Deploying Avaya Session Border Controller on Microsoft® Azure

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Contents

Chapter 1: Introduction

Purpose

This document describes the procedures to deploy Avaya Session Border Controller (Avaya SBC) on a Microsoft® Azure (Azure) cloud services platform.

This document is intended for people who install and configure Avaya SBC.

Chapter 2: Architecture overview

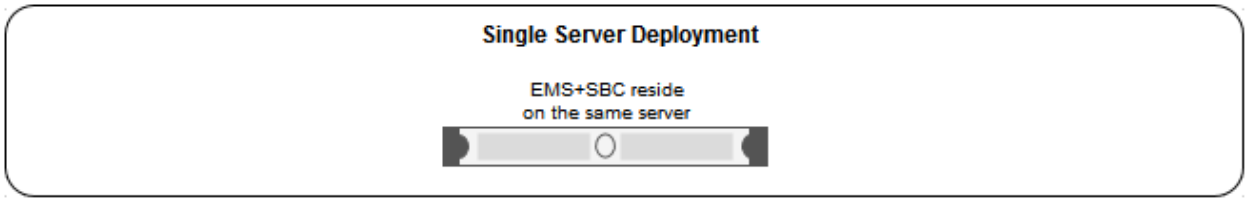
Avaya SBC on Microsoft® Azure overview

Microsoft® Azure (Azure) is a cloud services platform that enables enterprises to run applications on the virtual cloud securely. By deploying Avaya SBC on Azure, you get the following benefits:

- Minimizes the capital expenditure (CAPEX) on infrastructure. The customers can move from CAPEX to an operational expense (OPEX).
- Reduces the maintenance cost of running the data centers.
- Provides a common platform for deploying the applications.
- Provides a flexible environment to accommodate the changing business requirements of customers.

Single server non-HA deployment

In a single server non-HA deployment, the Element Management System (EMS) and SBC software are installed on a single server. Use this deployment scenario when you want to deploy Avaya SBC in a basic mode.



Important:

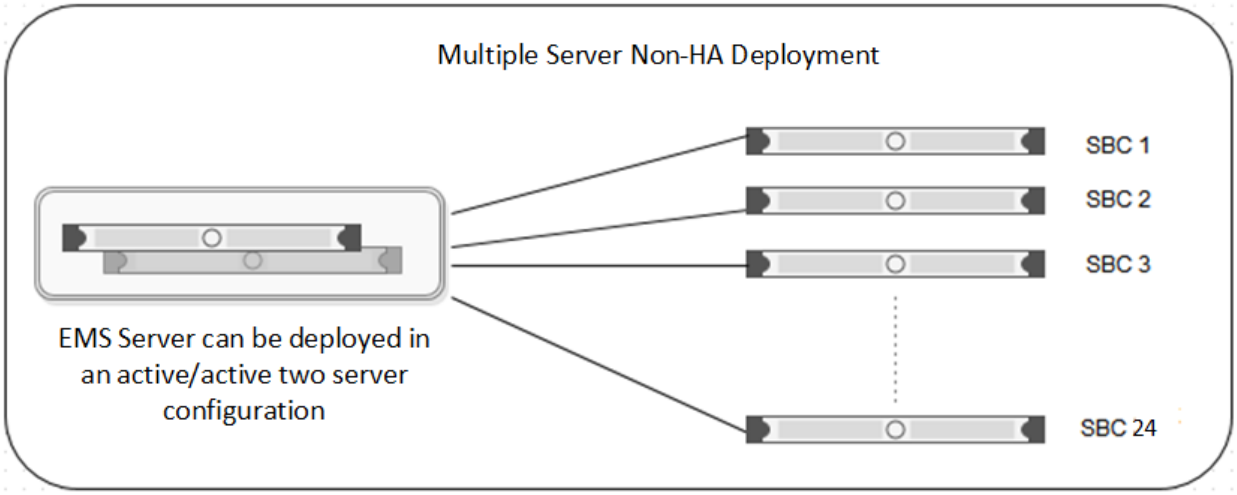
All hardware server types, virtualized environment platforms, and cloud platforms support the single-server non-HA deployment type.

Multiple server non-HA deployment

In a multiple server deployment, the EMS and SBC software are installed on separate servers.

In a non-HA multiple server deployment, you can have one or more SBC servers controlled by a single EMS server or a replicated EMS HA pair. In an active/active deployment, the EMS software is installed on two servers. One EMS server is configured as Primary and the other is configured as Secondary. When using a single EMS server, the EMS server is configured as Primary.

You can have up to 24 individual Avaya SBC servers in this type of configuration.



If you start with a non-HA deployment and want to later move to an HA deployment, you must completely reconfigure the deployment.

Important:

All hardware server types, virtualized environment platforms, and cloud platforms support the multi-server non-HA deployment type.

Multiple server HA deployment

In a multiple server deployment, the EMS and SBC software are installed on separate servers.

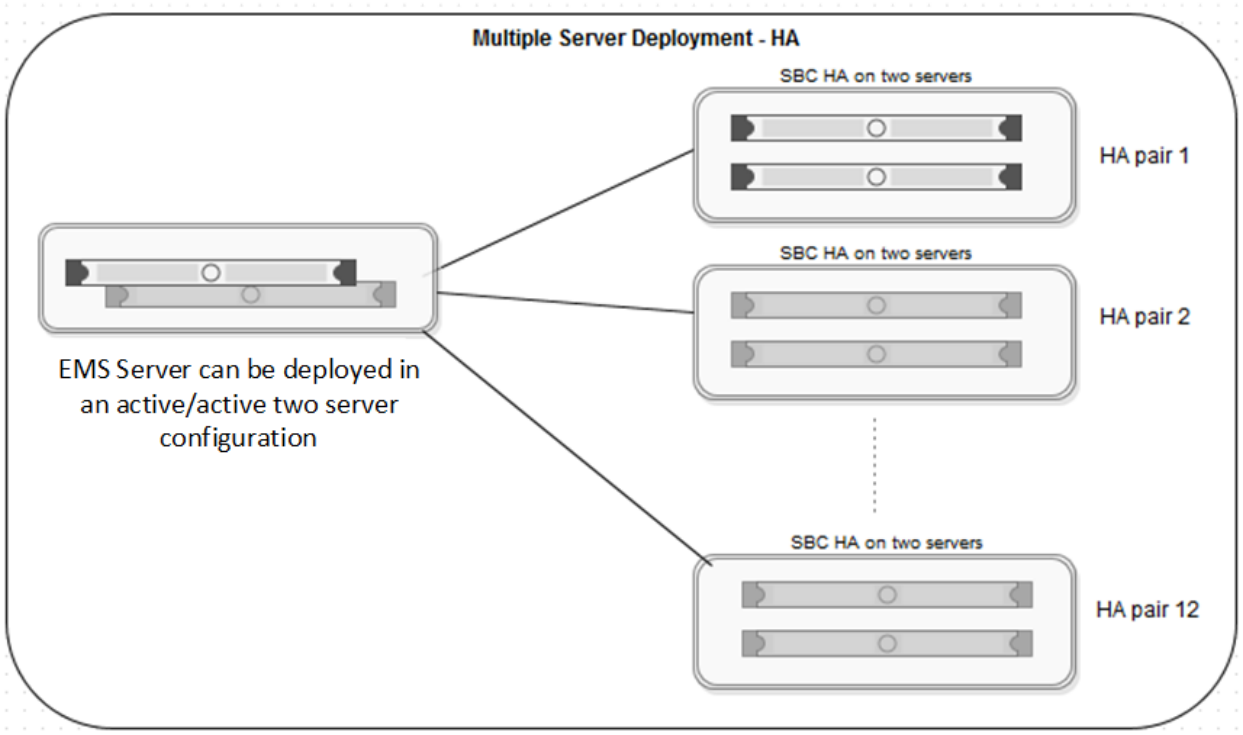
In an HA deployment, SBC servers are deployed in pairs. Each pair has one SBC server configured as Primary while the other is configured as Secondary.

Optionally, the EMS software can be replicated in an active/active HA pair deployment. In an active/active deployment, the EMS software is installed on two servers. One EMS server is configured as Primary and the other is configured as Secondary. An EMS HA pair must be reachable to each other and with the SBC servers, and can be in different geographical locations.

One EMS server or an active/active pair of EMS servers can control up to 12 separate pairs of SBC servers.

Note:

When deploying an HA configuration on Amazon Web Services, you only have to configure the SBC software on the primary device



Important:

All hardware server types, virtualized environment platforms, and cloud platforms support the multi-server HA deployment type.

Although the HA pairs and non-HA deployments are shown separately in this figure, EMS can control both an SBC HA server pair as well as a single SBC server.

