



Amazon Chime Voice Connector

SIP Trunking Configuration Guide:

3CX

May 2022

Document History

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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 trunks using **3CX** 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.

2 SIP Trunking Network Components

The network for the SIP trunk reference configuration is illustrated below and is representative of **3CX** with **Amazon Chime Voice Connector**. IP PBX is used as a secondary PBX in the topology to perform call failover and call distribution

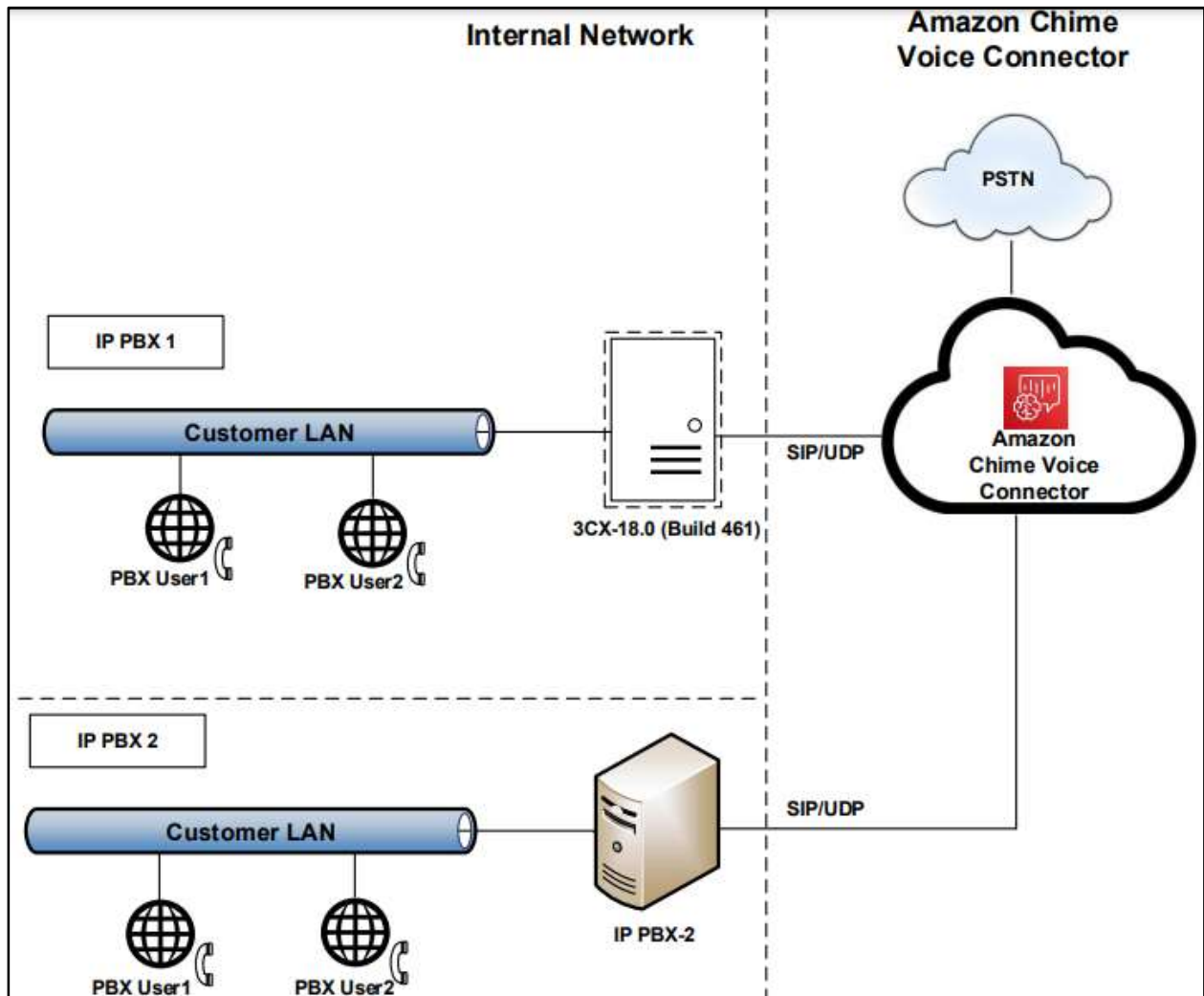


Figure 1 Network Topology

2.1 Hardware Components

- 3CX running on UCS VMware ESXi 6.7.0 Update3(Build 15160138) server

2.2 Software Requirements

- 3CX version 18.0 (Build 461)

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
- Call Authentication
- Anonymous call
- DTMF-RFC 2833
- Long duration calls
- Calls to conference scheduled by Amazon Chime user
- Call Distribution
- Call Failover

