Configure Active Directory Synchronization Service

Last Modified on 07/17/2024 10:05 am EDT

Starting with V10.0, Cora SeQuence has been renamed to Cora Orchestration.

V10.6 and later

Overview

After you install Cora SeQuence, you can configure the Active Directory Synchronization Service (ADSS) to import users from your Active Directories into Cora SeQuence. The Active Directory Synchronization Service will only pull information from your Active Directory and will never write to it. The configuration consists of two main procedures, each of which has numerous sub steps.

1. Complete the Active Directory Wizard
2. Configure ADSS

NOTE
Every user object in your Active Directory that needs to be synchronized, must have at least a First Name and a Last Name. These are mandatory fields and Cora SeQuence will not synchronize a user if these fields are empty.

Active Directory Synchronization Service (ADSS) is a Windows service that enables easier user management within Cora SeQuence. ADSS copies the structure from the Active Directory based on the filter(s) that you define. Any parent container will be placed on the top (root level), for example, Entire Organization. ADSS is an optional component that is installed by default when you install Cora SeQuence.

By default, Active Directory data is synchronized in bulk to Cora SeQuence, overwriting changes to the organization made in Cora SeQuence. This is true even if Insert/Update/Delete options have been deselected in the screen above. If you want to revert back to the synchronization behavior of previous versions, which took the above settings into account, for example, if Update is not selected, the synchronization will not overwrite records edited in Cora SeQuence, you can do so by editing the ADSS `web.config` file and setting this field to *false* (The default is *true*).

```
useBulkSynchronization="false"
```

Multiple Domains Synchronization Considerations

Cora SeQuence supports multiple domains synchronization.

Please note the following considerations for multiple domains synchronization:

1. Synchronizing a user who has the same display name on multiple domains: the user will by synchronized properly and each entry will be unique, since it will have a unique DN, meaning that a synchronized user will authenticate using his DOMAIN\username.
   However, the employee picker in the App Studio which is used in different activities and modules is based on employee display name, so the same display name may appear more than once.
2. When synchronizing an OU structure from multiple domains, ensure the parent name of an OU from different domains is different, for example:

Domain 1

-> OU=Retailers-1 (Parent)

-> OU=Retailer 1

-> OU=Users

-> OU=Retailer 2

-> OU=Users

-> OU=Retailer 3

-> OU=Users

Domain 2

-> OU=Retailers-2 (Parent)

-> OU=Retailer 1

-> OU=Users

-> OU=Retailer 2

-> OU=Users

-> OU=Retailer 3

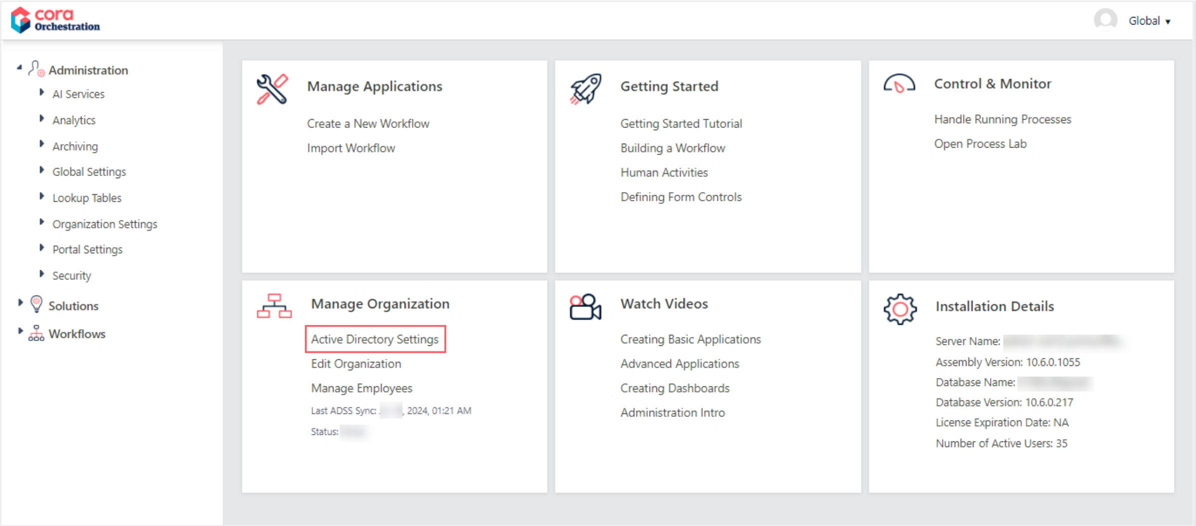
-> OU=Users

Prerequisites

- Verify that you have Read access to your organization's active directory.
- Administrative access to the Administration environment (i.e. global administrator).
- Knowledge of LDAP query and filter.
- Access to the Windows Services console on the server(s) where the Active Directory Synchronization Service is installed.
- Access to the external secret key storage, if external secret source is used.

1. Complete the Active Directory Wizard

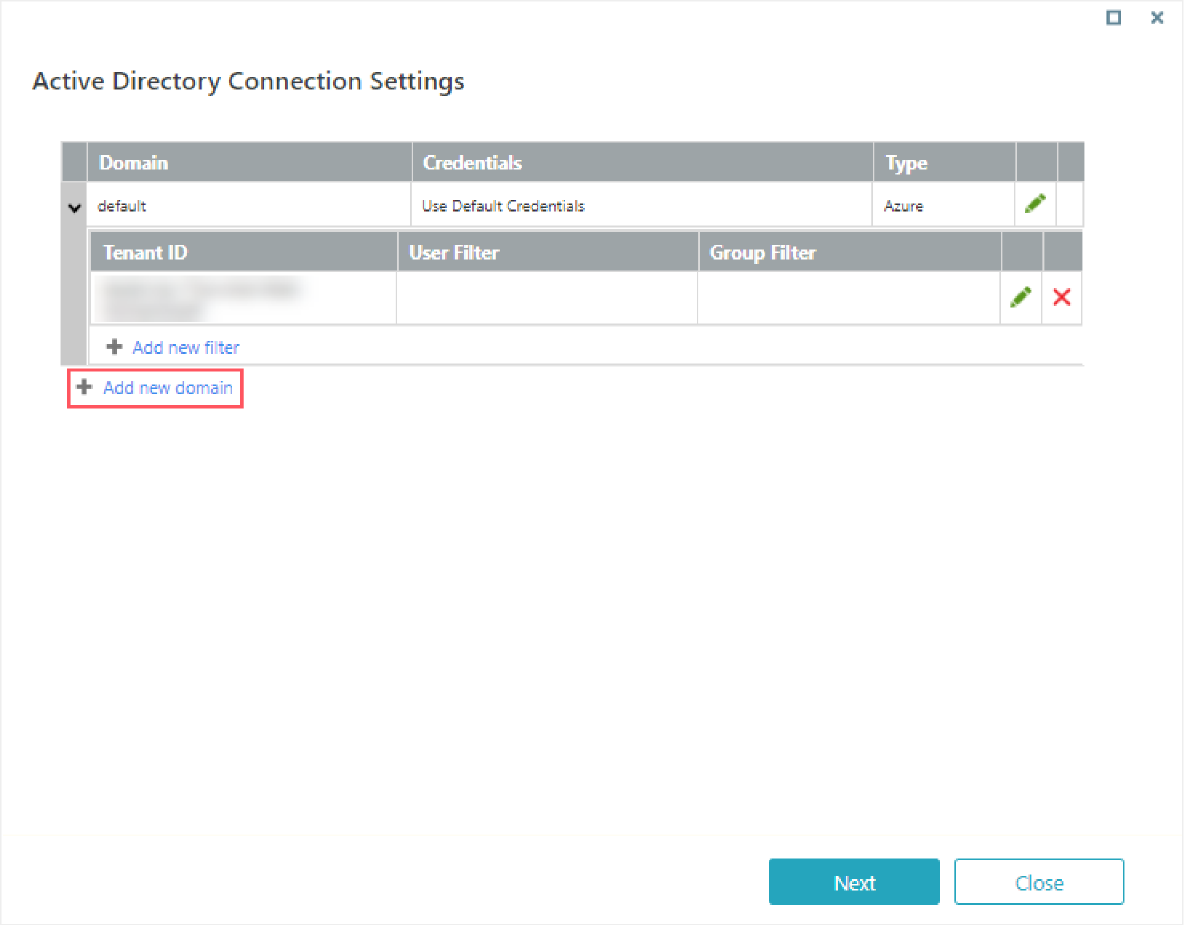
1. In the Administration site, click **Active Directory Settings**.



