

MiVoice 5000 Manager Directory Configuration

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AMT/PTD/NMA/0061/6/4/EN

INSTALLATION MANUAL



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1 ABOUT THIS DOCUMENT

This document describes the different LDAP directory configurations of the MiVoice 5000 Manager management centre. The configurations concern:

- The directory declaration in a multi-site configuration
- The sharing of the directory by several multi-site configurations
- The synchronisation of the LDAP directory.

1.1 REFERENCE DOCUMENTS

Refer to [Mitel.com](https://www.mitel.com) site.

1.2 GLOSSARY

Mitel 5000 Gateways	This term refers to all XS, XL and XD PBXs (as of R5.1).
MiVoice 5000 or MiVoice 5000 Server	Telephone switching system on a PC running with Linux Redhat (as of R5.1)
XS, XL, XD	MiVoice 5000 range physical gateways (as of R5.1)
MiVoice 5000 Manager	Systems management centre
ACL	<i>Access ControlList</i> ACLs are used to authenticate to LDAP databases and to receive filtered information (read and write rights and parameter list) according to configuration.
LSB	<i>Security Logic Block</i> Term used to identify an item supervised by the iPBX. Example: cluster equipment, X25 data card, digital subscriber channel, etc.
Bufic	Server associated with the integrated buffer for storing call tickets.
Campaign	Day-to-day processing operations comprising all the deferred programmed actions, both the occasional and periodic ones.
Group	
Community (mode)	Community mode is used to define a set of communities in which one or more number ranges are defined. For more information, see the document Managing DID numbers.
Kitaxe	Detailed-billing server. The KITAXE server is located on each site: its function is to collect site tickets and send them to the MUFACT server.
LDAP	<i>Lightweight Directory Access Protocol</i> Standard protocol used to manage administrative data (directory)
TL	Tie Line Specialised line between PBXs.
MIB	Management Information Base Database inside each agent. This base contains management information on the equipment concerned. The MIB allows communication between the SNMP agent and SNMP manager.
Multi-site	Name given to a group of iPBXs connected together to offer a distributed switching function. This group shares the same directory (when declared) and has a centralised call server. Refers to two or more networked iPBXs.

Mufact	The purpose of the MUFACT server (billing multiplexer-demultiplexer) is to collect the tickets issued by each itemised billing server (KITAXE). The multiplexer is located on the centralising site for itemised billing. It automatically sets up X25 links (Virtual Circuits) with the billing servers (KITAXE) of the sites belonging to the multi-site network.
Purpose of this document	Refers to any significant and interactive network component, represented by a symbol (icon or line).
Pool	Refers to two or more independent and unconnected iPBXs.
Region	Group of several sites. Set of (site or multi-site) cabinets sharing the same telephony parameters and profiles.
Repository	A place where the entire data is stored: <ul style="list-style-type: none">- application configuration data- data concerning managed sites- operator data
PSTN	<i>Public Switched Telephone Network</i> Ordinary telephone network
DID	<i>Direct Inward Dialling</i> A system which allows direct access to a correspondent's terminal without passing through the switchboard. The DID number is the public number used to reach a subscriber from an external network.
Site	A Mitel iPBX A site is either a MiVoice 5000 Server or a Mitel 5000 Gateways.
Standalone site	Site not belonging to any multi-site configuration. This site is located in a region, on the same level as multi-sites.
IVR	Interactive voice response
F1	M6501 L/R IP PBX (before R5.1)
F2	M6540 IP PBX (before R5.1)
F4	NeXspan 50 and NeXspan 500 (before R5.1)
F5	Mitel Call Server MiVoice 5000 Server (before R5.1)
F6	XS, XL and XD iPBX (before R5.1)

2 DECLARING A DIRECTORY IN A MULTI-SITE CONFIGURATION

For this procedure also see the documents listed in Section 4 *Reference documents*.

Prerequisites:

1. Configure the MiVoice 5000 Manager IP address in Menu Administration/Configuration, Directory tab.
2. Configure the topology and select the reference site.

In a traditional multi-site configuration with a MiVoice 5000 Manager, the directory is declared as follows:

1. Choose a temporary reference site for the directory and configure it.



Note : Choose a MiVoice 5000 type system for the reference site.

2. For each site in the multi-site configuration, configure the directory connection to the reference site.
3. Regenerate the internal directory records of each site on the reference site.
4. Check that all the directory records of the multi-site configuration are available on the reference site.
5. Import the reference site directory into MiVoice 5000 Manager, using the **generation** function of the management interface.
6. For each site on the multi-site network (including the reference site) reconfigure the address of the new directory base reference (MiVoice 5000 Manager).



Note : This configuration should be made at the end of the generation process (it cannot be made before this, because the operator will need to return to local directory mode in the event of any problems).

Example of how to declare a directory on a multi-site network (for sites as of R5.3)

Step 1: From Web Admin, for each site in the multi-site configuration, configure the directory connection to the reference site as indicated below.

Menu **Telephony service>Subscribers>Directory>Parameters>Connections**

Directory connections settings
Telephony service>Subscribers>Directory>Settings>Connections (1.1.1.1)

Configuration Name resolution Dialing service

Directory configuration base EXP

Type of server	EXTERN.
Name of server or IP address :	127.0.0.1
Port	389
Base or URL :	ou=local,o=AASTRA,dc=DOMAIN,dc=com
Login	cn=Manager,dc=DOMAIN,dc=com
Password	*****
Max number of answers by request	100
Regeneration of internal records	<input type="checkbox"/>
Reduced directory	<input type="checkbox"/>

OU=
This field enables the user to define the LDAP branch via which to access the directory (location, multi-site configuration name, etc.)

The IP address must match the reference site IP address.

- **TLS**

When the box is ticked, the MiVoice 5000 client connects to the remote LDAP database in LDAPS.

To validate the secure remote connection, the client checks, in the local certificate base, whether the certification chain used to verify the LDAP server certificate is present.

