Ribbon SBC Edge R11.0 Interop with Microsoft Virtual Survivable Branch Appliance : Interoperability Guide

Table of Contents

Interoperable Vendors

Document Overview

This document outlines the configuration best practices for the Ribbon solution covering the Ribbon SBC Edge when deployed with Microsoft Teams vSBA (virtual Survivable Branch Appliance).

About Ribbon SBC Edge

A Session Border Controller (SBC) is a network element deployed to protect SIP-based Voice over Internet Protocol (VoIP) networks. Early deployments of SBCs were focused on the borders between two service provider networks in a peering environment. This role has now expanded to include significant deployments between a service provider's access network and a backbone network to provide service to residential and/or enterprise customers.

The SBC Edge (SBC 1000/2000) addresses the next-generation needs of SIP communications by delivering embedded media transcoding, robust security, and advanced call routing in a high-performance, small form-factor device enabling service providers and enterprises to quickly and securely enhance their network by implementing services like SIP Trunking, secure Unified Communications, and Voice over IP (VoIP).

The SBC Edge provides a reliable, scalable platform for IP interconnect to deliver security, session control, bandwidth management, advanced media services, and integrated billing/reporting tools in an SBC appliance. This versatile series of SBCs is deployed as peering SBCs, access SBCs, or enterprise SBCs (eSBCs). The SBC product family is tested for interoperability and performance against a variety of third-party products and call flow configurations in the customer networks.

⚠️ SBC 1000, SBC 2000 and SWe Edge are represented as SBC Edge in the subsequent sections.

About Microsoft Survivable Branch Appliance (SBA)

When a customer site using Direct Routing to connect to Microsoft Phone System experiences an internet outage, the intranet inside the branch is still fully functional. Users can connect to the Session Border Controller (SBC) that is providing the PSTN connectivity.

During an internet outage, the Teams Phone should switch to the SBA automatically. No action is required from the user. As soon as the Teams Phone detects that the internet service is restored and any outgoing calls are finished, the Teams Phone falls back to normal operation mode and connects to other Teams services.

The interoperability compliance testing focuses on verifying inbound and outbound call flows between the Ribbon SBC Edge, Teams vSBA, and Teams Phone.

This guide contains the following configuration sections:

- Section A: Ribbon SBC Edge Configuration
    - Captures general SBC Edge configurations for deploying SBC with Teams vSBA.
- Section B: Microsoft SBA Configuration
    - Captures the Microsoft SBA configuration.

Non-Goals

It is not the goal of this guide to provide detailed configurations that meet the requirements of every customer. 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 SBCs and the third-party product.

To perform this interop, you need to:

- use the graphical user interface (GUI) or command line interface (CLI) of the Ribbon product.
- understand the basic concepts of TCP/UDP/TLS and IP/Routing.
- have SIP/RTP/SRTP to complete the configuration and for troubleshooting.

> ⓘ **Note**
> This configuration guide is offered as a convenience to Ribbon customers. The specifications and information regarding the product in this guide are subject to change without notice. All statements, information, and recommendations in this guide are believed to be accurate but are presented without warranty of any kind, express or implied, and are provided "as is". Users must take full responsibility for the application of the specifications and information in this guide.

Prerequisites

The following aspects are required before proceeding with the interop:

- Ribbon SBC Edge
- Public IP Addresses
- Microsoft admin account - a special type of account where the Teams user is configurable for Direct Routing SBA (Survivable Branch Appliance).
- TLS Certificates for the Ribbon SBC signed by one of the Microsoft approved CA vendors.
- Certificates must have the FQDN or domain name that is configured on the Microsoft admin portal.

Product and Device Details

The sample configuration in this document uses the following equipment and software:

Table 1: Requirements

|	Appliance/Application/Tool	Software Version
Ribbon Communications	SBC 2K	11.0.1 build 634
Microsoft	Survivable Branch Appliance (SBA)	v.2022.6.14.1
	Teams Client	8.0.1.4106
PSTN Phone	Jitsi	2.10
Administration and Debugging Tools	Ribbon LX Tool	2.1.0.6

> ⓘ **Note**
> - Microsoft SBA version is v.2022.6.14.1 or later.
> - Jitsi version is 2.10 or later.