Last ADSS Sync: [redacted], 2024, 01:21 AM
Status: [redacted]

Server Name: [redacted]
Assembly Version: 10.6.0.1055
Database Name: [redacted]
Database Version: 10.6.0.217
License Expiration Date: NA
Number of Active Users: 35

2. Click **Add new domain**.



Active Directory Connection Settings

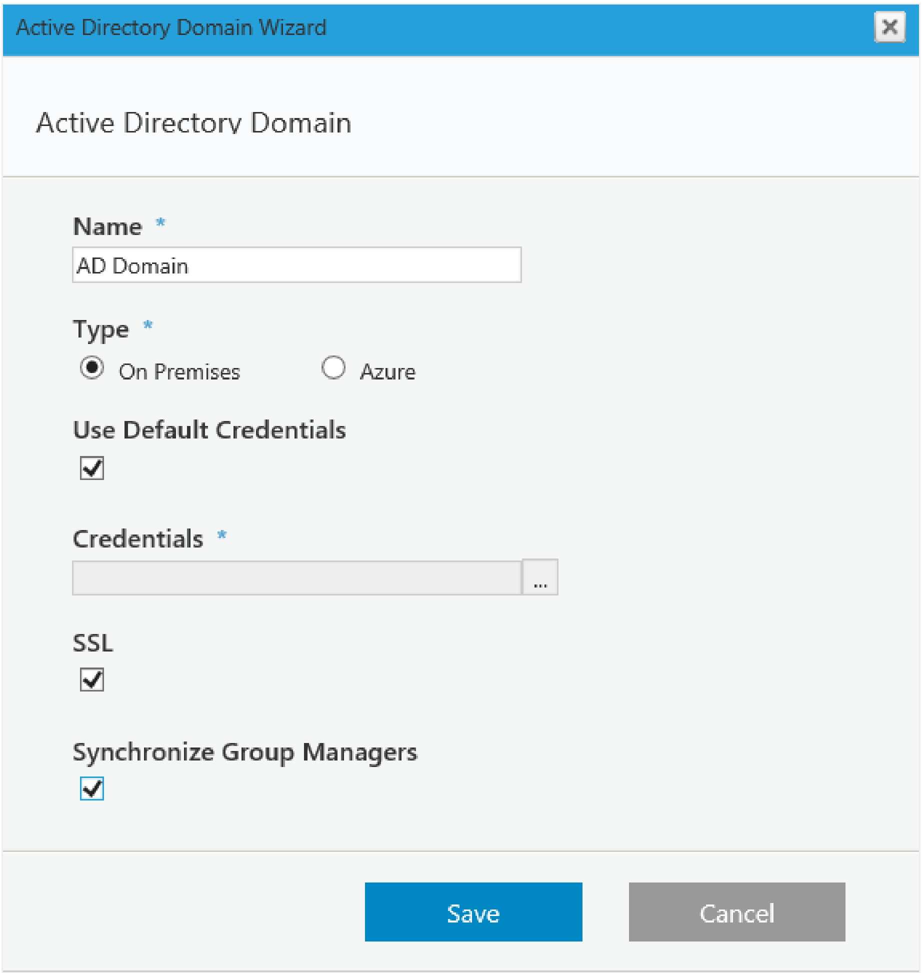
Domain	Credentials	Type
default	Use Default Credentials	Azure

Tenant ID	User Filter	Group Filter
[redacted]		

3. Define the Active Directory Domain (On Premises or Azure), and click **Save**.

On Premises

The credentials are going to be used to query the Active Directory (make sure the user has permissions to do this). If **Use Default Credentials** is selected, then the user running the Active Directory Synchronization Service will be used. If you select the **Synchronize Group Managers** check box, users with the manager role in AD will be assigned the manager role in Cora SeQuence.



Active Directory Domain Wizard

Active Directory Domain

Name *

AD Domain

Type *

● On Premises ○ Azure

Use Default Credentials

☑

Credentials *

SSL

☑

Synchronize Group Managers

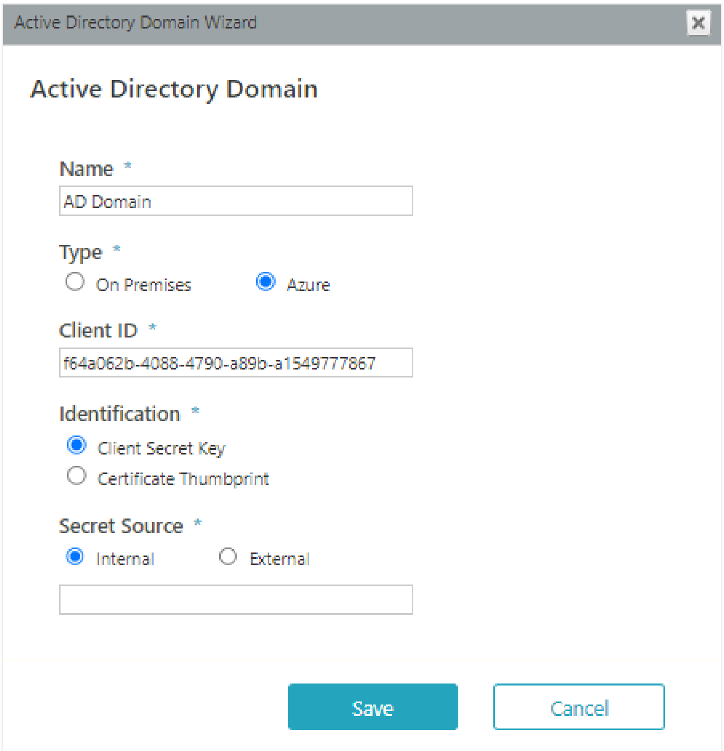
☑

Azure

Copy the **Client ID** from your Azure AD portal, **Azure Active Directory** > **App registration** > *Your app*.

Copy the **Client Secret Key** from your Azure AD portal, **Azure Active Directory** > **App registration** > *Your app* > **Keys** > **Set the Expiration Duration** > Click **Save** (the certificate value displays after you click Save).

Select the **Secret Source** of the secret key, **Internal** or **External**.



