# Oracle SBC with Microsoft Survivable Branch Appliance

**Technical Application Note**

## Disclaimer

The following is intended to outline our general product direction. It is intended for information purposes only and may not be incorporated into any contract. It is not a commitment to deliver any material, code, or functionality, and should not be relied upon in making purchasing decisions. The development, release, and timing of any features or functionality described for Oracle's products remains at the sole discretion of Oracle.

## 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<br>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 |

# Contents

# 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 ESBC with Microsoft Teams Media Bypass - Enterprise Model** 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 4 of the document "Planning Direct Routing" to understand the requirements related to Tenant Licensing and FQDN requirements.

https://www.oracle.com/a/otn/docs/OracleSBCwithMSFTTeamsMediaBypassEnabled.pdf

# 3 Related Documentation

## 3.1 Oracle Documentation –

https://www.oracle.com/a/otn/docs/OracleSBCwithMSFTTeamsMediaBypassEnabled.pdf

https://docs.oracle.com/en/industries/communications/enterprise-session-bordercontroller/8.4.0/configuration/esbc_scz840_configuration.pdf

https://docs.oracle.com/en/industries/communications/session-bordercontroller/8.4.0/security/sbc_scz840_security.pdf

## 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

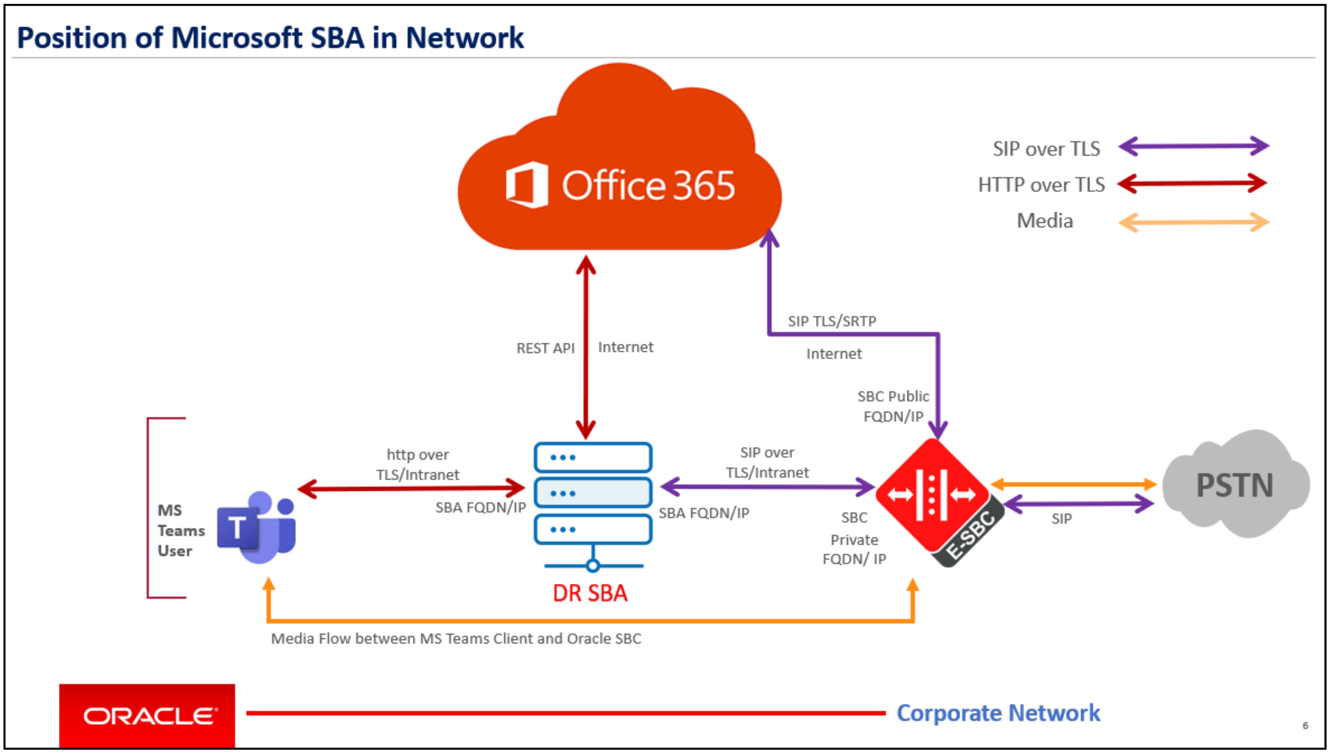
https://docs.microsoft.com/en-us/microsoftteams/direct-routing-configure

# 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.


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

## 4.2 Available calling functionality in offline mode

When the Microsoft Teams client is in offline mode, the following calling related functionality is available:

- Making PSTN calls via local SBA/SBC with media flowing via the SBC
- Receiving PSTN calls via local SBA/SBC with media flowing via the SBC
- Hold & Resume of PSTN calls

# 5. Set Up Requirements

## 5.1 Oracle SBC

Microsoft SBA has been successfully tested and validated with the Oracle SBC running the Software release **SCZ900**. 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
- 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 Framework 4.8 and C++ redistributable v14** to be installed as prerequisites on the Windows Server. TLS1.2 should be enabled on the Server to support DR-SBA TLS requirements.

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 Vcpus 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 |

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.

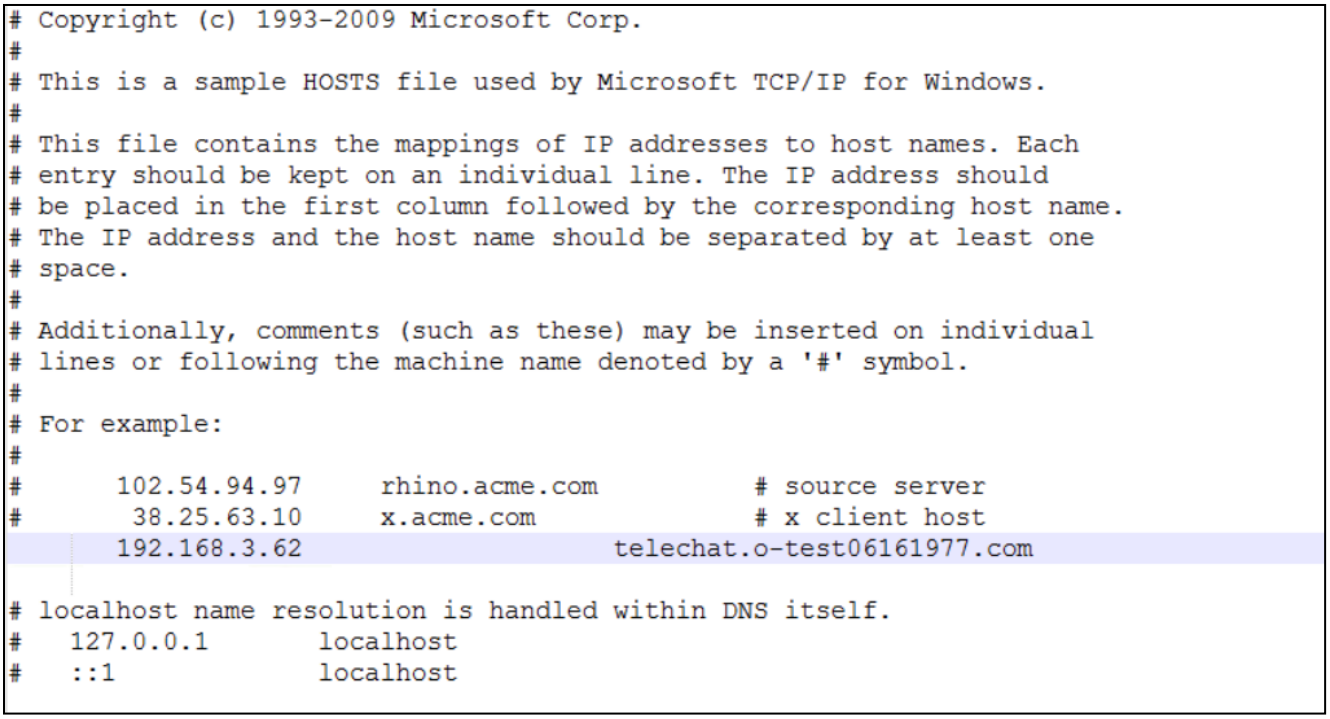
## 5.5 DNS Resolution

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. 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.

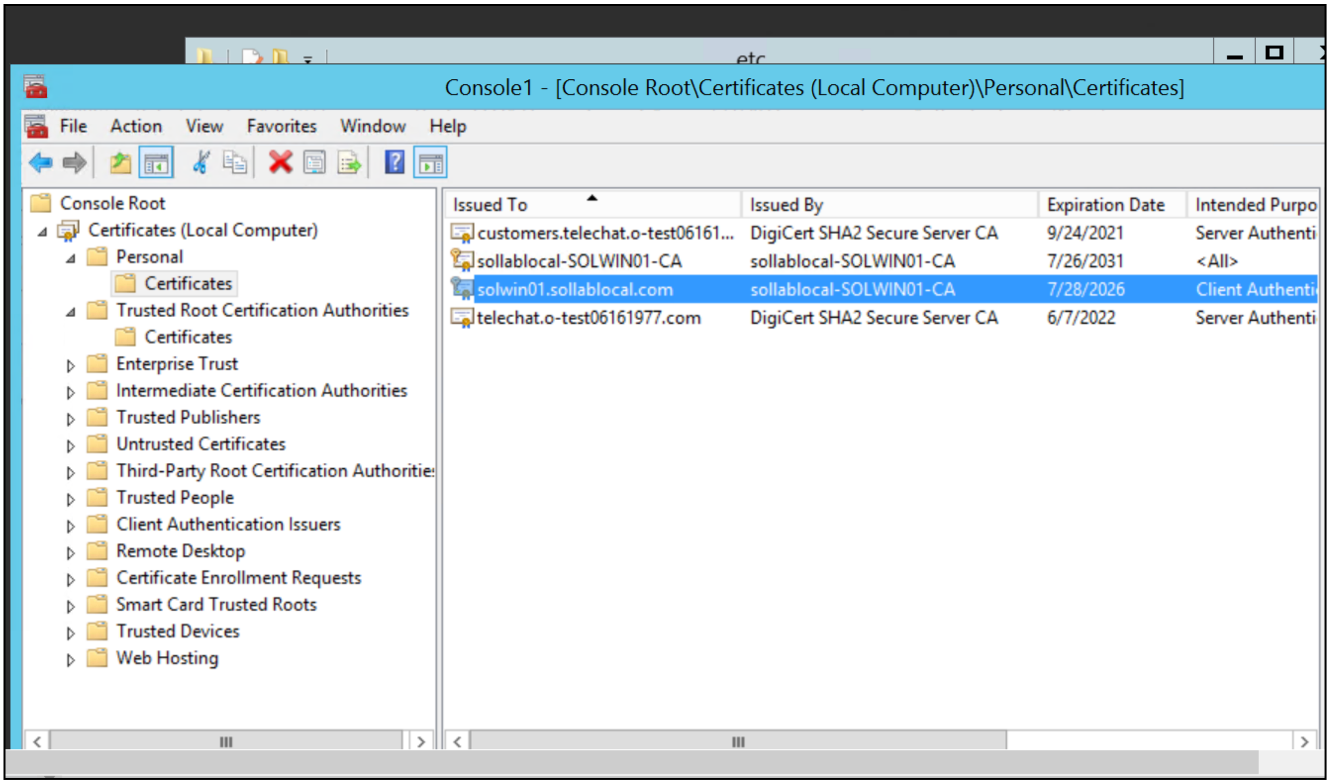
## 5.6 TLS Certificates

SBA communicates with Oracle SBC and Teams Client over TLS 1.2 Transport Protocol. 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.



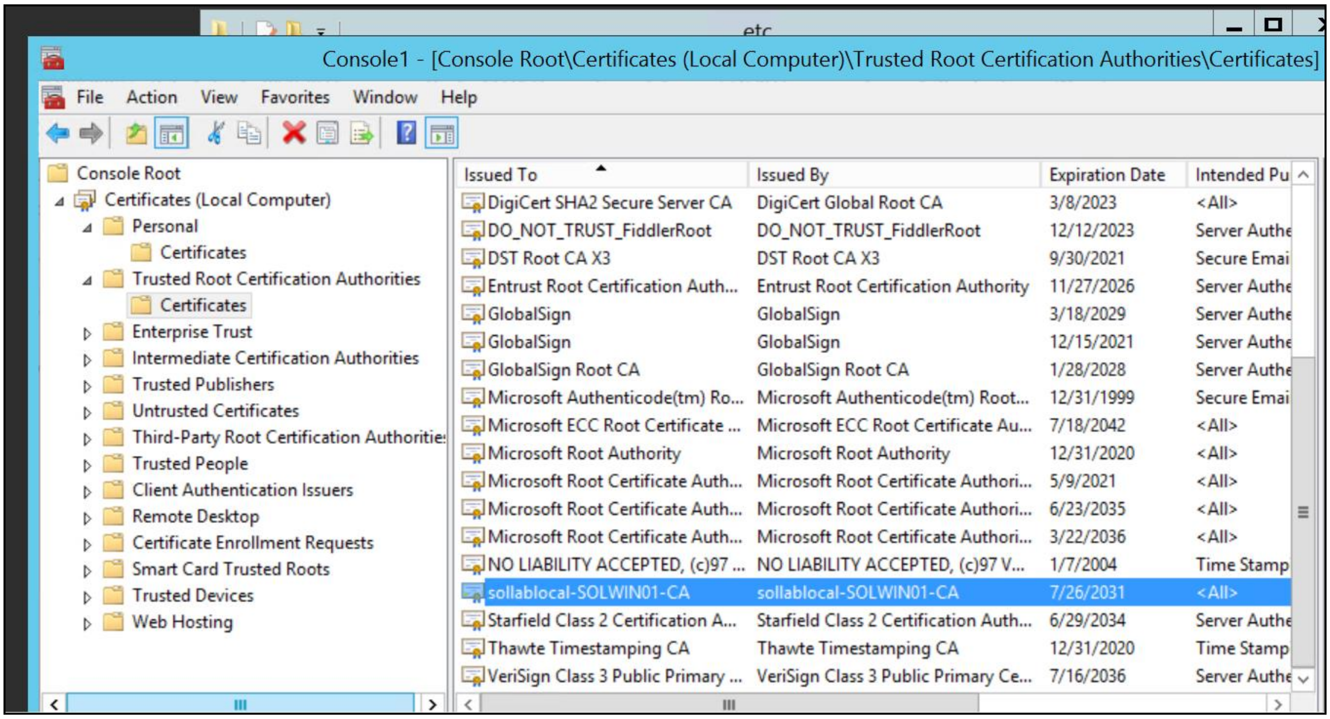
etc
Console1 - [Console Root\Certificates (Local Computer)\Personal\Certificates]
File
Action
View
Favorites
Window
Help

- 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.