LDAPS server certification authorities are imported from the Certification authorities tab.

- **Port**

Port for LDAP connection (389 is the default value for LDAP protocol) or 636 if the access is secure (TLS ticked).

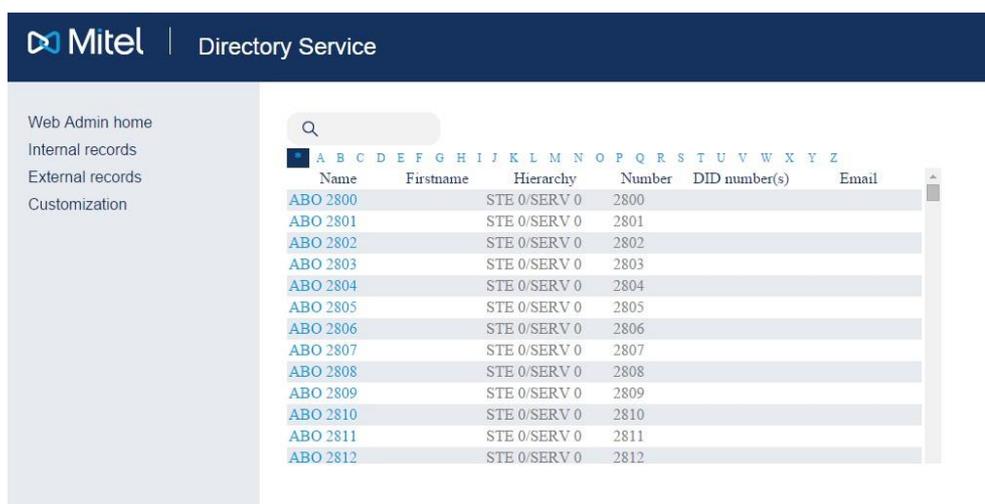
DATABASE OR URL field: ou=local,o=AASTRA,dc=DOMAIN,dc=com

The field "ou=local,o=AASTRA,dc=DOMAIN,dc=com" serves as the path. It is used to determine the LDAP hierarchy level on which the directory will be used. For the hierarchical structure of the LDAP database, see the documents cited in Section 4 *Reference documents*.

Password field: enter the LDAP directory password ("secret").

Tick the Generate internal records box then click **Validation** to replicate the internal directory records of each site to the reference site.

Step 2: Check that all the directory records of the multi-site configuration are available on the reference site.



The screenshot shows the Mitel Directory Service web interface. On the left is a navigation menu with options: Web Admin home, Internal records, External records, and Customization. The main area features a search bar and a table of directory records. The table has columns for Name, Firstname, Hierarchy, Number, DID number(s), and Email. The records listed are ABO 2800 through ABO 2812, all with a hierarchy of STE 0/SERV 0 and a number corresponding to the record ID.

Name	Firstname	Hierarchy	Number	DID number(s)	Email
ABO 2800		STE 0/SERV 0	2800		
ABO 2801		STE 0/SERV 0	2801		
ABO 2802		STE 0/SERV 0	2802		
ABO 2803		STE 0/SERV 0	2803		
ABO 2804		STE 0/SERV 0	2804		
ABO 2805		STE 0/SERV 0	2805		
ABO 2806		STE 0/SERV 0	2806		
ABO 2807		STE 0/SERV 0	2807		
ABO 2808		STE 0/SERV 0	2808		
ABO 2809		STE 0/SERV 0	2809		
ABO 2810		STE 0/SERV 0	2810		
ABO 2811		STE 0/SERV 0	2811		
ABO 2812		STE 0/SERV 0	2812		

Step 3: Import the directory into MiVoice 5000 Manager, using the **generation** function.

Menu **Administration>Configuration>Network topology>Select a region>Select a multi-site>Configuration>Generation>Import**.

Next steps: On each site of the multi-site configuration, enter the MiVoice 5000 Manager IP address then replace ou=local with the name of the multi-site configuration defined from the MiVoice 5000 Manager topology in the Web Admin directory configuration menu.

Menu **Telephony service>Subscribers>Directory>Parameters>Connections**

<ul style="list-style-type: none"> Web Admin home Subscribers Directory Settings Connections System Dialing plan Network and links Reception Voice mail and tones Fast links 	<p>Directory connections settings</p> <p>Telephony service>Subscribers>Directory>Settings>Connections (1.1.1.1)</p> <p>Configuration Name resolution Dialing service</p> <p>Directory configuration base EXP</p> <p>Type of server: <input type="text" value="EXTERN."/></p> <p>Name of server or IP address: <input type="text" value="AM7450 Server @ip"/></p> <p>Port: <input type="text" value="389"/></p> <p>Base or URL: <input type="text" value="ou=local,o=AASTRA,dc=DOMAIN,dc=com"/></p> <p>Login: <input type="text" value="cn=Manager,dc=DOMAIN,dc=com"/></p> <p>Password: <input type="password" value="*****"/></p> <p>Max number of answers by request: <input type="text" value="200"/></p> <p>Regeneration of internal records: <input type="checkbox"/></p> <p>Reduced directory: <input type="checkbox"/></p>
---	---

- **TLS**

When the box is ticked, the MiVoice 5000 client connects to the remote LDAP database in LDAPS.

To validate the secure remote connection, the client checks, in the local certificate base, whether the certification chain used to verify the LDAP server certificate is present.

LDAPS server certification authorities are imported from the Certification authorities tab.

- **Port**

Port for LDAP connection (389 is the default value for LDAP protocol) or 636 if the access is secure (TLS ticked).



Note : After these last steps the generation directory data import menu should no longer be used.

3 EXTERNAL DIRECTORY SYNCHRONISATION

3.1 PRINCIPLE

This function is used to synchronise the data in an external directory with the LDAP directory used by the management centre.

