GALsync® v8.4

Manual

NETsec

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Introduction 9
GALsync 9
contactSync 9
What are the principles? 10
How to start? 10
Recommendations (Do's and Don'ts) 10
Junk Mail Filter 10
Suggestions to test GALsync policies 10
Never delete manually 10
Schedule without overlaps 10
One import policy for exact one organizational unit (on-premises) 11
Only one export policy from the same source environment for the same Exchange Online target environment 11
Performance (Exchange Online) 12
Licensing 14
Trial license 14
How to add a license 15
How many objects are to be licensed? 15
Deployment Guide 16
Introduction 16
Synchronize multiple Exchange environments in a hub-spoke topology 17
Step 1: Partners export for the Central 17
Step 2: Central imports the received data file of each Partner 18
Step 3: Central exports all contact information for the Partners 19
Step 4: Partners import the received data file of the Central 20
Synchronizing between different Exchange Online environments 21
Own GALsync Server for each Microsoft 365 Exchange Online tenant 21
One GALsync Server for all Microsoft 365 Exchange Online tenant 22
System Requirements 23
Prerequisites 24
Overview 24
Service Account (on-premises) 25
Exchange mailbox for the GALsync Service Account 26
On-premises mailbox 26
Exchange Online mailbox 26
Local service account on a standalone server 27
Execution Policy (Microsoft 365 Exchange Online) 27

ExchangeOnlineManagement PowerShell module (Microsoft 365 Exchange Online) 28
Install ExchangeOnlineManagement PowerShell module 28
Update ExchangeOnlineManagement PowerShell module 28
Exchange Online authentication via App registration or Service Account 29
Exchange Online certificate-based authentication via App registration 30
Exchange Online authentication via Service Account 31
Exchange Online certificate-based authentication via App Registration 32
Register an Enterprise Application in Microsoft Entra ID 33
Where to find the domain name of the Microsoft 365 tenant? 35
Certificate for the registered Application 37
Upload certificate file for the registered Application 41
Assign API permissions to the registered Application 43
Exchange Administrator role for the registered Application 47
Overview of the registered Application in App registrations 49
Limit the scope of application permissions to access mailboxes 52
Test the Exchange Online PowerShell connection and the Exchange mailbox 53
Exchange Online authentication via Service Account 56
Service Account (Microsoft 365 Exchange Online) 56
Modern Authentication OAuth 2.0 for Exchange Web Services (EWS) to access Exchange Online 57
Active Directory Permission for the Import OU (on-premises) 73
GALsync components 80
Files 80
Environment Configuration 80
Policy 80
GUI 81
Information Bar 81
Policy Wizard 82
Service 82
Running GALsync Policies via command line 83
Internal Marks 84
NoGALsync (internal mark) 84
galsync:joe.dole@netsec.de (internal mark) 84
SyncWithGALsync (internal mark) 84
Global Settings 85
Settings Tab 85
Log file directory. 85

Property for source domain 85
Property for marks 86
Mark objects for deletion 86
Mark objects that have been modified. 86
Mark newly created objects. 86
Exchange Tab 87
General Settings for Exchange 88
Local on-premises Exchange Server settings for non-migrated policies 89
Environments Tab 90
Create Environment 90
Edit 91
Delete 92
Policies Tab 93
Create Policy 94
Edit policy 95
Delete 95
Clone 96
Test 97
Counter 97
Run 97
Status 98
Open and export log files 99
Help Tab 100
Environment Configuration 101
Environment Configuration dialog 101
General Tab 102
Exchange Scenario Tab 103
Exchange Server on-premises Tab 114
Exchange Online Tab 118
Policy Configuration 123
General Tab 123
Migrate an existing policy 124
Synchronization mode 126
Export policy 126
Import policy 127
Data transfer mode 128
manual 128

via email 130
via network share 132
via FTP 133
Directory 135
Export 135
Import 136
Encryption 137
Symmetric Keys 138
Asymmetric Keys (Public Key) 138
Status notification emails 139
Schedule Service 140
Export Policy 141
Select objects for export 141
Choose (on-premises) 141
Choose (Exchange Online) [not recommended] 145
Search (on-premises) 148
Search (Exchange Online) 151
Properties 152
NoGALsync (internal mark) 154
Migrate (Exchange Online only) 154
Special Options for Export 158
Export (Exchange on-premises) 158
Export (Exchange Online) 159
Maximum errors to transfer data file 160
Minimum objects to transfer data file 160
Disabled objects (on-premises only) 160
Synchronize objects hidden from address lists 160
Synchronize Manager 160
Export 'MasteredOnPremise' objects (Exchange Online only) 160
Compatible with version 7 and earlier versions (Exchange Online only) 161
Synchronize Picture (on-premises only) 161
Support cross-forest delegation (on-premises only) 162
Modify existing contacts with source domain 163
Export Settings: Object Filter 166
Import Policy 167
Filter and Modify objects for import 167
Choose (on-premises only) 167

Properties 167
Special Options for Import 176
Import Settings: General (Exchange on-premises) 176
Import Settings: General (Exchange Online) 176
Synchronize Guest User (Exchange Online only) 177
How to tell GALsync which existing Guest Users should be synchronized in the target Microsoft 365 tenant. 177
Mark synchronized guest users to delete 179
Create sub-OUs for each sending domain (on-premises only) 180
Use MAPI rich text format (on-premises only) 181
Build the cn of the distinguishedName (on-premises only) 181
Import Settings: E-Mail Addresses (Exchange on-premises) 182
Import Settings: E-Mail Addresses (Exchange Online) 183
Modify target address with domain 183
Modify primary SMTP address with domain 184
galsync:joe.dole@netsec.de (internal mark) 185
Modify mail address with domain (on-premises only) 185
Import only primary SMTP address 186
Import X500 addresses 186
Import legacyExchangeDN as X500 address 186
Import SIP addresses 186
Add suffix to MailNickname (on-premises only) 187
Retain targetAddress of users and contacts 187
Import Settings: E-Mail Addresses 2 188
Add additional secondary smtp addresses to proxyAddresses 188
Import Settings: Address Lists (Exchange on-premise) 189
Assign Address Lists to imported objects (on-premises only) 189
Hide from Address Lists (all Objects) (on-premise only) 190
Import Settings: Object Filter 190
Object Filter: Exclude all objects of the data file from import, which has one of the following conditions 190
Synchronize Group (Exchange on-premises) 192
Synchronize Group (Exchange Online) 193
Synchronize imported contacts as members to existing group 194
Synchronize group as group [not recommended] 196
Synchronize User 198
How to tell GALsync which existing Mail Users should be synchronized in the target Microsoft 365 tenant. 200

Mark synchronized mail-enabled users / mail users to delete 201
Create mail-enabled user / mail user 202
How to 204
How to build the displayName attribute during the import 204
Step 1: Build Property rule for displayName attribute 204
Step 2: Remove the first part, if firstname and lastname attribute are empty. 207
Step 3: Remove the second part, if firstname and lastname attribute are not empty 209
How to Book a Room Mailbox with GALsynced Contacts 212
On-premises Implementations 212
Office365 Exchange Online implementations 214
How to export guest users 216
How to tell GALsync to match non-GALsynced objects in Exchange Online (Microsoft 365) for synchronization 218
How to tell GALsync to modify GALsynced objects in Exchange Online (Microsoft 365) again 222
Modify all objects at the next execution 222
How to change the primary SMTP address of users in the source environment, which are synced to partners with GALsync 223
How to check existing application access policy for the application 224
How to restrict access to specific mailboxes for the application 225
Configure a mail-enabled security group 225
Configure Application Access Policy 234
Get existing application access policy for the application 235
How to migrate the source of the export policy in a hybrid Exchange environment 236
GALsync synchronization set up 236
Changed requirement for export policy 237
Problem of changed requirement at export for the importing partners 237
Configuration of the export to prevent the problems with the importing partners 238
Modify existing contacts with source domain 238
Warnings and Errors in old GALsync 8.1 versions and earlier at the import site 241
How to create a Dynamic Distribution Group by using the Exchange PowerShell 242
On-premises Exchange 242
Exchange Online 245
Troubleshooting and Support Guide 248
How to analyze object matches in the log file which GALsync uses during the import to update existing objects 248
How do I resolve NDR (Non-Delivery Report) problems? 251

How to check the PowerShell version on the GALsync server 252
How to Troubleshoot PowerShell 253
Failure to Establish Connection to Exchange Online 253
11021 - LegacyExchangeDN of the GALsync service account is in the old syntax. Please update this by re-mailenabling the service account or create a new GALsync service account. 254
19031 - Not all mails arrived 254
Solution 254
28104 - Error adding value of property showInAddressBook to the contact. 255
Solution 255
12010 - Error getting Exchange Online connection 256
Support: What to do when I notice an error / bug? 257
Environment Overview 257
Description of the issue 257
Configuration and log files 257

Introduction

GALsync

GALsync synchronizes the Global Address List (GAL) between different Exchange environments, which can be on-premises Exchange environments or Exchange Online of Microsoft 365 tenants.

For each Exchange environment, you can configure which mail-enabled objects will be synchronized as mail-enabled contacts to the other Exchange environments. Also, you can configure how the received mail-enabled objects from the other Exchange environments will be synchronized as mail-enabled contacts to your own Exchange environment. This will make the mail-enabled objects from the other Exchange environments visible as contacts in the Global Address List (GAL).

GALsync Documentation

https://www.netsec.de/en/products/galsync/documentation.html

contactSync

contactSync synchronizes contacts contained in a Shared Mailbox or in a modern Public Folder into users' mailboxes in the same Exchange environment.

It will also synchronize the Global Address List (GAL) into users' mailboxes, which are in the same environment. Mail-enabled objects of an on-premises Active Directory can be synchronized into Exchange mailboxes from the same Exchange environment and mail-enabled objects from a Microsoft 365 tenant can be synchronized into Exchange mailboxes in the same Exchange environment.

contactSync synchronizes the contacts into a subfolder within the user's mailbox contacts.

Please take a look at the contactSync documentation for additional information.

contactSync Documentation

https://www.netsec.de/en/products/contactsync/documentation.html

What are the principles?

- Independency – each company only shares that information it wants to share
- No trust is needed between the companies
- The software is easy to install and easy to configure
- Exchanging only the data you want to share should be very easy and secure – so we have chosen email as the preferred data transfer method between companies.

How to start?

1. Check out the **System Requirements** and the **Prerequisites**.
2. Check out the **Global Settings** of GALsync.
3. Configure an **Environment Configuration** corresponding to the Exchange environment.
4. Configure the **Policy Configuration** for the corresponding **Environment Configuration**.

Recommendations (Do's and Don'ts)

Junk Mail Filter

If you choose email as the data transfer method to exchange data, we strongly recommend you configure the receiving mailbox to not block email from your partner site. Especially in Exchange Online when GALsync email is often treated as junk email.

Suggestions to test GALsync policies

We recommended to test GALsync before using with your production accounts. This way you will prevent any unwanted changes, or impacts you might not have considered during setup.

- First use some test accounts and groups
- Then use only 1-5 real accounts

Never delete manually

Never manually delete synced accounts in the target organization after they have been used by clients! Outlooks **NK2 Cache / AutoComplete Cache** respective the name resolution of Outlook will not take care of the new objects with the same **cn** without having the **legancyExchangeDN** of the former object as x500 address present.

Schedule without overlaps

It is strongly recommended that you configure the scheduler in such a way, that exports and imports do not overlap. Try the time for each policy will run by a manual execution. After that configure your schedules.

One import policy for exact one organizational unit (on-premises)

It is strongly recommended never to configure more than one import-policy to save the objects in the same organizational unit. Following the architecture of GALsync all previous objects could be deleted if they are not identical to one in the import set.

Example:

Import policy 1: contains **user1@companya.com** and **user2@companya.com**

Import policy 2: contains **user1@companya.com** and **group1@companya.com**

Both policies are configured to import to OU **Contacts Company A** and both data files come from the same source environment. If now **policy 1** runs **user1@companya.com** and **user2@companya.com** are created. If afterwards **policy 2** runs then **user2@company.com** will be removed and **group1@companya.com** is created.

Only one export policy from the same source environment for the same Exchange Online target environment

It is strongly recommended to never configure more than one export policy whose target environment is the same Exchange Online organization. Following the architecture of GALsync all previous objects would be deleted if they are not identical to one in the import set.

Example:

Export policy 1 of Company A contains for an **Exchange Online import policy 1**: contains **user1@companya.com** and **user2@companya.com**

Export policy 2 of Company A contains for an **Exchange Online import policy 2**: contains **user1@companya.com** and **group1@companya.com**

Both policies are configured to import to **same Exchange Online tenant of Company B** and both data files come from the **same source environment**. If now **policy 1** runs **user1@companya.com** and **user2@companya.com** are created. If afterwards **policy 2** runs then **user2@company.com** will be removed and **group1@companya.com** is created.

Performance (Exchange Online)

When using any Microsoft 365 Exchange Online related Policy in GALsync, please be aware of the possibility of some lag. This is due Exchange Online being a remote environment, which GALsync connects to using Remote PowerShell. Microsoft can, and has been known to apply connection limitations though throttling.

Export from Microsoft 365 Exchange Online

1. Our experience using **certificate-based authentication** via **App registration** exporting 200,000 objects from Microsoft 365 Exchange Online:

We used

- 1 Enterprise Application (App registration), with the Exchange Administrator role
- and 2 connections to the Microsoft 365 tenant,
- and a Windows Server 2022 with 16 GB RAM and 2 cores.

Note: There are a lot of components in the local computer center, which may influence the remote PowerShell connections to the Microsoft 365 tenant.

Using the above settings, we exported the 200,000 objects within 1 hour from the Microsoft 365 tenant.

2. Our experience using **user credentials** exporting 200,000 objects from Microsoft 365 Exchange Online:

We used

- 5 service accounts, with the Exchange Administrator role
- and 2 connections per account to the Microsoft 365 tenant,
- and an Azure VM with 16 GB RAM and 4 cores.

Note: There are a lot of components in the local computer center, which may influence the remote PowerShell connections to the Microsoft 365 tenant.

Using the above settings, we exported the 200,000 objects within 1 hour from the Microsoft 365 tenant.

Import into Microsoft 365 Exchange Online

1. Our experience importing 100,000 objects into Microsoft 365 Exchange Online:

We used to create 100,000 objects at the same import policy run

- 1 Enterprise Application (App registration) and additional 2 service accounts*, with the Exchange Administrator role,
- and 2 connections per account to the Microsoft 365 tenant,
- and a Windows Server 2022 with 16 GB RAM and 2 cores.

** If less than 20,000 objects have to be created or modified during a policy run one Enterprise Application (App registration) without any user credentials is sufficient. If more than 20,000 objects are to be created or modified during a policy run, additional service accounts will speed up the process.*

Note: There are a lot of components in the local computer center, which may influence the remote PowerShell connections to the Microsoft 365 tenant.

Using the above settings, we imported the 100,000 objects within 6 to 10 hours into the Microsoft 365 tenant.

2. Our experience using only user credentials importing 100,000 objects into Microsoft 365 Exchange Online:

We used

- 5 service accounts, with the Exchange Administrator role
- and 2 connections per account to the Microsoft 365 tenant,
- and an Azure VM with 16 GB RAM and 2 cores.

Note: There are a lot of components in the local computer center, which may influence the remote PowerShell connections to the Microsoft 365 tenant.

Using the above settings, we imported the 100,000 objects within 6 to 10 hours into the Microsoft 365 tenant.

Licensing

Trial license

It is possible to run GALsync without a license. Please note that in this case only up to 100 objects can be exported or imported for up to 21 days. If you try to run a policy in the trial mode, which has been cloned or copied, then it will not work. If any GALsync version was previously installed on the same machine, the trial mode will not work.

If you try to export more objects than licensed, the data file will not be transferred and an error is written to the log file.

If your license is not valid or version-compatibility is not given, the data file will not be transferred, because importing it could lead to unwanted results in the target Active Directory.

Data files with more than 100 objects cannot be imported.

If you run GALsync as trial this is displayed in the information bar at the bottom of the program window.

Note: If you run the contactSync module without a license you will be able to synchronize contacts into maximum 20 mailboxes for up to 21 days!

If you have any licensing questions or queries, please feel free to contact our **GALsync Sales Team**

by phone +49 2421 998 78 20

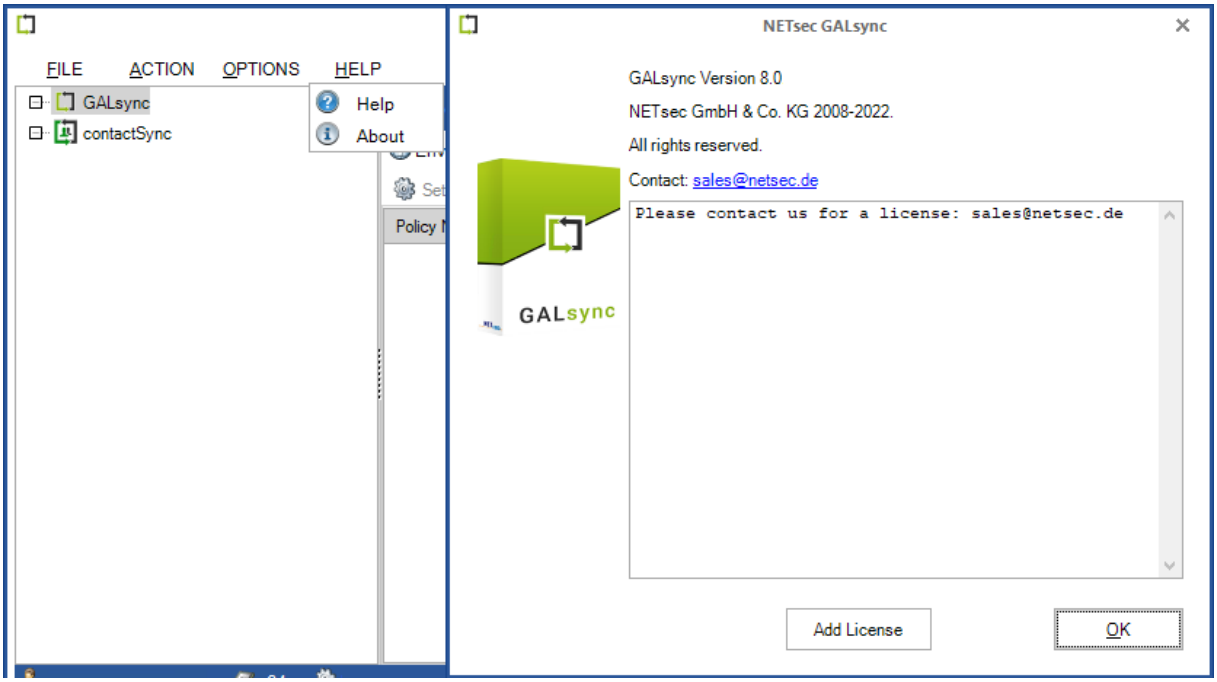
or via e-mail sales@netsec.de

How to add a license

Click **Help** and select **About**.

GALsync will provide you with basic information about your current license status.

To add a license, press the **Add License** button, and then select the license file you received.



How many objects are to be licensed?

Counter Create an export policy, choose the appropriate objects. Then you can count all of the objects which are valid for export and would be exported during a run. This can help you choose for how many sync objects you need to license.

If you have any licensing questions or queries, please feel free to contact our **GALsync Sales Team**

by phone +49 2421 998 78 20

or via e-mail sales@netsec.de

Deployment Guide

Introduction

This chapter will help you to plan your GALsync installation. To simplify the description of each scenario below, only a unidirectional synchronization is focused. Based on this technique you may configure bidirectional (one-way) or multidirectional synchronizations.

Some key notes before

- You can synchronize a limitless number of Exchange Forests. We have customers with over 45 forests using GALsync. You may design a hub-spoke topology synchronizing all branch offices to the Headquarter and receiving all objects from HQ.
- In a single policy configuration there are no technical limitations for the number of objects to select for synchronization.
- You can create a limitless number of policies. Multiple policies must be scheduled for execution – no concurrent executions are possible. Policies are kept in a queue and will be run sequentially.
- If there are multiple forests to import from, every exporting site must use its own subject line (when transferring the data via email). This permits multiple import policies to be configured using the same mailbox for receiving, and still determine the correct data file per policy.

Note: Synchronizing between different Exchange environments we recommend to choose email as preferred transport method.

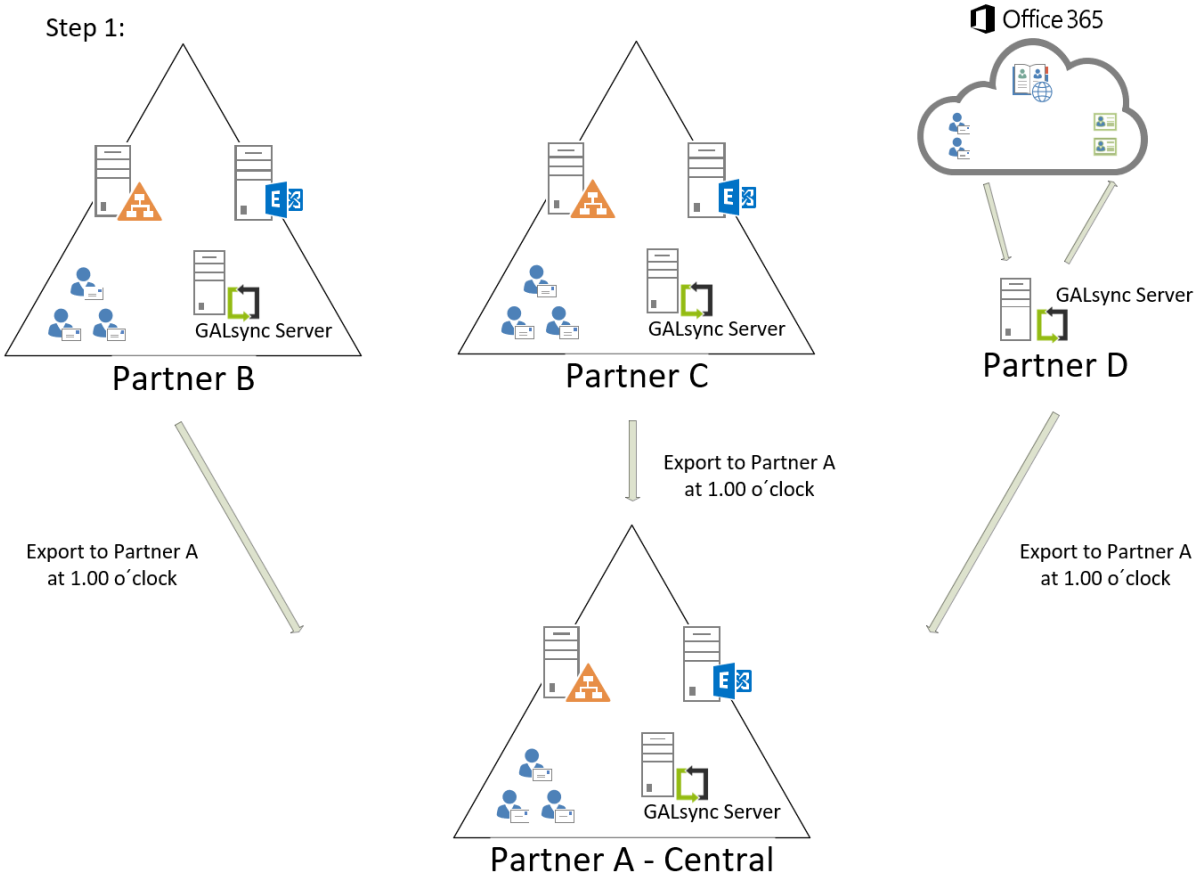
Synchronize multiple Exchange environments in a hub-spoke topology

The main goal of a hub-spoke topology is that all Exchange environments have the same contact information of the shared mail-enabled objects.

Step 1: Partners export for the Central

First, each partner (spoke) configures an export policy, adding only the desired objects to be sent to the central (hub) environment.

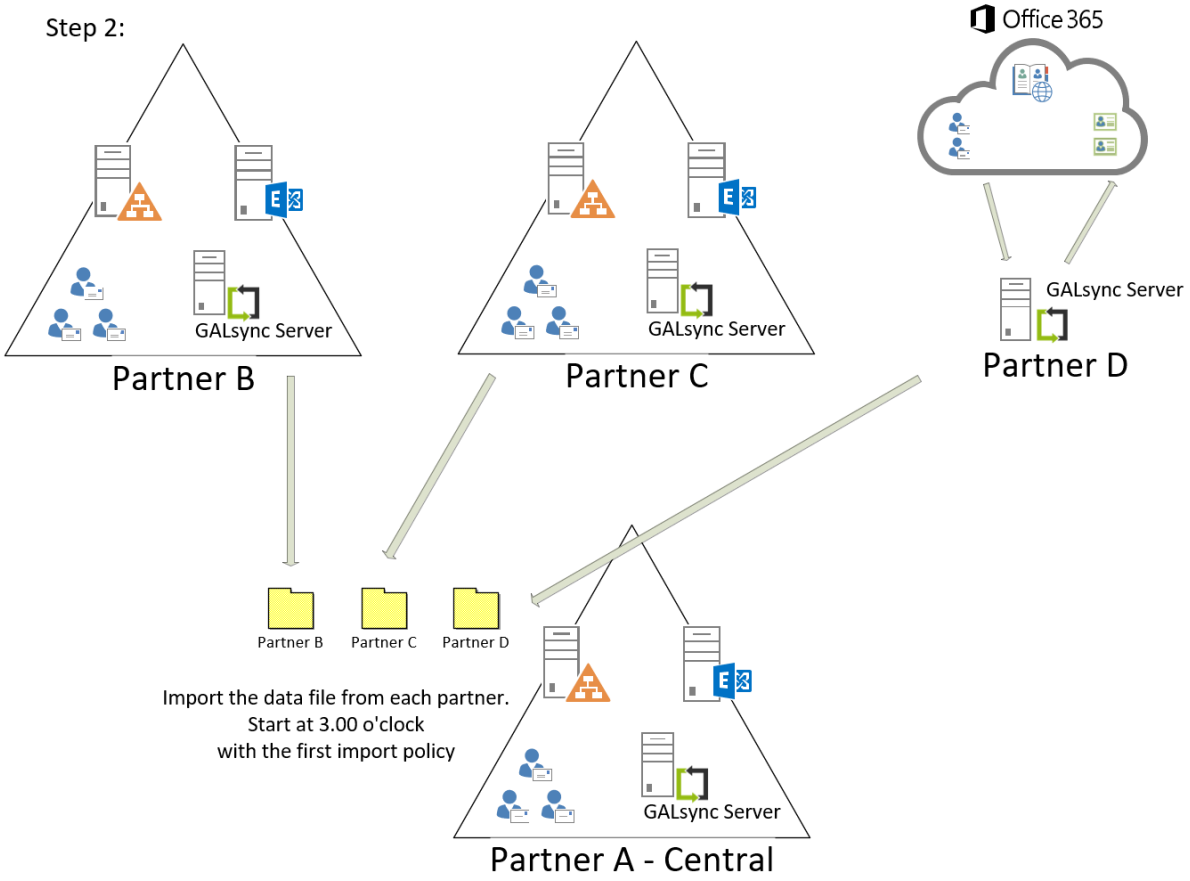
We recommend scheduling all export policies from each partner (spoke) in the same time slot.



Step 2: Central imports the received data file of each Partner

Second, the central (hub) configures an import policy for each partner, which imports the contents of the received corresponding data file.

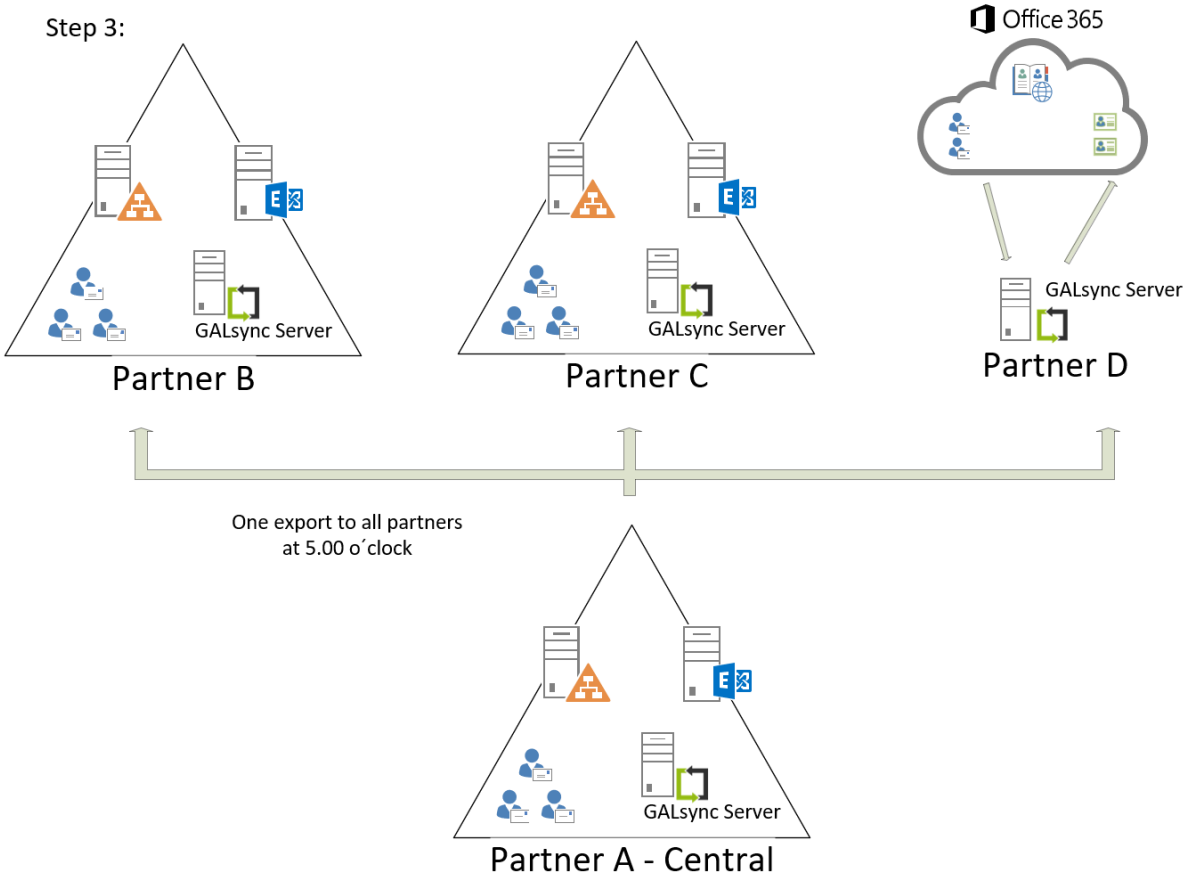
After all export policies from the partners are finished and the data files received at the central (hub), schedule the import policies for the central environment.



Step 3: Central exports all contact information for the Partners

Thirdly, configure the export policy of the central with the own mail-enabled objects selected and all contacts imported from the partners, so that all contact information from all environments is included.

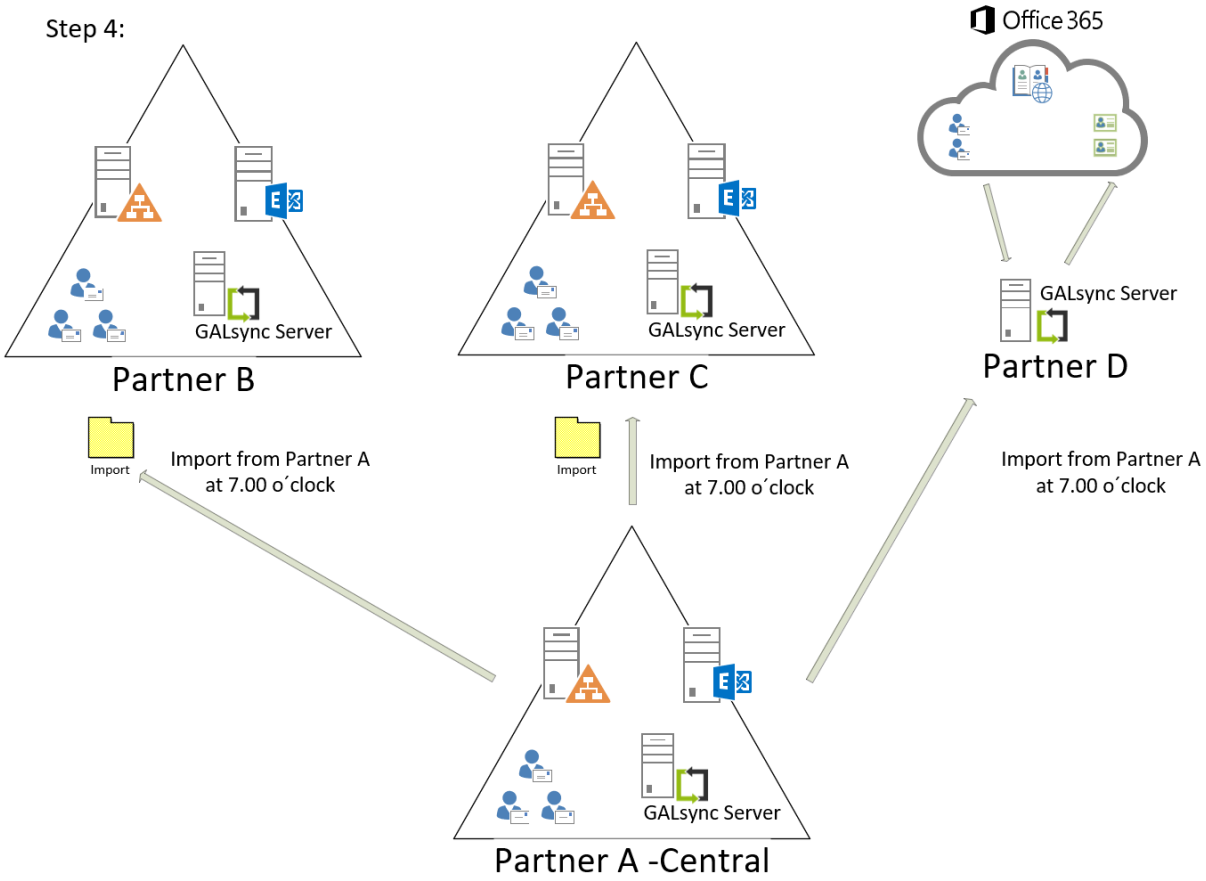
After all import policies are finished, schedule the export policy of the central environment.



Step 4: Partners import the received data file of the Central

Fourth, each partner configures an import policy that imports the receiving data file from the central office.

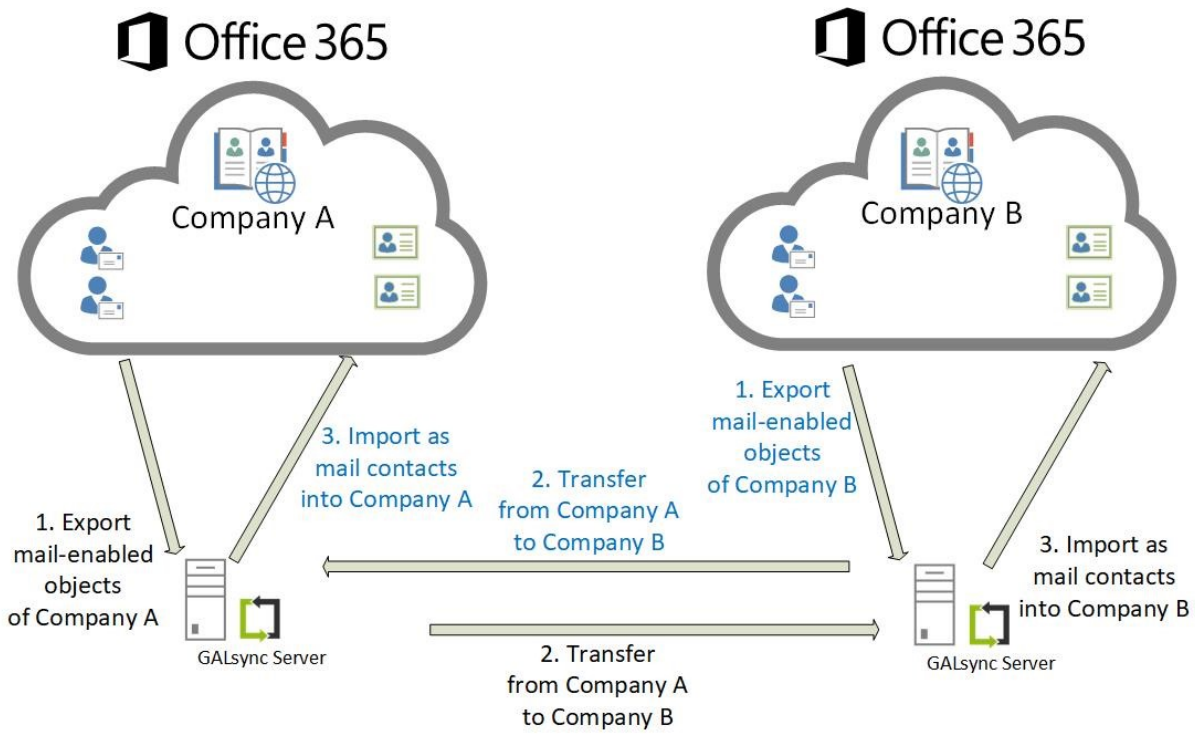
After the central export policy is finished, and the partners receive the data file, we recommend scheduling all partner (spoke) import policies for the same time slot.



Synchronizing between different Exchange Online environments

Own GALsync Server for each Microsoft 365 Exchange Online tenant

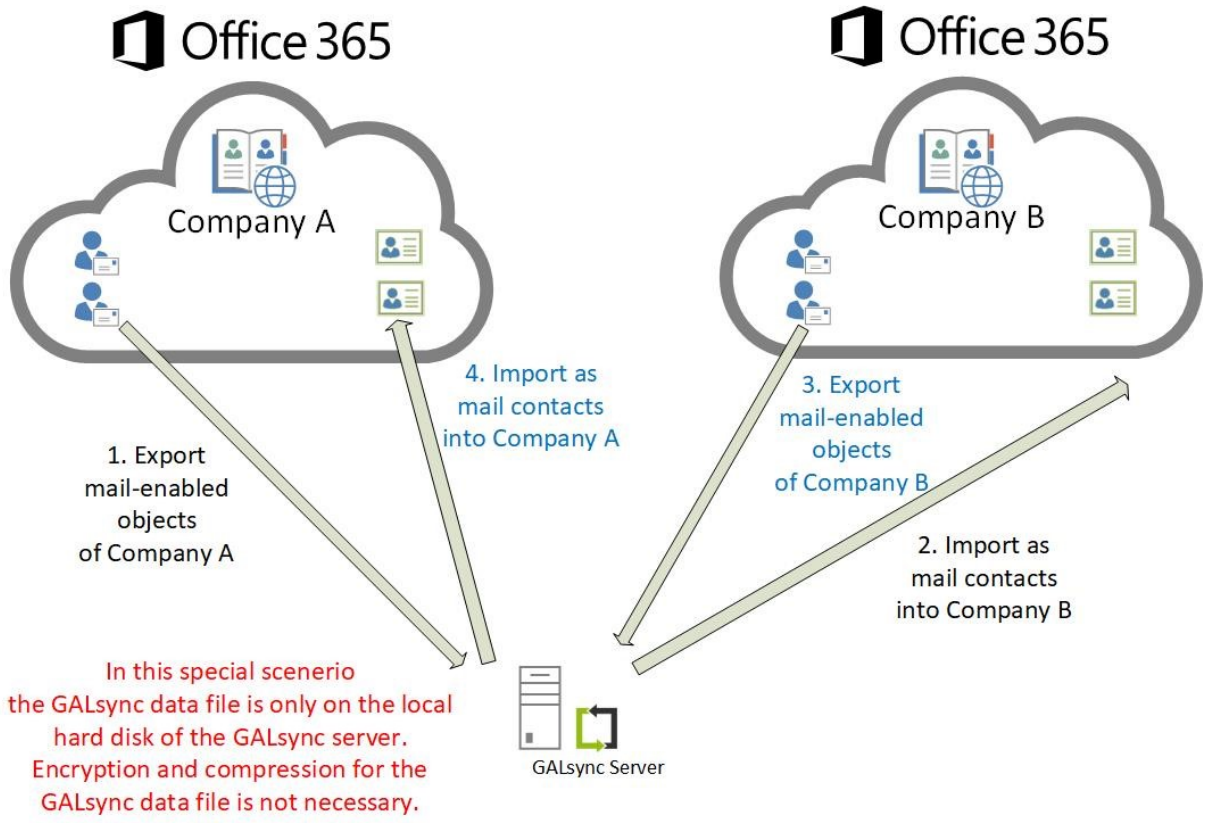
If you want directly synchronize between different Microsoft 365 Exchange Online tenants, you can use an own GALsync Server for each Microsoft 365 / Office 365 tenant.



In this scenario the administrator of each Microsoft 365 Exchange Online tenant configures an Environment Configuration for its Exchange environment. The corresponding policies for export and import are configured to the Environment Configuration of the Exchange environment.

One GALsync Server for all Microsoft 365 Exchange Online tenant

You can use one GALsync Server for all Microsoft 365 Exchange Online tenants. This is only possible for Exchange environments, where you do not need to synchronize the Global Address List (GAL) to an on-premises Exchange.



In this scenario, the GALsync service account credentials from each Microsoft 365 Exchange Online tenant are configured within an Environment Configuration, one of which is configured for each Exchange Online tenant. Each corresponding export/import policy is then configured within its own respective Environment Configuration.

System Requirements

Components	Required
OS (64Bit)	Windows Server 2016 Windows Server 2019 Windows Server 2022 In small environments or for testing purposes you can also install GALsync on a client computer running Windows 10 Professional.
Hardware	Processor: minimum dual core RAM: minimum 4GB
Software	.NET Framework 4.8.0 and later Windows PowerShell 5.1 and ExchangeOnlineManagement PowerShell module version 3.4 or later for Exchange Online PowerShell V3
Recommendations	**Exchange On-Premises**: We recommend to install GALsync on a member server within the domain (e.g., dedicated GALsync server or file server). The machine should be uncritical (e.g., may be restarted without complications). The GALsync server must have a high bandwidth connection to the DC/GC. **Exchange Online**: See recommendations for On-Premises; but you can use also a standalone computer.
Supported Exchange Versions*	Exchange 2013* SP1 and later Exchange 2016 and later Exchange 2019 and later Microsoft 365 Exchange Online

** Microsoft stopped supporting Exchange 2013 on the 11th April 2023. Microsoft stopped supporting for Windows Server 2012 and Windows Server 2012 R2 on the 10th October 2023.*

As much as we would like to keep up compatibility for all versions, we cannot support an Environment, which is no longer supported by the manufacturer.

Prerequisites

Overview

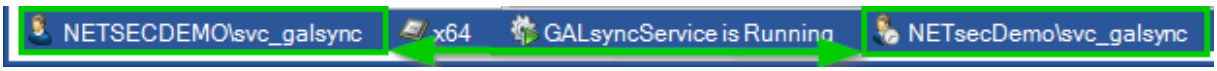
GALsync requires a service account. The GALsync service account is only a domain user in the Active Directory and has an Exchange mailbox. The mailbox of the GALsync service account can be located at the on-premises Exchange or in Exchange Online.

On your GALsync server, the service account should be the local administrator and it should be possible to log on to the server as this account. Remote desktop connectivity may also be required.

Furthermore, the service account on the GALsync server needs the right to run as a service.

It is recommended to run the GALsync GUI always in the credentials of the local GALsync service account.

This can be confirmed on the information bar at the bottom of the GALsync GUI.



Exchange on-premises and on-premises Active Directory:

The on-premises GALsync service account needs the permission to create, modify and delete objects and their attributes below your defined Import-OUs of the on-premises Active Directory for synchronizing into an on-premises Exchange environment.

Please take a look at the chapter
Active Directory Permission for the Import OU (on-premises).

Exchange Online:

Synchronizing directly with Exchange Online, you have the option of user-based authentication or certificate-based authentication. Certificate-based authentication for Exchange Online is recommended so the GALsync service account will not require any additional authorizations.

The certificate-based authentication for Exchange Online is described in the chapter
Exchange Online certificate-based authentication via App Registration

Service Account (on-premises)

The on-premises GALsync service account is a domain user of the on-premises Active Directory.

The on-premises service account is a member of the **Local Administrators** group on the Windows Server, where GALsync is installed.

The on-premises service account needs the local right to **run as a service** on the Windows Server, where GALsync is installed. This permission is added to the service account during the installation.

Make sure you can logon as the on-premises service account to the Windows Server, where GALsync is installed. It is likely that the on-premises service account requires membership in the local **Remote Desktop Users** group.

Note: We strongly recommend logging on as the service account to run the GALsync GUI.

The GALsync Service must run in the credentials of the on-premises service account.

In order to install GALsync you need administrative permission. Setup will also install the GALsync Service on the Windows Server you install GALsync on.

Important: If you configure the logon information for the Active Directory domain service account in the GALsync GUI using on-premises Exchange, it will be necessary use the format domain\username.

The on-premises GALsync service account needs the permission to create, modify and delete objects and their attributes below your defined Import-OUs for synchronizing into an on-premises Exchange environment.

Please take a look at the chapter
Active Directory Permission for the Import OU (on-premises).

Exchange mailbox for the GALsync Service Account

The GALsync service account needs a licensed Exchange mailbox in the environment.

- GALsync must have direct access to the user mailbox of the service account via Exchange Web Services (EWS).
- Ensure the mailbox is accessible (e.g., by Outlook Web Access).
- Ensure the mailbox can send to and receive email from the other organization.
- Ensure incoming mail from the other organization does not get caught by your spam filter or firewall.

On-premises mailbox

For an on-premises Exchange scenario, the on-premises GALsync service account needs a mailbox located on the on-premises Exchange Server.

Exchange Online mailbox

An Exchange Online mailbox for the GALsync service account needs to be licensed with an Exchange Online license in the Microsoft 365 tenant.

For example: Microsoft 365 Business Basic, Exchange Online (Plan 1) or Microsoft 365 E1 license will work for the service account.

Local service account on a standalone server

If you run GALsync on a standalone Windows Server, please create a local account for GALsync. This is only valid for Exchange Online cloud-only scenarios.

Please use the local account to configure and run the GALsync Service and the GALsync GUI in the credentials of this local account.

The local account needs the same local permissions as a domain user described above.

The local account will be required to use Modern Authentication for Microsoft 365 Exchange Online. The GALsync Service Account of the Microsoft 365 Exchange Online tenant is independent of this local account.

For example: **galsync** is a local account of the **standalone Windows Server**.

Please run also the GALsync GUI in the credentials of this local account.

Important: If you configure the logon information for the local service account in the GALsync GUI, it will be necessary use the format computername\username.

Execution Policy (Microsoft 365 Exchange Online)

If you configure a policy for Microsoft 365 Exchange Online, GALsync needs the parameter **ExecutionPolicy** to be set to **RemoteSigned** for the Windows PowerShell to connect to Exchange Online.

The reason for this is a security setting built into **Windows PowerShell** called execution policy. Execution policy determines how (or if) PowerShell runs scripts. By default, PowerShell's execution policy is set to Restricted; this means that scripts will not run. GALsync requires that scripts can be run.

```
Get-ExecutionPolicy
```

http://technet.microsoft.com/en-us/library/hh849821.aspx

```
Set-ExecutionPolicy RemoteSigned
```

https://technet.microsoft.com/en-us/library/hh849812.aspx

ExchangeOnlineManagement PowerShell module (Microsoft 365 Exchange Online)

GALsync requires **Windows PowerShell 5.1** and **ExchangeOnlineManagement PowerShell module version 3.4 or later** for Exchange Online PowerShell V3.

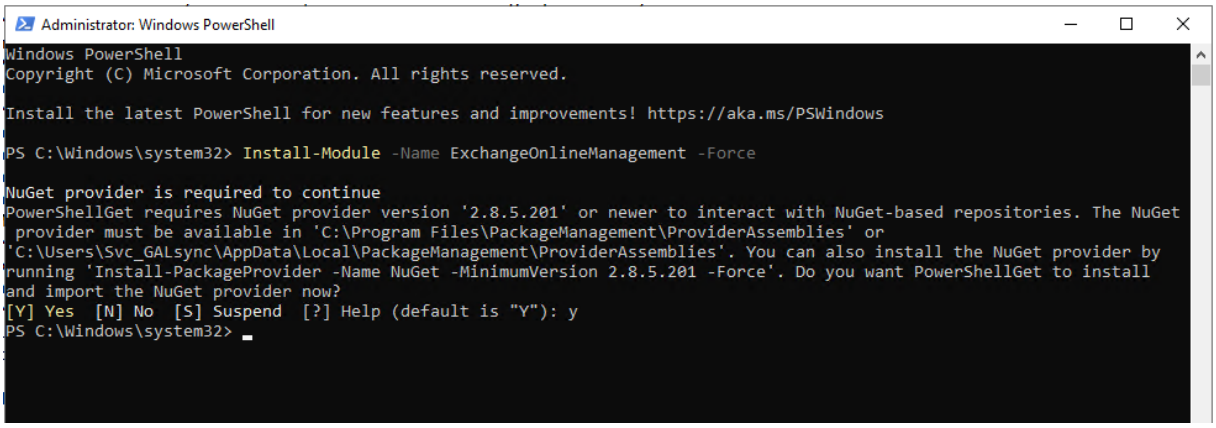
On the GALsync Server you need to install the **ExchangeOnlineManagement PowerShell module** so GALsync can directly communicate with a Microsoft 365 Exchange Online tenant.

Install ExchangeOnlineManagement PowerShell module

On the GALsync Server, open **Windows PowerShell** as **Administrator**, then run the following to install:

```
Install-Module -Name ExchangeOnlineManagement -Force
```

When prompted, enter **Y** for Yes then Return



Please have look at the **Prerequisites for the Exchange Online PowerShell module** chapter of the **Microsoft Docs: About the Exchange Online PowerShell module**

https://learn.microsoft.com/en-us/powershell/exchange/exchange-online-powershell-v2?view=exchange-ps#install-the-exchange-online-powershell-module

Update ExchangeOnlineManagement PowerShell module

On the GALsync Server, open **Windows PowerShell** as **Administrator**, then run the following to update:

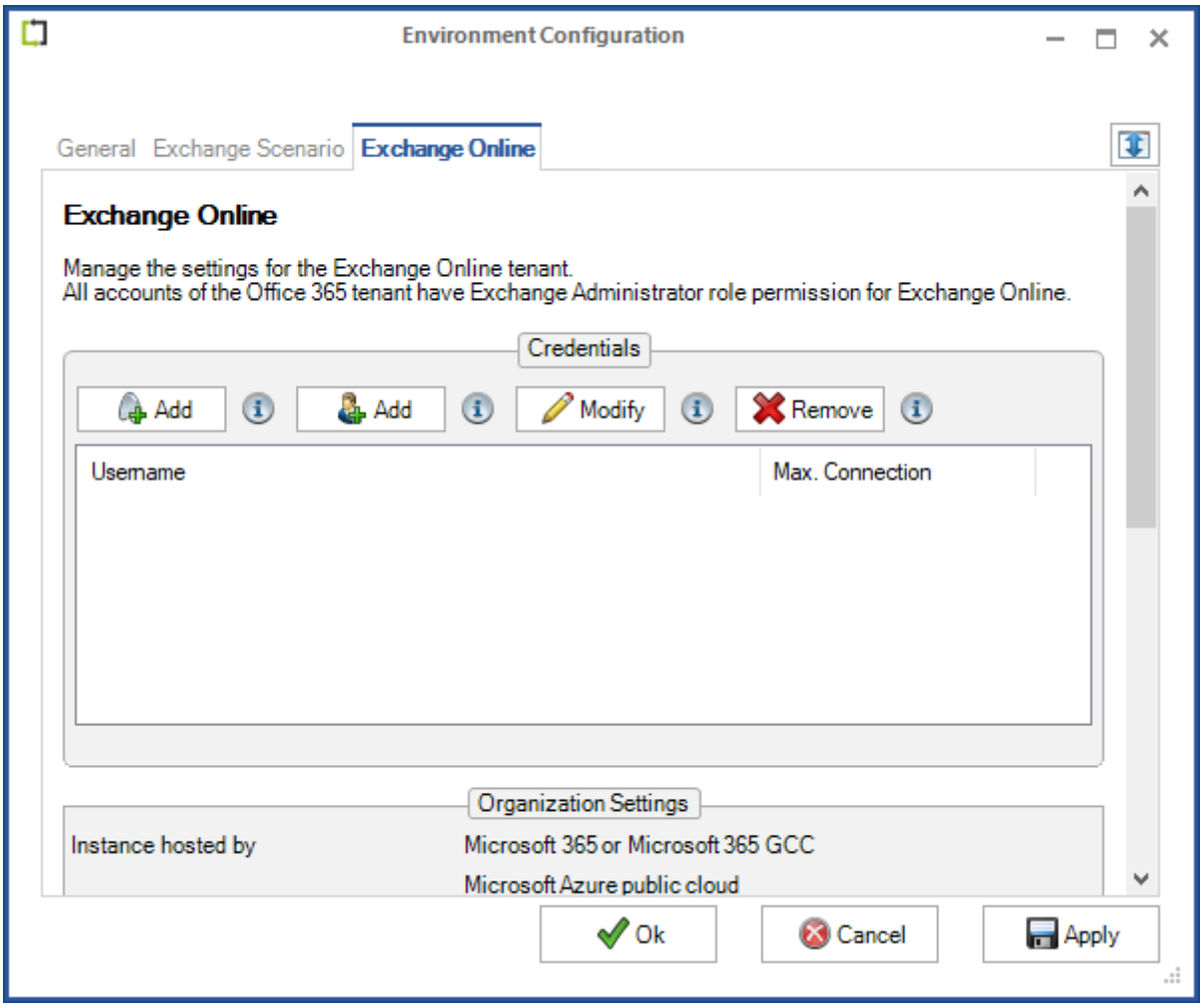
```
Update-Module -Name ExchangeOnlineManagement -Force
```

Please have look at the **Prerequisites for the Exchange Online PowerShell module** chapter of the **Microsoft Docs: About the Exchange Online PowerShell module**

https://learn.microsoft.com/en-us/powershell/exchange/exchange-online-powershell-v2?view=exchange-ps#update-the-exchange-online-powershell-module

Exchange Online authentication via App registration or Service Account

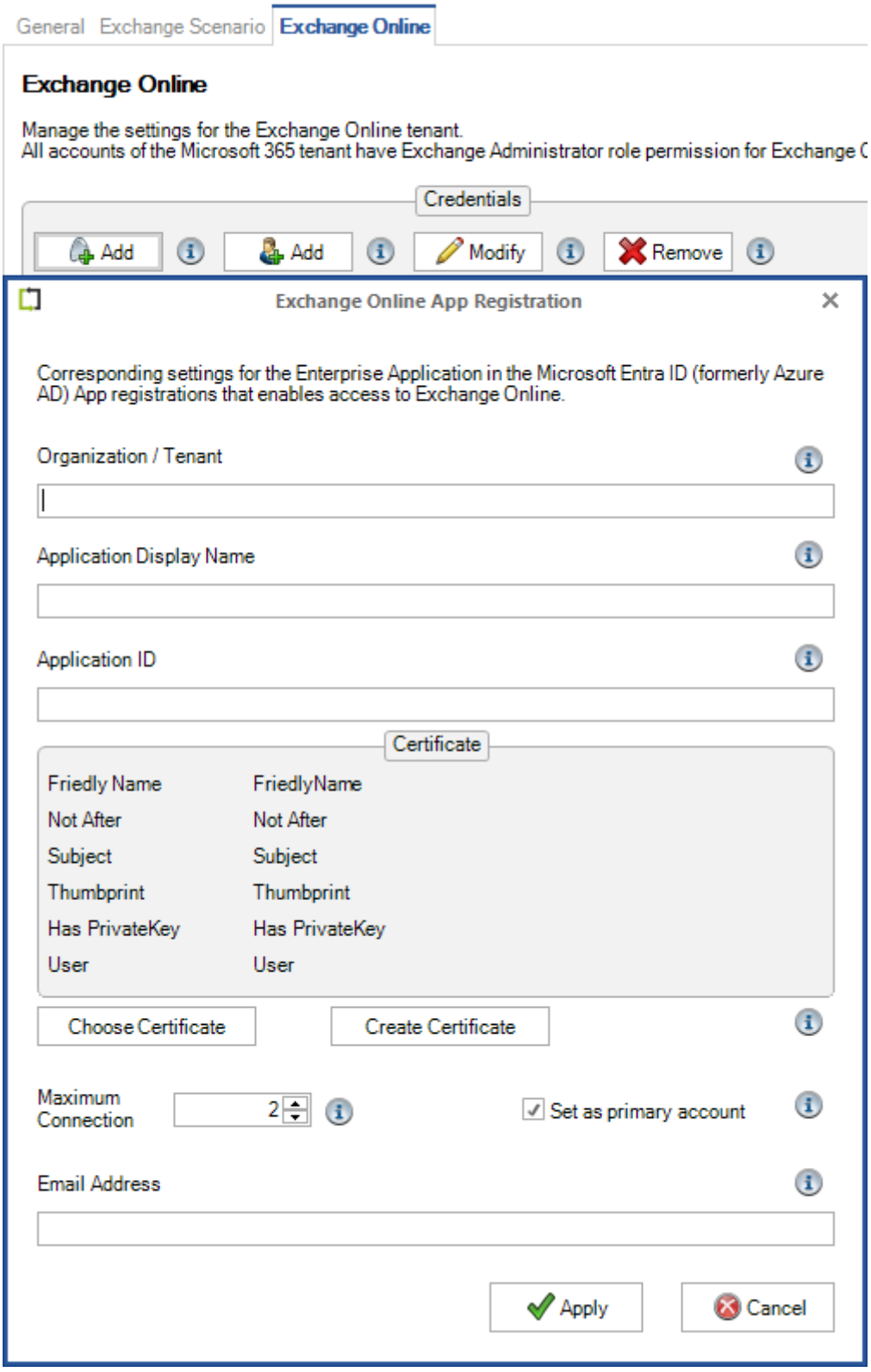
There are two available methods to establish a connection to Exchange Online on the Exchange Online tab of the **Environment Configuration**.



Please note, that user-based authentication via OAuth 2.0 works only for the Microsoft Azure Public Cloud instance. If your Microsoft 365/Office 365 instance is hosted by a national cloud, please use **Exchange Online certificate-based authentication via App registration**.

Exchange Online certificate-based authentication via App registration

The **Add** button on the left, will open a dialog window in which to configure **certificate-based authentication** via **App registration** for the Exchange Online tenant.

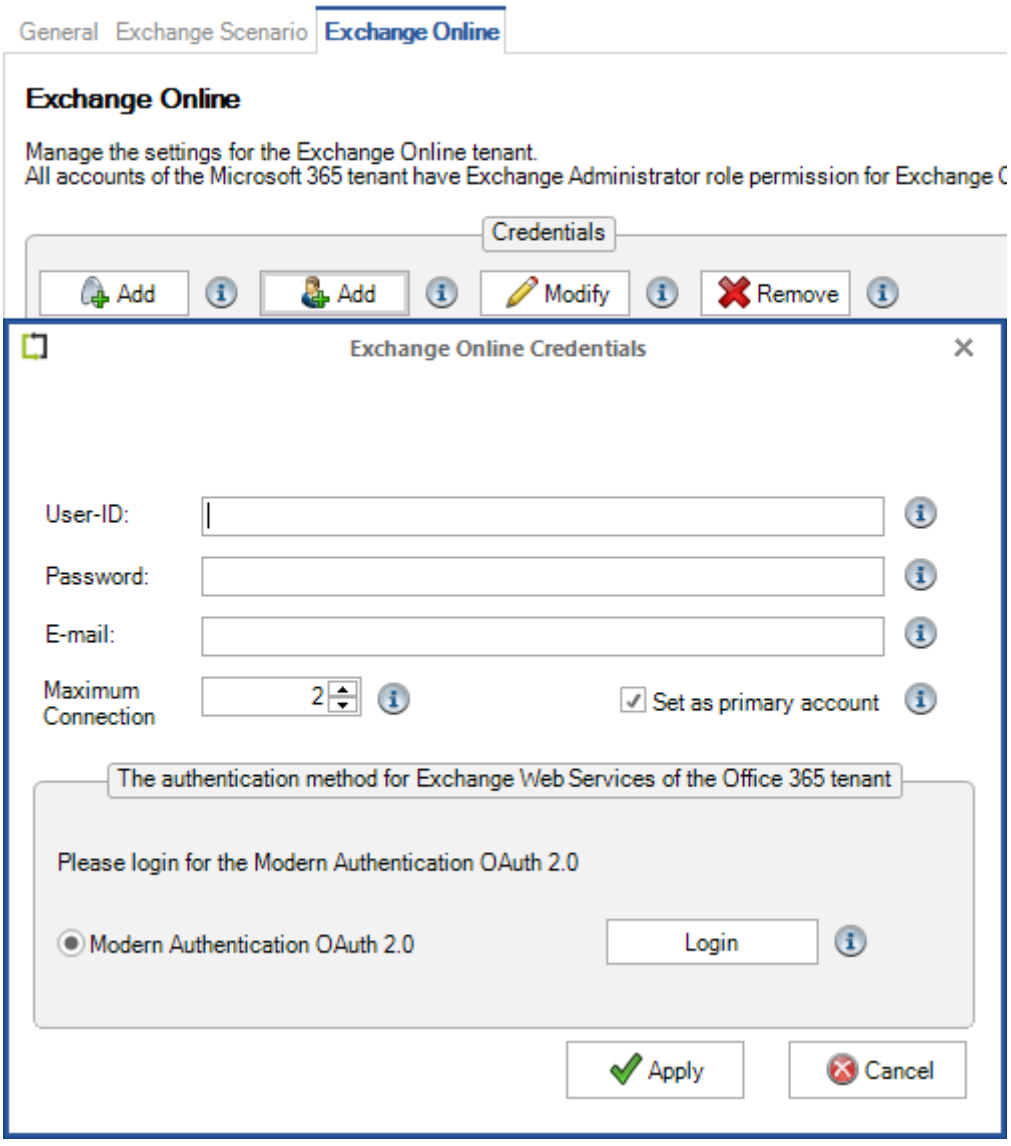


Detailed description is in chapter
Exchange Online certificate-based authentication via App Registration

Exchange Online authentication via Service Account

The **Add** button on the right, will open a dialog window in which to configure **user-based authentication** via **Service Account** for the Exchange Online tenant.

Please note, that user-based authentication via OAuth 2.0 works only for the Microsoft Azure Public Cloud instance. If your Microsoft 365/Office 365 instance is hosted by a national cloud, please use **Exchange Online certificate-based authentication via App registration**.

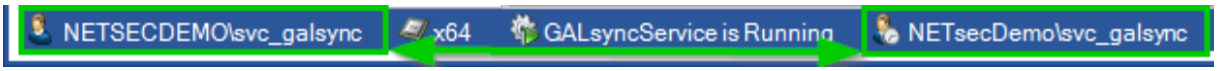


Detailed description is in chapter
Exchange Online authentication via Service Account

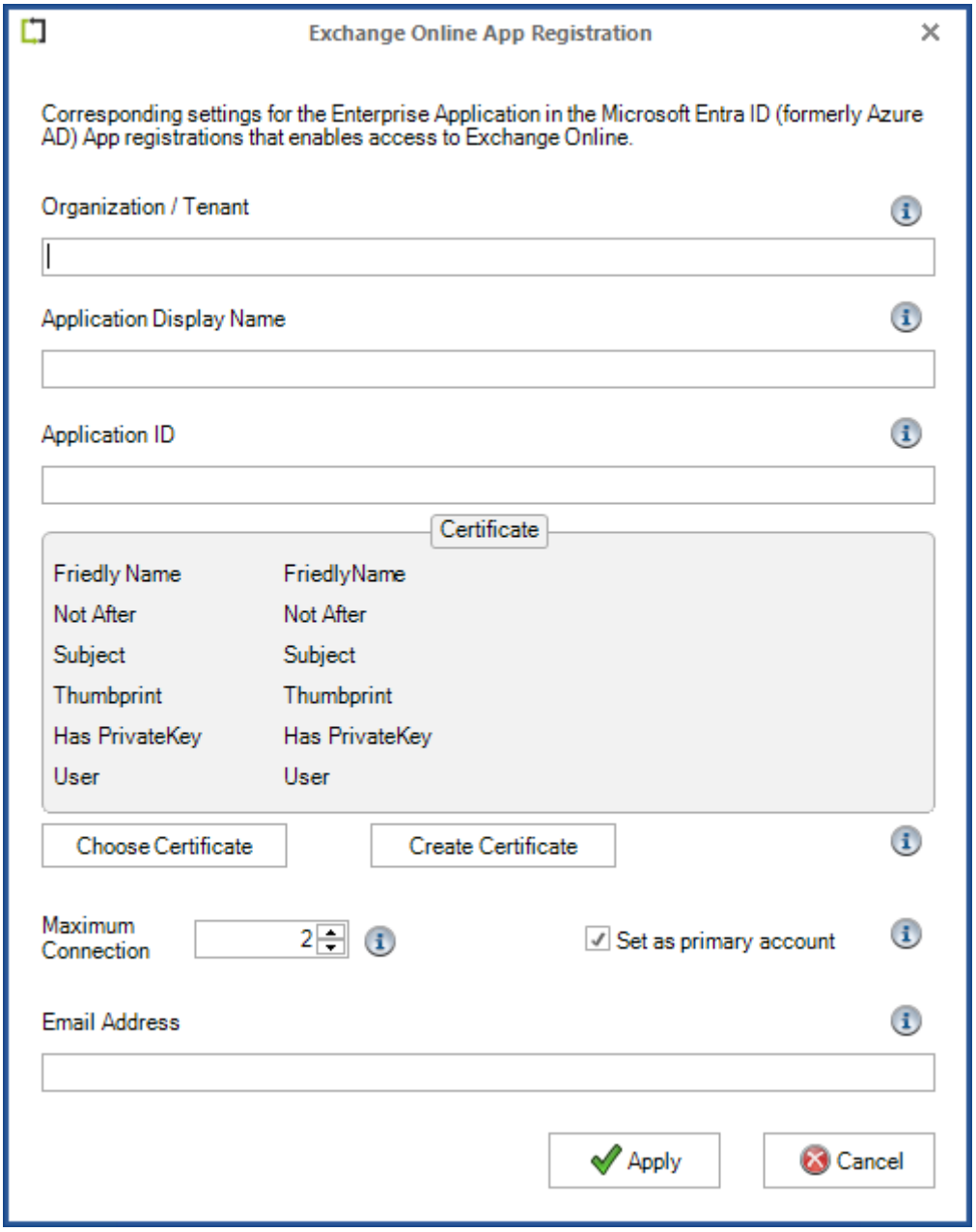
Exchange Online certificate-based authentication via App Registration

First, please verify the GALsync GUI is running in the credentials of the local GALsync service account, otherwise GALsync cannot decrypt the Application Id and cannot find the certificate later.

This can be confirmed on the information bar at the bottom of the GALsync GUI.



Register an Enterprise Application in the **Microsoft Entra admin center** (formerly known as **Azure Active Directory admin center**) and enter the corresponding values in the **Exchange Online App Registration** dialog.



The following description is based on the **Microsoft Documentation** article:

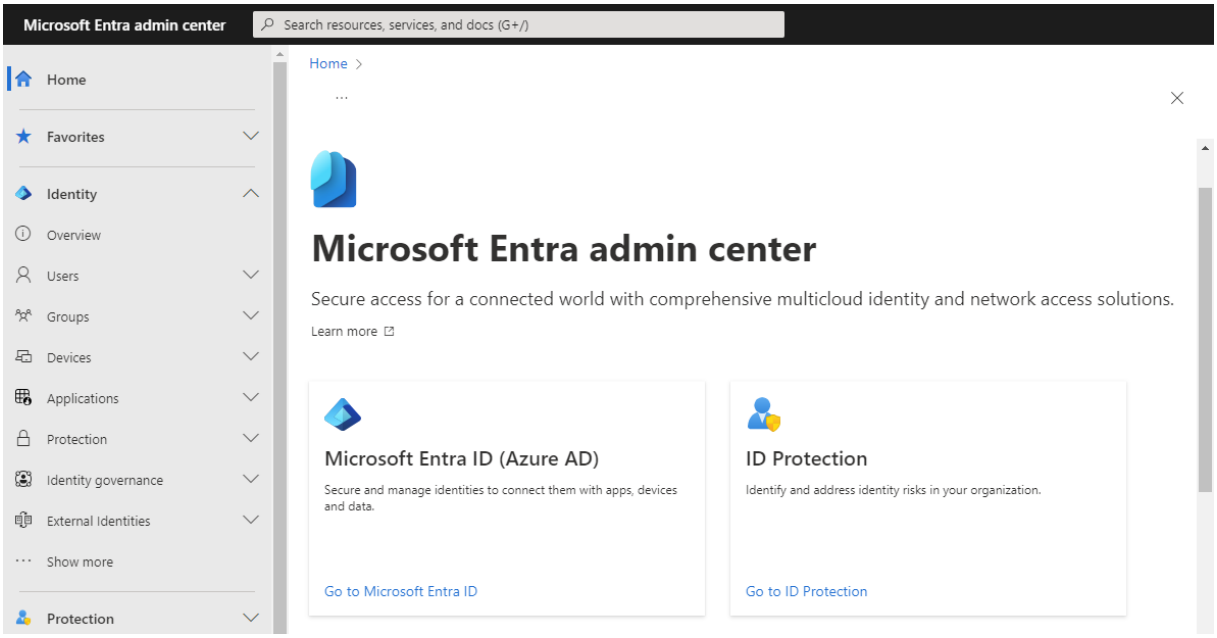
App-only authentication for unattended scripts in Exchange Online PowerShell and Security & Compliance PowerShell

https://learn.microsoft.com/en-us/powershell/exchange/app-only-auth-powershell-v2?view=exchange-ps

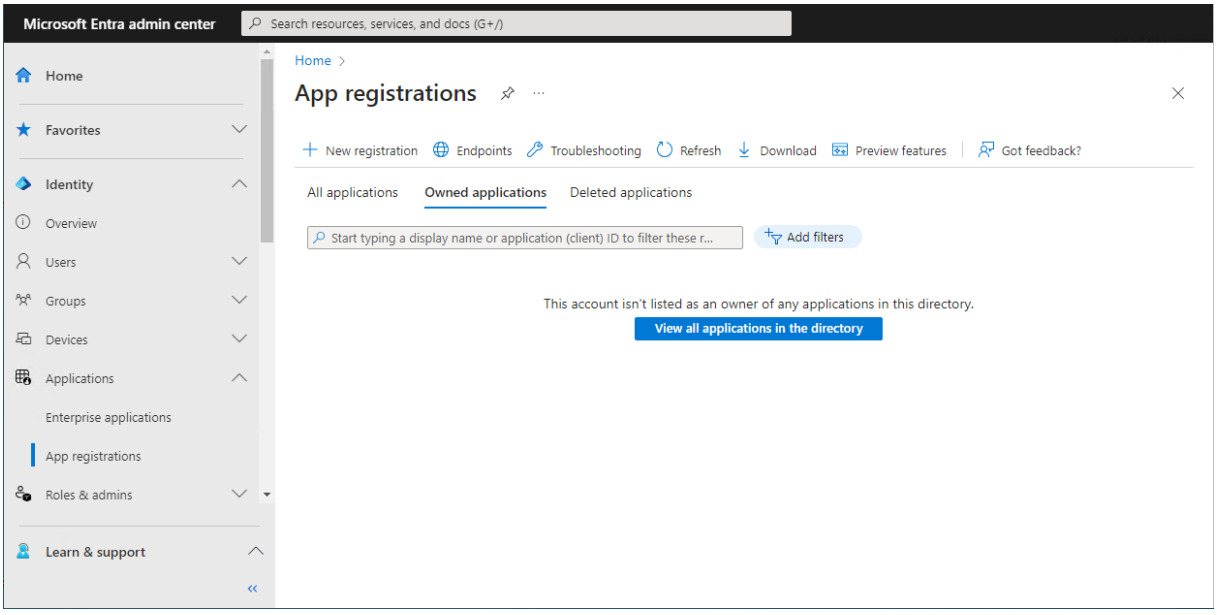
Register an Enterprise Application in Microsoft Entra ID

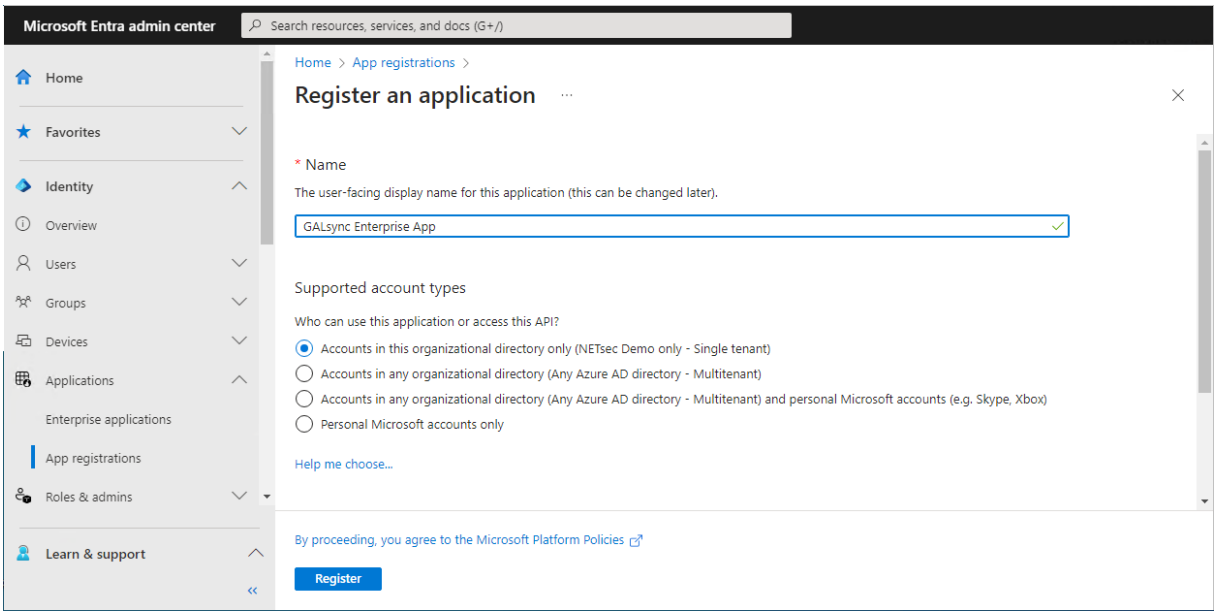
Logon to the **Microsoft Entra admin center** https://entra.microsoft.com

as a global administrator and expand **Identity** (formerly Azure Active Directory).



Expand **Applications** and go to **App registrations**. Then select **New registration**.

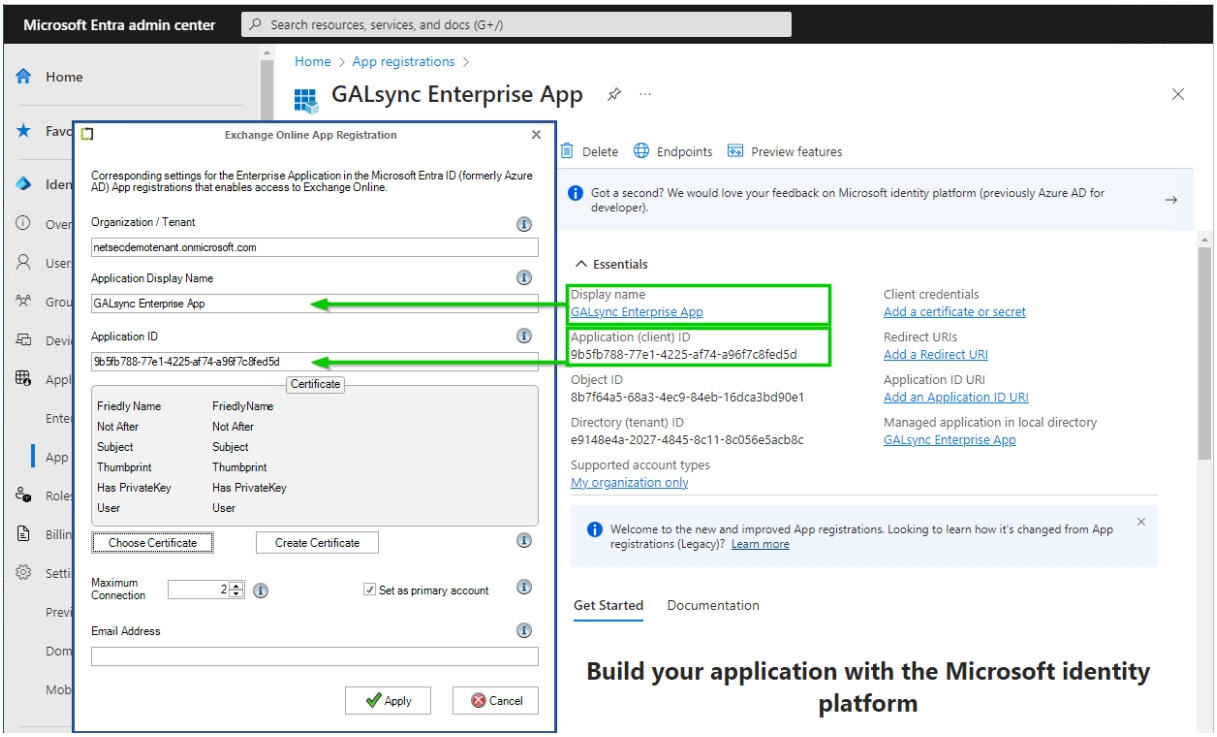




Enter a name for the **Application**.
In this example, it has been named **GALsync Enterprise App**.

Select the **Accounts in this organizational directory only (<*YourOrganizationName*> only - Single tenant)** radio button and click **Register**.

Transfer the information of the registered Application to the **Exchange Online App Registration** dialog.



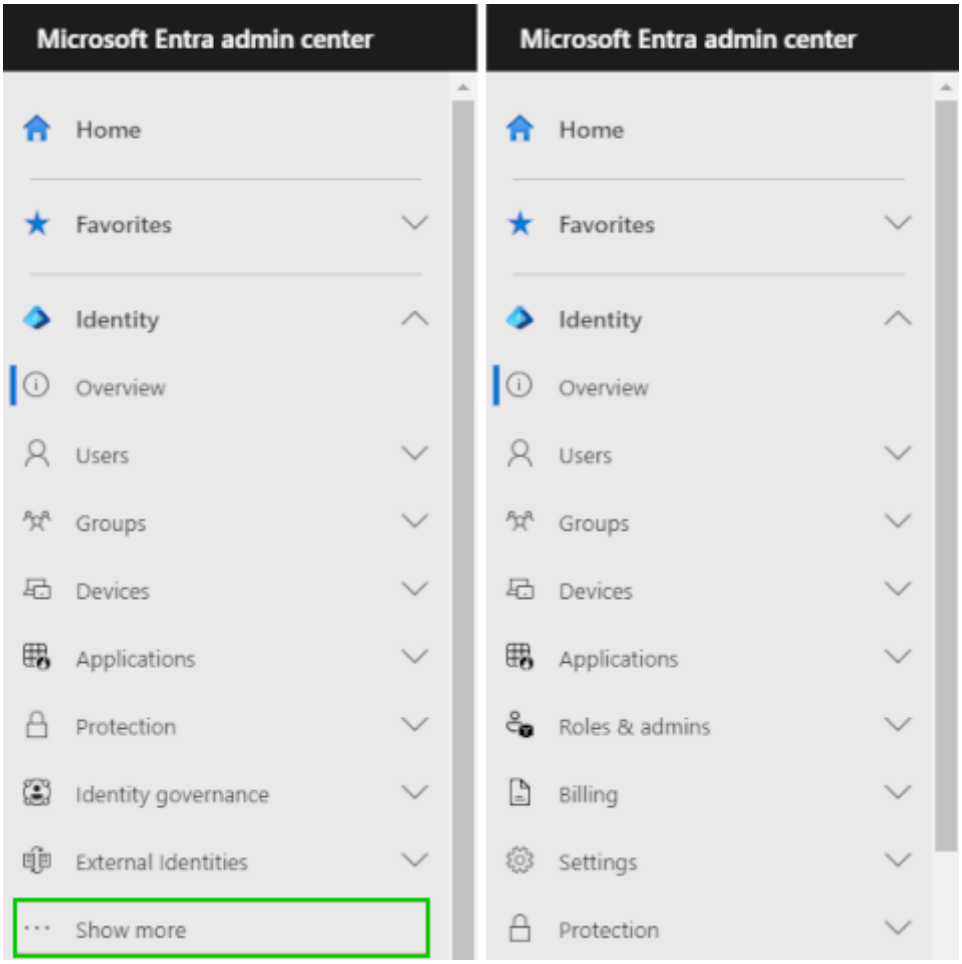
Organization / Tenant needs the **.onmicrosoft.com** domain name of the Microsoft 365 tenant. Otherwise, you may encounter cryptic permission issues when you run a policy in the app context. The next chapter will describe where to find the domain name of the Microsoft 365 tenant.

Application Display Name must have the value of the **Display name** of the registered Application.

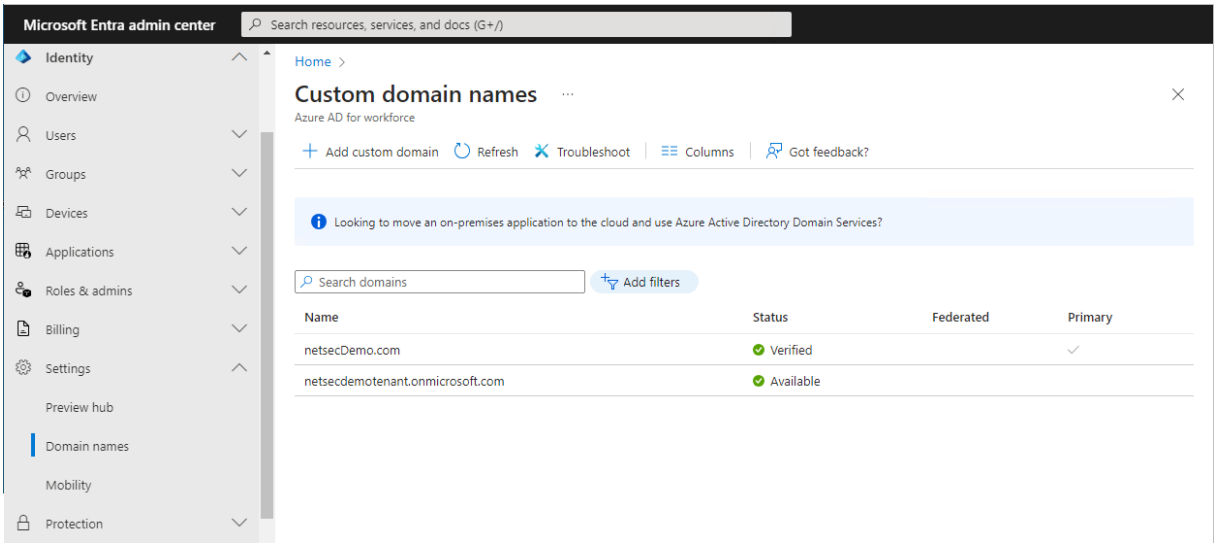
Application ID must have the value of the **Application (Client) ID** of the registered Application.

Where to find the domain name of the Microsoft 365 tenant?

Click **Show more** to see **Settings**



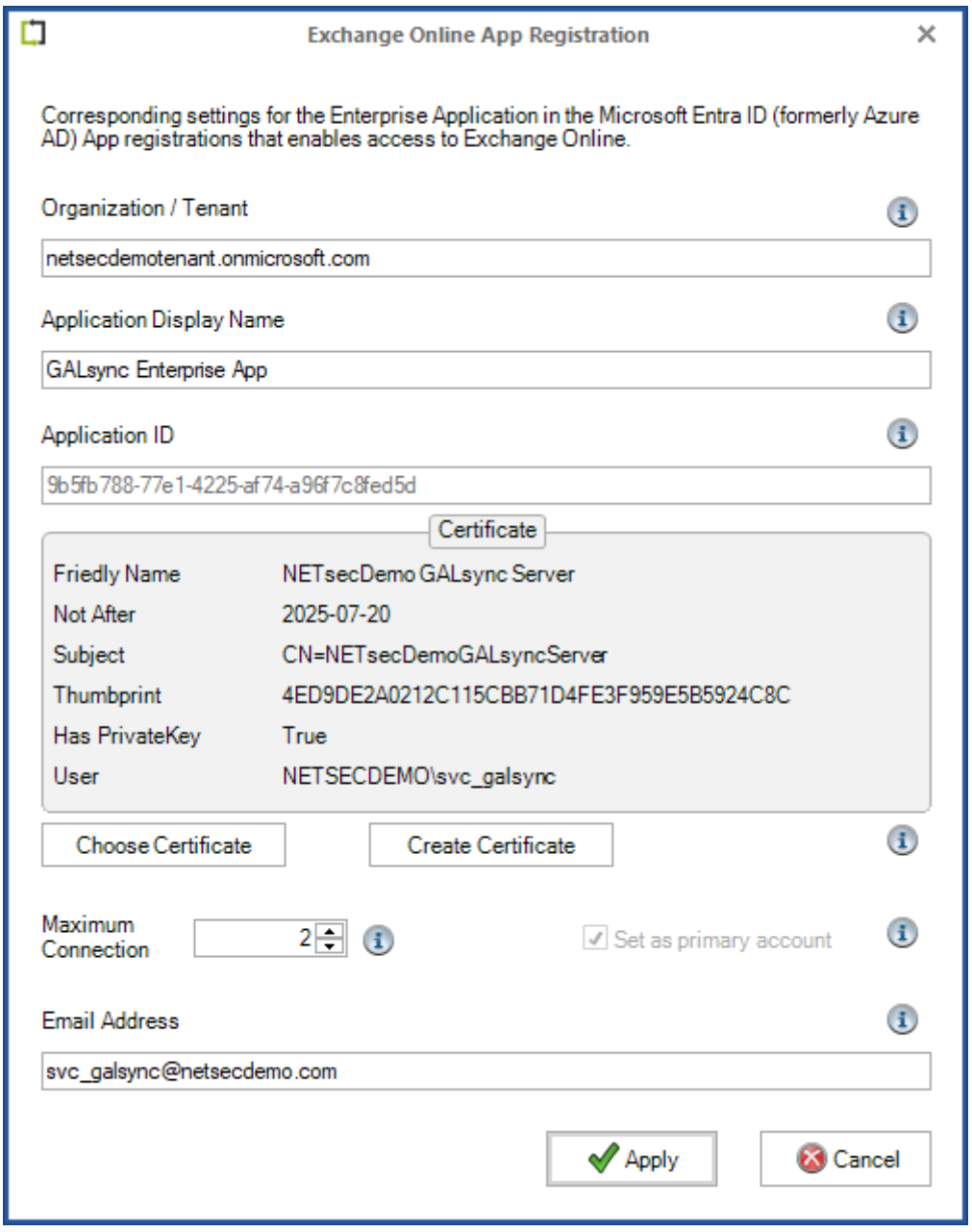
Expand **Settings,** go to **Domain names** and use the **.onmicrosoft.com** domain name.



Please do not confuse the Microsoft 365 tenant domain names with the Exchange Online accepted domains.

Certificate for the registered Application

For app-only authentication in **Microsoft Entra ID** (formerly known as Azure Active Directory), you typically use a certificate to request access. Anyone who has the certificate and its private key can use the application, and the permissions granted to the application.



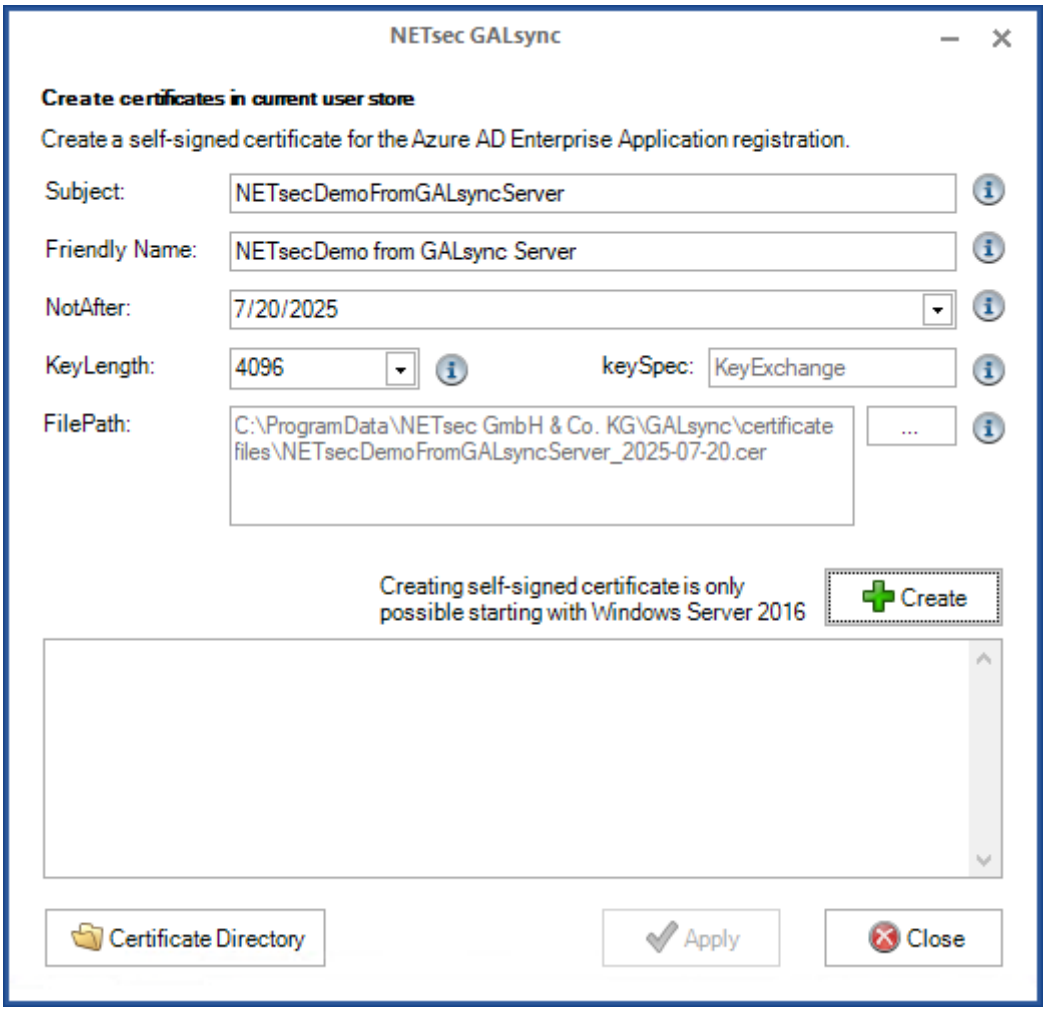
Choose Certificate

Choose an existing certificate and its private key from the user certificate store of the current user, which runs the GALsync GUI.

The corresponding public key file of this selected certificate must be uploaded to the registered Application.

Create Certificate

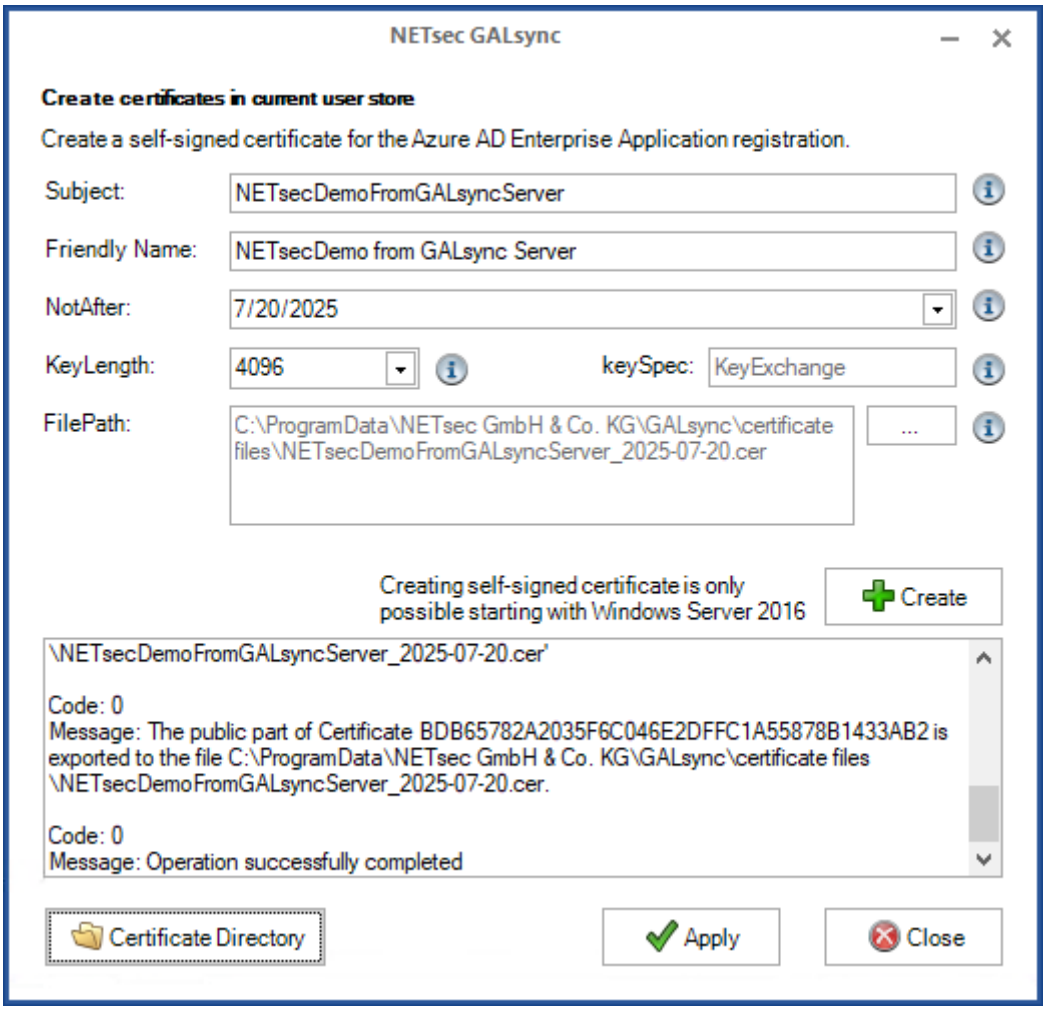
Create a self-signed certificate, which will be saved in the current user certificate store and will be used to authenticate your Application against **Identity** (formerly Azure Active Directory), while requesting the app-only access token.



Enter the **Subject**, and **Friendly Name** of the certificate.

In the example above, the forest name (NETsecDemo) and the name of the server (GALsync Server) from which the connection is established will be incorporated in both.

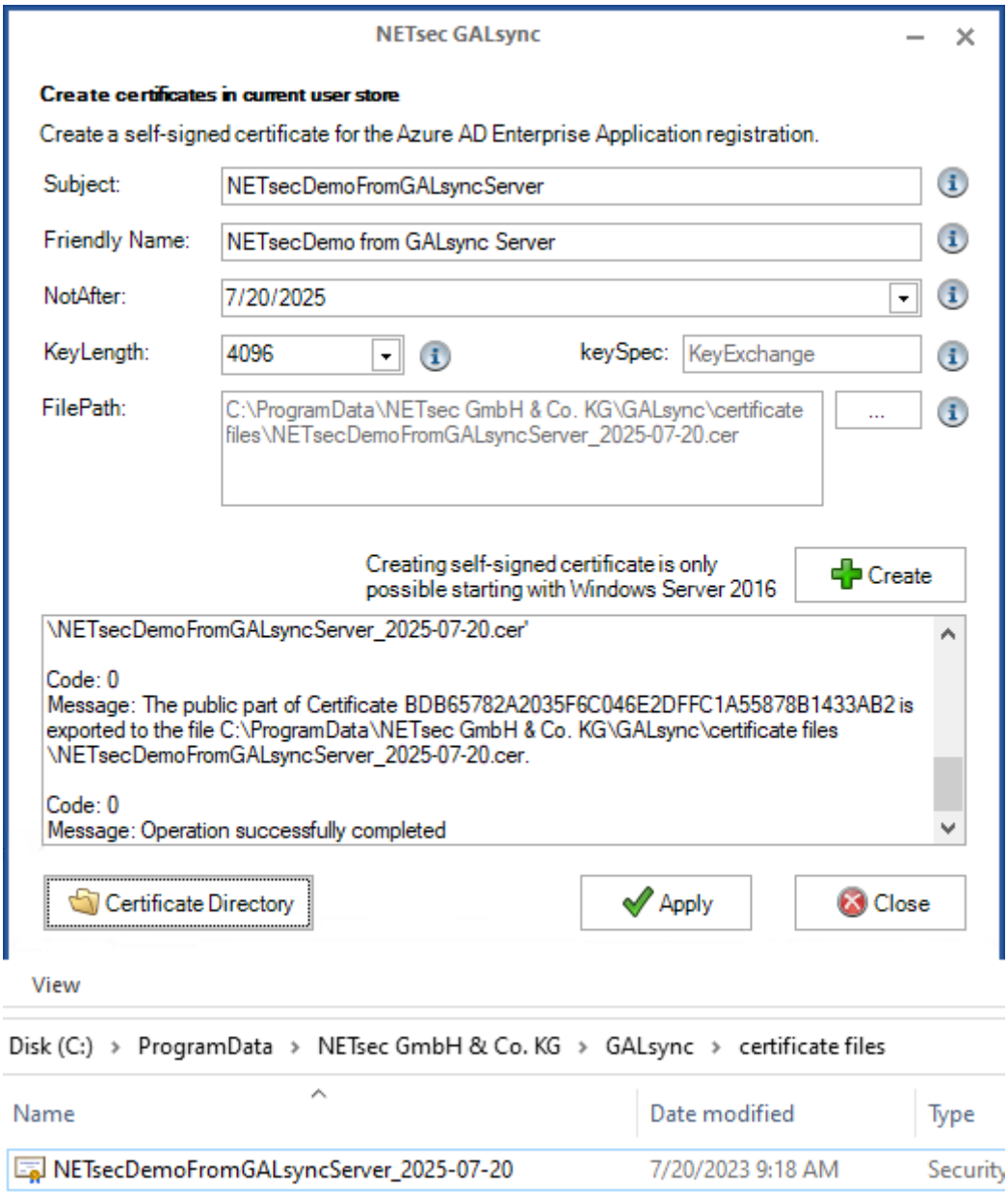
Click **Create** to generate a new certificate.



The public key file is created in the default path

```
C:\ProgramData\NETsec GmbH & Co. KG\GALsync\certificate files\
```

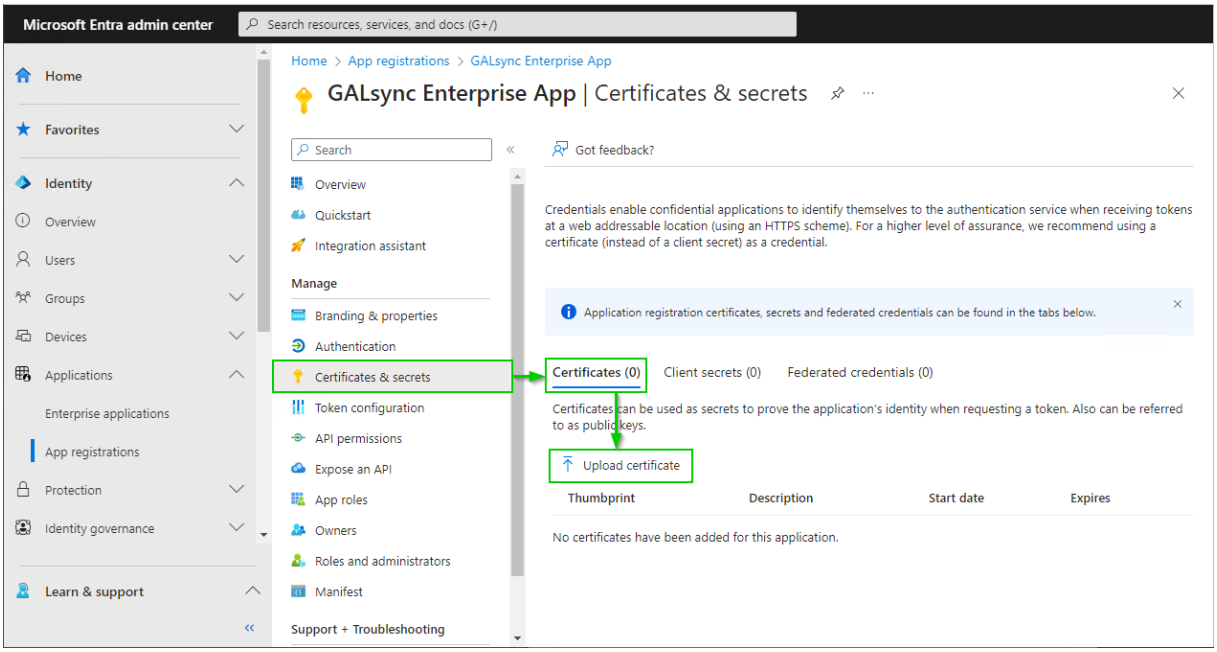
Click on the **Certificate Directory** button to open the folder in **File Explorer**



Then click **Apply** to close the Create Certificate dialog.

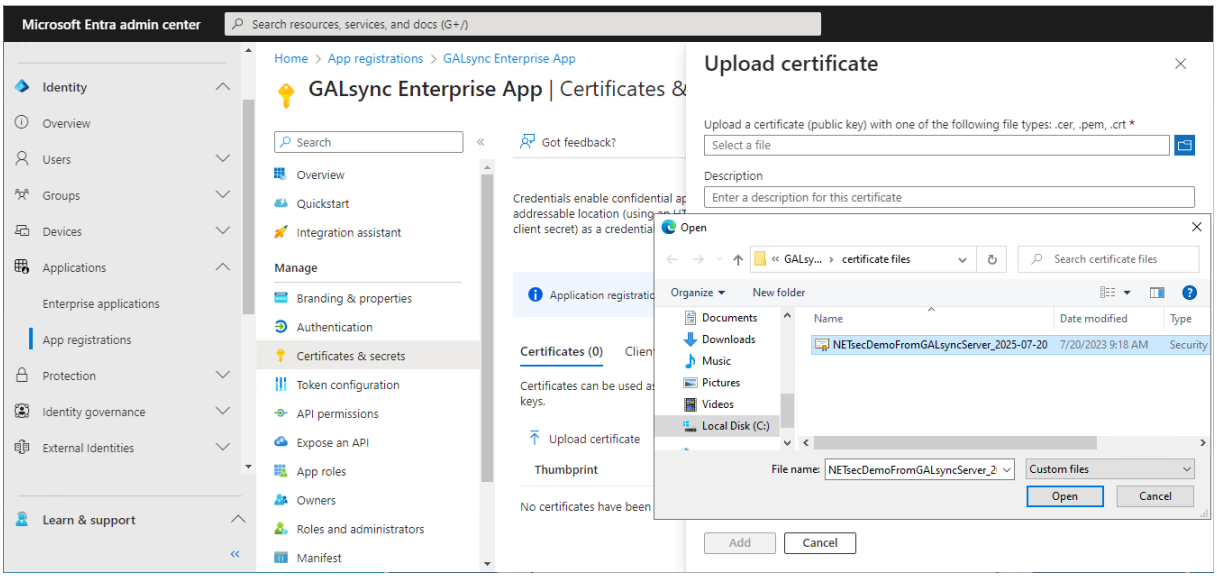
Upload certificate file for the registered Application

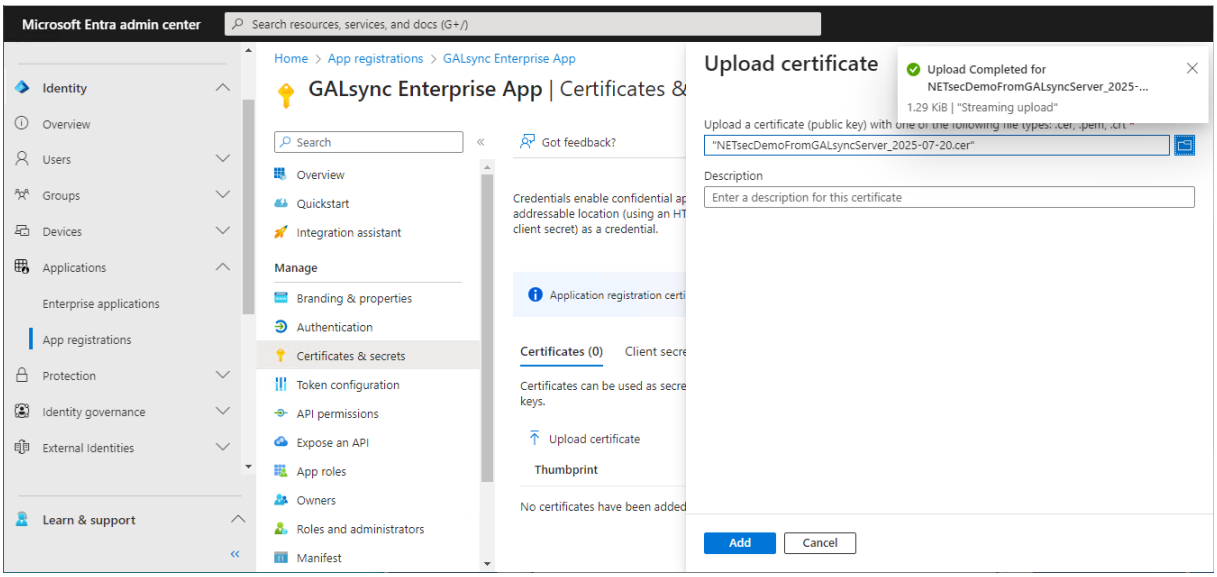
Go to **Certificates & secrets** of the registered Application in **Microsoft Entry ID** (Azure AD), and select the **Certificates** tab.