SBC HA server pairs must adhere to the following requirements:

- You can enable and use the HA deployment feature only if the license file contains an HA license.
- The HA pair servers must reachable by the EMS or EMS HA pair servers over the Management Plane (M1).
- The HA pair servers must be reachable between the devices over the Management link (M1) .
- The HA pair servers must have the HA link (M2) reachable between the HA pair servers.
- The HA pair servers must set up to have all the data interfaces between the servers replicated so that the servers are connected in same subnets. For example, the A1 data interface in one SBC server should be in the same subnet as the A1 data interface of the paired SBC server. This allows you to meet the requirement that failover be functional in an active/standby mode.
- In a multiple server HA virtualized deployment, when there are multiple HA pairs and automatic IP addressing is being used on the HA link (M2), every HA pair should either have their own isolated vSwitch or each HA pair should use different IP addresses reachable with their HA pairs as stated previously for M2 connectivity.

Chapter 3: Planning

Prerequisite knowledge, skills, and tools

Before deploying the product, ensure that you have the following knowledge, skills and tools.

Knowledge

- Microsoft® Azure (Azure) setup
- Avaya SBC setup
- Windows® Operating System
- Linux® Operating System

Skills

Ability to administer Azure and Avaya SBC.

Tools and utilities

To deploy the Avaya SBC software image and to configure the applications, you need the following tools and utilities:

- A browser for accessing the Azure Management Console.
- PuTTY, PuTTYgen, WinSCP, and WinZip.
- Linux QEMU tools.

Important:

Avaya recommends that you use the Azure Command Line Interface (CLI) when deploying Avaya SBC with Azure. The setup of the management and data interfaces is critical and the CLI is the most reliable method.

Note:

The ASBC image supports only UEFI boot mode. Therefore, only Azure instance type gen 2 supports the deployment.

Supported virtual machine types

The Azure virtual machine (VM) environment is designed to support Generation 2 VM type. Avaya SBC supports Generation 2 VM type.

Generation 2 uses newer UEFI-based boot architecture. Avaya SBC Virtual Hard Disk (VHD) and QEMU Copy-on-Write (QCOW2) format supports Generation 2 VMs.

See the information on the following Microsoft web site to help you use the Azure tools to create a VM:

https://docs.microsoft.com/en-us/azure/virtual-machines/

Important:

Avaya recommends that you use the Azure Command Line Interface (CLI) when deploying Avaya SBC with Azure. The setup of the management and data interfaces is critical and the CLI is the most reliable method.

Virtual machine specifications

Avaya SBC on an Azure virtual machine (VM) requires a minimum of four (4) and a maximum of six (6) network interfaces. For an HA deployment, you must use a VM with four (4) network interfaces. For more information about Linux VMs used for Azure, see the following websites:

https://docs.microsoft.com/en-us/azure/virtual-machines/linux/sizes

https://docs.microsoft.com/en-us/azure/virtual-machines/fsv2-series?toc=/azure/virtual-machines/linux/toc.json&bc=/azure/virtual-machines/linux/breadcrumb/toc.json

Table 1: Azure B-series VM specifications

Azure Size	vCPUs	Memory (GB)	Temporary Storage (GB)	NICs
Standard_B4ms	4	16	32	4
Standard_B8ms	8	32	64	4
Standard_B12ms	12	48	96	6

Table 2: Azure F-series high performance VM specifications

Azure Size	vCPUs	Memory	Temporary Storage	Maximum data disks	Maximum cached and temporary storage throughput	Maximum uncached disk throughput	NIC ports and Network Bandwidth
Standard_F2s_v2	2	4 GB	16 GB	4	4000 IOPS 31 Mbps 32 GB	3200 IOPS 47 Mbps	2 ports 875 Mbps

Table continues…

Azure Size	vCPUs	Memory	Temporary Storage	Maximum data disks	Maximum cached and temporary storage throughput	Maximum uncached disk throughput	NIC ports and Network Bandwidth
Standard_F4s_v2	4	8 GB	32 GB	8	8000 IOPS 63 Mbps 64 GB	6400 IOPS 95 Mbps	2 ports 1750 Mbps
Standard_F8s_v2	8	16 GB	64 GB	16	16000 IOPS 127 Mbps 128 GB	12800 IOPS 190 Mbps	4 ports 3500 Mbps
Standard_F16s_v2	16	32 GB	128 GB	32	32000 IOPS 255 Mbps 256 GB	25600 IOPS 380 Mbps	4 ports 7000 Mbps

Software to download

Download the ISO software image file from the Avaya Support Site or from the Avaya PLDS website:

https://support.avaya.com/downloads/

https://plds.avaya.com

- `sbce-10.2.1.0-101-24795.qcow2`

Capacities

An Avaya SBC deployment on Azure supports the following system capacities:

Number of Remote Worker Registrations	Non-encrypted Calls with Trunking	Encrypted Remote Worker Sessions
5,000	5,000	1,800

Network interfaces

The number of network interfaces that you set up depends the type of Avaya SBC instance that you are deploying.

The following table shows the minimum number of interfaces required for each type:

Type	Minimum number of interfaces	Maximum number of interfaces
EMS	1	2
SBC	4	6
EMS+SBC	4	4

The following table shows the relationship between the number of network interfaces and their configuration when deployed:

Number of network interfaces	Type of Avaya SBC configuration	Interface ports order
1	EMS only	M1
2	EMS only	M1, A1
4	EMS or EMS+SBC or SBC	B1, A1, M1, M2
6	EMS or EMS+SBC or SBC	M1, A1, B1, M2, A2, B2

Note:

EMS requires only M1 interface. A1 interface is ignored.

Supported browsers

For information about supported browser list and version, see the following website:

https://docs.microsoft.com/en-us/azure/azure-portal/

Password policies

The `root` and `ipcs` passwords are set during product installation. The EMS GUI has a separate password.

The default user IDs and passwords are the following:

Username	Password
`root`	`@V@Y@_123`
`ipcs`	`Avaya_123`
`ucsec` (GUI only)	`ucsec`

Note:

After the factory reset, the golden password for the root user ID is `Avaya_123`.

Security alert:

You must change the default passwords for the CLI root and ipcs user IDs after the first boot during the installation procedure. When prompted, you must enter and confirm the new password. Password restrictions are enforced on the root, ucsec, and ipcs user IDs. The new password must meet the following criteria:

- Contains at least eight characters.
- Contains one uppercase letter, one lowercase letter, and one number.
- Contains one special character from the following: a hyphen (-), an underscore (_), the at sign (@), an asterisk (*), or the exclamation mark (!). Do not use the pound sign (#), the dollar sign ($), or an ampersand (&).

Related links

Console and SSH passwords complexity on page 14
EMS GUI password complexity on page 14
Grub password complexity on page 15
Password hashing mechanisms on page 15

Console and SSH passwords complexity

The Console and SSH passwords must adhere to the following requirements:

- Contain at least eight characters.
- Contain at least two uppercase characters, not including the first character of the password.
- Contain at least one lowercase character.
- Contain at least one special character.
- Contain at least two digits, not including the last character of the password.

The Console and SSH passwords do not have a limit on the maximum length and are hashed by the MD5 hash algorithm.

Note:

Password Authentication Module (PAM) enforces password security, and hashes are stored in: `/etc/shadow`

Related links

Password policies on page 13

EMS GUI password complexity

The EMS GUI password must fulfill the following norms:

- Have at least eight characters.
- Contain mixed uppercase and lowercase characters.
- Contain at least one special character.
- Contain at least one number.

The EMS GUI password does not have a limit on the maximum length and is hashed by the MD5 hash algorithm.

Related links

Password policies on page 13
Change Password field descriptions on page 15

Change Password field descriptions

Name	Description
Current Password	The password currently used for logging in.
New Password	The new password that replaces the old password.
Repeat password	The new password repeated for confirmation.

Related links

EMS GUI password complexity on page 14

Grub password complexity

The Grub password must adhere to the following requirements:

- Contain at least eight characters.
- Contain uppercase and lowercase characters.
- Contain at least special character except %, &, and $.
- Contain at least two digits.

You can change the Grub password with the **`sbceconfigurator.py change-grub-password`** command.

Related links

Password policies on page 13

Password hashing mechanisms

Release	GUI	API / Peon (User only)	Platform
8.x	SHA-256	PBKDF2/SHA-512	SHA-512
10.1.x	SHA-256	PBKDF2/SHA-512	SHA-512
10.2.x	Argon2	PBKDF2/SHA-512	SHA-512

Related links

Password policies on page 13

Avaya SBC features not supported in an Azure deployment

Avaya SBC deployed on Azure does not support EMS primary and secondary High Availability (HA) deployment.

