

KBS - EdgeMarc 2900A Interop with Avaya IP Office



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Interoperable Vendors




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Document Overview

This document provides the configuration snapshot of the interoperability performed between Ribbon's EdgeMarc 2900A and Avaya IPO.



- For additional information on Avaya IPO, refer to <https://www.avaya.com/en/products/unified-communications/voip>
- For additional information on Ribbon EdgeMarc, refer to <https://ribboncommunications.com/products/service-provider-products/session-border-controllers/EdgeMarc-2900-series>

Section-A : Ribbon EdgeMarc 2900A Configuration

- This section provides the steps required to configure Ribbon EdgeMarc 2900A with Avaya IP Office and KBS (Kandy Business Solution).

Section-B : Avaya IP Office Configuration

- This section provides the steps required to configure Avaya IP Office with Ribbon EdgeMarc 2900A.

Scope/ Non-Goals

This document provides configuration best practices for deploying Ribbon's EdgeMarc 2900 with the Avaya IP Office. These configuration suggestion are best practices and each customer may have unique needs and networks. Use this guide as a starting point and build the SBC configurations in consultation with network design and deployment engineers.

Audience

This is a technical document intended for telecommunications engineers with the purpose of configuring both the Ribbon EdgeMarc 2900 and the third-party product.

You need to navigate the third-party product as well as the Ribbon product using the graphical user interface (GUI) or command line interface (CLI).

You need an understanding of the basic concepts of TCP/UDP/TLS, IP/ Routing, and SIP/RTP/SRTP to complete the configuration and any necessary troubleshooting.

Prerequisites

Before proceeding with Ribbon EdgeMarc 2900A & Avaya IP Office you require:

- Public IP Connectivity: Ribbon EdgeMarc 2900A requires connectivity with KBS. Make sure the device is reachable from the public network. If Ribbon EdgeMarc 2900A is behind the firewall, make sure that the firewall supports SIP ALG.
- FXS Connectivity: Make sure FXS connections coming from Ribbon EdgeMarc 2900A are connected to the correct ports on Avaya IP Office.

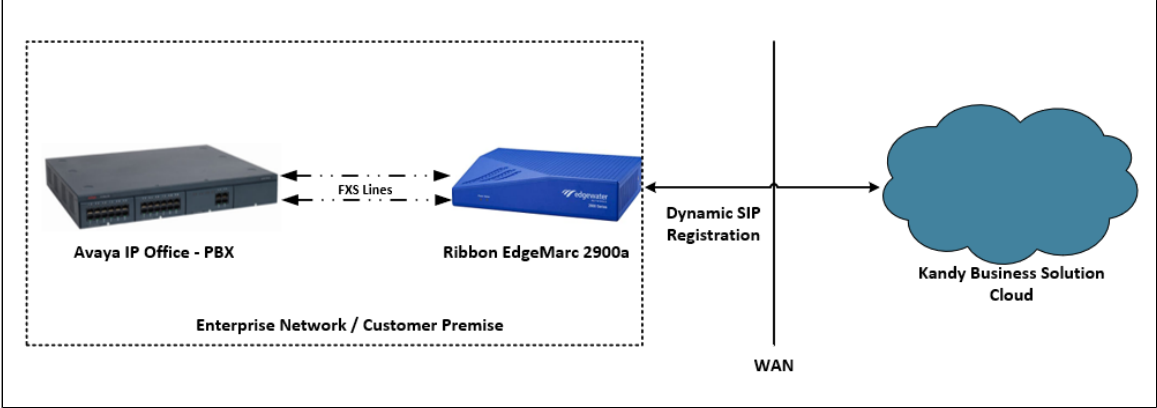
Product and Device Details

	Equipment/ Product	Software Version
Ribbon Communications	Ribbon EdgeMarc 2900	15.5.0
	Kandy Business Solution (KBS)	43.3
Third-Party Products	Avaya IP Office 500v2	10.1.2 Build-2

Network Topology Diagram

Deployment Topology

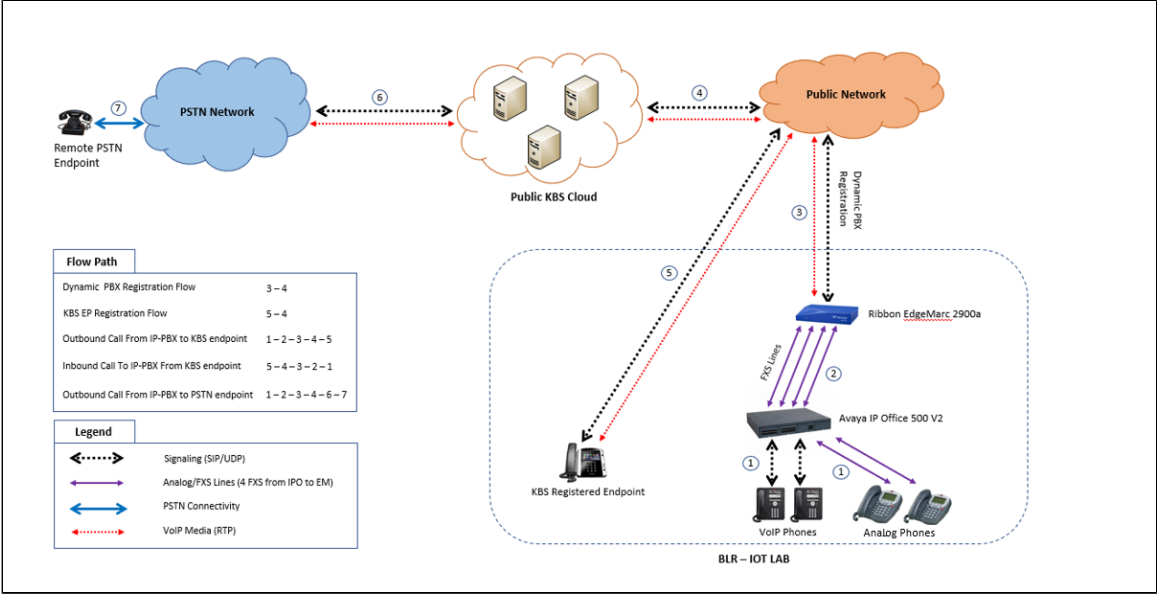
Figure 1: Deployment Topology



Interoperability Test Lab Topology (Call Flow Diagram)

IOT high level architecture covering call flows & overall topology is depicted below.