3.2 Features Not Supported

- Keep Alive- SIP OPTIONS is not supported by 3CX
- Amazon Chime Voice Connector responds to OPTIONS messages received from customer equipment, but does not send OPTIONS messages to customer equipment
- Keep Alive – Double CRLF are not supported by Amazon Chime Voice Connector and 3CX
- Secure Calling-Inbound and Outbound are not supported since 3CX does not support wildcard certificate provided by Amazon Chime Voice Connector

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
- 3CX supports Session Timers only when SIP Trunk provider also supports it or else it will be ignored. Amazon Chime Voice Connector does not support Session Timer. Call is kept active for more than one hour and the call sustained without any issues. No re-INVITE sent to refresh the session. This applies for both inbound and outbound calls.
- 3CX when configured with IP address of Amazon Chime Voice Connector, it does not validate the source (Host address) of the request therefore calls received from any of the IP address of Amazon Chime Voice Connector will be accepted. By default, the 3CX will identify the source of the call by matching the user part of the Request Line URI.

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

This section presents an overview of the steps that are required to configure **3CX** for SIP Trunking with **Amazon Chime Voice Connector**

Table 1 – PBX Configuration Steps

Steps	Description	Reference
Step 1	3CX Configuration	Section 4.2
Step 2	Amazon Chime Voice Connector Configuration	Amazon Chime Voice Connector

4.2 3CX Configuration

This section with screen shots taken from 3CX used for the interoperability testing gives a general overview of the 3CX configuration.

4.2.1 3CX Management Console

- To access the 3CX PBX, login to 3CX management console by providing the credentials.

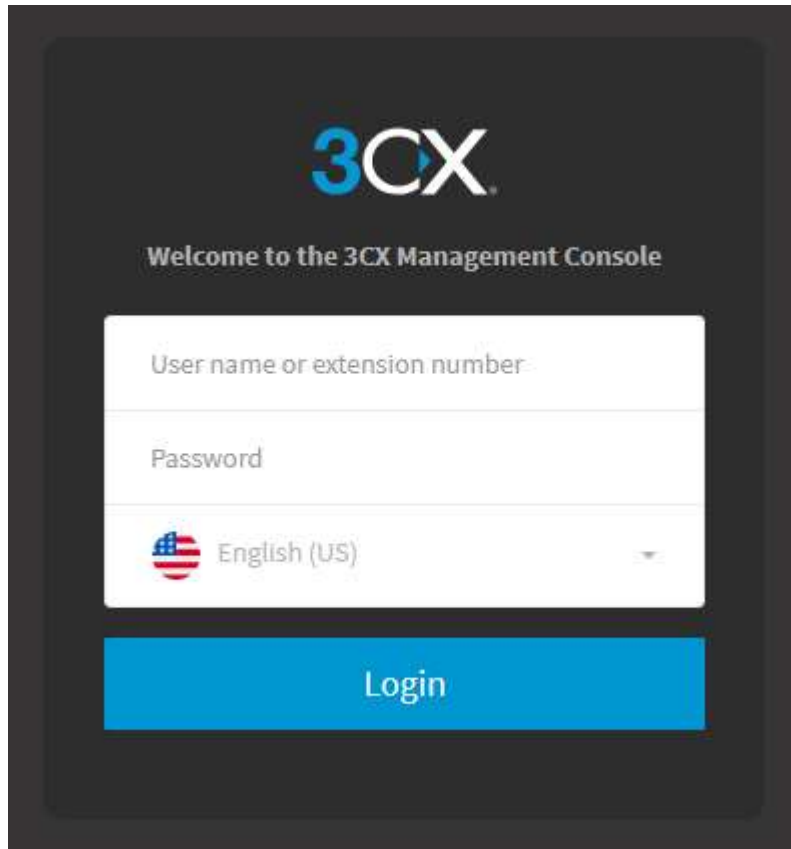


Figure 2: 3CX Management Console

Dashboard will be displayed after successful login. To verify the system version, navigate to **Information** section and find the version.

