Multi Entity Management

for

Microsoft Dynamics

Business Central

How-to

Setup Cross Database

replication

Table of Contents

1.1 Setup Guide for Cross Database replication.

This Guide describe how to setup Multi Entity Management to perform data replication between Companies located in separate Environments or Databases.

1.2 Subscriber Database, replication setup.

Start the setup with the dependent company in the subscriber environment/database. After the preparation, all the replication setups will be managed in the Publisher Database with the Template Company holding the Master Data.

1.2.1 Initial Setup

- Start Business Central with the Role "Master Data Manager"

- Go to "About Multi Entity Management" Page

- Activate function: "Create Template Setup Data"

- For Microsoft Dynamics 365 Business Central, version 17 and below.

    o Activate function: "Update Permissions Sets".

1.2.2 Cross Database Setup

- Go to the "Cross Database Setup"
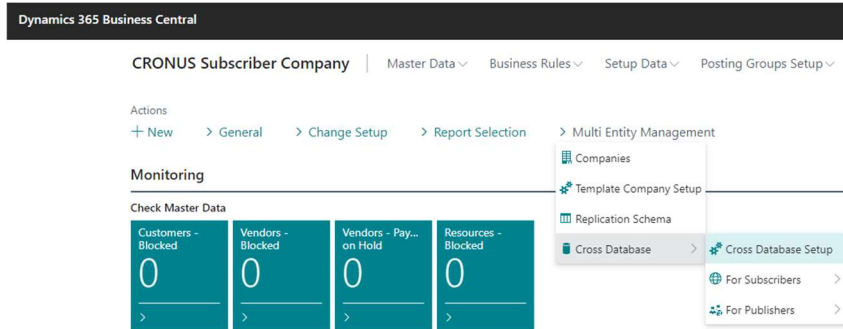
- When the Page "Cross Database Setup" is opened, Multi Entity Management performs an automatic setup.

  Please note that the "General" section, is only used, if the Subscriber Company, also acts as a Cross Database Publisher.
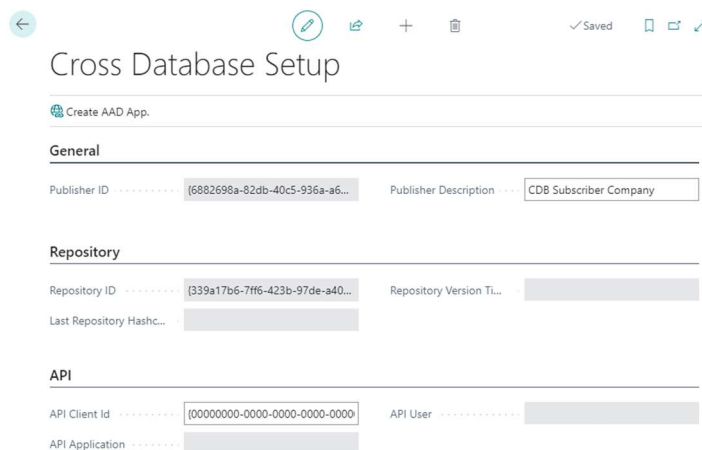
- After the Page have been shown on the screen, close it again.
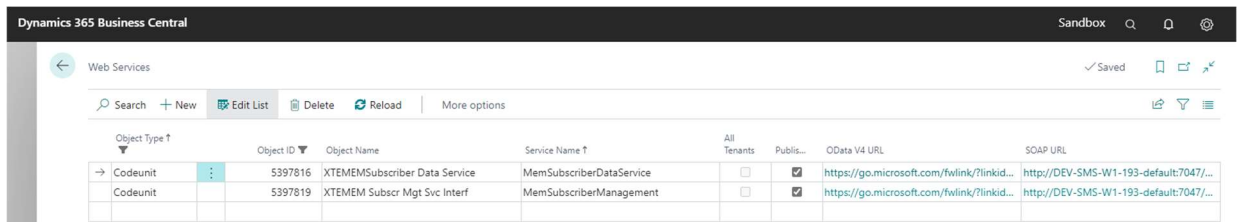
1.2.3 Setup Web services