Active Directory Domain Wizard

Active Directory Domain

Name *

AD Domain

Type *

○ On Premises ● Azure

Client ID *

f64a062b-4088-4790-a89b-a1549777867

Identification *

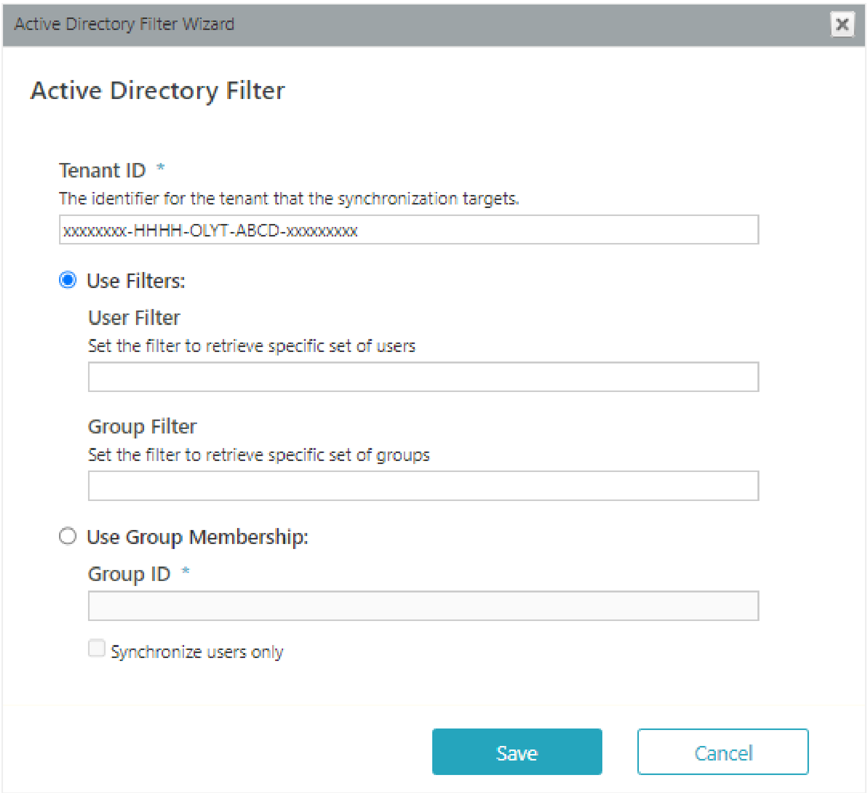
● Client Secret Key

○ Certificate Thumbprint

Secret Source *

● Internal ○ External

4. (Optional) Click **Add new filter** to define a filter for the domain, and click **Next**.
   For more information use these links.
   - https://msdn.microsoft.com/en-us/library/azure/ad/graph/api/entity-and-complex-type-reference#group-entity
   - https://msdn.microsoft.com/en-us/library/azure/ad/graph/api/entity-and-complex-type-reference#user-entity
     Copy the **Tenant ID** (Directory ID) from your Azure AD portal: **Azure Active Directory** > **Properties** > **Directory ID** (the Directory ID is the Tenant ID).



Active Directory Filter Wizard

Active Directory Filter

Tenant ID *

The identifier for the tenant that the synchronization targets.

xxxxxxxx-HHHH-OLYT-ABCD-xxxxxxxxx

● Use Filters:

User Filter

Set the filter to retrieve specific set of users

Group Filter

Set the filter to retrieve specific set of groups

○ Use Group Membership:

Group ID *

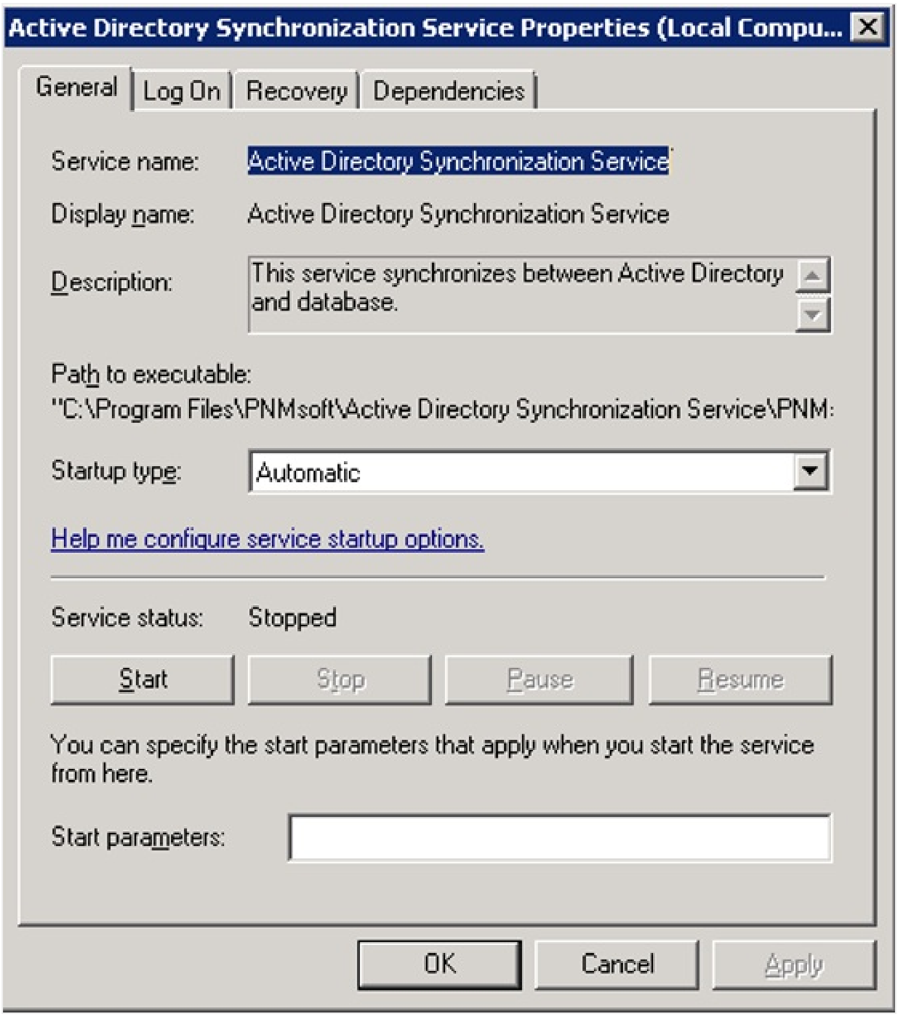
□ Synchronize users only

5. Select the attributes (in addition to the standard ones), that you want to import from the Active Directory to Cora SeQuence, and then click **Finish**.

You can import user photos from the Active Directory using the photo property. Any photos that are saved in this property will be imported into Cora SeQuence. Any additional properties you choose to synchronize will be added to the employees table in the Cora SeQuence database (*tblEmployees*). Apart from the photo, these properties will only be available on the database table.

2. Configure Active Directory Synchronization Service

1. Log on to the server where the Active Directory Synchronization Service is installed, and open the Services console.
2. Locate the **Active Directory Synchronization Service**, open its **Properties**page, and click the **General** tab. The service should be set to *Automatic* in the **Startup Type** field.



Active Directory Synchronization Service Properties (Local Compu...

Service name: Active Directory Synchronization Service

Display name: Active Directory Synchronization Service

Description: This service synchronizes between Active Directory and database.

Path to executable:
"C:\Program Files\PNMsoft\Active Directory Synchronization Service\PNM:

