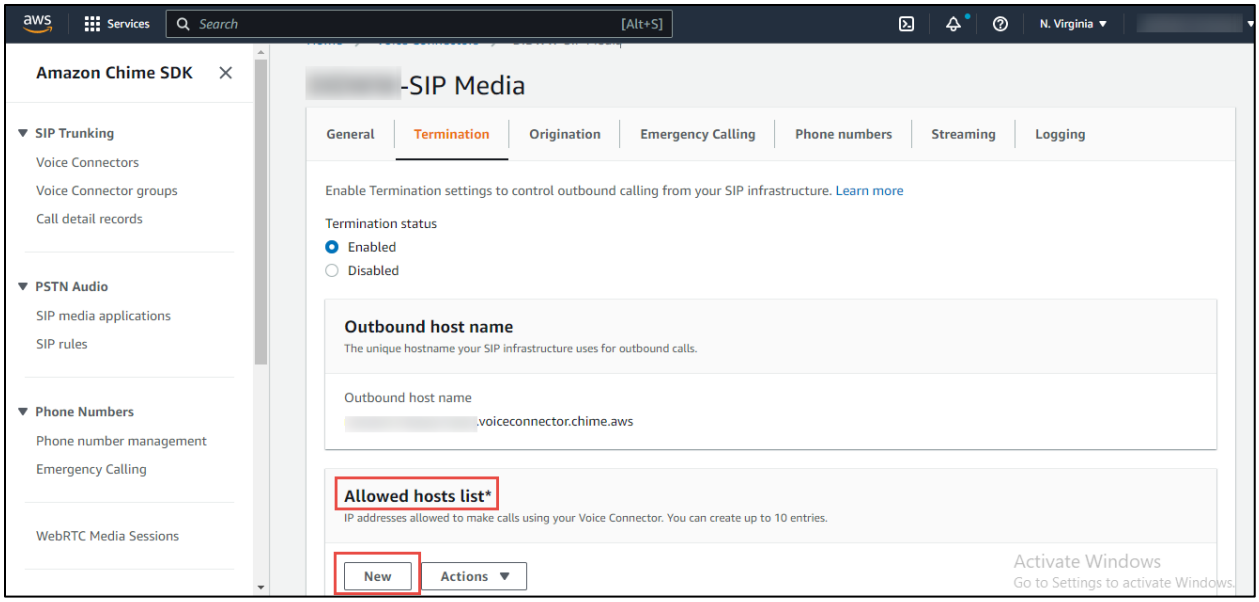

Figure 6 : Create Amazon Chime SDK Voice Connector (cont.)

Note
Adding host addresses is not limited to inbound and outbound configuration. Multiple host addresses will be required due to SIP infrastructure dependency.

4.2.3 Optional - Create AWS Lambda Function

This section explains how to create an AWS Lambda function to bridge a call to an Amazon Chime SDK meeting. It is for illustrative purposes only, and is not an essential part of the SIP trunk configuration. For more information on SIP media applications, refer to the Amazon Chime SDK developer guide.

