

MiVoice MX-ONE

MX-ONE Provisioning Manager Integration with Active Directory - Description

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Introduction

The purpose with this document is to describe the integration between Provisioning Manager (PM) and Microsoft Active Directory, (AD) in MX-ONE 7.0.

When a user is added, changed or removed in the AD by the system administrator, PM will be automatically notified to update the MX-ONE System accordingly. PM can be set to only handle user accounts in PM and CMG, or to also handle extensions and mailboxes in the MX-ONE System and MiCollab Advanced Messaging (AM) servers.

The integration with AD is a one way communication. AD notifies and passes data to PM. PM does not operate on AD. There are no schema changes or extensions/additions required in AD. AD is the master except for extensions.

Extensions can be added and updated but removal of extensions can only be done from PM for a specific user.

Only default fields in AD will be used by PM to create, update and remove user accounts. Additional AD fields can be mapped as User Defined Fields (UDF) in PM and hence extend the number of fields to import.

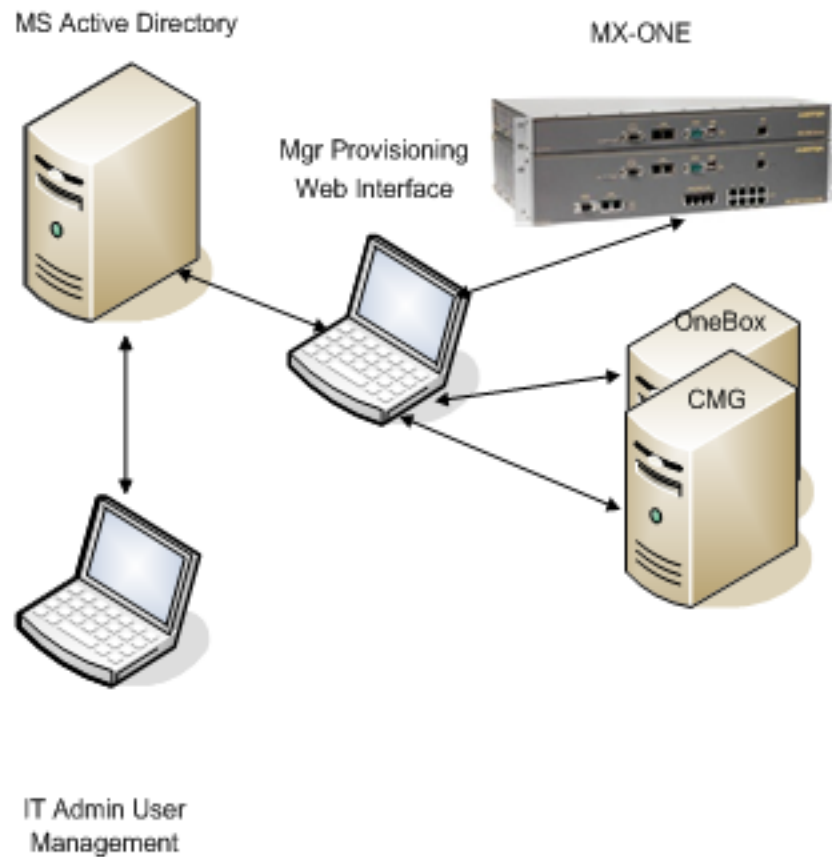
A PM template can be assigned to one of 4 telephony fields in AD so as to enable IP extensions to be created for a user according to the rules defined in the associated template. See [AD – PM Field Mapping](#) for more details.

Multiple IP templates can be used to extend the number of MiVoice MX-ONE for one AD server.

An optional way to determine which MiVoice MX-ONE the extensions are created in is to use the Telephony System Mapping.

Only IP extensions can be created and managed from AD since the other extension types requires additional data that don't have corresponding fields in the default setup of AD, such as equipment positions, IPEI numbers etc. To handle IP extensions, IP extension templates and Multi terminals templates need to be defined in PM and configured in the AD task in PM, please see the PM Active Directory configuration section below.