Network Topology Diagram

This section covers the Ribbon SBC Edge deployment topology and the Interoperability Test Lab Topology.
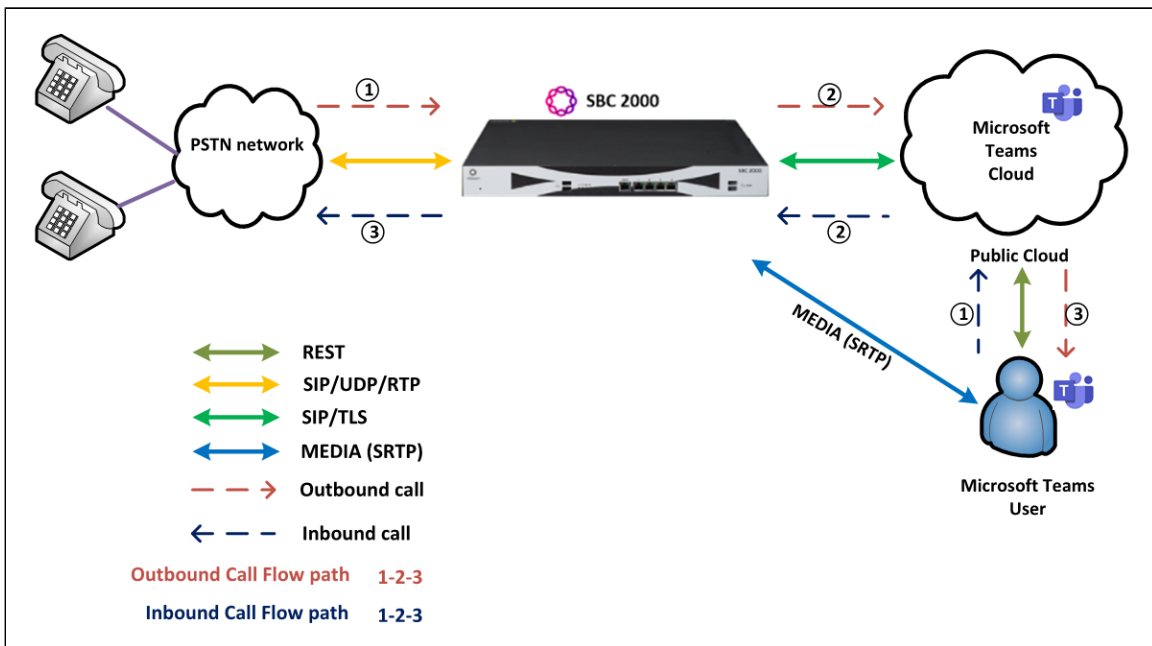
Deployment Topology - Ribbon SBC 2K

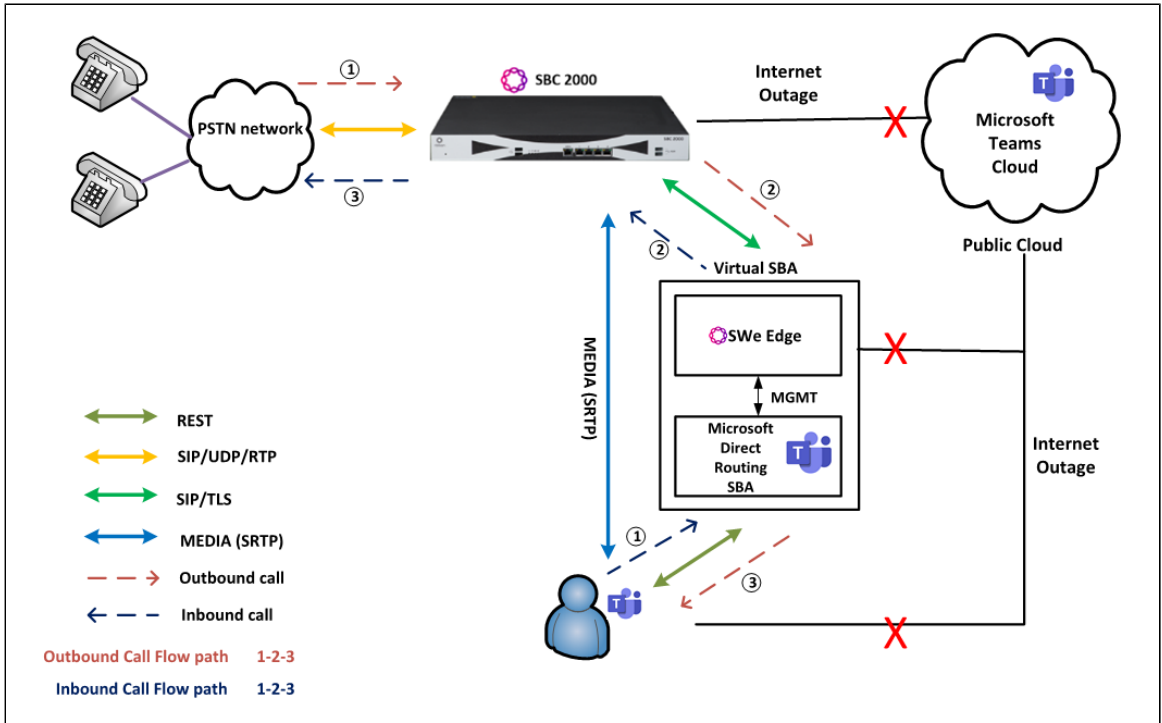**Figure 1:** Ribbon SWe Edge Deployment Topology
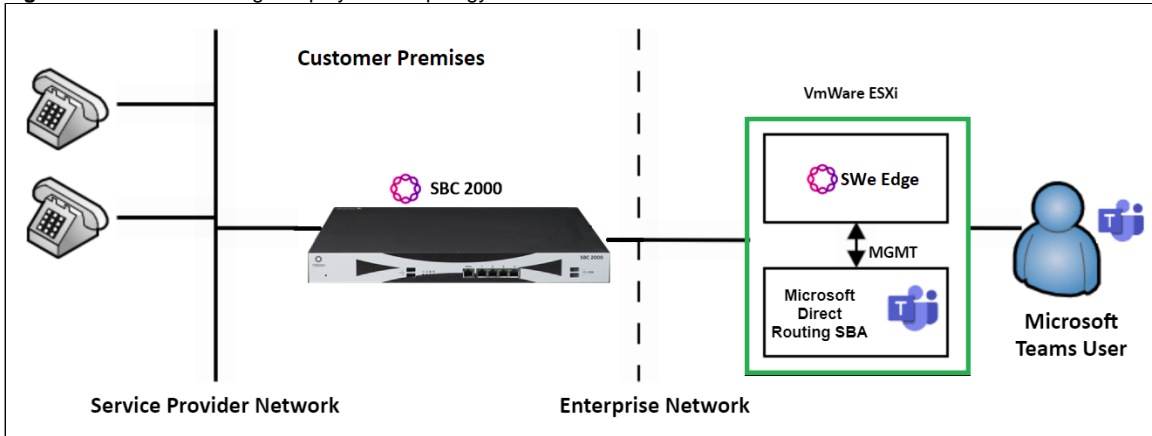
Interoperability Test Lab Topology - Ribbon SBC 2K

