

# AC Voca Virtualized Private Cloud and AWS Deployments

Version 1.0



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## Related Documentation

Document Name
AC Voca - Technical Highlights and Specifications
AC Voca Release Notes
AC Voca Installation Guide
AC Voca Administrator's Guide

## Document Revision Record

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## Documentation Feedback

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# 1 Introduction

This document describes how to deploy AC Voca on private clouds and Amazon Web Services (AWS).

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## 2 AC Voca Private Data Center Deployment

This section describes the deployment of the AC Voca Private Data Center (DC).

### 2.1 Architecture

The architecture of the AC Voca Private Data Center is described below.

#### 2.1.1 Concepts

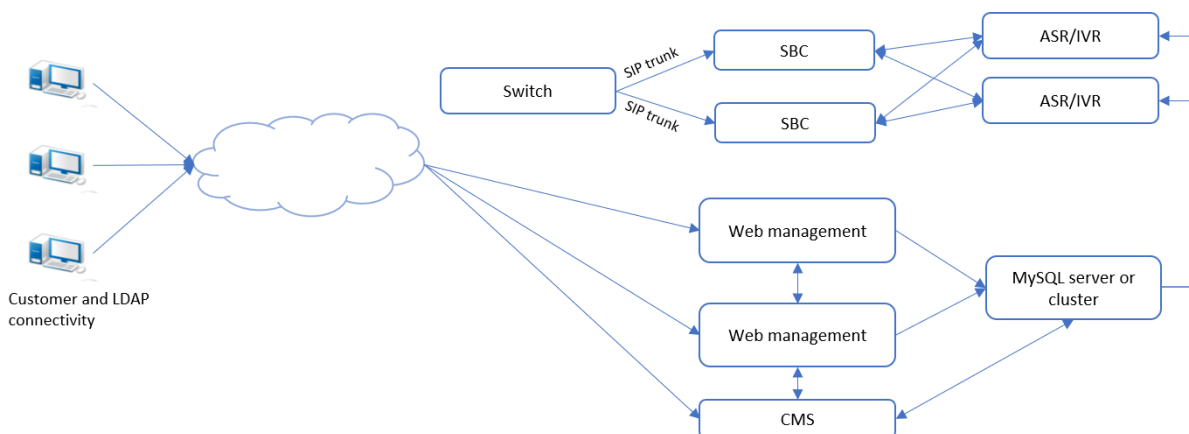
The AC Voca Data Center deployment architecture includes five server types:

- **SBC:** At least one SBC is required for an operational system; two or more SBCs are required for redundancy.
- **ASR/IVR:** At least one ASR/IVR server is required for an operational system; two or more SBCs are required for redundancy and additional capacity.
- **Web server:** The Web server is not a critical system component and does not carry a load. It can be run on a single server without requiring redundancy. Redundancy can be added using an additional server with DNS routing the traffic to the available server.
- **MySQL server:** The MySQL server can be deployed with a single server (backed up by IT) or using a MySQL cluster of three servers.
- **CMS server:** To provide the ability to customers to use the mobile application on iOS and Android, the CMS server is used to register and update the VocaNOM mobile application. The server is not used for day-to-day operation of the mobile application. It is only used to update grammar and first time registration.



**Note:** An iTunes and Google Play account are required to distribute the mobile application to the provider's customers.

**Figure 2-1: AC Voca Data Center Deployment Architecture**



## 2.1.2 Configuring Deployed Servers

Once the servers are deployed, they must be configured to an operative state by AudioCodes.

**Table 2-1: Servers Table**

Server	Networking	Scalable / Redundant	Capacity	VM Requirements	Deployment
<b>Web</b>	Located on the DMZ. 1 public IP address, 1 internal IP address (LAN)	No	Unlimited	2 cores, 8GB RAM, 100GB drive space	The AC Voca OVF image is provided by AudioCodes
<b>ASR/IVR</b>	1 internal IP address (LAN)	Yes	40 concurrent channels per server	8 cores, 16GB RAM, 256GB drive space	The AC Voca OVF image is provided by AudioCodes
			20 concurrent channels per server	4 cores, 8GB RAM, 256GB drive space	
<b>SBC</b>	May be located on the DMZ, if the SIP trunk is external. Otherwise, can use only internal IP addresses (LAN)	Yes	6000 concurrent channels	1 core, 4GB RAM, 60GB drive	The latest SBC OVF can be downloaded using the AudioCodes service portal
<b>CMS</b>	Located on the DMZ. 1 public IP address , 1 internal IP address (LAN)	No	Unlimited	2 cores, 8GB RAM, 100GB drive space	The CMS OVF image is provided by AudioCodes
<b>MySQL</b>	1 internal IP address (LAN)	As deployed	NA	2 cores, 8GB RAM, 100 GB drive space	A Windows 2016 server is required