1. Open the Amazon console at https://console.aws.amazon.com/console/
2. In the menu select services choose **Lambda.**

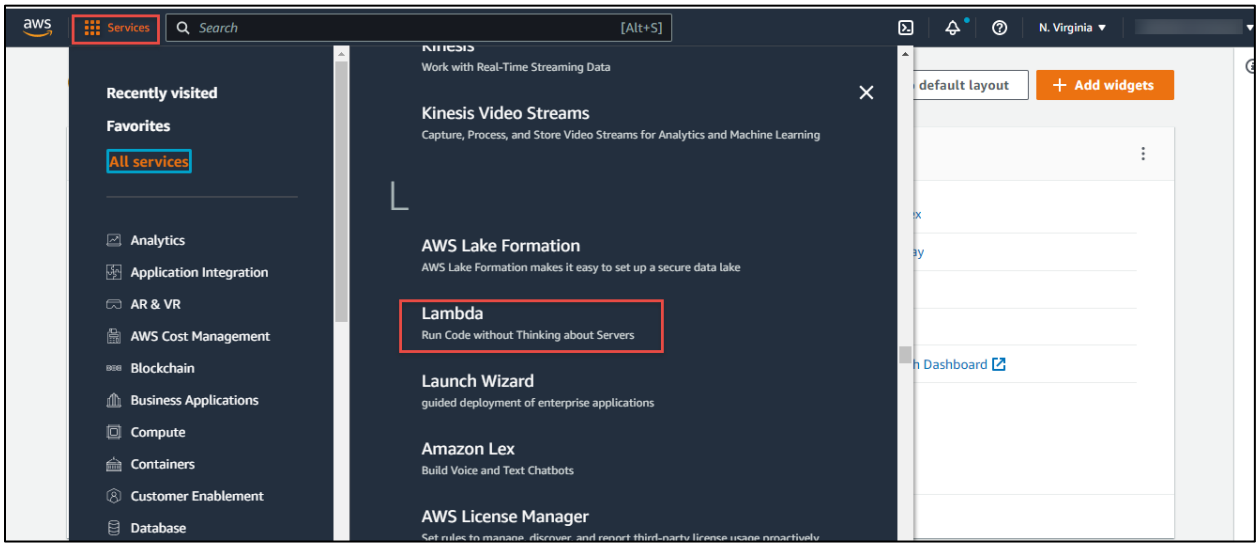

Figure 7 : Create Lambda

3. In the AWS Lambda menu, select the **Functions** and click **Create Function** button to create a new lambda function.

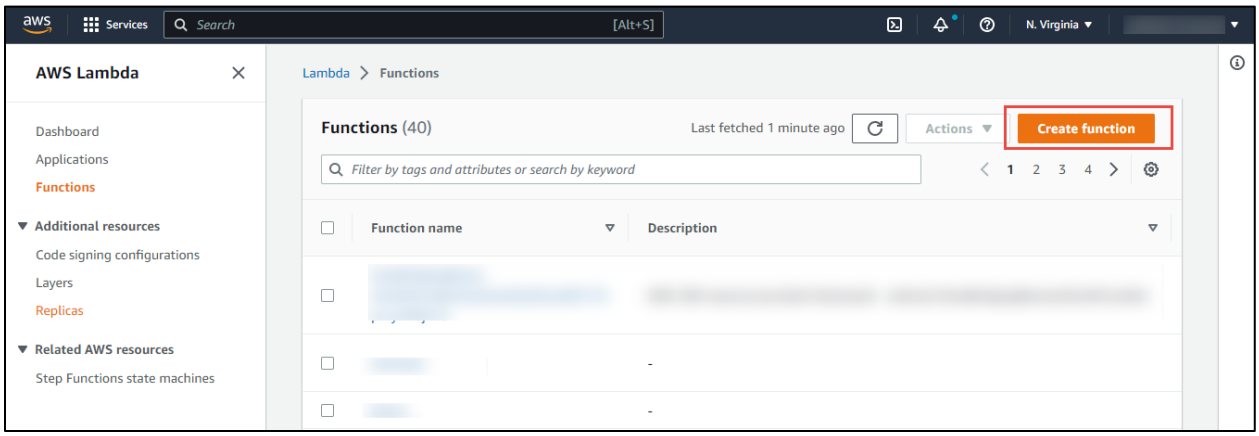

Figure 8 : Create Lambda (cont.)