- Go to the page "Web Services"
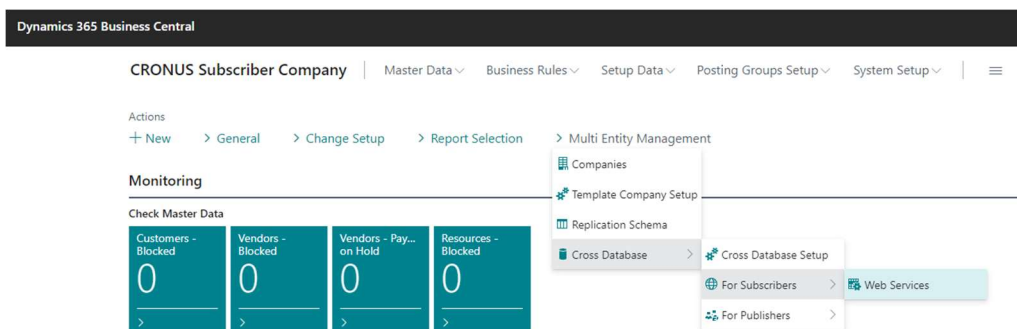
- At the page "Web Services" choose "Edit List".

- Add Codeunit 5397816 "XTEMEMSubscriber Data Service" to the list.

- Give the service a prober name in the field "Service Name".

- Set a Checkmark in the field "Publish"

- Add Codeunit 5397819 "XTEMEM Subscr Mgt Svc Interf" to the list and insert a prober name I the field "Service Name".

- Give the service a prober name in the field "Service Name".

- Set a Checkmark in the field "Publish"

When publishing the two webservices, an URL is created in field "SOAP URL" for each webservice.
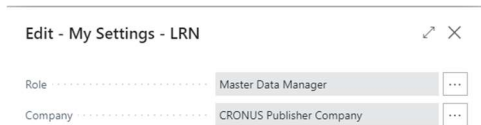
- Activate both webservice URL to check that they are working.

1.3   Setting up Publisher Database

The next step is preparing the Publisher Database with the Template Companies to transferring Data. After the preparation the Master Data is ready for replication.

1.3.1   Initial Setup

- Start Business Central with the Role "Master Data Manager"

- Go to "About Multi Entity Management" Page

- Activate function: "Create Template Setup Data"

- For Microsoft Dynamics 365 Business Central, version 17 and below.

    o   Activate function: "Update Permissions Sets".

1.3.2   Template Company Setup

- Go to the "Template Company Setup" and do the "Template Setup" for your Publishing Company, so it is marked as a "Template Company"
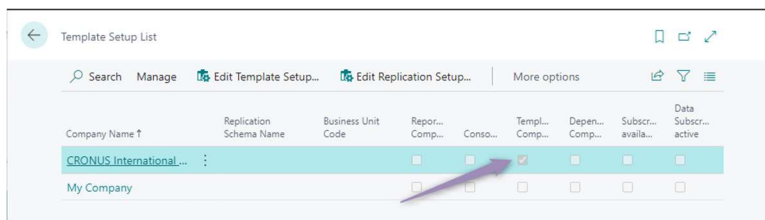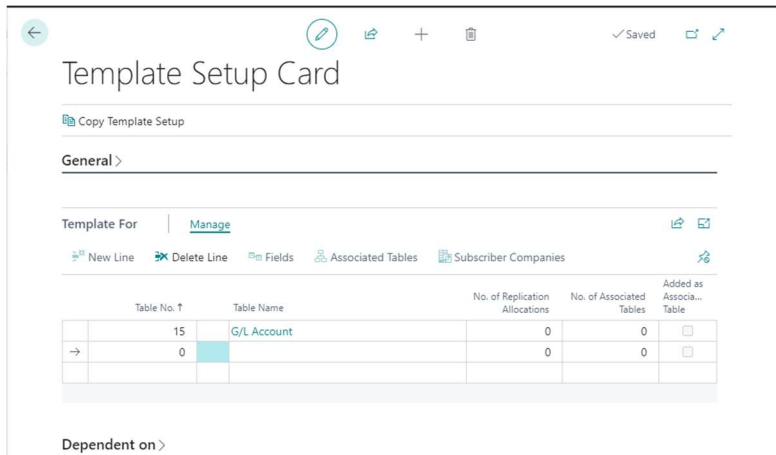
1.3.3 Cross Database Setup