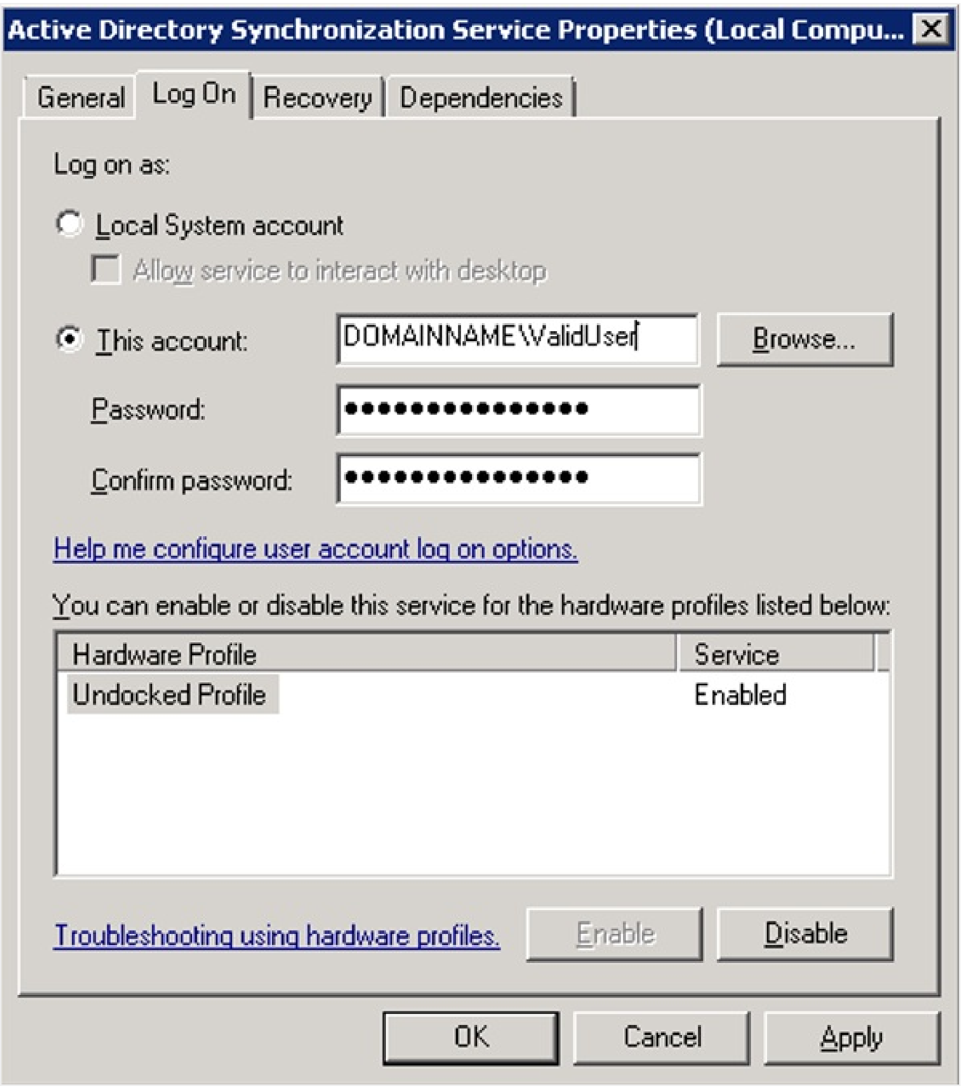
Startup type: Automatic

Service status: Stopped

You can specify the start parameters that apply when you start the service from here.

Start parameters:

3. Click the **Log On** tab.
   The user configured in this screen is the one that was specified during the Sequence installation. This is the user who will query Active Directory for the default domain and the domains that are set to use the default credentials.



Active Directory Synchronization Service Properties (Local Compu...
General
Log On
Recovery
Dependencies
Browse...
Help me configure user account log on options.
Troubleshooting using hardware profiles.
Enable
Disable
OK
Cancel
Apply

Log on as:

○ Local System account

□ Allow service to interact with desktop

● This account: DOMAINNAME\ValidUser

Password: •••••••••••••••

Confirm password: •••••••••••••••

You can enable or disable this service for the hardware profiles listed below:

Hardware Profile	Service
Undocked Profile	Enabled

NOTE
You can install the Active Directory service on multiple machines for redundancy. The Cora SeQuence engine automatically configures failover mode and no additional actions are required.

Appendix A: Active Directory Service Config File

Open the *Active Directory Service Config* file.

By default, the file is located in `C:\Program Files\PNMsoft\Active Directory Synchronization Service` .

IMPORTANT
Any manual changes made to the configuration will be overwritten when you upgrade Cora SeQuence versions. It is important that you record any changes, so you can implement them after you upgrade.

The following snippet is the only part that can be edited. An explanation of each key and its valid input follows:

```
<adSyncronizationThread type="PNMsoft.Sequence.WindowsServices.ADSS.BuiltinThreads.ADSyncronizator, PNMsoft.Sequence.WindowsServices.ADSS"
   interval="60"
   domain="MYDOMAIN"
   computerNameAD="MYDOMAIN"
   pageSize="100"
   serverPageTimeLimit="60"
   adUniqueKey="objectGuid"
   startSynchLoopsAt=""
   stopSynchLoopsAt=""
   useTombstonesToDetectDeletedObjects="true" />
```

Key Name	Description	Valid Setting	Recommended Setting
interval	Time period in minutes that the service will pause after each update from the AD server.	Any positive integer	720
domain	Name of the domain managed by the AD server. The value is taken from the config file when the domain name of the filter is empty.	Any string (configured by the installer to what was entered in the ADSS screen)	Short name of the default domain to synchronize
computerNameAD	AD server name.	Any string, but must be equal to the domain. Configured by the installer to what was entered in the ADSS screen)	Must be equal to the domain.
pageSize	Number of records copied from the AD server each time. Should be lowered when the AD server responds slowly to avoid timeouts.	20-500	100
serverPageTimeLimit	Time period in seconds that the service waits for a reply before timing out. Should be raised when the AD server responds slowly.	60-500	60
adUniqueKey	Determines the unique key setting for the AD service. Valid settings are *objectGuid* to denote using the key from the AD server, or *domainUserName* to denote a combination of the user's domain and NT user name.	objectGuid or domainUserName	objectGuid

Key Name	Description	Valid Setting	Recommended Setting
startSynchLoopsAt	Used in combination with the *stopSynchLoopsAt* attribute to limit the AD queries by hour of the day.	24 hour time format: HH:mm, for example 14:35. Other formats will not be processed.	-
stopSynchLoopsAt	Used in combination with the *stopSynchLoopsAt* attribute to limit the AD queries by hour of the day.	24 hour time format: HH:mm, for example 14:35. Other formats will not be processed.	-
useTombstonesToDetectDeletedOjbects	If set to *true* Cora SeQuence recognizes tombstones, which represent objects deleted from AD and deletes (if group or OU) or made inactive (if user).	True or False	True
debugState	Obsolete	On or Off	-

Appendix B: Add Custom Code

You can add custom code before and/or after each synchronization cycle, as follows:

1. Create a new class library project.
2. Ensure that your class inherits from *IBeforeSynchronizationCycleStarted* for code to be executed before synchronization or from *IAfterSynchronizationCycleCompleted* for code to be executed after synchronization.
3. Implement the method *OnBeforeSynchronizationCycleStarted* for code to be executed before synchronization or *OnAfterSynchronizationCycleCompleted* for code to be executed after synchronization.
4. Sign your assembly and place it on the server GAC.
5. Register the assembly you have just created in the following section of the config file, according to the following sample.

```
<serviceEvents>
 <!-- Example how to add custom event handler assembly to the service
 <eventAssemblies>
 <add type="CustomEventAssemblyNamespace.CustomEventClass, CustomEventAssemblyName, Version=1.0.0.0,
Culture=neutral, PublicKeyToken=ca08babd3815c17a" eventName="EvenetMethodName" />
 </eventAssemblies>
 -->
 </serviceEvents>
```

> **NOTE**
> Replace *EvenetMethodName* with *OnBeforeSynchronizationCycleStarted* or *OnAfterSynchronizationCycleCompleted*.

