Installation Manual

AudioCodes One Voice for Microsoft® Skype for Business

cX-UM Connector Installation Manual

Version 0.1.4

ac **audiocodes**

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https://downloads-audiocodes.s3.eu-central-1.amazonaws.com/Download/AC_cX-UM_IW.html

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Abbreviations and Terminology

Each abbreviation, unless widely used, is spelled out in full when first used.

Related Documentation

Document Name

Document Revision Record

LTRT	Description
40732	Initial document release for Version 0.1.4

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Software Revision Record

The following table lists the software versions released in Version 0.1.4.

Table 1-1: Software Revision Record

Software Version	Date
0.1.4	Mar 2020

> **Note:** The latest software versions can be downloaded from:
>
> https://downloads-audiocodes.s3.eu-central-1.amazonaws.com/Download/AC_cX-UM_IW.html
> Pay attention to download the cX-UM platform version (SfB Online/Teams)
> Unzip the file to a temporary directory.

1   Introduction

Office 365™ Microsoft Exchange Online Unified Messaging (UM) has reached End-of-Support as of February 28, 2020.

cX-UM (Cloud X-UM) provides MWI notifications for Cloud VoiceMails. The application is useful for users using non-MS telephony systems (e.g. Cisco), and at the same time using Microsoft Cloud Voicemail as their voicemail systems. These users can use cX-UM to receive standard SIP MWI notifications for any change in their voicemail status (new voicemail deposited, voicemail read or voicemail deleted).

To allow telephony (PBX) equipment to communicate securely with the Office 365 network, customers are required to deploy AudioCodes' Mediant Session Border Controllers (SBCs) with CCE for SfB Online or SBCs with Direct Routing for Teams Users.

This document details the installation procedure for **cX-UM Connector as a standalone server**. For Skype for Business 2015 and Skype for Business 2019 for **X-UM Standard based on CloudBond Standard Plus**, refer to LTRT-26791 AudioCodes X-UM Configuration Ver.0.1) or for X-UM Connector Installation, refer to LTRT-40729 AudioCodes X-UM Standard Installation Ver. 0.1.

> **Note:** This document describes MWI notifications for Cloud VoiceMails; however, it does not describe Microsoft Direct Routing functionality which is handled by AudioCodes SBC devices.

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2   cX-UM Data Flow

This section summarizes the steps for the cX-UM Data Flow:

1. cX-UM uses Graph API change notifications to subscribe changes to each user's voicemail folder.
2. The subscription requires a publicly open https webhook, that is called upon a change.
3. Since the cX-UM application is located on the customer premises behind a firewall, and cannot be reached from outside, a dedicated Azure App Service notification handler is configured as the notification webhook.
4. Cloud Voicemail sends notifications to the notification handler.
5. The notification handler pushes the notification to an Azure Service Bus queue.
6. The cX-UM application listens to the Azure Service Bus queue and recieves the notifications.
7. cX-UM sends a corresponding SIP MWI notification.

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3   Azure Notification Handler App Service and Service Bus

Graph API change notifications can only be sent to publically open HTTPS servers. Since the cX-UM application is located on customer premises behind a firewall and cannot be reached from outside, a dedicated Azure App Service receives the notifications and forwards them to cX-UM. The notification handler is a very basic application that simply receives the HTTPS notification and pushes it to an Azure Service Bus queue. Each cX-UM server listens to a single service bus queue with the hostname of the cX-UM server. The queue is automatically created by cX-UM upon startup, if required. While there may be multiple cX-UM servers per customer, only a single App service is required per customer.The App service pushes the notification to the correct queue, based on the URL which called it.

For example:

1. cX-UM server1 registers for change notification with webhook:

   https://notif-handler.azurewebsites.net/api/ExchNotif/server1

2. App service listens to:

   https://notif-handler.azurewebsites.net/api/ExchNotif/{serverName}

3. A notification is sent to:

   https://notif-handler.azurewebsites.net/api/ExchNotif/server1

4. App service pushes the notification to queue 'server1' based on URL suffix.

5. cX-UM server1 receives the notification.

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4   SIP Interface

cX-UM provides SIP interfaces only for receiving message-waiting indicators (MWI) notifications. It does not support phone registration and calling. cX-UM provides two methods for sending MWI:

■   unsolicited MWI

■   subscribe-based MWI

Note: cX-UM SIP interface supports TCP transport only. It does not support UDP.