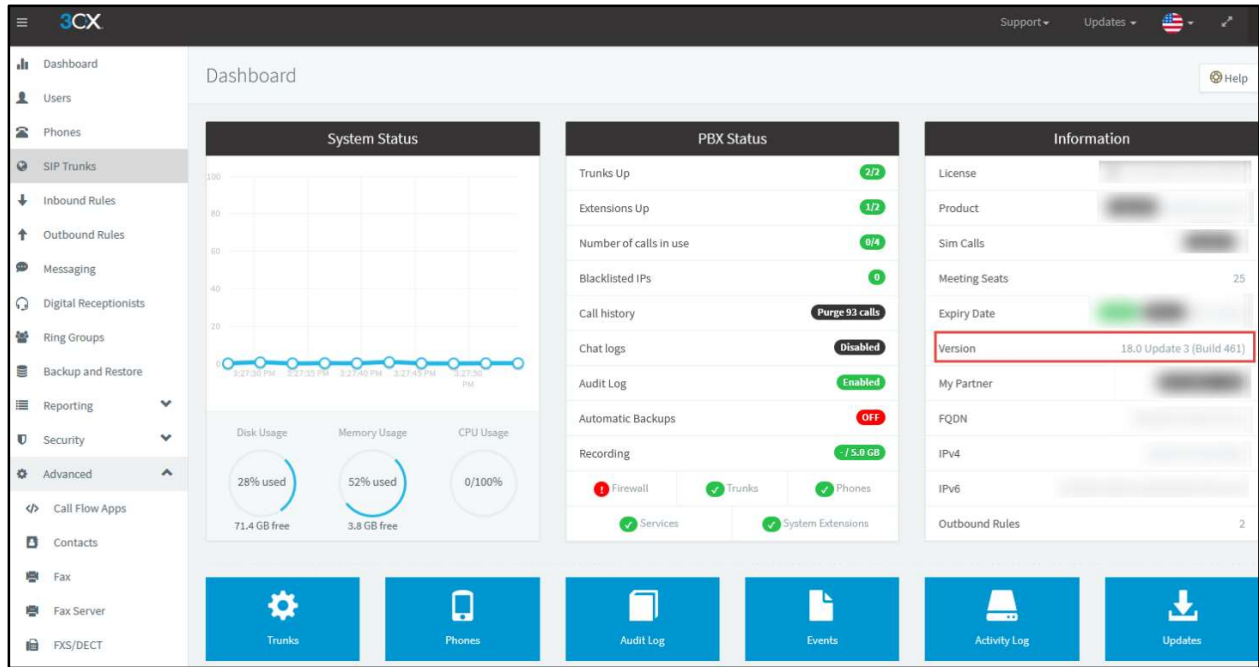


Figure 3: 3CX Dashboard

4.2.2 Add SIP Trunk

1. Navigate to **SIP Trunks** and click on **Add SIP Trunk**

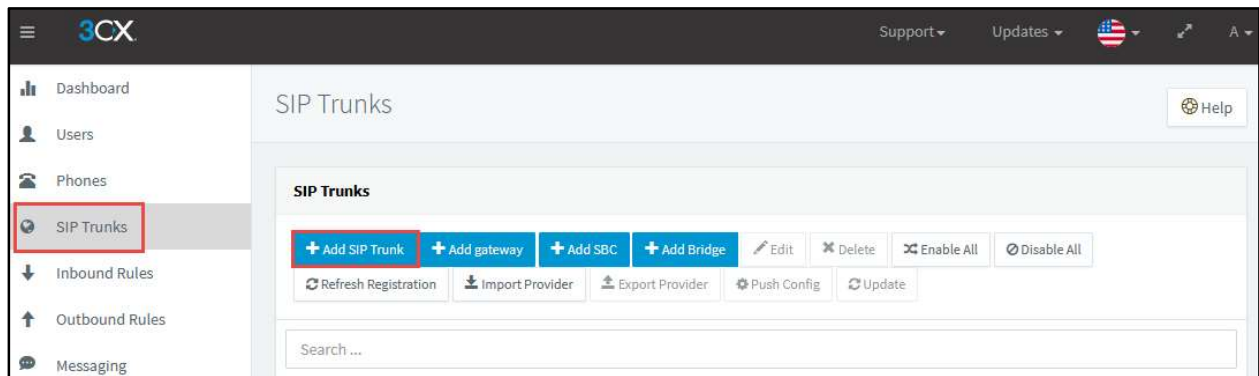


Figure 4: Add SIP Trunk

2. **Select Country** is set to US.
3. **Select Provider in your Country** is set to Amazon Chime Voice Connector.
4. **Main Trunk No** is set to +1919XXXXXXX.
5. Click **OK**.

A screenshot of the 'Add SIP Trunk/VoIP Provider' dialog box. The dialog has a title bar with a close button. It contains three dropdown menus, each highlighted with a red box: 'Select Country' is set to 'US' with a US flag icon; 'Select Provider in your Country' is set to 'Amazon Chime Voice Connector'; and 'Main Trunk No' is set to '+1919'. At the bottom right, there are 'OK' and 'Cancel' buttons.

Figure 5: Add SIP Trunk/VoIP Provider

Under **General** tab:

6. **Enter name for Trunk** is set to Amazon Chime Voice Connector
7. **Registrar/Server/Gateway Hostname or IP** is set to xxxxxxxxxxxxxxxxxxxxxxxx.voiceconnector.chime.aws
8. **Number of SIM Calls** set to 10
9. All other fields are left with default settings.