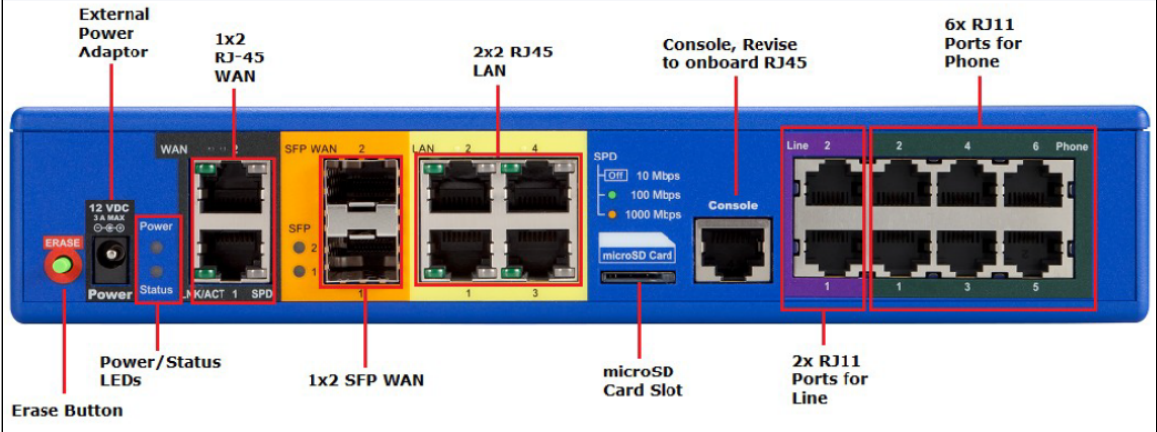
Figure 2: Interoperability Test Lab Topology



Section-A : EdgeMarc 2900A Configuration

Connectivity

Figure 3: EdgeMarc Back Panel



Hardware Specifications

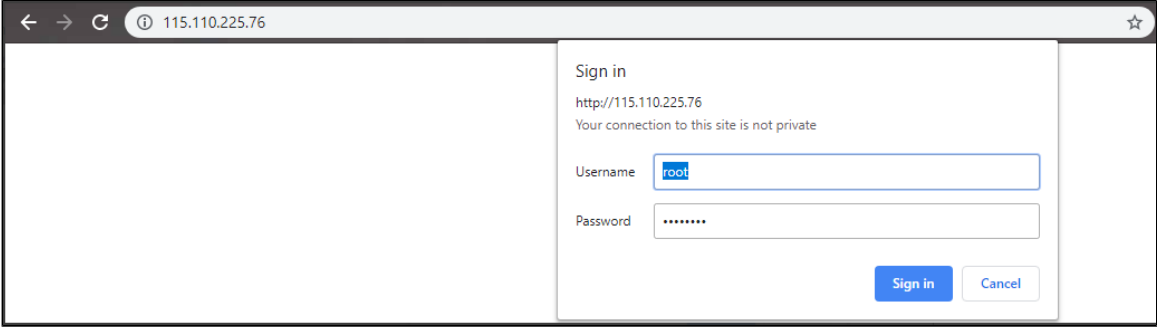
Figure 4: Hardware Specification

EdgeMarc 2900a	
Ports	
WAN 1Gb/s Ethernet (RJ-45)	2
Optical WAN 1 Gb/s ports (SFP)	2
LAN 1 Gb/s Ethernet (RJ-45)	4
FXO (RJ-11)	2
FXS (RJ-11)	6
Micro SD (SDXC) slot	1
Console (RJ-45)	1

Configuration for Ribbon EdgeMarc 2900A Towards KBS


Login to EdgeMarc 2900A.

Figure 5: Login Page



Network Configuration

Click on "Network" under the "Configuration Menu" on the left panel.

**Admin**[Help](#)

Configuration Menu

- + Admin
- + Network**
- + Users
- + Security
- + SD-WAN
- + VoIP
- + VPN

Software Version:
Version 15.5.0 -- Tue May 14 14:46:29 PDT 2019

Hostname:
2900A

Model:
EdgeMarc 2900A with IPv6 support

Vendor:
Edgewater-SCC

Provide the network details of LAN, WAN, Subnet, and Gateway IP address.

LAN Interface Settings:

IP Address:
Subnet Mask:

172.16.106.150
255.255.255.0

IPv6 Address/Prefix:

/

Enable VLAN support

☐

Default VLAN ID:

1

WAN Interface IPv6 Settings:

Select the type of IPv6 WAN Interface to use:

- ☒ Disabled
- ☐ DHCP
- ☐ Static IP (ethernet)
- ☐ IPv6 in IPv4 Tunnel
- ☐ VLAN

WAN Interface IPv4 Settings:

Select the type of IPv4 WAN Interface to use:

- ☐ Disabled
- ☐ PPPoE
- ☐ DHCP
- ☒ Static IP
- ☐ VLAN

IP Address:

Subnet Mask:

Network Settings:

Default Gateway:

Add the DNS Server Details

DNS servers:

Note: In case of dynamic links, if the manual override checkbox is not checked the address provided will be used.

Manually set DNS:




Primary DNS Server:

Secondary DNS Server:

VoIP Configuration

Click on "VoIP" under the "Configuration Menu" on the left panel.

Figure 6: VoIP Page

 **ribbon**

[Help](#)

Admin

Configuration Menu

- + [Admin](#)
- + [Network](#)
- + [Users](#)
- + [Security](#)
 - + SD-WAN
 - + **VoIP**
 - + VPN

Software Version:
Version 15.5.0 -- Tue May 14 14:46:29 PDT 2019

Hostname:
2900A

Model:
EdgeMarc 2900A with IPv6 support

Vendor:
Edgewater-SCC

SIP Server Configuration

Under VoIP SIP

Configure the SIP server address, port, transport protocol, and domain name.

 For security reasons, the SIP server domain and IP have been changed.

SIP protocol settings.

The SIP Server settings specify the address and port that all client traffic shall be forwarded to.

SIP Server Address:

198.17.84.XXX

SIP Server Port:

5060

SIP Server Transport

UDP

Exclude sips headers for TLS Transport

☐

Use Custom Domain:

☒

SIP Server Domain:

KBS.com

List of SIP Servers:

Create

Enable Multi-homed Outbound Proxy Mode:

☒

Enable Transparent Proxy Mode:

☐

Limit Outbound to listed SIP Servers:

☒

Limit Inbound to listed SIP Servers:

☒

Include UPDATE In Allow:

☒

PRACK Support:

☒

Call Audit Support:

☐

Credentials and Registration

Under the Configuration Menu, go to **VoIP --> SIP --> B2BUA**

Dynamic PBX Registration - As PBX does not support SIP registration, EdgeMarc performs Dynamic Registration with KBS.

Credentials and Registration

AOR	Auth-User	Password	Registrar	Status	Transport
✖ bglrlab-dynamic-2	bglrlab-dynamic-2	is set	default	OK	UDP
✖ default	bglrlab-dynamic-2	is set			

New Entry

Credentials

Username: Auth-User:

Edit Password: ☐

Password:

Confirm Password:

Use as default: ☐

Registrar

☐ Don't Register

☒ Default SIP Proxy

Custom URI Domain:

☐ Domain:

Address (optional): Port:

Transport:

Register Options (Optional)

Default Expires: sec. Renew interval: %

Header Modification Rules (SMM)

SBC needs to send all Requests to the KBS, which accepts the request in a standard SIP URI format. E.g. "INVITE sip:9722653XXXX@contoso.com:5060 SIP/2.0". To modify the message apply the following rules.

