Amazon Chime Voice Connector

SIP Trunk Configuration Guide:

Cisco BroadWorks and Cisco Unified Border Element (CUBE)

March 2021

Document History

Rev. No.	Date	Description
1.0	Mar-23-2021	Draft SIP Trunk Configuration Guide

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1 Audience

This document is intended for technical staff and Value Added Resellers (VAR) with installation and operational responsibilities. This configuration guide provides steps for configuring SIP Trunk using **Cisco BroadWorks** and **Cisco Unified Border Element (CUBE)** to connect to **Amazon Chime Voice Connector** for inbound and/or outbound telephony capabilities.

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1.1 Amazon Chime Voice Connector

Amazon Chime 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 Voice Connector uses the industry-standard Session Initiation Protocol (SIP). Amazon Chime 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 Voice Connector offers cost-effective rates for inbound and outbound calls. Calls into Amazon Chime meetings, as well as calls to other Amazon Chime Voice Connector customers are at no additional cost. With Amazon Chime Voice Connector, companies can reduce their voice calling costs without having to replace their on-premises phone system.

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2 SIP Trunking Network Components

The network for SIP Trunk reference configuration is illustrated below and is representative of **Cisco BroadWorks** using **CUBE** with **Amazon Chime Voice Connector**

IP PBX is used as a secondary PBX in the topology to perform call failover and call distribution
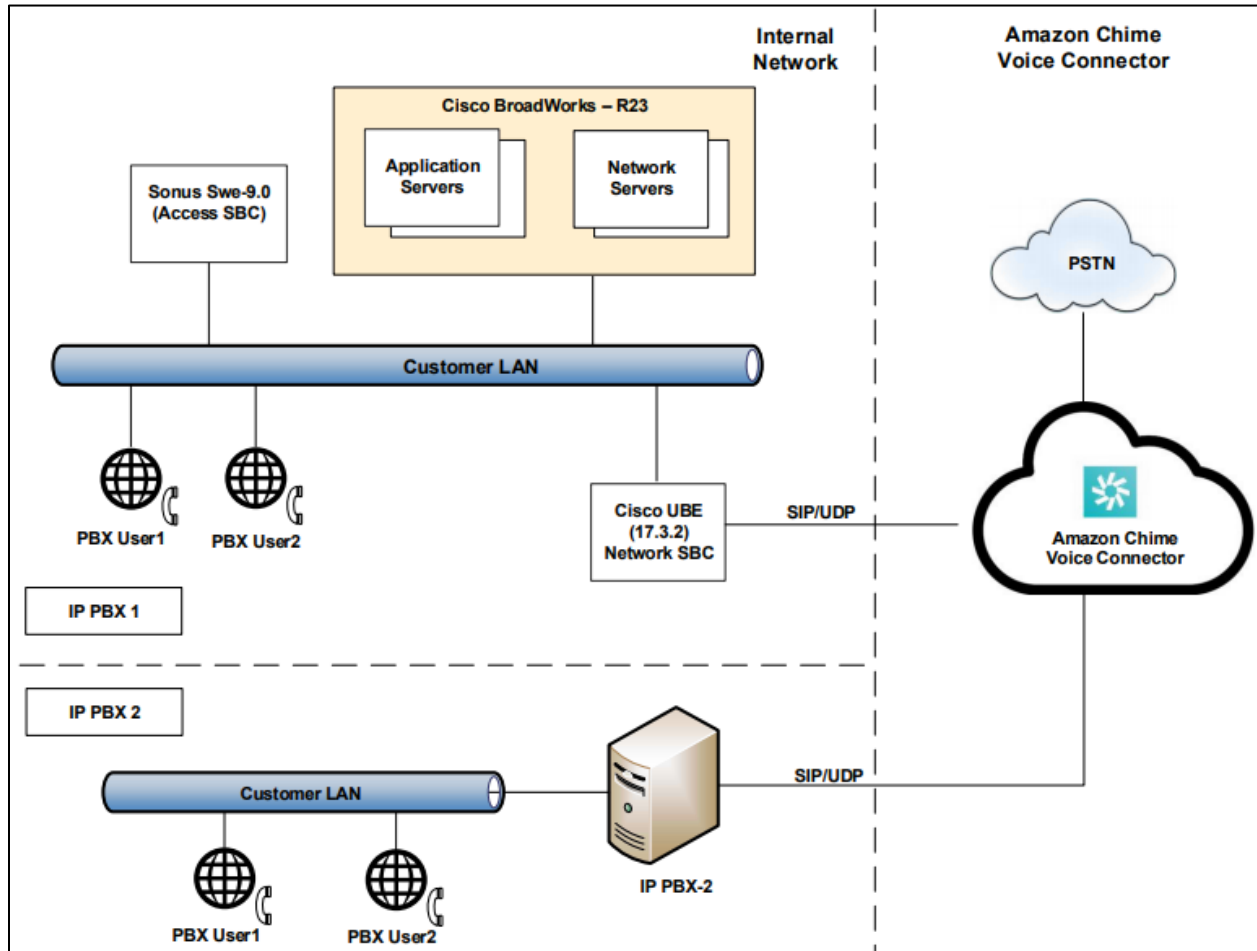

Figure 1 Network Topology

2.1 Hardware Components

- UCS-C240 VMWare server running ESXi 5.5 or later used for the following virtual machines
    - Cisco BroadWorks
- Cisco UBE (CUBE) on Cisco ISR 4321 router

2.2 Software Requirements

- Cisco BroadWorks – R23
- Cisco UBE: 14.1 running on IOS-XE 17.03.02 (isr4300-universalk9.17.03.02.SPA.bin)

3 Features

3.1 Features Supported

- Calls to and from non-Toll-Free number
- Calls to Toll Free number
- Calls to Premium Telephone number
- Calling Party Number Presentation
- Calling Party Number Restriction
- Inbound Calls to an IVR
- International Calls
- Anonymous call
- DTMF-RFC 2833
- Long duration calls
- Calls to conference scheduled by Amazon Chime user
- Calls to Amazon Chime Business number
- Call Distribution
- Call Failover

3.2 Features Not Supported

- Amazon Chime Voice Connector responds to OPTIONS and TCP Keep Alive messages received from customer equipment, but does not send OPTIONS or TCP Keep Alive messages to customer equipment

3.3 Features Not Tested

- None

3.4 Caveats and Limitations

- Amazon Chime Voice Connector,
    - does not support SIP NOTIFY or SIP INFO for DTMF
    - does not send SIP session refresher for long duration calls
- Amazon Chime Voice Connector does not support Mutual TLS which is required for secure trunk with CUBE. Encrypted signaling and media with SRTP has not been tested.
- When the WAN link is down and a call is in progress, the PSTN call leg is not disconnected automatically after a period of inactivity. The call must be cleared manually

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 to configure **Cisco BroadWorks** and **CUBE** for SIP Trunking with **Amazon Chime Voice Connector.**

Table 1 – PBX Configuration Steps

Steps	Description	Reference
Step 1	Cisco BroadWorks Configuration	Section 4.3
Step 2	CUBE Configuration	Section 4.4
Step 3	Amazon Chime Voice Connector Configuration	Amazon Chime Voice Connector

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4.2 Cisco BroadWorks Configuration

This section with screen shots taken from Cisco BroadWorks used for the interoperability testing gives a general overview of the Cisco BroadWorks configuration.