The various types of external directory databases, which can be synchronised, are:

- LDAP / PDAPS with Active Directory (AD, ADAM, AD LDS, Microsoft Entra Domain Services),
- LDAP / LDAPS with openLDAP
- Description file (CSV file) to be used when none of the previous two databases is available.

Synchronisation is made from the connectors dedicated to each type of external directory databases mentioned previously:

- The **Active Directory** connector is used to synchronise, in real time, some personal and contact records between an LDAP type external directory hosted by an Active Directory server and the OpenLDAP database of MiVoice 5000 Manager.
- The **OpenLDAP** connector is used to synchronise, in real time, some personal and contact records between one (or part of a) native OpenLDAP and the OpenLDAP database of MiVoice 5000 Manager.
- The **CSV file** connector is used to synchronise, almost in real time, some personal and contact records in the OpenLDAP database of MiVoice 5000 Manager from an update description file (**xxx.csv**).

For each connector type, a definition file (xxx.ini), describes the different connection parameters as well as the mapping of the fields to synchronise.



IMPORTANT: A connector is always linked to only one multi-site configuration.

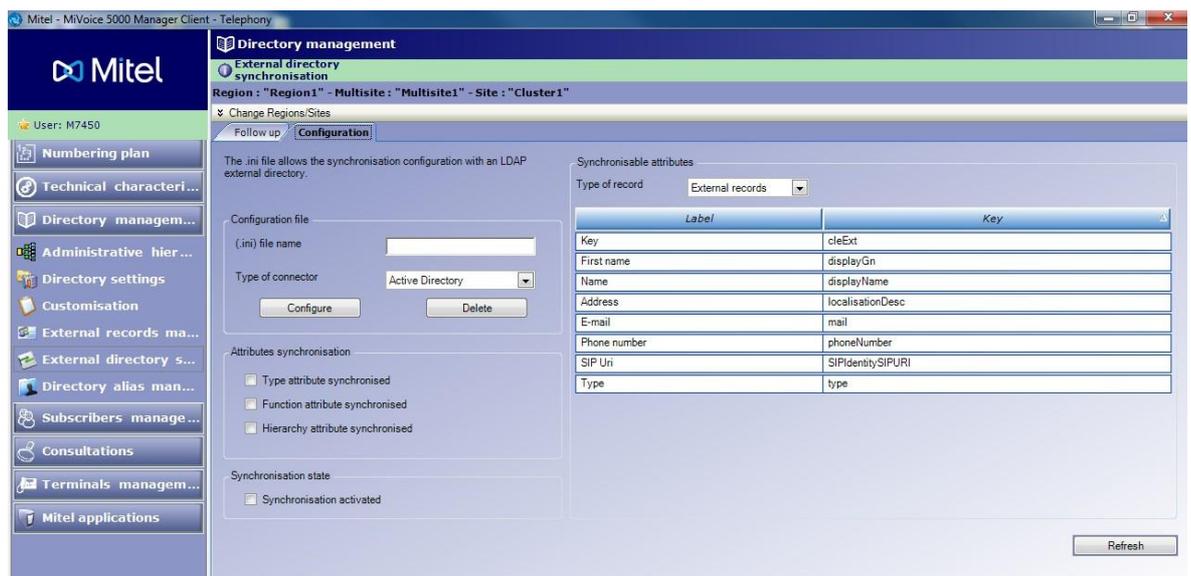
3.2 CONFIGURING THE ITEMS TO BE SYNCHRONISED

3.2.1 CONFIGURATION INTERFACE

To access the synchronisation function:

1. In the **Telephony** window, click **Directory management** then **External directory synchronisation**.
2. Select a region / multi-site. The synchronisation window opens. It comprises 2 tabs: **Administration** and **Configuration**.
3. Click the **Configuration** tab.

This tab is used to define the items to be synchronised between the external directory/directories and the MiVoice 5000 Manager LDAP directory.



Information from the site concerned (selection in progress) is indicated on top of the screen.

To change to another multi-site configuration, select the line Change Region/System then click the green arrow.

CONFIGURATION FILE AREA

- **File name (.ini):** configuration file for the items to be synchronised. This file is located in the **directory /home/m7450/synchad**.
- **Type of connector:** connector type option
- **Configure button:** after entering the login/password, the operator accesses the configuration pages for the connector in question (see Connector configuration file).
- **Delete button:** this button is used to delete the .ini file the name of which is indicated in the file name area. This makes it possible to start afresh from a new configuration file, with all the default values when it is created again.

ATTRIBUTE SYNCHRONISATION AREA

This area is used to define how the directory parameters will be synchronised.

For a given parameter, if the box is ticked, the fields concerned in the internal and external record management menus will no longer be handled like options but like simple text fields (for synchronised items only).



Note: Starting from R8.2 SP1, the administrative hierarchy of the external directory is automatically integrated to the hierarchy of the Manager's directory.

The modifications are displayed in the menu **Telephony>Directory management>Administrative hierarchy**. Refer to the document **MiVoice 5000 Manager – User Guide**.

SYNCHRONISATION STATUS AREA

If the box is ticked, the synchronisation function between the LDAP directory and the external directory is activated. Any action in the external directory will be reflected on the LDAP directory, according to the configuration of the .ini file.

SYNCHRONISABLE ATTRIBUTES AREA

This area is used to view the LDAP directory attributes of the MiVoice 5000 solution which can be synchronised from the external directory (for internal and external records).

3.2.2 CONNECTOR CONFIGURATION FILE

The configuration files for the items to be synchronised can be created and modified by clicking the **Configure** button; before any action on this file, enter its name in the File name area (the extension .ini is required) then select the right connector type.

UPGRADES FROM R2.2

- Some configuration pages of the .ini file can be used to generate all connector types.
- The **sn** and **gn** fields are replaced by the **displayName** and **displayGn** fields.



Note : This change must be taken into account during upgrade on existing configurations (R2.1).