4. Open the lambda **Function** and click Copy ARN button. This ARN will be used while creating SIP Media Applications.

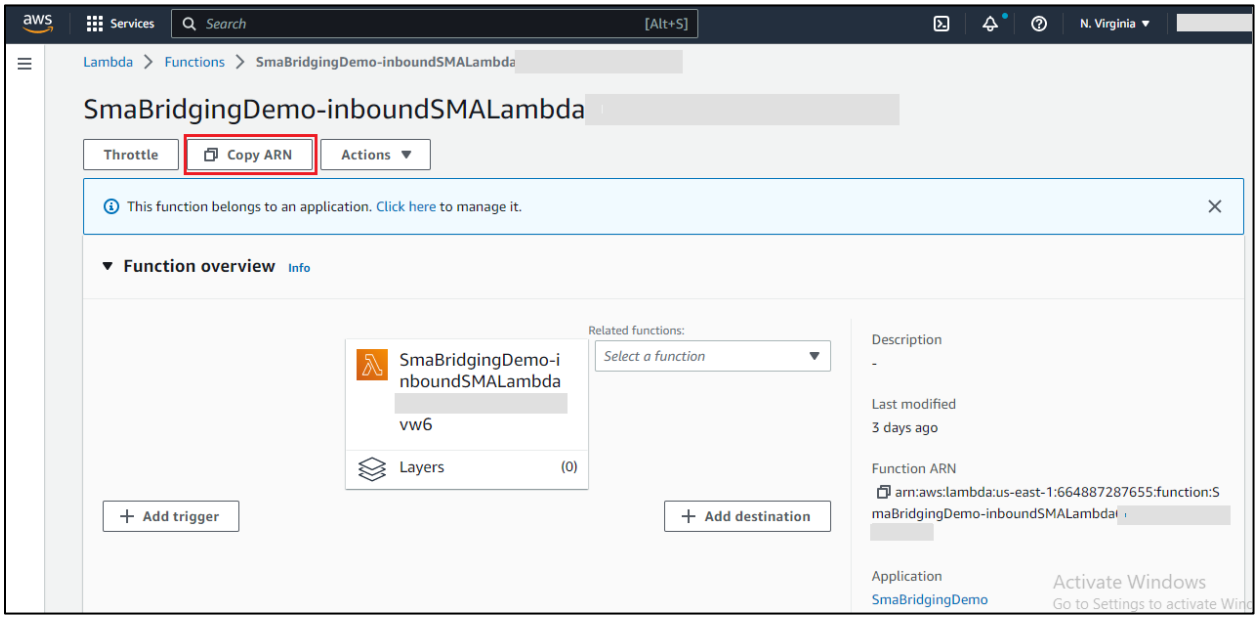

Figure 9 : Create Lambda (cont.)

4.2.4 Create SIP Media Application

To create a SIP media application

1. Open the Amazon Chime console at https://console.aws.amazon.com/chime-sdk/home.
2. In the Amazon Chime SDK console, in the navigation pane, choose **SIP media applications**.
3. Choose **Create**. The **Create a SIP media application** page appears.

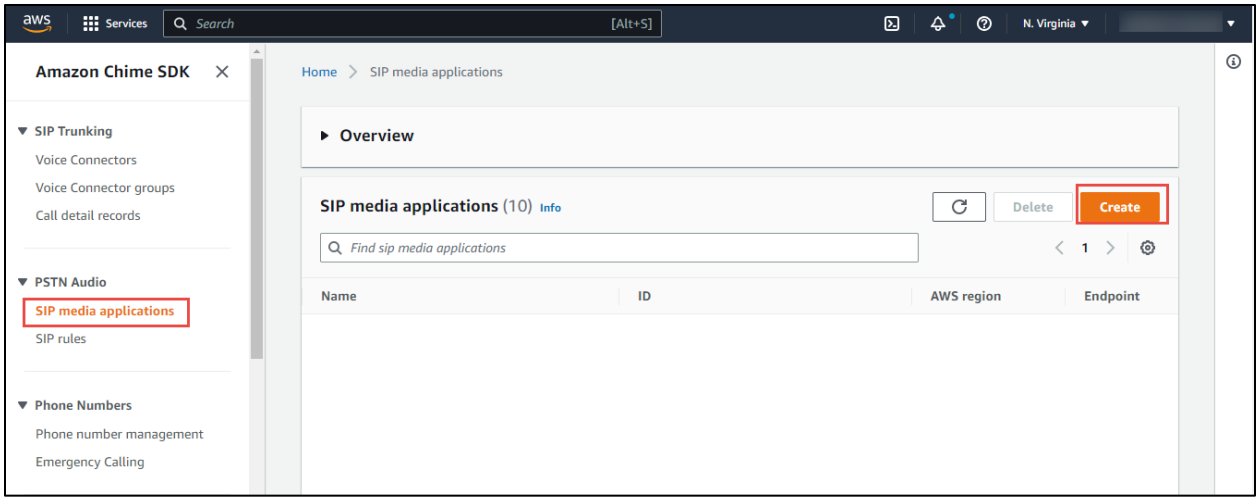

Figure 10 : Create SIP Media Application

4. For **Name**, enter a name for your application.
5. For **AWS Regions**, select a Region. Make sure your selection matches the Region in your Lambda function's Amazon Resource Name (ARN). For example, if your function's ARN contains **us-east-1**, choose the list item with that same Region.
6. Copy your Lambda function's ARN and paste it into the **ARN** box.
7. Choose **Create**.

   A success message appears at the top of the **Create a SIP media application** page, and your media application appears in the list of applications.