The following lab topology diagram shows connectivity between Ribbon SBC 2K, Microsoft vSBA.
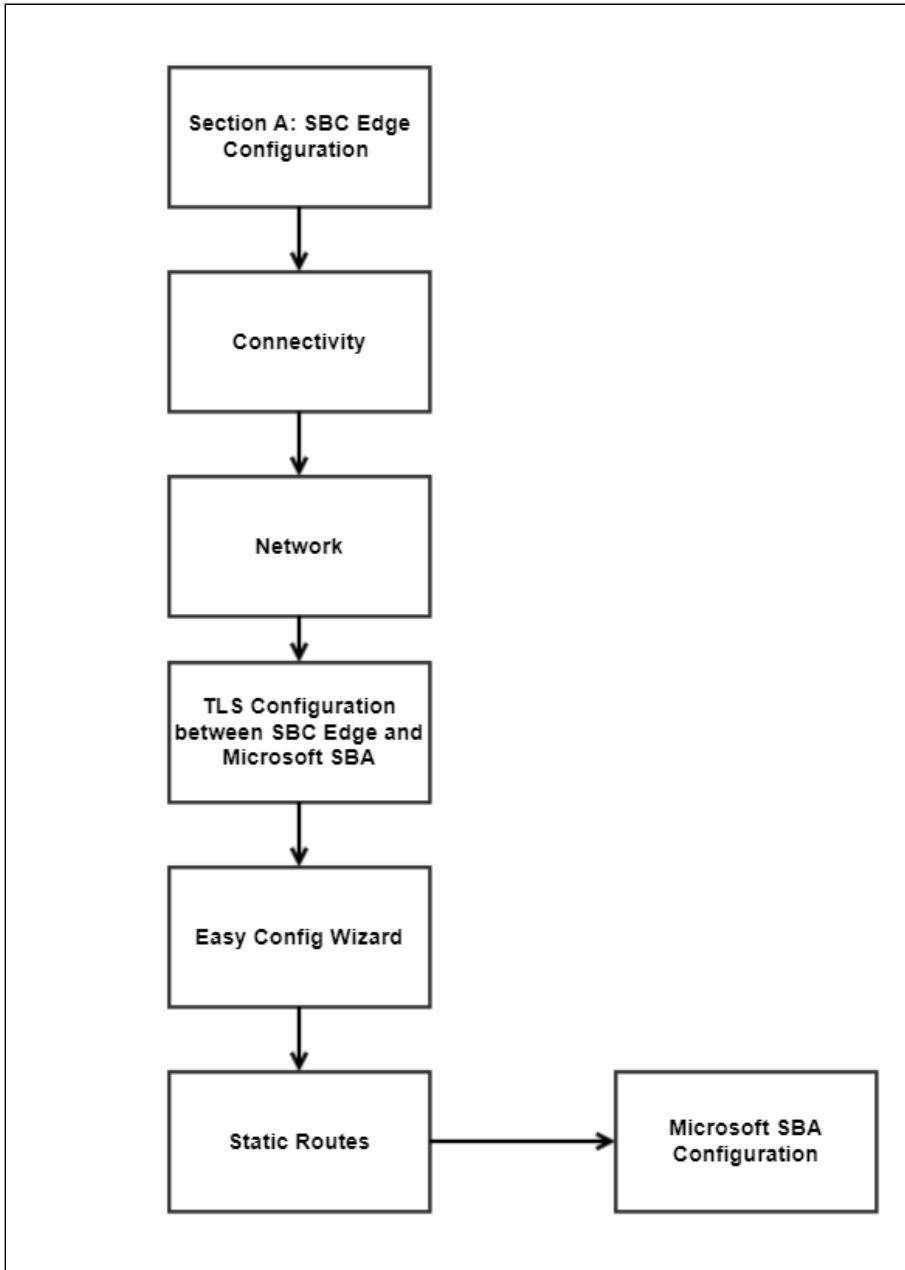
Figure 2: SBC 2K and Microsoft Virtual SBA interoperability Test Lab Topology

Document Workflow

The sections in this document use the following sequence. The reader is advised to complete each section for successful configuration.