- The multi-site name, as well as the region and multi-site ID, is automatically entered.
- Alias records can be synchronised (the link with the main record is created via telephoneNumber).

UPGRADES FROM R2.2 SP1

During synchronisation with an Active Directory database, the "cleExt " field was previously updated with the "**distinguishName**" field.

This latter (dn) changes according to the movement of the input in the Active Directory database, so the uniqueness of the synchronised record in the MiVoice Manager database cannot be guaranteed.

To avoid making double inputs, the "**objectGUID**" field is now used because it remains unchanged in the Active Directory database throughout the service life of the personal or contact record.

An upgrade is, therefore, necessary to update the content of external keys "**cleExt**" in the MiVoice 5000 Manager LDAP database. This procedure includes an executable which allows the value **distinguishedName** to be automatically replaced by the value **objectGUID**.

The procedure in detail:

- Upgrade MiVoice 5000 Manager to R2.2 SP1.
- Stop the MiVoice Manager service.

Open a terminal on MiVoice 5000 Manager Server and run the script "**update_AD_cleExt.py**" located in **/home/scripts_m7450**, giving as argument the tree structure in which the configuration file (.ini file) for Active Directory synchronisation is located.

Restart the MiVoice 5000 Manager service.

UPGRADES FROM R2.3

The creation of a directory record by synchronising from an external directory may be accompanied by the creation of the following records:

- A technical record
- Possibly, a UCP record
- Possibly, a TWP record

These creations are based on the definition of profiles containing all the characteristics of the records to be created.



Note: The management of these profiles is described in the **MiVoice 5000 Manager user guide**.

UPGRADES FROM R2.3 SP1

It is possible to synchronise the MiVoice 5000 Manager directory database (for a multi-site configuration) with several remote directory databases (up to 10), which are either the same or different.

Each .ini configuration file created must be identified by a basic number defined on the connector configuration page, to be selected using options.

Implementation:

1. In the **Configuration** tab, create and configure a configuration file which corresponds to the first connector for the first remote database to be synchronised.
 - example: synchro.ini
 - In the connector configuration file and in the **Connection to external database** area, select 1 from the options.
2. In the **Configuration** tab, create and configure a new configuration file which corresponds to the second connector for the second remote directory database to be synchronised.
 - Example: synchro_base2.ini (respecting the syntax name_x.ini for the second and third file).
 - In the connector configuration file and in the **Connection to external database** area, select 2 from the options.
3. Repeat the operation for the other connectors if necessary.
4. Activate synchronisation by going to the name of the connector corresponding to **directory database 1**.

UPGRADES FROM R3.1

- Activating/deactivating contact synchronisation

- Managing the notion of community.

3.2.3 CONFIGURATION FILE FOR ACTIVE DIRECTORY CONNECTOR

This type of connector is based on the notification service offered (and activated by default) in Active Directory. On the other hand, some additional rights are needed on the **DeletedObject** container for information about deletion. For more information, see technical records NT_178 and NT_179.



Connection to the external base		Connection to MiVoice 5000 Manager	
IP Address	10.102.31.115	Manager User	M7450
Port	389	Password	*****
DN Base	CN=Users,DC=Lab-inte	Multisite name	multidaps
Login	CN=Administrateur,CN	Region ID	635999464476002070
Password	*****	Multisite ID	636535950280661930
TLS	<input type="checkbox"/>	LDAP password	*****
Number basis	1 ▾		

<p>Synchro configuration</p> <p>Recycle Bin option enabled on the external base? <input type="checkbox"/></p> <p>Enable the contacts' synchro <input checked="" type="checkbox"/></p> <p>Listing of the external base at startup <input checked="" type="checkbox"/></p> <p>Synchro scope from root <input type="checkbox"/></p> <p>Organizations <input type="text"/> <input type="button" value="Add"/> <input type="button" value="Delete"/></p> <div style="border: 1px solid gray; height: 60px; width: 100%;"></div>	<p>Numbers transformation</p> <p>External prefix <input type="text" value="0"/></p> <p>International prefix <input type="text" value="00"/></p> <p>National prefix <input type="text" value="0"/></p> <p>Country code <input type="text" value="33"/></p> <p>Regional prefix <input type="text"/></p> <p>Internal prefix <input type="text"/></p> <p>Length of internal numbering plan <input type="text" value="4"/></p>																																																																																										
<p>Subscribers (internal records)</p> <p>Filter on the external base <input type="text" value="(b(objectCategory=per:AASTRA_FR)"/></p> <p>Default hierarchy <input type="text" value="MiVoice 5000 Manager attributes"/></p> <p>External base attributes to</p> <table style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 30%;"><input type="text" value="objectGUID"/></td><td><input type="text" value="cleExt"/></td></tr> <tr><td><input type="text" value="sn"/></td><td><input type="text" value="displayName"/></td></tr> <tr><td><input type="text" value="givenName"/></td><td><input type="text" value="displayGn"/></td></tr> <tr><td><input type="text" value="company"/></td><td><input type="text" value="hierarchySV"/></td></tr> <tr><td><input type="text"/></td><td><input type="text" value="type"/></td></tr> <tr><td><input type="text"/></td><td><input type="text" value="function"/></td></tr> <tr><td><input type="text" value="sAMAccountName"/></td><td><input type="text" value="userPrincipalName"/></td></tr> <tr><td><input type="text" value="mail"/></td><td><input type="text" value="mail"/></td></tr> <tr><td><input type="text"/></td><td><input type="text" value="SIPIIdentitySIPURI"/></td></tr> <tr><td><input type="text" value="streetAddress"/></td><td><input type="text" value="localisationDesc"/></td></tr> <tr><td><input type="text"/></td><td><input type="text" value="secretaire"/></td></tr> <tr><td><input type="text"/></td><td><input type="text" value="photo"/></td></tr> <tr><td><input type="text"/></td><td><input type="text" value="attr1"/></td></tr> <tr><td><input type="text"/></td><td><input type="text" value="attr2"/></td></tr> <tr><td><input type="text"/></td><td><input type="text" value="attr3"/></td></tr> <tr><td><input type="text"/></td><td><input type="text" value="attr4"/></td></tr> <tr><td><input type="text"/></td><td><input type="text" value="attr5"/></td></tr> <tr><td><input type="text"/></td><td><input type="text" value="attr6"/></td></tr> <tr><td><input type="text"/></td><td><input type="text" value="attr7"/></td></tr> <tr><td><input type="text"/></td><td><input type="text" value="attr8"/></td></tr> <tr><td><input type="text"/></td><td><input type="text" value="attr9"/></td></tr> <tr><td><input type="text"/></td><td><input type="text" value="attr10"/></td></tr> </table> <p>MiVoice 5000 Manager attributes to</p> <table style="width: 100%; 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DESCRIPTION OF THE CONFIGURATION INTERFACE