Chapter 4: Prerequisite procedures

Prerequisite procedures checklist

Ensure that you complete the following before deploying Avaya SBC on Azure:

Task	Link/Notes	✔
Download the ISO software image file.	Software to download on page 12	
Purchase the required Avaya SBC licenses. Register for PLDS and perform the following • Obtain the license file. • Activate license entitlements in PLDS.	https://plds.avaya.com/	
Convert the QCOW2 image to a VHD image.	Converting a QCOW2 image to a VHD image on page 18	

Downloading software from Avaya PLDS

About this task

When you place an order for an Avaya PLDS-licensed software product, PLDS creates the license entitlements of the order and sends an email notification to you. The email includes a license activation code (LAC) and instructions for accessing and logging into PLDS. Use the LAC to locate and download the purchased license entitlements. In addition to PLDS, you can download the product software from http://support.avaya.com/ by navigating to the Support by Product menu at the top of the page.

Procedure

1. To access the Avaya PLDS website, type http://plds.avaya.com/ in your web browser.
2. Type your login ID and password.
3. On the PLDS home page, select **Assets**.
4. Select **View Downloads**.
5. Click the search icon ( ) for Company Name.

6. In the Search Companies dialog box, do the following:
   a. In the **%Name** field, type `Avaya` or the Partner company name.
   b. Click **Search Companies**.
   c. Locate the correct entry and click the **Select** link.
7. In **Download Pub ID**, type the download pub ID.
8. In the **Application** field, click the application name.
9. In the **Download type** field, click one of the following:
   - **Software Downloads**
   - **Firmware Downloads**
   - **Language Packs**
   - **Miscellaneous**
10. In the **Version** field, click the version number.
11. Click **Search Downloads**.
12. Scroll down to the entry for the download file, and click the **Download** link.
13. Select a location where you want to save the file, and click **Save**.
14. **(Optional)** On Internet Explorer, if you receive an error message, click the install ActiveX message at the top of the page to start the download.

Latest software updates and patch information

Before you start the deployment or upgrade of an Avaya product or solution, download the latest software updates or patches for the product or solution. For more information, see the latest release notes, Product Support Notices (PSN), and Product Correction Notices (PCN) for the product or solution on the Avaya Support Web site at https://support.avaya.com/.

After deploying or upgrading a product or solution, use the instructions in the release notes, PSNs, or PCNs to install any required software updates or patches.

For third-party products used with an Avaya product or solution, see the latest release notes for the third-party products to determine if you need to download and install any updates or patches.

Converting a QCOW2 image to a VHD image

About this task

Depending on the type of VM you are using, you might need to convert a QCOW2 image to a VHD image. Use this procedure to do that conversion.

Before you begin

Download the QCOW2 image from PLDS as described in Downloading software from Avaya PLDS on page 17.

Confirm that you have access to Linux QEMU tools. For more information about QEMU tools, see the following website:

https://access.redhat.com/documentation/en-us/red_hat_enterprise_linux/8/html/configuring_and_managing_virtualization/managing-storage-for-virtual-machines_configuring-and-managing-virtualization#managing-virtual-disk-images-by-using-the-cli_managing-storage-for-virtual-machines

Procedure

1. Log on as root to the Linux server.
2. Copy the QCOW2 image file to a temporary directory.
3. Run the following command convert the QCOW2 image to a raw file format:

   ```
   qemu-img convert -f qcow2 -O raw ASBCE.qcow2 ASBCE.raw
   ```

   ```
   MB=$((1024 * 1024))
   ```

4. Verify that the size of the raw image is aligned with 1 MB. If it is not, use the following commands to round it up to 1 MB:

   ```
   size=$(qemu-img info -f raw --output json "ASBCE.raw" | gawk
   'match($0, /"virtual-size": ([0-9]+),/, val) {print val[1]}')
   ```

   ```
   rounded_size=$((($size/$MB + 1)*$MB))
   ```

   ```
   qemu-img resize ASBCE.raw $rounded_size
   ```

   Note:

   The **qemu-img** command sometimes displays the following message, but you can ignore the warning:

   ```
   WARNING: Image format was not specified for 'ASBCE.raw' and probing guessed
   raw.
   Automatically detecting the format is dangerous for raw images, write
   operations on block 0 will be restricted.
   Specify the 'raw' format explicitly to remove the restrictions. Image resized.
   ```

5. Run the following command to convert the raw file to a fixed-size VHD image:

   - If you are using QEMU Version 2.6 or later:

     ```
     qemu-img convert -f raw -o subformat=fixed,force_size -O vpc
     ASBCE.raw ASBCE.vhd
     ```

   - If you are using QEMU version earlier than 2.6:

     ```
     qemu-img convert -f raw -o subformat=fixed -O vpc ASBCE.raw
     ASBCE.vhd
     ```

Chapter 5: Deploying and configuring Avaya SBC

Deployment checklist

Task	Reference	✔
Upload the VHD file to your system.	Uploading the VHD file on page 20	
Create a managed disk.	Creating a managed disk from the VHD file on page 21	
Create the virtual machine.	Creating the virtual machine on page 24	
Configure the network interfaces.	Configuring the network interfaces on page 26	
Run the first boot configuration.	Running the first boot configuration on page 28	
Configure the Avaya SBC features.	Configuring Avaya SBC features on page 29	

Important:

Avaya recommends that you use the Azure Command Line Interface (CLI) when deploying Avaya SBC with Azure. The setup of the management and data interfaces is critical and the CLI is the most reliable method.

Uploading the VHD file

About this task

To use the VHD file as a VM image, you must upload it into a “page blob” storage type container on your Azure storage account. You can upload the VHD file using the Azure Storage Explorer. For more information about “page blobs”, see the following website:

https://docs.microsoft.com/en-us/azure/storage/blobs/storage-blob-pageblob-overview?tabs=dotnet

Before you begin

Create the storage account and blob container in the Azure Portal, or use the Azure CLI or PowerShell user interfaces.

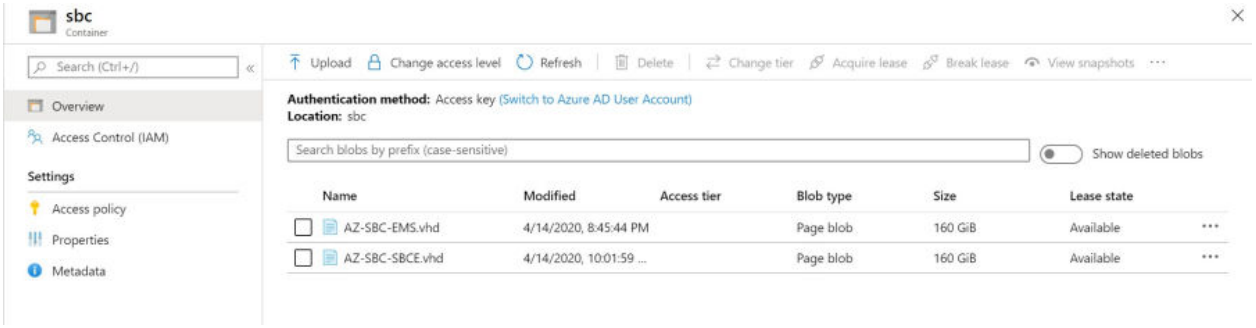
Procedure

1. Log on to the Azure Portal using your Azure logon credentials.
2. Use one of the following commands to upload and convert the VHD file:
   - **`ConvertTo-MvmcAzureVirtualHardDisk`**
   - **`AzCopy`**

   For example:

   `azcopy cp` *PathToVHDfile* **`"https://storageaccount.blob.core.windows.net/container?sas" --blob-type PageBlob`**

   The upload program uploads the VHD file and converts it into the proper format. You can view the file in your Azure storage account. See the following example:



Creating a managed disk from the VHD file

About this task

Use this procedure to create a managed disk from VHD file.

Note:

The screen examples shown in this procedure are shown to assist you using the Azure user interface. Your actual screens may differ than those shown here.

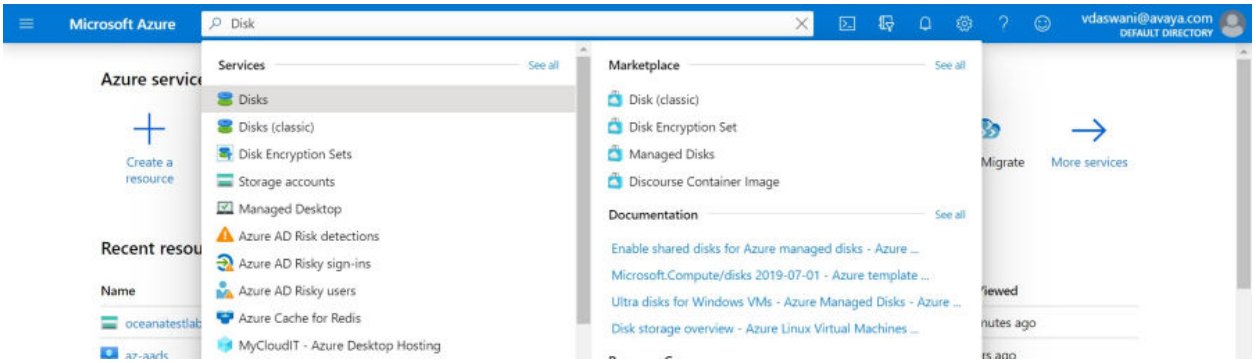
Before you begin

Create a resource group in the Azure Portal.