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

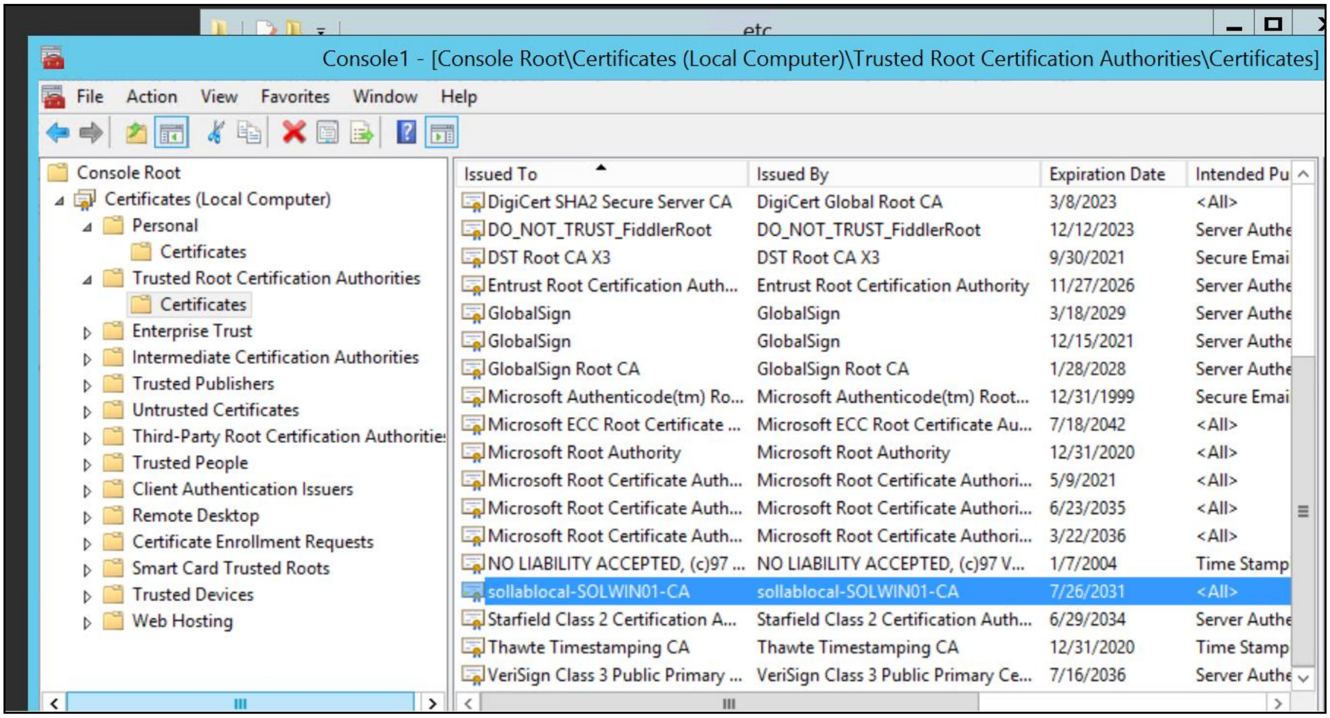
- Console Root
  - Certificates (Local Computer)
    - Personal
      - Certificates
    - Trusted Root Certification Authorities
      - Certificates
    - Enterprise Trust
    - Intermediate Certification Authorities
    - Trusted Publishers
    - Untrusted Certificates
    - Third-Party Root Certification 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 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
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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 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 -

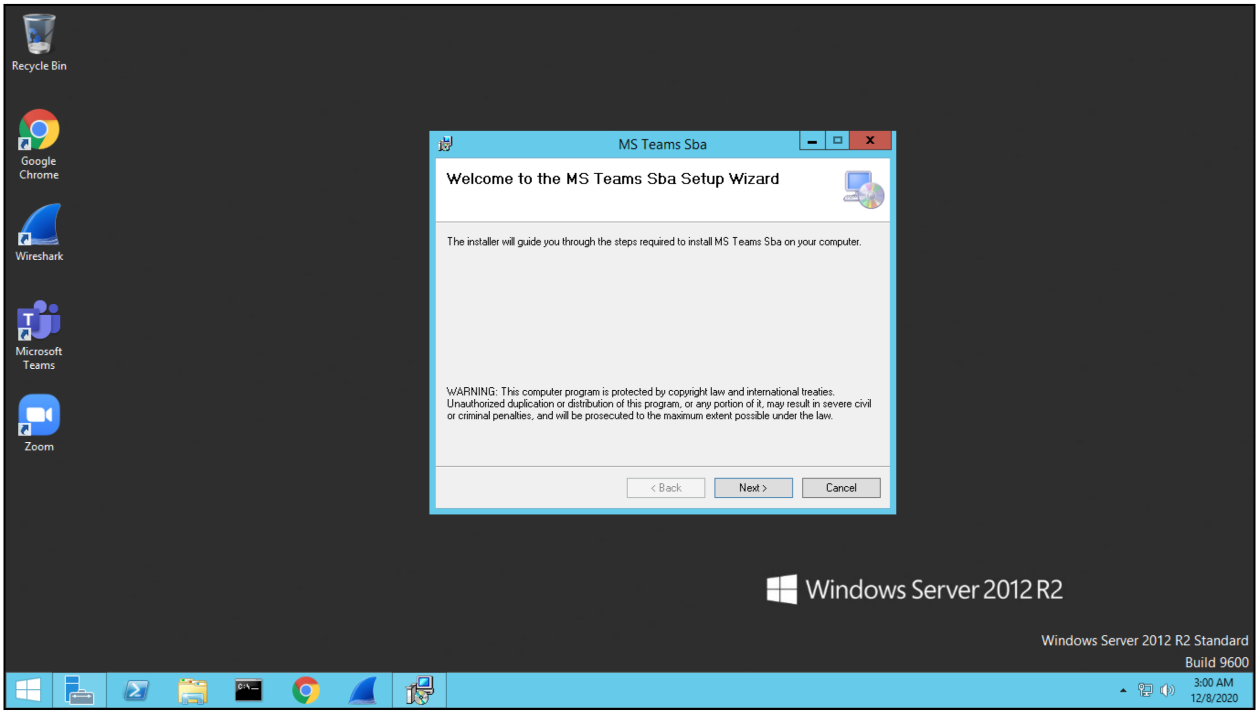
- Install the Microsoft SBA Application
- Create Azure Active Directory SBA Application
- Microsoft SBA API Configuration
- Configure Direct Routing Survivable Branch Appliance (SBA) in Microsoft 365

## 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.

Please follow below snapshots for reference –

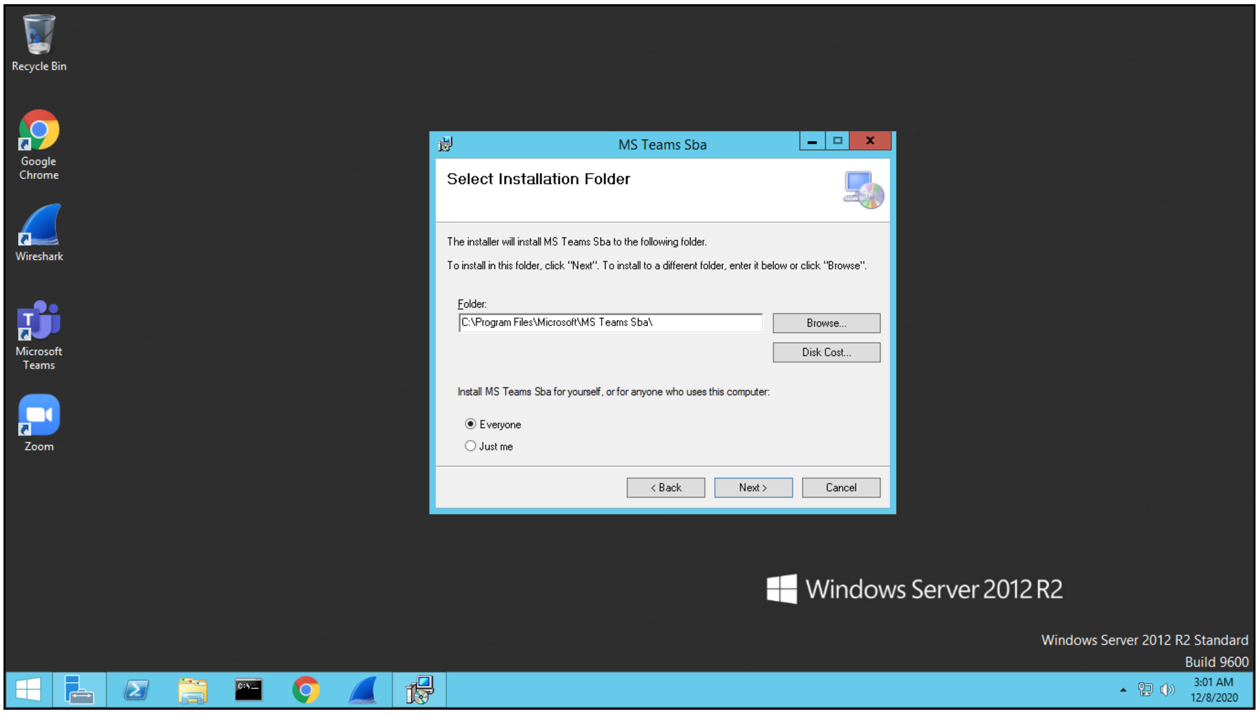


MS Teams Sba

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

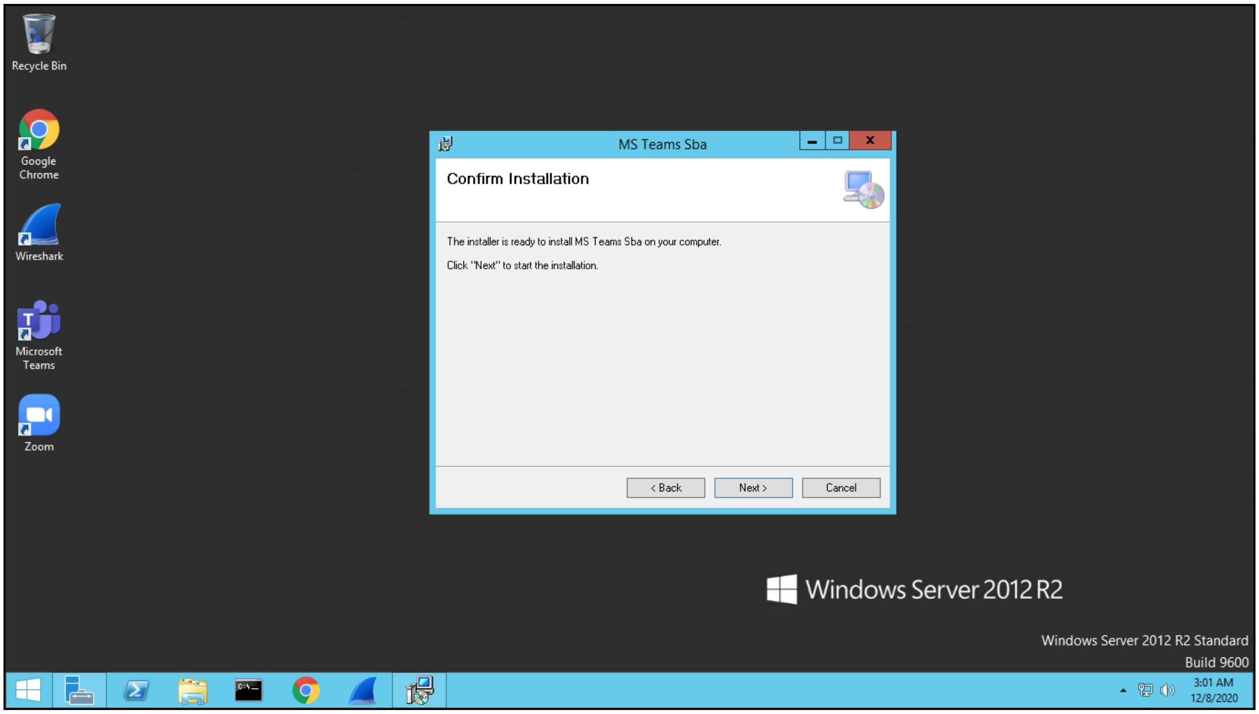
The installer will install MS Teams Sba to the following folder.

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

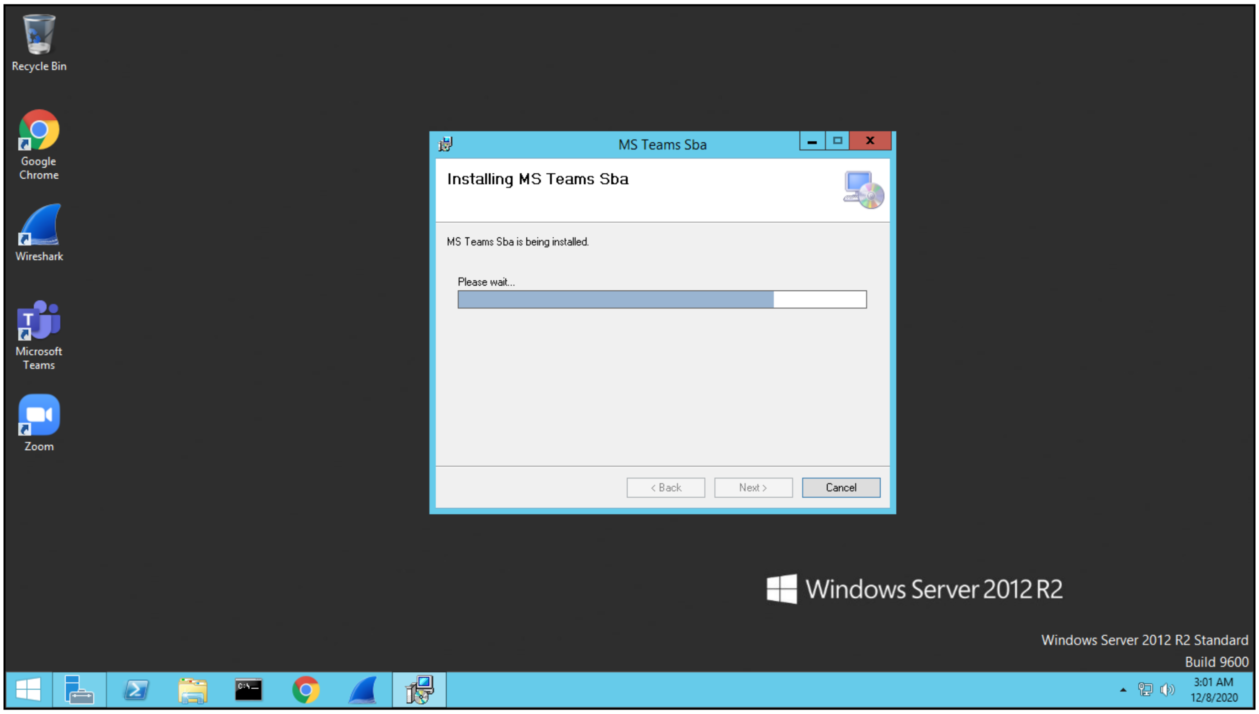


Confirm Installation

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

Click "Next" to start the installation.

Windows Server 2012 R2 Standard
Build 9600

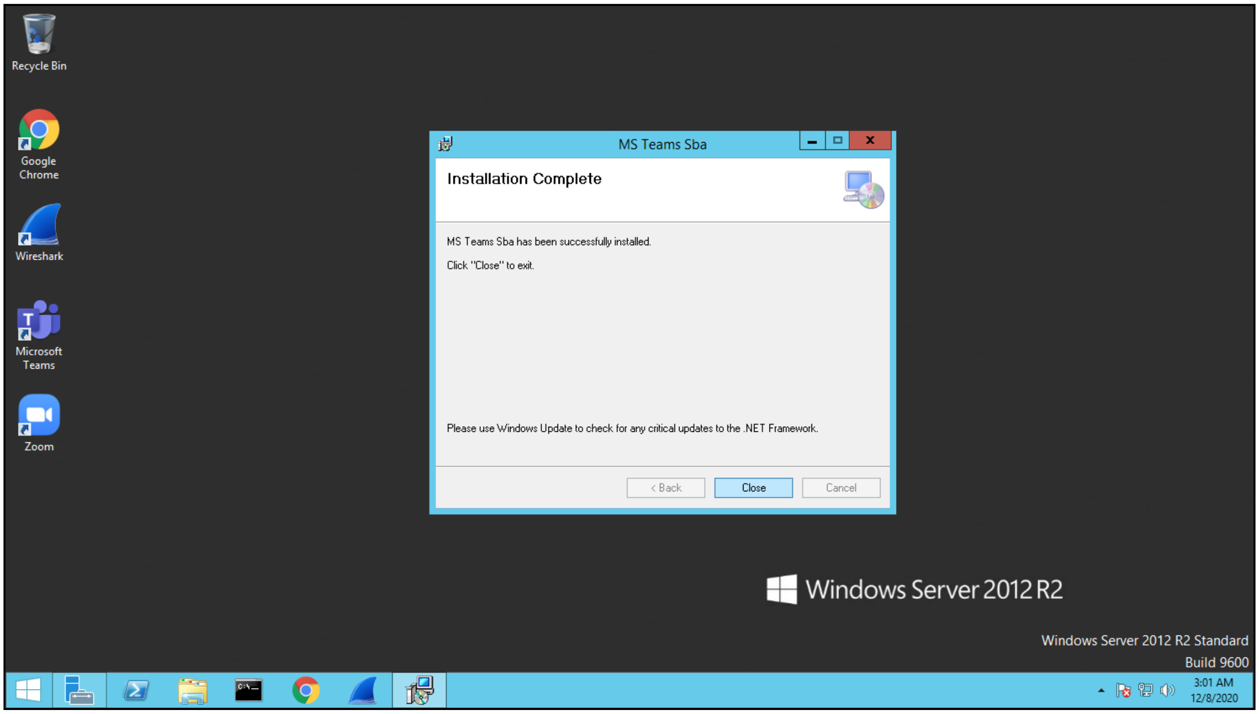


Installing MS Teams Sba

MS Teams Sba is being installed.

Please wait...

