Cisco CUCM Driver

for Novell Identity Manager

Technical Description
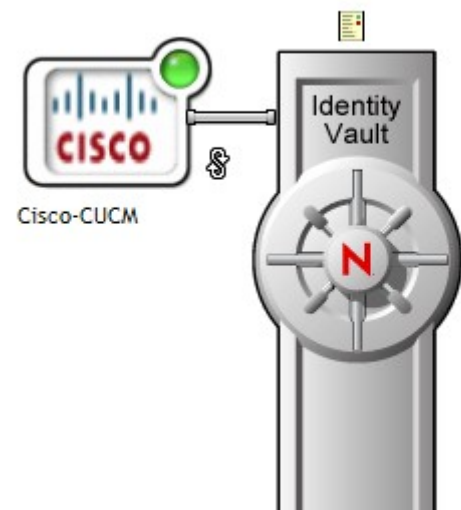
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1 Abstract

This document describes the technical functionality of the SKyPRO Cisco CUCM driver version 2.1 for Novell Identity Manager.

Based on the AXL SOAP communication interface of the Cisco unified communication manager (CUCM or in earlier versions called Cisco call manager) the CUCM driver for Novell Identity Manager provides an easy way to synchronize user data between the CUCM and the Novell eDirectory. The driver uses the standard SOAP protocol to exchange data between the CUCM and eDirectory. Therefore the driver is based on Novell's Identity Manager standard SOAP driver.

So the CUCM driver for Novell Identity Manager actually consists of three parts:

1. Novell Identity Manager Engine
2. Novell Identity Manager SOAP driver
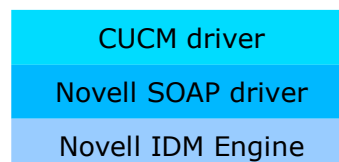3. the CUCM driver package

CUCM driver
Novell SOAP driver
Novell IDM Engine

Image 1: CUCM driver parts

1.1 system requirements

The following requirements must be met for the driver in order to guarantee complete functionality:

1. Novell Identity Manager Version min. 3.5.1 Engine Patch 3 (20080307)

2. Novell Identity Manager SOAP driver min. 3.5.3

3. Cisco Unified Communication Manager min 6.0

4. Cisco AXL Web Service activated in:
   "Cisco Unified Serviceability -> Tools -> Service Activation: Cisco AXL Web Service

1.2 overview

The Cisco unified communication manager allows to manage users, devices and lines in a very complex way. The CUCM driver eliminates this complexity by only synchronizing specific user and device information.

Nevertheless the Cisco AXL SOAP interface allows to synchronize almost all informations with the CUCM. The CUCM driver delivers basic functionality and can be extended to synchronize additional information like phone devices, lines or any other CUCM data at any time.
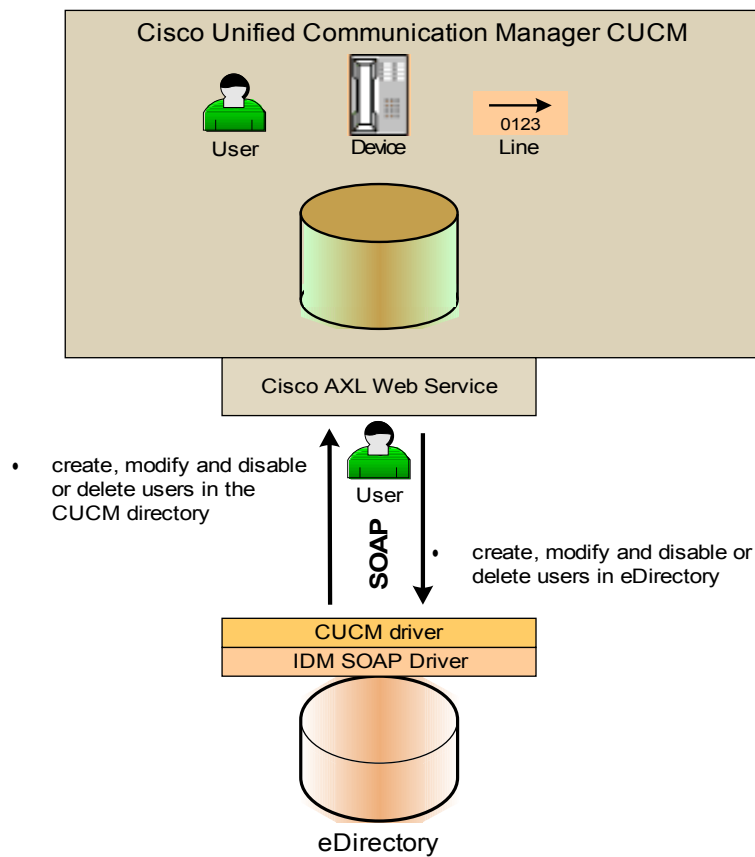
Image 2: CUCM driver schema