- Go to the "Cross Database Setup"
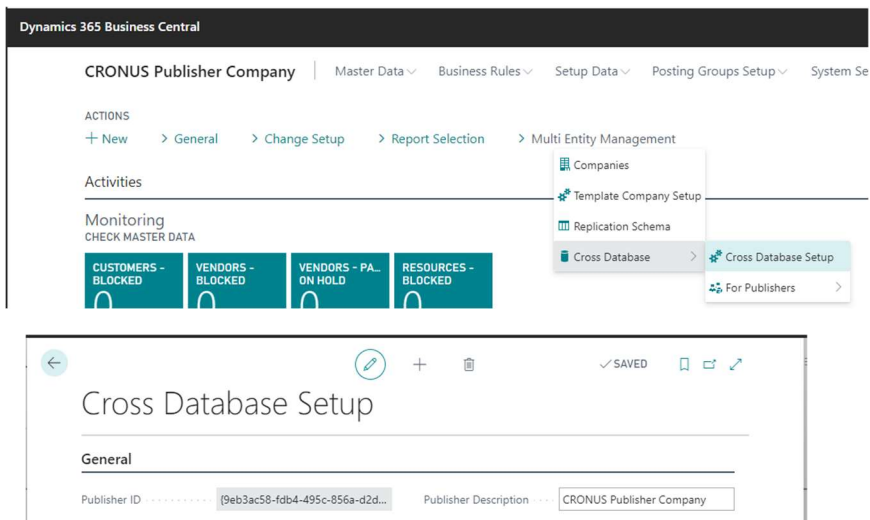
- The field "Publisher Description" is filled with a proper name.

1.3.4 Repository List

- Go to the "Repository List"
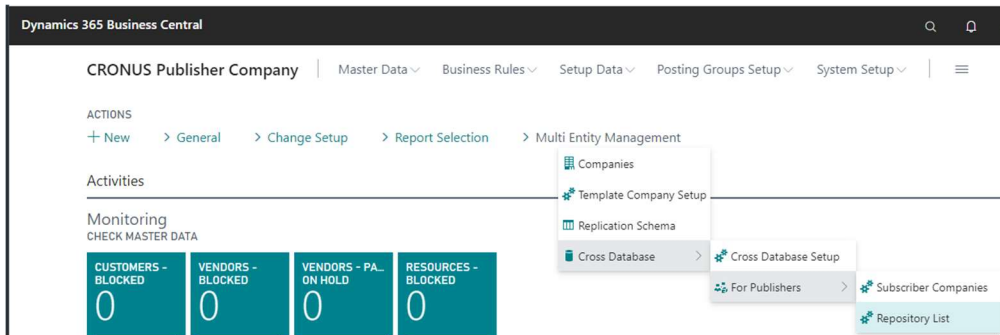
- Create a new CODE and Description
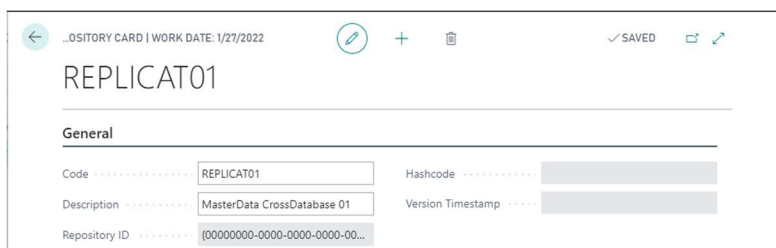
1.3.5 Subscriber Companies

