



## One Identity Manager 9.0

# LDAP Connector for IBM i Reference Guide

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**Legend**

-  **WARNING: A WARNING icon highlights a potential risk of bodily injury or property damage, for which industry-standard safety precautions are advised. This icon is often associated with electrical hazards related to hardware.**
-  **CAUTION: A CAUTION icon indicates potential damage to hardware or loss of data if instructions are not followed.**

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# Initializing and configuring the LDAP connector for IBM i

This document describes how to initialize and configure the LDAP connector for IBM i into an existing One Identity Manager system. This enables the One Identity Manager system to access, read, and update data stored on an IBM i system.

## Detailed information about this topic

- [Prerequisites](#) on page 4
- [Platform support](#) on page 5
- [How to initialize and configure the LDAP connector for IBM i](#) on page 5
- [Domain filter setting](#) on page 7
- [System variables](#) on page 6
- [User mapping information](#) on page 8
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- [IBM i attributes](#) on page 19

## Prerequisites

- The IBM i computer must have IBM i Directory Services installed and configured.
- A service account must be created on your IBM i server that has the appropriate permissions to administer users and groups on this platform:
  - Security administrator (\*SECADM) special authority rights
  - Object management (\*OBJMGT) rights over the user profile accounts that are to be managed
  - Use (\*USE) rights over the user profile accounts that are to be managed
  - Service account set up as a projected user

**NOTE:** Before attempting to connect to the IBM i Directory Services LDAP server with the LDAP connector, first check that the LDAP server is running correctly. This can be tested with any LDAP browser, for example, the LDP.exe tool from Microsoft. For more information, see your *LDAP browser documentation*.

## Platform support

The LDAP connector for IBM i has been verified for synchronization against os-400 V7R1 or later.

## How to initialize and configure the LDAP connector for IBM i

**NOTE:** The following sequence describes how you configure a synchronization project if the Synchronization Editor is in expert mode.

### ***To set up initial synchronization project for IBM i***

1. Start the Synchronization Editor and log in.
2. From the start page, select **Start a new synchronization project**.  
This starts the Synchronization Editor project wizard.
3. On the **Choose target system** page, select **IBM i LDAP Connector**.
4. On the **System access** page, click **Next**.
5. On the **Create system connection** page, select **Create new system connection**.
6. On the system connection wizard start page, click **Next**.
7. On the **Network** page:
  - a. In the **Server** field, enter the DNS name or IP address of your mainframe server.
  - b. In the **Port** field, enter the port number.
  - c. Click **Test** to make sure the server is accessible.
  - d. IBM i Directory Services supports LDAP v3. Enter the number 3 in the **Protocol version**.
  - e. If SSL is to be used, select the **Use SSL** check box.
8. On the **Authentication** page:

- a. Set the **Authentication method** to **Basic**.
- b. In the **Credentials** section, enter the full DN and password of the administrator account on your IBM i system.
- c. Click **Test** to check that the credentials are valid.

The schema is loaded from the IBM i system.

9. Ignore the **Define virtual classes** page. Click **Next**.
10. On the **Search options** page:
  - a. In the **Base DN** drop-down list, select the correct base DN for your system. It should begin with **OS400-SYS=**.
  - b. Ignore the **Use paged search** check box.
11. Ignore the **Modification capabilities** page. Click **Next**.
12. Ignore the **Auxiliary class assignment** page. Click **Next**.
13. On the **System attributes** page, in the **Revision properties** section, clear the **createTimestamp** and **modifyTimestamp** entries by double-clicking them.
14. Ignore the **Select dynamic group attributes** page. Click **Next**.
15. Ignore the **Password settings** page. Click **Next**.
16. Click **Finish**.

This takes you back to the Synchronization Editor project wizard.
17. On the **One Identity Manager connection** page, enter the database connection data.

This loads the IBM i schema into your One Identity Manager. Wait for this to complete.
18. On the **Select project template** page, select **Create blank project**.
19. On the **General** page, enter a display name for your synchronization project and set a scripting language if required.
20. Click **Finish**.
21. Select **Activate project**.

## System variables

The following system variables need to be defined for the attribute mappings. For more detailed information about variables, see the *One Identity Manager Target System Synchronization Reference Guide*.