Windows Server 2012 R2 Standard
Build 9600



MS Teams Sba

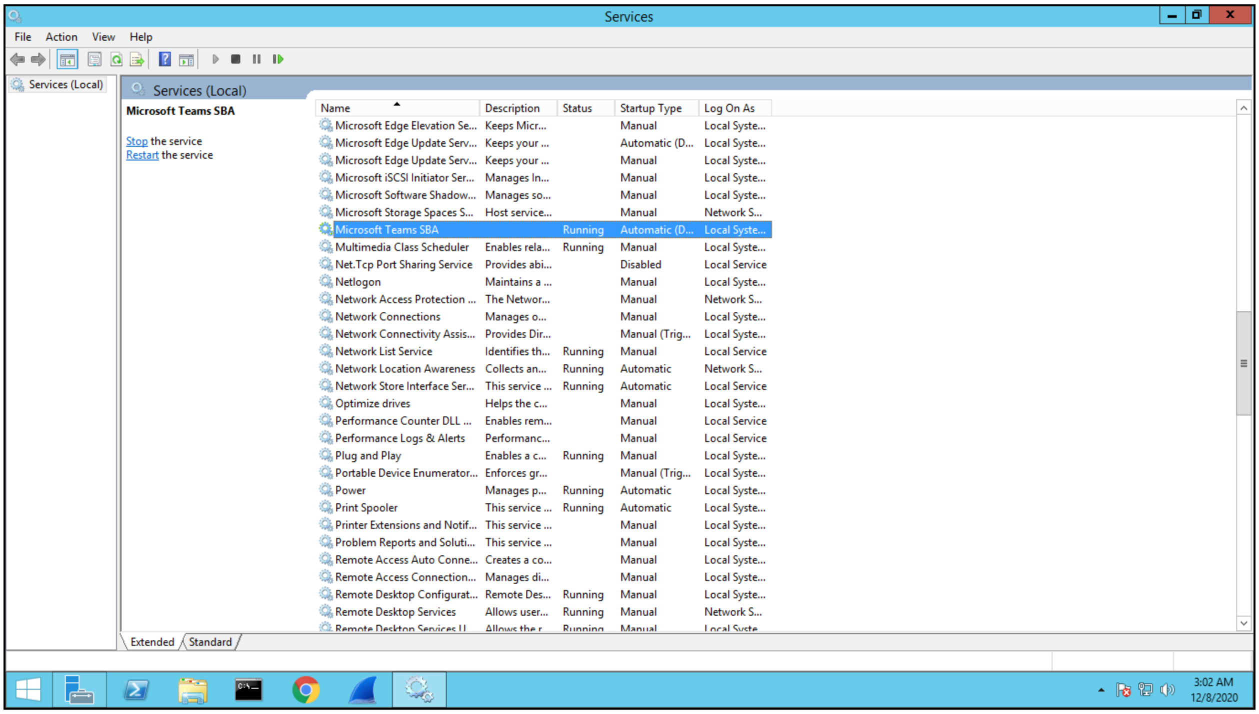
Installation Complete

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:

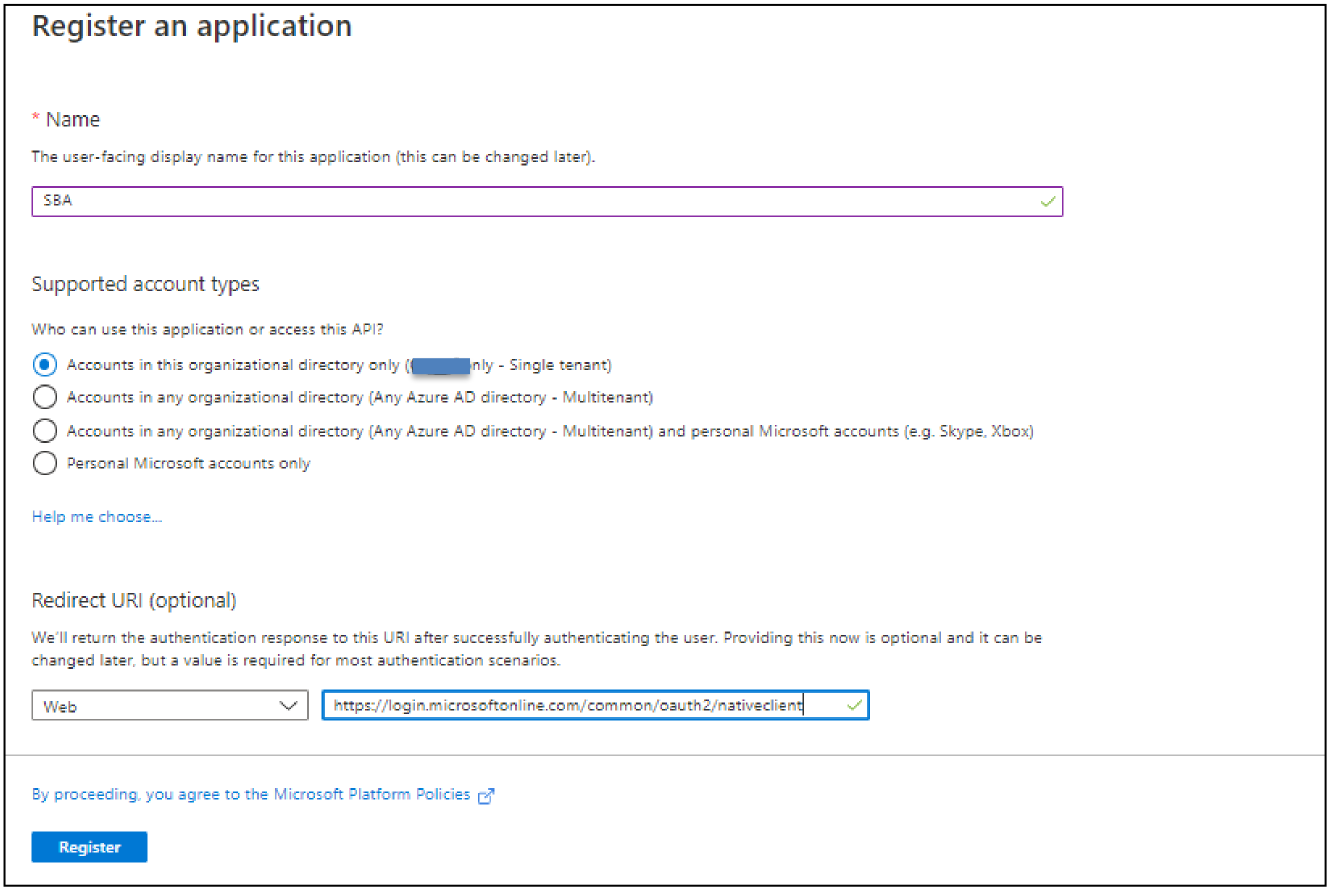
- The Name can be any Name, which you would like to use.
- Supported Account types = Account in this organizational directory only
- The Web Redirect Uri = https://login.microsoftonline.com/common/oauth2/nativeclient
- Implicit grant tokens = Access tokens and ID tokens
- API permissions = Skype and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

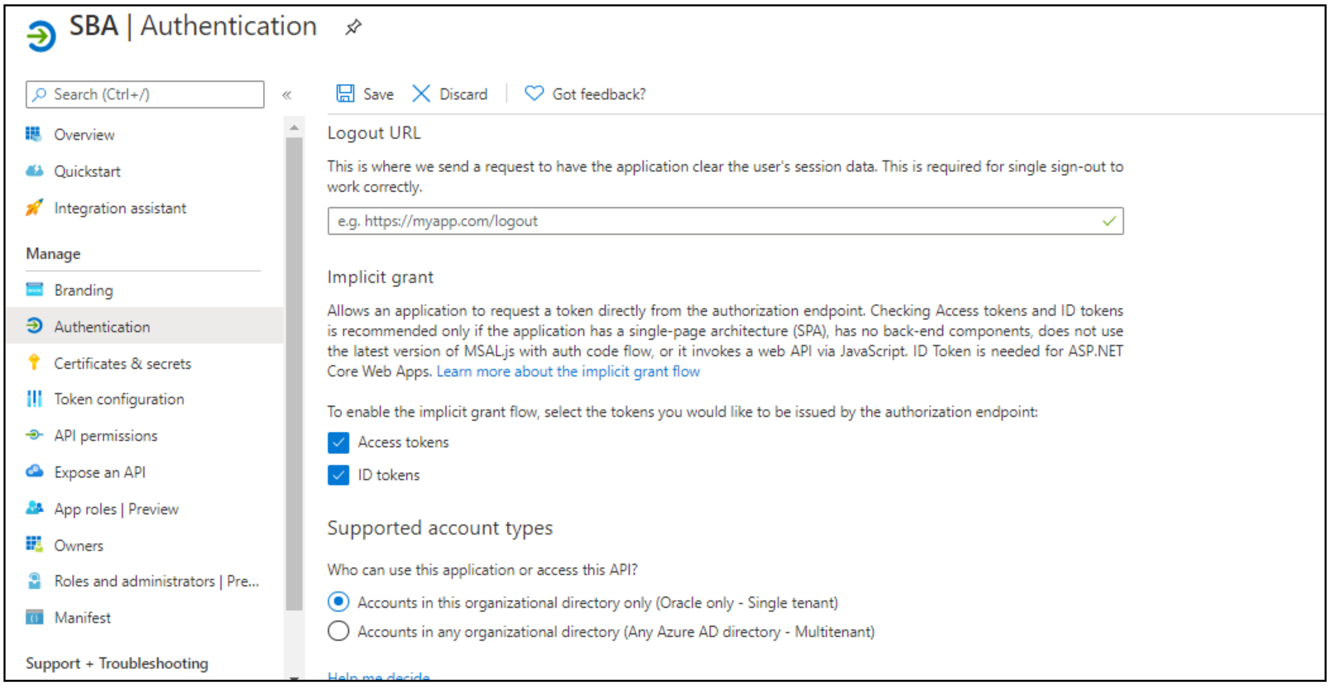
We'll return the authentication response to this URI after successfully authenticating the user. Providing this now is optional and it can be changed later, but a value is required for most authentication scenarios.

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)

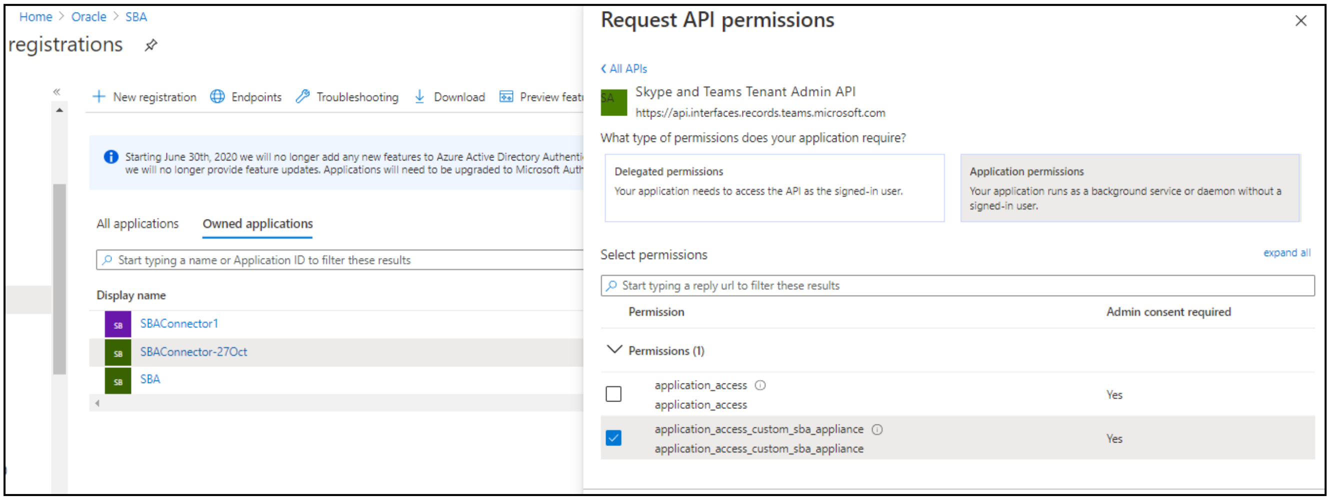
Help me decide

## 6.2.3 Request API Permissions

Go to section API permissions to configure the SBA API permissions. Search ‘Skype’ Request API permissions and choose ‘Skype and Teams Tenant API’

Select application_access_custom_sba_appliance.

Grant admin consent.



Starting June 30th, 2020 we will no longer add any new features to Azure Active Directory Authenti
we will no longer provide feature updates. Applications will need to be upgraded to Microsoft Auth

| Display name |
|---|
| SBAConnector1 |
| SBAConnector-27Oct |
| SBA |

## Request API permissions

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

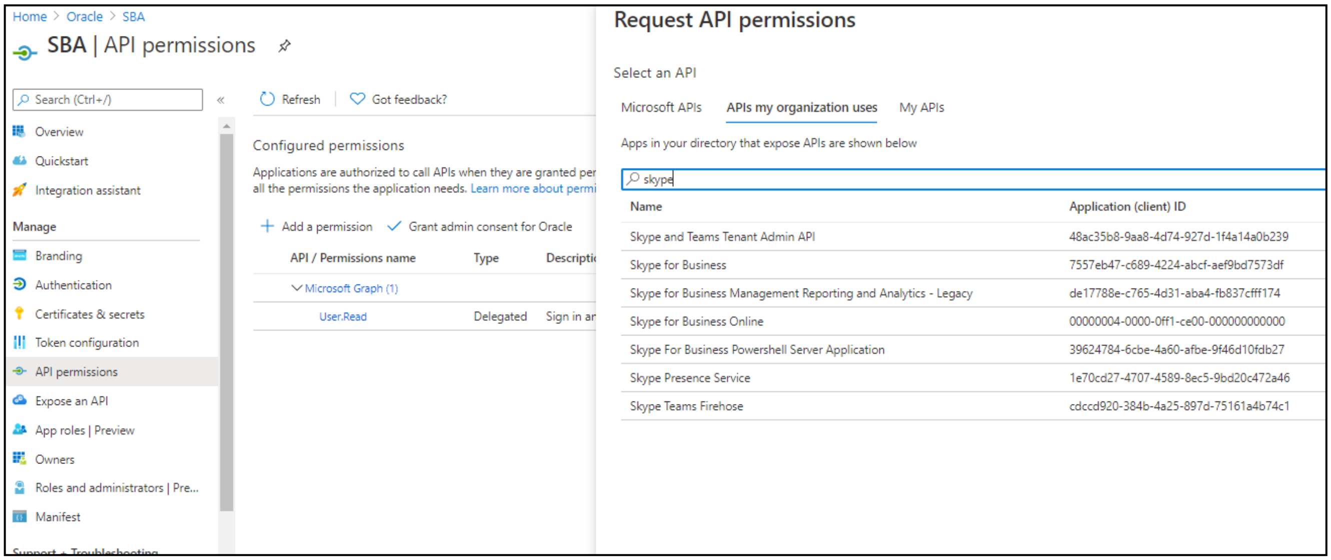
What type of permissions does your application require?