4.2.1 Cisco BroadWorks Application Server Configuration

4.2.1.1 Cisco BroadWorks Application Server Login

1. Access Cisco BroadWorks Application Server URL and enter the credentials to perform the configuration in Application Server.
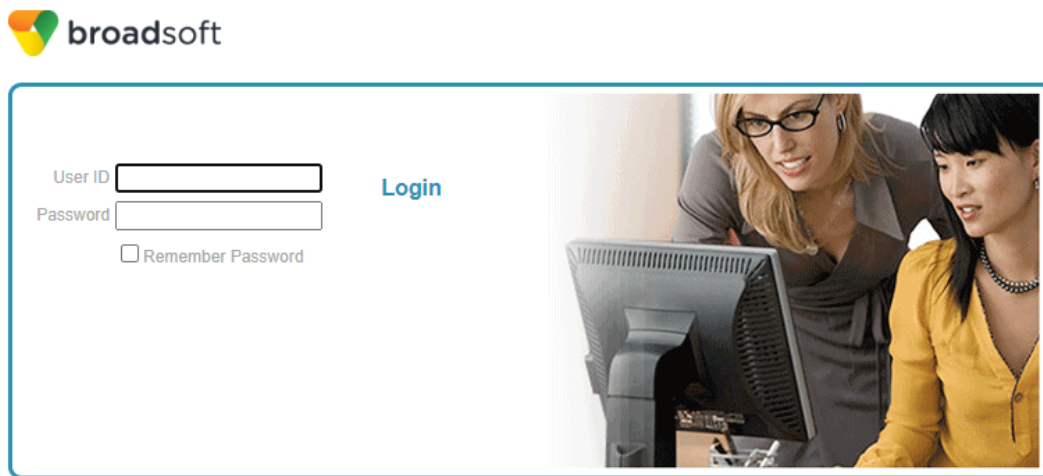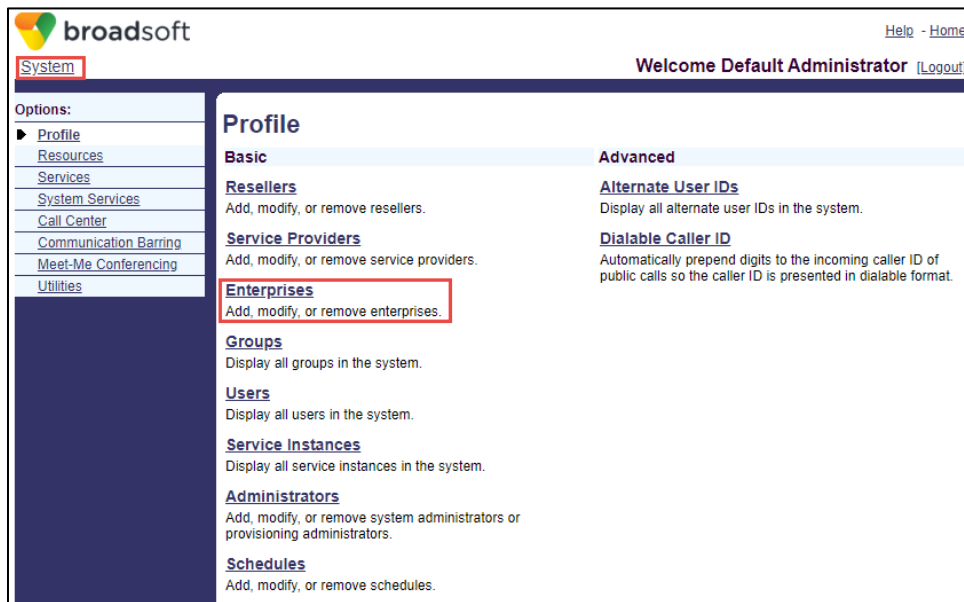

Figure 2: Cisco BroadWorks Application Server Login

4.2.1.2 Enterprise Configuration

1. Under **System** choose option **Enterprises**

Figure 3: Enterprise Configuration

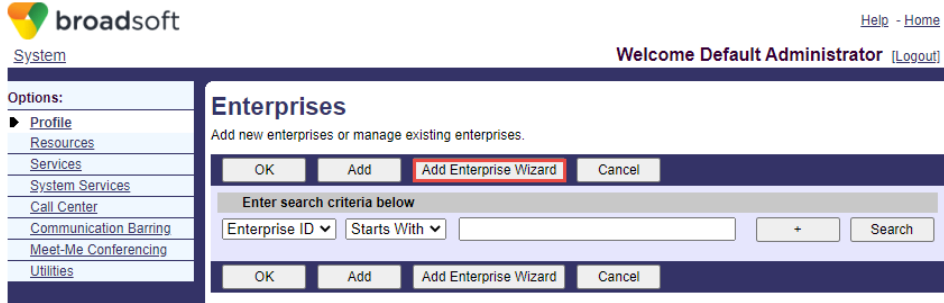2. Click on the option **Add Enterprise Wizard**

Figure 4: Enterprise Configuration-Contd.,

3. Enter the **Enterprise ID** and **Default domain** as shown below and click on the **Next** button,
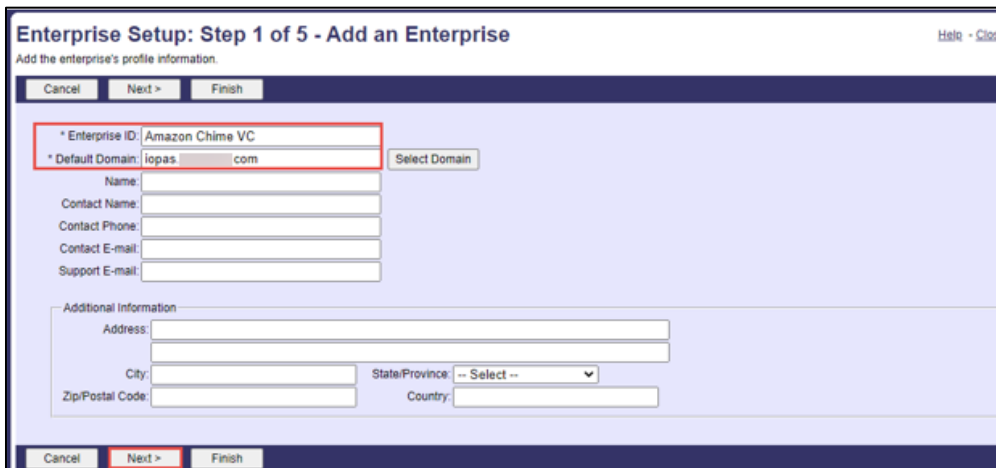

Figure 5: Enterprise Configuration-Contd.,

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4. Move the required domain names from **Enterprise Available Domains** to **Enterprise Assigned Domains** and click on click on **Next,**