4.1   Unsolicited MWI

cX-UM sends unsolicited MWI for all users who do not subscribe for MWI events. All unsolicited MWIs for all these users are sent to the same SIP host. See an example for Unsolicited MWI in Section D.1.

4.1.1   Backup SIP Hosts

cX-UM supports an optional configuration for multiple backup hosts, where notifications are sent to the first available backup host. Once the primary host is up again, cX-UM resumes sending the notifications. Availability is determined by periodically sending SIP Options messages.

4.2   Subscribe-Based MWI

cX-UM supports subscribe-based MWI to which phones subscribe for MWI events. When cX-UM needs to send an MWI, it sends it directly to the phone within the subscription session. See example Subscribe-Based MWI message in Section D.2.

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5   cX-UM Connector System Requirements

The X-UM Connector's minimum requirements are described in the table below:

Table 5-1: cX-UM Connector System Requirements

System Requirements	
Operation System	Windows 2012 R2/2016 standard
Processor	4 Core
Memory	6 GB
Disk size	Minimum 50 Gb. We recommend 80 Gb.

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6   Users Configuration

This chapter describes the configuration of cX-UM users.

6.1   CSV File

Users are defined in a CSV file. It is recommended to use Excel for creating and editing the CSV file. The table below describes the CSV file definition.

Table 6-1: CSV File

System Requirements	Extensions
Mandatory. User Principal Name	Optional. List of extensions. A user can identify themselves by one or more extensions separated by '|'. Unsolicited MWIs are only sent to the first extension. Sample value: '4001|4002'.standard

6.2   Users Modification

cX-UM monitors the CSV for change notifications. Whenever the file changes, cX-UM reloads the file immediately and adds, deletes or modifies users accordingly.

6.3   CSV file Location

cX-UM supports CSV file monitoring in two locations:

■   Backup Hosts (see Section **Error! Reference source not found.**)
■   Azure Blob Storage (see Section 6.3.2)

6.3.1   Local Storage

A local CSV file is appropriate for a single cX-UM server. cX-UM monitors the CSV for changes using the filesystem API.

6.3.2   Azure Blob Storage

cX-UM supports a CSV file stored in Azure Blob storage. This configuration is appropriate for a high-availability system with multiple cX-UM servers, each serving a distinct subset of the users. For more information, see Chapter 7.

> **Note:** cX-UM also supports CSV Azure Blob change notifications by configuring the blob to send a change notification event to a service bus topic to which the cX-UM listens.

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7   High Availability

cX-UM supports high availability for which multiple cX-UM servers share the same users CSV file, and automatically distribute user load balancing.

7.1   Enabling High Availability

High availability is automatically enabled by configuring all cX-UM servers to read the same CSV users file from Azure Blob storage (cX-UM assumes that every file location startsi with https:// is on Azure blob storage).

7.2   High Availability Operation

There are two aspects for High Availability operations for cX-UM HA:

■   User Blob file change (see Section 7.2.1)

■   Server up/down (see Section 7.2.2)

7.2.1   Azure Users Blob Change

Azure Blob is configured to send change notifications to a service bus topic. A topic, unlike a queue, can send the message to multiple subscribers.All cX-UM servers subscribe to the same topic, with the server name defined as the subscription name. The topic and subscriptions are automatically created by cX-UM, if required. When the users CSV blob is changed, all cX-UM servers receive the event and read the blob containing the updated list of users. Each server then re-distributes the users as described in Section 7.2.3.

7.2.2   Server Up/Down

The list of all HA servers is maintained at the same blob for all servers in the format shown in the table below:

Table 7-1: Server Up/Down

Server Name	Timestamp
Server1	Timestamp1
Server2	Timestamp2

All HA cX-UM servers periodically perform a read-modify-write operation to the same blob. Each server updates its timestamp. Each server also searches for servers that haven't updated their timestamps for a preconfigured period of time (default 60 seconds) and can be changed, and removes them from the list.

The read-modify-write operation is guaranteed to be atomic using the HTTP etag precondition. In the end, all servers read from the same list of active servers.Each server re-distributes the users as described in Section 7.2.3.