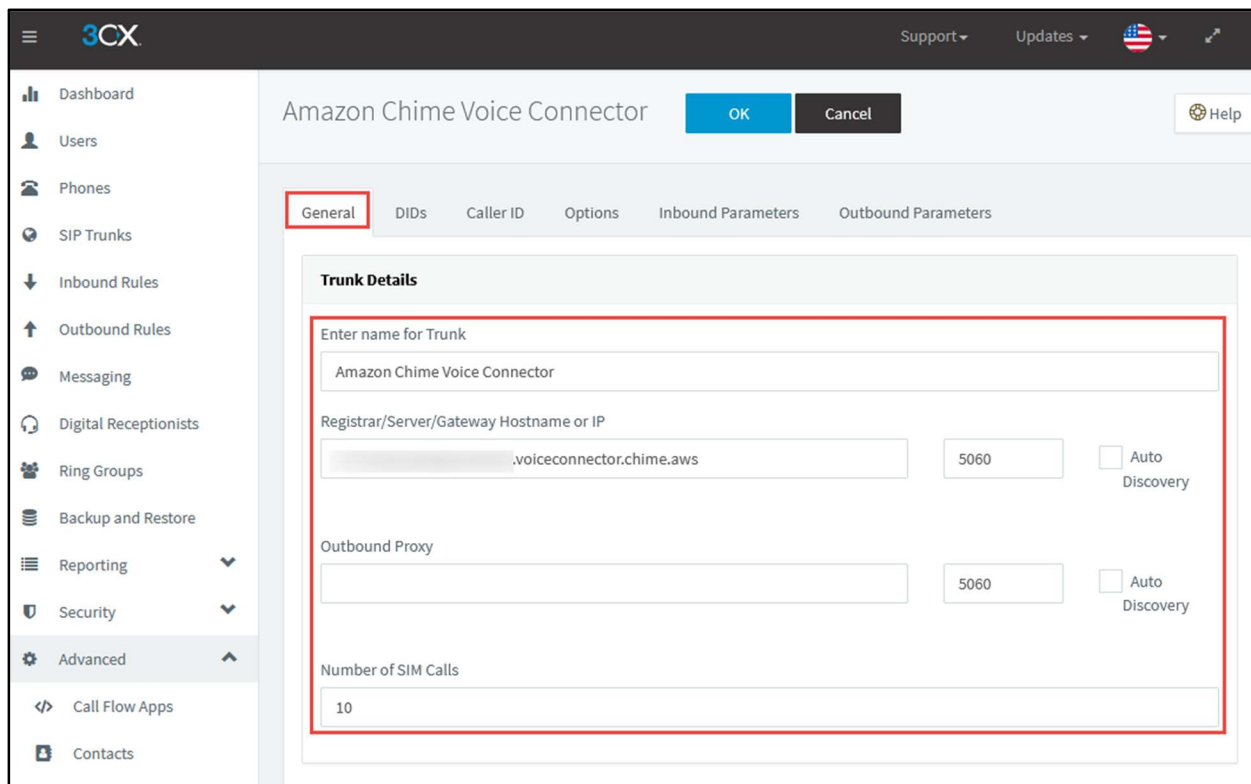


Figure 6: Add SIP Trunk (cont.)

Under **DIDs** tab:

10. Click **Add Single DID** and add all DIDs required.

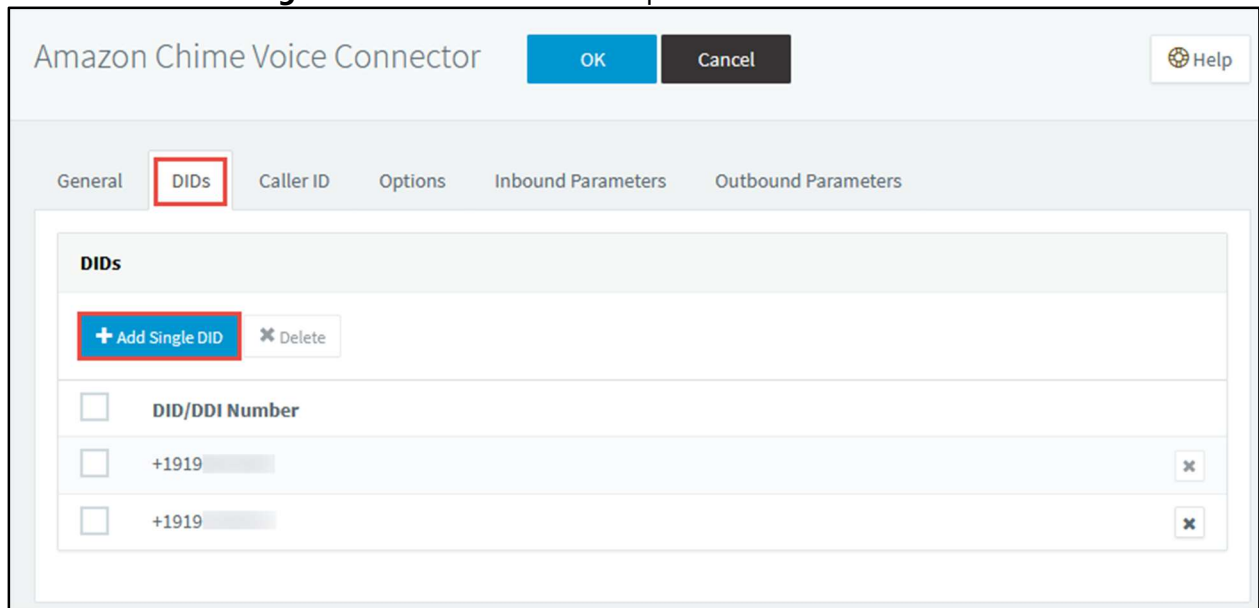


Figure 7: Add SIP Trunk (cont.)

Under **Options** tab:

11. Set the **Transport Protocol** as UDP

12. Set the **Codec Priority** as G711 U-law



Figure 8: Add SIP Trunk (cont.)

Under **Outbound Parameters** tab:

13. **P-Asserted Identity: Display name** is set to "OriginatorCaller ID" Original Caller number will be sent.
14. **P-Asserted Identity: User Part** is set to "OriginatorCaller ID" Original Caller number will be sent.
15. **P-Asserted Identity: Host Part** is set to "ContactUri" usually, content of Contact field
16. **Remote Party ID- Calling Party for Display Name, User Part and Host Part** is set to "Leave default value".
17. All other fields were left with default settings.

SIP Field	Variable	Custom Value
Request Line URI : User Part	"CalledNum" number that has bee	
Request Line URI : Host Part	"GWHostPort" gateway/provider h	
Contact : User Part	"OriginatorCallerID" Original Calle	
Contact : Host Part	"ContactUri" usually, content of C	
To : Display Name	"CalledName" name that has beer	
To : User Part	"CalledNum" number that has bee	
To : Host Part	"GWHostPort" gateway/provider h	
From : Display Name	"OriginatorCallerID" Original Calle	

Figure 9: Add SIP Trunk (Outbound Parameters)

From : User Part	"OriginatorCallerID" Original Calle ▾
From : Host Part	"GWHostPort" gateway/provider h ▾
User Agent : Text String	Leave default value ▾
Remote Party ID - Called Party : Display Name	Leave default value ▾
Remote Party ID - Called Party : User Part	Leave default value ▾
Remote Party ID - Called Party : Host Part	Leave default value ▾
Remote Party ID - Calling Party : Display Name	Leave default value ▾
Remote Party ID - Calling Party : User Part	Leave default value ▾
Remote Party ID - Calling Party : Host Part	Leave default value ▾
P-Asserted Identity : Display Name	"OriginatorCallerID" Original Calle ▾
P-Asserted Identity : User Part	"OriginatorCallerID" Original Calle ▾
P-Asserted Identity : Host Part	"ContactUri" usually, content of C ▾
P-Preferred Identity : Display Name	Leave default value ▾
P-Preferred Identity : User Part	Leave default value ▾
P-Preferred Identity : Host Part	Leave default value ▾
P-Called-Party-ID : Display Name	Leave default value ▾
P-Called-Party-ID : User Part	Leave default value ▾
P-Called-Party-ID : Host Part	Leave default value ▾

Figure 10: Add SIP Trunk (Outbound Parameters-cont.)