### 2.1.3 Basic Deployment – No Redundancy, No Application, Single Voca Server

A base deployment includes one Web server, ASR/IVR and MySQL on a single machine and one SBC for a total of two servers. Please refer to “AC Voca - Technical Highlights and Specifications” for machine specifications.

### 2.1.4 Basic Deployment – No Redundancy, No Mobile Application

A base deployment includes one Web server, one ASR/IVR server, one SBC and one MySQL server for a total of four servers.

## 2.1.5 Basic Deployment – No Redundancy with Mobile Application

A base deployment includes one Web server, one ASR/IVR server, one SBC, one CMS server and one MySQL server for a total of five servers.

## 2.1.6 Basic Deployment with High Availability

When redundancy is required, the redundant capable servers must be duplicated as follows:

- **ASR/IVR** – Add an additional server for every 40 channels. As many servers as required can be added, two minimum.
- **SBC** – Add an additional SBC, as many as are required. Two are sufficient for high loads.
- **Web** – One web server is required. An additional can be added for high availability.
- **CMS** – One CMS server is required.
- **MySQL** – One MySQL server is required, can be backed up using standard IT tools.

The minimum number of servers required is seven in this scenario.

## 2.1.7 Advanced Deployment with High Availability

When redundancy is required, the redundant capable servers must be duplicated as follows:

- **ASR/IVR** – Add an additional server for every 40 channels. As many servers as required can be added. There must be at least two servers as a minimum.
- **SBC** – Add an additional SBC, as many as are required. Two are sufficient for high loads.
- **Web** – One Web server is required.
- **CMS** – One CMS server is required.
- **MySQL** – Three MySQL servers are required to create a fully redundant cluster.

In this scenario, a minimum number of nine servers are required.

## 2.1.8 Customer Premises

When connecting to a customer's LDAP system, an LDAP client must be installed and configured at the customer's site on any Windows machine. The client requires Windows 7 and higher. The LDAP client is provided for installation by AudioCodes.

The Windows machine must have access to the Web server deployed

If connectivity is required to a customer's analog lines, an additional media gateway may be required (e.g., MP-124, MP-118).

## 2.1.9 Deployment Components

Deployment of the various components are provided by AudioCodes, which sets up the required components and ensures their interoperability.

AudioCodes works with the service provider to connect the SIP trunks to the SBC in a redundant manner.

The service provider must provide external (public) and internal (LAN) IP addresses as required per server.

### **2.1.10 Performance, Support and Management**

For optimal service to customers, AudioCodes provides advanced linguistic services with dedicated personnel for this purpose. As such, AudioCodes strongly suggests that access be granted to specific AudioCodes employees for the purpose of retrieving information, enhancing performance and providing support. This access is requested on both the web site access level and direct RDP connections to the deployed solution. Please see SLA document for more information.

## 2.2 Securing the DC Deployment

This section describes how to secure the DC deployment.

### 2.2.1 Best Practices

To best secure the operational environment, each server with a public facing IP address must have proper security groups set up. Every server requires specific ports open. In addition, access to each server from various public IP addresses must be restricted to only the minimum required number. For example, each SBC server deployed must block all external IP addresses to begin with. Every new customer or SIP trunk connected should be added to the security group individually.

Web site access to AC Voca must use HTTPS and not HTTP. In addition, a publicly signed certificate is required to ensure proper use of HTTPS. See Section 2.2.3 on page 7.

For RDP access to the external facing servers, it is recommended to open Port 3389 (TCP) only from the IP address from which the provider manages the systems.

For RDP access to internal only servers, the provider must first RDP to an external server and only then RDP to the internal server.

### 2.2.2 Firewall

Servers on the DMZ must be deployed behind the provider's firewall as per the provider's standard deployment practices.