7.2.3   Users Distribution

Using a shared hashing function to sort a list of servers, all servers also distribute the users using the following formula:

ServerIndex = Hash(UserUpn) Modulo NumServers

Each server then hosts only users according to the server index formula i.e. at any point in time, each user is managed by one server.

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8   License

cX-UM uses a license that is valid to itself only. The license is associated to the server hardware and software.The license includes the following parameters:

- Maximum number of users
- Expiration date

8.1   License Generation

License generation involves the following steps:

1. Obtaining the server ID string from cX-UM server, using a Swagger API.
2. Obtaining a license from AudioCodes iActivate site according to the mail you activation mail that you recieved.
3. Install the license token on the server, using a Swagger API.

8.2 Trial License

Note: If a license is not installed, then cX-UM can be used with a trial license that is valid for a maximum of three users and expires in 10 years.

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9   Installation and Configuration

This Chapter describes the cX-UM installation and configuration.

9.1   Prerequisites

This section describes the installation prerequisites.

9.1.1   UCMA 5 Runtime

This section describes the UCMA 5 Runtime requirements.

➢ **To install UCMA:**

1. Log on to the cX-UM Connector and install UCMA.
2. Download UCMA 5 from:
   https://www.microsoft.com/en-us/download/details.aspx?id=47344
3. Run the UCMA UcmaRuntimeSetup.exe setup file as the Administrator.

Figure 9-1: UCMA 5.0 Setup
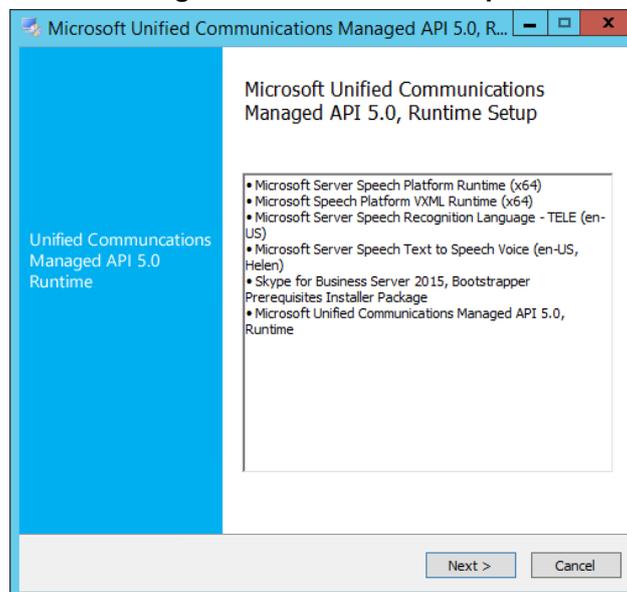
4. When the installation has completed, the following screen is displayed:

Figure 9-2:Installation Complete
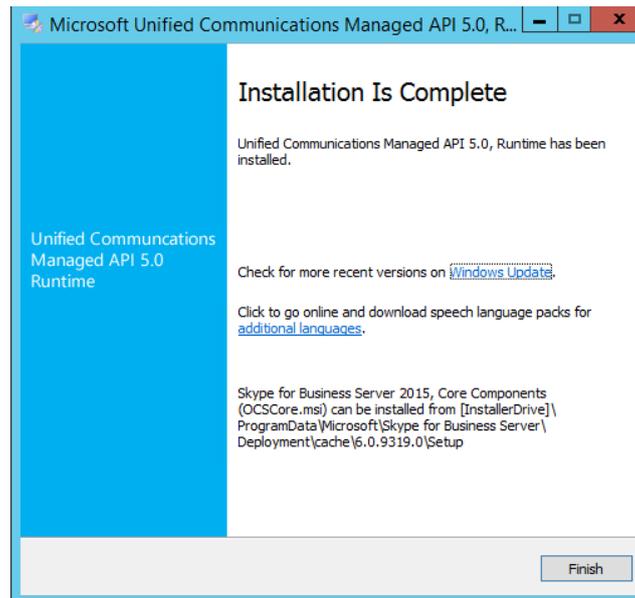
5. Click **Finish**.

9.1.2 Azure CLI on Windows

To install Azure CLI on Windows, refer to **Microsoft:** https://docs.microsoft.com/en-us/cli/azure/install-azure-cli-windows?view=azure-cli-latest

10   Azure Setup

Several Azure resources need to created and deployed. It is highly recommended to create a common resource group for these resources.