The figure below shows the connections between AD/PM and MiVoice MX-ONE/MiCollab AM/CMG

Figure 1.1: Connections between AD/PM and MiVoice MX-ONE/MiCollab AM/CMG

Scope

The document describes the following:

- AD Integration setup
- Functionality
- Limitations

Target Groups

This document is intended as an overview of the Provisioning Manager integration possibilities with Microsoft Active Directory and is targeted towards the system administrators of both the MiVoice MX-ONE and the Microsoft Active Directory system.

Functionality

Overview

There are two modes of integration:

- Manually triggered synchronization
- Automatic notification

The manual synchronization is used to initially move all existing AD users to PM, or to update PM if there has been a malfunction in the AD – PM connection.

The automatic notification is the normal mode of operation. When AD is updated PM gets notified and will act according to its setup.

In the PM User task, you can see if a user has been created from AD or through PM locally.

In the PM Active Directory task, you define the connection to AD, rules for operations and which parts of AD to synchronize with.

The search domains and IP number templates can be configured from the Active Directory task by selecting the **Configure Domains** tab.

The online help provides details to the **input** fields as well as a general overview.

Certain tasks need to be done in a specific order for the AD integration to work correctly. The recommended work flow to set up AD is as follows:

1. Create user in AD. See [Active Directory Connection Setup](#) for more details.
2. Create IP extension templates in the PM Extension task to be used when creating IP extensions, if automatic creation of extensions is desired in the Telephony System.
3. Ensure that the number series are set up in the Telephony System through Service Node Manager.
4. Configure the PM Active Directory task. See [Active Directory Connection Setup](#) and [PM Active Directory Task](#) for more details.
5. Execute a manual synchronization on each defined Search Domain.
6. Activate the automatic notification function for each Search Domain.
7. To find information about the synchronization, see the audit trail log and the event log. The logs will be automatically updated in case of an event from AD. It is therefore strongly recommended to frequently read the logs.

Active Directory Connection Setup

A user must be created in AD that is a member of Administrators and Domain Users. This user with its password shall be entered in the AD task together with the AD IP address and port to set up the AD connection.

AD can be organized to group its users in different domains defined by their distinguished names, usually according to geographical locations. In PM they are referred to as Search Domains, i.e. the AD areas

where PM shall be updated from. In PM you can define multiple Search Domains and manually synchronize them individually as well as enable and disable the automatic notification function.

Each AD domain can be configured to support multiple MX-ONE systems.

AD – PM Field Mapping

AD fields to be used in PM for setting up extensions:

Table 2.1: General User Information with fixed mapping

AD FIELD	PM FIELD
Given-Name (givenName)	First Name
Surname (sn)	Last Name
SAM-Account-Name (sAMAccountName)	User Id

Table 2.2: AD Number Field information mapped to a specific field in a PM Template

AD FIELD	PM FIELD
Telephone-Number (telephoneNumber)	Extension data based on selected template
Telephone-Number-Other (otherTelePhone)	Extension data based on selected template
Phone-IP-Primary (ipPhone)	Extension data based on selected template
Phone-IP-Other (otherIpPhone)	Extension data based on selected template

Table 2.3: AD Number Field information mapped to a specific field in a PM Template (Sheet 1 of 2)

AD FIELD	AD ATTRIBUTES
Initials	Initials
Display Name	displayName
Description	description
Office Location	location
Web Page Address	wwwHomePage
Web Page Address (Others)	url
Street	streetAddress
Post Office Box	postOfficeBox
City	l [Locality-Name]
State/Province	st

Table 2.3: AD Number Field information mapped to a specific field in a PM Template (Continued) (Sheet