Procedure

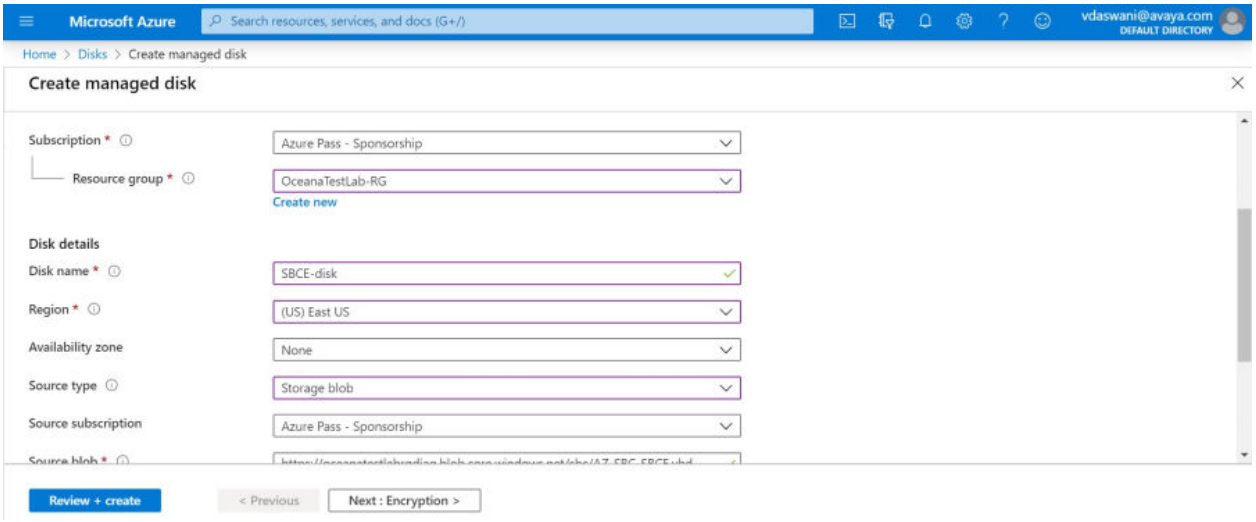
1. Log on to the Azure Portal using your Azure logon credentials.
2. In the Azure Portal search box, enter `disks` and press **Enter**.

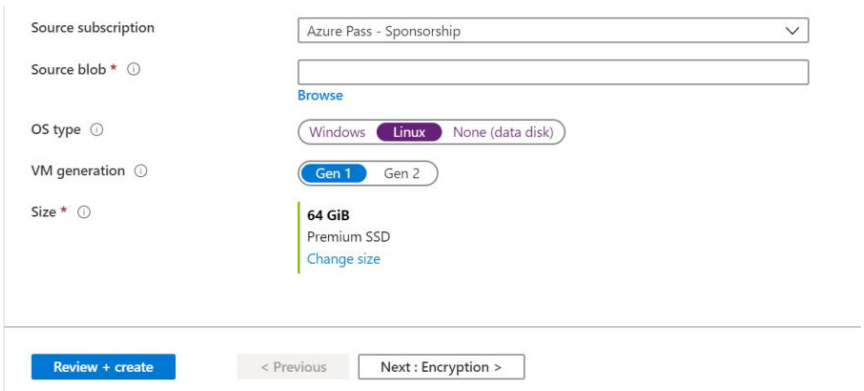
   The system displays various results similar to the following example:



3. Select **Disks**.
4. Click **Add**.

   The system displays the Create managed disk windows similar to those shown in the following examples:





5. On the Create managed disk window, configure the following options:
   - In the **Resource group** field, select a resource group you have configured.

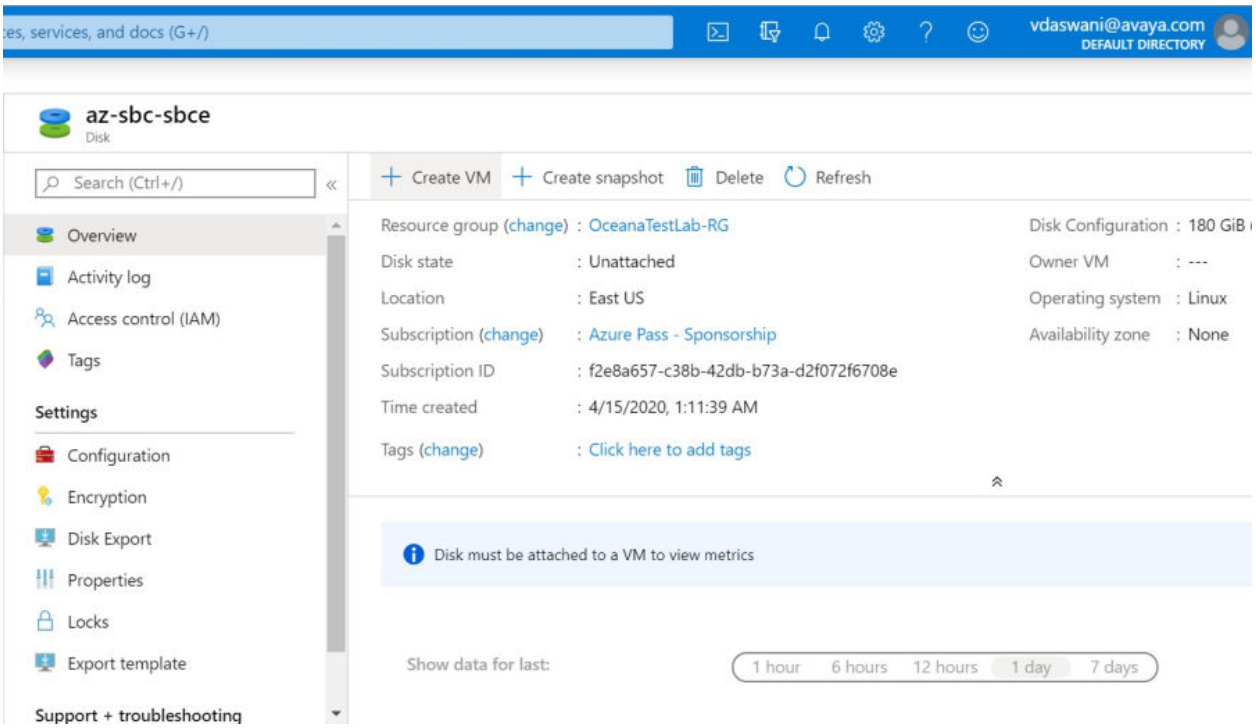
- In the **Disk name** field, enter the name of the disk you uploaded and converted.
- In the **Region** field, select the region where the system is located. If you have an HA pair, you must have them located in the same region.
- In the **Availability zone** field, an HA pair should be assigned to the same zone. Use **None** for all other configurations.
- In the **Source type** field, select **Storage blob**.
- In the **Source subscription** field, select the subscription you have purchased from Microsoft.
- In the **Source blob** field, browse to where you stored the VHD file.
- In the **OS type** field, select the operating system you want to use.

  Important:

  For disk0, you must select an operating system. Do not use **None (data disk)**. The rest of the disk will be a data disk. When using a Generation 2 QCOW image, you must select **Linux**.
- In the **VM generation** field, select **Gen 2** for the Generation 2 QCOW image.
- In the **Size** field, click the **Change size** link and select a size that is the same or larger than the size of the VHD file. Round up any values to the next highest round number value.