Logging on to the external database:

- IP address: IP address of the server hosting the external database
- DN database: DN database of the external database
- Login / Password: Active Directory account login and password for MiVoice 5000 Manager (read/write rights)
- Number base: database number corresponding to the .ini configuration file.

LOGGING ON TO MIVOICE 5000 MANAGER:

- User MiVoice 5000 Manager: MiVoice 5000 Manager user ID
- Password: associated password



Note : This operator may have minimum rights on the application. If password renewal is activated, it is advisable to use a dedicated operator who never logs on to the application.

- Multi-site name: name of the multi-site configuration to be synchronised
- Region ID: ID of the region
- Multi-site ID: ID of the multi-site
- LDAP password: Manager account password

Configuring synchronisation:

- Recycle bin active option: This option prevents the reception of double deletion notifications due to the Active Directory Recycle bin.
- Deactivate the synchronisation of contacts: this option prevents the synchronisation of contacts.
- List external database during start: this option is used to run the listing of external database before starting the synchronisation cycle.



Note : It is advisable not to activate this option permanently but only when the function is implemented.

- Scope of synchronisation from the root:
 - If this box is ticked, synchronisation must be made from the external database LDAP tree root. In this case, all the external database records are synchronised. The root (or suffix) must only be entered in the DN database field.
 - If this box is not ticked, synchronisation is on a OU by OU basis for the OUs specified in the list of organisations. It is necessary to define the sub-OUs so they can be taken into account.
- Organisations: used to add or delete a tree structure concerned by synchronisation.



Note : Up to 500 OUs can be specified on the Organisations list.

Number translation:

These fields are necessary for automatic processing of phone numbers during external database synchronisation to LDAP (formatting of the phone numbers available in Active Directory records before writing in the LDAP database).

Subscribers (internal records) and external contacts:

- Filter on external database: list of items in the organisation, concerned by the filtering operation.



Note : LDAP filter to be modified according to the external database and synchronisation scope criteria.

- Default hierarchy: default value of the hierarchy field, for creating records in the LDAP database if the field is not defined in the external database.



Note : The default hierarchy must exist on the tree defined in MiVoice 5000 Manager (menu Directory management / Administrative hierarchy).

- External database attributes to MiVoice 5000 Manager attributes:
 - On the left side, the external database fields (modifiable) and on the right side the LDAP directory fields (not modifiable). To add the synchronisation of an external database attribute, enter its field name in the left column opposite the attribute you wish to enter in the LDAP.



CAUTION : The areas in yellow must be filled in, and the objectGUID attribute is not modifiable. If the default hierarchy of the AD synchronization is not supported by the MiVoice 5000 Manager, this causes a stop of SDN service.



Note : For picture synchronisation, see the document - Picture management - Implementation manual.

- If attr1 to attr10 correspond to some phone number fields, it is necessary to tick the box on the right.
- MiVoice 5000 Manager attributes to external database attributes: (Optional) synchronisation of LDAP directory numbers to external database.



Note : It is advisable to define a multi-evaluated external database field for multi-line or multi-location subscribers (several numbers for the same subscription).

Internal record (managing profiles) or alias record:

This field is used to specify the phone number in case of synchronisation through automatic creation profiles (see Section Automatic creation of technical, UCP and TWP records records) or for alias records.

External attribute used to characterise the profile:

This field is used to specify the attribute in which will be characterised the profile to be used for synchronisation with automatic subscription creation profiles.

External attribute corresponding to Username:

This field is used to indicate the user name attribute, necessary for synchronising TWP records, in case of synchronisation with automatic creation profiles (by default SamAccountName, which corresponds to Windows login in Active Directory).

External attribute corresponding to community:

This field is used to specify the community attribute in case of synchronisation with automatic creation profiles and directory management in SDN mode with community. (See the document – MiVoice 5000 Manager – Managing DID numbers)

Debug mode:

Some **Traces** and **Statistics** files per connector are generated and stored respectively for each multi-site configuration; they can be viewed by clicking the View button. These files are saved in **/home/m7450/synchad:**

<multisite>_coutdbg.txt

<multisite>_stat.csv



Note : The More details box must be ticked to send the traces file to the Support department.

Save button:

This button is used to save the modifications made in the connector configuration.

Test connection button:

This button is used to check whether connection has actually been set up with the external database, and the filter consistency. Only the first 500 entries found in the external database will be displayed.



Note : Click the Save button before testing the connection.

3.2.4 CONFIGURATION FILE FOR OPENLDAP CONNECTOR

This type of connector is based on the replication service offered by OpenLdap as of release. It is necessary to configure the client server with the SYNCREPL protocol. For more information, see technical records NT_178 and NT_179.

Interface differences between the LDAP and Active Directory connector

The "**Synchro configuration**" area is not available for this type of connector; synchronisation is based solely on the field "**Filter on external database**".

The "**ObjectGUI**" attribute is replaced by its equivalent on the Openldap "**entryUUID**" side.