ZIP/Postal Code	postalCode
Country	C [Country-Name]
User Logon Name	userPrincipalName
Phone Number (Others)	otherPhoneNumber
Account is Disabled	UserAccountDisabled
User Must Password Change at Next Logon	Pwd-Last-Set **
User Cannot Change Password	UserAccountControl
Account Never Expires	UserDontExpirePassword
Account Expires (Use same data format as server)	accountExpires
Profile Path	profilePath
Logon Script	scriptPath
Title	title
Department	department
Company	company
Manager	manager
Fax	facsimileTelephoneNumber
Fax (Others)	otherFacsimileTelephoneNumber
IP Phone Number	ipPhone
IP Phone Number (Others)	otherIpPhone
Room Number	roomNumber
Secretary	secretary
Assistant Name	assistantName
Mobile Number	mobile
Mobile Number (Others)	otherMobile
Notes	info
Employee ID	employeeID
Employee Number	employeeNumber
Home Phone Number	homePhoneNumber
Home Phone Number (Others)	otherhomePhoneNumber
Telephone Number	telephoneNumber

The above table indicates that up to four different AD number fields can be associated to the same template or each of the four AD number fields could be used with different templates. In most situations, only one PM template is used and it is associated to 'Telephone-Number' field in AD. The other three AD number fields would be optional fields used to define additional numbers to the primary number for that user.

Associating a different template to any of the other AD number fields can be used to differentiate between users in different MX-ONE systems in the same PM. In this case, then only the corresponding AD number fields associated to a given template must be filled in. If you fill in two AD number fields associated to different templates, this would result in creating extensions for the same user in two different systems.

A PM template dictates the detailed settings for the extension when creating it in the MX-ONE Service Node. The number entered in an AD number field will be attributed the settings from the mapped template when PM then creates the extension in the MX-ONE Service Node.

An optional way to determine which Telephony System the extensions are created in is to use the Telephony System Mapping which will overwrite the Telephony System specified by the template with the mapped system.

The received AD record will be mapped to the Telephony System matching the **Active Directory Values** of the selected **Active Directory Field**.

Rules must be set in PM for how the AD synchronization shall be handled when changes are done in AD and one of the following situations occurs:

- An extension defined for a user already exists in PM.
- An existing user changes extension numbers.
- A user is deleted in AD.
- Users are configured with shared extensions in PM.

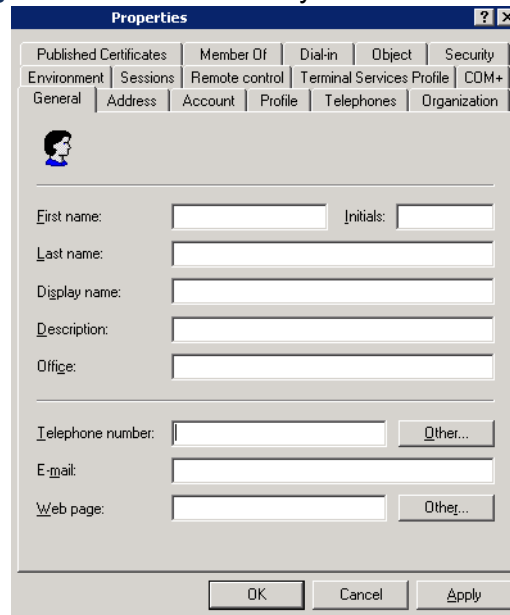
Refer to the *PM Active Directory task online help* for setting up the synchronization rules.

The AD fields will not provide any information about the creation of a mailbox, therefore the same number as for the extension will be used to set up a mailbox.

If no template has been mapped to an AD number field, no extension or mailbox will be created, even if the AD number field is filled in.

Below are some screens shots showing the "Active Directory Users and Computers" GUI, which is used to administer the AD, and the available AD fields for a standard AD installation.