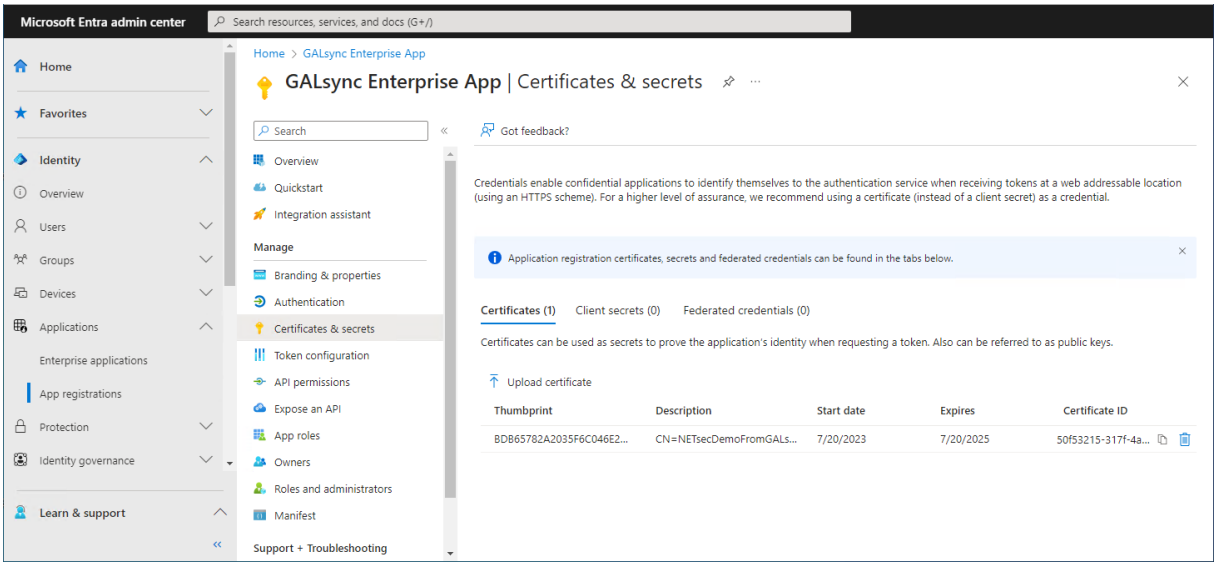
Select **Upload certificate**, then browse to the location where the certificate was saved. Select, and open it. The default path is:

```
C:\ProgramData\NETsec GmbH & Co. KG\GALsync\certificate files
```



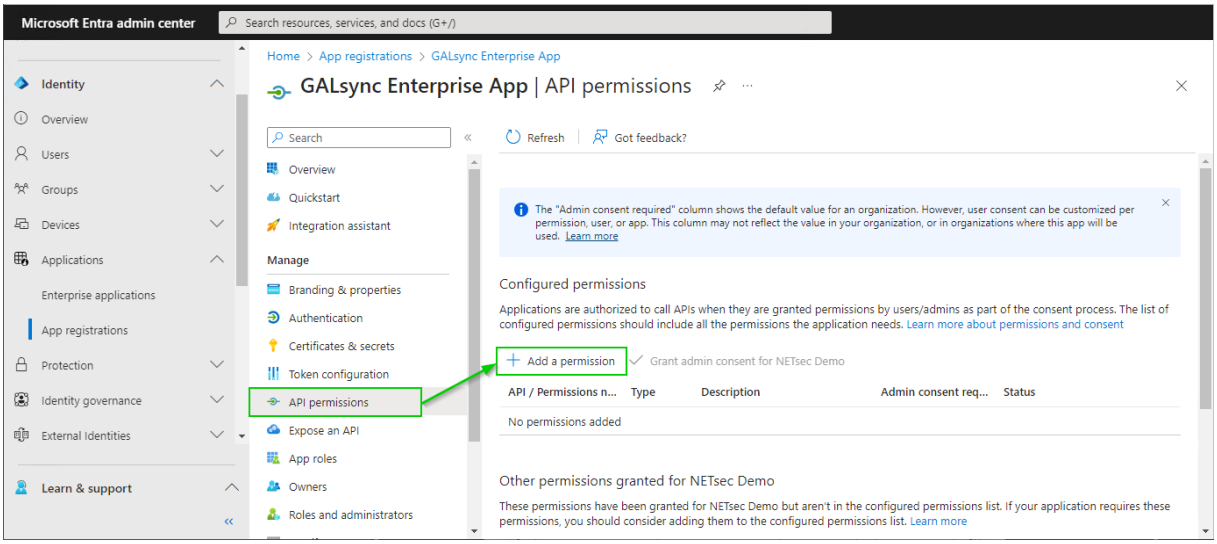


Add the selected certificate.

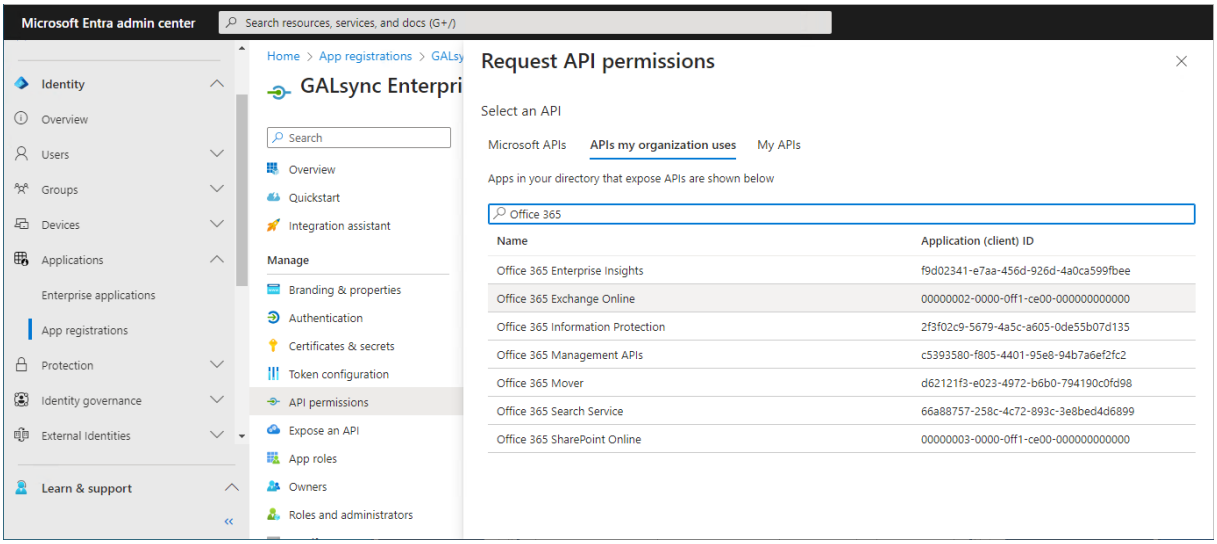


Assign API permissions to the registered Application

Go to **API permissions**, then select **Add a permission**

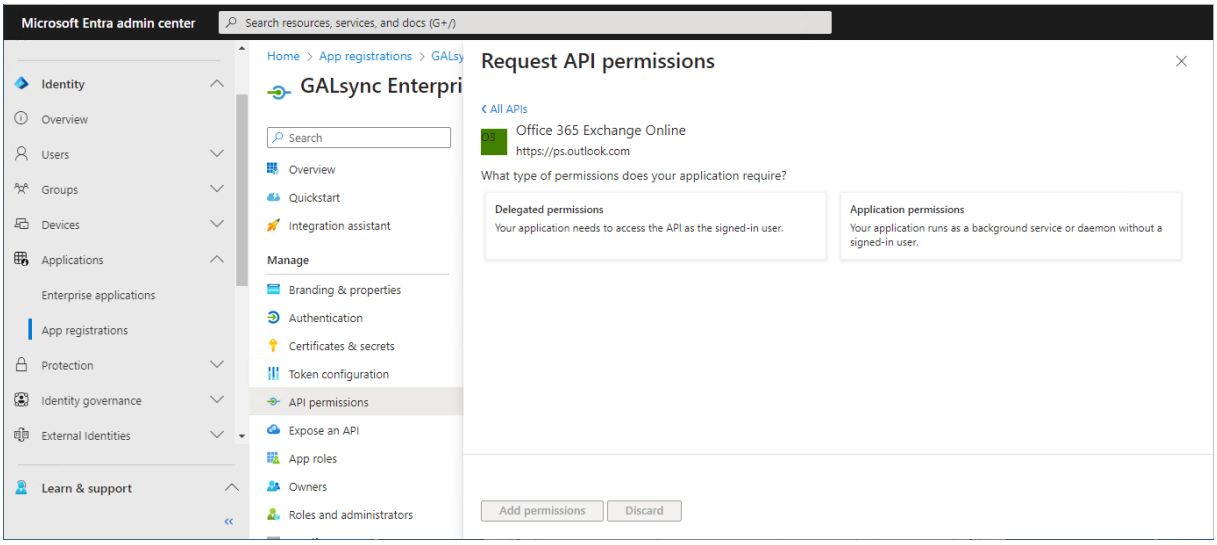


Select the **APIs my organization uses** tab on the **Request API permissions** dialog and search for **Office**.

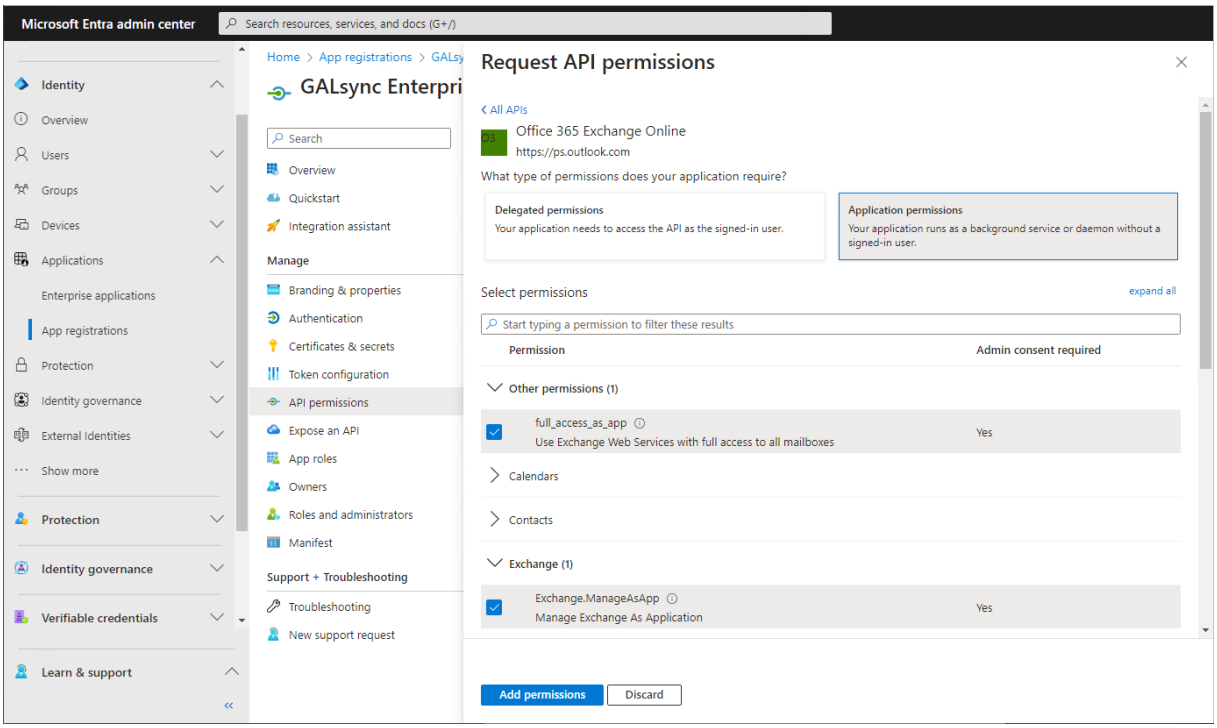


Click on **Office 365 Exchange Online** in the result list to open it.

Select **Application permissions**

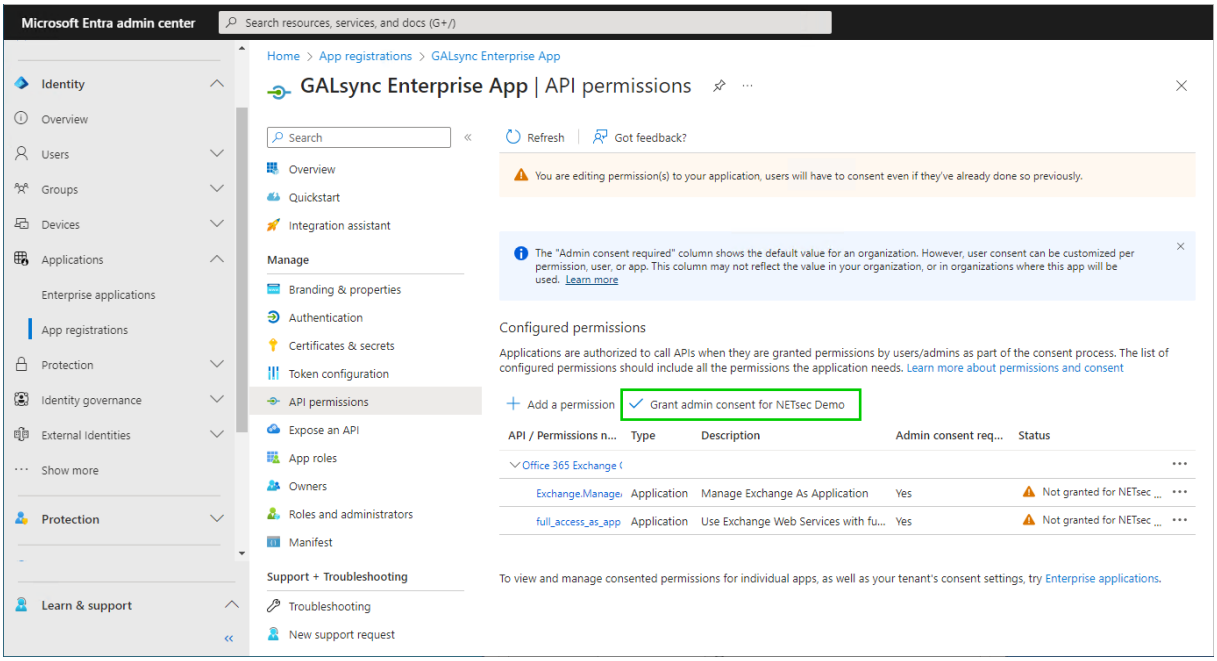


Select
full_access_as_app
Use Exchange Web Services with full access to all mailboxes
and
Exchange.ManageAsApp
Manage Exchange As Application

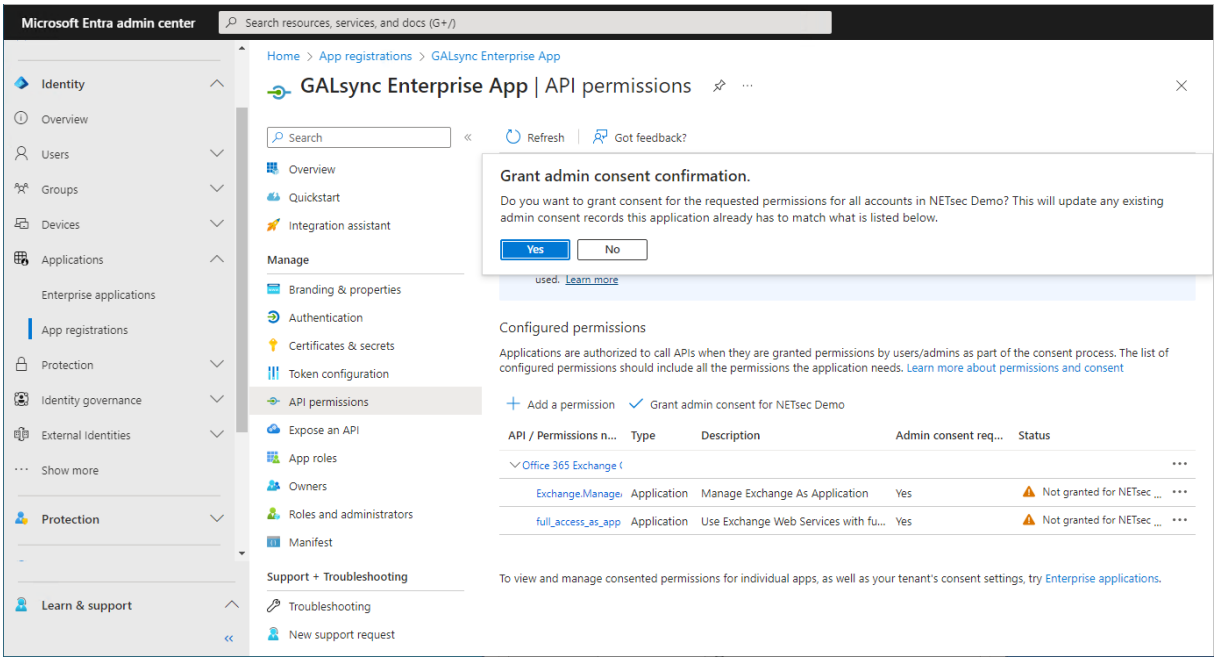


Click **Add permissions**

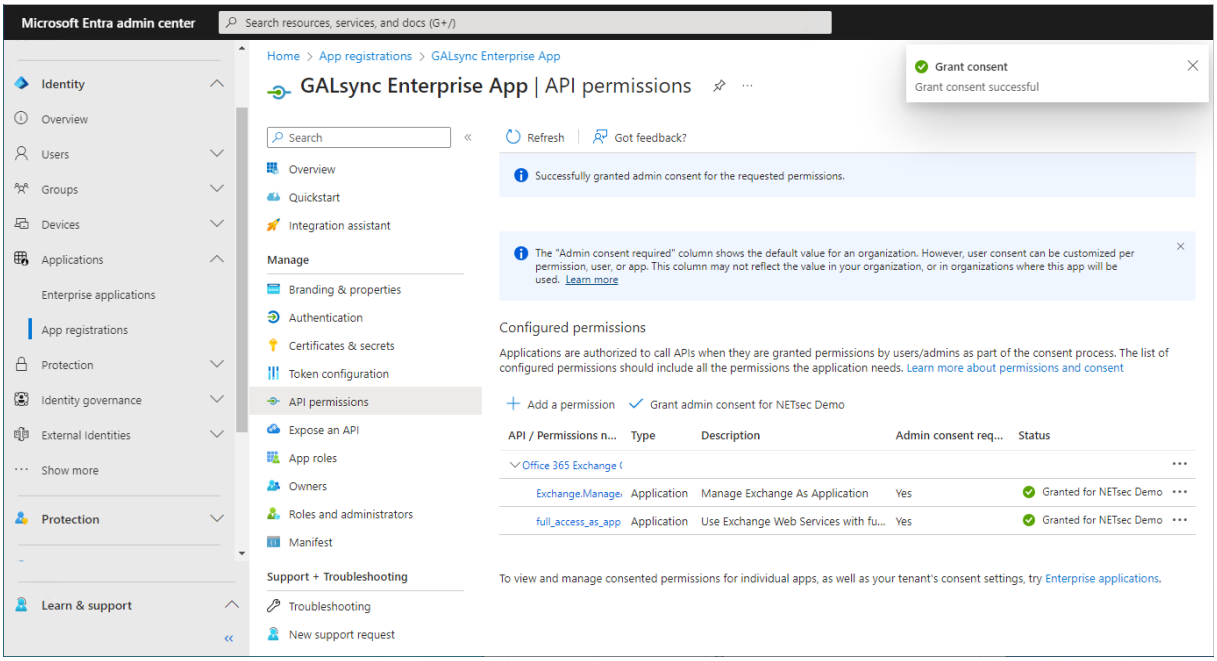
Click **Grant admin consent for** your tenant.



Click **Yes** to confirm the consent.



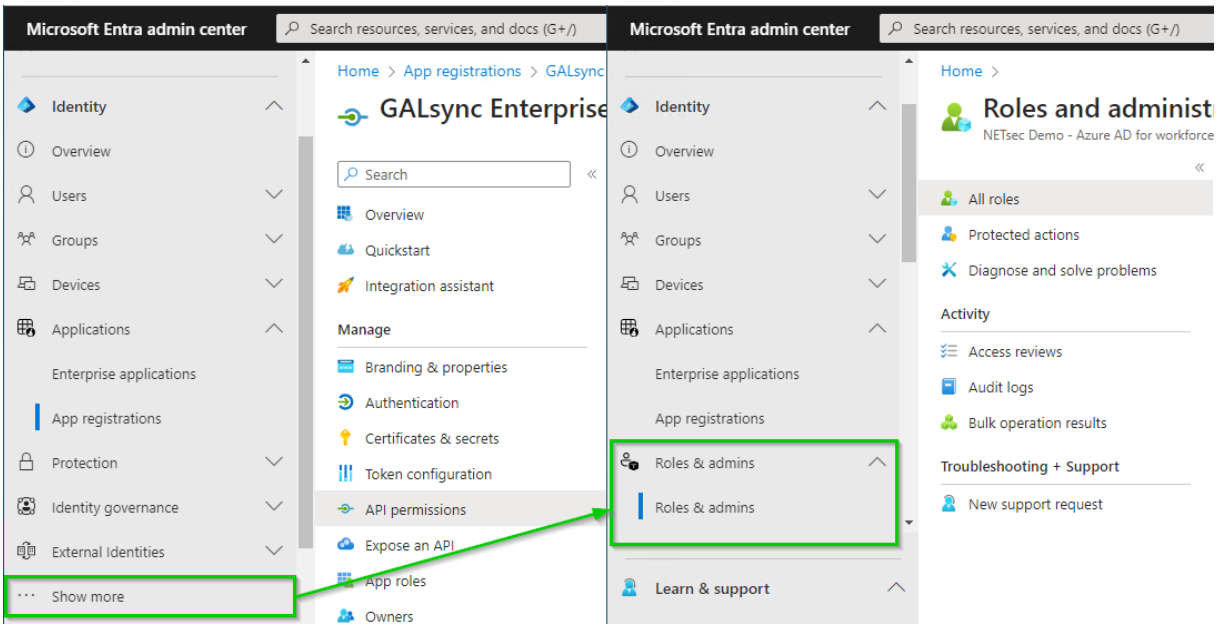
API permissions are assigned to the registered Application.



Exchange Administrator role for the registered Application

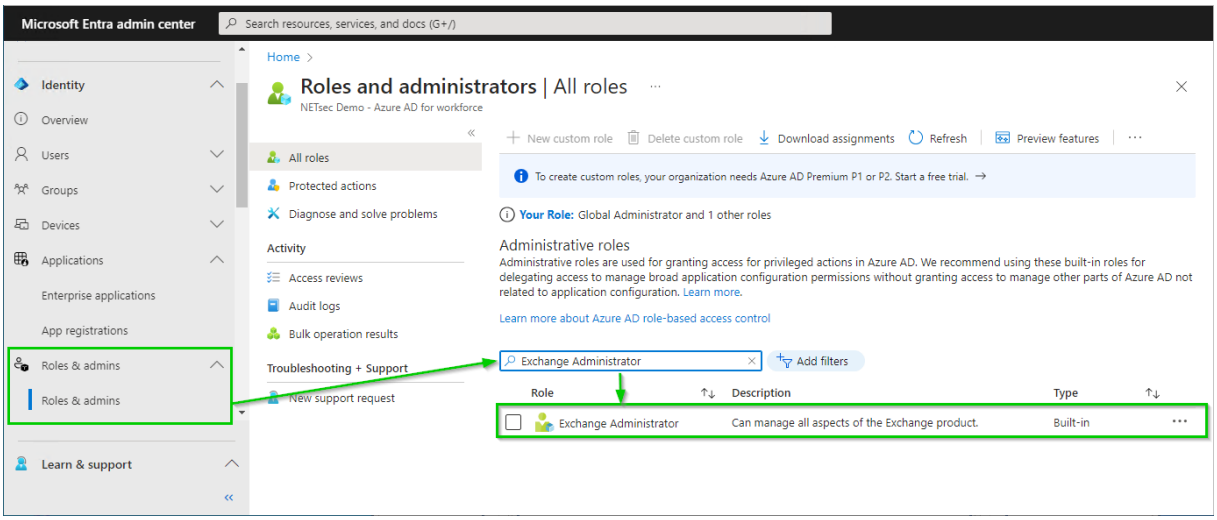
The **Exchange Administrator role** for **Exchange Online** is necessary because GALsync communicates via the **Exchange Online PowerShell** with the Microsoft 365 tenant.

The application requires **Exchange Administrator role** in the Microsoft 365 tenant, otherwise GALsync will not have access to the complete set of Exchange Online PowerShell cmdlets which are needed to function properly.

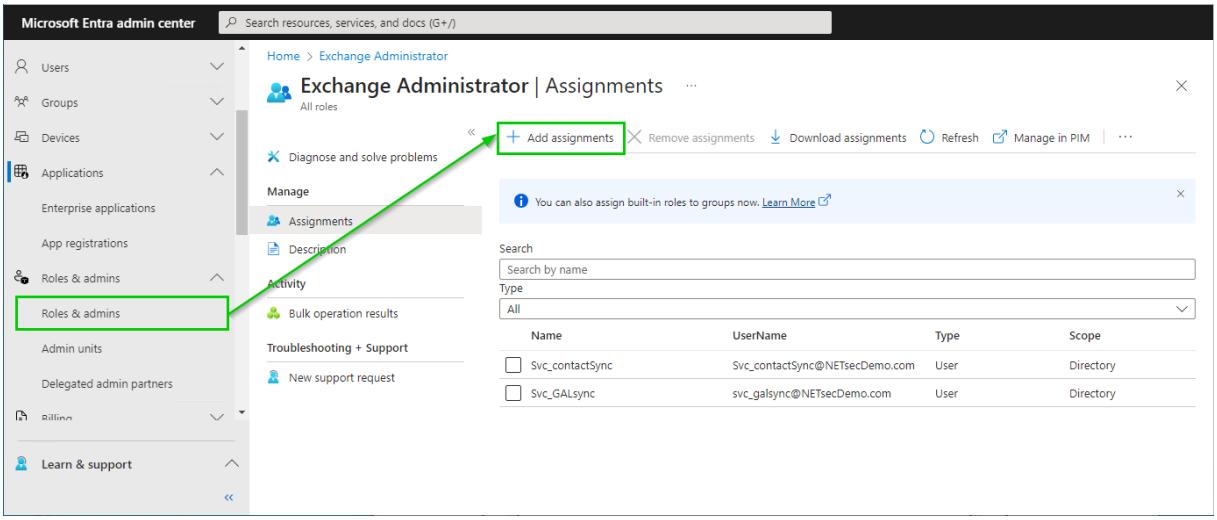


Expand **Roles & admins**. If you do not see **Roles & admins** in the **Identity** menu, click **Show more …** .

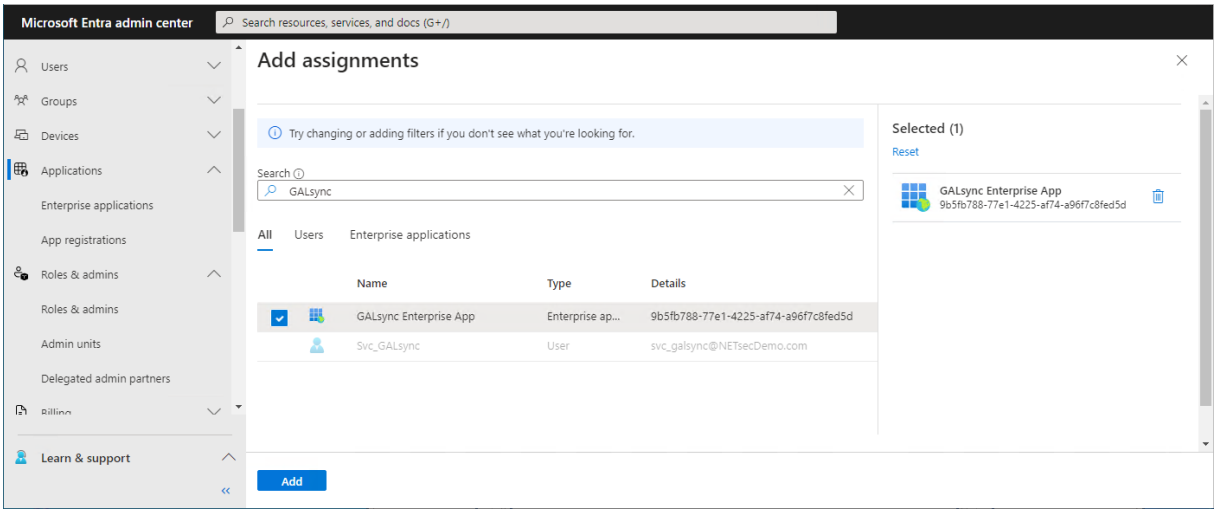
Go to **Roles & admins** in the expanded **Roles & admins** menu and search for **Exchange Administrator**.



Click on the **Exchange administrator** in the result list to open the **Exchange administrator role**.

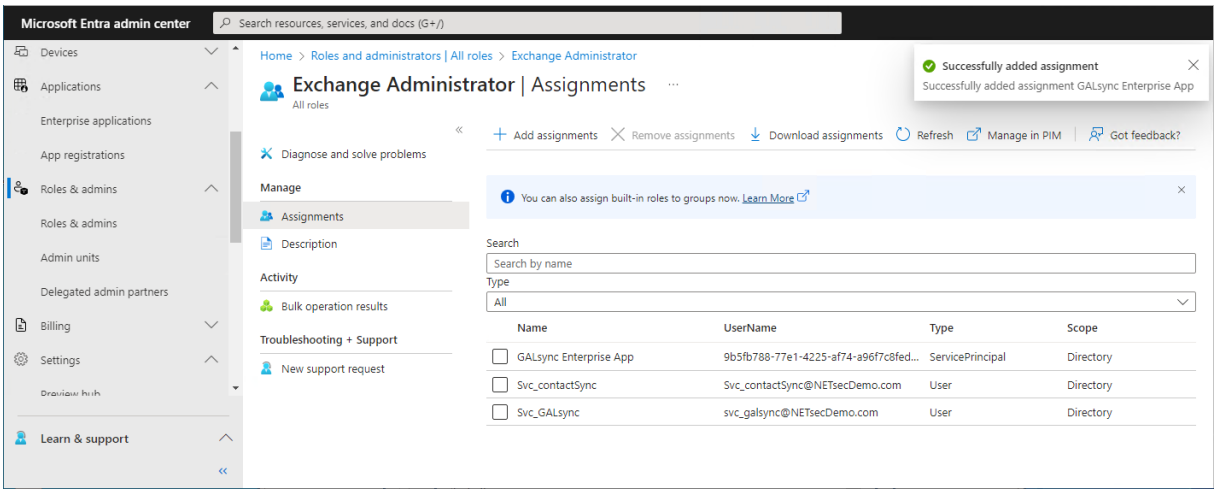


Click **Add assignments**, then search for the newly registered application.



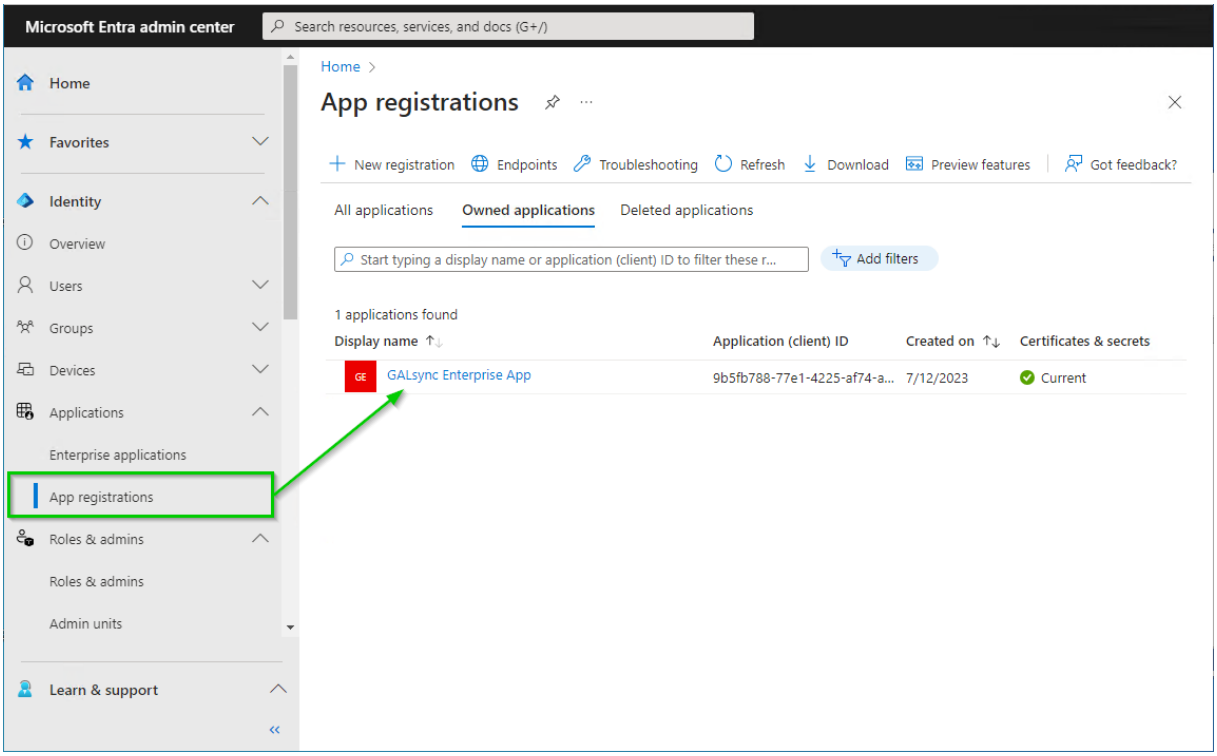
Select the newly registered application and click **Add**.

The application has been assigned the **Exchange Administrator Role**.

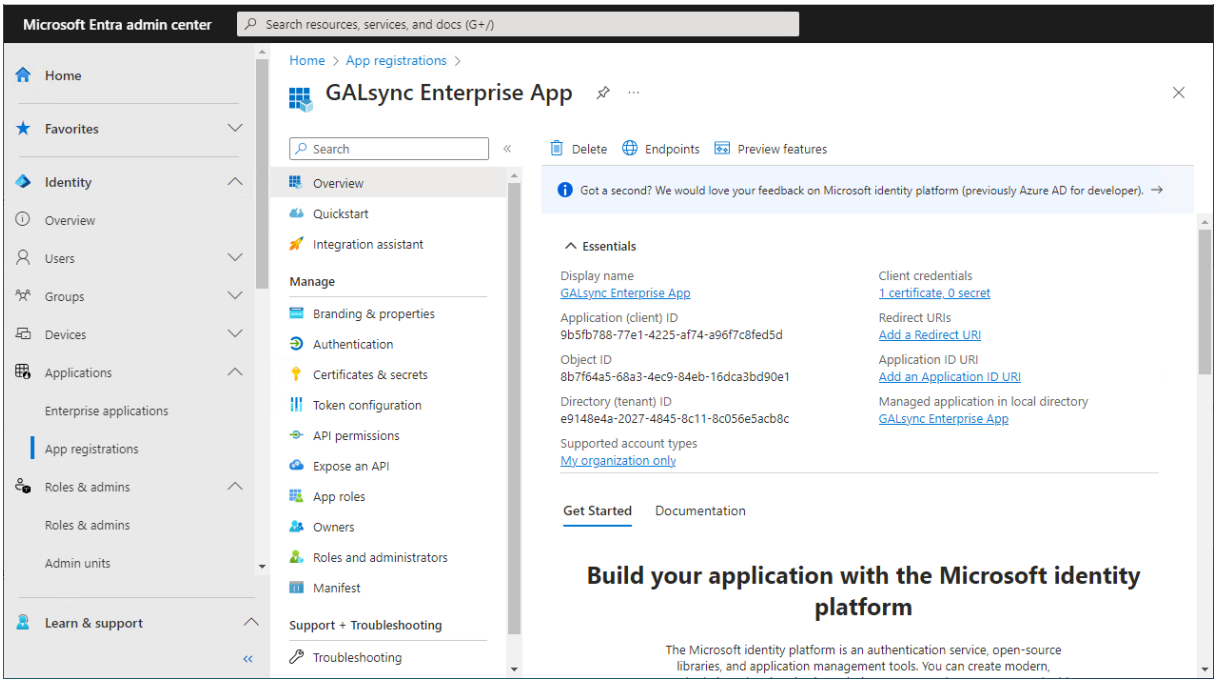


Overview of the registered Application in App registrations

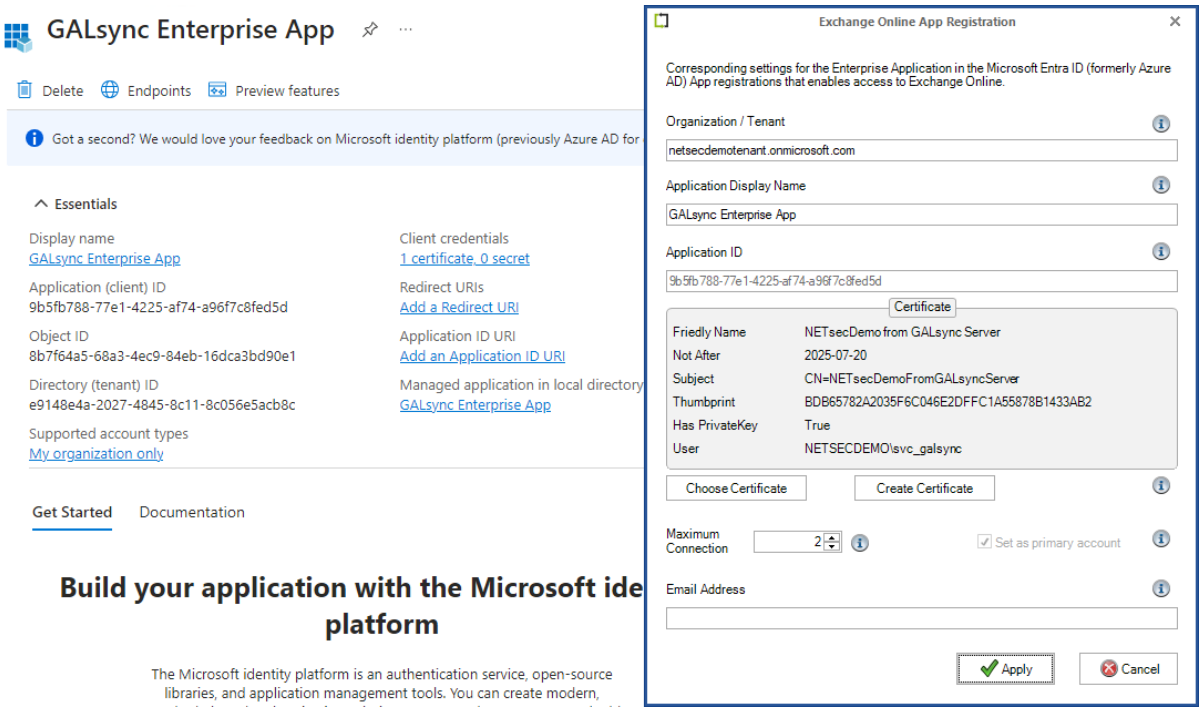
Go to **Identity** in the **Microsoft Entra admin center** menu, expand **Applications** and select **App registrations**.



Select the registered Application to see the overview.



Please check whether the values of the registered Application are corresponding with the values in the **Exchange Online App Registration** dialog.

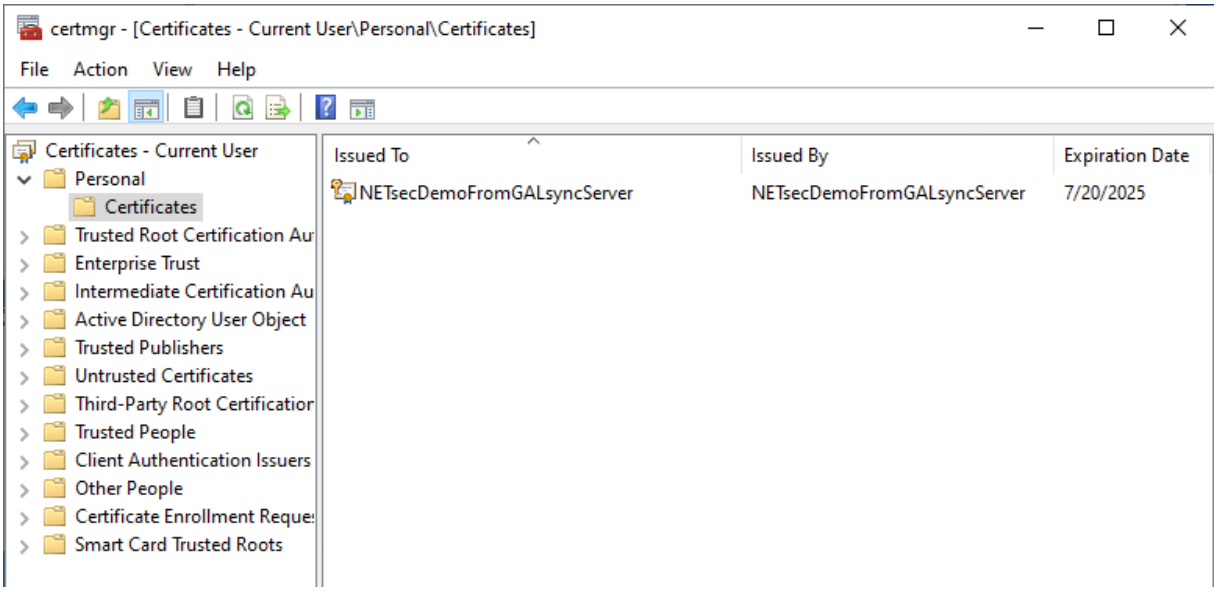


Organization / Tenant needs the **.onmicrosoft.com** domain name of the Microsoft 365 tenant. Otherwise, you might encounter cryptic permission issues when you run a policy in the app context.

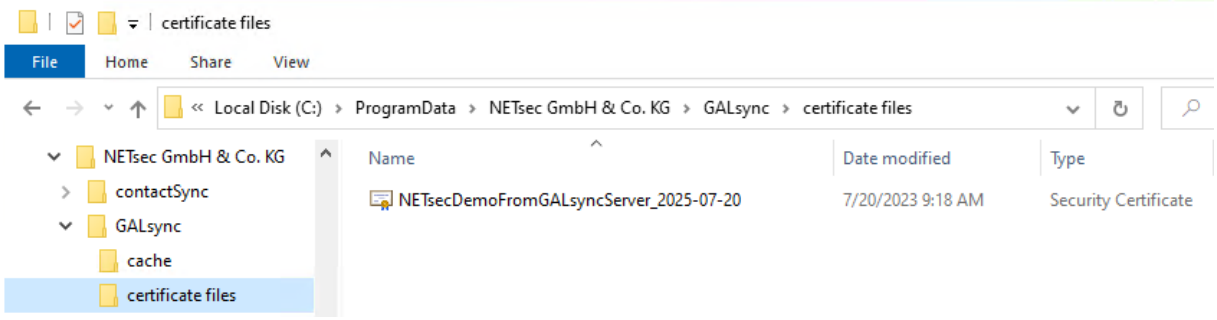
Application Display Name must have the value of the **Display name** of the registered Application.

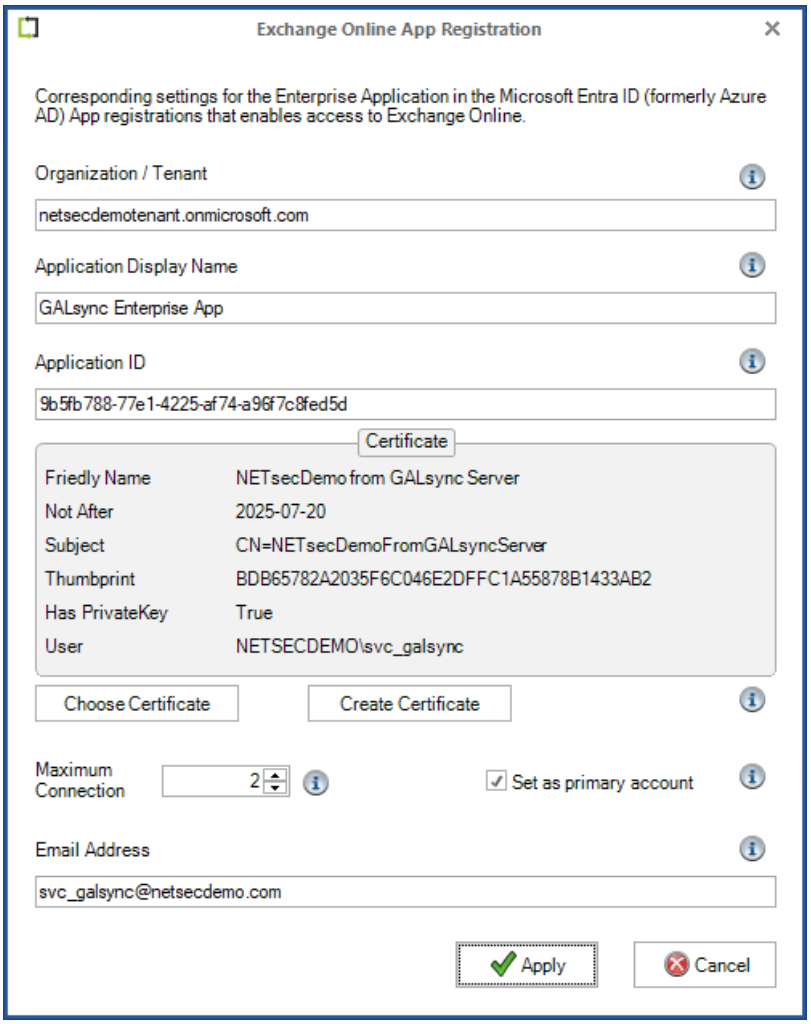
Application ID must have the value of the **Application (Client) ID** of the registered Application.

A **Certificate** is created and selected from **Current User Personal Certificates store**



and the corresponding certificate file is attached to the **Entra ID application**.





To complete the **Exchange Online App Registration** dialog, insert an **Email Address** of an Exchange Online mailbox.

Email Address of an Exchange Online mailbox is necessary to send and receive email. We recommend to use a dedicated Exchange Online mailbox for this purpose.

Click **Apply** to finish and close the **Exchange Online App Registration** dialog.

Limit the scope of application permissions to access mailboxes

The registered application (App registrations) for GALsync only needs access to the Exchange Online mailbox, which GALsync uses to send and receive email, if only GALsync policies should be configured.

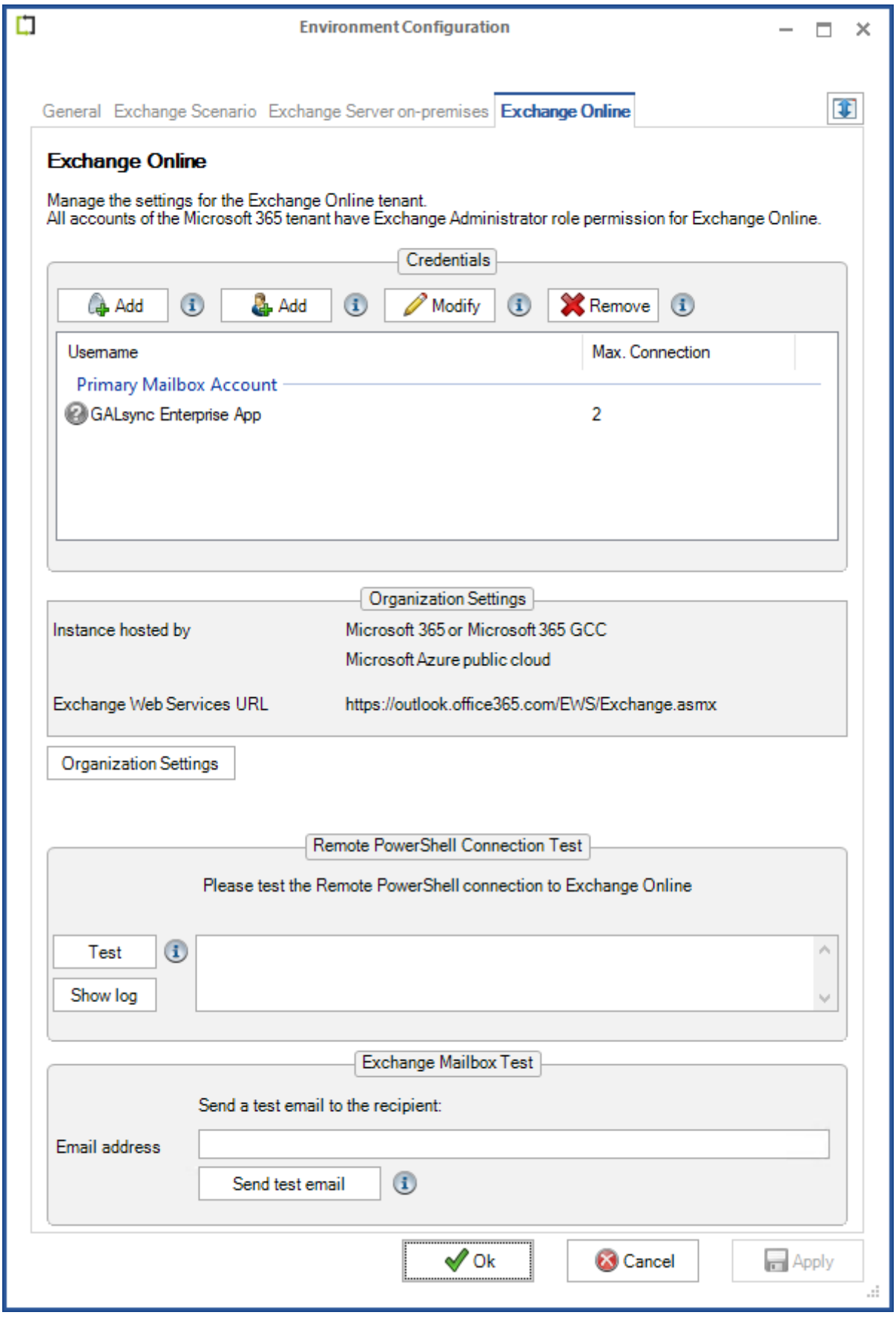
Please note, if contactSync policies should be configured, the application needs access to all the Exchange mailboxes, which should receive the contacts.

Please take a look at following chapters in the GALsync manual:

How to check existing application access policy for the application

How to restrict access to specific mailboxes for the application

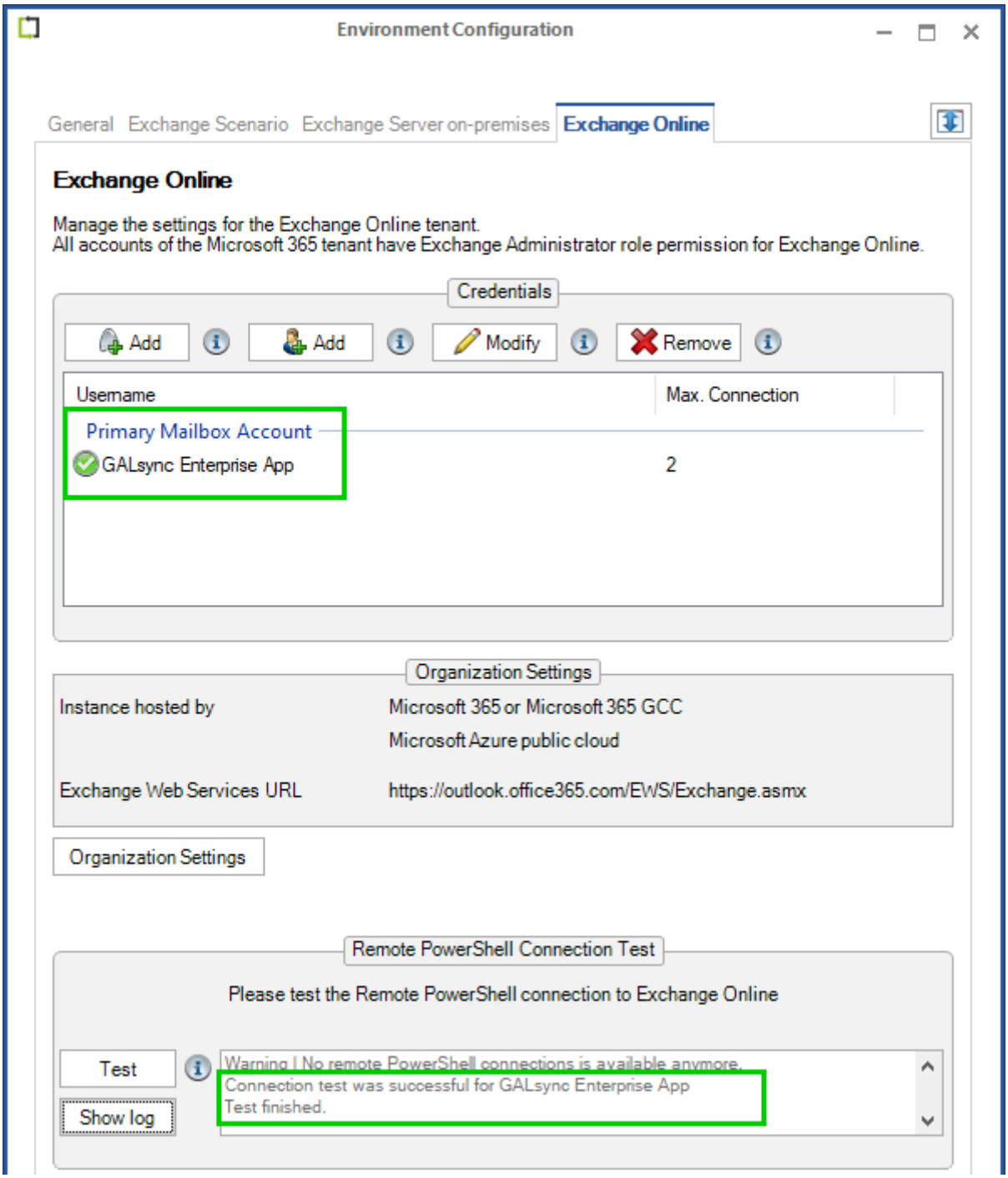
Test the Exchange Online PowerShell connection and the Exchange mailbox



Click the **Test** button for the **Remote PowerShell Connection Test**, to test connectivity to Exchange Online PowerShell.

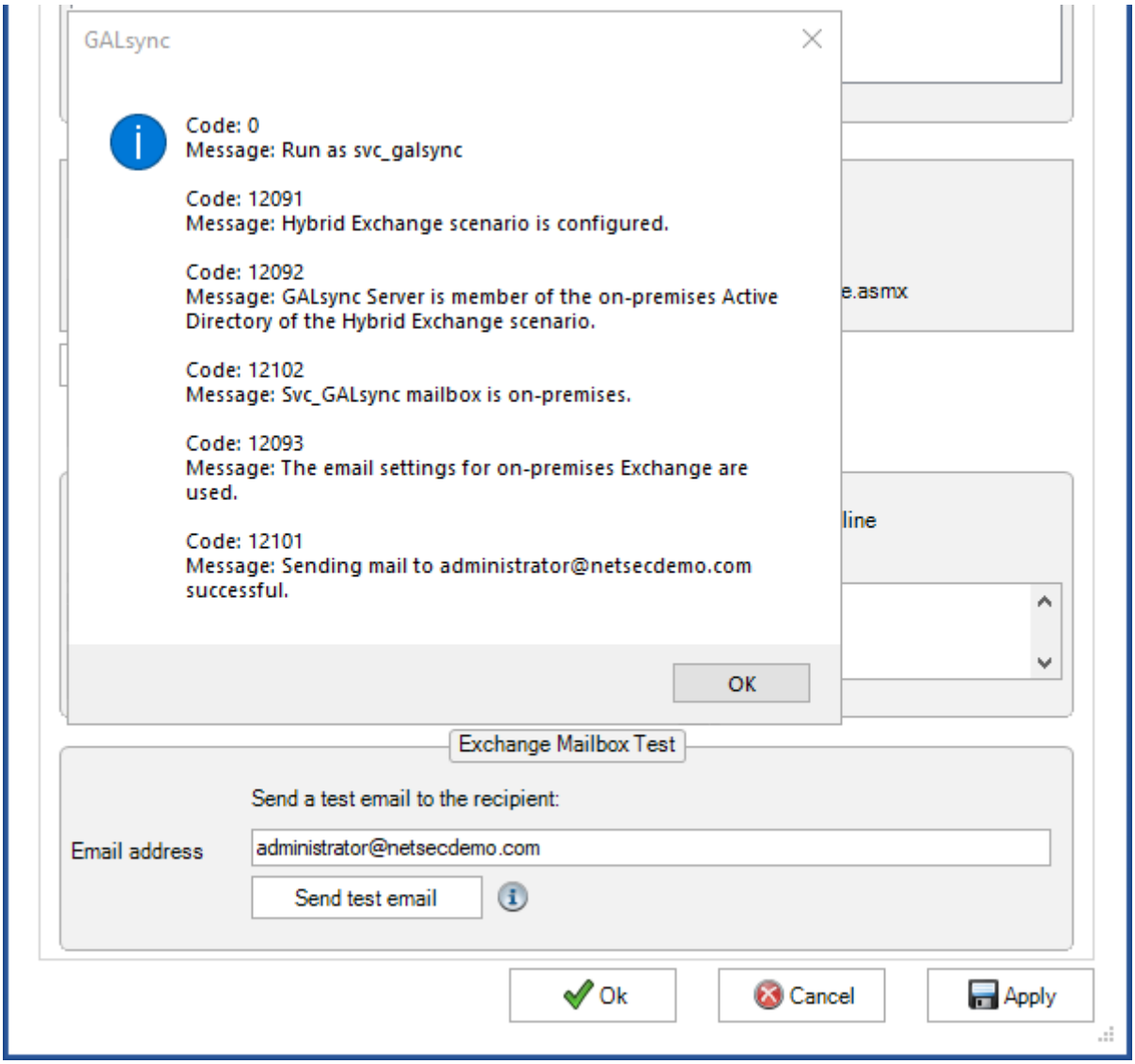
Please wait for the test to finish before proceeding.

Upon a successful connection, a green circle with a checkmark will be displayed.



If the connection test failed, click the **Show log** button for detailed information.

A test email can also be sent to the desired recipient as an additional test to validate mail flow. To do this, click the **Send test email** button for the **Exchange Mailbox Test**.



Please note, that the e-mail address of the recipient for the test email will not be saved.

Exchange Online authentication via Service Account

Please note, that user-based authentication via OAuth 2.0 works only for the Microsoft Azure Public Cloud instance. If your Microsoft 365 instance is hosted by a national cloud, please use **Exchange Online certificate-based authentication via App registration**.

Service Account (Microsoft 365 Exchange Online)

The GALsync service account needs to be a licensed Exchange Online mailbox user in the Microsoft 365 tenant.

For example: Microsoft 365 Business Basic, Exchange Online (Plan 1) or Microsoft 365 E1 license will work for the service account.

The service account must be a member of the **Exchange Administrator** role. GALsync uses the Exchange Online PowerShell commands, which are incomplete if the service account is not an Exchange Administrator for Exchange Online.

Note: By default, the Exchange Online password has to be changed within 30 days. To ensure, that GALsync works properly, you have to configure user passwords to never expire. To configure your password please follow the steps described in the following article:

https://support.office.com/en-us/article/Set-a-user-s-password-expiration-policy-0f54736f-eb22-414c-8273-498a0918678f

- GALsync must have direct access to the user mailbox of the service account via Exchange Web Services (EWS) of Exchange Online.
- Ensure that the mailbox is accessible (e.g., by Outlook Web Access).
- Ensure that the mailbox can send to and receive email from the other organization.
- Ensure that incoming email from the other organization does not get caught by your spam filter or firewall.

Please note, service accounts are non-human privileged accounts used by applications, automated services, and that execute other IT processes. Because these are machine accounts, they cannot be protected by **multi-factor authentication (MFA)**, since there is no way for it to interactively logon.

We recommend disabling **multi-factor authentication (MFA)** for this account, and use conditional access policies to lock down this account, such as allowing login only from trusted public IP addresses.

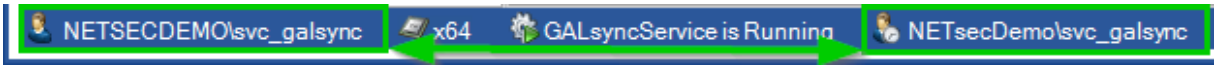
Modern Authentication OAuth 2.0 for Exchange Web Services (EWS) to access Exchange Online

The GALsync service account of a Microsoft 365 tenant needs access to its own mailbox, therefore, Modern Authentication OAuth 2.0 for Exchange Web Services (EWS) must be configured.

Please note, that user-based authentication via OAuth 2.0 works only for the Microsoft Azure Public Cloud instance. If your Microsoft 365 instance is hosted by a national cloud, please use **Exchange Online certificate-based authentication via App registration**.

First, please verify the GALsync GUI is running in the credentials of the local GALsync service account, otherwise GALsync cannot decrypt the token later.

This can be confirmed on the information bar at the bottom of the GALsync GUI.

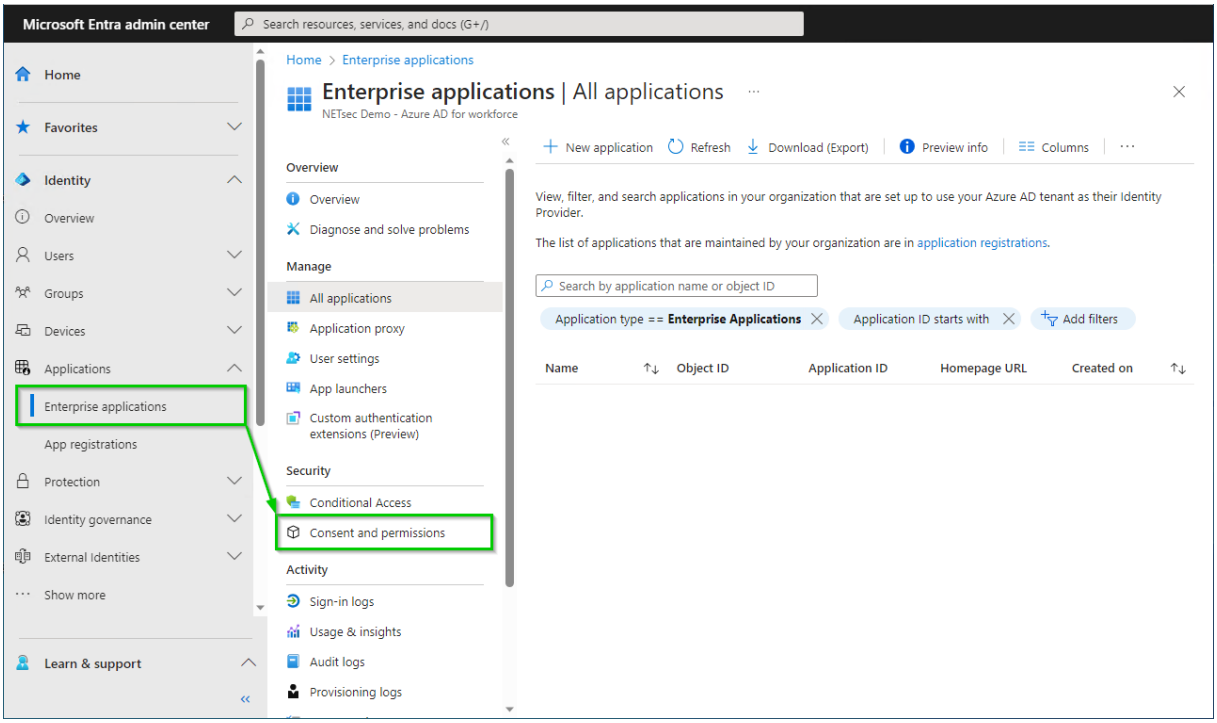


Admin consent requires in Entra ID Enterprise Applications (formerly Azure AD Enterprise Applications) to register NETsec GALsync as Enterprise Application.

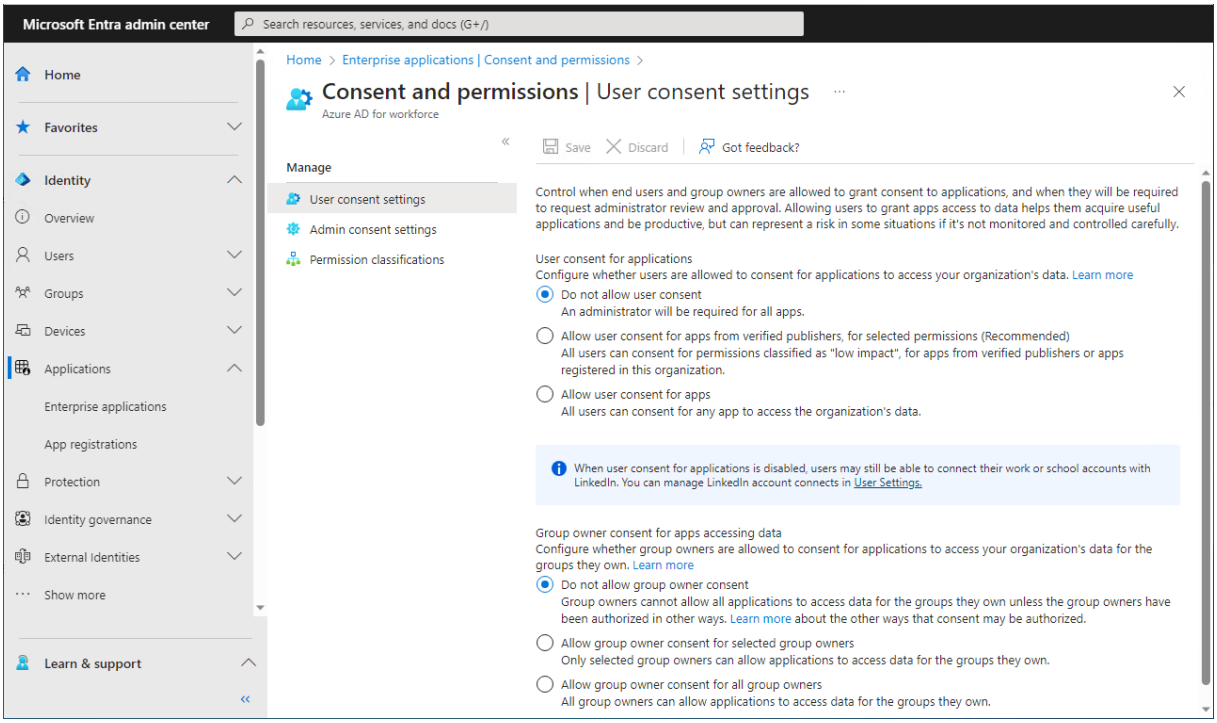
*Please note, that GALsync cannot request the necessary **User consent** for a non admin user with restricted settings **Consent and permissions** for Modern Authentication OAuth 2.0 for Exchange Web Services (EWS) of Exchange Online.*

How to check the Consent and permissions settings for Enterprise Applications?

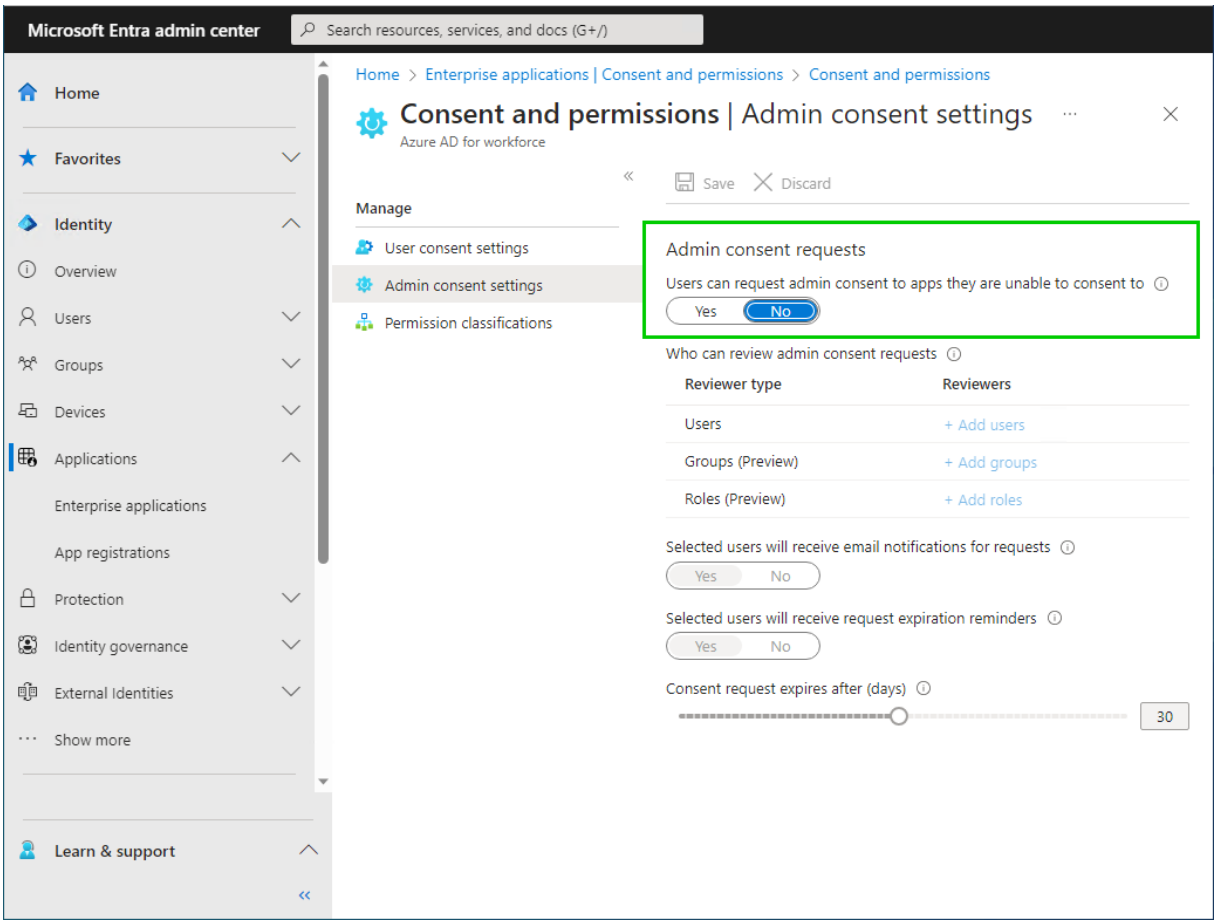
Microsoft Entra admin center -> Identity -> Applications -> Enterprise applications -> Consent and permissions



The **Consent and permissions** settings of the **Enterprise applications** are restricted:



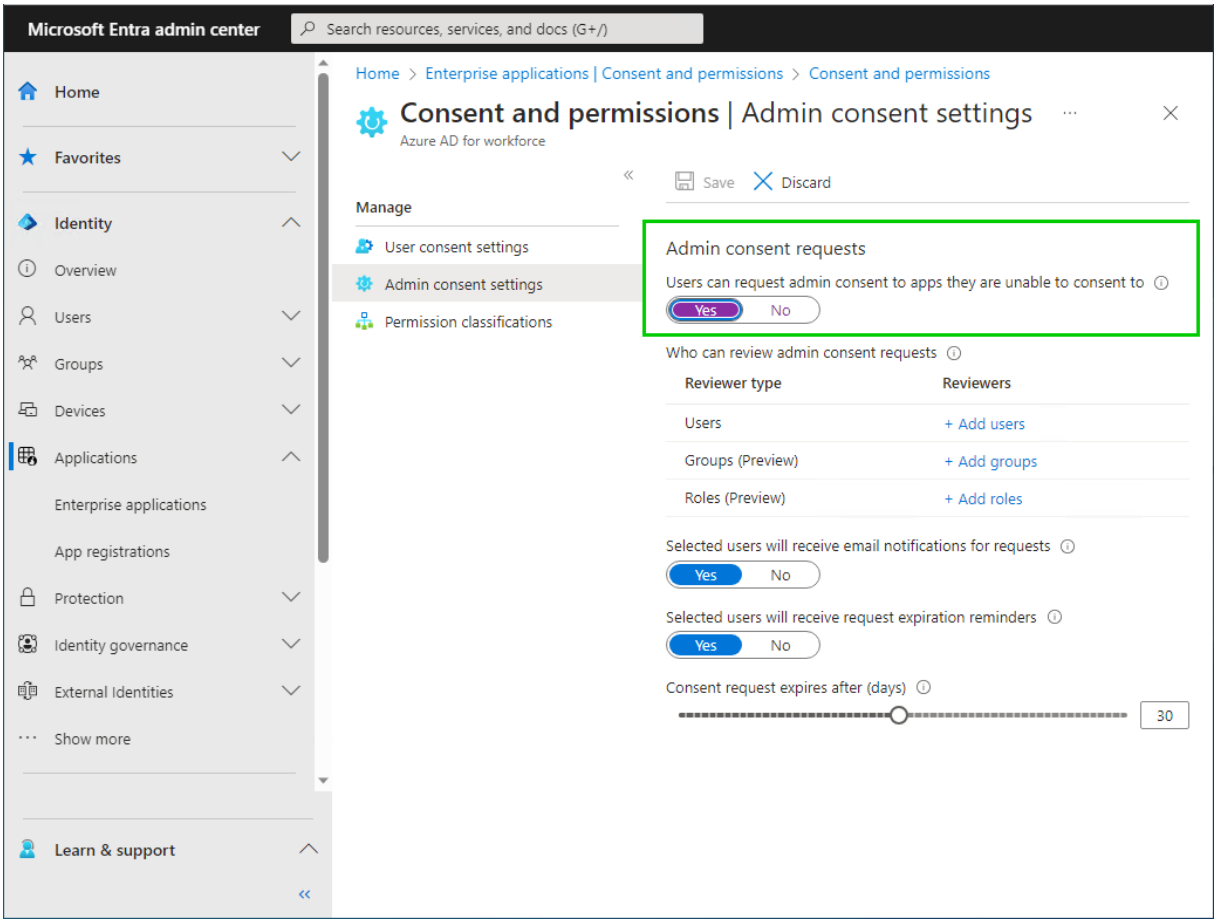
The **Consent and permissions** settings of the **Enterprise applications** are restricted and a Global Administrator account of the Microsoft 365 tenant must grant admin consent for the permissions of the Enterprise Application.



If the **Admin consent requests** in the **Admin consent settings** is **No**, the admin consent for the permissions of the Enterprise Application can be done with a sign in of a Global Administrator account during the first login process for Modern Authentication OAuth 2.0 for Exchange Web Services (EWS) of Exchange Online. This process is described in the following chapter.

*Please note, the GALsync service account should only be an Exchange Administrator of Exchange Online, but **not** a Global Administrator of the Microsoft 365 tenant.*

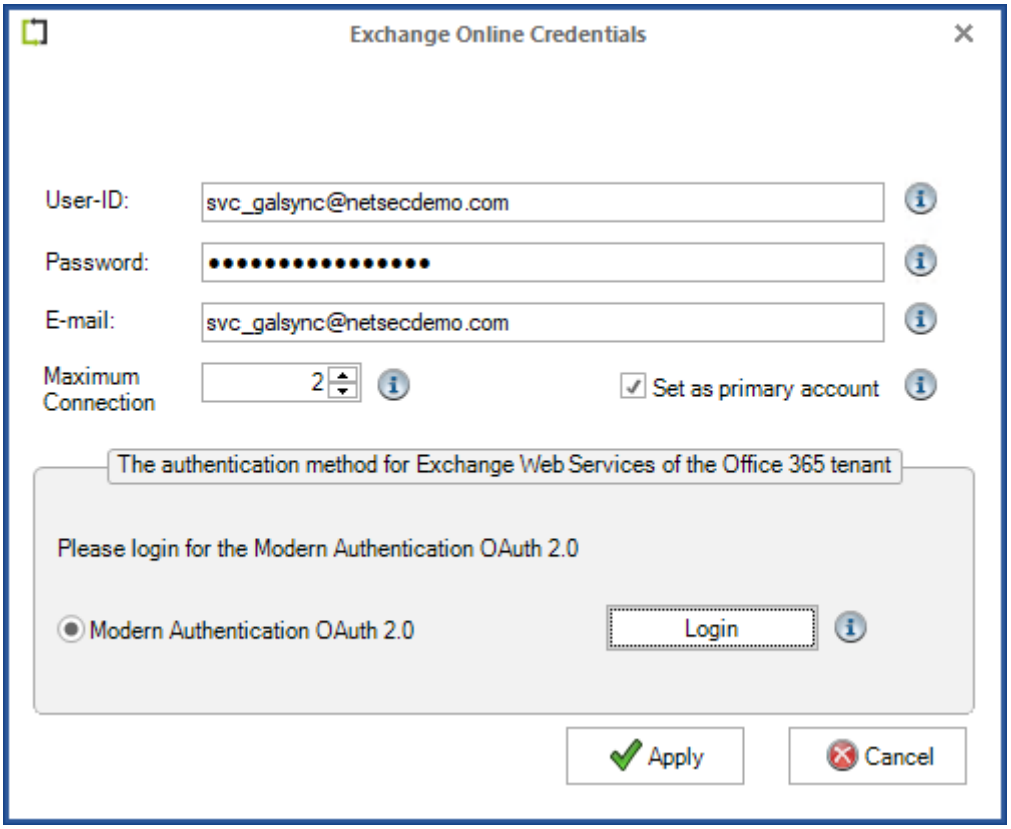
If the **Admin consent requests** in the **Admin consent settings** is **Yes**, the GALsync service account will send an admin consent request during the first login process for Modern Authentication OAuth 2.0 for Exchange Web Services (EWS) of Exchange Online.



After that a user, who can review admin consent requests, must accept the request, before the GALsync service account does the login for Modern Authentication OAuth 2.0 for Exchange Web Services (EWS) of Exchange Online a second time to get the token successfully.

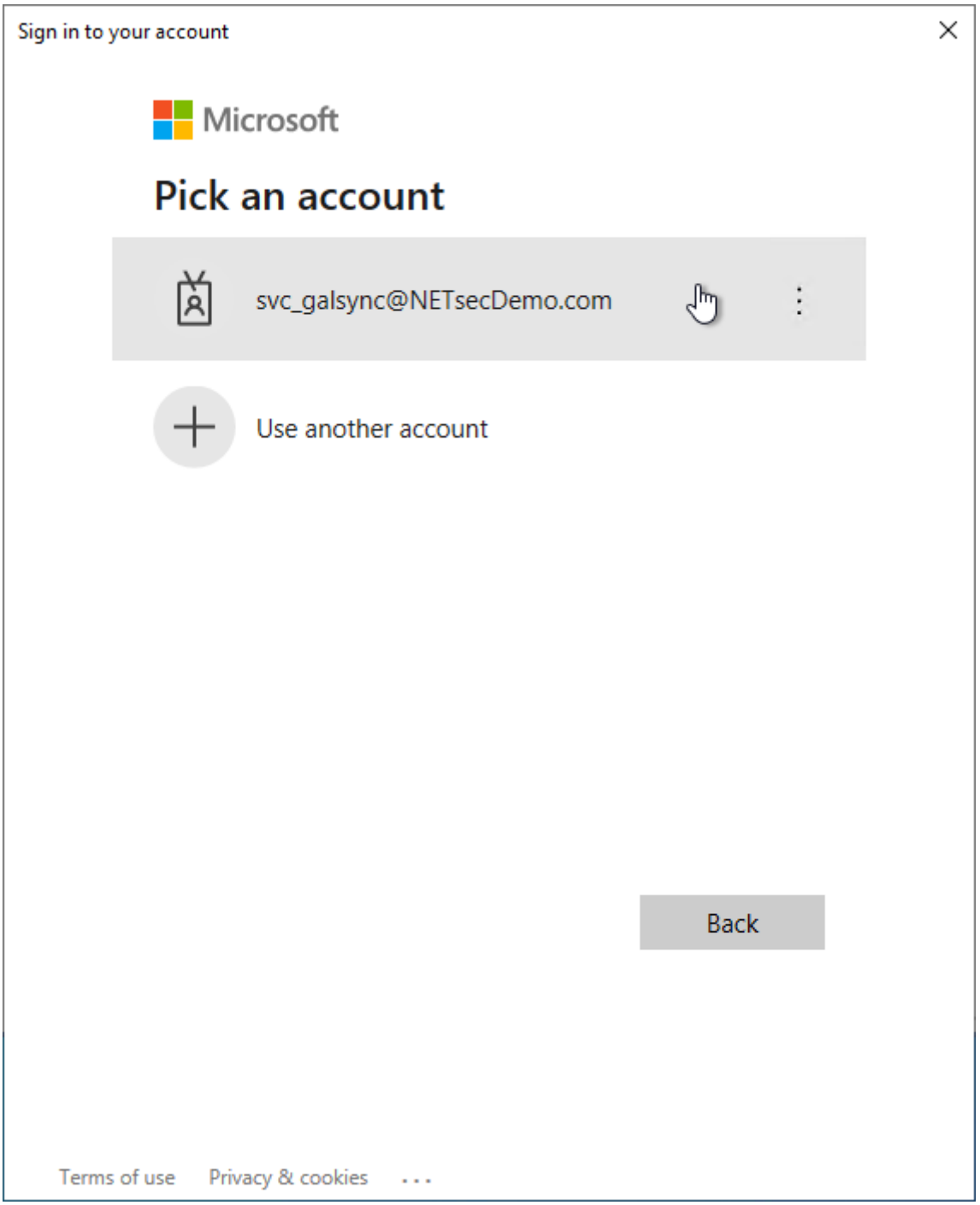
Login for Modern Authentication OAuth 2.0 for Exchange Web Services (EWS) of Exchange Online

Proceed with the Login for Modern Authentication OAuth 2.0 for Exchange Web Services (EWS) of Exchange Online with your GALsync Service Account.

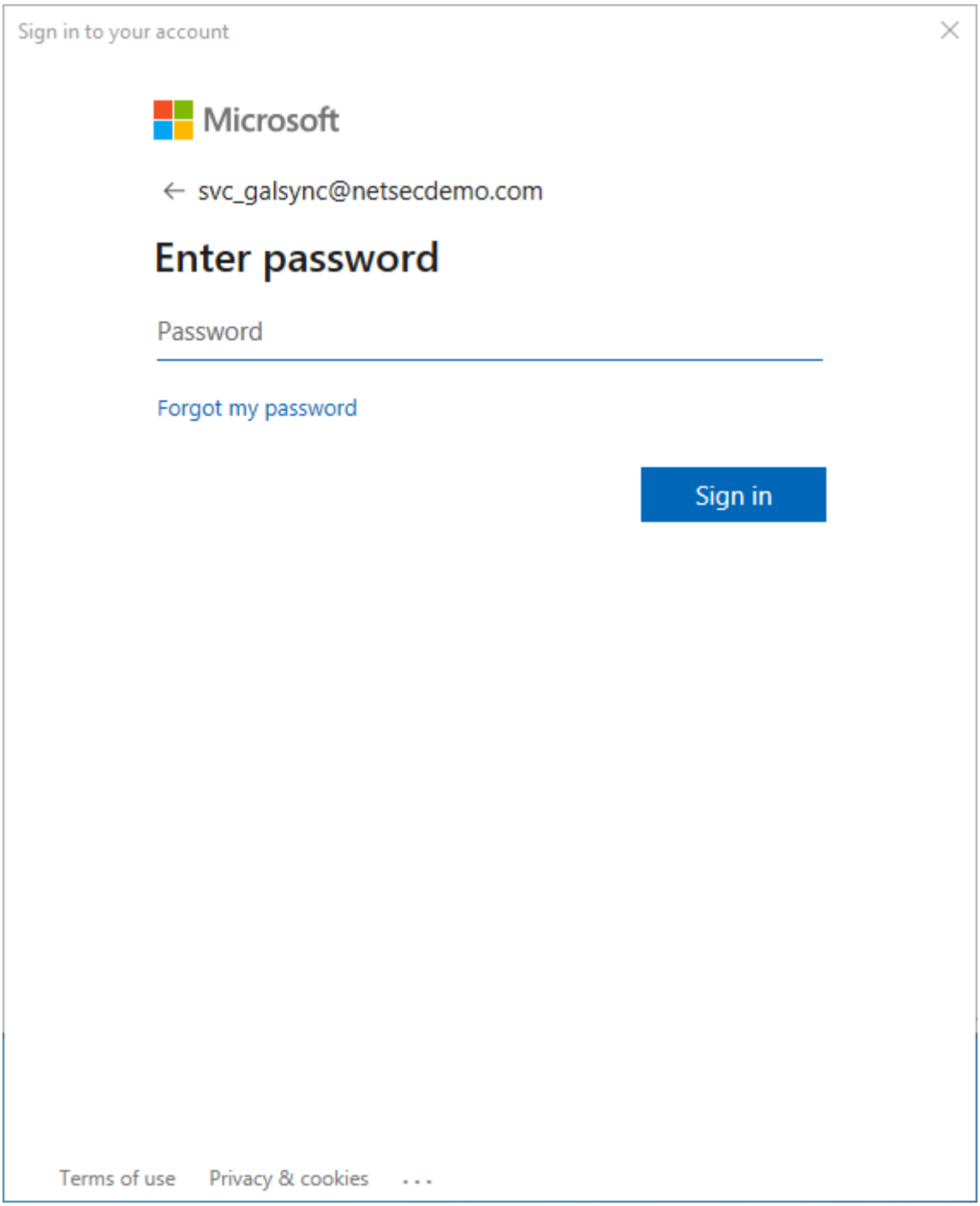


Please note, that the User-ID and the E-mail address can be different for an Exchange Online mailbox user. This depends on your Microsoft 365 Exchange Online tenant.

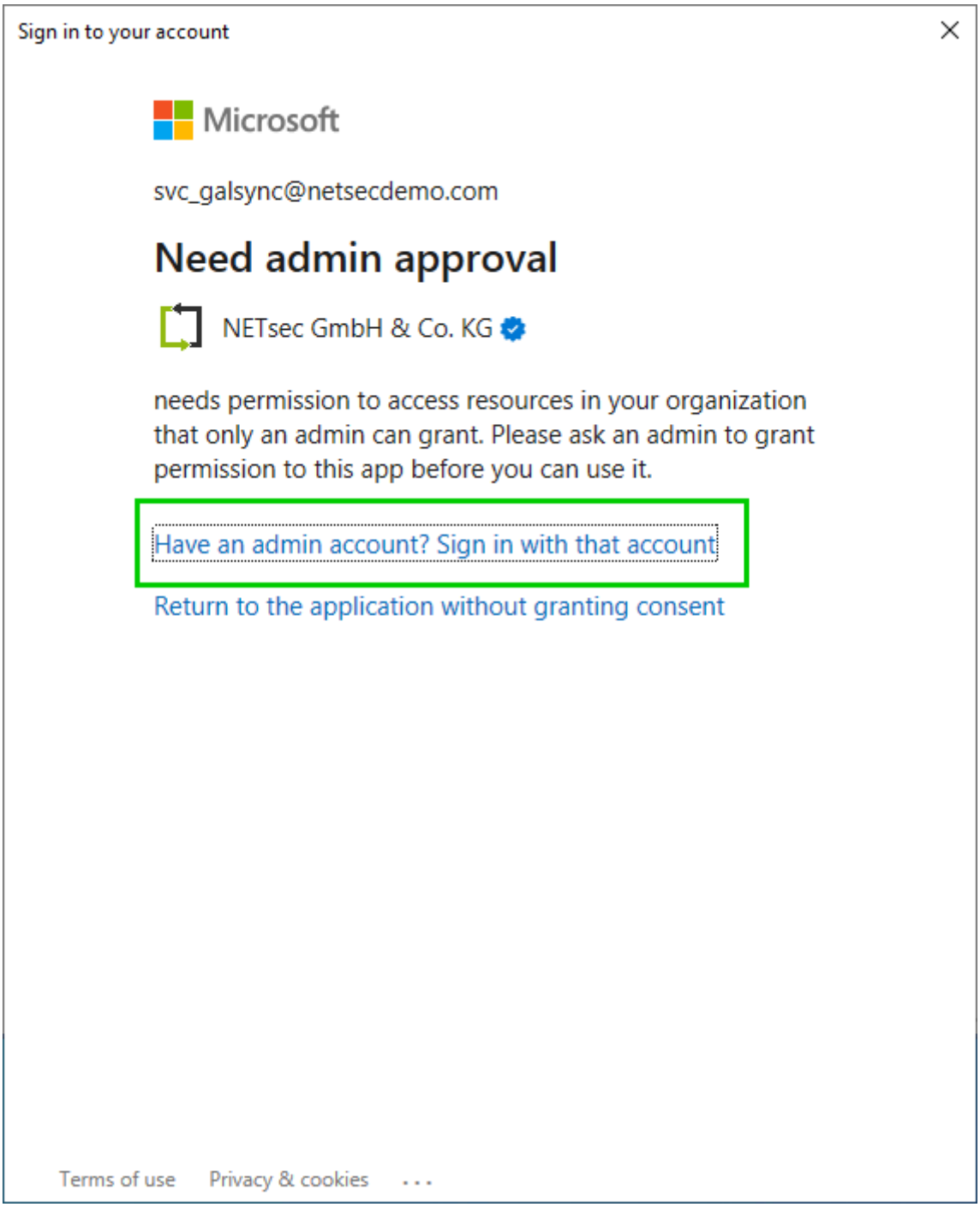
Insert the credentials for the GALsync service account, and click the **Login** button.



Select the same GALsync service account, which you have used in the **Exchange Online Credentials** dialog before.



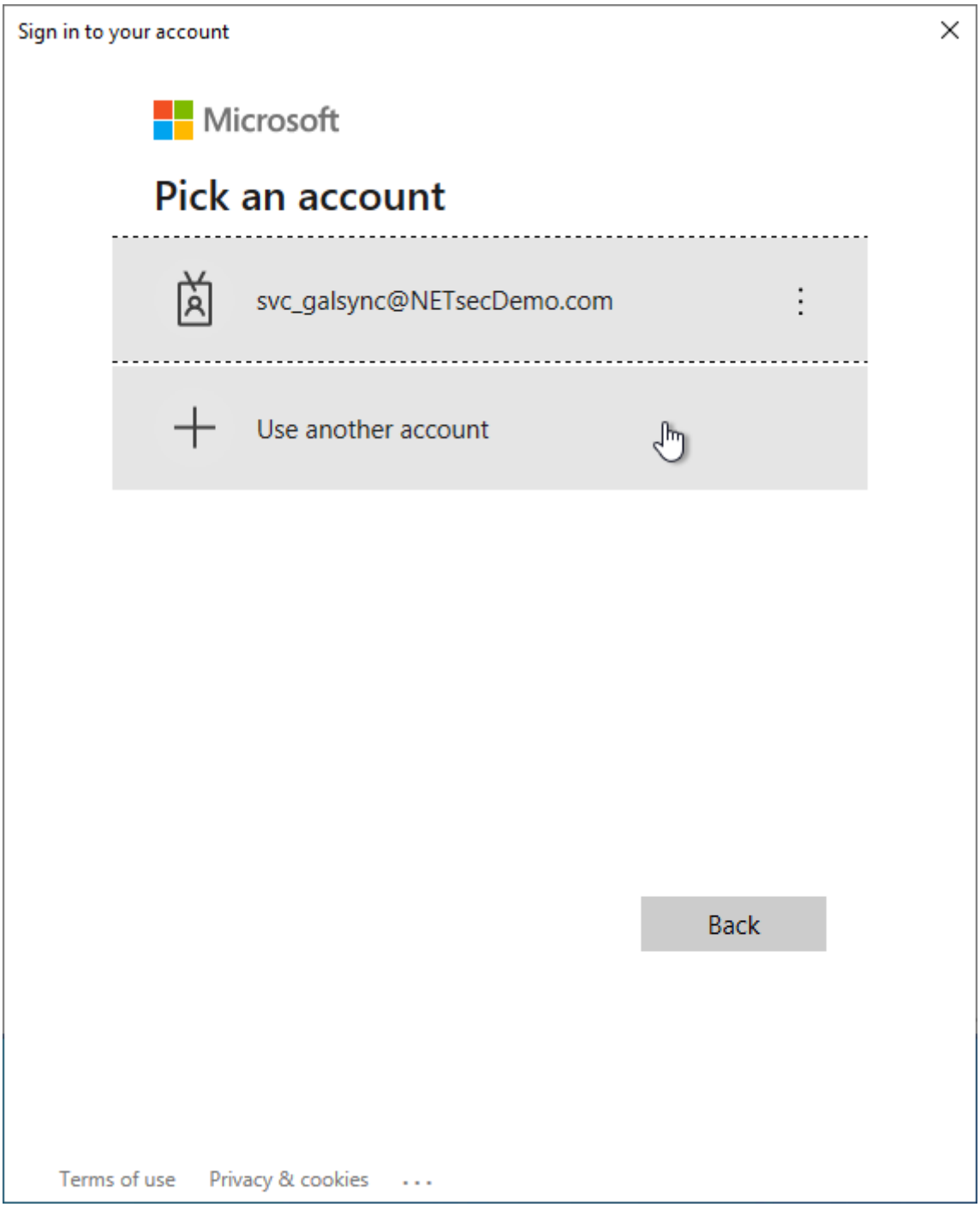
Insert the password of the GALsync service account.



NETsec GALsync needs a sign in of a Global Administrator, who will accept the requested permissions for the Enterprise Application.

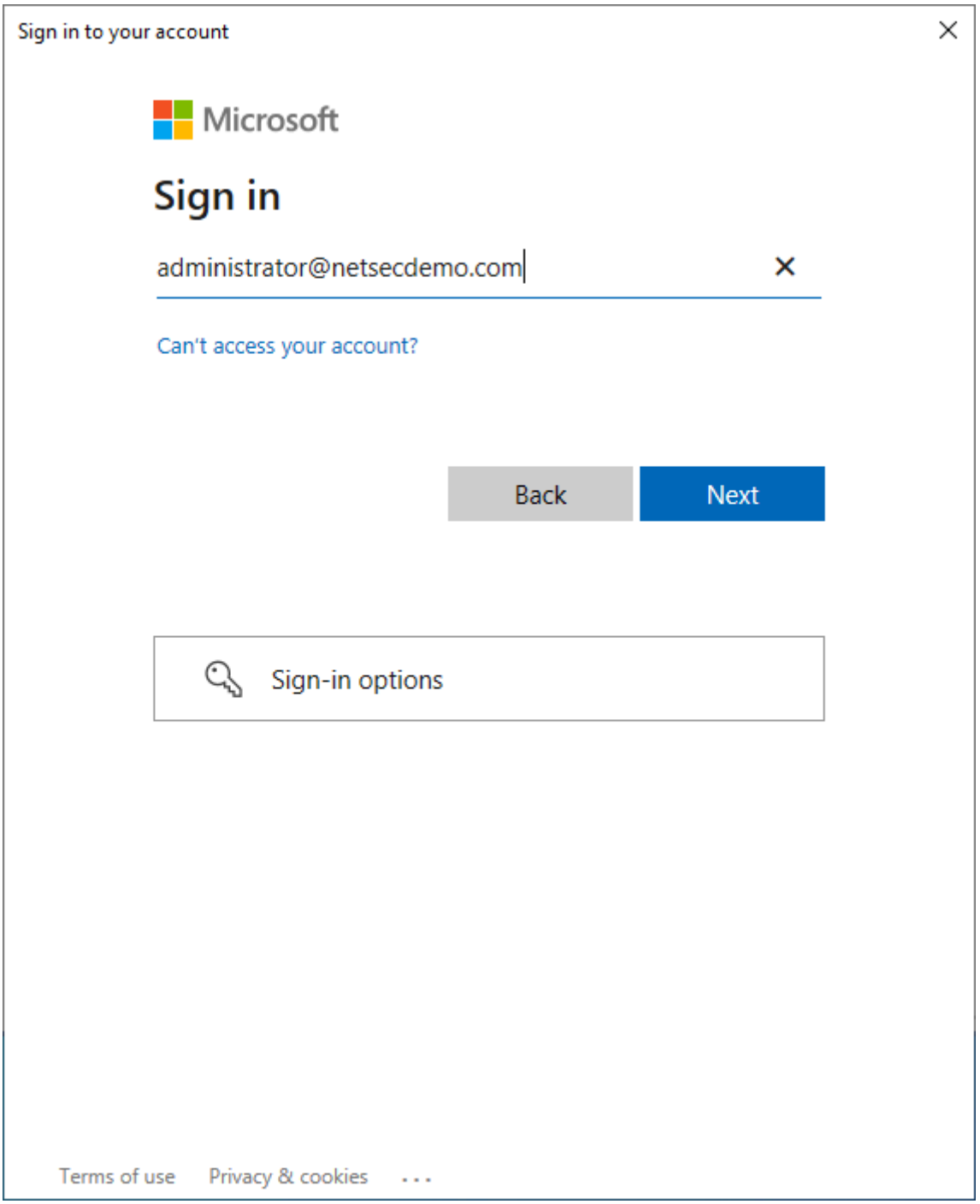
Click on **Have an admin account? Sign in with that account**.

Otherwise, a Global Administrator account grants consent for the requested permissions to the application under **Permissions** of the **NETsec GALsync Enterprise Application** in the **Microsoft Entra ID**, before the GALsync service account does the login for Modern Authentication OAuth 2.0 for Exchange Web Services (EWS) of Exchange Online a second time to get the token successfully.

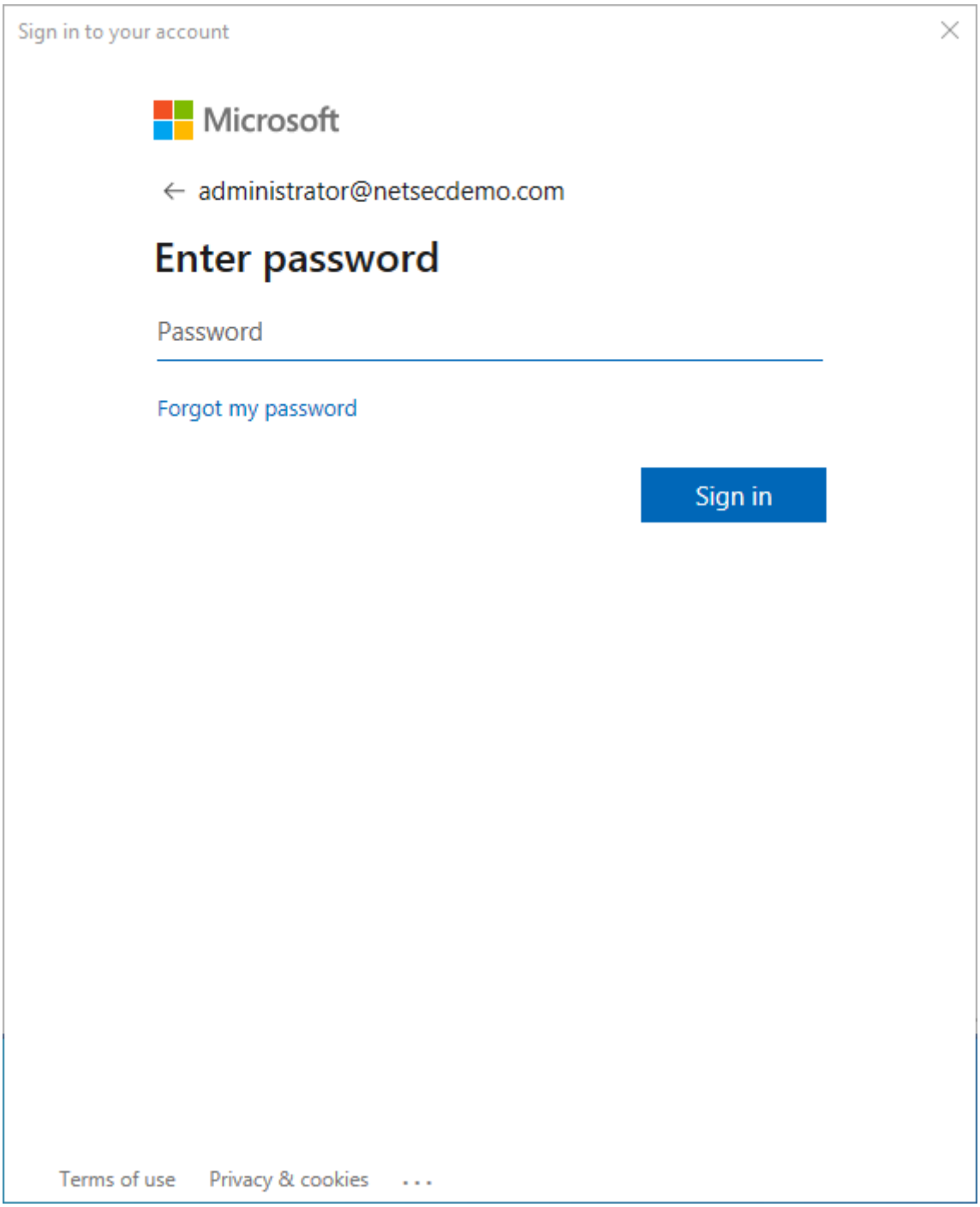


Use another account to sign in as a Global Administrator.

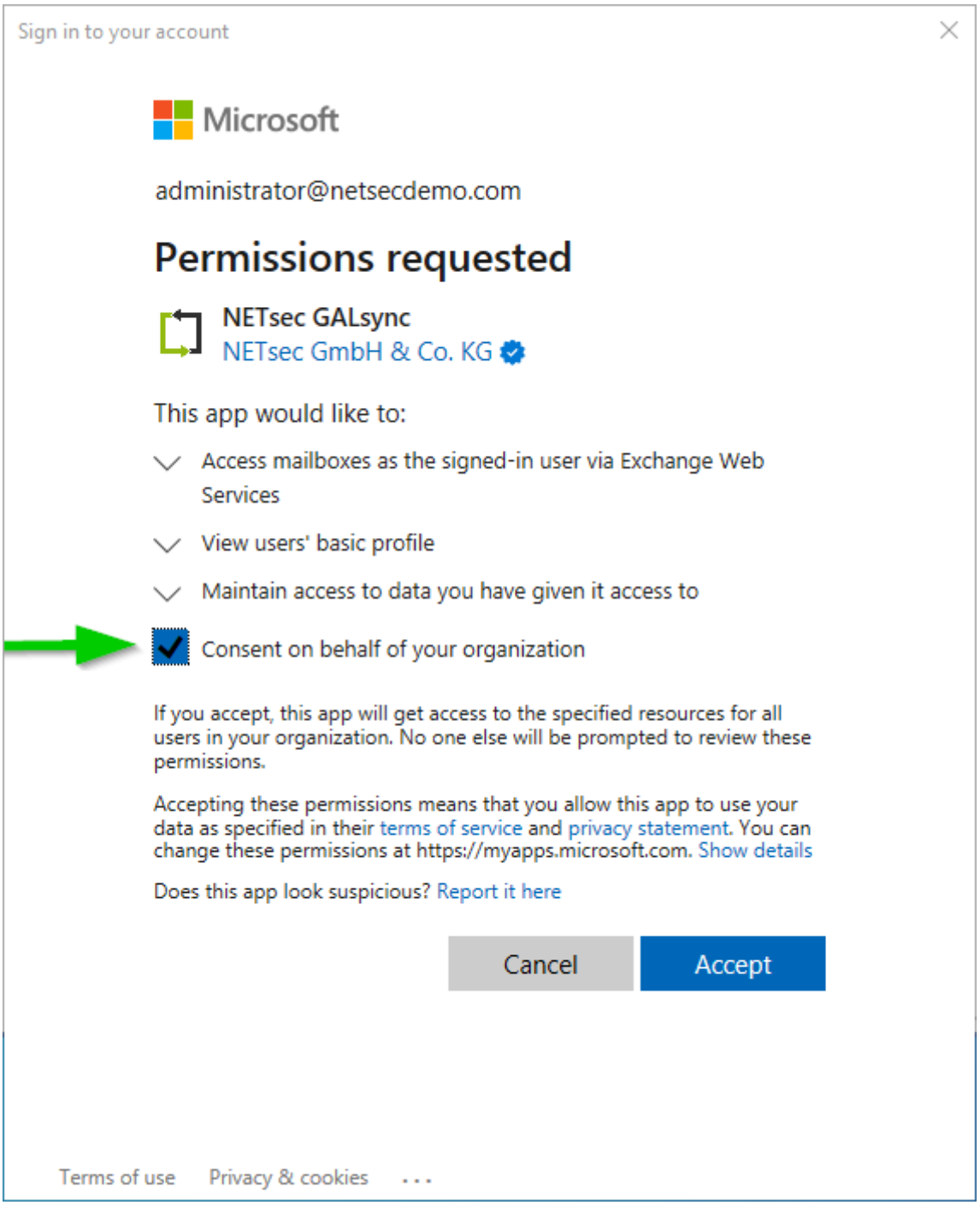
*Please note, the GALsync service account should only be an Exchange Administrator of Exchange Online, but **not** a Global Administrator of the Microsoft 365 tenant.*



Sign in with a **Global Administrator** account of the Microsoft 365 tenant.