2   driver functionality

2.1   Event handling

The CUCM driver synchronizes user data between eDirectory end CUCM. All events are handled as followed:

			Create	Modify	Rename	Move	Delete
Event source	**IDV**	*Matching Rule*	uniqueID=User ID				
		Create Rule	user in gcv configured container "uniqueID", "surname" and "Given Name" not empty User is not disabled				
		Placement Rule	not applicable				
		Events Description	create user in CUCM if user exists in CUCM, some attributes will be reset to eDir	synchronize all attributes except "Telephone Number"	rename User ID	not applicable	"Delete" or "delete & notify" (configurable)
	CUCM	*Matching Rule*	User ID = uniqueID (in configured container)				
		Create Rule	user ID, lastname and Firstname not empty				
		Placement Rule	in configurable container				
		Events Description	create user in eDirectory if user exists in eDir, phone Number will be reset to CUCM	synchronize Phone number Reset attr. to eDir	changed back to eDir uniqueID	not applicable	"delete", "notify (and remove Association)" or "remove association" (configurable)

Image 3: CUCM event table

from eDirectory:

Users created in eDirectory will be created in CUCM. The matching rule is *uniqueID* from eDirectory to *userID* in CUCM. The attributes *uniqueID, Surname* and *Given Name* mustn't be empty. User objects have to be placed in a specific container to be synchronized. The container can be configured by a global config value (GCV).

All modification of attributes in the filter will be synchronized to CUCM.

If a user is renamed in eDirectory the *UserID* is only modified in CUCM if the attribute *uniqueId* has changed. This depends on the tool to be used to rename the user object. (e.g. ConsoleOne also changes *uniqueID* if a user is renamed)

If the attribute *Telephone Number* has been modified in eDirectory and the object is associated with a CUCM user, the attribute will be reset to the CUCM value.

If a user is deleted in eDirectory the driver can be configured to just delete the user in CUCM or delete and send a notification via email to a CUCM system administrator.

to eDirectory:

Users created in CUCM will be created in eDirectory in a specific container. The container can be configured by a GCV. The matching is done by *UserID* and *uniqueID*. Only users in the configured container are matched. At least the attributes *user ID, firstname* and *lastname* mustn't be empty.

Modification of *UserID* will be reset to the eDirectory value of *uniqueID.* Modifications to *firstname, lastname, password, department* and *mailid* will also be reset to the appropriate eDirectory value, if the object is associated.

If a user is deleted in CUCM the driver can be configured to only remove the association in eDirectory, notify and/or delete the user in eDirectory.

2.2   data handling

Following attributes will be synchronized by the driver:

Identity Vault					CUCM user		
Description (localized)	**eDir attr. name**	**type**	**content**		**attribute**	**content**	**remarks**
object class	*User*			<>	*User*		
	driver type				*SOAP*		
	Filter			!			
description	*DirXML-Associations*				*UniqueID = user ID*		
user login ID	uniqueID		jsmith	>	user ID	jsmith	reset to eDir value if associated
universal eDir password	Universal Password		A23hGt4	>	password	A23hGt4	reset to eDir value if associated
	surname		Smith	>	lastname	Smith	reset to eDir value if associated
				>	internal Caller ID (display)	John Smith	"Given Name" + " " + "surname" reset to eDir value if associated
	Given Name		John	>	firstname	John	reset to eDir value if associated
complete phone no	Telephone Number		+1 222 333 4455	<	telephone Number	+1 222 333 4455	reset to CUCM value if associated
eMail addresse	Internet EMail Address		john.smith@skypro.ch	>	mailid	john.smith@skypro.ch	reset to eDir value if associated
departement	OU		sales east	>	department	sales east	reset to eDir value if associated

Image 4: Attribut DataFlow

Data authority for *userID, password, firstname, lastname, mailid* and *department* is eDirectory. So all changes in CUCM will be reset to the eDirectory value.

ATTENTION!

Password changes in CUCM will be reset to the eDirectory password!

2.3 Configuration parameters

To configure the driver there are some important parameters to know:

URL of DSML server:

The URL of the remote DSML server actually is the URL of the Cisco AXL SOAP server. By default the communication is encrypted and is using port 8443. e.g.

https://ccm-sdk.cisco.com:8443/axl/

You can check the Cisco AXL SOAP server by just entering the URL in your browser. You will be asked for a userid and password. Check with the CUCM administrator for the correct credentials. After you entered userid and password the AXL SOAP server will show up with the a page confirming its functionality.

The AXL Web Service is working and accepting requests. Use HTTP POST to send a request.

Truststore

The SOAP communication is encrypted using SSL. To get the certificate login to the CUCM administration web site. e.g.

https://ccm-sdk.cisco.com:8443/ccmadmin

You have to export the server certificate into a file. With the java "keystore" utility you have to generate a java keystore file containing this certificate. This keystore file has to be configured as the *Truststore file* in the driver.

