



Quest® On Demand Migration

Active Directory GAL Sync Set Up Quick Start Guide



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Legend

 **CAUTION: A CAUTION icon indicates potential damage to hardware or loss of data if instructions are not followed.**

 **IMPORTANT, NOTE, TIP, MOBILE, or VIDEO:** An information icon indicates supporting information.

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Introduction

This guide describes the steps to set up 2-way Global Address List (GAL) Synchronization between your Microsoft 365 Tenants, regardless of the tenant configuration, hybrid or cloud only.

Directory Sync supports Microsoft directories both on-premises and in the cloud. When setting up Global Address List (GAL) Synchronization there can be many different needs depending on where your Exchange Mailboxes reside and the project scope. These factors will determine the synchronization method for GAL sync. Below are two of the most common setups:

Cloud to Cloud

In most Microsoft O365 tenant setups, user mailboxes are exclusively hosted on Exchange Online, even when the user identities originate from On-Premises. In those cases, there is little need to set up local directory sync unless driven by other coexistence or migration needs, such as SID history or Password Sync. Cloud to Cloud is also the recommended configuration if you use Microsoft Entra ID to manage your user identities.

Local to Local

When you have a Microsoft O365 Hybrid tenant setup and have requirements to leverage On-Premises Active Directory to manage the user identities or have the need for SID History migration and Password Sync, then it is recommended to configure your GAL Synchronization with Local to Local setup.

To set up Directory Sync for GAL sync, 4 configurations must be completed prior to the first synchronization.

1. Set up Environments
2. Set up Local Agents
3. Set up Templates
4. Set up Workflows

The next section will provide the list of requirements needed to set up GAL Sync for Microsoft 365 Hybrid Tenants.

Requirements

The following are a list of minimum requirements to get set up using Directory Sync with your Microsoft Entra ID. If you are only deploying Directory Sync between Cloud only directories, then skip the next section of requirements.

- One Global Administrator Account for each Microsoft 365 Tenant.

The following are a list of minimum requirements to get set up using Directory Sync with your Microsoft On-Premises Active Directory. If you are deploying Directory Sync between local directories for a hybrid deployment of Microsoft 365 then these additional items are required.

- One Local Administrator Account for each Microsoft Forest and/or Domain that has permissions to create, update or delete depending on the scope of your Directory Sync workflows.
- One Windows Server to install and host the Directory Sync Agent.

For more detailed information about agent installation and set-up requirements visit the [On Demand Migration Active Directory User Guide](#).

The next section will provide a step-by-step guide on how to set up GAL Sync for Microsoft 365 Hybrid Tenants.

Setup

This section provides a step-by-step guide on how to set up GAL Sync for Microsoft 365 Hybrid Tenants.

Setup Environments

To begin at least two hybrid tenants must be configured in Directory Sync. Each hybrid tenant will consist a cloud environment and a local Active Directory environment. At the end of this section there will be two hybrid tenants with four local and cloud environments fully configured.

An environment is an end-point connection that can control the scope of objects read. This guide will walk through how to create the source and target hybrid environments.

To create a cloud environment, an Office 365 Global Administrator is required during set up for each tenant. During the initial set up, Directory Sync will create a new unlicensed user account within each tenant. This account is used to orchestrate some of the PowerShell automation related to directory synchronization services. This account will be created with the Exchange, User and Team Administrator Roles to facilitate its designated jobs.

The Global Administrator account used to set up the environments, is required for directory synchronization services, as it is used to facilitate Graph API related automation activities. The account role can be safely lowered to User, Team and Exchange Administrator once the previously mentioned PowerShell account is created.

To create a local AD environment for the hybrid tenant, the following are required

- One Local Administrator Account for each Microsoft Forest and/or Domain that has permissions to create, update or delete depending on the scope of your Directory Sync workflows.
- One Windows Server to install and host the Directory Sync Agent.

How to create a cloud environment

Follow these steps to setup the cloud environment endpoints.

1. Navigate to **Environments** .
1. Click **New**.
2. Click Cloud as the environment type. Click **Next**.
3. Name the environment. Click **Next**.
4. The Global Administrator credentials should be in-hand and ready.
5. Click **Connect**.
6. Login to Microsoft 365.
7. Accept the requested Application Permissions.

8. Select any discovery group(s) that will be used to determine which objects are part of the environment.
9. Do not place a check in the “INCLUDE OBJECTS SYNCHRONIZED WITH A LOCAL ACTIVE DIRECTORY VIA MICROSOFT ENTRA CONNECT” option as this is a cloud environment with hybrid objects that originate in an On-Premises Active Directory. For hybrid objects, we will be utilizing Local to Local setup to perform the GAL Sync.
10. Click **Next**, then **Finish**.
11. Repeat steps 2 – 11 for the next cloud environment.

How to create a local environment for the hybrid tenant

Follow these steps to setup the cloud environment endpoints.

1. Navigate to **Environments**.
2. Click **New**.
3. Click **Local** as the environment type. Click **Next**.
4. Name the environment. Click **Next**.
5. Name the local agent. Click **Next**.
6. Note the agent registration URL and registration Key for later use, click **Finish**.
7. Install the agent in the Windows Server that is joined to the local AD domain. Refer to the On Demand Migration Active Directory User Guide for detailed information about agent installation and set-up requirements.
8. When the agent is installed and the environment is discovered, click **Setting** to access the local AD environment setting page.
9. Under General Tab, select the Microsoft 365 tenant from the tenant drop down list under ‘Which cloud environment should this environment associated with?’
10. Click the Organization Unit tab and define the OU filter based on your project scope.
11. Click the Filters tab and define any LDAP filter based on your project scope.
12. Click **Save**.
13. Repeat steps 2 – 12 for the next local environment

Setup Templates

Before we can build our workflow, it is best to set up your template(s). Templates contain common mappings and settings used to sync Users, Contacts, Devices, Groups, Office 365 Groups and Microsoft Teams. A template can then be applied to any workflow with a Stage Data step.