**Table 1: System variables**


<b>Name</b>	<b>Value</b>
IdentDomain	The name of your IBM i domain, for example, AS400_001
UserLocation	Parent DN of your IBM i user container, for example, CN=ACCOUNTS, OS400-SYS=AS4001.MYCOMPANY.COM
GroupLocation	Parent DN of your IBM i group container, for example, CN=ACCOUNTS, OS400-SYS=AS4001.MYCOMPANY.COM

## Related topics

- [Domain filter setting](#) on page 7
- [Property mapping rules](#) on page 10
- [Property mapping rules](#) on page 15

# Domain filter setting

A domain filter needs to be created to identify information that has been retrieved from the IBM i database to keep it separate from other imported data.

1. Update the One Identity Manager schema so that all entries are included.
  - a. In the Synchronization Editor, open your IBM i project.
  - b. Select **Configuration > One Identity Manager connection**.
  - c. In the **General** section, click **Update schema**.
  - d. Click **Yes** in the next two dialogs.
  - e. Click **OK** when completed.
2. In the Manager
  - a. Select **LDAP > Domains**.
  - b. In the result list toolbar, click .

- c. On the **General** tab, enter the following general master data.

**Table 2: Domain master data**

<b>Property</b>	<b>Description</b>
Display name	Display name, for example, AS400 Domain 001
Distinguished name	Distinguished name of the domain, for example, OS400-SYS=AS4001.MYCOMPANY.COM
Domain	Domain name, for example, AS400_001
Structural object class	Structural object class representing the object type; enter <b>DCOBJECT</b>

- d. Save the changes.
3. In the Synchronization Editor, open your IBM i project.
    - a. Select **Configuration > One Identity Manager connection**.
    - b. Select **Scope view** and click **Edit scope**.
    - c. Select the object type LDPDomain in the **Scope hierarchy** list and set the **Object filter** to Ident\_Domain = '\$IdentDomain\$'.
    - d. Save the changes.

For more detailed information about scopes, see the *One Identity Manager Target System Synchronization Reference Guide*.

## Related topics

- [System variables](#) on page 6

# User mapping information

This section shows a possible mapping between a user account in IBM i and the standard One Identity Manager database table called LDAPAccount. User and group information on the IBM i is stored in the same container, so a filter needs to be set up to tell these apart.



- When creating the user mapping, add a new schema class as follows.

**Table 3: Schema class settings**

Property	Value
Schema type	os400-usprf
Display name	user_os400_usrprf
Class name	user_os400_usrprf
Select objects: Condition	os400_gid='*NONE'
Select objects: Ignore case	Activated

- Map the LDAPAccount (a11) schema class to this new schema class, user\_os400\_usrprf, for this user mapping.

For more detailed information about setting up mappings, see the *One Identity Manager Target System Synchronization Reference Guide*.

### Detailed information about this topic

- [Mandatory IBM i user attributes](#) on page 9
- [Property mapping rules](#) on page 10
- [Object matching rules](#) on page 12
- [Sample user mapping](#) on page 13

## Mandatory IBM i user attributes

When creating a user in the IBM i database, the following LDAP attributes must be defined:

- objectclass
- os400-profile

### Related topics

- [Property mapping rules](#) on page 10
- [Object matching rules](#) on page 12

# Property mapping rules

- CanonicalName ← vrtEntryCanonicalName  
vrtEntryCanonicalName is a virtual property, set to the canonical name of the object in the connector.  
Sample value:  
AS4001.MYCOMPANY.COM/ACCOUNTS/USER1234
- cn ← → os400-profile  
On the IBM i system, os400-profile is the user ID.  
Sample value:  
USER1234
- DistinguishedName ← vrtEntryDN  
vrtEntryDN is a virtual property, set to the DN of the object in the connector. Once this mapping rule has been created, edit the mapping rule by clicking on it. Then select **Force mapping against direction of synchronization**.  
Sample value:  
os400-profile=USER1234,CN=ACCOUNTS,OS400-SYS=AS4001.MYCOMPANY.COM
- ObjectClass ← → objectClass  
The objectClass attribute (multi-valued) on the IBM i system. Enable **Ignore case sensitivity**.  
Sample value:  
TOP;OS400-USRPRF
- StructuralObjectClass ← vrtStructuralObjectClass  
vrtStructuralObjectClass on the IBM i system defines the single object class for the object type.  
Sample value:  
OS400-USRPRF
- UID\_LDPDomain ← vrtIdentDomain  
Create a fixed value property variable on the IBM i side called vrtIdentDomain that is set to the value \$IdentDomain\$. Map this to UID\_LDPDomain. This will cause a conflict, and the Property Mapping Rule Conflict Wizard opens automatically.