- Go to the "Subscriber Companies"
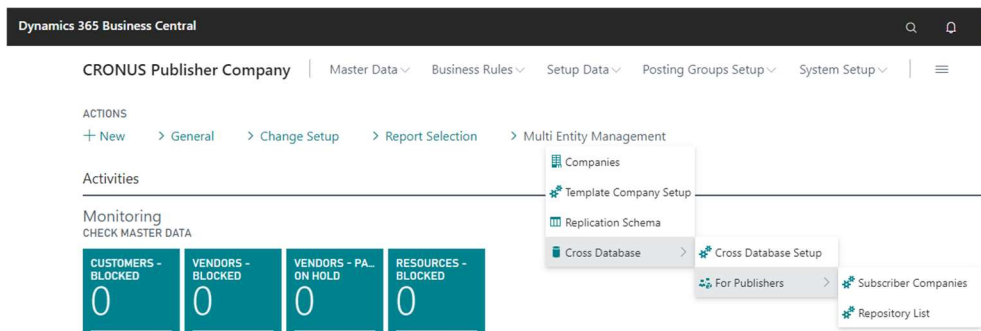
- Insert "Code", "Description" and "Repository Code"

- Open the Subscriber Company and find the SOAP URL's for "Subscriptions" and "Management"
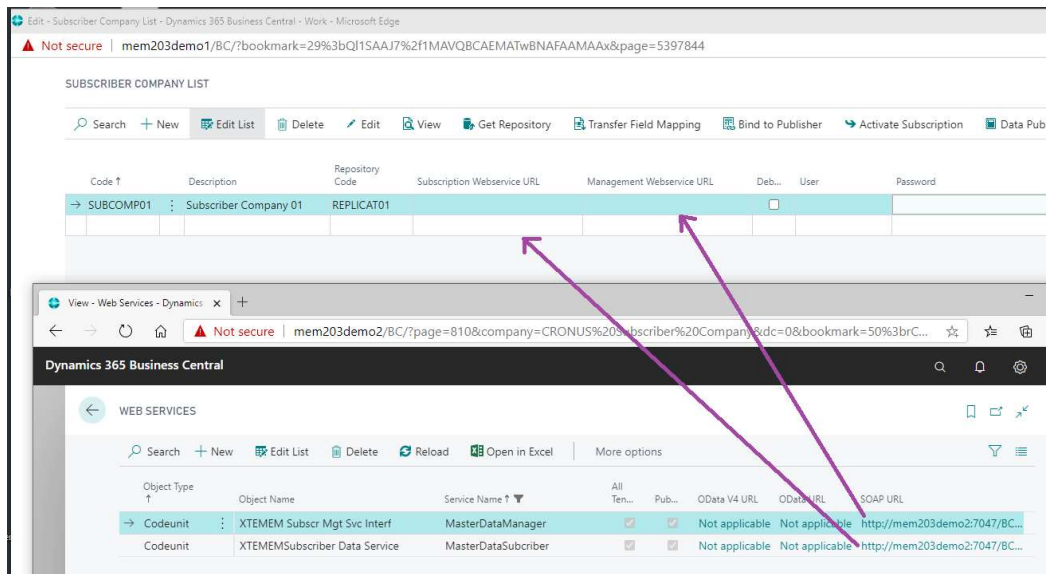
Copy the values to the "Subscriber Company Line"

- Choose the Authentication Methods

    o Basic Authentication/Web Access Key: Insert **User**/Id and **Password**/Key. The field "Tenant Id" is left empty, without any value. (See section 1.4 about how to setup authentication)

    o Service-to-Service (Client Credentials): Insert **Tenant Id**, User/**Id** and Password/**Key**. (See section 1.4 about how to setup authentication)