3.2.5 CONFIGURATION FILE FOR AZUR AD CONNECTOR

The configuration is the same as for the AD connector by selecting the LDAPS protocol and using the URL for the configuration, the link to Azure AD:

<https://docs.microsoft.com/en-us/azure/active-directory/fundamentals/auth-ldap>

3.2.6 CONFIGURATION FILE FOR .CSV FILE CONNECTOR

This type of connector is based on the exchange of flat file (CSV) and may be used when the external databases are neither Active Directory nor OpenLDAP. For more information, see Chapter 3.2.6.

Subscribers (internal records) and external contacts:

- Some attributes may or may not be activated for import (left checkbox).
- The number type attributes must be specified (right checkbox).



Note : Contextual help is available when the cursor is placed over the field concerned.

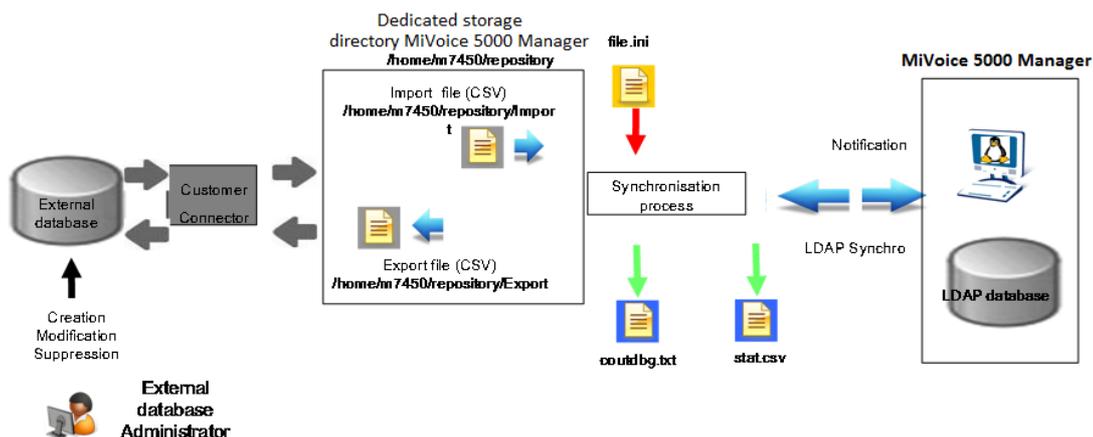
Configuring export:

An exportable file can be generated in order to update the numbers in the remote database.



CAUTION : TWP record creation is not available in synchronisation with automatic creation profiles for this connector type.

3.2.7 HOW THE CSV CONNECTOR WORKS



The principle is to synchronise the external directory database and the MiVoice 5000 Manager LDAP database by exchanging description files in .csv format in **UTF-8 without BOM**.

The files exchanged (import and export) are stored in some dedicated storage directories in **/home/m7450/repository**. The client has to respectively place and retrieve these files.

Two utilities are used to automate these tasks:

- CURL for depositing the import file
- WGET for retrieving the export file.



Note : The use of these utilities is described in detail in the Appendix in Chapter 5.3 - CURL deposit utility and 5.4 - WGET downloading utility.

Import file (external directory to MiVoice 5000 Manager)

Since the structure and name of these files is specific to the MiVoice 5000 Manager application, the client must check that their formats are good and comprehensive (cleExt uniqueness) through its own means (example: dedicated client connector).



Note : The file structure is described in detail in the appendix in Chapter 5.1 - Structure of import files.

The MiVoice 5000 Manager portal monitors and manages the synchronisation process which retrieves the import file every 10 minutes in the folder.

/home/m7450/repository/Import/synDirectory_<multisite>

If a new file is detected, the new items are taken into account by MiVoice 5000 Manager, and the corresponding records updated in the LDAP database. The file is then deleted.

Export file (from MiVoice 5000 Manager to an external directory)

During creation or modification in MiVoice 5000 Manager, an export file is created to update the numbers in the external database (via the client connector).



Note : The file structure is described in detail in the appendix in Chapter 5.2 - Structure of import files.

The MiVoice 5000 Manager portal supervises and manages the synchronisation process which constitutes the export file in the directory:

/home/m7450/repository/Export/External_Directory/<multisite>

This file then remains available for two weeks before automatic deletion.

Follow-up files

Some CSV connector follow-up files are available in **/home/m7450/synchad**:

<multisite>_stat.csv

<multisite>_import_people_errors.csv

<multisite>_import_contact_errors.csv

3.3 AUTOMATIC CREATION OF TECHNICAL, UCP AND TWP RECORDS

Automatic creation by profile is available for the three connector types.

To configure the system so that technical, UCP and TWP records can be created automatically, proceed as follows:

3.3.1 ACTIVATING AUTOMATIC SUBSCRIPTION CREATION

By default, automatic creation is deactivated. To activate it, the line below must be modified in the file **/home/m7450/portail/7450Portail.dll.config**:

```
<add key="SYNCHRO_ANNU_ANDFT" value="true"/>
```

This activation applies to all the managed multi-site configurations.

It is only operational for a multi-site configuration if at least one default "profile" file is configured. Otherwise, automatic creation is inactive for the multi-site configuration in question.



CAUTION : It is necessary to restart the m7450 service to activate the function.



Note : Subscribers created through external directory synchronisation must not be managed by the Quick Create interface. They must be modified from the remote directory database.

3.3.2 DEFINING THE NUMBER ATTRIBUTE

This attribute, used to choose the subscription assignment number from the external directory, must be defined in the connector configuration file (see Chapter 3.2 - "Internal record (profile management) or alias record").

Number management:

The number is freely chosen (the operator is chosen from the external directory) or is automatically assigned (according to profile configuration).