> **Note:** You must have "tenant admin" permissions to perform some of the actions described in this section.

10.1   Resource Group

This section describes how to create a resource group.

> ➤ **To create a resource group:**

1.   Login to Azure portal.
2.   Create a new resource group named cX-UM-rg (or any other name) in your region.
3.   Open the new resource group.

10.2   Service Bus

This section describes how to connect to the service bus.

> ➤ **To create a service bus:**

1.   Create Azure Service Bus:

- Open Resource Group > Add Service Bus > Create.
- Set name to <your-prefix>-cX-UM-ServiceBus, or similar

2.   In pricing tier:

- Select **Basic** for a single standalone cX-UM server.
- Select **Standard** for multiple cX-UM high availability system. Note: HA cX-UM requires topics, that are not included in the basic pricing tier.

3.   Select your region:

- Click **Create**.
- Open the service bus resource when deployment is complete.
- Shared access policies > RootManageSharedAccessKey > Copy and save **Primary connection string** as it is required in several other configurations.

10.3   Notification Handler Web App

This section describes how to create a notification Web App.

> ➤ **To create a Notification Handler Web App:**

1.   Create Azure Web App (Resource Group > Add Web App > Create):

- Name: <your-prefix>-cX-UM-NotifHandler, or similar
- Runtime stack: .Net Core 3.0
- Operating System: Windows
- Select your region and preferred size

- Optionally enable Application Insights
- Click **Create**.

2. Open resource when complete.

3. Deploy cX-UM notification handler to the created Web App:
   - Open CMD prompt
   - Run **az login**
   - Sign in with your Azure account credentials
   - Run **az account show**

4. Check the resultant "name" output. If the name doesn't match your subscription account used for creating the Web App and resource group, do the following:
   a. run 'az account list' then 'az account set --subscription "<your-subscription>"' where <your-subscription> is the subscription name from the 'az account list' output.
   b. Verify by running 'az account show' again.

5. Deploy Function App by running the following commands in the command line:
   a. cd "C:\Program Files\Audiocodes\cX-UM\AzureAppServiceDeploy"
   b. az webapp deployment source config-zip --resource-group <group-name> --name <app-name> --src ExchNotifHandler.zip.
   c. Replace <app_name> with the Web App name and replace <resource_group> with the name of your resource group.
   d. If successful, you should see several output lines, including: "message": "Created via a push deployment".

6. Return to Azure portal and open the Web App and do the following:
   a. Configuration > Connection strings > New connection string
   b. Name: ServiceBusConnectionString
   c. Value: <Value of service bus connection string created above>
   d. Type: **Custom**
   e. Click **OK**
   f. Click **Save**
   g. Select Overview, copy and save the URL value. This value will be required for other configurations.

10.4 Azure Application

This section describes how to create an Azure application.

➢ **To create an Azure Application:**

1. In the Azure portal, from the top-left menu, select Azure Active Directory > App Registrations.

2. Create a new registration:
   a. Name: cX-UM
   b. Select 'Accounts in this organizational directory only'
   c. Register

3. For the created application, copy and save the following values that will be required in other configurations:
   a. Application (client) ID
   b. Directory (tenant) ID

4. In Certificates and Secrets > New client secret, and set the following:
   a. Description: 'Never expires'

       b. Select Expires: Never

       c. Click **Add**.

       d. Copy the secret value it will be needed in other configurations. Note: The secret value will only be shown once. Make sure to copy it.

5. Select **API Permissions**.

6. Add a permission and then Select **Microsoft Graph**.

   a. Select **Application Permissions**.

   b. Expand 'Mail' and then select **Mail.Read**.

   c. Expand 'User' and then select **User**.**Read.All**.

   d. Click **Add Permissions**

7. In API Permissions, select **Grant Admin consent for <your tenant>**, and confirm.

> ⚠️ **Note:** You must be a tenant admin to grant consent.

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11 cX-UM

■ Run cX-UM install file. The default install directory is *C:\Program Files\Audiocodes\cX-UM.*

Note: It is highly recommended to install Notepad++ on cX-UM server to edit files.

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12   cX-UM Configuration

This chapter describes the cX-UM configuration using the Swagger REST API local Web GUI.