For the purpose of this guide, the following templates will need to be created GAL objects. Additional templates may be created for group membership synchronization.

- Cloud to Cloud GAL Sync Source to Target
- Cloud to Cloud GAL Sync Target to Source

- Local to Local GAL Sync

How to create a Cloud to Cloud Source to Target template

1. Navigate to **Templates**.
2. Click **New**.
3. Enter a Name and Description for the template.
4. In our example, we will name the template "Cloud to Cloud GAL Sync Source to Target". Click **Next**.
5. Click **Cloud** as the source environment type. Click **Next**.
6. Click **Cloud** as the target environment type. Click **Next**.
7. Set CREATE NEW USERS AS = AS-IS
8. Set UPDATE CREATED USERS= ENABLE
9. Set UPDATE MATCHED USERS= DISABLE
10. Click **Next**.
11. Set CREATE GROUPS AS = SKIP
12. Set UPDATE CREATED GROUPS = DISABLE
13. Set UPDATE MATCHED GROUPS = ENABLE
14. Click **Next**.
15. Set CREATE OFFICE365 GROUPS AND TEAMS AS = SKIP
16. Set UPDATE CREATED CONTACTS = DISABLE
17. Set UPDATE MATCHED CONTACTS = DISABLE
18. Click **Next**.
19. Set CREATE NEW CONTACTS AS = DO NOT CREATE
20. Set UPDATE CREATED CONTACTS = DISABLE
21. Set UPDATE MATCHED CONTACTS = DISABLE
22. Click **Next**.
23. Enter a default password. Click **Next**.
24. Under mappings, we need to make several modifications to the default template in order to make the MEU to be compatible with Tenant to Tenant.
 - Select mapping for 'EmailAddresses' and double click, enter the below expression under value field.

```
GetProxyAddresses(null, null, prefix(Result("WindowsEmailAddress"), "SMTP:"), prefix(LegacyExchangeDN, "x500:"))
```
 - Select **User** as the Target Object Type.
 - Select mapping for 'CustomAttribute1' and double click, enter the below expression under value field.

"s.WindowsEmailAddress"

- Select **All** as the Target Object Type
25. Leave rest of the mappings as default.
 26. Click **Next**.
 27. Click **Finish**.

How to create a Cloud to Cloud Target to Source template

1. Navigate to **Templates**.
1. Click **New**.
2. Enter the Name and Description of the template.
3. In our example, we will name our template "Cloud to Cloud GAL Sync Target to Source". Click **Next**.
4. Click Cloud as the source environment type. Click **Next**.
5. Click Cloud as the target environment type. Click **Next**.
6. Set CREATE NEW USERS AS = CONTACT
7. Set UPDATE CREATED USERS= ENABLE
8. Set UPDATE MATCHED USERS= DISABLE
9. Click **Next**.
10. Set CREATE GROUPS AS = SKIP
11. Set UPDATE CREATED GROUPS = DISABLE
12. Set UPDATE MATCHED GROUPS = ENABLE
13. Click **Next**.
14. Set CREATE OFFICE365 GROUPS AND TEAMS AS = SKIP
15. Set UPDATE CREATED CONTACTS = DISABLE
16. Set UPDATE MATCHED CONTACTS = DISABLE
17. Click **Next**.
18. Set CREATE NEW CONTACTS AS = DO NOT CREATE
19. Set UPDATE CREATED CONTACTS = DISABLE
20. Set UPDATE MATCHED CONTACTS = DISABLE
21. Click **Next**.
22. Enter a default password. Click **Next**.
23. Under mappings, we need to make several modifications to the default template in order to make the MailContact to be compatible with Tenant to Tenant.

- Select mapping for 'EmailAddresses' and double click, enter the below expression under value field.

```
GetProxyAddresses(null, null, prefix(Result("WindowsEmailAddress"),
"SMTP:"), prefix(LegacyExchangeDN, "x500:"))
```

- Select **Contact** as the Target Object Type
- Select mapping for 'CustomAttribute1' and double click, enter the below expression under value field.

```
"s.WindowsEmailAddress"
```

- Select **All** as the Target Object Type

24. Leave rest of the mappings as default.

25. Click **Next**.

26. Click **Finish**.

How to create a Local to Local template

1. Navigate to **Templates**.
1. Click **New**.
1. Enter the Name and Description the template.
2. In our example, we will name our template "Local to Local GAL Sync". Click **Next**.
3. Click Local as the source environment type. Click **Next**.
4. Click Local as the target environment type. Click **Next**.
5. Set CREATE NEW USERS AS = CONTACT
6. Set UPDATE CREATED USERS= ENABLE
7. Set UPDATE MATCHED USERS= DISABLE
8. Set IF TARGET ADDRESS EXISTS setting as OVERWRITE ONCE.
9. Click **Next**.
10. Set CREATE GROUPS AS = SKIP
11. Set UPDATE CREATED GROUPS = DISABLE
12. Set UPDATE MATCHED GROUPS = DISABLE
13. Click **Next**.
14. Set CREATE NEW CONTACTS AS = DO NOT CREATE
15. Set UPDATE CREATED CONTACTS = DISABLE
16. Set UPDATE MATCHED CONTACTS = DISABLE
17. Click **Next**.
18. Set CREATE NEW DEVICES AS = SKIP
19. Set UPDATE CREATED CONTACTS = DISABLE
20. Set UPDATE MATCHED CONTACTS = DISABLE
21. Click **Next**.