6. Click **Create**.

   The system displays a screen similar to the following example:



Note:

For more information, see the following links:

https://docs.microsoft.com/en-us/azure/storage/common/storage-account-create?tabs=azure-portal

https://docs.microsoft.com/en-us/azure/storage/blobs/storage-blobs-introduction

Creating the virtual machine

About this task

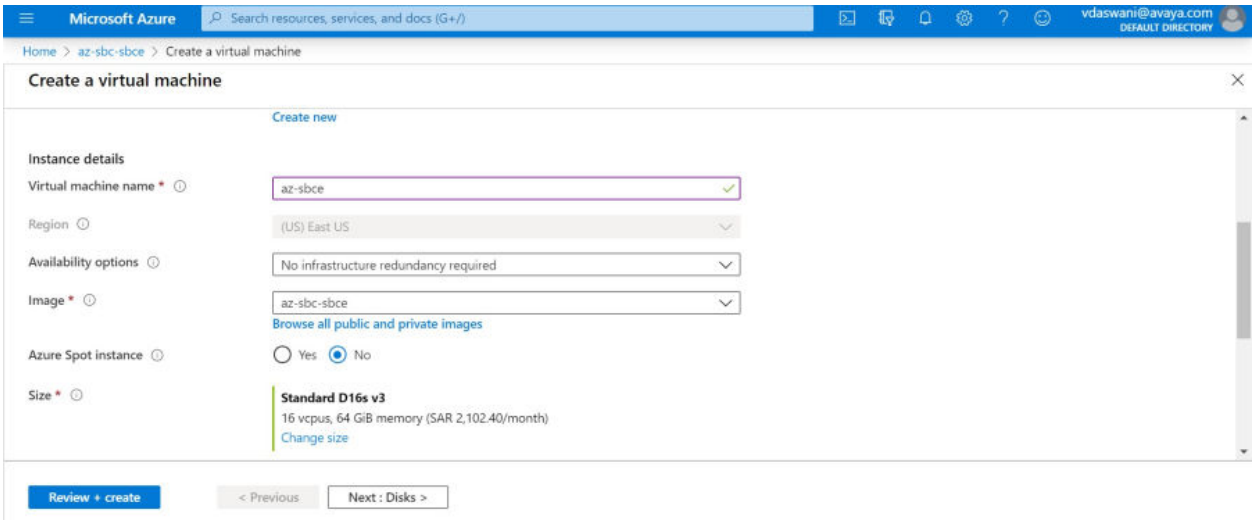
Note:

The screen examples shown in this procedure are shown to assist you using the Azure user interface. Your actual screens may differ than those shown here.

Procedure

1. Log on to the Azure Portal using your Azure logon credentials.
2. Click **Create VM**.

   The system displays the Create a virtual machine window.



3. Select the resource group you created earlier.
4. Configure the following options:
   - In the **Virtual machine name** field, enter a name for the machine you are creating.
   - In the **Size** field, select the Azure machine size you want to use. For more information, see Virtual machine specifications on page 11.

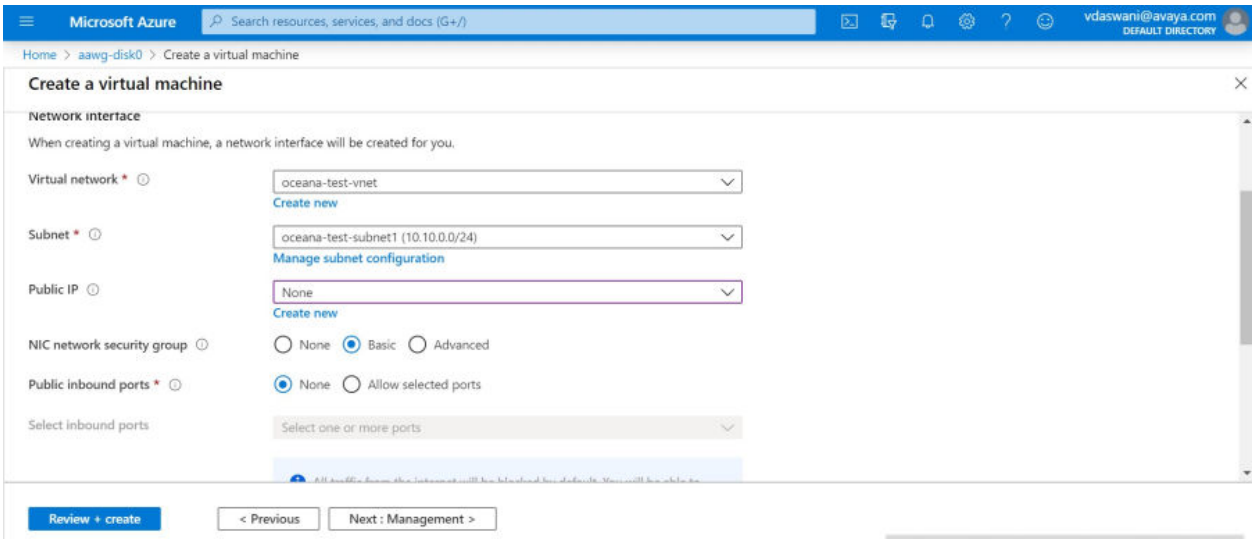
- In the **Inbound port rules** options, administer any inbound ports you wish to allow. In most cases, you would not allow any public interface or public inbound ports open.

5. Click **Next : Disks**.

   Accept all disk defaults.

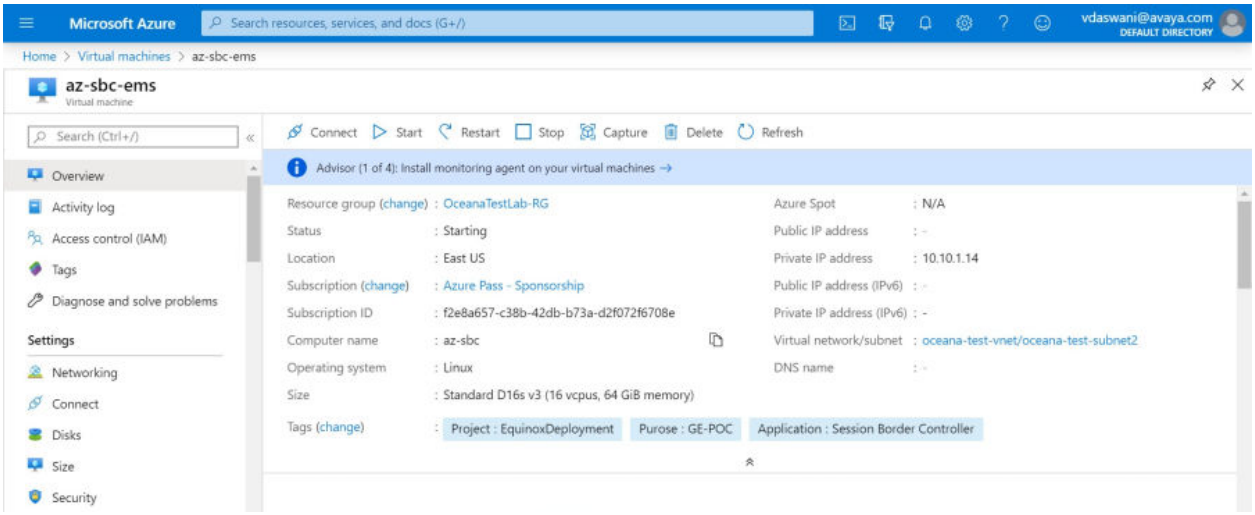
6. Click **Next : Network interface**.

   The system displays the **Network Interface** options window.



7. Configure the following options:
   - In the **Virtual network** field, select a virtual network to use for the system.
   - In the **Subnet** field, select the subnet you want to use.
   - In the **Public IP** field, select **None**.
8. Leave all other options defaulted.
9. Click **Review + create**.

   The system displays a screen similar to the following example:



Next steps

Verify that the following configuration items are valid:

- The host name must be in the `/etc/hosts` file in the correct format.
- The DNS server must be in the `/etc/resolv.conf` file.
- The VMware IP address must not exist in any of these configuration files.
- Verify the SSH configuration in the `/etc/ssh/sshd_config` file.

Configuring the network interfaces

About this task

Before you install and configure the Avaya SBC software, you must configure the network interfaces on Azure as follows:

- For an EMS+SBC deployment – Four network interfaces (M1, A1, B1, M2)
- For all other deployments, including HA – Six network interfaces (M1, A1, B1, M2, A2, B2)

By default, Azure creates only the one M1 interface automatically, so you have to manually create the rest of the interfaces required by your deployment.

Important:

You must verify that none of the network interfaces have already been assigned prior to configuring them for use with Avaya SBC. If you have not verified this before you configure the network interfaces, you might need to follow a special procedure to detach and then attach the network interfaces. For more information, see the following KB article:

https://docs.microsoft.com/en-us/azure/virtual-network/virtual-network-network-interface-vm

Note:

The screen examples shown in this procedure are shown to assist you using the Azure user interface. Your actual screens may differ than those shown here.

Before you begin

Create three different subnets, one each for Avaya SBC Management, Avaya SBC external, and Avaya SBC internal networks.

Procedure

1. Verify that you can SSH to the Avaya SBC virtual machine from the subnet that is enabled for your system. Use the password `Avaya_123` or `@V@Y@_123`.