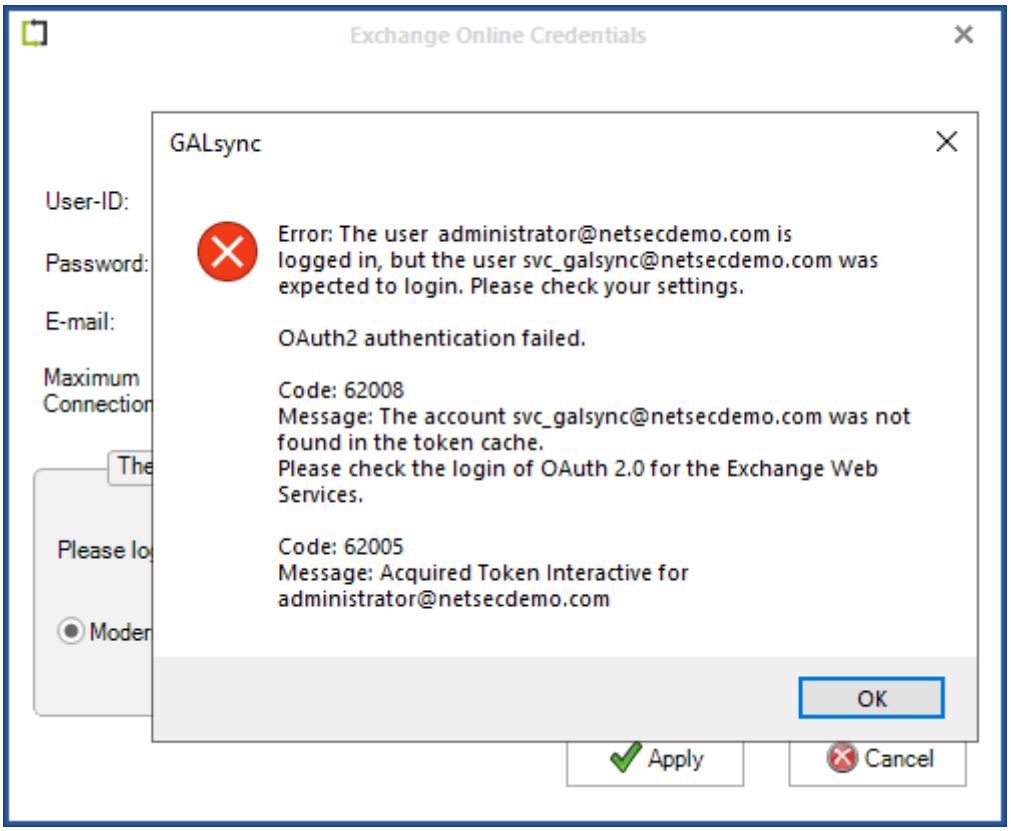


Insert the password of the **Global Administrator** account.

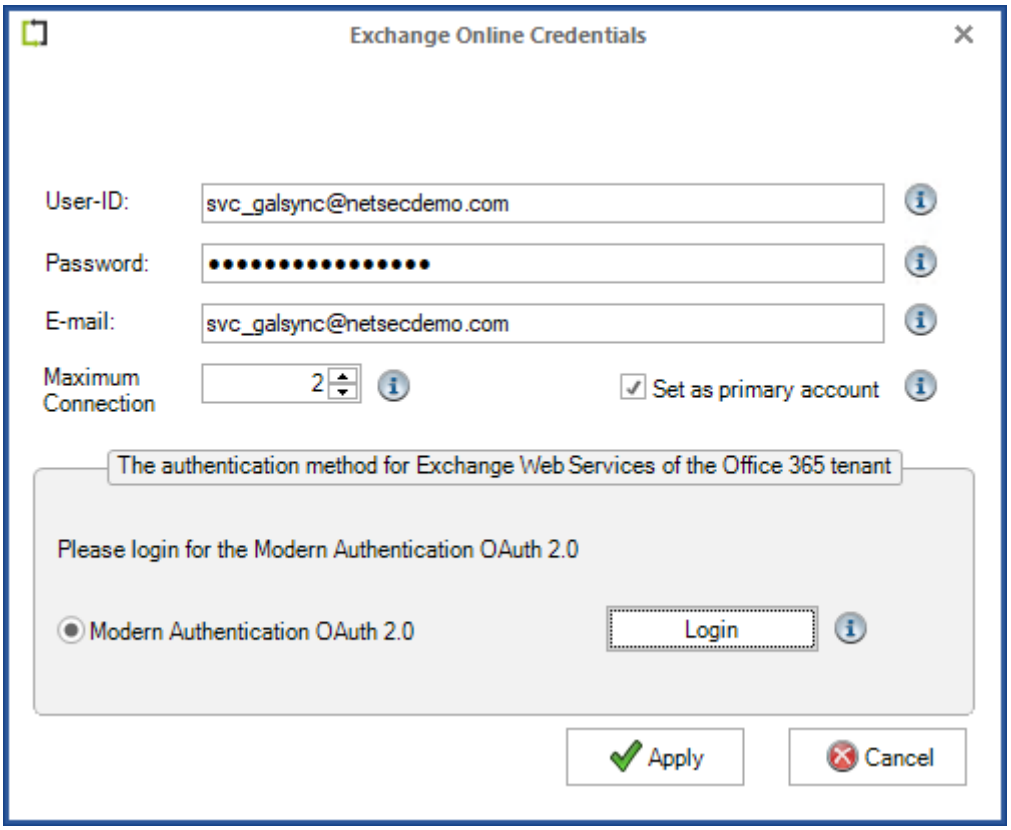


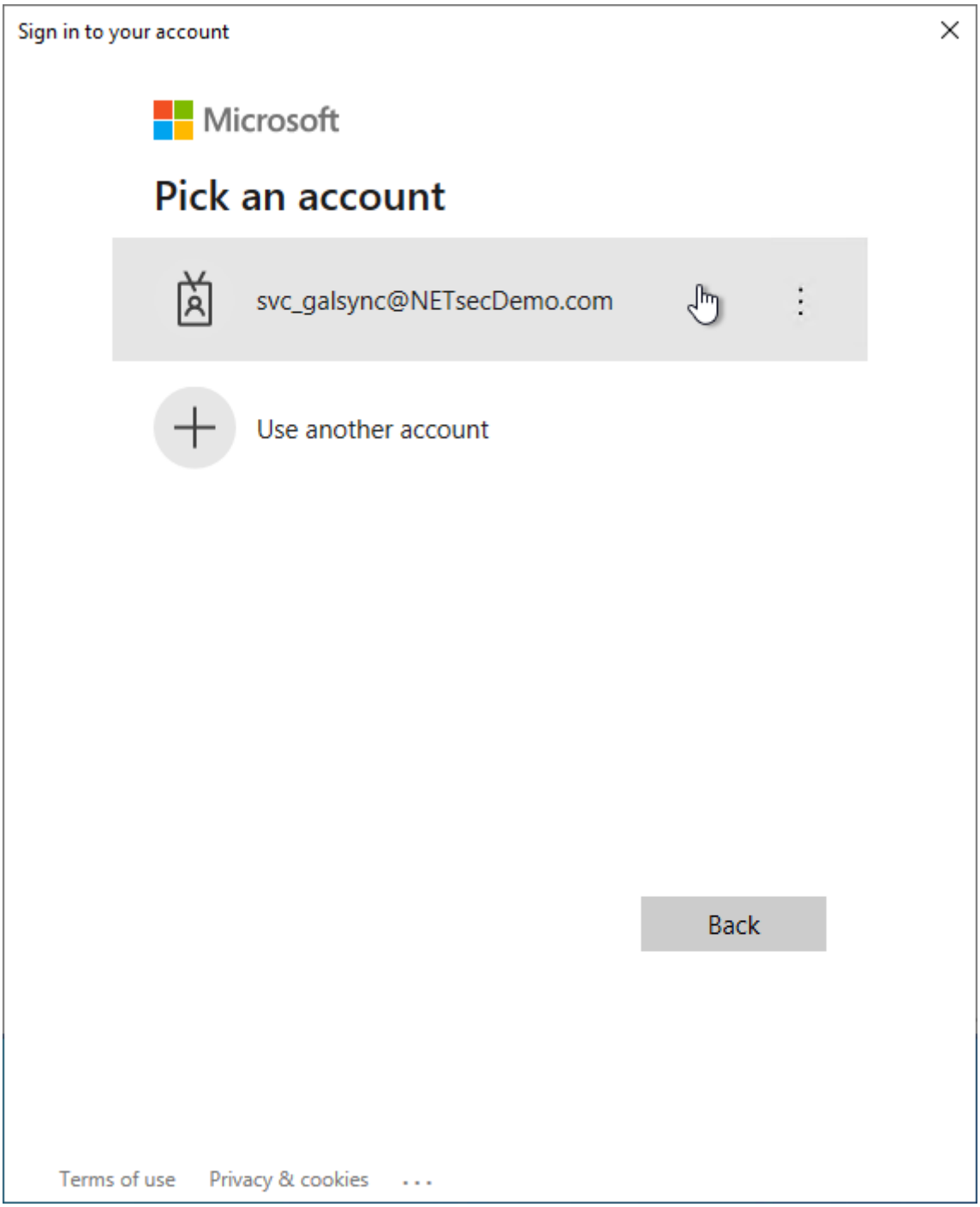
Enable **Consent on behalf of your organization**, then click **Accept**.

The OAuth2 authentication will fail after the first login process.

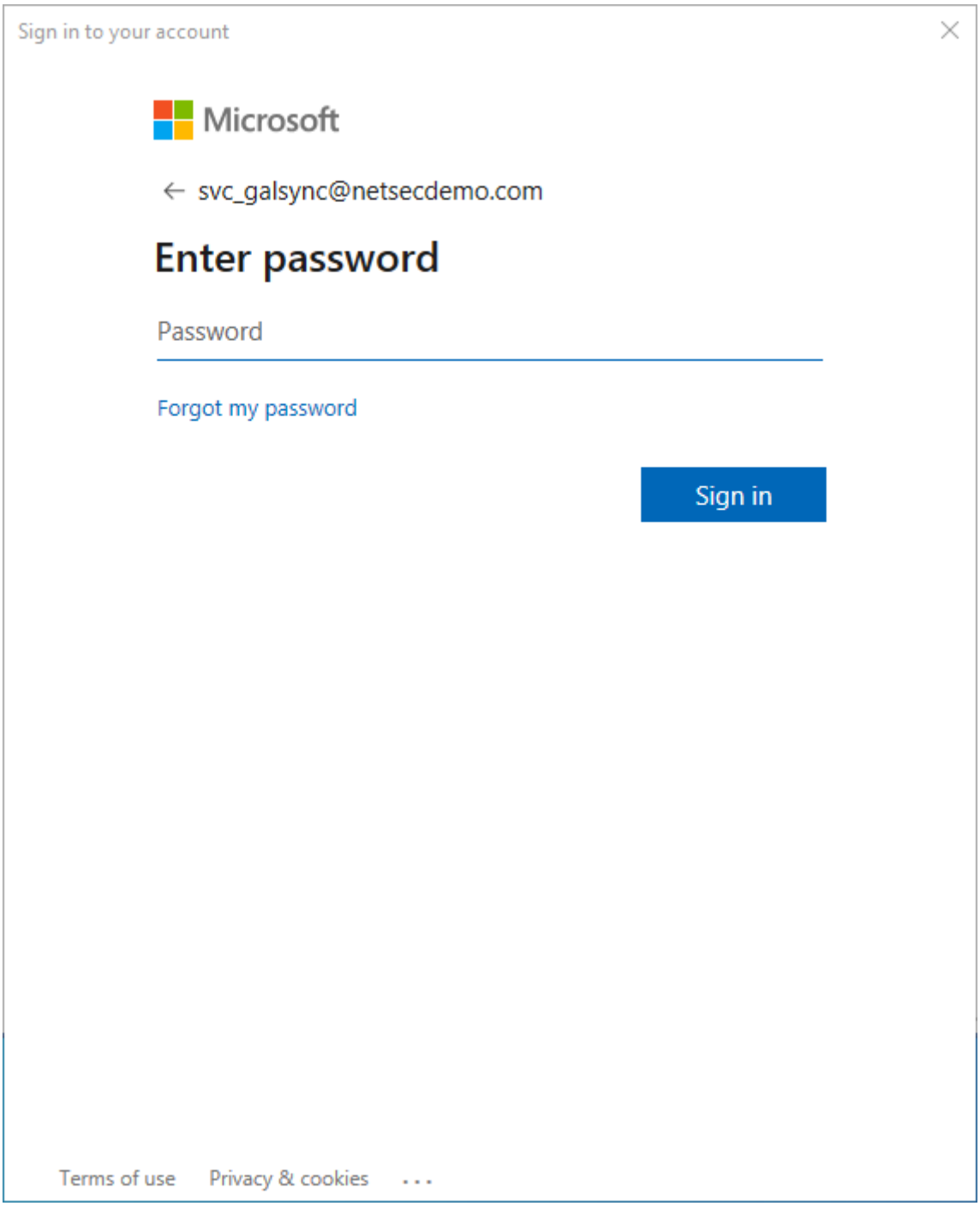


Proceed with the **Login** for Modern Authentication OAuth 2.0 for Exchange Web Services (EWS) of Exchange Online with your GALsync Service Account again.



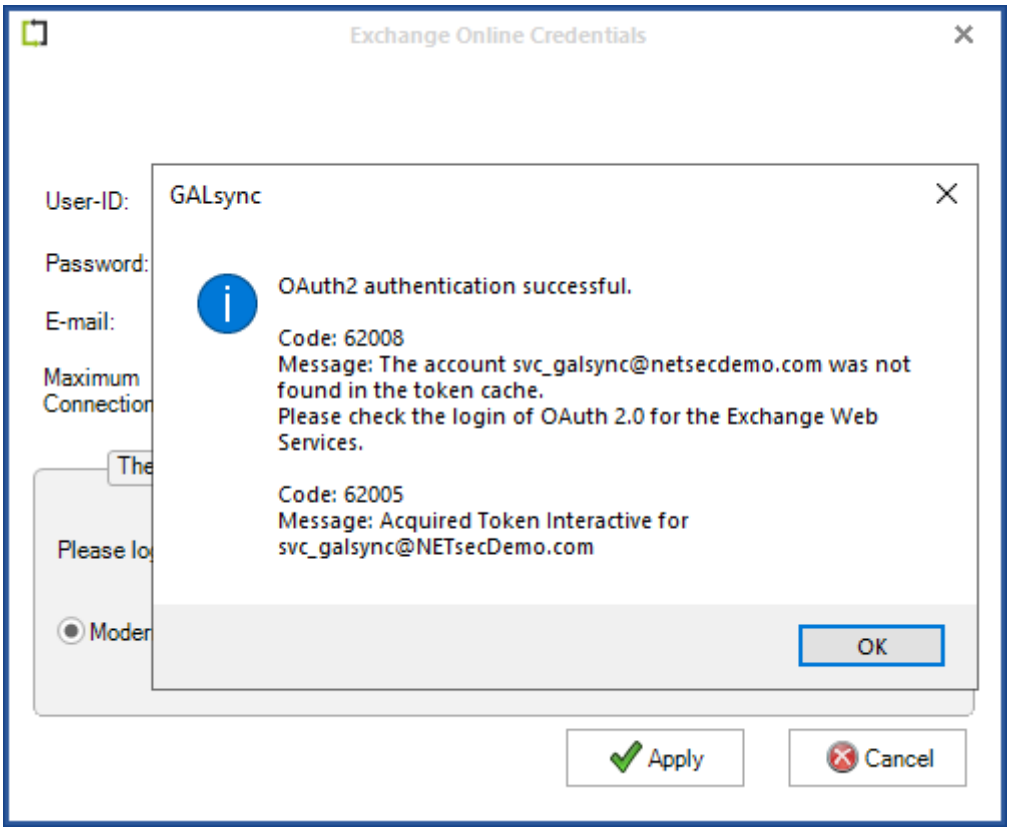


Once again select the same GALsync service account, which has been previously used in the **Exchange Online Credentials** dialog.



Insert the password of the GALsync service account.

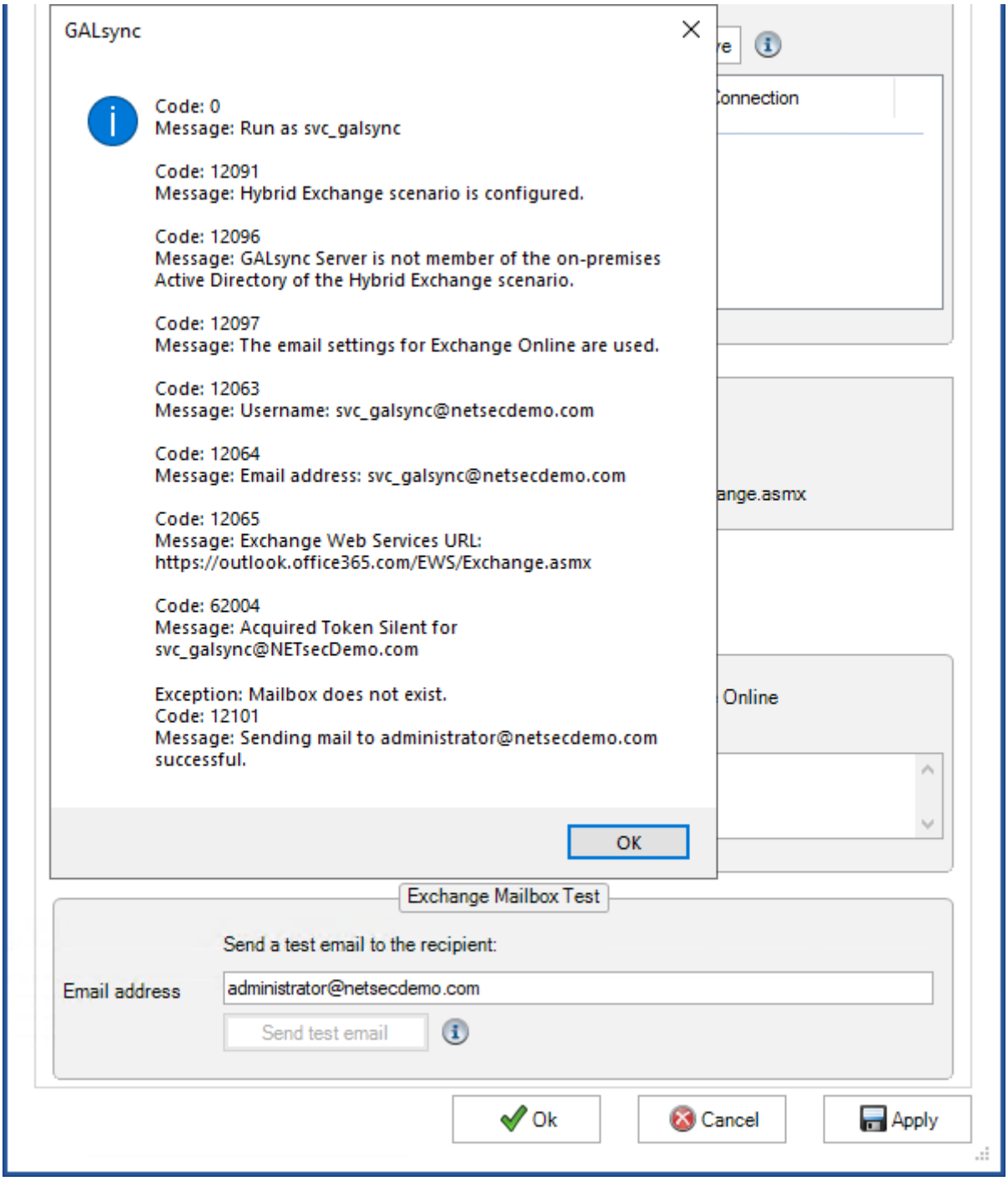
The login will now be successful.



GALsync can now use OAuth tokens for authentication to access the Exchange Web Services (EWS) for your Exchange Online during the policy runs.

Click **Apply** to close the **Exchange Online Credentials** dialog.

A test email can also be sent to the desired recipient as an additional test to validate mail flow. To do this, click the **Send test email** button for the **Exchange Mailbox Test**.



Please note, that the email address of the recipient for the test email will not be saved.

Also, please see the GALsync manual chapter:

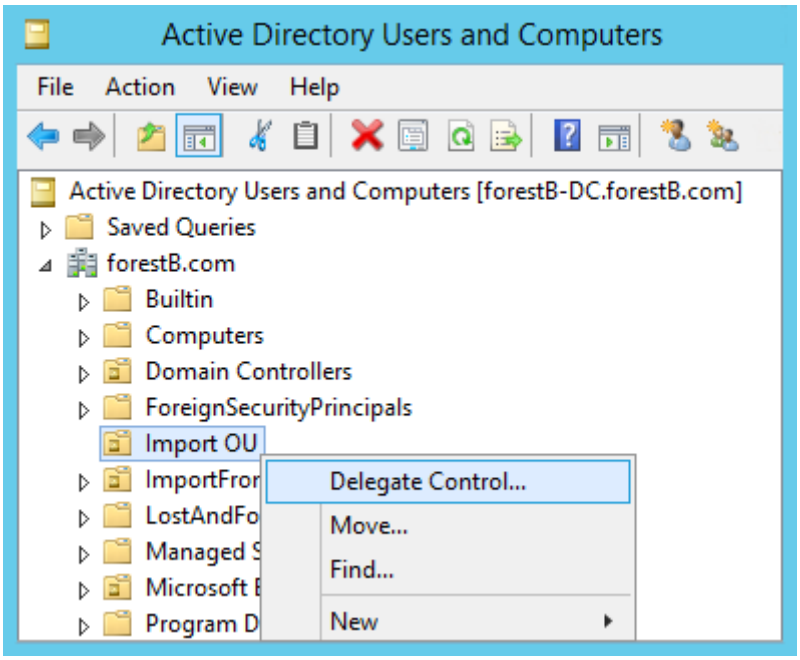
12010 - Error getting Exchange Online connection

Active Directory Permission for the Import OU (on-premises)

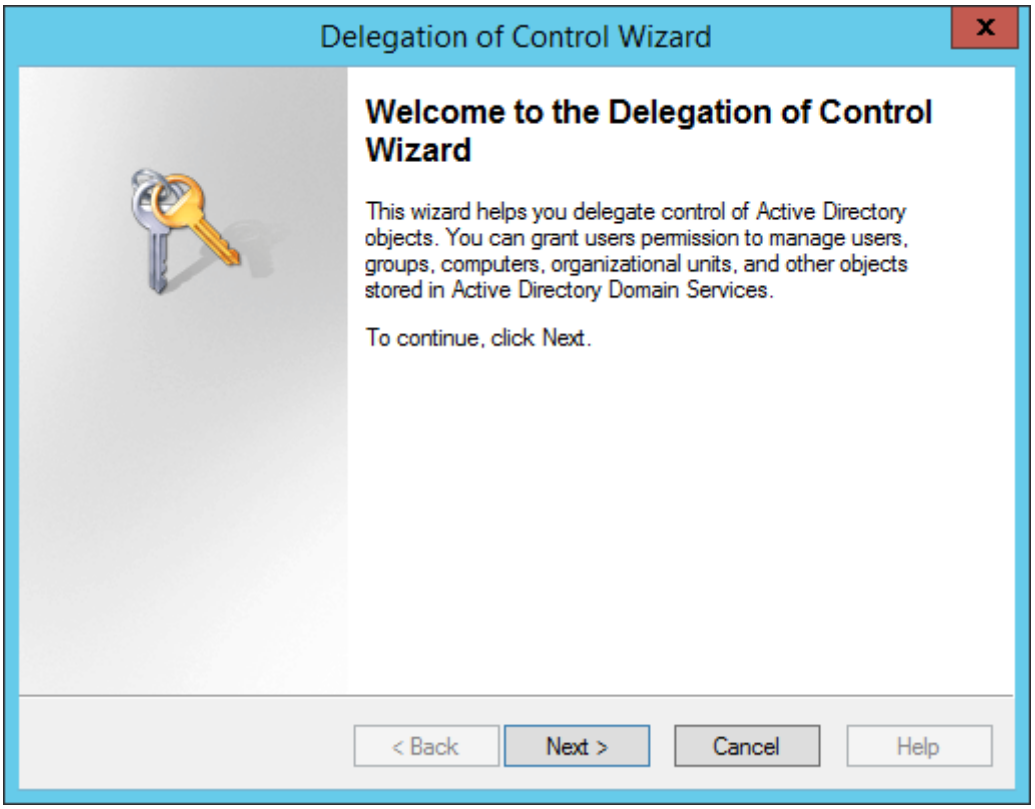
The GALsync Service Account needs write permissions to all Organizational Units where you want to import data to with GALsync.

Note: The resulting permissions must be for "This object and all descendant objects" and for all properties.

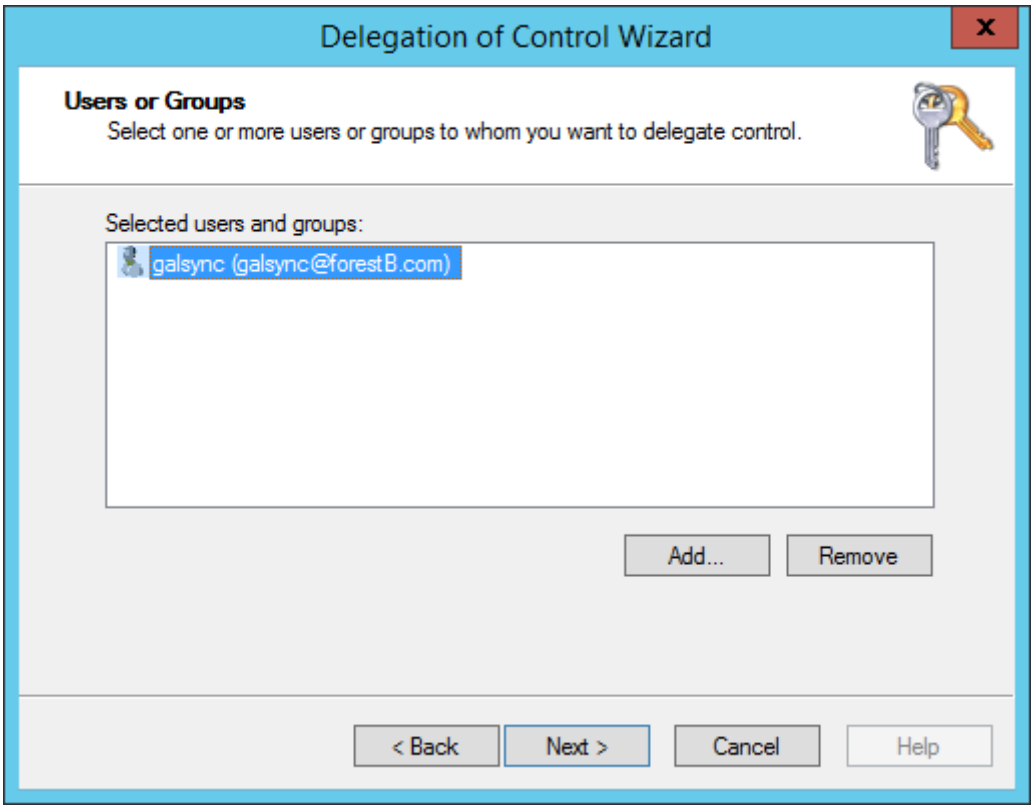
Use **Active Directory Users and Computers**. After creating the OU right-click the OU and choose **Delegate Control**.



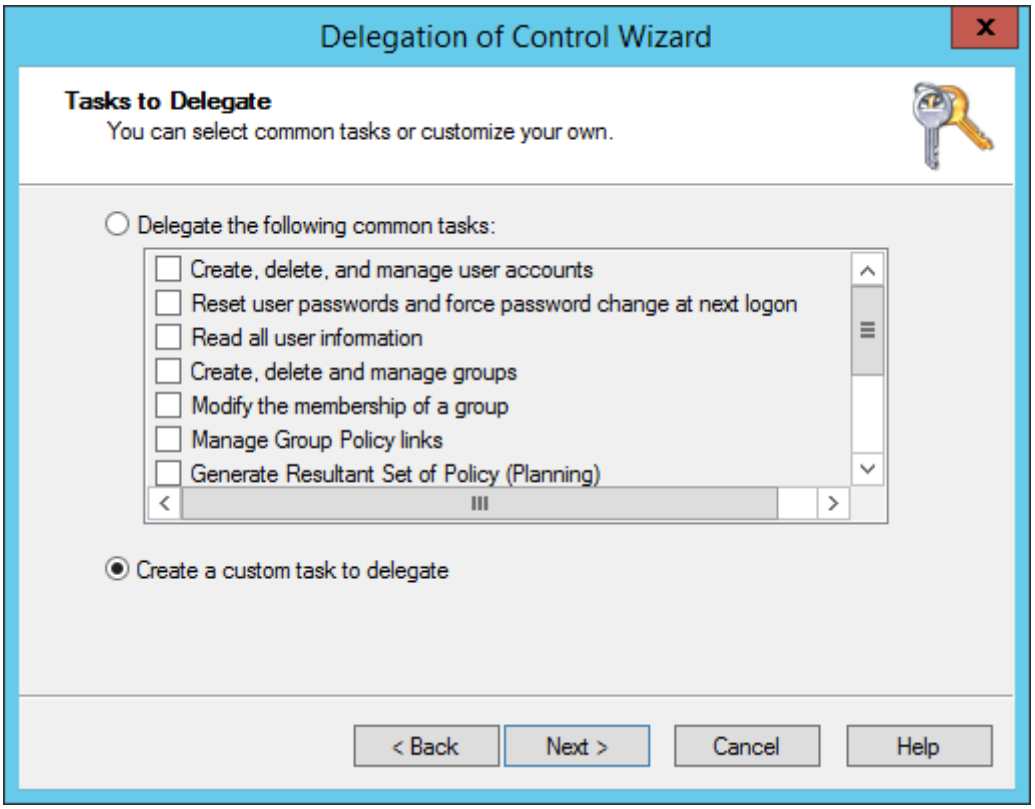
Follow the wizard and click **Next**.



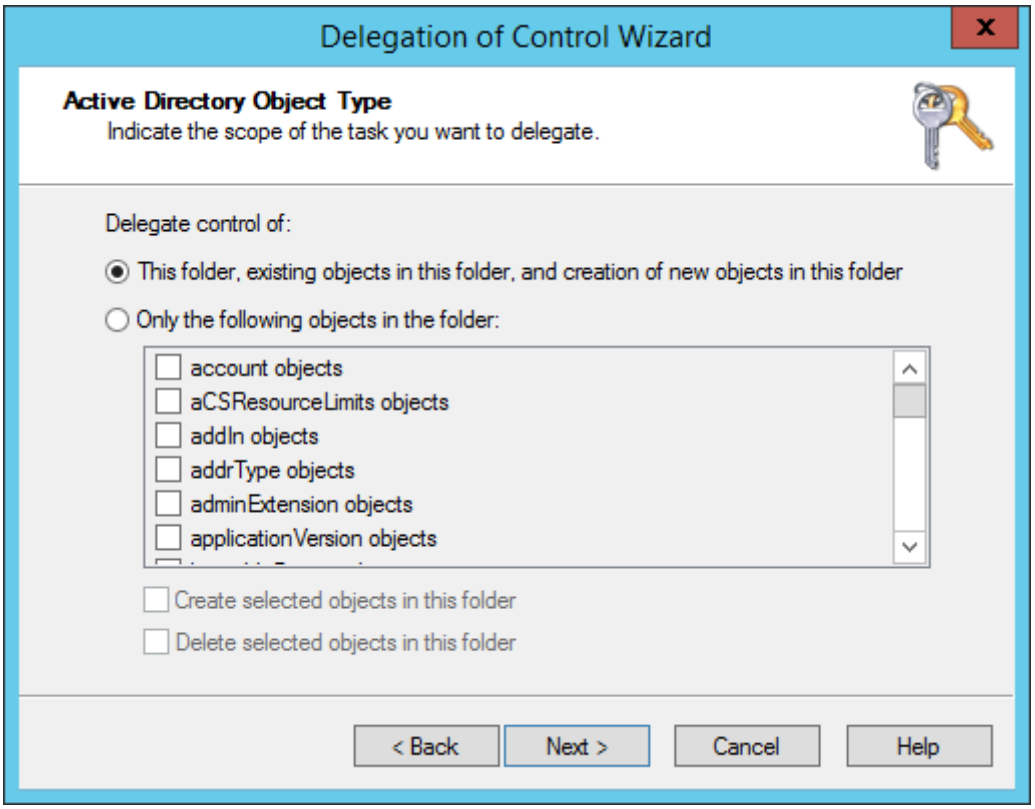
Add the GALsync Service account to the list and click **Next**.



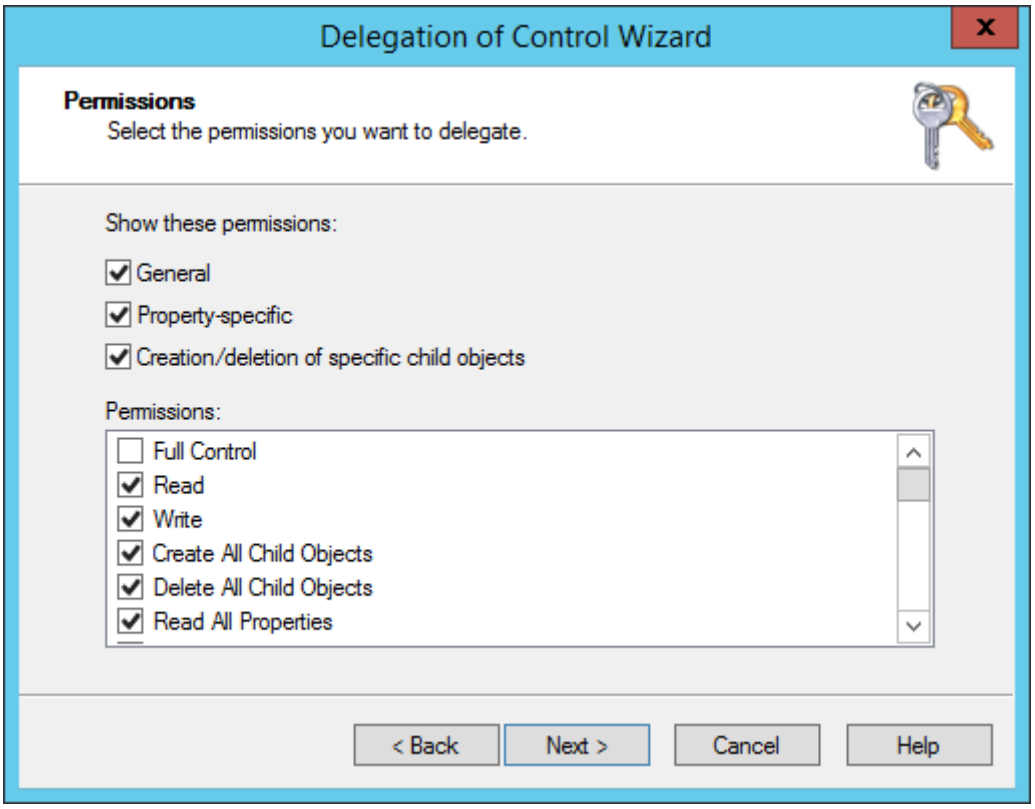
Choose the option **Create a custom task** to delegate and click **Next**.



Leave the next window as it is and click **Next**.

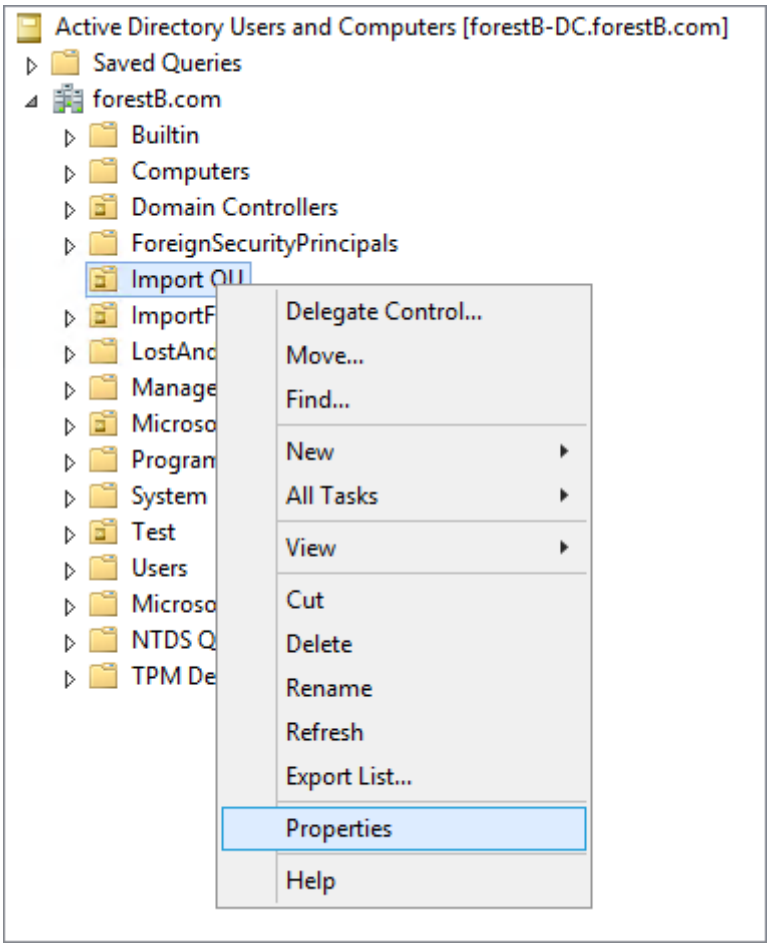


In the next dialog select all permissions exclude **Full Control** in the **Permissions**: list and click **Next**.

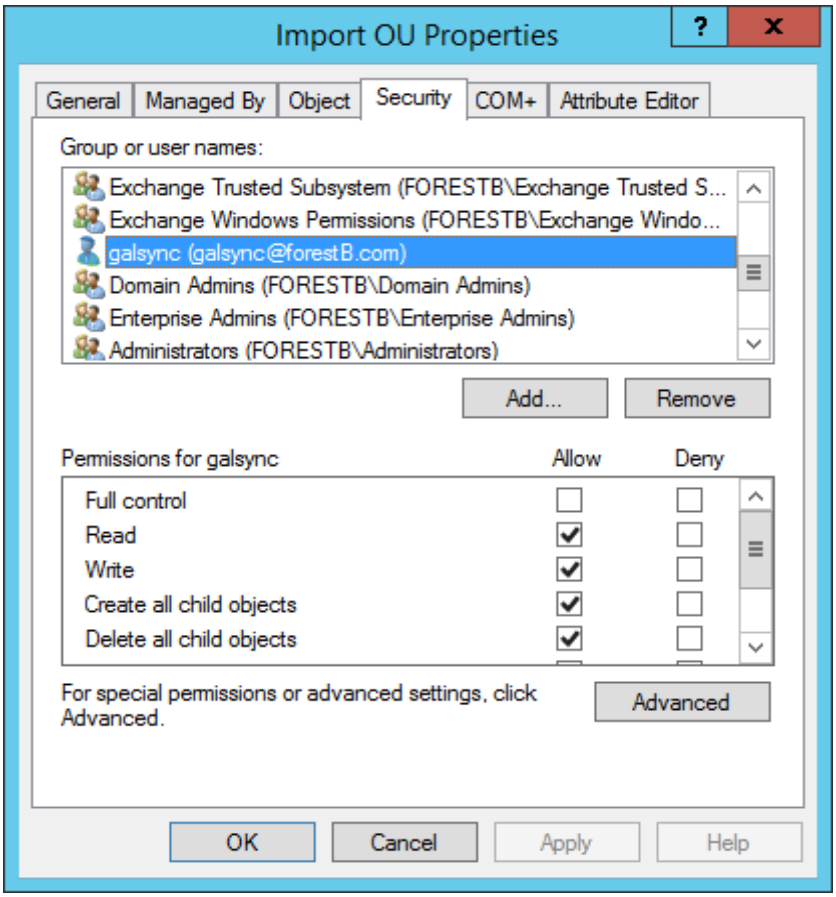


You complete the wizard clicking **Finish**.

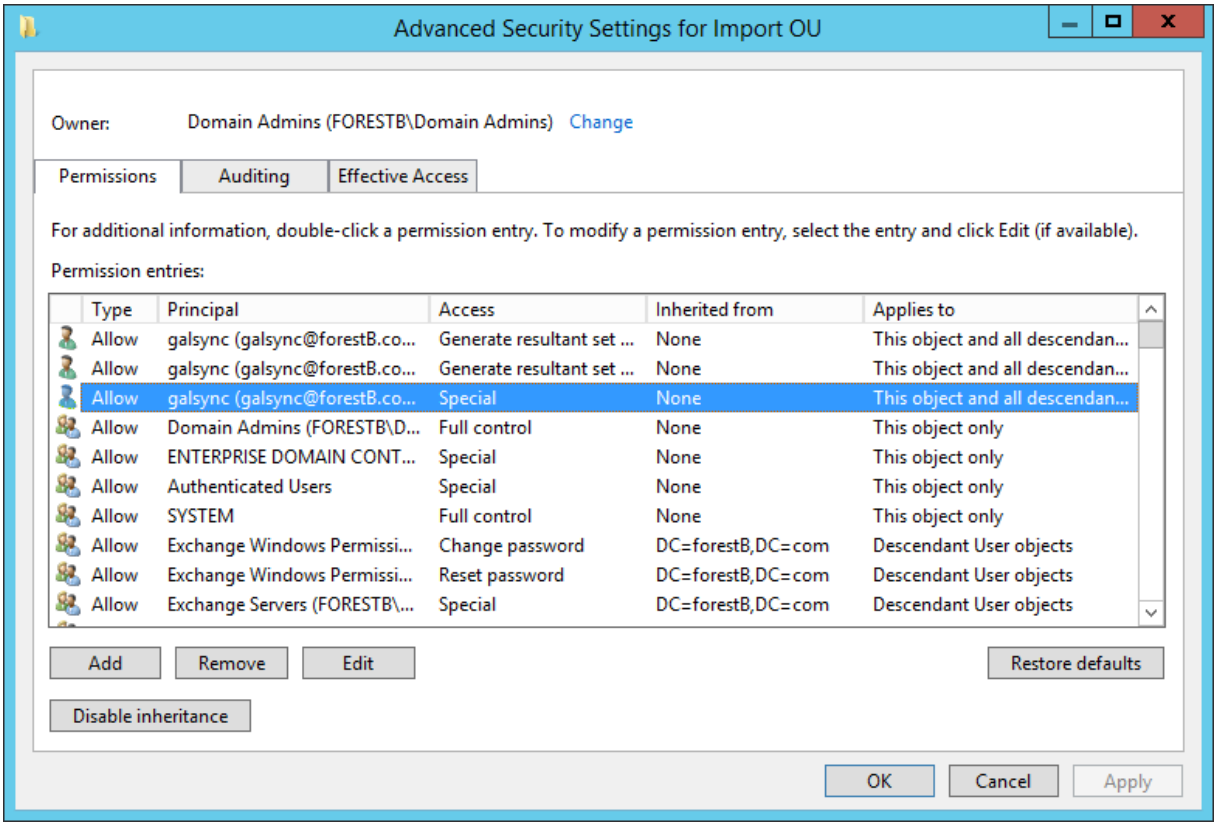
After that, right-click the OU and choose **Properties**.



Select the GALsync Service account and click **Advanced.**

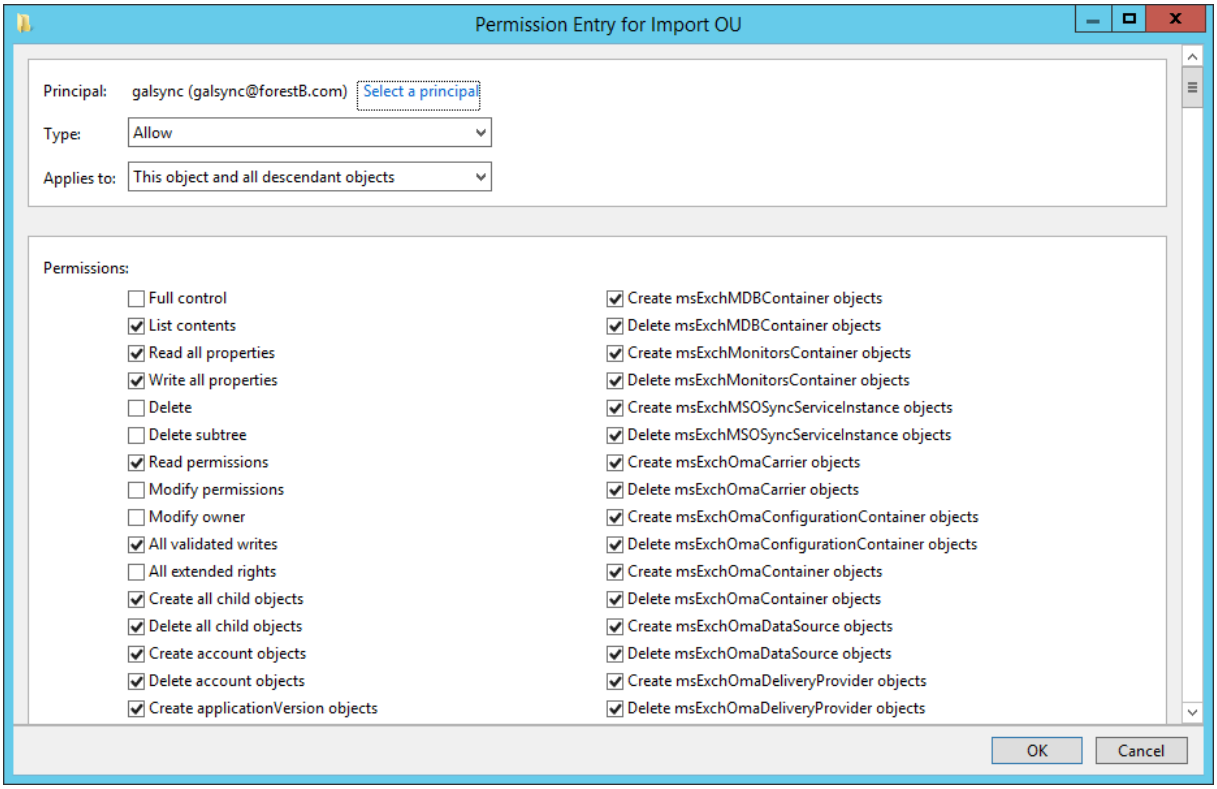


Select the GALsync Service account again and click **Edit**.

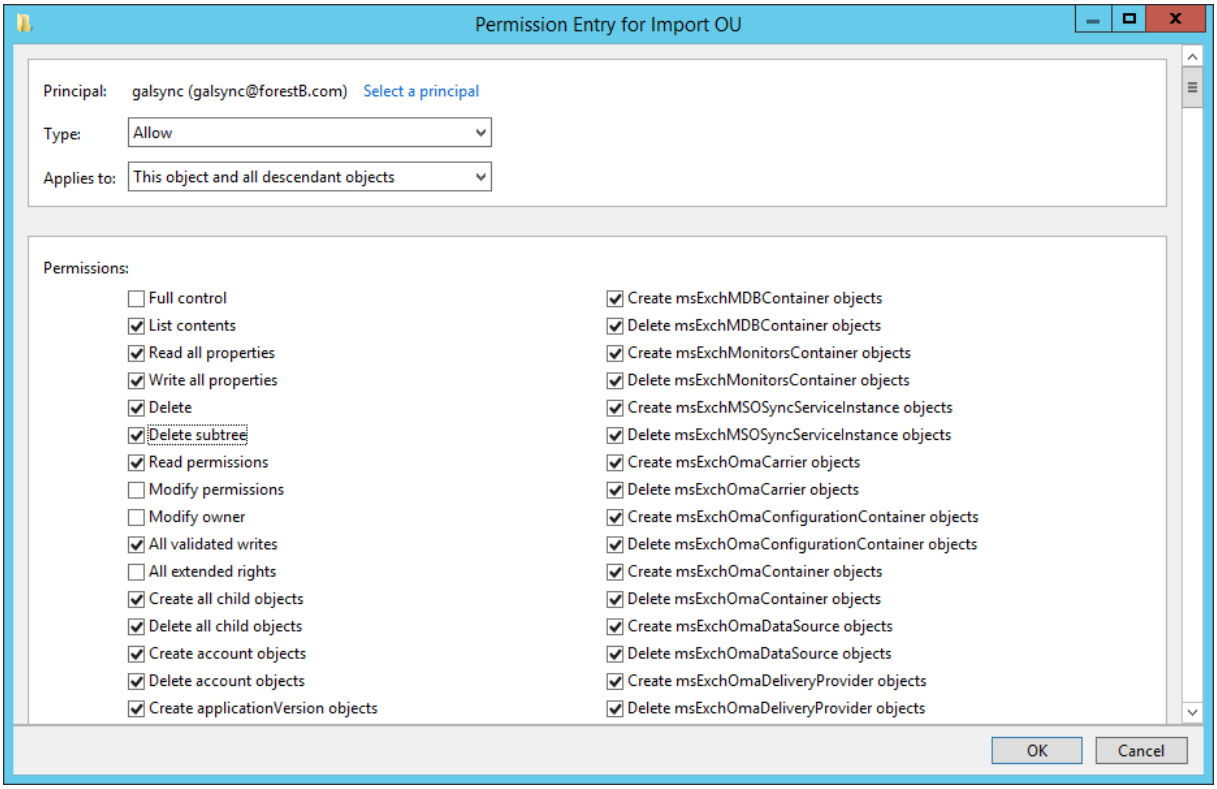


Check that the permission applies to:

This object and all descendant objects



Select the permissions: **Delete** and **Delete subtree**



Click **OK** to close all Dialogs.

GALsync components

Files

The executables are stored by default in **C:\Program Files\NETsec GALsync**, but you may change this during setup routine. This folder will be removed if you uninstall the software.

Files containing your configured policies, created encryption keys, logfiles and so on are placed in folder **%programdata%\NETsec GmbH & Co. KG\GALsync**. This folder will persist, if you uninstall the software.

Note: the folder %programdata% usually is hidden. you may activate the option 'Show hidden files, folders, and drives' in folder 'options' of the Windows Explorer.

Environment Configuration

An Environment Configuration describes the Exchange environment for which the Policies will be configured and contains the environment-specific settings.

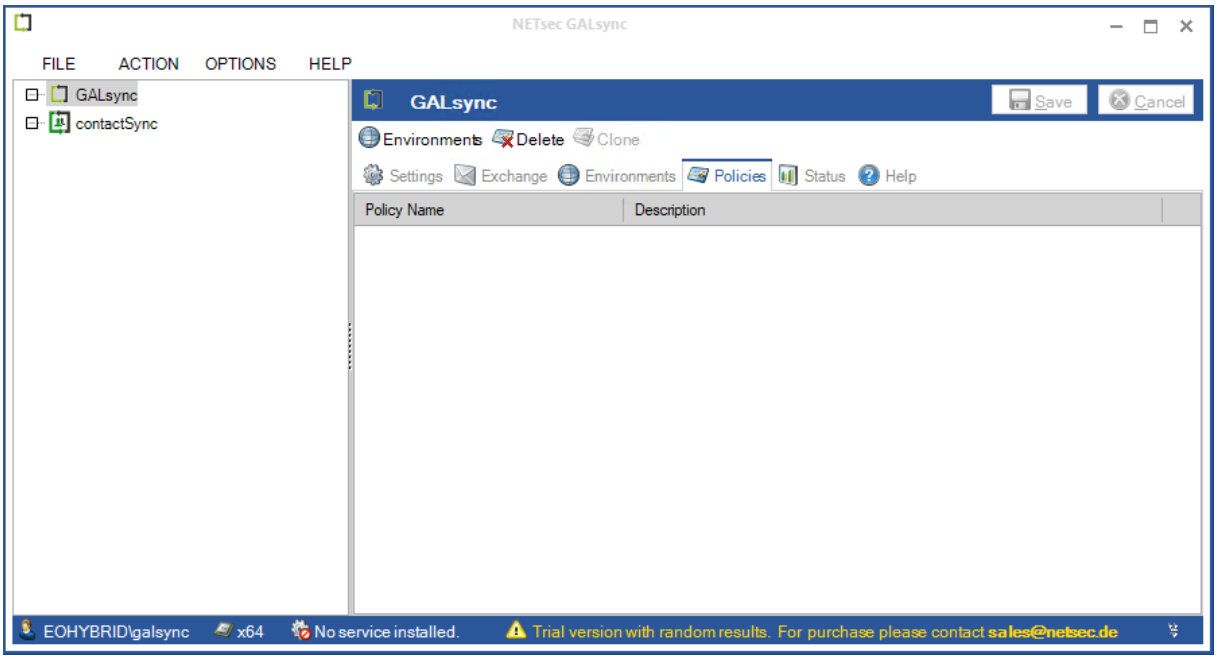
- The Exchange environment can be an on-premises Exchange environment.
- The Exchange environment can be a hybrid Exchange environment.
- The Exchange environment can be a Microsoft 365 Exchange Online environment.

Policy

Policies are the core logical component. A policy defines

- which data you want to share with your partner,
  by filtering objects from your own directory,
- the method by which to transfer the data to your partner,
  mail, ftp, network share including encryption,
- to which target you want to send the data included in this policy,
- to which email address you want to send an administrative report,
- at what times you want the policy to be executed automatically.

GUI



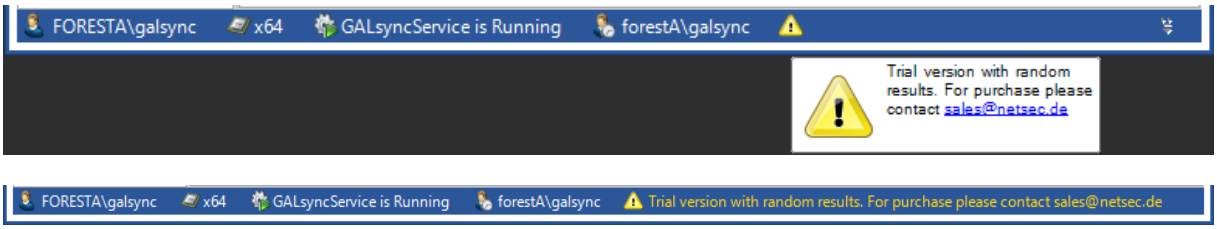
The Graphical User Interface is used to configure the environment configuration for the Exchange environment and the corresponding policies for export and import. You can also test and execute policies manually.

Note: If you run a policy using the GUI the policy runs in the context of the user that is logged in. Therefore, it is recommended to log in with the same account which is configured for the GALsync service.

The GUI is executed as a process named **GALsync.exe**.

Information Bar

The bar at the bottom of the GALsync window shows information about the user account running the GALsync Graphical User Interface (GUI), and the status of GALsync Service. Additionally, it will inform you about the licensing state.



Policy Wizard

The GALsync Console also provides Wizards for simplifying the tasks of creating export and import policies. The Wizards walk you through each step, in order to create a usable policy that you can run manually or scheduled. If you go through the wizard GALsync provides you with different information

Indicates a positive validation

Indicates that some conditions in this step have not been validated yet

Feature is not used

Indicates a configuration process

Service

The GALsync Service is only used to execute the scheduled policies.

The GALsync Service checks once a minute if there are enabled policies to be executed. These policies will be added to the execution queue and run sequentially.

The service is executed as a process named **GALsyncService.exe**.

Every scheduled policy runs in the context of the user that is used by the GALsync Service.

Running GALsync Policies via command line

Start a GALsync policy with the following command:

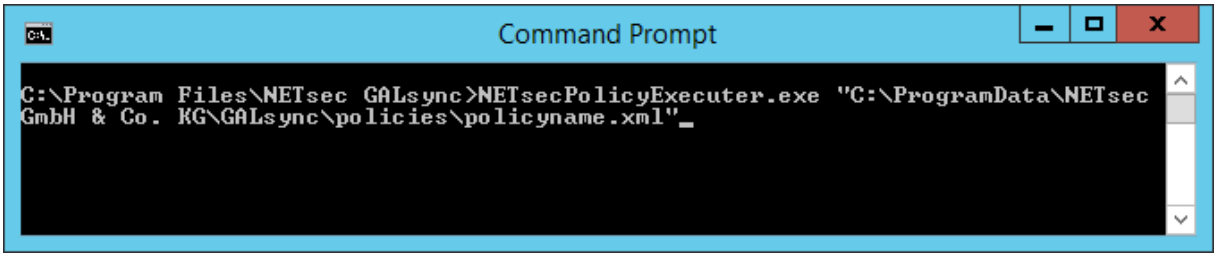
Syntax

```
cd "<program files>\NETsec GALsync\"
NETsecPolicyExecuter.exe "%programdata%\NETsec GmbH & Co.
KG\GALsync\policies\<policy file>"
```

Note: the folder %programdata% usually is hidden. you may activate the option 'Show hidden files, folders, and drives' in folder 'options' of the Windows Explorer.

Example

```
cd "C:\Program Files\NETsec GALsync\"
NETsecPolicyExecuter.exe "C:\ProgramData\NETsec GmbH & Co.
KG\GALsync\policies\policyname.xml"
```



As of GALsync Version 7.0.5 the **GALsyncPolicyExecuter.exe** is renamed to **NETsecPolicyExecuter.exe**.

Important: If you use the Windows Task Scheduler for running the policies, then you have to correct the command in your scheduled tasks.

Internal Marks

NoGALsync (internal mark)

If you do not want a special object to be exported, you may insert the value **NoGALsync** in any of the custom attributes (on-premises Exchange: **extensionattribute1** - **extensionattribute15** or Exchange Online: **customAttribute1** - **customAttribute15**). This prevents GALsync from adding this object to the export list.

galsync:joe.dole@netsec.de (internal mark)

If you change the primary SMTP address of already synchronized objects GALsync cannot match the appropriate contact during import. It will delete the existing contact and create a new one with the modified SMTP address.

To prevent this behavior, you can change the primary SMTP address of an object in the source environment and note the old primary SMTP address in one of the custom attributes (on-premises Exchange: **extensionattribute1** - **extensionattribute15** or Exchange Online: **customAttribute1** - **customAttribute15**) using the prefix **galsync:**

Example

```
galsync:joe.dole@netsec.de
```

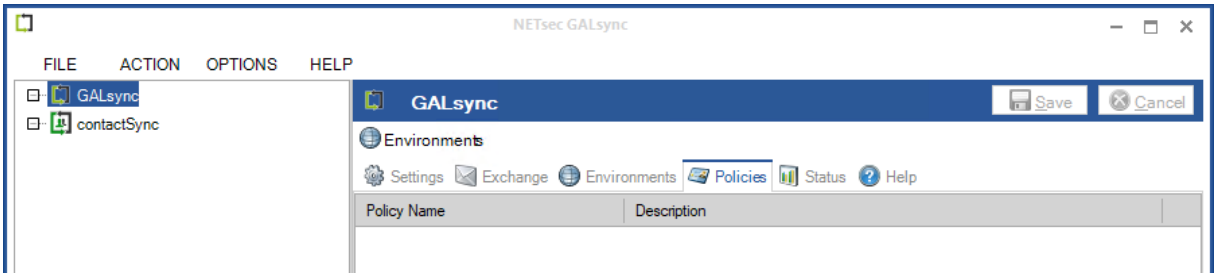
Now the existing contact in the target environment will not be deleted and recreated, but instead GALsync will match the contact and change the primary SMTP address of the exiting contact.

SyncWithGALsync (internal mark)

If you want to synchronize an existing **Guest User (GuestMailUser)** by GALsync, you may insert the value **SyncWithGALsync** in any of the custom attributes (Exchange Online: **customAttribute1** - **customAttribute15**).

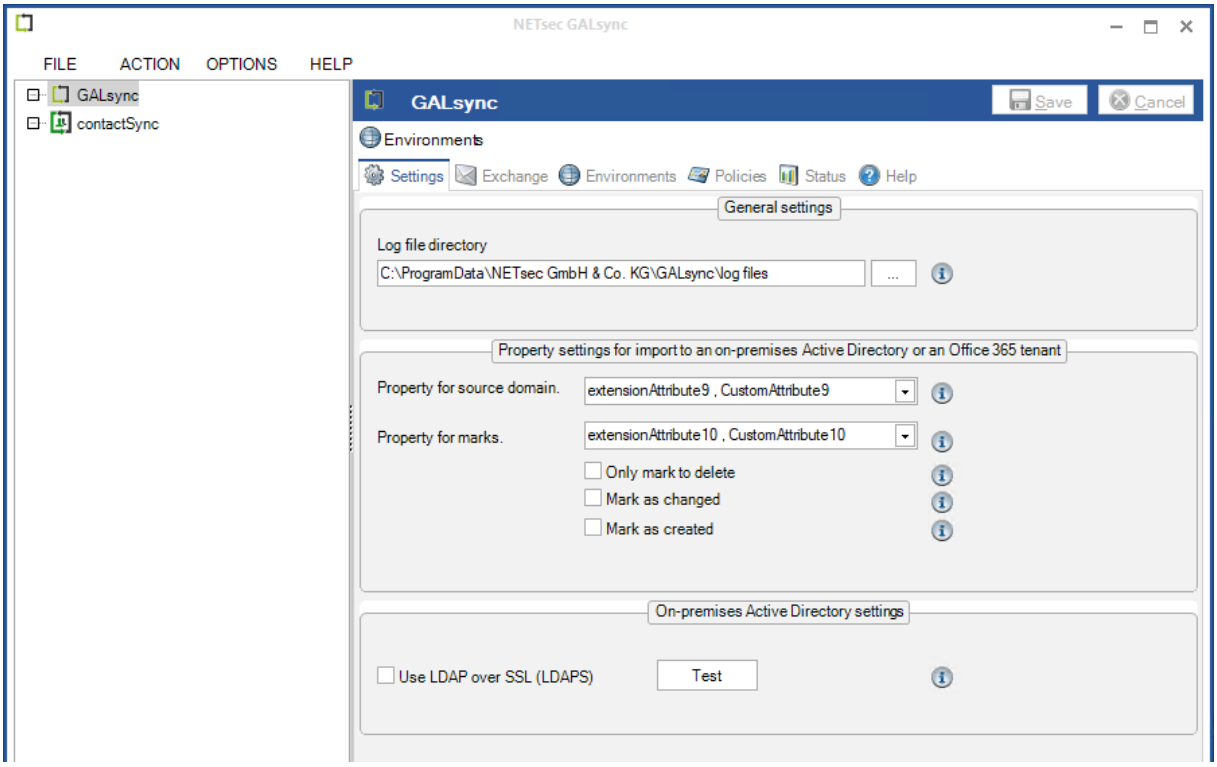
Global Settings

The Global Settings are available if you click the **GALsync** node in the left hierarchy tree. The content pane now displays the **Settings**, **Exchange**, **Environments**, **Policies**, **Status** and **Help** tabs.



Settings Tab

Here you can configure general settings used in all policies.



Log file directory.

GALsync stores the log files in the application data of the program for all users. If the log files should be stored somewhere else the suitable directory path can be chosen here.

Property for source domain

This feature is used to distinguish between objects being imported from multiple source organizations. As value, the objects' **distinguishedName** (DN) and further technical information will be present. Please choose an appropriate attribute where to store the value.

Property for marks

This feature is used to store marks as history about actions taken or to be taken concerning imported objects. Please choose an appropriate attribute where to store the marks. GALsync provides three different types of marking:

Mark objects for deletion

Select this option if you do not want objects to be deleted automatically. Instead, they will be marked for deletion.

Note: If you choose this option, you may have objects in your Active Directory / Microsoft 365 tenant that are no longer related to objects in your partner's Active Directory / Microsoft 365 tenant.

Mark objects that have been modified.

Select this option, if you want to mark modified objects for later viewing.

You can list all modified objects by creating a new Saved Query with a custom search in MMC **Active Directory Users and Computers** for on-premise environments or with PowerShell commands for Microsoft 365 tenants.

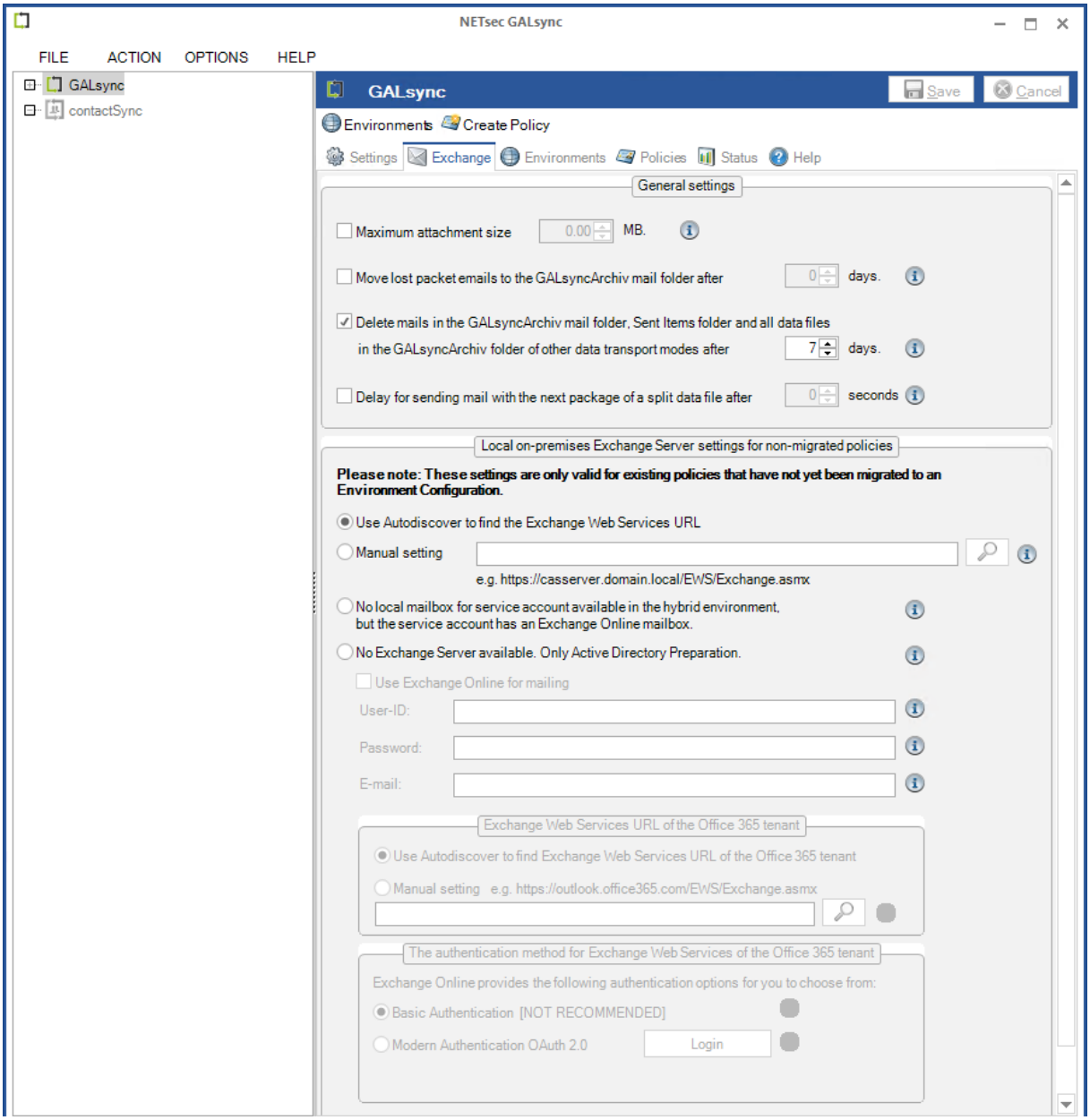
Mark newly created objects.

Select this option, if you want to mark newly created objects for later viewing.

Check this option if you want to list all created objects by creating a new Saved Query with a custom search in MMC **Active Directory Users and Computers** for on-premise environments or with PowerShell commands for Microsoft 365 tenants.

Exchange Tab

Here you can configure **General settings** for Exchange used in all policies and some **Local on-premises Exchange Server settings for non-migrated policies**, which used in all old policies, which are not yet migrated to an Environment Configuration.



General Settings for Exchange

Maximum attachment size

This setting enables you to limit the attachment size of the data GALsync sends via email. Once the data file gets larger then set here the limited size, GALsync will send the data via multiple emails.

Note: This option is not activated by default.

Move lost packet emails to GALsyncArchiv mail folder after x days.

If your partner is sending GALsync data in chunked emails, this setting enables moving lost chunk emails to the **GALsyncArchiv** mailbox folder, so they get deleted according the setting **Delete mails in GALsyncArchiv mail folder**.

Note: This option is not activated by default.

Delete mails in "GALsyncArchiv" mail folder and Sent items folder and all data files in the "GALsyncArchiv" folder of other data transport modes after x days.

Email used for GALsync on the import side is stored in the **GALsyncArchiv** folder. To keep the mailbox small in size, you can configure email should be deleted from this folder.

On the export side, all GALsync email in the **Sent Items** folder is also deleted within the same interval. GALsync also deletes data files in **GALsyncArchiv** folder after the configured number of days.

Delay for sending mail with the next package of a split data file after x seconds.

This option is only valid when combined with the option **Maximum attachment size**. GALsync sends the next mail with an attached package of a split data file after GALsync waited x seconds.

Note: This option is not activated by default.

Local on-premises Exchange Server settings for non-migrated policies

These settings are for old policies of the on-premises Exchange environment, if the policy is not yet migrated to an Environment Configuration.

Note: This setting is also on the 'Exchange Server on-premises' tab of the Environment Configuration for the migrated policies.

Use Autodiscover to find the Exchange Web Services URL

If you work with on-premises Exchange Server you can choose **Use Autodiscover to find the Exchange Web Services URL**.

Manual setting

If Autodiscover does not work you may set the value for Exchange Web Services URL manually. If you click the SEARCH icon then GALsync tries to discover the **Exchange Web Services URL** via **Autodiscover**.

For example:

```
https://casserver.domain.local/EWS/Exchange.asmx
```

No local mailbox for service account available in the hybrid environment, but the service account has an Exchange Online mailbox.

If you export and import to the on-premises part of your hybrid Exchange environment and the mailbox of your local GALsync service account is moved to Exchange Online, please enable also the option **Use Exchange Online for mailing** and insert the credentials of your GALsync service account to use its Exchange Online mailbox for send and receive email.

No Exchange Server available. Only Active Directory Preparation

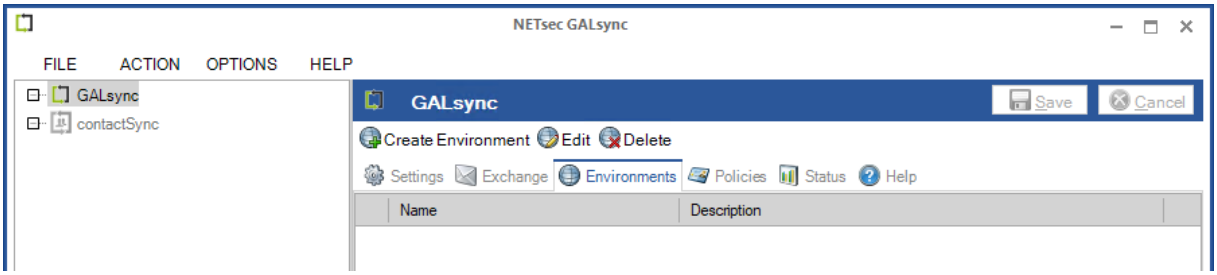
You can import / export objects using an Active Directory Forest without installing Exchange Server. In order to do so you need to extend the Active Directory Schema to actually have Exchange properties (start Exchange Setup with the flag **/adprep**). If you work with such a forest, you can choose the option **No Exchange server available. Only Active Directory Preparation**. In this case you cannot use an internal Exchange server for mailing, you can use an Exchange Online account selecting the option **Use Exchange Online for mailing**.

***Important:** We do not recommend extending the Active Directory Schema in the following scenario:*
Your current Active Directory is syncing via Azure Active Directory Connect (AADC) to your existing Microsoft 365 tenant.

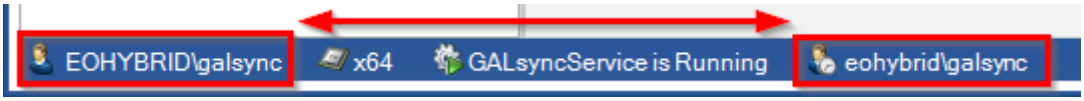
Note: This option is only for special scenarios.

Environments Tab

GALsync requires details concerning the Exchange environment and general settings for which a synchronization should be configured. The information about the Exchange environment is set in an Environment Configuration.

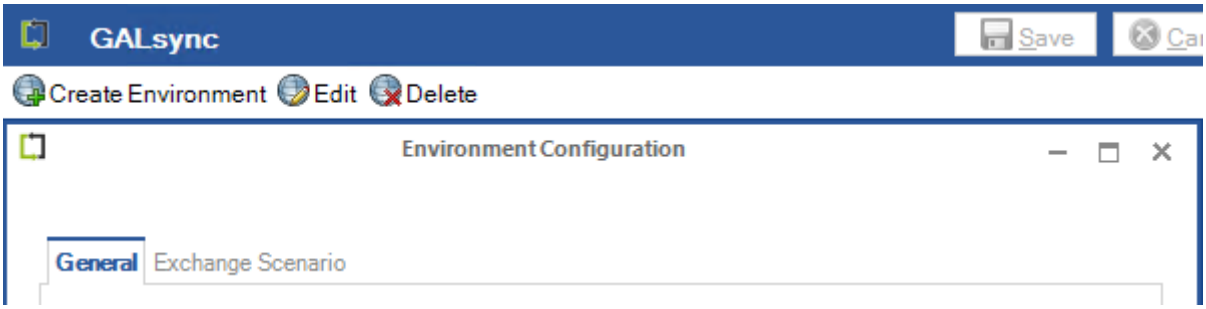


Before you configure an Environment Configuration, please ensure the GALsync GUI is running in the same credentials as the GALsyncService. This can be verified in the information bar at the bottom of the GUI.

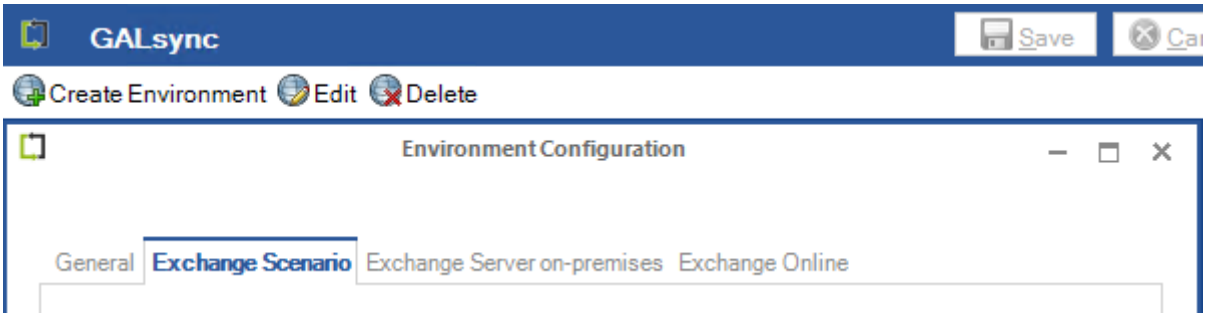


Create Environment

An **Environment Configuration** can be created on the Environments tab by clicking on **Create Environment**. This opens the **Environment Configuration dialog**.



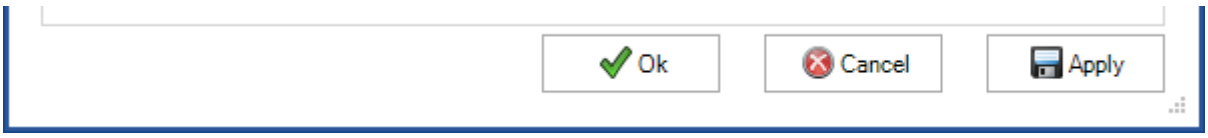
Upon commencement, only the **General tab** and the **Exchange Scenario tab** are visible.



Depending on the selection of the Exchange scenario on the **Exchange Scenario tab**, a variance of additional tabs appears. There is an **Exchange Server on-premises tab** and an **Exchange Online tab**. One of the two tabs can appear, or both.

After an **Exchange Configuration** is configured, it is possible to create policies for it.

Buttons of the Environment Configuration dialog



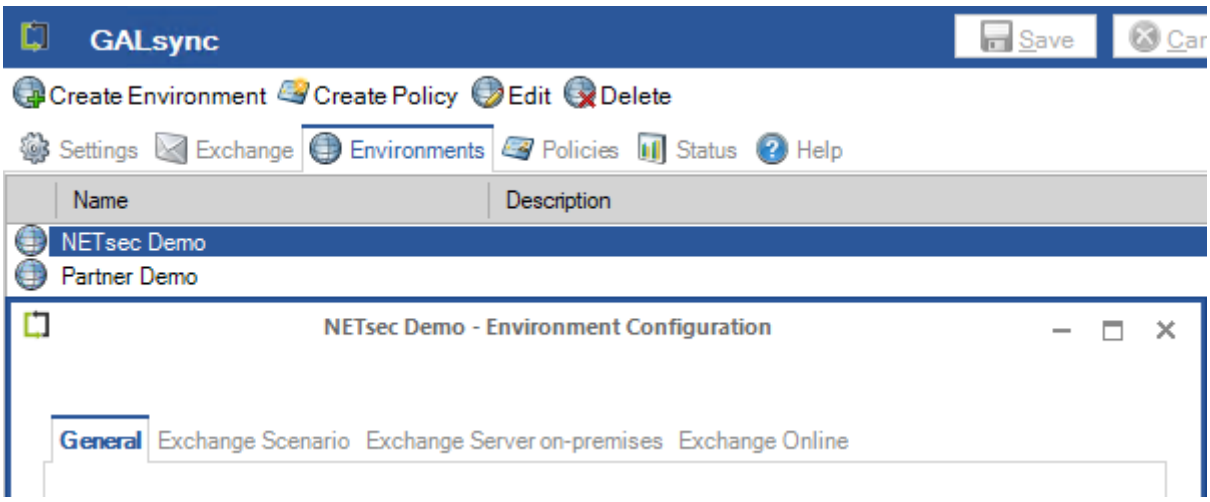
Ok will save the Environment Configuration and close the dialog.

Cancel will close the dialog without saving the Environment Configuration.

Apply will only save the Environment Configuration, but not close the dialog.

Edit

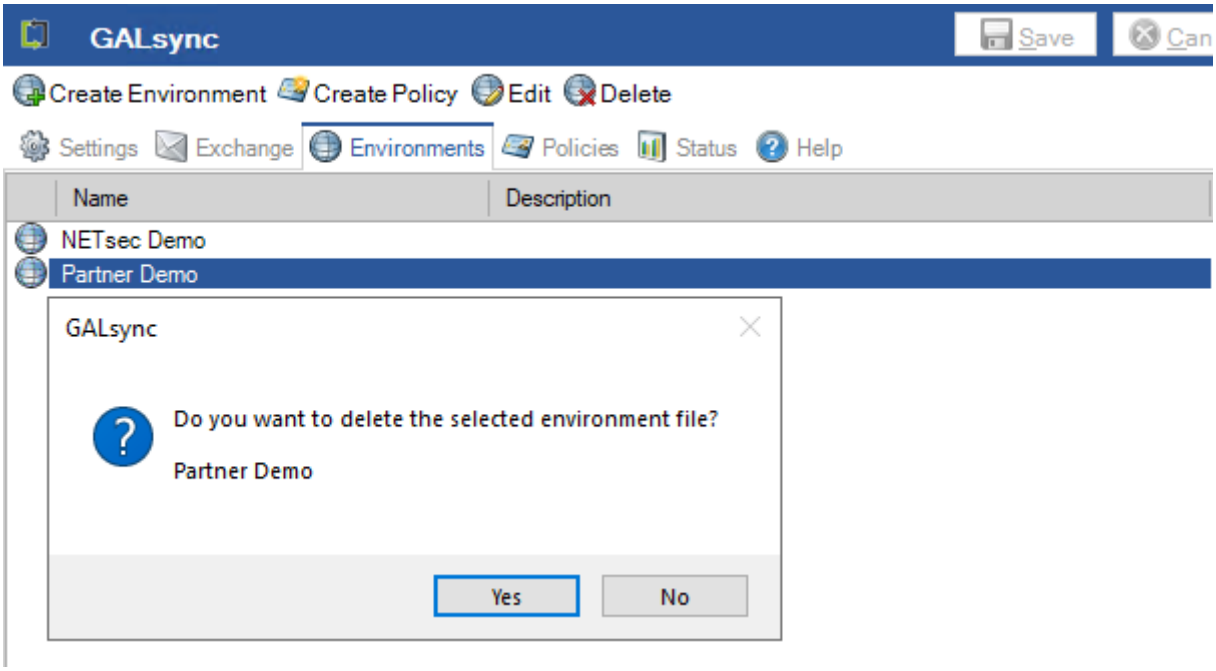
Select an **Environment Configuration** entry of the existing Environment Configuration list and click on **Edit** to open the **Environment Configuration dialog** for the selected Environment Configuration.



The Environment Configuration can be modified at the **Environment Configuration dialog**.

Delete

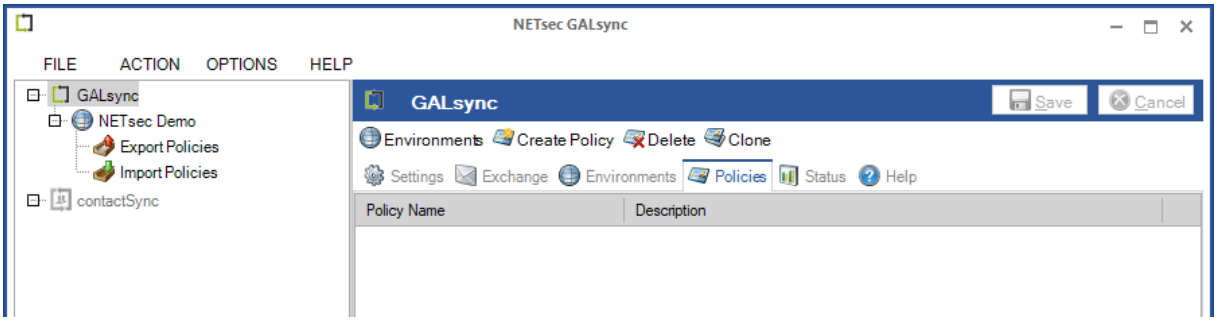
Select the **Environment Configuration**, which should be deleted, in the existing Environment Configuration list and click on **Delete**.



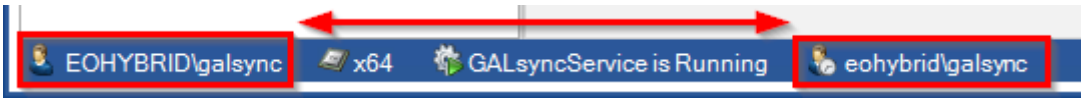
Note: An Environment Configuration can only be deleted, if no further policy exists for the Environment Configuration. This will ensure that no Environment Configuration is deleted that is still in use by a Policy.

Policies Tab

The **Policies** tab lists all existing export and import policies. Select a listed policy to see or modify configuration. After initial setup, if there is no policy created yet, so this list is empty.

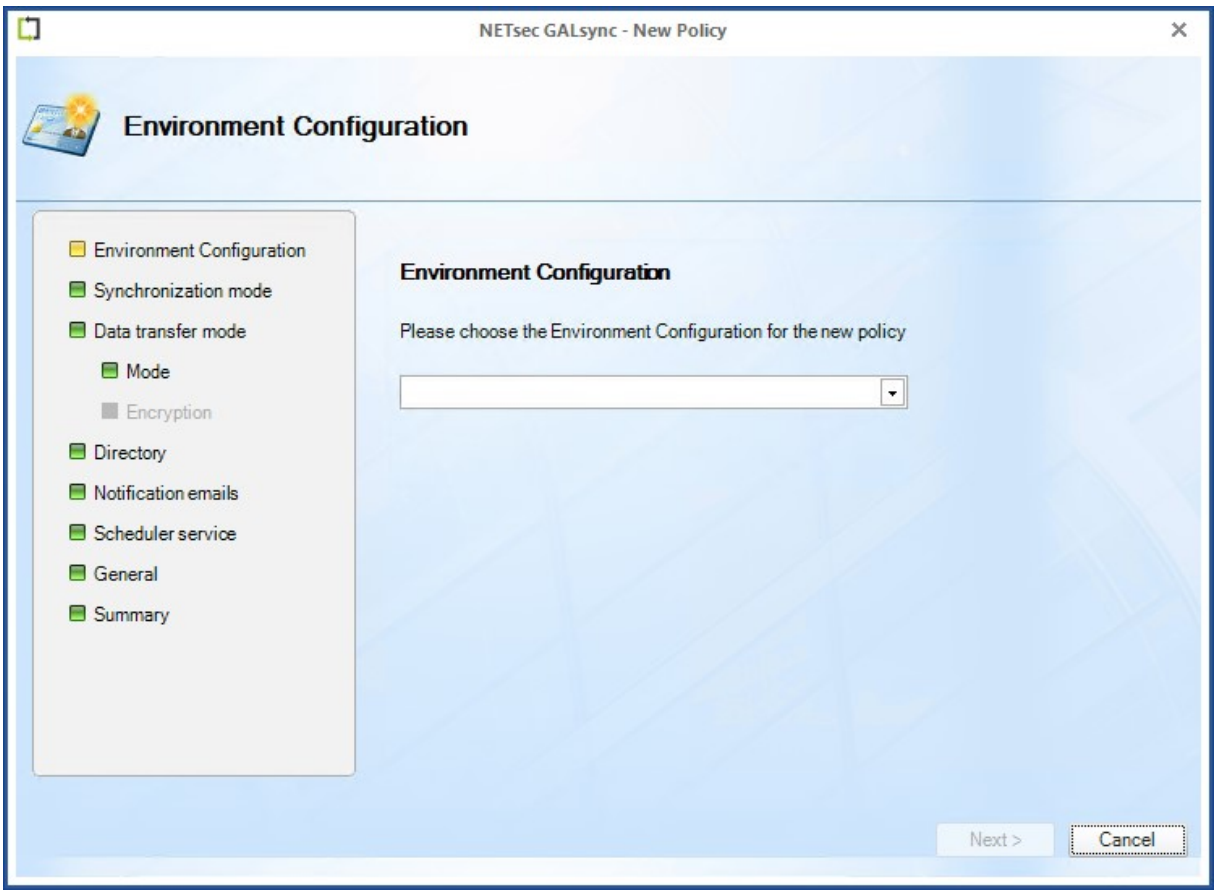


Before you configure a policy, please ensure the GALsync GUI is running in the same credentials as the GALsyncService. This can be verified in the information bar at the bottom of the GUI.



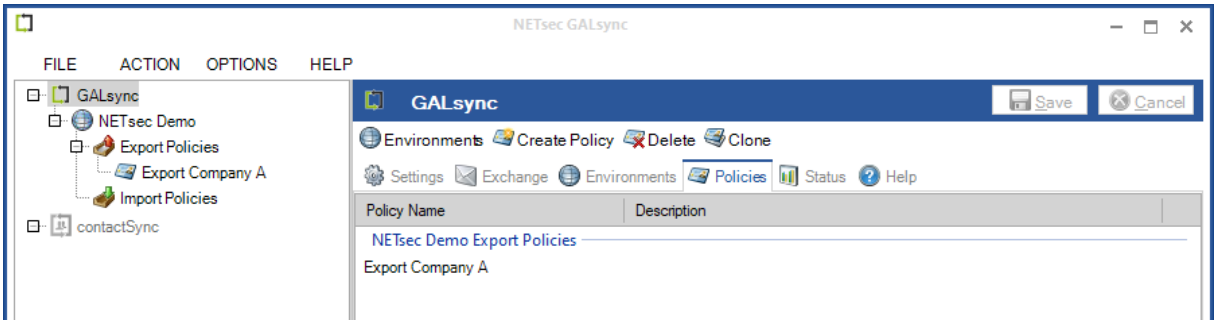
Create Policy

A **Policy** can be created on the Policies tab by clicking on **Create Policy**. This opens the **Policy wizard**.



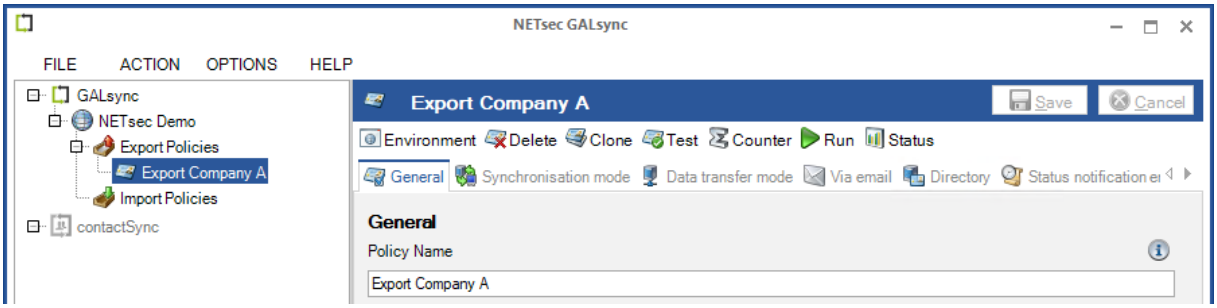
Please note that an Environment Configuration is required first to be able to create a Policy. If you have not yet created and configured an Environment Configuration for your Exchange environment, please create and configure one first.
*Please take a look at the **Environment Configuration** chapter.*

After finishing the Policy Wizard, the new created policy will be listed on the Policies tab.



Edit policy

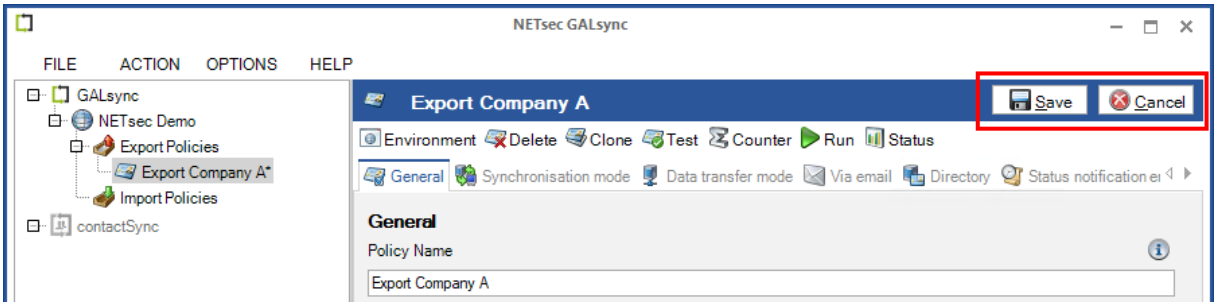
Click on the policy entry to show the policy configuration in the main window.



By clicking the tabs, you can view and modify the configuration of the policy.

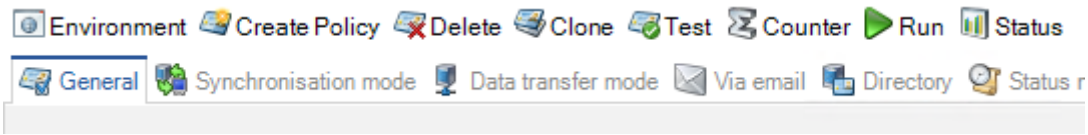
Please take a look at the **Policy Configuration** chapter.

After modifying the policy, please do not forget to save the policy.



Delete

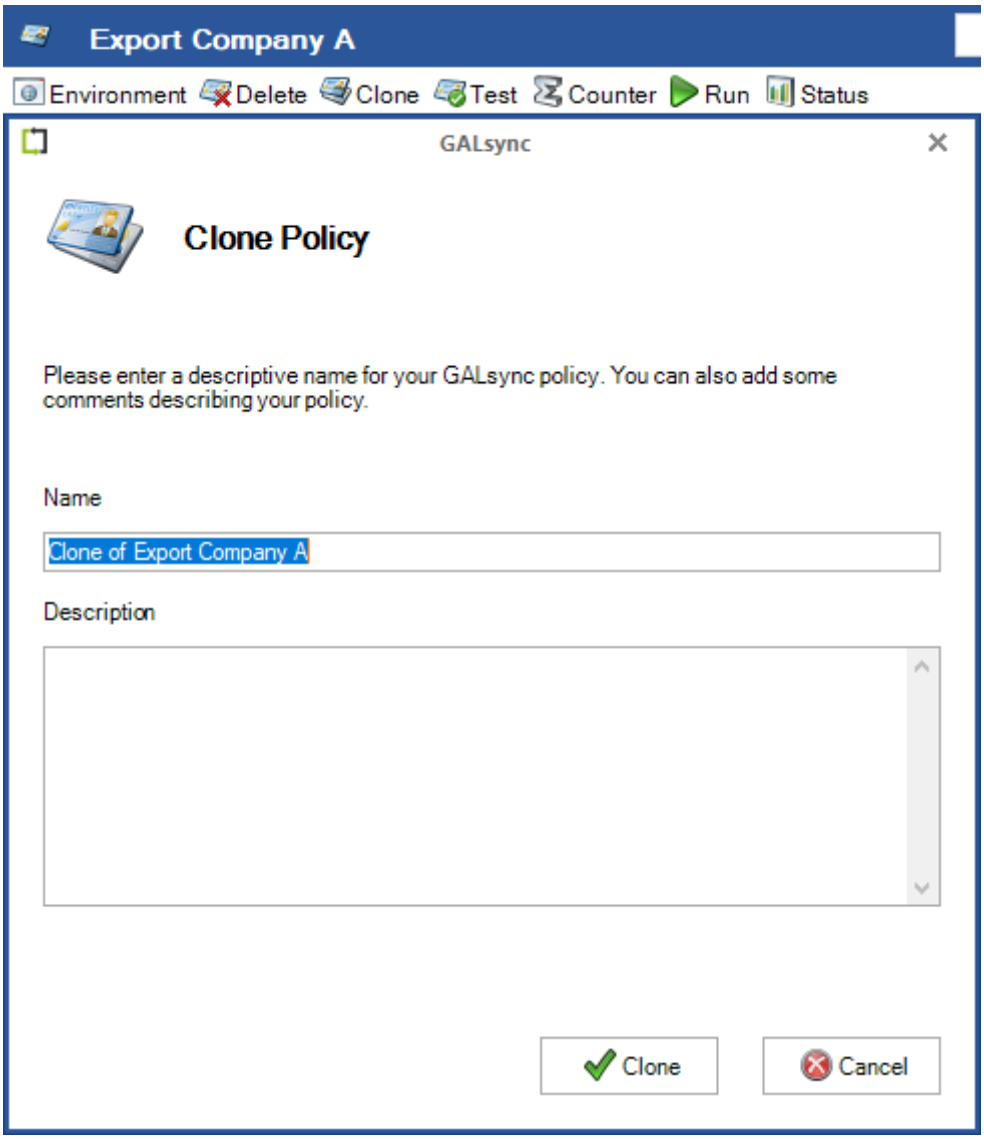
Select the desired **Policy** to be deleted, and click **Delete**.



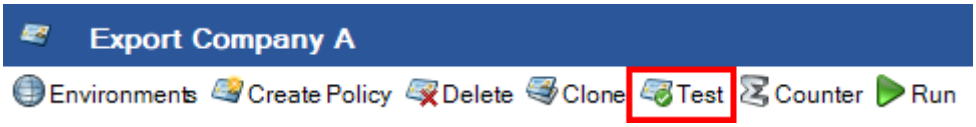
Clone

Select the desired **Policy** to be cloned, and click **Clone**.

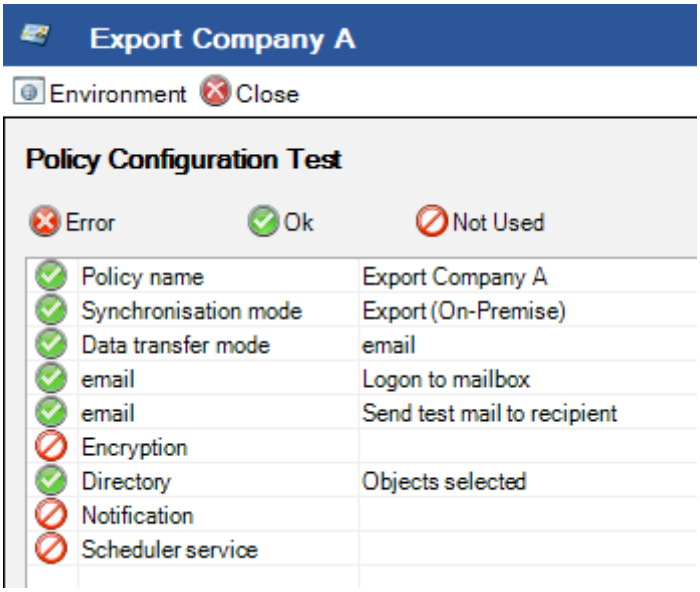
Please insert a new policy name and click **Clone** on the Clone Policy dialog.



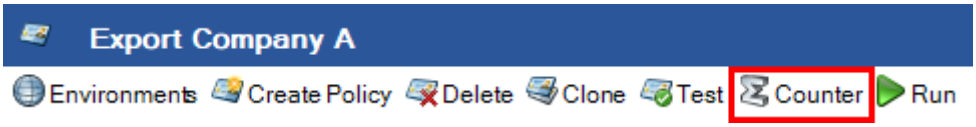
Test



The policy is checked rudimentary if the configuration is complete or anything is still missing. It is the same test as at the end of the wizard when creating a new policy.

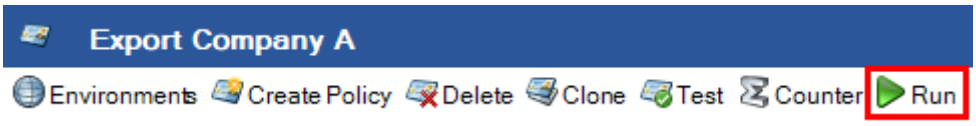


Counter



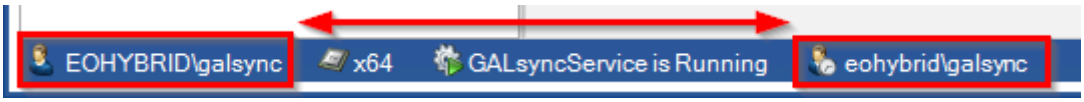
Counts the number of objects that are expected to be exported. This option is only available for export policies.

Run



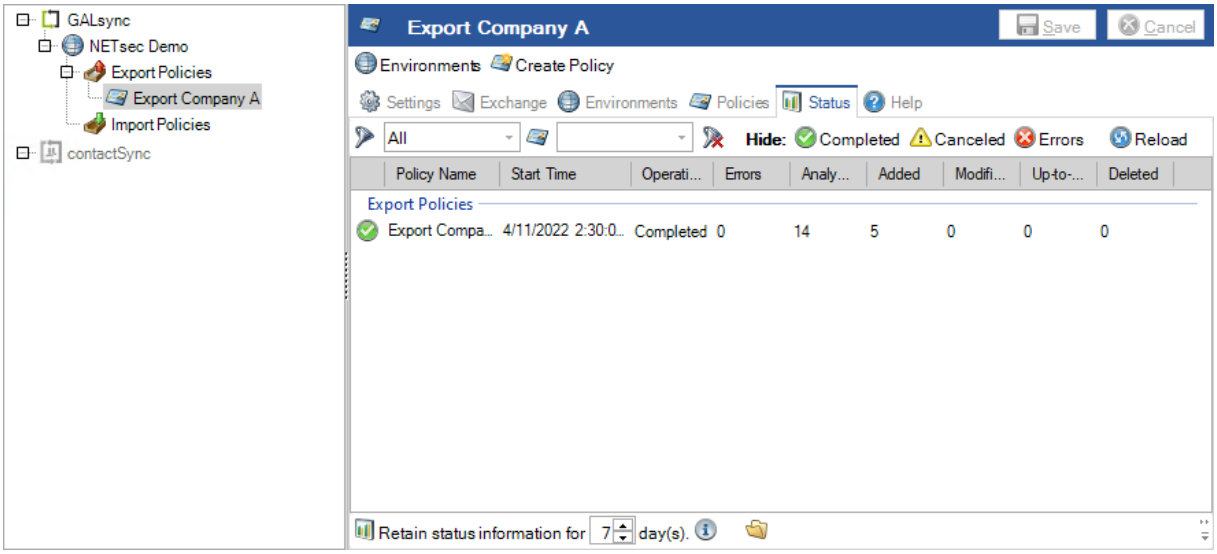
You can run the policy manually.

Please ensure beforehand the GALsync GUI is running in the same credentials as the GALsyncService. This can be verified in the information bar at the bottom of the GUI.



Status

For each policy run a log file entry is displayed on the status tab.



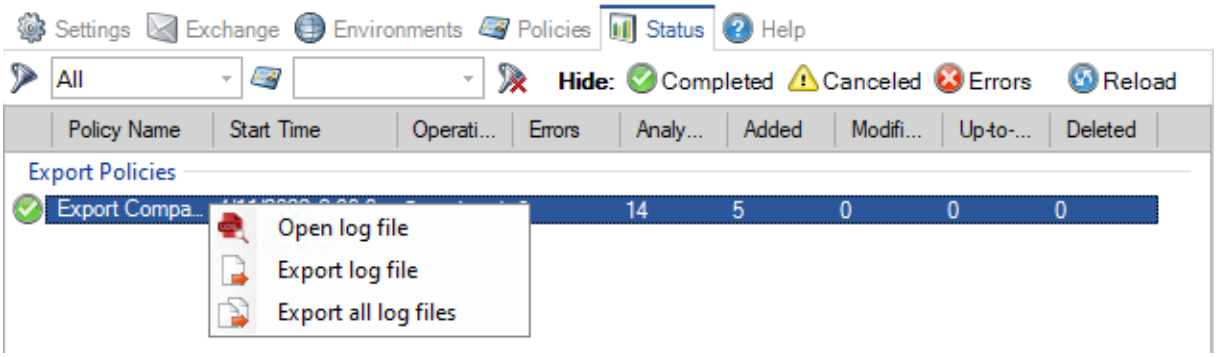
Note: If a policy just is running, access to the log file may not be possible. The log file will be displayed at the top of the list and is depicted with "error".

Retain status information

Here a retention policy can be configured to specify the amount of time the status information (log files) is kept before it is deleted. Also, there's a link to the folder where the log files are stored. Please keep in mind that windows explorer usually hides this folder by default. If you do not see this link, please click at the folder symbol at the bottom to open the folder with the windows explorer.

Open and export log files

The log file of the corresponding policy run can be opened with a double-click on the entry, or from the context menu with a right-click.



For support purposes you may open or export the status files / log files.

Open log file.

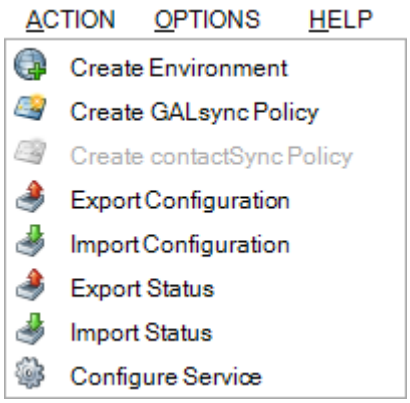
- You can double-click an entry of the status table and the log file will open in the **NETsec LogViewer**.
- Or, you can right-click the status entry to open the context-menu, where **Open log file** can be selected to open it in the **NETsec LogViewer**.

Export log file

Exports only the select log file and saves it to a zip file.

Export all log files

1. Exports all filtered log files which are currently displayed in the status table, and saves them to a zip file.
   For example: all log files of the last week or all log files of a selected policy.
2. The menu **ACTION** -> **Export Status** exports all log files to a zip file.



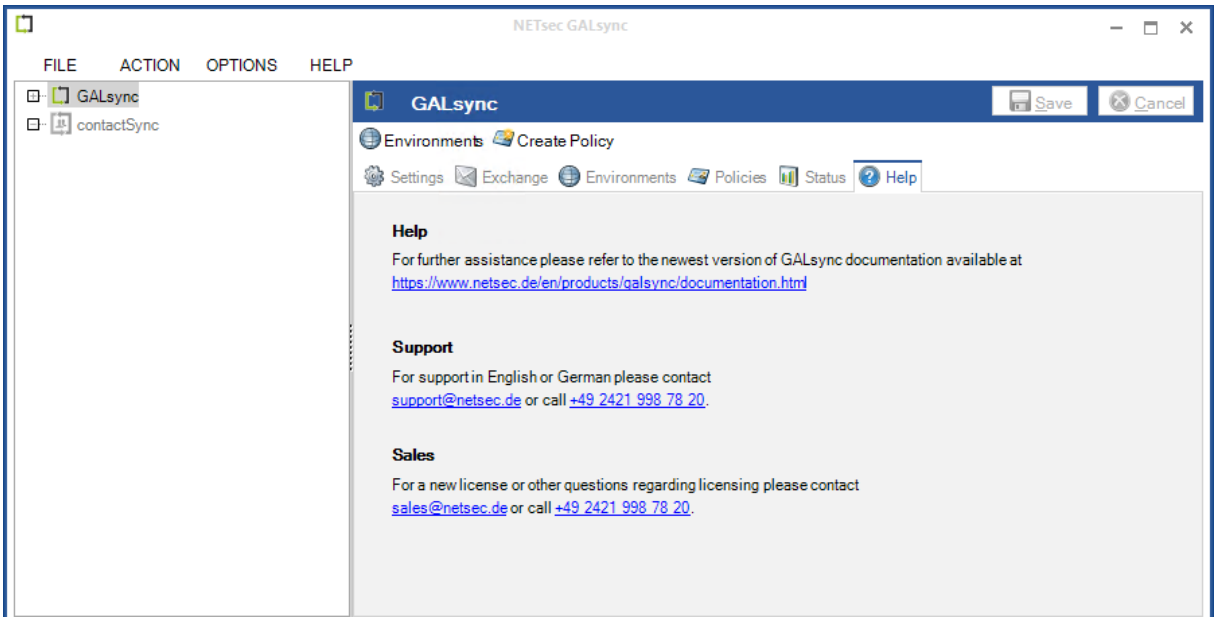
NETsec LogViewer

Please take a look at the NETsec LogViewer manual

https://www.netsec.de/fileadmin/download/LogViewer/NETsec_LogViewer_manual.pdf

Help Tab

The **help** tab provides you with a hyperlink for downloading the latest documentation as well as mail-addresses and phone numbers for support and sales.

