Oracle SBC with Microsoft Survivable Branch Appliance

Technical Application Note

ORACLE COMMUNICATIONS

Disclaimer

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Revision History

As a best practice always follow the latest Application note available on the Oracle TechNet Website.
https://www.oracle.com/technical-resources/documentation/acme-packet.html

Version	**Description of Changes**	**Date Revision Completed**
1.0 GA	Initial Publication	8/12/2020
2.0 GA	Changes to Network Design and Architecture Changes to Oracle SBC Configuration	8/11/2021
2.1 GA	Updated Screenshot Section 6.4	4/14/2021
2.2 GA	Added Section 7.9 access-control for Microsoft Cloud communication	13/09/2022
2.2 GA	Added Section 7.9 access-control for Microsoft Cloud communication	13/09/2022
2.3 GA	• Added Important warning regarding SBA upgrade • Updates on Section 6 • Added troubleshooting Steps in Section 8	25/06/2025

Contents

Important Announcement

□ Important: SBA Update Required by August 31, 2025

To maintain **uninterrupted service and support**, all Microsoft **Survivable Branch Appliance (SBA)** deployments must be upgraded to **version 2025.2.5.1** by **August 31, 2025**.

- This version includes **critical security fixes** and ensures **full compatibility** with all Microsoft Teams services.
- **Older versions** (prior to 2025.2.5.1) will **stop functioning** starting **September 1, 2025**.
- All customers using SBA are **required to upgrade** to a supported version to avoid service disruption.

Action Required: Plan and complete your upgrade before the deadline to ensure business continuity and Microsoft support compliance.

Note: The DR-SBA (Disaster Recovery – Survivable Branch Appliance) software application is not distributed by Oracle. It is provided directly by Microsoft. To obtain the DR-SBA application, please contact your Oracle Sales representative, who will coordinate with Microsoft to procure and deliver the software.

1. Intended Audience

This document describes how to connect the **Oracle SBC to Microsoft Survivable Branch Appliance**. The document is intended for use by Oracle Systems Engineers, third party Systems Integrators, Oracle Enterprise customers and partners and end users of the Oracle Session Border Controller (SBC). It is assumed that the reader is familiar with basic operations of the Oracle Session Border Controller.

2. Prerequisites

This Document assumes users have an existing environment with the **Oracle SBC connected to Microsoft Teams Direct Routing Interface with Media Bypass Enabled**. All the Tenant and Licensing requirements are in place and operational. In addition, the information used below is for example only, and specific to Oracle's Test environment. All IP addresses, FQDN's and other information used in the example below cannot be used outside of this Oracle Communications test environment.

The initial implementation of the Oracle SBC with Microsoft Teams is outside the scope of this document. If users do not have an existing, operational setup and require information regarding the initial setup and configuration, please refer to the documentation at the link below or reach out to your Oracle Account Team.

Oracle highly recommends referring **Oracle SBC with Microsoft Teams Direct Routing Application Note** before configuring the Microsoft SBA with the Oracle SBC. To interwork

Microsoft SBA with Oracle SBC several configuration elements for the existing Microsoft Teams Direct Routing configuration will be reused.
Please visit the Section 5 of the document "Planning Direct Routing" to understand the requirements related to Tenant Licensing and FQDN requirements.
https://www.oracle.com/a/otn/docs/msftteamsdirectroutingwithoraclesbc22-08-22.pdf

3 Related Documentation

3.1 Oracle Documentation –

https://docs.oracle.com/en/industries/communications/enterprise-session-border-controller/9.3.0/configuration/index.html

3.2 Microsoft Documentation –

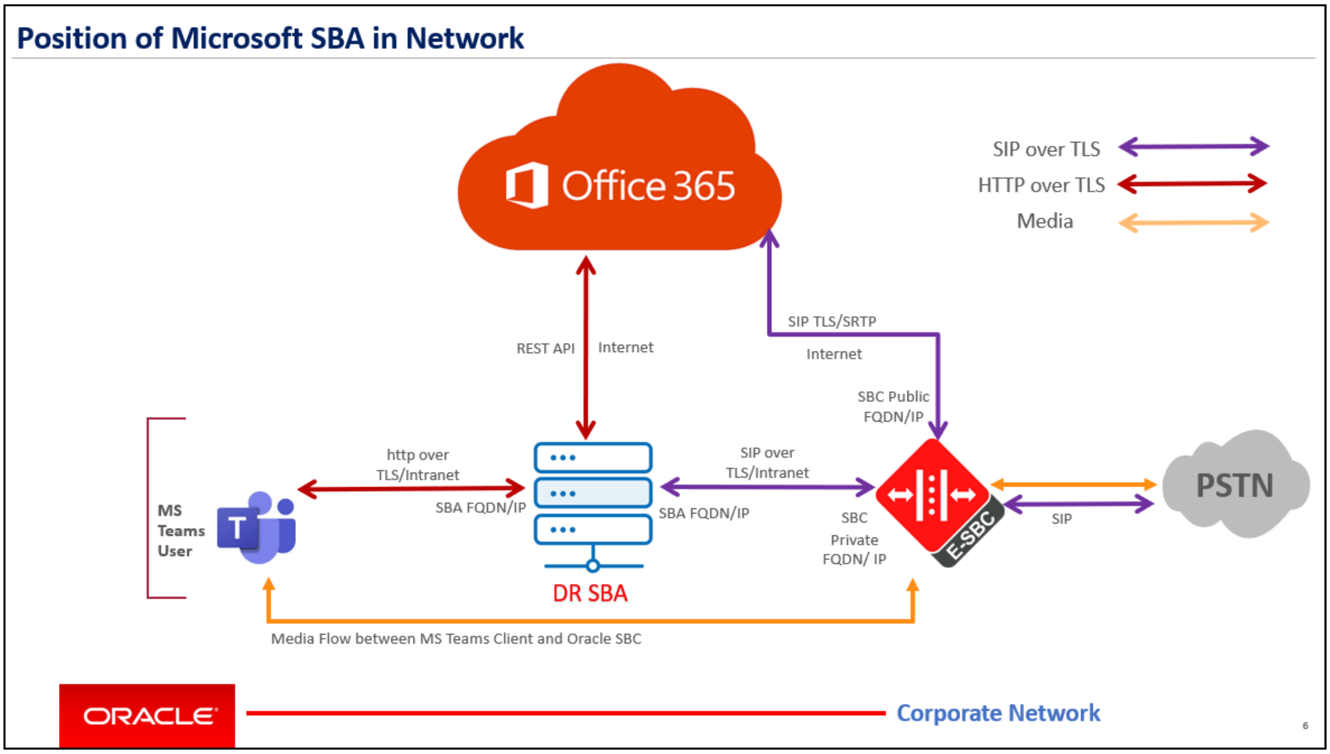
https://docs.microsoft.com/en-us/microsoftteams/direct-routing-survivable-branch-appliance
https://docs.microsoft.com/en-us/microsoftteams/direct-routing-landing-page
https://docs.microsoft.com/en-us/microsoftteams/direct-routing-configure

4. About Microsoft Survivable Branch Appliance

PSTN voice is considered as a business-critical application with high expectation to availability. Microsoft **Survivable Branch Appliance** allows customers to place and receive calls via **Microsoft Teams Direct Routing utilizing the Oracle SBC** if the internet/Office 365 connectivity is broken.
A Microsoft Survivable Branch Appliance runs on an on-premise Windows Server Machine. Oracle SBC communicates the Microsoft SBA Server and Teams Client over Intranet to terminate the PSTN calls through a SIP Trunk to the Carrier Network. Microsoft SBA utilizes the Microsoft Teams Direct Routing Media Bypass Model to provide Voice Resiliency through the Microsoft SBA Server.
Note: Local Media Optimization (LMO) is not supported through DR SBA.

Follow the Microsoft article for detailed infomration about Direct Routing SBA.

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



Position of Microsoft SBA in Network

Above figure illustrates the position of Microsoft Direct Routing SBA in a branch Site. MS Teams client communicate with DR SBA over http-tells using the office intranet connection. DR SBA is capable of converting the http packets to SIP and vice versa and communicates with Oracle SBC over Intranet's Private connection.

Microsoft SBA communicates with Office 365 over REST API connection and Oracle SBC over the Session initiation Protocol SIP protocol. The communication is secured via TLS and SRTP where the signaling is encrypted with TLS 1.2 and media packets are encrypted with SRTP Protocol for security.

During an internet outage when client is unable to communicate with O365 it automatically switches to DR SBA which is assigned to the User Survivable Business Appliance Policy. The client in offline mode can make receive PSTN Calls via DR SBA. Once the internet connectivity is restored, calls automatically switch to O365 SIP proxy and are completed over internet using the normal direct routing path using the Microsoft SIP Proxy and Oracle SBC Public connection. CDRs are pushed to O365 once the internet connectivity is restored.

DR SBA requires media bypass enabled on the Tenant so in both modes the media traverses directly from MS Teams Client to Oracle SBC and vice versa.

4.1 Supported Microsoft Teams clients

The SBA feature is supported on the following Microsoft Teams clients:

- Microsoft Teams Windows desktop
- Microsoft Teams MacOS desktop
- Teams Phones

4.2 Available calling functionality in offline mode

- Making PSTN calls through the local SBA/SBC with media flowing through the SBC.
- Receiving PSTN calls through the local SBA/SBC with media flowing through the SBC.
- Hold and resume of PSTN calls.
- Blind transfer.
- Call forwarding to a single phone number or Teams user.
- Unanswered call forwarding to single phone number or Teams user.
- Redirect of incoming PSTN call to a Call queue or Auto attendant number to a local agent.
- Redirect of incoming PSTN call to a Call queue or Auto attendant number to an alternative Call queue or Auto attendant number.
- VoIP Fallback. If a VoIP call can't be initiated and the receiving the same SBA, a VoIP call can be initiated instead of PSTN call, and the SBA will support the call.

5. Set Up Requirements

5.1 Oracle SBC

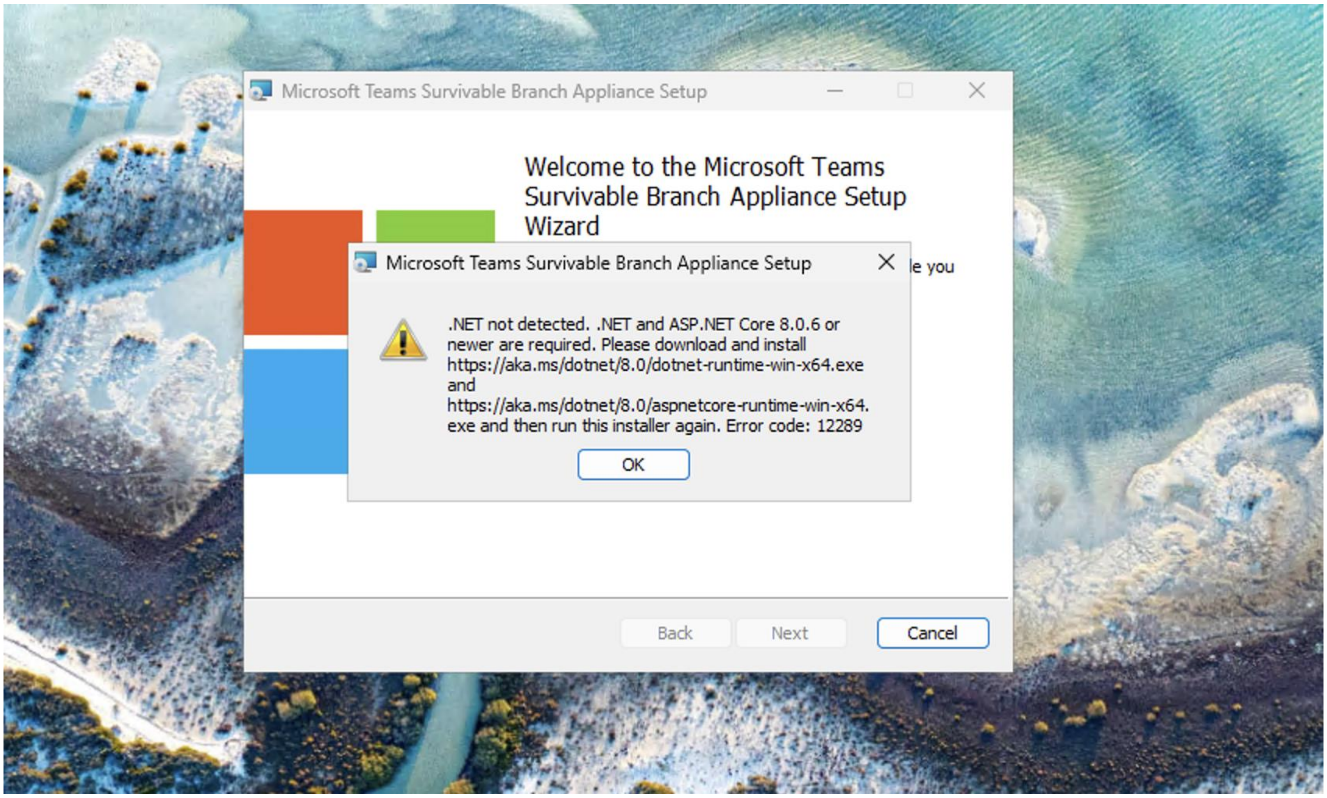
Microsoft SBA has been successfully tested and validated with the Oracle SBC running the Software release **SCZ930p6**. This software release with the configuration listed below can run on any of the following products: -

- AP 1100
- AP 3900
- AP 4600
- AP 6350
- AP 6300
- AP 3950
- AP 4900
- AP 6400
- VME

5.2 Microsoft SBA

Windows Server - Microsoft SBA application is a software Application that runs on **Microsoft Windows Server.** This can be a standalone server, or a Virtual Machine on VMware Esxii / Windows Hyper-V. Recommended Microsoft Windows Server version are Windows Server 2012, 2016 and 2019.
The Direct Routing SBA utilizes the Azure AD to sync the Subscriber information and Data, so an internet connection is **must** requirement on the SBA Server. A Public IP address is not necessary on SBA Server.

Microsoft SBA Package requires **.NET and ASP.NET Core 8.0.6 or above** to be installed as prerequisites on the Windows Server. TLS1.2 should be enabled on the Server to support DR-SBA TLS requirements.


Microsoft Teams Survivable Branch Appliance Setup
Back
Next
Cancel
Microsoft Teams Survivable Branch Appliance Setup
OK

Welcome to the Microsoft Teams Survivable Branch Appliance Setup Wizard

le you

.NET not detected. .NET and ASP.NET Core 8.0.6 or newer are required. Please download and install https://aka.ms/dotnet/8.0/dotnet-runtime-win-x64.exe and https://aka.ms/dotnet/8.0/aspnetcore-runtime-win-x64.exe and then run this installer again. Error code: 12289

Please contact your Microsoft Representative for the Latest DR SBA Package.

5.3 DR-SBA Server Dimensions

As per Microsoft Load Testing Standards an Azure Standard B2ms Machine i.e. - Windows Server with 2 VCPU and 8 GiB or RAM can handle up to 5000 Users. This can be scaled in or out as per your specific requirement. Oracle has performed the Microsoft SBA validation testing on Windows Server 2016 Datacenter Edition with 128 GB SSD and 2 cups, 8 GiB memory configurations.

5.4 Firewall and Port Requirements

Below Table illustrates the firewall Port requirements for the Communication of DR-SBA with MS Teams Client,O365 and Oracle SBC.

Microsoft Teams Client to Direct Routing SBA

Traffic Type	From	To	Source Port	Destination Port
TCP	MS Teams Client	DR-SBA	Any	3443
TCP	MS Teams Client	DR-SBA	Any	4444
TCP	MS Teams Client	DR-SBA	Any	8443

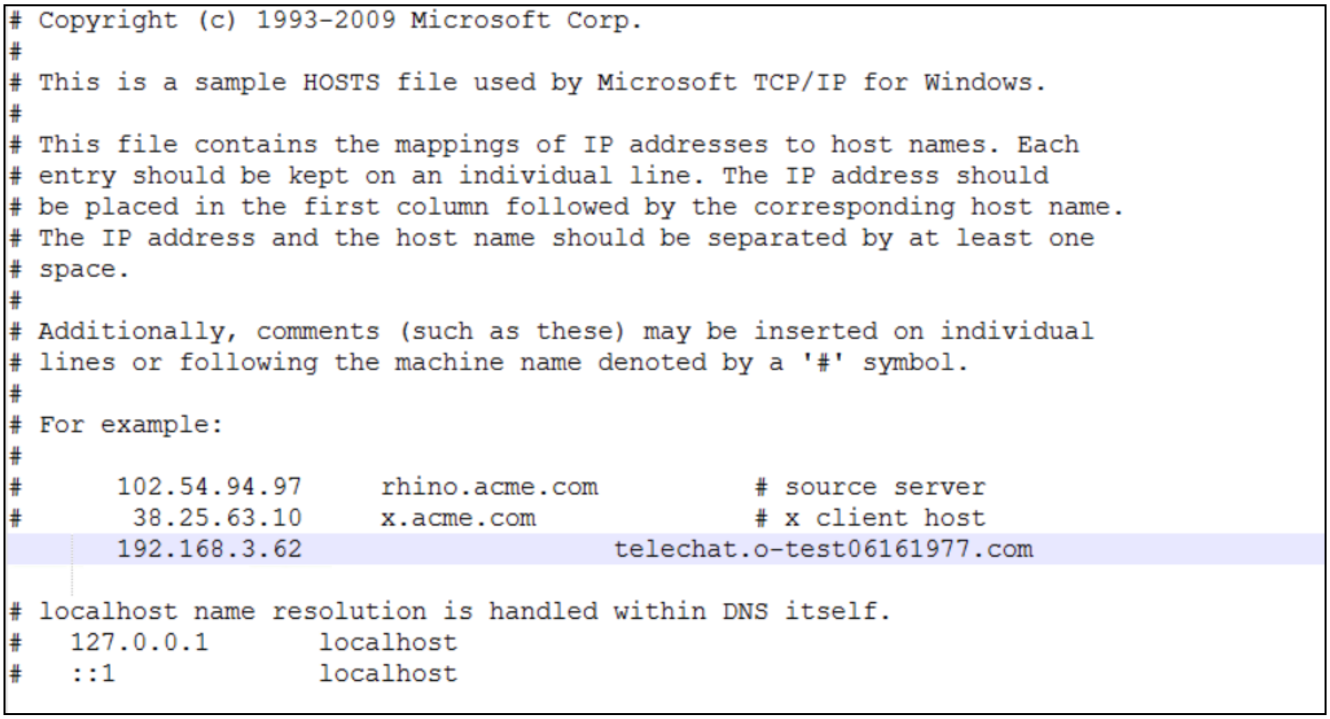
Direct Routing SBA to Office 365 and Oracle SBC

Traffic Type	From	To	Source Port	Destination Port
Https	SBA	Azure IPs	Any	443
TCP	SBA	Oracle SBC	Any	5061 (may vary based on the port configured on SBC)
Https	Oracle SBC	DR SBA	Any	5061
UDP	DR-SBA	NTP	Any	123

For the purpose of this document It is assumed that the Windows server has been properly deployed, configured and is setup with the necessary rules to allow **ICMP,TCP,UDP,HTTP,HTTPS** communication methods.

5.5 DNS Resolution

A DNS-Name (FQDN) must be assigned to the DR SBA Server. The DR-SBA-FQDN resolves to the IP address of the DR SBA. A Public IP is not required on DR SBA, but SBA Server must have an internet connection to access Azure AD. The DR-SBA-FQDN can be Public or a Private. Optionally you can join the Windows Server to a Domain as well.
Oracle SBC communicates with DR-SBA over the Oracle-SBC-FQDN which is registered on the O365 Tenant.(New-CsOnlinePSTNGateway).Normally Oracle-SBC-FQDN resolves to a Public IP Address. If there is no internet SBA Server will not be able to resolve the Oracle-SBC-FQDN, also since the communication happens over the Private Subnet a Local DNS can be used to resolve the SBC FQDN to the Private IP of the sip-interface communicating with the DR-SBA. In case a DNS Server is not available/required you can edit the host file entry on the Windows Server to resolve the Oracle SBC FQDN to the Private IP.
The Hosts file can be found under **C:\Windows\System32\drivers\etc**.Enter the Oracle SBC Direct Routing FQDN and the Ip address used to communicate the Oracle SBC with DR-SBA
Below is an example of a host file taken from the SBA Server which resolves the Oracle SBC FQDN to the Private IP Address of the sip-interface used to communicate with DR-SBA.

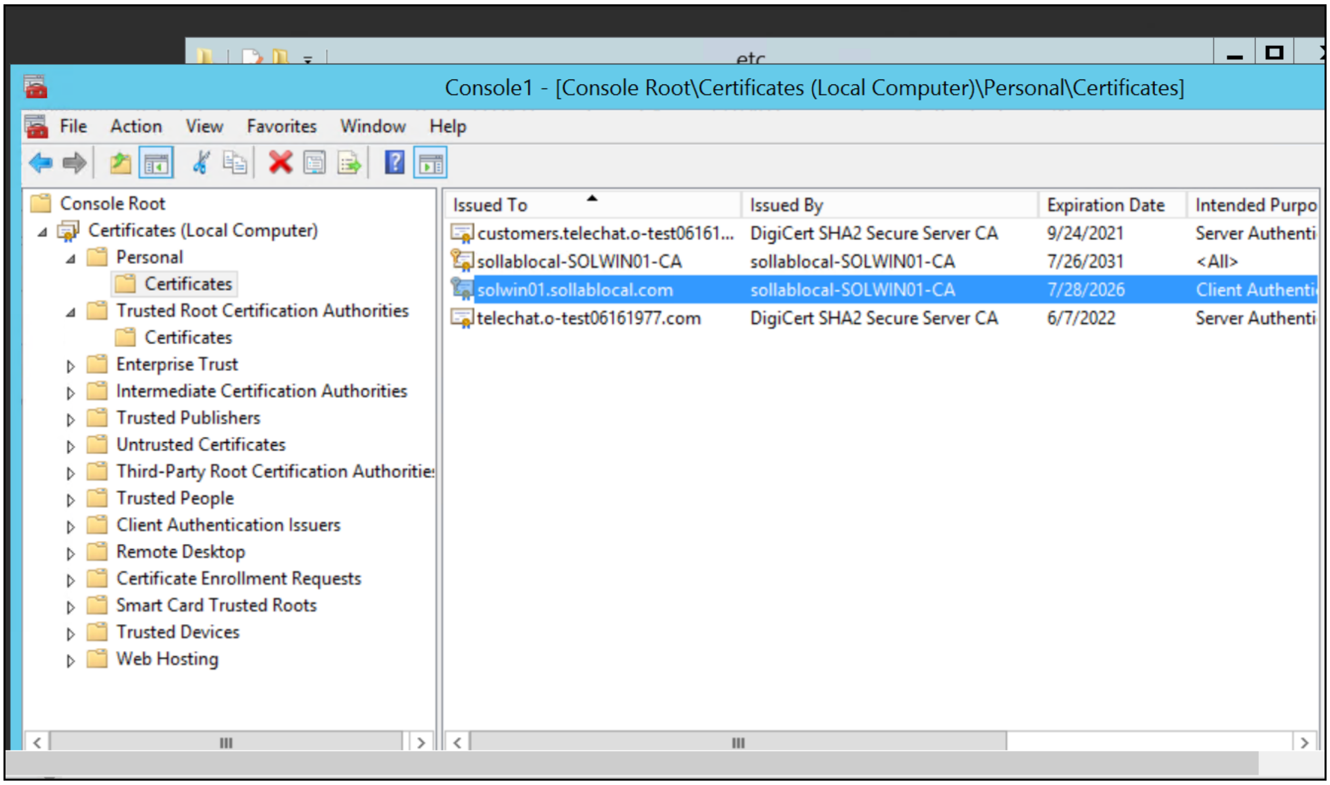


```
# Copyright (c) 1993-2009 Microsoft Corp.
#
# This is a sample HOSTS file used by Microsoft TCP/IP for Windows.
#
# This file contains the mappings of IP addresses to host names. Each
# entry should be kept on an individual line. The IP address should
# be placed in the first column followed by the corresponding host name.
# The IP address and the host name should be separated by at least one
# space.
#
# Additionally, comments (such as these) may be inserted on individual
# lines or following the machine name denoted by a '#' symbol.
#
# For example:
#
#      102.54.94.97     rhino.acme.com          # source server
#       38.25.63.10     x.acme.com              # x client host
       192.168.3.62                   telechat.o-test06161977.com

# localhost name resolution is handled within DNS itself.
#   127.0.0.1       localhost
#   ::1             localhost
```

Similarly, the workstations running MS Teams Client should be able to resolve the DR-SBA FQDN and establish a connectivity with the SBA when internet connection is unavailable. Update the hosts file if required on the Windows Machines or update the corresponding file on MAC-OS. If the SBA Application is not reachable by Teams Client, the SBA will be marked OOS and calls won’t switch to DR-SBA in Survivability mode.