22. Enter a default password. Click **Next**.
23. Leave SYNCHRONIZE SID HISTORY unchecked. Click **Next**.
24. Under mappings, we need to make several modifications to the default template in order to make the MailContact to be compatible with Tenant to Tenant.
 - Select mapping for 'ExtensionAttribute1' and double click, enter the below expression under value field.
`"s.mail"`
 - Select **Contact** as the Target Object Type
 - Select mapping for 'DistinguishName' and double click, enter the below expression under value field.
`GetDn(NewGuid())`
 - Select mapping for 'targetAddress' and double click, enter the below expression under value field.
`prefix(S.mail, "SMTP:")`
 - Select mapping for 'msExchRecipientDisplayType' and double click, enter the below expression under value field.
`"6"`
 - Select mapping for 'msExchRecipientTypeDetails' and double click, enter the below expression under value field.
`"64"`
25. Leave rest of the mappings as default or update them based on your project needs.
26. Click **Next**.
27. Click **Finish**.

Setup Workflow

Follow these steps to create one (1) new workflow for reading, matching, staging and writing data.

How to create a one-way sync workflow for Cloud to Cloud

1. Navigate to **Workflows**.
2. Click **New**.
3. Enter the Name and Description for the template. Click **Next**.
4. Select the all four environments (Cloud and Local environments per each hybrid tenant) created previously. Click **Next**.
5. Select ONE-WAY SYNC. Click **Next**.
6. The workflow task wizard opens. It is a pre-configured set of workflow steps to facilitate the flow of objects and attributes between your directories.

Workflow

ONE-WAY SYNC

SETUP > WORKFLOW > TASKS

Workflow

ONE-WAY SYNC

WORKFLOW STEPS

Drag a task from the list below to add it to your workflow.

READ FROM

Select all environments which you will need to match or compare objects to determine the changes required.

DELETE OBJECTS

Configure your deletion rules.

MATCH OBJECTS

Match objects between two environments based on a set of matching rules.

STAGE DATA

Select options and criteria for data selection.

RUN POWERSHELL SCRIPTS

Execute custom PowerShell scripts from an agent to customize the configured workflow.

WRITE TO

Choose destination environments for new objects, updates, and deletions.

WORKFLOW

Reorder the sequence of your tasks by dragging them up or down. Edit or remove a task by selecting the task.

1. READ FROM ✕

Select all environments which you will need to match or compare objects to determine the changes required.

Select

2. MATCH OBJECTS ✕

Match objects between two environments based on a set of matching rules.

Select

3. STAGE DATA ✕

Select options and criteria for data selection.

Select

4. WRITE TO ✕

Choose destination environments for new objects, updates, and deletions.

Select

← BACK
NEXT →

Step 1: READ FROM

- a. Click **Select**.
- b. Select all four environments created previously.
- c. Click **OK**.

Step 2: MATCH OBJECTS: SOURCE CLOUD TO TARGET CLOUD

- In this step you decide on how to match existing objects across your hybrid tenant directories
- Matching is conducted by pairing sets of attributes to find corresponding objects
- The environments may already have some attributes that can be used to find similar objects between the different directories, or you may need to set some to ensure accurate matching
- For the purpose of GAL Sync, it is most important that email addresses do not conflict before attempting to create new objects in either environment

- a. Click **Select**.

- b. Select your source cloud environment from the drop-down menu.
- c. Select your target cloud environment from the drop-down menu.
- d. Choose your first attribute pairings. For example, we will use WindowsEmailAddress for our first match criteria.
- e. Choose the WindowsEmailAddress attribute for the source and target fields.
- f. To add more attribute pairs, click **Add Attribute**.
- g. Additional pairings are evaluated as “OR” conditions. After the first match is found, the additional pairings are not assessed.
- h. Let's add three additional attribute pairings to our criteria
 - a. UserPrincipalName – UPN was added to ensure uniqueness of the local part of the address string. If creating new mail-enabled users in a destination directory it will be important to define any UPN conflicts that may exist
 - b. ExternalEmailAddress – This attribute was added to ensure no existing MEUs or Mail Contacts have existing objects with the same external or target address
 - c. WindowsEmailAddress to CustomAttribute1 – This matching pair is needed to create matching records for new objects created by Directory Sync.
- i. **Match Across all object types** - select this option to ensure the workflow is evaluating conflicts regardless of the object type because in two-way GAL sync there may be instances where this condition is true, and we want to ensure you have identified these matches before deciding to create new objects or keep the matche.
- j. There is no need in this guide to add another pair, so click **OK** to close this configuration.

Step 3: MATCH OBJECTS: TARGET CLOUD TO SOURCE CLOUD

- a. Drag another **Match Objects** workflow task from the left panel to the right under the Match Object task mentioned above. Click **Select**.