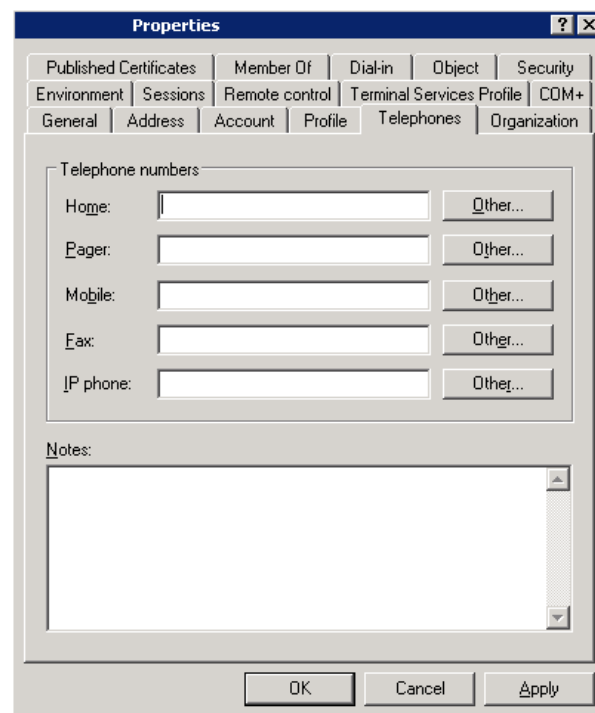
Figure 2.1: Active Directory Users and Computers GUI - 1



The screenshot shows the 'Properties' dialog box for an Active Directory user. The 'General' tab is selected. The dialog box contains the following fields and buttons:

- Published Certificates**, **Member Of**, **Dial-in**, **Object**, **Security**, **Environment**, **Sessions**, **Remote control**, **Terminal Services Profile**, **CDM+**, **General**, **Address**, **Account**, **Profile**, **Telephones**, **Organization**
- First name:** [Text Box] **Initials:** [Text Box]
- Last name:** [Text Box]
- Display name:** [Text Box]
- Description:** [Text Box]
- Office:** [Text Box]
- Telephone number:** [Text Box] **Other...**
- E-mail:** [Text Box]
- Web page:** [Text Box] **Other...**
- OK**, **Cancel**, **Apply**

Figure 2.2: Active Directory Users and Computers GUI - 2



The screenshot shows the 'Properties' dialog box for an Active Directory user, specifically the 'Telephones' tab. The dialog box contains the following fields and buttons:

- Published Certificates**, **Member Of**, **Dial-in**, **Object**, **Security**, **Environment**, **Sessions**, **Remote control**, **Terminal Services Profile**, **CDM+**, **General**, **Address**, **Account**, **Profile**, **Telephones**, **Organization**
- Telephone numbers:**
- Home:** [Text Box] **Other...**
- Pager:** [Text Box] **Other...**
- Mobile:** [Text Box] **Other...**
- Fax:** [Text Box] **Other...**
- IP phone:** [Text Box] **Other...**
- Notes:** [Text Area]
- OK**, **Cancel**, **Apply**

PM Active Directory Task

The set-up required in PM is done in the Active Directory task found a level below the System tab and Data Management sub tab.

Fill first in the **IP Address**, **Port**, **User Name** and **Password** to the AD server. Change the rest of the fields according to your preferences.

Email notification of connection failure to AD can be configured.

NOTE: PM Email Server task needs to be configured first.

Figure 2.3: Provisioning Manager

The screenshot shows the Mitel Provisioning Manager interface. The top navigation bar includes 'Users', 'Services', 'Administrators', 'System' (selected), 'Logs', and 'Own Settings'. Below this, a secondary navigation bar shows 'Location', 'Subsystem', 'Data Management' (selected), 'Options', 'Email Server', 'Configuration Wizard', and 'Password Settings'. The main content area is titled 'Active Directory Server - Change' and features a left sidebar with options like 'Compare with Subsystem', 'Backup & Restore', 'Scheduling', 'Active Directory', and 'Config Mirror Scheduling'. The 'Configure Domains' tab is active. The configuration form includes sections for General Settings (IP/FQDN Address, Use HTTPS, Port, User Name, Password, Confirm Password), Notification (Email Address), Rules (Automatic recovery function, Create Default Password, Automatically Remove Users, Scan for Removed Users Interval), Extension Handling (Extension/Mailbox Handling, Extension Number Length), and Mailbox Handling. A warning message states: 'No MiCollab Advanced Messaging Server subsystem is available. Please initiate through Add Subsystem task.' Below this is a button to 'Add MiCollab Advanced Messaging Server'. At the bottom, there is a 'UDF Mapping' section with a 'Remove Active Directory Server Configuration' button and an 'Apply' button.