The Configuration Menu, go to **VoIP --> SIP --> B2BUA**

Go to the **"toisp"** action and add a new **Request-URI** header with the following string values.

```
'sip:' + $to.uri.user + '@contoso.com:' + $env.target_port
```

Click **Add Submit**

Actions

	Name	Send	Prio	Hunt	Header	Refer-To-ReINV
✖	toisp				✓	
✖	tofsx	✓				

New Entry

Name:

Send To: ☒ Trunking Device: ☐ Client:
☐ URI:
☐ Response:

Prioritize: ☐ Refer to Re-INVITE: ☐

Serial Hunting:

Header Manipulations:

	Header	Value
Header:	<input type="text" value="Request-URI"/>	<input type="button" value="Add"/>
Value:	<input type="text"/>	

Phones and Port Settings

Under the Configuration Menu, go to **VoIP --> SIP --> SIPUA**

Global configuration:

Enable SIPUA: ☒

Use SIP Username for SIP authentication: ☐

Codec Preference:

Use Preferred codec only: ☐

Use REFER for transfer: ☐

Register with proxy: ☐

The DIDs listed as part of port configuration. The DIDs are not registered to KBS as EdgeMarc performs Dynamic Registration on behalf of the DIDs.

Port Level Basic Configuration

Port 1 Configuration:

Hook state: **On-hook**

SIP Display name:

9722653536

SIP Username:

9722653536

SIP Authentication name:

9722653536

Password:

is set

Edit Password:

☐

Password:

Confirm Password:

Port 2 Configuration:

Hook state: **On-hook**

SIP Display name:

9722653564

SIP Username:

9722653564

SIP Authentication name:

9722653564

Password:

is set

Edit Password:

☐

Password:

Confirm Password:

Port 3 Configuration:

Hook state: **On-hook**

SIP Display name:

9722653535

SIP Username:

9722653535

SIP Authentication name:

9722653535

Password:

is set

Edit Password:

☐

Submit

Reset

Apply Later

FAX Settings

Under the Configuration Menu, go to **VoIP --> SIP --> SIPUA --> Fax**

Use T.38 for FAX:

☒

Fax Bit rate(bps):

14400 ▾

Fax TCF:

Transferred ▾

Fax Options:

Default ▾

UDP Max buffer:

1024

UDP Max Datagram size:

512

Fax Error Correction:

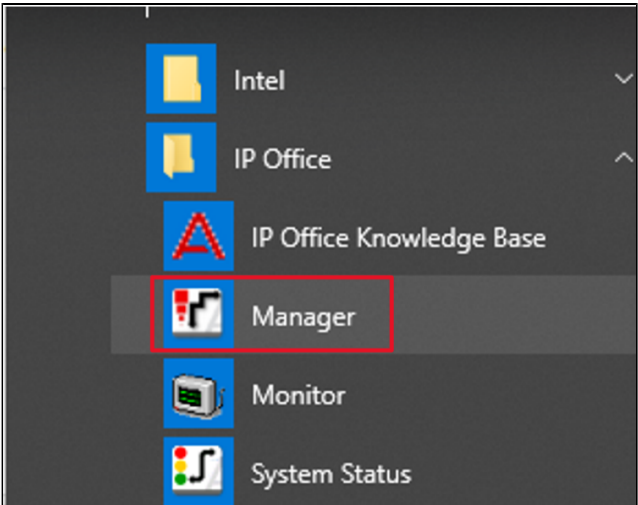
Redundancy ▾

Ignore T38 Request in Initial Invite:

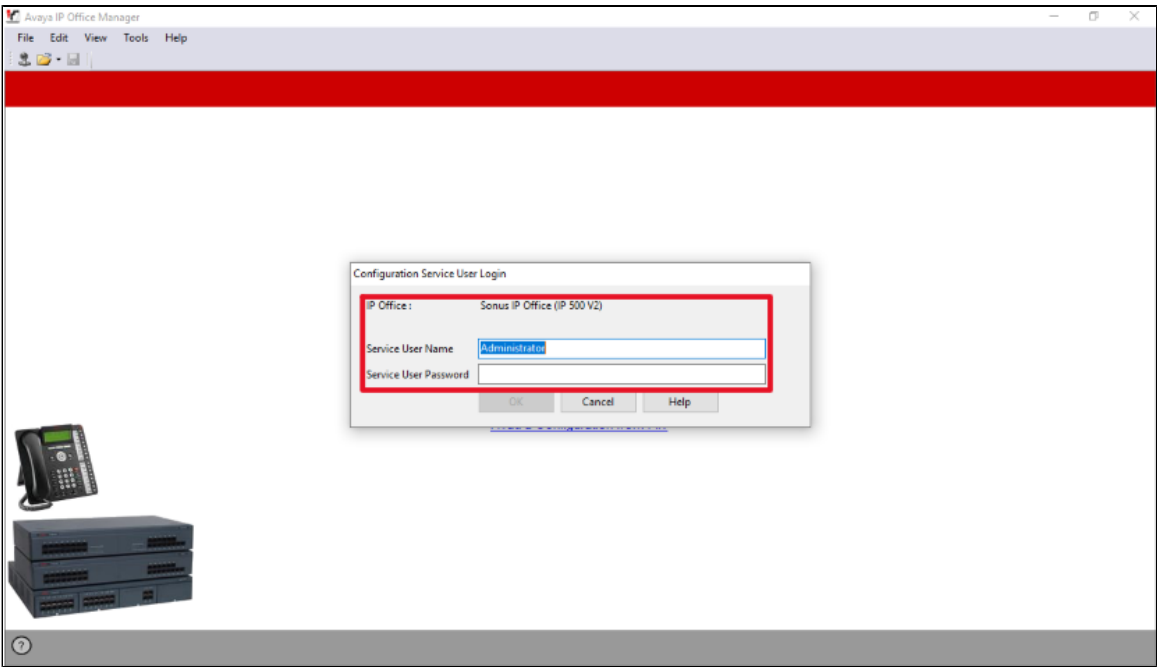
☐

Section-B : Avaya IP Office Configuration

Connect to the Avaya IP Office using "IP Office Manager" software.

