

# MX-ONE Provisioning Manager Integration with Active Directory

## DESCRIPTION



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# CONTENTS

|          |                                   |           |
|----------|-----------------------------------|-----------|
| <b>1</b> | <b>INTRODUCTION .....</b>         | <b>1</b>  |
| 1.1      | SCOPE                             | 2         |
| 1.2      | TARGET GROUPS                     | 2         |
| <b>2</b> | <b>FUNCTIONALITY .....</b>        | <b>3</b>  |
| 2.1      | OVERVIEW                          | 3         |
| 2.2      | ACTIVE DIRECTORY CONNECTION SETUP | 3         |
| 2.3      | AD – PM FIELD MAPPING             | 4         |
| 2.4      | PM ACTIVE DIRECTORY TASK          | 8         |
| 2.5      | EXTENSION HANDLING DETAILS        | 9         |
| 2.6      | NAME HANDLING                     | 10        |
| 2.7      | EXECUTION FLOW                    | 11        |
| <b>3</b> | <b>LIMITATIONS.....</b>           | <b>12</b> |
| <b>4</b> | <b>ADDITIONAL INFO.....</b>       | <b>13</b> |

# 1 INTRODUCTION

The purpose with this document is to describe the integration between Provisioning Manager (PM) and Microsoft Active Directory, (AD) in MX-ONE 6.0.

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.

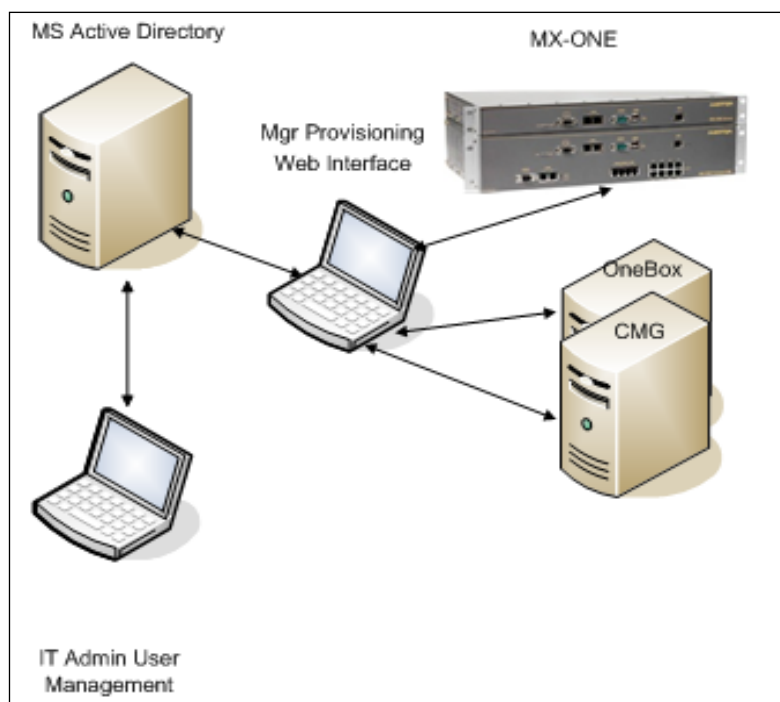
A PM template can be assigned to one of 4 telephony fields in AD so as to enable IP extensions to be created for a user according to the rules defined in the associated template. Please see the AD – PM Field Mapping section below.

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



## 1.1 SCOPE

The document describes the following:

- AD Integration setup
- Functionality
- Limitations

## 1.2 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.

## 2 FUNCTIONALITY

### 2.1 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 tab "Configure Domains".

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 section Active Directory Connection Setup below.
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. Make sure that the number series are set up in the Telephony System through Service Node Manager.
4. Configure the PM Active Directory task, see sections Active Directory Connection Setup and PM Active Directory below.
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 please 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.

### 2.2 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.

## 2.3 AD – PM FIELD MAPPING

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

**Table 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: 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 3: User Defined Fields (UDF):**

| 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                     |
| 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     |
| Password Never Expires                           | UserDontExpirePassword |
| Account Expires (Use same data format as server) | accountExpires         |

|                            |                               |
|----------------------------|-------------------------------|
| Profile Path               | profilePath                   |
| Login 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 or assigned, 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.