   `ssh root@`*<SBC_VM_IP_ADDRESS>* `-p 22`

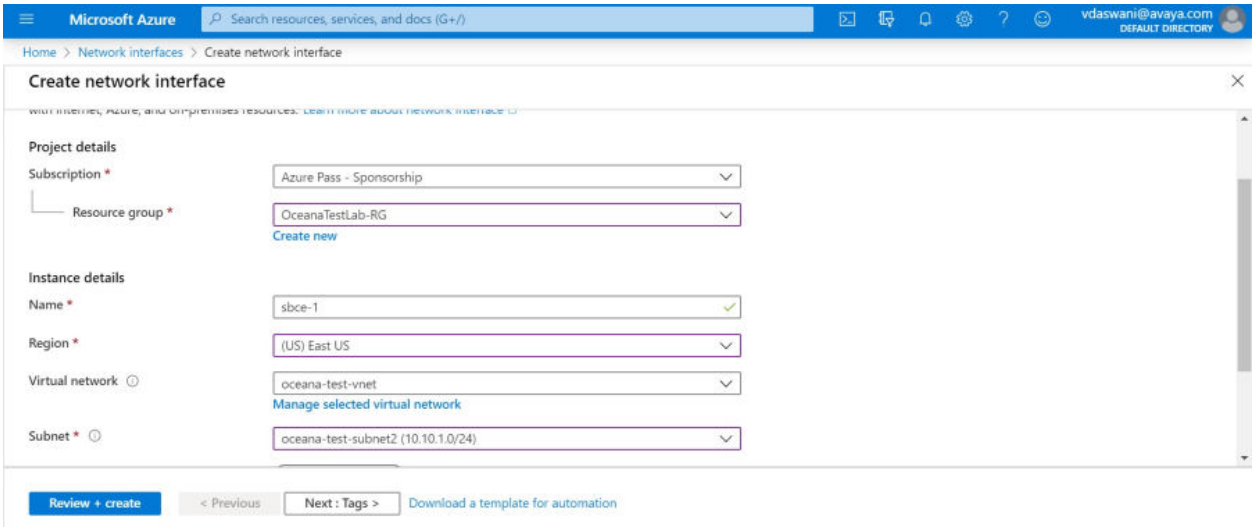
   If there is a problem using SSH, you can use the Serial Console in Azure.

2. Log on to the Azure Portal using your Azure logon credentials.
3. In the search box, enter “network interfaces” and press **Enter**.

   The system displays the results based on the search.

4. Select **Network interfaces**.

   The system displays the Create network interface window.



5. Do one of the following depending on if you are adding a total of four or six interfaces:

   Important:

   The M1 management network interface was automatically configured when you first created the VM. You do not need to create the M1 network interface again.

   - Add three network interfaces for EMS+SBC in the following order: SBC_A1, SBC_B1, and SBC_M2.

- Add five network interfaces for all other SBC configurations, including HA, in the following order: SBC_A1, SBC_B1, SBC_M2, SBC_A2, and SBC_B2.

For detailed instructions on how to add network interfaces using Azure, see the following website:

https://docs.microsoft.com/en-us/azure/virtual-network/virtual-network-network-interface-vm

Running the first boot configuration

Before you begin

In the Azure Portal, verify that the Overview window for the VM you created earlier is open. You can find the VM under All Resources if you need to open it. The Overview window allows you to see whether the VM is running, stop or restart the VM, get the public IP address of the VM, and see the activity of the CPU, disk, and network components.

Be prepared to change the password during the first boot configuration. You cannot keep the default password.

Note:

Prior to running cloud configurator, you must ensure that the following resources are configured correctly:

- CPU
- Disk
- Network interfaces

Procedure

1. Log in to the console using SSH to the Avaya SBC virtual machine from the subnet that is enabled for your system. Use the password `@V@Y@_123`.

   `ssh root@<SBC_VM_IP_ADDRESS> -p 22`

   If there is a problem using SSH, you can use the Serial Console in Azure.

2. Run the following command twice:

   `/usr/local/ipcs/icu3/scripts/CloudConfigurator.py -s`

   The system displays a prompt to accept the EULA agreement and then displays a configuration screen similar to configuration on VMware and hardware. For more information on deploying Avaya SBC using CLI methods, see *Deploying Avaya SBC in Virtualized Environment* document.

3. After the system reboots, wait for several minutes for the system processes to stabilize and you receive the “Boot process complete” message.

4. Power off and power on the VM from the Azure Portal page.

Configuring Avaya SBC features

Procedure

1. Use any Windows machine that is accessible as a remote desktop from the client machine to configure the Avaya SBC instance from EMS.

   You can access EMS from `https://<Avaya SBC IP address>/` by using following credentials:

   - Username : ucsec
   - Password: ucsec

   You can login to the Avaya SBC instance CLI by using port 222 and 'ipcs' user with the password set during installation stage.

   Note:

   At your first login, you must change the default password.

2. Configure the Avaya SBC features as required for this deployment.

   For more information, see the following documents that explain how to administer and configure different Avaya SBC features and solutions:

   - *Avaya Session Border Controller Overview and Specification*
   - *Administering Avaya Session Border Controller*
   - *Working with Avaya Session Border Controller Multi-Tenancy*
   - *Working with Avaya Session Border Controller and Microsoft® Teams*

Chapter 6: Licensing requirements

About licensing requirements

Avaya SBC uses the Avaya Product Licensing and Delivery System (PLDS) to create licenses and download Avaya SBC software. PLDS is not integrated with WebLM. Use PLDS to perform operations such as license activations, license upgrades, license moves and software downloads.

There are two licensed versions of Avaya SBC:

- Standard Services delivers non-encrypted SIP trunking.
- Advanced Services adds Mobile Workspace User, Media Replication, and other features to the Standard Services offer.

Avaya Aura® Mobility Suite and Collaboration Suite licenses include Avaya SBC.

Avaya SBC uses WebLM version 8.0 or later for licensing requirements. You can install the Avaya SBC license file on a primary Element Management System (EMS) using the Device Management page.

Important:

You must not enable the local WebLM option and install an Avaya SBC license file on the secondary EMS if used in an active-active deployment. If you install a license file on a secondary EMS in an active-active deployment, the licensing system will always show that the secondary EMS is in **OK** state.

Ensure that the license file of the WebLM server displays the product code Session Border Controller E AE. Before you configure the license file, you can view the **License State**, **Grace Period State**, and **Grace Period Expiration Date** fields on the Dashboard page. You have a 30-day grace period from the day of installation or upgrade to install the license. Avaya SBC works normally during the grace period.

Important:

Licenses and a WebLM server are required for new installations or upgrades.

The license file contains the following information:

- Product name
- Supported software version
- Expiration date
- Host ID

The primary host ID of WebLM is used for creating the license file.

- Licensed features
- Licensed capacity

All hardware Avaya SBC devices can use a local WebLM server for licenses. However, for mixed deployment environments with EMS on VMware and Avaya SBC on hardware, use a WebLM server installed on VMware or System Manager WebLM.

Avaya SBC supports pooled licensing. As opposed to static license allocation, Avaya SBC dynamically reserves and unreserves pooled licenses when needed. For example, customers with multiple Avaya SBC devices can use a pool of licenses dynamically across the devices as required.

For integration with Microsoft® Teams, Avaya SBC requires the Premium license and Premium HA license permissions in addition to the Standard Services and Advanced Services licenses.

For the use of AMR-WB codec, Avaya SBC requires counting license for AMR-WB codec license and AMR-WB codec HA tracking license. This is applicable to both static and dynamic licenses.

Initial Grace Period: Initial Grace Period is when Avaya SBC is newly installed and has no connection established to licensing server. When in initial grace period Avaya SBC only allows 100 licenses per feature.

Grace Period: Grace Period is when Avaya SBC loses its connection to licensing server after serving. In Dynamic Licensing Mode, when in Grace Period, State licensing statistics would show 0 and will be updated when connections with the licensing server are restored.

On upgrading to 10.2.1, EMS might display following warnings:

- *This system has one or more SBC(s) that does not have a valid AMR license configuration.*

  This may cause calls to fail or may cause other problems with the attached SBC(s). Check the device settings and license settings to ensure that calls will be processed properly.
- *This system has one or more SBC(s) that appear to have no licensing configuration.*

  This may cause calls to fail or may cause other problems with the attached SBC(s). Check the device settings and license settings to ensure that calls will be processed properly.

These warnings can be corrected by properly configuring licenses for all required features.

Avaya SBC licensed features

To use a feature, you must ensure that the license file that you upload to WebLM has the appropriate licenses for the feature. You cannot configure or use a feature if the correct license for that feature is not present in the license file.