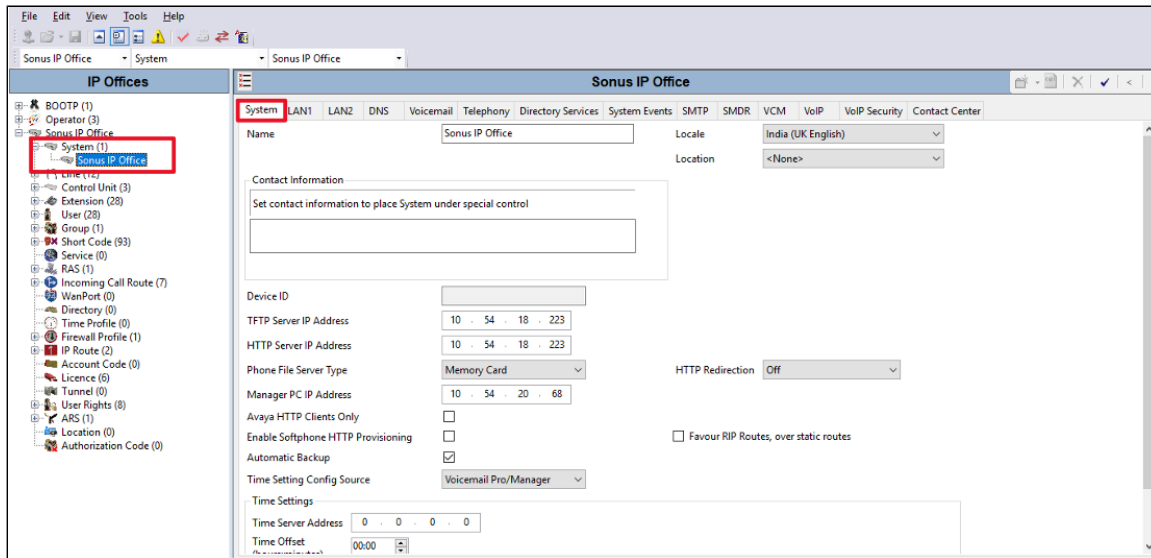


Login to IP Office Manager



System Settings

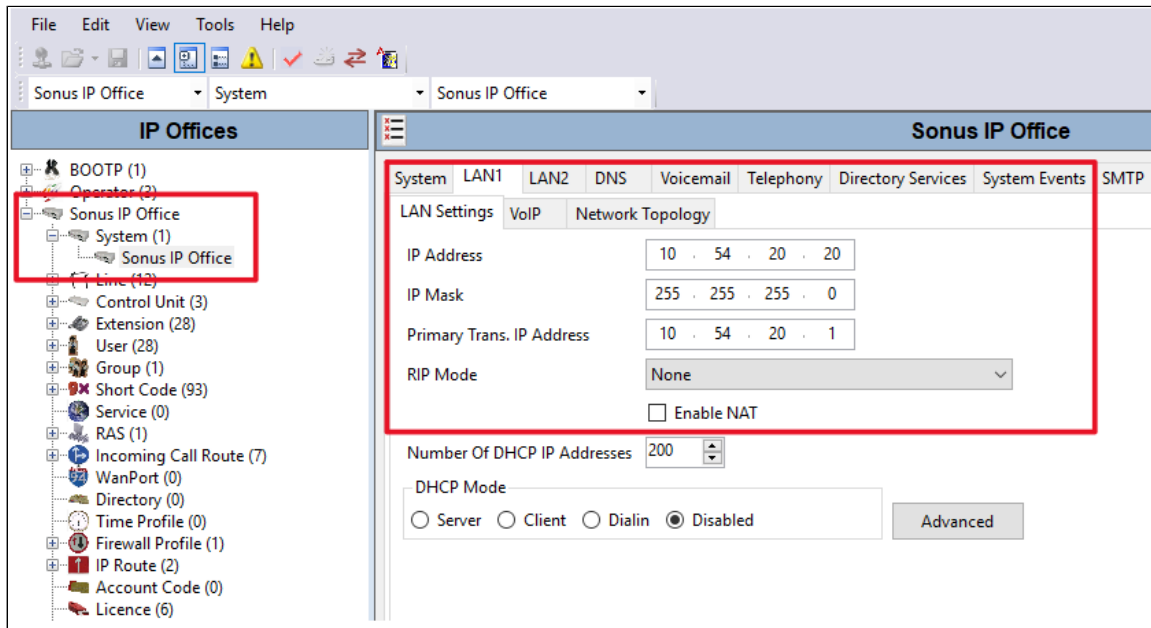
To access the System settings, click the name of the IP Office system. Select **Sonus IP Office > System > system name “Sonus IP Office”** and then click the **System** tab.



LAN1

Access to the IP Office was gained through the LAN side of the PBX (LAN1). The SIP PBX phones are also registered through the LAN side of the PBX.

To access the LAN1 settings, click the name of the IP Office system. Select **Sonus IP Office > System > system name “Sonus IP Office”** and then click the **LAN1** tab.

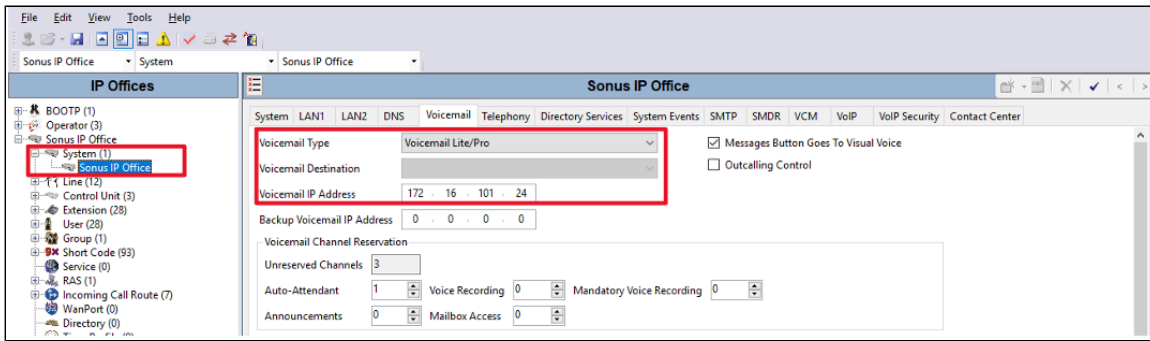


Voicemail

To access the Voicemail settings, click the name of the IP Office system. Select **Sonus IP Office > System > system name “Sonus IP Office”** and then click the **Voicemail** tab.