Appendix C: Basic LDAP Syntax

Argument	Name	Description
=	Equal to	This LDAP argument means a certain attribute must be equal to a certain value to be true. For example, if you want to find all objects that have the first name of John, you would use: (givenName=John) This would return all objects that have the first name of John. Parentheses are included to emphasize the beginning and end of the LDAP statement.
&	Logical AND	Use this syntax when you have more than one condition, and you want all conditions in the series to be true. For example, if you want to find all of the people that have the first name of John and live in Dallas, you would use: (&(givenName=John)(physicalDeliveryOfficeName=Dallas)) Notice that each argument is in its own set of parentheses. The entire LDAP statement must be encompassed in a main set of parentheses. The & operator means that each argument must be true for this filter to apply to your object.
!	Logical NOT	This operator is used to exclude objects that have a certain attribute. Suppose you need to find all objects except those that have the first name of John. You would use the following statement: (!givenName=John) This statement would find all objects that do not have the first name of John. Notice that the ! operator goes directly in front of the argument and inside the argument's set of parentheses. Because there is only one argument in this statement, it is surrounded with parentheses for illustration.
*	Wildcard	Use the wildcard operator to represent a value that could be equal to anything. One such situation might be if you wanted to find all objects that have a value for title. You would then use: (title=*) This would return all objects that have the title attribute populated with a value. Another example might be if you know an object's first name starts with Jo. Then, you could use the following to find those: (givenName=Jo*) This would apply to all objects whose first name starts with Jo.

For more information, review the following articles:

- LDAP Query Basics: http://technet.microsoft.com/en-us/library/aa996205(v=exchg.65).aspx
- Search Filter Syntax: http://msdn.microsoft.com/en-us/library/aa746475(v=vs.85).aspx
- Active Directory, LDAP Syntax Filters: http://social.technet.microsoft.com/wiki/contents/articles/5392.active-directory-ldap-syntax-filters.aspx

V9.x - V10.5

Overview

After you install Cora SeQuence, you can configure the Active Directory Synchronization Service to import users from your Active Directories into Cora SeQuence. The Active Directory Synchronization Service will only pull information from your Active Directory and will never write to it. The configuration consists of two main procedures, each of which has numerous sub-steps.

1. Complete the Active Directory Wizard
2. Configure ADSS

> NOTE
> Every user object in your Active Directory that needs to be synchronized, must have at least a First Name and a Last Name. These are mandatory fields and Cora SeQuence will not synchronize a user if these fields are empty.

About the Active Directory Synchronization Service

Active Directory Synchronization Service (ADSS) is a Windows service that enables easier user management within Cora SeQuence. ADSS copies the structure from the Active Directory based on the filter(s) that you define. Any parent container will be placed on the top (root level), for example, Entire Organization. ADSS is an optional component that is installed by default when you install Cora SeQuence.

By default, Active Directory data is synchronized in bulk to Cora SeQuence, overwriting changes to the organization made in Cora SeQuence. This is true even if Insert/Update/Delete options have been deselected in the screen above. If you want to revert back to the synchronization behavior of previous versions, which took the above settings into account, for example, if Update is not selected, the synchronization will not overwrite records edited in Cora SeQuence, you can do so by editing the ADSS `web.config` file and setting this field to *false* (The default is *true*).
`useBulkSynchronization="false"`

Multiple Domains Synchronization Considerations

Cora SeQuence supports multiple domains synchronization.

Please note the following considerations for multiple domains synchronization:

1. Synchronizing a user who has the same display name on multiple domains: the user will by synchronized properly and each entry will be unique, since it will have a unique DN, meaning that a synchronized user will authenticate using his DOMAIN\username.
   However, the employee picker in the App Studio which is used in different activities and modules is based on employee display name, so the same display name may appear more than once.
2. When synchronizing an OU structure from multiple domains, ensure the parent name of an OU from different domains is different, for example:

Domain 1

-> OU=Retailers-1 (Parent)

    -> OU=Retailer 1

        -> OU=Users

    -> OU=Retailer 2

-> OU=Users

-> OU=Retailer 3

-> OU=Users

Domain 2

-> OU=Retailers-2 (Parent)

-> OU=Retailer 1

-> OU=Users

-> OU=Retailer 2

-> OU=Users

-> OU=Retailer 3

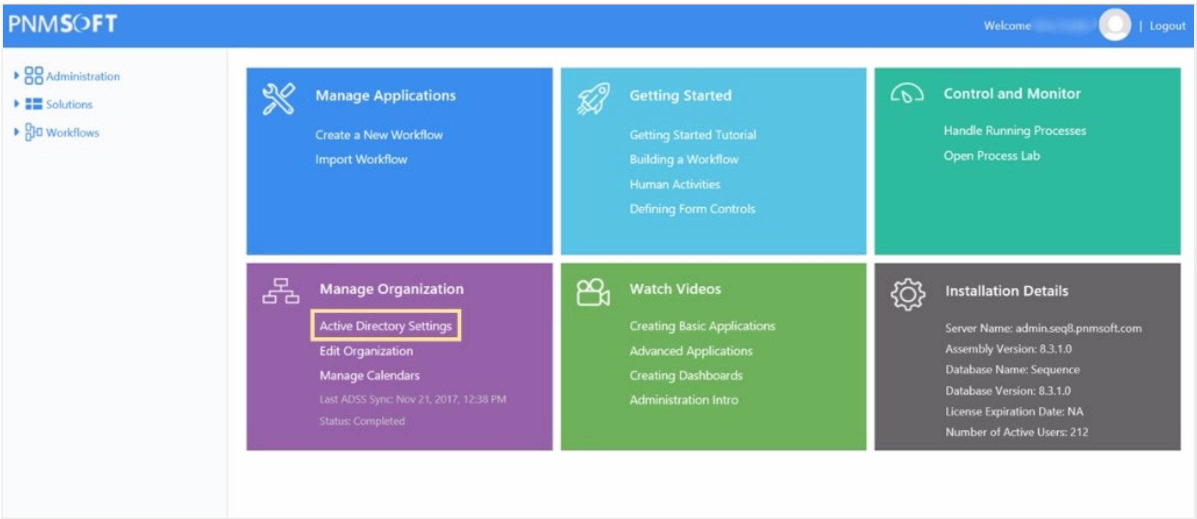
-> OU=Users

Prerequisites

- Verify that you have Read access to your organization's active directory.
- Administrative access to the Sequence Administration environment (i.e. global administrator).
- Knowledge of LDAP query and filter.
- Access to the Windows Services console on the server(s) where the Active Directory Synchronization Service is installed.

Procedure 1: Complete the Active Directory Wizard

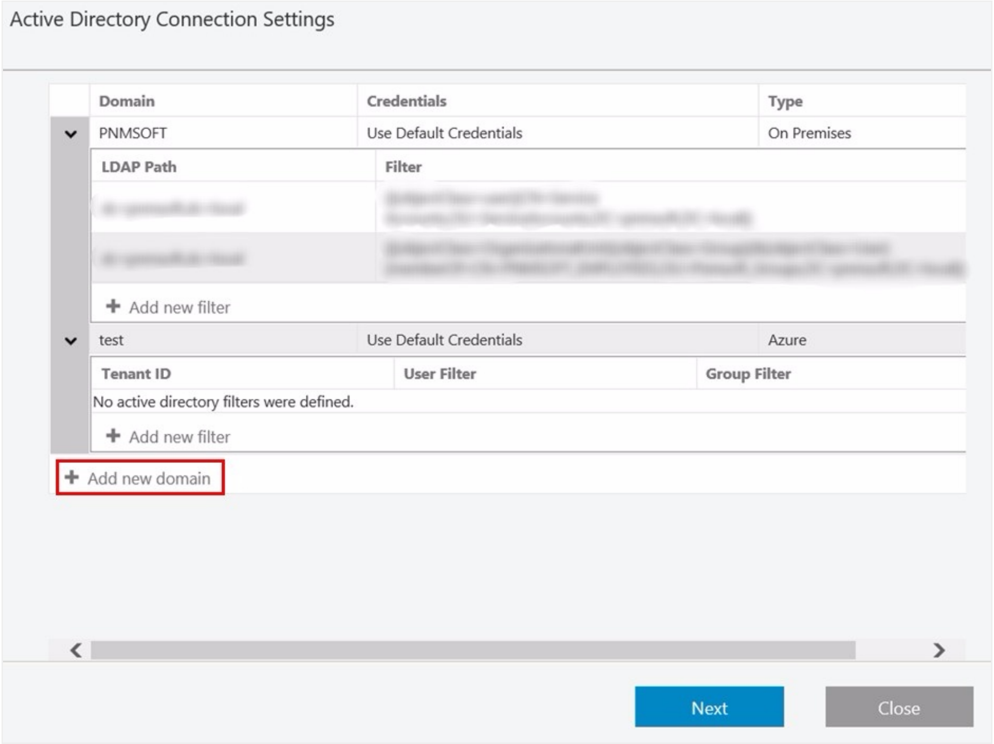
1. From the Administration site, click **Active Directory Settings**.