### 2.2.3 Certificates

AC Voca uses three certificates. Assuming the provider's domain is *provider.com*, the provider must supply these three certificates:

- admin.provider.com
- sdk.provider.com
- cms.provider.com

or this one certificate:

- \*.provider.com

## 2.2.4 Ports

Table 2-2: Ports

Server	Initial Open IP Address	Initial Open Ports	Required Open Ports per IP
Web and CMS	All	443 (TCP)(HTTPS)	<p><b>Internal:</b>                      Database ports:                      TCP, 3306.                      RDP port                      SMB ports: UDP,                      TCP, 135-139, 445</p> <p><b>External:</b>                      HTTPS port 443                      Any additional                      connectivity to                      customers, as                      required</p>
ASR/IVR	No public access	None	<p><b>Internal:</b>                      RTP: UDP 6000-                      8000                      SIP: TCP,UDP                      5060, 5080</p> <p><b>Database Ports:</b>                      TCP, 3306                      RDP port                      SMB ports: UDP,                      TCP, 135-139, 445</p>
SBC	None	None	<p><b>Internal:</b>                      RTP: UDP 6000-                      8500,                      SIP: TCP,UDP                      5060,5080                      RDP port</p> <p><b>External:</b>                      As required for                      connectivity to SIP                      trunks</p>

# 3 AC Voca AWS Cloud Deployment

This section describes the deployment of the AC Voca AWS Cloud.

## 3.1 Architecture

The architecture of the AC Voca AWS Cloud is described below.

### 3.1.1 Concepts

The AC Voca cloud deployment architecture includes five server types:

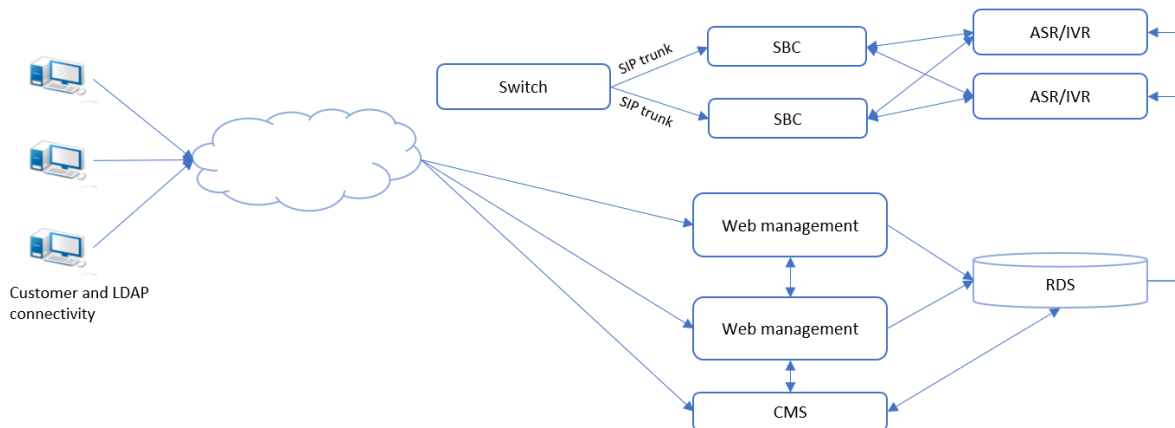
- **SBC:** At least one SBC is required for an operational system, two or more for redundancy.
- **ASR/IVR:** At least one ASR/IVR server is required for an operation system, two or more for redundancy and additional capacity.
- **Web Server:** The Web server is not a critical system component and does not carry load, it can be run on a single server without requiring redundancy. Redundancy can be added using an additional server with DNS routing the traffic to the available server.
- **CMS Server:** The CMS server is used to register and update the VocaNOM mobile application. The server is not used for day to day operation of the mobile application, only to update grammars and first time registration.

**Notes:**



- An iTunes and Google Play account are required to distribute the mobile application to the provider’s customers.
- Amazon Relational Database Service (RDS) is used as the primary database for the system.

**Figure 3-1: AC Voca AWS Cloud Architecture**



### 3.1.2 Configuring Servers

Once the servers are deployed, they must be configured to an operative state by AudioCodes.