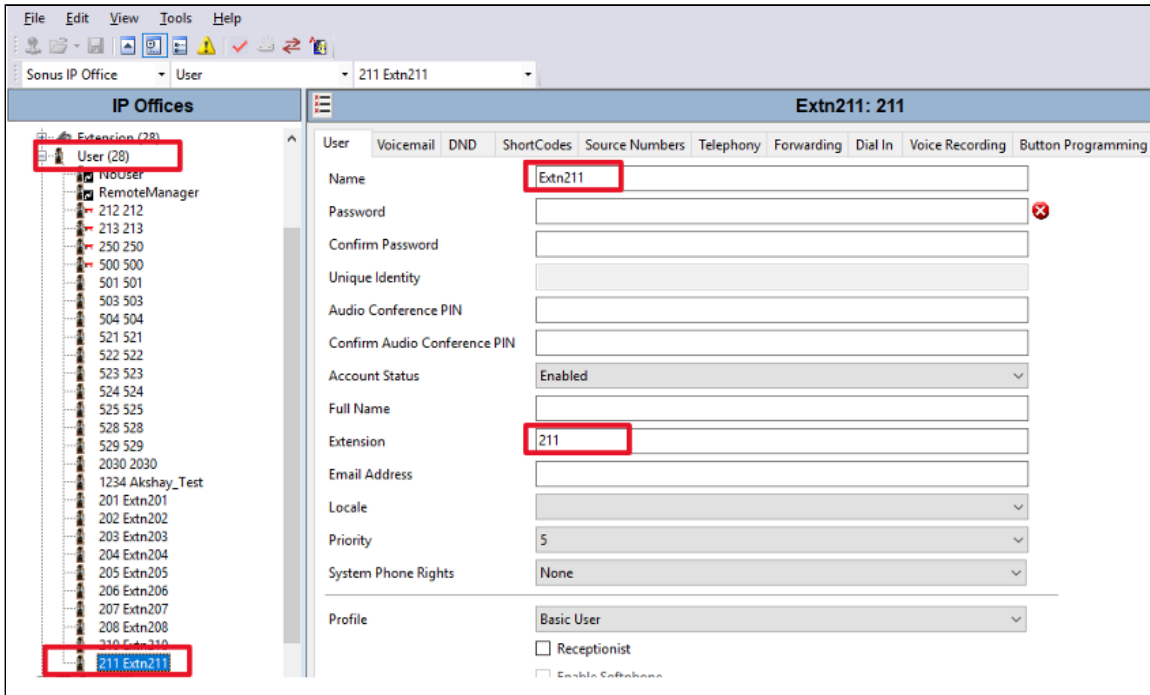


Voicemail pro was installed on the Enterprise network and was integrated with the IPO PBX. The voicemail server was hosted with IPO.



User Configuration

These are the end user profiles and can be associated with the DID. Supplementary services (Example. call forwarding, voicemail etc) for a user can be configured under the different sections.



Extension Configuration

Analog Extension

These PBX extensions are configured with "Extension id" and "Base Extension" number. The base extension number will be allocated to the analog phone. For Example. In this case extension 211

Ensure the analog phone is connected to the Avaya IPO on port number listed below. For Example, in this case, port 1.

File Edit View Tools Help

Sonus IP Office Extension 25 211

IP Offices

- Line (12)
 - Control Unit (3)
 - Extension (28)
 - 8009
 - 8007
 - 1 201
 - 2 202
 - 3 203
 - 4 204
 - 5 205
 - 6 206
 - 7 207
 - 8 208
 - 25 211
 - 8016 212
 - 8017 213
 - 8000 250

Analogue Extension: 25 211

Extn Analogue

Extension Id 25

Base Extension 211

Caller Display Type On

Device Type Analogue Handset

Location System (None)

Module BP2

Port 1

Disable Speakerphone ☐



Ensure "FAX Machine" under the Analogue Extension is checked for using FAX devices.

File Edit View Tools Help

Sonus IP Office Extension 25 211

IP Offices

- Line (12)
 - Control Unit (3)
 - Extension (28)
 - 8009
 - 8007
 - 1 201
 - 2 202
 - 3 203
 - 4 204
 - 5 205
 - 6 206
 - 7 207
 - 8 208
 - 25 211
 - 8016 212
 - 8017 213
 - 8000 250
 - 8001 500

Analogue Extension: 25 211

Extn Analogue

Equipment Classification

- ☐ Quiet Headset
- ☐ Paging Speaker
- ☐ Standard Telephone
- ☐ Door Phone 1
- ☐ Door Phone 2
- ☐ IVR Port
- ☒ FAX Machine
- ☐ MOH Source