Section A: Ribbon SBC Edge Configuration

The following SBC Edge configurations are included in this section:

Connectivity

Network

Static Routes

TLS Configuration between SBC Edge and Microsoft SBA

Easy Config Wizard

- The SBC Edge can connect to the network as mentioned in Connectivity and Network.
- Microsoft SBA prefers transport as TLS. Establishing a TLS connection between the SBC Edge and Microsoft SBA is covered under TLS Configuration between Ribbon SBC Edge and Microsoft SBA.

- Configure the SBC Edge with PSTN, Teams Direct Routing, and Teams Direct Routing SBA using Easy Config Wizard.

Connectivity

Figure 3: SBC 2000 Front Panel
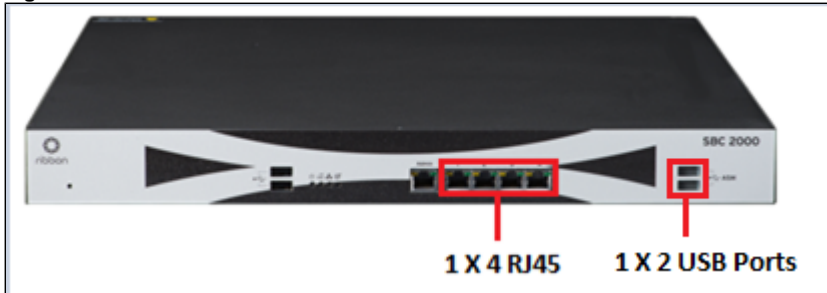
> (i) The SBC 2000 is connected to the network as follows:
>
> **Ethernet 1:** RJ45 "1" is connected towards the PSTN leg.
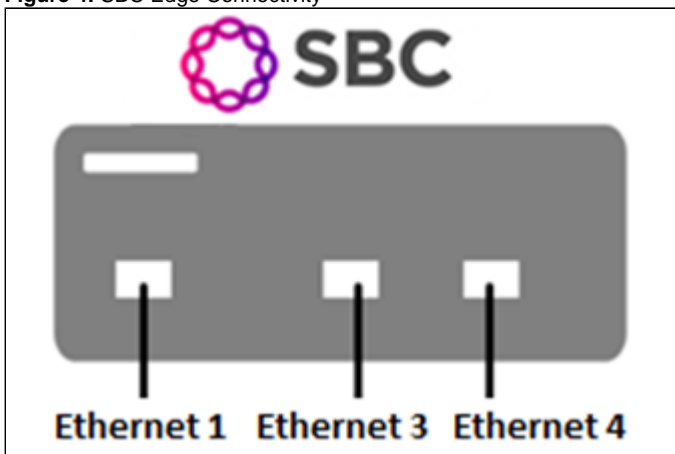>
> **Ethernet 3:** RJ45 "3" is connected towards the Teams Direct Routing leg.
>
> **Ethernet 4:** RJ45 "4" is connected towards the Teams Direct Routing SBA leg.
>
> **USB 1:** USB - LAN adapter used to connect ASM to network.
>
> **USB 2:** Connected to the keyboard.

Figure 4: SBC Edge Connectivity

> (i) The SBC Edge is connected to the network as follows:
>
> **Ethernet 1:** RJ45 "1" is connected towards the PSTN leg.
>
> **Ethernet 3:** RJ45 "3" is connected towards the Teams Direct Routing leg.
>
> **Ethernet 4:** RJ45 "4" is connected towards the Teams Direct Routing SBA leg.

Network

Configure Ethernet 1, Ethernet 3, and Ethernet 4 of the SBC Edge with the IP as follows:

Navigate to **Node Interfaces > Logical Interfaces.**
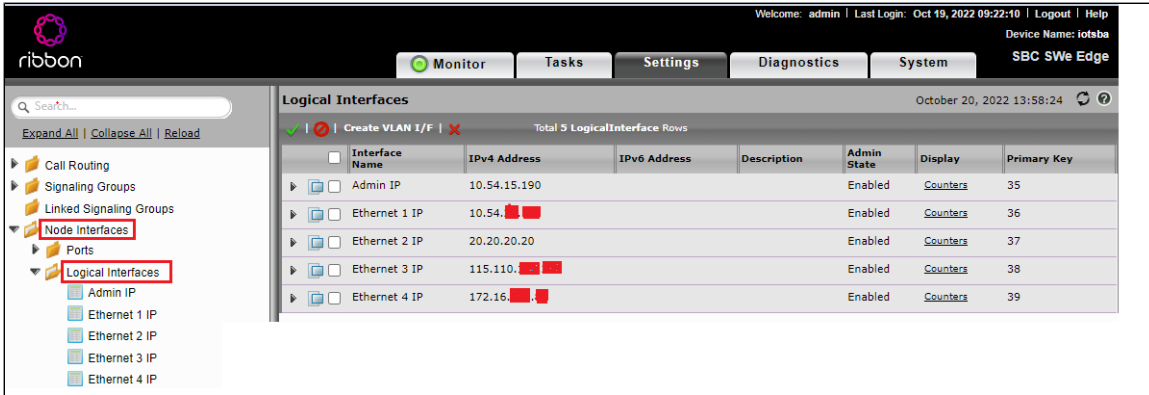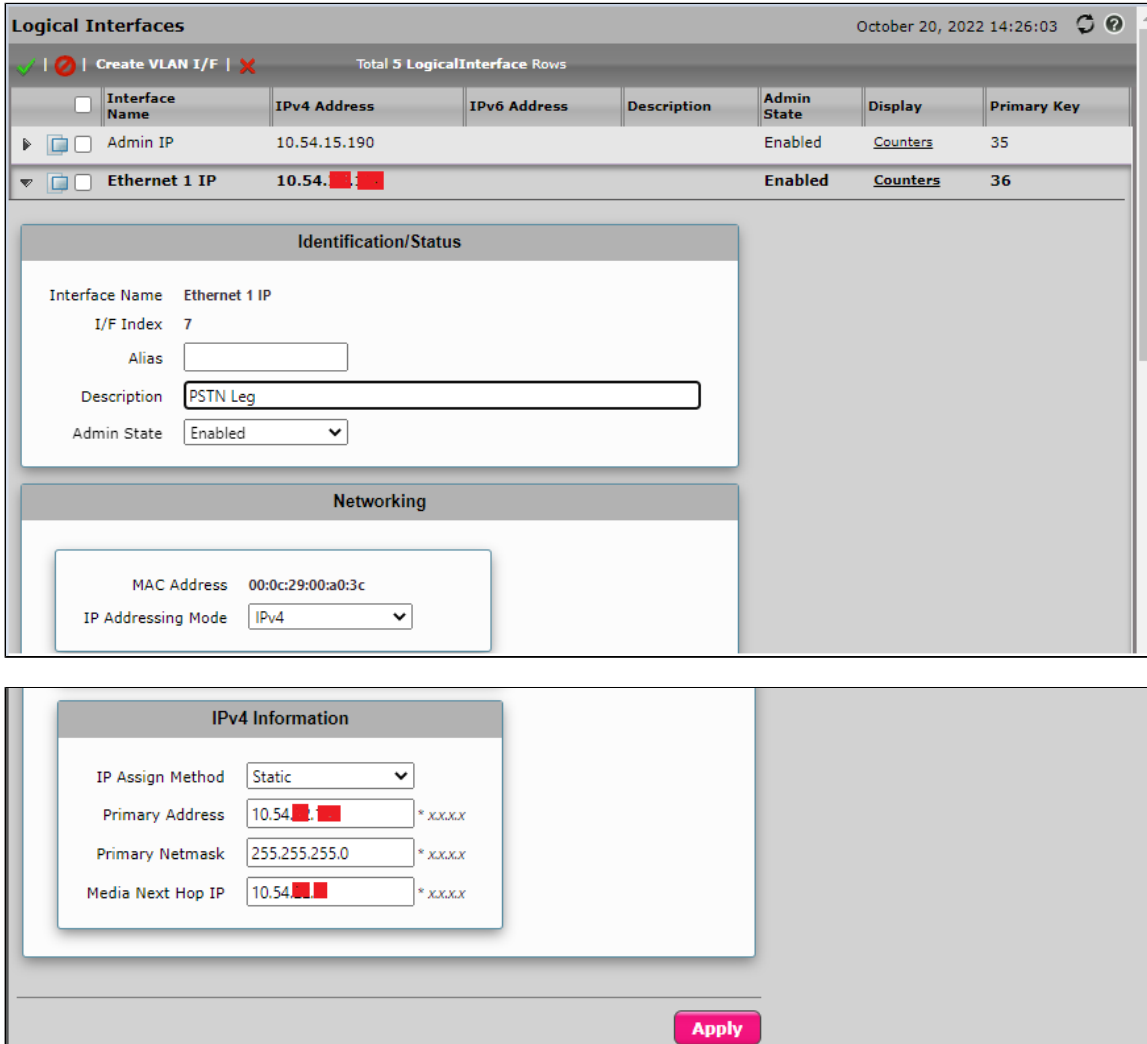
Figure 5: Logical Interfaces

Figure 6: Ethernet 1

Figure 7: Ethernet 3

Figure 8: Ethernet 4

- To configure Ethernet 1, Ethernet 2, and Ethernet 3 of an SBC SWe Edge, navigate to **Networking Interfaces > Logical Interfaces.**
- The SBC Edge is configurable with any of the available Ethernet ports. In the current testing Ethernet 1, 3, and 4 are used.