**Table 3-1: Servers Table**

Server	Requires public IP address	Scalable/Redundant	Capacity	EC2 Machine type	Drive Options
Web	Yes	No	Unlimited	m5.large	100GB
ASR/IVR	No	Yes	20 concurrent channels per server	c5.xlarge	256GB
			40 concurrent channels per server	c5.2xlarge	256GB
SBC	Yes	Yes	6000 concurrent channels	c5.large	60GB
CMS	Yes	No	Unlimited	m5.large	100GB
RDS	No	NA	NA	db.m4.large	100GB
AppLogger	Yes	No	Unlimited	T2.small	8GB

### 3.1.3 Basic Deployment with No Redundancy

A base deployment includes one Web server, one ASR/IVR server, one SBC and one CMS server for a total of four servers.

### 3.1.4 Basic Deployment with Redundancy

When redundancy is required, the redundant capable servers must be duplicated as follows:

- **ASR/IVR** – Add an additional server for every 40 channels. To reach 40 channels per server, the instance must be upgraded to c5.2xlarge. As many servers as required can be added.
- **SBC** – Add an additional SBC, as many as are required. Usually, two are sufficient for high loads.



## 3.2 Deployment Components

Deployment of the various components are provided by AudioCodes As well as setting up the required components and ensuring their interoperability.

On AWS, the customer provides AudioCodes access to the cloud environment for the purpose of the setup. Once deployed, access to the cloud environment can be limited as required.

### 3.2.1 Customer Premises Deployment

When connecting to the customer's Active Directory, an LDAP client must be installed and configured at the customer's site on any Windows machine. The client requires the installation of Windows 7 or higher. The LDAP client is provided for installation by AudioCodes.

The Windows machine must have access to the deployed Web server.

If connectivity is required to a customer's analog lines, an additional media gateway may be required (e.g., MP-124, MP-118).

### 3.2.2 Performance, Support and Management

For optimal service to customers, AudioCodes provides advanced linguistic support with dedicated personnel for this purpose. As such, AudioCodes strongly suggests that access be granted to specific AudioCodes employees for the purpose of retrieving information, enhancing performance and providing support. This access is requested on both the Website access level and direct RDP connections to the deployed solution.

## 3.3 Securing the AWS Deployment

This section describes how to secure the AWS deployment.

### 3.3.1 Best Practices

To best secure the operational environment, each server with a public facing IP address must have proper security groups set up. Every server requires specific ports open. In addition, access to each server from various public IP addresses must be restricted to only the minimum required number. For example, each SBC server deployed must block all external IP addresses to begin with. Every new customer or SIP trunk connected should be added to the security group individually.

Website access to Voca must use HTTPS and not HTTP. In addition, a publicly signed certificate is required to ensure proper use of HTTPS. See Section 2.2.3 on page 7.

For RDP access to the external facing servers, it is recommended to open Port 3389 (TCP) only from the IP address from which the provider manages the systems.

For RDP access to internal only servers, the provider must first RDP to an external server and only then RDP to the internal server.

### 3.3.2 Using VPC Security Groups

When deploying on AWS, security groups are used to prevent unauthorized access to the operational servers. Security groups must be set to prevent all access by default, where valid.

Please see the required open ports and addresses in the Ports section below.

### 3.3.3 Certificates

Voca uses three certificates. Assuming the provider's domain is *provider.com*, the provider must supply these three certificates:

- admin.provider.com
- sdk.provider.com
- cms.provider.com

or this one certificate:

- \*.provider.com

### 3.3.4 Ports

Table 3-2: Ports

Server	Initial Open IP Addresses	Initial Open Ports	Required Open Ports per IP
<b>Web, CMS and Applogger</b>	All	443 (TCP) (HTTPS)	<p><b>Internal:</b> Database ports: TCP, 3306. RDP port SMB ports: UDP, TCP, 135-139, 445</p> <p><b>External:</b> HTTPS port 443 Any additional connectivity to customers, as required</p>
<b>ASR/IVR</b>	No public access	NA	<p><b>Internal:</b> RTP: UDP 6000-8000 SIP: TCP,UDP 5060,5080 Database ports: TCP, 3306 RDP port SMB ports: UDP, TCP, 135-139, 445</p>
<b>RDS</b>	No public access	NA	<p><b>Internal:</b> Database ports: TCP, 3306</p>
<b>SBC</b>	Open only to IPs as required per SIP trunk	None	<p><b>Internal:</b> RTP: UDP 6000-8500, SIP: TCP,UDP 5060, 5080 RDP port</p> <p><b>External:</b> As required for connectivity to SIP trunks</p>

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