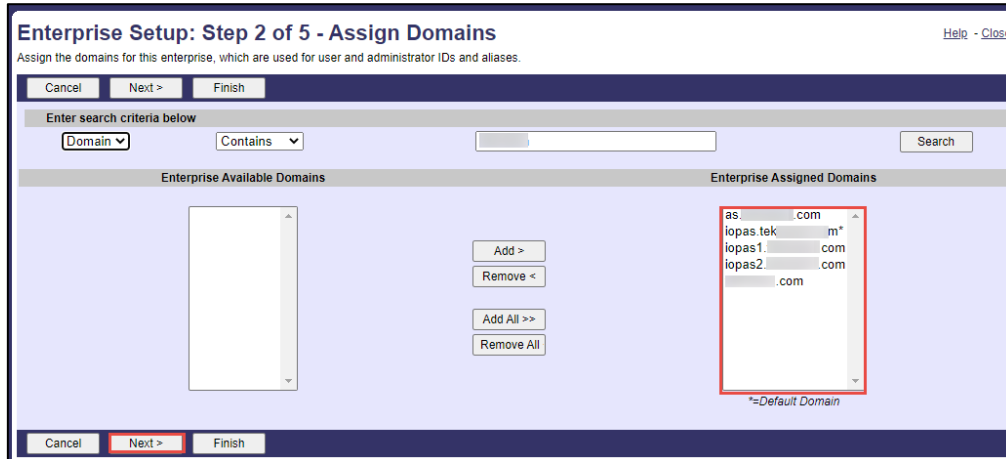Figure 6: Enterprise Configuration-Contd.,

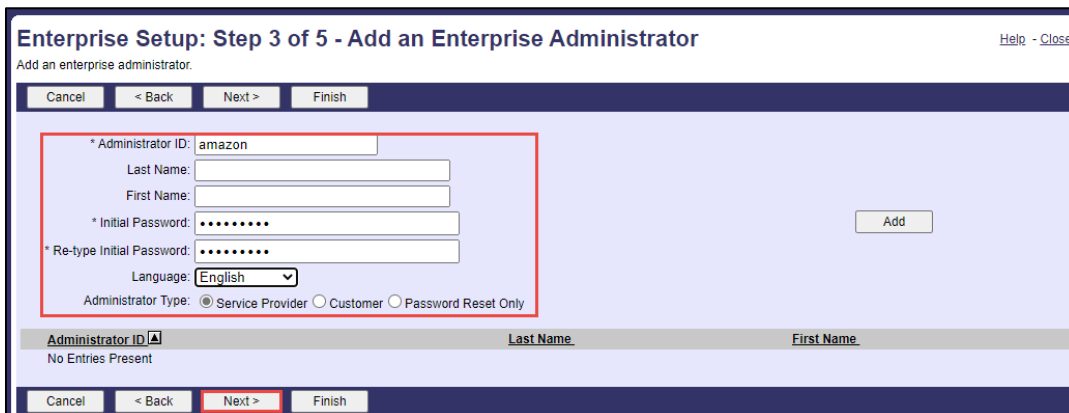5. Add an **Enterprise Administrator** with the required login credentials and click on Next,

Figure 7: Enterprise Configuration-Contd.,

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6. Select the required **Authorize Services** and click on **Next**,

Figure 8: Enterprise Configuration-Contd.,

Figure 9: Enterprise Configuration-Contd.,

☑	Business Communicator Mobile - Audio	☐ Limited To	
☑	Business Communicator Mobile - Video	☐ Limited To	
☑	Business Communicator Tablet	☐ Limited To	
☑	Business Communicator Tablet - Audio	☐ Limited To	
☑	Business Communicator Tablet - Video	☐ Limited To	
☑	Busy Lamp Field	☐ Limited To	
☑	Call Center - Basic	☐ Limited To	
☑	Call Center Monitoring	☐ Limited To	
☑	Call Center - Premium	☐ Limited To	
☑	Call Center - Standard	☐ Limited To	
☑	Call Forwarding Always	☐ Limited To	
☑	Call Forwarding Always Secondary	☐ Limited To	
☑	Call Forwarding Busy	☐ Limited To	
☑	Call Forwarding No Answer	☐ Limited To	
☑	Call Forwarding Not Reachable	☐ Limited To	
☑	Call Forwarding Selective	☐ Limited To	
☑	Calling Line ID Blocking Override	☐ Limited To	
☑	Calling Line ID Delivery Blocking	☐ Limited To	
☑	Calling Name Delivery	☐ Limited To	
☑	Calling Name Retrieval	☐ Limited To	
☑	Calling Number Delivery	☐ Limited To	
☑	Calling Party Category	☐ Limited To	
☑	Call Me Now	☐ Limited To	
☑	Call Notify	☐ Limited To	
☑	Call Recording	☐ Limited To	
☑	Call Return	☐ Limited To	
☑	Call Transfer	☐ Limited To	
☑	Call Waiting	☐ Limited To	

Figure 10: Enterprise Configuration-Contd.,

☑	Charge Number	☐ Limited To	
☑	Classmark	☐ Limited To	
☑	Client License 15	☐ Limited To	
☑	Client License 16	☐ Limited To	
☑	Client License 3	☐ Limited To	
☑	Collaborate - Audio	☐ Limited To	
☑	Collaborate - Sharing	☐ Limited To	
☑	Collaborate - Video	☐ Limited To	
☑	CommPilot Express	☐ Limited To	
☑	Communication Barring User-Control	☐ Limited To	
☑	Conference Room	☐ Limited To	
☑	Connected Line Identification Presentation	☐ Limited To	
☑	Connected Line Identification Restriction	☐ Limited To	
☑	Customer Originated Trace	☐ Limited To	
☑	Custom Ringback User	☐ Limited To	
☑	Custom Ringback User - Call Waiting	☐ Limited To	
☑	Custom Ringback User - Video	☐ Limited To	
☑	Directed Call Pickup	☐ Limited To	
☑	Directed Call Pickup with Barge-in	☐ Limited To	
☑	Directory Number Hunting	☐ Limited To	
☑	Direct Route	☐ Limited To	
☑	Diversion Inhibitor	☐ Limited To	
☑	Do Not Disturb	☐ Limited To	
☑	Enhanced Call Logs	☐ Limited To	
☑	Executive	☐ Limited To	
☑	Executive-Assistant	☐ Limited To	
☑	External Calling Line ID Delivery	☐ Limited To	
☑	External Custom Ringback	☐ Limited To	

Figure 11: Enterprise Configuration-Contd.,

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✓	Fax Messaging	☐ Limited To	
✓	Flash Call Hold	☐ Limited To	
✓	Flexible Seating Guest	☐ Limited To	
✓	Group Night Forwarding	☐ Limited To	
✓	Hoteling Guest	☐ Limited To	
✓	Hoteling Host	☐ Limited To	
✓	In-Call Service Activation	☐ Limited To	
✓	Integrated IM&P	☐ Limited To	
✓	Intercept User	☐ Limited To	
✓	Internal Calling Line ID Delivery	☐ Limited To	
✓	Last Number Redial	☐ Limited To	
✓	Location-Based Calling Restrictions	☐ Limited To	
✓	Malicious Call Trace	☐ Limited To	
✓	MobileLink	☐ Limited To	
✓	Multiple Call Arrangement	☐ Limited To	
✓	Music On Hold User	☐ Limited To	
✓	MWI Delivery to Mobile Endpoint	☐ Limited To	
✓	Number Portability Announcement	☐ Limited To	
✓	N-Way Call	☐ Limited To	
✓	Office Communicator Tab	☐ Limited To	
✓	PBX Integration	☐ Limited To	
✓	Personal Assistant	☐ Limited To	
✓	Physical Location	☐ Limited To	
✓	Polycom Phone Services	☐ Limited To	
✓	Pre-alerting Announcement	☐ Limited To	
✓	Preferred Carrier User	☐ Limited To	
✓	Prepaid	☐ Limited To	