12.1   Start cX-UM

Start cX-UM **as administrator** in console mode using one of the following methods:

■   Start > Select 'Run cX-UM in console mode' > Right-click > More > Run as administrator

OR

■   Windows Start button > cmd > Right-click > Run as administrator.

Cd "C:\Program Files\Audiocodes\cX-UM "

cX-UM

12.2   Configure cX-UM

All cX-UM configuration is performed using Swagger in a manually opened browser at http://localhost:8889/swagger.

12.2.1   cX-UM config-only Mode

When the configuration is invalid, cX-UM runs is config-only mode. In this mode, cX-UM runs Swagger only and allows only configuration-related operations.

After a valid configuration is performed, cX-UM must be restarted to enable full functionality.

> **Note:** The initial cX-UM configuration is invalid because it is missing specific mandatory Azure configuration values.

12.2.2   cX-UM Swagger Configuration

This section describes how to configure cX-UM via Swagger.

➢   **To configure via Swagger:**

1.   Open cX-UM swagger at http://localhost:8889/swagger

There are several available operations under AppConfig.

For initial configuration, it is recommended to download the full json configuration file, and edit it with the minimal mandatory configuration values:

Enter the Swagger URL:

```
AppConfig/api/config/download
```

2.   Select "download file" after Execute.
3.   Edit the downloaded file with minimal configuration as shown in the table below:

Table 12-1: Swagger Configuration

Configuration Setting	Value
Sip.OutboundHost	Name or IP address of the host to receive SIP notifications.
Sip.OutboundPort	Port of the host to receive SIP notifications.
Azure.AppId	Azure application ID from Azure Application (see Section 10.4).
Azure.AppSecret	Azure application secret from Azure Application Azure_Application: (see Section 10.4).
Azure.TenantId	Azure tenant ID from Azure Application (see Section 10.4).
Azure.NotifBaseUrl	App service URL from Notification Handler Web App (see Section 10.3)
Azure.ServiceBusConnectionString	Service bus connection string from Service Bus (see Section 10.2).

4. Upload the file using the following Swagger URL:

```
AppConfig/api/config/upload
```

5. Select file and execute.
6. Verify no errors are returned.
7. Verify the configuration using the following Swagger api > config URL.
8. Verify that all values set above are returned.

12.3 Testing cX-UM Configuration

This section describes how to test the cX-UM configuration.

➢ **To test the cX-UM configuration:**

1. Restart cX-UM in console mode.

   This time cX-UM should start normally, and not in config-only mode because configuration is valid.

2. Test the cX-UM configuration using the Swagger config > AzureTest URL.
3. Run all tests in order to verify all Azure settings are configured correctly. The tests include various Azure resources test (Web App, Graph API permissions, Service Bus, etc.).

12.4 Run cX-UM as Windows Service

Before running as a Windows service, it is highly recommended to install and enable AudioCodes Syslog viewer.

12.4.1 Syslog Viewer Configuration

This section describes how to configure the Syslog Viewer.

➢ **Do the following:**

1. Download install and start syslog viewer.

2. Run cX-UM in console mode, if it not already running by specifying the Swagger config > syslog URI.

3. Set "IsEnabled" to true, and set host and port (by default UDP port 514).

4. Execute.

5. Restart the cX-UM in console mode.

6. On the Syslog Viewer toolbar, use the Resume ▷ button or from the File menu, choose Resume to start capturing data; on the status bar, you notice that the Syslog Listener status changes to "UDP" or "TCP". For more information, refer to the *Syslog Viewer User's Guide*.

12.4.2 Start cX-UM Windows Service

■ Start service cX-UM service using one of the following methods:

• Windows Start button > Select 'Start cX-UM service' > Right Click > More > Run as administrator

OR

• From services, start service **cX-UM**.

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13   Users Configuration

This chapter describes users configuration.

13.1   CSV File

Users are defined in a CSV file. It is recommended to use Excel for creating and editing the CSV file. The following columns are defined in the CSV file:

Table 13-1: Mandatory User Configuration

Upn	Extensions
Mandatory. User Principal Name	Optional. List of extensions. A user can identify itself by one or more extensions separated by '|'. Unsolicited MWIs are sent to first extension only. Sample value: '4001|4002'.

The following shows an example of a basic sample CSV file:

```
Upn,Extensions
ron@audiocode.biz,4001
user-wo-extension@audiocode.biz,
```

The default users file path is: "C:\Program Files\Audiocodes\cX-UM\Users\users.csv". The location is configurable.