5.6 TLS Certificates

SBA communicates with Oracle SBC and Teams Client over TLS 1.2 Transport Protocol and uses mutual authentication method. This requires certificates exchange between the entities. Microsoft requires a SHA-256 Certificate to be assigned on the SBA Server.
DR-SBA can be assigned a Public or a Private Certificate. Create and assign a TLS Certificate (Public or Private to the DR-SBA).
DR-SBA-FQDN should be present in the common-name or in the SAN on the TLS Certificate. Wildcard Certificates are also supported.
The SBA Server Certificate must be present in the Personal>Certificates Location on the Certificate Store on the SBA Server.



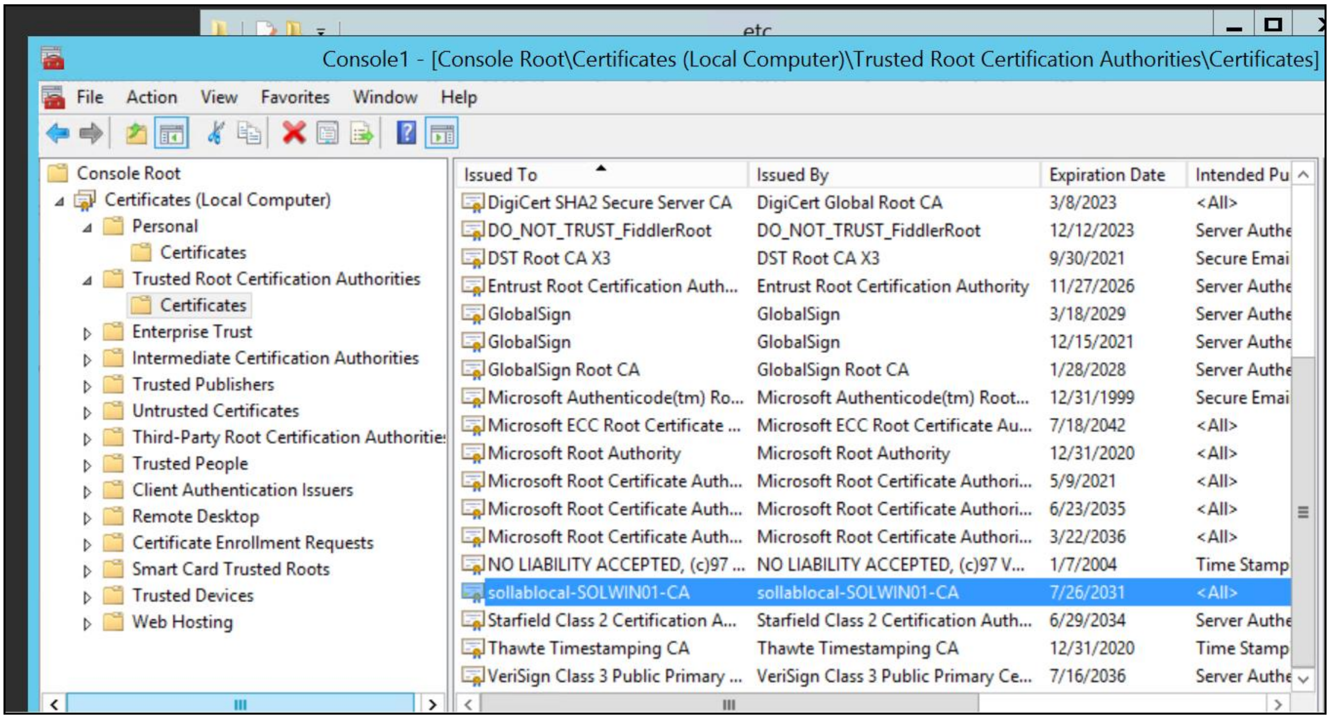
etc
Console1 - [Console Root\Certificates (Local Computer)\Personal\Certificates]
File Action View Favorites Window Help

Console Root
- Certificates (Local Computer)
  - Personal
    - Certificates
  - Trusted Root Certification Authorities
    - Certificates
  - Enterprise Trust
  - Intermediate Certification Authorities
  - Trusted Publishers
  - Untrusted Certificates
  - Third-Party Root Certification Authoritie
  - Trusted People
  - Client Authentication Issuers
  - Remote Desktop
  - Certificate Enrollment Requests
  - Smart Card Trusted Roots
  - Trusted Devices
  - Web Hosting

Issued To	Issued By	Expiration Date	Intended Purpo
customers.telechat.o-test06161...	DigiCert SHA2 Secure Server CA	9/24/2021	Server Authenti
sollablocal-SOLWIN01-CA	sollablocal-SOLWIN01-CA	7/26/2031	<All>
solwin01.sollablocal.com	sollablocal-SOLWIN01-CA	7/28/2026	Client Authenti
telechat.o-test06161977.com	DigiCert SHA2 Secure Server CA	6/7/2022	Server Authenti

The Root CA Certificate of the Certificate Signaling Authority that signed the SBA Certificate as well as the Oracle SBC Certificate must be present in the Trusted root Certificate Authorities Location on the Certificate Store on the DR-SBA Server. Any Intermediate Certificate must also be imported to Intermediate Certificate Authorities location.

Below Figure is an example from the Certificate Store on the DR-SBA Server.

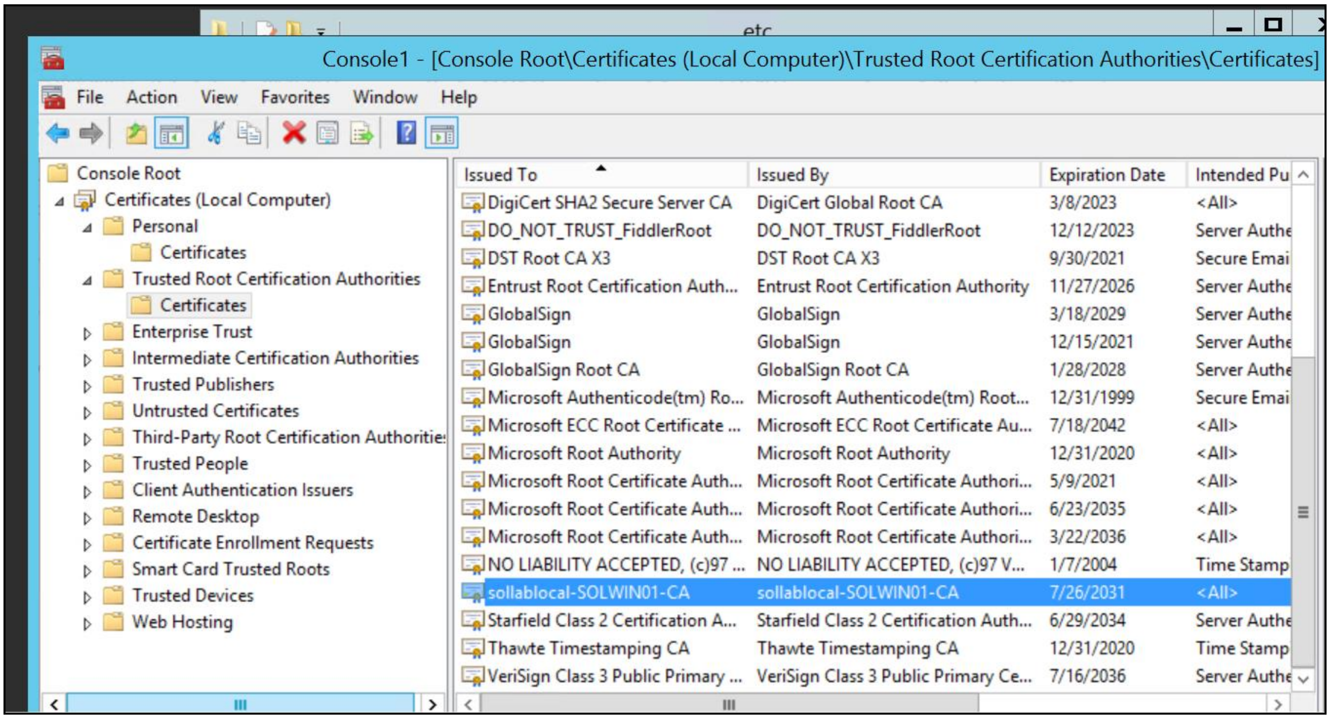


Console1 - [Console Root\Certificates (Local Computer)\Trusted Root Certification Authorities\Certificates]

Issued To	Issued By	Expiration Date	Intended Pu
DigiCert SHA2 Secure Server CA	DigiCert Global Root CA	3/8/2023	<All>
DO_NOT_TRUST_FiddlerRoot	DO_NOT_TRUST_FiddlerRoot	12/12/2023	Server Authe
DST Root CA X3	DST Root CA X3	9/30/2021	Secure Emai
Entrust Root Certification Auth...	Entrust Root Certification Authority	11/27/2026	Server Authe
GlobalSign	GlobalSign	3/18/2029	Server Authe
GlobalSign	GlobalSign	12/15/2021	Server Authe
GlobalSign Root CA	GlobalSign Root CA	1/28/2028	Server Authe
Microsoft Authenticode(tm) Ro...	Microsoft Authenticode(tm) Root...	12/31/1999	Secure Emai
Microsoft ECC Root Certificate ...	Microsoft ECC Root Certificate Au...	7/18/2042	<All>
Microsoft Root Authority	Microsoft Root Authority	12/31/2020	<All>
Microsoft Root Certificate Auth...	Microsoft Root Certificate Authori...	5/9/2021	<All>
Microsoft Root Certificate Auth...	Microsoft Root Certificate Authori...	6/23/2035	<All>
Microsoft Root Certificate Auth...	Microsoft Root Certificate Authori...	3/22/2036	<All>
NO LIABILITY ACCEPTED, (c)97 ...	NO LIABILITY ACCEPTED, (c)97 V...	1/7/2004	Time Stamp
sollablocal-SOLWIN01-CA	sollablocal-SOLWIN01-CA	7/26/2031	<All>
Starfield Class 2 Certification A...	Starfield Class 2 Certification Auth...	6/29/2034	Server Authe
Thawte Timestamping CA	Thawte Timestamping CA	12/31/2020	Time Stamp
VeriSign Class 3 Public Primary ...	VeriSign Class 3 Public Primary Ce...	7/16/2036	Server Authe

All the Teams Client Workstations that require DR-SBA Support **must also trust the DR-SBA's Certificate Authority Certificate**. The Root CA of the Certificate Signaling Authority that signed the SBA Certificate must be present in the Trusted root Certificate Authorities Location on the Certificate Store. Any Intermediate Certificate must also be imported to Intermediate Certificate Authorities location.
Upload the Certificate at the equivalent location on MAC-OS Workstations.

Below Figure is an example from the Certificate Store on a Windows Machine that runs the MS Teams Client. DR-SBA CAs Certificate is present in the Trusted Root Certificates Section as show below.


etc
Console1 - [Console Root\Certificates (Local Computer)\Trusted Root Certification Authorities\Certificates]
File
Action
View
Favorites
Window
Help
Console Root
Certificates (Local Computer)
Personal
Certificates
Trusted Root Certification Authorities
Certificates
Enterprise Trust
Intermediate Certification Authorities
Trusted Publishers
Untrusted Certificates
Third-Party Root Certification Authorities
Trusted People
Client Authentication Issuers
Remote Desktop
Certificate Enrollment Requests
Smart Card Trusted Roots
Trusted Devices
Web Hosting

Issued To	Issued By	Expiration Date	Intended Pu
DigiCert SHA2 Secure Server CA	DigiCert Global Root CA	3/8/2023	<All>
DO_NOT_TRUST_FiddlerRoot	DO_NOT_TRUST_FiddlerRoot	12/12/2023	Server Authe
DST Root CA X3	DST Root CA X3	9/30/2021	Secure Emai
Entrust Root Certification Auth...	Entrust Root Certification Authority	11/27/2026	Server Authe
GlobalSign	GlobalSign	3/18/2029	Server Authe
GlobalSign	GlobalSign	12/15/2021	Server Authe
GlobalSign Root CA	GlobalSign Root CA	1/28/2028	Server Authe
Microsoft Authenticode(tm) Ro...	Microsoft Authenticode(tm) Root...	12/31/1999	Secure Emai
Microsoft ECC Root Certificate ...	Microsoft ECC Root Certificate Au...	7/18/2042	<All>
Microsoft Root Authority	Microsoft Root Authority	12/31/2020	<All>
Microsoft Root Certificate Auth...	Microsoft Root Certificate Authori...	5/9/2021	<All>
Microsoft Root Certificate Auth...	Microsoft Root Certificate Authori...	6/23/2035	<All>
Microsoft Root Certificate Auth...	Microsoft Root Certificate Authori...	3/22/2036	<All>
NO LIABILITY ACCEPTED, (c)97 ...	NO LIABILITY ACCEPTED, (c)97 V...	1/7/2004	Time Stamp
sollablocal-SOLWIN01-CA	sollablocal-SOLWIN01-CA	7/26/2031	<All>
Starfield Class 2 Certification A...	Starfield Class 2 Certification Auth...	6/29/2034	Server Authe
Thawte Timestamping CA	Thawte Timestamping CA	12/31/2020	Time Stamp
VeriSign Class 3 Public Primary ...	VeriSign Class 3 Public Primary Ce...	7/16/2036	Server Authe

6. Deploying the Microsoft SBA

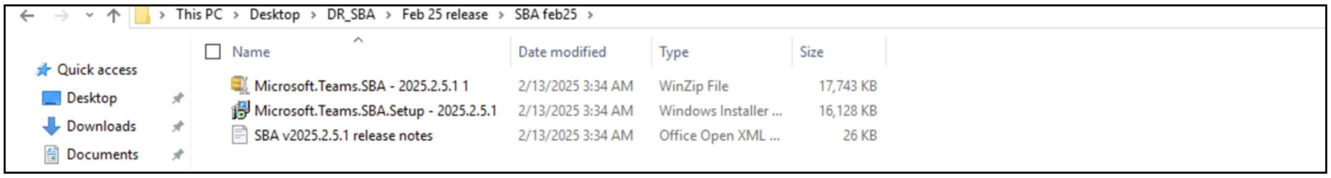
The Deployment of Microsoft SBA is divided to Four Sections -

- Install the Microsoft SBA Application
- Create Azure Active Directory SBA Application
- Microsoft SBA API Configuration
- Configure Direct Routing Survivable Branch Appliance (SBA) in Microsoft 365

6.1 Install the Microsoft SBA Application

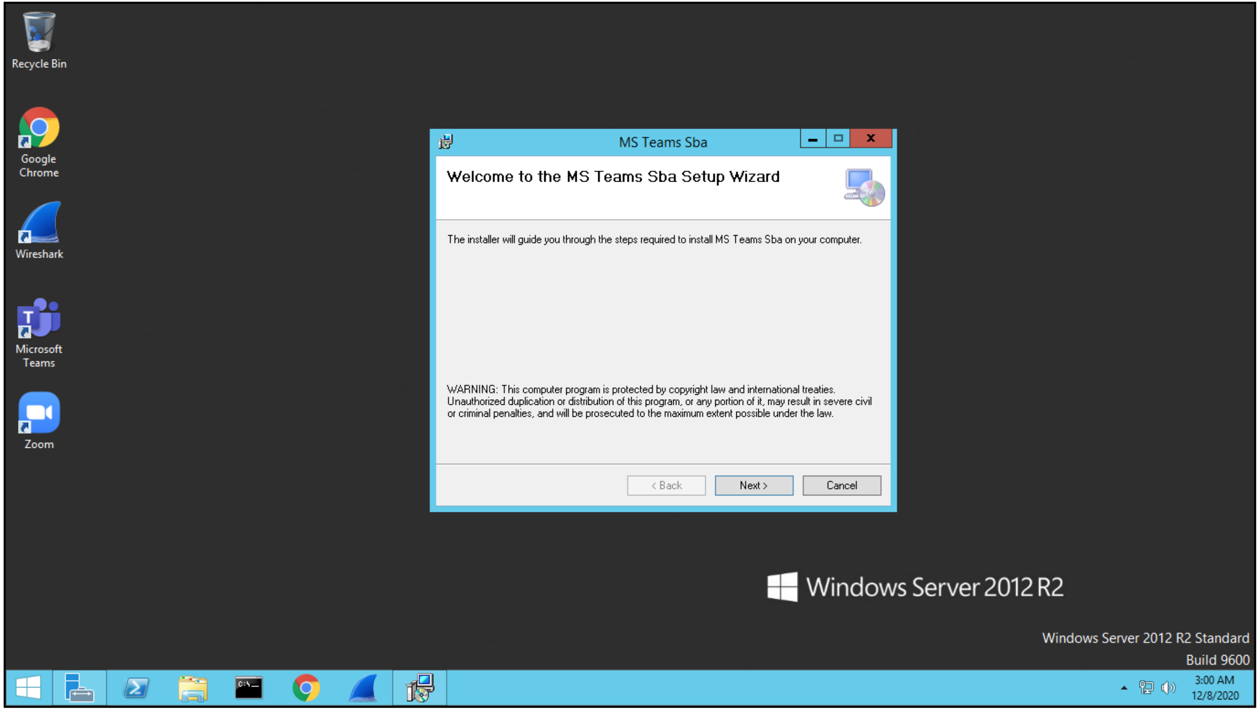
In this step we will provide steps on how to Deploy and configure Microsoft SBA.

Microsoft provides an easy to install Click and Run type Installer for the SBA Application. Transfer the Microsoft. Teams SBA Installer package to the Windows Server and Start the Installer to install the SBA.



Name	Date modified	Type	Size
Microsoft.Teams.SBA - 2025.2.5.1 1	2/13/2025 3:34 AM	WinZip File	17,743 KB
Microsoft.Teams.SBA.Setup - 2025.2.5.1	2/13/2025 3:34 AM	Windows Installer ...	16,128 KB
SBA v2025.2.5.1 release notes	2/13/2025 3:34 AM	Office Open XML ...	26 KB

Please follow below snapshots for reference –

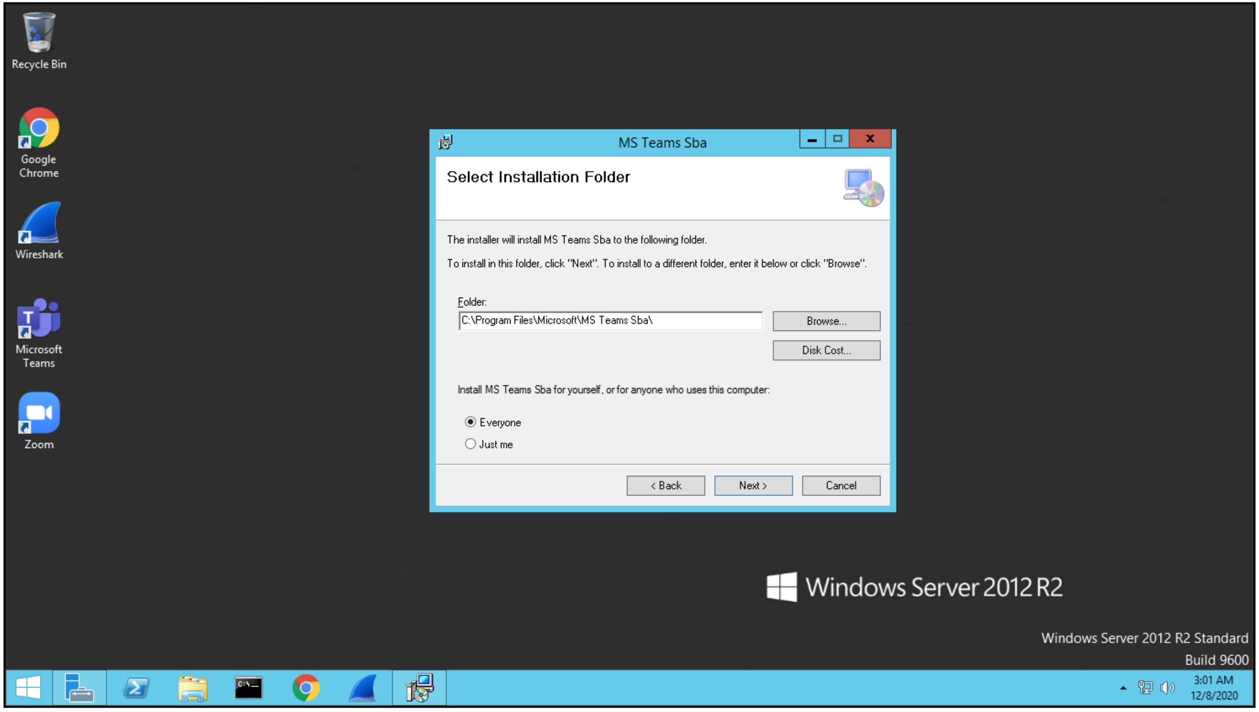


MS Teams Sba

Welcome to the MS Teams Sba Setup Wizard

The installer will guide you through the steps required to install MS Teams Sba on your computer.

WARNING: This computer program is protected by copyright law and international treaties. Unauthorized duplication or distribution of this program, or any portion of it, may result in severe civil or criminal penalties, and will be prosecuted to the maximum extent possible under the law.



MS Teams Sba

Select Installation Folder

The installer will install MS Teams Sba to the following folder.

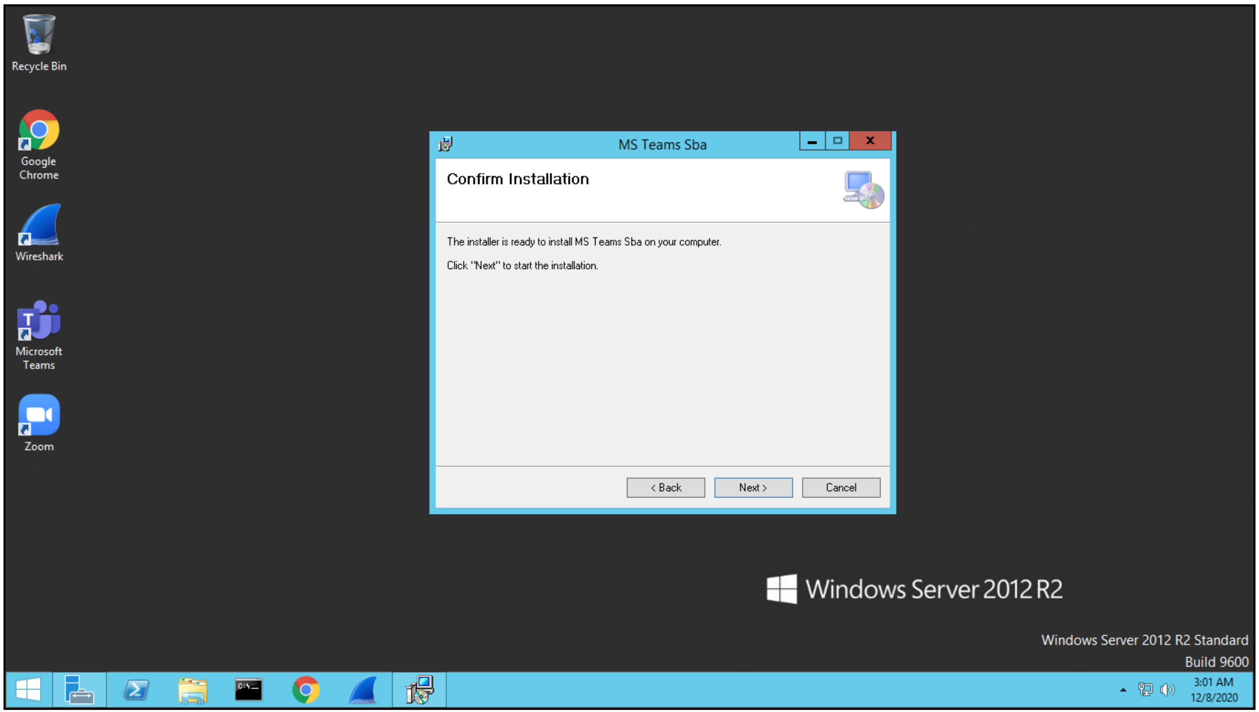
To install in this folder, click "Next". To install to a different folder, enter it below or click "Browse".