- Run the function "Bind to Publisher"
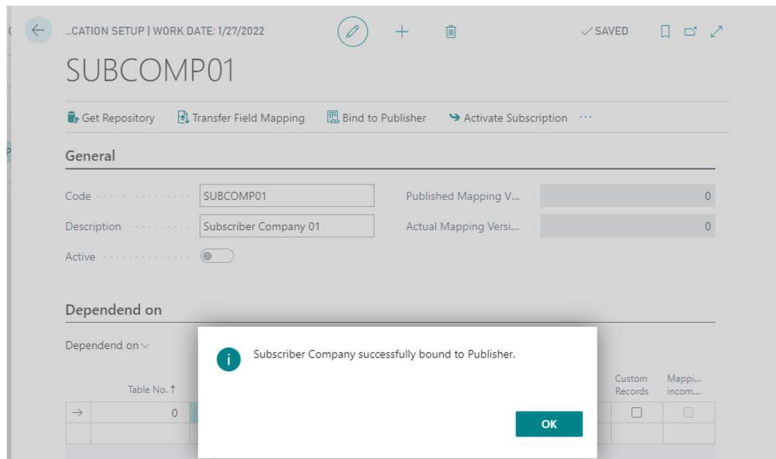
- Run the function "Get Repository"
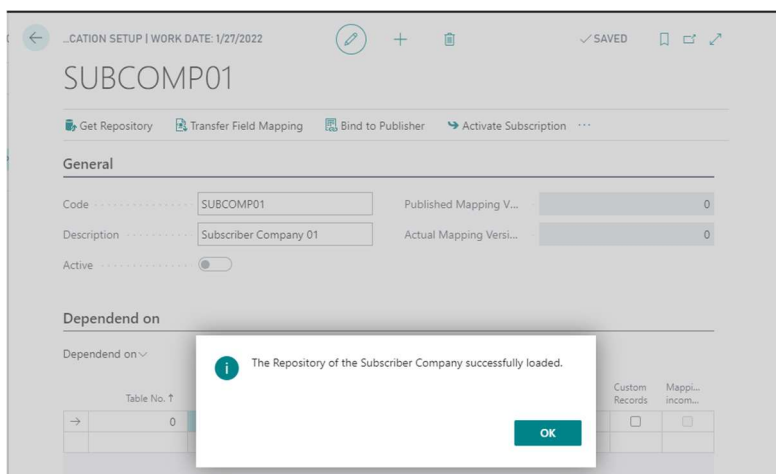
1.3.6 Replication Setup

- It is now time to do the Cross Database Replication setup

- Go to the "Subscriber Companies List" and open the Page Card.

- Do the Replication Setup in the "Dependent on" section and set Checkmark in the "Subscribe" field.

- Use the function "Transfer Field Mapping", to transfer the records to the "Subscriber Company"

- Use the function "Activate Subscription" to automate the replication

1.4   Authentication methods.

There is different requirement to the authentication's methods used, when replicating data between different version of Business Central Environments/Databases and NAV Databases.

1.4.1   Basic or Service-to-Service Authentication.

When Master Data is replicated between different Environments or Databases there is a requirement for either Basic or Service-2-Service Authentication to validate the communication.

When a Business Central Environment is part of the replication, Service-2-Service Authentication is required. See the table below.

Publisher	Subscriber	Authentication
Business Central (SaaS)	Business Central (SaaS)	Service-to-Service
Business Central (SaaS)	Business Central (On premises) From BC version 18 or later. *)	Service-to-Service
Business Central (SaaS)	Business Central (On premises) Up to BC version 17. *)	Basic
Business Central (SaaS)	Microsoft Dynamics NAV	Basic
BC On-premises (BC 18.0 or later) *)	Business Central (SaaS)	Service-to-Service
BC On-premises (up to BC 17.0)	Business Central (SaaS)	Not possible
BC On-premises	Business Central (On premises)	Basic
BC On-premises	Microsoft Dynamics NAV	Basic
Microsoft Dynamics NAV	Business Central (SaaS)	Not possible
Microsoft Dynamics NAV	Business Central (On premises)	Basic
Microsoft Dynamics NAV	Microsoft Dynamics NAV	Basic

*) For running the Service-2-Service Authentication on Business Central on-premises versions 18 and 19, these versions must be updated to BC 18.11 and BC 19.5 or newer.

More details can be found with the Microsoft Learn link:

https://learn.microsoft.com/en-us/dynamics365/business-central/dev-itpro/administration/automation-apis-using-s2s-authentication

1.4.2   Basic Authentication – Initial setup

To enable the Basic Authentication methods, create a User assigned both the "Business Central Password Authentication" and a "Web Service Access Key" in the subscriber environment/database.