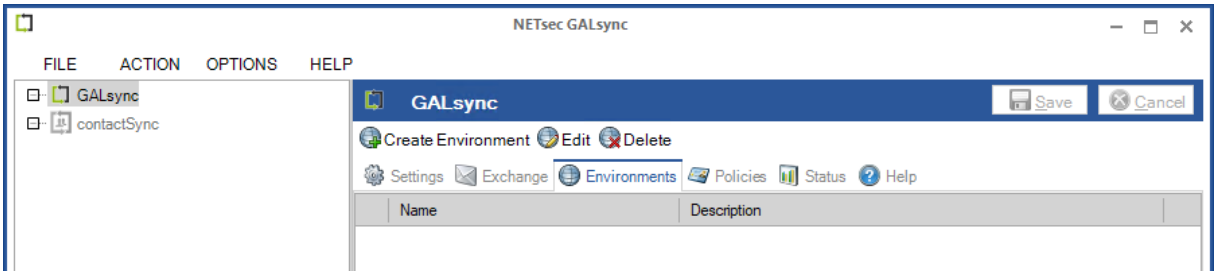


For more information, please see the chapter

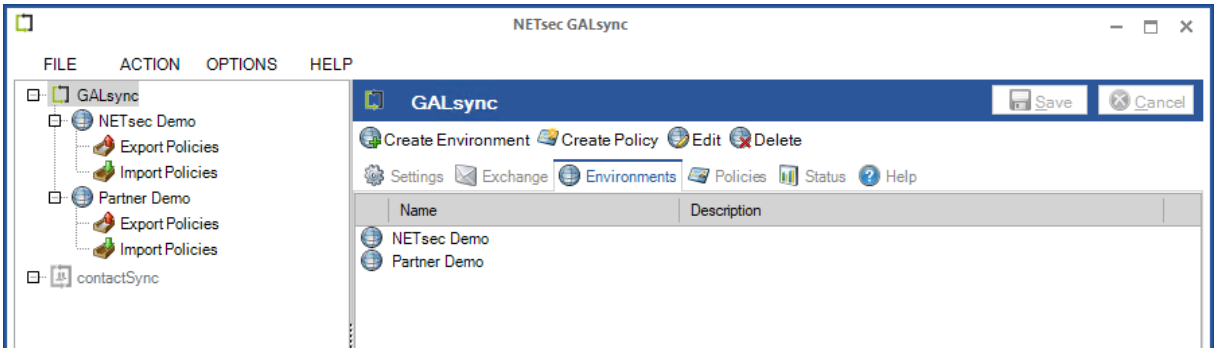
Support: What to do when I notice an error / bug?

Environment Configuration

For the purpose of connecting to Exchange, GALsync needs some general information about the Exchange environment it connects to. Details such as where, and how it connects to Exchange are configured here.

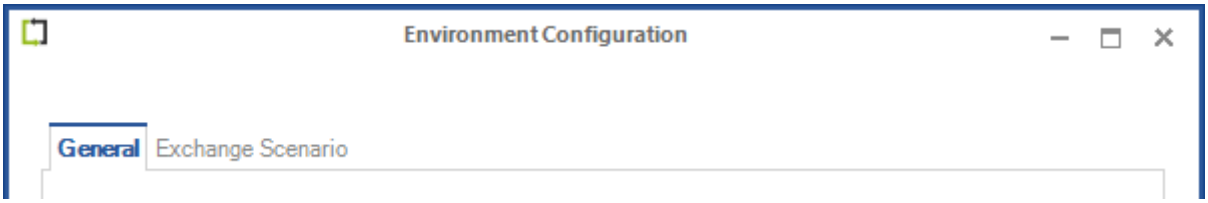


After the Environment Configuration has been configured, GALsync policies will be associated with, and fall under the Environment to which they connect.

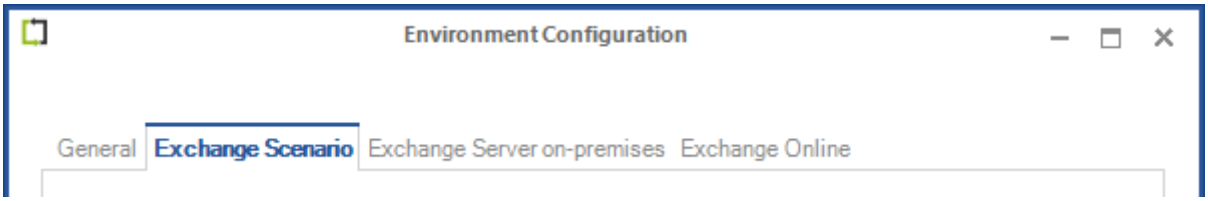


Environment Configuration dialog

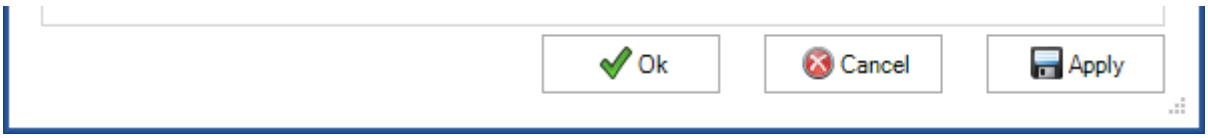
In the beginning, only the **General tab** and the **Exchange Scenario tab** are visible.



Depending on the selection of the Exchange scenario on the **Exchange Scenario tab**, a variance of additional tabs appears. There is an **Exchange Server on-premises tab** and an **Exchange Online tab**. One of the two tabs can appear, or both.



Buttons of the Environment Configuration dialog

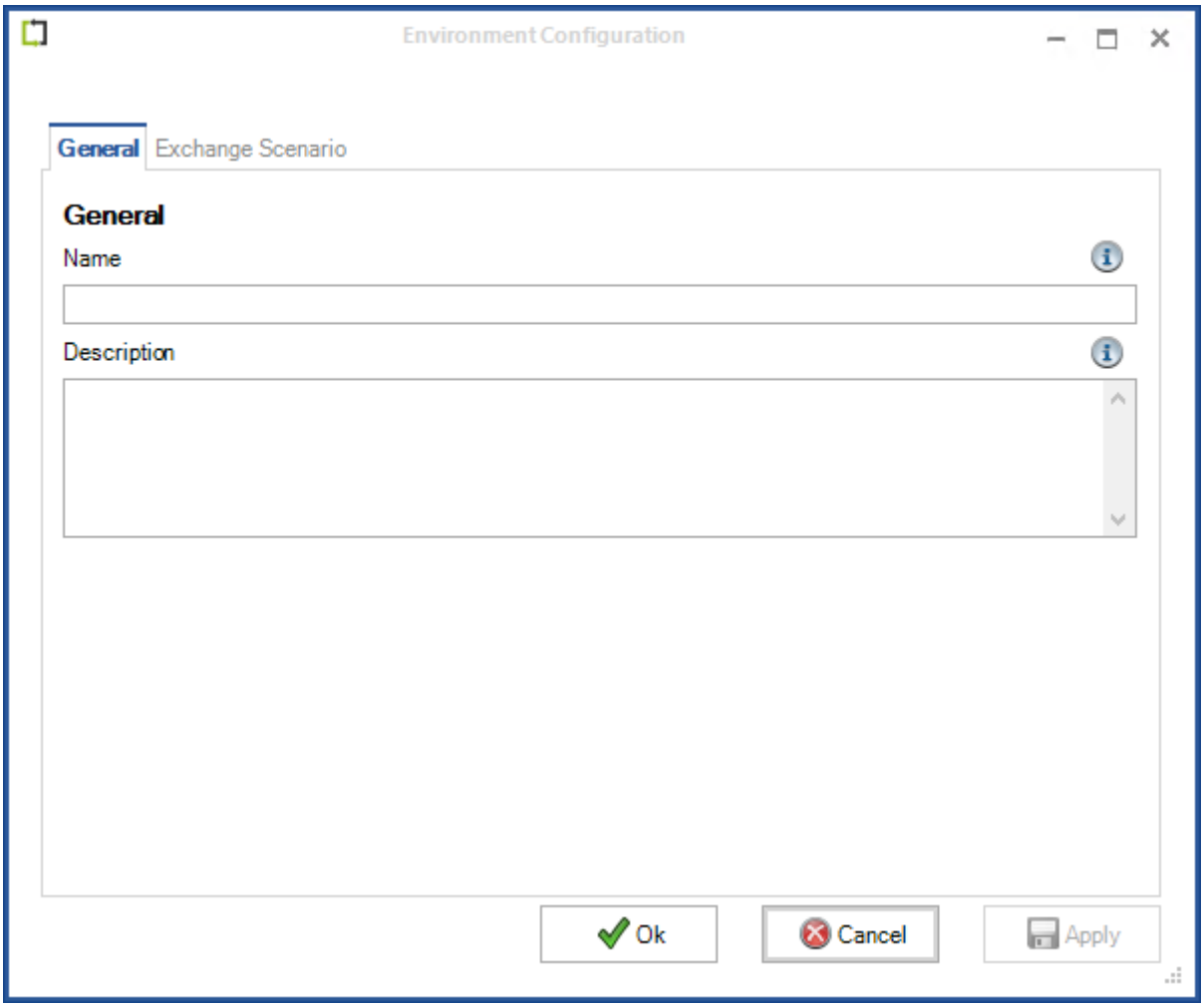


Ok will save the Environment Configuration and close the dialog.

Cancel will close the dialog without saving the Environment Configuration.

Apply will only save the Environment Configuration, but not close the dialog.

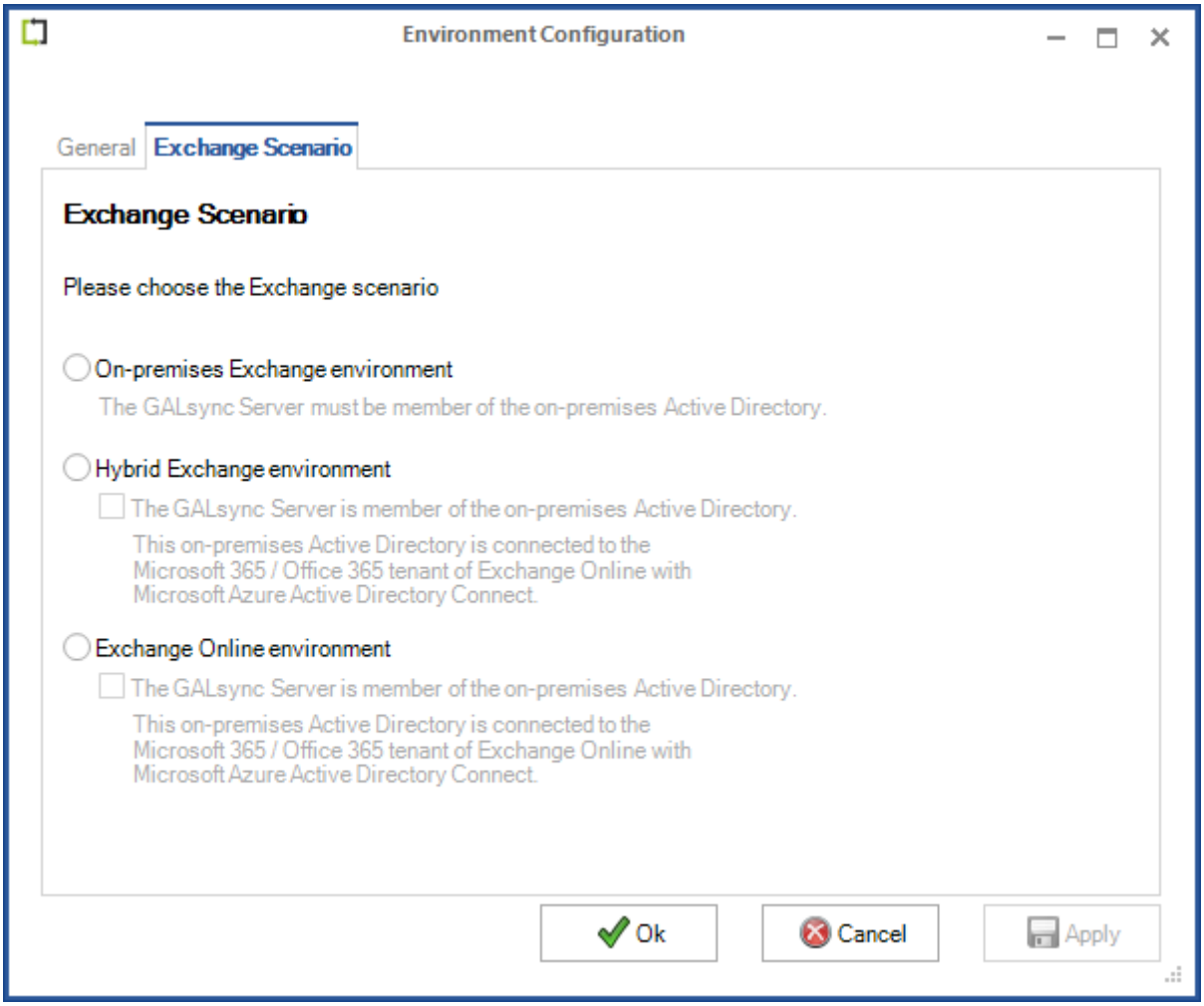
General Tab



On the **General** tab of the Environment Configuration dialog the **Name** of the Environment Configuration must be defined and a **Description** of the Exchange environment can be added.

Next, switch to the **Exchange Scenario tab** of the Environment Configuration dialog.

Exchange Scenario Tab

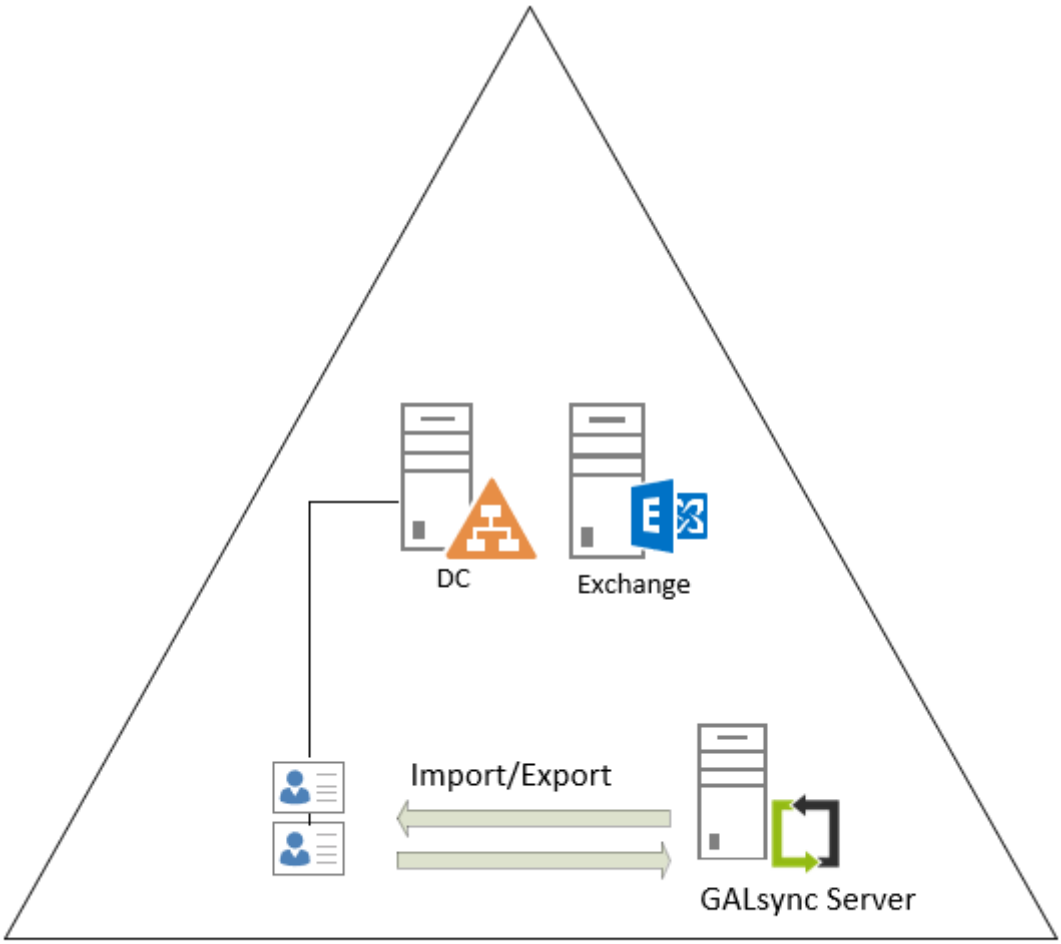


Please choose the **Exchange scenario** for which you want to configure the synchronization.

Three Exchange scenarios can be configured.

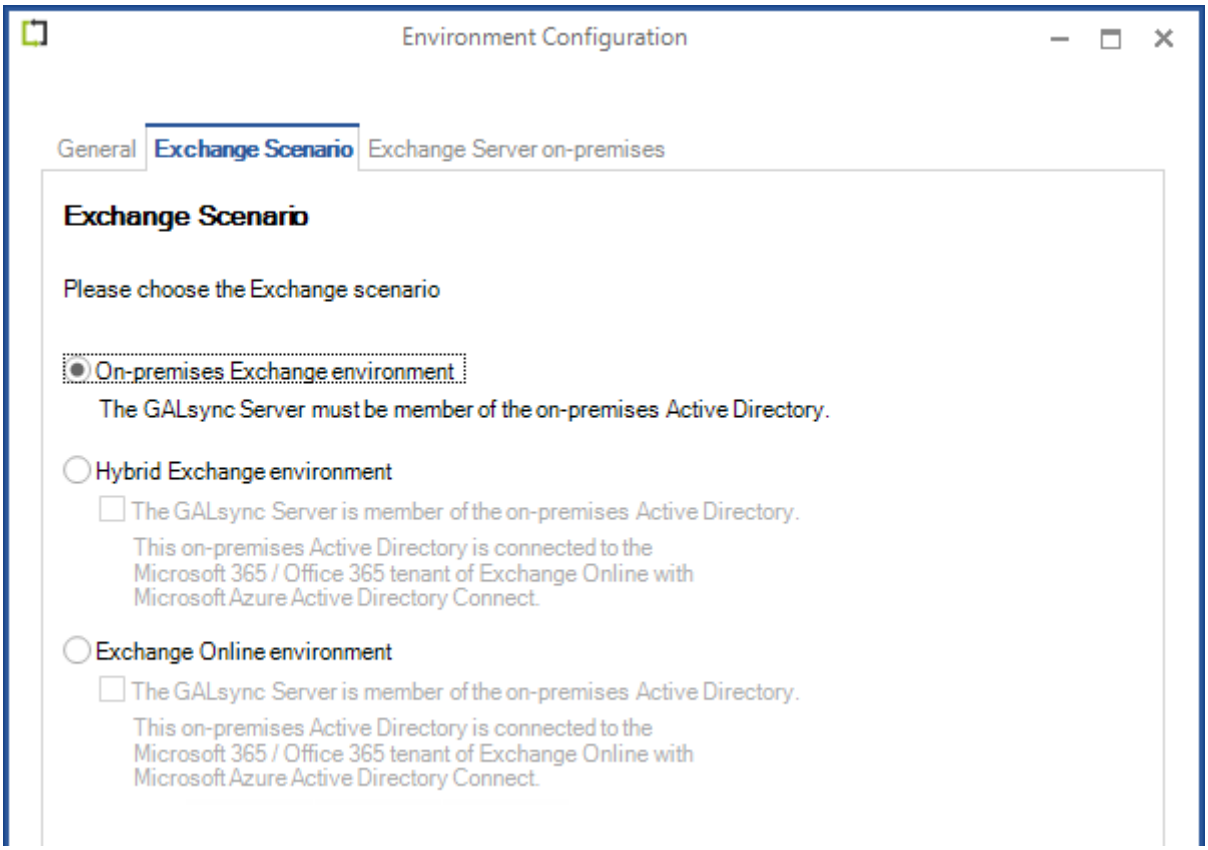
- On-premises Exchange environment
- Hybrid Exchange environment
- Exchange Online environment

On-premises Exchange environment



GALsync installed on a non-critical member server in the Active Directory domain

The Exchange scenario is an on-premises Exchange environment. GALsync needs in each on-premises Exchange environment a non-critical member server of the on-premises Active Directory, where GALsync is installed.



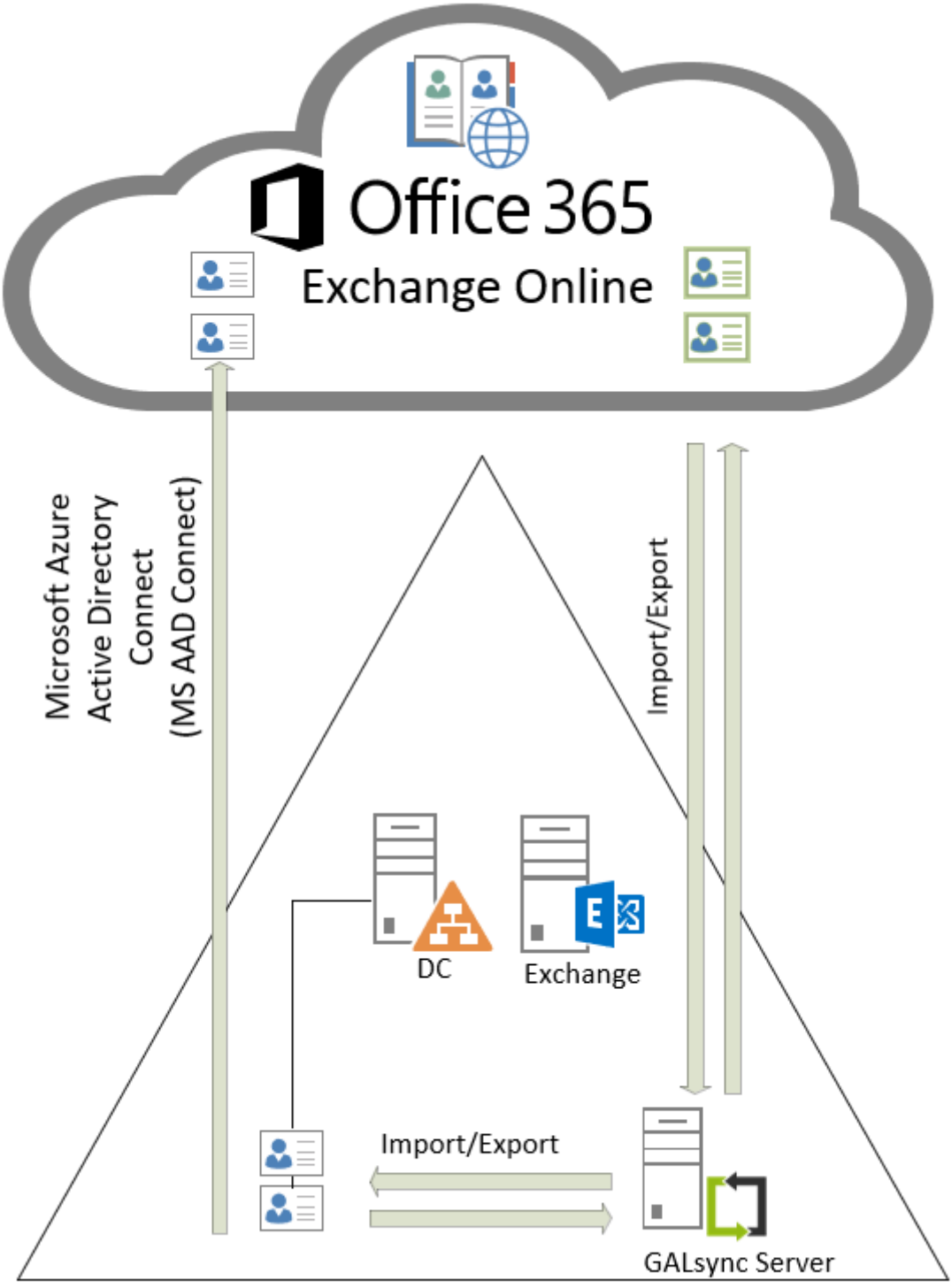
Select the **On-premises Exchange environment**. The GALsync Server must be a member of the on-premises Active Directory.

Note: Only one Environment Configuration with an on-premises Active Directory part can be configured in each environment.

After selecting the Exchange scenario, switch to the **Exchange Server on-premises tab** of the Environment Configuration dialog.

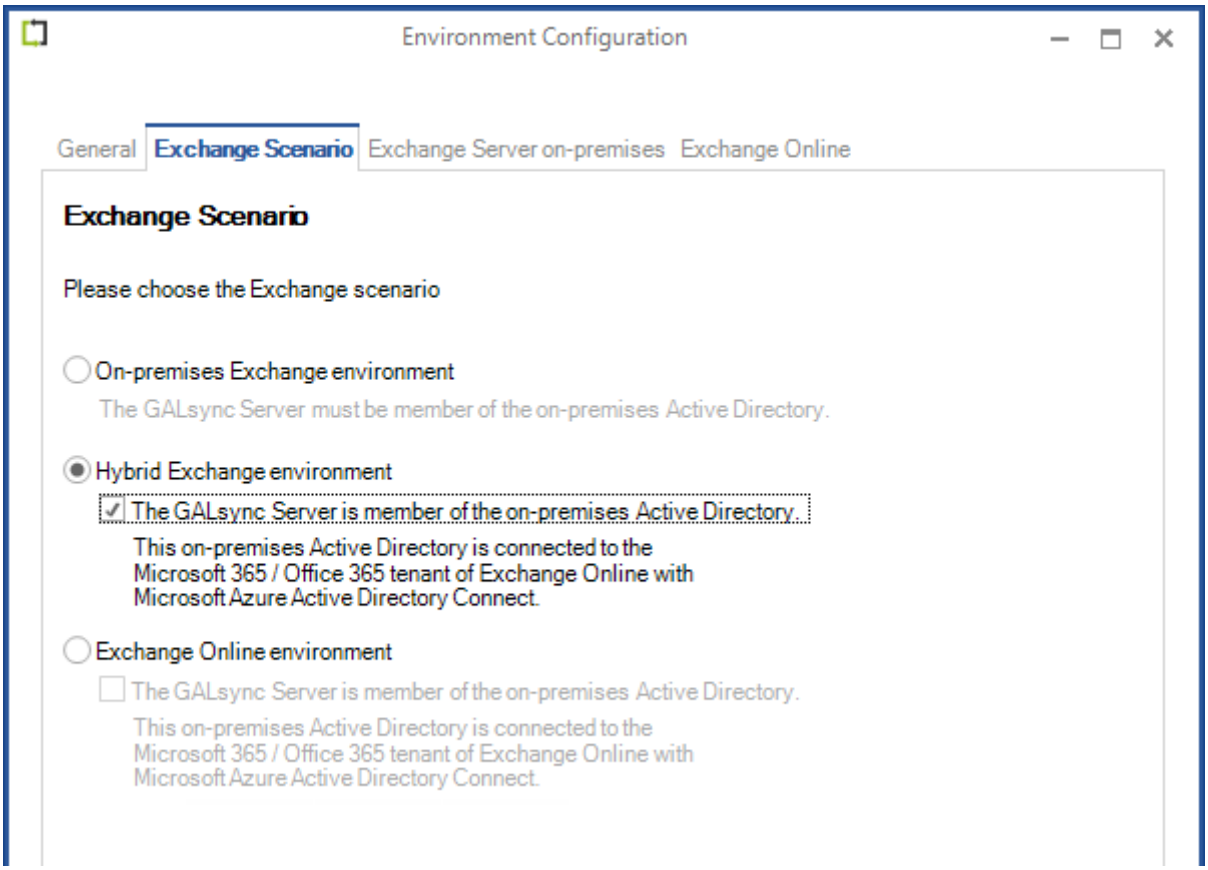
Hybrid Exchange environment

Synchronizing with both parts of the hybrid, on-premises Exchange and Exchange Online



GALsync installed on a non-critical member server in the on-premises Active Directory domain

The Exchange scenario is a hybrid Exchange environment. GALsync is installed on a non-critical member server of the on-premises Active Directory, which is part of the hybrid Exchange environment. GALsync can communicate to the on-premises Exchange part and the Exchange Online part of the hybrid Exchange environment.

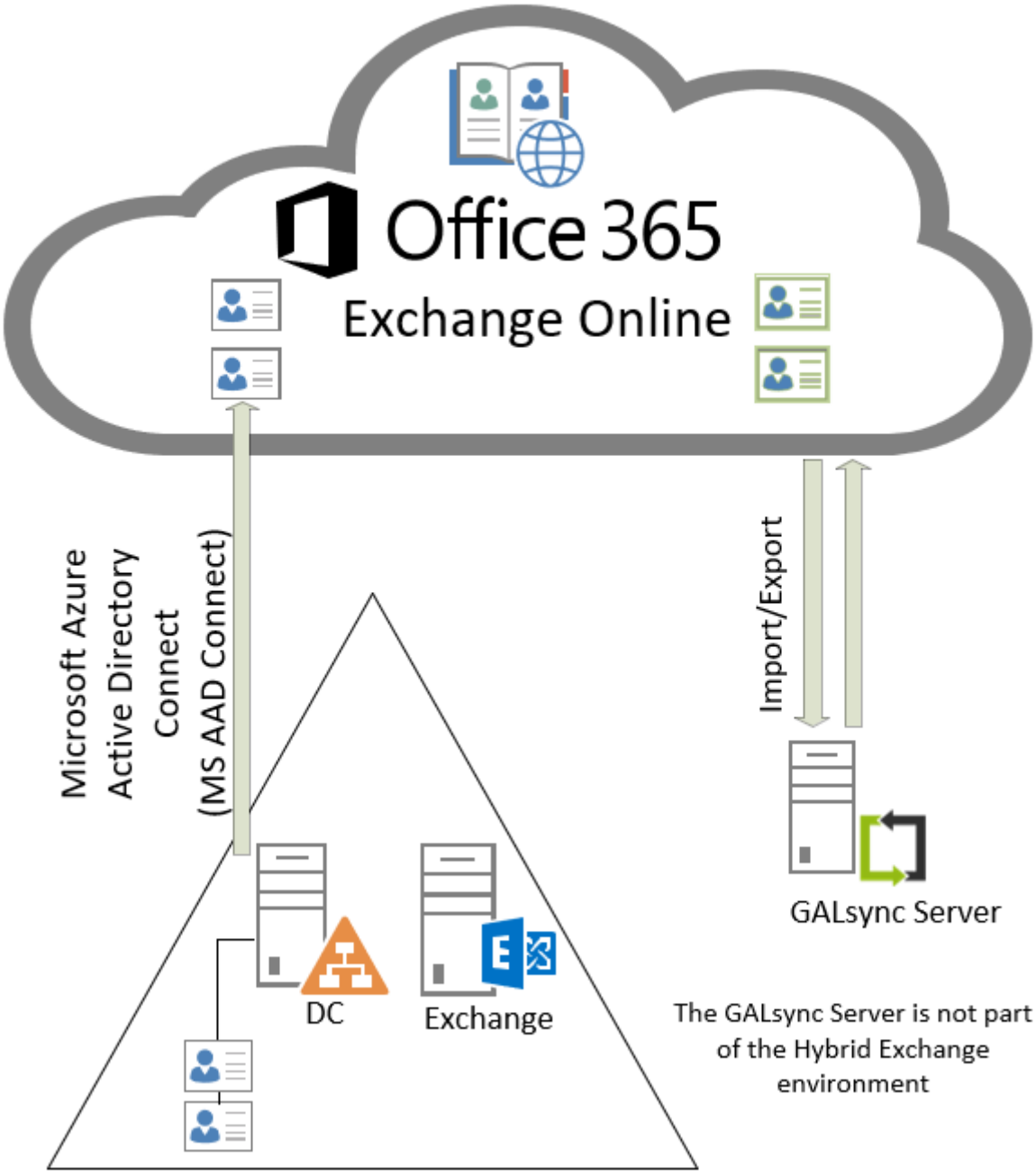


Select the **Hybrid Exchange environment** and enable the option **The GALsync Server is member of on-premises Active Directory**.

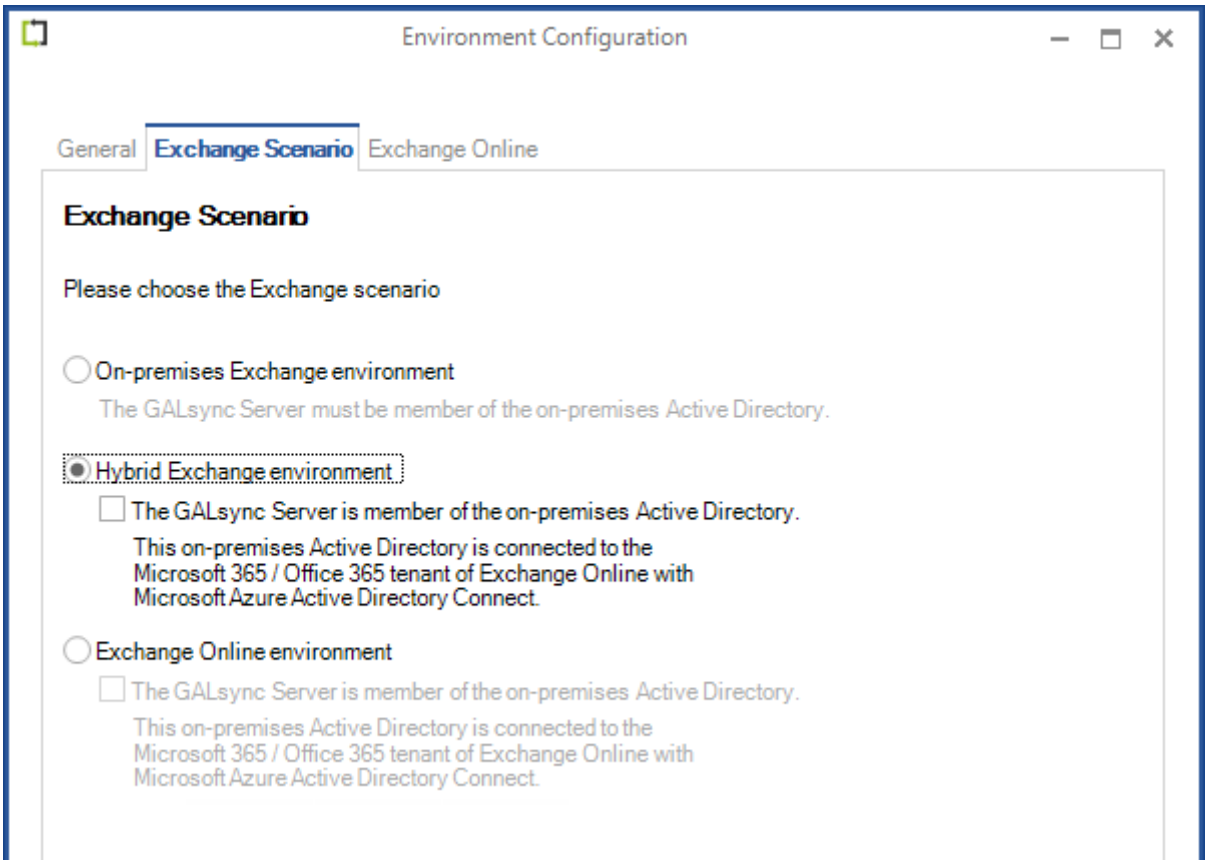
Note: Only one Environment Configuration with an on-premises Active Directory part can be configured in each environment.

After selecting the Exchange scenario, switch to the **Exchange Server on-premises tab** and the **Exchange Online tab** of the Environment Configuration dialog.

Synchronizing only with Exchange Online of the hybrid Exchange environment.



The Exchange scenario is a hybrid Exchange environment. The GALsync Server is not part of Hybrid Exchange environment. GALsync communicates only to the Exchange Online part of the hybrid Exchange environment.



Select only the **Hybrid Exchange environment**.

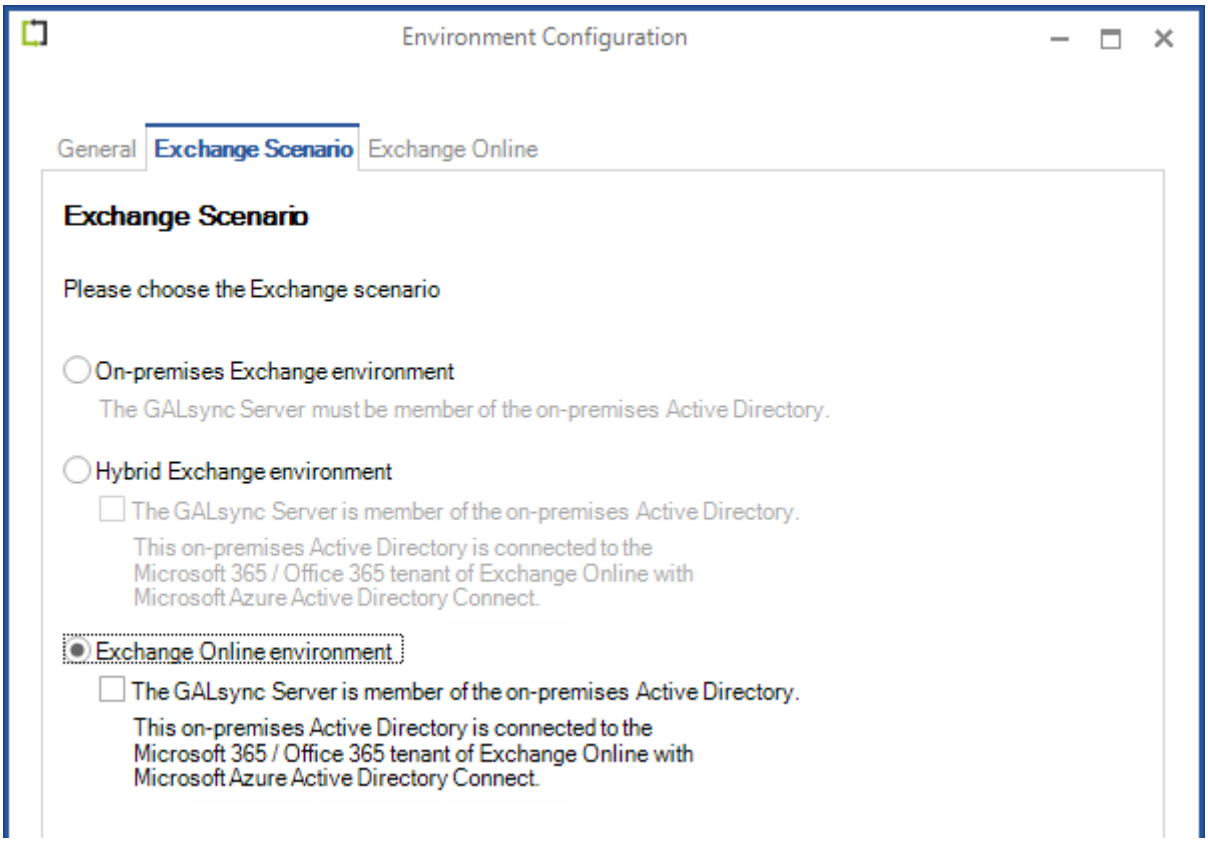
Please do not enable the option **The GALsync Server is member of on-premises Active Directory**, because GALsync is not part of the on-premise Active Directory of the Hybrid Exchange environment.

After selecting the Exchange scenario, switch to the **Exchange Online tab** of the Environment Configuration dialog.

Exchange Online environment

Synchronizing with Exchange Online

The Exchange scenario is an Exchange Online environment. An on-premises Active Directory can be connected with the Microsoft 365 Exchange Online tenant via Microsoft Azure Active Directory Connect. The GALsync Server is not part of the on-premises Active Directory. GALsync communicates with the Exchange Online.

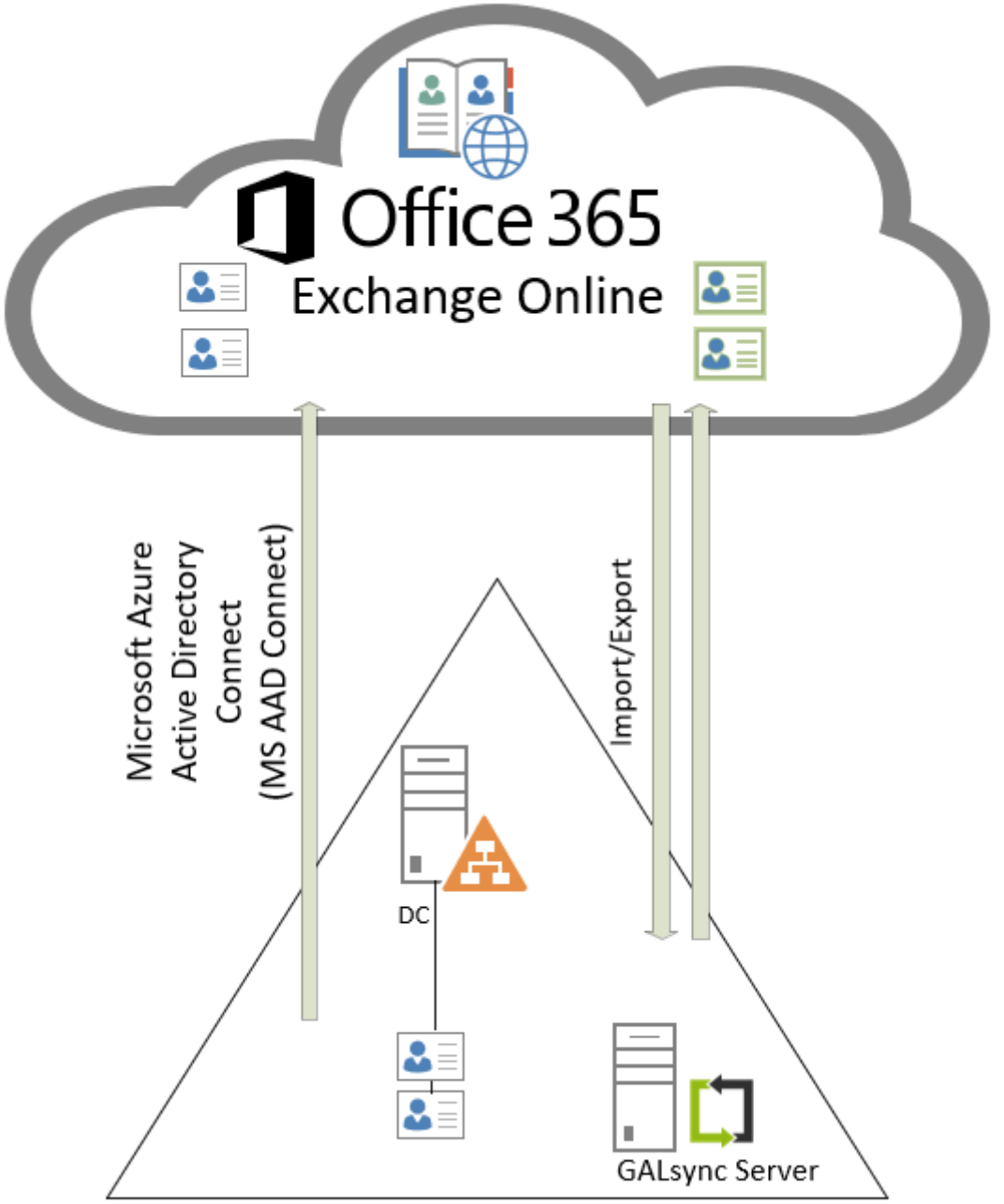


Select only the **Exchange Online environment**.

Please do not enable the option **The GALsync Server is member of on-premises Active Directory**, because GALsync is not part of the on-premise Active Directory of the Exchange Online environment.

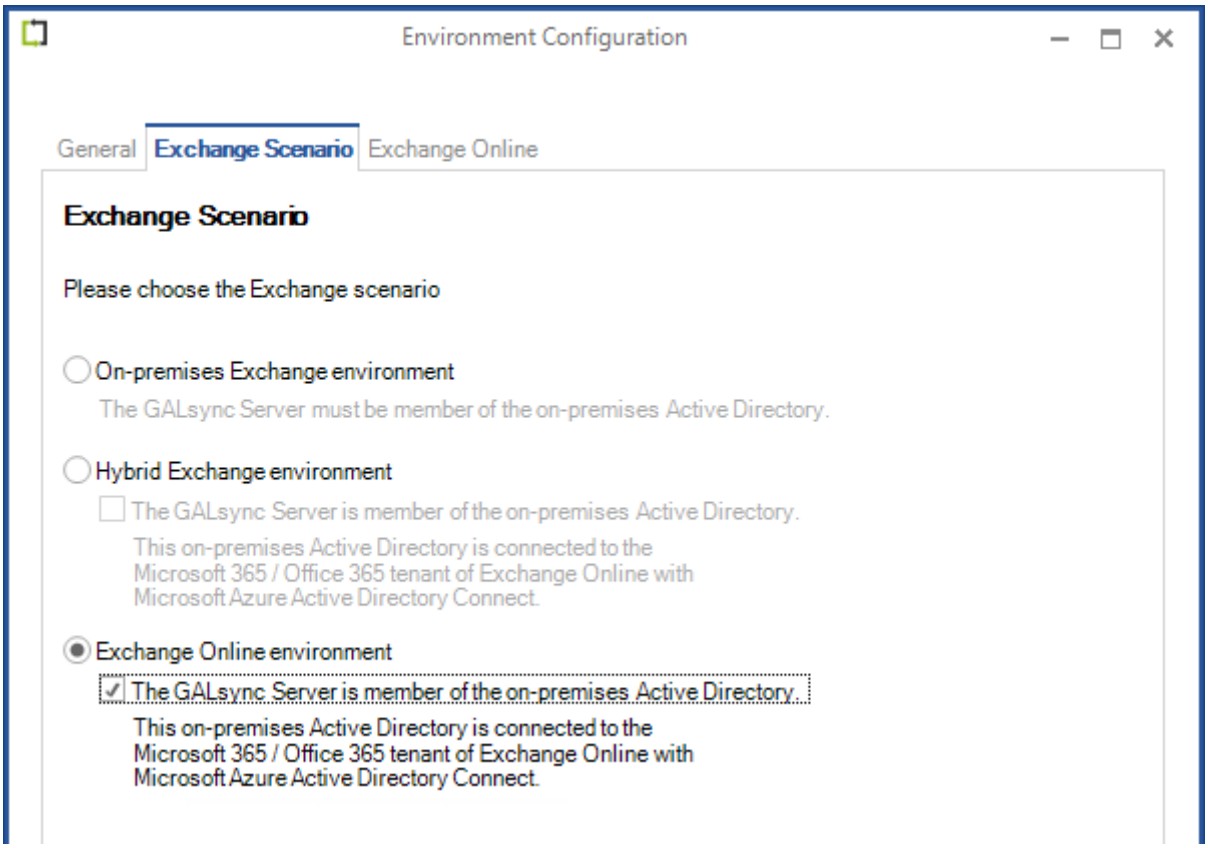
After selecting the Exchange scenario, switch to the **Exchange Online tab** of the Environment Configuration dialog.

Synchronizing with Exchange Online and GALsync is part of the corresponding on-premises Active Directory



GALsync installed on a non-critical member server in the on-premises Active Directory

The Exchange scenario is an Exchange Online environment. An on-premises Active Directory is connected with the Microsoft 365 Exchange Online tenant via Microsoft Azure Active Directory Connect. The GALsync Server is member of this on-premises Active Directory. GALsync communicates with the Exchange Online.



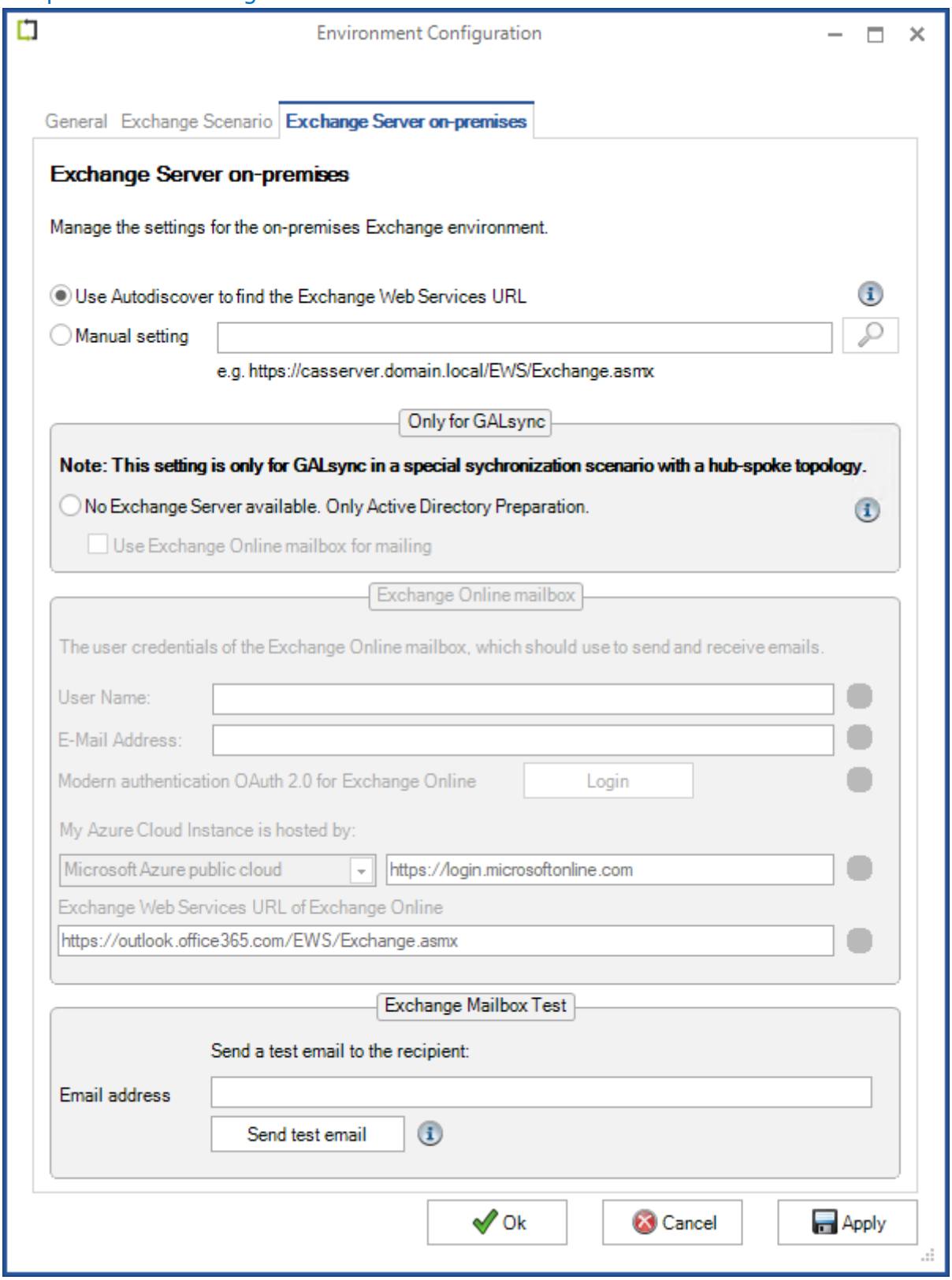
Select the **Exchange Online environment** and enable the option **The GALsync Server is member of on-premises Active Directory**.

Note: Only one Environment Configuration with an on-premises Active Directory part can be configured in each environment.

After selecting the Exchange scenario, switch to the **Exchange Online tab** of the Environment Configuration dialog.

Exchange Server on-premises Tab

On-premises Exchange environment



Use Autodiscover to find the Exchange Web Services URL

If you work with on-premises Exchange Server you can choose **Use Autodiscover to find the Exchange Web Services URL**.

Manual setting

If Autodiscover does not work you may set the value for Exchange Web Services URL manually. If you click the SEARCH icon then GALsync tries to discover the **Exchange Web Services URL** via **Autodiscover**.

For example:

```
https://casserver.domain.local/EWS/Exchange.asmx
```

No Exchange Server available. Only Active Directory Preparation

This setting is only for GALsync in a special synchronization scenario with a hub-spoke topology.

You can export and import objects using an Active Directory Forest without installing Exchange Server and without a connection to a Microsoft 365 Exchange Online tenant. In order to do so you need to extend the Active Directory Schema to actually have Exchange properties (start Exchange Setup with the flag **/adprep**). If you work with such a forest you can choose the option **No Exchange server available. Only Active Directory Preparation**. In this case you cannot use an internal Exchange server for mailing, you can use an Exchange Online account selecting the option **Use Exchange Online for mailing**.

Important: *We do not recommend extending the Active Directory Schema in the following scenario:*
Your current Active Directory is syncing via Azure Active Directory Connect (AADC) to your existing Microsoft 365 tenant.

Note: This option is only for special scenarios.

Exchange Online Mailbox

This setting is only for GALsync in a special synchronization scenario with a hub-spoke topology.

An external Exchange Online mailbox can be used in an on-premises Active Directory environment, which has no on-premises Exchange Server and is not connected with a Microsoft 365 Exchange Online tenant.

Insert **user name** and **email** address of the external Exchange Online mailbox and **Login for Modern Authentication OAuth 2.0 for Exchange Online**.

For using Modern Authentication OAuth 2.0 for Exchange Web Services (EWS) to access Exchange Online, please take a look at the chapter:

Modern Authentication OAuth 2.0 for Exchange Web Services (EWS) to access Exchange Online

The settings for the Azure instance are for the world-wide Microsoft 365 / Office 365 cloud by default. The **Azure Cloud Instance is hosted by** is set to the **Microsoft Azure public cloud** and the corresponding Exchange Web Services URL of Exchange Online.

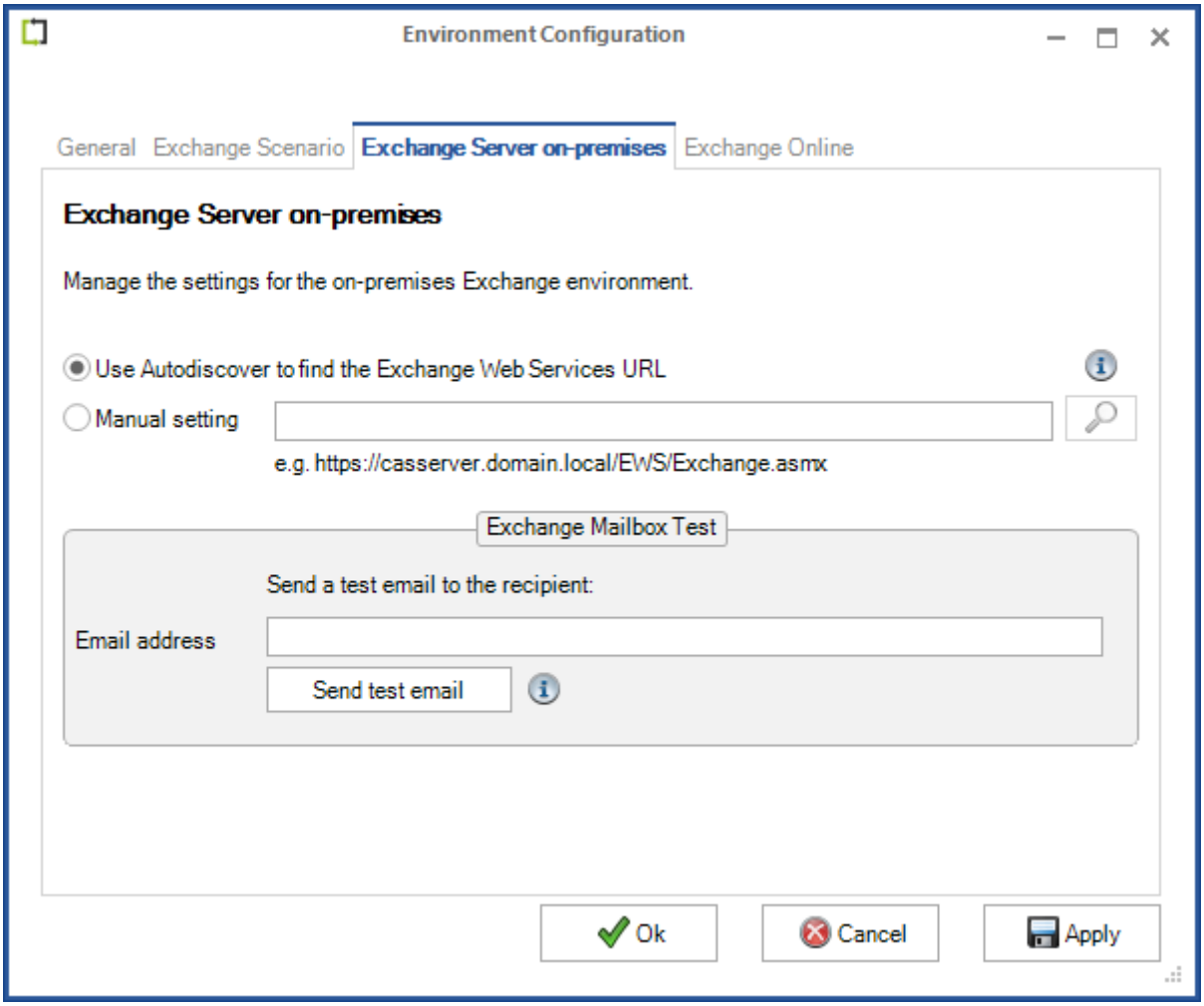
Please note, that user-based authentication via OAuth 2.0 works only for the Microsoft Azure Public Cloud instance.

Exchange Mailbox Test

To test that an email can be sent, insert the email address of the recipient for the test email and click **Send test email**. A test email should be sent to the recipient.

Please note, that the e-mail address of the recipient for the test e-mail will not be saved.

On-premises Exchange part of a hybrid Exchange environment



Use Autodiscover to find the Exchange Web Services URL

If you work with on-premises Exchange Server you can choose **Use Autodiscover to find the Exchange Web Services URL**.

Manual setting

If Autodiscover does not work you may set the value for Exchange Web Services URL manually. If you click the SEARCH icon then GALsync tries to discover the **Exchange Web Services URL** via **Autodiscover**.

For example:

```
https://casserver.domain.local/EWS/Exchange.asmx
```

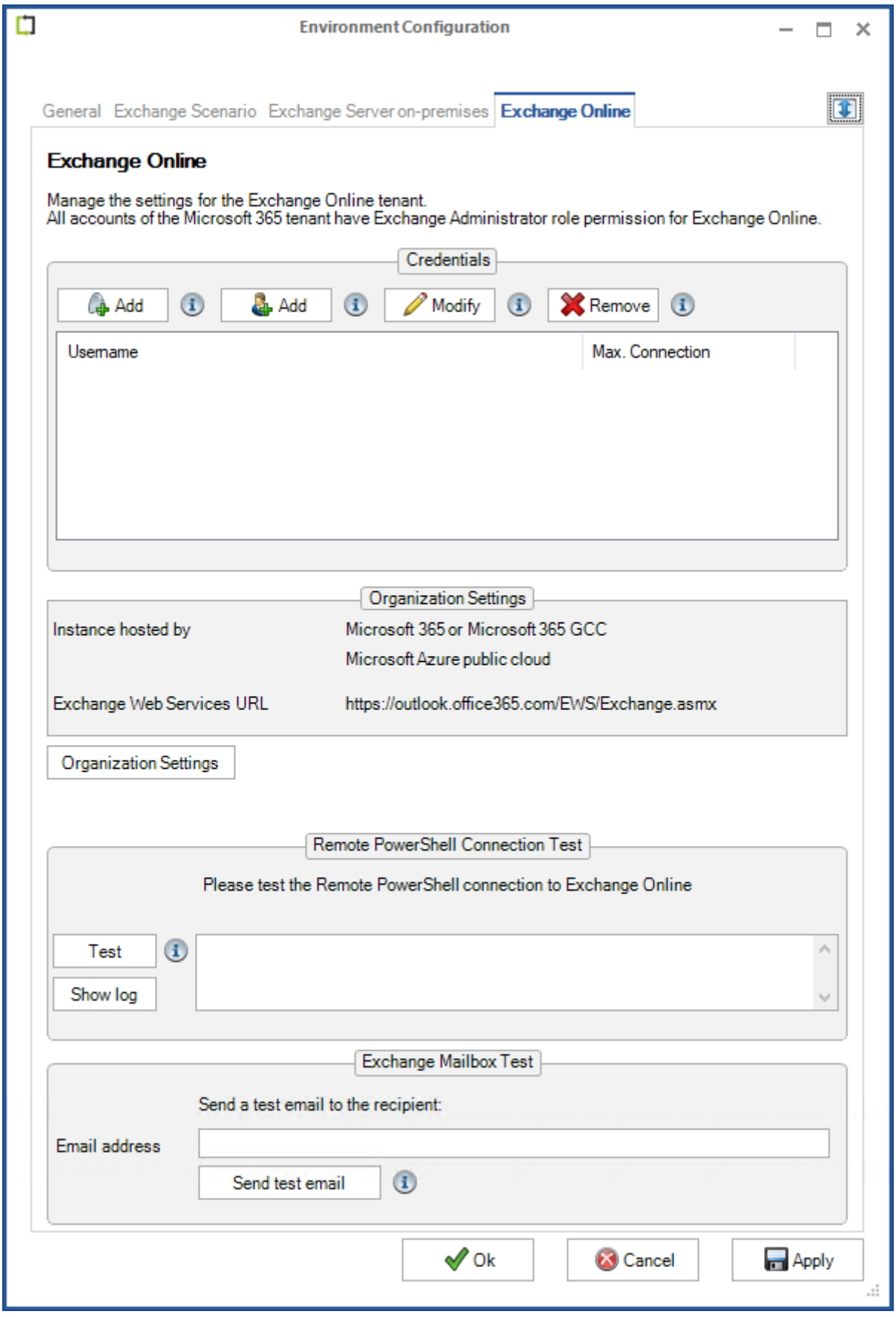
Please note: If the mailbox of the GALsync on-premises service account is located in Exchange Online, it will be necessary to enter the Exchange Web Services URL for the on-premises Exchange Server.

Exchange Mailbox Test

To test that an email can be sent, insert the email address of the recipient for the test email and click **Send test email**. A test email should be sent to the recipient.

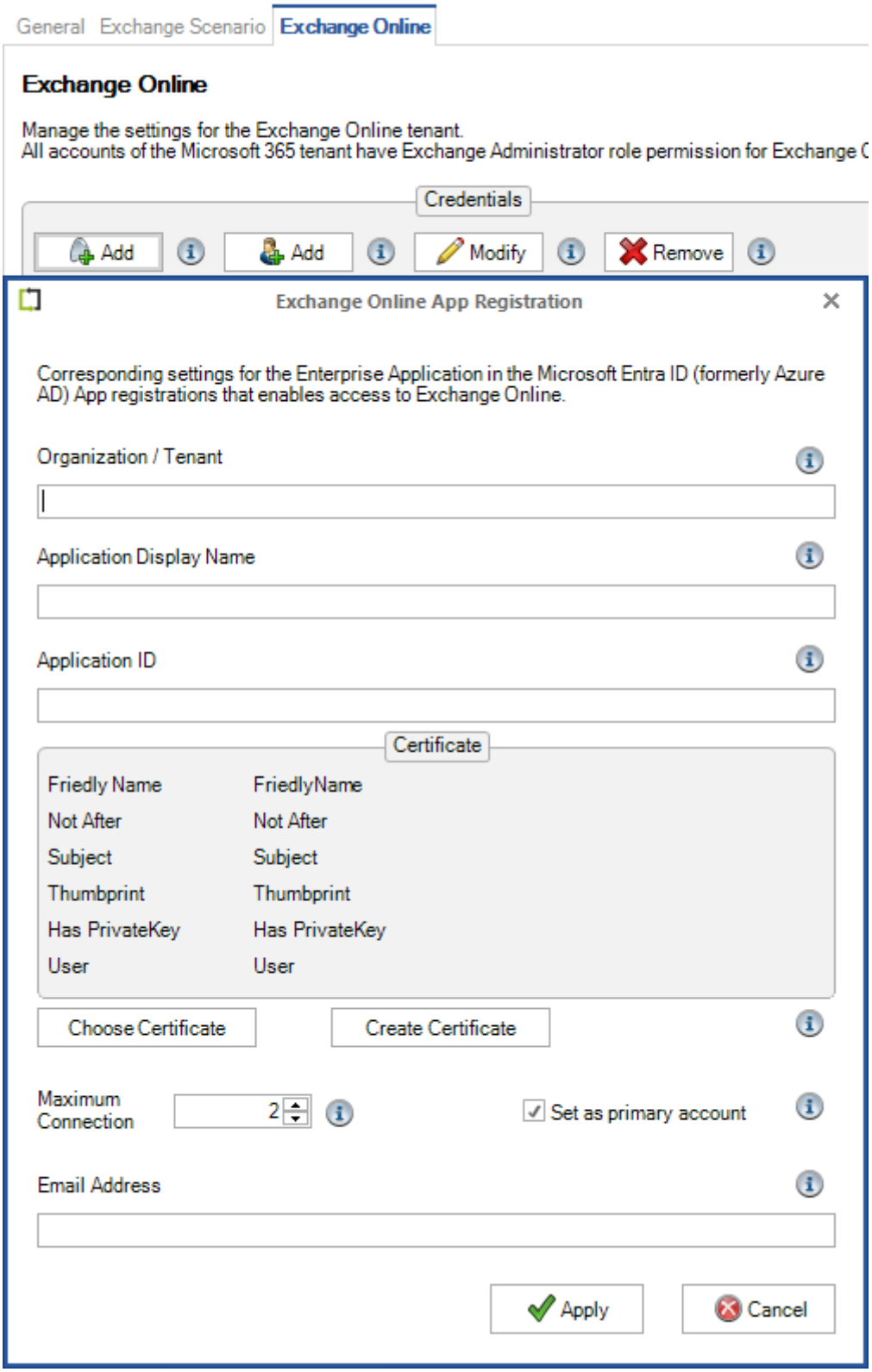
Please note that the e-mail address of the recipient for the test e-mail will not be saved.

Exchange Online Tab



Manage the Azure AD App Registration for Exchange Online

The **Add** button on the left, will open a dialog window in which to configure **certificate-based authentication** via **App registration** for the Exchange Online tenant.

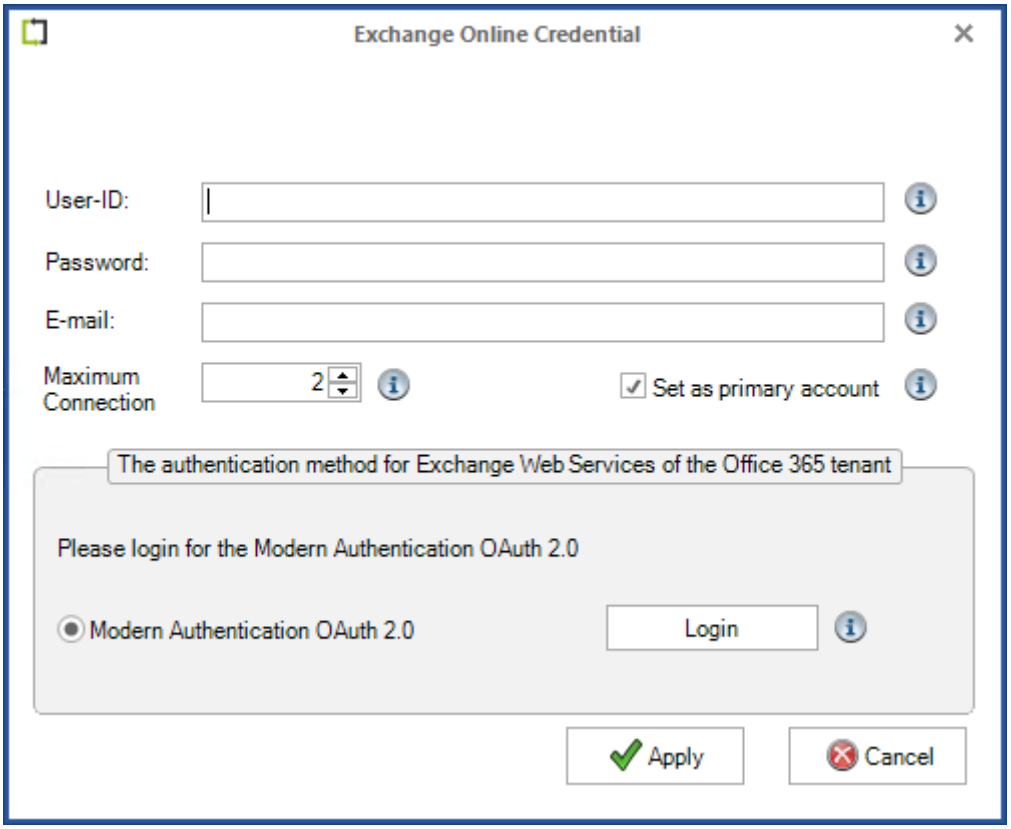


Detailed description is in chapter
Exchange Online certificate-based authentication via App Registration

Manage the user credentials of the service accounts for Exchange Online

The **Add** button on the right, will open a dialog window in which to configure **user-based authentication** via **Service Account** for the Exchange Online tenant.

Please note, that user-based authentication via OAuth 2.0 works only for the Microsoft Azure Public Cloud instance. If your Microsoft 365/Office 365 instance is hosted by a national cloud, please use **Exchange Online certificate-based authentication via App registration**.



Insert the **User-ID**, **Password** and **E-mail** address of an appropriate account in the Exchange Online.

We recommend to use maximum 2 connections per account for the Exchange Online PowerShell.

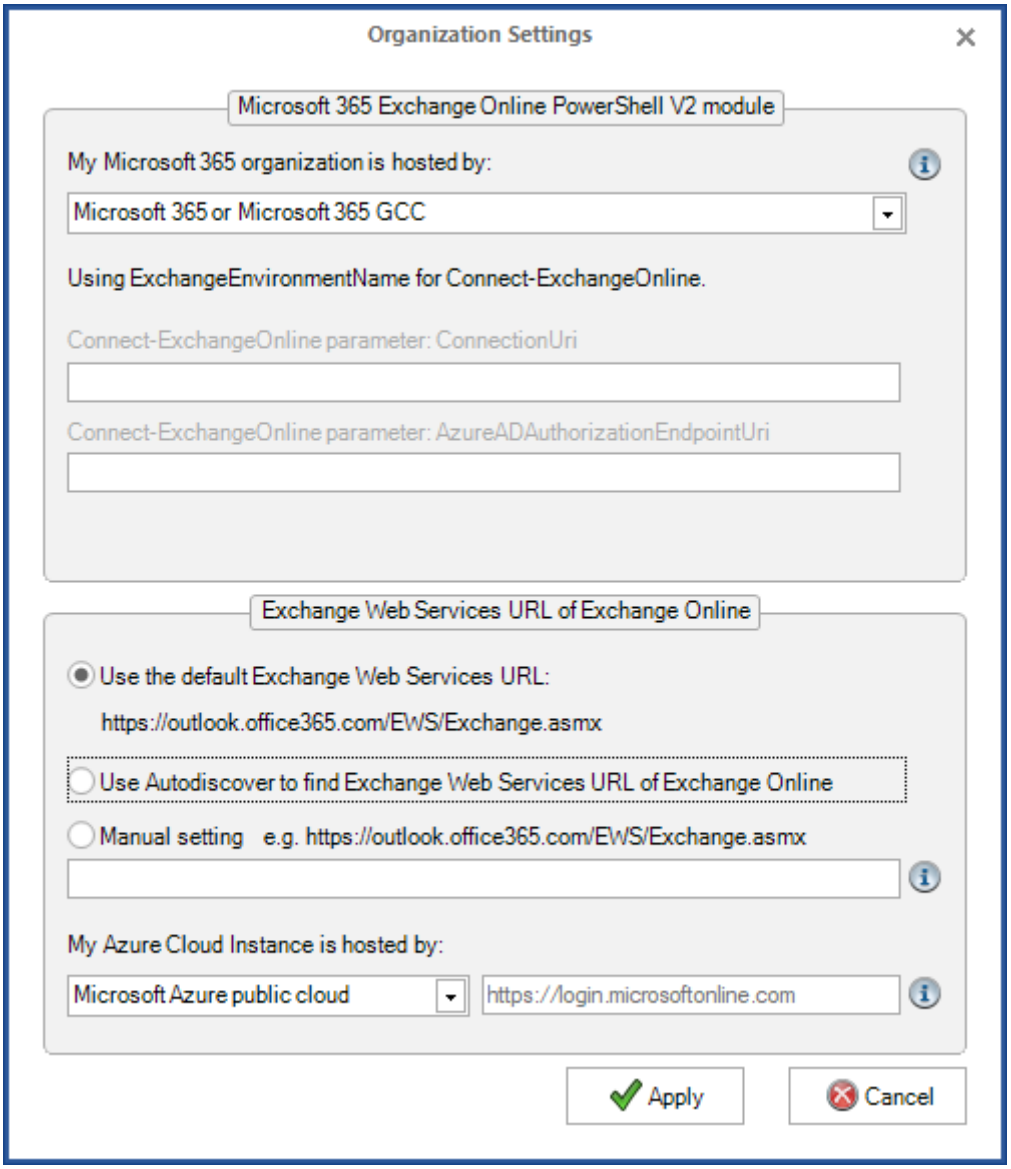
Please note, that Microsoft allows only 3 connections per account for the Exchange Online PowerShell by default.

Detailed description is in chapter
Exchange Online authentication via Service Account

Organization Settings

The default setting of **My Microsoft 365 organization is hosted by** is **Microsoft 365 or Microsoft 365 GCC** for the world-wide Microsoft cloud.

The settings for the Azure instance are also for the world-wide Microsoft 365 / Office 365 cloud by default. The **Azure Cloud Instance is hosted by** is set to the **Microsoft Azure public cloud** and the corresponding Exchange Web Services URL of Exchange Online.



If your Exchange Online tenant is hosted by a national cloud, you can select it. Please note, that both settings must match to the Exchange Online environment.

For the Microsoft 365 organization:

- Microsoft 365 or Microsoft 365 GCC
- Office 365 Germany (Closed on 29 October 2021)
- Office 365 operated by 21Vianet
- Microsoft 365 GCC High
- Microsoft 365 DoD

For the Azure Instance:

- US Government cloud — Azure Government
- Microsoft China national cloud — Azure China 21Vianet
- Microsoft Germany national cloud — Azure Germany (Closed on 29 October 2021)

For more information, please take a look at the Microsoft Docs article **National clouds**

https://docs.microsoft.com/en-us/azure/active-directory/develop/authentication-national-cloud

and the **-ConnectionUri** parameter of **Connect-ExchangeOnline** cmdlet at the Microsoft Docs article **Connect-ExchangeOnline**

https://docs.microsoft.com/de-de/powershell/module/exchange/connect-exchangeonline?view=exchange-ps

Please note, that we do not have an Exchange Online tenant hosted by one of the national clouds, so we will be unable to test it and to support it at this point.

Remote PowerShell Connection Test

Click **Test** to start the Exchange Online PowerShell connection test. This test will check whether a PowerShell connection can be established from your server to Exchange Online. The test will take a few minutes. Please wait until the test has completed before proceeding.

You can then click **Show log** to view the connection test log.

Exchange Mailbox Test

To test whether an email can be sent, insert the email address of the recipient for the test email and click **Send test email**. A test email should be sent to the recipient.

Please note, that the e-mail address of the recipient for the test e-mail will not be saved.

Policy Configuration

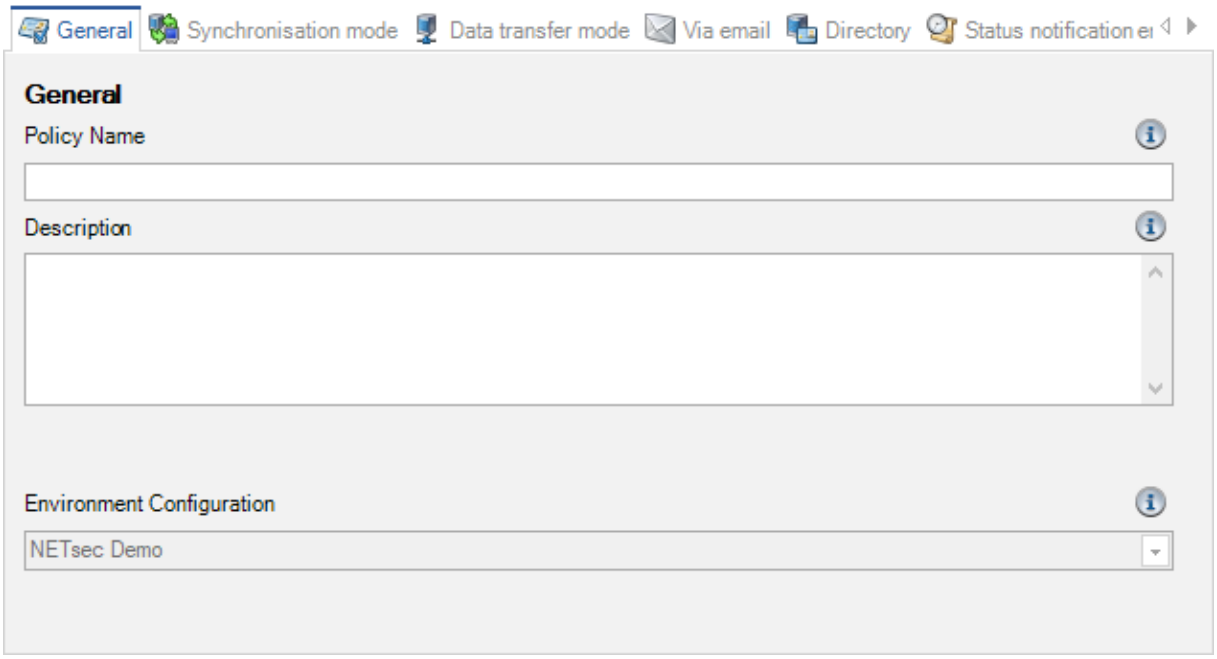
After you have created and configured an environment configuration, you can configure the corresponding policies.

If you have not yet created and configured an Environment Configuration for your Exchange environment, please create and configure one first.
Please take a look at the **Environment Configuration** chapter.

The actual synchronization process is performed through an export policy, and corresponding import policy.

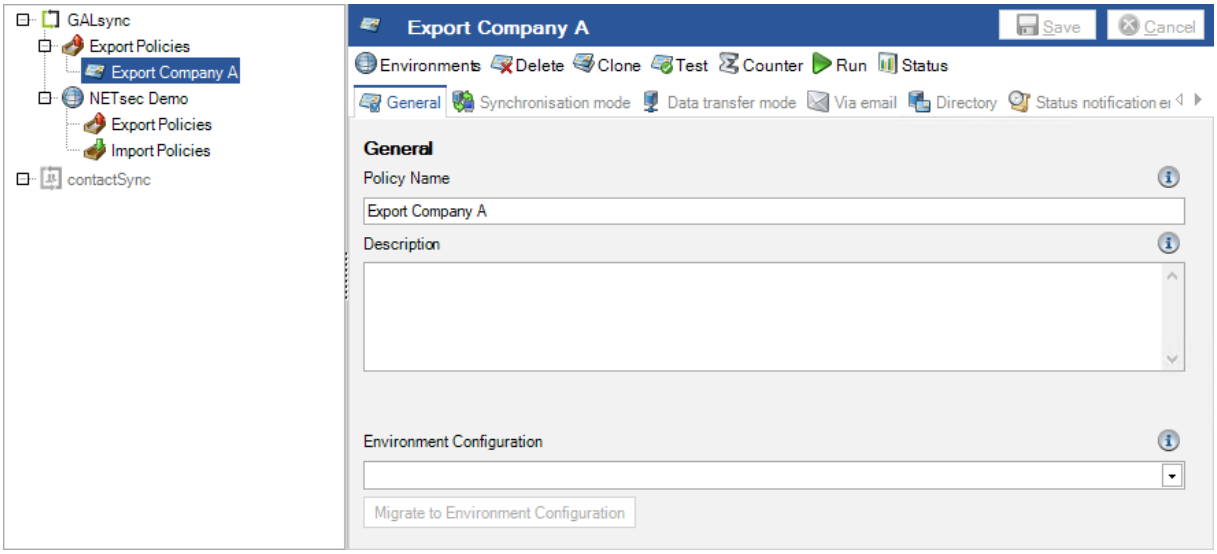
General Tab

The **General** tab contains the name of the policy, possibly a description and to which environment the policy belongs.



Migrate an existing policy

Policies created by GALsync Version 7 or earlier versions are not part of an Environment Configuration.



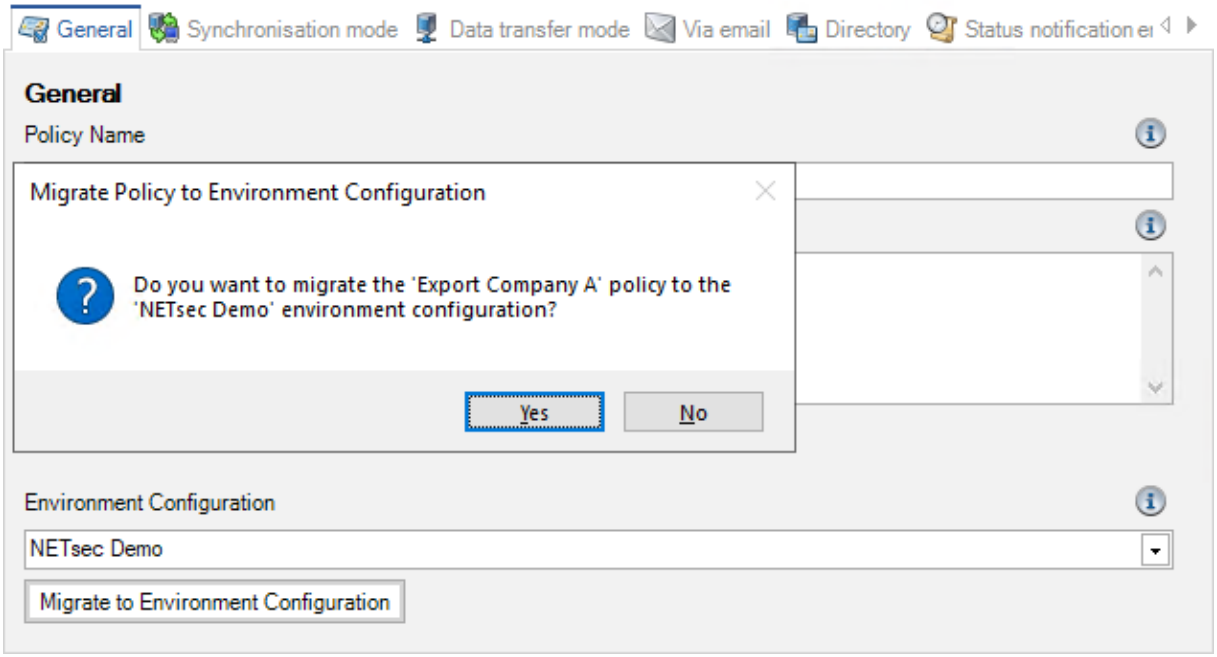
You can migrate such a policy to a corresponding Environment Configuration.

Please note that a policy can only be migrated once.

Select the corresponding **Environment Configuration** on the **General** tab of the policy and click **Migrate to Environment Configuration**.

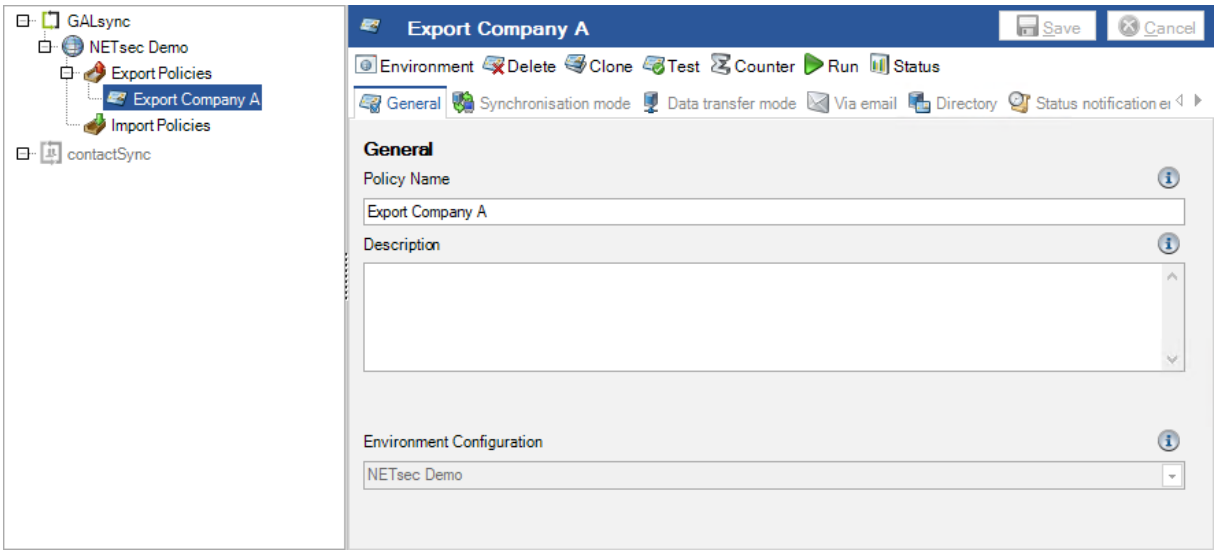
Once you are sure you have selected the correct **Environment Configuration** for the policy migration, click **Yes** to migrate the policy to the selected Environment Configuration.

Please note that a policy can only be migrated once.



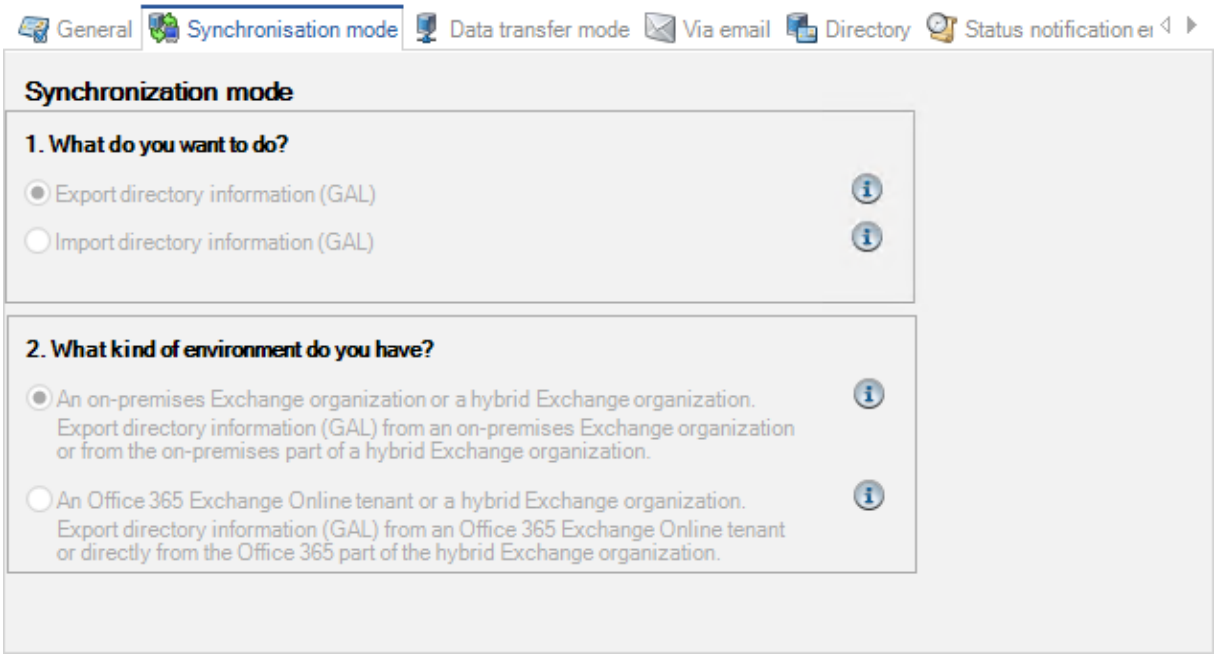
After that, please save the policy.

The policy now belongs to the corresponding Environment Configuration, and uses the settings of the Environment Configuration for the Exchange environment.



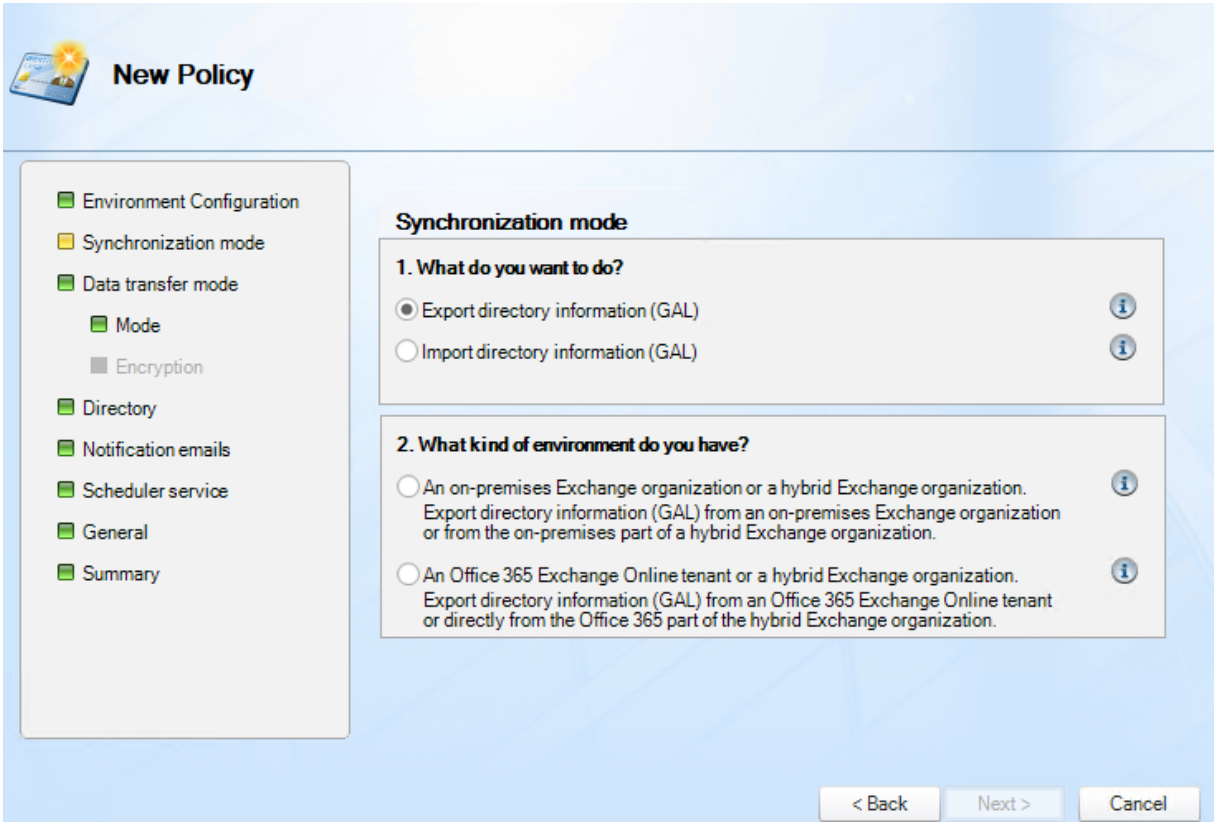
Synchronization mode

The **Synchronization mode** tab shows whether it is an export or an import.



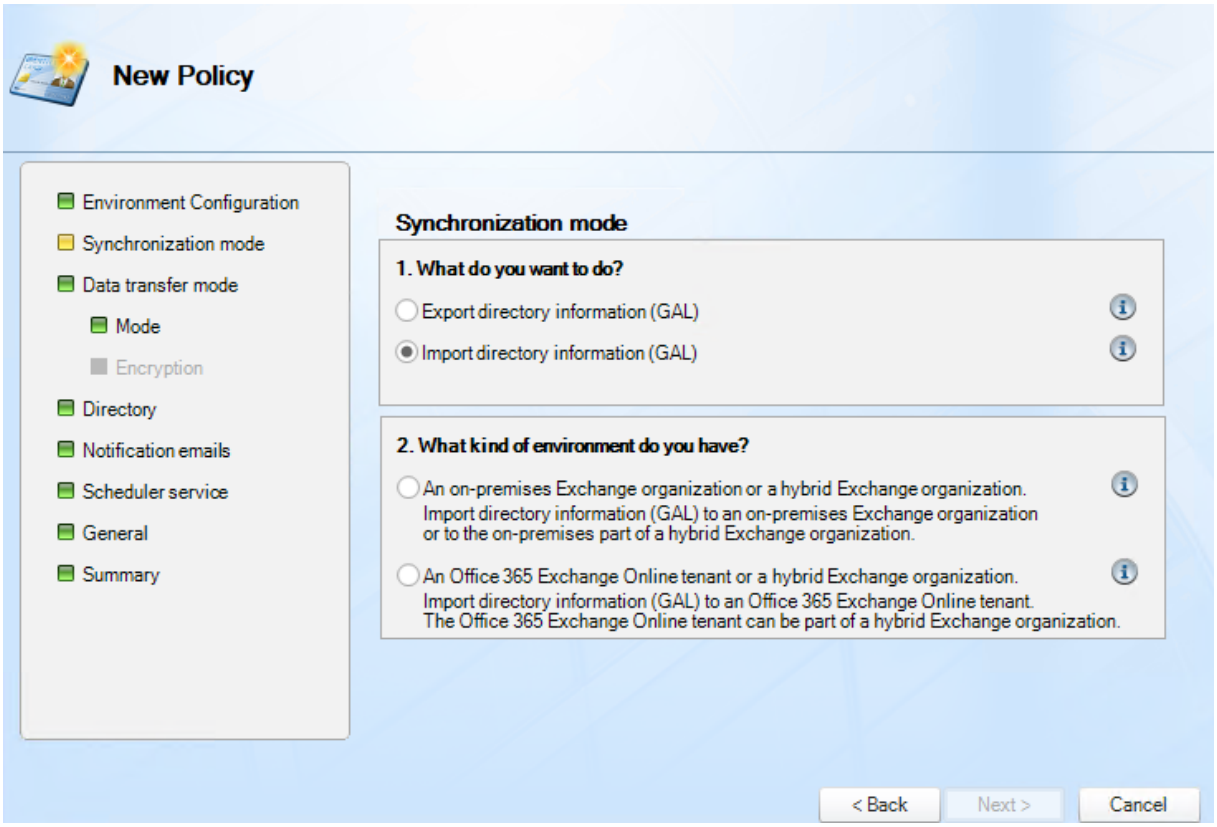
The questions for the Synchronization mode can only be answered, if you create a new policy.

Export policy



Export directory information from an on-premises Exchange organization or an Exchange Online organization.

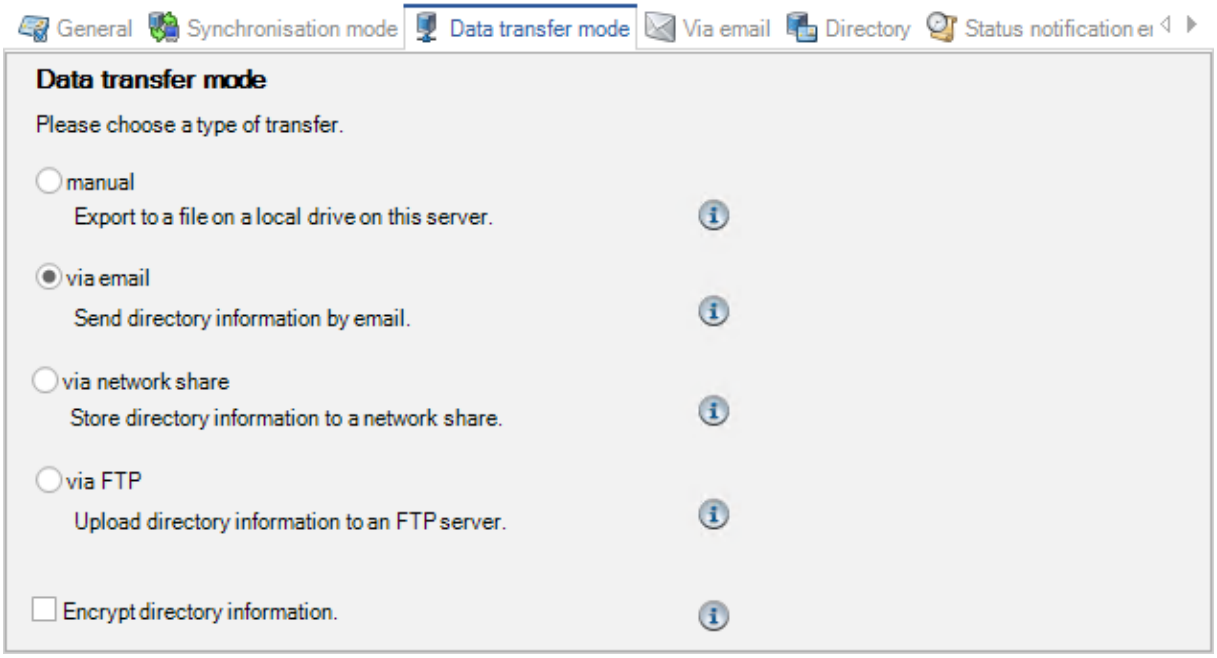
Import policy



Import directory information into an on-premises Exchange organization or an Exchange Online organization.

Data transfer mode

GALsync supports different methods to transfer the data file between the Exchange environments.

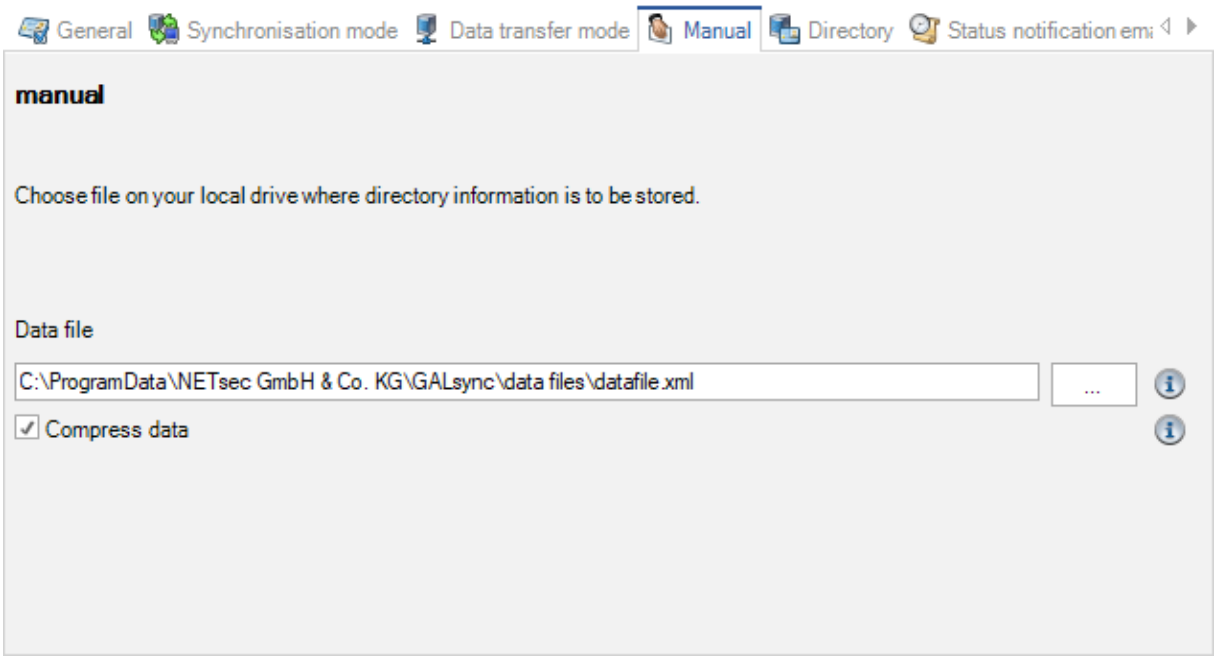


manual

The data file will be saved on a local drive on the GALsync Server.

Export policy

In an export policy GALsync exports the selected mail-enabled objects from your Exchange environment and stores this information into a data file on a local drive on the GALsync Server.



The directory information is not handed over automatically to the other exchange environment.

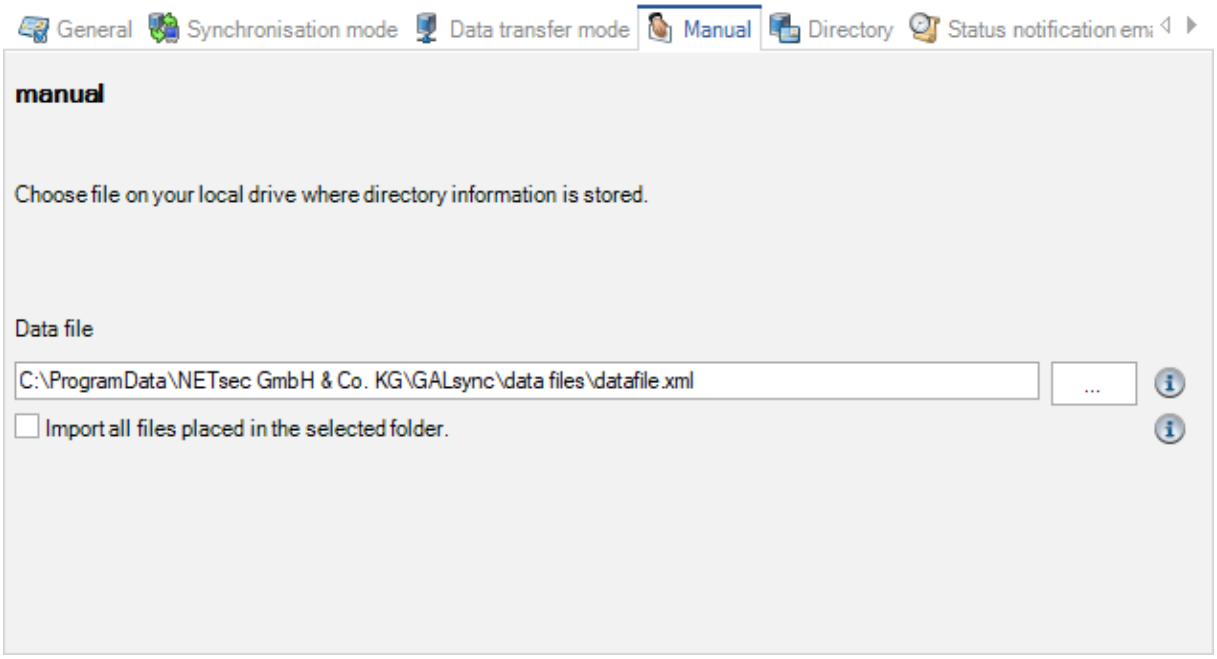
Please choose a drive, folder and file name.

Data file: Choose a folder and file name on your local drive where directory information will be stored.

Compress Data: Compresses the data to a .ZIP file.

Import policy

In an import policy GALsync extracts the information from a data file on a local drive on the GALsync Server and imports this information into your Exchange environment.



The directory information is not handed over automatically to the other exchange environment.

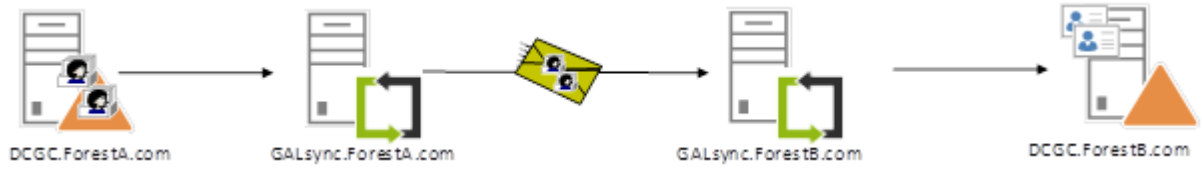
Please choose a drive, folder and file name.

Data file: Choose a folder and file name on your local drive where directory information will be stored.

Import all files placed in the selected folder: When enabled, GALsync will import all data files placed in the given folder, other than just importing the one file specified. To do so, the account which runs the application (and service) needs modified permissions on the folder selected.

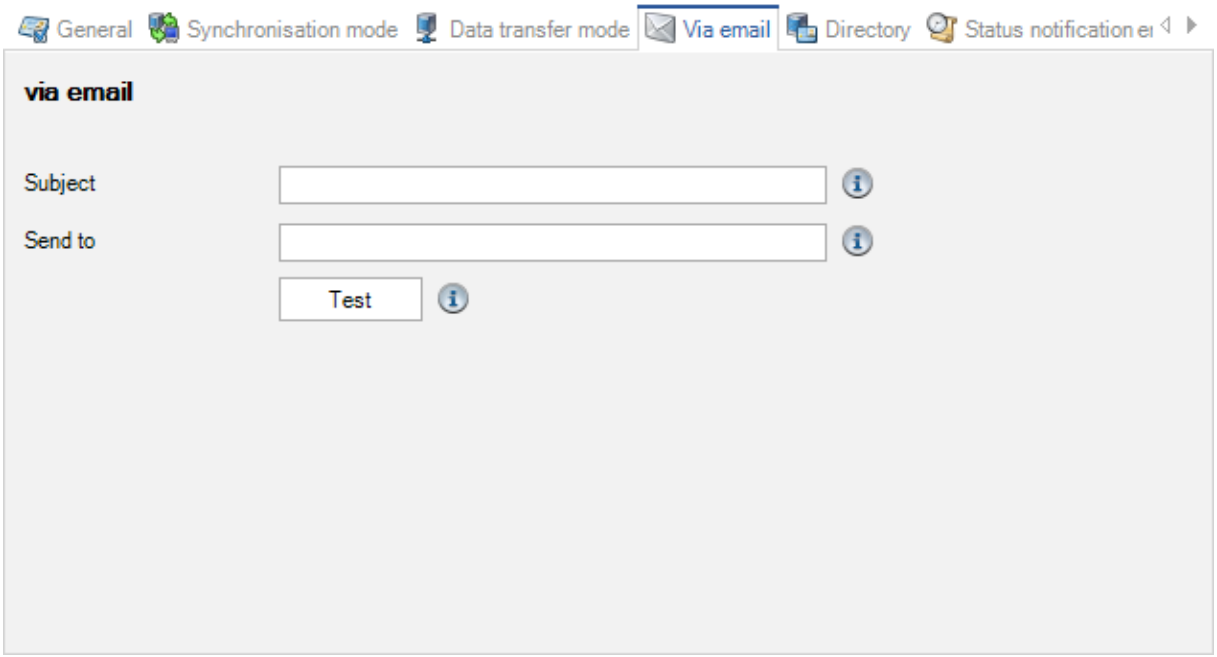
via email

GALsync will transfer the data file between the Exchange environments via email.



Export policy

In an export policy GALsync exports the selected mail-enabled objects from your Exchange environment and automatically sends the directory information as an email-attachment to the destination Exchange environment.



Subject: The text specified here will appear in the subject field of the email containing the directory information GALsync sends to the other Exchange environment. The subject should be unique in the GALsync synchronization scenario.