Folder: C:\Program Files\Microsoft\MS Teams Sba\

Install MS Teams Sba for yourself, or for anyone who uses this computer:

● Everyone

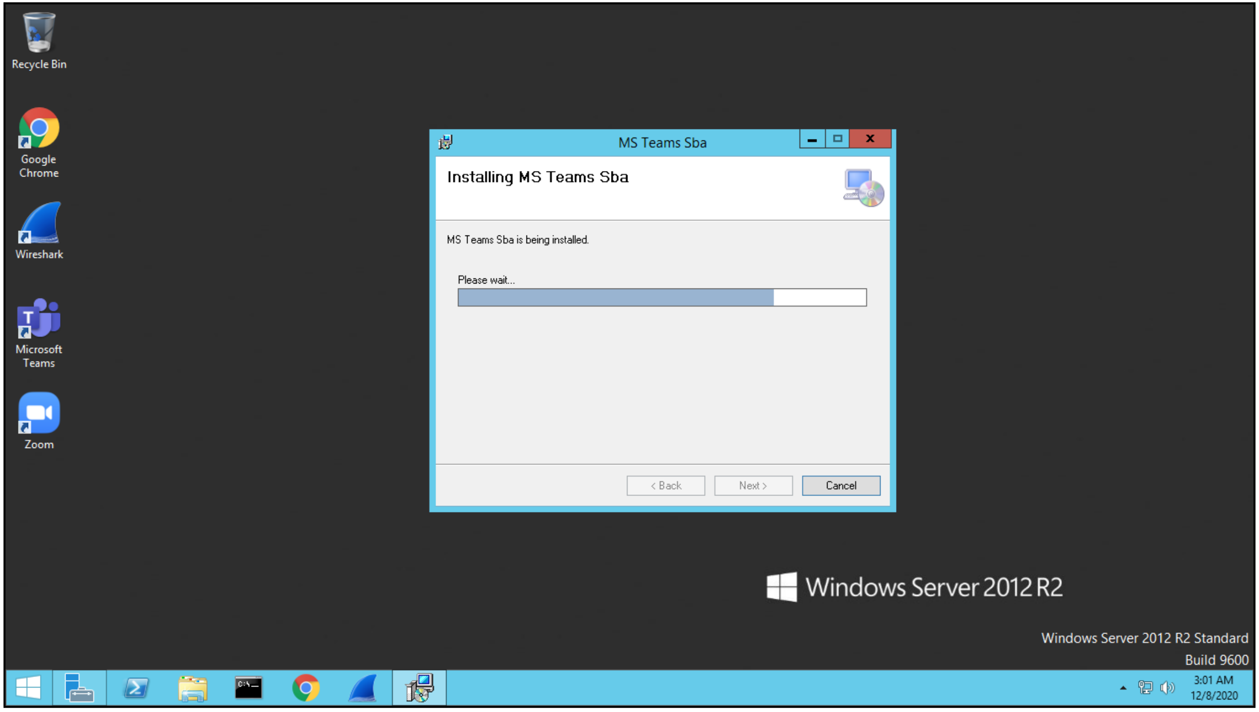
○ Just me



Confirm Installation

The installer is ready to install MS Teams Sba on your computer.

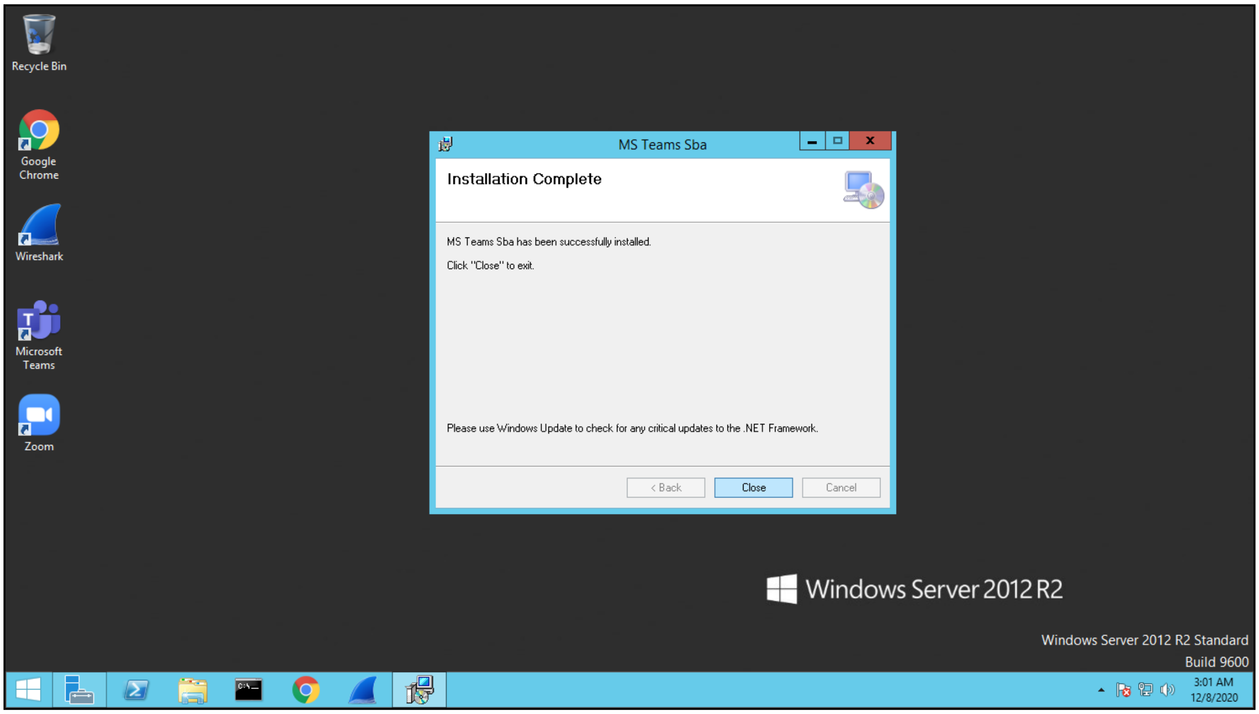
Click "Next" to start the installation.



Installing MS Teams Sba

MS Teams Sba is being installed.

Please wait...



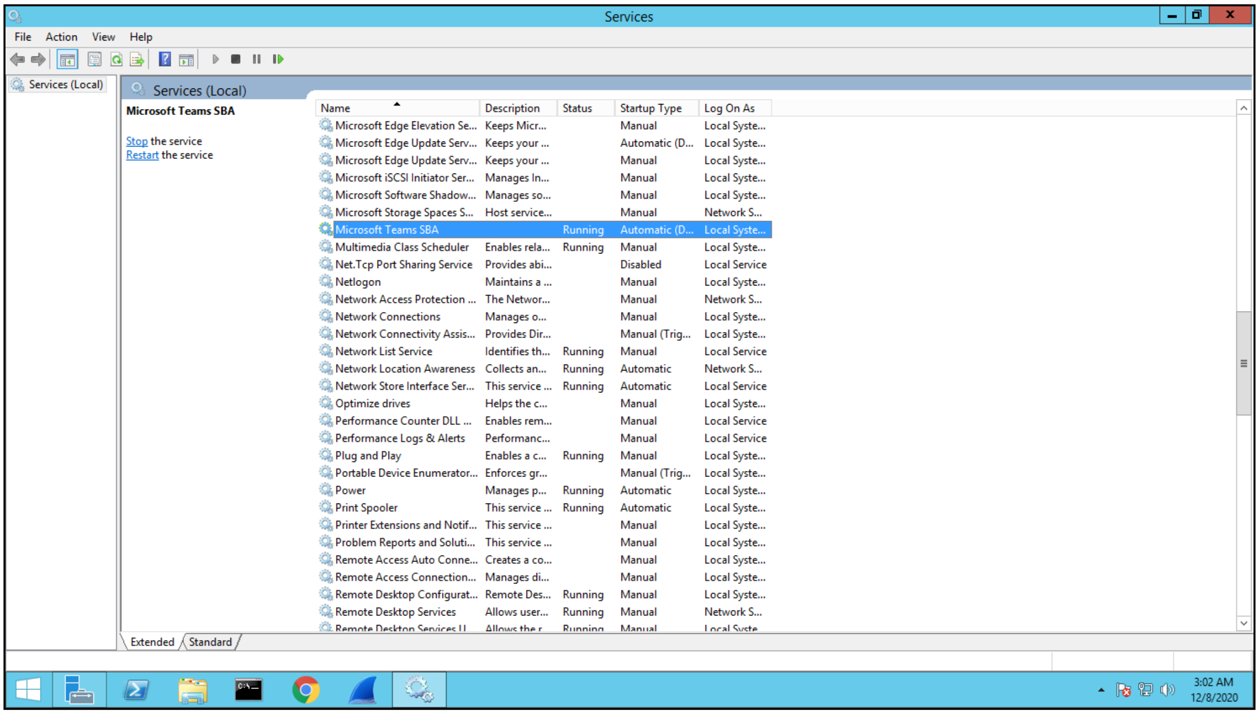
Installation Complete

MS Teams Sba has been successfully installed.

Click "Close" to exit.

Please use Windows Update to check for any critical updates to the .NET Framework.

Once the Microsoft SBA Application is installed. Verify that the Microsoft SBA Service is running to validate successful completion of the installation.



Microsoft Teams SBA

Stop the service
Restart the service

Name	Description	Status	Startup Type	Log On As
Microsoft Edge Elevation Se...	Keeps Micr...		Manual	Local Syste...
Microsoft Edge Update Serv...	Keeps your ...		Automatic (D...	Local Syste...
Microsoft Edge Update Serv...	Keeps your ...		Manual	Local Syste...
Microsoft iSCSI Initiator Ser...	Manages In...		Manual	Local Syste...
Microsoft Software Shadow...	Manages so...		Manual	Local Syste...
Microsoft Storage Spaces S...	Host service...		Manual	Network S...
Microsoft Teams SBA		Running	Automatic (D...	Local Syste...
Multimedia Class Scheduler	Enables rela...	Running	Manual	Local Syste...
Net.Tcp Port Sharing Service	Provides abi...		Disabled	Local Service
Netlogon	Maintains a ...		Manual	Local Syste...
Network Access Protection ...	The Networ...		Manual	Network S...
Network Connections	Manages o...		Manual	Local Syste...
Network Connectivity Assis...	Provides Dir...		Manual (Trig...	Local Syste...
Network List Service	Identifies th...	Running	Manual	Local Service
Network Location Awareness	Collects an...	Running	Automatic	Network S...
Network Store Interface Ser...	This service ...	Running	Automatic	Local Service
Optimize drives	Helps the c...		Manual	Local Syste...
Performance Counter DLL ...	Enables rem...		Manual	Local Service
Performance Logs & Alerts	Performanc...		Manual	Local Service
Plug and Play	Enables a c...	Running	Manual	Local Syste...
Portable Device Enumerator...	Enforces gr...		Manual (Trig...	Local Syste...
Power	Manages p...	Running	Automatic	Local Syste...
Print Spooler	This service ...	Running	Automatic	Local Syste...
Printer Extensions and Notif...	This service ...		Manual	Local Syste...
Problem Reports and Soluti...	This service ...		Manual	Local Syste...
Remote Access Auto Conne...	Creates a co...		Manual	Local Syste...
Remote Access Connection...	Manages di...		Manual	Local Syste...
Remote Desktop Configurat...	Remote Des...	Running	Manual	Local Syste...
Remote Desktop Services	Allows user...	Running	Manual	Network S...
Remote Desktop Services U...	Allows the r...	Running	Manual	Local Syste...

6.2 Create Azure Active Directory SBA Application

To allow the different SBAs used within your tenant to read required data from Microsoft 365 you need to register an application for the SBA with Azure Active Directory.
For more information about application registration please see below link -
https://docs.microsoft.com/en-us/azure/active-directory/manage-apps/developer-guidance-for-integrating-applications
https://docs.microsoft.com/en-us/azure/active-directory/develop/quickstart-register-app

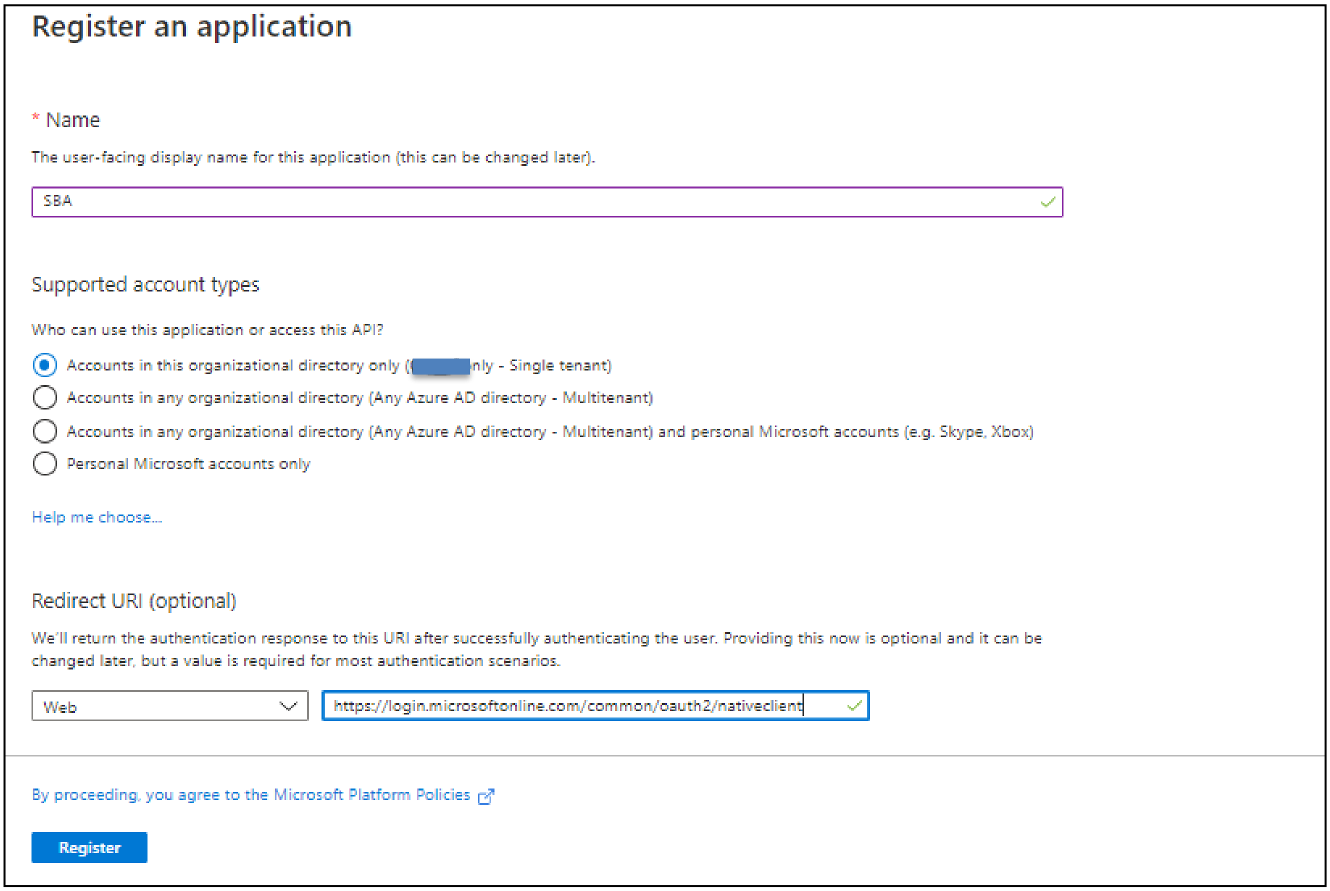
You only need to register one application for use by all the SBA's in your tenant.
For the SBA registration, you need the following values created by the registration below:
These are the specific steps & notes to follow as reference specifically for the SBA application:

- The Name can be any Name, which you would like to use.
- Supported Account types = Account in this organizational directory only
- The Web Redirect Uri = https://login.microsoftonline.com/common/oauth2/nativeclient
- Implicit grant tokens = Access tokens and ID tokens
- API permissions =
  - ➢ Skype and Teams Tenant Admin Access -> Application permissions -> application_access_custom_sba_appliance
  - ➢ user_impersonation

- Client secret: you can use any description and expiration. Remember to copy the client secret right away after you have created it
- The Application (client) id is shown on the Overview tab

6.2.1 SBA Connector registration on Microsoft Azure.

Create an AAD SBA Application following the steps mentioned below. The Application will be used for the communication of Local SBA Application with Microsoft 365.
Sign-in to Azure portal on behalf of your tenant and create new App registration
Note: Application should not be multi-tenant.



Register an application

* Name

The user-facing display name for this application (this can be changed later).

SBA ✓

Supported account types

Who can use this application or access this API?

● Accounts in this organizational directory only ([redacted]nly - Single tenant)

○ Accounts in any organizational directory (Any Azure AD directory - Multitenant)

○ Accounts in any organizational directory (Any Azure AD directory - Multitenant) and personal Microsoft accounts (e.g. Skype, Xbox)

○ Personal Microsoft accounts only

Help me choose...

Redirect URI (optional)

We'll return the authentication response to this URI after successfully authenticating the user. Providing this now is optional and it can be changed later, but a value is required for most authentication scenarios.

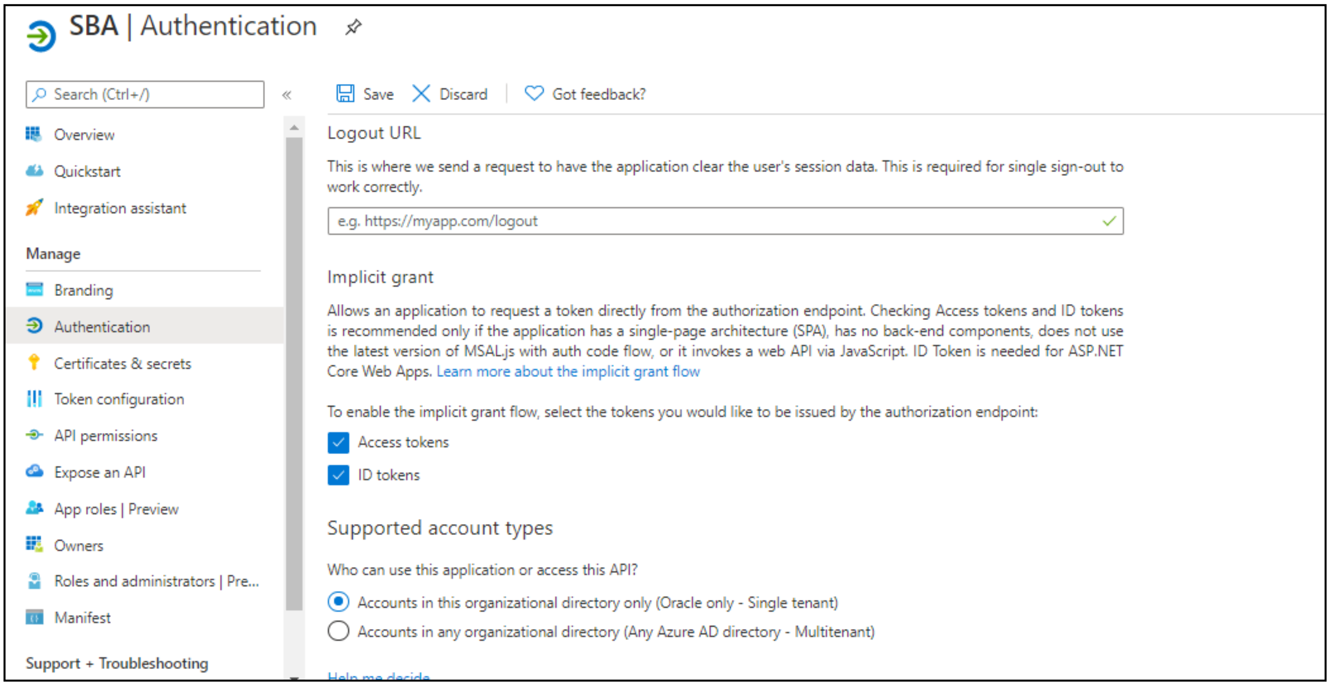
Web ⌄

https://login.microsoftonline.com/common/oauth2/nativeclient ✓

By proceeding, you agree to the Microsoft Platform Policies

Put https://login.microsoftonline.com/common/oauth2/nativeclient into Redirect URIs as shown.

6.2.2 Setting Implicit Grant Token



Logout URL

This is where we send a request to have the application clear the user's session data. This is required for single sign-out to work correctly.

e.g. https://myapp.com/logout ✓

Implicit grant

Allows an application to request a token directly from the authorization endpoint. Checking Access tokens and ID tokens is recommended only if the application has a single-page architecture (SPA), has no back-end components, does not use the latest version of MSAL.js with auth code flow, or it invokes a web API via JavaScript. ID Token is needed for ASP.NET Core Web Apps. Learn more about the implicit grant flow

To enable the implicit grant flow, select the tokens you would like to be issued by the authorization endpoint:

☑ Access tokens

☑ ID tokens

Supported account types

Who can use this application or access this API?

● Accounts in this organizational directory only (Oracle only - Single tenant)

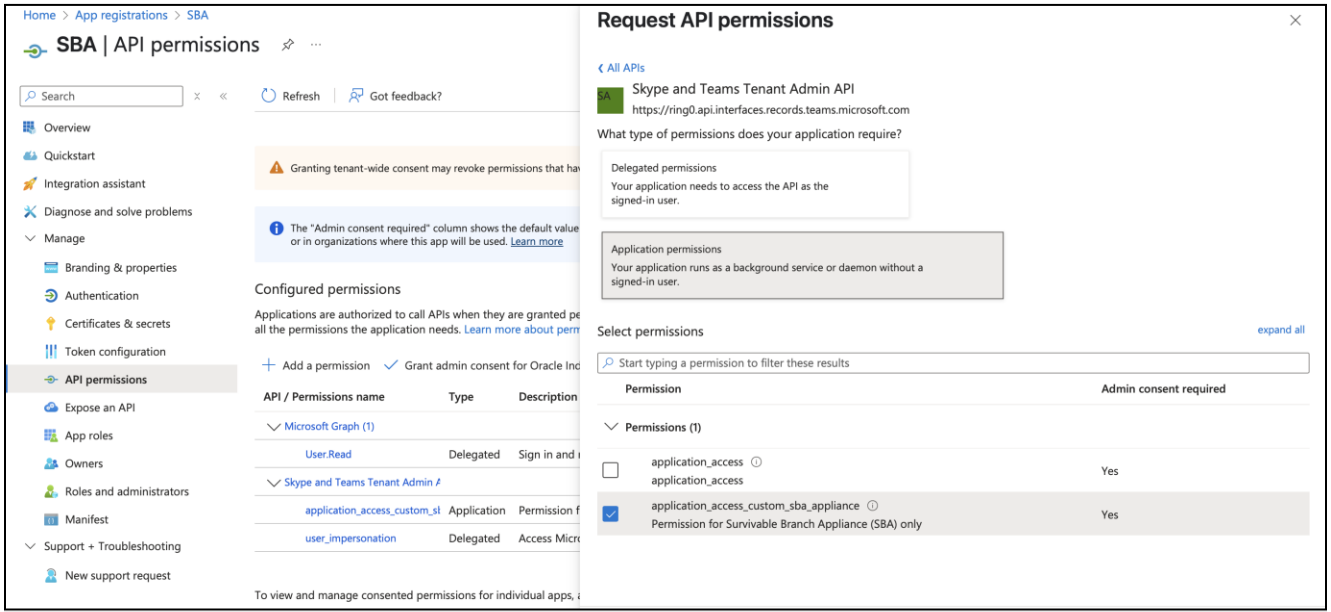
○ Accounts in any organizational directory (Any Azure AD directory - Multitenant)

Help me decide

6.2.3 Request API Permissions

Go to section API permissions to configure the SBA API permissions.

1.Select API my organisation uses and Search ‘Skype’ Request API permissions and choose ‘Skype and Teams Tenant API’
Select Application permissions
Select application_access_custom_sba_appliance.
Grant admin consent.