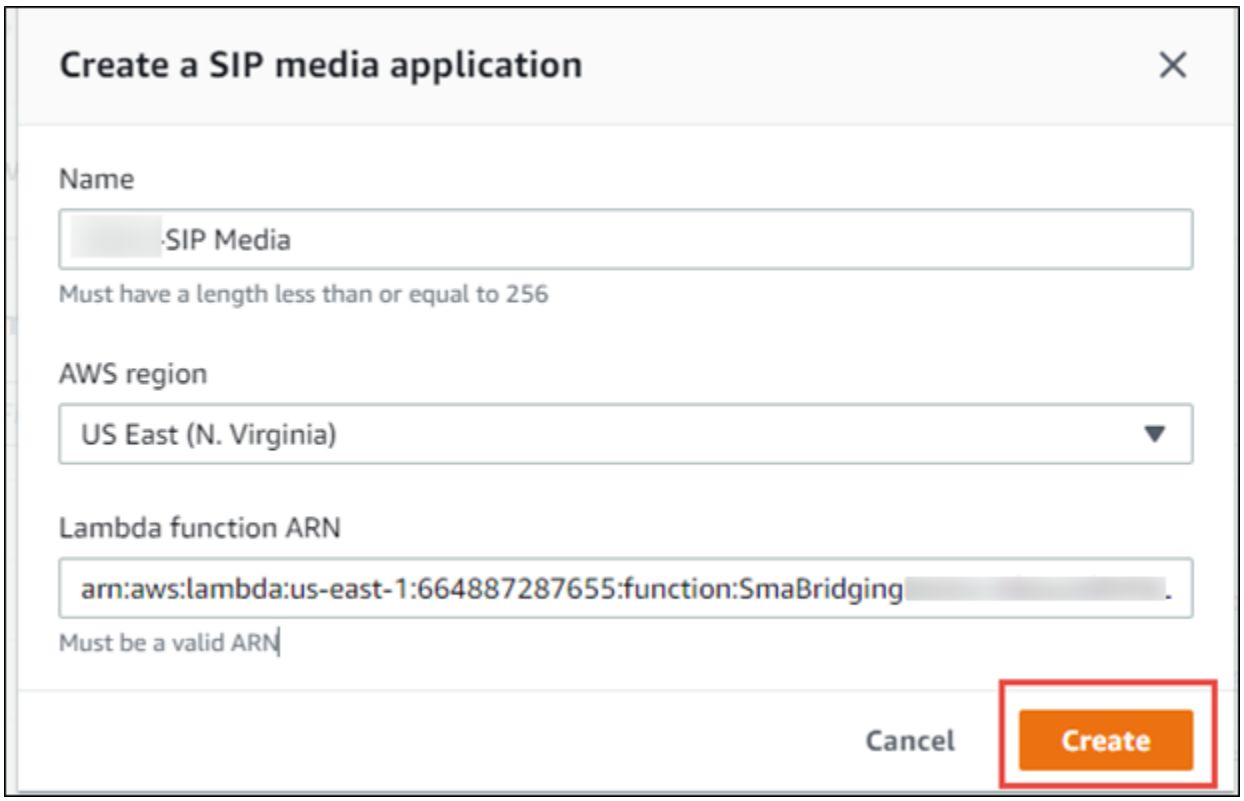

Figure 11 : Create SIP Media Application (cont.)

4.2.5 Create SIP Rules

To create a SIP rule

1. Open the Amazon Chime console at https://console.aws.amazon.com/chime-sdk/home.
2. In the navigation pane, choose **SIP rules**. The **SIP rules** page appears.
3. Choose **Create**. The **Create a SIP rule** dialog box appears.

Figure 12 : Create SIP Rule

4. Enter a name for the rule.
5. Set the Trigger type to **“Request URI hostname”.**
6. From the drop down, select the request URI hostname as the voice connector host created.

Figure 13 : Create SIP Rule *(cont.)*

7. Choose **Next**, and on the **Step 2** page, open the **SIP media application** list and select the SIP application that you want to use.
8. As needed, choose **Add a SIP media application** to use the rule with multiple applications.
9. Choose **Create.**

Figure 14 : Create SIP Rule (cont.)

4.2.6 Enable SIP Logs in Amazon Chime SDK Voice Connector

The Amazon Chime SDK disables logging for Voice Connectors by default. When you enable logging, the system sends the data to an Amazon CloudWatch log group. For more information about logging, see [Monitoring the Amazon Chime SDK with Amazon CloudWatch](#).