Note: If the Business Central subscriber environment/database is setup with Windows Authentication, there must be created an extra Service Tier, to handle the Webservice access with Business Central Password Authentication.

1.4.3 Service-to-Service Authentication – Initial Setup

If the replication setup requires the service-to-service authentication, there are two steps to do.

1) Register an application in your Azure Active Directory tenant for authenticating API call against Business Central
2) Grant access for that application in Business Central

1.4.3.1 Register application in Azure Active Directory (ADD)

To register an application in Azure Active Directory, do the following steps

- Open the Azure Portal, https://portal.azure.com
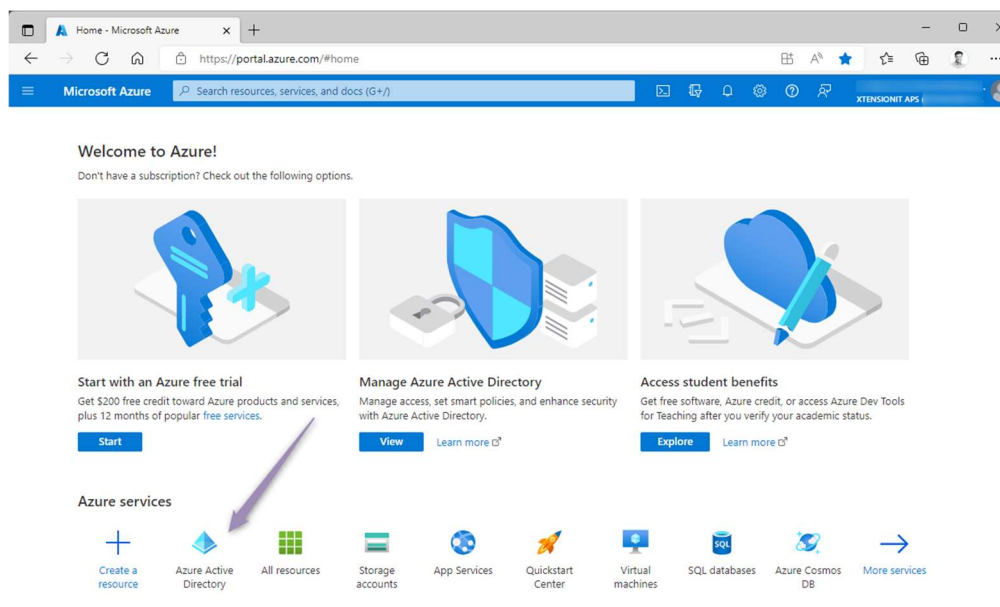
- Go to Azure Active Directory
- Select App registrations and + New registration
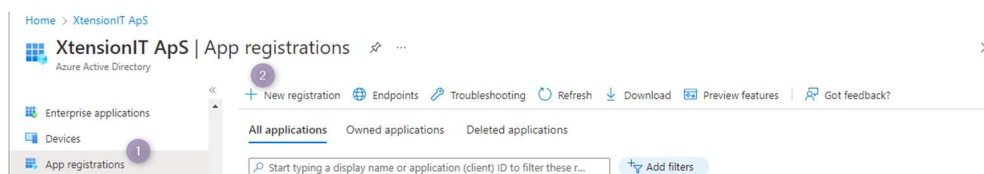
When creating the **App registration** select the following options

Register an application ···   ✕

* Name

The user-facing display name for this application (this can be changed later).

MEM Cross Database Replication ①   ✓

Supported account types

Who can use this application or access this API?

○ Accounts in this organizational directory only (XtensionIT ApS only - Single tenant)

◉ Accounts in any organizational directory (Any Azure AD directory - Multitenant) ②

○ Accounts in any organizational directory (Any Azure AD directory - Multitenant) and personal Microsoft accounts (e.g. Skype, Xbox)

○ Personal Microsoft accounts only

Help me choose...

Redirect URI (optional)

We'll return the authentication response to this URI after successfully authenticating the user. Providing this now is optional and it can be changed later, but a value is required for most authentication scenarios.