Flash Hook Pulse Width

☒ Use System Defaults

Minimum Width 20 ms

Maximum Width 500 ms

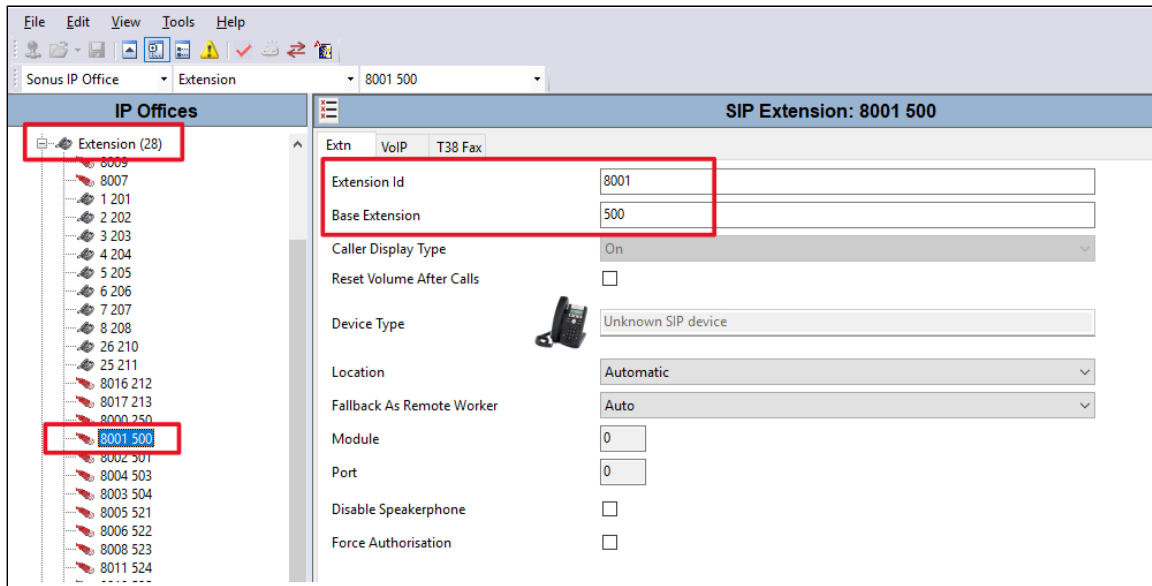
Message Waiting Lamp Indication Type

51V Stepped

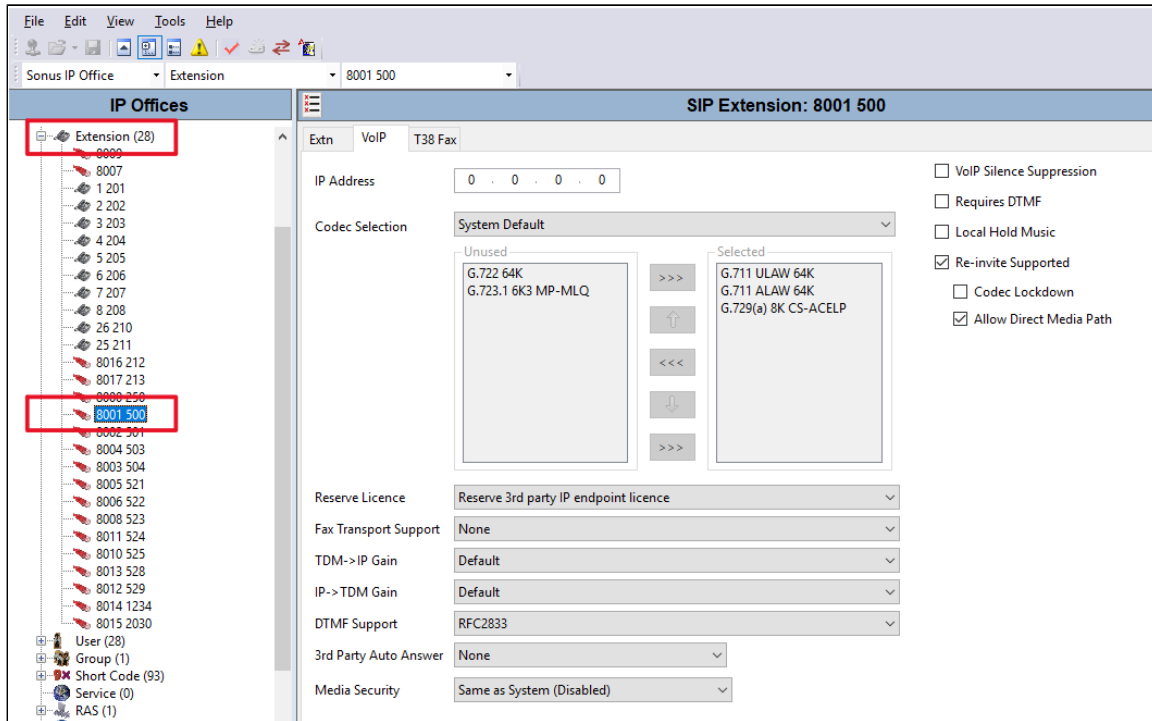
Hook Persistency 100 ms

SIP Extension

The following example shows a SIP extension with a SIP-supported IP phone with a base extension of 500.



The following example shows a SIP extension with selected codecs.



Analog Trunk Configuration

Analog trunk line is configured on "Line Number 1" (same Line group ID will be used for the outgoing call using short code) and "Port 9" as shown below. Ensure that your analog cable connects with EdgeMarc 2900a FXS port. For Example. In this case, analog from EdgeMarc was connected on port number 9 on the Avaya IPO.

File Edit View Tools Help

Sonus IP Office Line 1

IP Offices

- BOOTP (1)
- Operator (3)
- Sonus IP Office
 - System (1)
 - Sonus IP Office
 - Line (12)
 - 1
 - 2
 - 3
 - 4
 - 5
 - 17
 - 18
 - 19
 - 20
 - 21
 - 22
 - 23
 - Control Unit (3)
 - Extension (28)
 - User (28)
 - Group (1)
 - Short Code (93)
 - Service (0)

Analogue Trunk - Line 1

Line Settings Analogue Options

Line Number: 1

Card/Module: 1

Port: 9

Telephone Number:

Incoming Group ID: 0

Outgoing Group ID: 0

Outgoing channels: 1

Voice channels: 1

Prefix:

Line Appearance ID: 0

Admin: In Service

i Ensure that "Direction" is set to "Bothway" for incoming & outgoing calls.

File Edit View Tools Help

Sonus IP Office Line 1

IP Offices

- BOOTP (1)
- Operator (3)
- Sonus IP Office
 - System (1)
 - Sonus IP Office
 - Line (12)
 - 1
 - 2
 - 3
 - 4
 - 5
 - 17
 - 18
 - 19
 - 20
 - 21
 - 22
 - 23
 - Control Unit (3)
 - Extension (28)
 - User (28)
 - Group (1)
 - Short Code (93)
 - Service (0)
 - RAS (1)
 - Incoming Call Route (7)
 - WanPort (0)
 - Directory (0)
 - Time Profile (0)
 - Firewall Profile (1)

Analogue Trunk - Line 1

Line Settings Analogue Options

Channel: 0

Trunk Type: Loop Start ICLID

Signalling Type: DTMF Dialing

Direction: Bothway

Impedance Match

Impedance:

Digit(s) to break dial tone: 2

Automatic Balance Impedance Match: Start Stop ☐ Quiet Line

Flash Pulse Width (ms): 500

Await Dial Tone (ms): 3000

Echo Cancellation Delay: 16 ms

Main Hum Filter Freq.: Off

☒ Allow Analog Trunk to Trunk Connect

☐ Long CLI Line

☐ Modem Enabled

Pulse Dialing

Mark (Units - ms): 40

Space (Units - ms): 60

Inter-Digit Pause (ms): 500

Ring Detection

Ring Persistency (ms): 200

Ring Off Max (ms): 5000

☒ Disconnect Clear

Units (ms): 500

Secondary Dial Tone

Await time(ms): 3000

After n Digit(s) n = 1

Matching Digit: 8

DTMF

On (ms): 80

Off (ms): 80

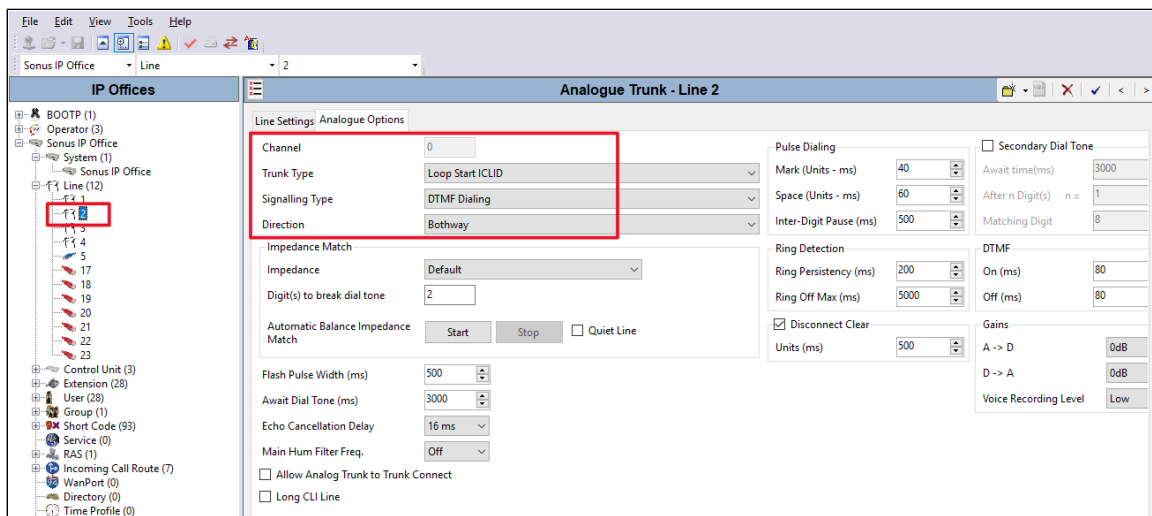
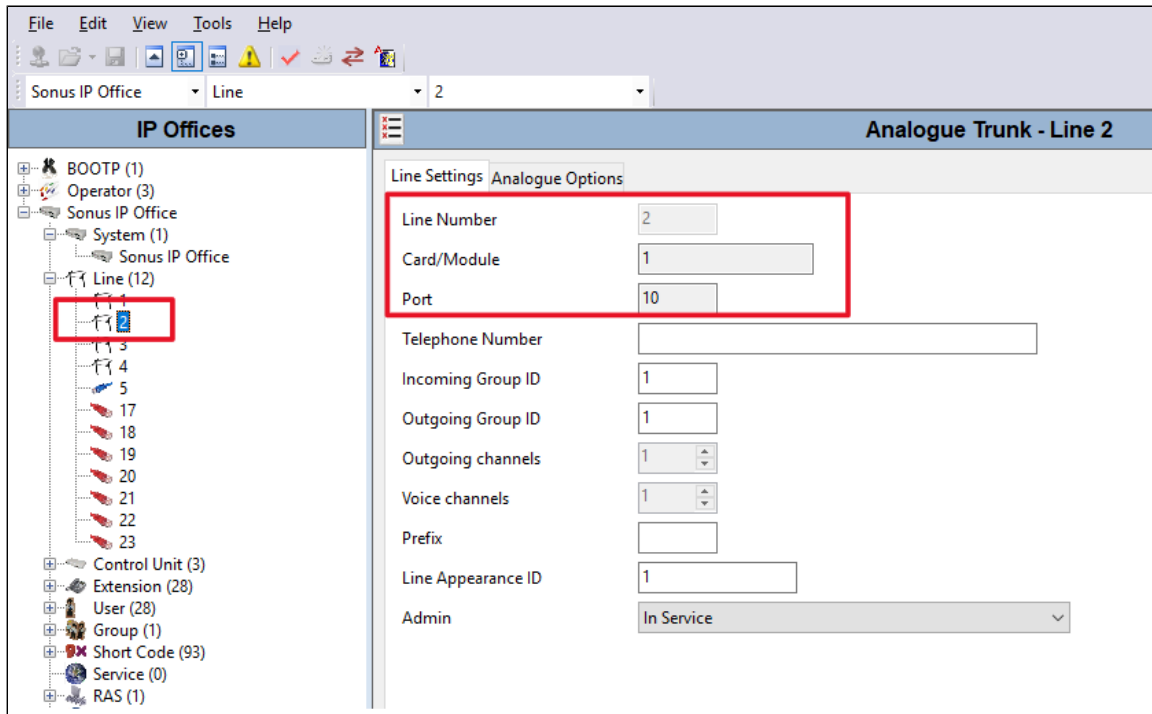
Gains