Figure 12: Enterprise Configuration-Contd.,

✓	Priority Alert	☐ Limited To	
✓	Privacy	☐ Limited To	
✓	Push to Talk	☐ Limited To	
✓	Remote Office	☐ Limited To	
✓	Resource Priority	☐ Limited To	
✓	Route List	☐ Limited To	
✓	Security Classification	☐ Limited To	
✓	Selective Call Acceptance	☐ Limited To	
✓	Selective Call Rejection	☐ Limited To	
✓	Sequential Ring	☐ Limited To	
✓	Shared Call Appearance	☐ Limited To	
✓	Shared Call Appearance 10	☐ Limited To	
✓	Shared Call Appearance 15	☐ Limited To	
✓	Shared Call Appearance 20	☐ Limited To	
✓	Shared Call Appearance 25	☐ Limited To	
✓	Shared Call Appearance 30	☐ Limited To	
✓	Shared Call Appearance 35	☐ Limited To	
✓	Shared Call Appearance 5	☐ Limited To	
✓	Silent Alerting	☐ Limited To	
✓	Simultaneous Ring Personal	☐ Limited To	
✓	SMDI Message Desk	☐ Limited To	
✓	Speed Dial 100	☐ Limited To	
✓	Speed Dial 8	☐ Limited To	
✓	Terminating Alternate Trunk Identity	☐ Limited To	
✓	Third-Party MWI Control	☐ Limited To	
✓	Third-Party Voice Mail Support	☐ Limited To	
✓	Three-Way Call	☐ Limited To	
✓	Two-Stage Dialing	☐ Limited To	

Figure 13: Enterprise Configuration-Contd.,

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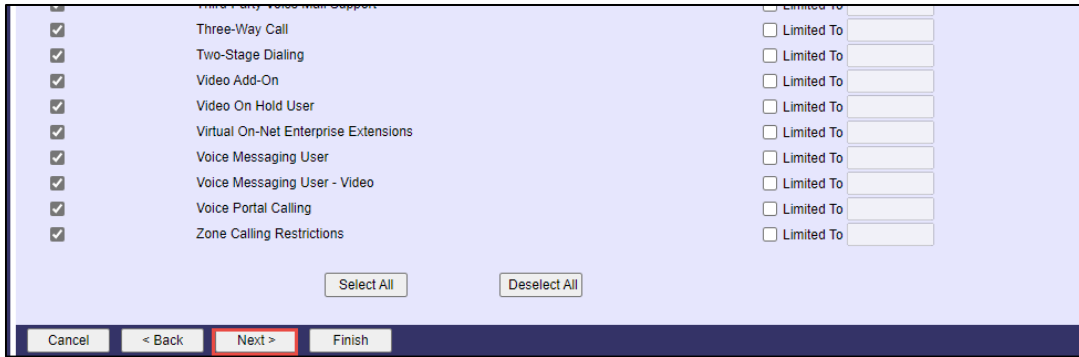
Figure 14: Enterprise Configuration-Contd.,

7. Add the required **Phone numbers** and click on **Finish**,
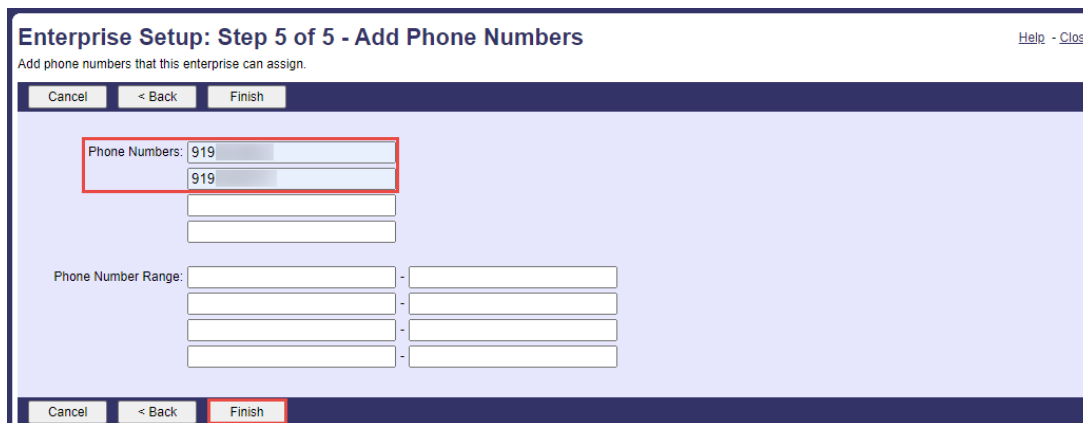
Figure 15: Enterprise Configuration-Contd.,

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4.2.1.3 Group Configuration

1. Under **System** choose the option **Enterprises** and choose the Enterprise Created for Amazon Chime Voice Connector (**Amazon Chime VC**) as created in the previous steps
2. Choose the option **Groups** and click on **Add Group Wizard**
3. Enter the **Group ID**, Choose the **Default Domain**, Enter the **Group Name** and **Calling Line ID Group Name** and click on **Next,**

Figure 16: Group Configuration

4. Move the **Group Available Domains** to **Group Assigned Domains**,

Figure 17: Group Configuration-Contd.,

5. Add **Group Administrator**

Figure 18: Group Configuration-Contd.,

6. Select required **Authorize Services** and click on **Next**,

Figure 19: Group Configuration-Contd.,

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Authorized	User Services	Limits		Allowed
☑	Meet-Me Conferencing	☐ Limited To		Unlimited
☑	Music On Hold			Unlimited
☑	Music On Hold - Video			Unlimited
☑	Outgoing Calling Plan			Unlimited
☑	Preferred Carrier Group			Unlimited
☑	Route Point	☐ Limited To		Unlimited
☑	Series Completion	☐ Limited To		Unlimited
☑	Trunk Group	☐ Limited To		Unlimited
☑	Voice Messaging Group			Unlimited
☑	VoiceXML	☐ Limited To		Unlimited

Authorized	User Services	Limits		Allowed
☑	Advice Of Charge	☐ Limited To		Unlimited
☑	Alternate Numbers	☐ Limited To		Unlimited
☑	Anonymous Call Rejection	☐ Limited To		Unlimited
☑	Authentication	☐ Limited To		Unlimited
☑	Automatic Callback	☐ Limited To		Unlimited
☑	Automatic Hold/Retrieve	☐ Limited To		Unlimited
☑	Barge-in Exempt	☐ Limited To		Unlimited
☑	Basic Call Logs	☐ Limited To		Unlimited
☑	BroadWorks Agent	☐ Limited To		Unlimited
☑	BroadWorks Anywhere	☐ Limited To		Unlimited
☑	BroadWorks Mobility	☐ Limited To		Unlimited
☑	BroadWorks Receptionist - Enterprise	☐ Limited To		Unlimited
☑	BroadWorks Receptionist - Office	☐ Limited To		Unlimited
☑	BroadWorks Receptionist - Small Business	☐ Limited To		Unlimited
☑	BroadWorks Supervisor	☐ Limited To		Unlimited
☑	Business Communicator Desktop	☐ Limited To		Unlimited
☑	Business Communicator Desktop - Audio	☐ Limited To		Unlimited