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

| | Permission | Admin consent required |
|---|---|---|
| | Permissions (1) | |
| □ | application_access<br>application_access | Yes |
| ☑ | application_access_custom_sba_appliance<br>application_access_custom_sba_appliance | Yes |



Configured permissions

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

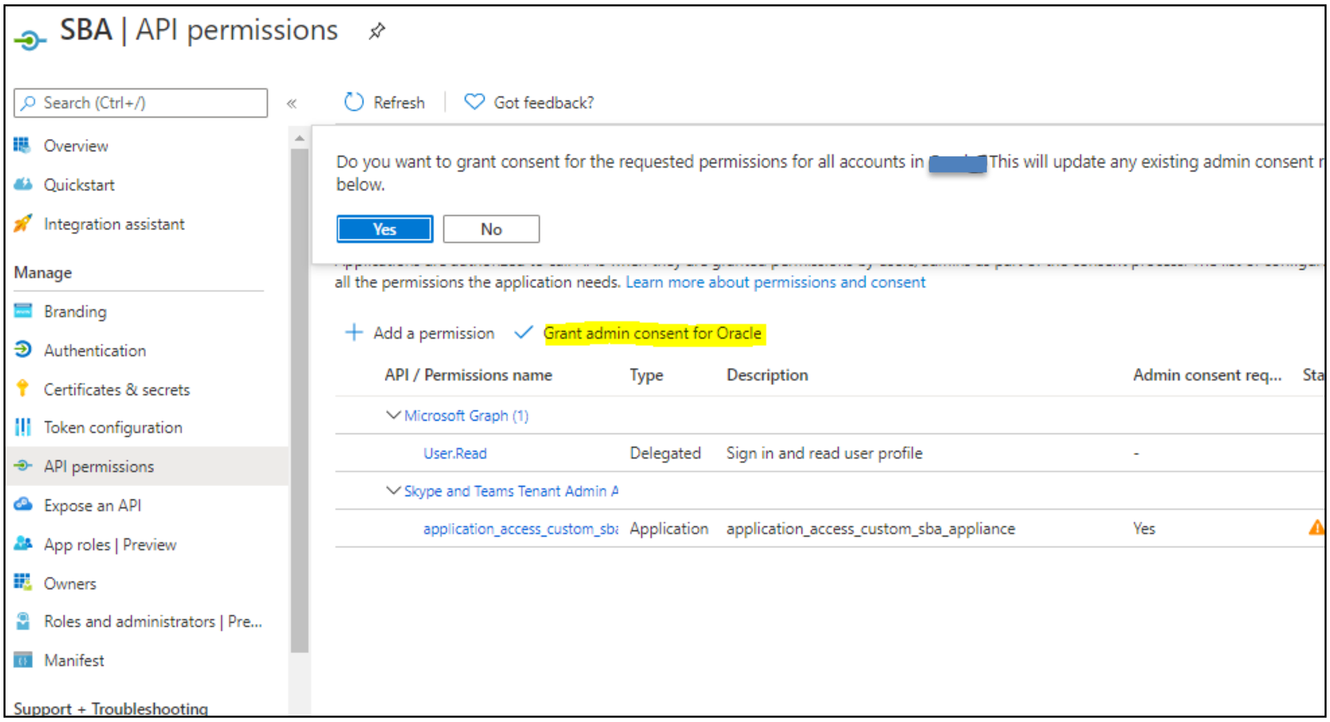
| API / Permissions name | Type | Descripti |
|---|---|---|
| Microsoft Graph (1) | | |
| User.Read | Delegated | Sign in ar |

## Request API permissions

Select an API

Apps in your directory that expose APIs are shown below

| Name | Application (client) ID |
|---|---|
| Skype and Teams Tenant Admin API | 48ac35b8-9aa8-4d74-927d-1f4a14a0b239 |
| Skype for Business | 7557eb47-c689-4224-abcf-aef9bd7573df |
| Skype for Business Management Reporting and Analytics - Legacy | de17788e-c765-4d31-aba4-fb837cfff174 |
| Skype for Business Online | 00000004-0000-0ff1-ce00-000000000000 |
| Skype For Business Powershell Server Application | 39624784-6cbe-4a60-afbe-9f46d10fdb27 |
| Skype Presence Service | 1e70cd27-4707-4589-8ec5-9bd20c472a46 |
| Skype Teams Firehose | cdccd920-384b-4a25-897d-75161a4b74c1 |



Do you want to grant consent for the requested permissions for all accounts in [redacted] This will update any existing admin consent r below.

Yes No

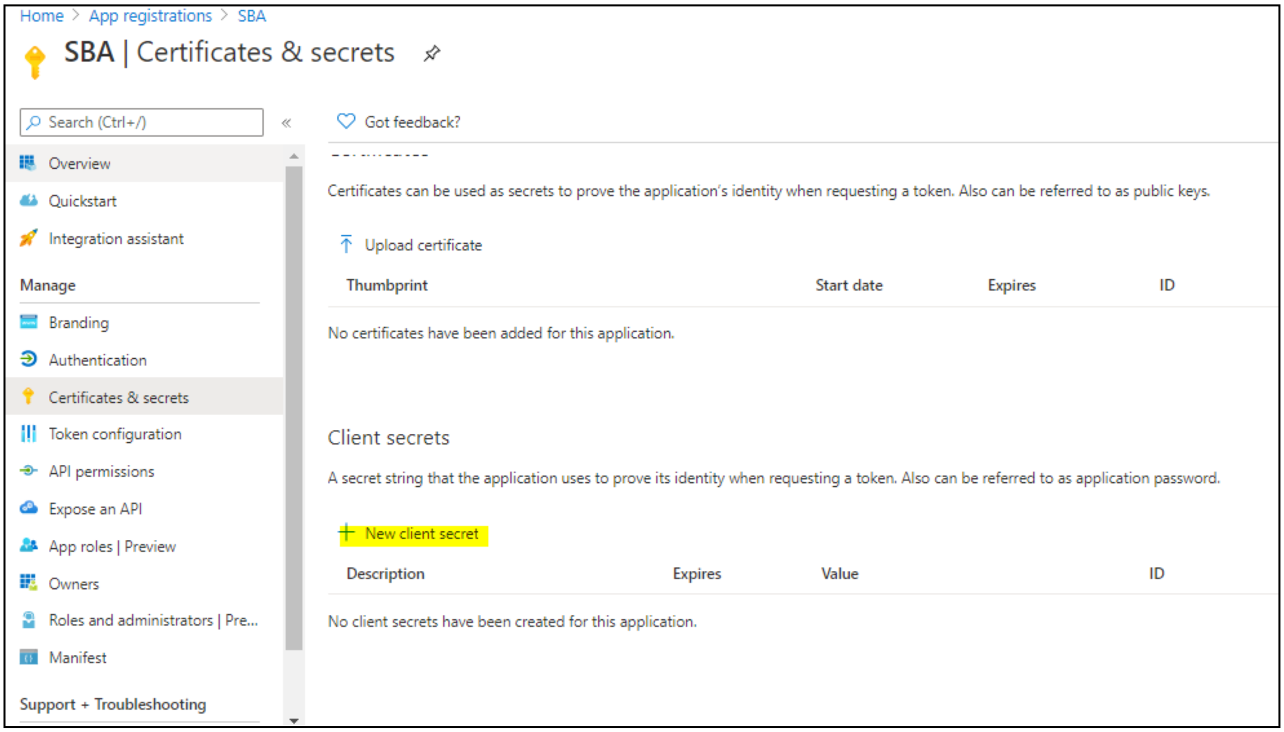
all the permissions the application needs. Learn more about permissions and consent

+ Add a permission ✓ Grant admin consent for Oracle

| API / Permissions name | Type | Description | Admin consent req... | Sta |
|---|---|---|---|---|
| Microsoft Graph (1) | | | | |
| User.Read | Delegated | Sign in and read user profile | - | |
| Skype and Teams Tenant Admin A | | | | |
| application_access_custom_sba | Application | application_access_custom_sba_appliance | Yes | ⚠ |

## 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.

Upload certificate

| Thumbprint | Start date | Expires | ID |
|---|---|---|---|

No certificates have been added for this application.

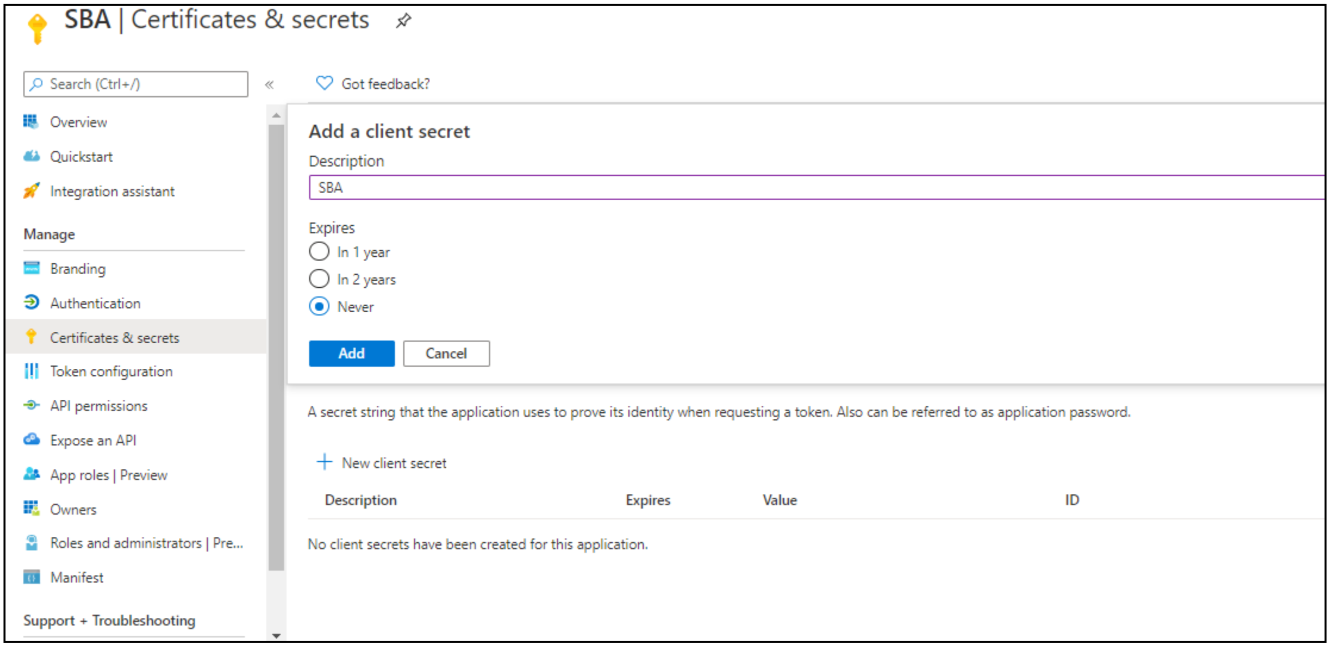
Client secrets

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

+ New client secret

| Description | Expires | Value | ID |
|---|---|---|---|

No client secrets have been created for this application.



Add a client secret

Description: SBA

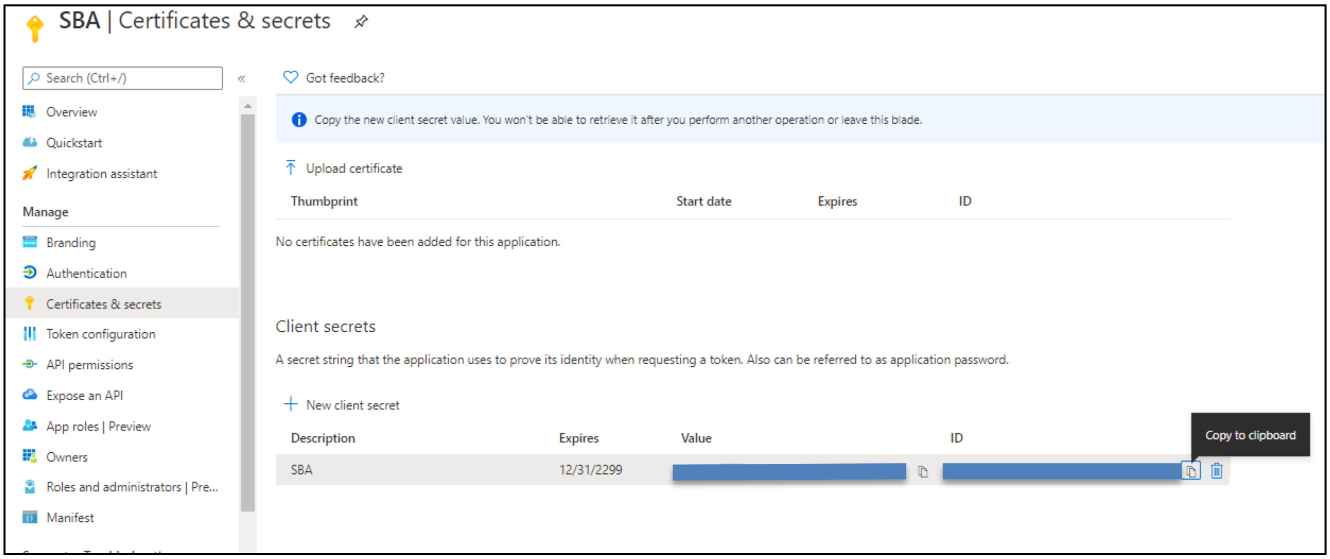
Expires

○ 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.

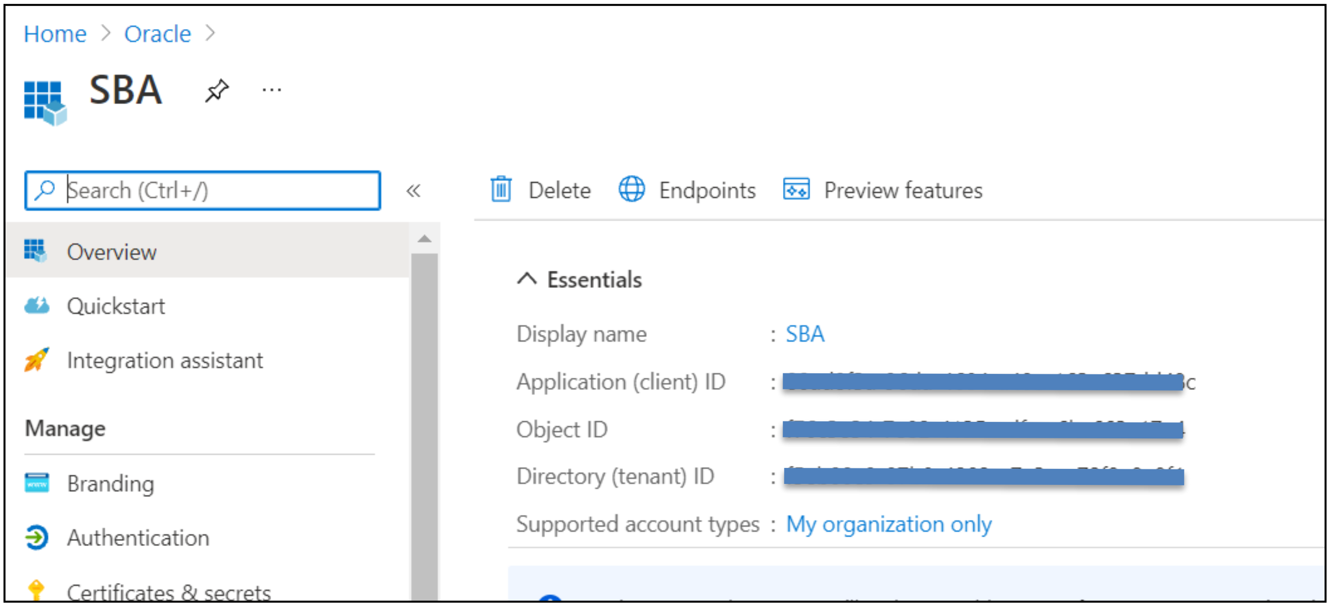
| Description | Expires | Value | ID |
|---|---|---|---|
| SBA | 12/31/2299 | [redacted] | [redacted] |

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 Skype for Business Online PS.

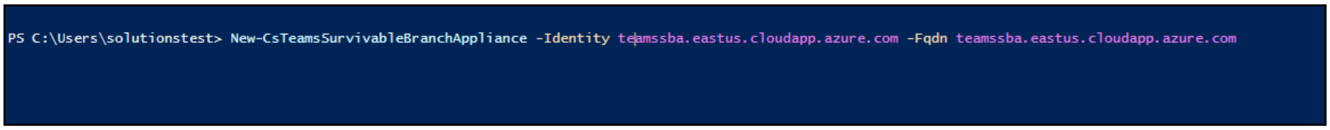
The parameters to the cmdlet are shown in Table 1.

| 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 |

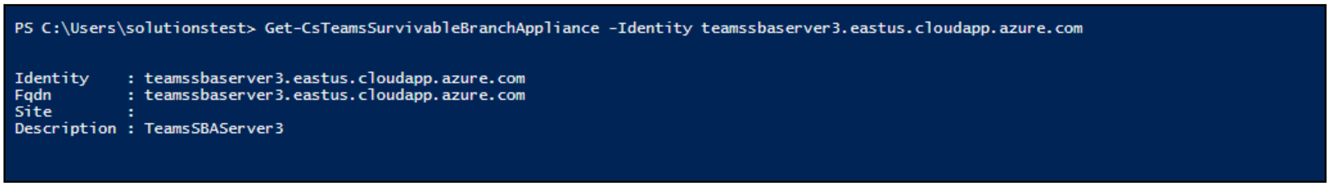
Table 1 Parameters for New-CsTeamsSurvivableBranchAppliance

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"

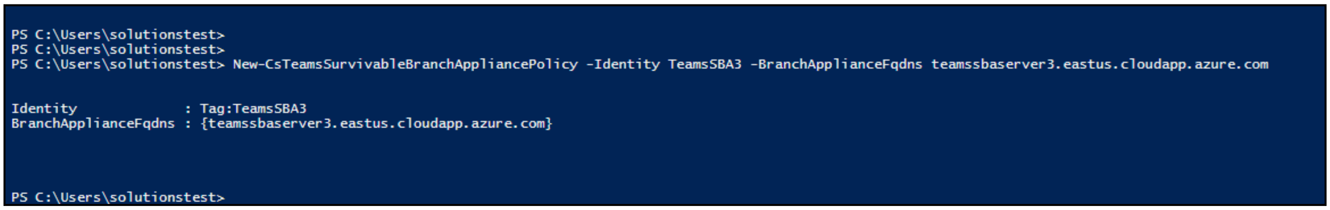
Identity : Tag:CPH

BranchApplianceFqdns : {sba1.contoso.dk, sba2.contoso.dk}

You can add or remove SBA’s from a policy by using the **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 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