A -> D: 0dB

D -> A: 0dB

Voice Recording Level: Low

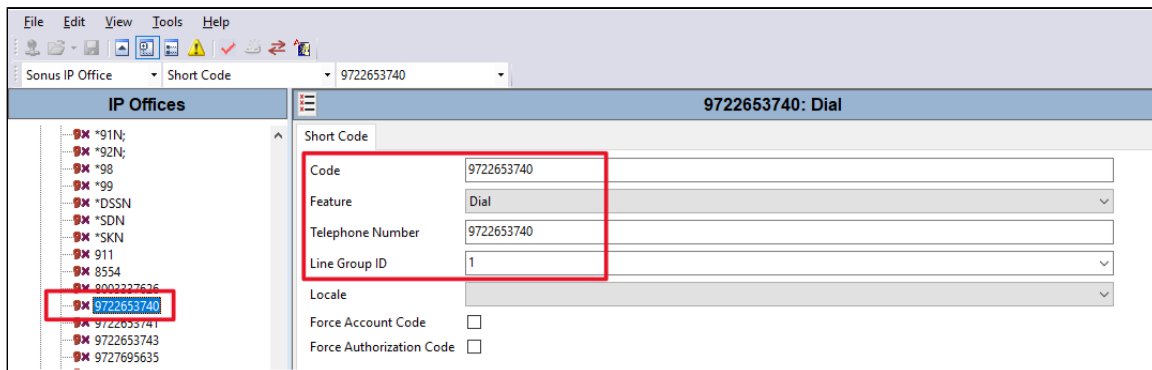
For multiple trunks connect multiple ports of Avaya IPO with EdgeMarc 2900a FXS ports. The following example shows an addition analog trunk on port number 10 of the Avaya IPO for Interop purposes.



Short Code

Short codes are used for call routing of outgoing calls from Avaya IPO.

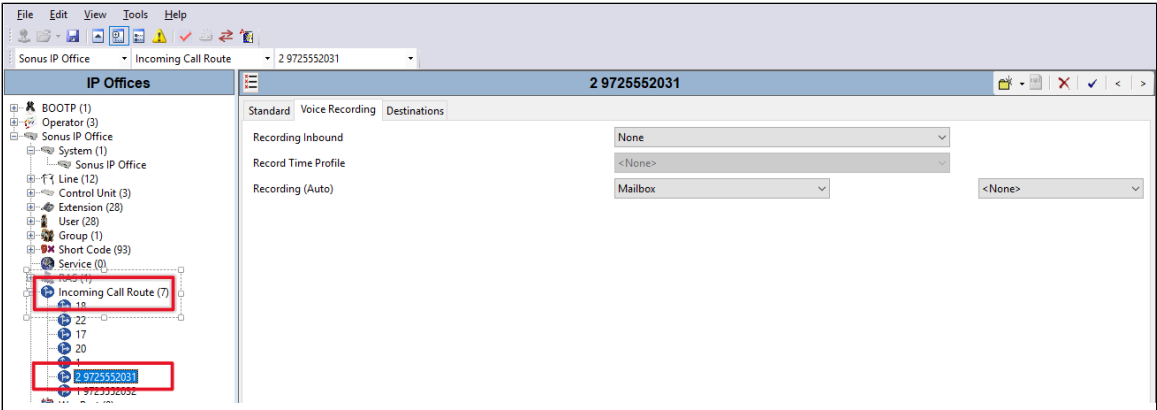
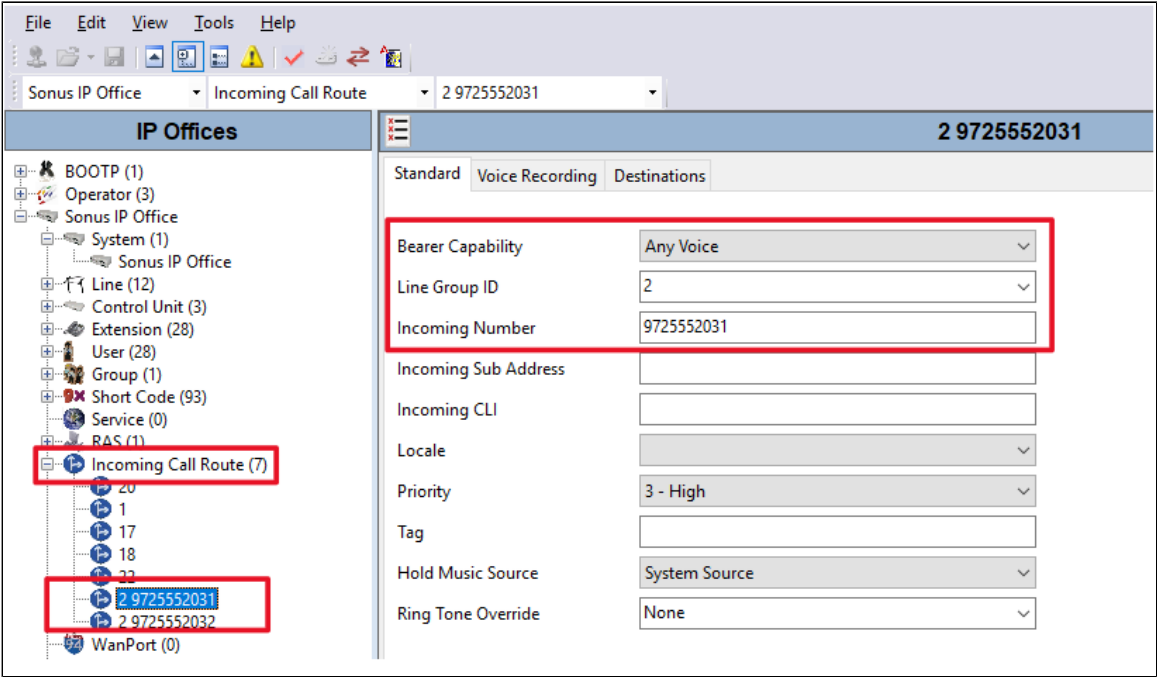
The following example shows a short code for dial pattern "9722653740" which is mapped to "line Group Id 1". Refer to Analog trunk configuration where the line group id is already defined with a FXS port number.