Static Routes

Static routes are used to create communication to remote networks. In a production environment, static routes are mainly configured for routing from a specific network to a network that can only be accessed through one point or one interface (single path access or default route).
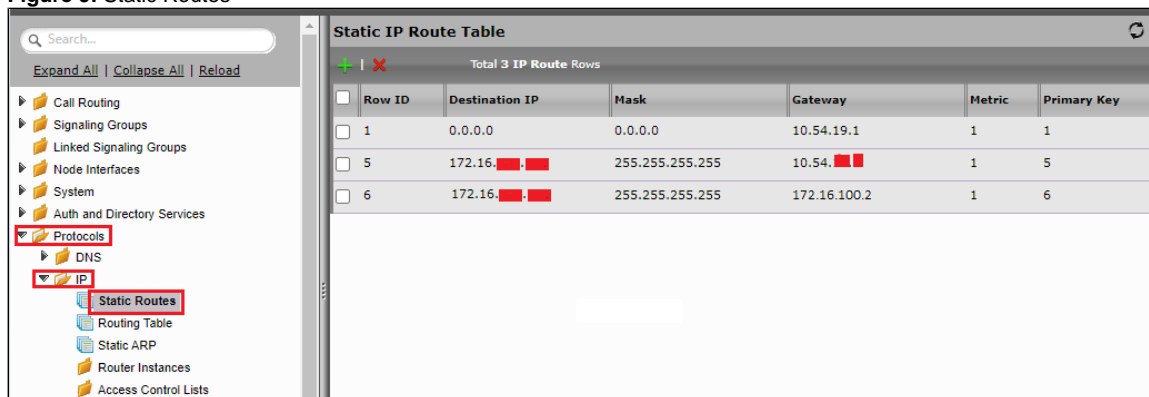
> **Tip**
>
> - For smaller networks with just one or two routes, configuring static routing is preferable. This is often more efficient since a link is not wasted by exchanging dynamic routing information.
> - For networks that have a LAN-side Gateway on Voice VLAN or Multi-Switch Edge Devices (MSEs) with Voice VLAN towards the SBC Edge, static routing configurations are not required.

Add static routes towards the Eth1 interface 172.16.X.X (PSTN) and the Eth2 interface 172.16.X.X (Microsoft SBA).

The default static route is towards the Eth1, which is in a private network.

- Navigate to **Settings > Protocol > IP > Static Routes** to configure the routes.

Figure 9: Static Routes

TLS Configuration between SBC Edge and Microsoft SBA

Prerequisites:

- For TLS to work on the public side of the network, a trusted Certificate Authority (CA) is needed. In this scenario, Go Daddy is used as a trusted CA.
- Go Daddy Root Certificate Authority G2 and Go Daddy Secure Certificate Authority G2 is used as a trusted CA.
- Baltimore CyberTrust Root certificate is required.

Request a certificate for the SBC and configure it based on the example using Go Daddy as follows:

- Generate a Certificate Signing Request (CSR) and obtain the certificate from a Certificate Authority.
- Import the Public CA Root/Intermediate Certificate and the SBC Certificate on the SBC.

Step 1: Generate a Certificate Signing Request and obtain the certificate from a Certificate Authority (CA).

- Navigate to **Settings > Security > SBC Certificates**.
- Click **Generate SBC Edge CSR**.
- Enter data in the required fields. Click **OK**. After the Certificate Signing Request is generated, copy the result to the clipboard.
- Use the generated CSR text from the clipboard to obtain the certificate.

Figure 10: Generate Certificate Signing Request

Generate Certificate Signing Request

Subject Distinguished Name

Common Name	*.customers.interopdomain.com	* Hostname or FQDN
Subject Alternative Name DNS		comma-separated FQDN list
Email Address	user1@rbbn.com	
ISO Country Code	United States ▾	
State/Province	NJ	
Locality		e.g.: City
Organization	Sonus	e.g.: Company
Organizational Unit	IT	e.g.: Department
Key Length	2048 bits ▾	

Result

Copy CSR

-----BEGIN CERTIFICATE REQUEST-----
MIIDCzCCAfMCAQAwfjEmMCQGA1UEAxQdKi5jdXN0b21lcnMuaW50ZXJvcGRvbWFp
bi5jb20xHTAbBgkqhkiG9w0BCQEWDnVzZXIxQHJiYm4uY29tMQswCQYDVQQGEwJV
UzELMAkGA1UECBMCTkoxDjAMBgNVBAoTBVNvbnVzMQswCQYDVQQLEwJJVDCCASIw
DQYJKoZIhvcNAQEBBQADggEPADCCAQoCggEBAP1m1uHXRgbKsGLGeOPwKFNOLuwi
FOgv0Augqrefvk5+Ru938w5OyrRsZZ5KN58vS/Bl7tkqvZeqFZTEToUq23qvMADO
2OxJkZQzgheZ5dk39On1THemRYa7tdBtmyyD1F8XRFPEUaANOFtrLzyMPvFnJuls
sTNmjA76/i3Qg+80kY0X2266uoTzs2puNEOIKpqZ6yxWngEyp50BDgZUKx53U6Yy
OyJNILpXTUYeDMwDtsICM0j3YdV6KbcA/Z6ZMLHvis3B34q8c4gm0wEjwVLbknd4
t/gub6+ZQPGXVphgg3W6E8GUFVyZC6b36oHhCS6NJVT6qkNMKnKxRhkfLBUCAwEA
AaBIMEYGCSqGSIb3DQEJDjE5MDcwCQYDVR0TBAIwADALBgNVHQ8EBAMCBaAwHQYD
VR0IBBYwFAYIKwYBBQUHAwEGCCsGAQUFBwMCMA0GCSqGSIb3DQEBCwUAA4IBAQD0
f0b+nhanA06rQxrjoGffcpPdjlCFt3SQQIAcxb7eR49BpSJzVINfO38IPmJgvYD8
w/h2JTFLExyzbkPKTIVdKaHb920ZgrGta5JYFaOYxF9mHBrZhCIMZc6qhv+58H9T
1K1r3wUelyR5e2PwKPP03LyFNvP4PbNc3XA0zh53mhZEqs9EEcRP+J3rqxVoaFUa

Step 2: Deploy the Root/Intermediate and SBC certificates on the SBC.