Figure 20: Group Configuration-Contd.,

	Service	Limits		Allowed
☑	Business Communicator Desktop - Video	☐ Limited To		Unlimited
☑	Business Communicator Mobile	☐ Limited To		Unlimited
☑	Business Communicator Mobile - Audio	☐ Limited To		Unlimited
☑	Business Communicator Mobile - Video	☐ Limited To		Unlimited
☑	Business Communicator Tablet	☐ Limited To		Unlimited
☑	Business Communicator Tablet - Audio	☐ Limited To		Unlimited
☑	Business Communicator Tablet - Video	☐ Limited To		Unlimited
☑	Busy Lamp Field	☐ Limited To		Unlimited
☑	Call Center - Basic	☐ Limited To		Unlimited
☑	Call Center Monitoring	☐ Limited To		Unlimited
☑	Call Center - Premium	☐ Limited To		Unlimited
☑	Call Center - Standard	☐ Limited To		Unlimited
☑	Call Forwarding Always	☐ Limited To		Unlimited
☑	Call Forwarding Always Secondary	☐ Limited To		Unlimited
☑	Call Forwarding Busy	☐ Limited To		Unlimited
☑	Call Forwarding No Answer	☐ Limited To		Unlimited
☑	Call Forwarding Not Reachable	☐ Limited To		Unlimited
☑	Call Forwarding Selective	☐ Limited To		Unlimited
☑	Calling Line ID Blocking Override	☐ Limited To		Unlimited
☑	Calling Line ID Delivery Blocking	☐ Limited To		Unlimited
☑	Calling Name Delivery	☐ Limited To		Unlimited
☑	Calling Name Retrieval	☐ Limited To		Unlimited
☑	Calling Number Delivery	☐ Limited To		Unlimited
☑	Calling Party Category	☐ Limited To		Unlimited
☑	Call Me Now	☐ Limited To		Unlimited
☑	Call Notify	☐ Limited To		Unlimited
☑	Call Recording	☐ Limited To		Unlimited
☑	Call Return	☐ Limited To		Unlimited

Figure 21: Group Configuration-Contd.,

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☑	Call Transfer	☐ Limited To	Unlimited
☑	Call Waiting	☐ Limited To	Unlimited
☑	Charge Number	☐ Limited To	Unlimited
☑	Classmark	☐ Limited To	Unlimited
☑	Client License 15	☐ Limited To	Unlimited
☑	Client License 16	☐ Limited To	Unlimited
☑	Client License 3	☐ Limited To	Unlimited
☑	Collaborate - Audio	☐ Limited To	Unlimited
☑	Collaborate - Sharing	☐ Limited To	Unlimited
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☑	Customer Originated Trace	☐ Limited To	Unlimited
☑	Custom Ringback User	☐ Limited To	Unlimited
☑	Custom Ringback User - Call Waiting	☐ Limited To	Unlimited
☑	Custom Ringback User - Video	☐ Limited To	Unlimited
☑	Directed Call Pickup	☐ Limited To	Unlimited
☑	Directed Call Pickup with Barge-in	☐ Limited To	Unlimited
☑	Directory Number Hunting	☐ Limited To	Unlimited
☑	Direct Route	☐ Limited To	Unlimited
☑	Diversion Inhibitor	☐ Limited To	Unlimited
☑	Do Not Disturb	☐ Limited To	Unlimited
☑	Enhanced Call Logs	☐ Limited To	Unlimited
☑	Executive	☐ Limited To	Unlimited
☑	Executive-Assistant	☐ Limited To	Unlimited

Figure 22: Group Configuration-Contd.,

☑	External Calling Line ID Delivery	☐ Limited To	Unlimited
☑	External Custom Ringback	☐ Limited To	Unlimited
☑	Fax Messaging	☐ Limited To	Unlimited
☑	Flash Call Hold	☐ Limited To	Unlimited
☑	Flexible Seating Guest	☐ Limited To	Unlimited
☑	Group Night Forwarding	☐ Limited To	Unlimited
☑	Hoteling Guest	☐ Limited To	Unlimited
☑	Hoteling Host	☐ Limited To	Unlimited
☑	In-Call Service Activation	☐ Limited To	Unlimited
☑	Integrated IM&P	☐ Limited To	Unlimited
☑	Intercept User	☐ Limited To	Unlimited
☑	Internal Calling Line ID Delivery	☐ Limited To	Unlimited
☑	Last Number Redial	☐ Limited To	Unlimited
☑	Location-Based Calling Restrictions	☐ Limited To	Unlimited
☑	Malicious Call Trace	☐ Limited To	Unlimited
☑	MobileLink	☐ Limited To	Unlimited
☑	Multiple Call Arrangement	☐ Limited To	Unlimited
☑	Music On Hold User	☐ Limited To	Unlimited
☑	MWI Delivery to Mobile Endpoint	☐ Limited To	Unlimited
☑	Number Portability Announcement	☐ Limited To	Unlimited
☑	N-Way Call	☐ Limited To	Unlimited
☑	Office Communicator Tab	☐ Limited To	Unlimited
☑	PBX Integration	☐ Limited To	Unlimited
☑	Personal Assistant	☐ Limited To	Unlimited
☑	Physical Location	☐ Limited To	Unlimited
☑	Polycom Phone Services	☐ Limited To	Unlimited
☑	Pre-alerting Announcement	☐ Limited To	Unlimited
☑	Preferred Carrier User	☐ Limited To	Unlimited

Figure 23: Group Configuration-Contd.,

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☑	Prepaid	☐ Limited To	Unlimited
☑	Priority Alert	☐ Limited To	Unlimited
☑	Privacy	☐ Limited To	Unlimited
☑	Push to Talk	☐ Limited To	Unlimited
☑	Remote Office	☐ Limited To	Unlimited
☑	Resource Priority	☐ Limited To	Unlimited
☑	Route List	☐ Limited To	Unlimited
☑	Security Classification	☐ Limited To	Unlimited
☑	Selective Call Acceptance	☐ Limited To	Unlimited
☑	Selective Call Rejection	☐ Limited To	Unlimited
☑	Sequential Ring	☐ Limited To	Unlimited
☑	Shared Call Appearance	☐ Limited To	Unlimited
☑	Shared Call Appearance 10	☐ Limited To	Unlimited
☑	Shared Call Appearance 15	☐ Limited To	Unlimited
☑	Shared Call Appearance 20	☐ Limited To	Unlimited
☑	Shared Call Appearance 25	☐ Limited To	Unlimited
☑	Shared Call Appearance 30	☐ Limited To	Unlimited
☑	Shared Call Appearance 35	☐ Limited To	Unlimited
☑	Shared Call Appearance 5	☐ Limited To	Unlimited
☑	Silent Alerting	☐ Limited To	Unlimited
☑	Simultaneous Ring Personal	☐ Limited To	Unlimited
☑	SMDI Message Desk	☐ Limited To	Unlimited
☑	Speed Dial 100	☐ Limited To	Unlimited
☑	Speed Dial 8	☐ Limited To	Unlimited
☑	Terminating Alternate Trunk Identity	☐ Limited To	Unlimited
☑	Third-Party MWI Control	☐ Limited To	Unlimited
☑	Third-Party Voice Mail Support	☐ Limited To	Unlimited
☑	Three-Way Call	☐ Limited To	Unlimited