## **To resolve the conflict**

1. In the Property Mapping Rule Conflict Wizard, select the first option and click **OK**.
2. On the **Select an element** page, select **Ident\_Domain** and click **OK**.
3. Confirm the security prompt with **OK**.

4. On the **Edit property** page:
  - a. Clear **Save unresolvable keys**.
  - b. Select **Handle failure to resolve as error**.
5. To close the Property Mapping Rule Conflict Wizard, click **OK**.

Sample value:

AS400\_001

- vrtParentDN → vrtEntryParentDN

Create a fixed-value property variable on the One Identity Manager side called vrtParentDN equal to a fixed string with value \$UserLocation\$. Map this to vrtEntryParentDN on the IBM i side.

Sample value:

CN=ACCOUNTS,OS400-SYS=AS4001.MYCOMPANY.COM

- vrtRDN → vrtEntryRDN

Create a new variable on the One Identity Manager side of type **Format Defined Property** with the name vrtRDN. Set its value to os400-profile=%CN%. Then map this to vrtEntryRDN on the IBM i side.

Sample value:

os400-profile=USER1234

- userPassword → os400-password

Used to change a user's IBM i password. A condition needs to be set on this rule to map the password only when there is a value to be copied.

#### **To add a condition**

1. Create the mapping.
2. Edit the property mapping rule.
3. Expand the **Condition for execution** section at the bottom of the dialog.
4. Click **Add condition** and set the following condition (a blank password is indicated by using two apostrophe characters).

```
Left.UserPassword<>' '
```

- UID\_LDAPContainer ← vrtEmpty

This is a workaround needed to support group mappings. Create a new fixed-value variable on the IBM i side of type **String** with no value called vrtEmpty. Map this to UID\_LDAPContainer. This generates a property mapping rule conflict.

#### **To resolve the conflict**

- In the Property Mapping Rule Conflict Wizard, highlight **Select this option if you do not want to change anything** and click **OK**.


## Related topics

- [Mandatory IBM i user attributes](#) on page 9
- [System variables](#) on page 6
- [Object matching rules](#) on page 12
- [Sample user mapping](#) on page 13

# Object matching rules

- DistinguishedName (primary rule) vrtEntryDN  
vrtEntryDN is a virtual property, set to the DN of the object in the connector. This forms a unique ID to distinguish individual user objects on the IBM i system.

### ***To convert this mapping into an object matching rule***

1. Select the property mapping rule in the rule window.
2. Click  in the rule view toolbar.  
A message appears.
3. Click **Yes** to convert the property mapping rule into an object matching rule and save a copy of the property mapping rule.
4. Open the new object matching rule in the top window and clear the **Case sensitive** check box.

Sample value:


os400-profile=USER1234,CN=ACCOUNTS,OS400-SYS=AS4001.MYCOMPANY.COM









## Related topics

- [Mandatory IBM i user attributes](#) on page 9
- [Property mapping rules](#) on page 10
- [Sample user mapping](#) on page 13


# Sample user mapping






The following figure shows the user mapping in operation.


 Object matching rules

Schema property in One Identity Manager	Information	Schema property in the target system
DistinguishedName	Primary rule	vrtEntryDN

 Property mapping rules

Schema property in One Identity Manager	Information	Schema property in the target system
CanonicalName	←	vrtEntryCanonicalName
cn	←	→ os400-profile
DistinguishedName	←	vrtEntryDN
ObjectClass	←	→ objectClass
StructuralObjectClass	←	vrtStructuralObjectClass
UID_LDAPContainer	←	vrtEmpty
VRT_UID_LDAPDomain	←	vrtIdentDomain
UserPassword	← 	→ os400-password
vrtParentDN		→ vrtEntryParentDN
vrtRDN		→ vrtEntryRDN

## Group mapping information

This section shows a possible mapping between a group profile in IBM i and the standard One Identity Manager database table called LDAPGroup. User and group information on the IBM i is stored in the same container, so a filter needs to be set up to tell these apart.

- When creating the group mapping, add a new schema class as follows.