Note: If the receiving Exchange environment gets directory information from multiple Exchange environments, you can use a certain phrase for subject, which identifies your own Exchange environment.

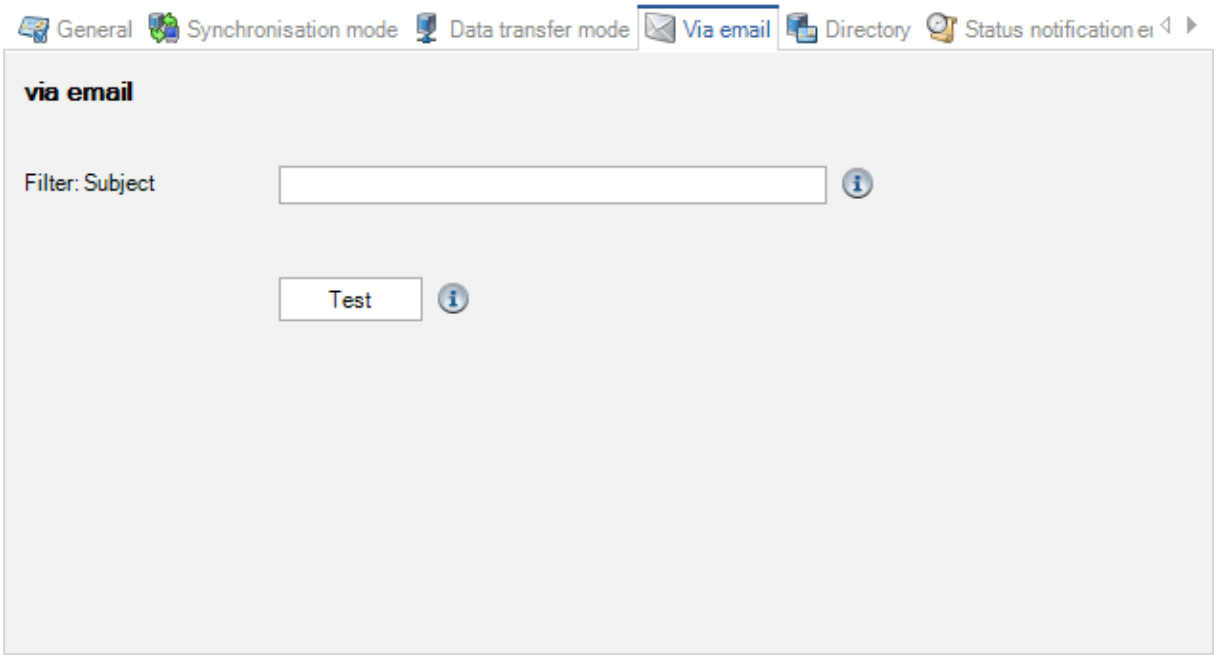
The GALsync instance at the receiving site will recognize the string by using the **contains** operator.

Send to: Directory information is sent to the recipient by email. The recipient usually is the mailbox of the service account of another Exchange environment configured for use by GALsync.

Test: This sends a test email to the mailbox of the recipient.

Import policy

In an import policy GALsync imports the information from an attachment in an email and imports this information into your Exchange environment.

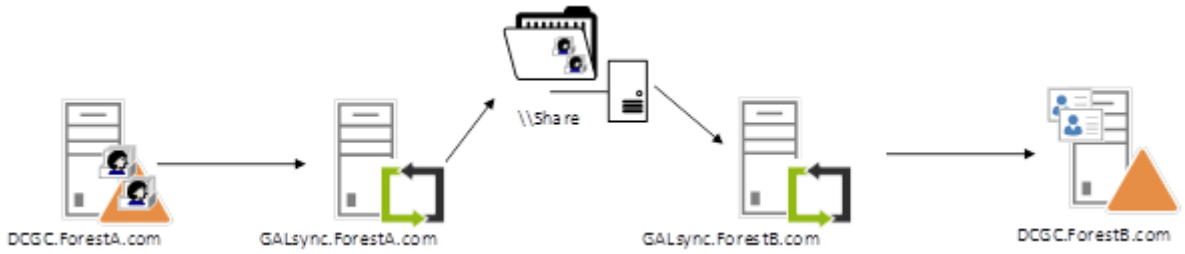


Filter: Subject: GALsync will distinguish between which Exchange environment the data file originated from based on the subject of each received email.

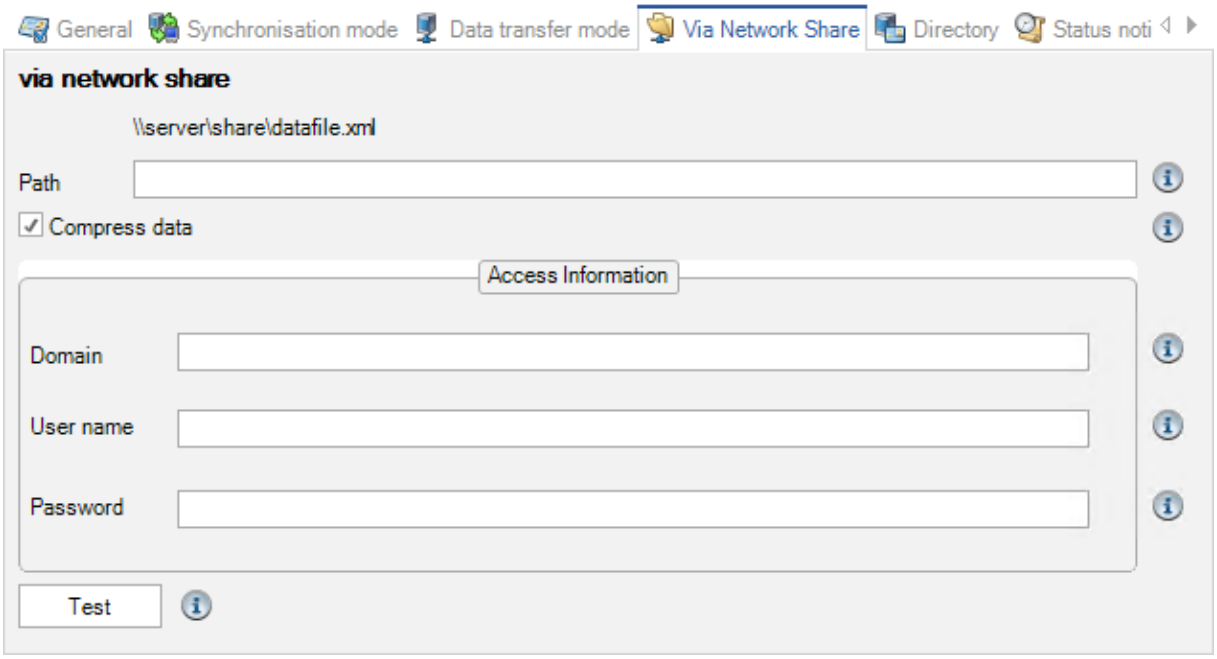
GALsync uses the **contains** operator to detect if the string is contained in the subject of received email, and will look for, and open the data file contained in each of them.

Test: This tests the access to the mailbox of the GALsync service account.

via network share



GALsync will transfer the data file between the Exchange environments via network share. The network share must be accessible for all Exchange environments.



Path: The path specifies the qualified name of the share and file name where you want to store directory information.

Domain: This is the domain the user belongs to who wants to access the specified network share. Usually this is the NETBIOS name of the domain.

User Name: This is the user who wants to access the specified network share.

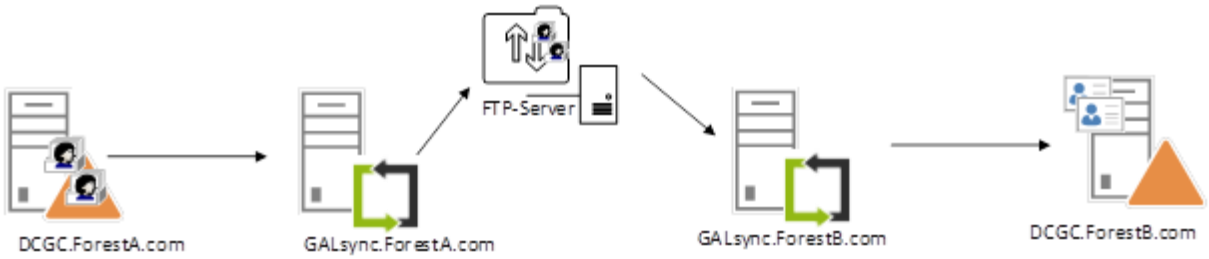
Password: This is the password of the user.

Test: Clicking this button GALsync will validate the access to the share.

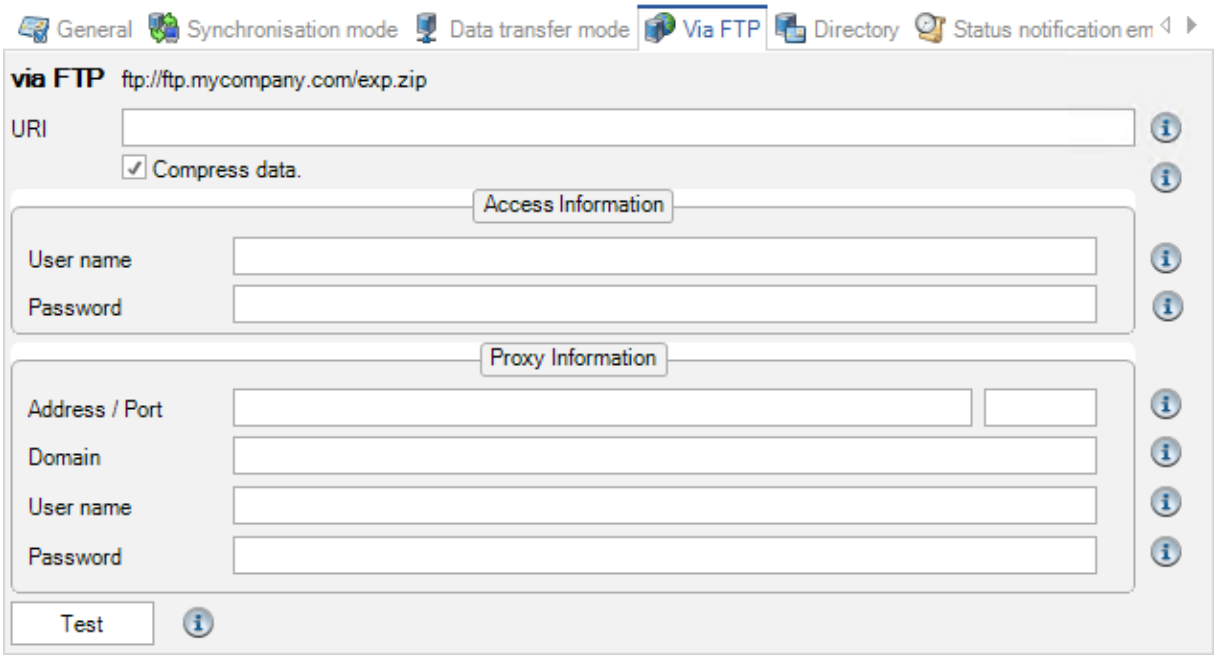
Compress Data: Compresses the data to a .ZIP file.

Import all files placed in the selected folder: When enabled, GALsync will import all data files placed in the given folder, other than just importing the one file specified. To do so, the account which runs the application (and service) needs modified permissions on the folder selected.

via FTP



GALsync will transfer the data file between the Exchange environments via FTP server. The FTP server must be accessible for all Exchange environments.



URI: The Uniform Resource Identifier (URI) specifies the qualified name of the FTP server and file name where you want to upload the directory information.

Access Information

User Name: This is the user who was granted access the specified FTP server.

Password: This is the password of the user.

Note: The used account has to be granted read and write permissions in the ftp directory.

Proxy Information

Address/Port: If your environment uses a proxy server to gain access to the FTP server please type the name of the proxy server and the port which should be used.

Domain: This is the domain the user belongs to and who wants to access the specified proxy. Usually this is the NETBIOS name of the domain.

User Name: This is the user who wants to access the specified proxy.

Password: This is the password of the user.

Test: By clicking this button, GALsync will validate the access to the FTP server and proxy (if configured).

Compress Data: Compresses the data to a .ZIP file.

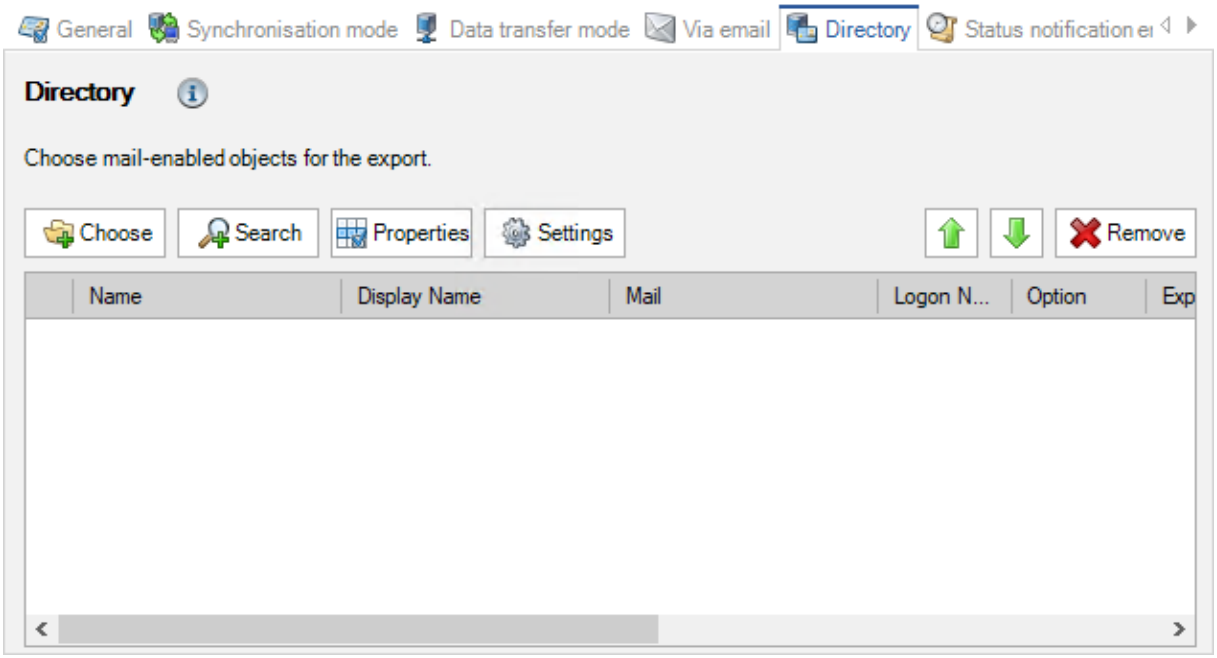
Import all files placed in the selected folder: When enabled, GALsync will import all data files placed in the given folder, other than just importing the one file specified. To do so, the account which runs the application (and service) needs modified permissions on the folder selected.

Directory

Please take a look for detailed information of the **Directory** tab at the **Export Policy** and **Import Policy** chapters.

Export

In the **Directory** tab of an export policy, selections are made to export the desired mail-enabled objects.



By selecting one or multiple groups, OUs or RecipientType, the search range can be defined for specific objects to be exported.

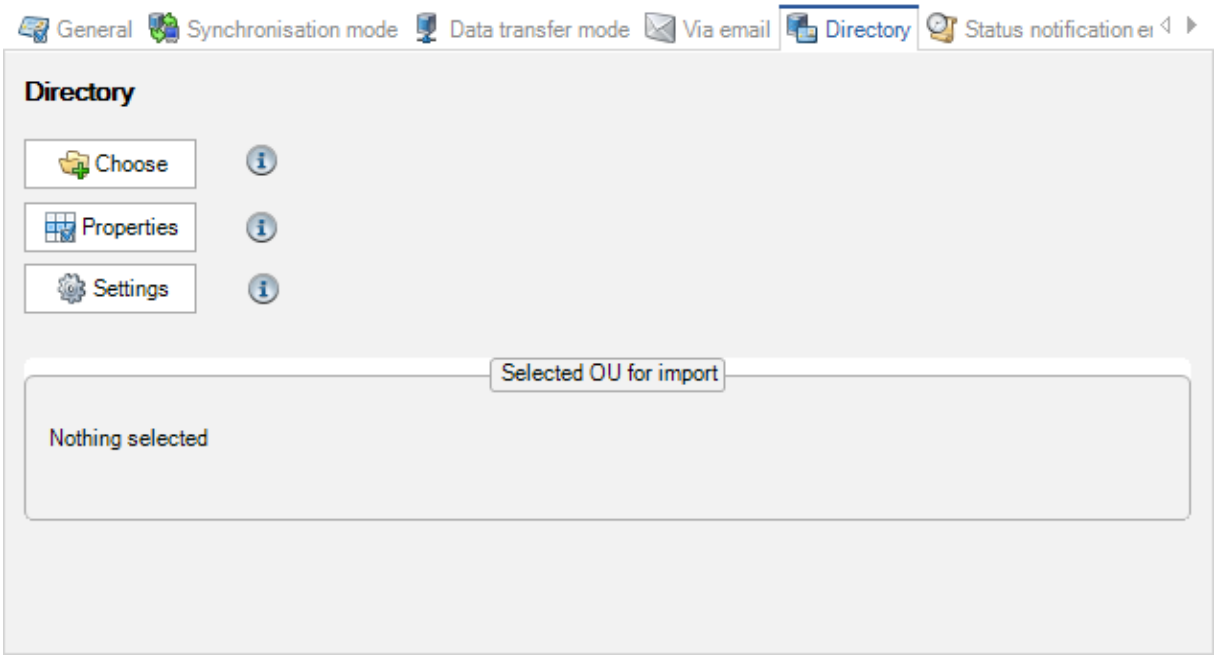
The selection by **Recipient Type** will be deprecated and is not recommended to use for configuration any longer. It is recommended to define the selection of objects to be synchronized by membership in a group. The group can be searched for in the **Search** dialog and only its members are exported with the group option **Only Membership**. This allows you to specify much more precisely which objects will actually be exported.

Additionally, you may exclude certain object properties that should not be transferred to the other exchange organization. You may also remove a selected entry from the list.

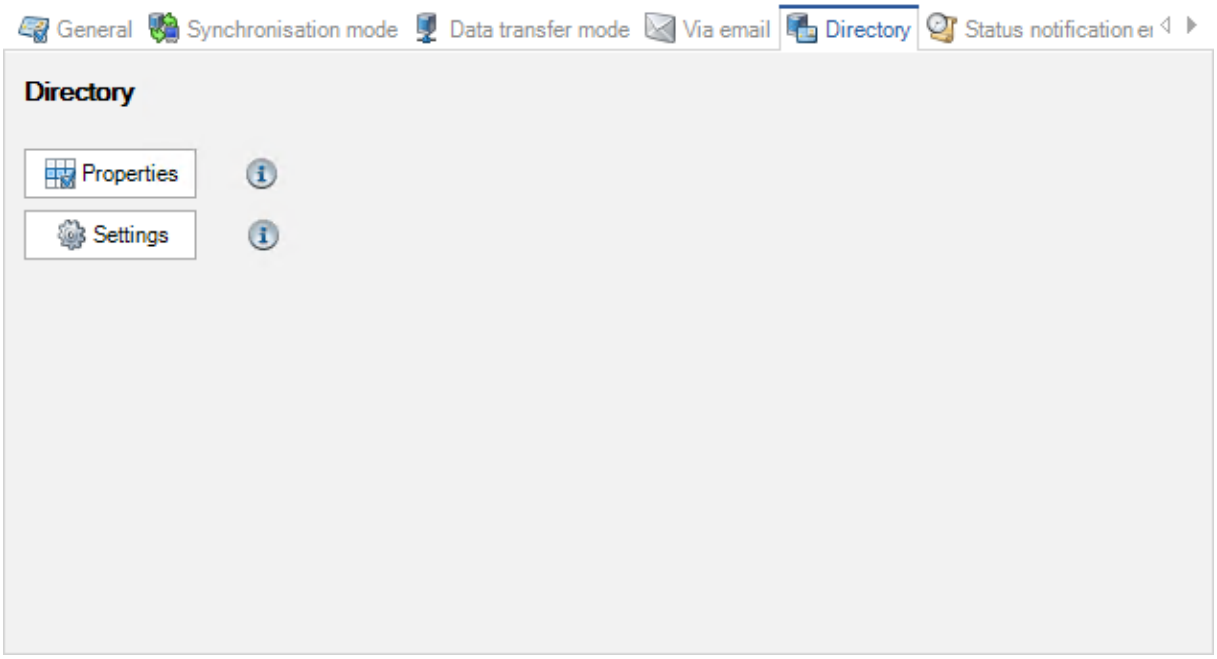
Please take a look for detailed information for the Directory tab of an Export policy at the **Export Policy** chapter.

Import

In the Directory tab of an import policy, you can select an Organizational Unit of an on-premises Active Directory to store the imported directory information in for an on-premises Exchange organization.



Organizational Unit does not exist in an Exchange Online organization and cannot be selected for an import policy into Exchange Online

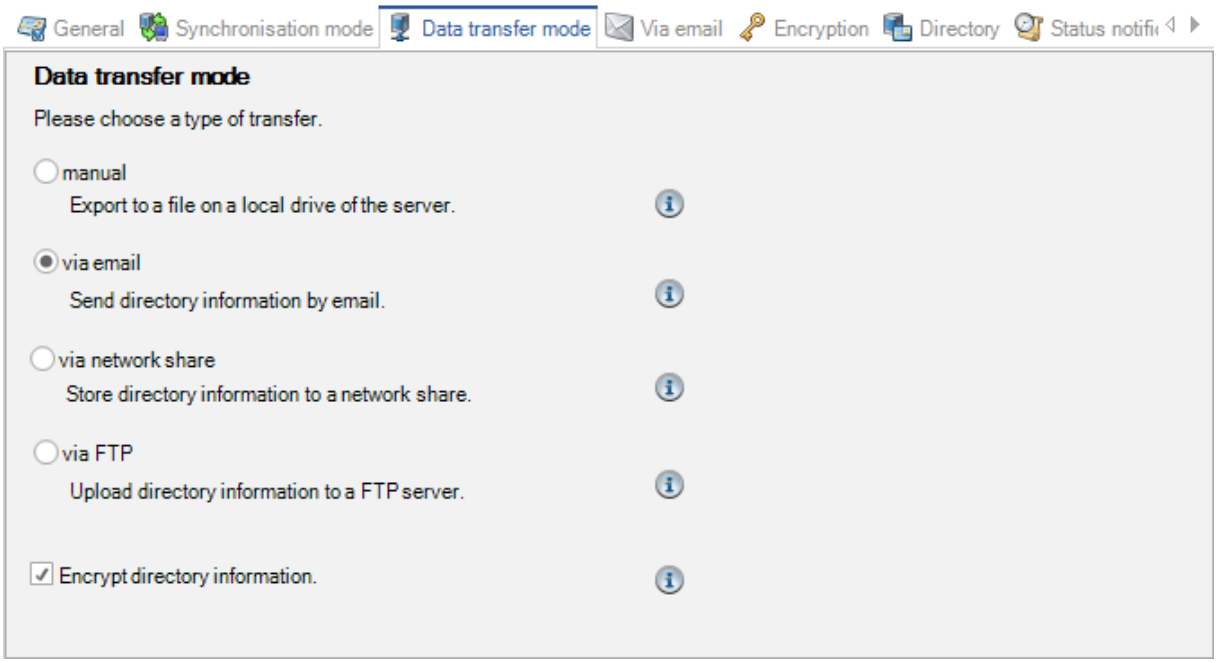


The **Properties** button allows you to modify the property values of the imported objects during the import and the **Settings** button opens a dialog where additional settings can be applied.

Please take a look for detailed information for the Directory tab of an Import policy at the **Import Policy** chapter.

Encryption

The directory information can be encrypted for transport. The **Encrypt directory information** option can be activated while selecting the **Data transfer mode**.



While setting up the **Data transfer mode**, **Encryption** can be selected.

GALsync supports the local security option System cryptography: **Use FIPS compliant algorithms for encryption, hashing, and signing**.

Note: If the local security option "System cryptography: Use FIPS compliant algorithms for encryption, hashing, and signing" is enabled, GALsync 7.2.0 and later versions cannot communicate encrypted with older versions.

Symmetric Keys

If you choose **symmetric keys** a single key is used for both, encryption and decryption. This means sender and receiver use the same key.

Procedure

Once you create an export policy create a key-file and hand it over to your partner organization. Then your partner creates an import policy. Imported information will be accessible after using the key-file.

If you want to use this key in any other of your own policies simply refer to the created key-file.

Asymmetric Keys (Public Key)

If you choose **asymmetric keys**, the key for encrypting the message is different from the key for decryption. This means a public key is used to encrypt the data file, whereas the private key is kept secretly and will be used to decrypt the data file. If you want the other exchange organization to send encrypted directory information to you, you have to generate a pair of keys and hand over the public key to the other exchange organization first. They will use the key for encryption and send you the encrypted file. The private key is stored directly in the policy file.

Note: Using an asymmetric key the private key is built upon the machines GUID. As soon as you move GALsync to another machine you have to renew your existing key.

Procedure

If you create an import policy create a key-file and hand it over to your partner organization. Your partner himself creates an export policy and key-file can be applied on the Encryption tab of this policy.

Please ensure the public key file (needed to encrypt the file) generated by your sync partner is available when the corresponding export policy is created.

Further information

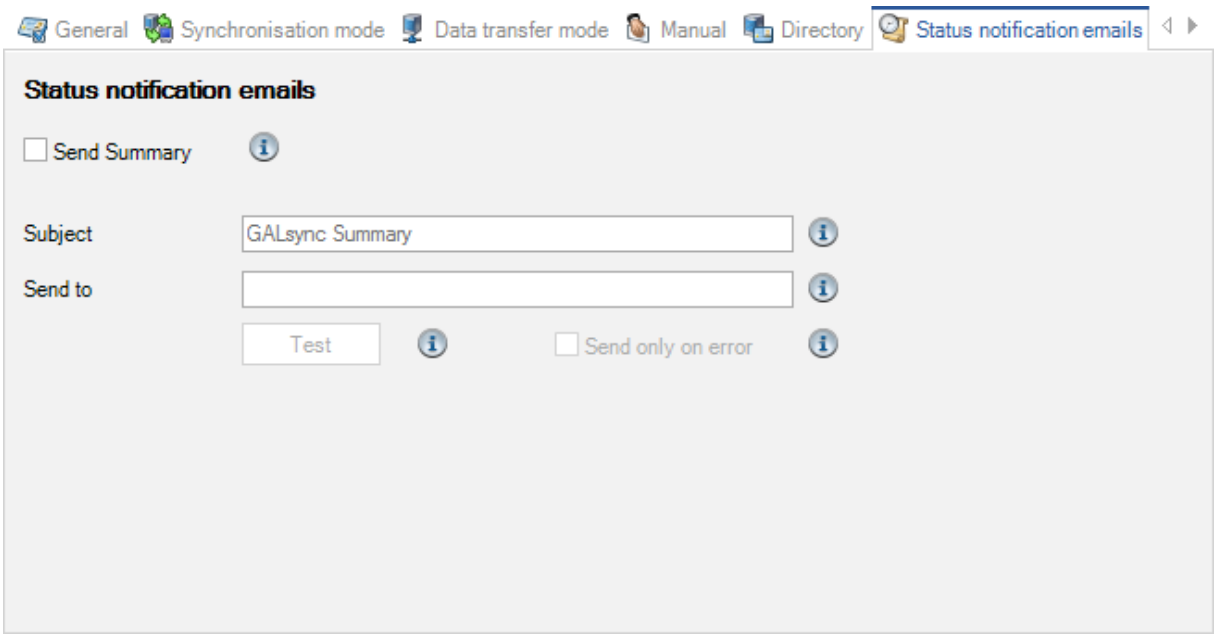
Please take a look for further information at the following articles:

http://en.wikipedia.org/wiki/Symmetric-key_algorithm

http://en.wikipedia.org/wiki/Asymmetric_key_algorithm

Status notification emails

GALsync can send status notification emails to provide you a brief summary of policy activity, including errors that may have occurred. Status notification is a component of each policy. If you leave this option unselected no notification email will be sent.



Subject: The email header

Send to: The SMTP-address of the person who will receive the administrative report

Test: GALsync will send an email to the specified email address.

Send only on error: GALsync will only send status notification mails if at least one error occurred during a running policy.

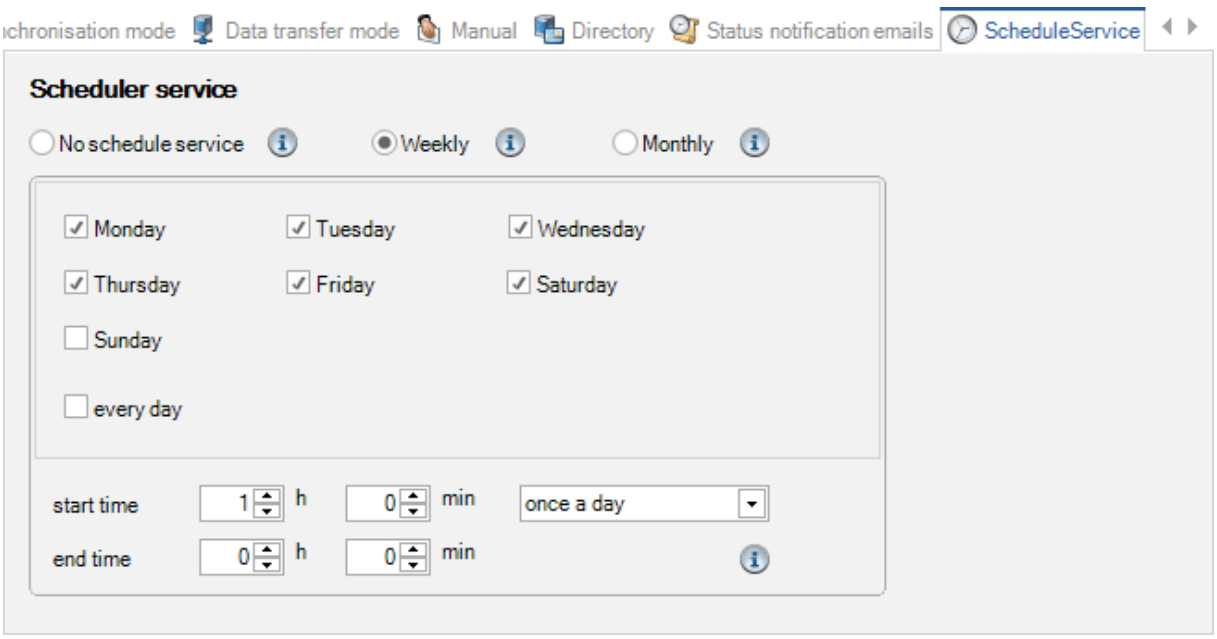
Note: GALsync does not send a status notification mail if a policy has not been started due to an error.

Schedule Service

GALsync policies can be scheduled to run automatically at the desired interval. You can choose between what days in the week. or month policies run, as well as the desired frequency, as often as every 15 minutes, every hour, or once a day.

We recommend to schedule the policies **once a day**.

Using start time and end time option GALsync starts only in the defined period. The synchronization itself can take a longer time than is set in this time slot.



Export Policy

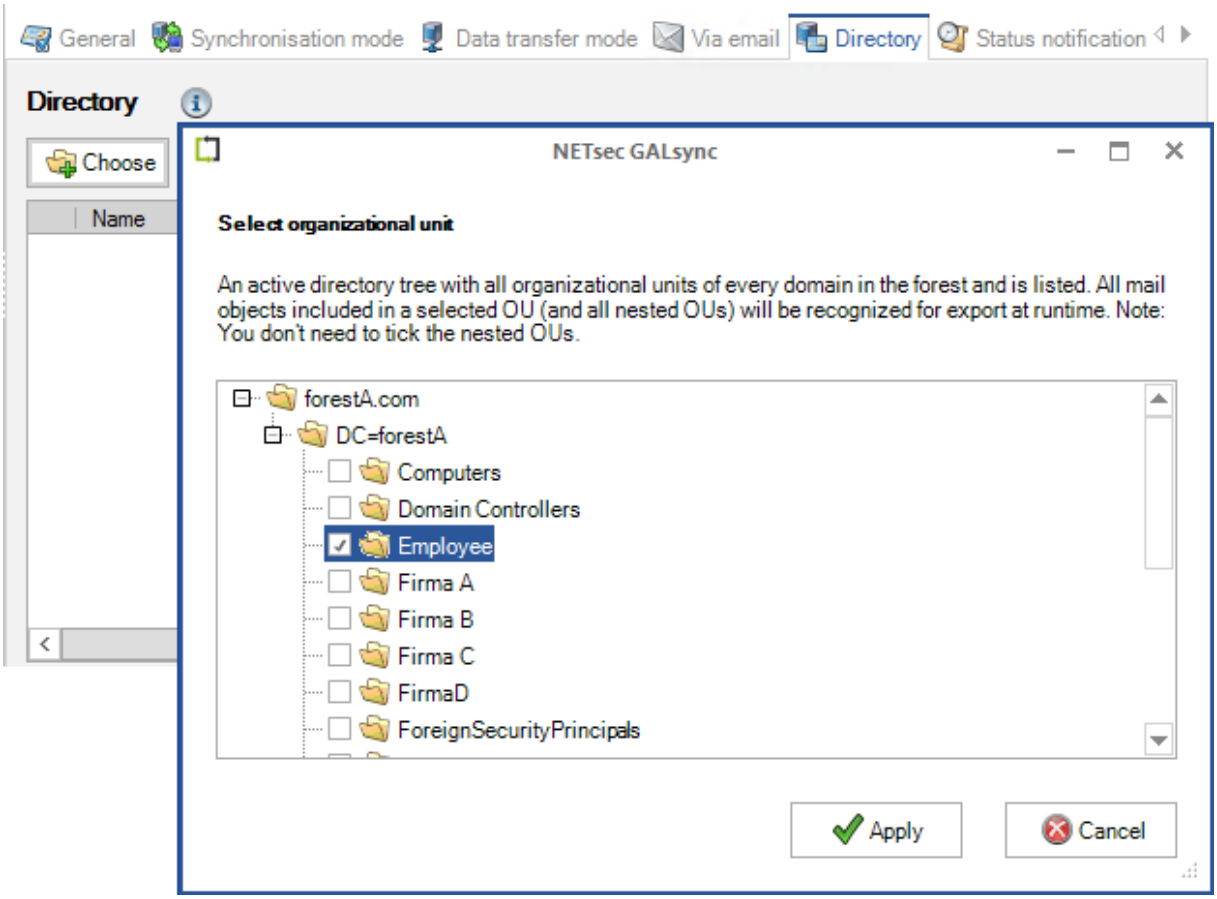
Select objects for export

In the **Directory** tab of export policies, you can select the active directory objects you want to export. Search scope is a single object type all over the domain or selected organizational units in the local domain. Additionally, you may exclude certain object properties that are not transferred to the other exchange organization. You may also remove a selected entry from the list.

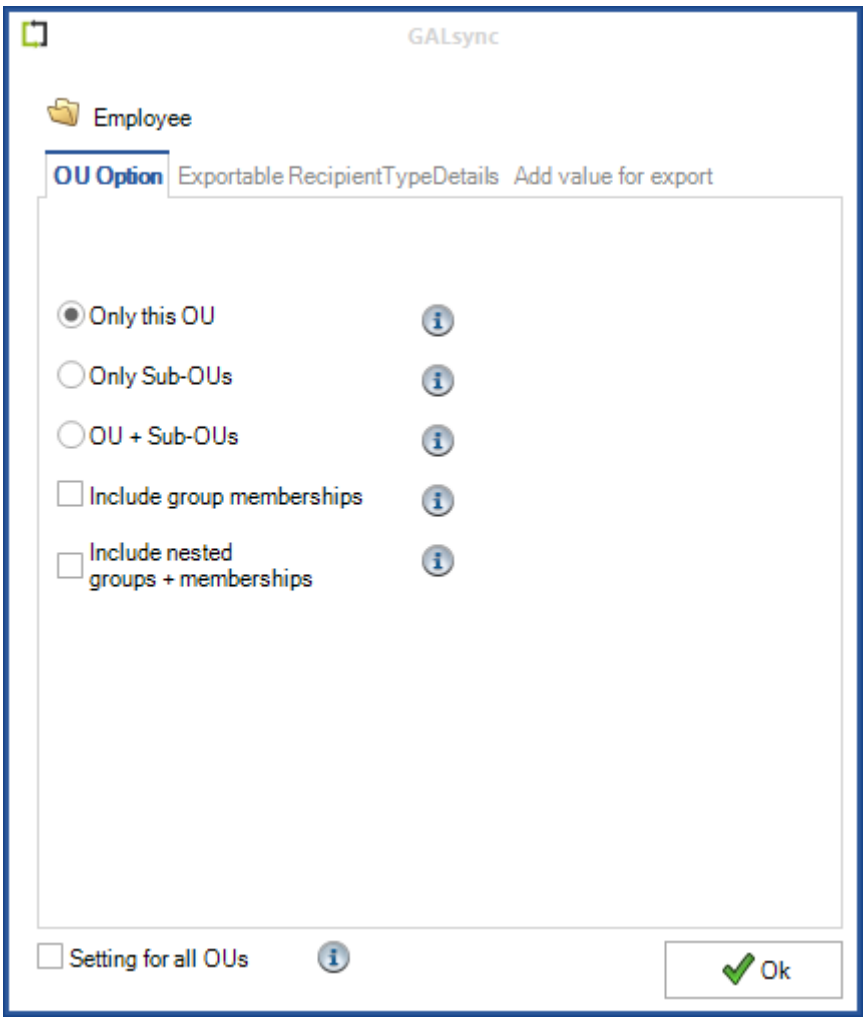
Choose (on-premises)

Here you may tick a dedicated Organizational Unit in the listed domains. An active directory tree with all domains and organizational units will be listed.

In forests with multiple domains all domains are displayed.



OU Option



Only this OU

All mail-enabled objects included in the selected OU will be recognized for export at runtime.

Only Sub-OUs

All mail-enabled objects included in one of the sub-OU of the selected OU will be recognized for export at runtime.

OU + Sub-OUs

All mail-enabled objects included in a selected OU and all nested OUs will be recognized for export at runtime.

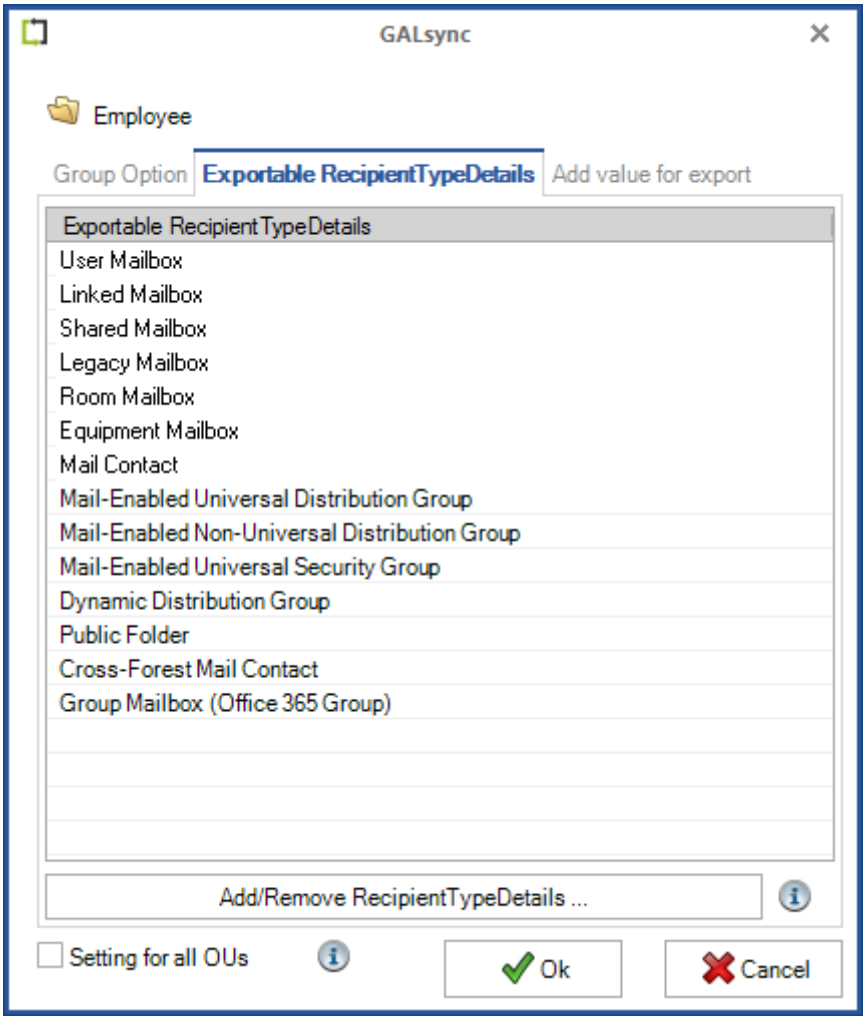
Include group memberships

All mail-enabled objects that are members of a group will be recognized for export at runtime, if the group is in a selected OU.

Include nested groups + memberships

Nested groups and their members will be also resolved for export at runtime.

Exportable RecipientTypeDetails

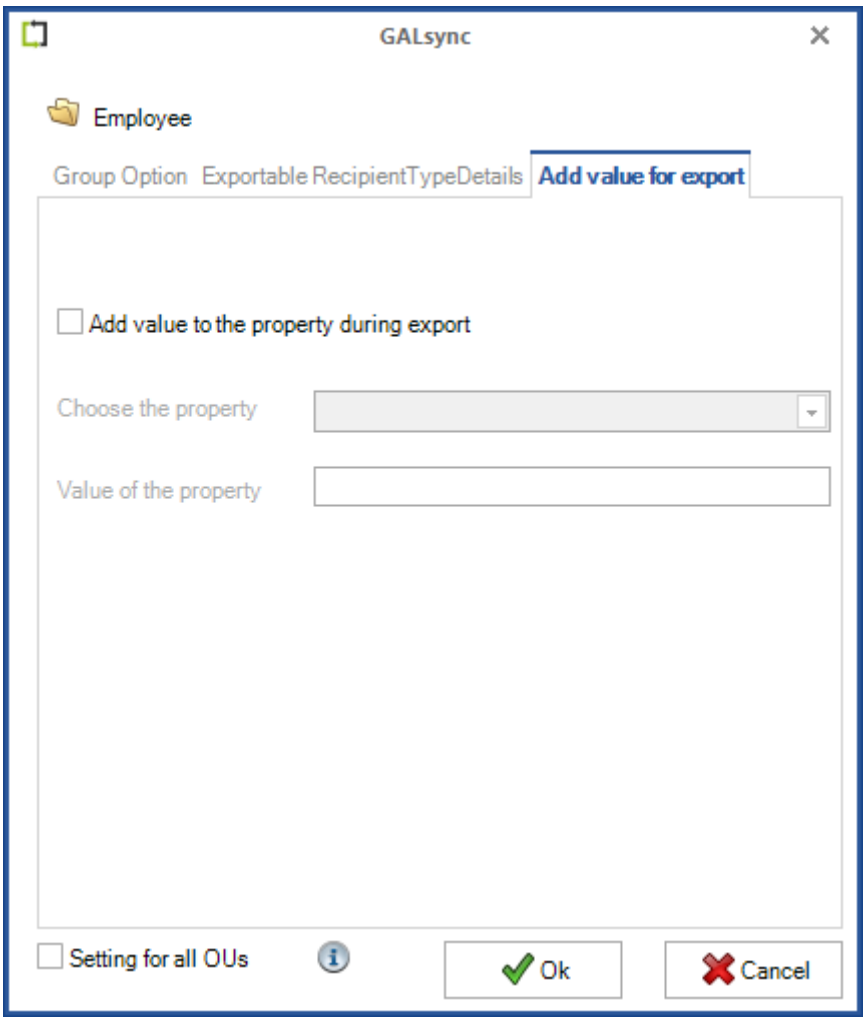


GALsync exports objects which have one of the **RecipientTypeDetails** set in the **msExchRecipientTypeDetails** / **RecipientTypeDetails** property or the **msExchRecipientTypeDetails** / **RecipientTypeDetails** property has not been set.

The list of **RecipientTypeDetails** can be modified with **Add/Remove RecipientTypeDetails ...**.

Note: In the case of RecipientTypeDetails, that are not present in the Exportable RecipientTypeDetails list by default, GALsync does not check whether they are present or useful in your environment. We leave the verification to the responsible administrator to support as many scenarios as possible A disadvantage is this can potentially be misconfigured and produce undesirable results.

Add value for export

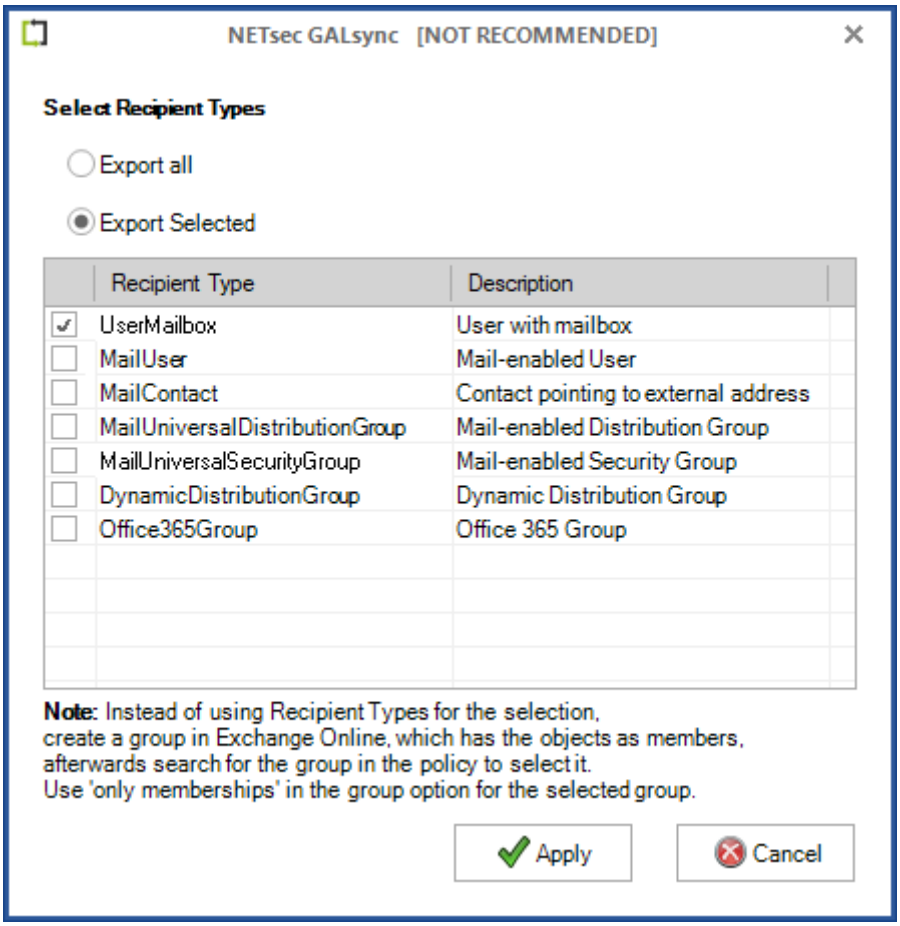


GALsync can optionally add a value to an extensionAttribute of exported objects related to the policy. This value is only added to the exported object on the data file, not the source object itself.

Choose (Exchange Online) [not recommended]

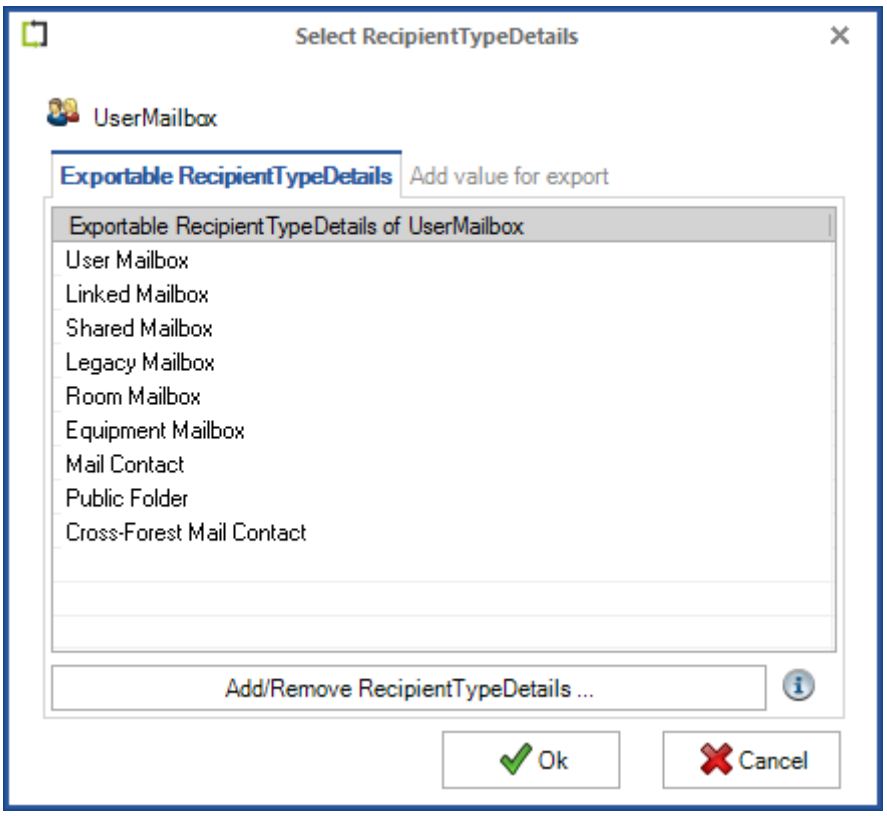
The selection by **Recipient Type** will be deprecated and is not recommended to use for configuration any longer. It is recommended to define the selection of objects to be synchronized by membership in a group. The group can be searched for in the **Search** dialog and only its members are exported with the group option **Only Membership**. This allows you to specify much more precisely which objects will actually be exported.

Here you may pick either all objects or specify a filter by ticking recipient types you want to choose.



And define the recipient type details, which are allow for export, of the selected recipient type.

Exportable RecipientTypeDetails

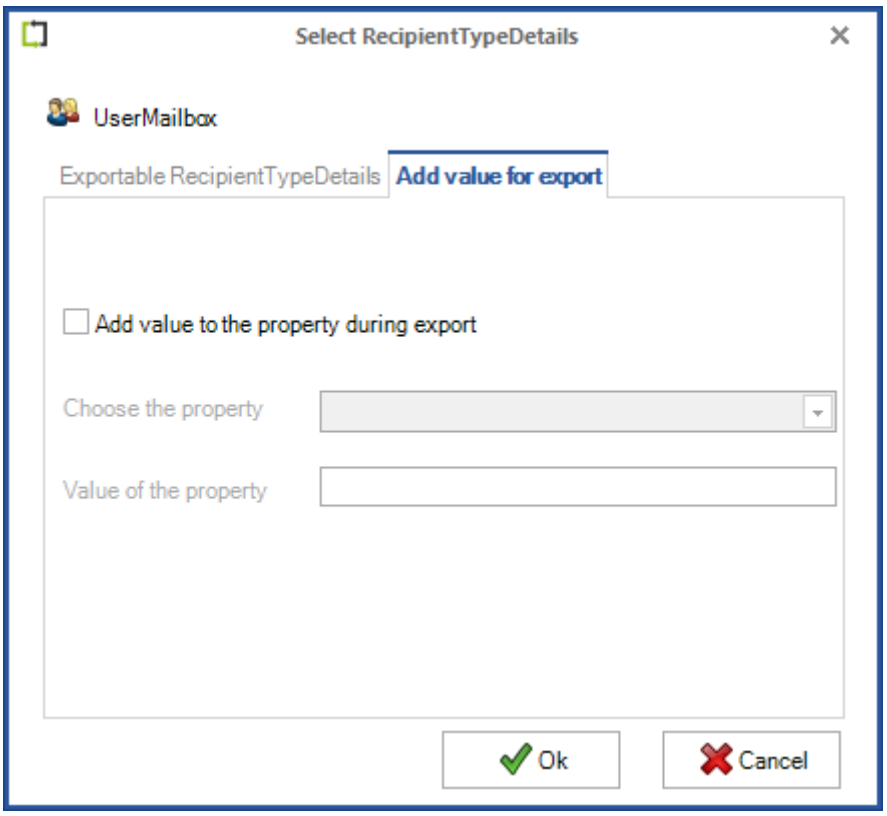


GALsync exports objects which have one of the **RecipientTypeDetails** set in the **msExchRecipientTypeDetails** / **RecipientTypeDetails** property or the **msExchRecipientTypeDetails** / **RecipientTypeDetails** property has not been set.

The list of **RecipientTypeDetails** can be modified with **Add/Remove RecipientTypeDetails ...**.

Note: In the case of RecipientTypeDetails, that are not present in the Exportable RecipientTypeDetails list by default, GALsync does not check whether they are present or useful in your environment. We leave the verification to the responsible administrator to support as many scenarios as possible. A disadvantage is this can potentially be misconfigured and produce undesirable results.

Add value for export

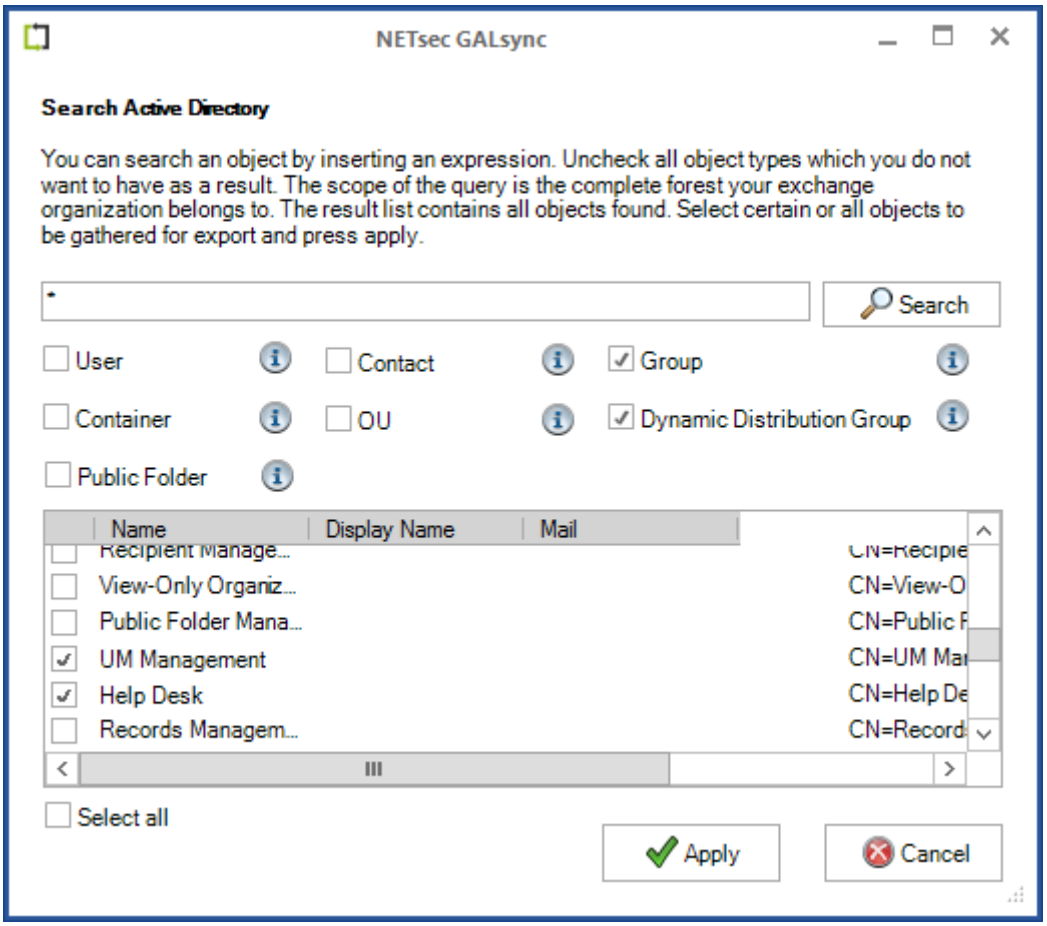


GALsync can optionally add a value to an Extension Attribute of exported objects related to the policy. This value is only added to the exported object on the data file, not the source object itself.

Search (on-premises)

You can search an object by inserting an expression. Uncheck all object types you do not want to have as a result.

Note: The scope of the query is the Active Directory Forest.



The result listed contains all objects found. Select certain or all objects to be gathered for export and click Apply.

Inserting an asterisk (*) will query for all corresponding objects of the selected recipient type(s). For example, if you check only Public Folder, all Public Folders will be returned as a result.

User

You can search for user objects and select dedicated users for export matching the inserted expression.

Recommendation: Select dedicated users only if you are sure they will never be deleted from Active Directory. Consider selecting objects with 'dynamic' members, such as OUs, groups etc.

Contact
You can search for contact objects and select dedicated contacts for export.

Recommendation: Select dedicated contacts only if you are sure They will never be deleted from Active Directory. Consider selecting objects with 'dynamic' members, such as OUs, groups etc.

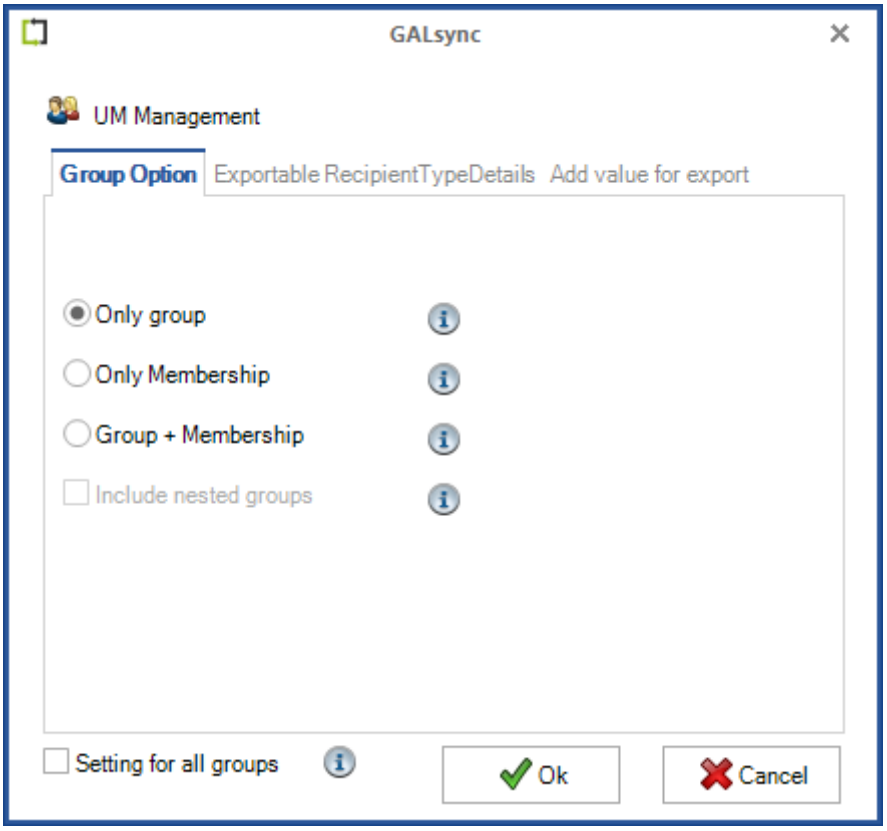
Container
You can search for container objects to export all objects in this container matching the inserted expression.

OU
You can search for Organizational Units to export all objects in this OU matching the inserted expression.

Dynamic Distribution Group
Dynamic Distribution Group (formerly Query-Based Group) provides a type of Distribution Group with a flexible method to dynamically define the membership to this type of group. It is not a static membership like regular groups.

Search for Dynamic Distribution Groups matching the inserted expression and select if you want to export all members of this group.

Groups
Search for local, global and universal groups of type security group or distribution group.



If you select a listed group which is mail-enabled you will be able to choose between a group itself or only the members of this group (only membership) or both (group +

membership) to be exported. If you select groups which are not mail-enabled the option Only group is not available.

Note: You can sort for column Mail if you only want to mark the mail-enabled groups.

If Setting for all groups is check, the configuration will be applied to all listed and selected groups. Otherwise, you will be prompted to redefine and apply your settings individually for every selected group.

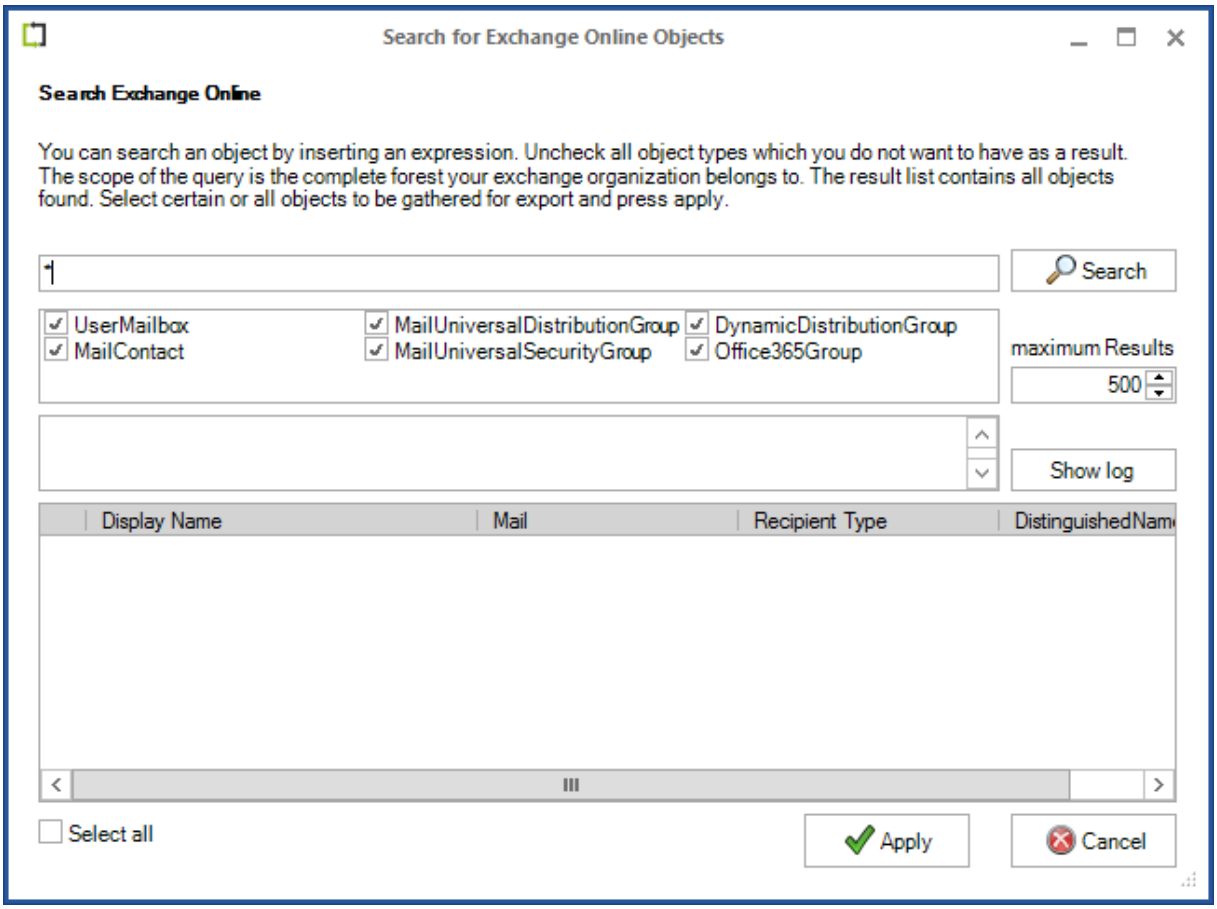
Public Folder

You can search for mail-enabled Public Folders object and choose any Public Folder object you want to export. The Public Folder object will be created as a contact in the target environment.

Please note that Public Folder means the old object class of Exchange 2003 technology and not the current Public Folder mailbox technology.

Search (Exchange Online)

Here you may pick either all objects or specify a filter by choosing a recipient type. Inserting an asterisk (*) will query for all corresponding objects of the selected recipient type(s). For example, if you check only contacts, all contacts will be returned as a result.



The result listed contains all objects found. Select certain or all objects to be gathered for export and press apply. It is very important that you change the option maximum Results if you want to export more than 500 objects.

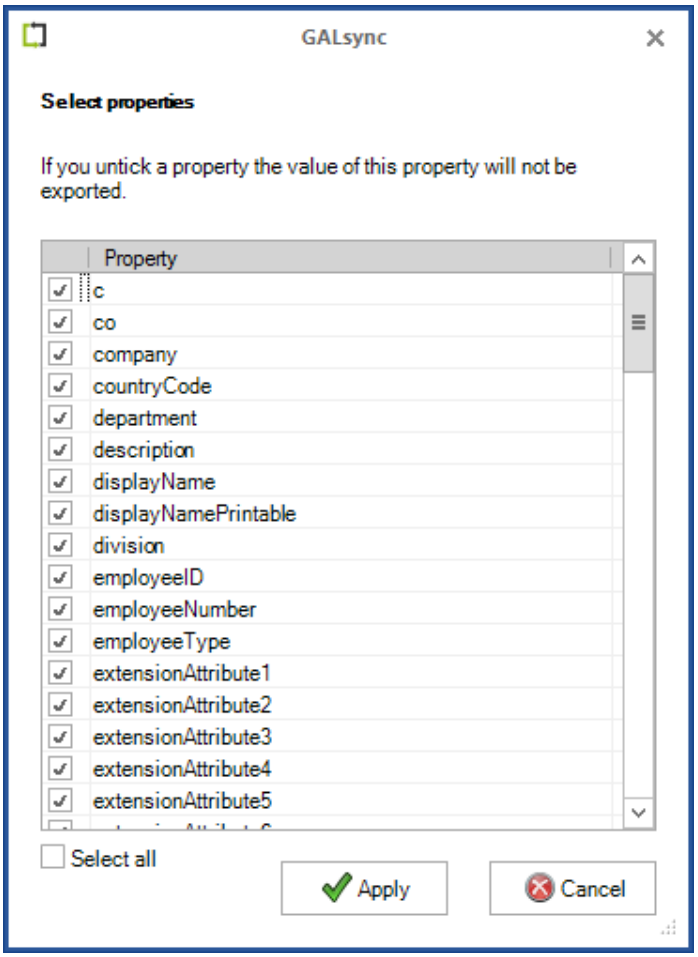
You can limit the results which you want to be exported.

Note: The default 500 is set to prevent you from a long-time search. If your result is larger than the given value, the not listed objects are not included in the policy!

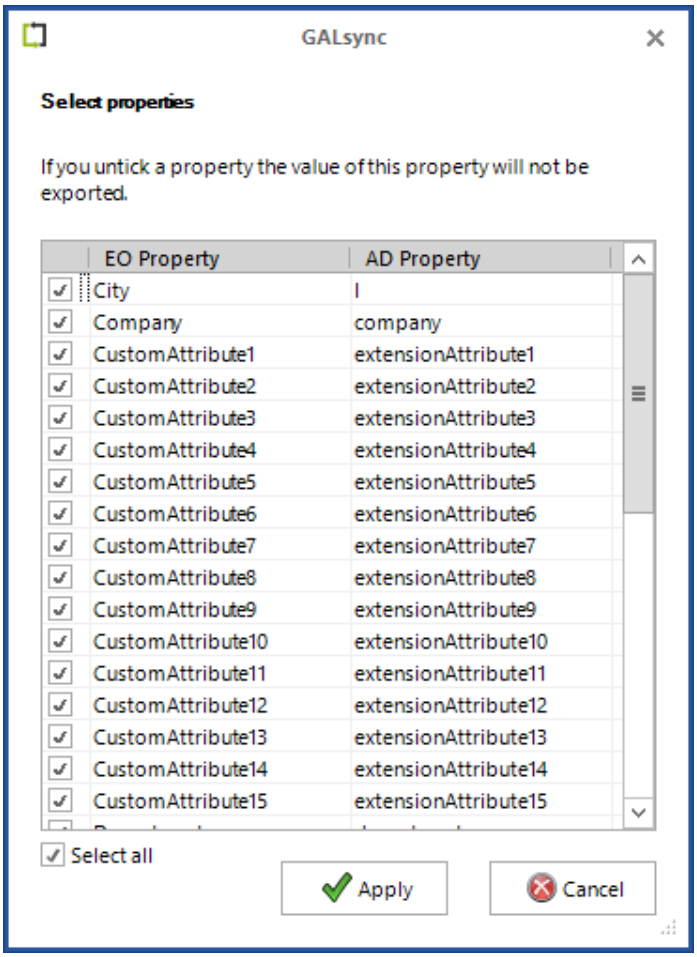
Properties

Select which properties are to be exported.

Exchange On-Premises



Exchange Online



In detail:

These attributes are mandatory

Exchange Online

Guid, DistinguishedName, ObjectClass, EmailAddresses, ExternalEmailAddress, Alias, Name, FirstName, LastName, RecipientTypeDetails

Exchange On-Premises

GUID, DistinguishedName, Cn, ObjectClass, Proxy addresses, TargetAddress, Mail, MailNickname, Name, GivenName, Sn, MsExchRecipientTypeDetails

These attributes are optional

Exchange Online

City, Company, CustomAttribute1, CustomAttribute2, CustomAttribute3, CustomAttribute4, CustomAttribute5, CustomAttribute6, CustomAttribute7, CustomAttribute8, CustomAttribute9, CustomAttribute10, CustomAttribute11, CustomAttribute12, CustomAttribute13, CustomAttribute14, CustomAttribute15, Department, DisplayName, Fax, HomePhone, Initials, MobilePhone, Notes, Office, OtherFax, OtherHomePhone, OtherTelephone, Pager, Phone, PostalCode, PostOfficeBox, SimpleDisplayName, StateOrProvince, StreetAddress, Title, WebPage

Exchange On-Premises

C, Co, Company, CountryCode, Department, Description, DisplayName, DisplayNamePrintable, EmployeeID, EmployeeNumber, EmployeeType, ExtensionAttribute1, ExtensionAttribute2, ExtensionAttribute3, ExtensionAttribute4, ExtensionAttribute5, ExtensionAttribute6, ExtensionAttribute7, ExtensionAttribute8, ExtensionAttribute9, ExtensionAttribute10, ExtensionAttribute11, ExtensionAttribute12, ExtensionAttribute13, ExtensionAttribute14, ExtensionAttribute15, FacsimileTelephoneNumber, HomePhone, Info, Initials, IpPhone, L, Mobile, MsExchHideFromAddressLists, OtherFacsimileTelephoneNumber, OtherHomePhone, OtherIpPhone, OtherMobile, OtherPager, OtherTelephone, Pager, PersonalTitle, PhysicalDeliveryOfficeName, PostalCode, PostOfficeBox, St, StreetAddress, TelephoneNumber, Title, Url, WWWHomePage

These attributes have to be selected explicitly for export

Exchange Online

AssistantName, LegacyExchangeDN, TelephoneAssistant

Please note that the export of these attributes extends the runtime of the policy.

Exchange on-premises

generationQualifier, legacyExchangeDN, msExchAssistantName, msRTCSIP-DeploymentLocator, msRTCSIP-FederationEnabled, msRTCSIP-InternetAccessEnabled, msRTCSIP-OptionFlags, msRTCSIP-PrimaryHomeServer, msRTCSIP-PrimaryUserAddress, msRTCSIP-UserEnabled, msRTCSIP-UserPolicies, msExchExtensionAttribute16 – msExchExtensionAttribute45, TelephoneAssistant

Note: If you already have run a sync (e.g., with phone number Selected) and afterwards you modify the policy and you unselect the property (e.g., with phone number now unticked), then the already synced value will not be modified in the target!

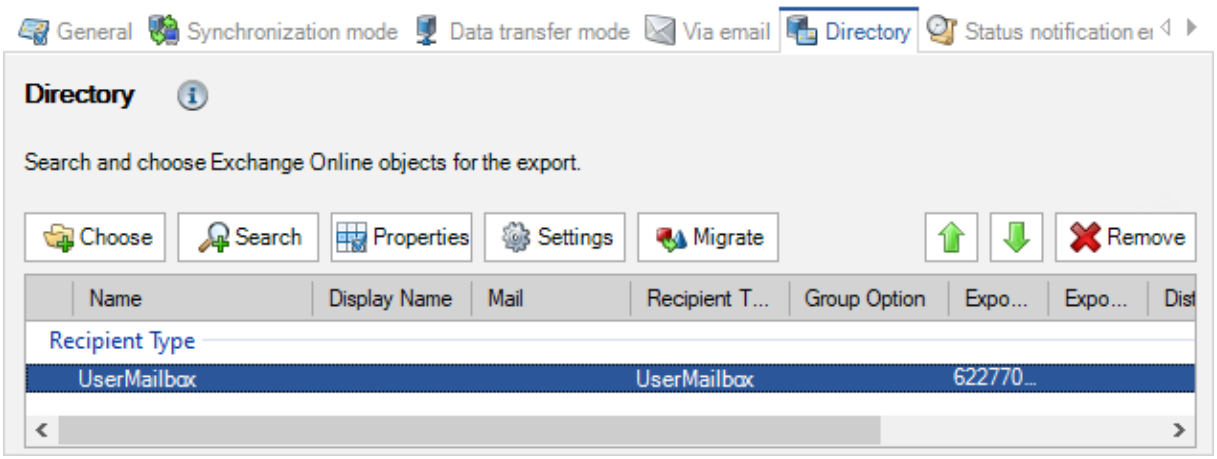
NoGALsync (internal mark)

If you do not want a special object to be exported, you may insert the value **NoGALsync** in any of the custom attributes (on-premises: **extensionAttribute1** - **extensionAttribute15** or Exchange online: **customAttribute1** - **customAttribute15**). This prevents GALsync from adding this object to the export list.

Migrate (Exchange Online only)

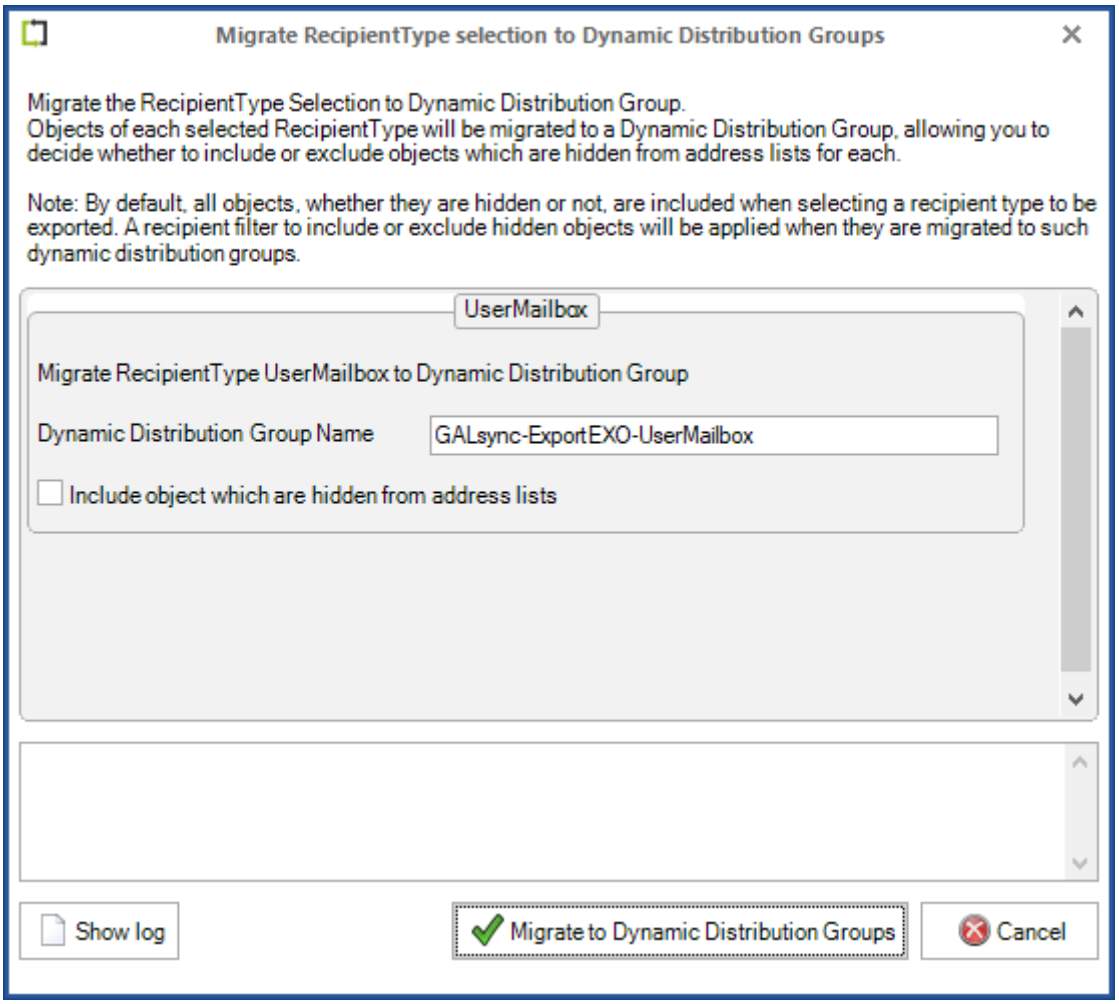
It is possible to migrate a selected **Recipient Type** on the **Directory** tab of an Exchange Online export policy to a dynamic distribution group.

The selection by **Recipient Type** will be deprecated and is not recommended to use for configuration any longer. It is recommended to define the selection of objects to be synchronized by membership in a group. The group can be searched for in the **Search** dialog and only its members are exported with the group option **Only Membership**. This allows you to specify much more precisely which objects will actually be exported.



Select the **Recipient Type** entry, e.g. **UserMailbox**, in the list and click **Migrate**.

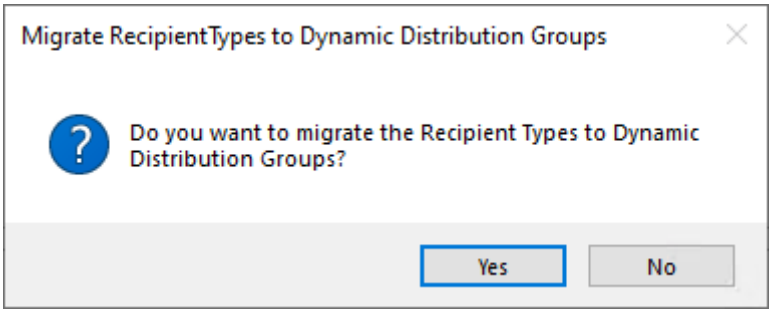
The **Migrate RecipientType selection to Dynamic Distribution Groups** dialog will open.

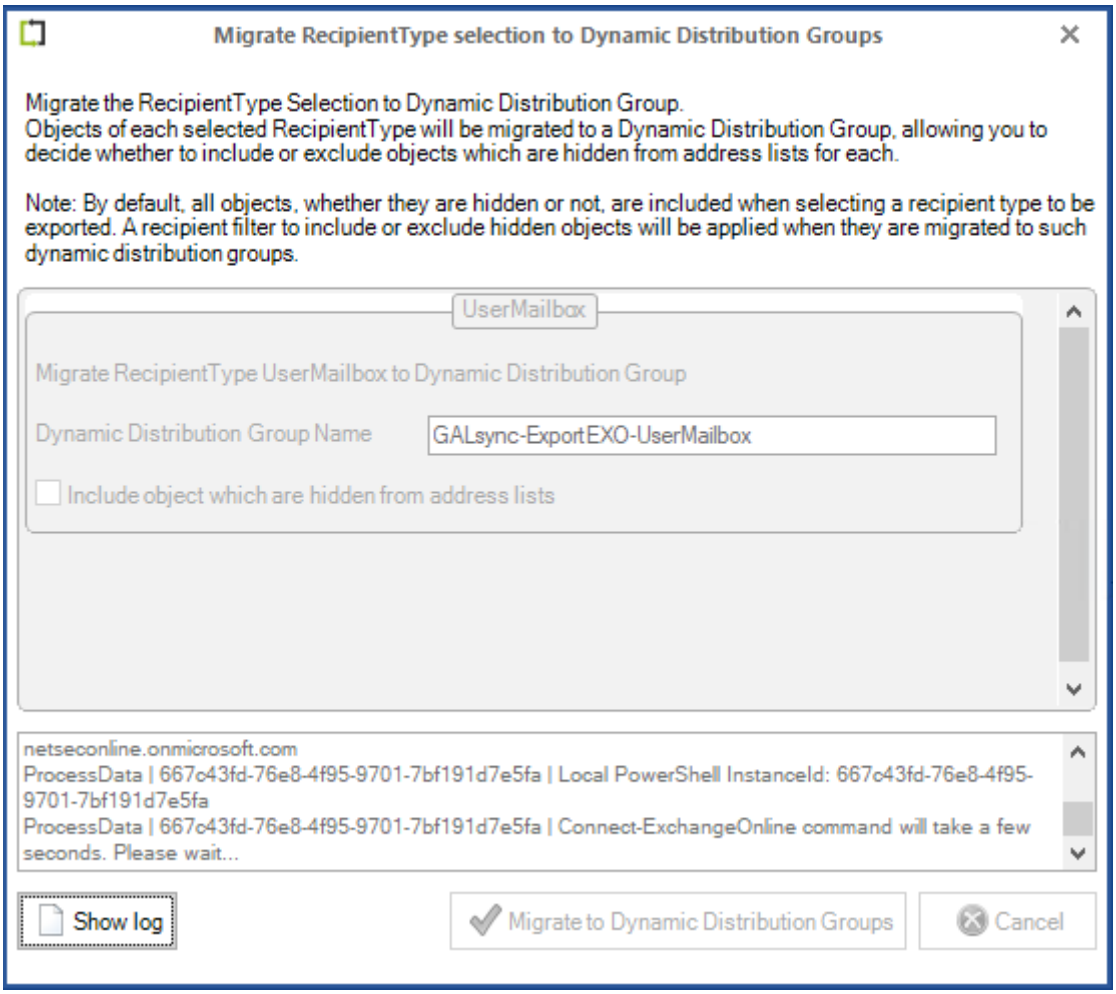


For each **Recipient Type** a dynamic distribution group will be created in Exchange Online.

The name of each dynamic distribution group must be unique in Exchange Online. The proposed name of the dynamic distribution group can be changed accordingly in the dialog before it is created in Exchange Online.

Click on **Migrate to Dynamic Distribution Groups**.



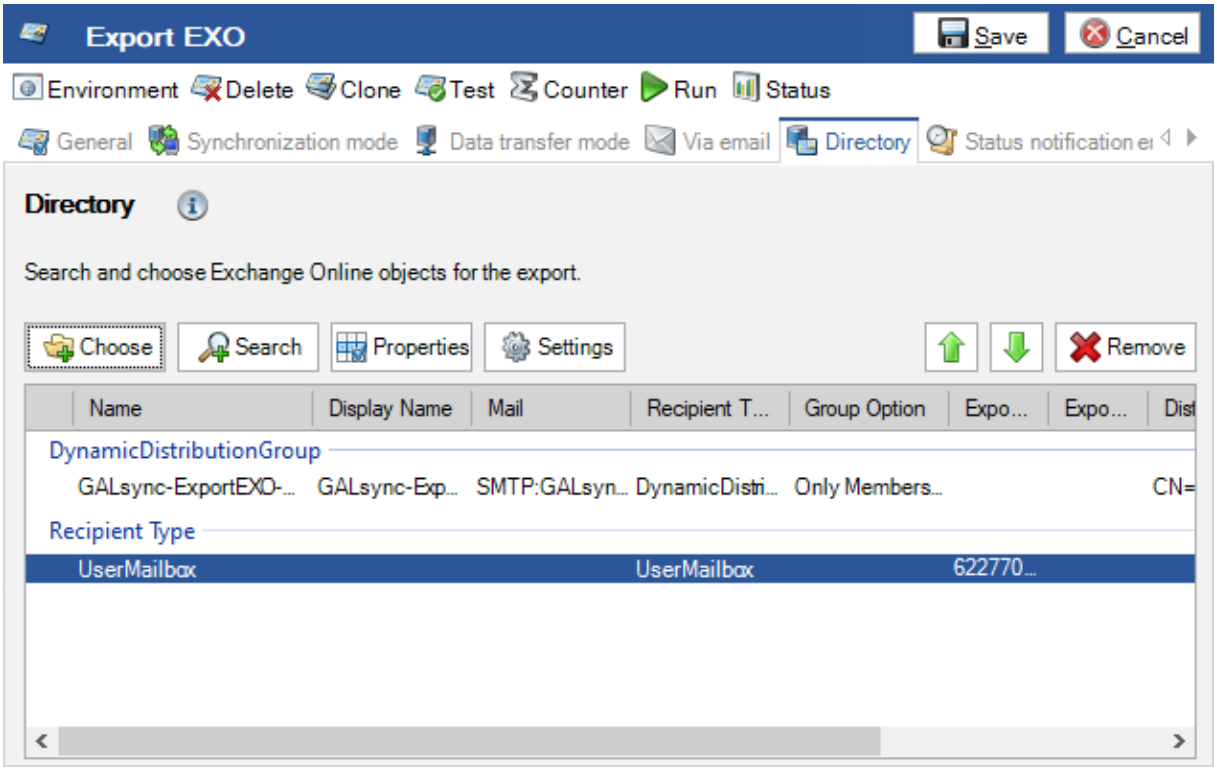


To create the dynamic distribution groups in Exchange Online, the **Exchange Online PowerShell** is used along with the settings from the **Environment Configuration**.

If the creation was successful, the dialog closes automatically.

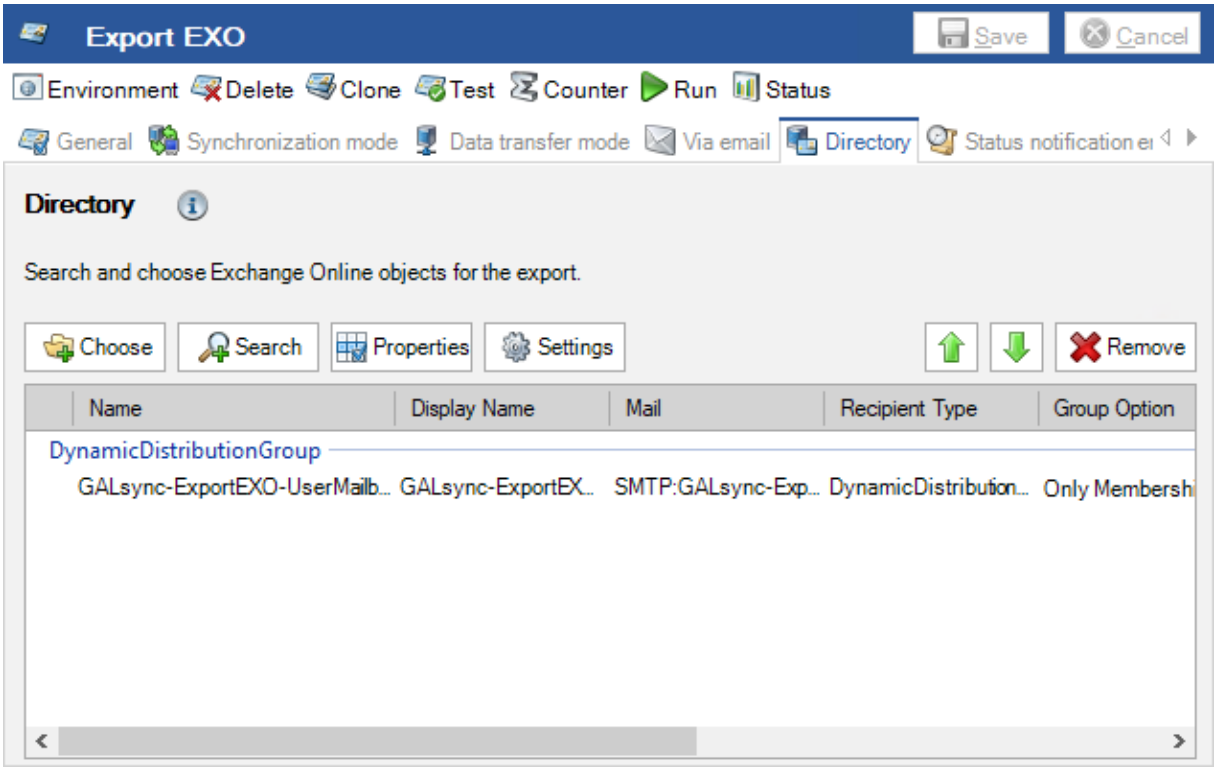
If an error occurs, the dialog remains open and the log file can be viewed by clicking on **Show log** in order to understand what did not work.

Once the dynamic distribution groups have been successfully created, the **Recipient Type** entries and the dynamic distribution group entries are displayed together until the policy is saved.



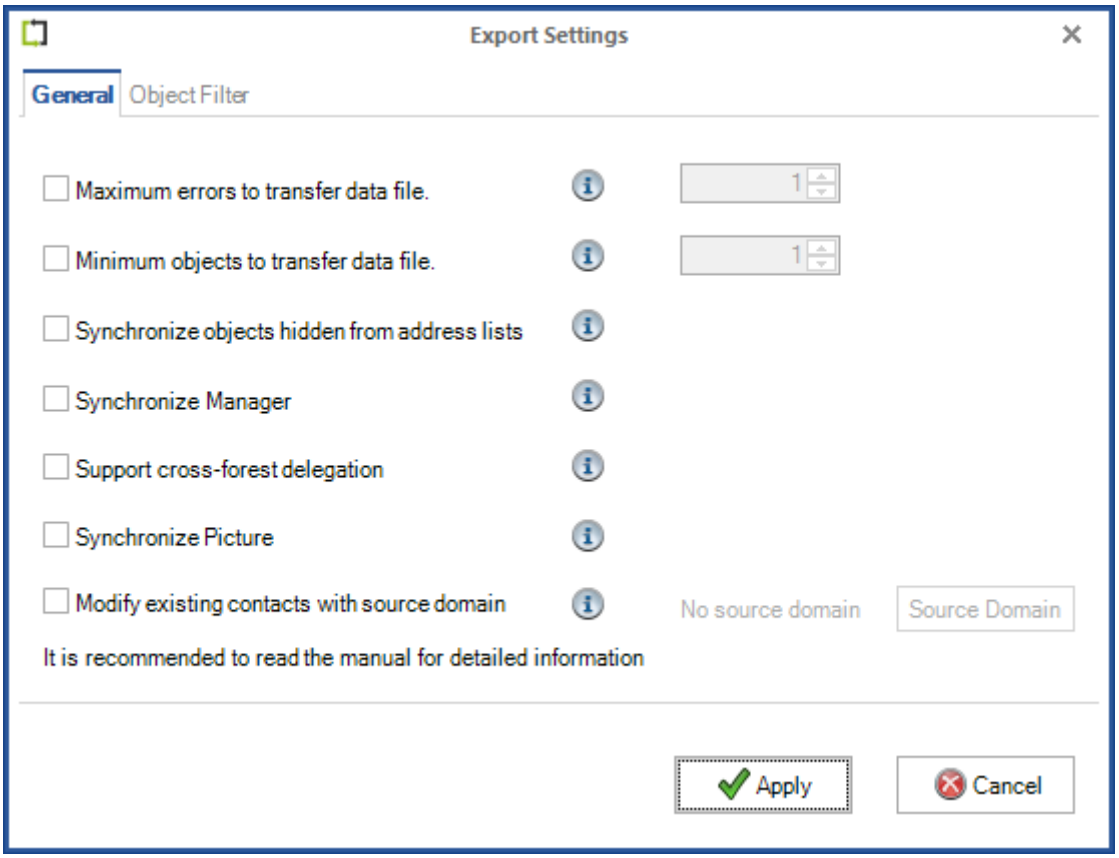
Please save the policy.

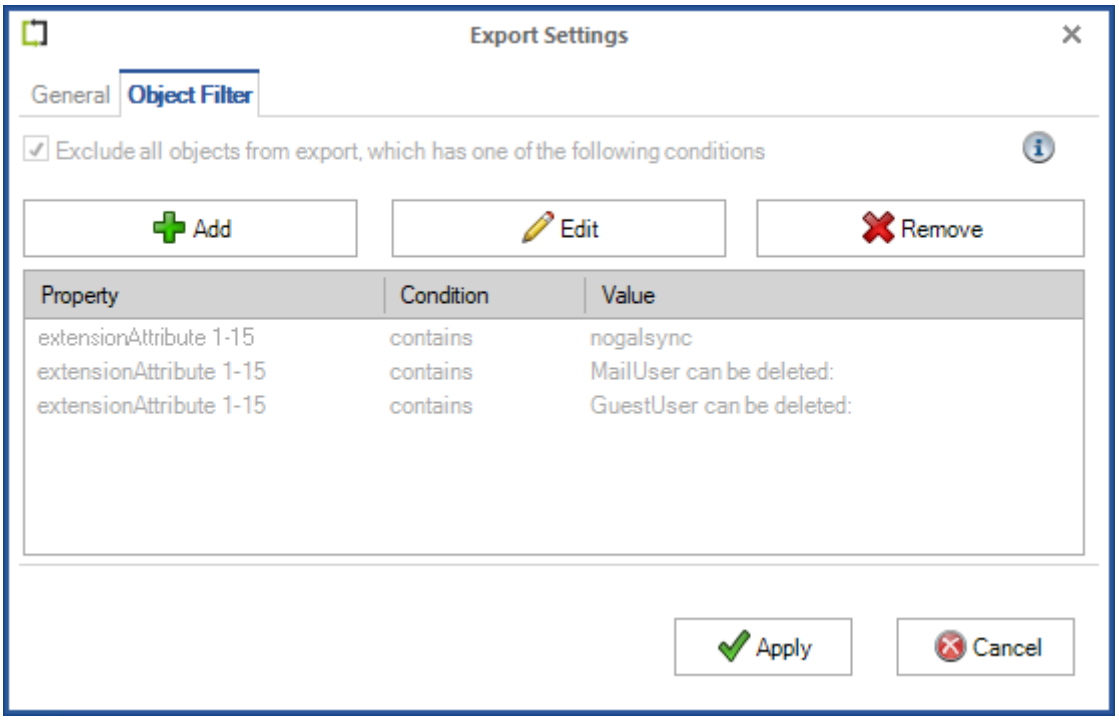
When the policy is saved, the migrated **Recipient Type** entries are removed from the list.



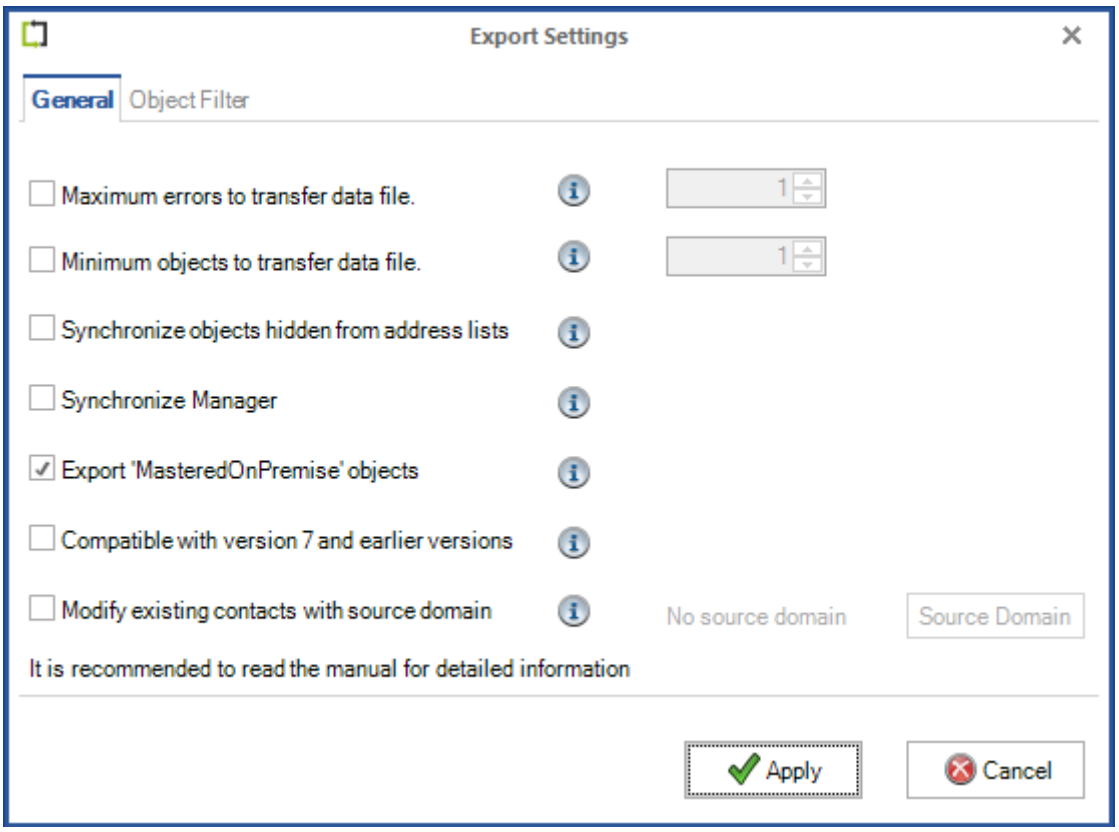
Special Options for Export

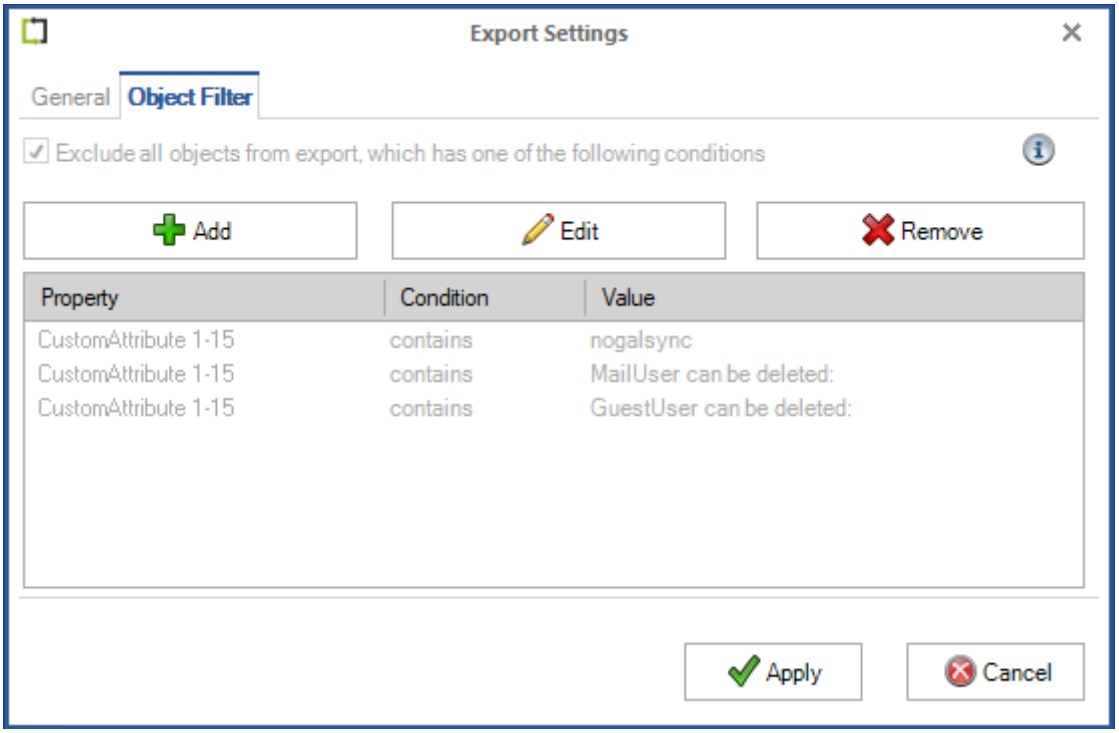
Export (Exchange on-premises)





Export (Exchange Online)





Maximum errors to transfer data file

In the **Directory Settings** of an export policy, a limit can be set for how many errors are tolerated when creating a data file, before it is sent. If this limit is exceeded, the affected data file will not be sent to the target.

Minimum objects to transfer data file

In the **Directory Settings** of an export policy, you can define a minimum number of objects to be written to the data file before sending to the recipient. If the data file contains less than the specified number of objects, it will not be sent.

For example, if you expect to export over 11000 objects, you can set a minimum number of objects to 11000. Assuming that a network error occurs at runtime and GALsync identifies only 8000 objects for export (because of unavailability of your domain controller). The data file will not be sent to the recipient. Otherwise, in the target environment the missing number of contacts would have been deleted even though they still exist in the source.

Disabled objects (on-premises only)

GALsync will export all mailboxes, or mail-enabled objects regardless of whether they are enabled or not. User or groups must have an SMTP proxy address value; contacts must have a target address value.

Synchronize objects hidden from address lists.

Formerly known as Include hidden objects.

If this option in the **Directory Settings** of an export policy is selected, objects that are hidden from the address lists, will also be exported.

Synchronize Manager

If this option in the **Directory Settings** of an export policy is selected GALsync will also export the manager's object (if there is a value present). The manager will be exported even if the object is not in the scope of the export query.

For example, if all users in the Developers OU are exported, but a manager of one object therein is located in the Managers OU which has not been selected for export, This manager is also exported.

If this option in the **Directory Settings** TAB **General** of an import policy is selected GALsync will set the manager property of the imported contact and imported mail-user.

Export 'MasteredOnPremise' objects (Exchange Online only)

This option allows you to export objects from Microsoft 365 Exchange Online, which are synchronized with Microsoft Azure Active Directory Connect tool. Microsoft Azure Active Directory Connect allows identities to be mastered on-premises and all updates to that identity are synchronized to Microsoft 365.

Compatible with version 7 and earlier versions (Exchange Online only)

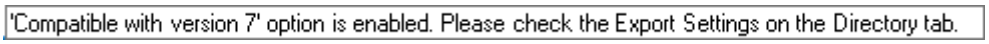
In GALsync version 7, when exporting from an Exchange Online tenant, the **ExternalEmailAddress / targetAddress** was set as the primary SMTP address in the **EmailAddresses / proxyAddresses**. This can cause problems, if the **ExternalEmailAddress** and the primary SMTP address are different.

As of GALsync version 8, the primary SMTP address of the **EmailAddresses** will not be changed by default when a new policy is created.

If the **Compatible with version 7 and earlier versions** option is enabled, GALsync will change the primary SMTP address of the **EmailAddresses** to the **ExternalEmailAddress** as with GALsync version 7.

In case of an upgrade from a GALsync version 7 and earlier to a current GALsync version 8, the **Compatible with version 7 and earlier versions** option is enabled.

Policies with enabled **Compatible with version 7 and earlier versions** option have warning symbol at the tree view node.



Please note, after disabling the option during importing on your partner's side, GALsync will modify existing objects that are being synchronized in order to possibly adjust the primary SMTP address and the value of the source domain property.

Please take a look at the **Incompatibility** chapter of the **GALsync 8 Upgrade Instructions** for further information:

https://www.netsec.de/en/products/galsync/documentation.html

Synchronize Picture (on-premises only)

If this option in the **Directory Settings** of an export policy is selected the user's photos stored in the source directory are exported as well. Photos usually are stored in attribute thumbnailPhoto. This option is only available in an on-premises export policy.

If this option in the **General** tab of the **Directory Settings** of an import policy is selected the transferred photos are stored in the **thumbnailPhoto** attribute in the target directory.

Please set the permissions **Read thumbnailPhoto** and **Write thumbnailPhoto** for the GALsync service account in the Active Directory, so GALsync can synchronize the **thumbnailPhoto** attribute.

Support cross-forest delegation (on-premises only)

Cross Forest Delegation was introduced in Exchange 2007. It enables a user in environment A to manage a calendar of a user in environment B.

Prerequisites are

- GALsync
- Forest Trust between Forests
- Cross-Forest Availability

An object with the **Recipient Type** of **Cross-forest mail contact** is created and you can use this contact to assign delegated permissions.

You may create this type of contact manually - some attributes need to have certain values, described in the article **Exchange Server 2010 Cross Forest Delegation** of the **MCS UK Unified Communications Blog**.

https://docs.microsoft.com/en-us/archive/blogs/msukucc/exchange-server-2010-cross-forest-delegation

GALsync supports to sync all attributes which you need to realize a Cross Forest Delegation.

If the option **Support cross-forest delegation** in the **Directory Settings** of an export policy and of an import policy is selected, GALsync handles the contact sync according to the chapter **Manually Creating a cross-forest mail contact** of the article **Exchange Server 2010 Cross Forest Delegation** of the **MCS UK Unified Communications Blog**.