Granting tenant-wide consent may revoke permissions that ha

The "Admin consent required" column shows the default value or in organizations where this app will be used. Learn more

Configured permissions

Applications are authorized to call APIs when they are granted pe all the permissions the application needs. Learn more about perm

API / Permissions name	Type	Description
Microsoft Graph (1)		
User.Read	Delegated	Sign in and
Skype and Teams Tenant Admin A		
application_access_custom_sl	Application	Permission f
user_impersonation	Delegated	Access Micr

To view and manage consented permissions for individual apps, a

Request API permissions

Skype and Teams Tenant Admin API
https://ring0.api.interfaces.records.teams.microsoft.com

What type of permissions does your application require?

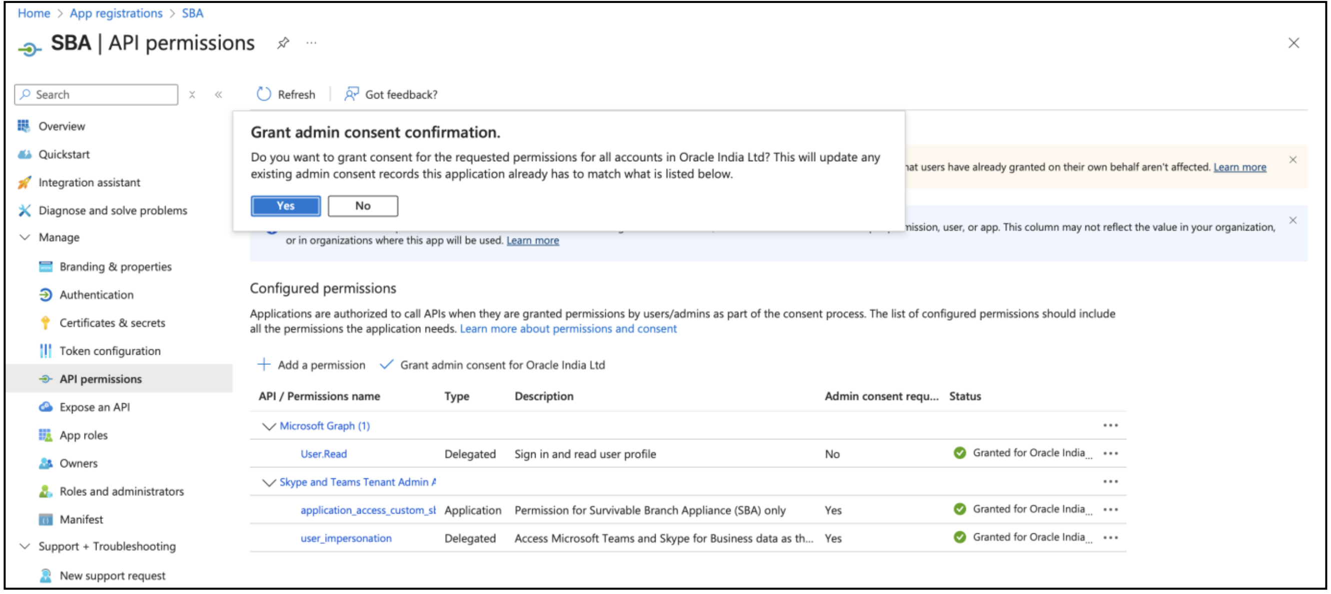
Delegated permissions
Your application needs to access the API as the signed-in user.

Application permissions
Your application runs as a background service or daemon without a signed-in user.

Select permissions

Start typing a permission to filter these results

Permission	Admin consent required
Permissions (1)	
□ application_access application_access	Yes
☑ application_access_custom_sba_appliance Permission for Survivable Branch Appliance (SBA) only	Yes



Grant admin consent confirmation.

Do you want to grant consent for the requested permissions for all accounts in Oracle India Ltd? This will update any existing admin consent records this application already has to match what is listed below.

nat users have already granted on their own behalf aren't affected. Learn more

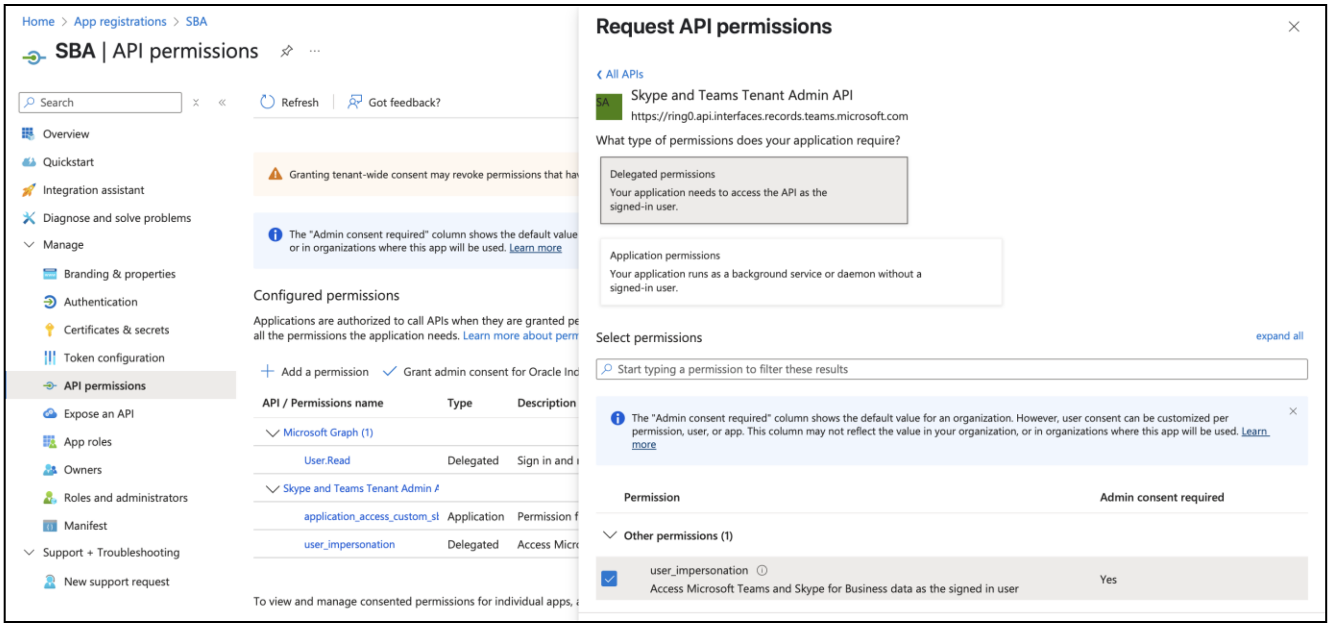
nission, user, or app. This column may not reflect the value in your organization, or in organizations where this app will be used. Learn more

Configured permissions

Applications are authorized to call APIs when they are granted permissions by users/admins as part of the consent process. The list of configured permissions should include all the permissions the application needs. Learn more about permissions and consent

API / Permissions name	Type	Description	Admin consent requ...	Status
Microsoft Graph (1)				
User.Read	Delegated	Sign in and read user profile	No	✓ Granted for Oracle India...
Skype and Teams Tenant Admin A				
application_access_custom_sl	Application	Permission for Survivable Branch Appliance (SBA) only	Yes	✓ Granted for Oracle India...
user_impersonation	Delegated	Access Microsoft Teams and Skype for Business data as th...	Yes	✓ Granted for Oracle India...

2. Select API my organisation uses and Search ‘Skype’ Request API permissions and choose ‘Skype and Teams Tenant API’
Select Delegated permissions
Select user_impersonation
Grant admin consent.



Home > App registrations > SBA

SBA | API permissions

Search

Refresh | Got feedback?

- Overview
- Quickstart
- Integration assistant
- Diagnose and solve problems
- Manage
  - Branding & properties
  - Authentication
  - Certificates & secrets
  - Token configuration
  - API permissions
  - Expose an API
  - App roles
  - Owners
  - Roles and administrators
  - Manifest
- Support + Troubleshooting
  - New support request

Granting tenant-wide consent may revoke permissions that ha

The "Admin consent required" column shows the default value or in organizations where this app will be used. Learn more

Configured permissions

Applications are authorized to call APIs when they are granted pe all the permissions the application needs. Learn more about perm

+ Add a permission ✓ Grant admin consent for Oracle Ind

API / Permissions name	Type	Description
Microsoft Graph (1)		
User.Read	Delegated	Sign in and r
Skype and Teams Tenant Admin A		
application_access_custom_sl	Application	Permission f
user_impersonation	Delegated	Access Micro

To view and manage consented permissions for individual apps, a

Request API permissions

‹ All APIs

Skype and Teams Tenant Admin API
https://ring0.api.interfaces.records.teams.microsoft.com

What type of permissions does your application require?

Delegated permissions
Your application needs to access the API as the signed-in user.

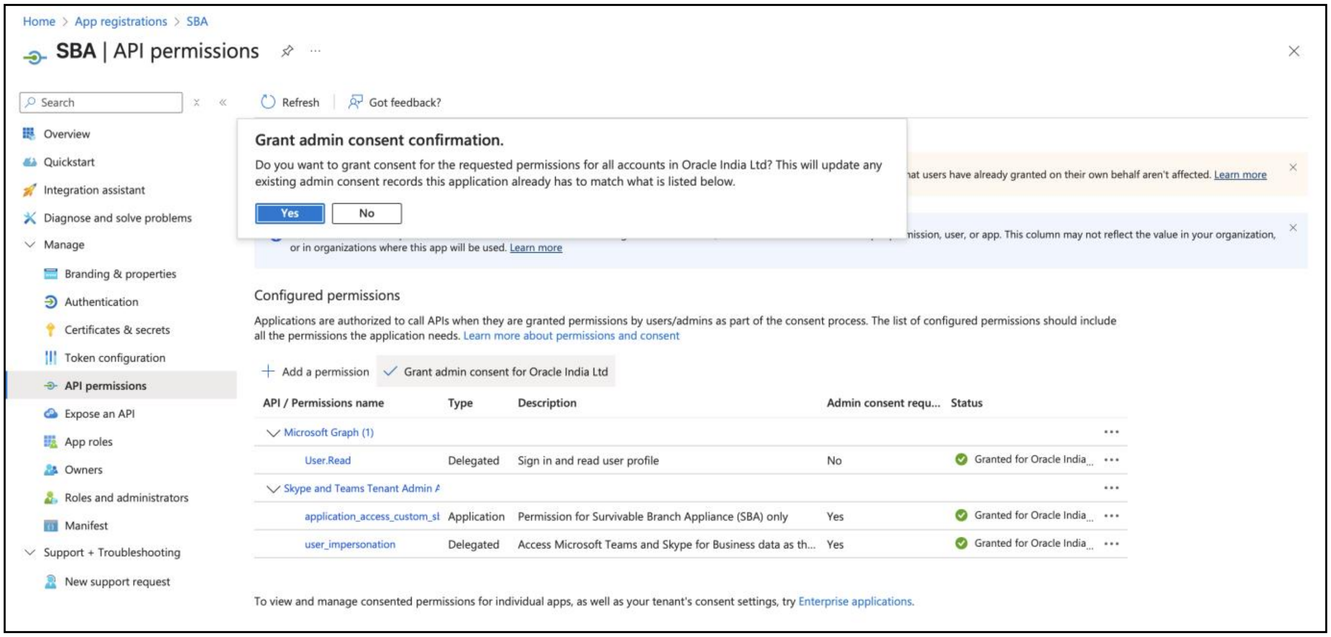
Application permissions
Your application runs as a background service or daemon without a signed-in user.

Select permissions | expand all

Start typing a permission to filter these results

The "Admin consent required" column shows the default value for an organization. However, user consent can be customized per permission, user, or app. This column may not reflect the value in your organization, or in organizations where this app will be used. Learn more

Permission	Admin consent required
Other permissions (1)	
☑ user_impersonation ⓘ Access Microsoft Teams and Skype for Business data as the signed in user	Yes



Home > App registrations > SBA

SBA | API permissions

Search

Refresh | Got feedback?

- Overview
- Quickstart
- Integration assistant
- Diagnose and solve problems
- Manage
  - Branding & properties
  - Authentication
  - Certificates & secrets
  - Token configuration
  - API permissions
  - Expose an API
  - App roles
  - Owners
  - Roles and administrators
  - Manifest
- Support + Troubleshooting
  - New support request

Grant admin consent confirmation.

Do you want to grant consent for the requested permissions for all accounts in Oracle India Ltd? This will update any existing admin consent records this application already has to match what is listed below.

Yes | No

nat users have already granted on their own behalf aren't affected. Learn more

nission, user, or app. This column may not reflect the value in your organization, or in organizations where this app will be used. Learn more

Configured permissions

Applications are authorized to call APIs when they are granted permissions by users/admins as part of the consent process. The list of configured permissions should include all the permissions the application needs. Learn more about permissions and consent

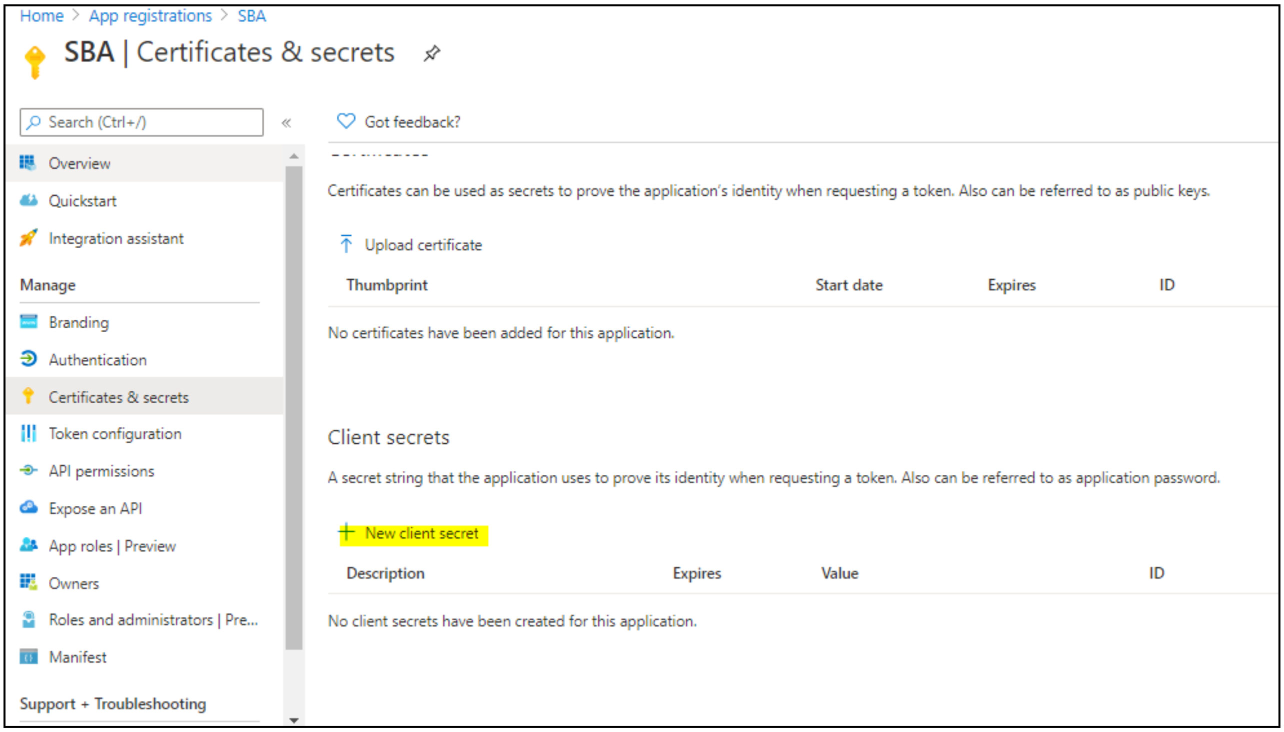
+ Add a permission ✓ Grant admin consent for Oracle India Ltd

API / Permissions name	Type	Description	Admin consent requ...	Status
Microsoft Graph (1)				···
User.Read	Delegated	Sign in and read user profile	No	✓ Granted for Oracle India... ···
Skype and Teams Tenant Admin A				···
application_access_custom_sl	Application	Permission for Survivable Branch Appliance (SBA) only	Yes	✓ Granted for Oracle India... ···
user_impersonation	Delegated	Access Microsoft Teams and Skype for Business data as th...	Yes	✓ Granted for Oracle India... ···

To view and manage consented permissions for individual apps, as well as your tenant's consent settings, try Enterprise applications.

6.2.4 Create Client Secret

Navigate to Certificates and Secrets > New Client Secret and create new client secret as shown below.



Certificates can be used as secrets to prove the application's identity when requesting a token. Also can be referred to as public keys.

Thumbprint	Start date	Expires	ID

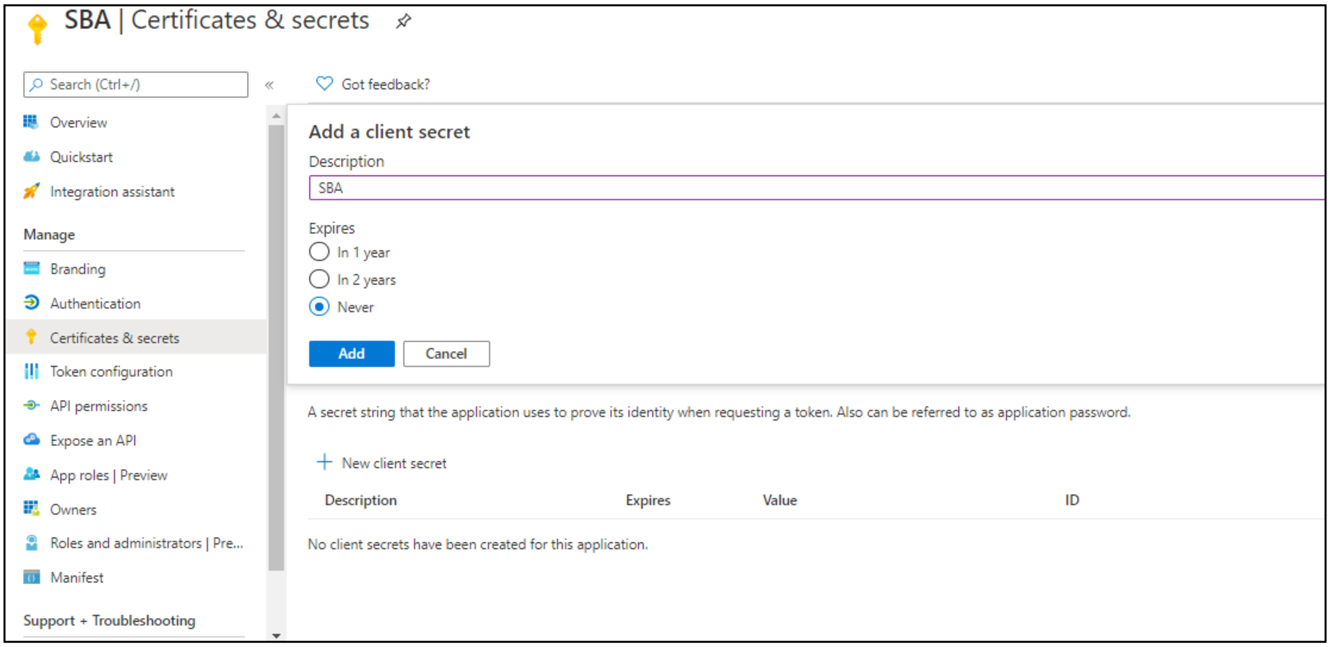
No certificates have been added for this application.

Client secrets

A secret string that the application uses to prove its identity when requesting a token. Also can be referred to as application password.

Description	Expires	Value	ID

No client secrets have been created for this application.



Add a client secret

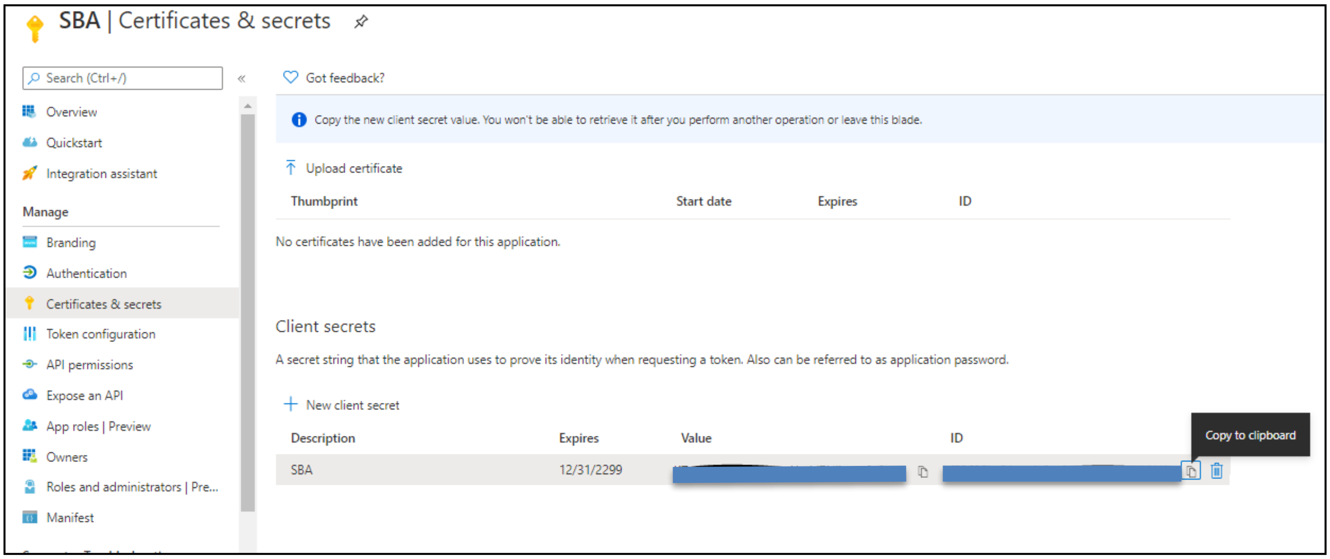
Description: SBA

Expires
○ In 1 year
○ In 2 years
● Never

A secret string that the application uses to prove its identity when requesting a token. Also can be referred to as application password.

Description	Expires	Value	ID

No client secrets have been created for this application.



Copy the new client secret value. You won't be able to retrieve it after you perform another operation or leave this blade.

Thumbprint	Start date	Expires	ID

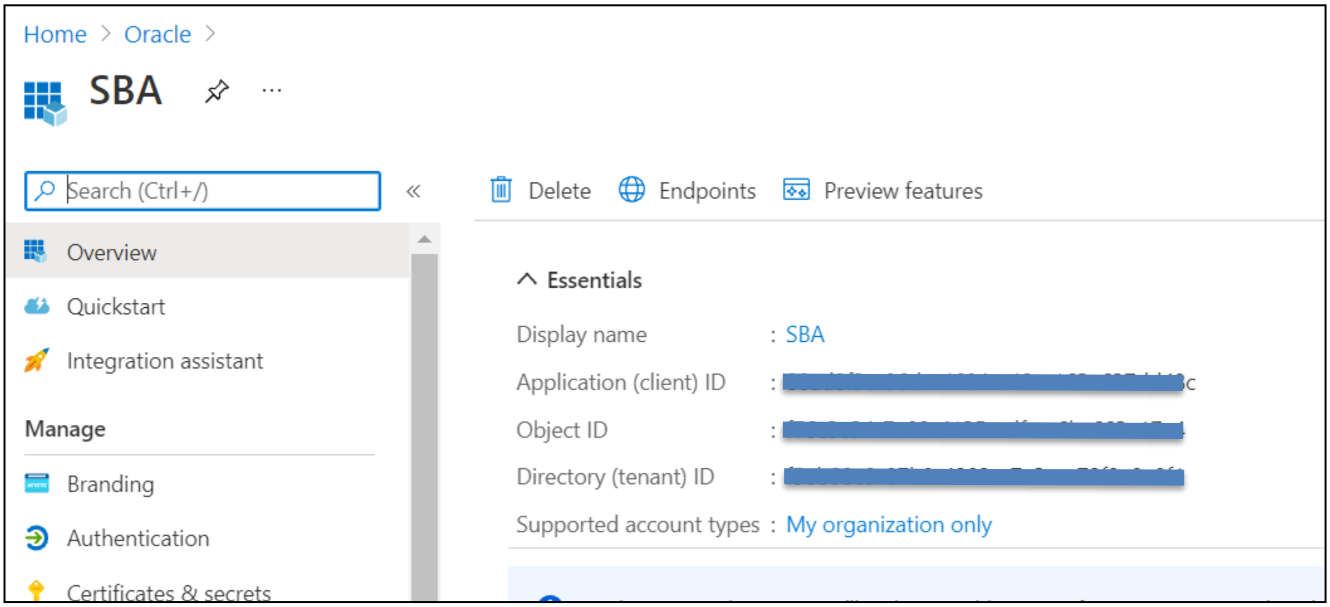
No certificates have been added for this application.