**Table 4: Schema class settings**

Property	Value
Schema type	os400-usprf
Display name	group_os400_usrprf
Class name	group_os400_usrprf
Select objects: Condition	os400_gid<>*NONE'
Select objects: Ignore case	Activated

- Map the LDAPGroup (all) schema class to this new schema class, group\_os400\_usrprf, for this group mapping.

For more detailed information about setting up mappings, see the *One Identity Manager Target System Synchronization Reference Guide*.

### Detailed information about this topic

- [Mandatory IBM i group attributes](#) on page 14
- [Property mapping rules](#) on page 15
- [Object matching rules](#) on page 17
- [Sample group mapping](#) on page 17

## Mandatory IBM i group attributes

When creating a group in the IBM i database, the following LDAP attributes must be defined:

- objectclass
- os400-profile
- os400-groupmember (this is not mandatory but if omitted, a user profile will be created instead)

### Related topics

- [Property mapping rules](#) on page 15
- [Object matching rules](#) on page 17

# Property mapping rules

- CanonicalName ← vrtEntryCanonicalName  
vrtEntryCanonicalName is a virtual property, set to the canonical name of the object in the connector.  
Sample value:  
AS4001.MYCOMPANY.COM/ACCOUNTS/GROUP123
- cn ← → os400-profile  
On the IBM i system, os400-profile is the group ID.  
Sample value:  
USERGRP
- DistinguishedName ← vrtEntryDN  
vrtEntryDN is a virtual property, set to the DN of the object in the connector.  
Sample value:  
os400-profile=GROUP123,CN=ACCOUNTS,OS400-SYS=AS4001.MYCOMPANY.COM
- ObjectClass ← → objectClass  
The objectClass attribute (multi-valued) on the IBM i system. Select the **Ignore case sensitivity** check box.  
Sample value:  
TOP;OS400-USRPRF
- StructuralObjectClass ← vrtStructuralObjectClass  
vrtStructuralObjectClass on the IBM i system defines the single object class for the object type.  
Sample value:  
OS400-USRPRF
- vrtParentDN → vrtEntryParentDN  
Create a fixed value property variable on the One Identity Manager side called vrtParentDN equal to a fixed string with the value \$GroupLocation\$. Map this to vrtEntryParentDN on the IBM i side.  
Sample value:  
CN=ACCOUNTS,OS400-SYS=AS4001.MYCOMPANY.COM
- vrtRDN → vrtEntryRDN  
Create a virtual attribute on the One Identity Manager side equal to the CN value. Then map this to vrtEntryRDN on the IBM i side.  
Sample value:  
os400-profile=GROUP123

- UID\_LDAPContainer ← vrtEmpty

This is a workaround needed to support group mappings. Create a new fixed value variable on the IBM i side of type **String** with no value called vrtEmpty. Map this to UID\_LDAPContainer. This generates a property mapping rule conflict.

**To resolve the conflict**

- In the Property Mapping Rule Conflict Wizard, highlight **Select this option if you do not want to change anything** and click **OK**.

- vrtMember ← → os400-groupmember

Synchronizing this attribute on the IBM i will manage the group memberships for the user.

1. Create a new virtual entry on the One Identity Manager side of type **Members of M:N schema types** with the name vrtMember. Select the **Ignore case** and **Enable relative component handling** check boxes.
2. Add an entry for LDAPAccountInLDAPGroup(all). Set the left box to UID\_LDAPGroup and the right box to UID\_LDAPAccount. Set the **Primary Key Property** to DistinguishedName.
3. Create a new mapping rule of type **Multi-reference mapping rule**. Set the rule name to **Member** and the mapping direction to **Both directions**. Set the One Identity Manager schema property to vrtMember and the IBM i schema property to os400-groupmember.

- UID\_LDPDomain ← vrtIdentDomain

Create a fixed-value property variable on the IBM i side called vrtIdentDomain that is set to the value \$IdentDomain\$. Map this to UID\_LDPDomain. This will cause a conflict and the Property Mapping Rule Conflict Wizard opens automatically.

**To resolve the conflict**

1. In the Property Mapping Rule Conflict Wizard, select the first option and click **OK**.
2. On the **Select an element** page, select **Ident\_Domain** and click **OK**.
3. Confirm the security prompt with **OK**.
4. On the **Edit property** page:
  - a. Clear **Save unresolvable keys**.
  - b. Select **Handle failure to resolve as error**.
5. To close the Property Mapping Rule Conflict Wizard, click **OK**.