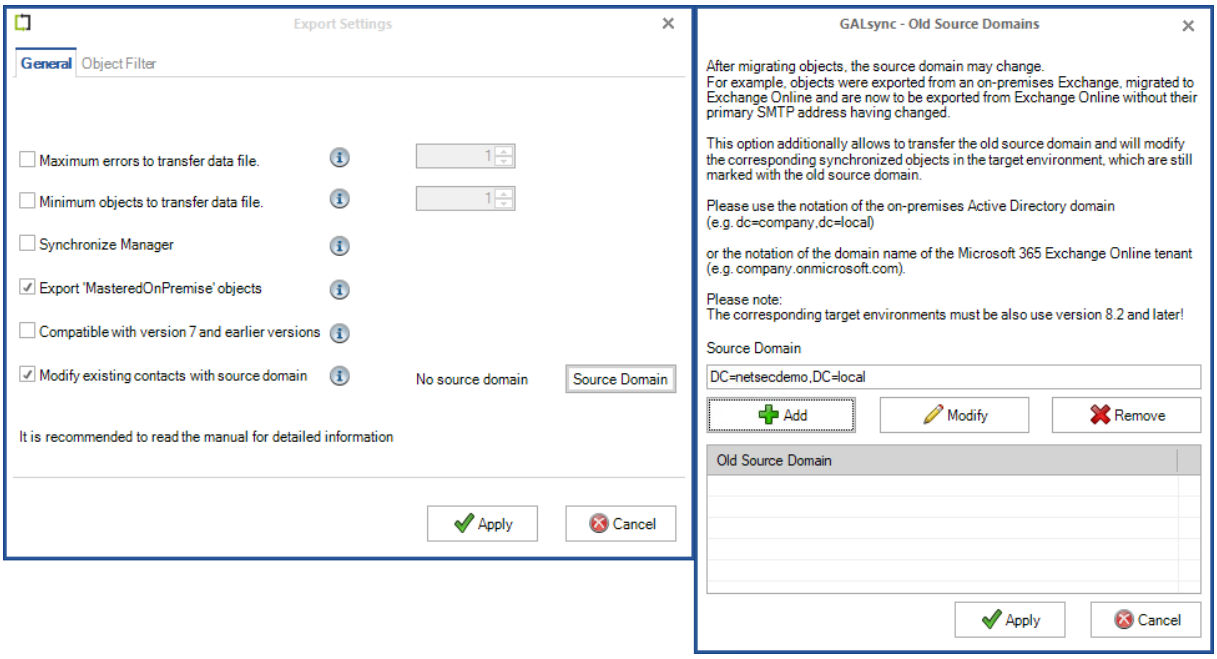
https://docs.microsoft.com/en-us/archive/blogs/msukucc/exchange-server-2010-cross-forest-delegation

Note: If you have a shared address space between the source and target forest, you must also use the option "Modify target address with domain" (on-premise only)

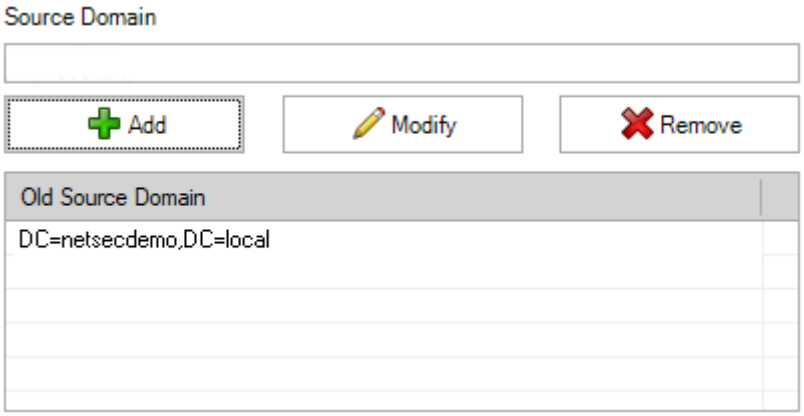
Modify existing contacts with source domain

Please note, that the importing partners also need GALsync version 8.2 or later, if you enabled this option. Otherwise, the importing partners will get warnings or errors and GALsync cannot import the data file.

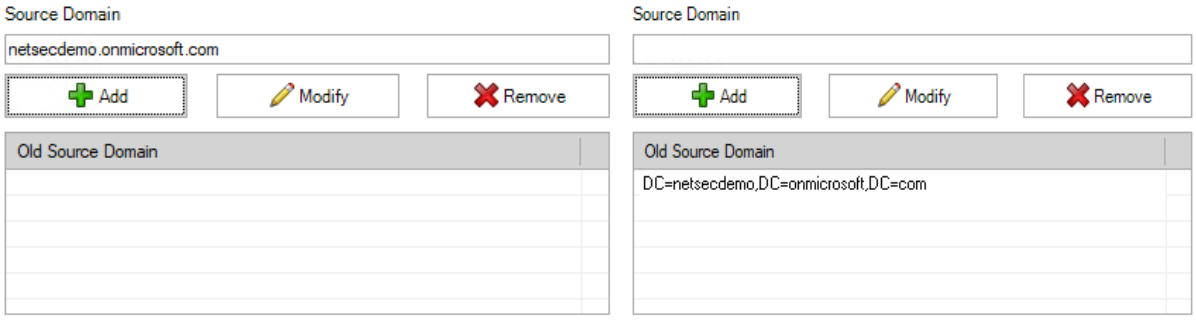
Enable the **Modify existing contacts with source domain** option at the **Export Settings** dialog and add old source domain values to the list.



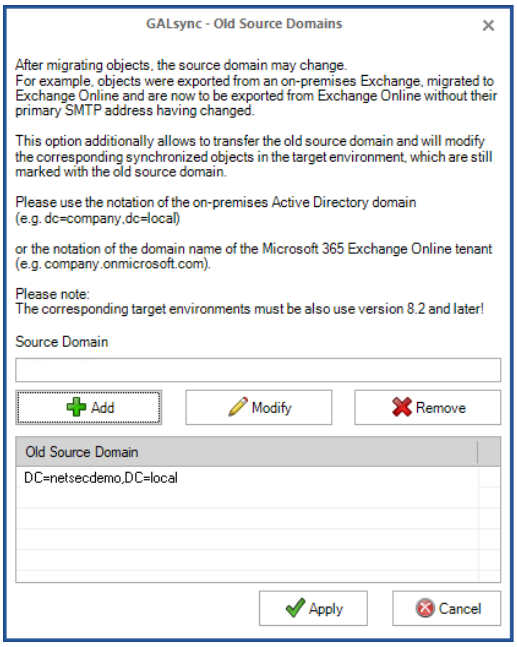
Insert the old source domain value, which is the Active Directory domain name, e.g. `DC=netsecdemo,DC=local`, or the Microsoft 365 Exchange Online tenant domain name, e.g. `netsecdemo.onmicrosoft.com`.

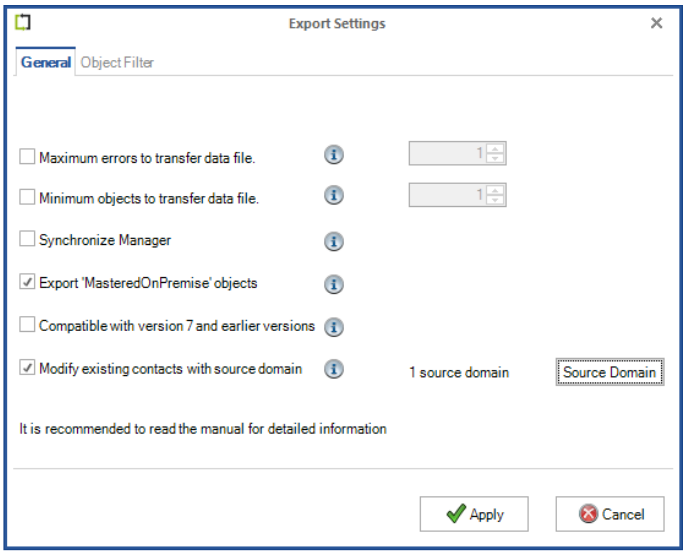


Please note, the source domain syntax `netsecdemo.onmicrosoft.com` will be added as `DC=netsecdemo,DC=onmicrosoft,DC=com` to the **Old Source Domain** list.

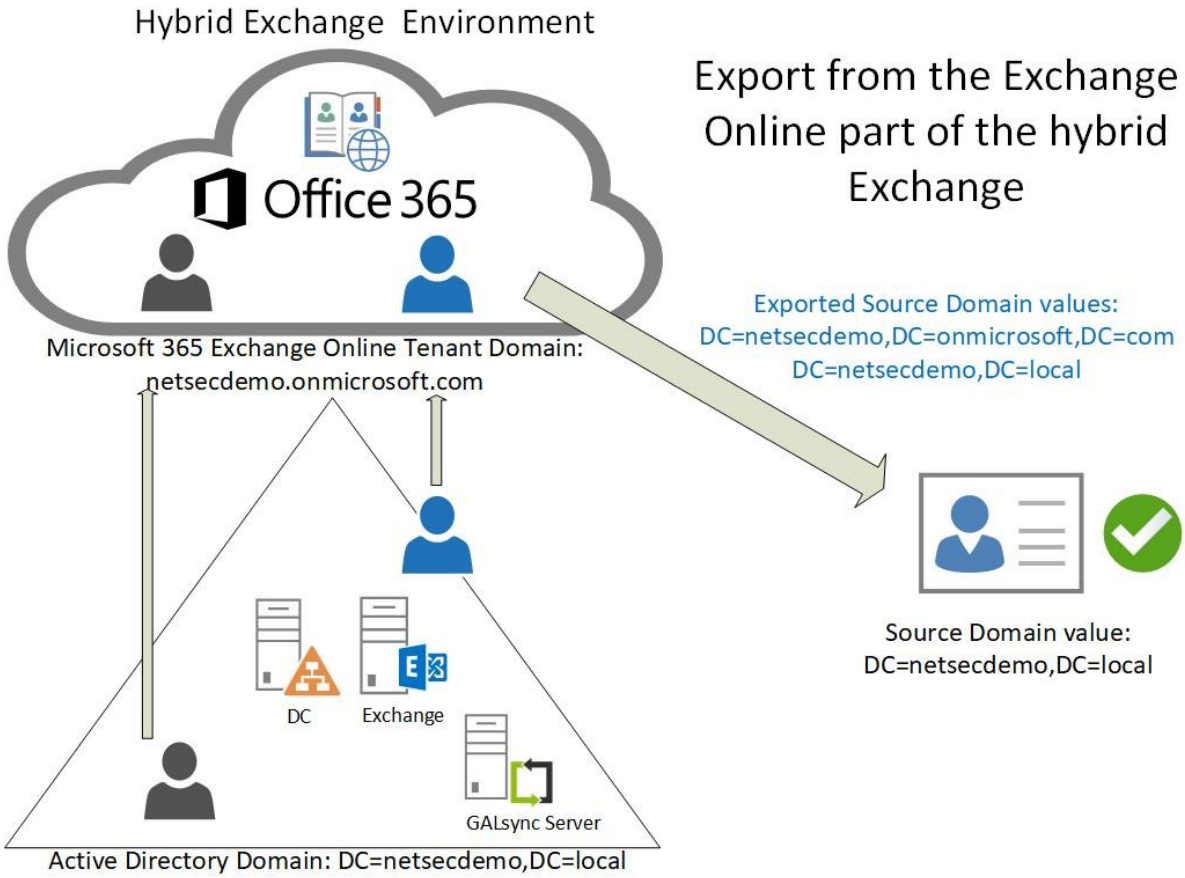


After that click **Apply**.





GALsync will add the old source domain values to the data file during the export, so that existing synchronized objects, which are marked with such old source domain value at the target environment, will be synchronized.



Please note, that the importing partners also need GALsync version 8.2 or later, if you enabled this option. Otherwise, the importing partners will get warnings or errors and GALsync cannot import the data file.

Please take a look at detailed description of this option in chapter

How to migrate the source of the export policy in a hybrid Exchange environment

Export Settings: Object Filter

This option excludes all objects in the data file from export that meet one of the conditions. This feature allows you to exclude objects from the export process. Here you may add conditions containing a name of the property of which value is compared to the given value using your chosen comparison operator. During an export every object will be analyzed to determine whether one or more properties match these conditions. If at least one condition is fulfilled, the object will not be exported.

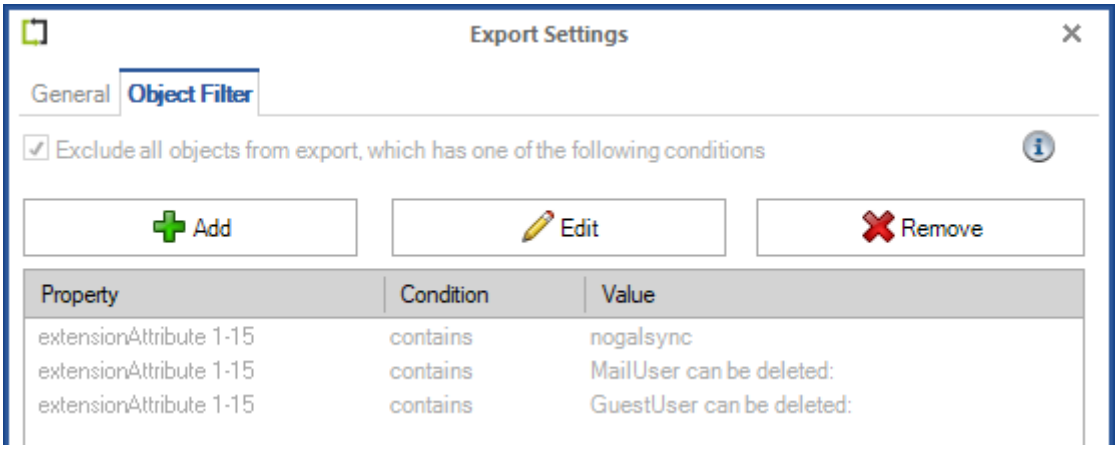
Two default rules allow **MailUsers** and **GuestUsers**, that are marked for deletion, will not be exported by GALsync.

Default rules for export from on-premises

extensionAttribute 1-15 contains **nogalsync**

extensionAttribute 1-15 contains **MailUser can be deleted:**

extensionAttribute 1-15 contains **GuestUser can be deleted:**

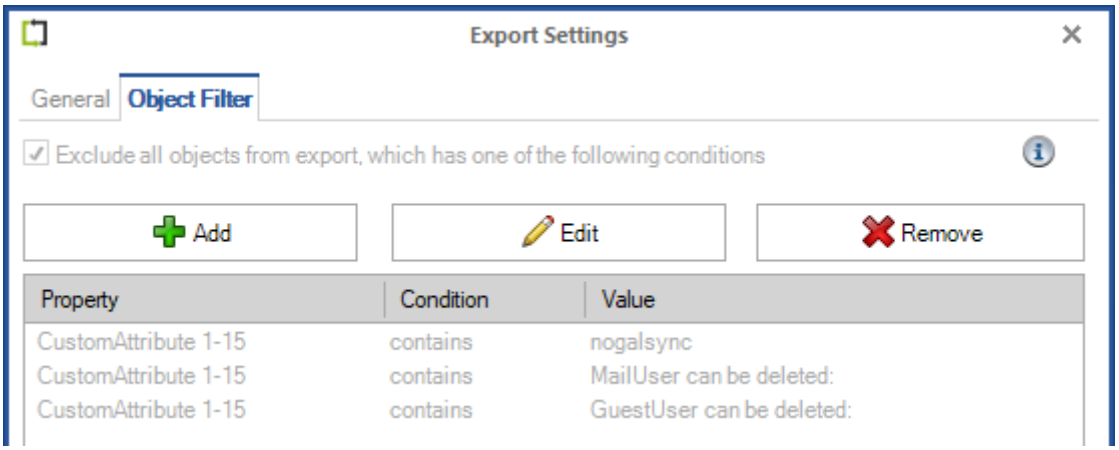


Default rules for export from Exchange Online

CustomAttribute 1-15 contains **nogalsync**

CustomAttribute 1-15 contains **MailUser can be deleted:**

CustomAttribute 1-15 contains **GuestUser can be deleted:**



Import Policy

Filter and Modify objects for import

Configure all import related directory settings.

Choose (on-premises only)

Choose an Organizational Unit you want to store the imported directory information in.

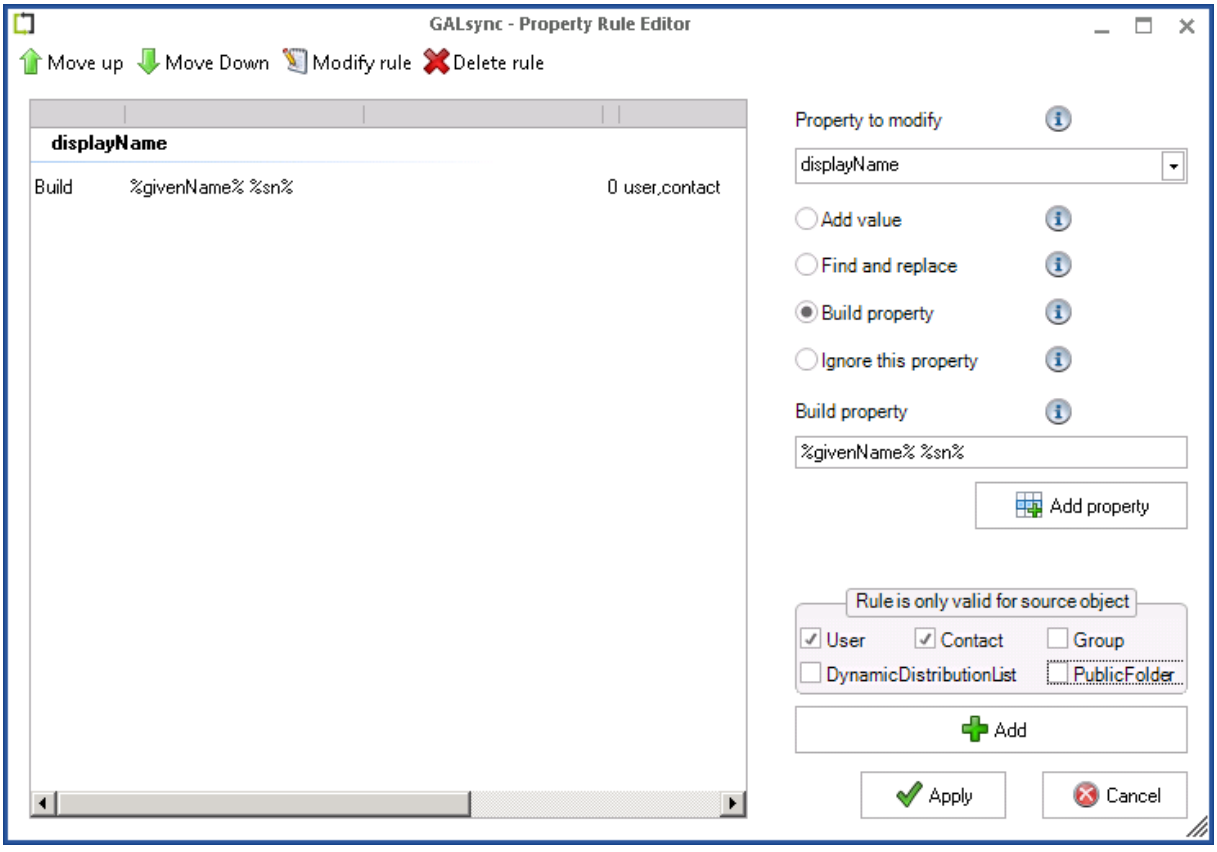
Recommendation: Create an Organizational Unit which is specifically dedicated for import.
Do not bind any group policy to this OU, which could lead to unexpected results.
The GALsync service account needs additional permissions for this OU.
Please take a look at the Active Directory Permission for the Import OU (on-premises) chapter.

Properties

Modify the values for the Import Policy.

Usually in your import list, there are different classes of objects (e.g **user**, **contact** and **group**). Because these classes have different attributes rules are applied related to the object class. For example, the attribute **displayName** the first rule displayed in the screenshot will be applied only to users and contacts, because a group does not have an attribute **givenName**.

For more information, please take a look at the chapter
How to build the displayName attribute during the import.



Please note that Public Folder means the old object class of Exchange 2003 technology and not the current Public Folder mailbox technology.

Property to modify

These attributes can be modified before import:

Exchange On-Premises

Company, Department, DisplayName, DisplayNamePrintable, ExtensionAttribute1, ExtensionAttribute2, ExtensionAttribute3, ExtensionAttribute4, ExtensionAttribute5, ExtensionAttribute6, ExtensionAttribute7, ExtensionAttribute8, ExtensionAttribute9, ExtensionAttribute10, ExtensionAttribute11, ExtensionAttribute12, ExtensionAttribute13, ExtensionAttribute14, ExtensionAttribute15, FacsimileTelephoneNumber, GivenName, HomePhone, Info, Initials, IpPhone, L, Mobile, Pager, PersonalTitle, PhysicalDeliveryOfficeName, PostalCode, Sn, St, StreetAddress, TelephoneNumber, Title, WWWHomePage, msRTCSIP-PrimaryUserAddress

Exchange Online

We support this matrix to transform the property between Exchange On-Premises and Exchange Online:

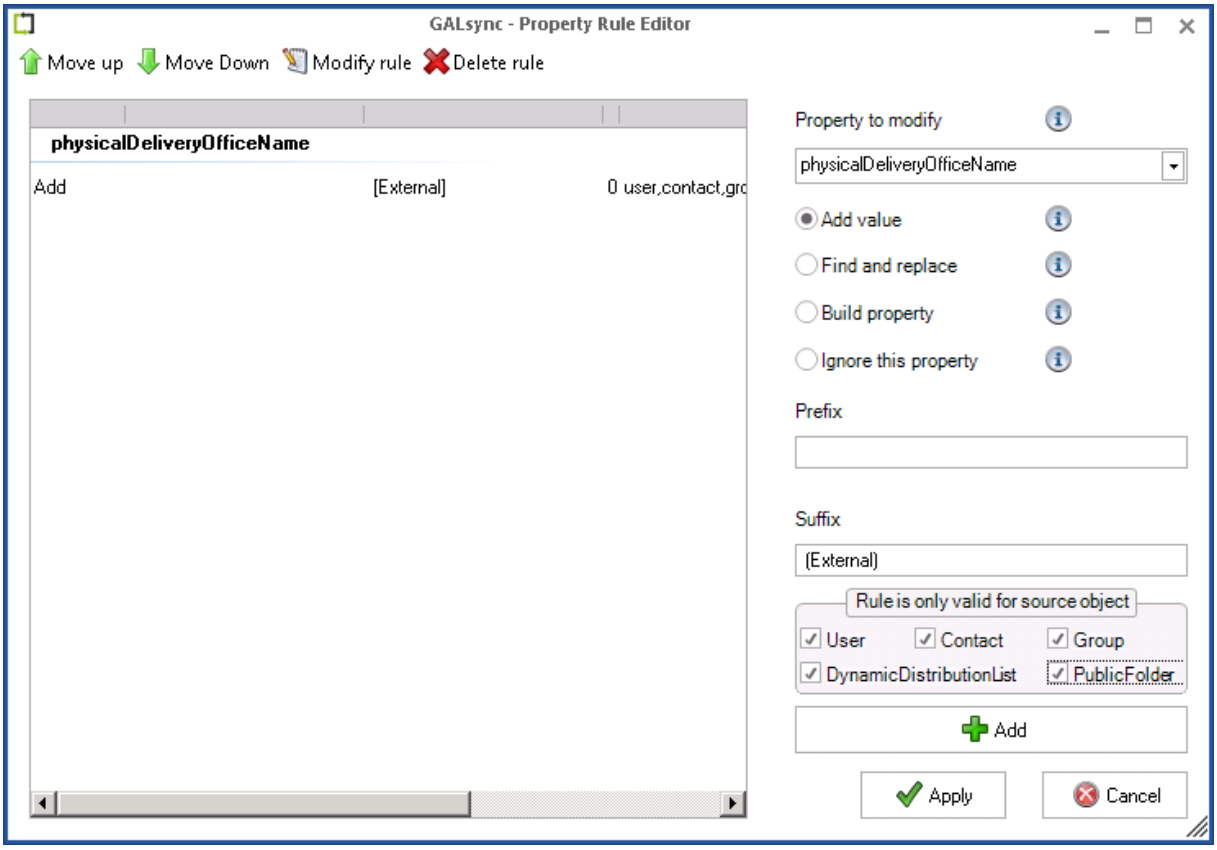
Active Directory (Exchange on-premises)	**Active Directory (Exchange Online)**
Guid	Guid
DistinguishedName	DistinguishedName
TargetAddress	ExternalEmailAddress
ObjectClass	ObjectClass
ProxyAddresses	EmailAddresses
GivenName	FirstName
Sn	LastName
MailNickname	Alias
Initials	Initials
PhysicalDeliveryOfficeName	Office
TelephoneNumber	Phone
WWWHomePage	WebPage
L	City
St	StateOrProvince
Title	Title
PostalCode	PostalCode
PostOfficeBox	PostOfficeBox
FacsimileTelephoneNumber	Fax

DisplayName	DisplayName
Info	Notes
Department	Department
Company	Company
StreetAddress	StreetAddress
DisplayNamePrintable	SimpleDisplayName
Name	Name
HomePhone	HomePhone
Mobile	MobilePhone
Pager	Pager
ExtensionAttribute1 - ExtensionAttribute15	CustomAttribute1 - CustomAttribute15
OtherFacsimileTelephoneNumber	OtherFax
OtherHomePhone	OtherHomePhone
OtherTelephone	OtherTelephone
Manager	Manager
Member	Member
GroupType	GroupType
SAMAccountName	SAMAccountName
ObjectCategory	ObjectCategory

Add Value

You can add a text to a property. Choose the property that you want to add a value to, and then choose the option **Add Value**.

You then have the option to add your value before the property (**Prefix**) or after it (**Suffix**).

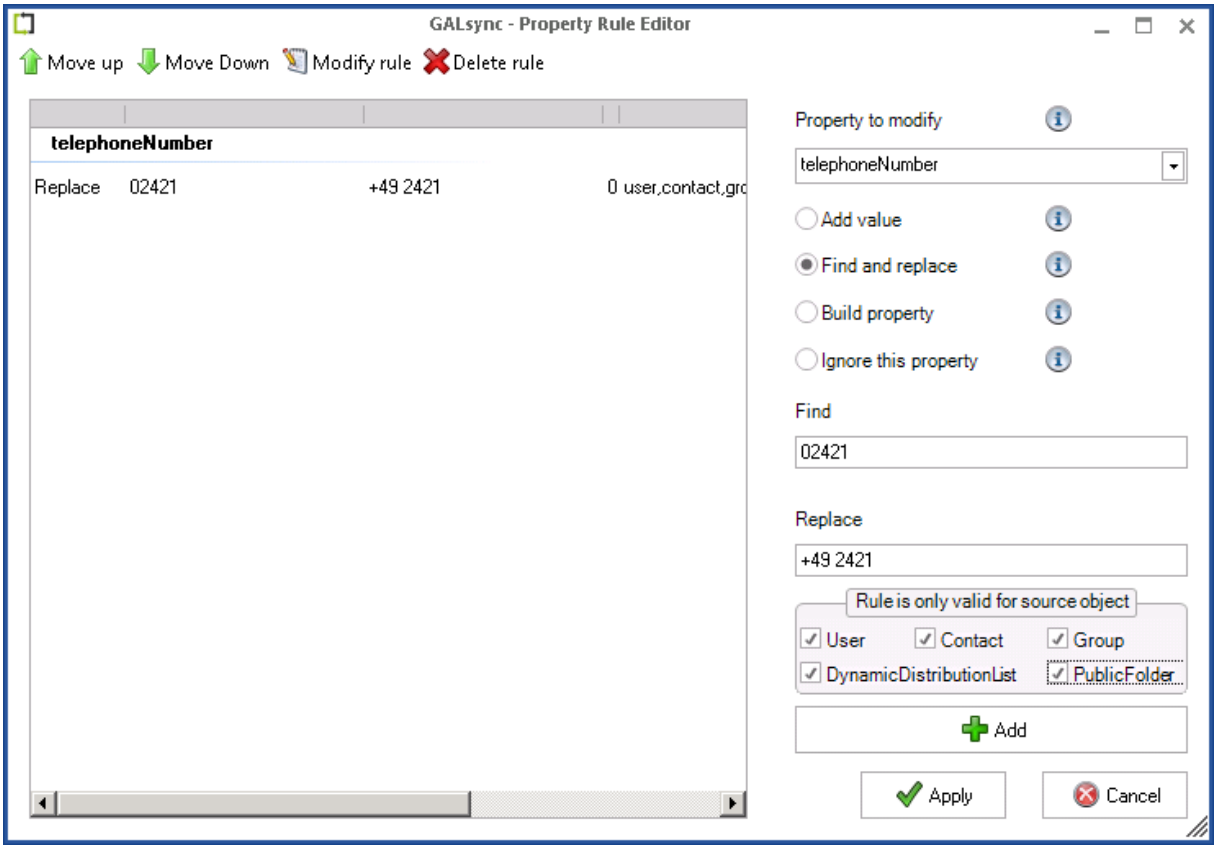


Please note that Public Folder means the old object class of Exchange 2003 technology and not the current Public Folder mailbox technology.

Find and Replace

You can replace a specific string with a new value. Choose the property, then select **Find and replace**.

In the **Find** textbox insert the text which you wish to replace and in the **Replace** textbox insert the new text.



Please note that Public Folder means the old object class of Exchange 2003 technology and not the current Public Folder mailbox technology.

You can use Regular Expressions.

For example, you have the string **Dueren Germany** however want to switch the words and separate them with a comma.

You expect the following string as the outcome **Germany, Dueren** and then insert into the **Find** field:

```
(?<first>\S+) (?<last>\S+)
```

In the **Replace** field, add the following text:

```
${last},${first}
```

Here are a few Regular Expressions, which are allowed to be used:

```
$&                  matched text
$_                  original source string
$`                  text before match
$'                  text after match
${group_name}       text matched by named group
$1, $2              text matched by numbered group
$$                  the literal "$"
```

Build Property

You can create values by concatenating other property values. Choose the property and select the option **Build Property**.

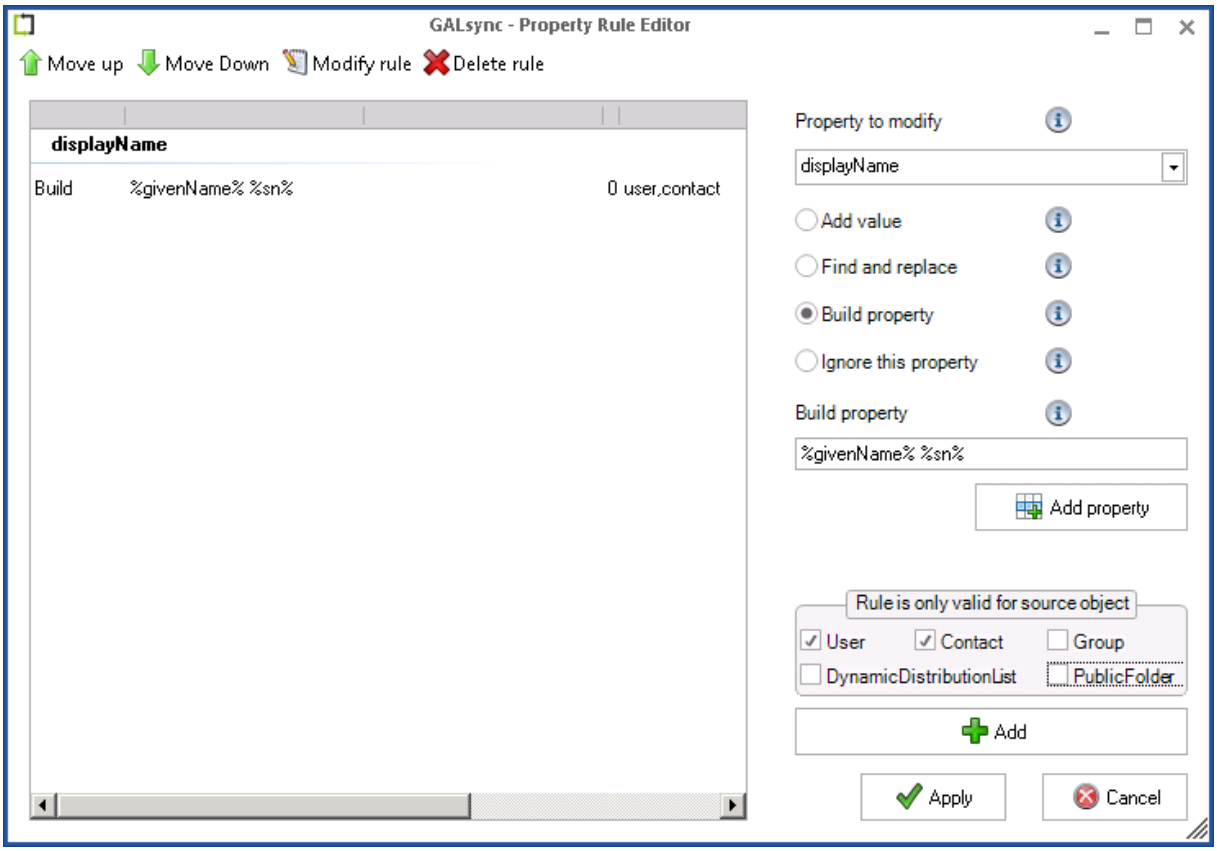
In the textbox **Build Property**, add a string, how the property value should be built. Via the **Add Property** button, you can choose which properties are used.

For example, you want to generate the property **displayName** from the last name and first name separated by comma. Choose the property **sn** and the property **givenName** and insert a comma and space between them in the textbox Build Property.

Thereafter, all values in property **displayName** will be created from a comma separated **sn** and **givenName**.

The complete steps to create a **displayName** attribute correctly can be found in the chapter:

How to build the displayName attribute during the import



Please note that Public Folder means the old object class of Exchange 2003 technology and not the current Public Folder mailbox technology.

Ignore this Property

If you do not want to import a specific property, then you can select **Ignore this property**.

Note: Values that are already assigned to the object's property will not be modified by GALsync.

Tip: You Export a property and you want to import a different property in the target environment. By combining the options 'Build property' and 'Ignore this property' you can either copy or move a property value to a different property.

Remove Property

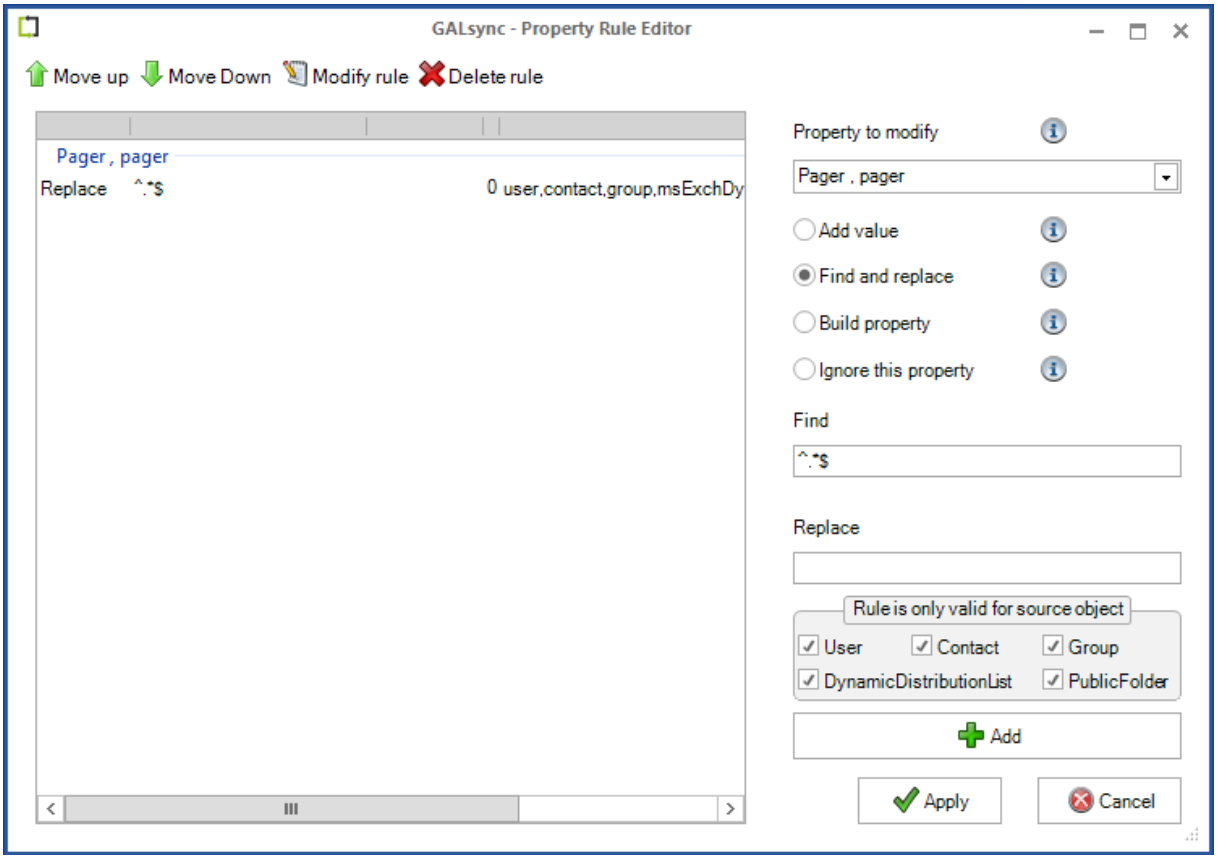
You can remove the value of a property which was previously synchronized.

For example, you want to remove the value of the **pager** attribute.

Select the property to modify **pager** and select the option **Find and replace**.

The value for the **Find and replace** rule:

```
^.*$
```



After the next synchronization the value of the pager attribute will be removed.

Copy Property

You can copy a property by choosing the target property and selecting the option **Build property**. Then choose the property you wish to copy via the **Add property** dialog. Add the rule with the **Add** button.

Move Property

You can move a property by doing the following:

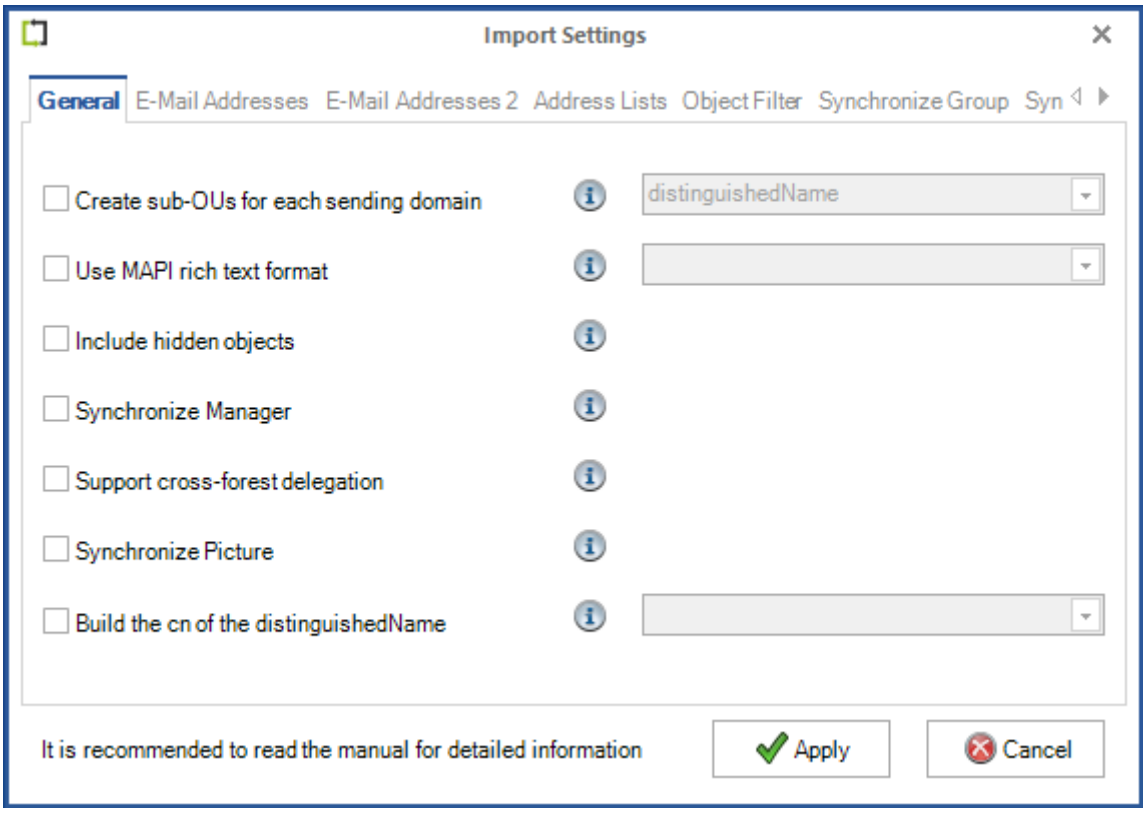
1. Choose the target property and select the option **Build property**. Then choose the property you wish to copy via the **Add property** dialog. Add the rule with the button **Add**.

2. Choose the initial property and select the option **Ignore this property**, and add the rule by clicking the **Add** button.

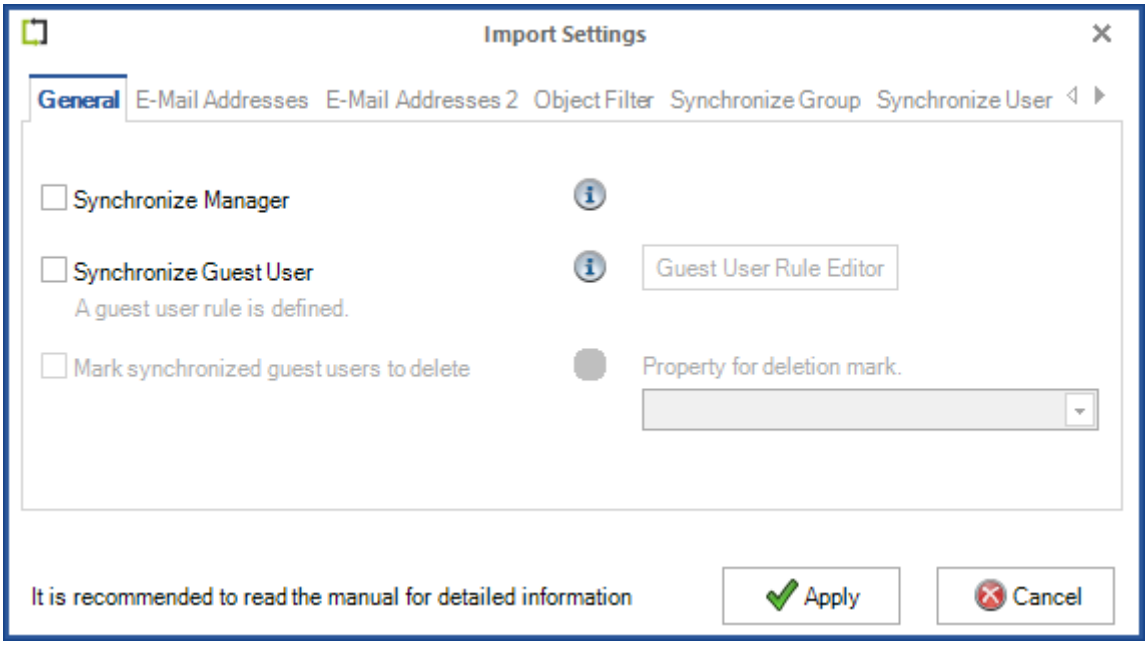
Ergo, the property value moved from the initial property to the target property.

Special Options for Import

Import Settings: General (Exchange on-premises)



Import Settings: General (Exchange Online)



Please take a look at the description of the export settings for these options:

- Synchronize Manager
- Support cross-forest delegation
- Synchronize Picture

Synchronize Guest User (Exchange Online only)

GALsync synchronizes existing Guest User (GuestMailUser) of a Microsoft 365 tenant. GALsync will not create Guest User (GuestMailUser) nor delete Guest User (GuestMailUser) in a Microsoft 365 tenant.

For GALsync to synchronize existing guest users in the target Microsoft 365 tenant they must be marked accordingly.

Note: GALsync cannot update Phone and Mobile Phone for Guest User in Exchange Online. Microsoft has changed the Exchange Online PowerShell command Set-User and excluded updating Phone and Mobile Phone for security reasons.

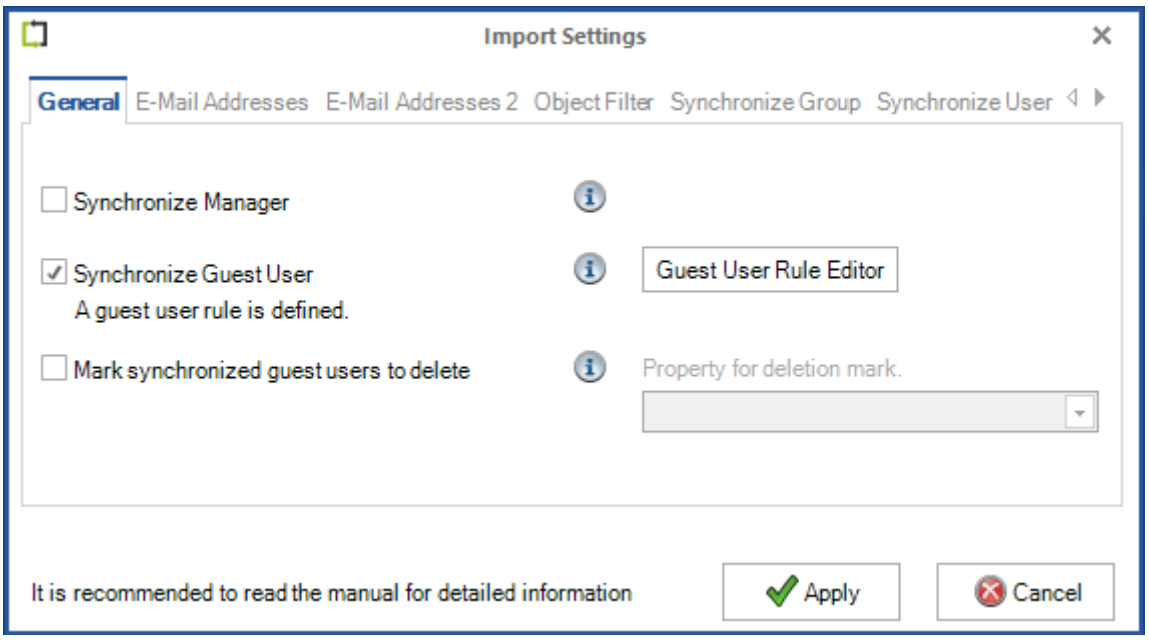
How to tell GALsync which existing Guest Users should be synchronized in the target Microsoft 365 tenant.

SyncWithGALsync (internal mark)

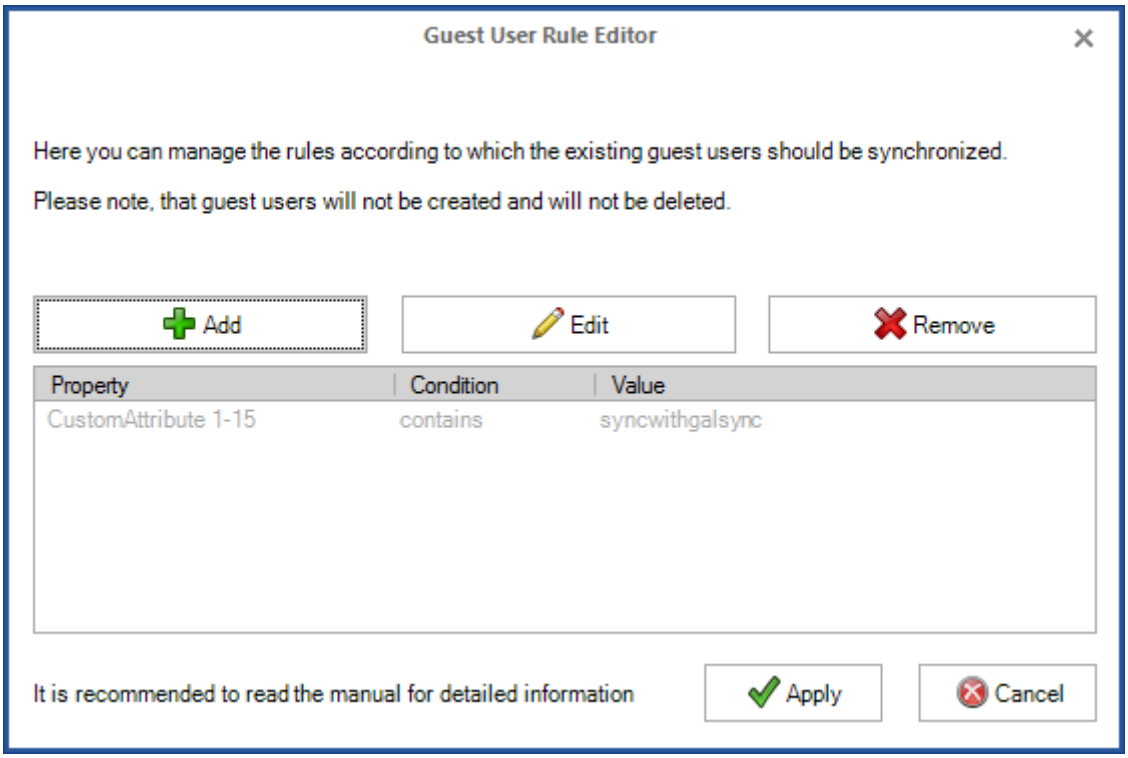
If you want to synchronize an existing Guest User (GuestMailUser) by GALsync, you may insert the value **SyncWithGALsync** in any of the custom attributes (Exchange Online: **customAttribute1** - **customAttribute15**).

Define further rules for additional Guest Users (GuestMailUser) to be synchronized.

The option exists to define further rules for GALsync to identify which Guest Users (GuestMailUser) should be synchronized.



After you have enabled the **Synchronize Guest User** option, you can open the **Guest User Rule Editor** to configure rules.



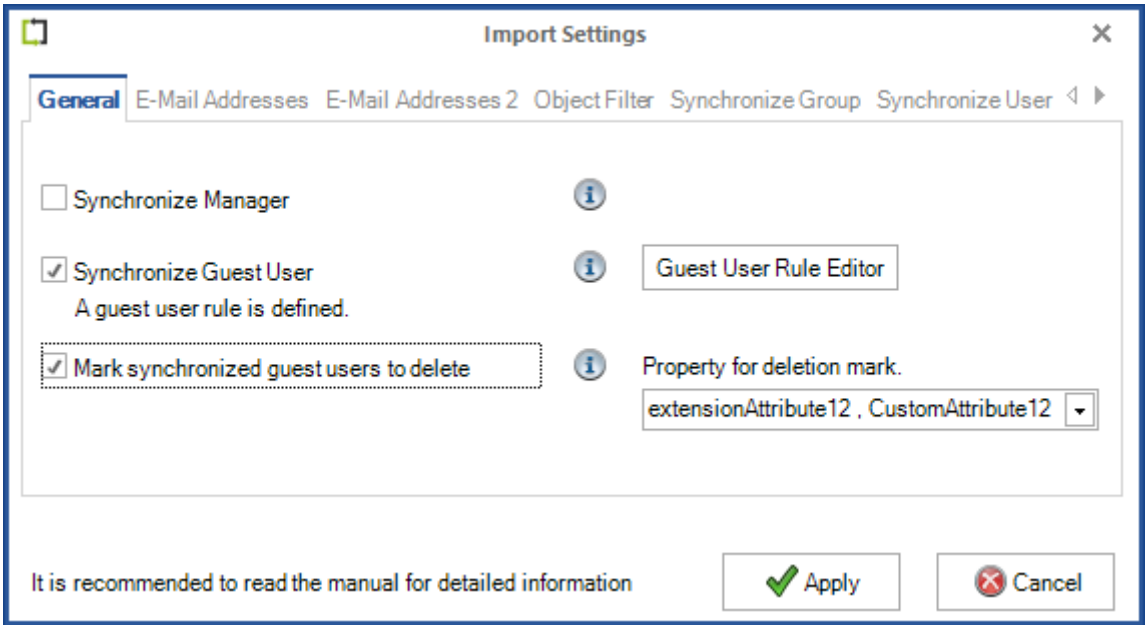
This option includes all existing Guest Users (GuestMailUser), which meet one of the conditions. This feature allows you to include existing Guest Users (GuestMailUser) for synchronization.

Here you may add conditions containing a name of the property of which value is compared to the given value using your chosen comparison operator. During an import every existing Guest User (GuestMailUser) will be analyzed, if one or more properties match these conditions. If at least one condition is fulfilled, the existing Guest User (GuestMailUser) will be synchronized.

Mark synchronized guest users to delete

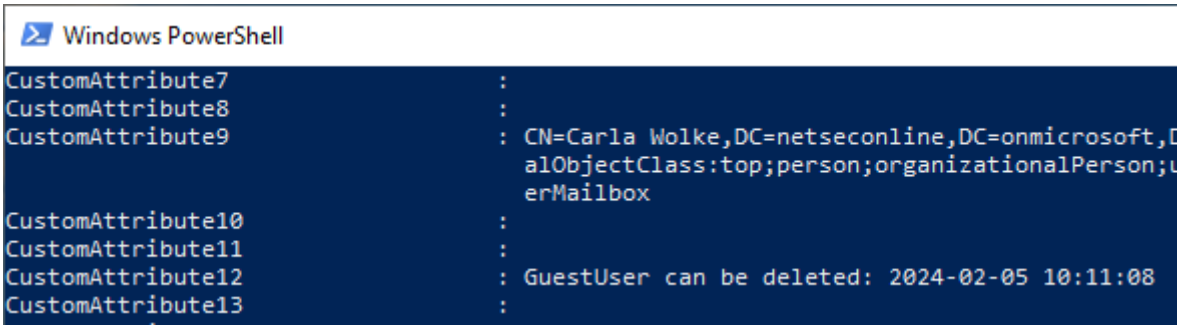
Synchronized guest users will not be deleted in the target environment, if no corresponding object is in the data file.

In addition, the **Mark synchronized guest users to delete** option can be enabled and configured, if the **Synchronize Guest User** option is enabled.



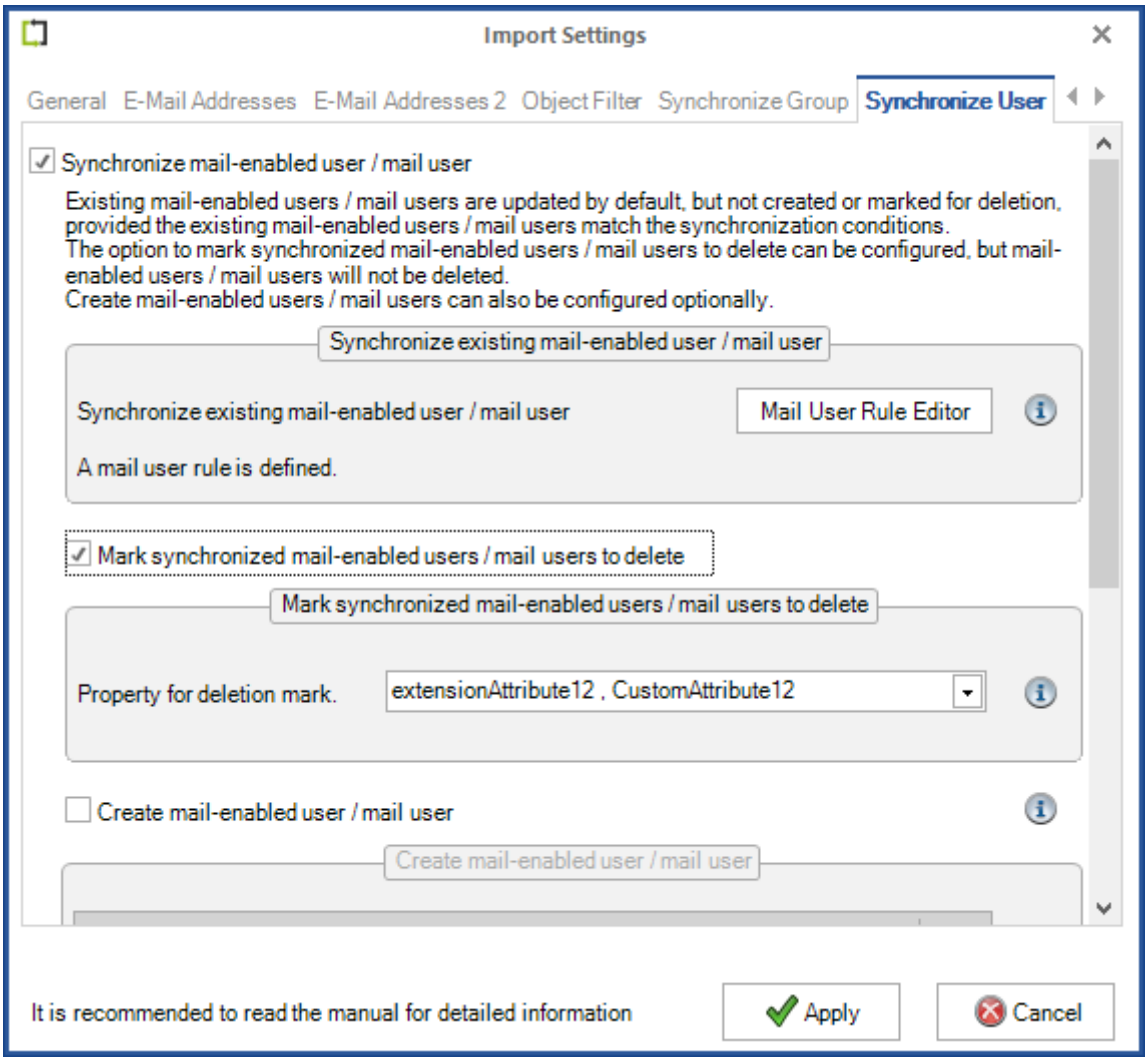
One of the CustomAttribute 1-15 can be selected, where GALsync will write the value, which starts with **GuestUser can be deleted** …

The screenshot below displays an example of CustomAttribute12 of an existing Guest User:



Please note, that guest users will not be deleted by GALsync.

It is recommended to use the same **CustomAttribute / extensionAttribute** for **Mark synchronized guest users to delete** as configured for the option **Mark synchronized mail-enabled users / mail users to delete**, if the option is enabled on the **Synchronize User** tab.



Create sub-OUs for each sending domain (on-premises only)

You find this option in the **Directory Settings** -> **General** tab of an import policy. You can choose to import all objects into one import OU with different sub-OUs. GALsync creates sub-OUs depending on the original Active Directory domain names. Therefore, you are able to create one Import OU and GALsync will create a sub-OU for each received domain. GALsync also can read the names of the sub-OUs from a Custom Attribute (**Settings** of an Import-Policy, **Property for source domain**). In this case the name must be present at time of export.

Use MAPI rich text format (on-premises only)

This option is found in the **Directory Settings** -> **General** tab of an import policy. Here you choose whether to use MAPI-RTF for the contacts you will import. The following options are available:

Never: If you select this option, messages sent to this recipient convert to plain text.

Always: If you select this option, messages sent to this recipient will be in the MAPI rich text format (RTF).

Use Default Settings: If you select this option, messages sent to this recipient are in either MAPI RTF or plain text, depending on the settings of the client computer.

See the article **Configure Mail Contact Properties**:

http://technet.microsoft.com/en-us/library/aa997434.aspx

Note: If the option "Support cross-forest delegation" is enabled, it is not possible to change this option.

Build the cn of the distinguishedName (on-premises only)

GALsync uses **cn** of the **distinguishedName** from the source object when it creates a new contact or group. The option **Build the cn of the distinguishedName** allows for the possibility to choose the value for **cn** of the **distinguishedName** from **mailNickname, display name, email address** (using the **mail** attribute) or the combination **display name (email address)**. When enabled, GALsync uses the value of the selected attribute to create the **cn** of the **distinguishedName**, when GALsync creates a new contact or group.

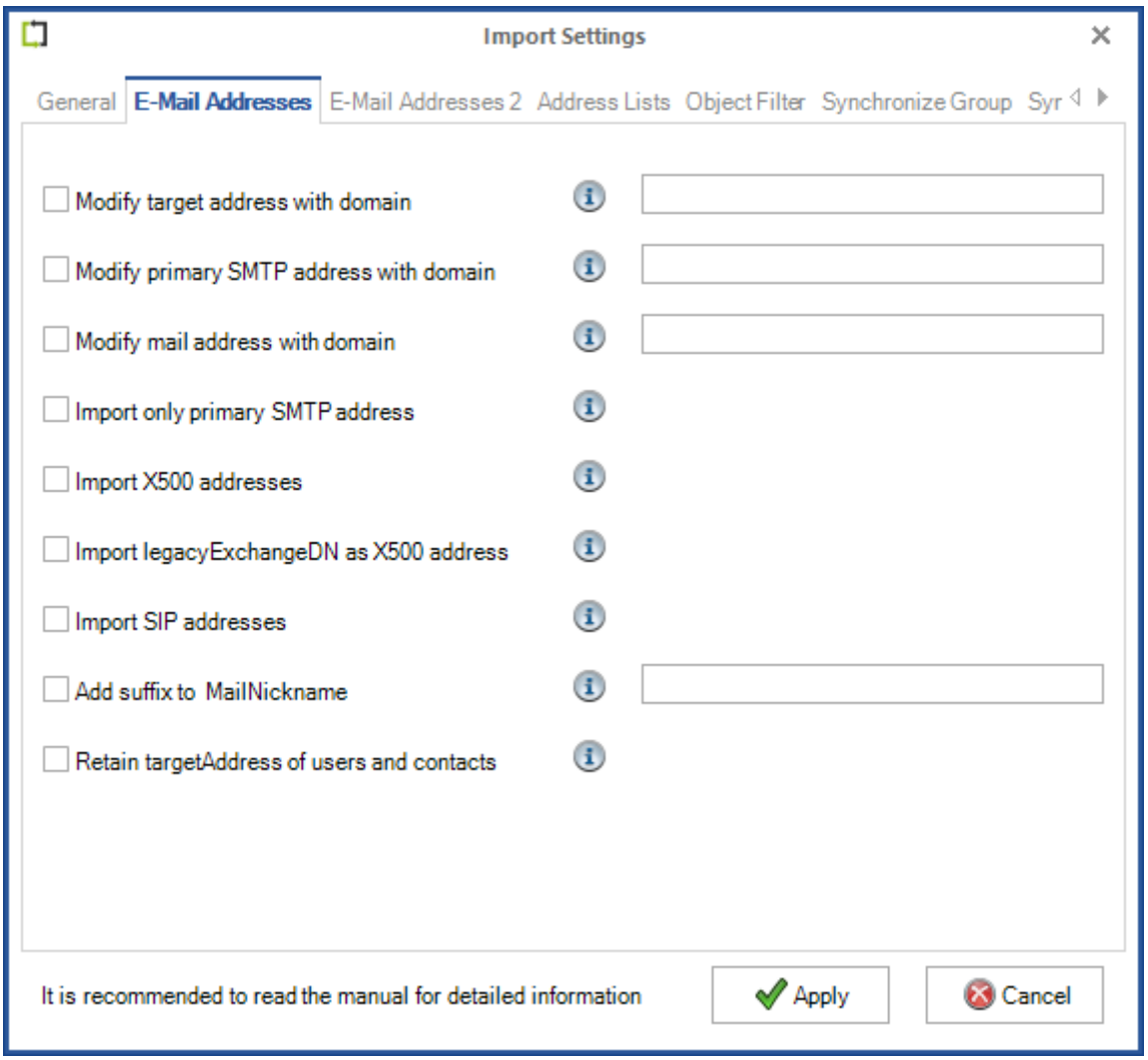
E.g.: Using the combination **display name (email address)**:

Name	Class	Distinguished Name
CN=John Dole (jdole@contoso.com)	contact	CN=John Dole (jdole@contoso.com),OU=Import,
CN=John Smith (jsmith@contoso.com)	contact	CN=John Smith (jsmith@contoso.com),OU=Impc

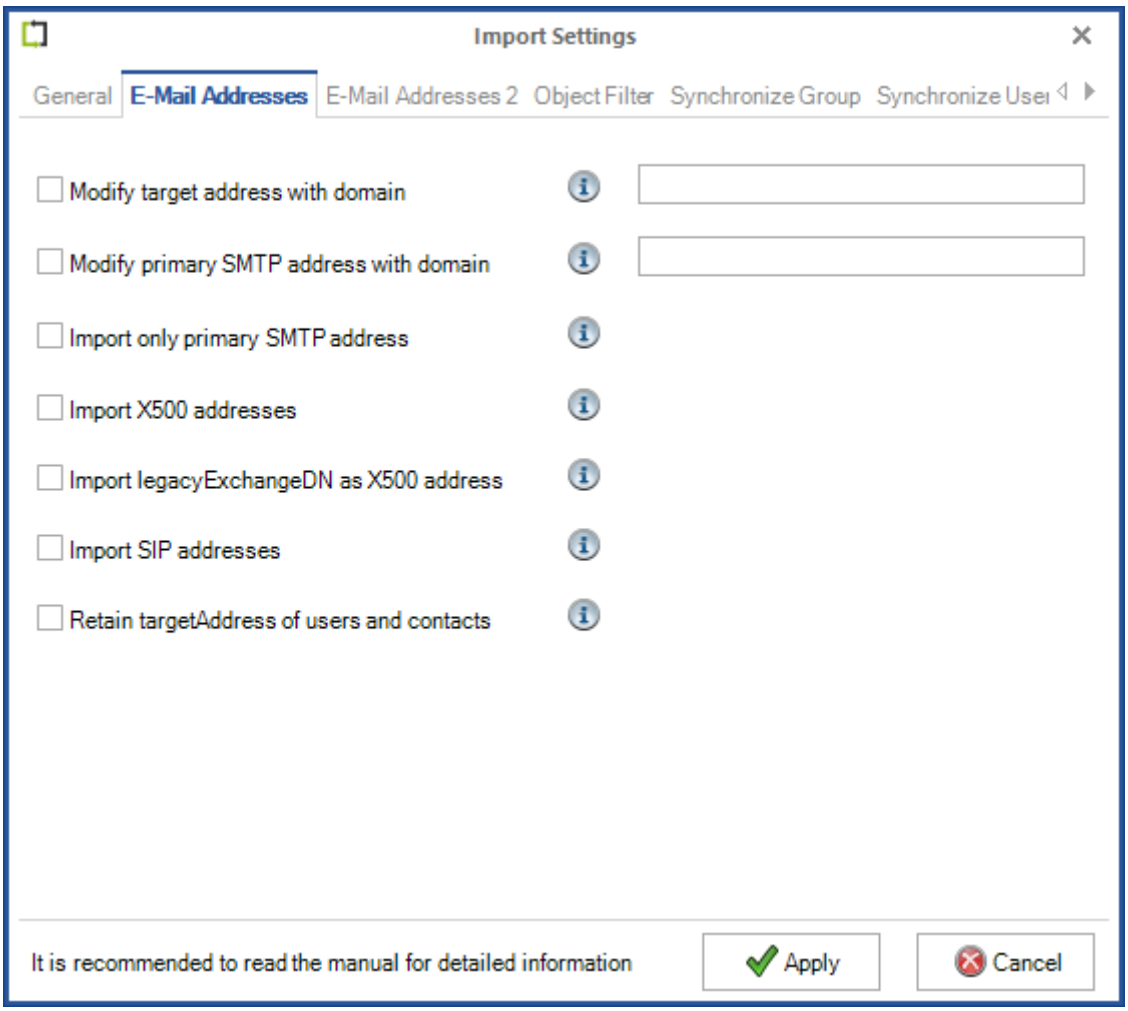
Note: The cn cannot be longer than 64 characters. GALsync limits the created cn to 62 characters, so that it is possible to append a number to the end of the CN. If there are objects with the same cn, GALsync will add a subsequent number as suffix (e.g smithjohn, smithjohn1, smithjohn2).

Allowed characters are case-sensitive alphanumeric and .-()@,+<> and space. All other characters will be removed via a filter. Should the newly generated cn be empty, GALsync will use the cn of the distinguishedName from the source object.

Import Settings: E-Mail Addresses (Exchange on-premises)



Import Settings: E-Mail Addresses (Exchange Online)



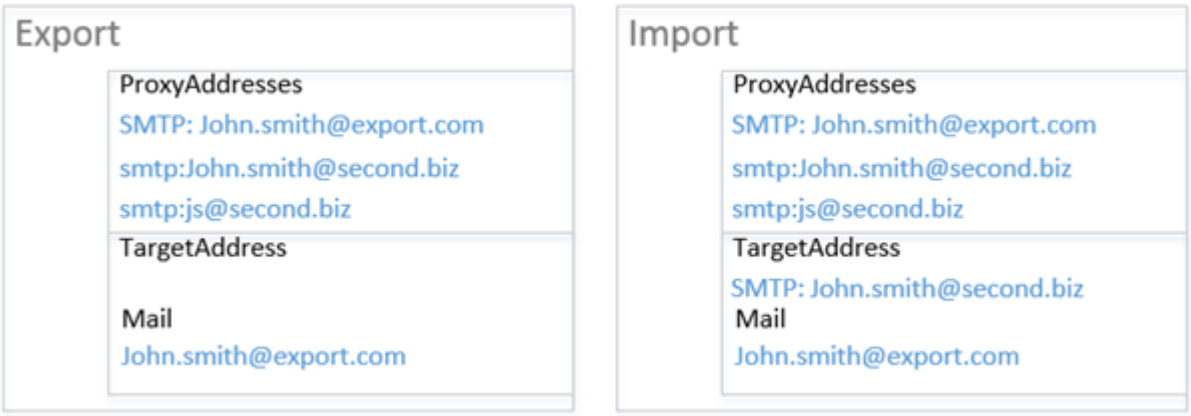
Modify target address with domain

This option is available in the **Directory Settings** -> **Email Addresses** tab of an import policy. To modify the **targetAddress** attribute correctly it may be necessary to take a value from of the **proxyAddresses** attribute from the source, which is not the primary SMTP address.

For Example, the mailbox in the source has multiple SMTP Addresses. The main domain is: **@export.com** and secondary domain is: **@second.biz**. You would like to use the **@second.biz** domain as the **targetAddress** attribute after the import.

Insert the filter **@second.biz** into the textbox next to the option **Modify target address with domain**.

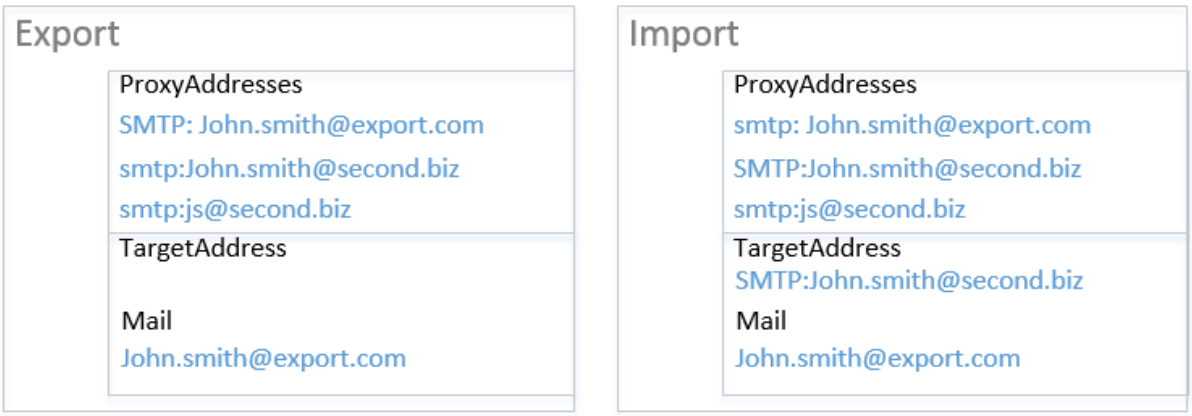
GALsync will use the first found instance of **@second.biz** in the **proxyAddresses** and set it as the **targetAddress** for the imported contact.



Modify primary SMTP address with domain

This option is available in the **Directory Settings** -> **Email Addresses** tab of an import policy. To modify the primary SMTP address correctly. we will need to take a value from the **proxyAddresses** attribute from the source. For Example, the mailbox in the source has two smtp Addresses, the primary SMTP address is: **@export.com** and a secondary smtp address: **@second.biz** and you would like to use the **@second.biz** address as the primary SMTP after the import.

Example: If you insert **@second.biz** in the textbox then GALsync will look for the first instance of **@second.biz** in the **proxyAddresses** and will set it as primary SMTP address for the imported contact.



Note: If you activate the option "Modify primary SMTP address with domain", then run an export/import and then deactivate the option, a warning message appears. Deactivation would lead to a total deletion and recreation of the objects imported.

galsync:joe.dole@netsec.de (internal mark)

If you change the primary SMTP address of already synchronized objects GALsync cannot match the appropriate contact during the import. It will delete the existing contact and create a new one with the modified SMTP address.

To prevent this behavior, you can change the primary SMTP address of an object in the source environment and note the old primary SMTP address in one of the custom attributes (on-premises: **extensionattribute1** - **extensionattribute15** or Exchange online: **customAttribute1** - **customAttribute15**) using the prefix **galsync:**

For example:

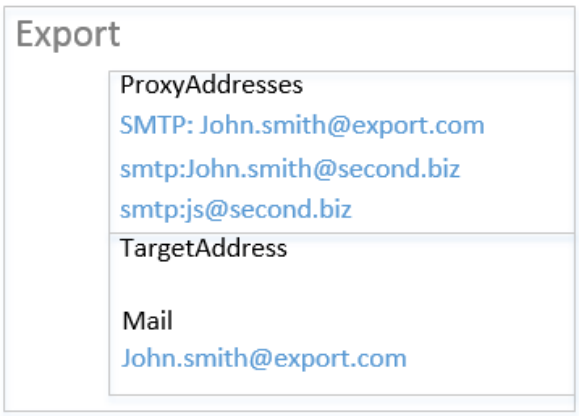
```
galsync:joe.dole@netsec.de
```

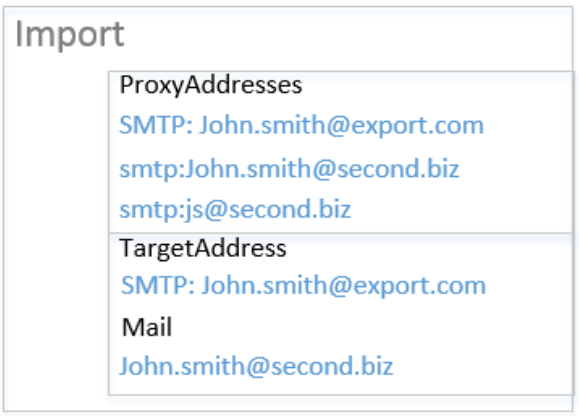
The existing contact in the target environment will now not be deleted and recreated, but GALsync will match the contact and change the primary SMTP address.

Modify mail address with domain (on-premises only)

You find this option in the **Directory Settings** -> **Email Addresses** tab of an import policy. To modify the mail attribute correctly, we may need to take a value from the **proxyAddresses** attribute of the source object, which is not the primary SMTP address. For Example, the mailbox in the source has two smtp Addresses, the primary address is: **@export.com** and a secondary address: **@second.biz** and you would like to use the **@second.biz** address as the mail attribute after the import.

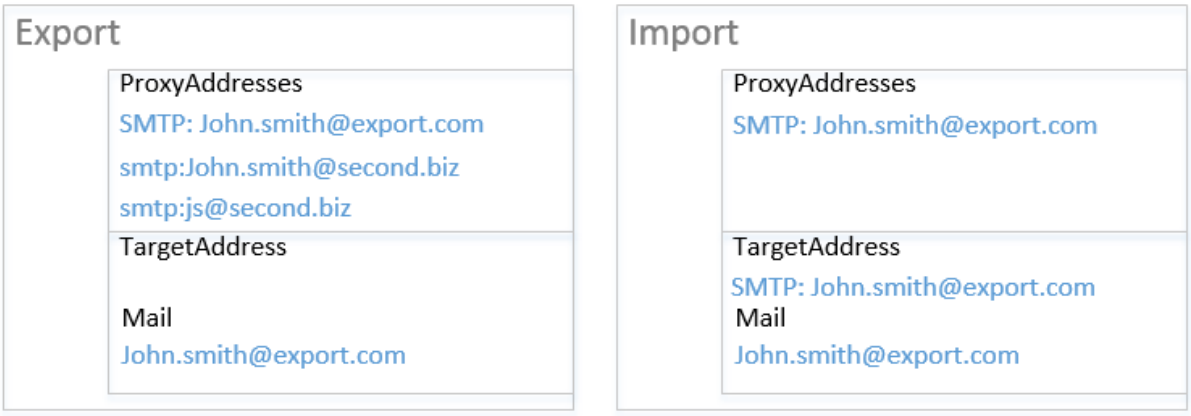
Insert the filter **@ second.biz** into the textbox next to the option **Modify mail address with domain**. GALsync will use the first found instance of **@second.biz** in the **proxyAddresses** and set it as mail attribute for the imported contact.





Import only primary SMTP address

If this option in the **Directory Settings** -> **Email Addresses** tab of an import policy is selected you will import the primary SMTP address only. This is required in some scenarios (e.g., if more than one smtp address is present within the **proxyAddresses**).



Import X500 addresses

This option is available in the **Directory Settings** -> **Email Addresses** tab of an import policy. Sometimes it is required to synchronize the X500 addresses in the **proxyAddresses**. This helps if you get NDRs (Non-Delivery Reports) due to earlier migrations.

Import legacyExchangeDN as X500 address

This will import the **legacyExchangeDN** of the source object as **X500** address in the **proxyAddresses**.

Note: Do not forget to enable the export of the legacyExchangeDN property in the source environment.

Important: All legacyExchangeDN values must be unique in the Exchange environment.

The legacyExchangeDN value can be the value of the legacyExchangeDN property or an X500 address in the proxyAddresses.

Import SIP addresses

This option is available in the **Directory Settings** -> **Email Addresses** tab of an import policy. Sometimes it is necessary to synchronize the SIP addresses in the **ProxyAddresses**. This will import all of the addresses in the **ProxyAddresses** attribute marked as a SIP address.

Add suffix to MailNickname (on-premises only)

This option is available in the **Directory Settings** -> **Email Addresses** tab of an import policy, which allows the **MailNickname** to be extended. This is sometimes necessary to prevent duplicate **MailNickname** values from being created, because the **LegacyExchangeDN** is derived from the **Exchange Administrative Group** and the **MailNickname**. GALsync will only add a suffix to the **MailNickname** when a new contact is created, which does not apply to previously created objects.

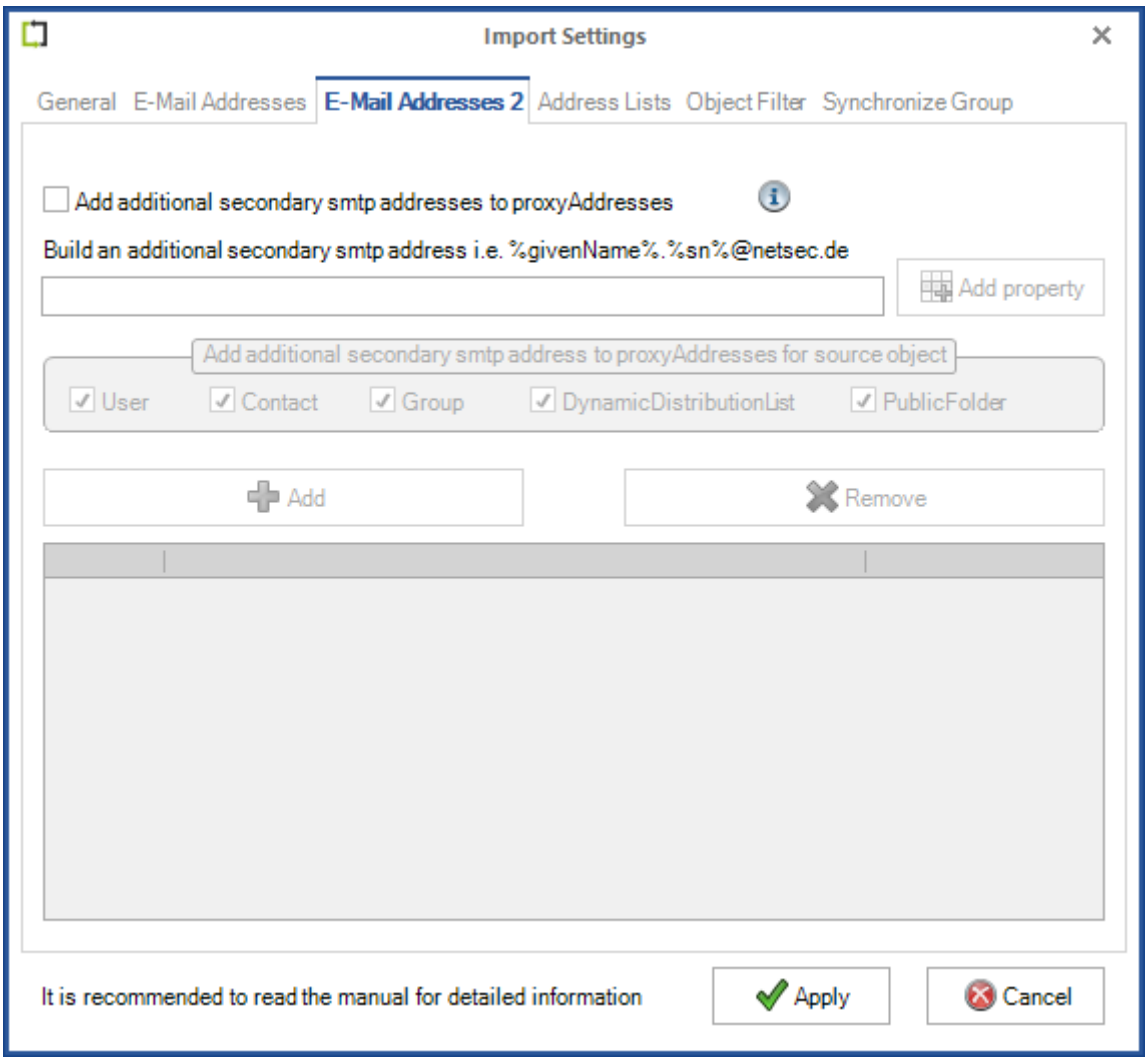
Note: Please notice that the MailNickname has a limit of 64 characters and allowed characters are: a-z A-Z 0-9 and . _ - +.

Retain targetAddress of users and contacts

GALsync exports the values found in attribute **proxyAddresses** as well as the value of the attribute **targetAddress**.

By default, during import the **targetAddress** of mailbox-users, mail-users and contacts is stamped with the value of the source primary SMTP address value. If the option **Retain targetAddress of users and contacts** is selected the **targetAddress** of the source object is retained.

Import Settings: E-Mail Addresses 2



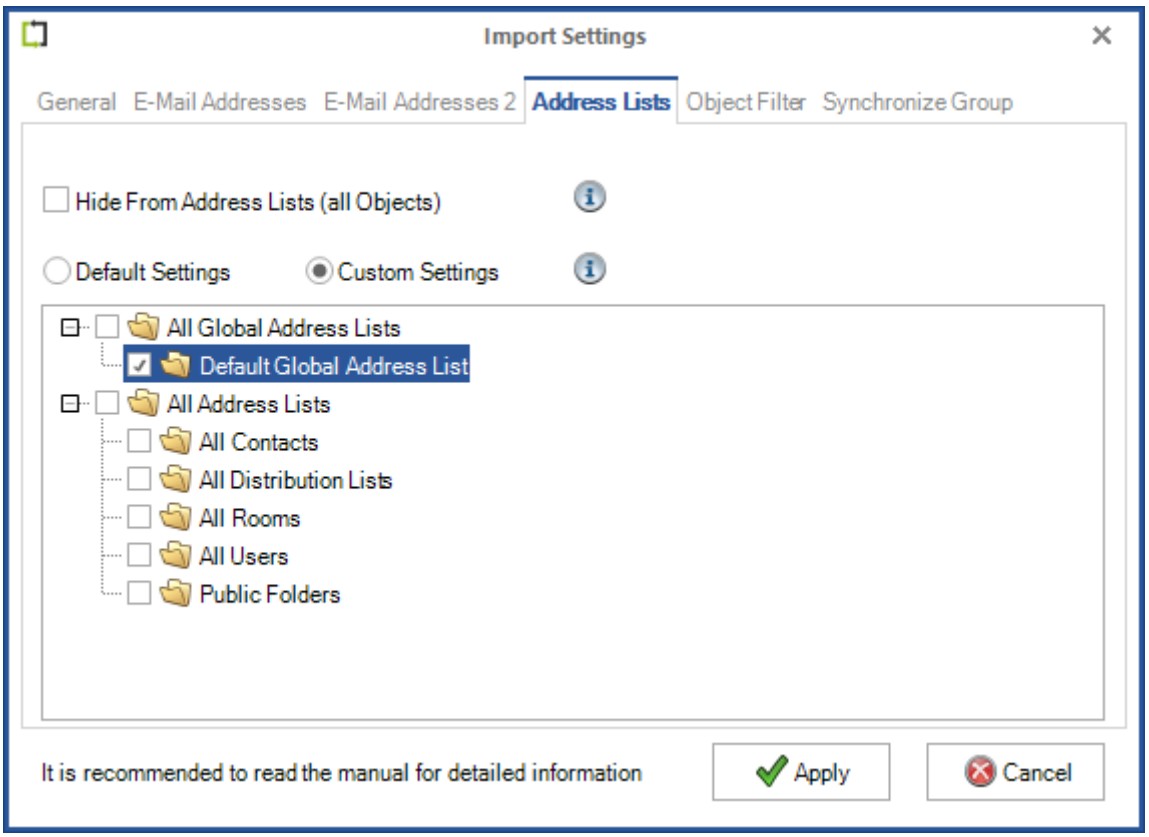
Add additional secondary smtp addresses to proxyAddresses

Use this to add custom secondary smtp addresses to certain object types, as needed.

Please make sure not to use attributes on object types that don´t have them.

Important: smtp addresses must be unique in the environment

Import Settings: Address Lists (Exchange on-premise)



Assign Address Lists to imported objects (on-premises only)

Default Settings

Default Settings is the setting, if you have nothing changed at the recipient filters of the address lists on the Exchange server.

GALsync sets the address lists of the Active Directory configuration partition to the **showInAddressBook** property of the imported contacts.

Custom Settings

Custom Settings helps at an on-premise Exchange environment, if you have changed the recipient filters of the address lists on the Exchange server.

GALsync sets the selected address lists, which you selected on the tree view, to the **showInAddressBook** property of the imported contacts.

Note: This will not change any recipient filters of any address lists. You may want to change your global address lists (GALs) recipient filter to not include these objects, and the recipient filter of the chosen to include them.

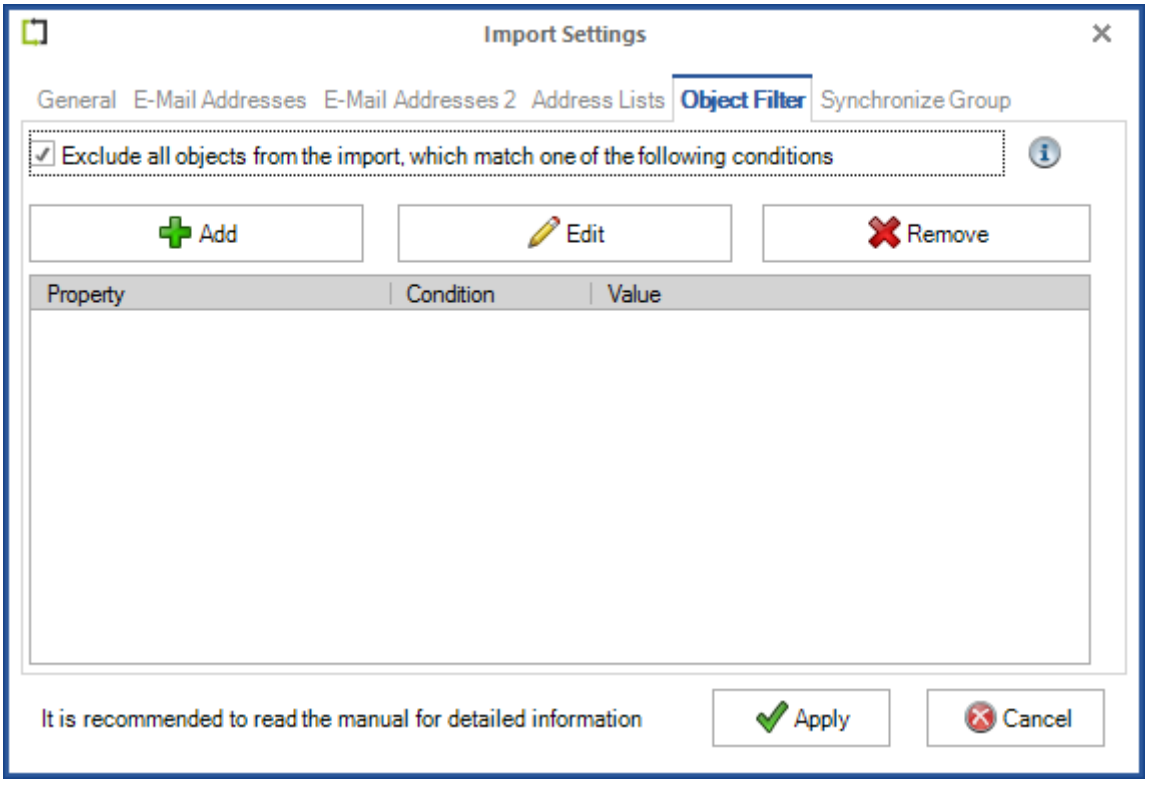
Hide from Address Lists (all Objects) (on-premise only)

If you select this option all imported contacts are hidden from your address book. If you unselect this option all hidden (this is the default), imported contacts will be visible after running the policy.

We recommend concerning this requirement to configure a different export policy containing only the affected objects. In the target forest create a special OU which is used to import all contacts which should be hidden from your address book.

Important: With the synchronization of objects that are also hidden from the GAL, it is possible for problems to develop, because GALsync cannot correctly determine whether or not the contact of the imported object already exists.

Import Settings: Object Filter



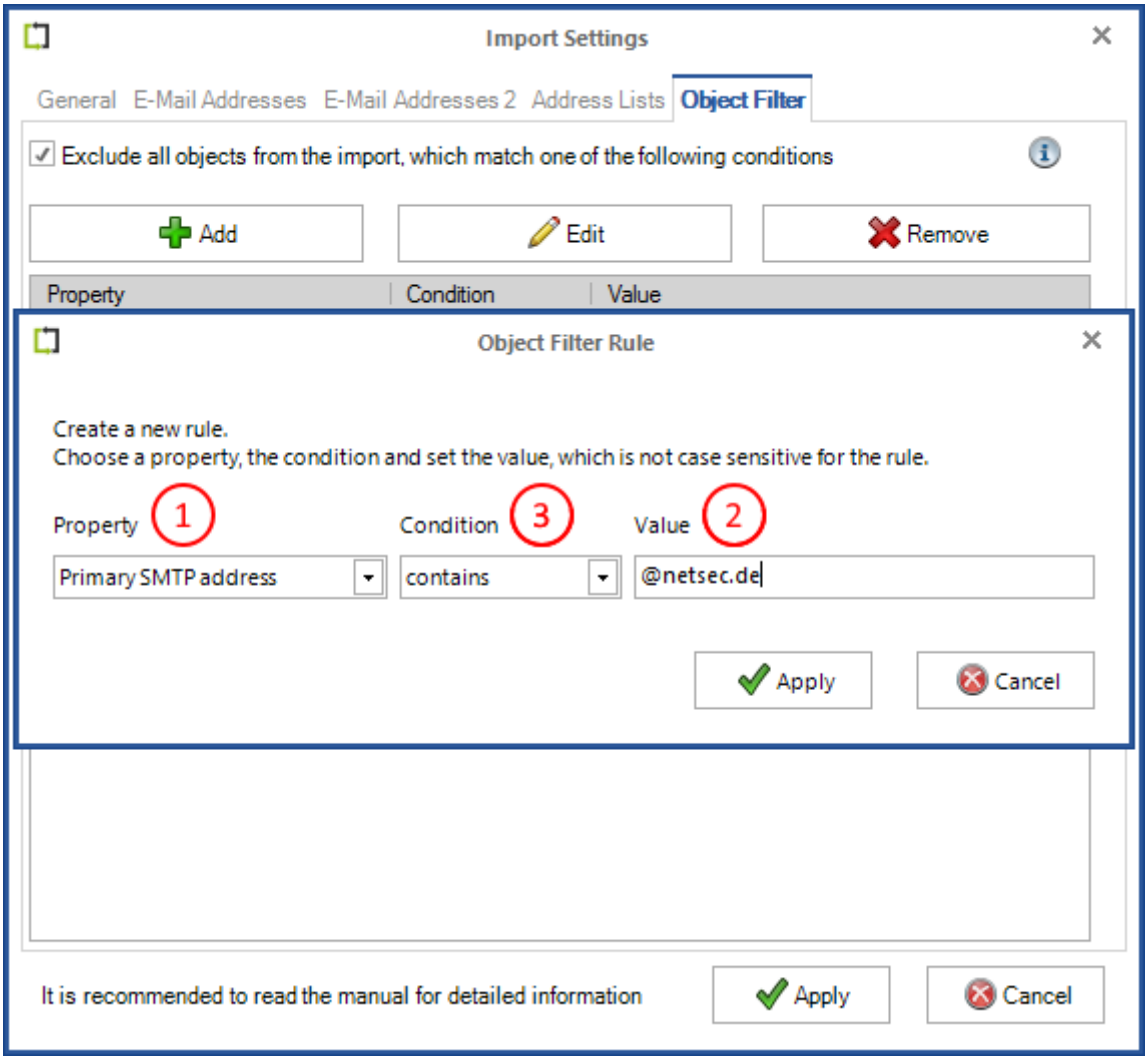
Object Filter: Exclude all objects of the data file from import, which has one of the following conditions

This feature allows you to exclude objects from the import process similar to object exclusion during export. For example, objects, which contain **NoGALsync** in one of their **extensionAttribute,** will not be exported.

This feature may help you to optimize the performance during an import during a scenario in which several organizations export their users and import them on a common Active Directory from which exports are performed towards all importing organizations.

In this case the import-object filter should be set to prevent objects coming from the organization's Active Directory from being analyzed.

If you enable this feature inside the **Import Setting** on the **Directory** Tab, you may add conditions containing a name of the property (1), which value is compared to the given value (2), and choose the comparison operator (3).



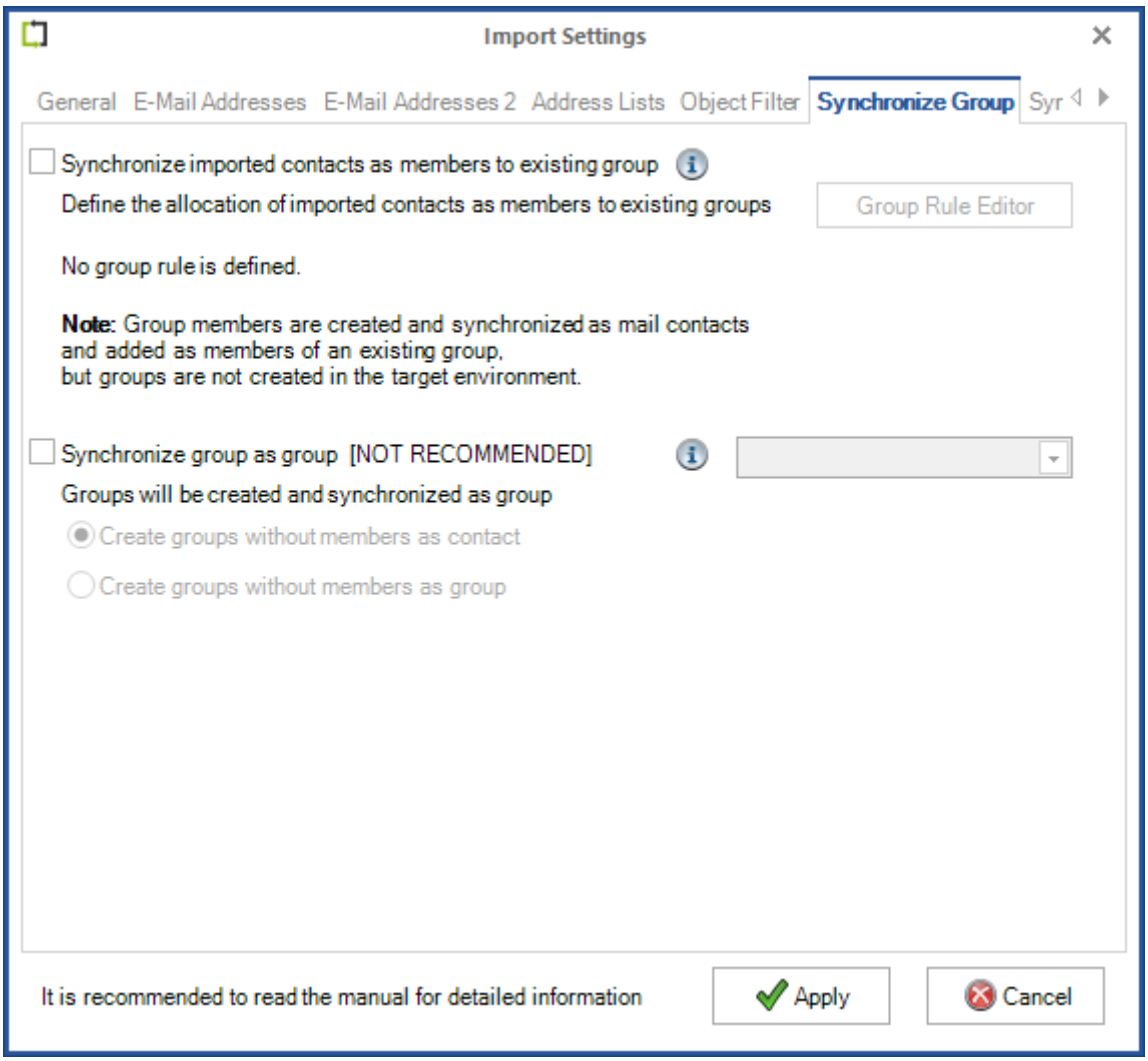
During an import every object will be analyzed, if one or more properties matches these conditions.

If at least one condition is fulfilled, the object will neither be imported into the Active Directory nor be analyzed any further.

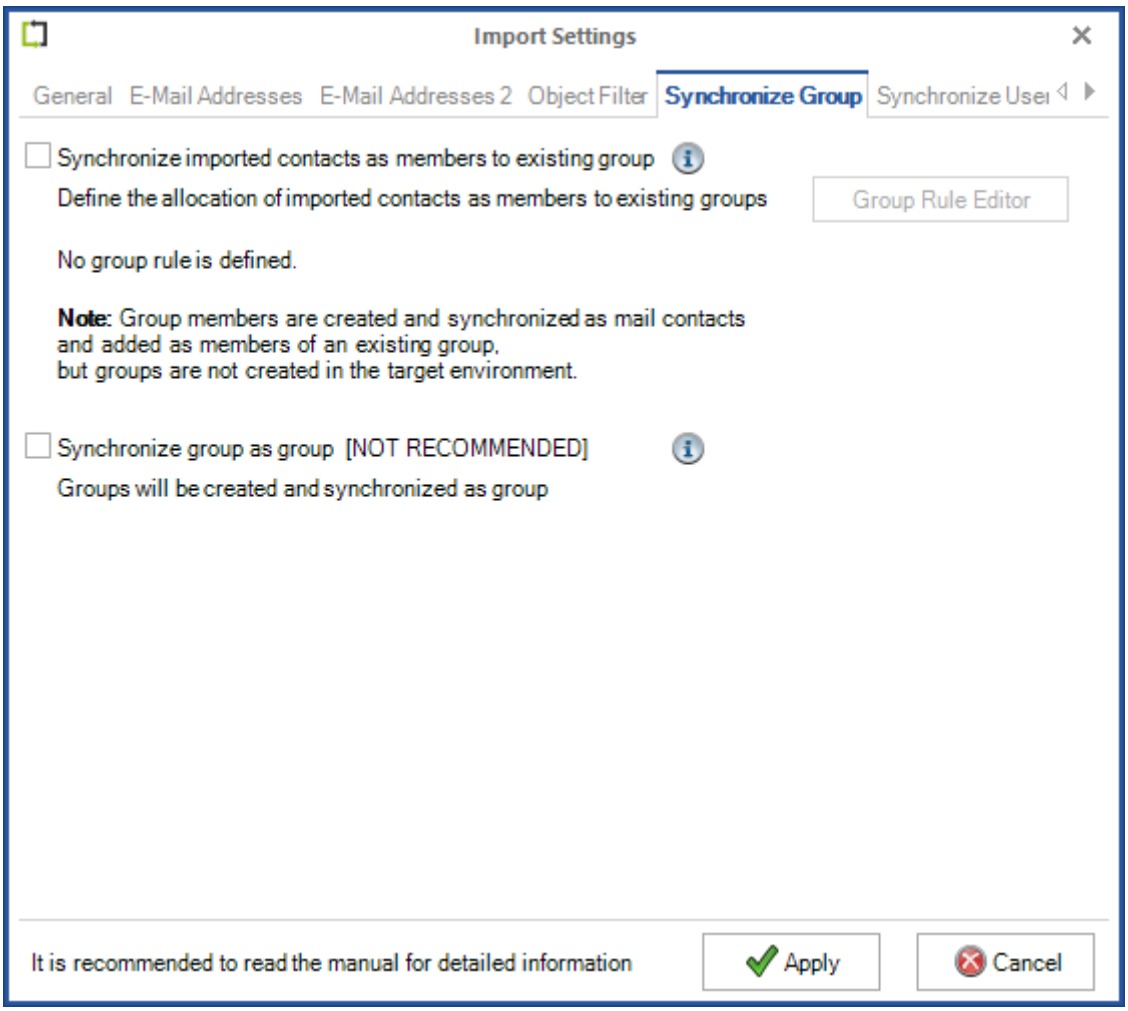
Note: Objects, which already exist inside the import OU of the environment or which are stamped for the source domain in Microsoft 365, will be deleted.

Please keep in mind, that objects, which already exist inside the import environment, will be not be added to imported groups as members, if they are filtered by this feature. Normally GALsync would add them as members to the group, even if they are not located inside the chosen import OU.

Synchronize Group (Exchange on-premises)



Synchronize Group (Exchange Online)

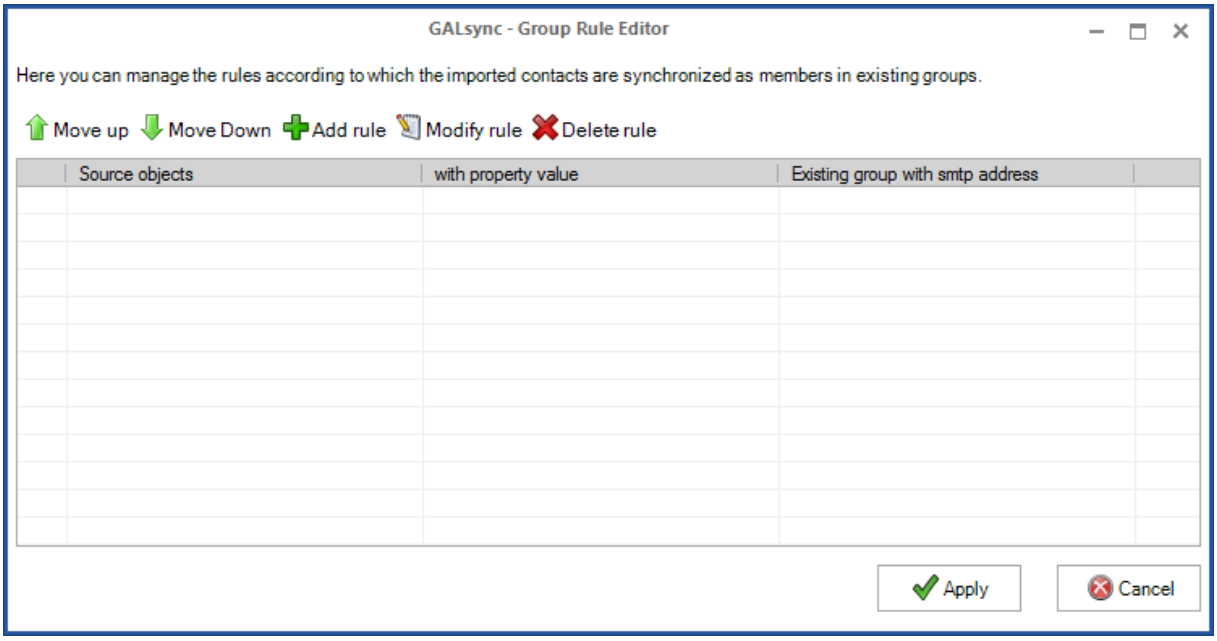


Synchronize imported contacts as members to existing group

GALsync synchronizes imported contacts as members to existing groups. Define the allocation of imported contacts as members to existing groups in the **Group Rule Editor**.

Group Rule Editor

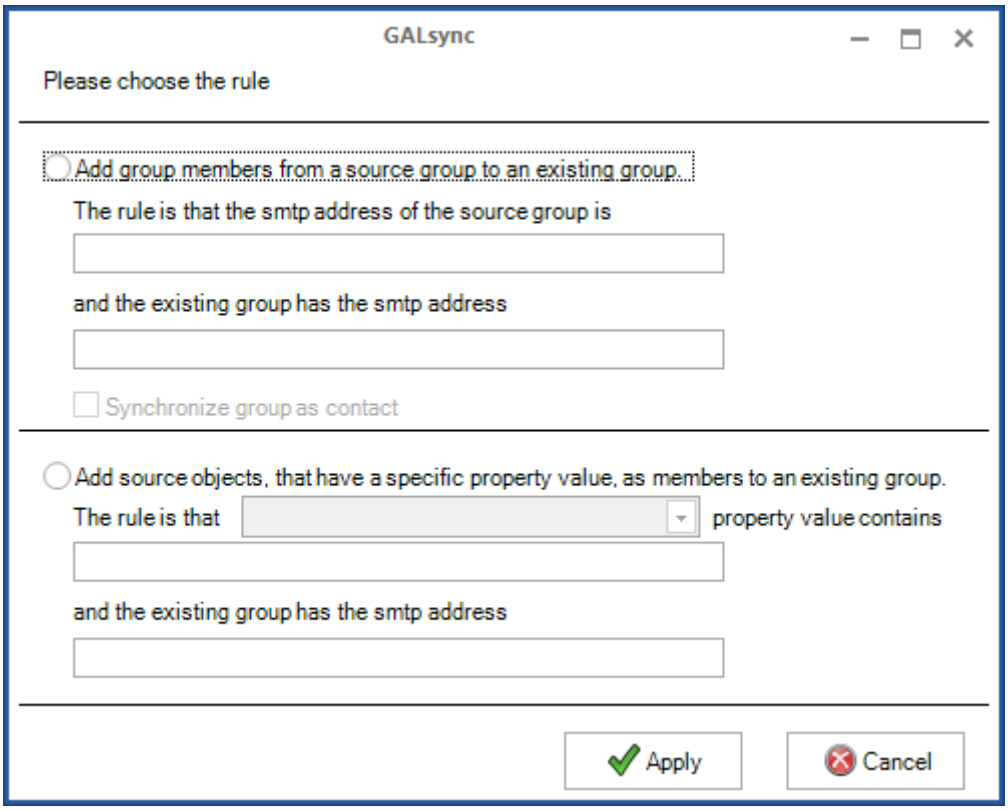
A list of rules defines which imported contacts should be added as members of existing groups.