Client secrets

A secret string that the application uses to prove its identity when requesting a token. Also can be referred to as application password.

Description	Expires	Value	ID
SBA	12/31/2299	[redacted]	[redacted]

Copy **Application Id and AppSecret**.
Application ID can be found under Overview Tab.
Value – is the App Secret
These will be used during SBA API configuration.



Display name : SBA

Application (client) ID : [redacted]

Object ID : [redacted]

Directory (tenant) ID : [redacted]

Supported account types : My organization only

6.3 Configure Direct Routing Survivable Branch Appliance (SBA) in Office 365

This Section describes how to configure Direct Routing Survivable Branch Appliance (SBA) in Microsoft 365. This cover the following elements:

- Teams Survivability Branch Appliance
- Teams Branch Survivability Policy
- Assigning the policy to users

For the SBA feature to work the Microsoft Teams client needs to know, which SBA(s) are available in each branch site and are assigned to the users in that site. This is done via assigning a TeamsBranchSurvivabilityPolicy that contains one or more TeamsSurvivableBranchAppliance to individual users.

All the configuration is performed via Microsoft Teams Module on PowerShell.

Please note -

- When you add new branch appliances, it might take some time before you can use them in branch survivability policies.
- When you assign a branch survivability policy to a user it might take some time before it is shown in the output of Get-CsOnlineUser

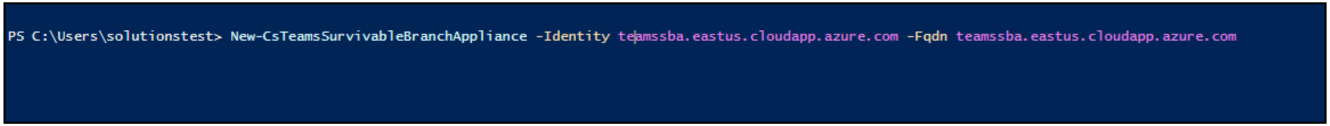
6.3.1 Teams Survivable Branch Appliance

You create SBA's via the **New-CsTeamsSurvivableBranchAppliance** cmdlet in Teams Module. The parameters to the cmdlet are shown in Table 1.

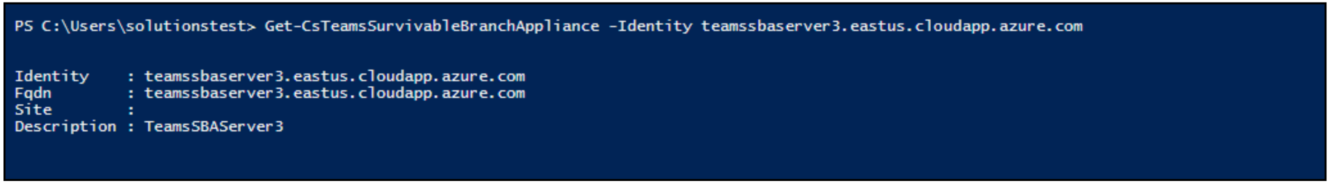
Parameter	Description
Identity	The FQDN of the SBA
Fqdn	The FQDN of the SBA
Site	The TenantNetworkSite where the SBA is located. Used for Location Based Routing (LBR)
Description	Free format text

Table 1 Parameters for New-CsTeamsSurvivableBranchAppliance
An example is shown below:
C:\> New-CsTeamsSurvivableBranchAppliance -Fqdn sba1.contoso.dk -Description "SBA 1"
Identity : sba1.contoso.dk
Fqdn : sba1.contoso.dk
Site :
Description: SBA 1

Lab Snippet for reference -



```
PS C:\Users\solutionstest> New-CsTeamsSurvivableBranchAppliance -Identity teamssba.eastus.cloudapp.azure.com -Fqdn teamssba.eastus.cloudapp.azure.com
```



```
PS C:\Users\solutionstest> Get-CsTeamsSurvivableBranchAppliance -Identity teamssbaserver3.eastus.cloudapp.azure.com


Identity    : teamssbaserver3.eastus.cloudapp.azure.com
Fqdn        : teamssbaserver3.eastus.cloudapp.azure.com
Site        :
Description : TeamsSBAServer3
```

6.3.2 Teams Branch Survivability Policy

This policy contains one or more SBA and you create it via the **New-CsTeamsSurvivableBranchAppliancePolicy** cmdlet in Skype for Business Online PS.

The parameters to the cmdlet are shown in Table 2.

Parameter	Description
Identity	The identity of the policy
BranchApplianceFqdns	The FQDN of the SBA(s) in the site

Table 2 Parameters for New-CsTeamsSurvivableBranchAppliancePolicy
An example is shown below:
C:\> New-CsTeamsSurvivableBranchAppliancePolicy -Identity CPH -BranchApplianceFqdns "sba1.contoso.dk","sba2.contoso.dk"

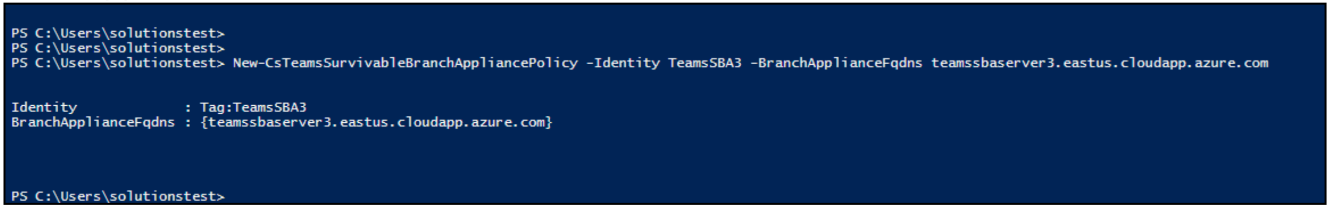
Identity : Tag:CPH
BranchApplianceFqdns : {sba1.contoso.dk, sba2.contoso.dk}

You can add or remove SBA from a Policy using -

Set-CsTeamsSurvivableBranchAppliancePolicy like this:

Set-CsTeamsSurvivableBranchAppliancePolicy -Identity CPH -BranchApplianceFqdns @{remove="sba1.contoso.dk"}
Set-CsTeamsSurvivableBranchAppliancePolicy -Identity CPH -BranchApplianceFqdns @{add="sba1.contoso.dk"}

Lab Snippet for reference -



```
PS C:\Users\solutionstest>
PS C:\Users\solutionstest>
PS C:\Users\solutionstest> New-CsTeamsSurvivableBranchAppliancePolicy -Identity TeamsSBA3 -BranchApplianceFqdns teamssbaserver3.eastus.cloudapp.azure.com


Identity             : Tag:TeamsSBA3
BranchApplianceFqdns : {teamssbaserver3.eastus.cloudapp.azure.com}



PS C:\Users\solutionstest>
```

6.3.3 Assigning Teams Branch Survivability Policy to users

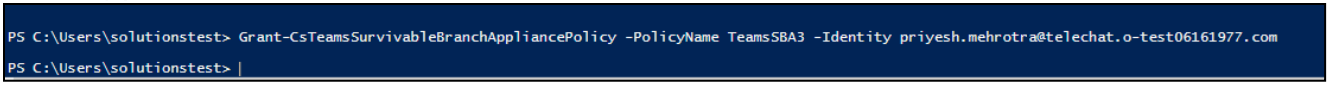
You can assign the policy to individual users by using the Grant-CsTeamsSurvivableBranchAppliancePolicy cmdlet in Skype for Business Online PS.

The parameters to the cmdlet are shown in Table 3.

Parameter	Description
Identity	The identity of the user
Policy Name	The identity of the policy

Table 3 Parameters to Grant- CsTeamsSurvivableBranchAppliancePolicy
An example is shown below:
C:\> Grant- CsTeamsSurvivableBranchAppliancePolicy -PolicyName CPH -Identity user@contoso.dk
You can remove a policy from a user by granting the $Null policy:
C:\> Grant- CsTeamsSurvivableBranchAppliancePolicy -PolicyName $Null -Identity user@contoso.dk

Lab Snippet for reference -



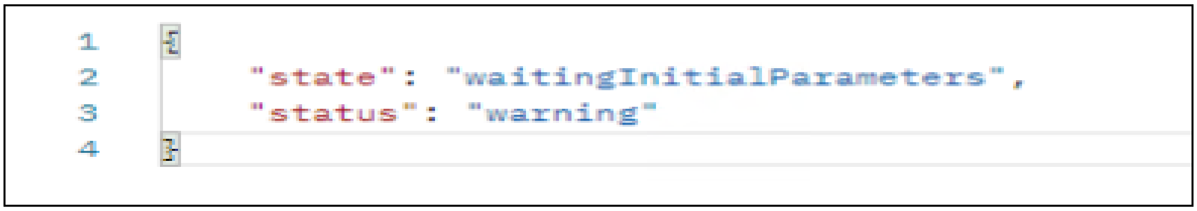
```
PS C:\Users\solutionstest> Grant-CsTeamsSurvivableBranchAppliancePolicy -PolicyName TeamsSBA3 -Identity priyesh.mehrotra@telechat.o-test06161977.com

PS C:\Users\solutionstest> |
```

6.4 SBA API Configuration

Once the Microsoft SBA Package is installed and the SBA Service is running, mentioned steps should be performed in order to configure the Microsoft SBA.
The SBA configuration is done through configuration via Rest-API. Currently the SBA API is configured using a Freeware Client called POSTMAN, which can be downloaded from below link.

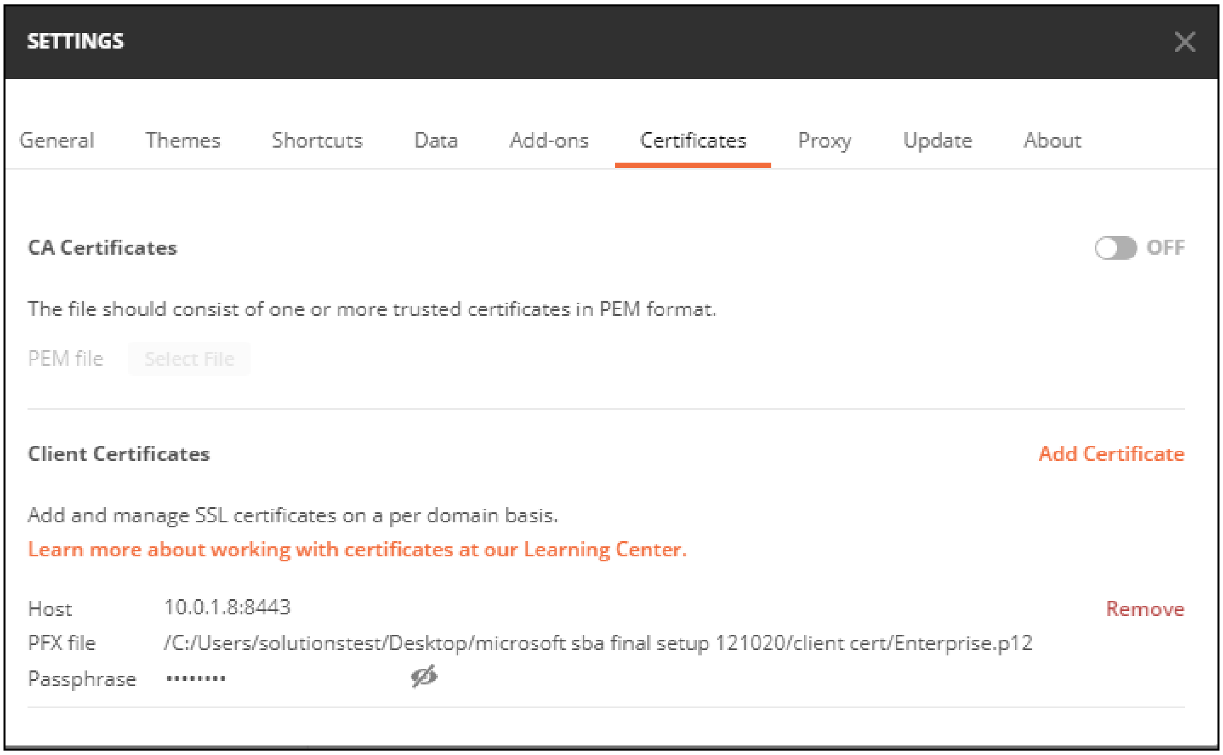
https://www.postman.com/downloads/

- The below query provides the state of SBA Application. The initial state is 'waiting initial parameters'
  SBA state: GET http://localhost:8081/api/v1/diagnostics/state



```
{
    "state": "waitingInitialParameters",
    "status": "warning"
}
```

- A **200 OK and 202 Accepted** is a successful response. 'GET' queries can be performed to get the state of existing item or return the existing configuration values.
- Please ensure that you are using right syntax during configuration of the API. Wrong Syntax would lead to return of error responses. Oracle recommends using **JSON** format for API queries.
- **SBA https port is 8443**.Please make sure that POSTMAN sends your client certificate on the PUT requests for general and secure configuration.
- Use **FQDN:PORT / SBA IP:PORT** combination when sending https API queries in the URI address
- For the steps that require TLS you would need to provide the Certificate and Key file or the PFX File along with the Passcode along with the API query to establish communication between Client and Server and update records.We have provided the SBC certificate and key in our test environment to perform secure configurations (Shown below)



CA Certificates OFF

The file should consist of one or more trusted certificates in PEM format.

PEM file

Client Certificates

Add and manage SSL certificates on a per domain basis.
Learn more about working with certificates at our Learning Center.

Host 10.0.1.8:8443
PFX file /C:/Users/solutionstest/Desktop/microsoft sba final setup 121020/client cert/Enterprise.p12
Passphrase ••••••••

6.4.1 Basic configuration

This step is needed for initial SBA API configuration and applies to localhost.

Server cert needs to be installed in Local Machine/My store for the configuration.

- **Server Certificate Common Name** – Common Name of the Microsoft SBA Server Certificate.

  Note: If you are using a self-signed certificate, please ensure the certificate is present in the trusted certificate list of the Computer, which is running the Microsoft Teams Client. If not, the tls negotiation and the communication between Microsoft Teams Client and the Microsoft SBA Server will fail.

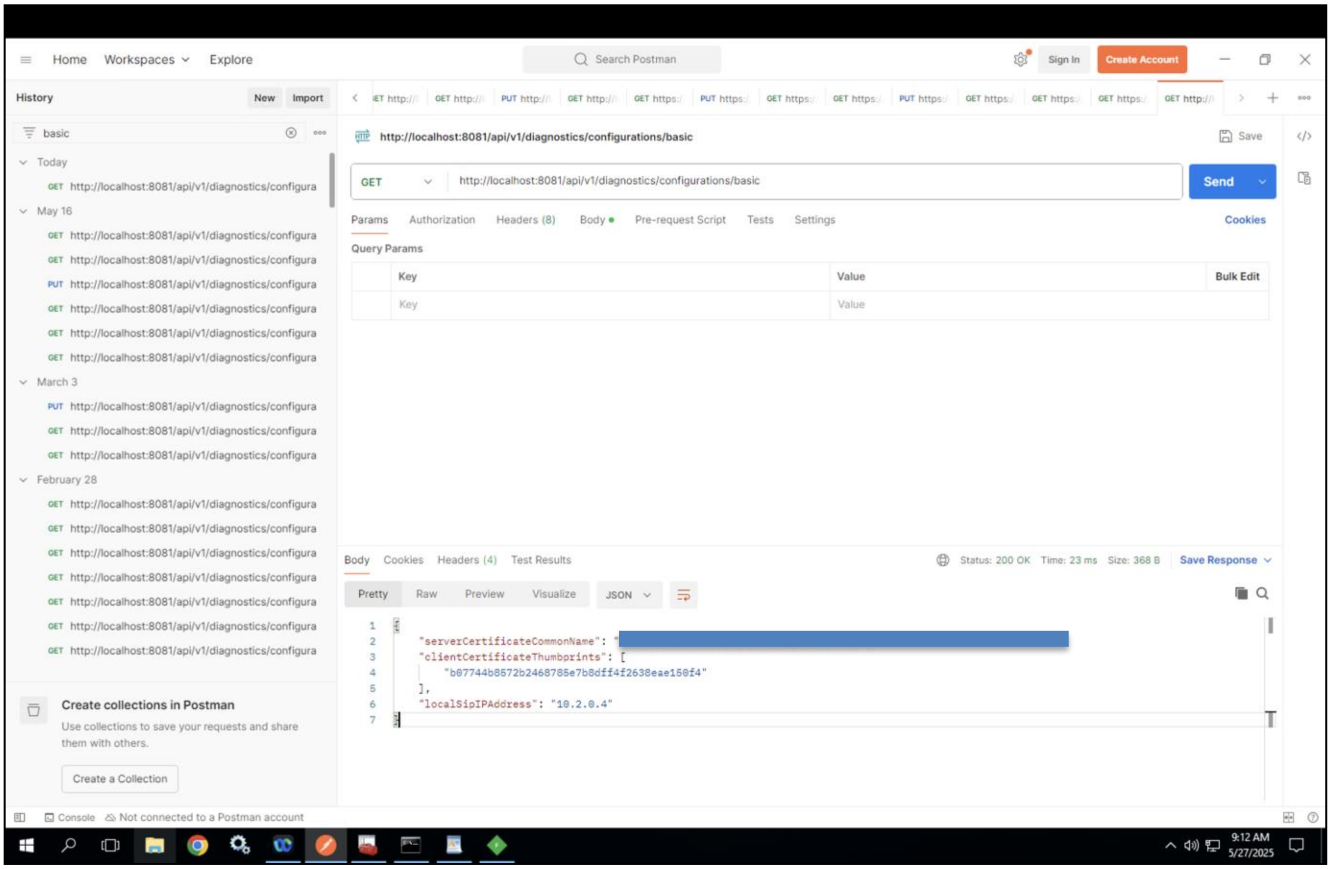
- **Client Certificate Thumbprints** – Use the Thumbprints of the Oracle SBC Certificate that are used for communication with Microsoft SBA. As part of Lab Setup and for the purpose of the document the same Certificate is used that are used with Microsoft Teams Direct Routing with the SBC.

- **Local SIP IP Address** – IP address that will be used by Microsoft SBA for communication. If not set, Default NIC is automatically selected.

Endpoint: http://localhost:8081/api/v1/diagnostics/configurations/basic
Allowed methods: GET, PUT, PATCH
Auth: N/A
SBA state: Wait initial parameters

```
{
   "serverCertificateCommonName": ""
   "clientCertificateThumbprints": [
      "thumprint1",
      "thumprint2"
   ],
   "localSipIPAddress": null|"<local ip address>"|"0.0.0.0 //if you do not set it, default one is used as before
}
```

Lab Snippet for reference –



GET http://localhost:8081/api/v1/diagnostics/configurations/basic

Status: 200 OK Time: 23 ms Size: 368 B

```
{
    "serverCertificateCommonName": "[redacted]
    "clientCertificateThumbprints": [
        "b07744b8572b2468785e7b8dff4f2638eae150f4"
    ],
    "localSipIPAddress": "10.2.0.4"
}
```

6.4.2 General configuration

The following step is the 2nd Step to configure the SBA Application.

- Use the SBA Server **FQDN** (Hostname) for the Endpoint.
- **Identity** - SBA identity i.e the SBA FQDN
- **tenantId** - Identity of your Tenant,If you do not know the Tenant ID,It can be obtained from Powershell or the Microsoft O365 portal
- **Directory** – Is the SBA Logs Directory and can be set based on preference.

Endpoint: https://fqdn/api/v1/configurations/general
Allowed methods: GET, PUT, PATCH
Auth: mTLS (uses cert from Basic configuration "clientCertificateThumbprints")
SBA state: Wait tenant application credentials

```
{
 "identity": "sbalab-xxx.com", //sba identity when register with cmdlets. Actually, SBA Fqdn
 "tenantId": "xxxxxxxx-xxxx-xxxx-xxxx-xxxxxxxxxxxx ",
 "logger": {
   "directory": "C:\\logs",
   "level": "Critical|Error|Warning|Information|Debug|Trace|None",
   "maxArchiveDays": 10 // default is 30 days
 },
 "voiceApps": { // section is optional
   "pstnUsages": [  // DR PstnUsage to be used to route calls to numbers
     "DRUsage1",
     "DRUsageN"
   ],
   "callQueue": [
     {
       "phoneNumber": "samplenum", // Orig To number (CQ/AA number)
       "agents": [
         "samplenum" // Agent number or username
       ]
     },
     {
       "PhoneNumber": "samplenum ",
       "FallbackCloudNumber": "samplenum ",
       "Agents": [
         " sampleagent"
       ],
       "FallbackInterval": 17
     },
     {
       "phoneNumber": "samplenum",
       "agents": [
         "sampleagent"
       ]
     },
     {
       "PhoneNumber": "samplenum",
       "FallbackCloudNumber": "samplenum",
       "Agents": null,
       "FallbackInterval": 17
     }
   ],
   "autoAttendant": [
```

```
      {
        "phoneNumber": "samplenum",
        "agents": [
          "sampleagent"
        ]
      }
    ],
    "other": null
  },
  "ExpiredTokenAcceptancePeriodHours": 72,
  "AcceptExpiredTokenAfterMinutes": 20,
  "ConnectivityCheckIntervalSeconds": 3,
  "DeclareOutageAfterSeconds": 10
}
```

FallbackCloudNumber –(OPTIONAL!!!) is Calling Plan, Operator Connect or external PSTN number, where call might be forwarded if the agent is not configured or is busy, rejects the call or does not pick up the call during FallbackInterval in seconds.
FallbackInterval —(OPTIONAL!!!) value in seconds. Should be in range [16..30] seconds. If the value is not configured or out of range, then FallbackInterval is set to 25 seconds. Recommended values are 17-25 seconds.

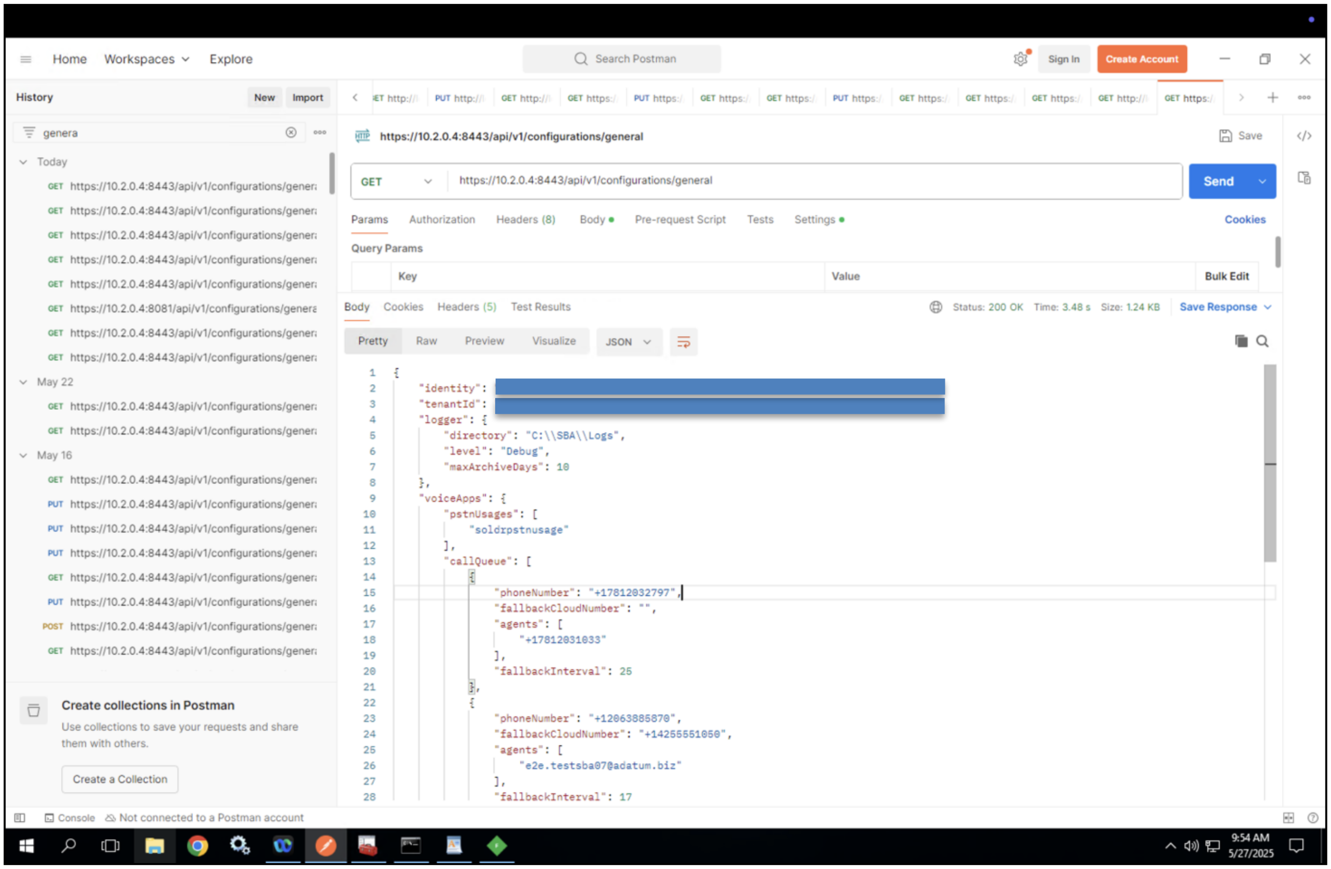
NOTE: For voice app SBA requires at least agent or FallbackCloudNumber to be configured. Or both agent and fallback number.
In case if only FallbackCloudNumber is configured, forwarding happens immediately despite FallbackInterval value.