To enable SIP logs for inbound calls

1. Open the Amazon Chime console at https://console.aws.amazon.com/chime-sdk/home.
2. For **Collecting SIP logs**, Choose the name of the Amazon Chime SDK Voice Connector to edit.
3. Choose **Logging** and select SIP message and Media metric logs **Enabled.**
4. Choose **Save.**

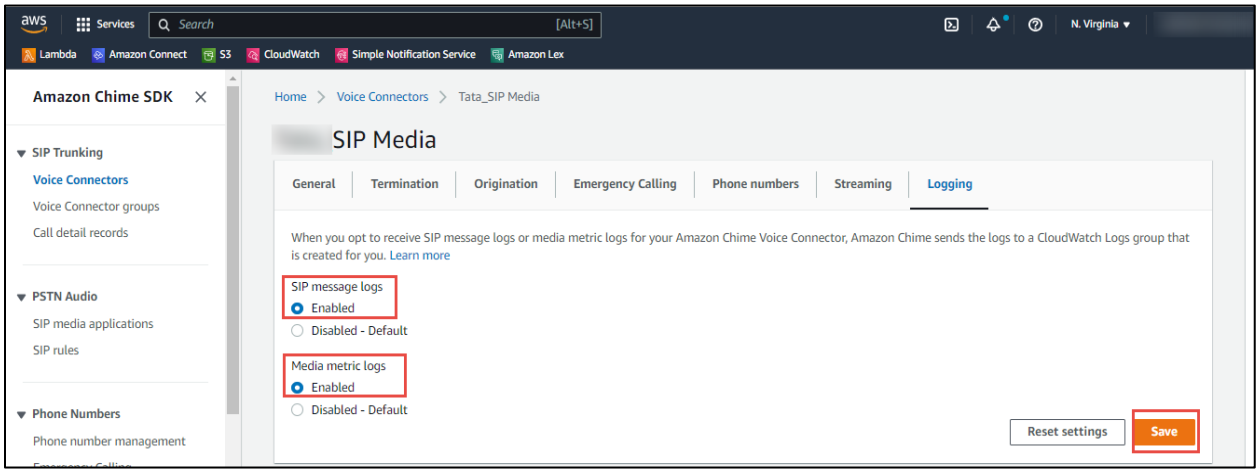

Figure 15 : Enable SIP logs in Cloud Watch

4.2.7 Collect CloudWatch SIP Logs

To collect a SIP Logs

1. Open the Amazon console at https://console.aws.amazon.com/console/.
2. In the menu select services choose **CloudWatch.**
3. Select the **log groups** in AWS CloudWatch and filter the SIP log using the Voice Connector Outbound host name.
4. Select the **SIP messages** from Log group.

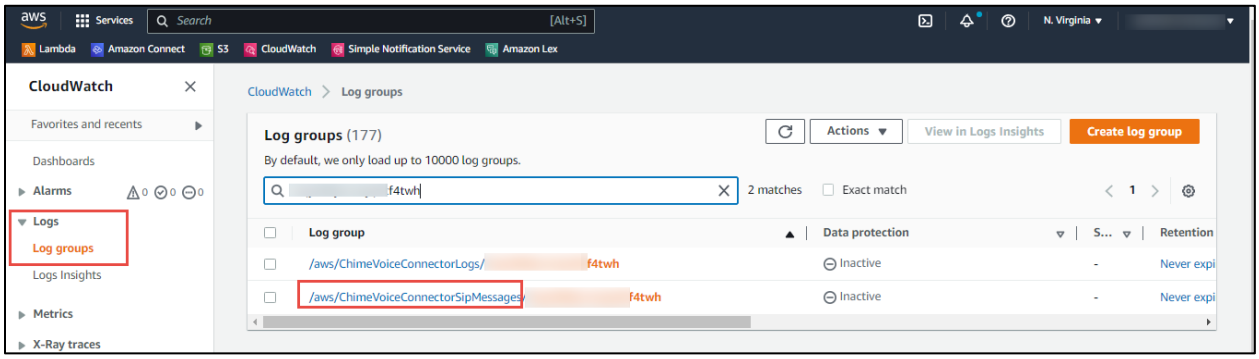

Figure 16 : Collect CloudWatch SIP Logs

4.3 INTELIQUENT SIP Trunk Configuration

To provision a voice trunk using INTELIQUENT to Amazon Chime SDK Voice Connector, utilize the following process:

- Call 844-84-SINCH (Option 2) or access https://www.sinch.com/products/voice/voice-services/ and complete the brief form and we will reach out to initiate the contract and provisioning process