License feature	Description
VALUE_SBCE_STD_SESSION_1	Specifies the number of standard session licenses.
VALUE_SBCE_STD_HA_SESSION_1	Specifies the number of standard service HA session licenses.
VALUE_SBCE_ADV_SESSION_1	Specifies the number of session licenses for remote worker, media recording, and encryption. **Note:** You must buy and deploy a standard session license with every advanced license feature.
VALUE_SBCE_ADV_HA_SESSION_1	Specifies the number of advanced service HA session licenses.
VALUE_SBCE_PREM_SESSION	Specifies the number of premium session licenses. Premium licenses are required when using Microsoft Teams.
VALUE_SBCE_PREM_HA_SESSION	Specifies the number of premium service HA session licenses. Premium licenses are required when using Microsoft Teams.
VALUE_SBCE_VIDEO_CONF_SVC_SESSION_1	Specifies the number of Avaya Meetings Server video conferencing session licenses.
VALUE_SBCE_VIDEO_CONF_HA_SVC_SESSION_1	Specifies the number of Avaya Meetings Server video conferencing HA session licenses.
VALUE_SBCE_CES_SVC_SESSION_1	Specifies the number of Client Enablement Services session licenses.
VALUE_SBCE_CES_HA_SVC_SESSION_1	Specifies the number of Client Enablement Services HA session licenses.
VALUE_SBCE_TRANS_SESSION_1	Specifies the number of transcoding session licenses.
VALUE_SBCE_TRANS_HA_SESSION_1	Specifies the number of transcoding HA session licenses.
VALUE_SBCE_ELEMENTS_MANAGED_1	Specifies the maximum number of Avaya SBC elements managed.
VALUE_SBCE_VIRTUALIZATION_1	Specifies that the download of virtual system installation files for VMware, KVM, Amazon Web Services, and Microsoft® Azure is permitted.
VALUE_SBCE_ENCRYPTION_1	Specifies that both media and signaling can be encrypted for Avaya SBC. This license is required when using any advanced licenses.

Table continues…

License feature	Description
FEAT_SBCE_HIGHAVAILABILITY_CONFIG_1	Specifies the configuration of HA for the setup.
FEAT_SBCE_DYNAMIC_LICENSING_1	Specifies that dynamic or pooled licensing is permitted for Avaya SBC. The quantity of this license must match the quantity of standard licensing in the system being managed.
VALUE_SBCE_RUSSIAN_ENCRYPTION_1	Specifies Avaya SBC encryption only for signaling.
VALUE_SBCE_NG911	Specifies the number of AMR-WB codec licenses.
VALUE_SBCE_NG911_HA	Specifies the number of AMR-WB codec HA licenses.

License installation

You can install Avaya SBC license on either of the following servers:

- The WebLM server on System Manager
- The local WebLM server

Installing a license on WebLM server on System Manager

Before you begin

Get the license file from the Avaya Product Licensing and Delivery System (PLDS) website at https://plds.avaya.com/.

About this task

If you experience problems while installing the license file, see the License file installation errors section in *Administering standalone Avaya WebLM*.

Procedure

1. Log in to the System Manager web interface.
2. On the home page, in the **Services** section, click **Licenses**.
3. In the left navigation pane, click **Install license**.
4. Browse to the location where you saved the license file, and select the file to upload.
5. Click **Install**.
6. Verify that the license is installed. If the installation is successful, a new menu item named ASBC appears in the left navigation pane. Click **ASBC** to view the licensed features.

Installing a license file on the local WebLM server

Procedure

1. Log in to the WebLM application. If you are logging in for the first time, the system prompts you to change the default password.
2. In the left navigation pane, click **Install License**.

   The system displays the Install License page.
3. In the **Enter license path** field, select the downloaded license from your computer and click **Install**.

   After the license is successfully installed, the system displays a new menu **ASBC**.
4. Click **ASBC** to view the license information.

Configuring the WebLM server IP address using the EMS web interface

Before you begin

Install the Avaya SBC license file on a WebLM Release 8.0 or later server installed on System Manager, a local WebLM, or a standalone WebLM server. For more information about installing license files and WebLM, see *Administering standalone Avaya WebLM*.

Get the URL for the WebLM server.

Procedure

1. Log in to the EMS web interface with administrator credentials.
2. Navigate to **Device Management** > **Licensing**.
3. Do one of the following tasks:
   - For a WebLM server or standalone server installed on System Manager , in the **WebLM Server URL** field, type the URL of the WebLM server and click **Save**.

     The URL format of the WebLM server installed on System Manager is:

     `https://<SMGR_server_IP>:52233/WebLM/LicenseServer`

     The URL format of the standalone WebLM server is:

     `https://<WEBLM_server_IP>:52233/WebLM/LicenseServer.`
   - For an external WebLM server, type the link for the external WebLM server in **External WebLM Server URL** and click **Save**.
4. Click **Refresh Existing License** to refresh the existing licenses.
5. Click **Verify Existing License** to verify the existing WebLM license to confirm it is trusted.

If the WebLM license is trusted, a pop window will display the certificate details. Otherwise, you can select the option to trust the WebLM certificate manually.

6. On the Dashboard screen, check the **License State** field.

   If the configuration is successful, the **License State** field shows `OK`.

7. Click the **Devices** tab.
8. Locate the Avaya SBC device you configured, and click **Edit**.

   The EMS server displays the Edit Device dialog box.

9. In the **Standard Sessions**, **Advanced Sessions**, **Scopia Video Sessions**, and **CES Sessions** fields, type the number of licensed sessions depending on the license you purchased.
10. Click **Finish**.

Configuring the WebLM server IP address using CLI

Before you begin

Install the Avaya SBC license file on a WebLM Release 8.0 or later server installed on System Manager, a local WebLM, or a standalone WebLM server. For more information about installing license files and WebLM, see *Administering standalone Avaya WebLM*.

Get the URL for the WebLM server.

Procedure

1. Log in to the CLI with administrator credentials.
2. Run the following command to configure an external WebLM server URL:

   `sbceconfigurator.py config-weblm-url <WebLM URL>`

3. Reboot Avaya SBC.

About centralized licensing

Using Centralized Licensing feature, the WebLM server can directly distribute the licenses to Avaya SBC connected to different Element Management System (EMS) in different networks.

The Centralized Licensing feature provides the following advantages:

- Eliminates the need to install and configure multiple WebLM servers, one for each Avaya SBC setup.
- Eliminates the need to log in to each WebLM server to manage licenses for each Avaya SBC setup.

- Reduces the VMware licensing cost for installing and configuring multiple WebLM OVAs on VMware.
- Provides a centralized view of license usage for Avaya SBC.

Note:

- The setup does not support the Centralized Licensing feature.
- The Centralized Licensing feature is optional. Use the Centralized Licensing feature when you have more than one Avaya SBC setup.

Chapter 7: Verifying a successful deployment

You can verify the successful deployment of EMS using one of the following methods:

- Access the EMS server using the web interface.
- Access the EMS server through console.
- Establish a CLI session through a secure shell session (SSH).

Logging on to the EMS web interface

Procedure

1. Open a new browser tab or window.
2. Type the following URL:

   `https://<Avaya EMS IP address>`
3. Press **Enter**.

   The system displays a message indicating that the security certificate is not trusted.
4. Accept the system message and continue to the next screen.

   If the Welcome screen is displayed, the EMS is operating normally and available for use. You can log in to EMS and perform normal administrative and operational tasks. See *Administering Avaya Session Border Controller for Enterprise*.
5. Type the username and password as `ucsec`.

   On first login, system prompts you to change the password.
6. Enter a new password and login with the new password.

Installing and verifying successful installation of EMS and SBC

Procedure

1. Log in to the EMS web interface with administrator credentials.
2. In the navigation pane, click **Device Management**.

   Note:

   The following step is not applicable for the single server deployment of Avaya SBC.
3. On the Device Management page, do the following:
   a. In the **Devices** tab, click **Add**.
   b. In the Add Devices window, enter the Avaya SBC details, such as the host name and the management IP address.
   c. Click **Finish**.

   On the Device Management page, the **Status** column of the Avaya SBC device displays Registered.
4. Click **Install**.
5. In the Install Wizard, enter the configuration. For more information, see *Administering Avaya Session Border Controller*.
6. Click **Finish**.

   In the **Devices** tab, the **Status** column of the device displays **Commissioned** indicating that the device is successfully deployed and configured.

Logging in to the EMS using SSH

Procedure

1. Log in to SSH client using PuTTy.
2. Type the IP address for Avaya SBC.
3. Specify the port as **22** or **222**.
4. Select the connection type as SSH and press `Enter`.
5. Enter the user name and password to log in.

   Note:

   You cannot gain access to shell with user account `ucsec`.

User account `ipcs` or user accounts that have shell access can be used for logging in to Avaya SBC.