3. Match Objects

Configure your matching criteria by selecting up to five attributes below. ⓘ

▲ LAB2 CLOUD ↔ LAB1 CLOUD
▼

<p>SOURCE ENVIRONMENT Lab2 Cloud</p> <p>SOURCE ATTRIBUTES</p> <p>WindowsEmailAddress</p> <p>UserPrincipalName</p> <p>ExternalEmailAddress</p> <p>WindowsEmailAddress</p> <p style="text-align: center; background-color: #e67e22; color: white; padding: 2px;">ADD ATTRIBUTE</p> <p><input checked="" type="checkbox"/> MATCH ACROSS ALL OBJECT TYPES <small>Objects are matched even if they are of different object types such as users and contacts.</small></p> <p style="text-align: center; background-color: #e67e22; color: white; padding: 2px;">ADD ANOTHER PAIR</p>	<p>TARGET ENVIRONMENT Lab1 Cloud</p> <p>TARGET ATTRIBUTES</p> <p>WindowsEmailAddress X</p> <p>UserPrincipalName X</p> <p>ExternalEmailAddress X</p> <p>CustomAttribute1 X</p>
---	---

OK
CANCEL

- b. Select your target cloud environment from the drop-down menu on the left as target will now become the source in a bi-directional setup.
- c. Select your source cloud environment from the drop-down menu on the right as source will now become the target in a bi-directional setup.
- d. Choose your first attribute pairings. For example, we will use **WindowsEmailAddress** for our first match criteria.
- e. Choose the **WindowsEmailAddress** attribute for the source and target fields.
- f. To add more attribute pairs, click **Add Attribute**.
- g. Additional pairings are evaluated as “OR” conditions. After the first match is found, the additional pairings are not assessed.
- h. Let's add three additional attribute pairings to our criteria
 - a. UserPrincipalName – UPN was added to ensure uniqueness of the local part of the address string. If creating new mail-enabled users in a destination directory it will be important to define any UPN conflicts that may exist
 - b. ExternalEmailAddress – This attribute was added to ensure no existing MEUs or Mail Contacts have existing objects with the same external or target address
 - c. WindowsEmailAddress to CustomAttribute1 – This matching pair is needed to create matching records for new objects created by Directory Sync.
- i. **Match Across all object types** - select this option to ensure the workflow is evaluating conflicts regardless of the object type because in two-way GAL sync there may be instances where this condition is true, and we want to ensure you have identified these matches before deciding to create new objects or keep the matches.
- j. There is no need in this guide to add another pair, so click **OK** to close this configuration.

Step 4: MATCH OBJECTS: SOURCE LOCAL TO TARGET LOCAL

- a. Drag another **Match Objects** workflow task from the left panel to the right under the Match Object task mentioned above. Click **Select**.

4. Match Objects

Configure your matching criteria by selecting up to five attributes below. ⓘ

LAB1-AD → LAB2-AD

SOURCE ENVIRONMENT: Lab1-AD

TARGET ENVIRONMENT: Lab2-AD

SOURCE ATTRIBUTES: mail, mail, mail

TARGET ATTRIBUTES: mail, targetAddress, extensionAttribute1

ADD ATTRIBUTE

MATCH ACROSS ALL OBJECT TYPES
Objects are matched even if they are of different object types such as users and contacts.

ADD ANOTHER PAIR

OK CANCEL

- Select your source local environment from the drop-down menu on the left.
- Select your target local environment from the drop-down menu on the right.
- Choose your first attribute pairings, we will use **mail** for our first match criteria
- Choose the **mail** attribute for the source and target fields
- To add more attribute pairs, click the Add Attribute button
- Additional pairings are evaluated as “OR” conditions. After the first match is found, the additional pairings are not assessed.
- In our case we are adding two additional attribute pairings to our criteria
 - mail to targetAddress – This matching pair created to ensure the system can match onto existing mail contacts in the target with targetAddress pointed to the source mail attribute.
 - mail to extensionattribute1 – This matching pair is needed to create matching records for new objects created by Directory Sync.
- Match Across all object types** - select this option to ensure the workflow is evaluating conflicts regardless of the object type because in two-way GAL sync there may be instances where this condition is true, and we want to ensure you have identified these matches before deciding to create new objects or keep the matches.
- There is no need in this guide to add another pair, so click **OK** to close this configuration.

Step 5: MATCH OBJECTS: TARGET LOCAL TO SOURCE LOCAL

- Drag another **Match Objects** workflow task from the left panel to the right under the Match Object task mentioned above. Click **Select**.

5. Match Objects

Configure your matching criteria by selecting up to five attributes below. ⓘ

LAB2-AD → LAB1-AD
✕

<p>SOURCE ENVIRONMENT</p> <p>Lab2-AD</p> <p>SOURCE ATTRIBUTES</p> <div style="margin-bottom: 5px;">mail</div> <div style="margin-bottom: 5px;">mail</div> <div style="margin-bottom: 5px;">mail</div> <p style="text-align: center; background-color: #e67e22; color: white; padding: 2px 5px; border: 1px solid #ccc;">ADD ATTRIBUTE</p> <p><input checked="" type="checkbox"/> MATCH ACROSS ALL OBJECT TYPES <small>Objects are matched even if they are of different object types such as users and contacts.</small></p> <p style="text-align: center; background-color: #e67e22; color: white; padding: 2px 5px; border: 1px solid #ccc;">ADD ANOTHER PAIR</p>	→	<p>TARGET ENVIRONMENT</p> <p>Lab1-AD</p> <p>TARGET ATTRIBUTES</p> <div style="margin-bottom: 5px;">mail ✕</div> <div style="margin-bottom: 5px;">targetAddress ✕</div> <div style="margin-bottom: 5px;">extensionAttribute1 ✕</div>
--	---	---