Standard User Authentication (userid and password) is required for the driver.

Heartbeat

Keep in mind, that only the subscriber is working in real time. The publisher has a polling interval and is defined in the publisher settings *Heartbeat interval in minutes*.

2.4   driver parameters

The driver is configurable with global config values (GCV):

root container for synchronization

Only users in this subtree will be synchronized with the CUCM.

CUCM version

For further CUCM versions you have to define your CUCM version.

Delete User in eDirectory

If users are deleted in eDirectory you can define to delete the user in CUCM or delete and notify the administrator.

Delete Users in CUCM

If users are deleted in CUCM you can either delete, notify and/or remove association in eDirectory.

Notification eMail

eMail address of the CUCM administrator.

2.5   AXL service parameters

The parameter „Maximum AXL writes allowed per minute" specifies the maximum number of updates per minute to the Cisco CallManager database and the LDAP user directory that can be performed by using the AVVID XML Layer (AXL) API. This is a required field.

The default is 50, minimum is 0 and the maximum is 999.

Since the subscriber is polling the AXL SOAP service and requesting all user information at each polling interval you have to increase this value accordingly to the amount of user objects you are going to synchronize. A good value is the amount of objects divided by 5.
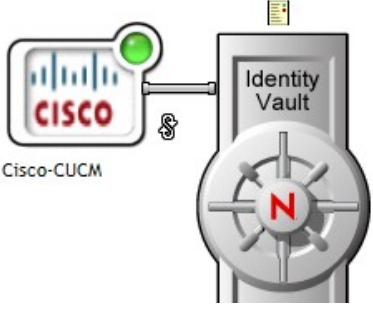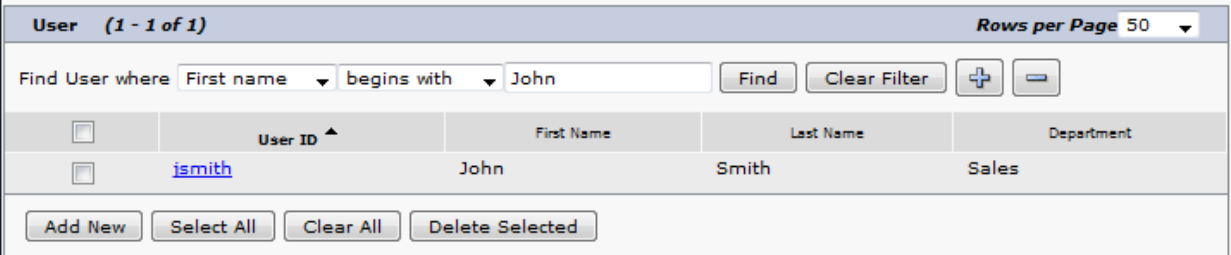
So if you have more than 5'000 objects to synchronize set the maximum value of 999.

Except from the Cisco administration manual

Throttling of Requests:
The side effects of updating the Cisco Unified Communications Manager database can adversely affect system performance; therefore, the system administrator can control how many AXL requests are allowed to update the database per minute. You can control this value by using the Database Layer Monitor advanced service parameter "MaxAXLWritesPerMinute."

3   Example

Check if your Cisco SOAP server is running. Enter the URL in your browser e.g. *https://ccm-sdk.cisco.com:8443/axl/*	**Cisco CallManager: AXL Web Service** The AXL Web Service is working and accepting requests. Use HTTP POST to send a request.
Check if your Cisco CUCM driver is up and runnig.	
Create user in eDirectory with at least the attributes *username, firstname, lastname* and place the user in the container, which you have configured to synchronize.	

Got to the CUCM admin web site e.g.

https://ccm-sdk.cisco.com:8443/ccmadmin

Go to the *User Management* and search for user *John.*

Select user *jsmith* and display his details. You see, that John has been successfully provisioned to the CUCM.

Now we have to assign a device to John's account. Make sure that you already have assigned a valid line to the device. According to the lines that are assigned to the phone(s) we are assigning to John, all numbers of these devices are synchronized to eDirectory.

One device with two lines is assigned to John:

In our example we assign one device to John. This device has to lines (123 and 125) assigned. So the phone numbers 123 and 125 are synchronized to the eDirectory attribute "Telephone Number".

Go back to eDirectory an have a look at Johns phone number. The phone number has been synched to eDirectory.

Modify Object: jsmith.users.utopia

General | SecureLogin SSO | User Profile | Kerberos | Certificates | Sec

Identification | Environment | Group Memberships | Login Script | See Also | Postal Addres

First name:	John
Last name:	Smith
Full name:	John Smith
Generational qualifier:	
Middle initial:	
Other name:	
Title:	
Location:	
Department:	International Sales
Telephone number:	123
	123
	125
Fax number:	
E-mail address:	john.smith@skypro.ch
Description:	