Select the **Configure Domains** tab and add a new Search Domain.

Fill in the Search Domains, the easiest way is to copy the **distinguishedName** field in the AD server.

It can be selected if a received telephone number shall be made into extensions and mailboxes and how and when to assign them to the received user. New extensions will use the selected extension template. The mailboxes will get the same number as the extensions. The IP Extension Templates are defined in the PM Extension task.

An optional way to determine which MX-ONE the extensions are created in is to use the **Telephony System Mapping**.

Select the **Active Directory** field that will be used when mapping the MX-ONE used when creating an extension. The mapped MX-ONE will overwrite the system read from the templates.

Enter the **Active Directory Values** that will be used then mapping the MX-ONE towards the received Active Directory record.

Enabling **Automatic recovery function** will sync the users that were changed in AD (during the time interval between) when the AD notification task is off due to AD is down, and when the AD notification task is up and running.

Figure 2.4: Active Directory Values

Synchronization is done when performing an initial setup of PM, to quickly port all users from Active Directory to PM. The manual synchronization can be used in case of a connection failure to AD and it is required to get the systems back in sync.

Manual sync of the selected domain can be scheduled as shown. The manual synchronization is triggered by clicking on the **Refresh** icon for the desired Search Domain as shown in the picture below.

The **Automatic notification** option is used when a change in AD shall be automatically transferred to PM. The notification is enabled or disabled by clicking the **Activate/Deactivate** icon for the desired Search Domain.

Figure 2.5: Enabling/disabling automatic notification

Users will be sent and updated to CMG if a CMG system is registered. When users are added, users will be placed in the same department that they belong to in AD. If the department does not exist, it will be automatically created. If you remove a department from AD, then it reflects Department in PM as **User**

without Department. If you rename the department, then the same gets reflected in PM after the sync between AD to PM.

When user gets moved between departments in AD, it gets reflected in PM after the sync is done between the AD and PM.

Extension Handling Details

If the extension already exists, an option in the PM Active Directory task will decide if the request shall fail or if it shall assign the existing extension as a shared extension to the new user. By the term fail, it is meant that the extension part of the request will not go through. The user as such will still be added.

As Active Directory only automatic sends notifications for user additions and changes, not for removal of users, Provisioning Manager will have to check for removed users with a specified interval.

If PM is set to not remove extensions when a user is removed in AD, then, potentially, shared extension setting must be set to enable the user to be assigned to already existing extensions. The same logic applies for mailboxes.

If a user is removed from AD, the PM setting for removing or keeping mailboxes must be adhered to. If the user has been assigned with extensions, these extensions will not be removed.

The phone numbers listed in AD may be listed in international format. They will be cut to the specified number length when used to add a new extension. Non-digit characters will also be stripped. If the number is not a number, then no action shall be made.

Example of numbers:

+46 8 56867074

+46 8 568 xxxxx

+1 905-760-1234

+46 (0)8 1234567

NOTE: AD administrator must have the master list for extension numbers and is responsible for the allocation of numbers as no list of available numbers will be available in the AD Users and Computers tool.