After receiving the certificates from the certificate authority, install the SBC Certificate and the Root/Intermediate certificates as follows:

- Obtain the Trusted Root and Intermediary signing certificates from your Certificate Authority.
- To install the Trusted Root/Intermediate certificates, go to **Settings > Security > SBC Certificates > Trusted Root Certificates**.
- Click **Import** and select the trusted root certificates.
- To install the SBC certificate, open **Settings > Security > SBC Certificates > SBC Edge Certificate**.
- Validate the certificate is installed correctly.

Figure 11: Trusted CA Certificate Table

Trusted CA Certificate Table
October 20, 2022 07:22:36

Total 3 Certificate Rows

	Common Name	Issuer	Start Validity	Expiration	Key Length	Display	Primary Key
▶	Baltimore CyberTrust...	Baltimore CyberTrust...	May 12, 2000	May 12, 2025	2048		2
▶	Go Daddy Root Certif...	Go Daddy Root Certif...	Sep 1, 2009	Dec 31, 2037	2048		3
▶	Go Daddy Secure Cert...	Go Daddy Root Certif...	May 3, 2011	May 3, 2031	2048		4

- Click **Import** and select **X.509 Signed Certificate**.
- Validate that the certificate is installed correctly.

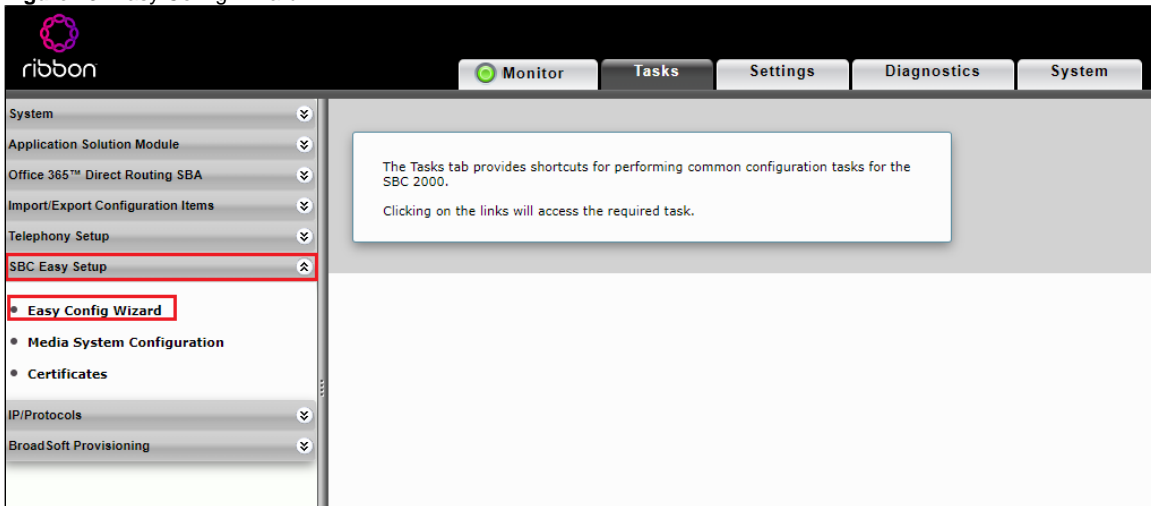**Figure 12:** Validate certificate
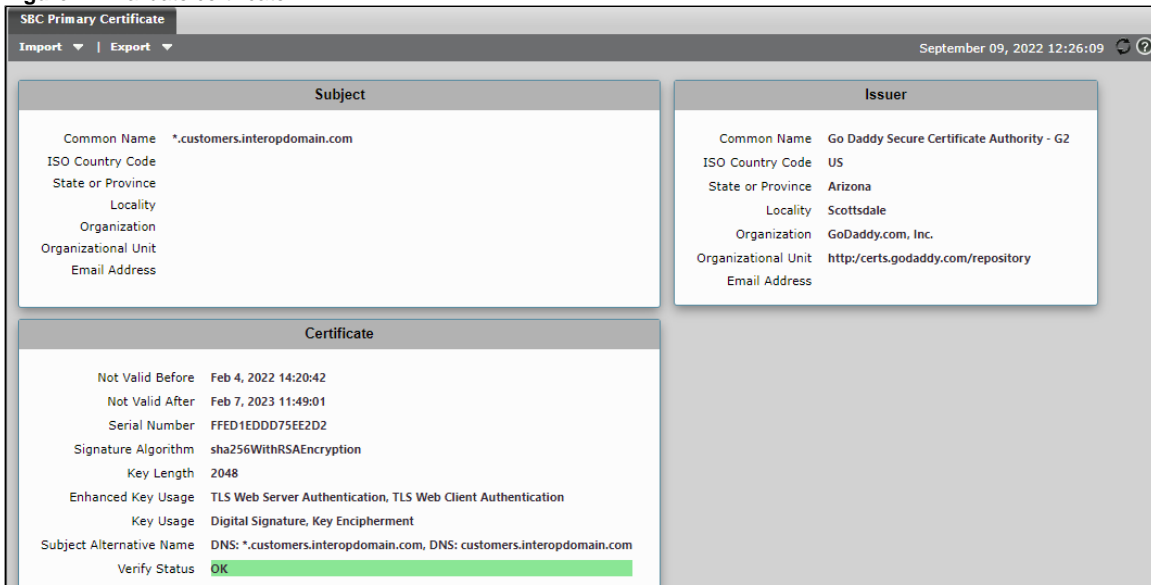
Easy Config Wizard

Configure the SBC Edge with Teams Direct Routing SBA using the Easy Config Wizard.