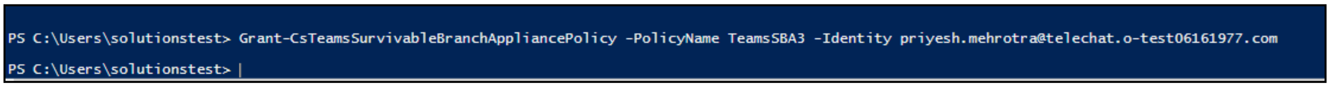
An example is shown below:

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> |
```

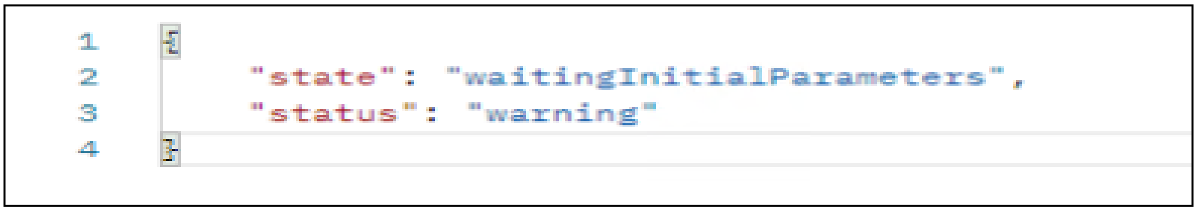
## 6.4 SBA API Configuration

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 API. The configuration can be performed using a REST API Client. Currently the SBA API is configured using a Freeware Client called POSTMAN, which can be downloaded from below link.

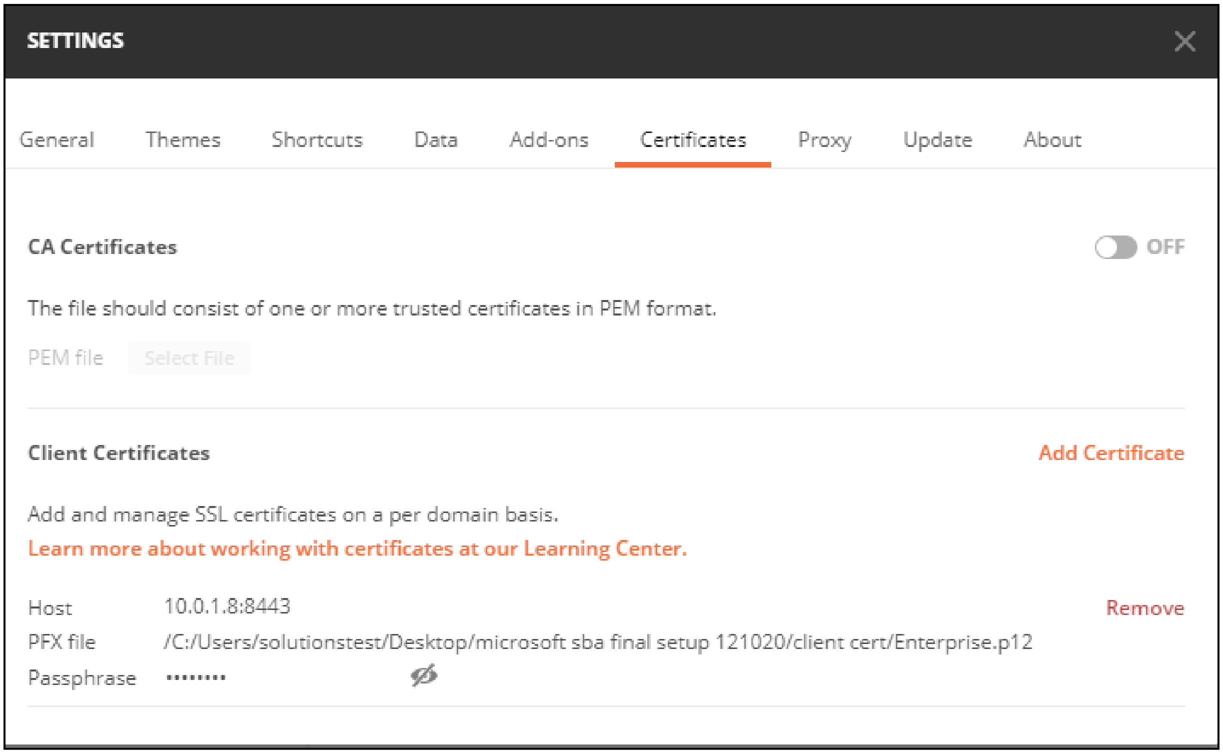
https://www.postman.com/downloads/

- 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
- Provide the SBC's 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.(Shown below)



CA Certificates

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.

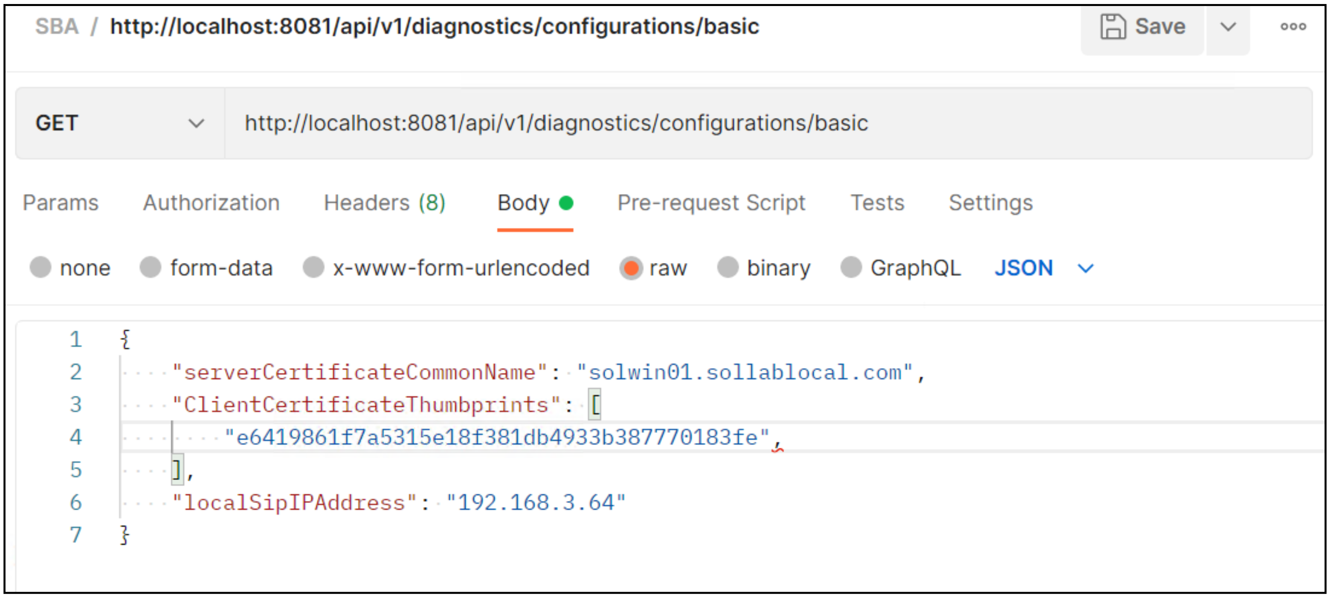
- **Local SIP IP Address** – IP address that will be used by Microsoft SBA for communication. If not set, Default NIC is automatically selected.

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
}
```

Lab Snippet for reference -



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

```
{
    "serverCertificateCommonName": "solwin01.sollablocal.com",
    "ClientCertificateThumbprints": [
        "e6419861f7a5315e18f381db4933b387770183fe",
    ],
    "localSipIPAddress": "192.168.3.64"
}
```

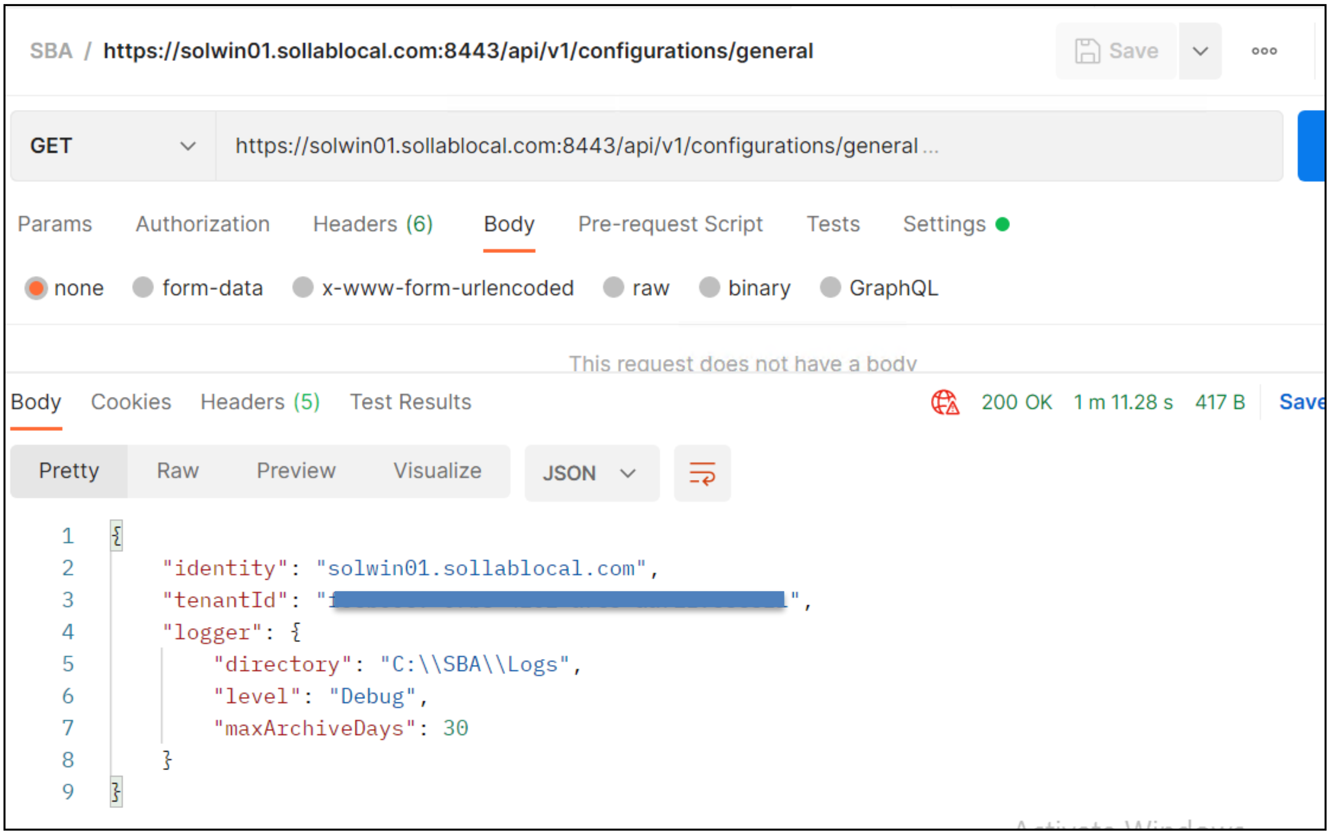
## 6.4.2 General configuration

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

- Use the SBA Server **FQDN** (Hostname) for the Endpoint.
- **Identity** - 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": "", //sba identity when register with cmdlets- SBA FQDN
    "tenantId": "", //Identity of your Tenant
    "logger": {
        "directory": "C:\logs"
        "level": "Critical| Error| Warning| Information| Debug| Trace|None",
        "maxArchiveFiles": 720 // range of 24-10000; default 720
    }
}
```



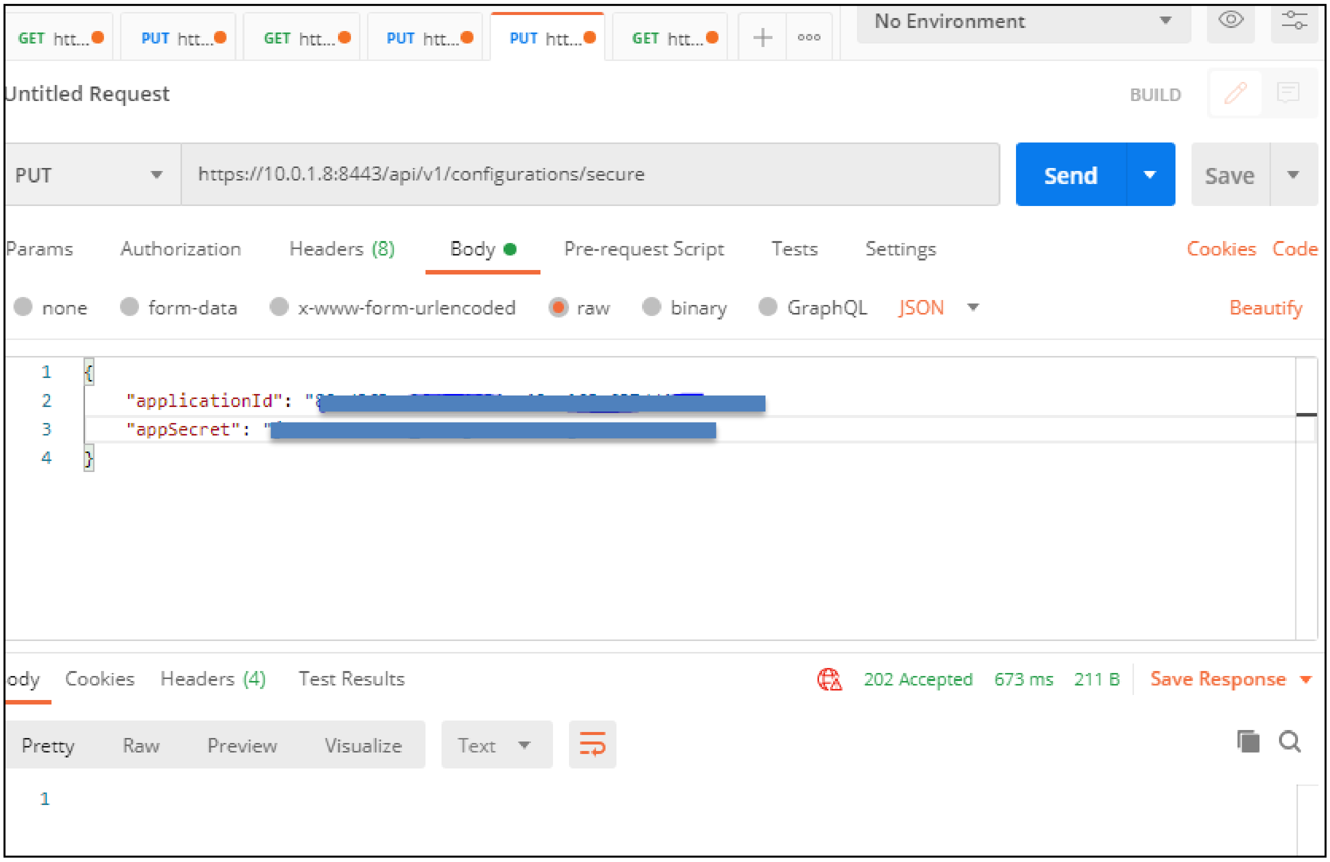
```
{
    "identity": "solwin01.sollablocal.com",
    "tenantId": "[redacted]",
    "logger": {
        "directory": "C:\\SBA\\Logs",
        "level": "Debug",
        "maxArchiveDays": 30
    }
}
```

## 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": ""
}
```