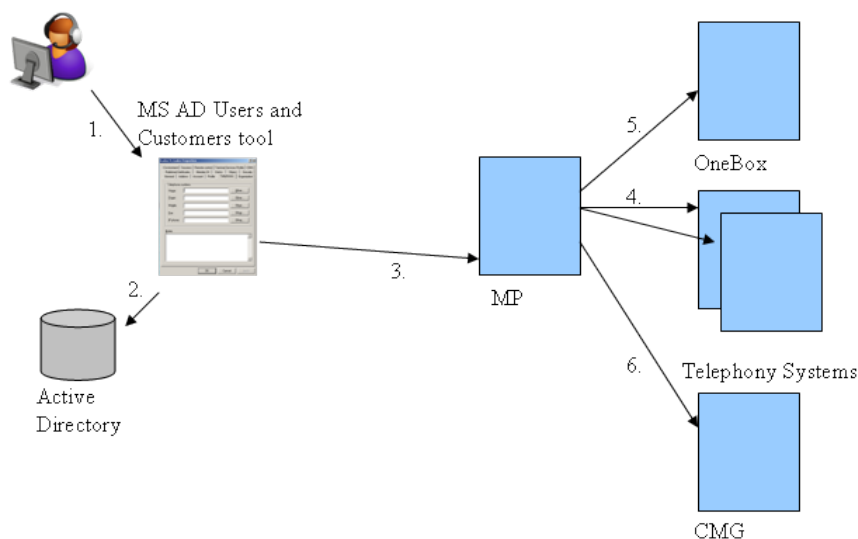
There is an option to add “Other” numbers for each telephony field, that is, additional numbers, in the AD GUI. Because these are not tagged separately, it will not be possible to handle them separately and they will therefore become additional numbers of the same extension type and based on the same template.

Name Handling

A changed name will be propagated to all extensions associated with the user, assuming it is not a shared extension. In the case of a shared extension, the name will be added to this extension on CMG and MiCollab Advanced Messaging, but will not be changed or added in MX-ONE Service Node. If the name is too long for the name field for the extensions, it will be truncated.

Execution Flow

Figure 2.6: Exceution flow



The execution flow is as follows:

1. The AD administrator logs on to the **Active Directory Users and Computers** tool.
2. The administrator configures the users and submits the request. The standard AD settings are stored in AD.
3. The data is sent through notification to PM where a predefined template is mapped to the submitted phone numbers. The user is created or modified.
4. PM sends a web services request to the selected MX-ONE to configure extensions.
5. PM sends a web services request to the selected MiCollab AM to configure a mailbox.
6. PM sends a web services request to the CMG to configure/modify a user.

Limitations

The following limitations apply:

- In a system with legacy extensions, these extensions will not be automatically provisioned from AD. Only the user will be set up in PM providing that no template has been mapped to the AD number fields. If a template has been defined, IP extensions will be created.
- PM supports provisioning of maximum 75000 users from AD.
- Only four AD number fields can be mapped to PM IP extension templates. This means up to 4 templates can be used to create IP extensions, each mapped to a specific AD number field. In this case, only AD number fields associated to the same template should be filled in for a given user. Filling in 2 AD number fields that are associated to different templates for the same user will result in creating 2 different IP extensions for this user. A template contains detailed settings as well as in which Telephony System the IP extension shall be created in. That means that you can create IP extensions with the same settings in four different systems, or four different types of IP extensions in the same Telephony System or a combination thereof.
- Number handling is not included in PM; this will have to be handled by the MX-ONE administrator.
- Only 1 AD is currently supported.

NOTE: For very large systems (for example, above 15000 users) with multiple servers in the same logical system, the AD synchronization with PM and the subsequent creation/update of users/extensions in the MX-ONE system and its associated applications can be taken anywhere from a few hours up to a day or longer.

NOTE: There is a limitation in AD, it allows only to have five subscriptions for automatic change notifications. AD synchronization in PM does not work with more than five active domains. If you activate more than five domains (green icon), the automatic synchronization will not work anymore.

Additional Info

For larger systems with many users, there will be a lot of notifications coming from AD to PM. Every computer login that a user performs triggers an update of AD and thereby a notification to PM. This will most likely not have an impact on the network performance, but it is worth mentioning.

NOTE: It is **NOT** recommended to use the System Setup Admin for Active Directory synchronization, as the users created by System Setup Admin during AD sync are not visible to other administrators.