Here you can manage the rules according to which imported contacts are synchronized as members in existing groups.

You can create two types of rules:

1. If the source environment exports a group and their members, you can define a rule that imports the members of this group as mail-contacts and adds these imported mail-contacts as member to an existing group.
2. If the exported objects in the data file contain a specific value, you can define a rule that adds the corresponding imported mail-contacts as member to an existing group.
   The **Add a value** option for the selected objects of the corresponding export policy of the source side can be helpful, if the source objects have no suitable value.



Add group members from a source group to an existing group

Imported contacts, which are members of an exported group, will be synchronized as members to an existing group.

Note: This option does not work with nested groups and their members. You need to create a separate rule for each group whose members are to be synchronized.

By default, the exported group will not be created or synchronized in the target environment.

The exported group can optionally be synchronized as mail-contact in the target environment.

Add source objects, that have a specific property value, as members to an existing group

Imported contacts, which have a specific property value in the source object, will synchronize as members to an existing group.

Note: The "Add a value" option for the selected objects of the corresponding export policy of the source side can be helpful, if the source objects have no suitable value.

Synchronize group as group [not recommended]

Important: The "Synchronize group" option is incompatible to GALsync versions lower than GALsync version 7.2.0, otherwise you will get an error if GALsync tries to import an Office 365 group as group.

Export groups and members

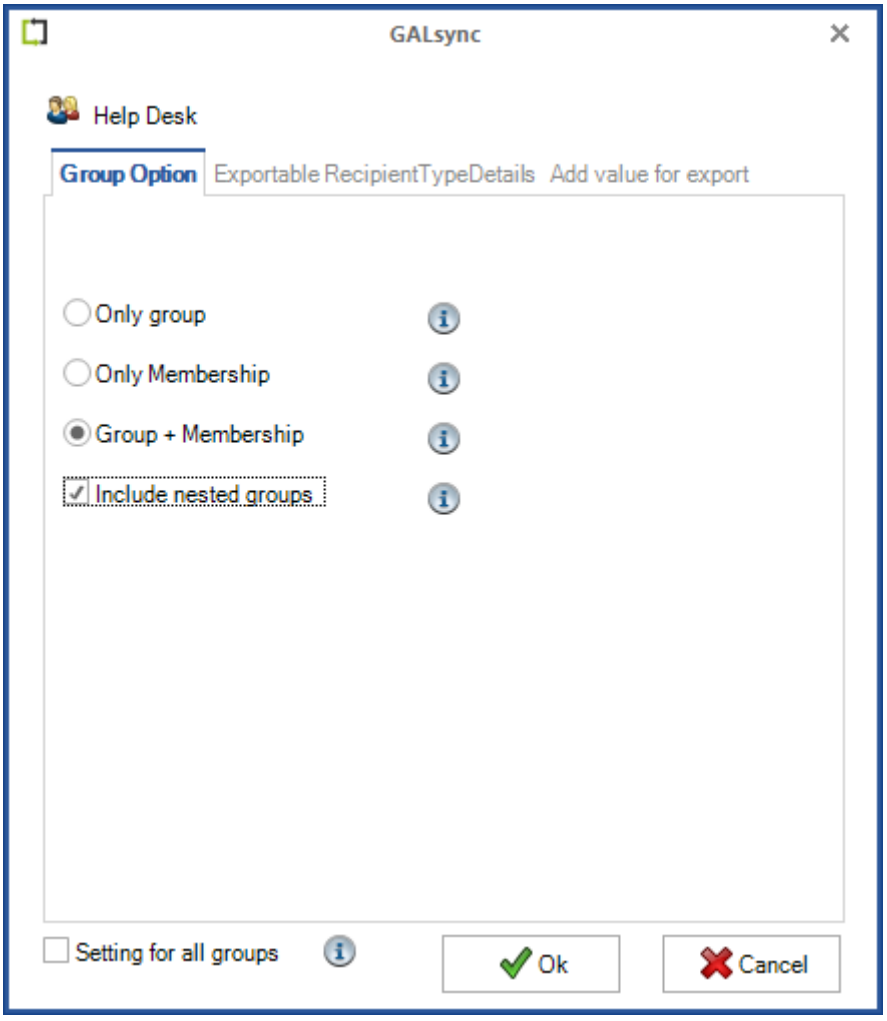
If a mail-enabled group is selected for export (**local**, **global**, **universal** of the types **security** or **distribution**) or a dynamic distribution group, you will be prompted to choose from the below options:

Only Group: Only the group by itself is exported. If the group is not mail-enabled the option is deactivated. Members of the group will not be exported.

Only membership: Only the mail-activated members of the group are exported. The group by itself will not be exported.

Group + Membership: Both, group and group members will be exported.

Include nested groups: If a group has other groups as members also the nested groups (and their members) are exported. This feature is not available for the option **Only Group**.



Import Groups and Members (Exchange on-premises)

By default, a group will be created in the target as mail-enabled contact referring to the original SMTP-address of the source group. If someone writes to the group, the membership will be resolved in the source Exchange organization.

If the option **Synchronize group as group** is selected GALsync creates the group as mail-enabled group with the same type and scope as in the source. But you can also choose the type and the scope, the group should have in the target. If the option **Synchronize group as group** is not selected GALsync will create groups and members as contacts.

If the sub-option **Create groups without members as contact** is selected (default), all groups without members will be created as contacts.

If the option **Create groups without members as groups** is selected, all groups without members will be created as groups.

If you select **Only group** in the export policy configuration for mail-enabled groups or distribution lists for synchronization, only the objects themselves will be exported. Users will be able to see these objects in the GAL and can send email to these addresses but they are not able to look up their memberships.

Groups and Members (Exchange Online)

If a group is imported to Exchange Online, it will be created as a contact by default. If someone writes to this object, the members will be resolved in the source Exchange organization.

If the option **Synchronize group as group** is selected, GALsync creates the group as a mail-enabled distribution group. If someone writes to the group, its members will be resolved in Exchange Online.

Normally GALsync synchronizes groups as contacts, but with this option it will create **MailDistributionGroups** and assign the synchronized contacts to these groups. If you choose to import groups as groups, the **targetAddress** of the created group will change according to Exchange Online restrictions.

The resulting email-address will be:

```
<groupname>.<subdomain>.<topleveldomain>@<Exchange Online Domain>.onmicrosoft.com
```

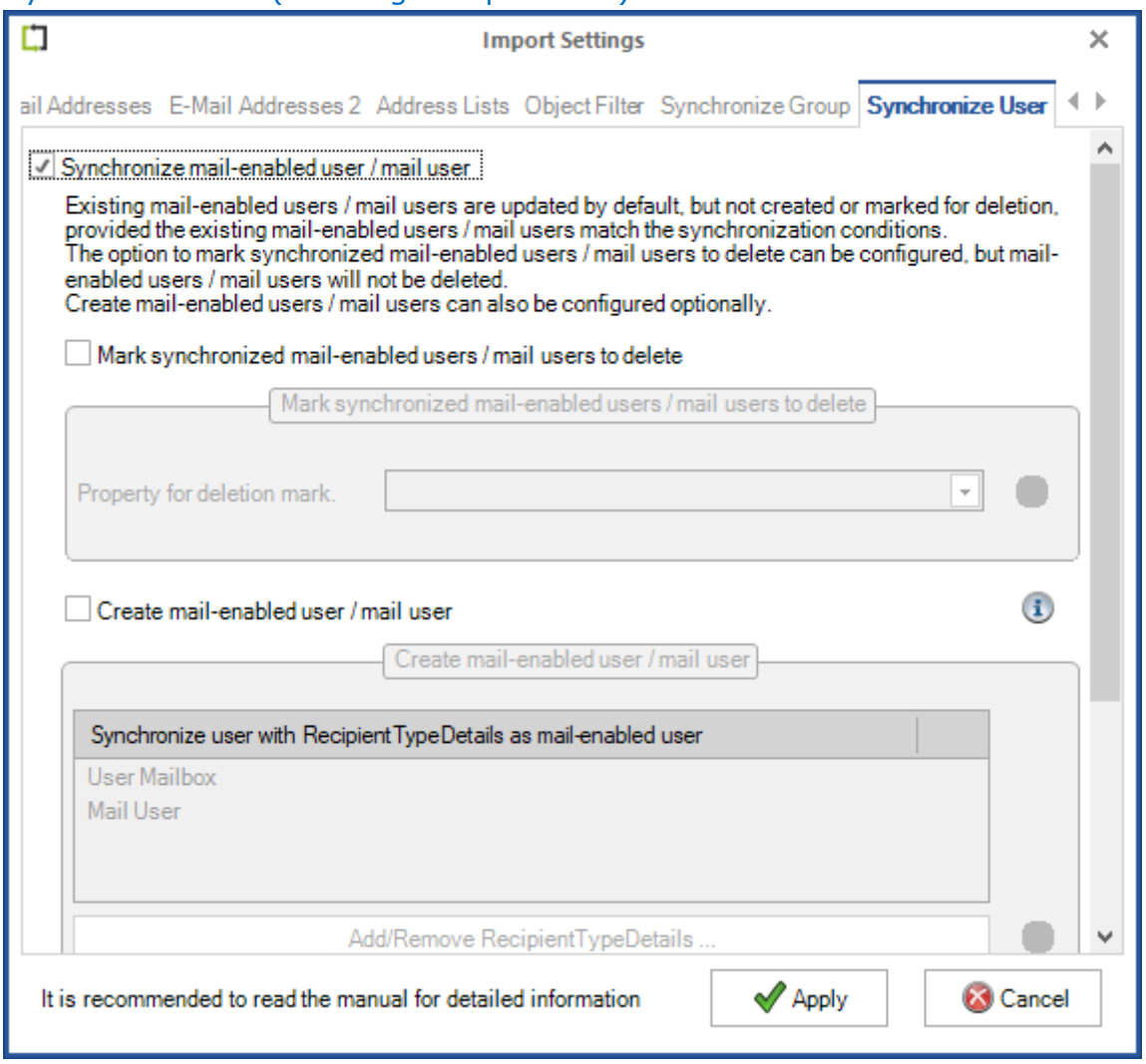
For example: Importing the group **users@netsec.de** to Exchange Online (**@netseconline.onmicrosoft.com**) will become

```
users.netsec.de@netseconline.onmicrosoft.com
```

Please keep in mind this is the only way to permit successfully synchronized group members to receive email sent to this particular group.

Synchronize User

Synchronize User (Exchange on-premises)



Existing mail-enabled users / mail users are updated by default, but not created or marked for deletion.

The existing mail-enabled users / mail users must be located in the import OU of the policy, if they are to be synchronized.

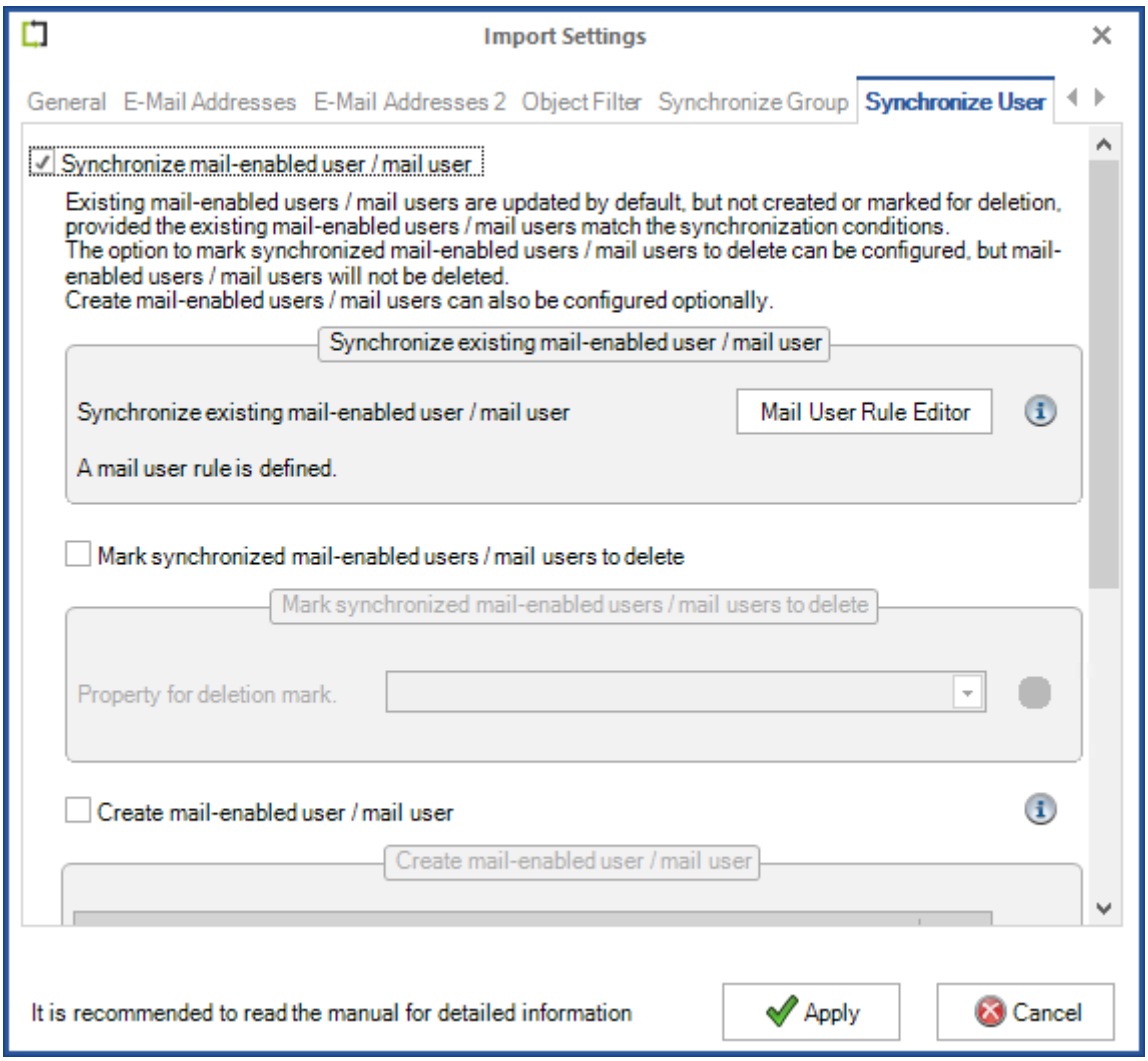
The option **Mark synchronized mail-enabled users / mail users to delete** can be enabled and configured.

One of the extensionAttribute 1-15 can be selected, where GALsync will be write the value starts with **MailUser can be deleted** …

Please note, that mail-enabled users / mail users will not be deleted by GALsync.

Create mail-enabled users / mail users can also be configured optionally.

Synchronize User (Exchange Online)



Existing mail users are updated by default, but not created or marked for deletion.

For GALsync to synchronize existing mail users in the target Microsoft 365 tenant they must be marked accordingly.

Note: GALsync cannot update Phone and Mobile Phone for Mail User in Exchange Online. Microsoft has changed the Exchange Online PowerShell command Set-User and excluded updating Phone and Mobile Phone for security reasons.

The option **Mark synchronized mail-enabled users / mail users to delete** can be enabled and configured.

One of the CustomAttribute 1-15 can be selected, where GALsync will be write the value starts with **MailUser can be deleted** …

Please note, that mail-enabled users / mail users will not be deleted by GALsync.

Create mail users can also be configured optionally.

Note: It will take more time, if the Exchange Online PowerShell command Set-User fails after the New-MailUser command. If this is the case, do the synchronization again to update the new existing mail users in Exchange Online.

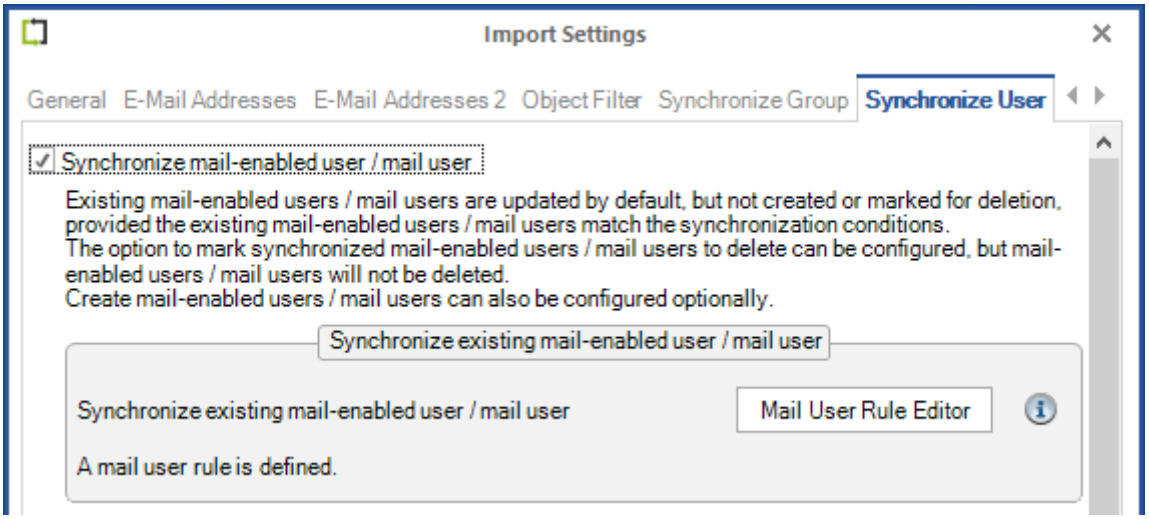
How to tell GALsync which existing Mail Users should be synchronized in the target Microsoft 365 tenant.

SyncWithGALsync (internal mark)

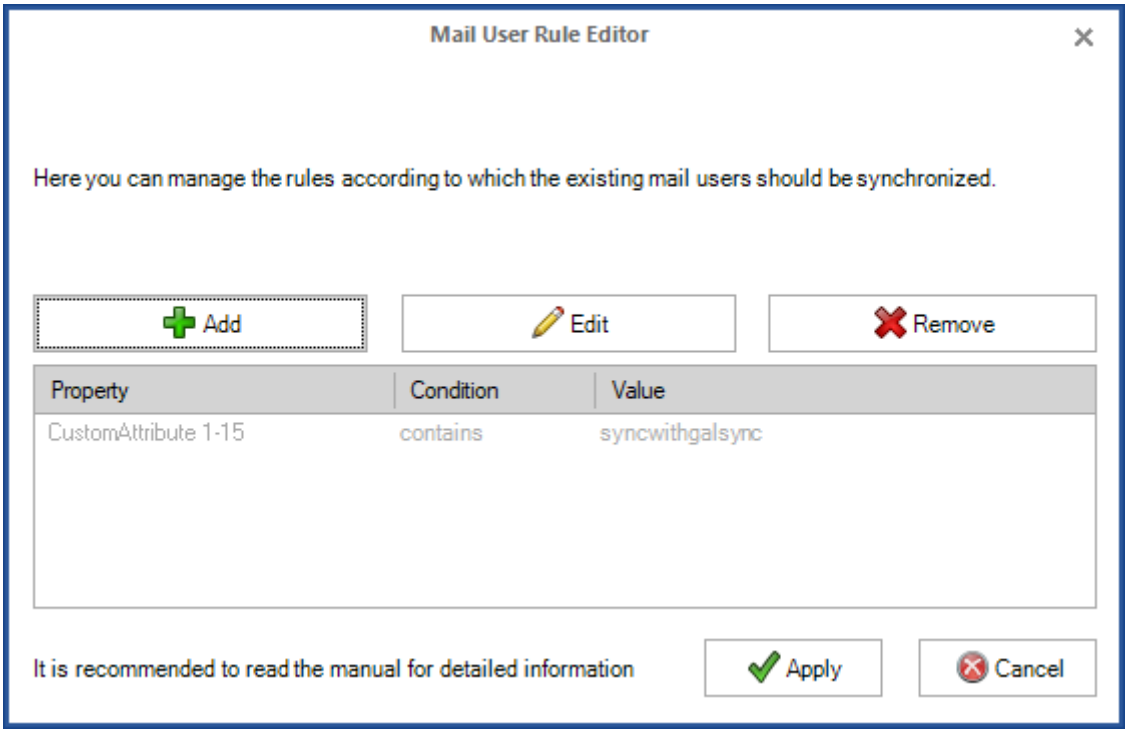
If you want to synchronize an existing Mail User by GALsync, you may insert the value **SyncWithGALsync** in any of the custom attributes (Exchange Online: **customAttribute1** - **customAttribute15**).

Define further rules for additional Mail Users to be synchronized.

The option exists to define further rules for GALsync to identify which Mail Users should be synchronized.



After you have enabled the **Synchronize mail-enabled user/ mail user** option, you can open the **Mail User Rule Editor** to configure rules.

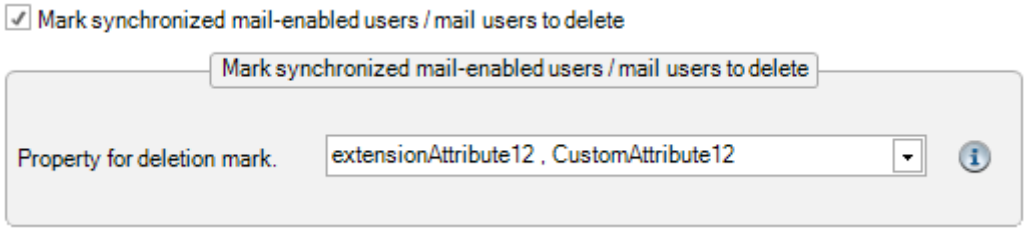


This option includes all existing Mail Users, which meet one of the conditions. This feature allows you to include existing Mail Users for synchronization.

Here you may add conditions containing a name of the property of which value is compared to the given value using your chosen comparison operator. During an import every existing Mail User will be analyzed, if one or more properties match these conditions. If at least one condition is fulfilled, the existing Mail User will be synchronized.

Note: GALsync cannot update Phone and Mobile Phone for Mail User in Exchange Online. Microsoft has changed the Exchange Online PowerShell command Set-User and excluded updating Phone and Mobile Phone for security reasons.

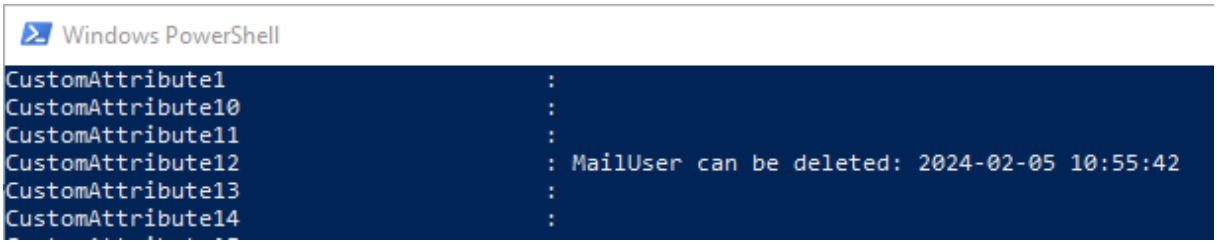
Mark synchronized mail-enabled users / mail users to delete



Created and synchronized mail-enabled users will not be deleted in the target environment, if the corresponding object is not in the data file.

Mail-enabled users / mail users can be optionally marked for deletion in one of the extensionAttribute 1-15 / CustomAttribute 1-15 as illustrated above.

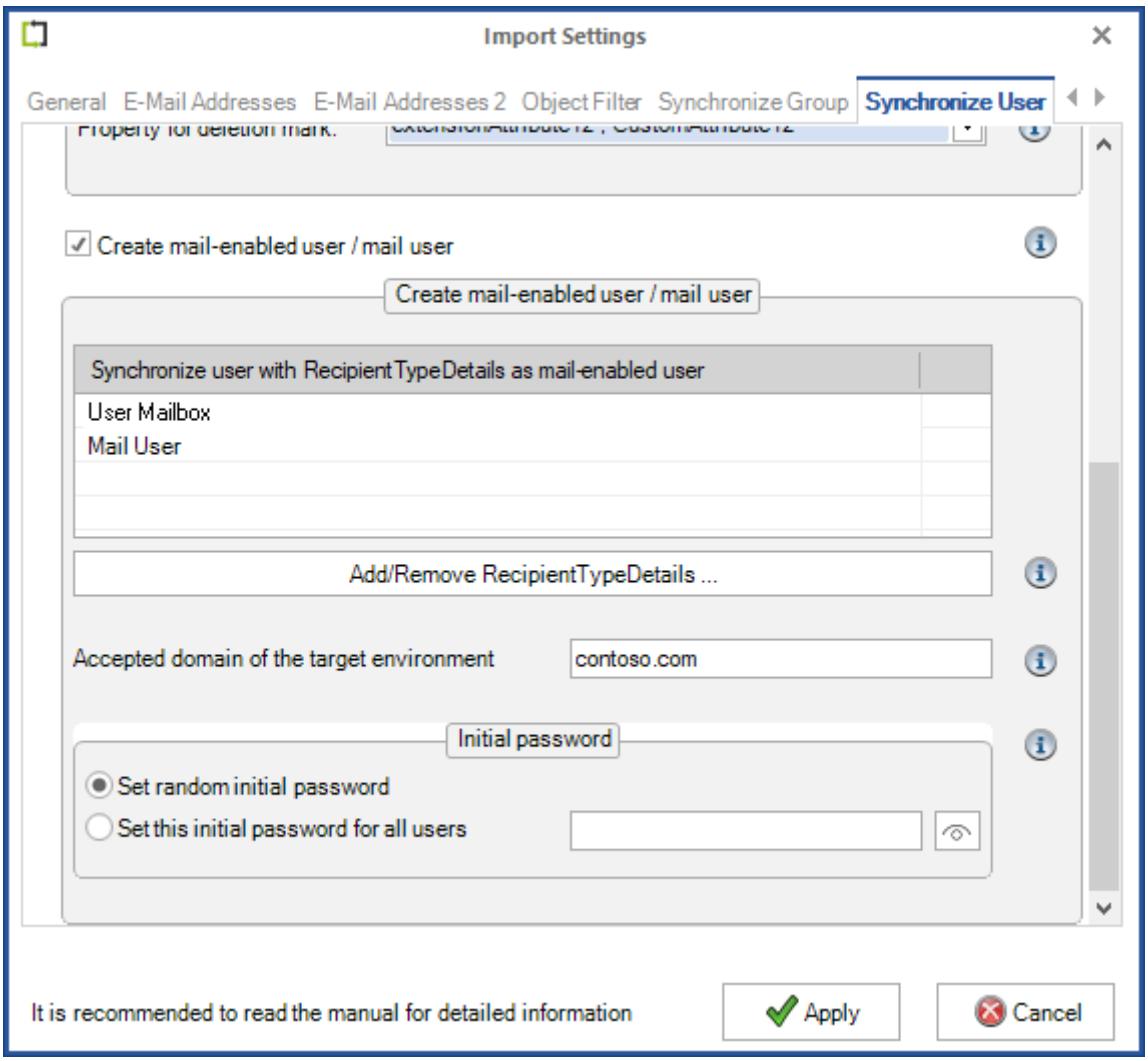
The mark starts with **MailUser can be deleted** …



Please note, that mail-enabled users / mail users will not be deleted by GALsync.

It is recommended to use the same **CustomAttribute / extensionAttribute** for **Mark synchronized mail-enabled users / mail users to delete** as configured for the option **Mark synchronized guest users to delete**, if the option is enabled on the **General** tab.

Create mail-enabled user / mail user



Mail-enabled users and mailbox-enabled users from the source will be created and synchronized as mail-enabled users / mail users in the target Exchange environment.

Restrictions for Synchronize User option

Please note, creating and synchronizing mail-enabled users / mail users in the target environment have more limitations as if you create and synchronize them as mail-enabled contacts in the target environment.

GALsync does not synchronize or change any password for imported mail-enabled users.

A mail user always needs a smtp address with an accepted domain in the **proxyAddresses** / **EmailAddresses** of the target Exchange environment.

GALsync will not remove any smtp address(es) with the accepted domain in the **proxyAddresses** / **EmailAddresses** of a synchronized mail user.

GALsync will not delete a synchronized mail user in the target environment, because the mail user is a security object.

Well known issues while creating mail users in Exchange Online

GALsync uses the `New-MailUser`, `Set-MailUser` and `Set-User` cmdlets while creating a new mail user. All these commands are necessary to write all the properties to the newly created mail user.

It will take more time, if the Exchange Online PowerShell command `Set-User` fails after the `New-MailUser` command.

On occasion the `Set-User` command fails during creating the mail user, so that some properties are not synchronized. If this is the case, do the synchronization again to update the new existing mail users in Exchange Online.

User with RecipientTypeDetails

Only users which contain a corresponding **RecipientTypeDetails** value in the data file object, will be synchronized as mail-enabled users / mail users.

Add/Remove RecipientTypeDetails ...

Modify the selection (based on **RecipientTypeDetails**) which mail-enabled users and mailbox-enabled users in the data file should be created as mail-enabled users in the target environment.

Accepted domain of the target environment

An accepted domain of the target environment is needed to create the login name for the imported mail-enabled user in the target environment. GALsync will not remove any smtp address(es) with the accepted domain in the **proxyAddresses** / **EmailAddresses** of a synchronized mail user.

Initial password

The initial password is needed for the login of the mail-enabled user to the target environment.

Set random initial password

GALsync generates a random password for each created mail-enabled user.

Set this initial password for all users

GALsync sets the same defined password for all created mail-enabled users.

Please be aware of the target environment's password policy and use only passwords that meet its requirements.

Note: The GALsync Service Account needs the "All extended rights" permission for the import OU and all descendant objects to set the password for a mail-user, which will be created in an on-premises environment.

How to

How to build the displayName attribute during the import

Sometimes Exchange environments have different syntax for the display name.

The syntax can be **firstname lastname** or **lastname, firstname**
and now you want to adapt the syntax to your environment.

It should be noted that not every object has a first name and a last name e.g., room mailboxes. For such objects the existing display name should be used.

The example changes the **displayName** to the syntax **lastname, firstname**

Three rules are needed.

Step 1: Build Property rule for displayName attribute

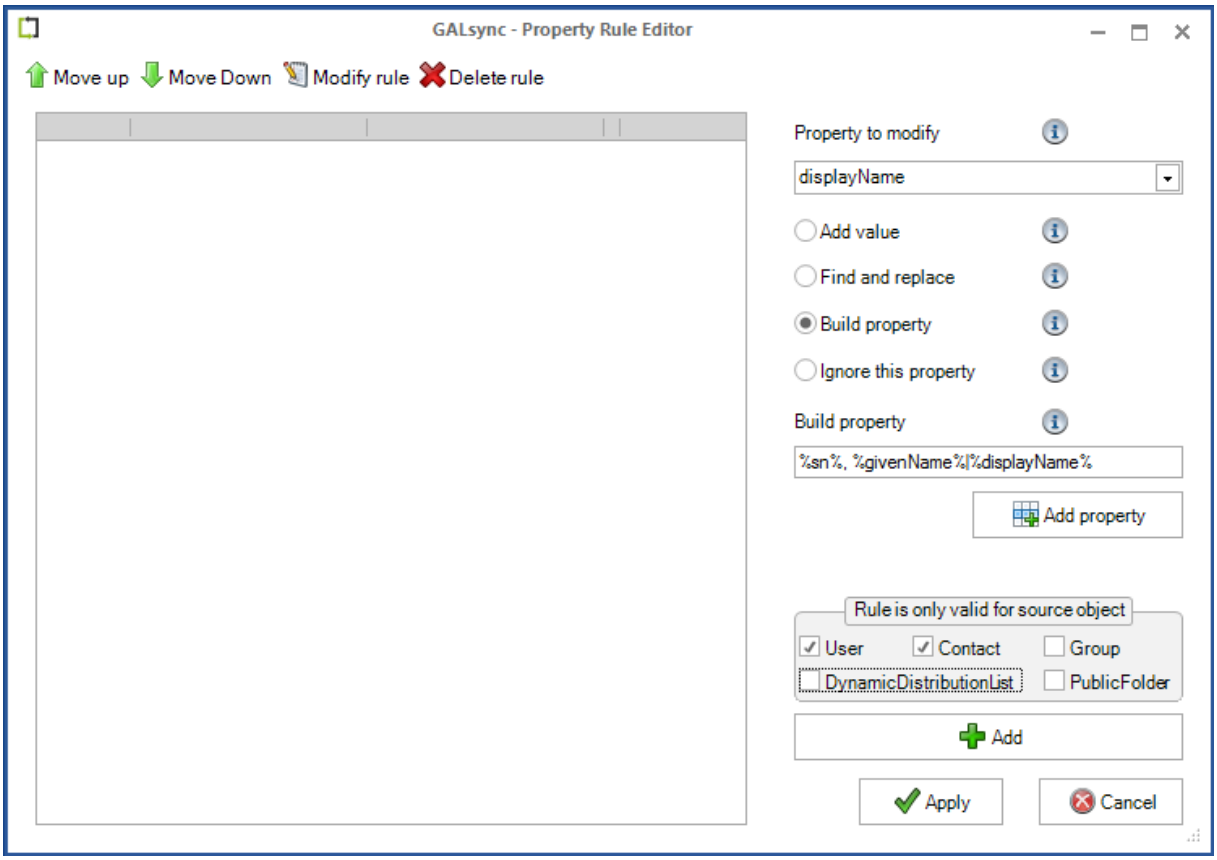
Select the property to modify **displayName** and select the option **Build property**.

Exchange on-premises: The value for the **Build property** rule:

```
%sn%, %givenName%|%displayName%
```

Please note that we use the pipe character | as separator in these rules, so that it must not exist in the values of the attributes **givenName**, **sn** and **displayName**.

The rule should only be valid for source objects, which are **User** or **Contact**, because **Group**, **DynamicDistributionList** and **Public Folder** have no **firstname** and no **lastname**.



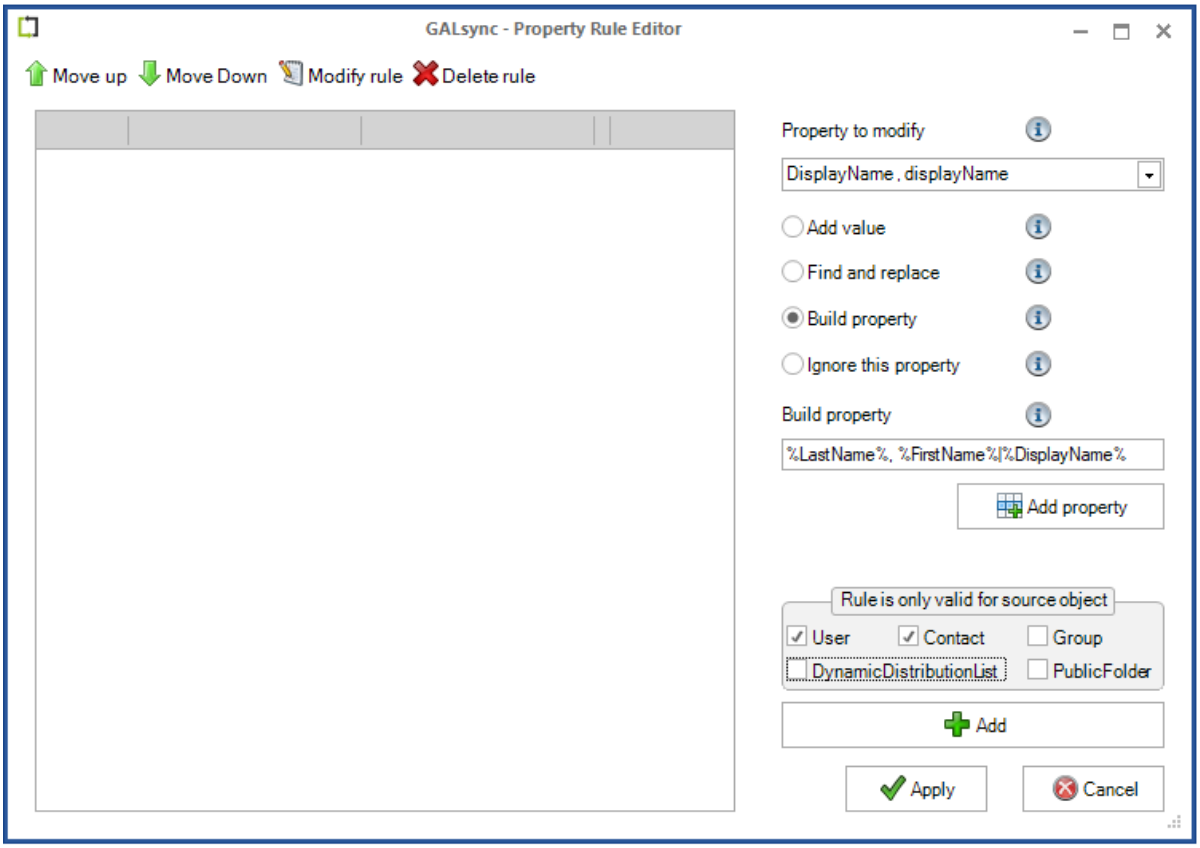
After that, add the rule to the list.

Exchange Online: The value for the **Build property** rule:

```
%LastName%, %FirstName%|%DisplayName%
```

Please note that we use the pipe character | as a separator in these rules, so that it must not exist in the values of the attributes **FirstName**, **LastName** and **DisplayName**.

The rule is only valid for **User** or **Contact** source objects, and should not be applied to **Group**, **DynamicDistributionList** and **Public Folder**, because they do not have a **Firstname** or **Lastname**.



After that, add the rule to the list.

Step 2: Remove the first part, if firstname and lastname attribute are empty.

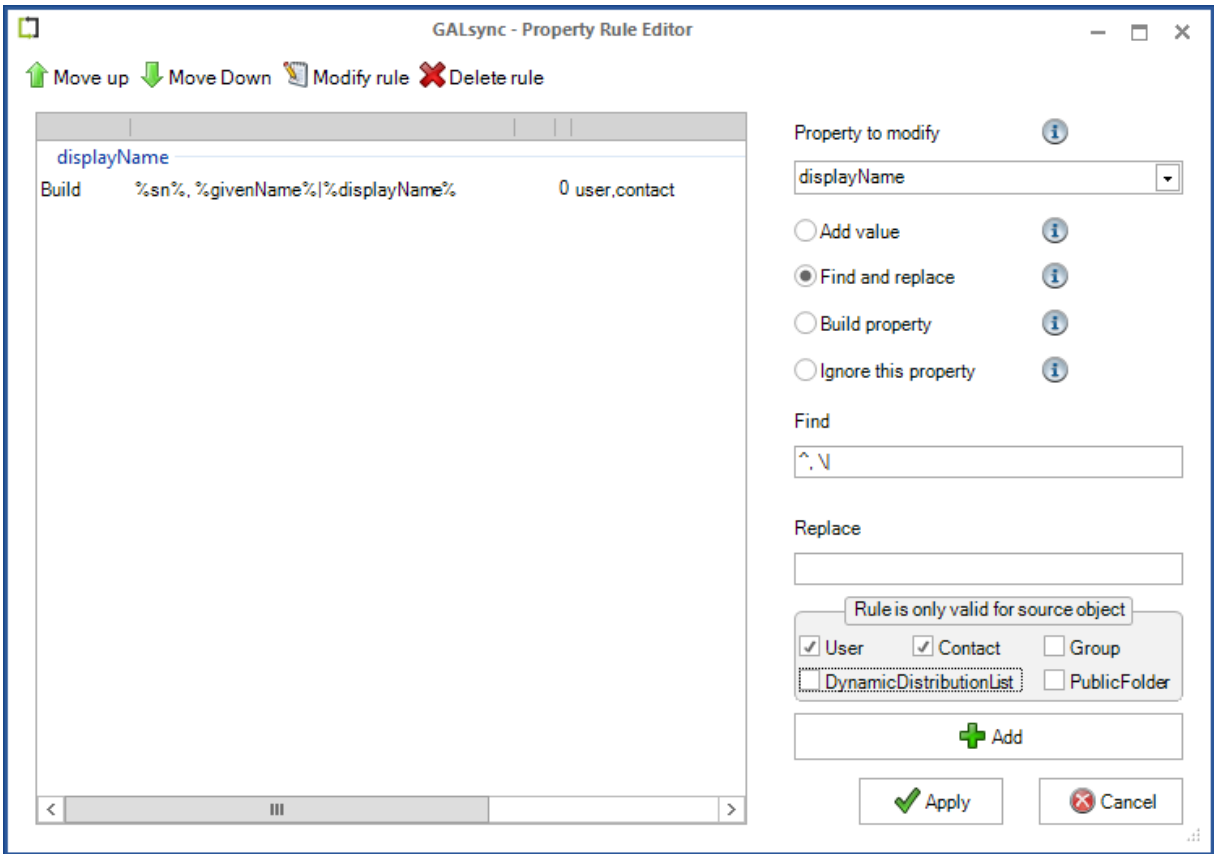
Select the property to modify **displayName** and select the option **Find and replace**.

Exchange on-premises: Remove the first part with Regular Expression, if the **givenName** attribute and the **sn** attribute are empty.

The value for the **Find** rule:

```
^, \|
```

The rule is also only valid for **User** or **Contact** source objects.



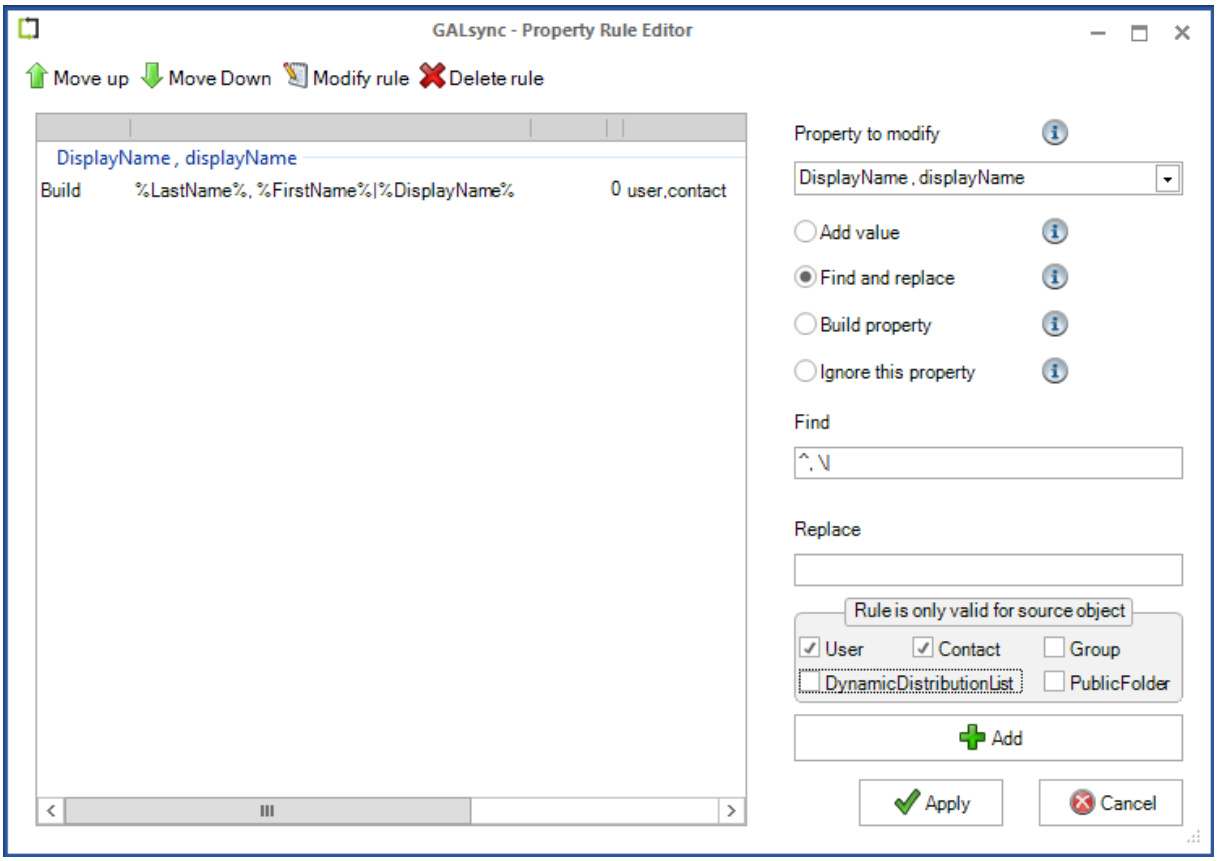
After that, add the rule to the list.

Exchange Online: Remove the first part with Regular Expression, if the **FirstName** attribute and the **LastName** attribute are empty.

The value for the **Find** rule:

```
^, \|
```

The rule is also only valid for **User** or **Contact** source objects.



After that, add the rule to the list.

Step 3: Remove the second part, if firstname and lastname attribute are not empty

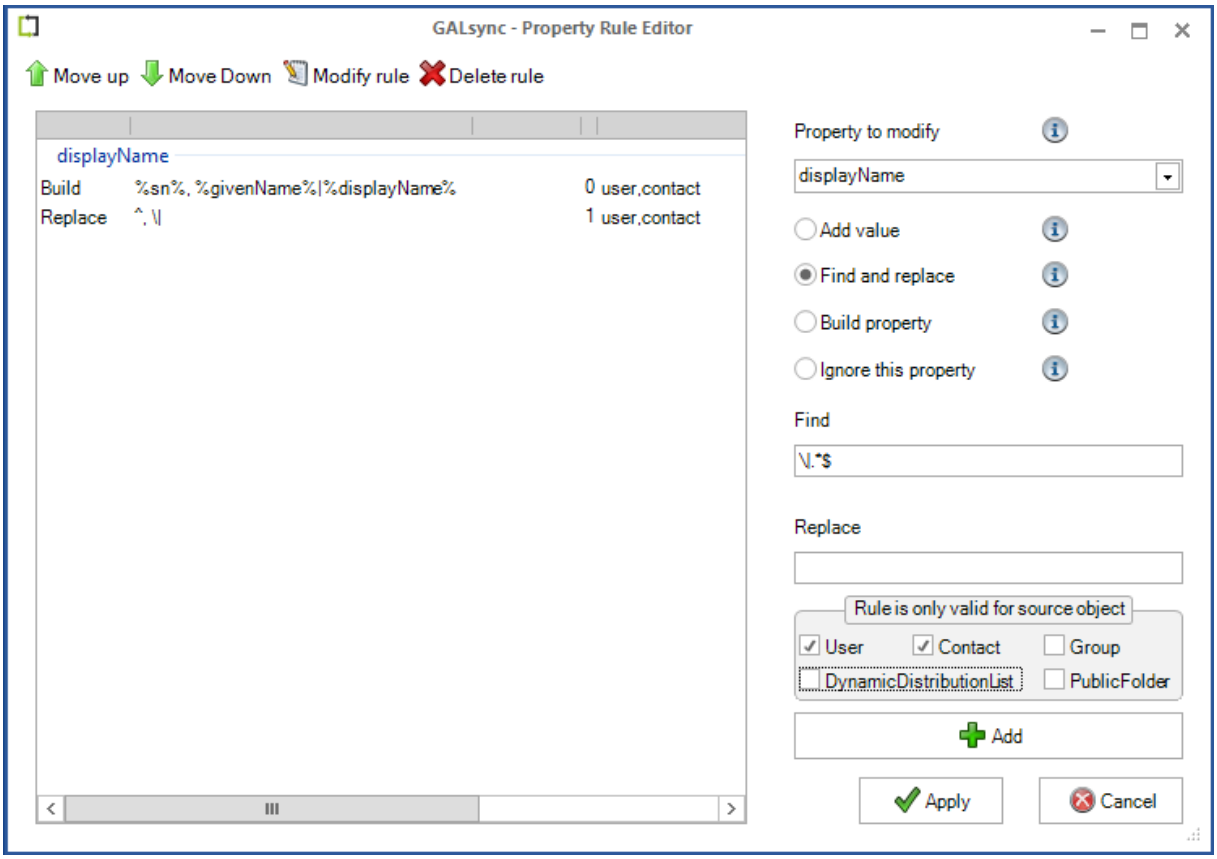
Select the property to modify **displayName** and select the option **Find and replace**.

Exchange on-premises: Remove the second part with Regular Expression, if the **givenName** attribute and the **sn** attribute are empty.

The value for the **Find** rule:

```
\|.*$
```

The rule is also only valid for **User** or **Contact** source objects.



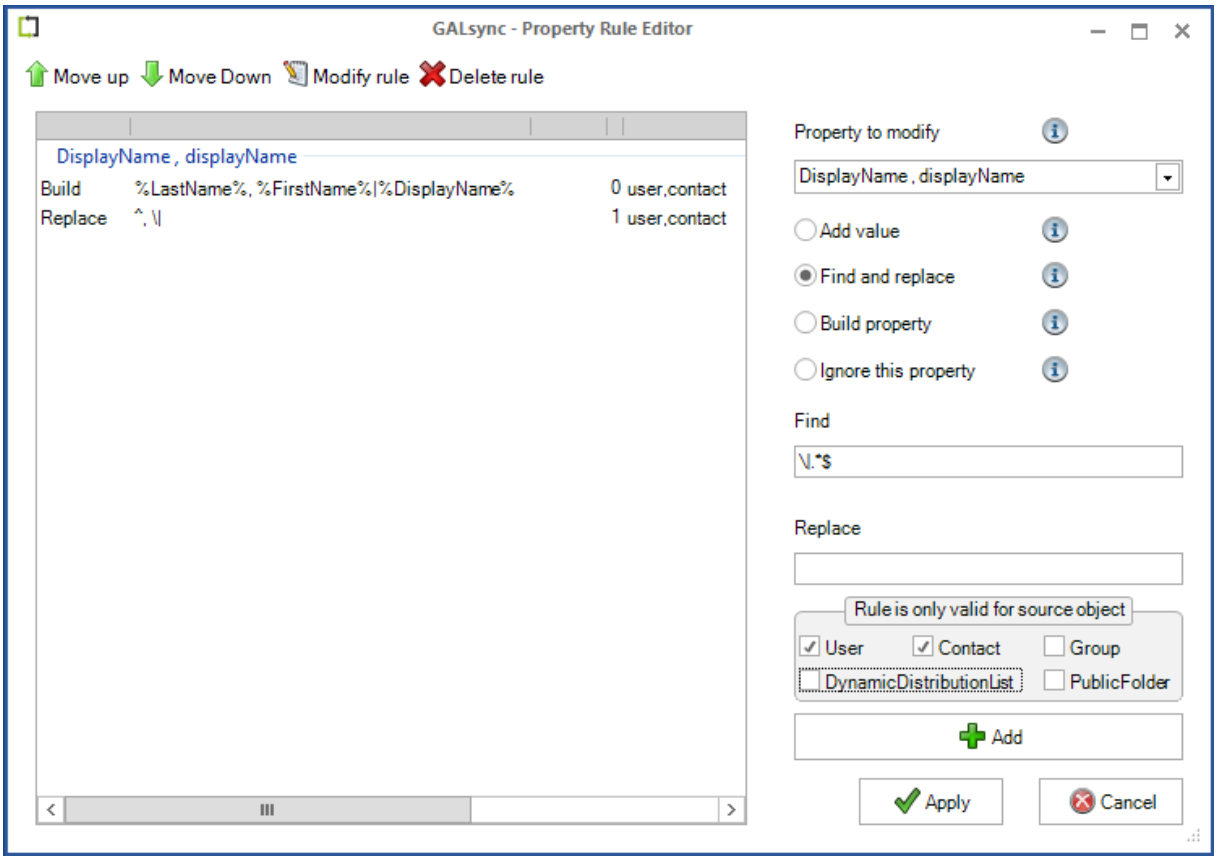
After that, add the rule to the list.

Exchange Online: Remove the second part with Regular Expression, if the **FirstName** attribute and the **LastName** attribute are empty.

The value for the "Find" rule:

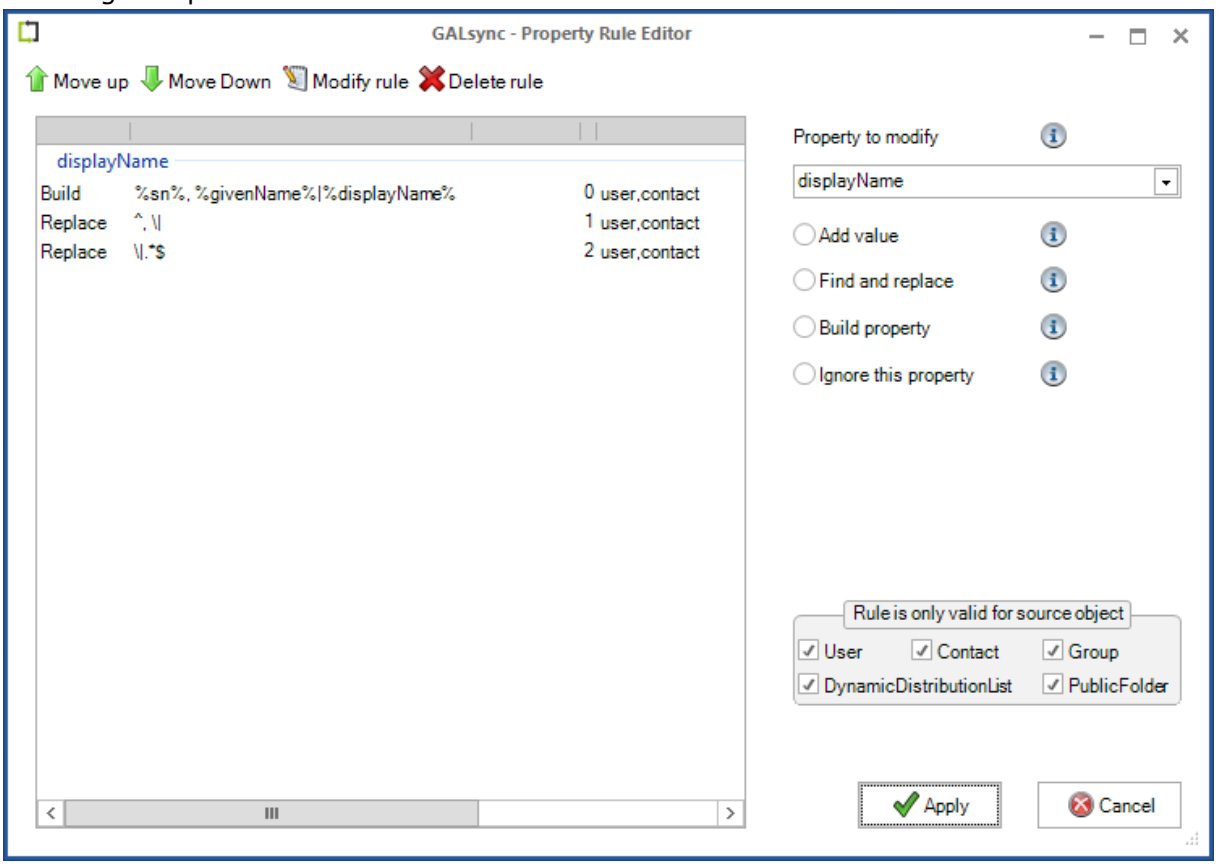
```
\|.*$
```

The rule should also only be valid for source objects, which are **User** or **Contact**.

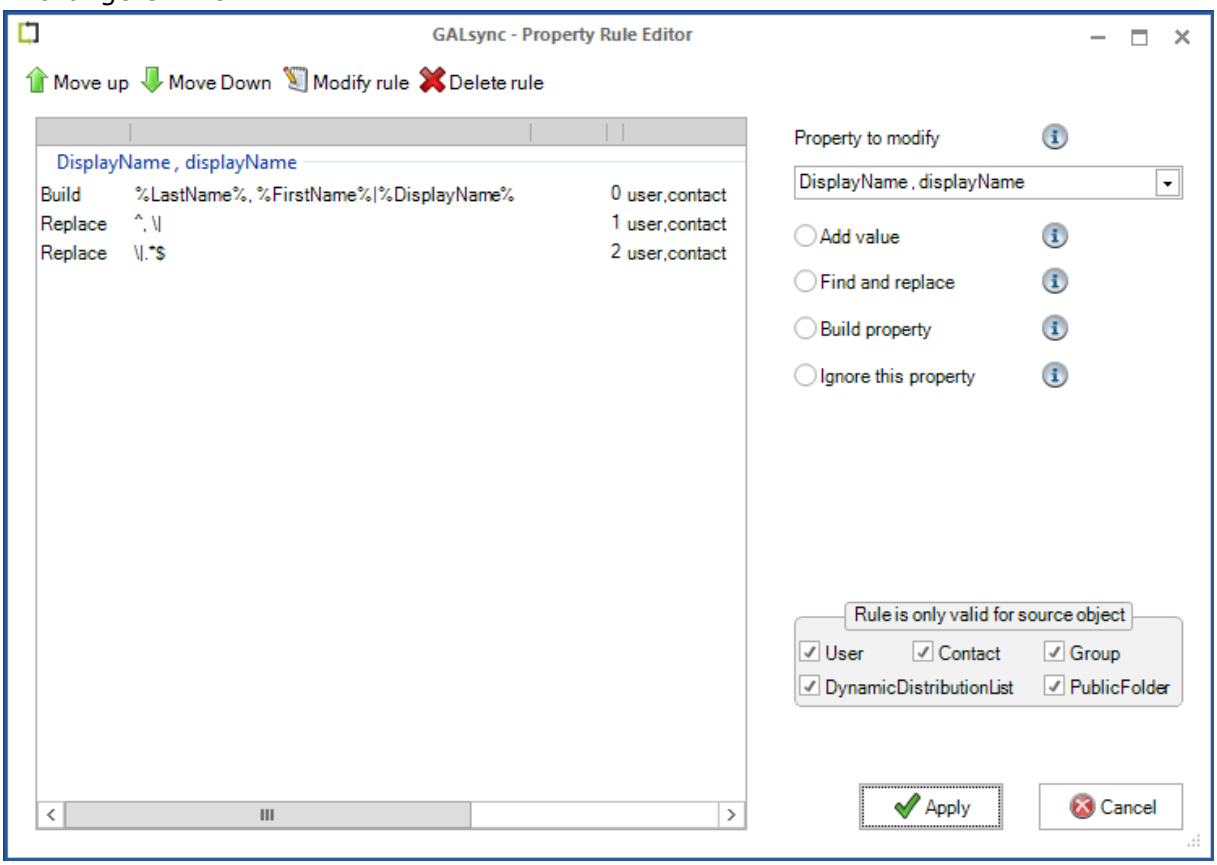


After that, add the rule to the list.

There should now be three rules listed:
Exchange on-premises:



Exchange Online:



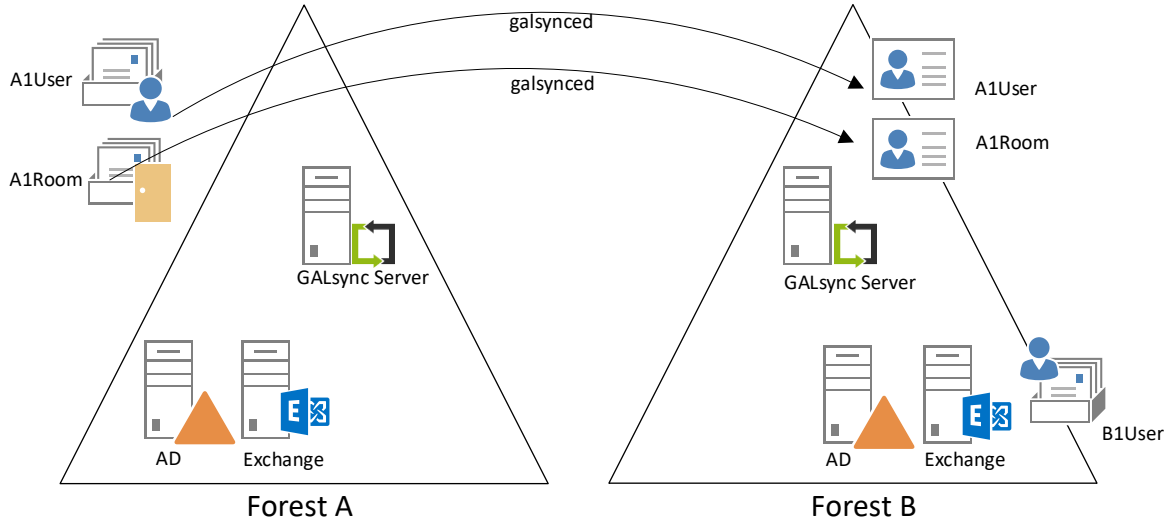
How to Book a Room Mailbox with GALsynced Contacts

Room Mailboxes are fundamentally the same as regular User Mailboxes (a user account in Active Directory and an associated mailbox in Exchange Server). A Room Mailbox is a special type of mailbox:

- The user account password is generated automatically, and the account is disabled by default (preventing interactive logons).
- The Room Mailbox object has special attributes that are used for automated processing of bookings etc.

GALsync allows a room mailbox to be synchronized from the source forest to the target forest the same way a mailbox-enabled user is synchronized. At the target, the room mailbox is created as a mail-enabled contact. A user in the target environment performs a meeting request by picking the GALsynced contact (representing the source room mailbox) from the GAL and adding it as a resource to the request.

On-premises Implementations



Booking

Can people in the target forest book a meeting?

3. Yes, by inviting the contact which represents the room mailbox from the source forest.
4. People in target forest can pick the contact (which represents the source room mailbox) and place it as "resource" into an invitation.
5. The room mailbox in the source forest replies to the conference/meeting originator (in the target forest) with a message (e.g., if the room is available at the required period).

Note: By default, the room mailbox does not reply. So, it will be necessary to configure Exchange and the mailbox as described below.

Booking a Reply

Presumably the booking of the room mailbox works in the originating forest by verifying that automatic or manual replies work, and attendees and the organizer are visible.

By default, Exchange will not reply to external meeting requests So, if a user in the target forest performs a meeting request to the galsynced contact, the parameter **Allow Automatic Replies** needs to be configured in the source forest for the remote domain **Default**, or a specified domain.

Exchange 2013 or Later:

From **Exchange Management Shell**, run:

```
Get-RemoteDomain Default | fl


Set-RemoteDomain Default -AutoReplyEnabled $true
```

The parameter **AutomateProcessingAutoAccept** must be configured for the room mailbox in the source forest.

```
Set-CalendarProcessing "Room 1" -AutomateProcessing AutoAccept
```

The parameter **ProcessExternalMeetingMessages** must be configured for the room mailbox in the source forest

Exchange 2013 or Later:

```
Set-CalendarProcessing -Identity "Room 1" -ProcessExternalMeetingMessages $true
```

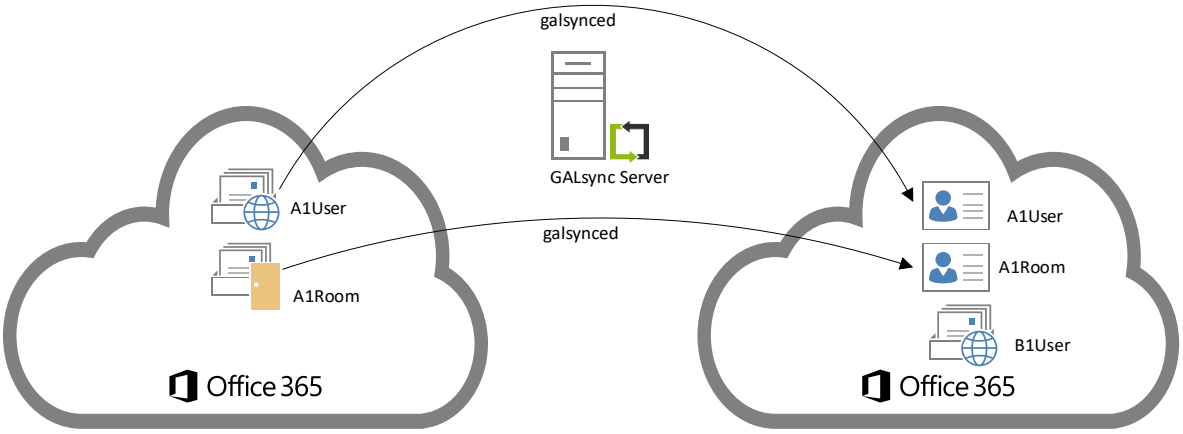
Free/Busy / Attendees

Can people in the target forest see Free/Busy or attendee information?

- Assuming GALsync 8 has been installed, the Free/Busy information can only be seen by contacting the room mailbox in the source forest.
  No Free/Busy information is physically stored in the target within the galsynced contact object.

6. Microsoft Exchange Federation can be configured additionally between both environments to see the Free/Busy information. Exchange Federation is a service provided by Microsoft.

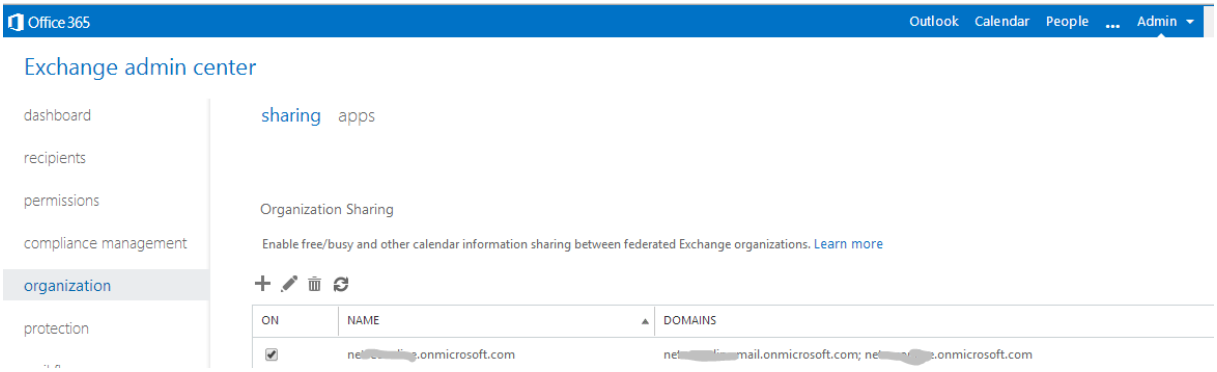
Office365 Exchange Online implementations



Booking

In the admin center for **Exchange Online** > **Organization** > **Organization Sharing**, it is only necessary to add the Microsoft 365 organization to the list. No further configuration is required since a federation trust has already been implemented.

Note: The room mailbox must not be licensed.



Booking a Reply

By default, the room mailbox in Microsoft 365 does not reply to an external sender. So, you may configure Exchange-Online and the mailbox as described below.

```
## Logon to Office365 with Exchange PowerShell
## Use the Exchange Online PowerShell V2 module
## https://docs.microsoft.com/en-us/powershell/exchange/exchange-online/exchange-online-powershell-v2/exchange-online-powershell-v2?view=exchange-ps

Connect-ExchangeOnline;

## Configure the room mailbox
Set-CalendarProcessing -Identity „Room 1“ -ProcessExternalMeetingMessages $true;

## or do it for all room mailboxes

get-mailbox | Where {$_.RecipientTypeDetails -eq “RoomMailbox”} | set-CalendarProcessing -ProcessExternalMeetingMessages $true;
```

Free/Busy / Attendees

Can people in the target forest see Free/Busy or attendee information?

7. Assuming GALsync 8 has been installed, the Free/Busy information can only be seen by contacting the room mailbox in the source forest.
   No Free/Busy information is physically stored in the target within the galsynced contact object.
8. Microsoft Exchange Federation can be configured additionally between both environments to see the Free/Busy information. Exchange Federation is a service provided by Microsoft.

How to export guest users

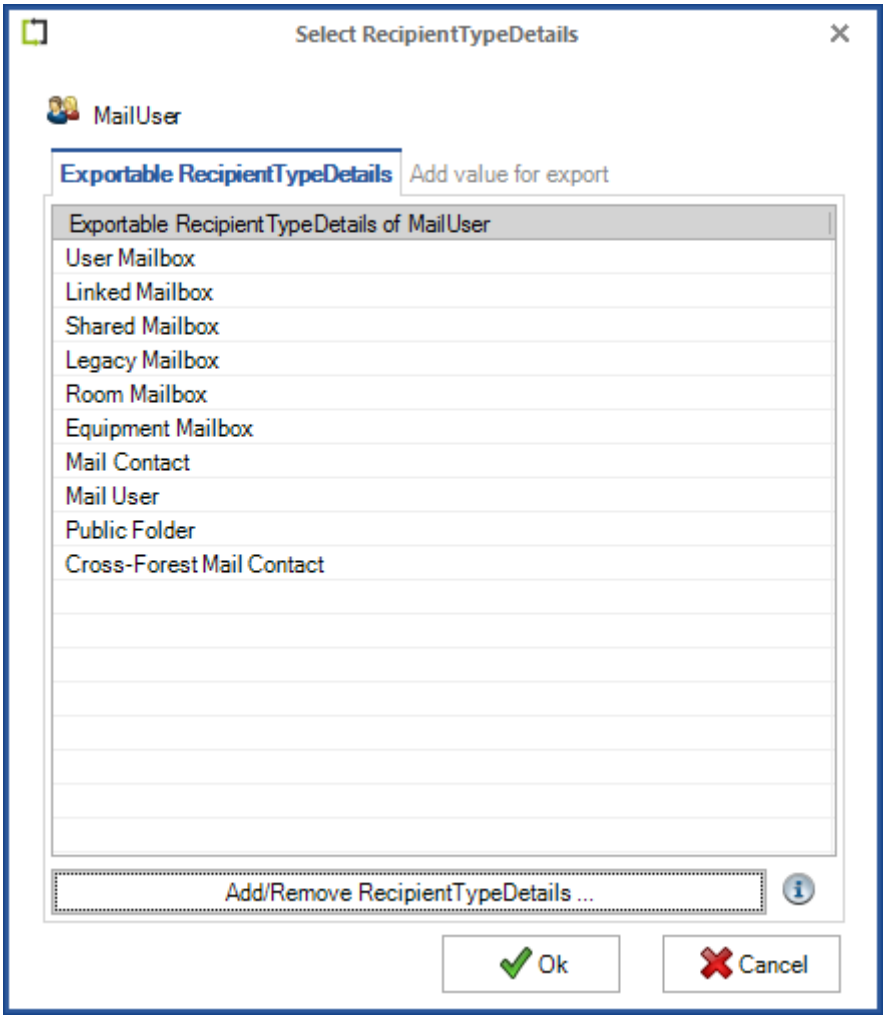
GALsync will not export guest users by default.

A guest user has the recipientType **MailUser** and the recipientTypeDetails **Guest Mail User** in Microsoft 365.

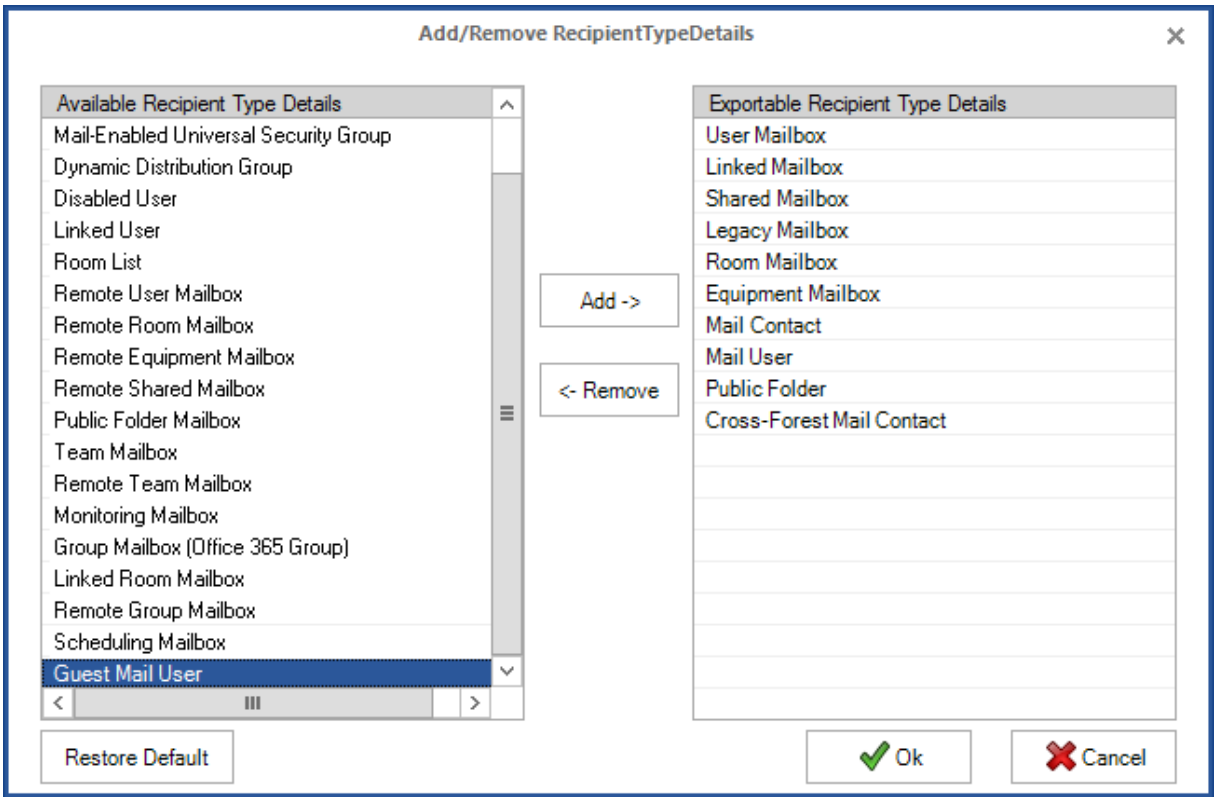
GALsync will export guest users if the **Guest Mail User** recipientTypeDetails is added to the **Exportable RecipientTypeDetails** list, while selecting objects to be exported.

For example:

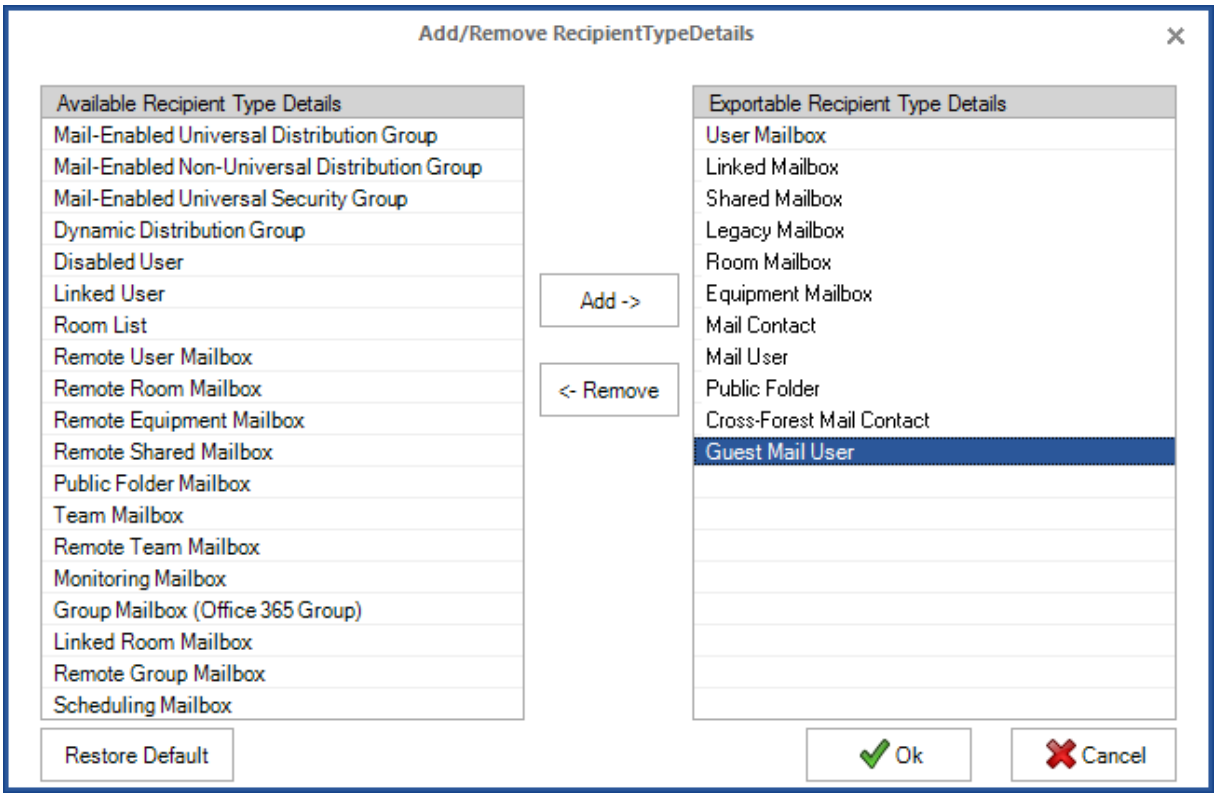
Click the **Add/Remove RecipientTypeDetails ...** button.



Select the **Guest Mail User** in the **Available Recipient Type Details** list on the left side.



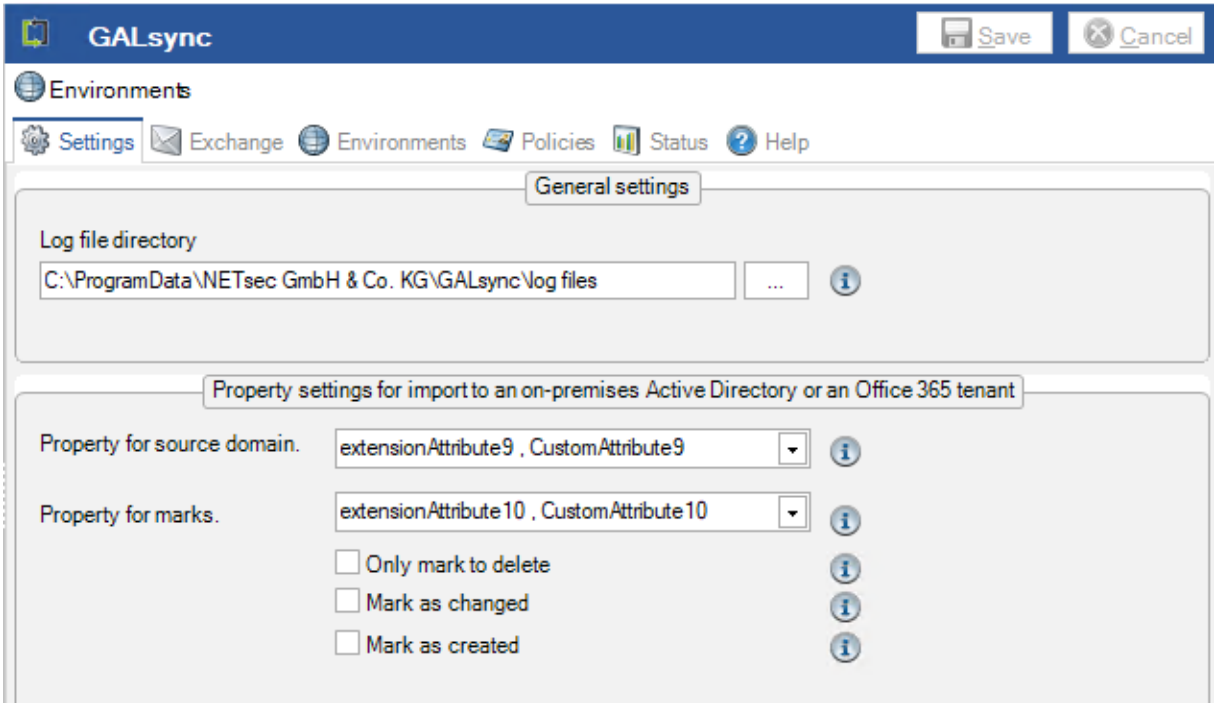
Click the **Add ->** button to add the Guest Mail User to the **Exportable RecipientTypeDetails** list on the right side and click **Ok**.



How to tell GALsync to match non-GALsynced objects in Exchange Online (Microsoft 365) for synchronization.

The possibility exists contacts might already be present in the target environment which were not created by GALsync. By default, GALsync does not have the ability to match the previously created objects to the contents of the data file. Following the described procedure, you will be able to teach GALsync to match the exported source objects against the existing target contacts.

Basically, GALsync only checks for contacts in Exchange Online (Microsoft 365) if the contacts are marked by a former GALsync import. In the general settings for **Property for source** domain (see screenshot below) select a **customAttribute** (**extensionAttribute**) which is used as a "watermark". **CustomAttribute9** (**extensionAttribute9**) is configured by default.



GALsync matches a source object against an existing target object if two conditions are true

9. The configuration of the **Property for source domain** uses the same extensionAttribute while exporting and importing
10. The target contact(s) are stamped with a special value in the configured extensionAttribute

As a result, GALsync will consider the target contact for synchronization even if the object was not originally created by GALsync.

You have to prepare your environment before you run export and import:

Connect to your Exchange Online (Microsoft 365) environment via Exchange Online PowerShell with an account, which is an **Exchange Administrator of Exchange Online**.

For how to do this check the following article **Connect to Exchange Online PowerShell**

https://docs.microsoft.com/en-us/powershell/exchange/connect-to-exchange-online-powershell

Example to connect to Exchange Online PowerShell:

```
Connect-ExchangeOnline;
```

After you are connected copy the text below and paste it into the PowerShell window with the established session. After pasting press return twice. This will only define a filter which will be used later.

```
filter setGALsyncFlag($customAttributeNumber,$dnDomainPart)
{
	if(($dnDomainPart -ne $null) -and ($_.PrimarySmtpAddress -ne $null))
	{
		[string] $flag = $dnDomainPart + "|SMTP:";
		$flag += $_.PrimarySmtpAddress + "|" + "GALsync";

		[string] $id = $_.Identity;

		[string] $cmd = "Set-MailContact -Identity " + $id;
		$cmd += " -CustomAttribute" + $customAttributeNumber + " " + $flag;

		Write-Host $cmd;

		switch ($customAttributeNumber)
		{
			1 { Set-MailContact -Identity $id -CustomAttribute1 $flag };
			2 { Set-MailContact -Identity $id -CustomAttribute2 $flag };
			3 { Set-MailContact -Identity $id -CustomAttribute3 $flag };
			4 { Set-MailContact -Identity $id -CustomAttribute4 $flag };
			5 { Set-MailContact -Identity $id -CustomAttribute5 $flag };
			6 { Set-MailContact -Identity $id -CustomAttribute6 $flag };
			7 { Set-MailContact -Identity $id -CustomAttribute7 $flag };
			8 { Set-MailContact -Identity $id -CustomAttribute8 $flag };
			9 { Set-MailContact -Identity $id -CustomAttribute9 $flag };
			10 { Set-MailContact -Identity $id -CustomAttribute10 $flag };
			11 { Set-MailContact -Identity $id -CustomAttribute11 $flag };
			12 { Set-MailContact -Identity $id -CustomAttribute12 $flag };
			13 { Set-MailContact -Identity $id -CustomAttribute13 $flag };
			14 { Set-MailContact -Identity $id -CustomAttribute14 $flag };
			15 { Set-MailContact -Identity $id -CustomAttribute15 $flag };
		}
	}
}
```

To mark the objects, you now use the just defined setGALsyncFlag filter.

In the first example we mark a contact assuming that

11. The configuration of **Property for source domain** is **extensionAttribute9**
12. The target contact has the primary SMTP address **support@netsec.de**
13. The object (from on-premise) should be originated from the source Active Directory domain **netsec.local**

```
Get-MailContact "support@netsec.de" | setGALsyncFlag 9 "dc=netsec,dc=local"
```

Note: The distinguishedName of the object (from Exchange Online / Office365) is modified by GALsync export, because Microsoft has a unique part in the dn for all tenants.

GALsync cuts this part as shown in the example below:

Example for the original distinguishedName:

```
CN=support,OU=netsectest.onmicrosoft.com,OU=Microsoft Exchange Hosted
Organizations,DC=EURPR03A001,DC=prod,DC=outlook,DC=com
```

Example how GALsync transforms the distinguishedName:

```
CN=support,DC=netsectest,DC=onmicrosoft,DC=com
```

Use the domain part of the transformed dn to stamp the contact in the target Exchange Online / Office365

```
Get-MailContact "support@netsectest.onmicrosoft.com" | setGALsyncFlag 9
"dc=netsectest,dc=onmicrosoft,dc=com";
```

In the second example we mark a contact assuming that

14. The configuration of **Property for source domain** is **extensionAttribute9**
15. The target contact's display name is **Adam Smith**
16. The object should be originated from the source Active Directory domain **netsec.local**

```
Get-MailContact "Adam Smith" | setGALsyncFlag 9 "dc=netsec,dc=local"
```

If you use Microsoft 365 Exchange Online as source please see the transformation note in the first example.

In the third example we stamp all contacts which have the smtp domain **netsec.de** as **ExternalEmailAddress** (target address)

```
Get-MailContact | where{$_.ExternalEmailAddress -like "*@netsec.de"} |
setGALsyncFlag 9 "dc=netsec,dc=local";
```

If you use Microsoft 365 Exchange Online as source please see the transformation note in the first example.

After doing so you can validate the modification by checking the appropriate extensionAttribute

```
Get-MailContact | fl;
```

As a result, you can now export objects from the source, import them into the target, and GALsync will find matching objects and synchronize them.

You do not need to repeat this procedure for the objects being in the same export scope.

How to tell GALsync to modify GALsynced objects in Exchange Online (Microsoft 365) again

Modify all objects at the next execution

As of GALsync version 7.2.5, we added the option Modify all objects at the next execution. on the General tab of the import policy for Microsoft 365 Exchange Online.

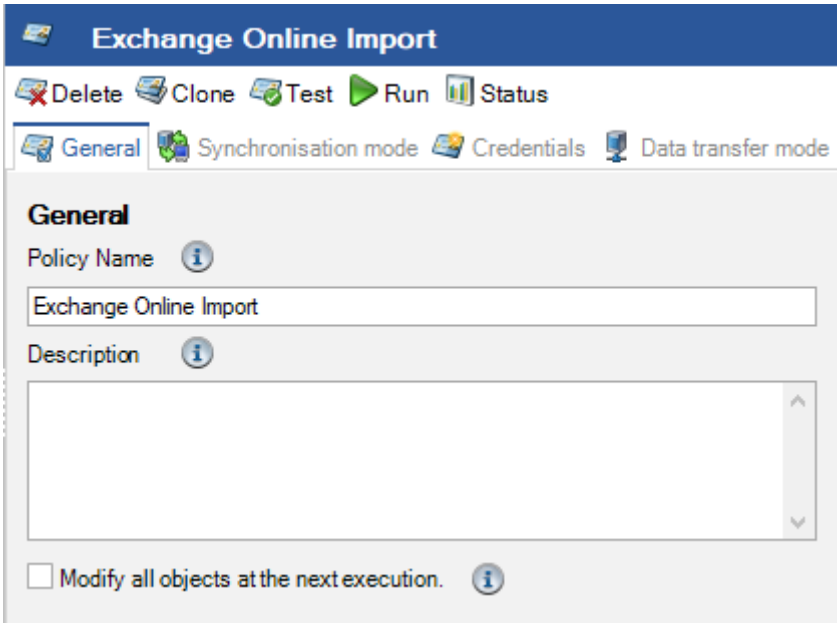
This option allows to modify GALsynced objects in Exchange Online (Microsoft 365) again.

After this option is enabled the next import policy run will modify all GALsynced objects in the Microsoft 365 tenant.

This option is only valid for the next policy execution.

After the policy has been executed, the option is automatically deactivated.

Please keep in mind that enabling this option will extend the amount of time for the policy to complete its cycle, similar to an initial synchronization.



How to change the primary SMTP address of users in the source environment, which are synced to partners with GALsync

If the primary SMTP address of a user, contact, or group is changed which is synchronized to partners with GALsync, your partners will experience NDR issues, because the primary SMTP address is the matching criteria of GALsync. GALsync cannot find the synchronized contact in the partners' environment if the primary SMTP address of the user, contact, or group has been changed, so GALsync will delete the old contact and create a new one. After that the Outlook clients of your partner cannot find the contact anymore, because the **legacyExchangeDN** has changed, causing the NDR issue.

To prevent this behavior, save the old primary SMTP address in one of the custom attributes (**extensionAttribute1** - **extensionAttribute15**) of the applicable user, contact, or group in source environment using the prefix **galsync:**

Example:

```
galsync:joe.dole@netsec.de
```

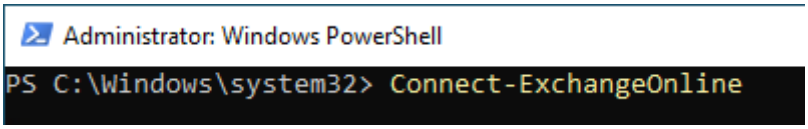
If the old primary SMTP address has been saved in one of the custom attributes (**extensionAttribute1** - **extensionAttribute15**) of the user, contact, or group, then GALsync can find the old contact in the target environment, change the primary SMTP address for it and has not to delete the old contact.

How to check existing application access policy for the application

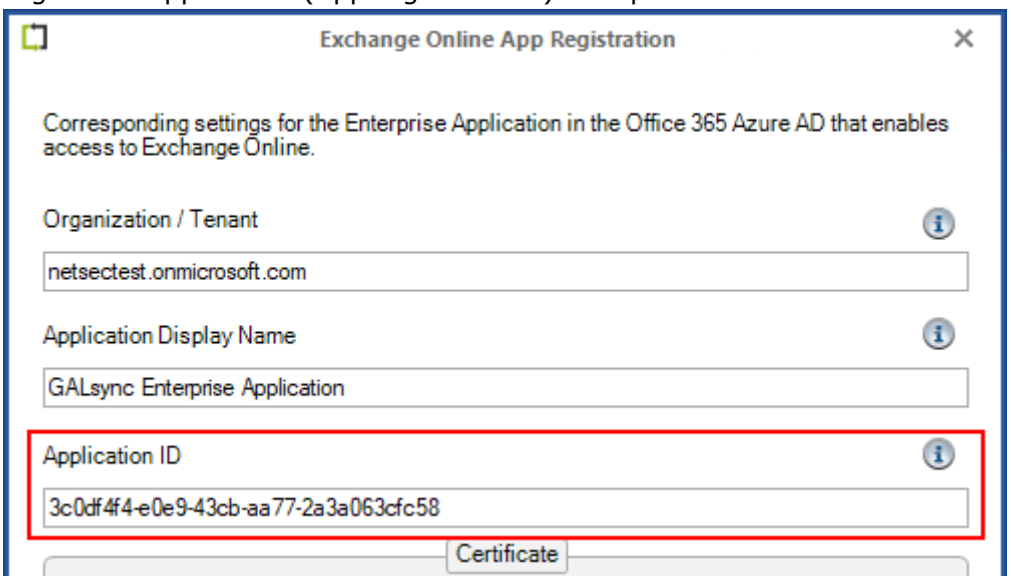
Get existing application access policies for the registered application (App registrations), that limit the access to Exchange Online mailboxes.

To do this, connect to Exchange Online via **Exchange Online PowerShell** as an **Exchange Administrator**.

```
Connect-ExchangeOnline;
```

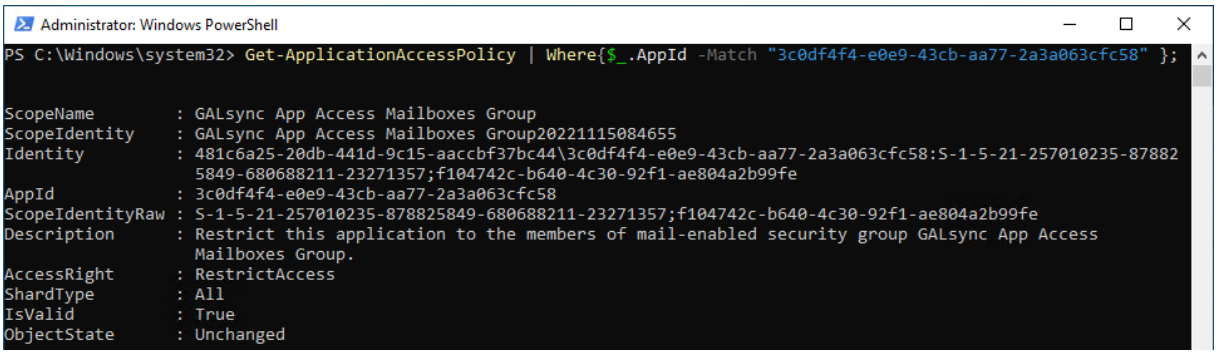


The **Get-ApplicationAccessPolicy** command takes the **Application ID** of the registered application (App registrations) as a parameter.



Get existing **application access policy** for the application.
For example:

```
Get-ApplicationAccessPolicy | Where{$_.AppId -Match "<Application ID>" };
```



Please note, if contactSync policies are configured, the application needs access to all the Exchange mailboxes, which should receive the contacts.

How to restrict access to specific mailboxes for the application

The registered application (App registrations) for GALsync only needs access to the Exchange Online mailbox, which GALsync uses to send and receive email.

Please note, if contactSync policies are configured, the application needs access to all the Exchange mailboxes, which should receive the contacts.

The configuration of an **application access policy** restricts access to certain Exchange Online mailboxes.

1. **Configure a mail-enabled security group**
2. **Configure Application Access Policy**

The following description is based on the **Microsoft Documentation** article:

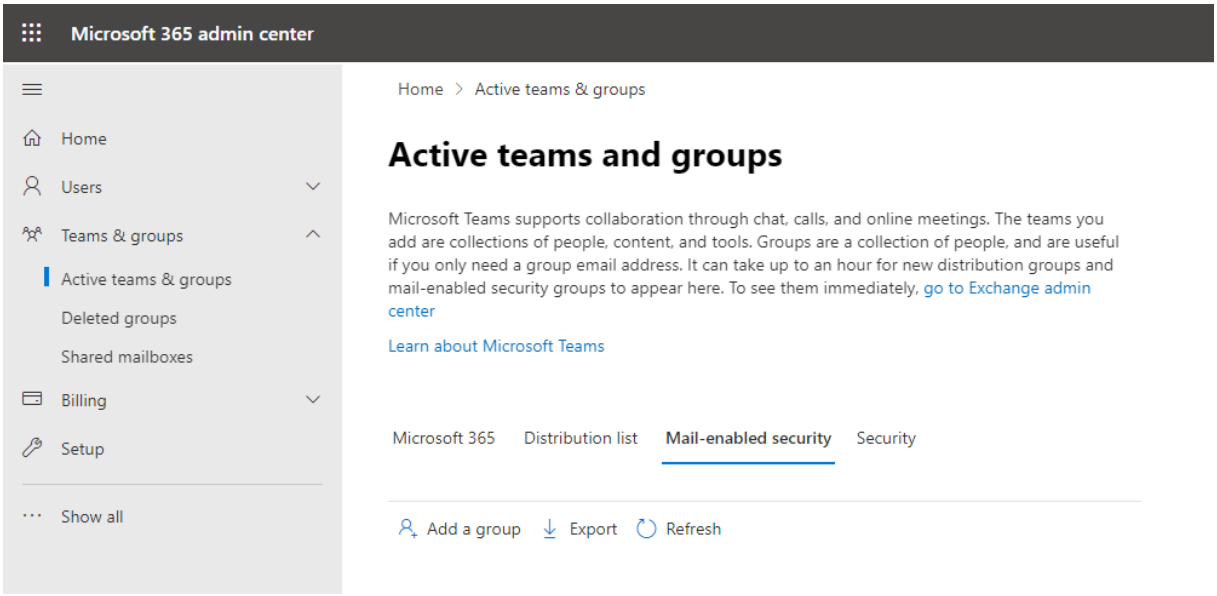
Microsoft Learn: Limiting application permissions to specific Exchange Online mailboxes

https://learn.microsoft.com/en-us/graph/auth-limit-mailbox-access

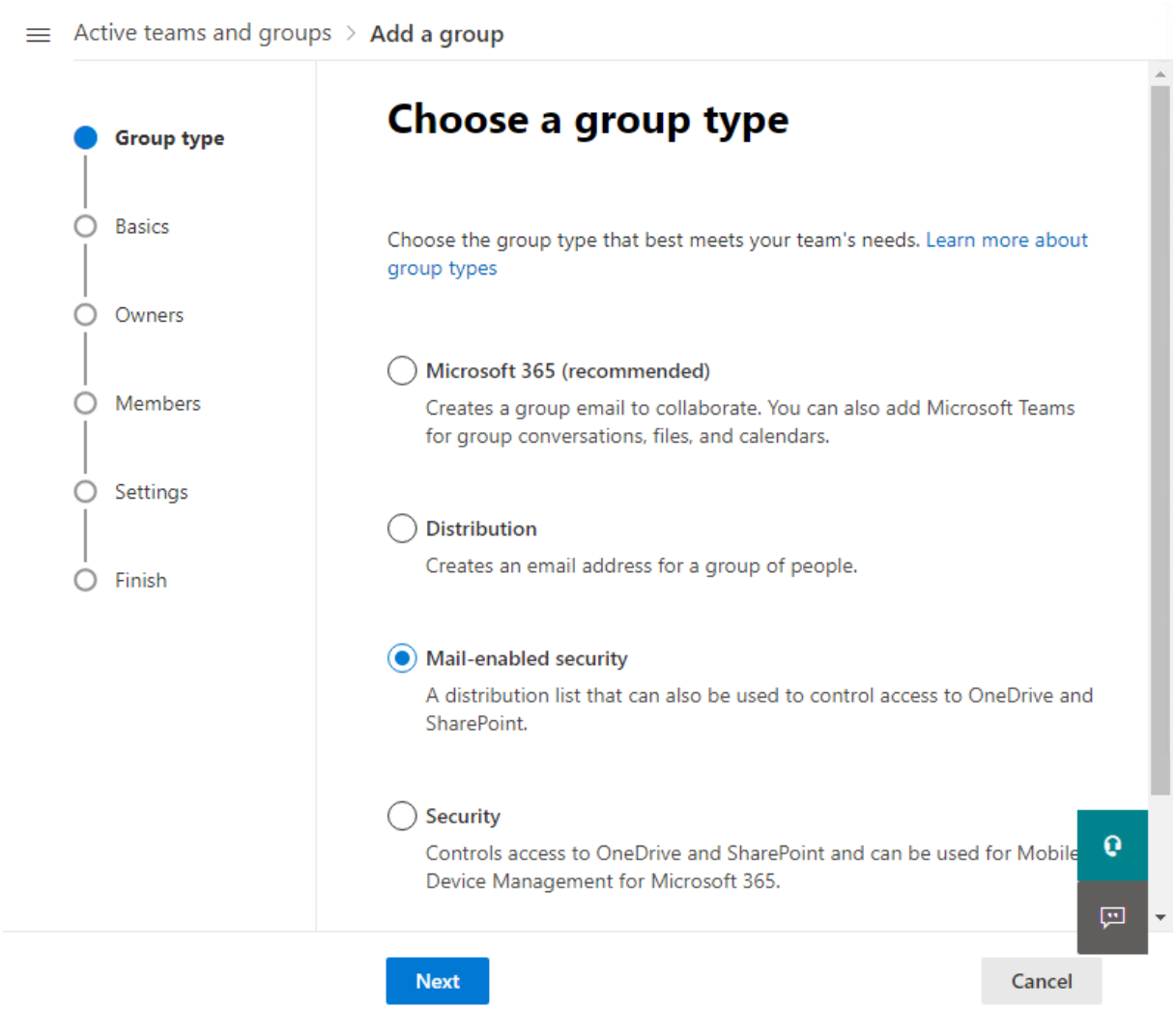
Configure a mail-enabled security group

A mail-enabled security group is needed in Exchange Online for the restriction. The application has access to the mailboxes of such a mail-enabled security group, if an **application access policy** is configured for the application.

A mail-enabled security group can be created in the **Microsoft 365 admin center** or the **Exchange admin center** of Exchange Online.

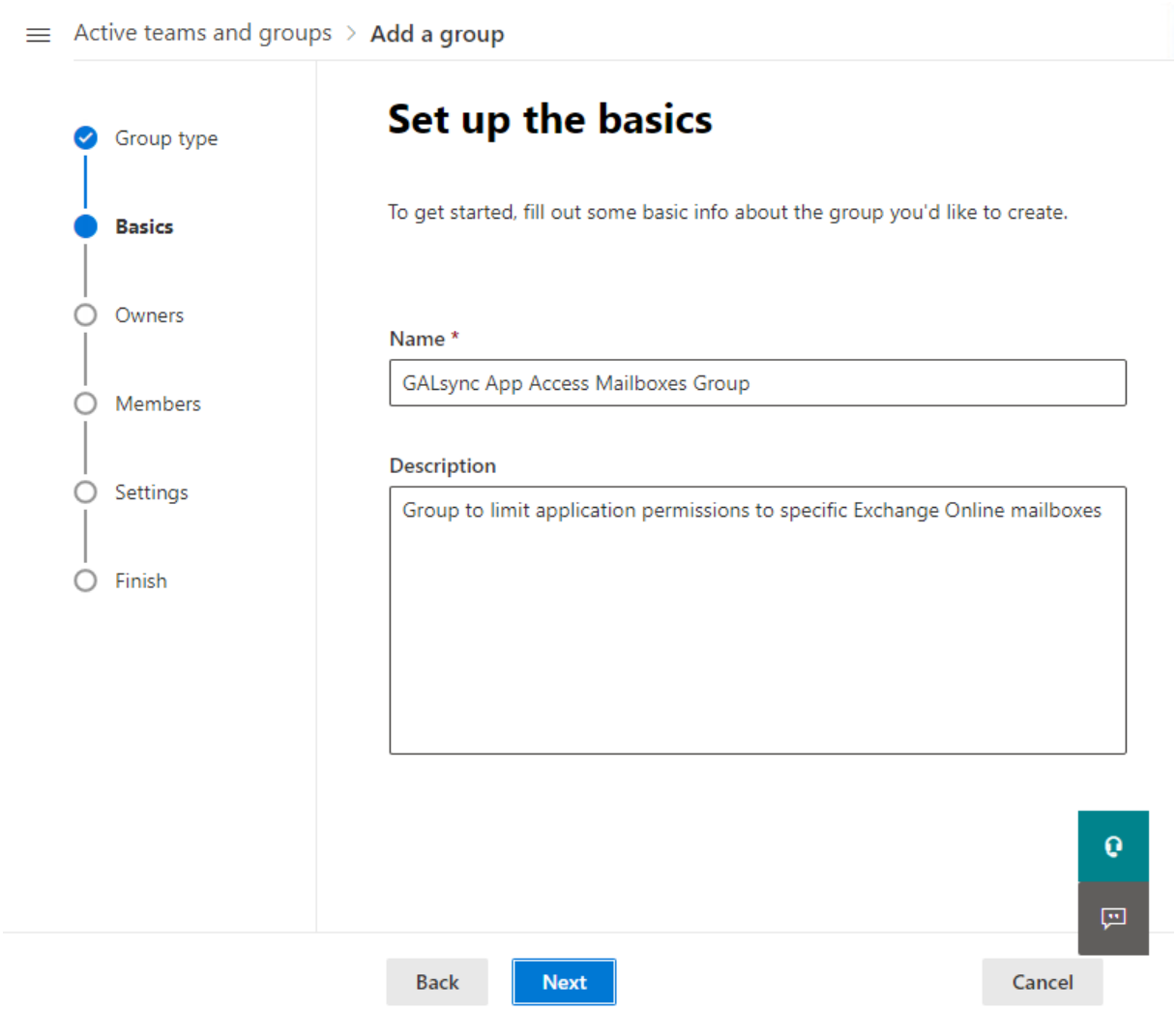


Add a group and select **Mail-enabled security**.

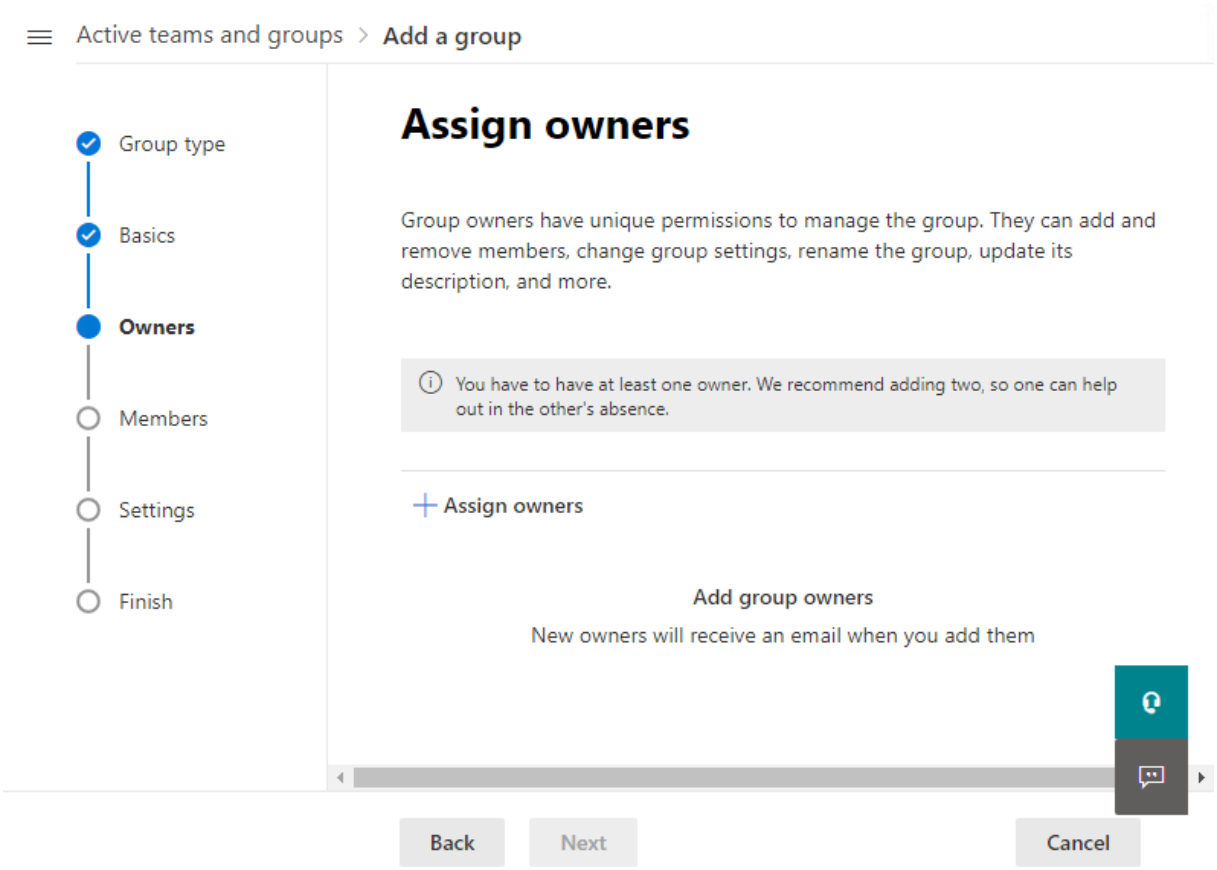


Insert a **Name** and a **Description** for the group.