ExpiredTokenAcceptancePeriodHours - (OPTIONAL!!!) An integer value in hours, ranging from 0 to 168. If this value is not configured, the default value of 72 hours is used. Setting the value to 0 or less disables the acceptance of expired tokens, and any request with an expired token will be rejected.

There are three additional settings related to the expired token acceptance functionality. However, we strongly recommend avoiding changes to these settings and using the default values

AcceptExpiredTokenAfterMinutes - (OPTIONAL!!!) This is the grace period in minutes after which expired tokens are accepted. The range is from 5 to 720 minutes, with a default value of 20 minutes.
ConnectivityCheckIntervalSeconds -(OPTIONAL!!!) This is the interval in seconds for connectivity checks. The SBA checks if sip.pstnhub.microsoft.com, sip2.pstnhub.microsoft.com, and sip3.pstnhub.microsoft.com are accessible. The range is from 3 to 120 seconds, with a default value of 10 seconds.
DeclareOutageAfterSeconds - (OPTIONAL!!!) This is the time in seconds after which an internet outage is declared and the start of the grace period after which expired tokens will be accepted. The range is from [ConnectivityCheckIntervalSeconds * 2] to 360 seconds, with a default value of 30 seconds.

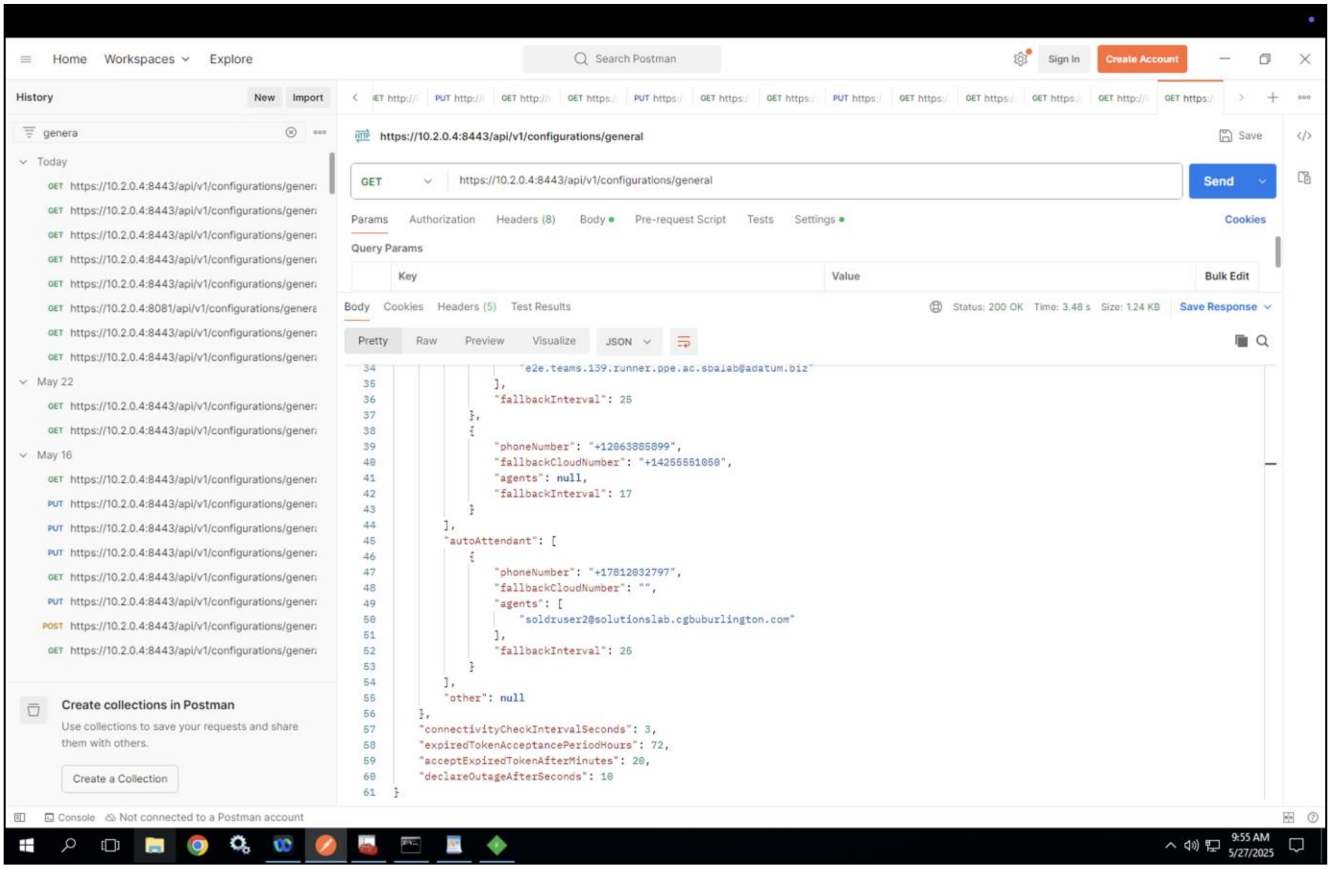
Lab Snippet for reference -



GET https://10.2.0.4:8443/api/v1/configurations/general

Status: 200 OK Time: 3.48 s Size: 1.24 KB

```
{
    "identity": [redacted]
    "tenantId": [redacted]
    "logger": {
        "directory": "C:\\SBA\\Logs",
        "level": "Debug",
        "maxArchiveDays": 10
    },
    "voiceApps": {
        "pstnUsages": [
            "soldrpstnusage"
        ],
        "callQueue": [
            {
                "phoneNumber": "+17812032797",
                "fallbackCloudNumber": "",
                "agents": [
                    "+17812031033"
                ],
                "fallbackInterval": 25
            },
            {
                "phoneNumber": "+12063885870",
                "fallbackCloudNumber": "+14255551050",
                "agents": [
                    "e2e.testsba07@adatum.biz"
                ],
                "fallbackInterval": 17
```



GET https://10.2.0.4:8443/api/v1/configurations/general

Status: 200 OK Time: 3.48 s Size: 1.24 KB

```
                    "e2e.teams.139.runner.ppe.ac.sbalab@adatum.biz"
                ],
                "fallbackInterval": 25
            },
            {
                "phoneNumber": "+12063885899",
                "fallbackCloudNumber": "+14255551050",
                "agents": null,
                "fallbackInterval": 17
            }
        ],
        "autoAttendant": [
            {
                "phoneNumber": "+17812032797",
                "fallbackCloudNumber": "",
                "agents": [
                    "soldruser2@solutionslab.cgbuburlington.com"
                ],
                "fallbackInterval": 25
            }
        ],
        "other": null
    },
    "connectivityCheckIntervalSeconds": 3,
    "expiredTokenAcceptancePeriodHours": 72,
    "acceptExpiredTokenAfterMinutes": 20,
    "declareOutageAfterSeconds": 10
}
```

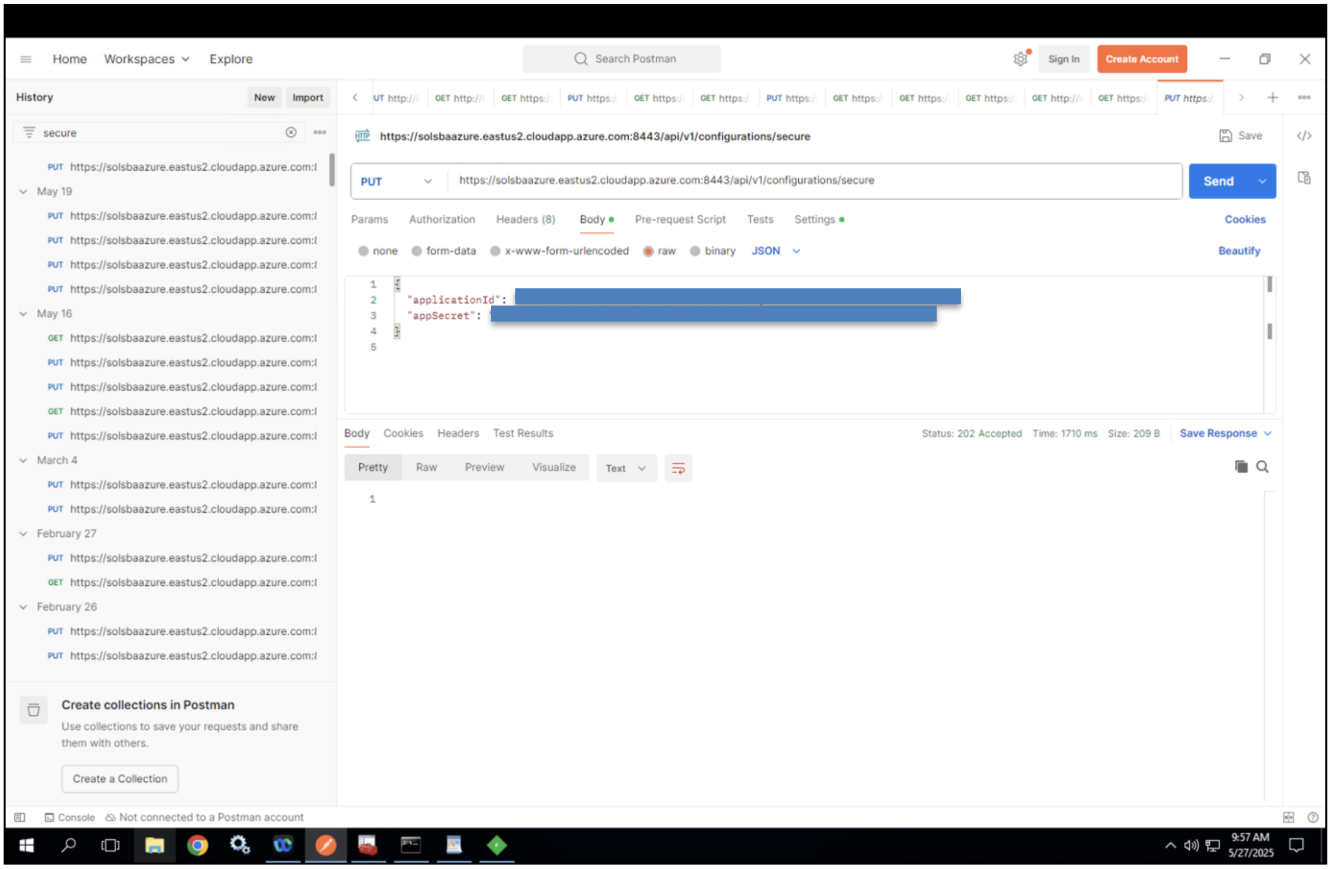
6.4.3 Secure configuration

This is the last step of the configuration and is required for tenant information synchronization.Please use the Application ID and Application Secret which are generated in Step 6.2.4

Endpoint: https://fqdn/api/v1/configurations/secure
Allowed methods: PUT, PATCH
Auth: mTLS (uses cert from Basic configuration "clientCertificateThumbprints")
SBA state: Wait tenant application credentials

```
{
   "applicationId": ""
   "appSecret": ""
}
```

Lab snippet for reference -



https://solsbaazure.eastus2.cloudapp.azure.com:8443/api/v1/configurations/secure

PUT https://solsbaazure.eastus2.cloudapp.azure.com:8443/api/v1/configurations/secure

○ none ○ form-data ○ x-www-form-urlencoded ● raw ○ binary JSON

```
{
  "applicationId": [redacted]
  "appSecret": [redacted]
}
```

Status: 202 Accepted Time: 1710 ms Size: 209 B

Text

Restart the SBA Server once the Secured configuration step is complete.

7. Configuring the Oracle SBC

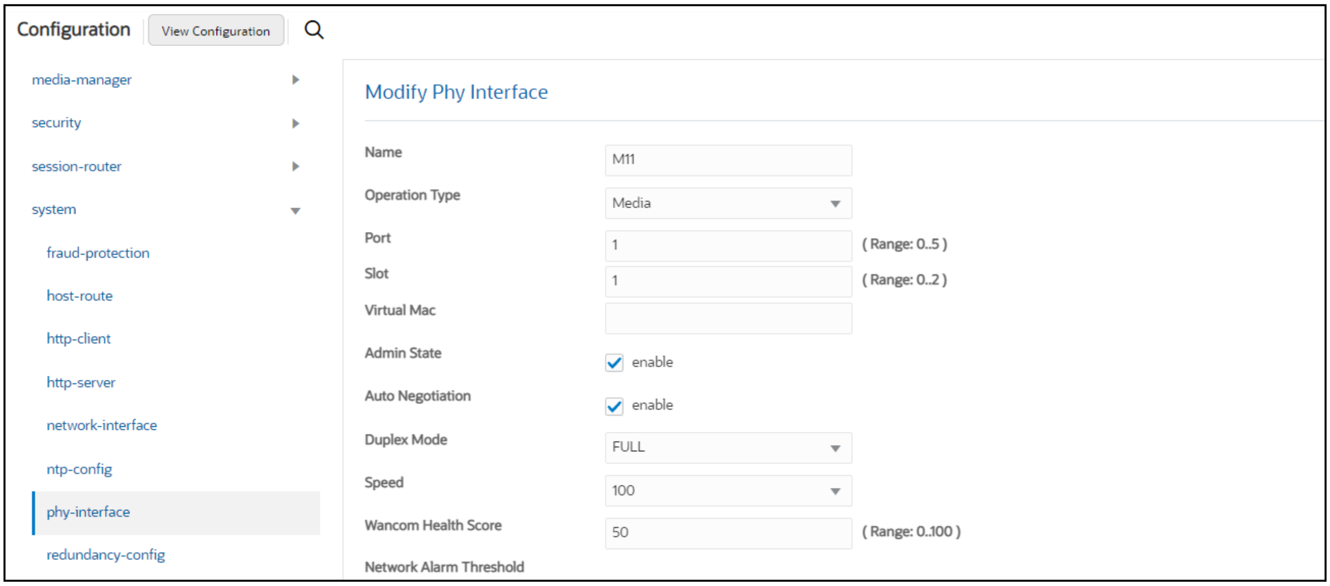
This section provides instructions to establish the communication of DR-SBA with Oracle SBC. In the setup, we are re-using many configuration elements that are already in place for direct routing with Microsoft Teams on the SBC. The document covers the additional steps that are required to configure the Microsoft SBA and enable calling functionality between the SBC and SBA. It is assumed that media bypass has been enabled on the Tenant.

The detailed steps to configure TLS between the Oracle SBC and Microsoft Teams can be referred from Oracle SBC with Microsoft Teams Media Bypass - Enterprise Model Application note https://www.oracle.com/a/otn/docs/OracleSBCwithMSFTTeamsMediaBypassEnabled.pdf

Note : It is assumed the interconnection between Oracle SBC and the Carrier has been implemented and is operational with or without Public internet access. If Oracle SBC is unable to communicate with the Carrier, the PSTN calls will fail. The App note does not provide instructions to implement communication between Oracle SBC and Carrier. Visit our Application Note page which has instructions to internet multiple carriers with Oracle SBC.

7.1 Configure Physical Interface for DR-SBA

To configure physical Interface values,
Navigate to System->phy-interface.
ACLI Path: config t->system->phy-interface
Here we have configured, phy-interface M11 for DR SBA communication.

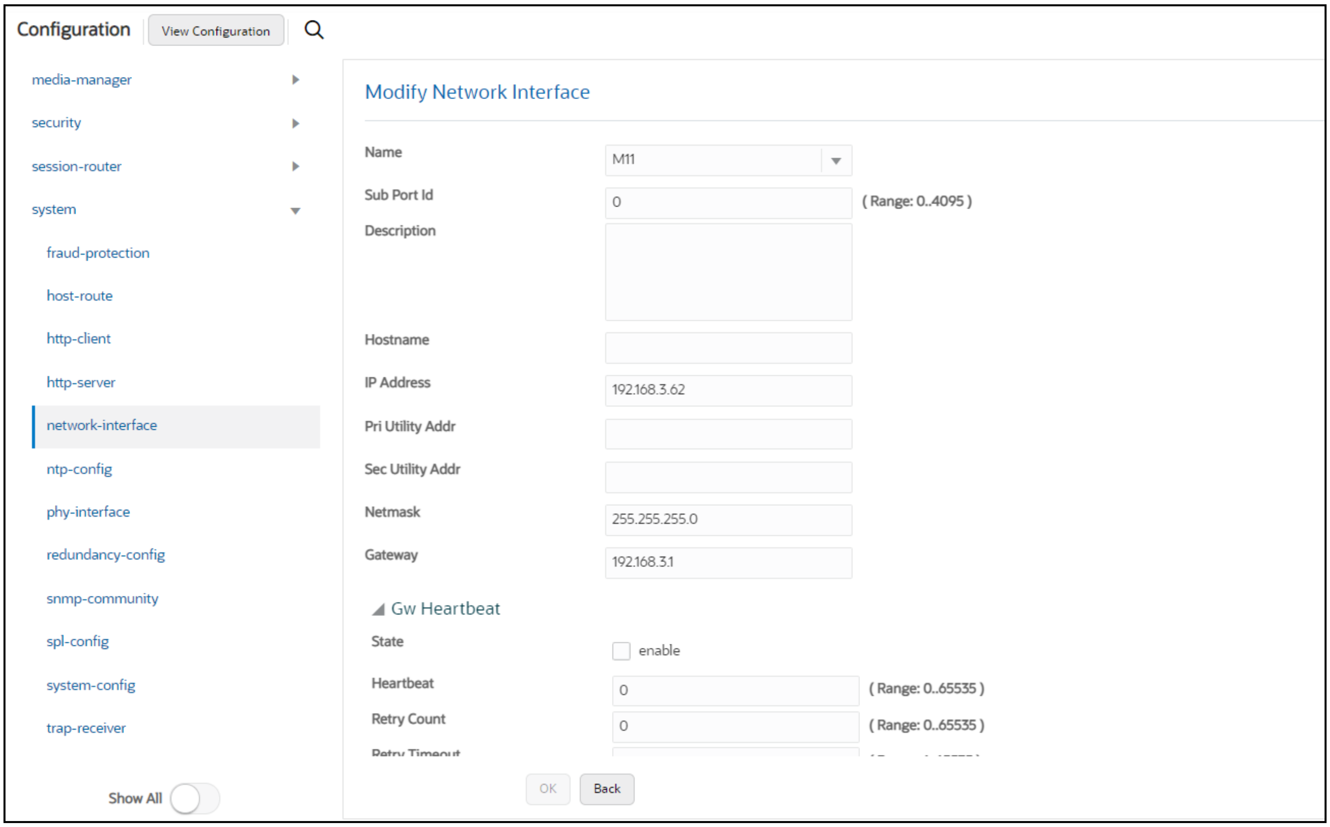


Modify Phy Interface

Name: M11
Operation Type: Media
Port: 1 (Range: 0..5)
Slot: 1 (Range: 0..2)
Virtual Mac:
Admin State: ☑ enable
Auto Negotiation: ☑ enable
Duplex Mode: FULL
Speed: 100
Wancom Health Score: 50 (Range: 0..100)
Network Alarm Threshold

7.2 Configure Network Interface for DR-SBA

To configure network-interface, Navigate to system->Network-Interface.
ACLI Path: config t->system->network-interface
Below Network interface enables the communication between Oracle SBC and DR-SBA.



Modify Network Interface

Name: M11

Sub Port Id: 0 (Range: 0..4095)

Description:

Hostname:

IP Address: 192.168.3.62

Pri Utility Addr:

Sec Utility Addr:

Netmask: 255.255.255.0

Gateway: 192.168.3.1

Gw Heartbeat

State: □ enable

Heartbeat: 0 (Range: 0..65535)

Retry Count: 0 (Range: 0..65535)

Retry Timeout

7.3 Configure Realm for DR-SBA

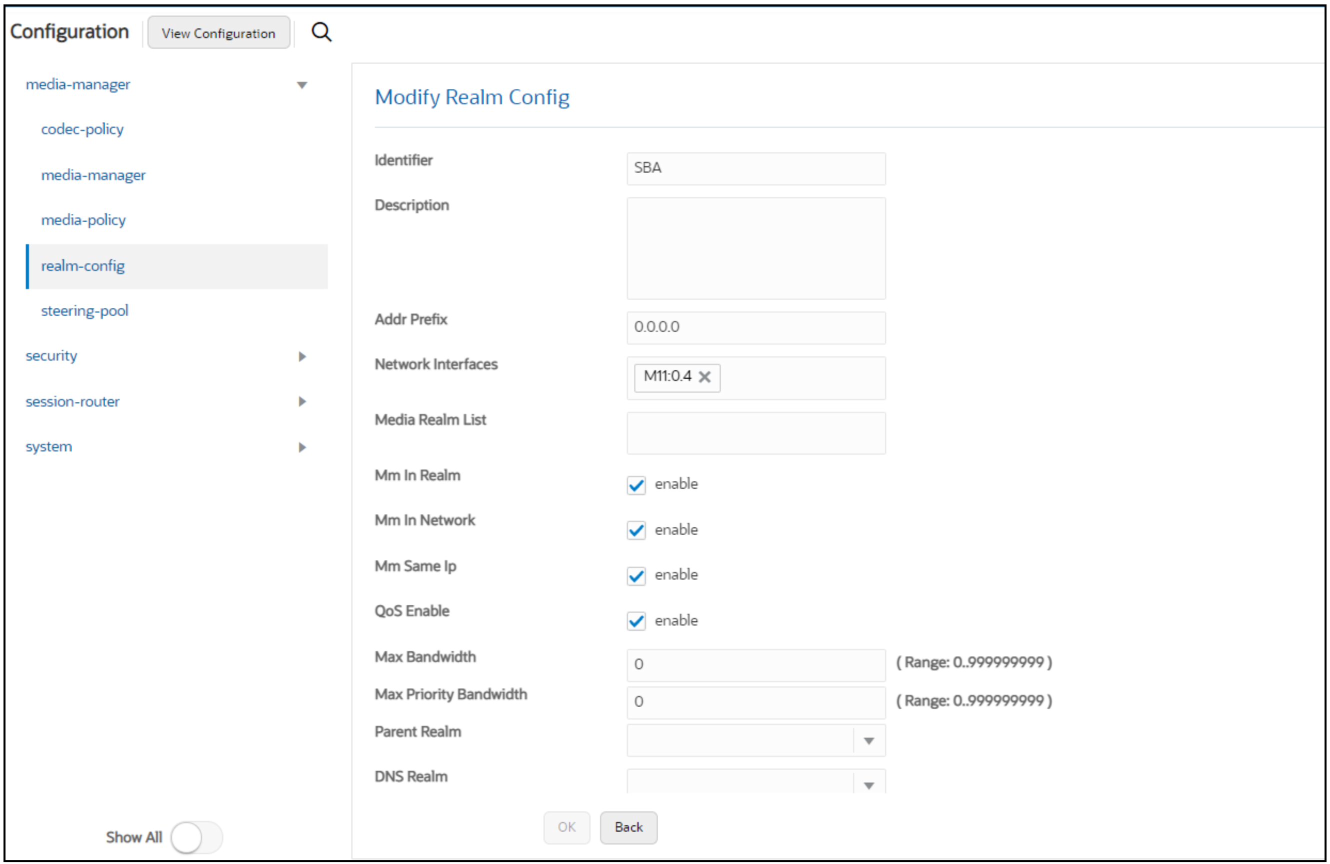
In this step will configure the DR-SBA Realm. Most of the Parameters will align with the Realm configured for communication with Microsoft Sip Proxies on the Teams Realm.