OK
CANCEL

- b. Select your target local environment from the drop-down menu on the left as target will now become the source in a bi-directional setup.
- c. Select your source local environment from the drop-down menu on the right as source will now become the target in a bi-directional setup.
- d. Choose your first attribute pairings, we will use **mail** for our first match criteria
- e. Choose the **mail** attribute for the source and target fields
- f. To add more attribute pairs, click the Add Attribute button
- g. Additional pairings are evaluated as “OR” conditions. After the first match is found, the additional pairings are not assessed.
- h. In our case we are adding two additional attribute pairings to our criteria
 - mail to targetAddress – This matching pair created to ensure the system can match onto existing mail contacts in the target with targetAddress pointed to the source mail attribute.
 - mail to extensionattribute1 – This matching pair is needed to create matching records for new objects created by Directory Sync.
- i. **Match Across all object types** - select this option to ensure the workflow is evaluating conflicts regardless of the object type because in two-way GAL sync there may be instances where this condition is true, and we want to ensure you have identified these matches before deciding to create new objects or keep the matches.
- j. There is no need in this guide to add another pair, so click **OK** to close this configuration.

Step 6: STAGE DATA: SOURCE CLOUD TO TARGET CLOUD

- a. Click **Select** to configure the first STAGE DATA workflow task for your Source Cloud to Target Cloud synchronization rule.
- b. Select the “Cloud to Cloud GAL Sync Source to Target” template. Click **Next**.
- c. Select the source cloud environment as your source. Click **Next**.
- d. Select the target cloud environment as your target. Click **Next**.
- e. Select the default target domain name. Click **Next**.

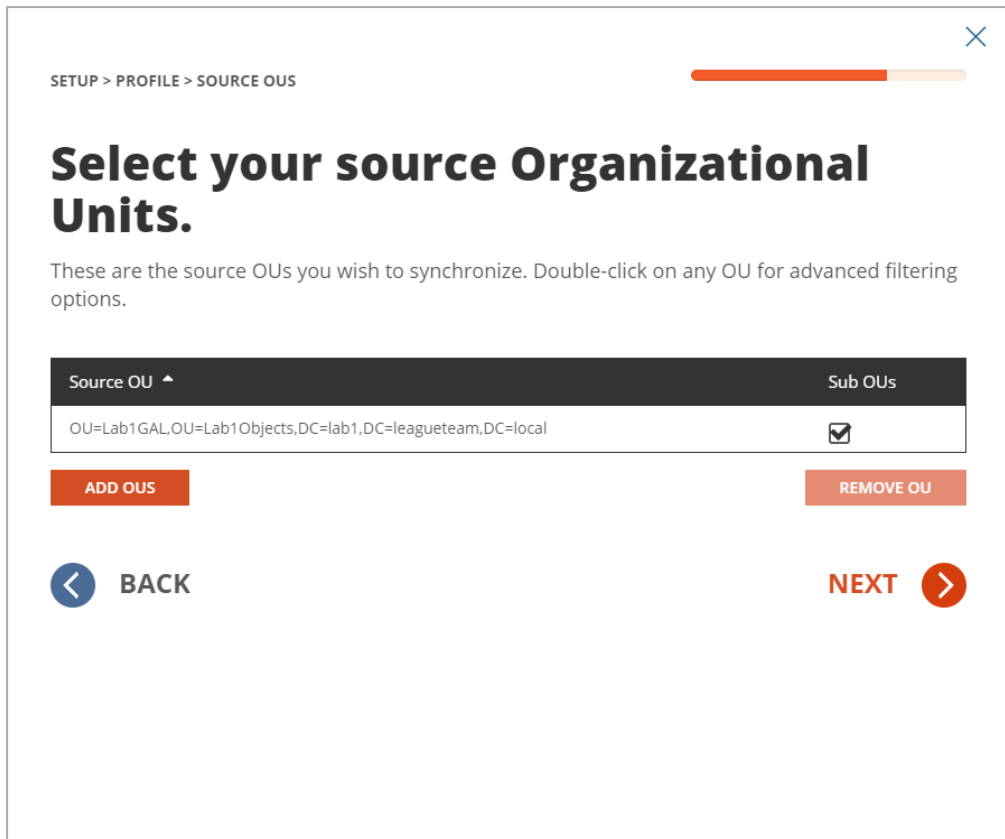
- f. Configure any Stage Data filter you like, it is highly recommended to setup filter to limit the scope to perform a test on the first sync as part of the validation. Click **Next**.
- g. Click **Finish**.

Step 7: STAGE DATA: TARGET CLOUD TO SOURCE CLOUD

- a. Drag another **Stage Data** workflow task from the left panel to the right under the PREVIOUS Stage Data task. Click **Select** to configure the second STAGE DATA workflow task for your target Cloud to source Cloud synchronization rule.
- b. Select the “Cloud to Cloud GAL Sync Source to Target” template. Click **Next**.
- c. Select the source cloud environment. Click **Next**.
- d. Select the target cloud environment. Click **Next**.
- e. Select the default target domain name. Click **Next**.
- f. Configure any Stage Data filter you like, it is highly recommended to setup filter to limit the scope to perform a test on the first sync as part of the validation. Click **Next**.
- g. Click **Finish**.