Figure 24: Group Configuration-Contd.,

☑	Two-Stage Dialing	☐ Limited To	Unlimited
☑	Video Add-On	☐ Limited To	Unlimited
☑	Video On Hold User	☐ Limited To	Unlimited
☑	Virtual On-Net Enterprise Extensions	☐ Limited To	Unlimited
☑	Voice Messaging User	☐ Limited To	Unlimited
☑	Voice Messaging User - Video	☐ Limited To	Unlimited
☑	Voice Portal Calling	☐ Limited To	Unlimited
☑	Zone Calling Restrictions	☐ Limited To	Unlimited

Select All   Deselect All

Cancel   < Back   Next >   Finish

Figure 25: Group Configuration-Contd.,

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7. Create and choose the **Identity/Device Profile name** and **type** and click on **Next**,

Figure 26: Group Configuration-Contd.,

8. Assign the required **Phone numbers** and click on **Finish**,

Figure 27: Group Configuration-Contd.,

Amazon Web Services

4.2.1.4   User Configuration

1. Under **System** choose the option **Enterprises,** choose the Enterprise Created for Amazon Chime Voice Connector (**Amazon Chime VC**)
2. Choose the option **Groups** and click on **Group (Amazon CVC Group)**
3. Click the option **Users** and click on **Add**

Figure 28: User Configuration

4. In the **Users** section, Click on **Addresses,** Enter the **Phone Number, Extension**, **Identity/Device Profile Name, Line/Port** and **Aliases**

Figure 29: User Configuration-Contd.,

Amazon Web Services

4.2.1 Cisco BroadWorks Network Server Configuration

Login to Cisco BroadWorks Network Server via CLI and perform the following configuration

4.2.1.1 Create Instance

Create an Instance as shown below

Instance Name: AWS
Enabled: true
CallTypes: ALL

NS_CLI/Policy/SvcCtrRtg> **add AWS true CallTypes ALL**

4.2.1.2 Create Profile

Create Profile as shown below and assign the Instance **AWS** to Profile

Profile Name : hosting2

NS_CLI/Policy/Profile> **add hosting2 CallTyping DefaultInst**

NS_CLI/Policy/Profile> **add hosting2 FarEndRtg DefaultInst**

NS_CLI/Policy/Profile> **add hosting2 MediaSrvSel DefaultInst**

NS_CLI/Policy/Profile> **add hosting2 SvcCtrRtg AWS**

4.2.1.3 Assign Profile to Group

Assign the profile created to the Group in the Application Server

Group Name : Amazon CVC Group
Hosting NE: Application Server-iopas1
Profile name: hosting2

NS_CLI/SubscriberMgmt/Enterprise/UserGroup> **set Amazon CVC Group iopas1 profile hosting2**

4.2.1.4 Create Routing NE Address

Configure the CUBE IP Address in Network Server to route the call to CUBE

Instance Name: AWS
Address: IP address of CUBE
Cost: 1
Weight: 99
Port: 5060

NS_CLI/System/Device/RoutingNE/Address>**add AWS <CUBE IP> 1 99 5060 udp**

4.2.1.5 Create Routing NE

Create Routing NE as shown below

NE Name: AWS
Location: 1214242
Static Cost: 1
Static Weight: 1
Profile: routing
Poll: false
State: OnLine
Signaling Attributes: E164Compliant

NS_CLI/System/Device/RoutingNE> **add AWS 1214242 1 99 routing false onLine E164Compliant**

4.2.1.6 Create Routing Policy

Create Routing Policy as shown below

Instance name: AWS
callType: ALL
From: 1919XXXXXXX
To: 1919XXXXXXX
Cost : 1
Weight: 1
routingNE : AWS

NS_CLI/Policy/SvcCtrRtg/SCRL> **add AWS ALL 1919XXXXXXX 1919XXXXXXX 1 99 routingNE AWS**

4.3 Cisco UBE Configuration

4.3.1 Global Cisco UBE settings

```
voice service voip
ip address trusted list
ipv4 199.xx.xx 255.255.xx.xx
ipv4 3.80.xx.xx 255.255.xx.xx
ipv4 52.55.xx.xx 255.255.xx.xx
ipv4 52.55.xx.xx 255.255.xx.xx
ipv4 34.212.xx.xx 255.255.xx.xx
ipv4 34.223.xx.xx 255.255.xx.xx
address-hiding
no notify redirect ip2ip
mode border-element
media disable-detailed-stats
allow-connections sip to sip
no supplementary-service sip moved-temporarily
no supplementary-service sip refer
no supplementary-service sip handle-replaces
fax protocol t38 version 3 ls-redundancy 0 hs-redundancy 0 fallback
pass-through g711alaw
sip
 min-se 900
 session refresh
 asserted-id pai
 early-offer forced
 midcall-signaling passthru
 privacy-policy passthru
 g729 annexb-all
 pass-thru headers unsupp
```

4.3.2 Codecs

```
voice class codec 1
 codec preference 1 g711ulaw
 codec preference 2 g711alaw
```

4.3.3 Dial Peer

Inbound Dial Peer for Cisco BroadWorks

```
dial-peer voice 101 voip
 description Incoming dial-peer for BroadWorks
 session protocol sipv2
 session transport udp
 destination dpg 101
 incoming uri via BroadWorks
 voice-class codec 1
 voice-class sip bind control source-interface GigabitEthernet0/0/1
 voice-class sip bind media source-interface GigabitEthernet0/0/1
 dtmf-relay rtp-nte
 no vad
```

Inbound Dial Peer for Amazon Chime Voice Connector

```
dial-peer voice 100 voip
 description Incoming dial-peer for AmazonCVC
 translation-profile incoming Amazon-In
 session protocol sipv2
 session transport udp
 destination dpg 100
 incoming uri to AmazonCVC
 voice-class codec 1
 dtmf-relay rtp-nte
 no vad
```

Outbound Dial Peer Group and Dial Peer to Cisco BroadWorks Network Server

```
voice class dpg 100
 description from CUBE to BroadWorks-NS
 dial-peer 200 preference 1
 dial-peer 201 preference 2

dial-peer voice 200 voip
 description Outgoing dial-peer from CUBE to BroadWorks-NS1
 destination-pattern BAD.BAD
 session protocol sipv2
 session target ipv4:199.182.XX.XX
 session transport udp
 voice-class codec 1
 voice-class sip bind control source-interface GigabitEthernet0/0/1
 voice-class sip bind media source-interface GigabitEthernet0/0/1
 dtmf-relay rtp-nte
 no vad
!
dial-peer voice 201 voip
 description Outgoing dial-peer from CUBE to BroadWorks-NS2
```

```
  destination-pattern BAD.BAD
  session protocol sipv2
  session target ipv4:199.182.XX.XX
  session transport udp
  voice-class codec 1
  voice-class sip bind control source-interface GigabitEthernet0/0/1
  voice-class sip bind media source-interface GigabitEthernet0/0/1
  dtmf-relay rtp-nte
  no vad
```

Outbound Dial Peer Group and Dial Peer to Amazon Chime Voice Connector

```
voice class dpg 101
 description from CUBE to AmazonCVC
 dial-peer 202 preference 1

dial-peer voice 202 voip
 description Outgoing dial-peer from CUBE to AmazonCVC
 translation-profile outgoing Amazon-Out
 destination-pattern BAD.BAD
 session protocol sipv2
 session target sip-server
 session transport udp
 voice-class codec 1
 voice-class sip localhost dns:dtndXXXX.voiceconnector.chime.aws
 voice-class sip profiles 100
 voice-class sip bind control source-interface GigabitEthernet0/0/0
 voice-class sip bind media source-interface GigabitEthernet0/0/0
 dtmf-relay rtp-nte
 no vad
```