Navigate to media-manager -> realm-config
ACLI Path: config t->media-manger->realm-config

The name of the Realm can be any relevant name according to the user convenience. Use the following table as a configuration example for the three realms used in this configuration:

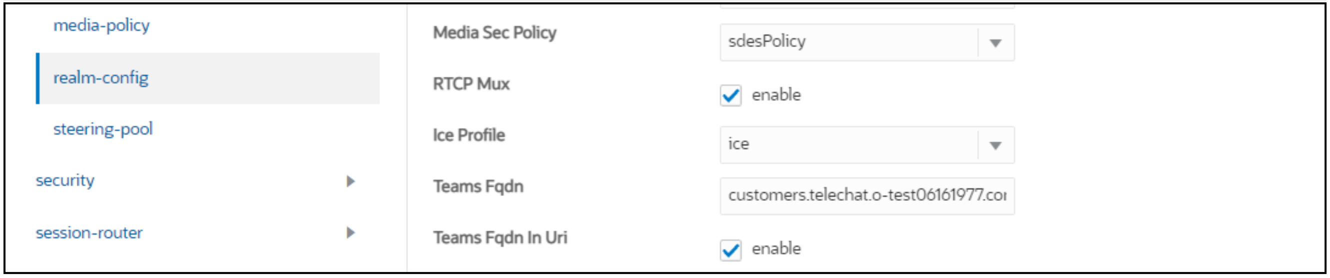
Configuration Parameter	Value
Identifier	SBA
Network Interface	M11
Mm in realm	☑
Access Control Trust Level	High
Media Sec policy	sdesPolicy
rtcp-mux	enabled
ice-profile	Ice

teams-fqdn	telechat.o-test06161977.com
teams-fqdn-in-uri	enabled



Modify Realm Config

Identifier: SBA
Description:
Addr Prefix: 0.0.0.0
Network Interfaces: M11:0.4
Media Realm List:
Mm In Realm: ☑ enable
Mm In Network: ☑ enable
Mm Same Ip: ☑ enable
QoS Enable: ☑ enable
Max Bandwidth: 0 (Range: 0..999999999)
Max Priority Bandwidth: 0 (Range: 0..999999999)
Parent Realm:
DNS Realm:

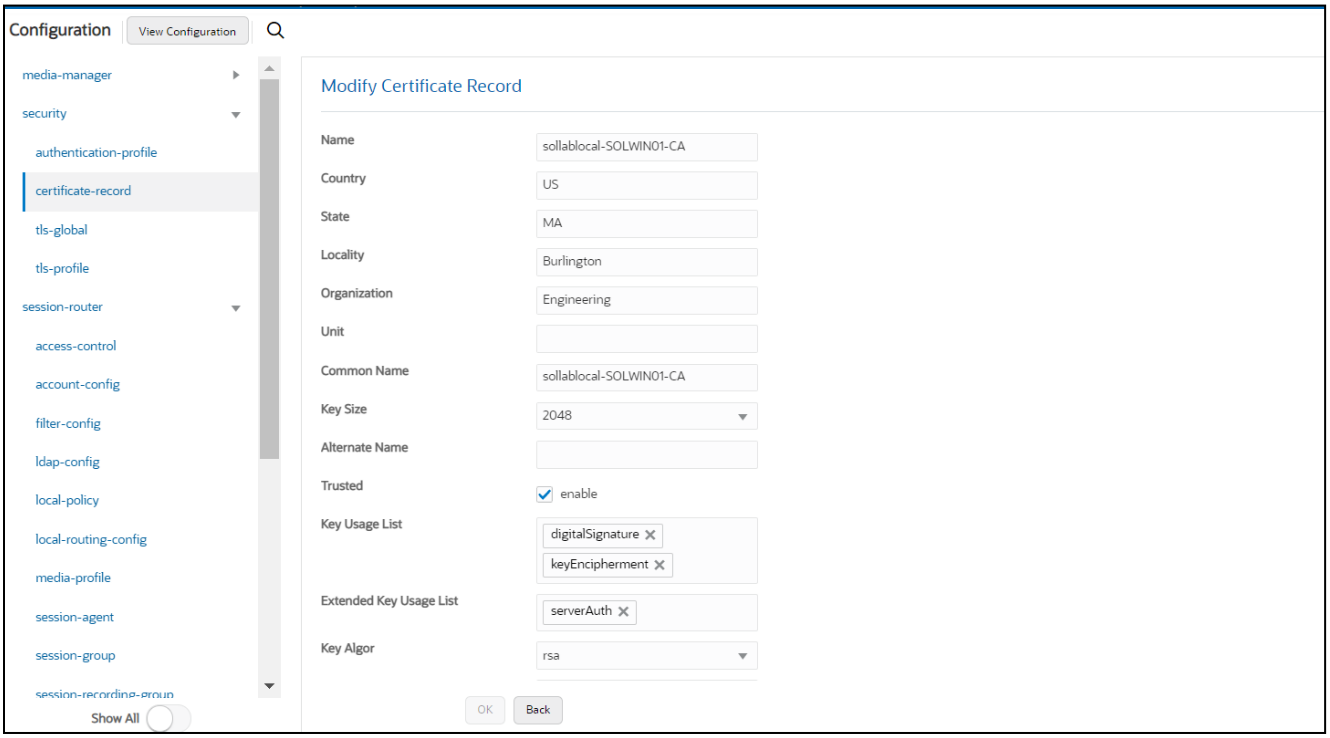


Media Sec Policy: sdesPolicy
RTCP Mux: ☑ enable
Ice Profile: ice
Teams Fqdn: customers.telechat.o-test06161977.coı
Teams Fqdn In Uri: ☑ enable

7.4 Create Microsoft SBA certificate-record

“Certificate-record” are configuration elements on Oracle SBC that captures information for a TLS certificate – such as common-name, key-size, key-usage etc.

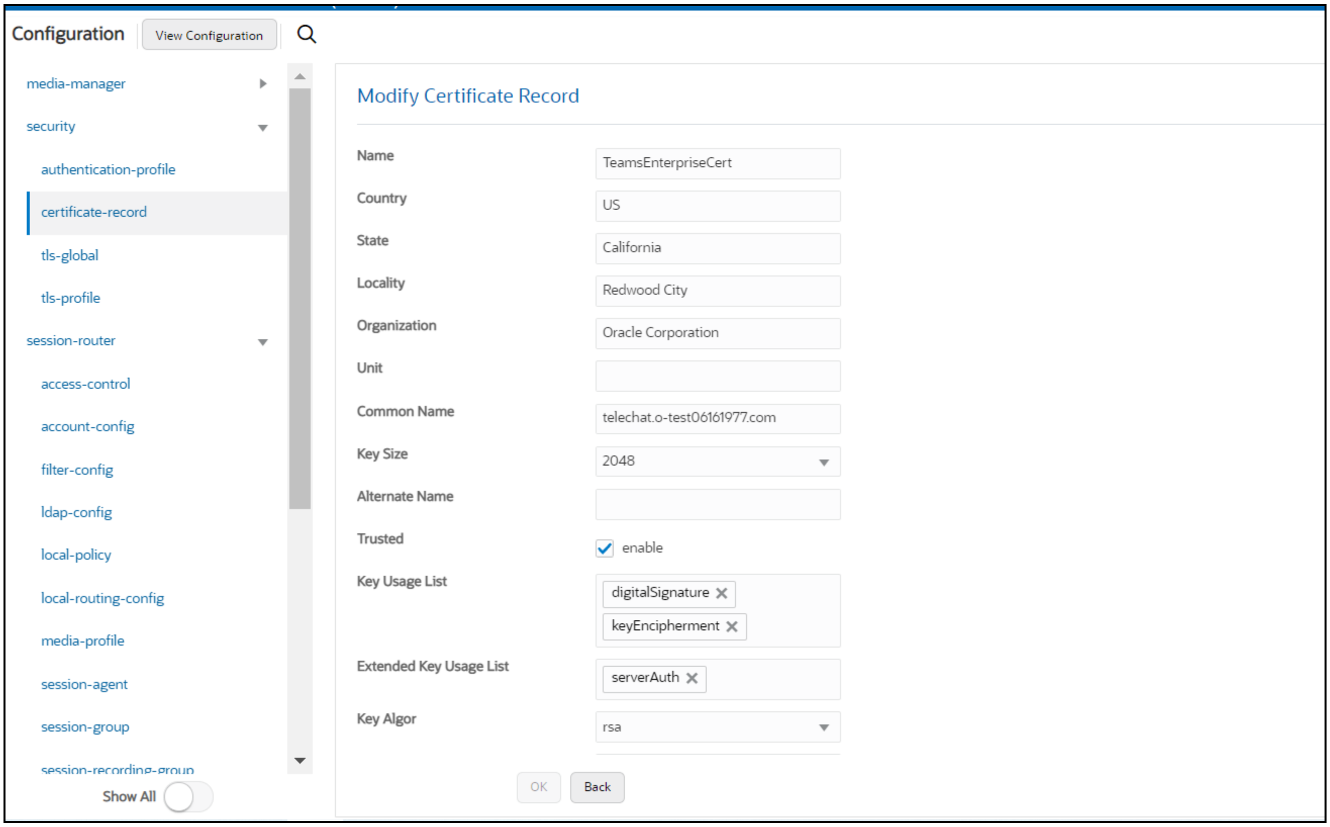
A certificate record must be created on the Oracle SBC for the Microsoft SBA. This is the Certificate record for the Certificate Authority for Microsoft SBA.



Modify Certificate Record

Name	sollablocal-SOLWIN01-CA
Country	US
State	MA
Locality	Burlington
Organization	Engineering
Unit	
Common Name	sollablocal-SOLWIN01-CA
Key Size	2048
Alternate Name	
Trusted	☑ enable
Key Usage List	digitalSignature keyEncipherment
Extended Key Usage List	serverAuth
Key Algor	rsa

Oracle SBC Certificate “TeamsEnterpriseCert” already configured for Direct Routing will be reused in this setup. The certificate is shown below –

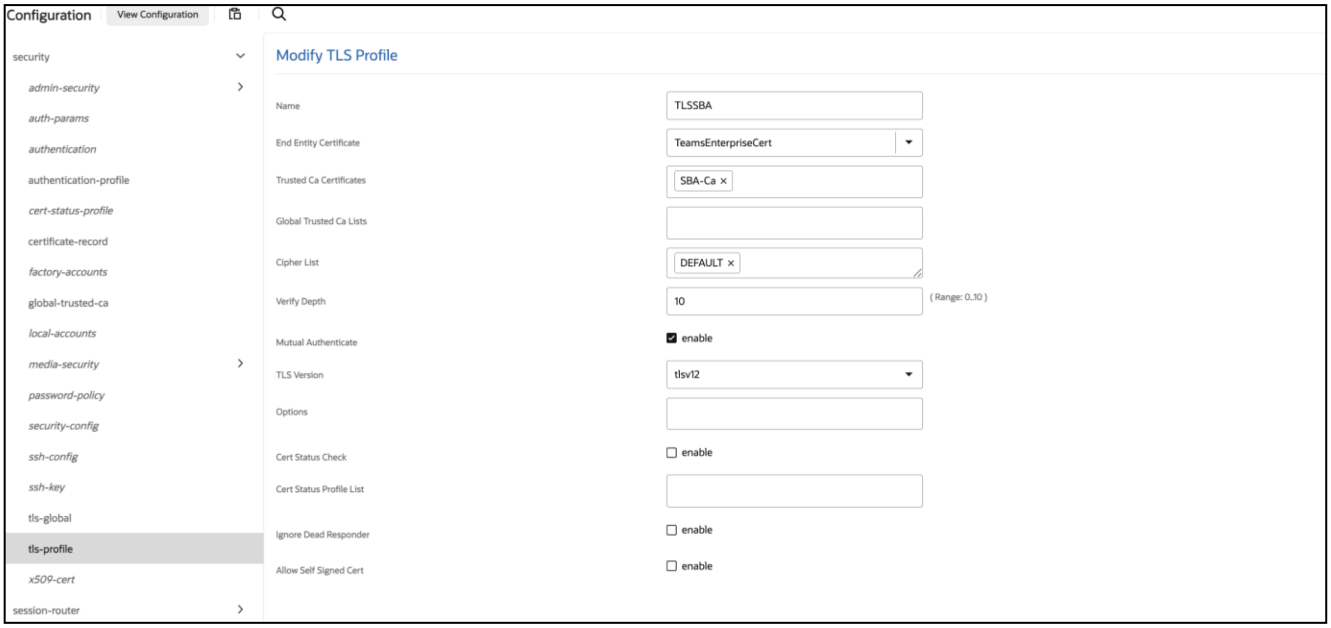


Modify Certificate Record

Name	TeamsEnterpriseCert
Country	US
State	California
Locality	Redwood City
Organization	Oracle Corporation
Unit	
Common Name	telechat.o-test06161977.com
Key Size	2048
Alternate Name	
Trusted	☑ enable
Key Usage List	digitalSignature keyEncipherment
Extended Key Usage List	serverAuth
Key Algor	rsa

7.5 Create DR-SBA TLS Profile.

A TLS profile configuration on the SBC allows specific certificates to be assigned.
Go to security-> TLS-profile configuration element and configure the tls-profile
Below figure illustrates the TLS-Profile created for DR-SBA
Oracle SBC Certificate used to communicate with DR-SBA is present in End Entity Certificate. SBA-CA is added to the trusted Root CA to trust the communication from DR-SBA.



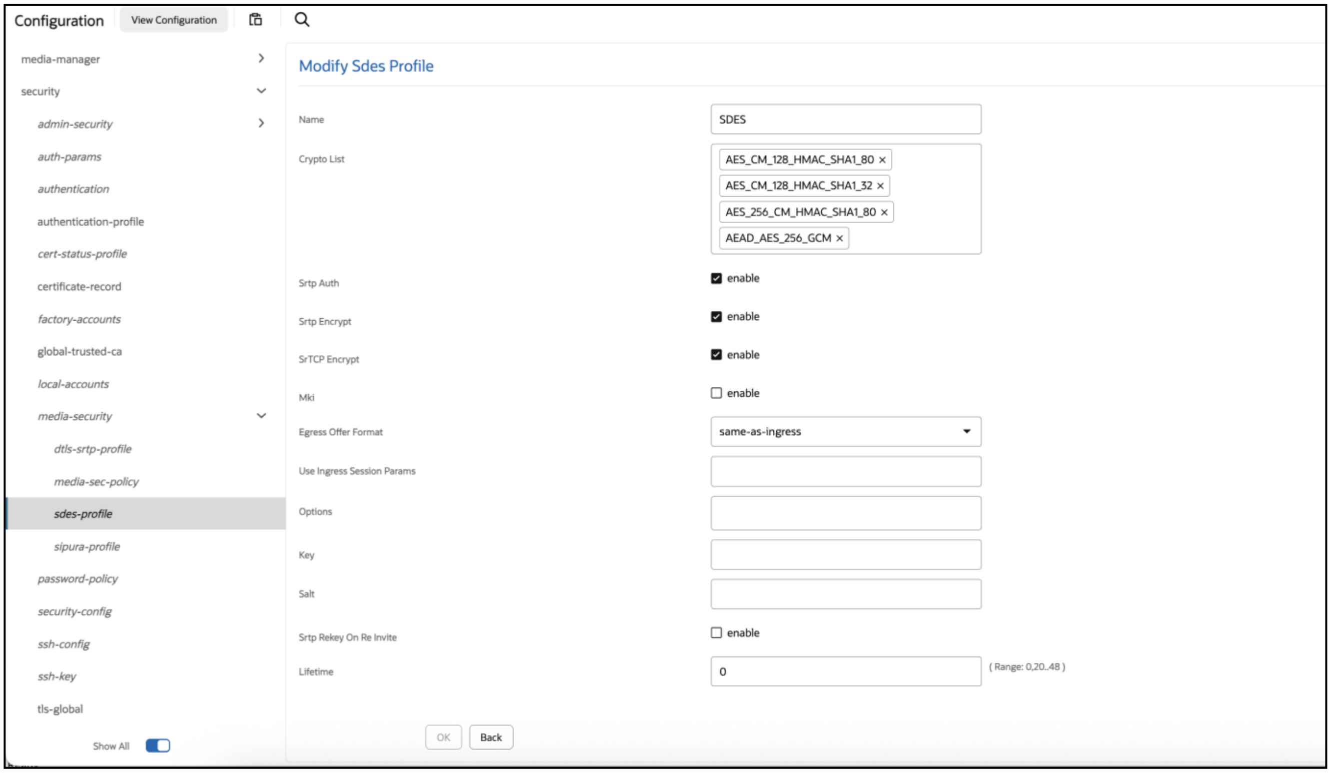
Modify TLS Profile

Name	TLSSBA
End Entity Certificate	TeamsEnterpriseCert
Trusted Ca Certificates	SBA-Ca ×
Global Trusted Ca Lists	
Cipher List	DEFAULT ×
Verify Depth	10 (Range: 0..10)
Mutual Authenticate	☑ enable
TLS Version	tlsv12
Options	
Cert Status Check	☐ enable
Cert Status Profile List	
Ignore Dead Responder	☐ enable
Allow Self Signed Cert	☐ enable

7.6 Media Security

Media between Oracle SBC and the Microsoft SBA Server is secured with SRTP Protocol. To implement SRTP between Oracle SBA and Microsoft SBA we are using the existing SDES-Profile and the media-sec-policy which is used for communication with Microsoft Teams Direct Routing. Please refer to section 6.3.3 of the Oracle SBC with Microsoft Teams Direct Routing for detailed steps to configure SRTP.
Below is the snippet for the sdes-Profile "SDES" and media-sec-policy "sdesPolicy".

7.6.1 SDES Profile



Modify Sdes Profile

Name: SDES

Crypto List: AES_CM_128_HMAC_SHA1_80 × AES_CM_128_HMAC_SHA1_32 × AES_256_CM_HMAC_SHA1_80 × AEAD_AES_256_GCM ×

Srtp Auth: ☑ enable

Srtp Encrypt: ☑ enable

SrTCP Encrypt: ☑ enable

Mki: □ enable

Egress Offer Format: same-as-ingress

Use Ingress Session Params:

Options:

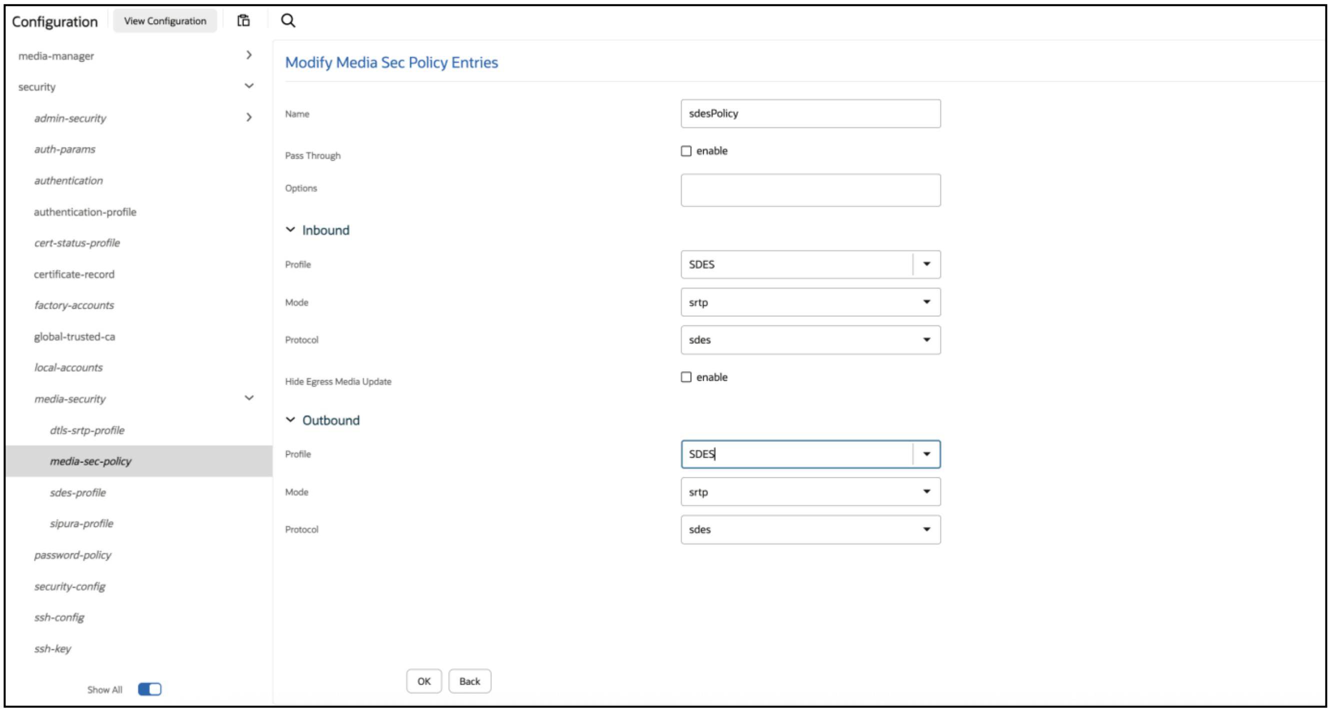
Key:

Salt:

Srtp Rekey On Re Invite: □ enable

Lifetime: 0 (Range: 0,20..48)

7.6.2 Media-sec-policy



Modify Media Sec Policy Entries

Name: sdesPolicy

Pass Through: □ enable

Options:

Inbound

Profile: SDES

Mode: srtp

Protocol: sdes

Hide Egress Media Update: □ enable

Outbound

Profile: SDES

Mode: srtp

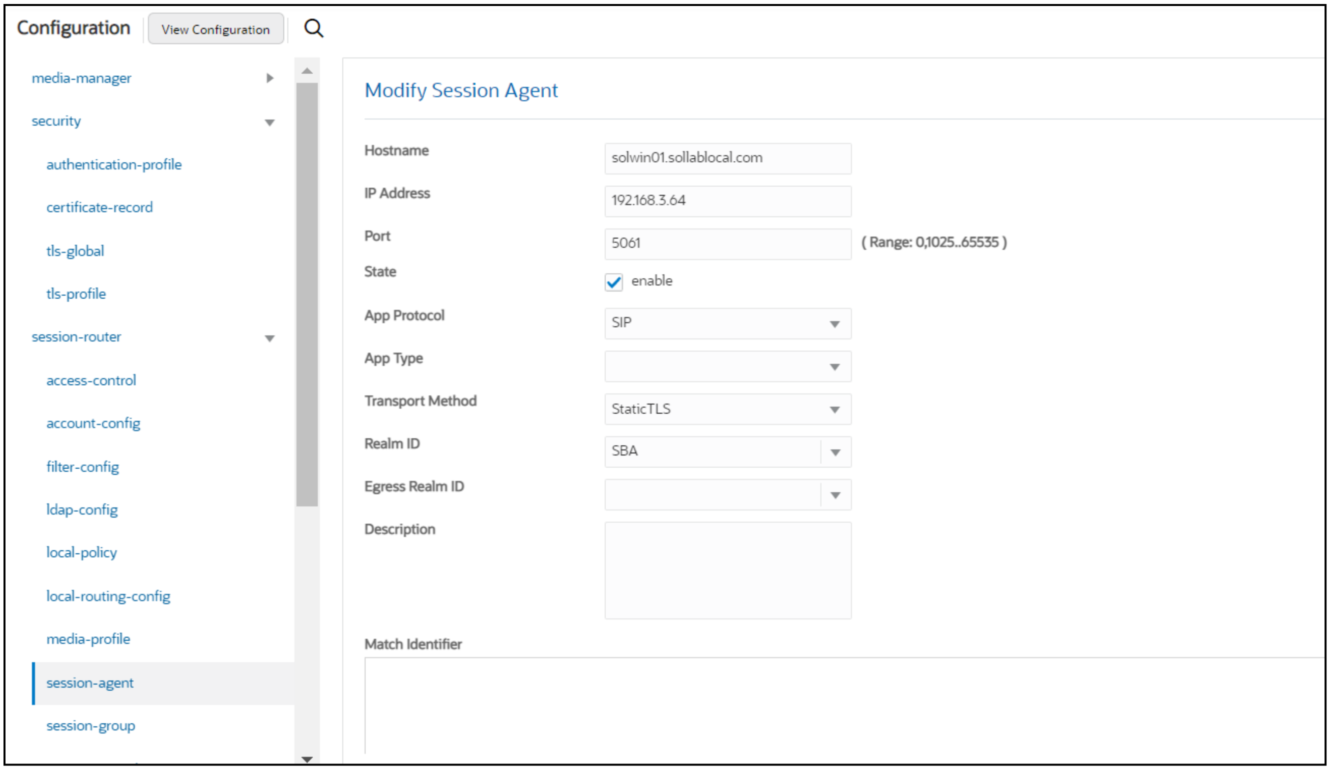
Protocol: sdes

7.7 Configure the SBA Session-Agent

Session-agents are configuration elements, which are trusted agents who can send/receive traffic from the SBC with direct access to trusted data path.
Configure the session-agent for Microsoft SBA with the following parameters.