Step 8: STAGE DATA: SOURCE LOCAL TO TARGET LOCAL

- a. Drag another **Stage Data** workflow task from the left panel to the right under the Stage Data task mentioned above. Click **Select** to configure the third STAGE DATA workflow task for your source local to target local synchronization rule.
- b. Select the “Local to Local GAL Sync” template. Click **Next**.
- c. Select the source local environment. Click **Next**.
- d. Select the target local environment. Click **Next**.
- e. Select the default target domain name. Click **Next**.
- f. Click **ADD OUS** in the Select the source Organizational Units step. In the OU pop-up window, select the OU that will be in-scope, check the **INCLUDE ALL SUB OUS** checkbox. Click **OK** to close the pop-up.



- g. Configure any Stage Data filter you like by double click on the OU in the OUs list, it is highly recommended to setup filter to limit the scope to perform a test on the first sync as part of the validation. Click **Next**.
- h. Select the default OU for newly created objects for Users, Groups, Contacts, and Devices. In our case, we can select the same OU for all object types as we are only syncing user as contact.

SETUP > PROFILE > TARGET OU
✕

Select your default OU for newly created objects.

This is the Organizational Unit where you plan to store any newly created objects. ⓘ

<p>USERS This option determines in which OU new users are created.</p>	<p>OU=Contacts,OU=FromLab1,OU=Lab2Objects,DC=Lab2,DC=L...</p> <p style="text-align: center;">SELECT OU</p>
<p>GROUPS This option determines in which OU new groups are created.</p>	<p>OU=Contacts,OU=FromLab1,OU=Lab2Objects,DC=Lab2,DC=L...</p> <p style="text-align: center;">SELECT OU</p>
<p>CONTACTS This option determines in which OU new contacts are created.</p>	<p>OU=Contacts,OU=FromLab1,OU=Lab2Objects,DC=Lab2,DC=L...</p> <p style="text-align: center;">SELECT OU</p>
<p>DEVICES This option determines in which OU new devices are created.</p>	<p>OU=Contacts,OU=FromLab1,OU=Lab2Objects,DC=Lab2,DC=L...</p> <p style="text-align: center;">SELECT OU</p>

SYNC OPTIONS
Choose to either use the default OU or replicate the OU hierarchy when creating new objects.

SYNC ALL OBJECTS TO A DEFAULT CONTAINER

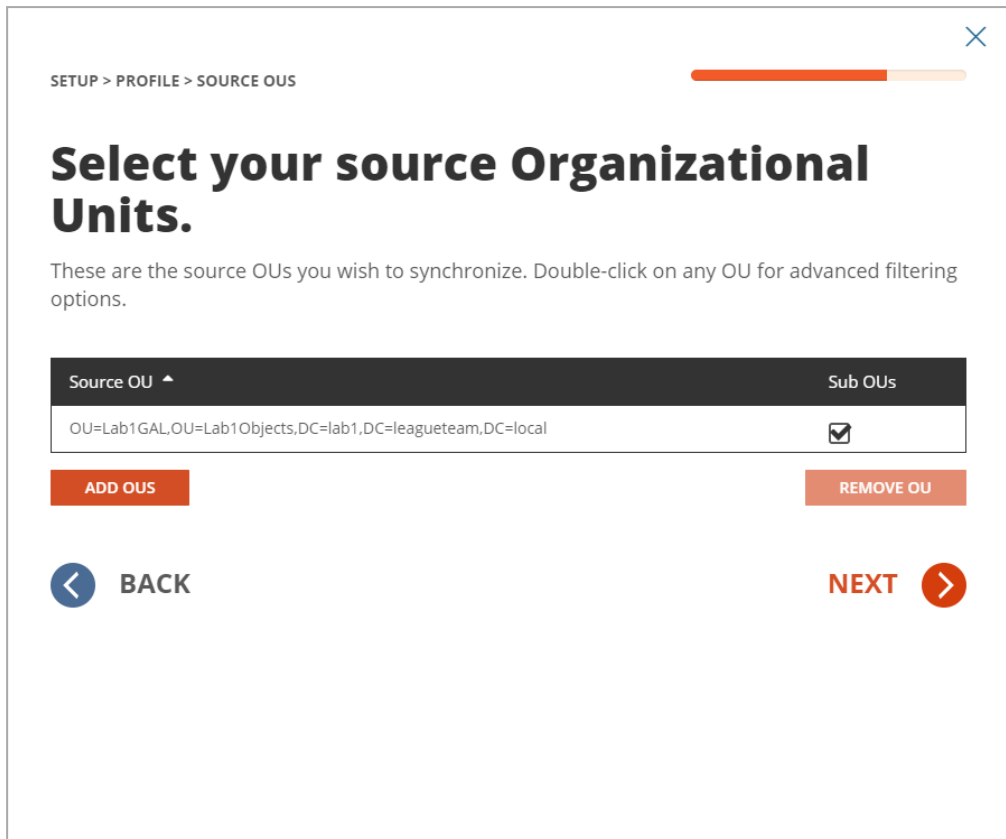
RECREATE SOURCE OU HIERARCHY IN THE DEFAULT OU

PROTECT NEW OUS FROM DELETION?

i. Click **Finish**.

Step 9: STAGE DATA: TARGET LOCAL TO SOURCE LOCAL

- a. Drag a Stage Data workflow task from the left panel to the right under the Stage Data task mentioned above. Click **Select** to configure the fourth STAGE DATA workflow task for your target local to source local synchronization rule.
- b. Select the “Local to Local GAL Sync” template. Click **Next**.
- c. Select the target local environment as your source. Click **Next**.
- d. Select the source local environment as your target. Click **Next**.
- e. Select the default target domain name. Click **Next**.
- f. Click **ADD OUS** in the Select the source Organizational Units step. In the OU pop-up window, select the OU that will be in-scope, check the **INCLUDE ALL SUB OUS** checkbox. Click **OK** to close the pop-up.