13.2   Users Modification

cX-UM monitors the CSV for change notifications. Whenever the file changes, cX-UM immediately reloads the file and adds, deletes or modifies users accordingly.

> **Important:** Do not use Excel to modify the users file used directly by cX-UM, because Excel locks the file and, as a result cX-UM will fail to read it. Instead, edit a local copy of the file and override the file in use.

13.3   CSV File Download and Upload

cX-UM supports the downloading and uploading of the users file via Swagger. This applies to both when the users file is stored locally and when its stored in Azure blobs.

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14   License

cX-UM uses a license that is only valid for a specific host.

14.1   Trial License

Initially, no license is installed and cX-UM uses a trial license that is valid for three users.

14.2   Production License

The following describes the production license installation process:

1. The Customer sends AudioCodes the server ID by using the following the Swagger URL:

    ```
    POST AppConfig/api/license/serverId
    ```

    Or

    Uses the iActivate web site to create the license automatically according to the product key that was sent by mail to the customer.

2. AudioCodes generates a license for the specified server ID containing a maximum number of allowed users and an expiration date. The license string is sent to the customer.

3. The customer installs the license using the following Swagger URL:

    ```
    POST AppConfig/api/license/token
    ```

4. cX-UM is restarted.

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15   cX-UM High Availability Configuration

cX-UM supports high availability where multiple servers automatically distribute the load of all users. In case a server connection is lost, or a new server is added, all cX-UM servers re-distribute all users automatically. cX-UM is based on the configuration of all servers to use the same users file stored in Azure blobs storage, and to receive events whenever the file is modified.

The same Azure blobs storage is also used for keep-alive communication between cX-UM servers.

15.1   Azure Blobs Storage

An Azure blobs storage resource is required.

➢ **To define an Azure Blob:**

1.   In the Azure portal, select the resource group (Add > Storage account - blob, file, table, queue).
2.   Click **Create**.
3.   Define a Storage account name: your-prefix.cX-UM
4.   Set the Access tier: cool
5.   Accept all other defaults.
6.   Review and Create.
7.   When the deployment is complete, open the resource.
8.   On left menu, select **Settings Access Keys**.
9.   Copy key1 connection string. This string will be required in other configurations.

15.1.1   Users Blob File

This section describes how to define a users Blob.

➢ **To define a user's Blob file:**

1.   On the left menu, select Blob service containers.
2.   Add container with the following settings:
   •   Name: cX-UM-ha
   •   Public Access level: private
   •   OK
3.   Select the created container.
4.   Click **Upload** to upload the users file.
5.   Select the uploaded users file; copy and save the URL. This file will be required in other configurations.

15.1.2   User Blob Change Event

A blob change event is required to monitor any change in the users file. The change event pushes an entry to a Service bus topic to which all CX-UM servers subscribe.

15.1.2.1 Service Bus Topic

This section describes how to create a service bus topic.

➢ **To create the service bus topic:**

1. Select your resource group > Service bus namespace > Create a topic:

Name: blob-changed-topic

Message time to live: 5 Minutes

2. Click **Create**.

•

> **Note:**
>
> • The Service bus topic is not available in the **Basic** service bus pricing tier. Make sure that the pricing tier is **Standard**: Select your resource group > Service bus namespace > Overview > Pricing > Standard.
>
> • The service bus topic name must be defined identically to the **blob-changed-topic** and is not configurable.

15.1.2.2 Storage Change Event

This section describes how to create a change event.

➢ **To create a Storage Change Event:**

1. Select your resource group (Storage account > Events > Create Event Subscription).

2. Define a Name: user-blob-change-event.

3. Define an Event type: Select only 'Blob-created'.

4. Define an Endpoint type: Service bus topic.

5. Endpoint: Select your Resource Group and Service Bus Namespace.

6. The Service Bus Topic should display "**blob-changed-topic**"

7. Confirm selection.

8. Click **Create**.

9. Select Event Subscriptions > user-blob-change-event.

10. Select Filter > Check 'enable subject filtering' > Subject ends with > **.csv**

15.2 cX-UM Configuration

This section describes how to configure cX-UM.