- If the number is not defined from the external directory, creation is implemented with a number automatically assigned according to the configuration of the profile concerned.
- If the number defined from the external directory is free, creation takes place according to the characteristics of the profile concerned.
- If the number defined from the external directory is not part of the numbering plan, creation is implemented with a number automatically assigned according to the configuration of the profile concerned.

- If the number defined from the external directory has already been assigned, an alias record is created instead of a new subscription.

3.3.3 DEFINING THE PROFILE ATTRIBUTE

This attribute, which characterises the profile to be called during subscription creation, must be defined in the connector configuration file (see the chapter - "External attribute used to characterise the profile").

Sample scenario:

The client chooses the **"function"** attribute in its external directory to characterise the profiles in the connector configuration.

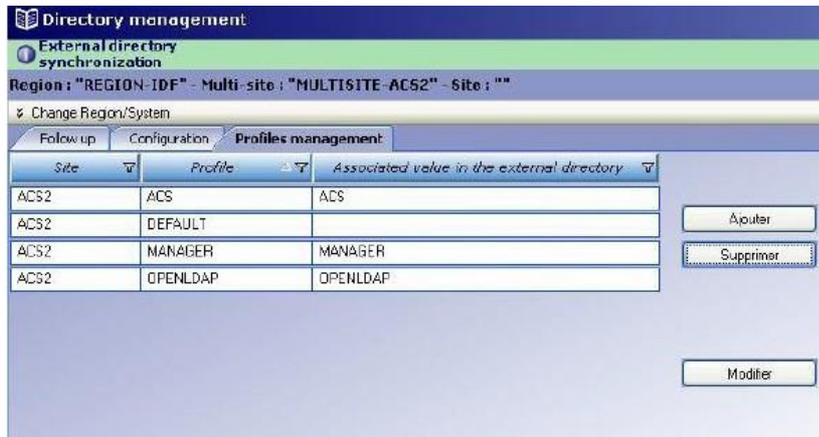
An Assistant profile is created in Profile management, with as associated value in the external directory **SEC_S1** for Site 1 and **SEC_S2** for Site 2.

To apply the Assistant profile for a given directory record, the client must enter the value **SEC_1** or **SEC_S2** in the **"function"** attribute of its external directory.

If the value **SEC_S2** is entered, creation will automatically be implemented on Site 2 with the criteria defined in the Assistant profile.

3.3.4 PROFILES CONFIGURATION

The profiles are created or modified from Menu **Telephony>Subscriber management>Profile management**.



Note : Profile creation is described in the document **Managing subscribers by profile**.

Profiles management:

- Defining a default profile is mandatory.
- A profile can be defined for one or more sites.
- If the value characterising the profile is not available in the external directory, creation is implemented with the characteristics of the default profile.
- If the value characterising the profile in the external directory does not exist in any of the profiles defined, creation is implemented with the characteristics of the default profile.
- It is possible to relocate by changing profiles (modifying the value characterising the profile in the external directory).

4 DIRECTORY SHARED BY SEVERAL MULTI-SITES

When an installation comprises several multi-sites, it is possible not to have a directory per multi-site but a centralised directory for all the multi-sites.

The call by name function or number resolution is thus possible on all the internal records of the installation.

In the MiVoice 5000 Manager LDAP database, a single directory branch will be shared for all the multi-sites.



CAUTION : Since this operation is delicate to put in place, it requires contacting Mitel's Support department.

4.1 CONSTRAINTS

- The internal numbers must be different in each multi-site configuration: therefore, different multi-site-based number segments must be defined (MiVoice 5000 Manager does not check whether a number has already been assigned in another multi-site configuration).
- The call by name or number resolution function implies the following constraints:
 - Either the numbering plan is homogeneous: the prefix for each internal number segment allows either internal routing or routing to the corresponding multi-site (via TL),
 - Or the vital subscriber is deployed (timeout to be adjusted) and, in this case, it is preferable to have the SDN service to know the translation of internal number to PSTN (or TL) number.
- The abbreviated number length must be the same in all the multi-sites.
- The lists of barred numbers will also be unified (at least the names of the lists retrieved by MiVoice 5000 Manager).

4.2 IMPLEMENTATION

The entire directory data of all the multi-sites to be managed must be centralised in MiVoice 5000 Manager, especially in the LDAP database branch defined as Centralising Directory.

Since MiVoice 5000 Manager cannot centralise in the unified directory (centraliser) while a new site is generated or imported, it is necessary to perform a preliminary work.

These operations must be performed using an LDAP browser through LDIF import/export. The LDIF files must be adapted before import, to specify the centralising multi-site branch.

Each multi-site or internal branch of a site must be imported into the centralising multi-site branch.

In MiVoice 5000 Manager

- Define the centralising multi-site:

Modify the file `/home/m7450/portail/7450Portail.dll.config` to add the following key:

```
<add key="NOM_MULTISITE_CENTRALISE_LDAP" value="NOM_MULTISITE"/>
```

With `NOM_MULTISITE` the name of the multi-site configuration in which the directory will be centralised as defined in MiVoice 5000 Manager.

Once the content of the key is defined, all the actions on the directory records (internal, external, alias), as well as on the directory customisation (hierarchy, gender, function) will be made on the centralising multi-site).

The same thing applies to ACLs (Access Control Lists), pictures and installation numbers within the framework of the numbering plan with SDN.

Subscriber management remains configured by multi-site in MiVoice 5000 Manager. It is only for directory update that there is a write operation in the centralised directory.

- For a configuration with external directory synchronisation:

In the connector configuration file `/home/m7450/synchAD/xxx.ini`, manually modify the input "site" by indicating the name of the multi-site on which the directory will be centralised:

#OpenLDAP database connection

```
[BASE_RECH_P0]
```

```
site=NOM_MULTISITE
```

With `NOM_MULTISITE` the name of the multi-site configuration in which the directory will be centralised as defined in MiVoice 5000 Manager.



WARNING : The file `xxx.ini` is created again during each saving operation on the external directory synchronisation connector configuration screen. Therefore, the input "site" will be overwritten if the "Save" button is pressed.