4.3.4 Cisco UBE Running Configuration

```
AWS_BSFT#show running-config
Building configuration...


Current configuration : 13046 bytes
!
! Last configuration change at 09:15:56 UTC Thu Mar 18 2021
!
version 17.3
service timestamps debug datetime msec
service timestamps log datetime msec
service password-encryption
service call-home
platform qfp utilization monitor load 80
no platform punt-keepalive disable-kernel-core
!
hostname AWS_BSFT
!
boot-start-marker
boot system bootflash:isr4300-universalk9.17.03.02.SPA.bin
boot-end-marker
!
!
vrf definition Mgmt-intf
 !
 address-family ipv4
 exit-address-family
 !
 address-family ipv6
 exit-address-family
!
logging queue-limit 1000000000
```

```
logging buffered 10000000
logging rate-limit 10000
enable secret 9
$9$AgsE6krqyAv.Ok$3Sx8D9/DwRET/jy4WOjWKHVFLHNldE.sZtVytLL3ULA
!
no aaa new-model
!
!
ip name-server 8.8.8.8 10.85.0.232 172.16.31.3
!
!
login on-success log
!
subscriber templating
!
!
multilink bundle-name authenticated
no device-tracking logging theft
!
!
crypto pki trustpoint SLA-TrustPoint
 enrollment terminal
 revocation-check crl
!
crypto pki trustpoint TP-self-signed-1017057749
 enrollment selfsigned
 subject-name cn=IOS-Self-Signed-Certificate-1017057749
 revocation-check none
 rsakeypair TP-self-signed-1017057749
!
!
crypto pki certificate chain SLA-TrustPoint
 certificate ca 01
```

30820321 30820209 A0030201 02020101 300D0609 2A864886 F70D0101
0B050030

32310E30 0C060355 040A1305 43697363 6F312030 1E060355 04031317
43697363

6F204C69 63656E73 696E6720 526F6F74 20434130 1E170D31 33303533
30313934

3834375A 170D3338 30353330 31393438 34375A30 32310E30 0C060355
040A1305

43697363 6F312030 1E060355 04031317 43697363 6F204C69 63656E73
696E6720

526F6F74 20434130 82012230 0D06092A 864886F7 0D010101 05000382
010F0030

82010A02 82010100 A6BCBD96 131E05F7 145EA72C 2CD686E6 17222EA1
F1EFF64D

CBB4C798 212AA147 C655D8D7 9471380D 8711441E 1AAF071A 9CAE6388
8A38E520

1C394D78 462EF239 C659F715 B98C0A59 5BBB5CBD 0CFEBEA3 700A8BF7
D8F256EE

4AA4E80D DB6FD1C9 60B1FD18 FFC69C96 6FA68957 A2617DE7 104FDC5F
EA2956AC

7390A3EB 2B5436AD C847A2C5 DAB553EB 69A9A535 58E9F3E3 C0BD23CF
58BD7188

68E69491 20F320E7 948E71D7 AE3BCC84 F10684C7 4BC8E00F 539BA42B
42C68BB7

C7479096 B4CB2D62 EA2F505D C7B062A4 6811D95B E8250FC4 5D5D5FB8
8F27D191

C55F0D76 61F9A4CD 3D992327 A8BB03BD 4E6D7069 7CBADF8B DF5F4368
95135E44

DFC7C6CF 04DD7FD1 02030100 01A34230 40300E06 03551D0F 0101FF04
04030201

06300F06 03551D13 0101FF04 05300301 01FF301D 0603551D 0E041604
1449DC85

4B3D31E5 1B3E6A17 606AF333 3D3B4C73 E8300D06 092A8648 86F70D01
010B0500

03820101 00507F24 D3932A66 86025D9F E838AE5C 6D4DF6B0 49631C78
240DA905

604EDCDE FF4FED2B 77FC460E CD636FDB DD44681E 3A5673AB 9093D3B1
6C9E3D8B

D98987BF E40CBD9E 1AECA0C2 2189BB5C 8FA85686 CD98B646 5575B146
8DFC66A8

Amazon Web Services

467A3DF4 4D565700 6ADF0F0D CF835015 3C04FF7C 21E878AC 11BA9CD2
55A9232C

7CA7B7E6 C1AF74F6 152E99B7 B1FCF9BB E973DE7F 5BDDEB86 C71E3B49
1765308B

5FB0DA06 B92AFE7F 494E8A9E 07B85737 F3A58BE1 1A48A229 C37C1E69
39F08678

80DDCD16 D6BACECA EEBC7CF9 8428787B 35202CDC 60E4616A B623CDBD
230E3AFB

418616A9 4093E049 4D10AB75 27E86F73 932E35B5 8862FDAE 0275156F
719BB2F0

D697DF7F 28
     quit
crypto pki certificate chain TP-self-signed-1017057749
 certificate self-signed 01
30820330 30820218 A0030201 02020101 300D0609 2A864886 F70D0101
05050030