4.2.3 Add Users

1. Navigate to **Users** and click **Add**

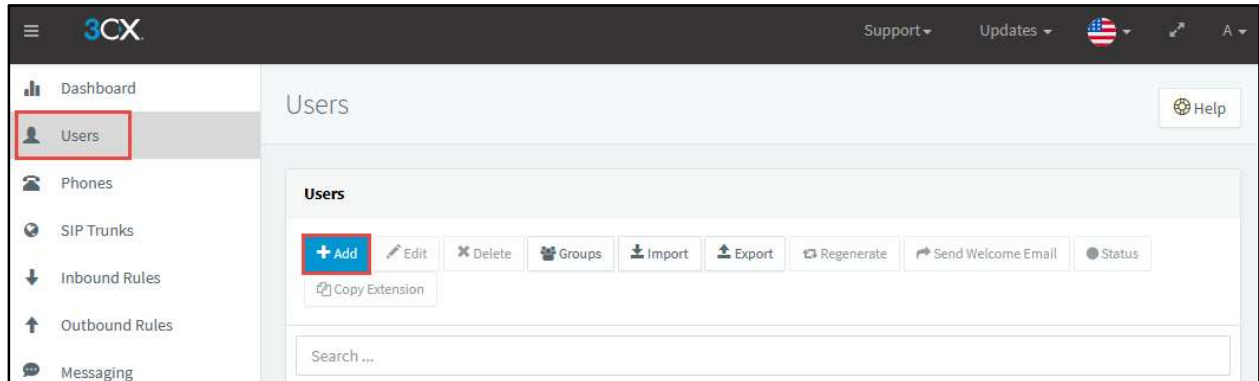


Figure 11: Add Extension

2. **Extension** is set as 9199 for example
3. **First Name** is set as AmazonVC and **Last Name** is set as User1
4. **Outbound Caller ID** is set to +1919XXXXXXX
5. Under **Direct Inbound Dialing (DID)**, click **Add a DID/DDI**
6. At the new pop-up window, select the desired DID and Click OK.

General Voicemail Forwarding Rules Phone Provisioning BLF Options Rights

Click2Talk/Click2Meet

User Information

Extension
9919

First Name
AmazonVC

Last Name
User1

Email Address
Email Address

Mobile Number
Mobile Number

Outbound Caller ID
+1919

Scan this QR code from the 3CX Android or IOS app to provision it for this extension




Figure 12: Add Extension (cont.)

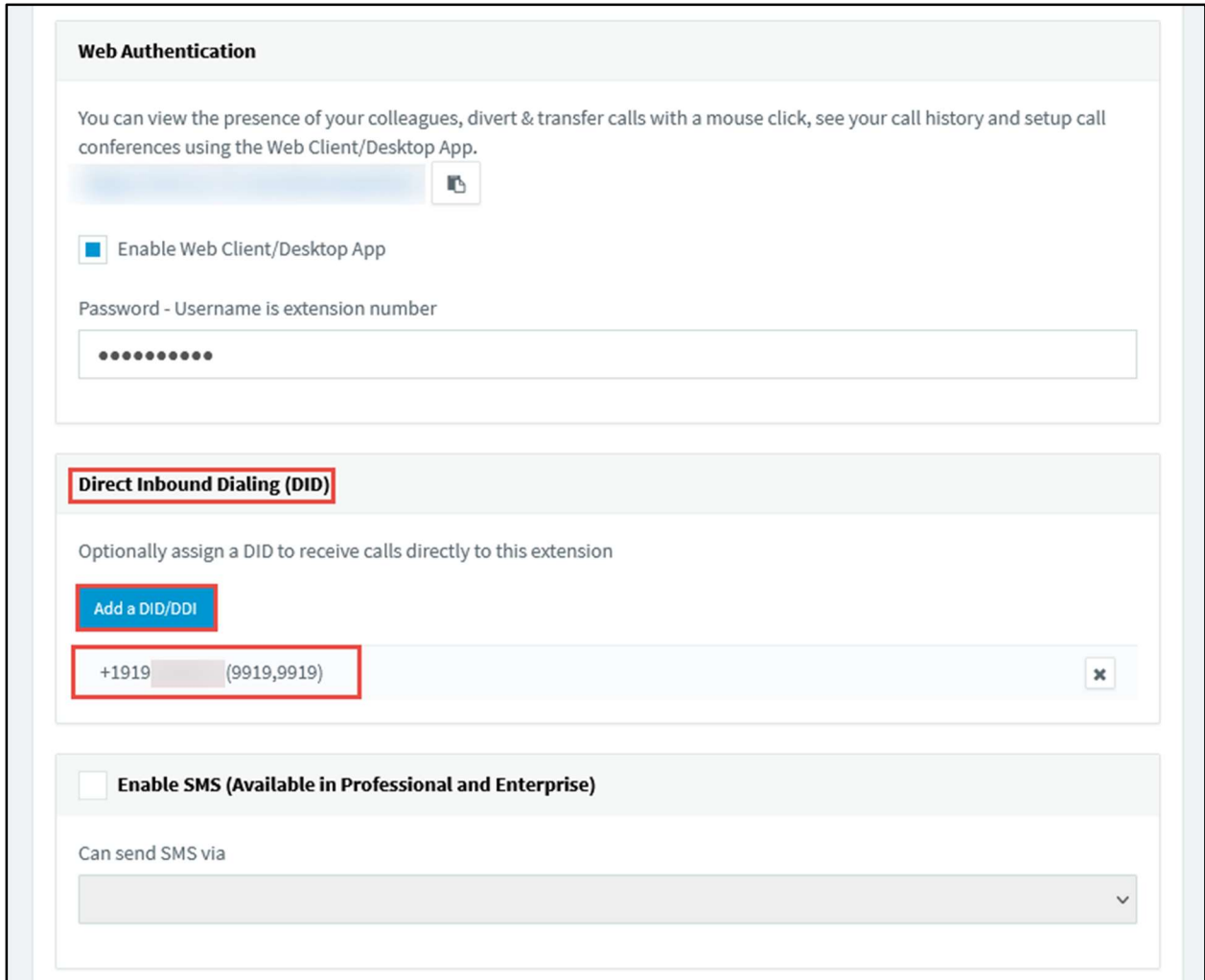


Figure 13: Add Extensions (cont.)