➢ **To configure cX-UM:**

1. Enter the following Swagger URL:

```
POST /api/config/flat/{path}
```

Where:

• path: General.UsersFileName

• value: <Path to users blob from Users blob file>

2. Execute.

3. Enter the Swagger URL:

```
POST /api/config/flat/{path}
```

Where:

- path: AzureBlobsHa.HaBlobsConnectionString
- value: <Path to Azure blobs storage connection string from <u>Azure Blobs Storage</u>>

4. Execute.
5. Upload the users file to Azure: enter Swagger URL: POST /api/usersManager/upload.
6. Verify configuration.
7. Restart cX-UM.

15.3   HA Verification

This section describes HA verification using dedicated Swagger API operations.

➤ **To perform HA verification:**

1. After the cX-UM service has restarted (see Section 15.2 above), verify cX-UM loads users from users blob.
2. Upload a modified users blob. Verify cX-UM restarts upon change and reloads users.
3. Configure another cX-UM with an identical configuration. Verify users are distributed between servers (Use dedicated Swagger HA operations).
4. Start and stop servers and verify that other servers are aware of this operation.

Following is the list of all cX-UM configuration parameters:

Table 15-1: All cX-UM Configuration Parameters

Key	Default Value	Description
General.UsersFileName	"Users\\users.csv"	Users CSV file location. For HA systems, the value can be an Azure blob URL
General.WebListenUrl	"http://127.0.0.1:8889/"	The web server listening URL. By default, open from localhost only. To enable access from everywhere, set to "http://+:8889/"
Sip.OutboundHost	INVALID	The outbound host where unsolicited MWI notifications are sent.
Sip.OutboundPort	5060	Outbound port.

Key	Default Value	Description
Sip.ListenPort	5070	The SIP listening port for MWI subscriptions.
Sip.BackupOutboundHostsList	null	List of backup outbound hosts, in format of "host:port"
Sip.ProxyCheckSeconds	60	Period in seconds of primary and backup outbound hosts check
Sip.NotificationInSubscribe' ResponseSupported (all in one word)	false	If true, then subscribe response will contain the notification info. If false, then an additional notify message will be sent containing the notification info
Azure.AppId	INVALID	Azure application ID.
Azure.AppSecret	INVALID	Azure application secret.
Azure.TenantId	INVALID	Azure tenant ID.
Azure.NotifBaseUrl	INVALID	The based URL of the Web App to receive the voicemail changed event.
Azure.NotifExpirationMinutes	4230	The expiration time, in minutes, of the Exchange voicemail notification.

Key	Default Value	Description
Azure.ServiceBusConnectionString	INVALID	The Azure service bus connection string, used for the notifications.
Syslog.IsEnabled	false	Enables syslog.
Syslog.SyslogServer	"localhost"	Syslog server.
Syslog.SyslogPort	514	Syslog port.
AzureBlobsHa.HaBlobsConnectionString	null	Azure blobs connection string used for HA.
AzureBlobsHa.HaManagers' UpdatePeriodSeconds (in one word)	60	The period in seconds that each server reports itself and checks the other servers. Set to zero to disable.

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A   HA – SIP Message Redirection

cX-UM provides **automatic** HA for users by distributing the users between cX-UM servers.

Each user is automatically assigned a unique X-UM server. If one server fails, then another server takes over responsibility for this user.

cX-UM HA is implemented without any manual configuration.

There is no limit to the number of cX-UM servers that can be configured in the HA setup. All servers in the HA configuration are active (there is no standby server), and load for all users are distributed evenly between the servers.

A.1.1   Incoming Messages Redirection

In a HA environment, incoming messages from the proxy side (SBC/gateway) should reach the HA user owner server. This is relevant for the following example scenario:

■   User MWI subscribe session

Since the proxy server is not aware of the current user owner server, X-UM replies with a **SIP redirect** response to the HA user owner server. The redirect address is taken from the ExtraData field sent by each server.

> **Important:** The redirect messages destination is the server FQDN, not the IP address. As a result, the proxy SBC must be configured to use a DNS that can resolve the cX-UM host names.
>
> An example contact header of a redirect message is:
> ```
> CONTACT: <sip:ron-devel-02.lync2013.net:5070;transport=Tcp>
> ```

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B   XUM Limitations

The following is a list of cX-UM limitations:

- Up to ~5K users are supported per cX-UM.
- Only use the Google Chrome browser to work with Swagger.
- cX-UM has no SNMP or other monitoring capabilities. Monitoring of the service status can only be done using a third-party tool.
- If all SBCs down, new MWI messages are lost. On the next mailbox change or SIP Subscribe, the PBX is synchronized with the MWI status.