Go to session-router- >Session-Agent and set the parameters as below-

- Hostname to “FQDN of your SBA Server”
- IP Address to “IP Address of your SBA Server”
- Port 5061
- Realm-id – needs to match the realm created for DR-SBA – in this case – “SBA”
- Transport set to “StaticTLS”
- Ping-method – send OPTIONS message to Microsoft for health check
- Ping-interval to 30 secs
- Ping-response enable
-



Modify Session Agent

Hostname: solwin01.sollablocal.com

IP Address: 192.168.3.64

Port: 5061 (Range: 0,1025..65535)

State: ☑ enable

App Protocol: SIP

App Type:

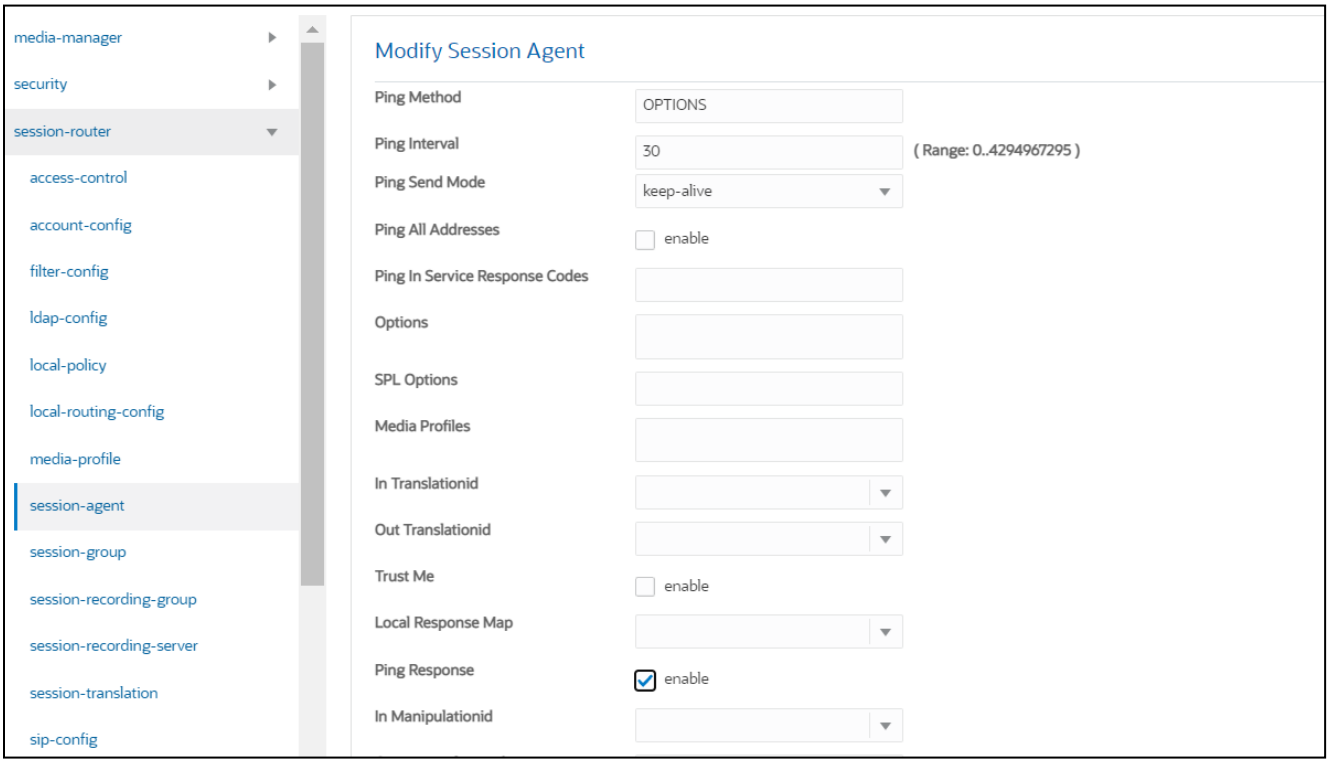
Transport Method: StaticTLS

Realm ID: SBA

Egress Realm ID:

Description:

Match Identifier:



Modify Session Agent

Ping Method	OPTIONS
Ping Interval	30 (Range: 0..4294967295)
Ping Send Mode	keep-alive
Ping All Addresses	□ enable
Ping In Service Response Codes	
Options	
SPL Options	
Media Profiles	
In Translationid	
Out Translationid	
Trust Me	□ enable
Local Response Map	
Ping Response	☑ enable
In Manipulationid	

]Note: Microsoft accepts the OPTIONS ping and other requests in a format as described in the section 4 of the Direct Routing Media Bypass document. Please refer and validate the message format to ensure the signaling is in accepted format required by Microsoft.

Requirements for "OPTIONS" messages syntax

```
OPTIONS sip:solwin01.sollablocal.com:5061;transport=tls SIP/2.0
Via: SIP/2.0/TLS 192.168.3.62:5061;branch=z9hG4bK827nmi1088j8asfav5n0
Call-ID: f6574f99d22a4514dbaad5ff6712cfa70200008gm3000@192.168.3.62
To: sip:ping@solwin01.sollablocal.com
From:<sip:ping@telechat.o-test06161977.com>;tag=dedc857e7c327cff2f2e07600b881da20008gm3
Max-Forwards: 70
CSeq: 1261 OPTIONS
Contact: <sip:ping@telechat.o-test06161977.com:5061;transport=tls>;sip.ice
Expires: 10
Route: <sip:192.168.3.64:5061;lr>
X-MS-SBC: Oracle/NN4600/8.4.0p5A
```

1. **From header** When sending OPTIONS to DR SBA "FROM" header MUST have SBC FQDN in URI hostname:

   Syntax: From: sip: @;tag=....
   If the parameter is not set correctly, the OPTIONS are rejected with "403 Forbidden" message.

2. **Contact Header**. When sending OPTIONS to Teams Hybrid Voice Connectivity Interface "Contact" header should have SBC FQDN in URI hostname along with Port & transport parameter set to TLS.
   Syntax: Contact: sip:
   If the parameter is not set correctly, outbound OPTIONS won't be sent by Teams The above requirements are automatically fulfilled in the referenced build of the software.

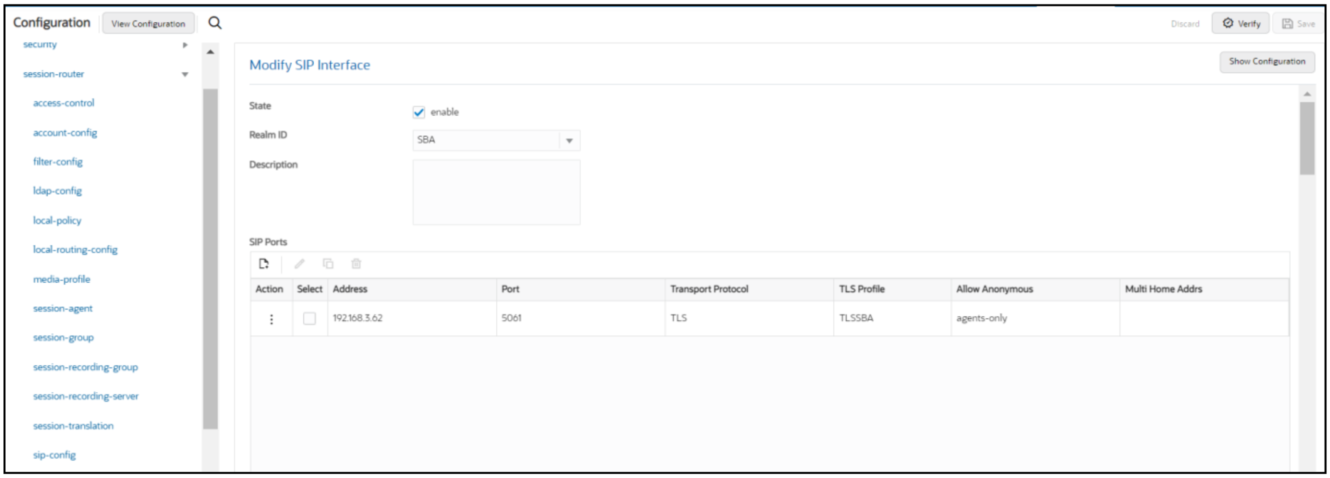
   Configure SIP Interface

7.8 Configure the sip-interface

Navigate to session-router-> sip-interface and configure the sip-interface as shown below.
ACLI Path: config t->session-router->sip-interface

Configure sip-interface for the DR-SBA as below-

- Tls-profile needs to match the name of the tls-profile previously created
- Set allow-anonymous to agents-only to ensure traffic to this sip-interface only comes from the Session agents added to the SBC.



Modify SIP Interface

State ☑ enable

Realm ID SBA

Description

SIP Ports

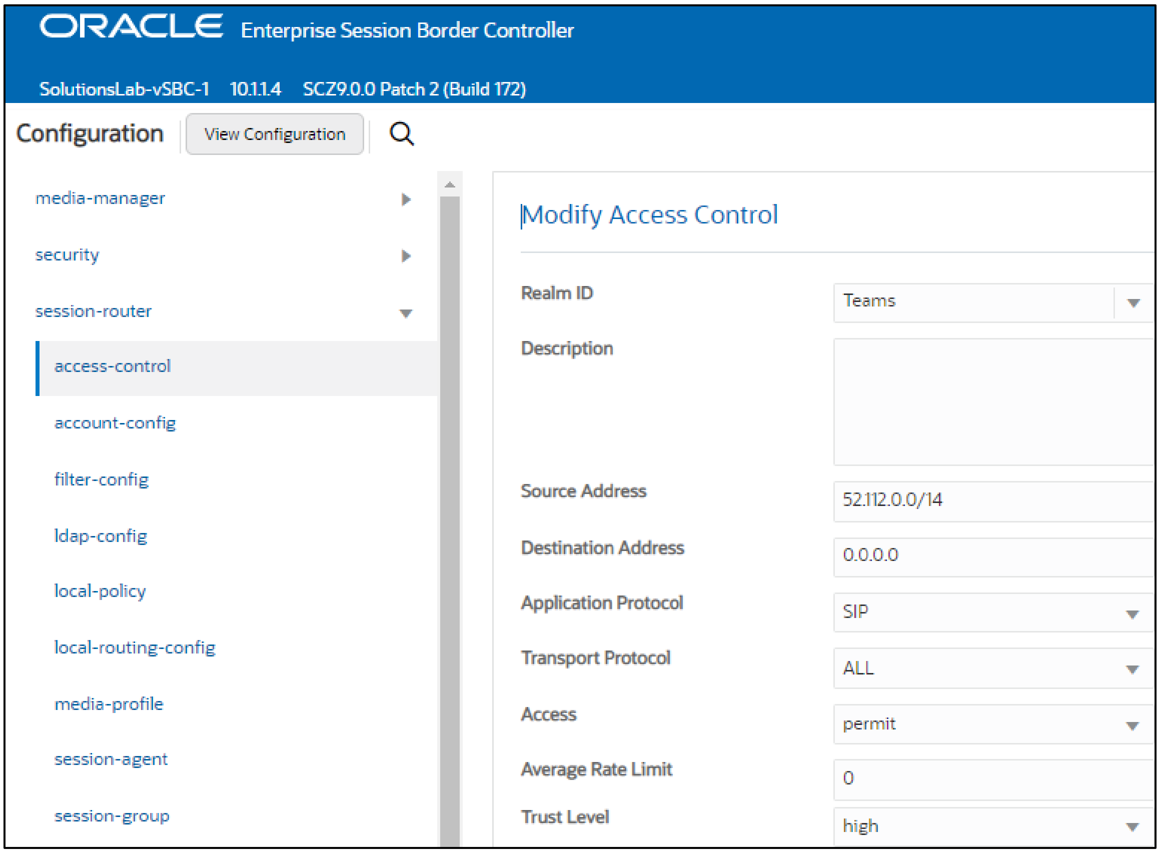
Action	Select	Address	Port	Transport Protocol	TLS Profile	Allow Anonymous	Multi Home Addrs
⋮	□	192.168.3.62	5061	TLS	TLSSBA	agents-only	

7.9 Configure access-control

Microsoft Teams has two subnets, 52.112.0.0/14 and 52.120.0.0/14 that must be allowed to send traffic to the SBC.Both must be configured as an access control on the Oracle SBC and associated with the realm facing Teams.

Note- This section only applies to the communication between Microsoft Cloud SIP proxies in the Cloud and not the Local DR SBA. If needed you can create access control for communication with DR-SBA.

GUI Path: session-router/access-control
Use this example to create ACL's for both MSFT Teams subnets, 52.112.0.0/14, and 52.120.0.0/14.



Modify Access Control

Realm ID	Teams
Description	
Source Address	52.112.0.0/14
Destination Address	0.0.0.0
Application Protocol	SIP
Transport Protocol	ALL
Access	permit
Average Rate Limit	0
Trust Level	high

- Select OK at the bottom

To configure access control from ACLI

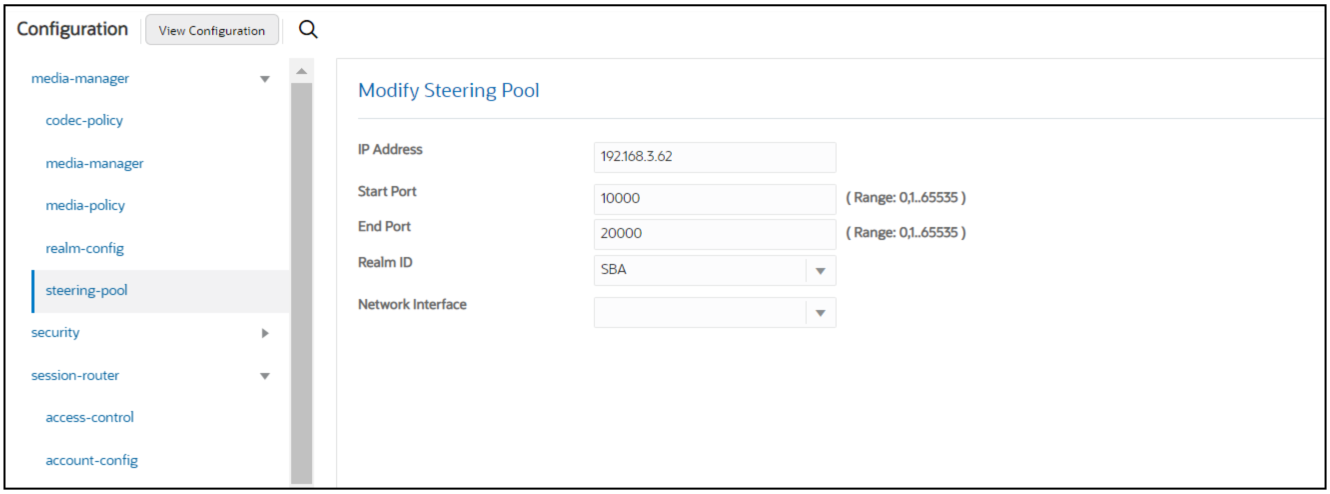
- Perform a save and activate configuration for changes to take effect.

7.10 Configure steering-pool

Steering-pool config allows configuration to assign IP address(s), ports & a realm. They define sets of ports that are used for steering media flows through the Oracle SBC. These selected ports are used to modify the SDP to cause receiving session agents to direct their media toward this system.

Navigate to GUI Path: media-manger->steering-pool
ACLI Path: config t->media-manger->steering-pool

Configure a Steering pool for DR-SBA as below -



Modify Steering Pool

IP Address 192.168.3.62

Start Port 10000 (Range: 0,1..65535)

End Port 20000 (Range: 0,1..65535)

Realm ID SBA

Network Interface

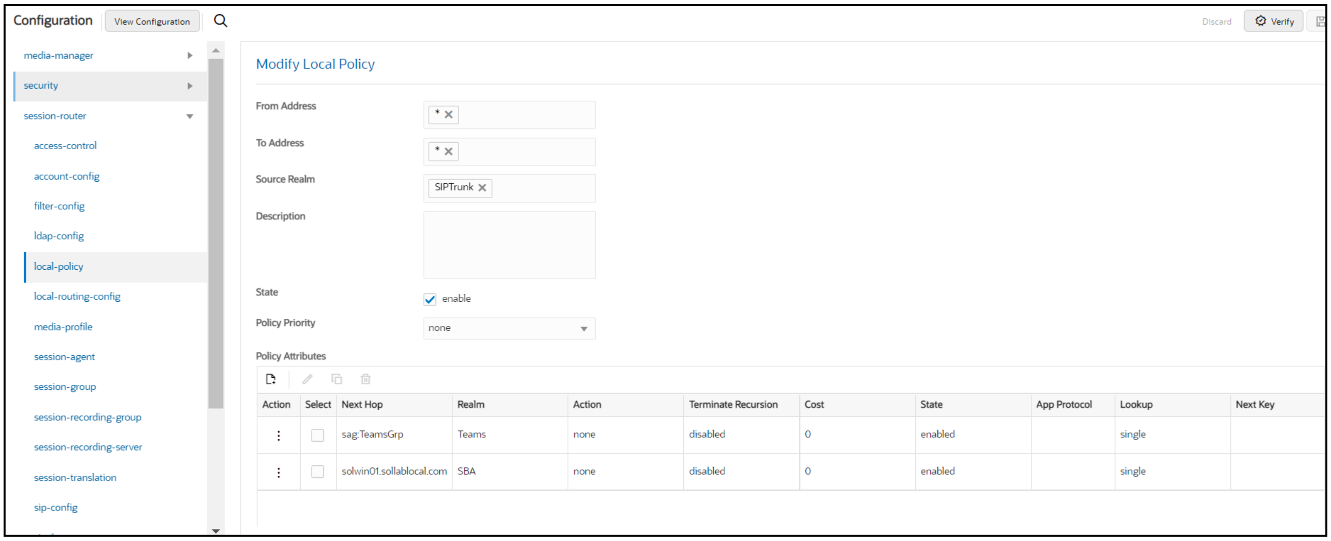
7.10 Modification to local-policy

7.10.1 Outbound calls to Microsoft

Microsoft SBA is configured to accept calls in case of connectivity with Office 365 goes down, to achieve this Microsoft SBA is defined as an additional hop to the local-policy which is used to route calls from PSTN to Microsoft 365.

The existing local-policy routes the PSTN calls to the sag:TeamsGrp, which contains Microsoft SIP proxy FQDNs.
sip.pstnhub.microsoft.com
sip2.pstnhub.microsoft.com
sip3.pstnhub.microsoft.com

This local-policy is modified with Microsoft SBA Session-Agent “solwin01.sollablocal.com” defined as an additional next hop.
”solwin01.sollablocal.com” is the FQDN of the Oracle Lab Microsoft SBA Server that resolves to its communication IP address. Calls upon failure through O365 will be routed to DR-SBA as configured.
Below is the snippet of the modified local-policy. Microsoft returns a “480 Temporarily Unavailable” when the O365 endpoints fail to complete the call. After trying all the hops, the call is connected via Microsoft SBA Server.
Terminate recursion parameter should be disabled on the local-policy for SBC to try all the hops.
Stop recurse: parameter on the session-agent/sip-interface should not contain a 480-cause code, as this would result to failure of calls.



Modify Local Policy

From Address: * ×

To Address: * ×

Source Realm: SIPTrunk ×

Description:

State: ☑ enable

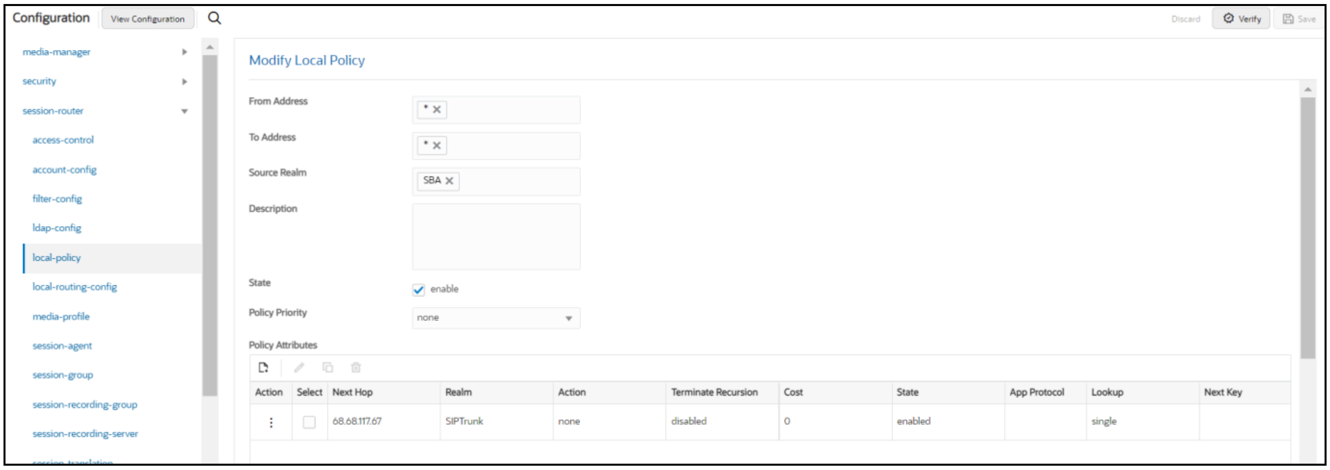
Policy Priority: none

Policy Attributes

Action	Select	Next Hop	Realm	Action	Terminate Recursion	Cost	State	App Protocol	Lookup	Next Key
⋮	□	sag:TeamsGrp	Teams	none	disabled	0	enabled		single	
⋮	□	solwin01.sollablocal.com	SBA	none	disabled	0	enabled		single	

7.10.2 Inbound calls from Microsoft

Inbound calls from DR-SBA are routed to the PSTN from the SIP Trunk. Below is the snippet of Lab Local Policy for reference.



Modify Local Policy

From Address: * ×

To Address: * ×

Source Realm: SBA ×

Description:

State: ☑ enable

Policy Priority: none

Policy Attributes

Action	Select	Next Hop	Realm	Action	Terminate Recursion	Cost	State	App Protocol	Lookup	Next Key
⋮	□	68.68.117.67	SIPTrunk	none	disabled	0	enabled		single	

Note – It is important for the dialed number to be in the exact same format as configured for the Direct Routing calls. So that SBA to perform the User Number lookup in its database, hence do ensure to include the session-translations, sip-manipulation on the SBA Ream/Sip-Interface if you have configured any for direct routing calls.

8. DR SBA troubleshooting

This section lists some troubleshooting steps on DR-SBA -

8.1 There is no TLS connection between SBC and SBA.

Check Filewall rules of SBC and SBA VMs. SBA uses port 5061 for SIP Signalling (tls over tcp)

8.2 SIP OPTIONS are answered with 503 or not answered and in logs you found “No trunks found”

a. Check that you added proper tenantId and userId into SBA general configuration
b. Check, that SBC is registered as Gateway in your tenant (New/Get-CsOnlinePSTNGateway)
c. Ensure, From header uses SBC Fqdn
d. Ensure Record-Route header presented and uses SBC Fqdn OR Contact header presented and uses SBC Fqdn as well.

8.3 When trying inbound call you get 404 “User not found”

To get calls working, user must sign into teams client which is connected to SBA (register on SBA) otherwise, SBA does not have any information about users.This is controlled by

Grant- CsTeamsSurvivableBranchAppliancePolicy -PolicyName CPH -Identity user@contoso.dk

8.4 Collecting Teams Client Logs –

The following article from Microsoft provides instructions on Teams client logs collection.

https://learn.microsoft.com/en-us/microsoftteams/log-files

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