31312F30 2D060355 04031326 494F532D 53656C66 2D536967 6E65642D
43657274

69666963 6174652D 31303137 30353737 3439301E 170D3231 30333136
30383036

35315A17 0D333130 33313630 38303635 315A3031 312F302D 06035504
03132649

4F532D53 656C662D 5369676E 65642D43 65727469 66696361 74652D31
30313730

35373734 39308201 22300D06 092A8648 86F70D01 01010500 0382010F
00308201

0A028201 0100AB49 E38ECDC0 5C4450E1 01A1B546 CAD1634E 7923750D
4EDFD904

1070D73C 6EB2FC02 64C8DCEE A12F43E8 8ABCE1FC 43A986CD 5AFF63E4
10BAFA6C

BF81E083 199B1090 E6416E1B 2F5ACE93 E3C14378 57A82D07 C501A846
6DB09B99

ACF6D476 AB681590 E1EF30F3 6C114B69 477B33E5 F5D2D418 0392927A
6BB9C9B7

43FD9E42 16777903 E79AE77A 1F9C2ABA 59AD53F6 0FF82549 421BB882
909A985F

084D2FFE 0FECFEEB BC738100 2F5B0D6E CBE7201E C02B34E1 1859E4FB
E4921FC6

E5B1021E 31C32D3F 3A126F94 582C0377 E92818DC 5A5ACB91 CE443DD8
10D60AD9

020D54B8 B59DF623 6136DB54 78EE9FF4 92B641C2 22DF91D0 90A8516C
873A5853

F2381504 639F0203 010001A3 53305130 0F060355 1D130101 FF040530
030101FF

301F0603 551D2304 18301680 1445E2AB 2D02902B C766B722 7DB9DC41
E860D0E8

BC301D06 03551D0E 04160414 45E2AB2D 02902BC7 66B7227D B9DC41E8
60D0E8BC

300D0609 2A864886 F70D0101 05050003 82010100 15773D40 98478AAC
0A21D59A

C385E79D 5AFD94AA 21984E10 FF6F5316 1A01AAE5 64397CFE D32F2B63
CBA2813C

97B3E629 2D409587 8083E2C1 2E1AF93B F1F68661 4716EDB0 F9D5AB3B
4558FF79

458D35E5 6E07D3A8 92BBEA89 F7DB1645 1CAF0C50 4E19999C F82272E6
03CF6C61

6D0F5551 C0000796 BCA5F355 E09C7BD1 B32974FA 9DB6E42F 1B9FC9FA
2DCB565C

2C5E3358 F8E7CC54 B60ED3A9 053DD70E 9F4ECA84 14463ECB 3ED03C6B
BB5CEE9F

31514851 CC7DC40B 53066D78 C1A8BA73 8B82C8BE 3375AE72 C88E58A6
2564F8F5

3636791A CA0BDA61 8CBAB986 55FBBF30 D34EFA9A C9971718 68A79540
13833AB4

325C77A1 D249C48F 8C1245DE 65106D20 E16BEF65

        quit
!
crypto pki certificate pool
 cabundle nvram:ios_core.p7b
!
!
!
!
voice service voip
 ip address trusted list
  ipv4 199.XX.XX 255.255.XX.XX
  ipv4 3.80.XX.XX 255.255.XX.XX

```
  ipv4 52.55.XX.XX 255.255.XX.XX

  ipv4 52.55.XX.XX 255.255.XX.XX

  ipv4 34.212.XX.XX 255.255.XX.XX

  ipv4 34.223.XX.XX 255.255.XX.XX

 address-hiding

 no notify redirect ip2ip

 mode border-element

 media disable-detailed-stats

 allow-connections sip to sip

 no supplementary-service sip moved-temporarily

 no supplementary-service sip refer

 no supplementary-service sip handle-replaces

 fax protocol t38 version 3 ls-redundancy 0 hs-redundancy 0 fallback
pass-through g711alaw

 sip

  min-se 900

  session refresh

  asserted-id pai

  early-offer forced

  midcall-signaling passthru

  privacy-policy passthru

  g729 annexb-all

  pass-thru headers unsupp

!

!

voice class uri AmazonCVC sip

 host ipv4:192.XX.XX.XX

!

voice class uri BroadWorks sip

 host dns:iopas.XXXX.com

!

voice class codec 1

 codec preference 1 g711ulaw
```

```
  codec preference 2 g711alaw
!
voice class sip-profiles 100
 rule 1 request INVITE sip-header X-BroadWorks-DNC remove
!
voice class dpg 100
 description from CUBE to BroadWorks-NS
 dial-peer 200 preference 1
 dial-peer 201 preference 2
!
voice class dpg 101
 description from CUBE to AmazonCVC
 dial-peer 202 preference 1
!
!
!
!
voice translation-rule 10
 rule 1 /\(^.........$\)/ /+1\1/
!
voice translation-rule 11
 rule 1 /\(^.........$\)/ /+1\1/
!
voice translation-rule 20
 rule 1 /^\+\(.*\)/ /\1/
!
!
voice translation-profile Amazon-In
 translate called 20
!
voice translation-profile Amazon-Out
 translate calling 11
 translate called 10
```

```
!
!
!
license feature hseck9
license udi pid ISR4321/K9 sn FDO19220MQ9
memory free low-watermark processor 67123
!
diagnostic bootup level minimal
!
spanning-tree extend system-id
!
username cisco privilege 15 password 7 XXXXXXXXXX
!
redundancy
 mode none
!

interface GigabitEthernet0/0/0
 description Interface for Amazon Chime VC
 ip address 192.65.XX.XX 255.255.XX.XX
 negotiation auto
!
interface GigabitEthernet0/0/1
 description Interface for BroadWorks
 ip address 10.80.11.18 255.255.255.0
 media-type rj45
 negotiation auto
!
interface GigabitEthernet0
 vrf forwarding Mgmt-intf
 no ip address
 negotiation auto
!
```

```
ip http server
ip http authentication local
ip http secure-server
ip forward-protocol nd
ip route 0.0.0.0 0.0.0.0 192.65.XX.XX
ip route 172.16.24.0 255.255.248.0 10.80.11.1
ip route 172.17.0.0 255.255.248.0 10.80.11.1
ip route 199.XX.XX.XX 255.255.255.0 10.80.11.1
!
!
control-plane
!
!
mgcp behavior rsip-range tgcp-only
mgcp behavior comedia-role none
mgcp behavior comedia-check-media-src disable
mgcp behavior comedia-sdp-force disable
!
mgcp profile default
!
!
!
!
dial-peer voice 200 voip
 description Outgoing dial-peer from CUBE to BroadWorks-NS1
 destination-pattern BAD.BAD
 session protocol sipv2
 session target ipv4:199.182.XX.XX
 session transport udp
 voice-class codec 1
 voice-class sip bind control source-interface GigabitEthernet0/0/1
 voice-class sip bind media source-interface GigabitEthernet0/0/1
 dtmf-relay rtp-nte
```

```
 no vad
!
dial-peer voice 201 voip
 description Outgoing dial-peer from CUBE to BroadWorks-NS2
 destination-pattern BAD.BAD
 session protocol sipv2
 session target ipv4:199.182.XX.XX
 session transport udp
 voice-class codec 1
 voice-class sip bind control source-interface GigabitEthernet0/0/1
 voice-class sip bind media source-interface GigabitEthernet0/0/1
 dtmf-relay rtp-nte
 no vad
!
dial-peer voice 202 voip
 description Outgoing dial-peer from CUBE to AmazonCVC
 translation-profile outgoing Amazon-Out
 destination-pattern BAD.BAD
 session protocol sipv2
 session target sip-server
 session transport udp
 voice-class codec 1
 voice-class sip localhost dns:dtndXXXX.voiceconnector.chime.aws
 voice-class sip profiles 100
 voice-class sip bind control source-interface GigabitEthernet0/0/0
 voice-class sip bind media source-interface GigabitEthernet0/0/0
 dtmf-relay rtp-nte
 no vad
!
dial-peer voice 100 voip
 description Incoming dial-peer for AmazonCVC
 translation-profile incoming Amazon-In
 session protocol sipv2
```

```
 session transport udp
 destination dpg 100
 incoming uri to AmazonCVC
 voice-class codec 1
 dtmf-relay rtp-nte
 no vad
!
dial-peer voice 101 voip
 description Incoming dial-peer for BroadWorks
 session protocol sipv2
 session transport udp
 destination dpg 101
 incoming uri via BroadWorks
 voice-class codec 1
 voice-class sip bind control source-interface GigabitEthernet0/0/1
 voice-class sip bind media source-interface GigabitEthernet0/0/1
 dtmf-relay rtp-nte
 no vad
!
!
gateway
 timer receive-rtp 1200
!
sip-ua
 timers connection aging 60
 sip-server dns:dtndXXXX.voiceconnector.chime.aws
!
!
line con 0
 exec-timeout 0 0
 stopbits 1
line aux 0
 stopbits 1
```

```
line vty 0 4
 exec-timeout 122 0
 password 7 XXXXXXXXX
 login
 transport input telnet ssh
!
call-home
 ! If contact email address in call-home is configured as sch-smart-
licensing@cisco.com
 ! the email address configured in Cisco Smart License Portal will be
used as contact email address to send SCH notifications.
 contact-email-addr sch-smart-licensing@cisco.com
 profile "CiscoTAC-1"
  active
  destination transport-method http
!
end

AWS_BSFT#
```