Web ③ ⌄ | https://businesscentral.dynamics.com/OAuthLanding.htm ④   ✓

Register an app you're working on here. Integrate gallery apps and other apps from outside your organization by adding from Enterprise applications.

By proceeding, you agree to the Microsoft Platform Policies 🗗

[Register]

- Name: A suitable name
- Supported account type: Accounts in any organizational directory (Any Azure AD directory - Multitenant)
- Redirect URI (optional): Web + https://businesscentral.dynamics.com/OAuthLanding.htm
- Register with the **Register** button

The App registration is now created but requires permissions setup.

- Go to API permissions

MEM Cross Database Replication | API permissions 📌 ···   ✕

🔍 Search «	↻ Refresh	🗨 Got feedback?

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Expose an API

Configured permissions

Applications are authorized to call APIs when they are granted permissions by users/admins as part of the consent process. The list of configured permissions should include all the permissions the application needs. Learn more about permissions and consent

③

➕ Add a permission   ✓ Grant admin consent for XtensionIT ApS

API / Permissions name	Type	Description	Admin consent req...	Status	
∨ Microsoft Graph (1)					···
User.Read	Delegated	Sign in and read user profile	No		···

To view and manage permissions and user consent, try Enterprise applications.

- Select **+ Add a permission** to open the Request API permissions page

- Select Dynamics 365 Business Central

- Select Application permissions
- Select API.ReadWrite.All
- Register with the **Add permissions** button

- Then Grant admin consent for your organization

MEM Cross Database Replication | API permissions ✗ ⋯   ✕

⟳ Refresh | ✍ Got feedback?

⚠ You are editing permission(s) to your application, users will have to consent even if they've already done so previously.

Configured permissions

Applications are authorized to call APIs when they are granted permissions by users/admins as part of the consent process. The list of configured permissions should include all the permissions the application needs. Learn more about permissions and consent

+ Add a permission | ✓ Grant admin consent for XtensionIT ApS

API / Permissions name	Type	Description	Admin consent req...	Status	
∨ Dynamics 365 Business Central					⋯
API.ReadWrite.All	Application	Full access to web services API	Yes	⚠ Not granted for Xtensio...	⋯
∨ Microsoft Graph (1)					⋯
User.Read	Delegated	Sign in and read user profile	No		⋯

To view and manage permissions and user consent, try Enterprise applications.

- When the Consent is granted, the Status must be marked with a Green Check

✗ Integration assistant

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⟳ Authentication

🔑 Certificates & secrets

|⁝| Token configuration
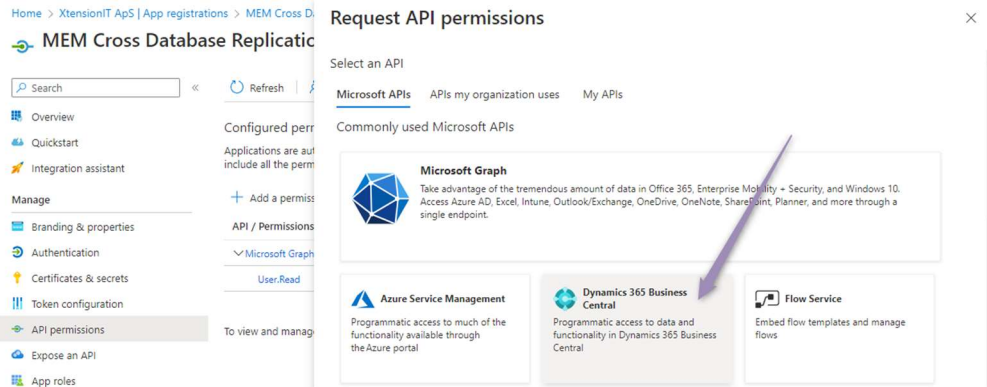
⟳ API permissions

Configured permissions

Applications are authorized to call APIs when they are granted permissions by users/admins as part of the consent process. The list of configured permissions should include all the permissions the application needs. Learn more about permissions and consent