Last ADSS Sync: Nov 21, 2017, 12:38 PM
Status: Completed

Server Name: admin.seq8.pnmsoft.com
Assembly Version: 8.3.1.0
Database Name: Sequence
Database Version: 8.3.1.0
License Expiration Date: NA
Number of Active Users: 212

2. Click **Add new domain**.



Active Directory Connection Settings

Domain	Credentials	Type
PNMSOFT	Use Default Credentials	On Premises

LDAP Path	Filter
[redacted]	[redacted]
[redacted]	[redacted]

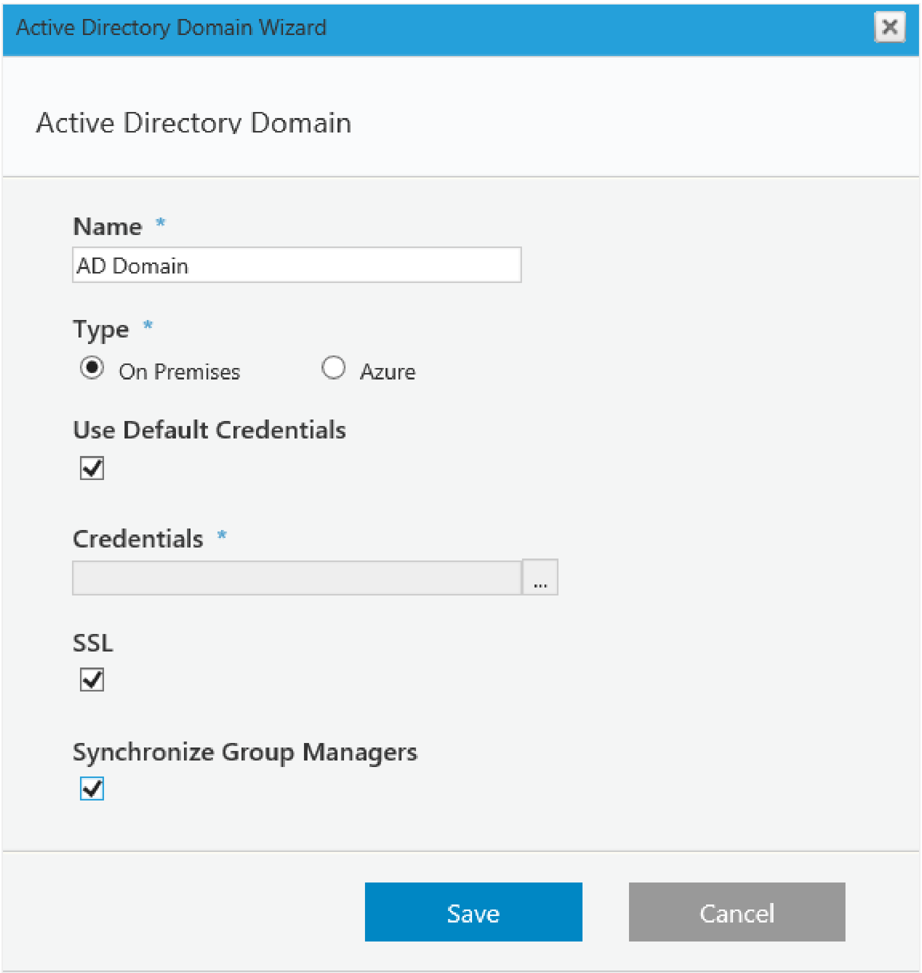
Domain	Credentials	Type
test	Use Default Credentials	Azure

Tenant ID	User Filter	Group Filter

No active directory filters were defined.

3. Define the Active Directory Domain (On Premises or Azure), and click **Save**.

   On Premises
   The credentials are going to be used to query the Active Directory (make sure the user has permissions to do this). If **Use Default Credentials** is selected, then the user running the Active Directory Synchronization Service will be used. If you select the **Synchronize Group Managers** check box, users with the manager role in AD will be assigned the manager role in Cora SeQuence.


Active Directory Domain Wizard

Active Directory Domain

Name *
AD Domain

Type *
● On Premises ○ Azure

Use Default Credentials
☑

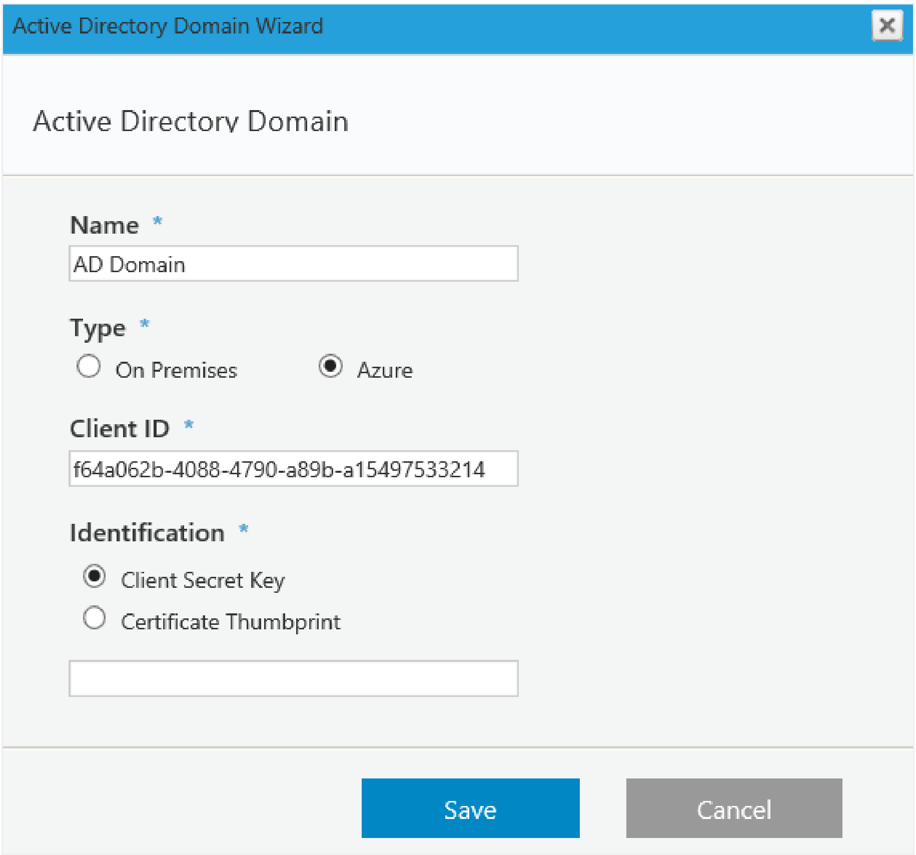
Credentials *

SSL
☑

Synchronize Group Managers
☑

Azure

Copy the **Client ID** from your Azure AD portal: **Azure Active Directory** > **App registration** > *Your app*.
Copy the **Client Secret Key** from your Azure AD portal: **Azure Active Directory** > **App registration** > *Your app* > **Keys** > **Set the Expiration Duration** > **Click Save** (the certificate value displays after you click Save).