Untitled Request

PUT https://10.0.1.8:8443/api/v1/configurations/secure

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

202 Accepted 673 ms 211 B

**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.

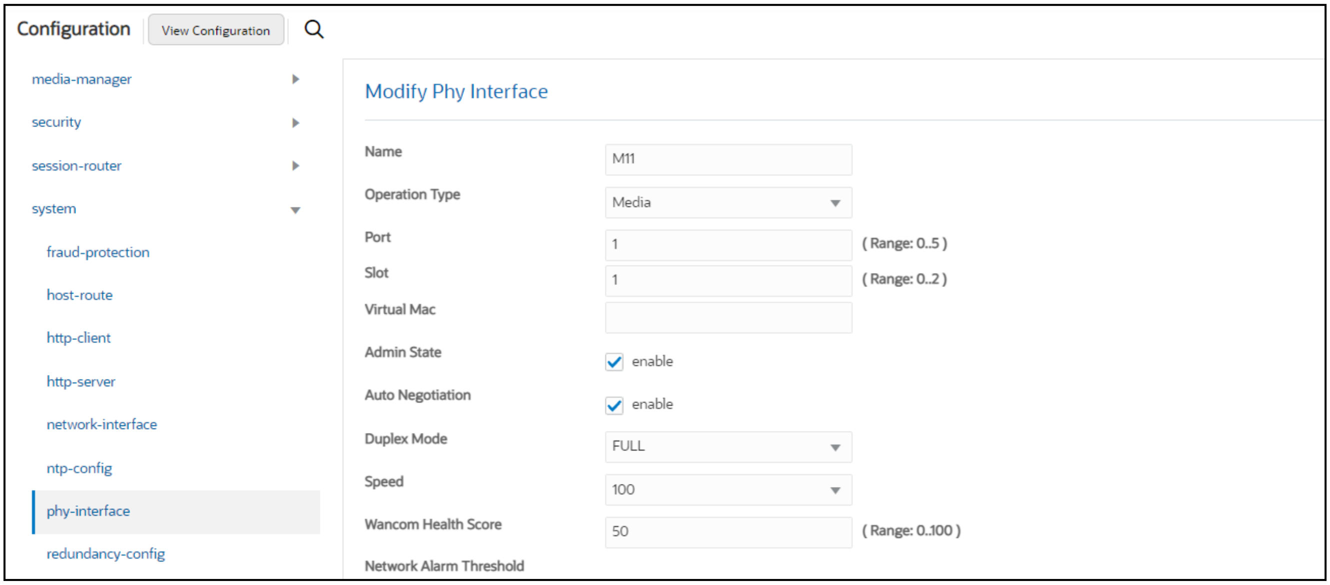
## 7.1 Configure Physical Interface for DR-SBA

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

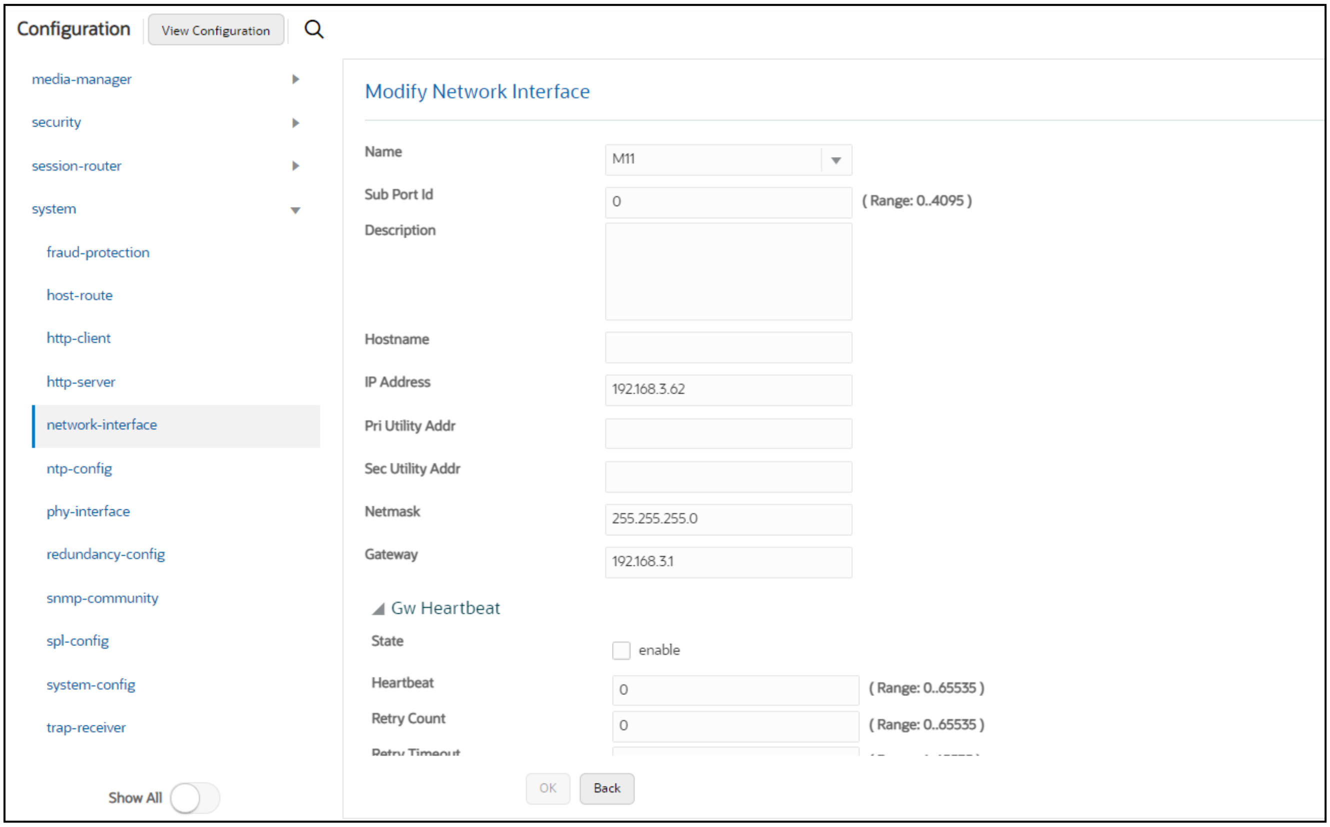
| | |
|---|---|
| Name | M11 |
| Operation Type | Media |
| Port | 1 ( Range: 0..5 ) |
| Slot | 1 ( Range: 0..2 ) |
| Virtual Mac | |
| Admin State | ☑ enable |
| Auto Negotiation | ☑ enable |
| Duplex Mode | FULL |
| Speed | 100 |
| Wancom Health Score | 50 ( Range: 0..100 ) |
| Network Alarm Threshold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

## 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.

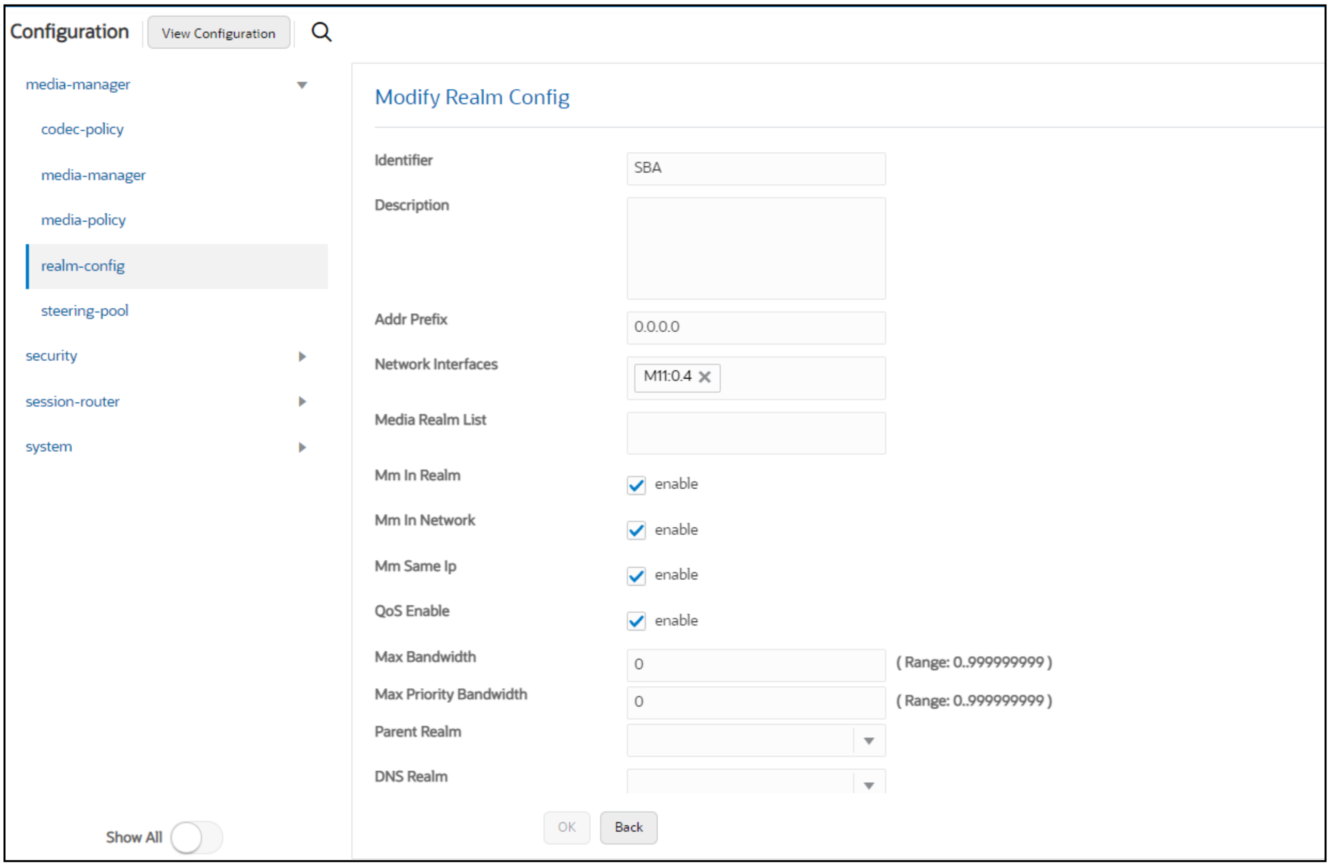
Navigate to media-manager -> realm-config

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

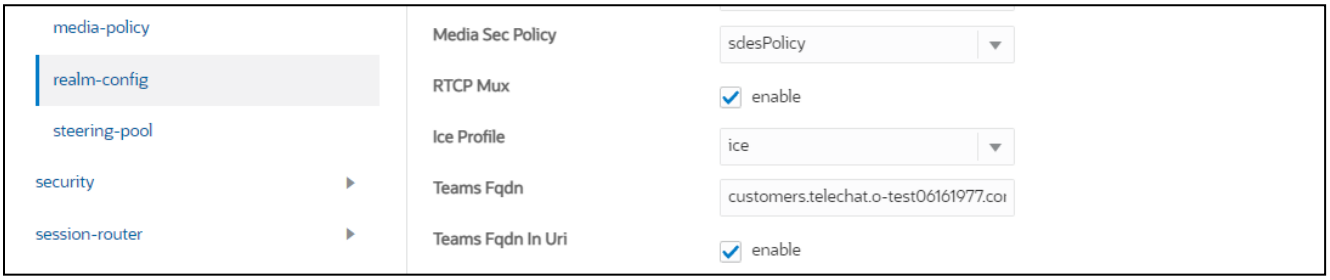
QoS Enable: ☑ enable

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

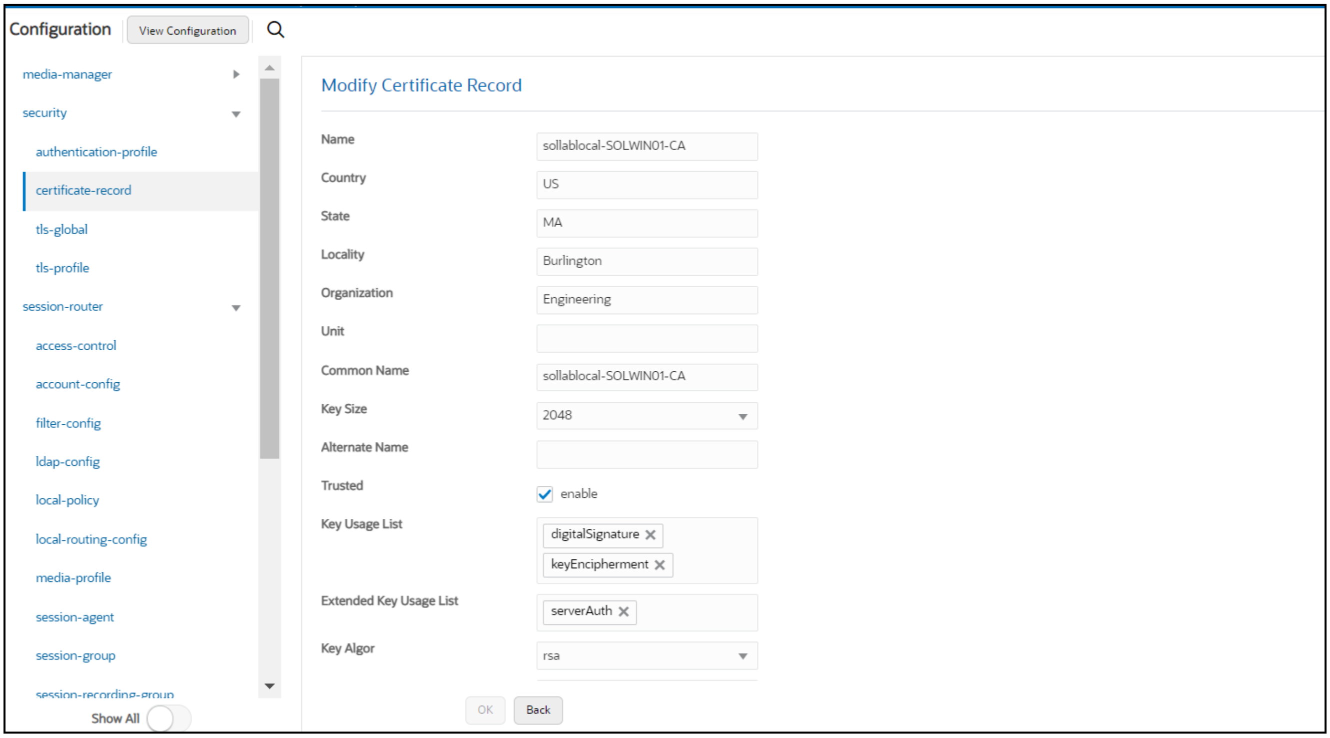
Teams Fqdn: customers.telechat.o-test06161977.coı

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.

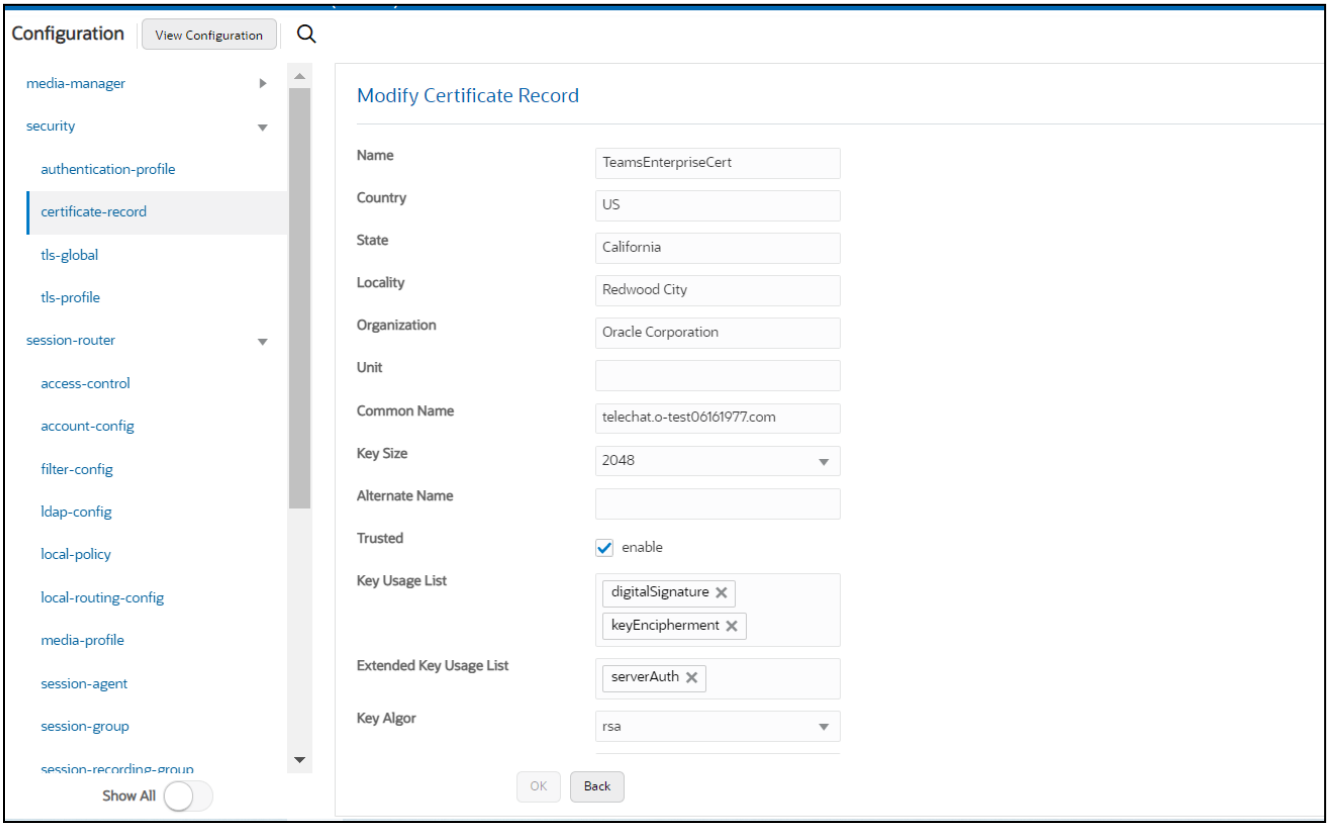
A certificate record must be created on the Oracle SBC for the Microsoft SBA. This is the Certificate record for the Certificate Authority for Microsoft SBA.