- g. Configure any Stage Data filter you like by double click on the OU in the OUs list, it is highly recommended to setup filter to limit the scope to perform a test on the first sync as part of the validation. Click Next
- h. Select the default OU for newly created objects for Users, Groups, Contacts, and Devices. In our case, we can select the same OU for all object types as we are only syncing user as contact.

SETUP > PROFILE > TARGET OU
✕

Select your default OU for newly created objects.

This is the Organizational Unit where you plan to store any newly created objects. ⓘ

<p>USERS This option determines in which OU new users are created.</p>	<p>OU=Contacts,OU=FromLab1,OU=Lab2Objects,DC=Lab2,DC=L...</p> <p style="text-align: center;">SELECT OU</p>
<p>GROUPS This option determines in which OU new groups are created.</p>	<p>OU=Contacts,OU=FromLab1,OU=Lab2Objects,DC=Lab2,DC=L...</p> <p style="text-align: center;">SELECT OU</p>
<p>CONTACTS This option determines in which OU new contacts are created.</p>	<p>OU=Contacts,OU=FromLab1,OU=Lab2Objects,DC=Lab2,DC=L...</p> <p style="text-align: center;">SELECT OU</p>
<p>DEVICES This option determines in which OU new devices are created.</p>	<p>OU=Contacts,OU=FromLab1,OU=Lab2Objects,DC=Lab2,DC=L...</p> <p style="text-align: center;">SELECT OU</p>

SYNC OPTIONS
Choose to either use the default OU or replicate the OU hierarchy when creating new objects.

SYNC ALL OBJECTS TO A DEFAULT CONTAINER

RECREATE SOURCE OU HIERARCHY IN THE DEFAULT OU

PROTECT NEW OUS FROM DELETION?

i. Click **Finish**.

Step 9: WRITE TO

- a. Click **Select**.
 - b. Ensure all four environments are selected. Click **OK**.
7. When you are done with the workflow wizard, you are ready to schedule this workflow.
- a. Click **Next**.
 - b. Select **Manual** for now and we can setup a sync schedule once the test sync has completed.
 - c. Click **Next**.
8. You can set up workflow alerts if needed. For now, click **SKIP**.
- a. Click **Finish**.

Set up Test Objects

Follow these steps to create one test objects in each environment to validate the GAL Sync workflow.

1. Setup a Remote Mailbox in the source local environment and ensure it is part of the OU filter setup for the Local Environment.
 - a. DisplayName: Lab1RMBX1
 - b. PrimarySMTPAddress: Lab1RMBX1@Lab1.Leagueteam.us
2. Setup a Remote Mailbox in the target local environment it is part of the OU filter setup for the Local Environment.
 - a. DisplayName: Lab2RMBX1
 - b. PrimarySMTPAddress: Lab2RMBX1@Lab2.Leagueteam.us
3. Setup a Mailbox in the source cloud environment.
 - a. DisplayName: Lab1CLDMBX1
 - b. PrimarySMTPAddress: Lab1CLDMBX1@Lab1.Leagueteam.us
4. Setup a Mailbox in the source cloud environment.
 - a. DisplayName: Lab2CLDMBX1
 - b. PrimarySMTPAddress: Lab2CLDMBX1@Lab2.Leagueteam.us
5. Copy and save the LegacyExchangeDN value for the above test objects for later use.
6. Add the test cloud objects as a member of the filter group for the Cloud Environment if filter group is configured when the environment was first configured.

Validating the Workflow

Follow the below steps to perform the GAL Sync workflow and validation.

1. Select the workflow configured and click **RUN**.
2. Allow the workflow execution to complete.
3. Validate Lab1RMBX1 from source local environment will be created in target local environment as Mail Contact. The target Mail Contact should have the following set:
 - a. Source Mailbox's PrimarySMTPAddress will be added as targetAddress
 - b. Source Mailbox's LegacyExchangeDN will be added as x500 address.
 - c. Source Mailbox's PrimarySMTPAddress will be added as PrimarySMTPAddress.
 - d. Target Contact's cn will be created as a random GUID to ensure there will be no name collisions.
4. Validate Lab1CLDMBX1 from source cloud environment will be created in target cloud environment as Mail Contact. The target Mail Contact should have the following set:
 - a. Source Mailbox's PrimarySMTPAddress will be added as external email address
 - b. Source Mailbox's LegacyExchangeDN will be added as x500 address.
5. Source Mailbox's PrimarySMTPAddress will be added as PrimarySMTPAddress. Validate Lab1CLDMBX1 from source cloud environment will be created in target cloud environment as Mail User. The Mail User should have the following set:
 - a. Source Mailbox's PrimarySMTPAddress will be added as external email address
 - b. Source Mailbox's LegacyExchangeDN will be added as x500 address.

- c. Source Mailbox's PrimarySMTPAddress will be added as PrimarySMTPAddress.
- 6. Validate Lab2CLDMBX1 from source cloud environment will be created in target cloud environment as Mail Contact. The Mail Contact should have the following set:
 - a. Source Mailbox's PrimarySMTPAddress will be added as external email address
 - b. Source Mailbox's LegacyExchangeDN will be added as x500 address.
 - c. Source Mailbox's PrimarySMTPAddress will be added as PrimarySMTPAddress.