Repeat the above steps for creation of another Short code for other dial pattern "9722653741" which is mapped to "line Group Id 2". Refer t the Analog trunk configuration where the line group id 2 is already defined with a FXS port number.

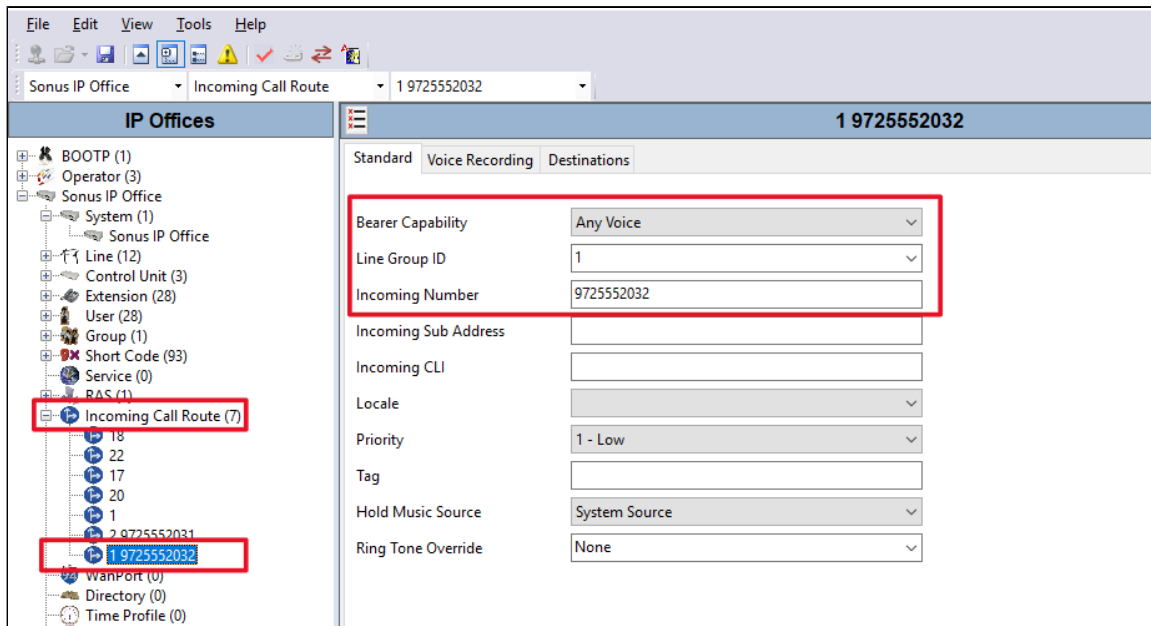
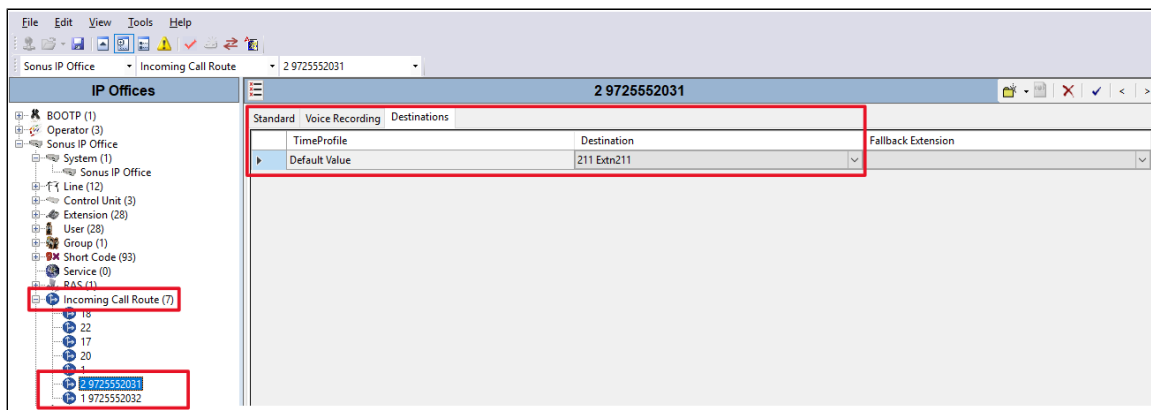
Incoming Route

Incoming call route defines the incoming call patterns mapped to the "line group ID



Inside incoming call routes, the line group Id has been mapped to the PBX local user extension. For Example. *In the following example, dialed incoming number 9725552031 (DID) has been mapped to the local PBX extension 211 phone.*

 If you wish to use DIDs directly on analog pbx phones line then internal mapping to local extension is not required.



Supplementary Services & Features Coverage

The following checklist lists the set of services/features covered through the configuration defined in this Interop Guide.

Sr. No.	Supplementary Services/ Features	Coverage
01.	IP PBX User To PSTN	✓
02.	PSTN to IP PBX User	✓
03.	Cancel Call	✓
04.	Voice Mail Deposit	✓
05.	Early Media	✓
06.	DTMF Using RFC2833	✓
07.	Call Forward No Answer	✓
08.	Call Forward Unconditional	✓
09.	Call Forward Busy	✓
10.	Blind Transfer To PSTN	✓
11.	Attendant Transfer To PSTN	✓

12.	Meet-Me Conference	✓
13.	Long Duration	✓
14.	Hold And Resume	✓
15.	Fax With T.38	✓
16.	Fax With G711	✓
17.	Conference	✓
18.	Music On Hold	✓

Legend

Supported	✓
Not Supported	✗

Support

For any support related queries about this guide, please contact your local Ribbon representative, or use the details below:

- Sales and Support: 1-833-742-2661
- Other Queries: 1-877-412-8867
- Website: <https://ribboncommunications.com/about-us>

References

For detailed information about Ribbon products & solutions, please visit:

<https://ribboncommunications.com/products>

Conclusion

This configuration guide provides an approach for successfully configuring EdgeMarc SBC with Avaya IPO and KBS. This configuration is applicable to almost all major supplementary services and call flows.

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