**Properties** [?] [X]

Published Certificates | Member Of | Dial-in | Object | Security  
Environment | Sessions | Remote control | Terminal Services Profile | COM+  
General | Address | Account | Profile | Telephones | Organization



First name:  Initials:   
Last name:   
Display name:   
Description:   
Office:   
Telephone number:    
E-mail:   
Web page:

**Properties** ? X

Published Certificates | Member Of | Dial-in | Object | Security  
Environment | Sessions | Remote control | Terminal Services Profile | COM+  
General | Address | Account | Profile | **Telephones** | Organization

Telephone numbers

Home:  Other...

Pager:  Other...

Mobile:  Other...

Fax:  Other...

IP phone:  Other...

Notes:

OK Cancel Apply

## 2.4 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.

The screenshot shows the Mitel Provisioning Manager interface. The top navigation bar includes 'Users', 'Services', 'Administrators', 'System' (selected), 'Logs', and 'Own Settings'. Below this, the 'Data Management' sub-tab is selected. The main content area is titled 'Active Directory Server - Change' and features a 'Configure Domains' tab. The configuration fields are as follows:

- General Settings:**
  - IP Address: 172.17.11.100
  - Port: 389
  - User Name: WBMaastra
  - Password: \*\*\*\*\*
  - Confirm Password: \*\*\*\*\*
- Notification:**
  - Email Address: (empty field)
- Rules:**
  - Create Default Password: ☒
  - Automatically Remove Users: ☒
  - Scan for Removed Users Interval [m]: 30
- Extension Handling:**
  - Extension/Mailbox Handling: Try assign otherwise create new extension/mailbox
  - Extension Number Length: 5
- Mailbox Handling:**
  - OneBox Server: OneBox, version 5.0
  - Create Mailbox: ☒
  - Class Of Service: None
  - UDF Mapping: Edit...

At the bottom, there is a 'Remove Active Directory Server Configuration' section with a 'Remove 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 which Active Directory field shall 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 shall be used then mapping the MX-ONE towards the received Active Directory record



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 synch. 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.

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 be created. For PM to be able to add user to CMG, the directory must map the Organization Unit structure. This has to be created manually in CMG before synchronization.

## 2.5 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.



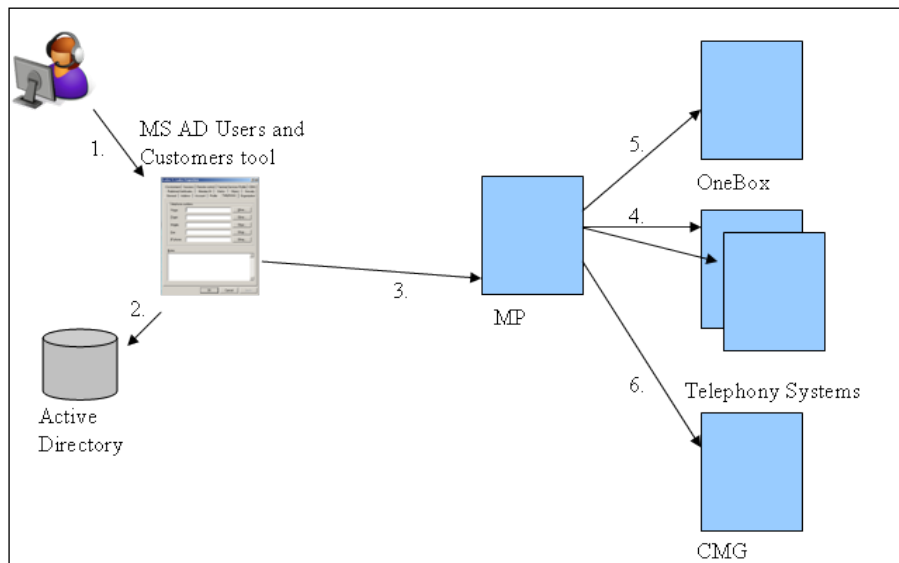
**Note!** AD administrator must have the master list for extension numbers and is responsible for the allocation of numbers as no list of available numbers will be available in the AD Users and Computers tool.

There is an option to add “Other” numbers for each telephony field, i.e. additional numbers, in the AD GUI. Since 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.

## 2.6 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.

## 2.7 EXECUTION 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.

### 3 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, then IP extensions will be created or assigned with an extension to the user.
- PM supports provisioning of maximum 75000 users from AD.
- If a CMG is connected to Provisioning Manager, Active Directory can't have an user with the same "last name" and "first name" due to CMG that don't have an unique id (like user id). If Provisioning Manager doesn't have any CMG connected, it will work with same name but with different user id.
- 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. 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.

## 4 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!** You must 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.