Best Practices & Tips

This list of best practices and tips has been assembled to further the understanding and assist with implementation questions that may arise during setup and testing.

1. Mappings have no impact on the matching attributes.
2. Mappings do not modify the Read Step; all object metadata is read.
3. If creating an object, such as Unified Groups in the destination the default mappings such as "GroupType" or "ObjectType" are not required because they will be auto generated by Exchange Online during creation.
4. If only synchronizing Group Membership, then all User attributes can be removed from the default mappings related to your group workflow and template.
5. Matching by "UserPrincipalName" will only match on the local part value, not the domain part.
6. Matching by "WindowsEmailAddress" will match on the entire string, not just the local part.
7. For membership/ownership to sync, within the template option, "If Users are matched" must be set to "Update", not Skip. Skip will prevent membership from synchronizing.
8. During testing/piloting you may create a filter under Stage Data step to isolate a subset of test Groups to create and sync membership. This will provide a method to validate a few examples before proceeding onto creating all groups.
9. The Test Mode option in the workflow prevents the write data step from occurring in a workflow.
10. If the RecipientTypeDetails attribute mapping is missing, you will receive this error during the Stage Step. "No mapping found for RecipientTypeDetails."
11. If this Name attribute mapping is missing, you will receive this error during the Write Step. "Missing required attribute: Name".
12. The default mappings for Proxy Addresses (i.e. EmailAddresses) may prevent the creation of Unified Groups. The following error is received during the Write Step, "There should be at least one MOERA in Email Addresses."
13. When we create a group, we grant our account Owner access. This can be removed once Sync services are no longer required.
14. The "ONLY EVALUATE OBJECTS WHICH HAVE CHANGED SINCE THE LAST READ" option only affects the Stage Step. Enable this option after the initial data has been read. Do not set that setting on read and write only workflows.
15. By default, the "ReplaceDomain" function is used by the "WindowEmailAddress" attribute to set your default email address to the Target Domain selected within the Stage Data step. This can be changed if required.
16. The Delete Objects Step in a workflow is required to delete target objects if that is in scope for your project. Here are details on this step:

- a. Reconcile finds source object XYZ is no longer in scope and removes it from CDS, adds it to a list of "Reconciled objects" for that source.
- b. Delete step looks in "Reconciled objects" for anything from the configured source. It finds object XYZ.
- c. Delete step then looks for a match to object XYZ from the configured target. If found, the target object is deleted.

In summary, the Reconcile step captures anything removed from the source, the delete step looks for any matching objects on the target and deletes them.

17. A cloud environment filter is highly recommended, so we only must process in-scope objects to be read-in for the cloud environment. This will reduce the time needed to read in the objects by Directory Sync.
18. Both cloud and local environments will be added and associated automatically if we create the Tenant to Tenant project first.
19. Due to O365 limitation, there can be no more than one cloud only objects having the same ExternalAddress, therefore, we must create the GAL object as MEU in the target cloud tenant. Contact object will be created after mailbox provisioning.
20. The custom mapping below will copy the source object's WindowsEmailAddress value to target as PrimarySMTPAddress, and it will also copy the source object's LegacyExchangeDN to the target as an x500 address.

Select mapping for 'EmailAddresses' and double click, enter the following expression under value field:

```
GetProxyAddresses(null, null, prefix(Result("WindowsEmailAddress"), "SMTP:"),
prefix(LegacyExchangeDN, "x500:"))
```

21. The custom mapping below will copy the source object's WindowsEmailAddress value to the target's customattribute1 for matching purposes after the object is created. Customattribute1 can be replaced by another attribute if it is already taken in the tenant.

Select mapping for 'CustomAttribute1' and double click, enter the below expression under value field:

```
"s.WindowsEmailAddress"
```

22. Target user objects will be created in the source as contact object because the limitation described in number 19 does not apply here. The source user object will not have the ExternalAddress set, hence there will be no duplication.
 23. For Local to Local, the limitation described in number 19 no longer applies; therefore, we can create the GAL object as contact with ExternalAddress configured.
 24. The custom mapping below will set the target contact's CN as a random GUID; this is needed to avoid possible name collision as CN is not a unique attribute in Active Directory.
- Select mapping for 'DistinguishedName' and double click, enter the below expression under value field:

```
GetDn(NewGuid())
```

25. The below custom mapping will set the target contact's targetAddress field with the source object's mail attribute (which is also the PrimarySMTPAddress).

Select mapping for 'targetAddress' and double click, enter the below expression under value field:

```
prefix(S.mail, "SMTP:")
```

26. msExchRecipientTypeDetails and msExchRecipientDisplayType will need to be set per Microsoft requirement for Mail Contact. In this case, they should be set to "64" and "6".

Quest Software creates technology and solutions that build the foundation for enterprise AI. Focused on data management and governance, cybersecurity and platform modernization, Quest helps organizations address their most pressing challenges and make the promise of AI a reality. Around the globe, more than 45,000 companies including over 90% of the Fortune 500 count on Quest Software. For more information, visit www.quest.com or follow Quest Software on [X \(formerly Twitter\)](#) and [LinkedIn](#).

Technical support resources

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

- Submit and manage a Service Request
- View Knowledge Base articles
- Sign up for product notifications
- Download software and technical documentation
- View how-to-videos
- Engage in community discussions
- Chat with support engineers online
- View services to assist you with your product