- Access the WebUI of SBC Edge.
- Click on the **Tasks** tab.
- From the left side menu, click **SBC Easy Setup > Easy Config Wizard**.

Figure 13: Easy Config Wizard

Fill in the details for Step 1 as follows:

- Application **SIP TrunkMicrosoft Teams**.
- Scenario Description as **Teams SBA**.
- SIP Sessions as **100**.

(i) Enter a value for SIP sessions as per the requirement. The value is listed up to 960.

Figure 14: Step 1

Fill in the details for Step 2 as follows:

- Border Element Server is the PSTN IP.
- Use Secondary Border Element Server is **Disabled**.
- Teams Connection Type is **Standalone Direct Connection**.
- The SBC Signaling/Media Source IP towards Teams Direct Routing (public IP).
- Configure Direct Routing SBA is set to **True**.
- Direct Routing SBA FQDN as **ioteamsba.customers.interopdomain.com**.
- The SBC Signaling /Media Source IP towards Teams Direct Routing SBA.

Figure 15: Step 2

Review the configurations in Step 1 and Step 2, and click on the **Finish** button.

> ⚠ The SBC 2000 would not have the option to choose the Signaling/Media Interface - "SBA Signaling/Media Source IP".

Figure 16: Step 3

Section B: Microsoft SBA Configuration

For information on configuring the Survivable Branch Appliance (SBA) for Direct Routing, refer to following link:

https://docs.microsoft.com/en-us/microsoftteams/direct-routing-survivable-branch-appliance

For the Prerequisites, Installation, and Configuring the Direct Routing SBA, refer to following link:

https://doc.rbbn.com/display/UXDOC110/Best+Practice+-+Configure+Direct+Routing+Virtual+Survivable+Branch+Appliance#

Prerequisites

For Prerequisites on Direct routing SBA, refer to the following link:

https://doc.rbbn.com/display/UXDOC110/Best+Practice+-+Configure+Direct+Routing+Virtual+Survivable+Branch+Appliance#BestPracticeConfigureDirectRoutingVirtualSurvivableBranchAppliance-Prerequisites

Installation

For Installation on Direct routing SBA, refer to Step 1 in the following link:

https://doc.rbbn.com/display/UXDOC110/Best+Practice+-+Configure+Direct+Routing+Virtual+Survivable+Branch+Appliance#BestPracticeConfigureDirectRoutingVirtualSurvivableBranchAppliance-Step1:InstallVirtualSBASoftware

Configuration

For Configuring on Direct routing SBA, refer to Step 2 in the following link:

https://doc.rbbn.com/display/UXDOC110/Best+Practice+-
+Configure+Direct+Routing+Virtual+Survivable+Branch+Appliance#BestPracticeConfigureDirectRoutingVirtualSurvivableBranchAppliance-Step2:
SetuptheOffice365DirectRoutingvSBA

> ⓘ
> - Strictly follow Prerequisite, Installation and Configuration of the SBA respectively.
> - To configure a Ribbon SBC Edge for Microsoft SBA, follow the Section A: Ribbon SBC Edge Configuration.

Supplementary Services and Features Coverage

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

Sr. No.	Supplementary Features/Services	Coverage
1	OPTIONS ping (SBC to SBA)	✔
2	OPTIONS ping (SBA to SBC)	✔
3	Basic Call from PSTN to Teams	✔
4	Basic Call from Teams to PSTN	✔
5	Call Hold & Call Resume	✔

Legend

✔	Supported
✘	Not Supported
N/A	Not Applicable

Caveats

The following items were observed during this Interop - these are either limitations, untested elements, or useful information pertaining to the Interoperability:

- Message on the Teams Client desktop in Survivable Mode - "No internet connection. Calling, including emergency calls, is only available to and from phone numbers". This indicates that the Teams phone is now registered or connected with Microsoft SBA.
- Teams User status would be "Offline" in Survivable mode.

> ⚠ Above mentioned caveats doesn't hamper the Teams performance, instead it's the Teams client user notifications in Survivability mode.

Support

For any support related queries about this guide, 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/services/ribbon-support-portal

References

For detailed information about Ribbon products & solutions, go to:

https://ribboncommunications.com/products

For information about Microsoft Survivable Branch Appliance (SBA) & solutions, go to:

https://learn.microsoft.com/en-us/microsoftteams/direct-routing-survivable-branch-appliance

Conclusion

This Interoperability Guide describes a successful configuration of the Ribbon SBC Edge and Microsoft Survivable Branch Appliance .

All features and capabilities tested are detailed within this document - any limitations, notes, or observations are also recorded in order to provide the reader with an accurate understanding of what has been covered, and what has not.

Configuration guidance is provided to enable the reader to replicate the same base setup - there maybe additional configuration changes required to suit the exact deployment environment.