7. Under **Phone Provisioning** click **Add**

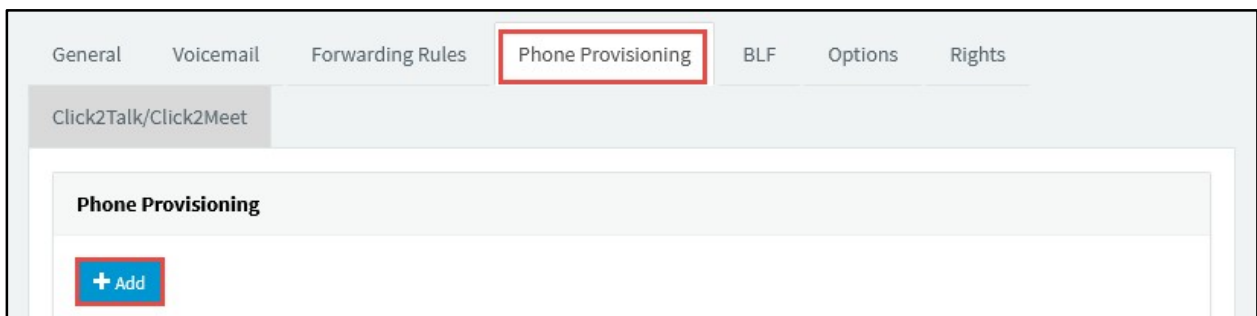
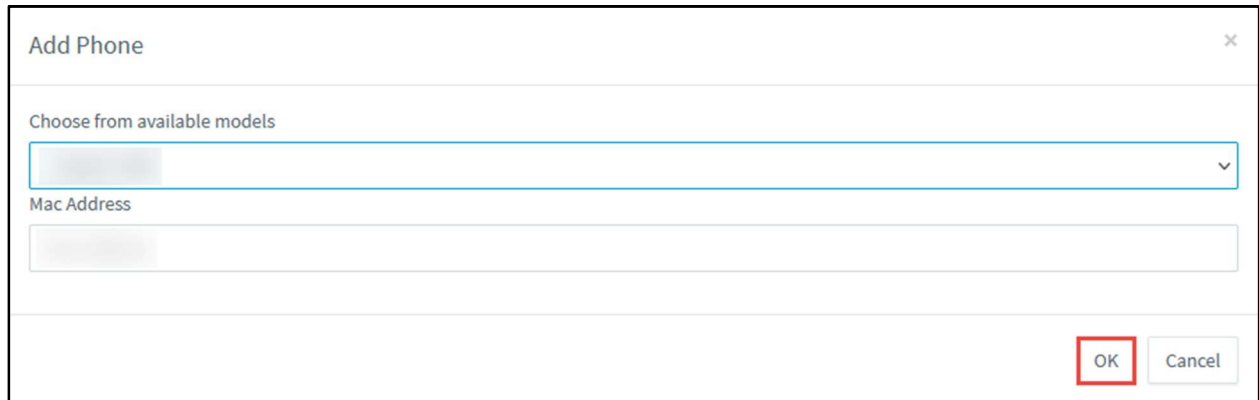


Figure 14: Add Extensions (cont.)

8. On the **Add Phone** pop-up window, select the phone model and enter the MAC address
9. Click **OK** in the pop-up window and **OK** in the main window to complete Add Extensions procedure.



The image shows a dialog box titled "Add Phone" with a close button in the top right corner. Below the title bar, there is a section labeled "Choose from available models" containing a dropdown menu. Underneath the dropdown is a text input field labeled "Mac Address". At the bottom right of the dialog, there are two buttons: "OK" and "Cancel". The "OK" button is highlighted with a red square.

Figure 15: Add Extensions (cont.)