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C   Known Issues

C.1   Working with Internet Explorer

When working with the Swagger management interface, it is mandatory to work with Google Chrome (instead of Internet Explorer IE) for full Swagger support.

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D   Sample Messages

This section shows sample SIP messages.

D.1   Unsolicited MWI

Below is a sample unsolicited MWI sent by cX-UM:

```
NOTIFY sip:4001@audiocode.biz;user=phone SIP/2.0
FROM:
<sip:4001@audiocode.biz;user=phone>;epid=1A6F48764F;tag=c0806ac29f
TO: <sip:4001@audiocode.biz;user=phone>
CSEQ: 3 NOTIFY
CALL-ID: fae7217b6c354c1682b004196b3a373c
MAX-FORWARDS: 70
VIA: SIP/2.0/TCP 127.0.0.1:60103;branch=z9hG4bK1b3498f
CONTACT: <sip:IL-RONA-
PC.corp.audiocodes.com:5071;transport=Tcp;maddr=127.0.0.1;ms-
opaque=65b13b27a81e29f8>;automata;actor="attendant";text;audio;vid
eo;image;application
CONTENT-LENGTH: 103
EVENT: message-summary
SUBSCRIPTION-STATE: terminated
USER-AGENT: RTCC/6.0.0.0 Audiocodes cX-UM (0.1.1.14)
CONTENT-TYPE: application/simple-message-summary

Messages-Waiting: yes
Message-Account: sip:4001@audiocode.biz;user=phone
Voice-Message: 7/0 (0/0)
```

D.2   Subscribe Based MWI

Phone subscription:

```
SUBSCRIBE sip:4001@dummy.org SIP/2.0
FROM: <sip:4001@dummy.org:23456;transport=Tcp;ms-
opaque=daab015eaea13cfd>;epid=239FC94943;tag=67ae306221
TO: <sip:4001@dummy.org>
CSEQ: 1 SUBSCRIBE
CALL-ID: a15de141929f4c31876fc5195c02eeb2
MAX-FORWARDS: 70
VIA: SIP/2.0/TCP 10.13.2.29:60471;branch=z9hG4bK7f7051df
CONTACT: <sip:IL-RONA-
PC.corp.audiocodes.com:23456;transport=Tcp;maddr=10.13.2.29;ms-
opaque=daab015eaea13cfd>;automata;actor="attendant";text;audio;vid
eo;image;application
CONTENT-LENGTH: 0
EVENT: message-summary
SUPPORTED: com.microsoft.autoextend
SUPPORTED: ms-piggyback-first-notify
USER-AGENT: RTCC/6.0.0.0 MwiLoad

(OK omitted)
cX-UM Notify:
NOTIFY sip:IL-RONA-
PC.corp.audiocodes.com:23456;transport=Tcp;maddr=10.13.2.29;ms-
opaque=daab015eaea13cfd SIP/2.0
FROM: <sip:4001@dummy.org>;tag=aba9f22f21
```

```
TO: <sip:4001@dummy.org:23456;transport=Tcp;ms-
opaque=daab015eaea13cfd>;epid=239FC94943;tag=67ae306221
CSEQ: 2 NOTIFY
CALL-ID: a15de141929f4c31876fc5195c02eeb2
MAX-FORWARDS: 70
VIA: SIP/2.0/TCP 10.13.2.29:60472;branch=z9hG4bK68eb6723
CONTACT: <sip:IL-RONA-
PC.corp.audiocodes.com:5071;transport=Tcp;maddr=10.13.2.29;ms-
opaque=9cdd2dd80377fabe>;automata;actor="attendant";text;audio;vid
eo;image;application
CONTENT-LENGTH: 88
EVENT: message-summary
SUBSCRIPTION-STATE: active
USER-AGENT: RTCC/6.0.0.0 Audiocodes cX-UM (0.1.1.14)
CONTENT-TYPE: application/simple-message-summary

Messages-Waiting: yes
Message-Account: sip:4001@dummy.org
Voice-Message: 7/0 (0/0)
```

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