Active Directory Domain Wizard

Active Directory Domain

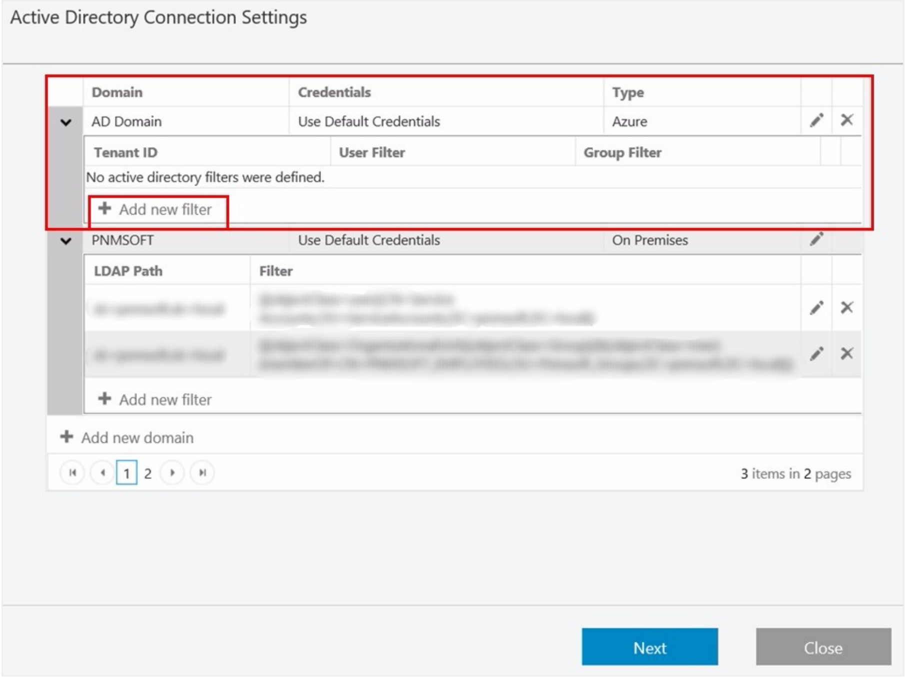
Name *
AD Domain

Type *
○ On Premises ● Azure

Client ID *
f64a062b-4088-4790-a89b-a15497533214

Identification *
● Client Secret Key
○ Certificate Thumbprint

4. (Optional) Define a filter for the domain, and click **Next**.
   For more information use these links.
   - https://msdn.microsoft.com/en-us/library/azure/ad/graph/api/entity-and-complex-type-reference#group-entity
   - https://msdn.microsoft.com/en-us/library/azure/ad/graph/api/entity-and-complex-type-reference#user-entity


Active Directory Connection Settings

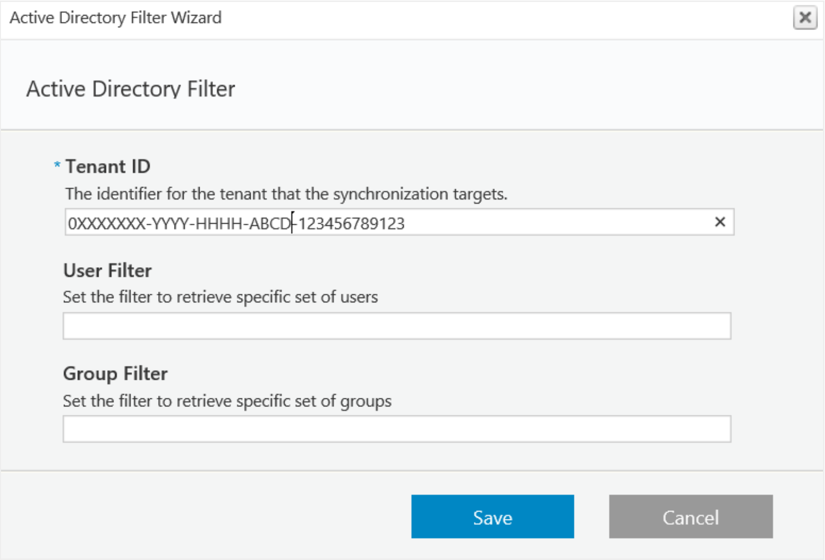
Domain	Credentials	Type
AD Domain	Use Default Credentials	Azure

Tenant ID	User Filter	Group Filter
No active directory filters were defined.		

Domain	Credentials	Type
PNMSOFT	Use Default Credentials	On Premises

LDAP Path	Filter
[redacted]	[redacted]
[redacted]	[redacted]

Copy the **Tenant ID** (Directory ID) from your Azure AD portal: **Azure Active Directory** > **Properties** > **Directory ID** (the Directory ID is the Tenant ID).


Active Directory Filter Wizard

Active Directory Filter

* Tenant ID
The identifier for the tenant that the synchronization targets.
0XXXXXXX-YYYY-HHHH-ABCD-123456789123

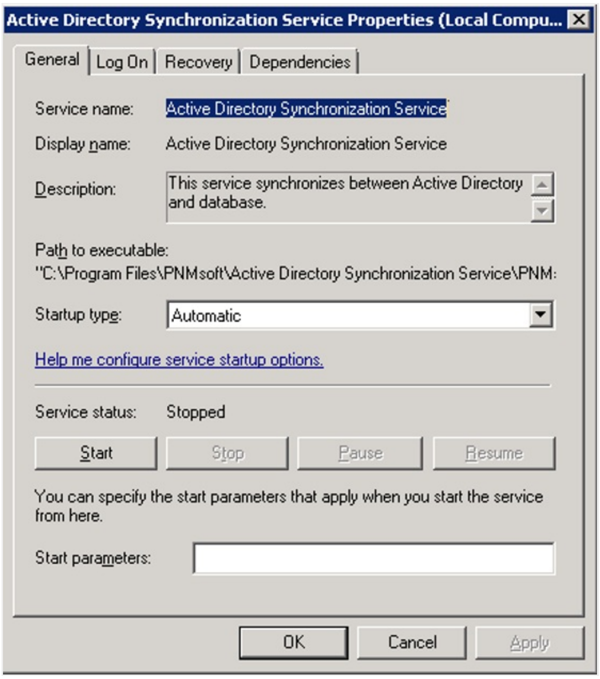
User Filter
Set the filter to retrieve specific set of users

Group Filter
Set the filter to retrieve specific set of groups

5. Select the attributes (in addition to the standard ones), that you want to import from the Active Directory to Cora SeQuence, and then click **Finish**.
   You can import user photos from the Active Directory using the photo property. Any photos that are saved in this property will be imported into Cora SeQuence. Any additional properties you choose to synchronize will be added to the employees table in the Cora SeQuence database (*tblEmployees*). Apart from the photo, these properties will only be available on the database table.

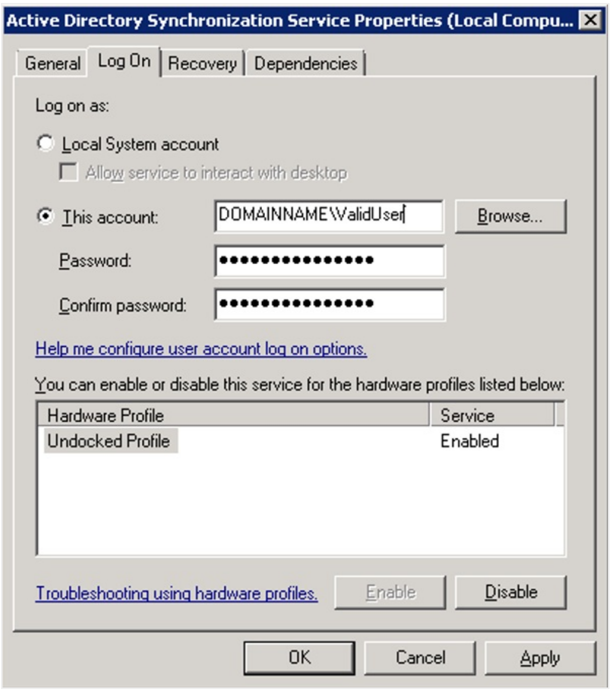
Procedure 2: Configure Active Directory Synchronization Service

1. Log on to the server where the Active Directory Synchronization Service is installed, and open the Services console.
2. Locate the **Active Directory Synchronization Service**, open its **Properties**page, and click the **General** tab.
   The service should be set to *Automatic* in the **Startup Type** field.