4.2.4 Outbound Rules

1. Navigate to **Outbound Rules** and click **Add**.

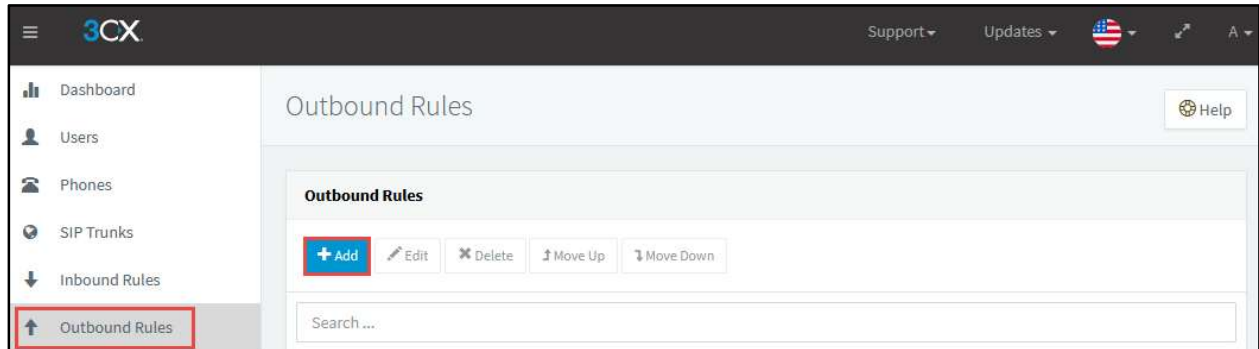


Figure 16: Outbound Rules

2. **Rule Name** is set as Amazon_VC_local
3. **Calls to numbers starting with prefix** is set as 9
4. Route 1 is set to Amazon Chime Voice Connector from the drop down.
5. **Strip Digits** is set to 1 and **Prepend** is set to +1. This strips 9 and adds +1 before sending to Amazon Chime Voice Connector.
6. All other fields are left with default settings.
7. Similarly another rule is created for international number dialing using prefix 5.

AWS_VC_Local OK Cancel Help

General

Rule Name

Apply this rule to these calls

Calls to numbers starting with prefix

Calls from extension(s)

Calls to Numbers with a length of

Calls from extension group(s)
+ Add

Make outbound calls on

Configure up to 5 backup routes for outgoing calls. Each route can be configured differently

Route		Strip Digits	Prepend	Outbound Caller ID
1	Amazon Chime Voice C ▾	1 ▾	+1	

Figure 17: Outbound Rules (cont.)

AWS_VC_International OK Cancel Help

General

Rule Name

Apply this rule to these calls

Calls to numbers starting with prefix

Calls from extension(s)

Calls to Numbers with a length of

Calls from extension group(s)
+ Add

Make outbound calls on

Configure up to 5 backup routes for outgoing calls. Each route can be configured differently

Route		Strip Digits	Prepend	Outbound Caller ID
1	Amazon Chime Voice C ▾	1 ▾	+	

Figure 18: Outbound Rules (cont.)

4.2.5 Inbound Rules

1. Navigate to **Inbound Rules**, click **Add DID Rule**.

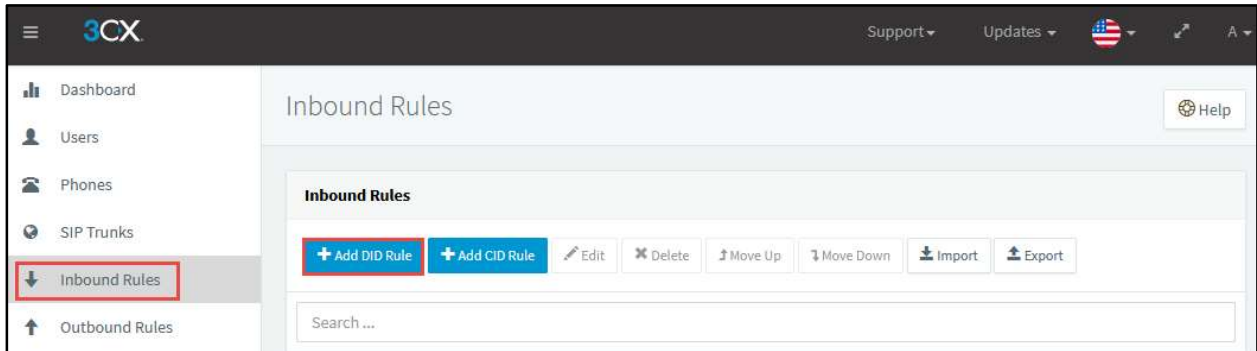


Figure 19: Inbound Rules

2. **DID/DDI** is set to +1919XXXXXXX
3. **Destination for calls during office hours** is set as Extension
4. Click **OK** to complete the configuration.

The screenshot shows the configuration form for an Inbound Rule. It is divided into two main sections: 'General' and 'Route calls to'.
In the 'General' section, there is a 'Name' field with the placeholder text 'Inbound rule name'. Below it is the 'DID/DDI' field, which contains the value '+1919' and is highlighted with a red box.
In the 'Route calls to' section, there are two dropdown menus. The first is labeled 'Destination for calls during office hours' and is set to 'Extension'. The second is labeled 'Destination for calls outside office hours' and is also set to 'Extension'. Both dropdown menus are highlighted with a red box. Below these are two checkboxes: 'Set up Specific Office Hours for this rule' and 'Play holiday prompt when it's a global holiday', both of which are currently unchecked.

Figure 20: Inbound Rules (cont.)