On Web Admin

On each site of the each multi-site configuration, define the centralising directory:

Telephony service>Subscribers> Directory>Parameters>Connections

- Type of server = external
- MiVoice 5000 Manager server IP address
- In the Base or URL field, point to the LDAP branch of the centralising directory.

5 APPENDICES

5.1 IMPORT FILE STRUCTURE

These files, which correspond to 3 types of directory records, must be time-stamped and their name must respect the following syntax:

- **people_date.csv** for internal records
- **contact_date.csv**, for external records
- **alias_date.csv**, for external records

Since the files are time-stamped **{people|contact|alias} date.csv**, if several files are available in the import directory, the latest file will be taken into account.

The files must have the following structure, depending on the type of record.

Records that do not have a configured "**cleExt**" are ignored.

The **operation** field is used to determine the LDAP action to take:

- Add = 0
- Modify = 1
- Deletion = 2

People record (internal record) and **Alias record** (Secondary record)

In red the attributes that must be synchronised in the .csv file. The other fields can remain blank in the file if they are not necessary, but they must all be available in the file structure.

The "**telephoneNumber**" field is only imported for profile-based management or for alias records.

operation
cleExt
displayName
displayGn
type
function
hierarchySV
telephoneNumber
didNumbers
localisationDesc
mail
assistant
attr1
attr2
attr3
attr4
attr5

attr6
attr7
attr8
attr9
attr10

Example of a file in .csv format:

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1	operation	cleExt	displayName	displayGn	type	function	hierarchySV	telephoneNumber	extensionNumber	localisationDesc	email	secretaire	attr1	attr2	attr3	attr4	attr5	attr6
2	1	JohnBerson	Berson	John	Monsieur	MKG1	LAND001	4200	130984200	paris								
3	0	PatLane	Lane	Pat	Monsieur	HM	LAND002	4201	130984201	paris								
4	0	DavisLein	Lein	Davis	Monsieur	MANAG	LAND003	4202	130984202	paris								
5	0	AliceAin	Ain	Alice	Madame	HM	LAND004	4203	130984203	paris								
6	0	ThomKann	Kann	Thom	Madame	MKG2	LAND005	4204	130984204	paris								
7	0	PeterMann	Mann	Peter	Madame	Export	LAND006	4205	130984205	paris								
8	2	EvaDety	Dety	Eva	Mademoiselle	TEL	LAND001	4206	130984206	paris	dety@corporat.com							

Contact record (external record)

In red the attributes that must be synchronised in the .csv file. The other fields can remain blank in the file if they are not necessary, but they must all be available in the file structure.

operation
cleExt
displayName
displayGn
type
phoneNumber
localisationDesc
private
mail
attr1
attr2
attr3
attr4
attr5
attr6
attr7
attr8
attr9
attr10

5.2 EXPORT FILE STRUCTURE

The syntax for these files is:

- **export_date.csv** (example "export_20100415140741")

Its structure comprises 4 fields:

operation
cleExt
telephoneNumber
didNumbers

The "operation" field is set to "modification" (value "1").

5.3 CURL DEPOSIT UTILITY

CURL transfer utility syntax, used to deposit import files

```
curl -k -X POST -F "file=@<import file>" https://<MiVoice 5000 Manager user
login>:<MiVoice 5000 Manager user
password>@<MiVoice 5000 Manager IP@>/M7450php/uploadfile.php -H "Content-Location:
syncDirectory_<multi site>
```

where:

<import file>: name of the export file (e.g.. people_20100212123456.csv)
 <MiVoice 5000 Manager user login>: login of a MiVoice 5000 Manager user (all profiles)
 <MiVoice 5000 Manager user password>: associated password
 <MiVoice 5000 Manager IP@>: MiVoice 5000 Manager server IP address
 <multi site>: name of the multi-site defined in MiVoice 5000 Manager

5.4 WGET DOWNLOAD UTILITY

Syntax of the WGET utility, used to download export files

```
wget -r -l1 -t 2 -nd -nc -P<local directory> -A.csv https://<MiVoice 5000 Manager user
login>:<MiVoice 5000 Manager user
password>@<MiVoice 5000 Manager IP@>/M7450export/External_Directory/<multisite>/ --no-
check-
certificate --no-parent
```

<local directory>: file recovery directory
 <MiVoice 5000 Manager user login>: login of a MiVoice 5000 Manager user
 <MiVoice 5000 Manager user password>: associated password
 <MiVoice 5000 Manager IP@>: MiVoice 5000 Manager server IP address
 <multi site>: name of the multi-site defined in MiVoice 5000 Manager

5.5 NOTIFICATION FOLLOW-UP

Telephony>Directory management>External directory synchronisation>Follow-up

For each type of notification (creation / modification / deletion), the MMI displays a follow-up status:

- New (0)
- Taken into account (1)
- Closed (2)

By default, the status of modification notifications is "Closed". However, it is possible to define another type of default status by modifying the following line in the file */home/m7450/portail/7450Portail.dll.config*:

```
<add key ="LDAP_SYNCHRO_MODIF_STATE" value="0"/>
```

By default, the notifications of creation are automatically set to the state "Closed" when a technical record is associated to a synchronised directory record (which is also immediate synchronization mode by profile).

However, it is possible-- to define another type of default status by modifying the following line in the file */home/m7450/portail/7450Portail.dll.config*:

```
<add key ="LDAP_SYNCHRO_AUTO_STATE" value="false"/>
```

By default, the status of deletion notifications is "New". However, it is possible to activate automatic deletion by modifying the following line in the file */home/m7450/portail/7450portail.exe.config*:

```
<add key ="LDAP_SYNCHRO_DELETE_AUTO" value="true"/>
```



CAUTION : The deletion is irreversible; any wrong operation in the external directory may result in an involuntary deletion of a telephone subscription.