Chapter 8: Resources

Documentation

The following table lists the documents related to this product. Download the documents from the Avaya Support website at http://support.avaya.com

Title	Description	Audience
Design		
Avaya Session Border Controller Overview and Specification	High-level functional and technical description of characteristics and capabilities of the Avaya SBC.	Sales engineers, solution architects, and implementation engineers
Avaya Session Border Controller Release Notes	Describes any last minute changes to the product, including patches, installation instructions, and upgrade instructions.	Sales and deployment engineers, solution architects, and support personnel
Avaya Solutions Platform Overview and Specification	Describes the key features of Avaya Solutions Platform servers.	IT Management, sales and deployment engineers, solution architects, and support personnel
Implementation		
Deploying Avaya Session Border Controller on a Hardware Platform	Describes how to plan and deploy an Avaya SBC system on the supported set of hardware servers.	Sales and deployment engineers, solution architects, and support personnel
Deploying Avaya Session Border Controller on a Virtualized Environment Platform	Describes how to plan and deploy an Avaya SBC system on customer-provided VMware servers.	Sales and deployment engineers, solution architects, and support personnel
Deploying Avaya Session Border Controller on a Google Cloud Platform	Describes how to plan and deploy an Avaya SBC system on a Google Cloud Platform.	Sales and deployment engineers, solution architects, and support personnel

Table continues…

Title	Description	Audience
Deploying Avaya Session Border Controller on an Amazon Web Services Platform	Describes how to plan and deploy an Avaya SBC system on Amazon Web Services.	Sales and deployment engineers, solution architects, and support personnel
Deploying Avaya Session Border Controller on a Microsoft® Azure Platform	Describes how to plan and deploy an Avaya SBC system on a Microsoft® Azure platform.	Sales and deployment engineers, solution architects, and support personnel
Avaya Session Border Controller Port Matrix	Describes the incoming and outgoing port usage required by the product.	Sales and deployment engineers, solution architects, and support personnel
Upgrading Avaya Session Border Controller	Describes how to upgrade to the latest release of Avaya SBC.	Sales and deployment engineers, solution architects, and support personnel
Installing the Avaya Solutions Platform 110 Appliance	Describes how to install Avaya Solutions Platform 110 Appliance servers.	Sales and deployment engineers, solution architects, and support personnel
Administration		
Administering Avaya Session Border Controller	Describes configuration and administration procedures.	Implementation engineers and administrators
Maintenance and Troubleshooting		
Maintaining and Troubleshooting Avaya Session Border Controller	Describes troubleshooting and maintenance procedures for Avaya SBC.	Implementation engineers
Maintaining and Troubleshooting Avaya Solutions Platform 110 Appliance	Describes procedures to maintain and troubleshoot Avaya Solutions Platform 110 Appliance servers.	Implementation engineers
Using		
Working with Avaya Session Border Controller and Microsoft® Teams	Describes how to set up, maintain, and use Avaya SBC with Microsoft Teams.	Implementation engineers and administrators
Working with Avaya Session Border Controller Multi-Tenancy	Describes how to set up, maintain, and use the Avaya SBC Multi-tenancy feature.	Implementation engineers and administrators
Working with Avaya Session Border Controller Geographic-Redundant Deployments	Describes how to set up, maintain, and use the Avaya SBC Geographic-redundant deployment feature.	Implementation engineers and administrators

For Dell documentation, go to https://www.dell.com/support/.

For HP documentation, go to https://www.hpe.com/support.

Finding documents on the Avaya Support website

Procedure

1. Go to https://support.avaya.com.
2. To log in, click **Sign In** at the top of the screen and then enter your login credentials when prompted.
3. Click **Product Support** > **Documents**.
4. In **Search Product**, start typing the product name and then select the appropriate product from the list displayed.
5. In **Select Release**, select the appropriate release number.

   This field is not available if there is only one release for the product.
6. **(Optional)** In **Enter Keyword**, type keywords for your search.
7. From the **Select Content Type** list, select one or more content types.

   For example, if you only want to see user guides, click **User Guides** in the **Select Content Type** list.
8. Click to display the search results.

Accessing the port matrix document

Procedure

1. Go to https://support.avaya.com.
2. To log in, click **Sign In** at the top of the screen and then enter your login credentials when prompted.
3. Click **Product Support** > **Documents**.
4. In **Select Release**, select the appropriate release number.

   This field is not available if there is only one release for the product.
5. From the **Select Content Type** list. select one or both of the following options:
   - **Application & Technical Notes**
   - **Design, Development & System Mgt**

Avaya Documentation Center navigation

For many programs, the latest customer documentation is available on the Avaya Documentation Center website at https://documentation.avaya.com. Some functionality is only available when you log in to the Avaya Documentation Center. The available functionality depends on your role.

Important:

If the documentation you are looking for is not available on the Avaya Documentation Center, you can find it on the Avaya Support website.

While navigating through the Documentation Center, you can click the **Avaya Documentation Center** logo at the top of the screen to return to the home page anytime. On the Avaya Documentation Center, you can do the following:

- Click **Avaya Links** in the top menu bar to access other Avaya websites, including the Avaya Support website.
- Click **Languages** ( ) in the top menu bar to change the display language and view localized documents.
- In the **Search Documentation** field, search for keywords and click **Filter** to filter by solution category, product, or user role.

  You can select multiple items in each filter category. For example, you can select a product and multiple user roles.
- Click **Library** in the top menu bar to access the complete library of documents. Use the filtering options to refine your results.
- After performing a search or accessing the library, you can sort content on the search results page. When you find the item you want to view, click it to open it.
- Use the table of contents in a document for navigation. You can also click **<** or **>** next to the document title to navigate to the previous topic or the next topic.
- Click **Share** ( ) to share a topic by email or copy the URL.
- Download a PDF of the current topic in a document, the topic and its subtopics, or the entire document.
- Print the section you are viewing.
- Add content to a collection by clicking **Add to My Topics** ( ). You can add the topic and its subtopics or add the entire publication.
- View the topics in your collections. To access your collections, click your name in the top menu bar and then click **My Topics**.

  You can do the following:

  - Create, rename, and delete a collection.
  - Set a collection as the default or favorite collection.

  - Save a PDF of the selected content in a collection and download it to your computer.
  - Share content in a collection with others through email.
  - Receive collections that others have shared with you.

- Click **Watch** ( ) to add a topic to your watchlist so you are notified when the content is updated or removed.
- View and manage your watchlist by clicking **Watchlist** from the top menu with your name.

  You can do the following:

  - Enable **Email notifications** to receive email alerts.
  - Unwatch the selected content or all topics.
- Send feedback for a topic.

Training

The following courses are available on the Avaya Learning website at www.avaya-learning.com. After logging into the website, enter the course code or the course title in the **Search** field and click **Go** to search for the course.

Note:

Avaya training courses or Avaya learning courses do not provide training on any third-party products.

Course code	Course title
20600W	Avaya Session Border Controller 8.1 Technical Delta
21098W	Session Border Controller 8.0 Technical Delta
20660W	Administering the Avaya Session Border Controller for Enterprise - SIP Trunk
60660W	Administering Avaya SBC Release 8 for Remote Worker
20660T	Administering Avaya SBC Release 8 Test
20800C	Implementing and Supporting Avaya SBC — Platform Independent
20800T	Avaya SBC Platform Independent and Support Test
20800V	Implementing and Supporting Avaya SBC — Platform Independent
26160W	Avaya SBC Fundamentals
7008T	Avaya SBC for Midmarket Solutions Implementation and Support Test
7008W	Avaya SBC for Midmarket Solutions Implementation and Support
2035W	Avaya Unified Communications Roadmap for Avaya Equinox Clients
43000W	Selling Avaya Unified Communications Solutions

Table continues…

Course code	Course title
71300	Integrating Avaya Communication Applications
72300	Supporting Avaya Communication Applications

Viewing Avaya Mentor videos

Avaya Mentor videos provide technical content on how to install, configure, and troubleshoot Avaya products.

About this task

Videos are available on the Avaya Support website, listed under the video document type, and on the Avaya-run channel on YouTube.

- To find videos on the Avaya Support website, go to https://support.avaya.com/ and do one of the following:
  - In **Search**, type `Avaya Mentor Videos`, click **Clear All** and select **Video** in the **Select Content Type**.
  - In **Search**, type the product name. On the Search Results page, click **Clear All** and select **Video** in the **Select Content Type**.

    The **Video** content type is displayed only when videos are available for that product.

  In the right pane, the page displays a list of available videos.
- To find the Avaya Mentor videos on YouTube, go to www.youtube.com/AvayaMentor and do one of the following:
  - Enter a keyword or keywords in the **Search Channel** to search for a specific product or topic.
  - Scroll down Playlists, and click a topic name to see the list of videos available. For example, Contact Centers.

Note:

Videos are not available for all products.

Support

Go to the Avaya Support website at https://support.avaya.com for the most up-to-date documentation, product notices, and knowledge articles. You can also search for release notes, downloads, and resolutions to issues. Use the online service request system to create a service request. Chat with live agents to get answers to questions, or request an agent to connect you to a support team if an issue requires additional expertise.

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