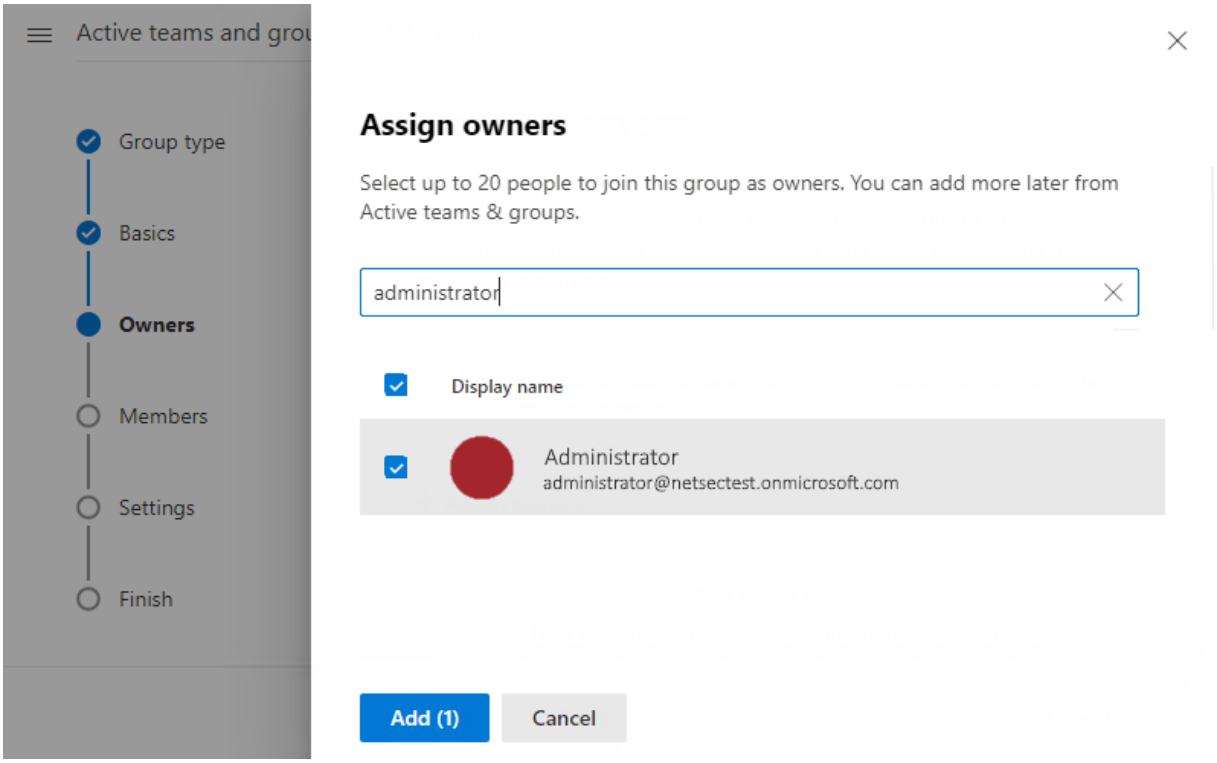
A description helps to know, which mailboxes this mail-enabled security group should contain.



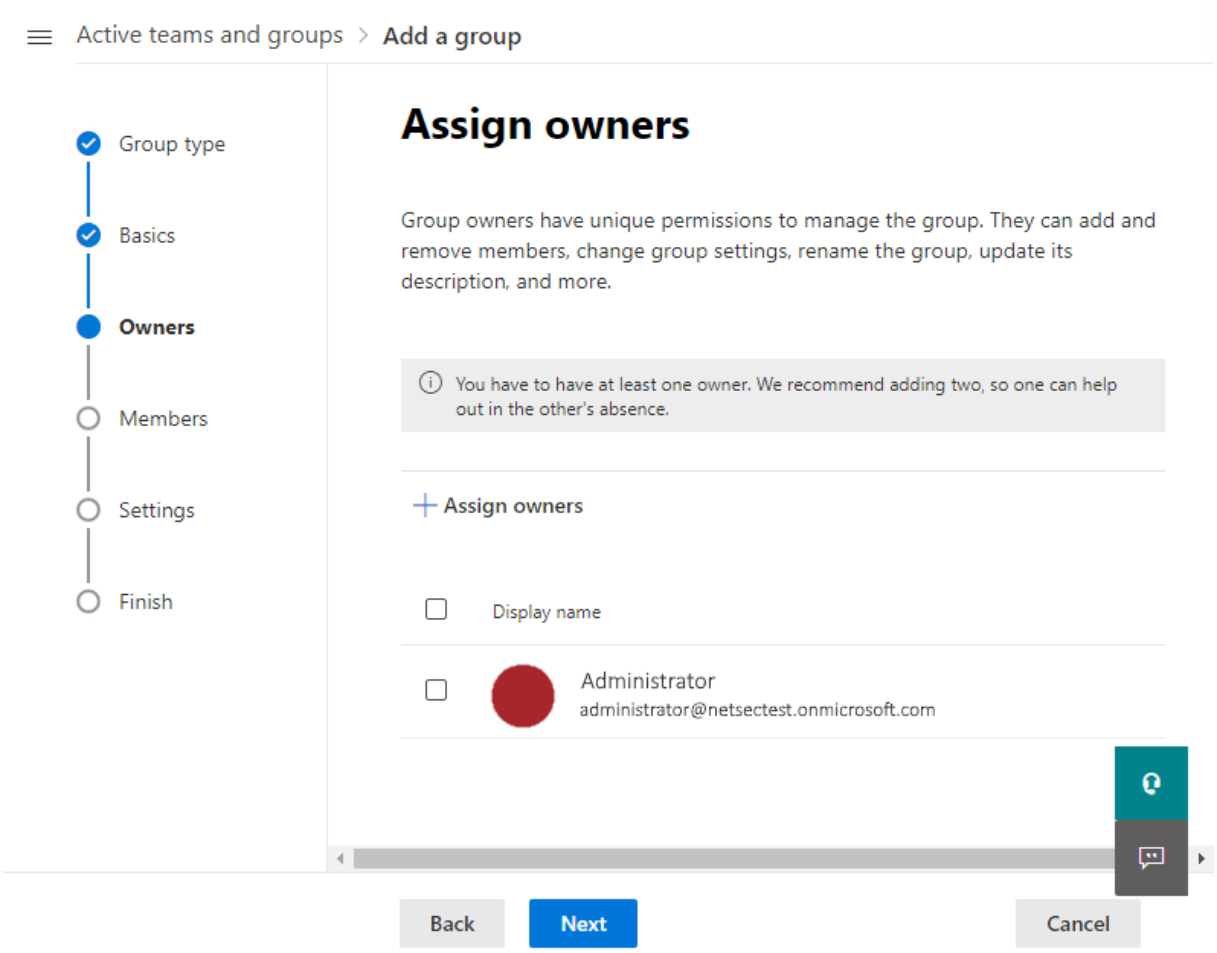
Assign owners for this group



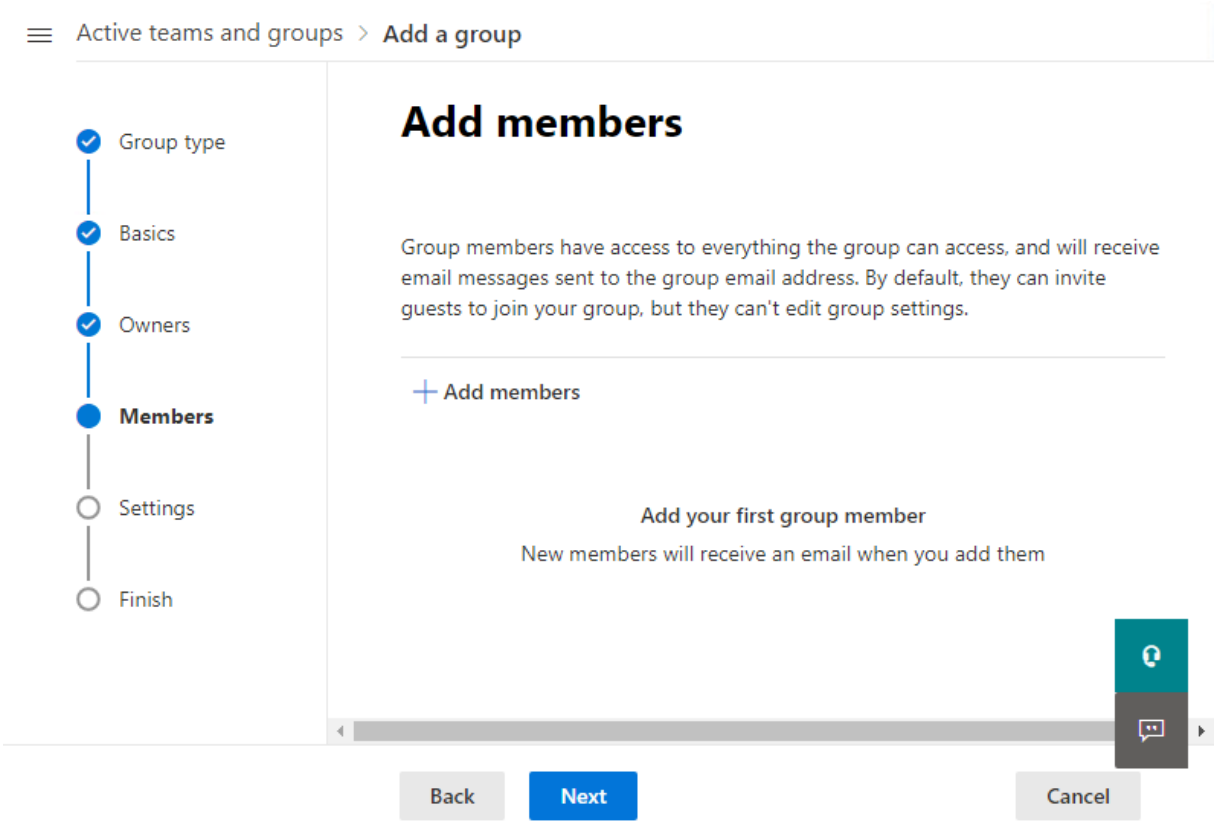
Click **Assign owners** to select the owner of the group.



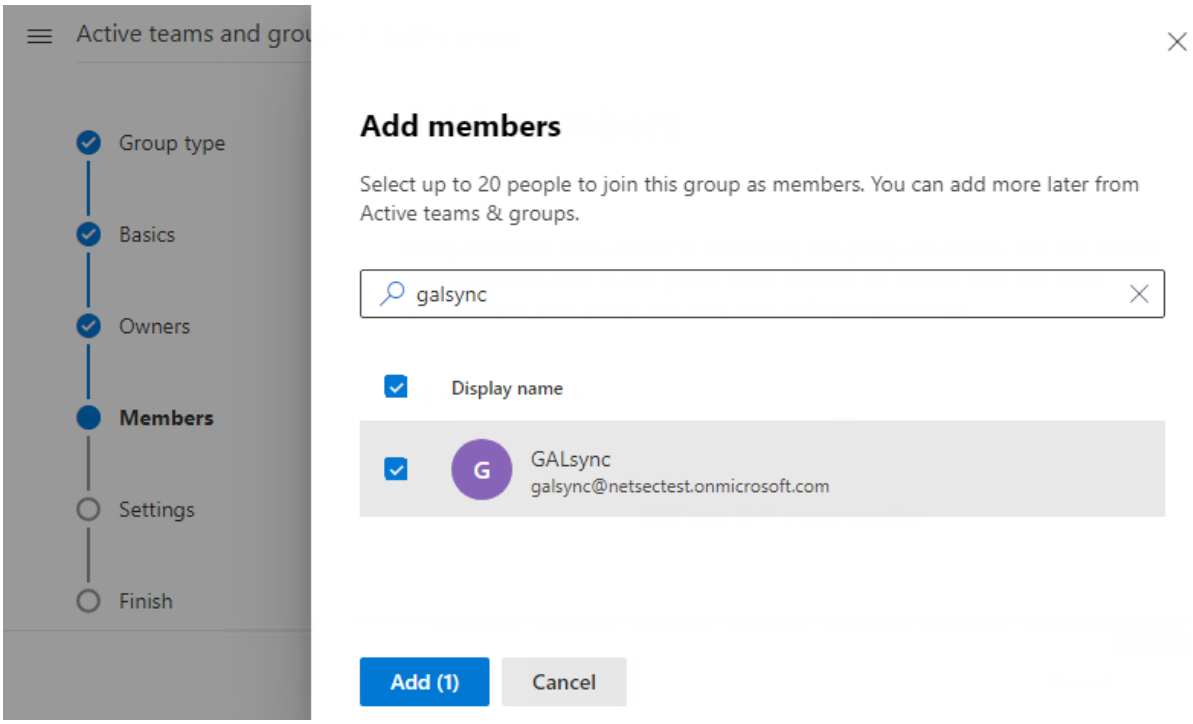
For example, the owner of this group is the Administrator. Click **Next**



Click **Add members** and search for only the mailboxes, which the application should have access to.

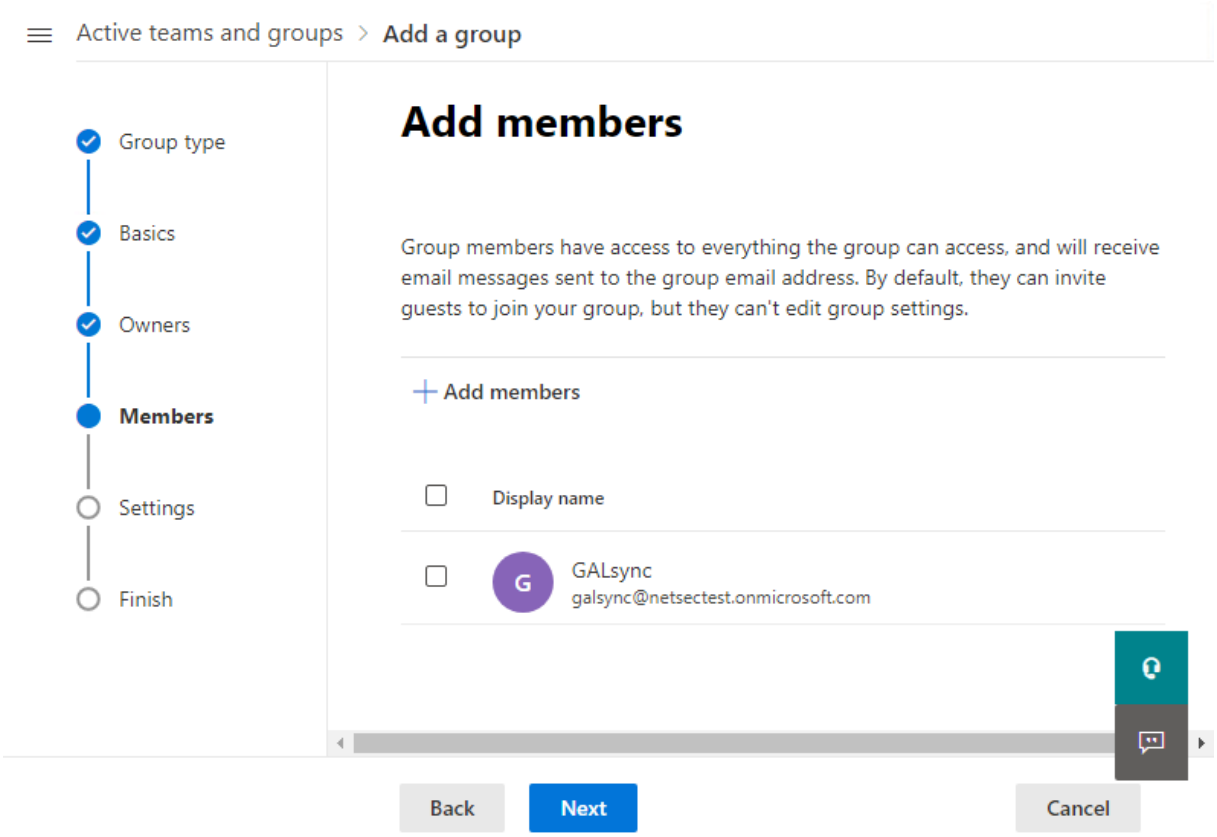


Add the mailbox account(s) as member(s) of the group.

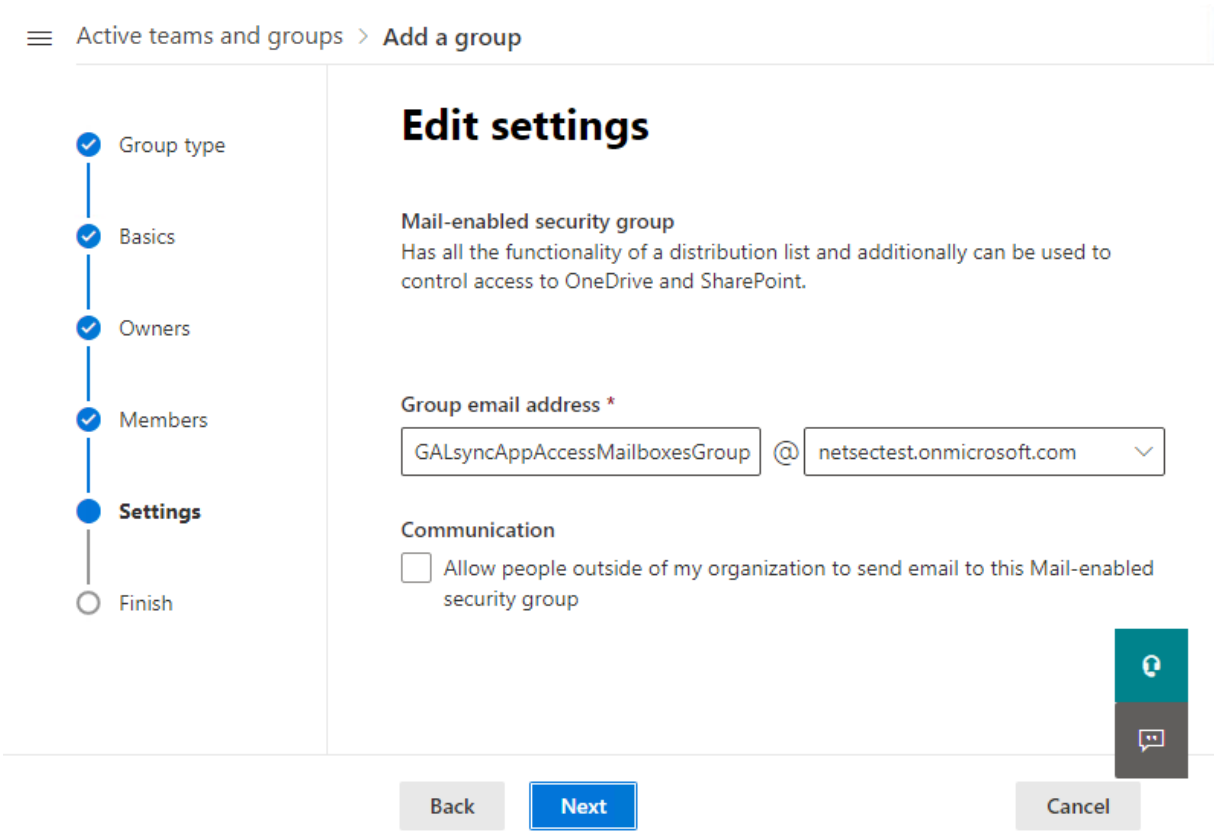


Please note, if contactSync policies are configured, the application needs access to all the Exchange mailboxes, which should receive the contacts.

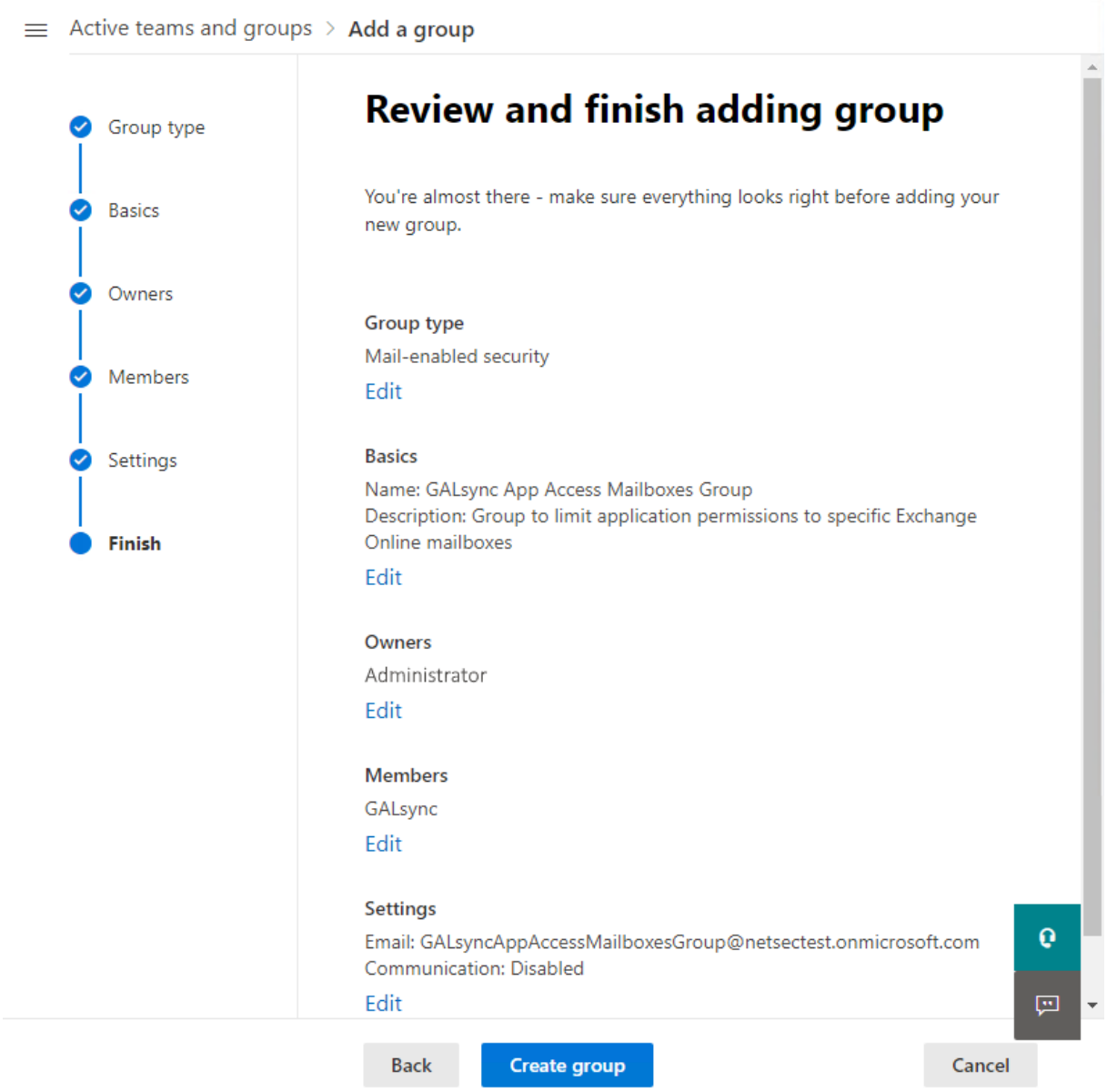
For example, the GALsync mailbox is the only member of this mail-enabled security group. Click **Next**



Insert the **Group email address**

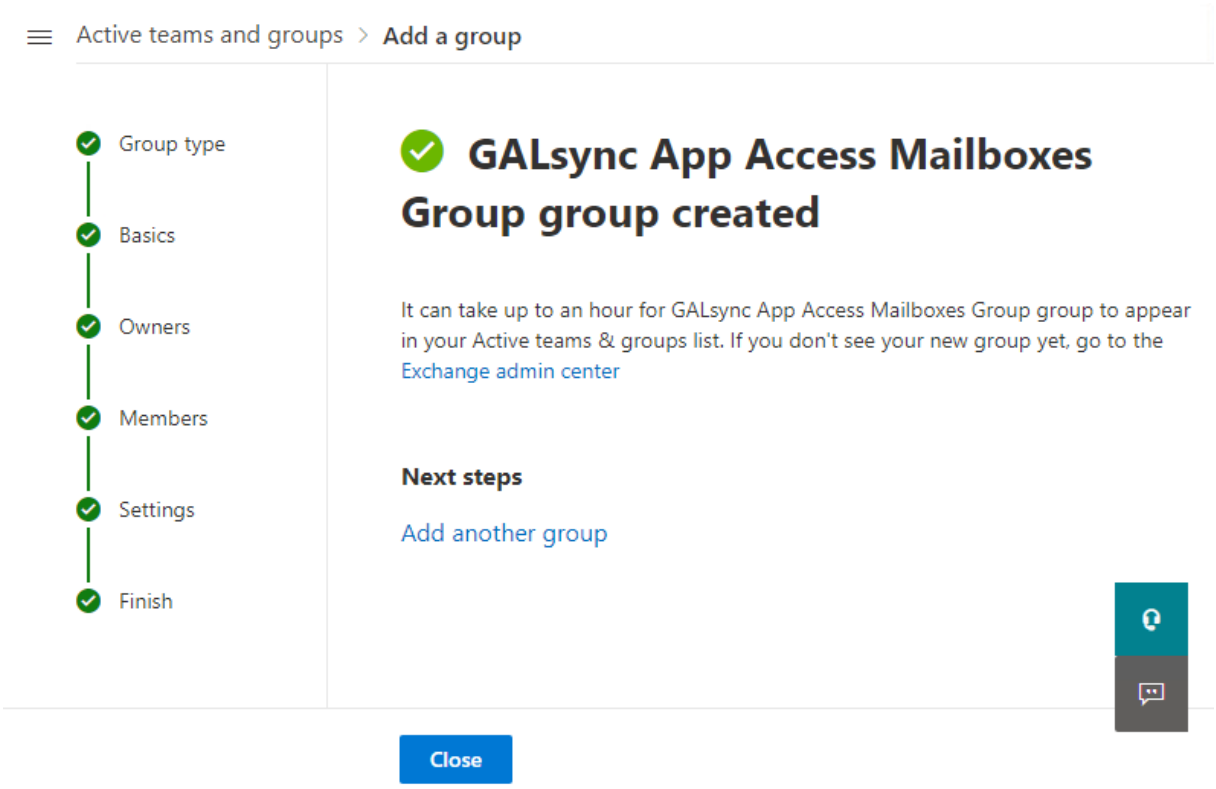


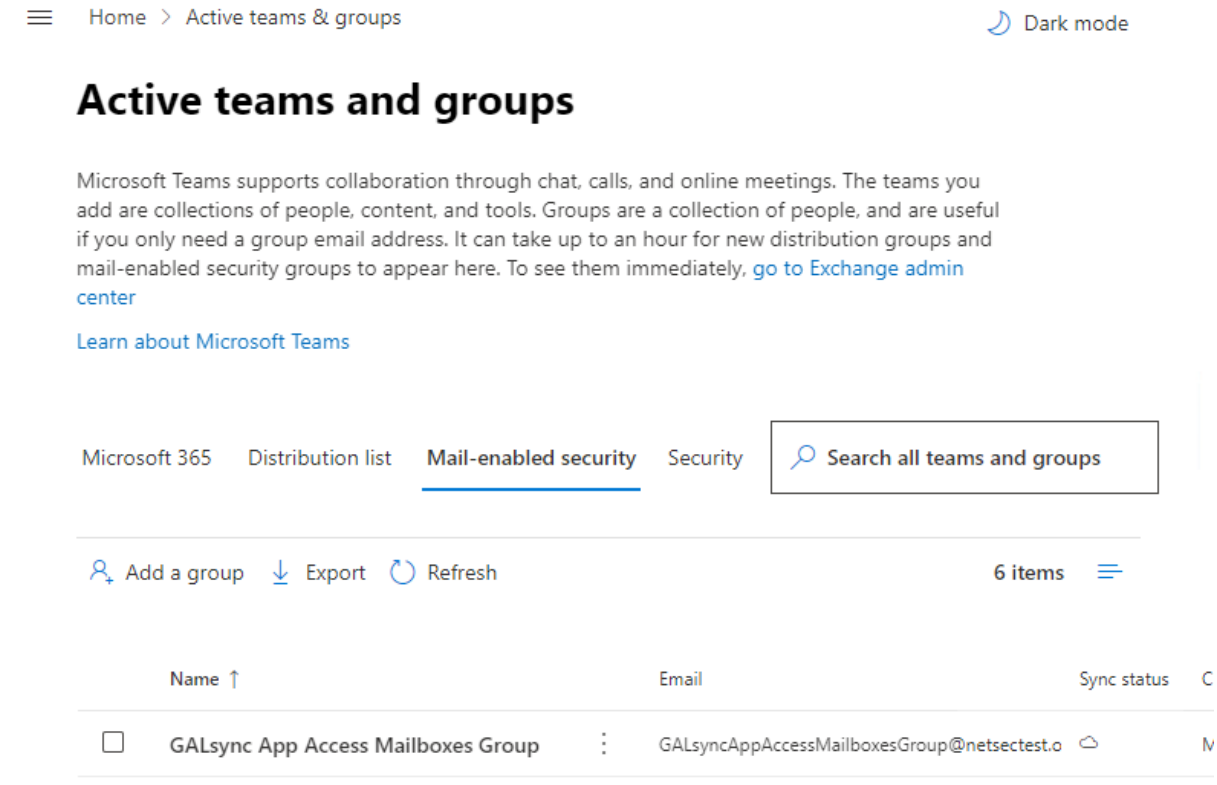
Review and confirm the configuration is correct and click **Create group**.



Please note, if contactSync policies are configured, the application needs access to all the Exchange mailboxes, which should receive the contacts.

If the mail-enabled security group is created successfully, it can be used for the **Application Access Policy**.





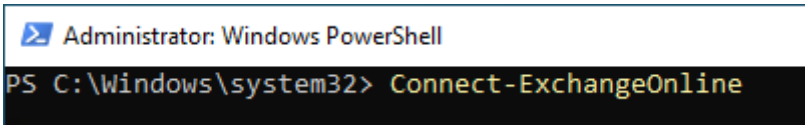
Configure Application Access Policy

To configure an application access policy and limit the scope of application permissions.

The **application access policy** for the application can be created via **Exchange Online PowerShell module**.

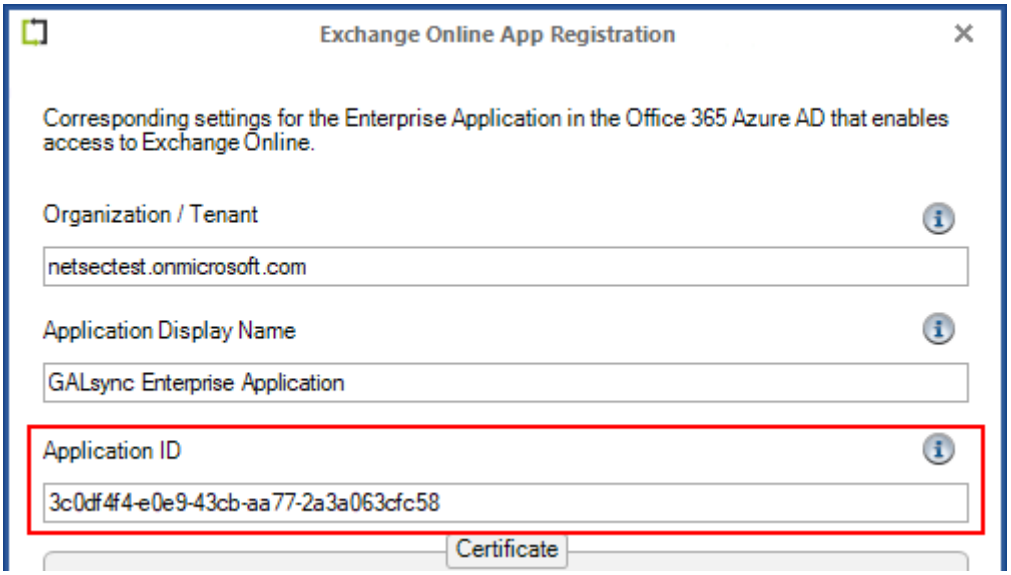
To do this, connect to Exchange Online via **Exchange Online PowerShell** as an **Exchange Administrator**.

```
Connect-ExchangeOnline;
```

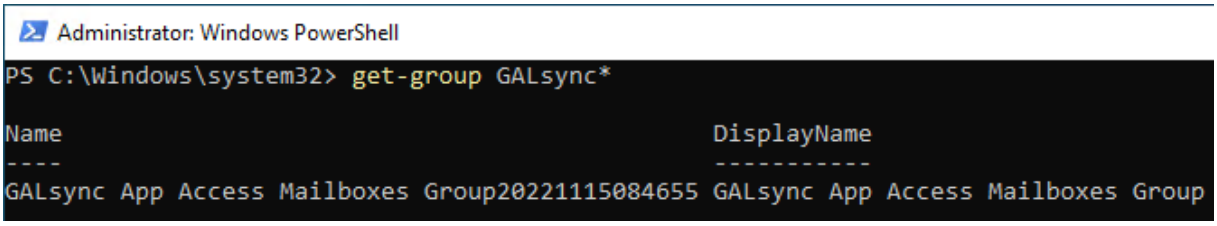


The **New-ApplicationAccessPolicy** command takes the **Application ID** of the registered application (App registrations) and the **mail-enabled security group** created as parameters.

For example:



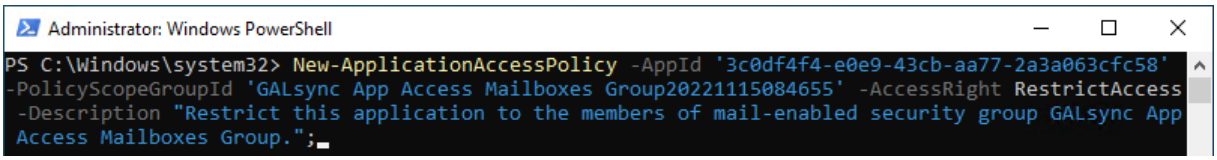
For example, get the name of the mail-enabled security group:



Create the **application access policy**.

For example:

```
New-ApplicationAccessPolicy -AppId '<Application ID>' -PolicyScopeGroupId '<group name>' -AccessRight RestrictAccess -Description "Restrict this application to the members of mail-enabled security group GALsync App Access Mailboxes Group.";
```



The application can only access the mailboxes that are member of the mail-enabled security group by the created **application access policy**.

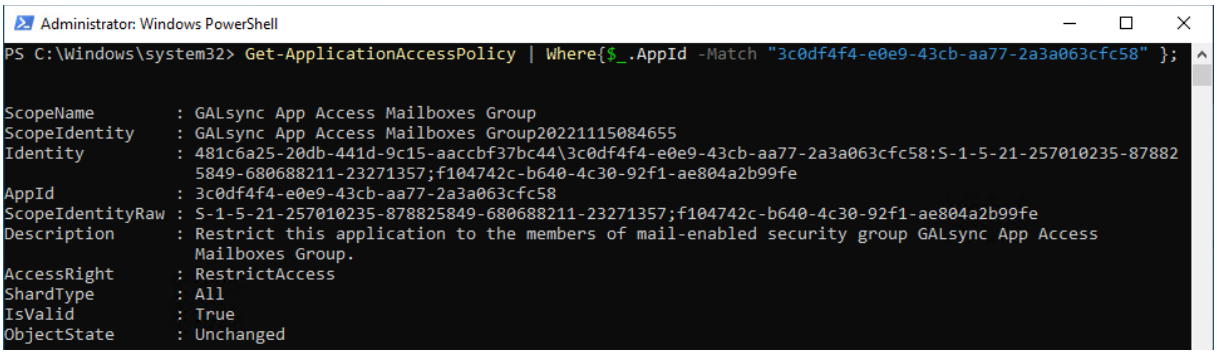
In this example only the mailbox of the service account is a member of the group.

Get existing application access policy for the application

The **Get-ApplicationAccessPolicy** command takes the **Application ID** of the application (App registrations) as parameter.

For example:

```
Get-ApplicationAccessPolicy | Where{$_.AppId -Match "<Application ID>" };
```



The application can only access the mailboxes that are a member of the mail-enabled security group by the existing **application access policy**.

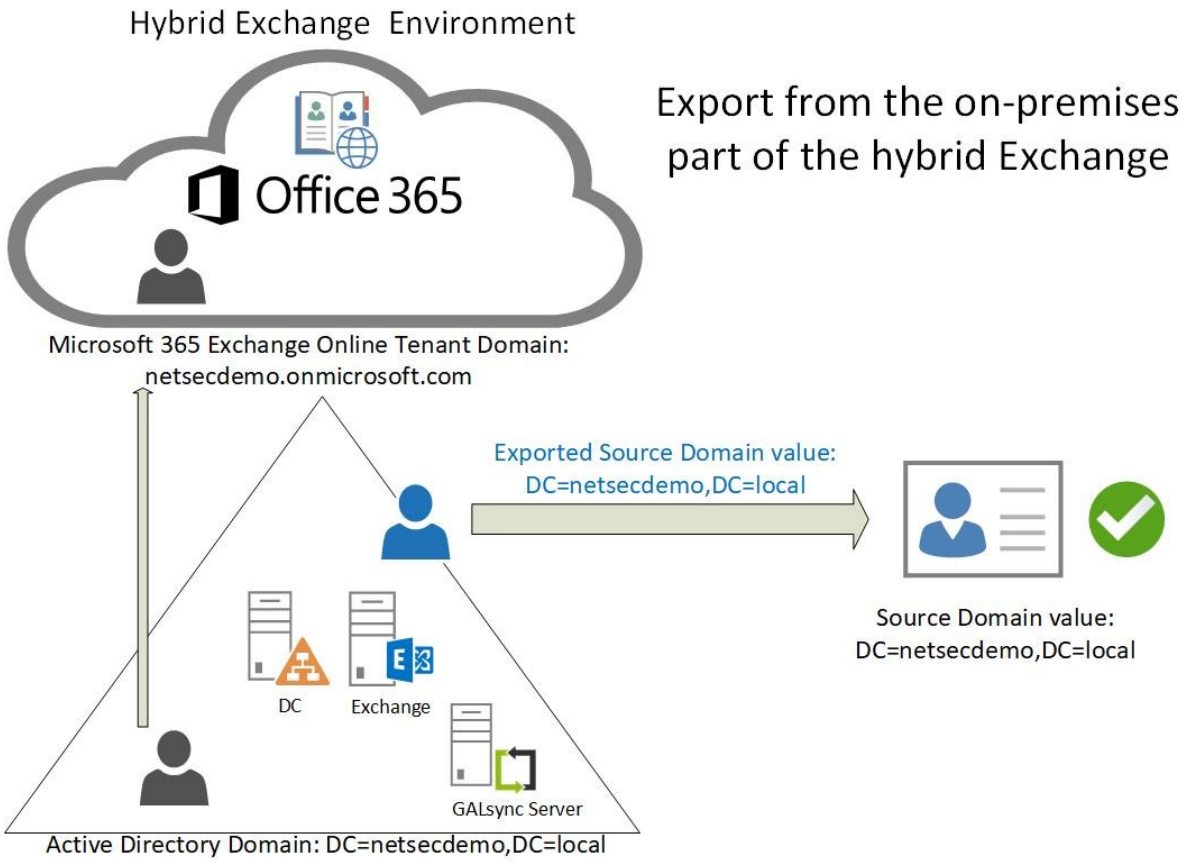
In this example only the mailbox of the service account is a member of the group.

Please note, if contactSync policies are configured, the application needs access to all the Exchange mailboxes, which should receive the contacts.

How to migrate the source of the export policy in a hybrid Exchange environment

GALsync synchronization set up

The GALsync export policy exports mail-enabled objects from the on-premises component of a hybrid Exchange environment for the partners. The partners import these objects as mail contacts with the source domain value of the on-premises Active Directory domain name of the source environment.



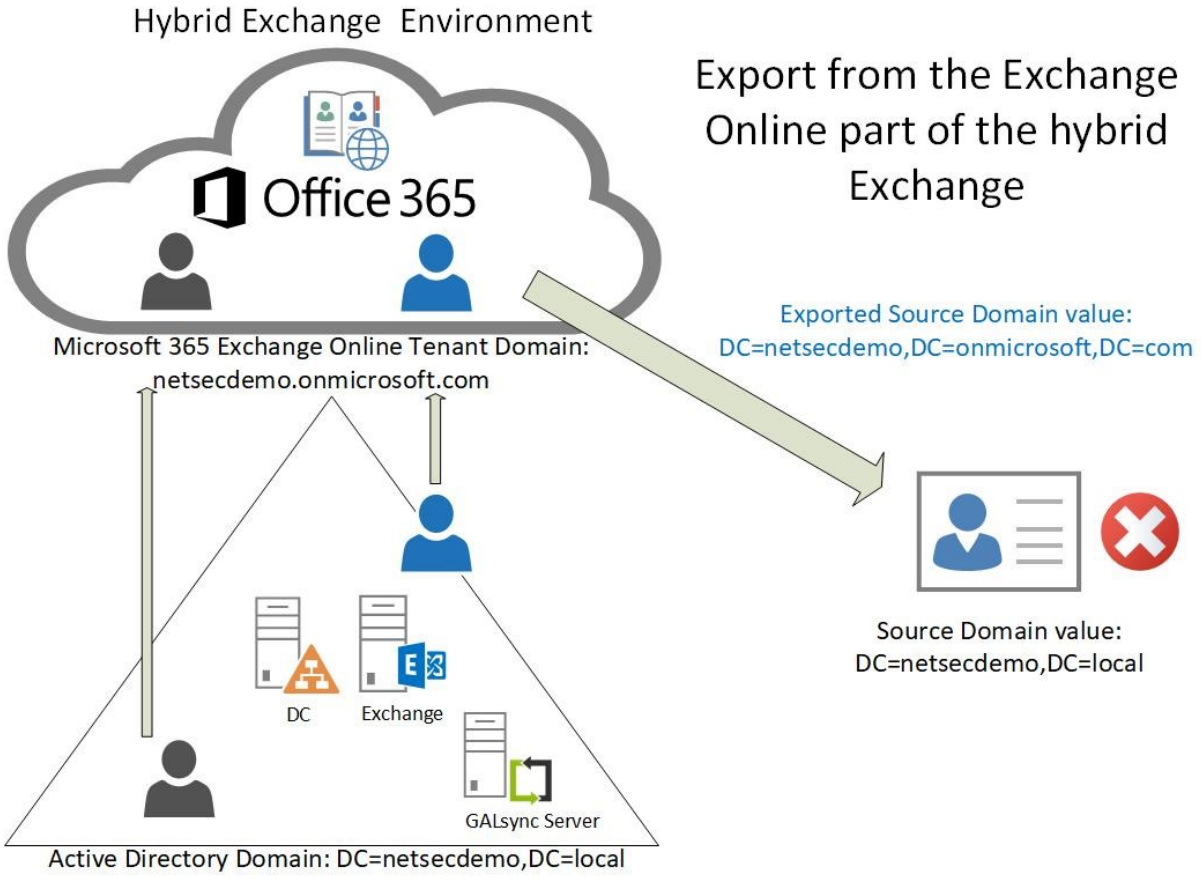
Changed requirement for export policy

The export of the mail-enabled objects for the partners should change from the on-premises component of a hybrid Exchange environment to the Exchange Online component of the hybrid Exchange environment.

Problem of changed requirement at export for the importing partners

GALsync exports the corresponding objects from the Exchange Online component of the hybrid Exchange environment instead of the mail-enabled objects from the on-premises component of a hybrid Exchange environment. The source domain of the exported objects are also changed from the Active Directory domain name to the Microsoft 365 Exchange Online Tenant domain name.

The partners import these objects and the existing mail contacts of these objects will not be synchronized, because the source domain values are different.



Configuration of the export to prevent the problems with the importing partners

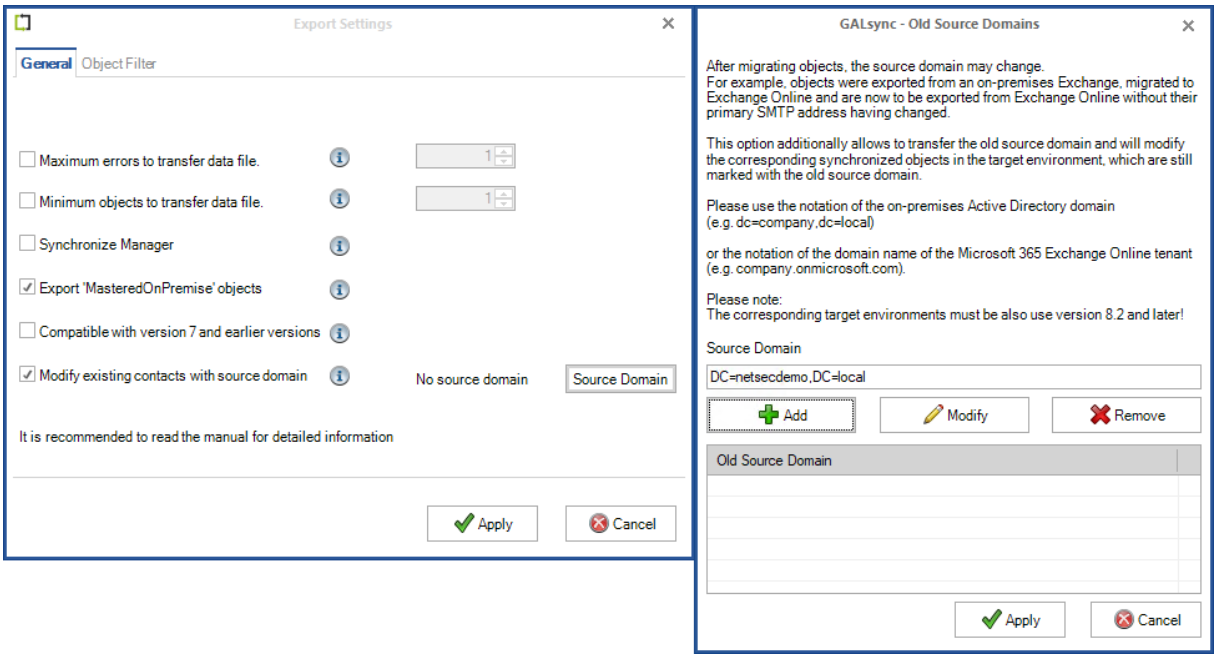
If the source domain changed in the source environment, GALsync will not synchronize existing objects with the same primary SMTP address in the target environment, because the source domain value is different. The exporting partner must configure the **Modify existing contacts with source domain** option in the **Export Settings** to inform the old source domain to the importing partners.

Modify existing contacts with source domain

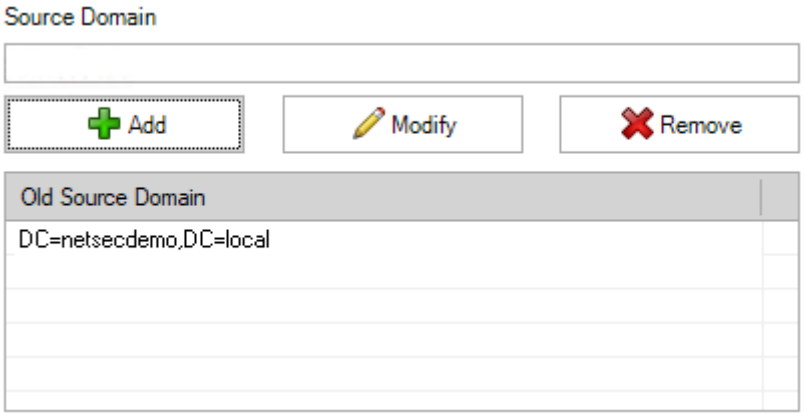
Please note, that the importing partners also need GALsync version 8.2 or later. Otherwise, the importing partners will get warnings or errors and GALsync cannot import the data file.

Enable the **Modify existing contacts with source domain** option at the **Export Settings** dialog.

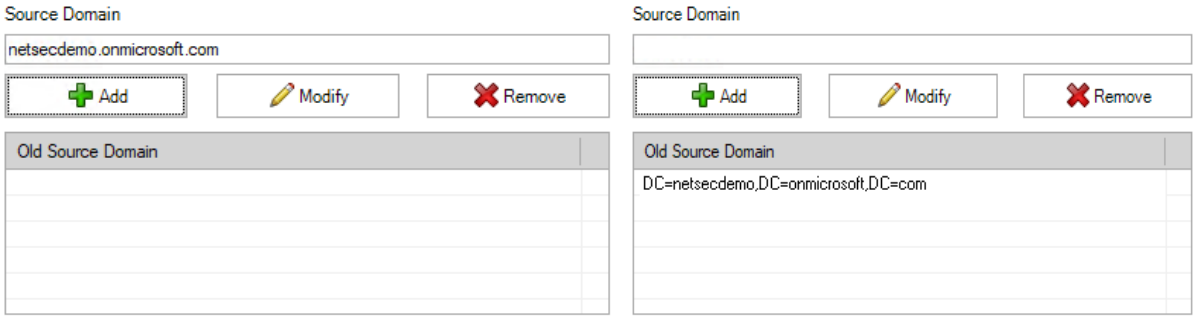
Click **Source Domain** to open the **GALsync – Old Source Domains** dialog.



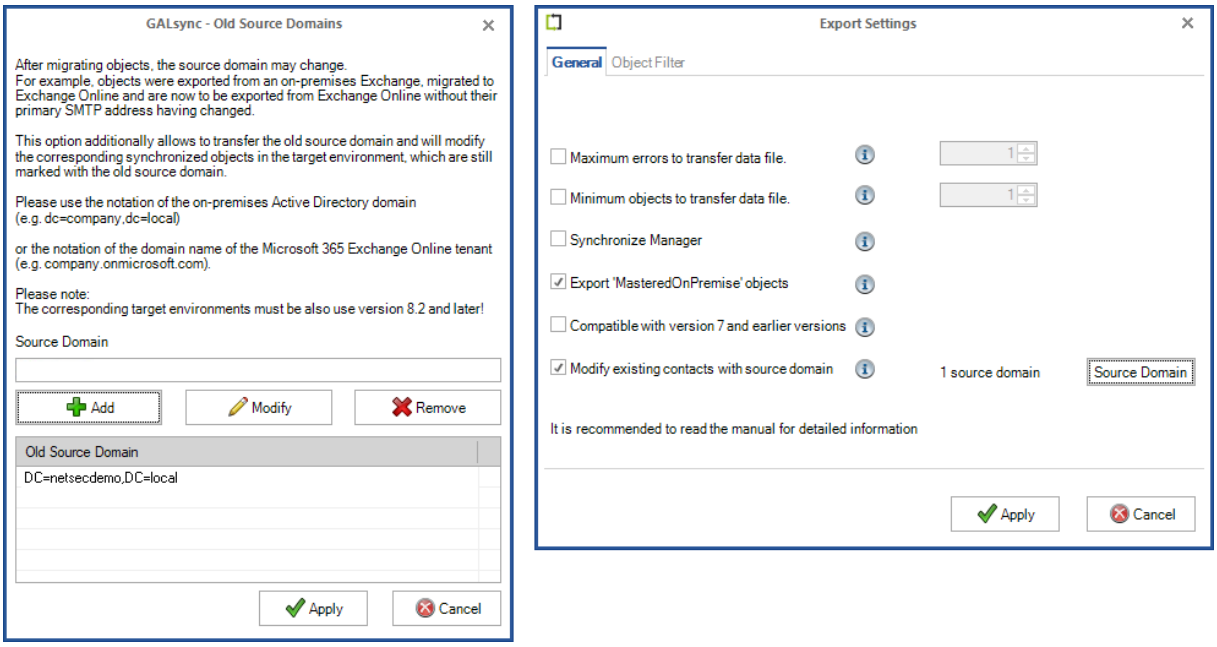
Insert the old source domain value, which is the Active Directory domain name, e.g. `DC=netsecdemo,DC=local`, or the Microsoft 365 Exchange Online tenant domain name.



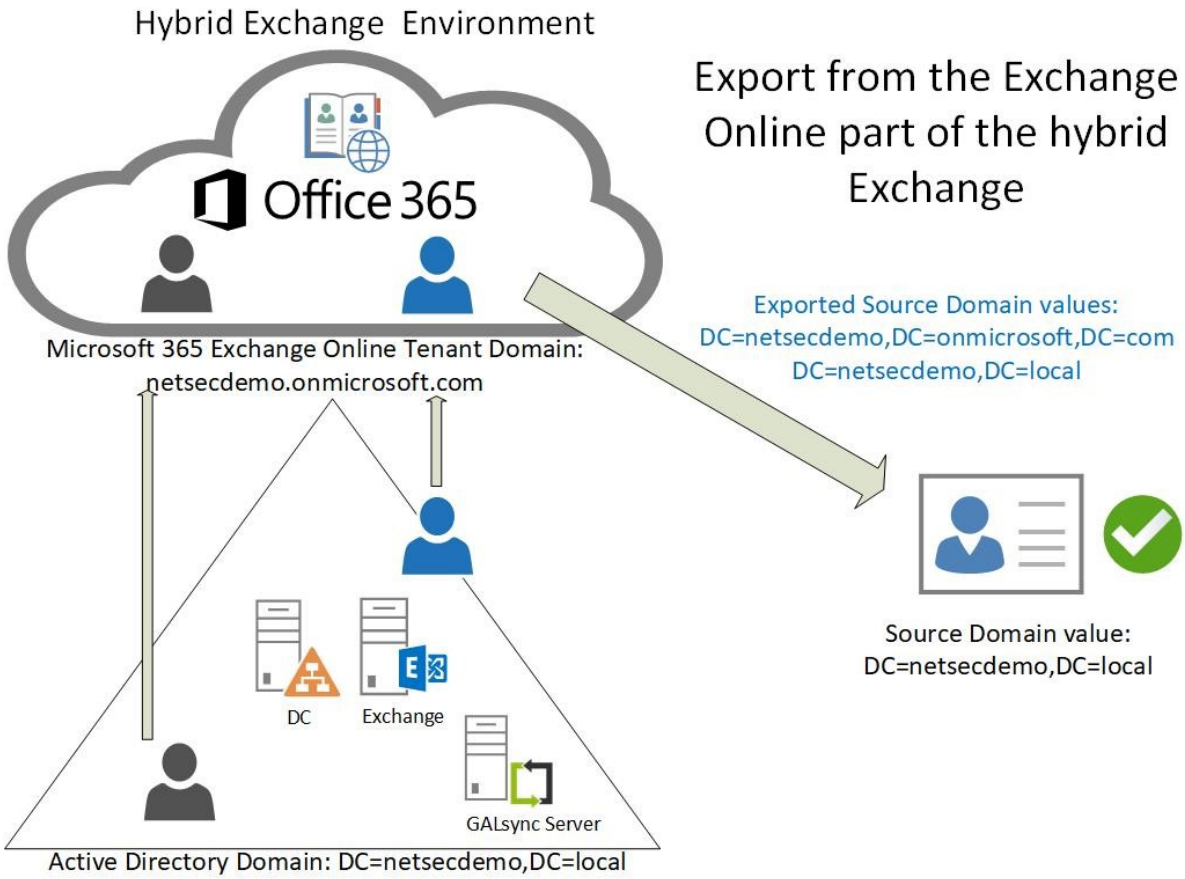
Please note, the source domain syntax `netsecdemo.onmicrosoft.com` will be added as `DC=netsecdemo,DC=onmicrosoft,DC=com` to the list of **Old Source Domain**.



After that click **Apply**.



GALsync will add the old source domain values to the data file during the export, so that existing synchronized objects, which are marked with such old source domain value at the target environment, will be synchronized.



Warnings and Errors in old GALsync 8.1 versions and earlier at the import site

Please note, that the importing partners also need GALsync version 8.2 or later. Otherwise, the importing partners will get warnings or errors and GALsync cannot import the data file.

Here are some possible warnings and errors, which can be occur during the import policy run:

19132 – Warning - Decompress failed

Warning	19132	1	5	GALsyncLibrary.DataFileTransfer.Decompress()	Decompress failed.	Cannot read that as a ZipFile Bad signature (0x003CFEFF) at position 0x00000000

Warning occurs, if an uncompressed data file (.xml) with additional source domain values should be imported.

38002 – Error - Error reading data file. This is no data file: …

Information	19127	187	12	GALsyncLibrary.DataFileTransfer.Decompress()	Data file is compressed. File size: 2888
Information	19128	187	12	GALsyncLibrary.DataFileTransfer.Decompress()	Decompress starting.
Information	19182	187	12	GALsyncLibrary.DataFileTransfer.DeleteDataFile()	Delete data file from C:\Users\galsync\AppData\Local\Temp\tmp5DDB.tmp
Information	19183	187	12	GALsyncLibrary.DataFileTransfer.DeleteDataFile()	Delete data file finished.
Information	38001	187	12	GALsyncLibrary.ADObjectNodeRepository.ReadDataFile()	Start reading data file.
Error	38002	187	12	GALsyncLibrary.ADObjectNodeRepository.ReadDataFile()	Error reading data file. This is no data file: C:\Users\galsync\AppData\Local\Temp\tmp5DDC.tmp
ProcessData	17050	187	12	GALsyncLibrary.PolicyState.cancel()	Cancelling the policy. The cancel method was called from: GALsyncLibrary.ADObjectNodeRepository.ReadDataFile()
Information	41042	187	12	NETsec.RemotePowerShellLibrary.RemotePowerShellManager	0 scripts are in the queue.
ProcessData	41043	187	12	NETsec.RemotePowerShellLibrary.RemotePowerShellManager	The disconnectAll method was called from: GALsyncLibrary.EOImportHandler.PolicyCancel()

Error occurs, if a compressed data file (.zip) with additional source domain values should be imported.

19229 – Error - Data file options available. Please check if a newer version is available.

Information	19066	1	5	GALsyncLibrary.DataFileTransfer.CopyDataFile()	Copy file finished.
Error	19229	1	5	GALsyncLibrary.DataFileTransfer.CkeckFileType()	Data file options available. Please check if a newer version is available.
Information	19127	1	5	GALsyncLibrary.DataFileTransfer.Decompress()	Data file is compressed. File size: 55786
Information	19128	1	5	GALsyncLibrary.DataFileTransfer.Decompress()	Decompress starting.
Warning	19132	1	5	GALsyncLibrary.DataFileTransfer.Decompress()	Decompress failed.

Error occurs, if the export partner uses a newer GALsync version with a new data file option, which the GALsync version at the import site cannot handle.

Please update to the latest GALsync version.

How to create a Dynamic Distribution Group by using the Exchange PowerShell

On-premises Exchange

Use the Exchange Management Shell of the on-premises Exchange to create the Dynamic Distribution Group

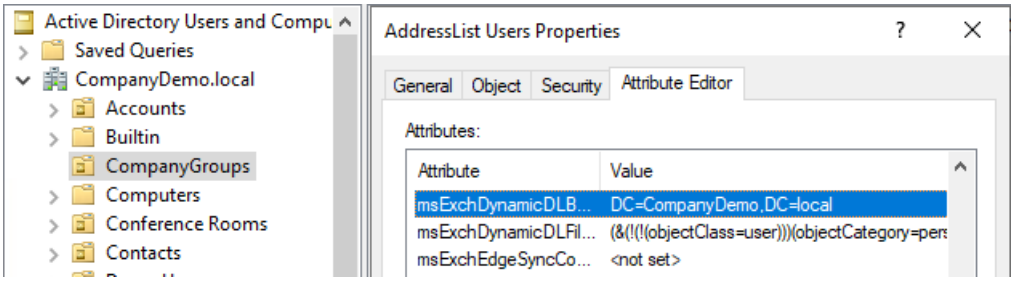
Create Dynamic Distribution Group for Mailbox Users Which are Shown in the Address List

A Dynamic Distribution Group containing Mailbox users which are not hidden from the Address List is created in the **CompanyGroups** OU, and will search the entire Active Directory.

Please adjust the Active Directory domain name and the OU name to your environment.

```
New-DynamicDistributionGroup -Name "AddressList Users" -RecipientFilter
{(RecipientType -eq 'UserMailbox' -and (HiddenFromAddressListsEnabled -eq $false))}
-RecipientContainer "CompanyDemo.local" -OrganizationalUnit "CompanyGroups"
```

Check it in the on-premises Active Directory:



msExchDynamicDLBaseDN start searching at this point of the Active Directory

msExchDynamicDLFilter corresponding LDAP-Filter for the AD search

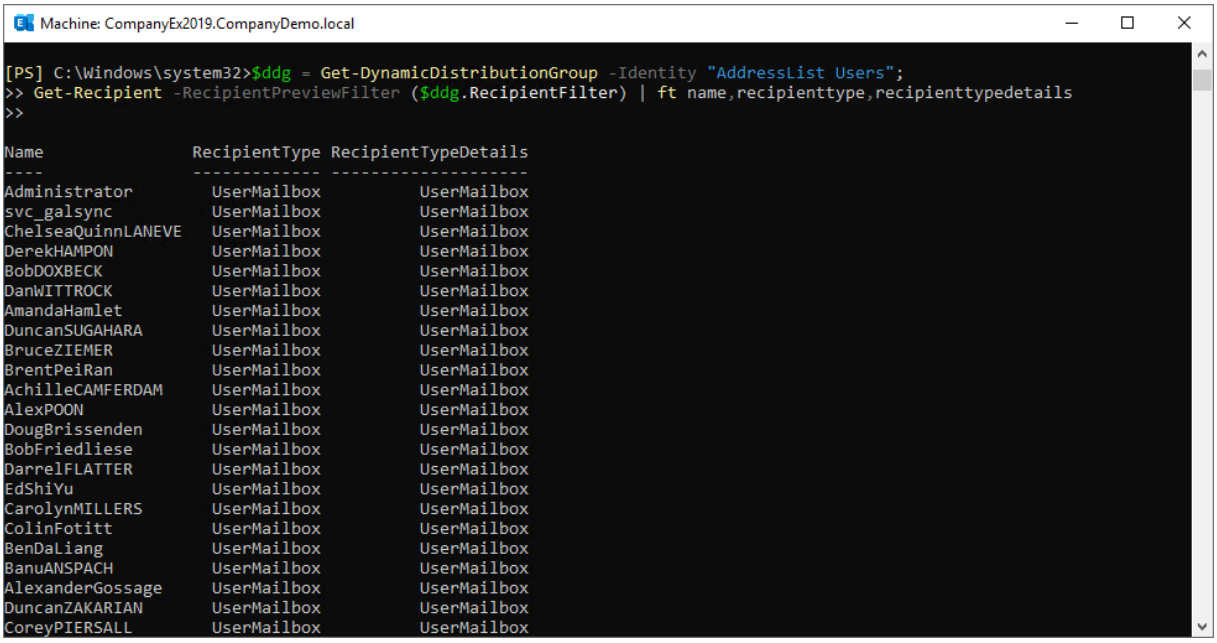
For example: mailbox users not hidden from the Address List

```
(&(!(!(objectClass=user)))(objectCategory=person)(mailNickname=*)(msExchHomeServerName=*)(!(msExchHideFromAddressLists=TRUE))(!(name=SystemMailbox{*))(!(name=CAS_{*))(!(msExchRecipientTypeDetails=16777216))(!(msExchRecipientTypeDetails=536870912))(!(msExchRecipientTypeDetails=68719476736))(!(msExchRecipientTypeDetails=8388608))(!(msExchRecipientTypeDetails=4398046511104))(!(msExchRecipientTypeDetails=70368744177664))(!(msExchRecipientTypeDetails=140737488355328)))
```

To verify membership of the group, please run the following script:

```
$ddg = Get-DynamicDistributionGroup -Identity "AddressList Users";
Get-Recipient -RecipientPreviewFilter ($ddg.RecipientFilter) | ft
name,recipienttype,recipienttypedetails
```

Output displayed below:



Modify Dynamic Distribution Group for mailbox users which are shown in the address list excluding resource mailboxes

The recipient filter is modified to also exclude Resource Mailboxes by running the **Set-DynamicDistributionGroup** cmdlet

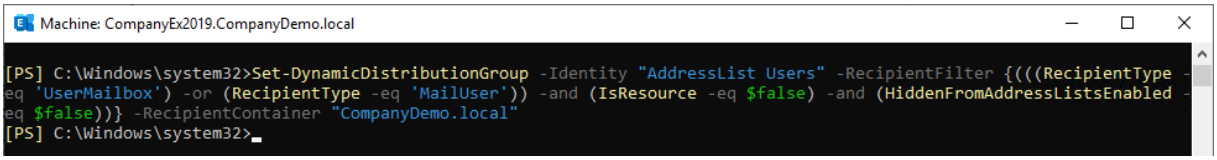
```
Set-DynamicDistributionGroup Set-DynamicDistributionGroup -Identity "AddressList Users" -RecipientFilter {(RecipientType -eq 'UserMailbox'-and (IsResource -eq $false) -and (HiddenFromAddressListsEnabled -eq $false))} -RecipientContainer "CompanyDemo.local"
```

Create Dynamic Distribution Group for mailbox users and mail users which are shown in the address list

```
New-DynamicDistributionGroup -Name "AddrssList Users" -RecipientFilter
{(((RecipientType -eq 'UserMailbox') -or (RecipientType -eq 'MailUser')) -and
(HiddenFromAddressListsEnabled -eq $false))} -RecipientContainer
"CompanyDemo.local" -OrganizationalUnit "CompanyGroups"
```

Modify Dynamic Distribution Group for mailbox users and mail users which are shown in the address list excluding resource mailboxes

The recipient filter is modified to also exclude Resource Mailboxes by running the **Set-DynamicDistributionGroup** cmdlet




```
Set-DynamicDistributionGroup -Identity "AddressList Users" -RecipientFilter
{(((RecipientType -eq 'UserMailbox') -or (RecipientType -eq 'MailUser')) -and
(IsResource -eq $false) -and (HiddenFromAddressListsEnabled -eq $false))} -
RecipientContainer "CompanyDemo.local"
```

Exchange Online

Use the Exchange Online PowerShell to create the Dynamic Distribution Group in Exchange Online

Windows PowerShell 5.1 with the Exchange Online PowerShell module:

```
Connect-ExchangeOnline
```

Create Dynamic Distribution Group for Mailbox Users Which are Shown in the Address List

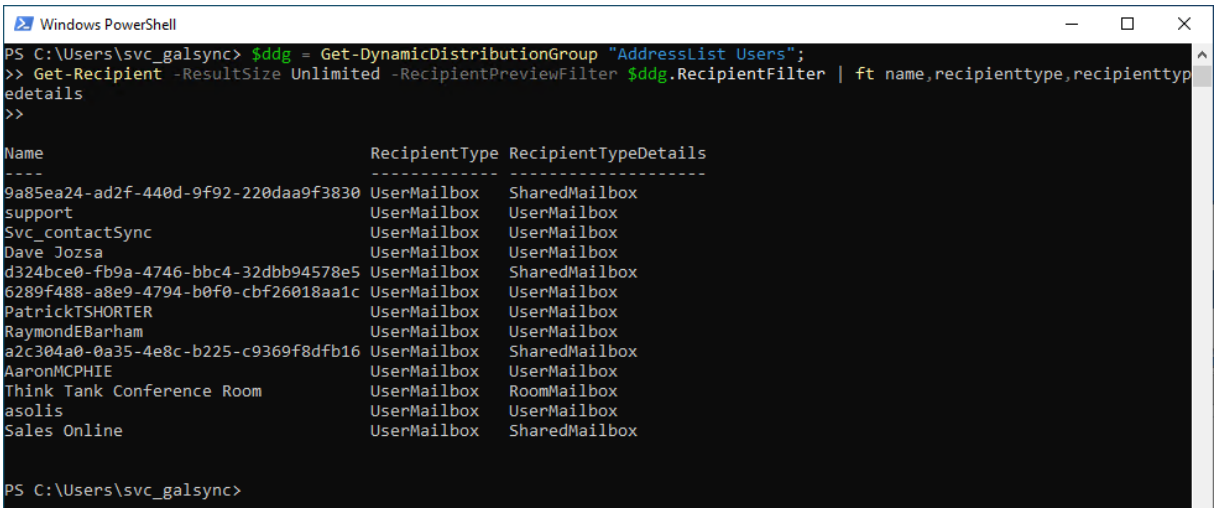
Mailbox users which are not hidden from the Address List

```
New-DynamicDistributionGroup -Name "AddressList Users" -RecipientFilter
{(RecipientType -eq 'UserMailbox' -and (HiddenFromAddressListsEnabled -eq $false))}
```

To verify membership of the group, please run the following script:

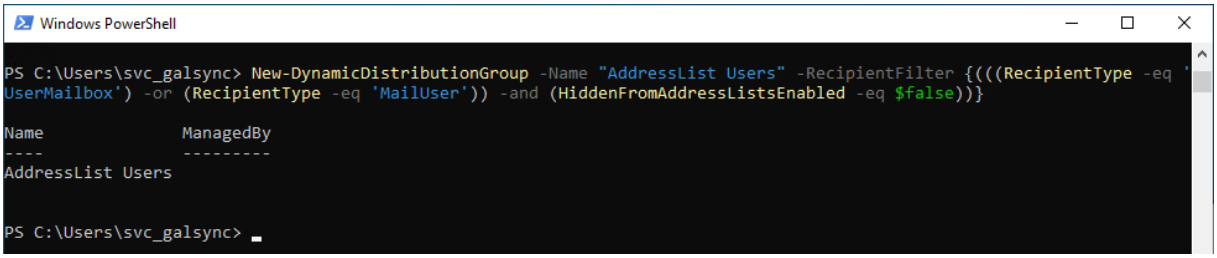
```
$ddg = Get-DynamicDistributionGroup "AddressList Users";
Get-Recipient -ResultSize Unlimited -RecipientPreviewFilter $ddg.RecipientFilter |
ft name,recipienttype,recipienttypedetails
```

Output displayed below:



Create Dynamic Distribution Group for Mailbox Users and Mail Users which are Shown in the Address List

Mailbox users and Mail Users which are not hidden from the address list.

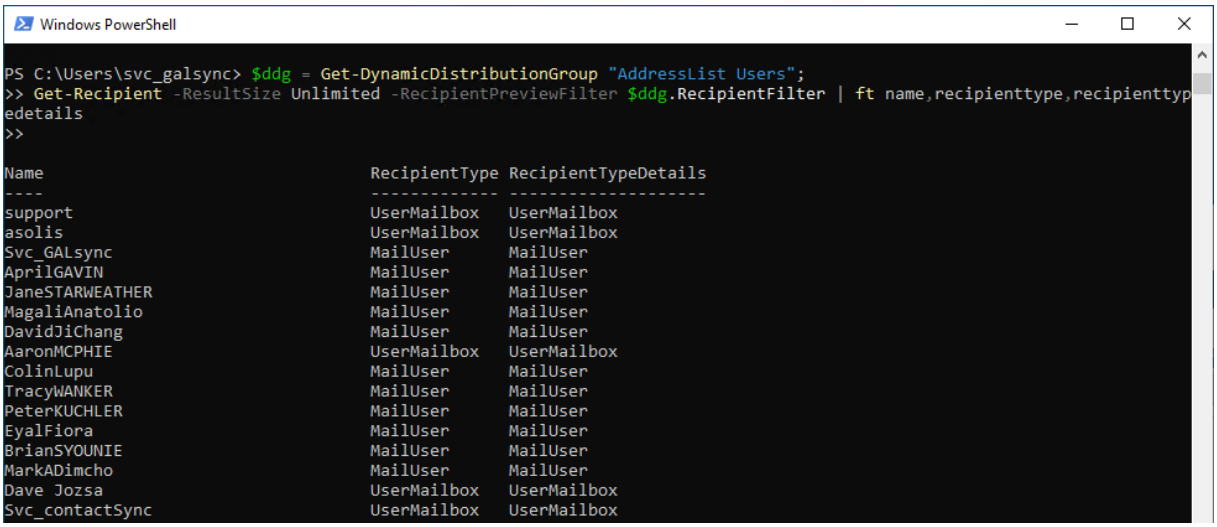



```
New-DynamicDistributionGroup -Name "AddressList Users" -RecipientFilter
{(((RecipientType -eq 'UserMailbox') -or (RecipientType -eq 'MailUser')) -and
(HiddenFromAddressListsEnabled -eq $false))}
```

To verify membership of the group, please run the following script:

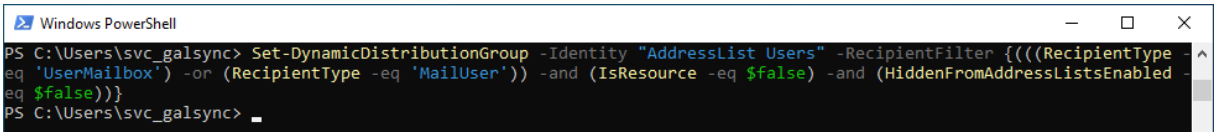
```
$ddg = Get-DynamicDistributionGroup "AddressList Users";
Get-Recipient -ResultSize Unlimited -RecipientPreviewFilter $ddg.RecipientFilter |
ft name,recipienttype,recipienttypedetails
```

Output displayed below:



Modify Dynamic Distribution Group for Mailbox Users and Mail Users which are Shown in the Address List to Exclude Resource Mailboxes

The recipient filter is modified to also exclude Resource Mailboxes by running the **Set-DynamicDistributionGroup** cmdlet




```
Set-DynamicDistributionGroup -Identity "AddressList Users" -RecipientFilter
{(RecipientType -eq 'UserMailbox'-and (IsResource -ne $true) -and
(HiddenFromAddressListsEnabled -ne $true))}
```

How to analyze object matches in the log file which GALsync uses during the import to update existing objects

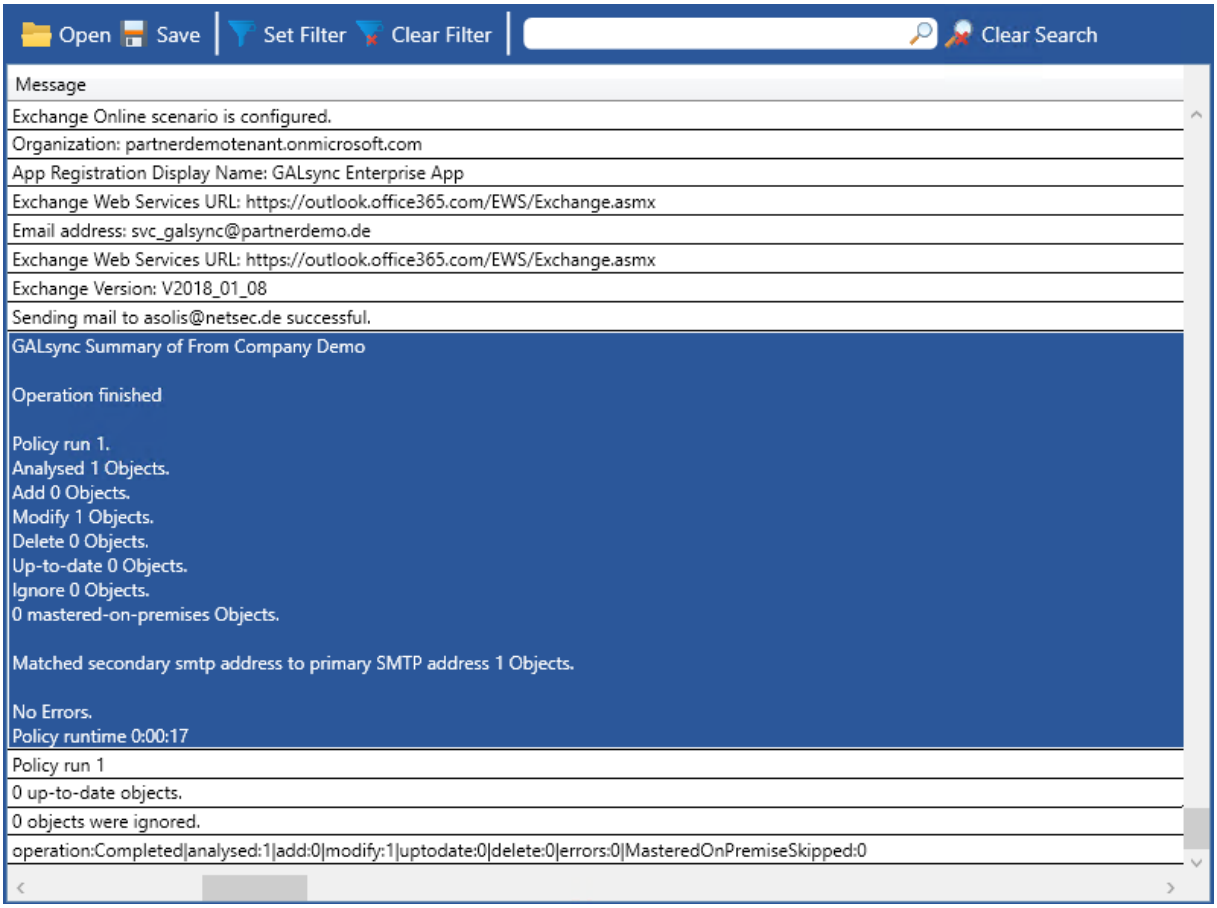
The matching of data file objects with existing objects in the target environment will be logged during the import policy run.

There can be different matches, for example the primary SMTP address of the data file object to the primary SMTP address of the existing object in the target, the primary SMTP address of the data file object to the secondary SMTP address of the existing object in the target and even more combinations.

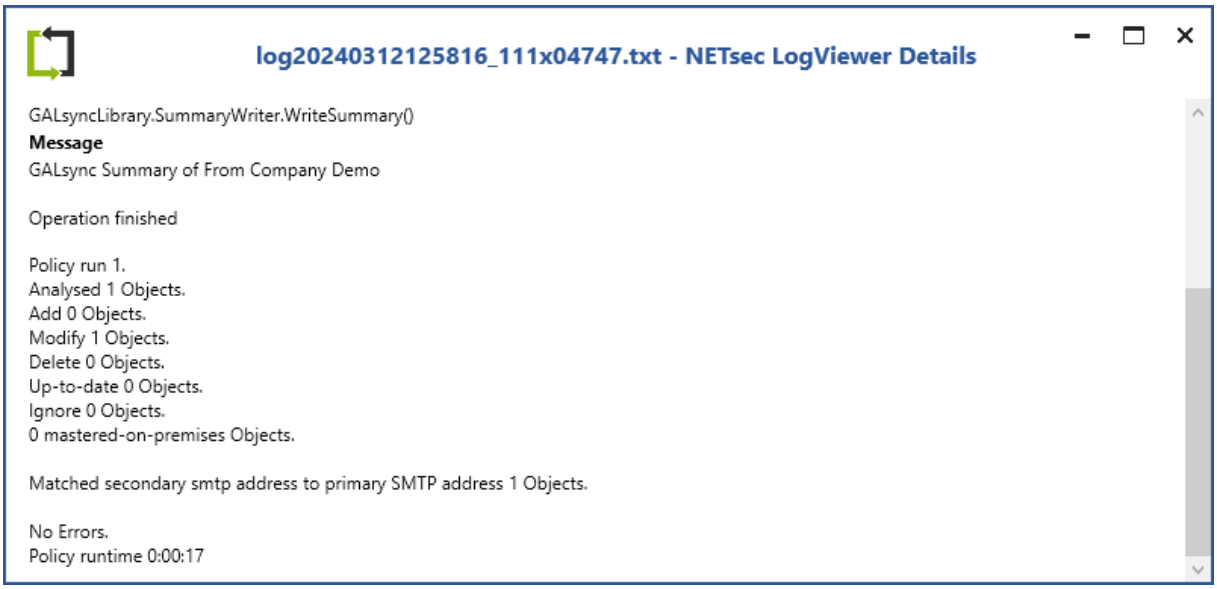
The default match is the primary SMTP address of the data file object with the primary SMTP address of the existing object in the destination.

A counter for each combination, so each matched combination that occurs during the policy run will be counted. The result of these counters will be added to the detailed summary in the log file and the status notification email. This will help you find mismatches, because the counter will indicate if other matches were logged than the default match. The default match is the primary SMTP address of the data file object with the primary SMTP address of the existing object in the destination.

If you suspect a mismatch has occurred, the log will provide you the details to be able to check the object in the source environment to ensure the changes to the target object were correct.

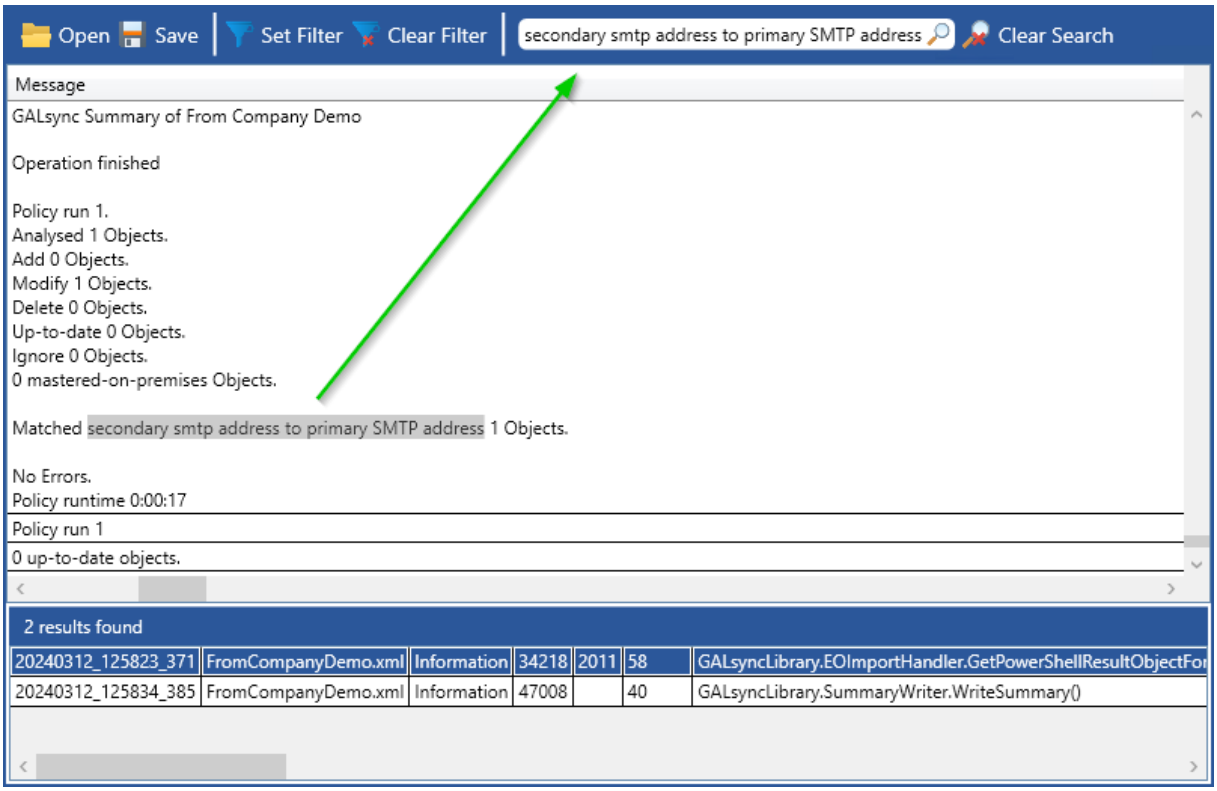


Double-click on the log entry of the detailed summary to open the **NETsec LogViewer Details** dialog of this entry.



Search for the log entries of the matched objects by using the text part of the counter after **Matched** until the number of the counter.

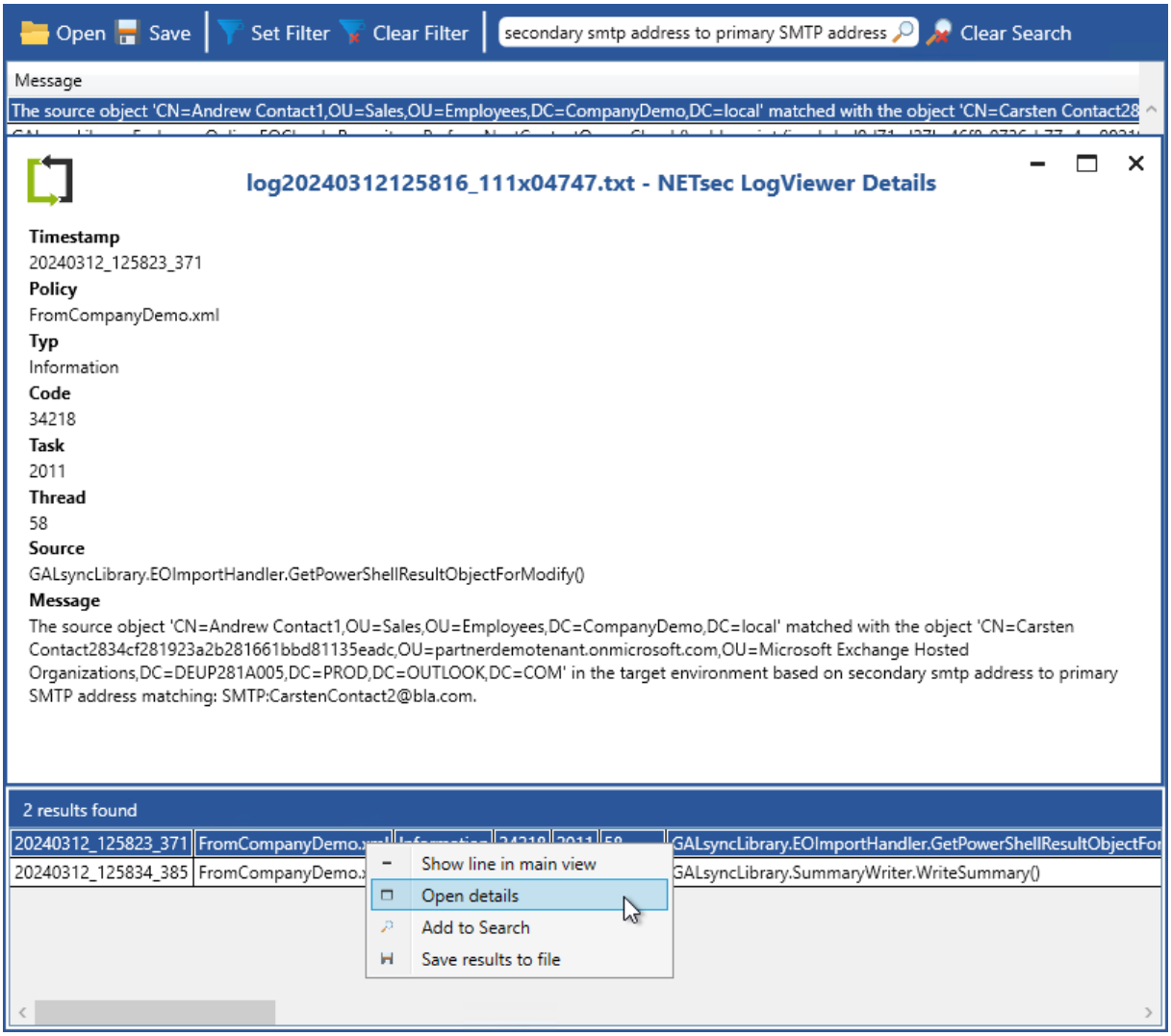
Insert it into the search field and click the search icon.



The result list shows the log entries of the matched objects with the matching criteria of the counter.

Double-click on a result entry to jump to the corresponding log entry in the main view and open the **NETsec LogViewer Details** dialog of the entry with a double-click, or open the **NETsec LogViewer Details** dialog directly from the context menu of the log entry in the result list.

The source object and the target object are logged with the used matching criteria in the **NETsec LogViewer Details** dialog of the log entry.



Please check the objects in the respective environment to verify if the matching is correct.

How do I resolve NDR (Non-Delivery Report) problems?

If you have NDRs then Outlook / Exchange cannot bind a **legacyExchangeDN** to a contact.

Please read the blog article **The Attribute, the Myth, the legacyExchangeDN** by Michel de Rooij to get general information about the legacyExchangeDN attribute:

https://www.enowsoftware.com/solutions-engine/exchange-center/bid/151745/the-attribute-the-myth-the-legacyexchangedn

https://eightwone.com/2013/08/12/legacyexchangedn-attribute-myth/

The first solution is to reconstruct the old **legacyExchangeDN** and to save it as **X500** address in the **proxyAddresses** attribute of the contact.

For Example:

You want to send an email to Ron Smith and receive the following NDR:

```
IMCEAEX-_O=TEST_OU=First+20administrative+20Group_cn=Recipients_cn=Ron.Smith
#550 5.1.1 RESOLVER.ADR.ExRecipNotFound; not found ##
```

Then the X500 address within the proxyAddresses should be:

```
X500:/O=TEST/OU=First administrative Group/cn=Recipients/cn=Ron.Smith
```

The **legacyExchangeDN** must be unambigious within an Exchange Forest. During the check, all **legacyExchangeDNs** and **X500** addresses must be checked.

The second solution is clearing the NK2-Cache, this must be done for all affected clients.

For more information read:

How to reset the nickname and the automatic completion caches in Outlook

http://support.microsoft.com/kb/287623

Clearing AutoComplete and other Recipient Caches

https://www.enowsoftware.com/solutions-engine/exchange-center/bid/184025/clearing-autocomplete-and-other-recipient-caches

How to check the PowerShell version on the GALsync server

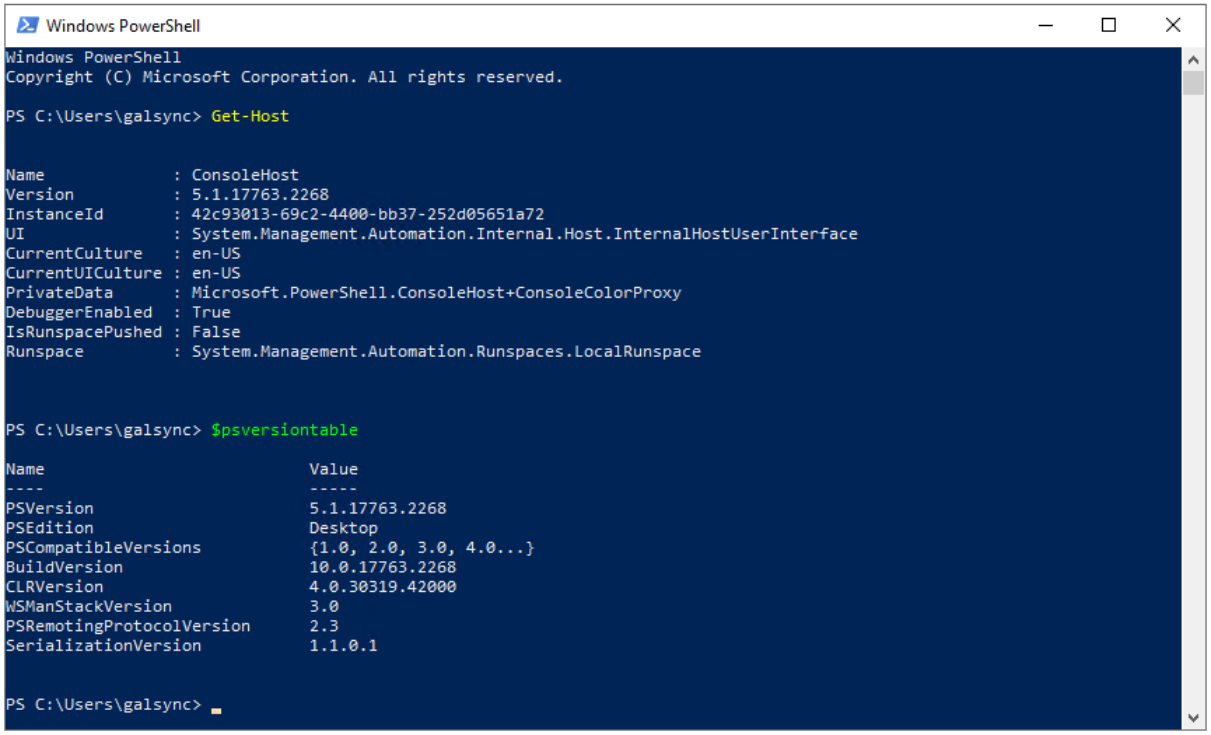
Please log in on the GALsync server with your GALsync service account.

Open the **Windows PowerShell** and check the result of the following two PowerShell cmdlets:

```
Get-Host
```

and

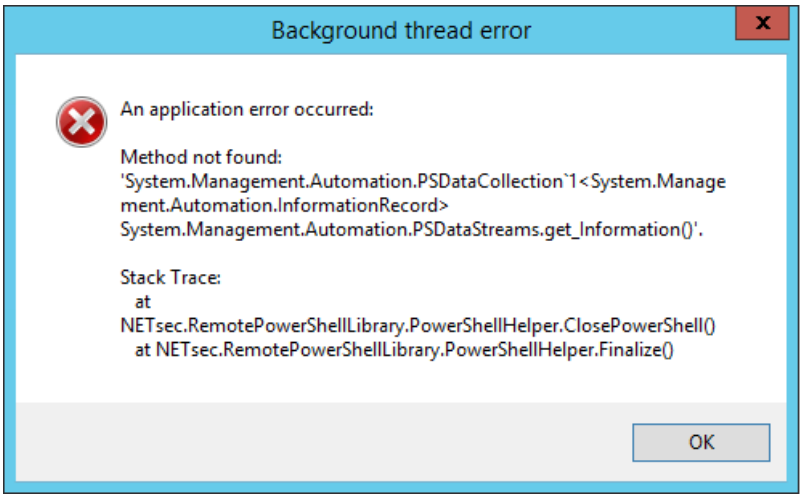
```
$psversiontable
```



How to Troubleshoot PowerShell

Failure to Establish Connection to Exchange Online

If an error such as the one below has been generated while connecting to Exchange Online, please follow the troubleshooting steps outlined below.



1. Verify Windows PowerShell 5.1 has been installed on the GALsync server by opening Windows PowerShell and running

```
Get-Host;
```

2. Verify Exchange Online Management module for Exchange Online PowerShell v2 has been installed on the GALsync server.
   The install instructions (from an Administrator PowerShell session) are as follows:

```
Install-Module -Name ExchangeOnlineManagement -Force;
Import-Module ExchangeOnlineManagement; Get-Module ExchangeOnlineManagement;
```

Connect to Exchange Online:

```
Connect-ExchangeOnline;
```

Get some recipients from Exchange Online:

```
Get-Recipient;
```

Disconnect from Exchange Online:

```
Disconnect-ExchangeOnline;
```

Additional details relating to Exchange Online PowerShell v2 module are available here:

https://docs.microsoft.com/en-us/powershell/exchange/exchange-online-powershell-v2?view=exchange-ps#prerequisites-for-the-exo-v2-module

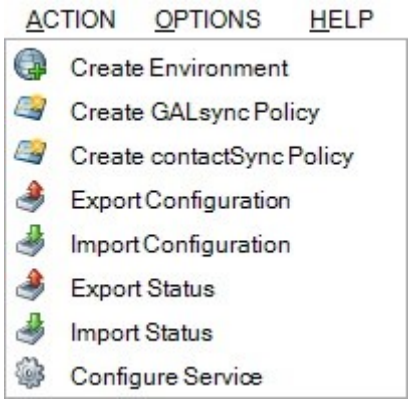
Important: GALsync does not support Exchange Online PowerShell V2 module for PowerShell 7.

11021 - LegacyExchangeDN of the GALsync service account is in the old syntax. Please update this by re-mailenabling the service account or create a new GALsync service account.

Your current GALsync service account mailbox was previously migrated from an Exchange 2003 environment. The **legacyExchangeDN** of the GALsync service account is in the old syntax, which was used up to Exchange 2003. However, GALsync needs a service account with a mailbox which has the new **legacyExchangeDN** syntax which is used by Exchange 2007 and later.

Please create a new GALsync service account with a new mailbox and the same permissions as the old one.

After that log on with the new GALsync service account, run the GALsync GUI with the new GALsync service account and change the GALsync service to the new GALsync service account.



Use **Configure Service** to start the wizard for changing the service account of the GALsync service.

19031 - Not all mails arrived ...

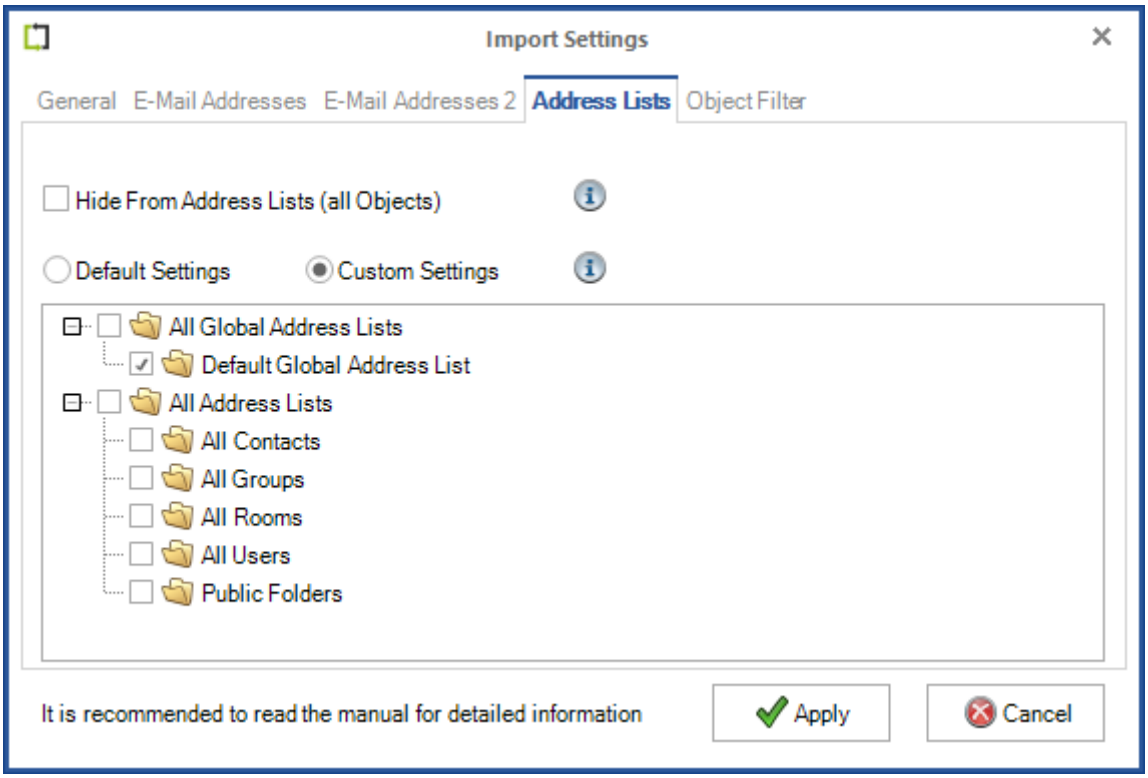
In this case the sender sent his data file split between multiple emails. The error indicates that GALsync on the receiving side tries to contact Exchange Online before all sent objects are really present in Exchange Online - even if you can see the mail within your OWA App.

Solution

Wait up to 5 minutes between receiving the data and running the import policy.

28104 - Error adding value of property showInAddressBook to the contact.

This issue occurs, if you use the **Custom Settings** at the **Address Lists** tab of Import Setting and you have selected an address list, which is not available anymore in your environment.



Solution

Please check the **Custom Settings** of the **Address Lists** tab of the Import Setting and save the import policy again, so that the wrong entry is removed.

Otherwise use the **Default Settings**.

12010 - Error getting Exchange Online connection

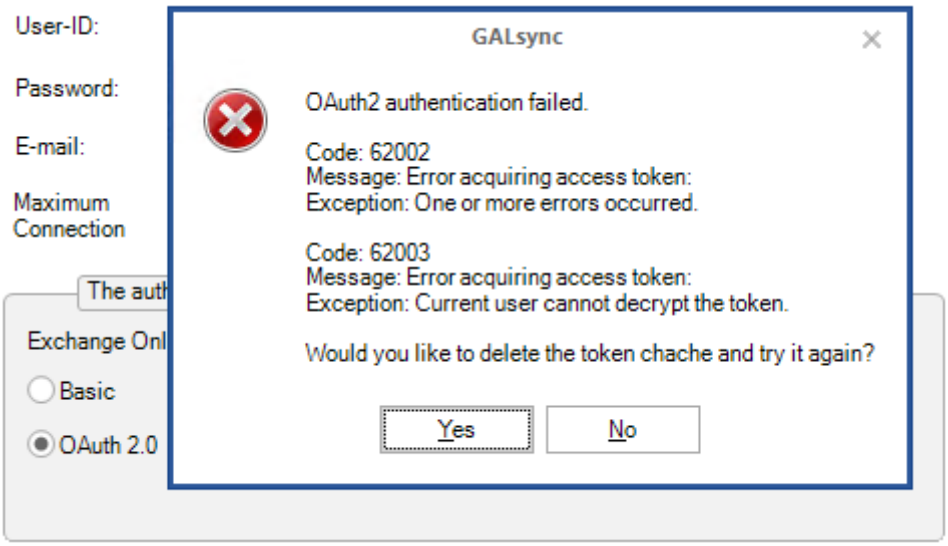
Typ
Error
Code
12010
Task
244
Thread
16
Source
GALsyncLibrary.EWSManager.getExchangeService()
Message
Error getting Exchange Online connection.
Exmessage
One or more errors occurred.
Key not valid for use in specified state.

Typ
Error
Code
12010
Task
111
Thread
7
Source
GALsyncLibrary.EWSManager.getExchangeService()
Message
Error getting Exchange Online connection.
Exmessage
One or more errors occurred.
Current user cannot decrypt the token.
Key not valid for use in specified state.

This error occurs, if the policy was configured with the credentials of a different user as the policy was executed.

Please run the policy in the credentials of the user, who configured the policy. We recommend to run the GALsync GUI in the credentials of the local GALsync service account.

You can encrypt the token for Modern Authentication OAuth 2.0 for Exchange Web Services (EWS) again, if you click the Login button for OAuth 2.0 and delete the token cache.



Please take a look at the chapter Modern Authentication OAuth2 for Exchange Web Services (EWS) to access Exchange Online

Support: What to do when I notice an error / bug?

We always try to provide a very responsive, solution orientated and effective support. Should you encounter any issue, bug or inconvenience please do not hesitate to contact us.

Please send us an email to support@netsec.de.

So that we can provide you the best quality support, please provide us with the following information:

Environment Overview

- Which Exchange version do you use?
- Which GALsync version do you use?
- Does the GALsync service account have an Exchange mailbox and where it is located?

Description of the issue

Please describe your issue/bug/inconvenience thoroughly, in detail, what you wanted to achieve and what you were doing as it occurred.
A screenshot of the issue often helps us to understand.

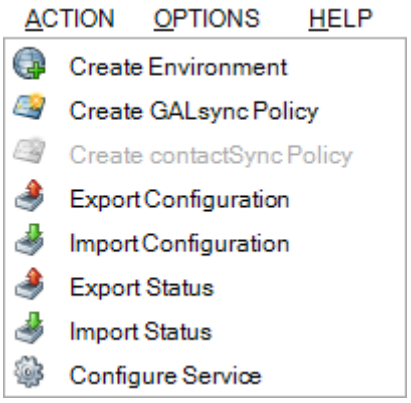
Configuration and log files

We also require the configuration and the logs, preferably zipped.

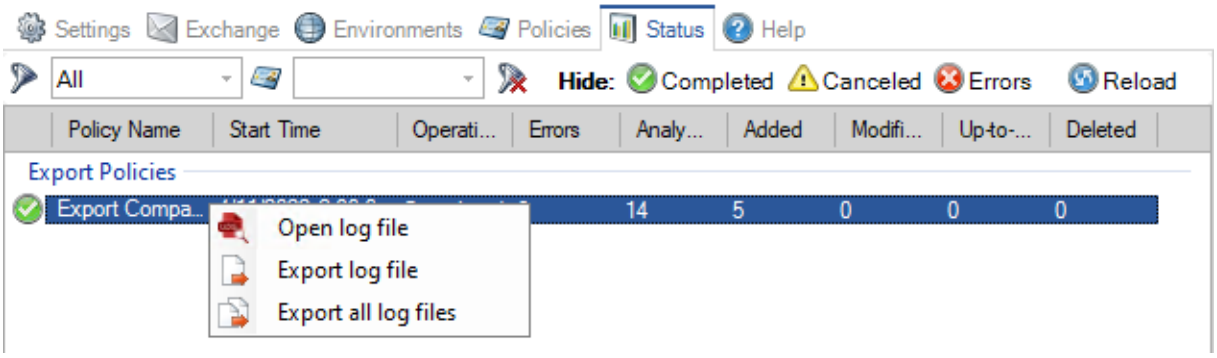
Please take a look at the chapter **Open and export log files**.

In menu **Action** -> **Export Configuration** you can zip the policies.

In menu **Action** -> **Export Status** you can zip the log files.



The log files of a police can be also compressed on the **Status** tab:



Please send an email to support@netsec.de with a description of the issue and attach the compressed file with the configuration and the compressed file with the log files.

Alternatively you could also upload the compressed files for us at the
NETsec Support Dropzone

https://transfer.netsec.de/dropzone/support

Do you have more questions or need further support than please do not hesitate to contact the GALsync Support Team.

GALsync Support Team

By phone +49 2421 998 78 16 or via e-mail support@netsec.de