Sample value:

AS400\_001

**Related topics**

- [Mandatory IBM i group attributes](#) on page 14
- [System variables](#) on page 6




- [Object matching rules](#) on page 17
- [Sample group mapping](#) on page 17

## Object matching rules

- DistinguishedName (primary rule) vrtEntryDN  
vrtEntryDN is a virtual property, set to the DN of the object in the connector. This forms a unique ID to distinguish individual user objects on the IBM i system.

### **To convert this mapping into an object matching rule**

1. Select the property mapping rule in the rule window.
2. Click  in the rule view toolbar.  
A message appears.
3. Click **Yes** to convert the property mapping rule into an object matching rule and save a copy of the property mapping rule.

Sample value:

os400-profile=GROUP123,CN=ACCOUNTS,OS400-SYS=AS4001.MYCOMPANY.COM

### Related topics

- [Mandatory IBM i group attributes](#) on page 14
- [Property mapping rules](#) on page 15
- [Sample group mapping](#) on page 17

## Sample group mapping

The following figure shows the group mapping in operation.

### Object matching rules



Schema property in One Identity Manager	Information	Schema property in the target system
DistinguishedName	Primary rule	vrtEntryDN

### Property mapping rules



Schema property in One Identity Manager	Information	Schema property in the target system
CanonicalName	←	vrtEntryCanonicalName
cn	←	→ os400-profile
DistinguishedName	←	vrtEntryDN
vrtMember	←	→ os400-groupmember
ObjectClass	←	→ objectClass
StructuralObjectClass	←	vrtStructuralObjectClass
UID_LDAPContainer	←	vrtEmpty
VRT_UID_LDAPDomain	←	vrtIdentDomain
vrtParentDN		→ vrtEntryParentDN
vrtRDN		→ vrtEntryRDN

## IBM i attributes

The following table lists the IBM i attributes that are made available to One Identity Manager by the LDAP connector for IBM i. User and group objects in the IBM i Directory Server are treated at the same level.

**Table 5: List of IBM i attributes**

<b>Attribute name</b>
os400-acgcde
os400-astlvl
os400-atnpgm
os400-audlvl
os400-ccsid
os400-chridctl
os400-cntryid
os400-curlib
os400-dlvry
os400-docpwd
os400-dspsgninf
os400-eimassoc
os400-gid
os400-groupmember
os400-grpaut
os400-grpauttyp
os400-grpprf
os400-homedir

**Attribute name**

---

os400-laspStorageInformation

---

os400-inlmnu

---

os400-inlpgm

---

os400-invalidSignonCount

---

os400-jobd

---

os400-kbdbuf

---

os400-langid

---

os400-lclpwdmgt

---

os400-lmtdevssn

---

os400-locale

---

os400-maxstg

---

os400-msgq

---

os400-objaud

---

os400-outq

---

os400-owner

---

os400-password

---

os400-passwordExpirationDate

---

os400-passwordLastChanged

---

os400-previousSignon

---

os400-profile

---

os400-prtdev

---

os400-ptylmt

---

os400-pwdexp

---

os400-pwdexpitv

---

os400-setobatr

---

os400-sev

---

os400-spcaut

---

os400-spcenv

---

os400-status

**Attribute name**

---

os400-storageUsed

---

os400-storageUsedOnlasp

---

os400-supgrpprf

---

os400-text

---

os400-uid

---

os400-usrcls

---

os400-usropt

One Identity solutions eliminate the complexities and time-consuming processes often required to govern identities, manage privileged accounts and control access. Our solutions enhance business agility while addressing your IAM challenges with on-premises, cloud and hybrid environments.

## Contacting us

For sales and other inquiries, such as licensing, support, and renewals, visit <https://www.oneidentity.com/company/contact-us.aspx>.

## Technical support resources

Technical support is available to One Identity customers with a valid maintenance contract and customers who have trial versions. You can access the Support Portal at <https://support.oneidentity.com/>.

The Support Portal provides self-help tools you can use to solve problems quickly and independently, 24 hours a day, 365 days a year. The Support Portal enables you to:

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- Chat with support engineers online
- View services to assist you with your product