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<br>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<br>keyEncipherment |
| Extended Key Usage List | serverAuth |
| Key Algor | rsa |

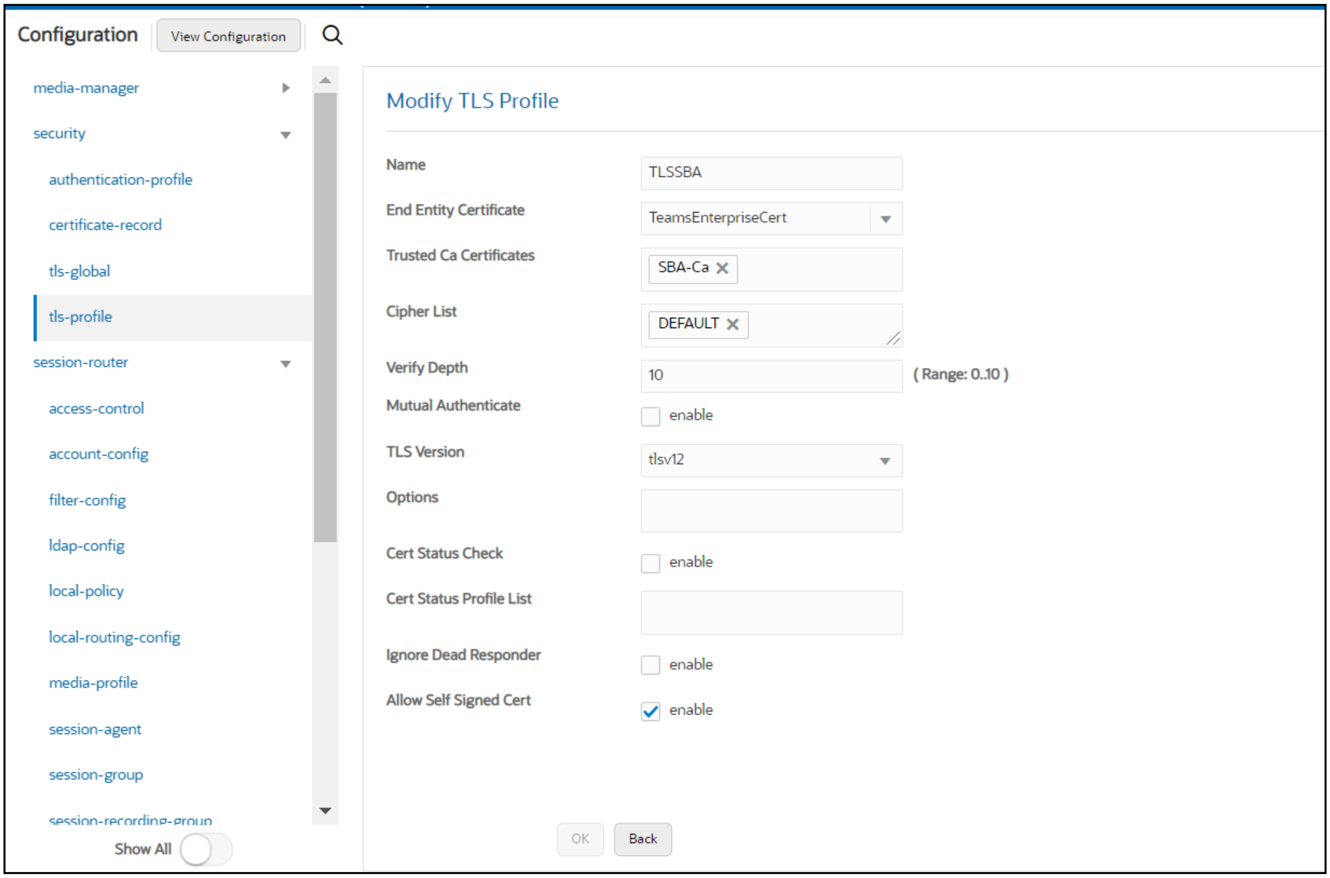
## 7.5 Create DR-SBA TLS Profile.

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 ✕

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

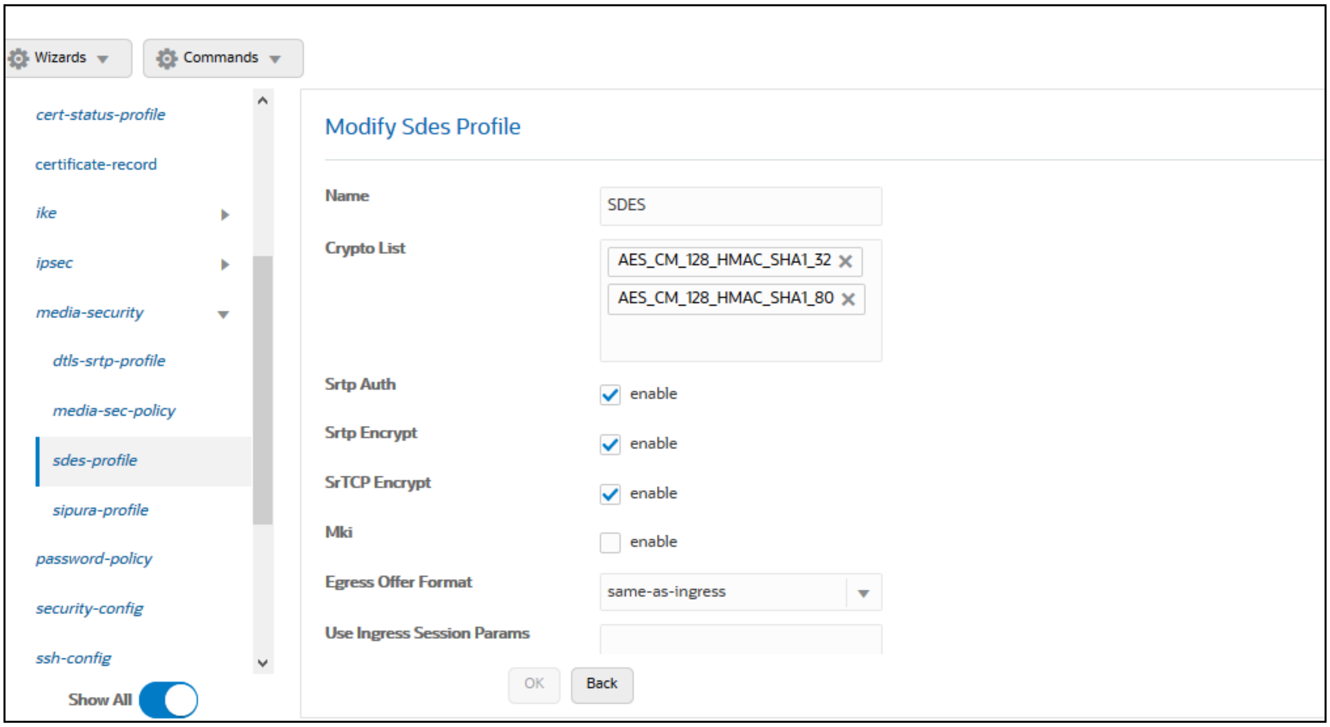
Allow Self Signed Cert: ☑ enable

## 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 7 of the Oracle SBC with Microsoft Teams Non Media Bypass 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_32 ✕ AES_CM_128_HMAC_SHA1_80 ✕

Srtp Auth: ☑ enable

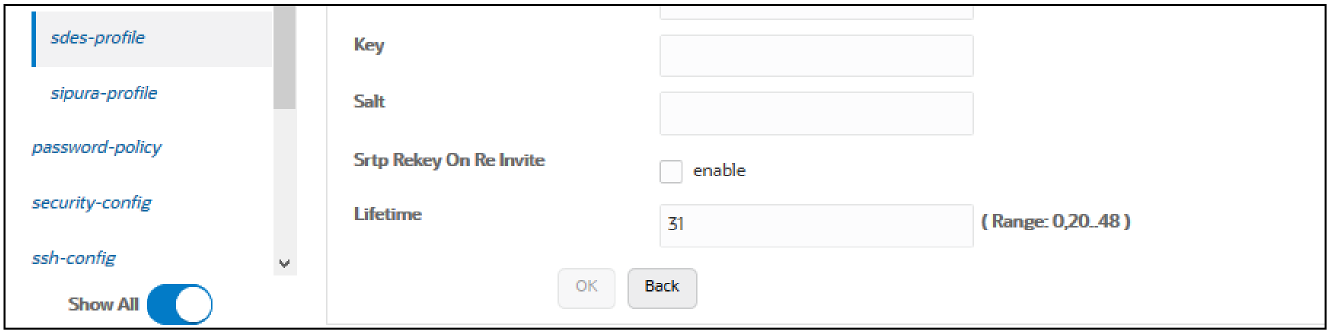
Srtp Encrypt: ☑ enable

SrTCP Encrypt: ☑ enable

Mki: □ enable

Egress Offer Format: same-as-ingress

Use Ingress Session Params:



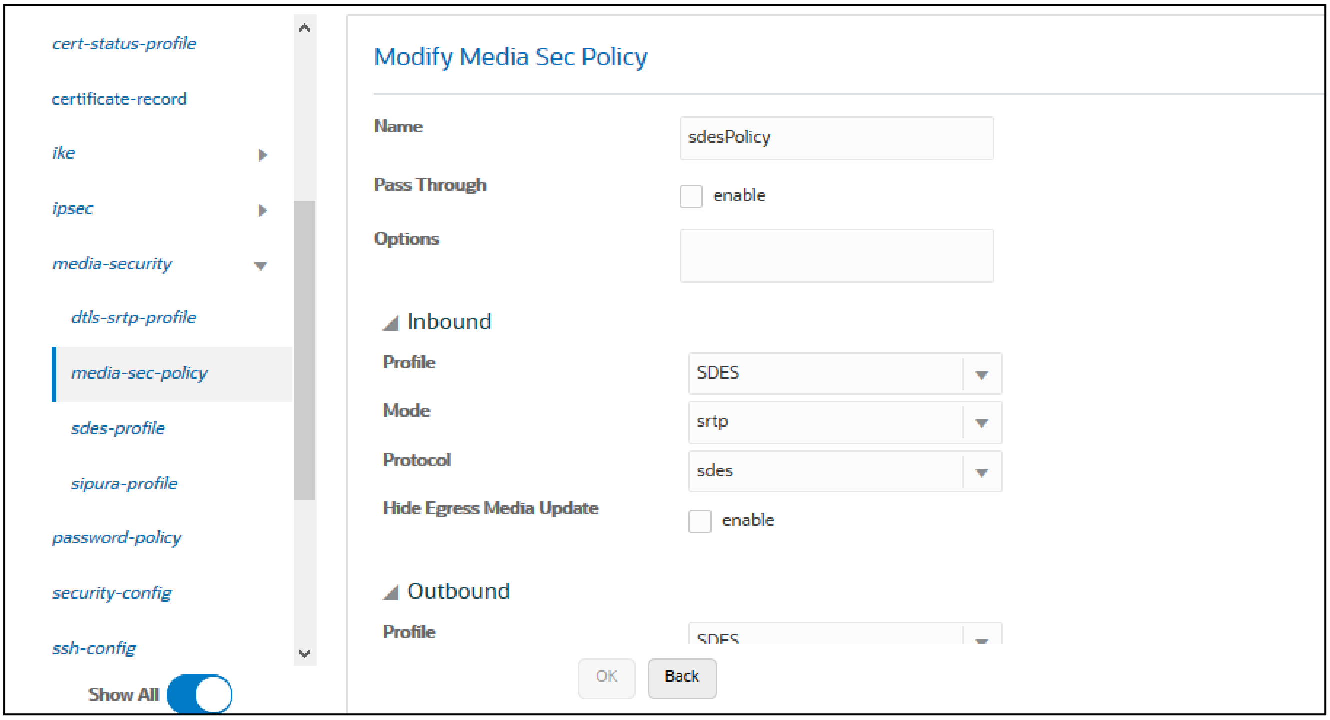
Key:

Salt:

Srtp Rekey On Re Invite: □ enable

Lifetime: 31 ( Range: 0,20..48 )

## 7.6.2 Media-sec-policy



Modify Media Sec Policy

Name: sdesPolicy

Pass Through: □ enable

Options:

◢ Inbound

Profile: SDES

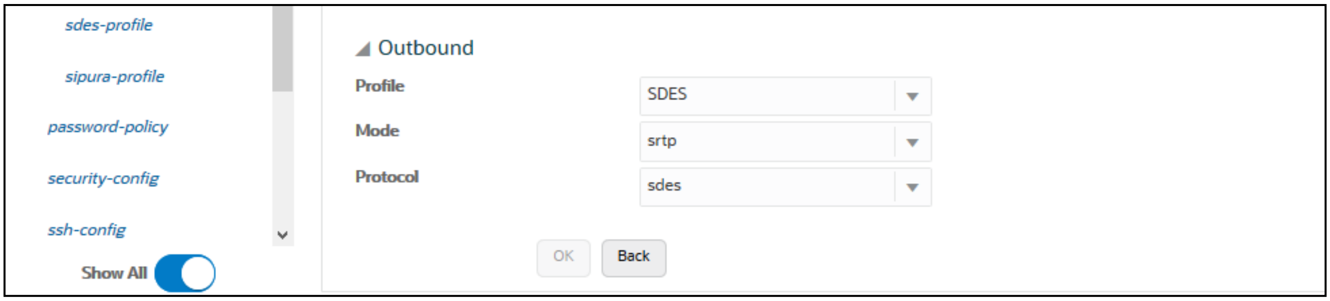
Mode: srtp

Protocol: sdes

Hide Egress Media Update: □ enable

◢ Outbound

Profile: SDES



◢ Outbound

Profile: SDES

Mode: srtp

Protocol: sdes

## 7.7 Configure the SBA Session-Agent

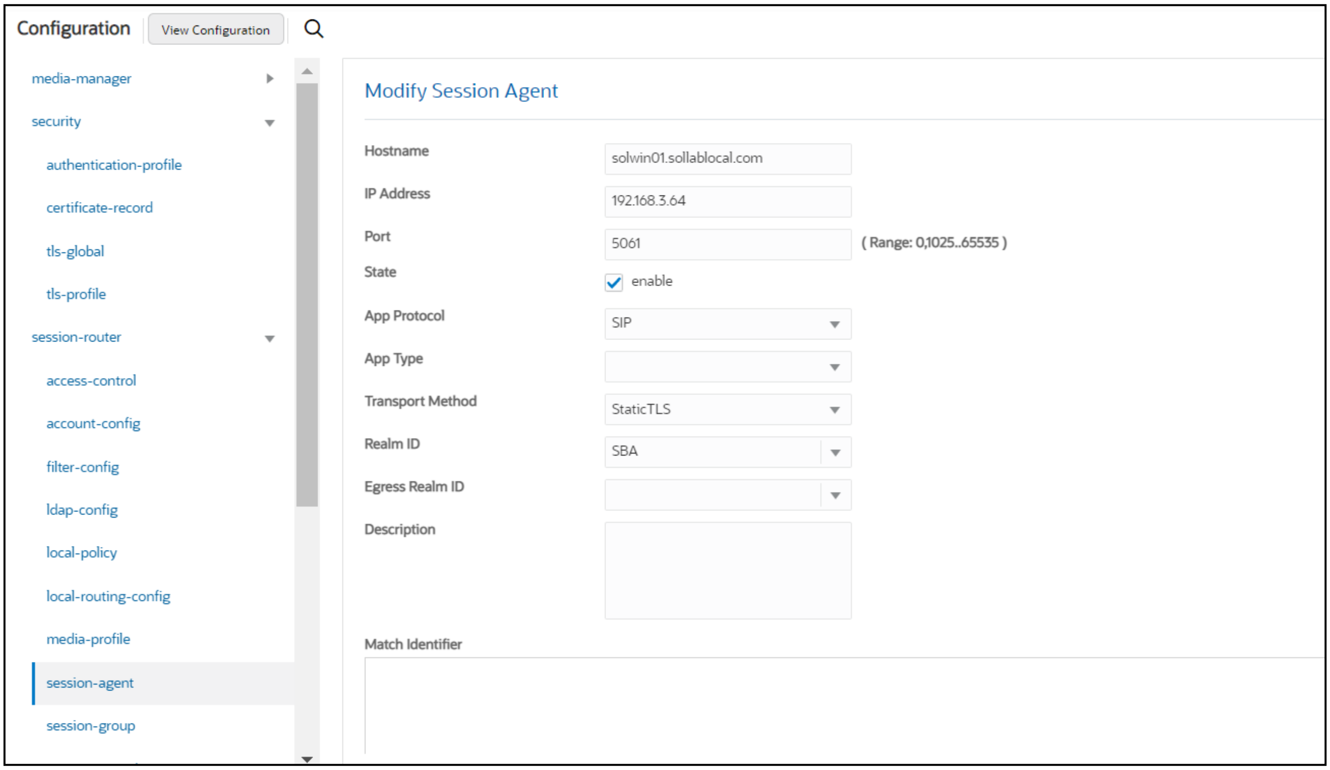
Session-agents are configuration elements, which are trusted agents who can send/receive traffic from the SBC with direct access to trusted data path.