Active Directory Synchronization Service Properties (Local Compu...

Service name: Active Directory Synchronization Service
Display name: Active Directory Synchronization Service
Description: This service synchronizes between Active Directory and database.
Path to executable:
"C:\Program Files\PNMsoft\Active Directory Synchronization Service\PNM:
Startup type: Automatic
Help me configure service startup options.
Service status: Stopped
You can specify the start parameters that apply when you start the service from here.
Start parameters:

3. Click the **Log On** tab.
   The user configured in this screen is the one that was specified during the Sequence installation. This is the user who will query Active Directory for the default domain and the domains that are set to use the default credentials.


Active Directory Synchronization Service Properties (Local Compu...
General
Log On
Recovery
Dependencies
Browse...
Help me configure user account log on options.
Troubleshooting using hardware profiles.
Enable
Disable
OK
Cancel
Apply

Log on as:

○ Local System account

□ Allow service to interact with desktop

● This account: DOMAINNAME\ValidUser

Password: •••••••••••••••

Confirm password: •••••••••••••••

You can enable or disable this service for the hardware profiles listed below:

Hardware Profile	Service
Undocked Profile	Enabled

NOTE: You can install the Active Directory service on multiple machines for redundancy. The Cora SeQuence engine automatically configures failover mode and no additional actions are required.

Appendix A: Active Directory Service Config File

Open the *Active Directory Service Config* file.

By default, the file is located in `C:\Program Files\PNMsoft\Active Directory Synchronization Service`.

IMPORTANT: Any manual changes made to the configuration will be overwritten when you upgrade Cora SeQuence versions. It is important that you record any changes so you can implement them after you upgrade.

The following snippet is the only part that can be edited. An explanation of each key and its valid input follows:

```
<adSyncronizationThread type="PNMsoft.Sequence.WindowsServices.ADSS.BuiltinThreads.ADSyncronizator, PNMsoft.Sequence.WindowsServices.ADSS"
   interval="60"
   domain="MYDOMAIN"
   computerNameAD="MYDOMAIN"
   pageSize="100"
   serverPageTimeLimit="60"
   adUniqueKey="objectGuid"
   startSynchLoopsAt=""
   stopSynchLoopsAt=""
   useTombstonesToDetectDeletedObjects="true" />
```

Key Name	Description	Valid Setting	Recommended Setting

Key Name	Description	Valid Setting	Recommended Setting
interval	Time period in minutes that the service will pause after each update from the AD server.	Any positive integer	720
domain	Name of the domain managed by the AD server. The value is taken from the config file when the domain name of the filter is empty.	Any string (configured by the installer to what was entered in the ADSS screen)	Short name of the default domain to synchronize
computerNameAD	AD server name. (Obsolete from Cora SeQuence v7.4)	Any string, but must be equal to the domain. Configured by the installer to what was entered in the ADSS screen)	Must be equal to the domain.
pageSize	Number of records copied from the AD server each time. Should be lowered when the AD server responds slowly to avoid timeouts.	20-500	100
serverPageTimeLimit	Time period in seconds that the service waits for a reply before timing out. Should be raised when the AD server responds slowly.	60-500	60
adUniqueKey	Determines the unique key setting for the AD service. Valid settings are *objectGuid* to denote using the key from the AD server, or *domainUserName* to denote a combination of the user's domain and NT user name.	*objectGuid* or *domainUserName*	*objectGuid*
startSynchLoopsAt	Used in combination with the *stopSynchLoopsAt* attribute to limit the AD queries by hour of the day.	24 hour time format: HH:mm, for example 14:35. Other formats will not be processed.	-

Key Name	Description	Valid Setting	Recommended Setting
stopSynchLoopsAt	Used in combination with the *stopSynchLoopsAt* attribute to limit the AD queries by hour of the day.	24 hour time format: HH:mm, for example 14:35. Other formats will not be processed.	-
useTombstonesToDetectDeletedOjbects	If set to *true* Cora SeQuence recognizes tombstones, which represent objects deleted from AD and deletes (if group or OU) or made inactive (if user).	*True* or *False*	*True*
debugState	Obsolete	*On* or *Off*	-

Appendix B: Add Custom Code

Adding Custom Code

You can add custom code before and/or after each synchronization cycle, as follows:

1. Create a new class library project.
2. Ensure that your class inherits from *IBeforeSynchronizationCycleStarted* for code to be executed before synchronization or from *IAfterSynchronizationCycleCompleted* for code to be executed after synchronization.
3. Implement the method *OnBeforeSynchronizationCycleStarted* for code to be executed before synchronization or *OnAfterSynchronizationCycleCompleted* for code to be executed after synchronization.
4. Sign your assembly and place it on the server GAC.
5. Register the assembly you have just created in the following section of the config file, according to the following sample.

```
<serviceEvents>
 <!-- Example how to add custom event handler assembly to the service
 <eventAssemblies>
 <add type="CustomEventAssemblyNamespace.CustomEventClass, CustomEventAssemblyName, Version=1.0.0.0,
Culture=neutral, PublicKeyToken=ca08babd3815c17a" eventName="EvenetMethodName" />
 </eventAssemblies>
 -->
 </serviceEvents>
```

NOTE: Replace *EvenetMethodName* with *OnBeforeSynchronizationCycleStarted* or *OnAfterSynchronizationCycleCompleted*.

Appendix C: Basic LDAP Syntax

Argument	Name	Description
=	Equal to	This LDAP argument means a certain attribute must be equal to a certain value to be true. For example, if you want to find all objects that have the first name of John, you would use: (givenName=John) This would return all objects that have the first name of John. Parentheses are included to emphasize the beginning and end of the LDAP statement.
&	Logical AND	Use this syntax when you have more than one condition, and you want all conditions in the series to be true. For example, if you want to find all of the people that have the first name of John and live in Dallas, you would use: (&(givenName=John)(physicalDeliveryOfficeName=Dallas)) Notice that each argument is in its own set of parentheses. The entire LDAP statement must be encompassed in a main set of parentheses. The & operator means that each argument must be true for this filter to apply to your object.
!	Logical NOT	This operator is used to exclude objects that have a certain attribute. Suppose you need to find all objects except those that have the first name of John. You would use the following statement: (!givenName=John) This statement would find all objects that do not have the first name of John. Notice that the ! operator goes directly in front of the argument and inside the argument's set of parentheses. Because there is only one argument in this statement, it is surrounded with parentheses for illustration.
*	Wildcard	Use the wildcard operator to represent a value that could be equal to anything. One such situation might be if you wanted to find all objects that have a value for title. You would then use: (title=*) This would return all objects that have the title attribute populated with a value. Another example might be if you know an object's first name starts with Jo. Then, you could use the following to find those: (givenName=Jo*) This would apply to all objects whose first name starts with Jo.

For more information please review the following articles:

- LDAP Query Basics - http://technet.microsoft.com/en-us/library/aa996205(v=exchg.65).aspx
- Search Filter Syntax - http://msdn.microsoft.com/en-us/library/aa746475(v=vs.85).aspx
- Active Directory: LDAP Syntax Filters - http://social.technet.microsoft.com/wiki/contents/articles/5392.active-directory-ldap-syntax-filters.aspx