Configure the session-agent for Microsoft SBA with the following parameters.

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

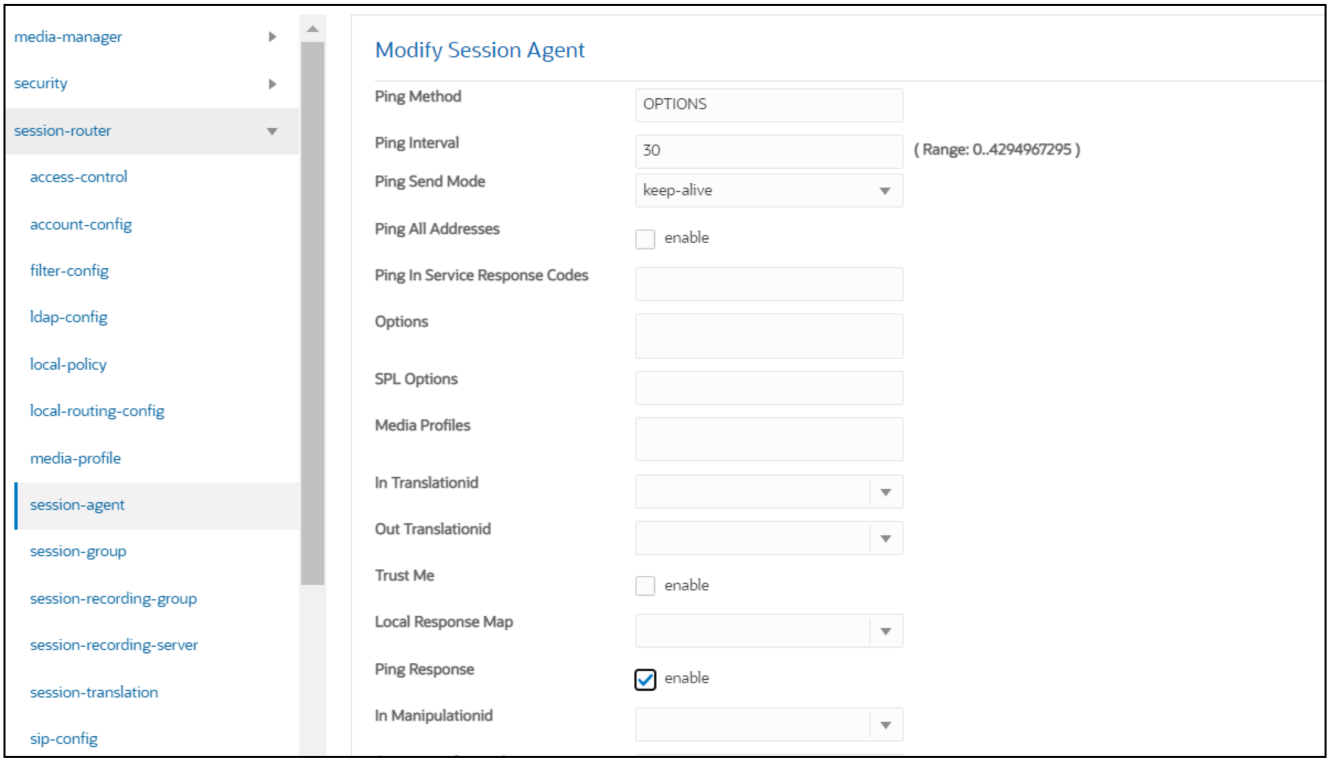
- Hostname to “FQDN of your SBA Server”
- IP Address  to “IP Address of your SBA Server”
- Port 5061
- Realm-id – needs to match the realm created for DR-SBA – in this case – “SBA”
- Transport set to “Statists”
- Ping-method – send OPTIONS message to Microsoft for health check

- Ping-interval to 30 secs



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

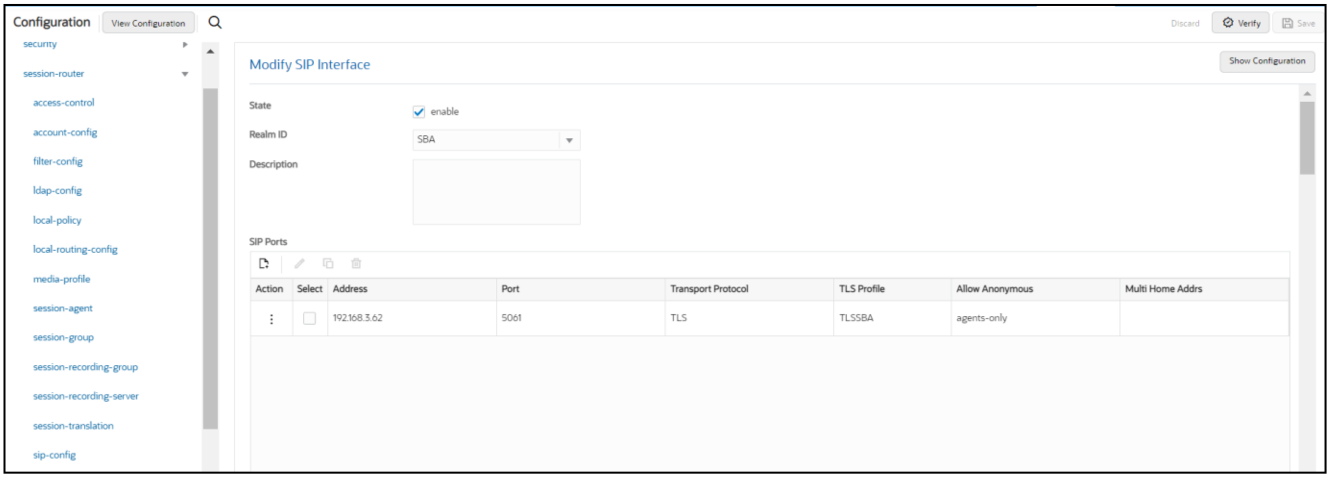
## 7.8 Configure the sip-interface

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.



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 | |

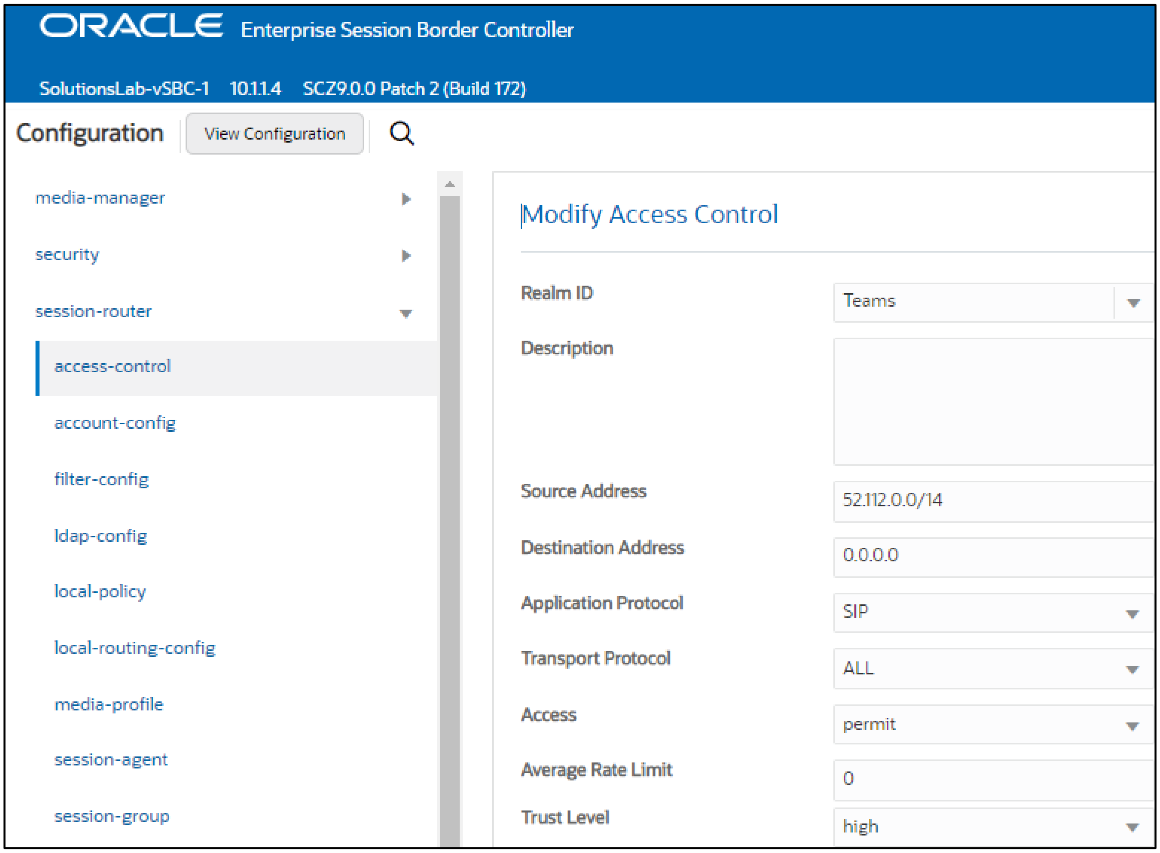
## 7.9 Configure access-control

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.

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.

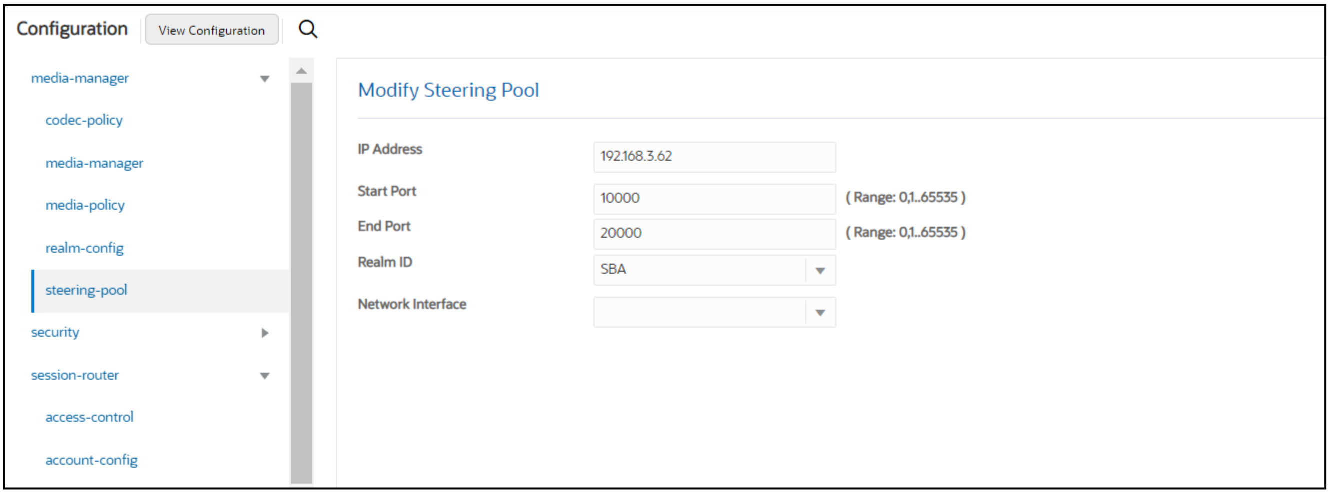
## 7.10 Configure steering-pool

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

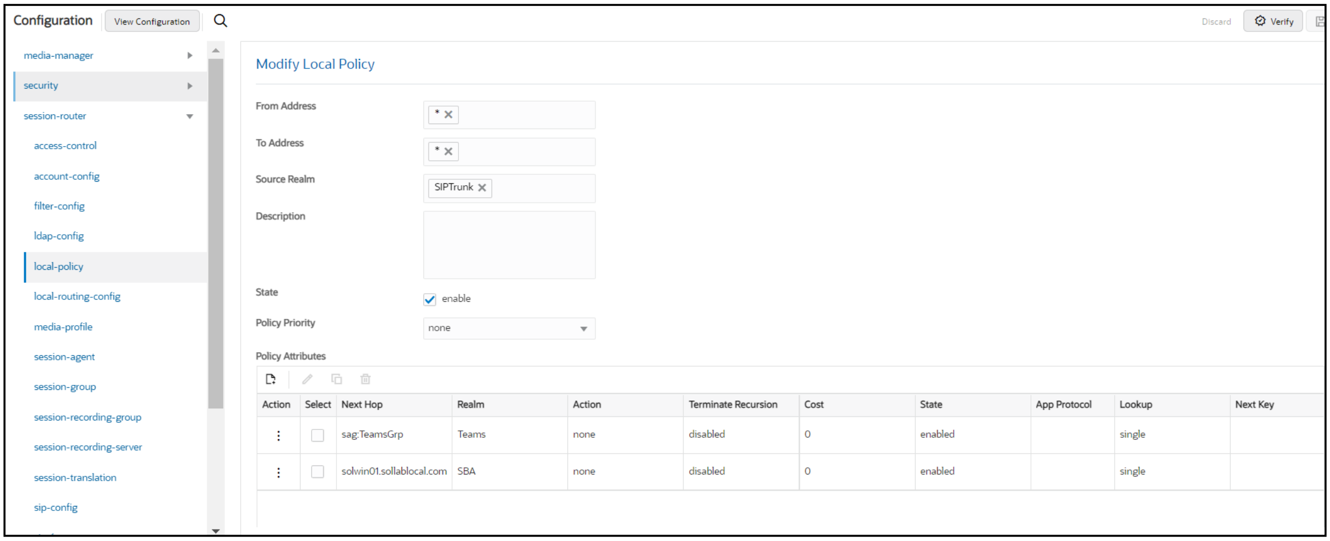
This local-policy is modified with Microsoft SBA Session-Agent “solwin01.sollablocal.com” defined as an additional next hop.

”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

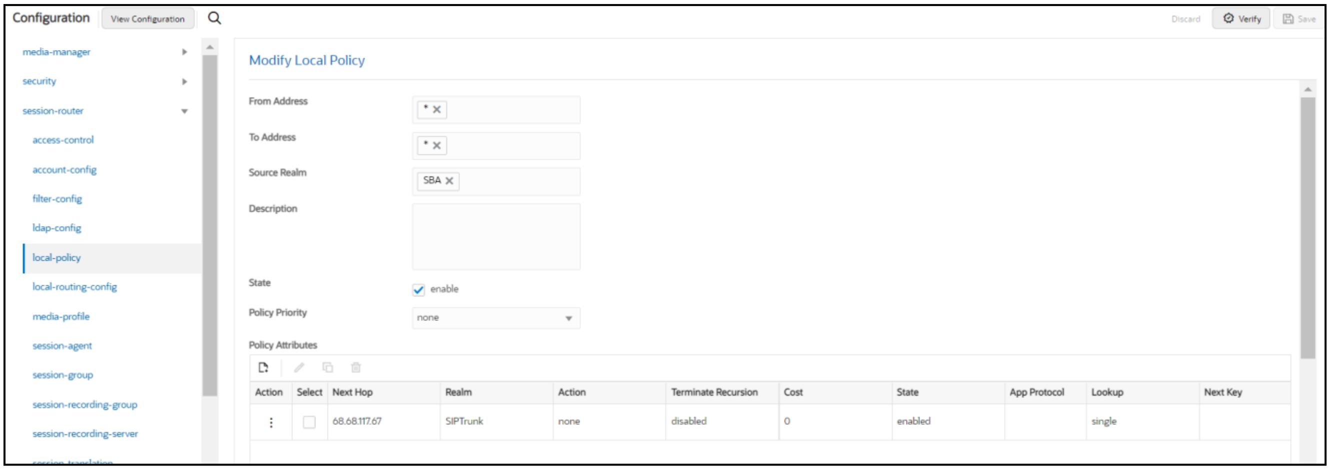
Policy Priority: none

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.

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