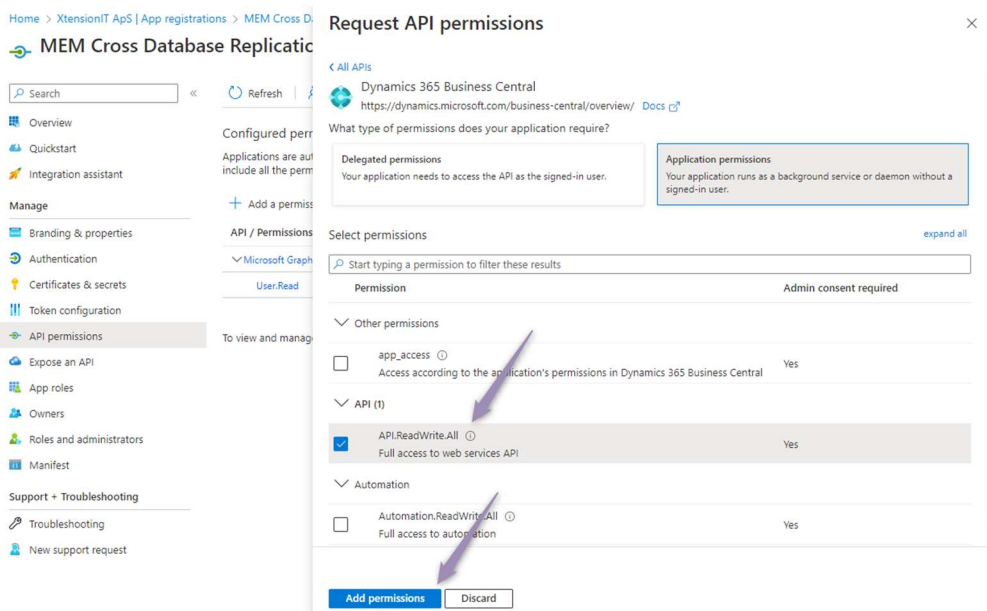+ Add a permission | ✓ Grant admin consent for XtensionIT ApS

API / Permissions name	Type	Description	Admin consent req...	Status	
∨ Dynamics 365 Business Central					⋯
API.ReadWrite.All	Application	Full access to web services API	Yes	✅ Granted for XtensionIT ...	⋯

After the permissions setup we must create the "Client secret".

- Go to Certificates & secrets

🔑 **MEM Cross Database Replication | Certificates & secrets** ✗ ⋯   ✕

✍ Got feedback?

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🔑 Certificates & secrets (2)

|⁝| Token configuration

⟳ API permissions

☁ Expose an API

Credentials enable confidential applications to identify themselves to the authentication service when receiving tokens at a web addressable location (using an HTTPS scheme). For a higher level of assurance, we recommend using a certificate (instead of a client secret) as a credential.

Certificates (0)   Client secrets (0)   (3)   Federated credentials (0)

A secret string that the application uses to prove its identity when requesting a token. Also can be referred to as application password.

+ New client secret

Description	Expires	Value ⓘ	Secret ID

No client secrets have been created for this application.

- Select **+ New client secret** to open the Add a client secret page

MEM Cross Database Replication | Certificates & secrets

Got feedback?

Credentials enable confidential applications to identify themselves
scheme). For a higher level of assurance, we recommend using a ce

Certificates (0)   Client secrets (0)   Federated credentials

A secret string that the application uses to prove its identity when

+ New client secret

Description	Expires

No client secrets have been created for this application.

Add a client secret   ✕

Description   MEM CDB key

Expires   Recommended: 6 months ⌄

Recommended: 6 months
3 months
12 months
18 months
24 months
Custom

Add   Cancel

- o   Give the Client Secret Key a proper description
- o   Select the lifetime of the Client Secret Key
- o   Register with the **Add** button

- Store the Value and Secret ID of the "Client secret" a safe place. It is not possible to restore the value again.

MEM Cross Database Replication | Certificates & secrets 📌 ···   ✕

Got feedback?

ℹ️ Got a second to give us some feedback? →   ✕

Credentials enable confidential applications to identify themselves to the authentication service when receiving tokens at a web addressable location (using an HTTPS scheme). For a higher level of assurance, we recommend using a certificate (instead of a client secret) as a credential.
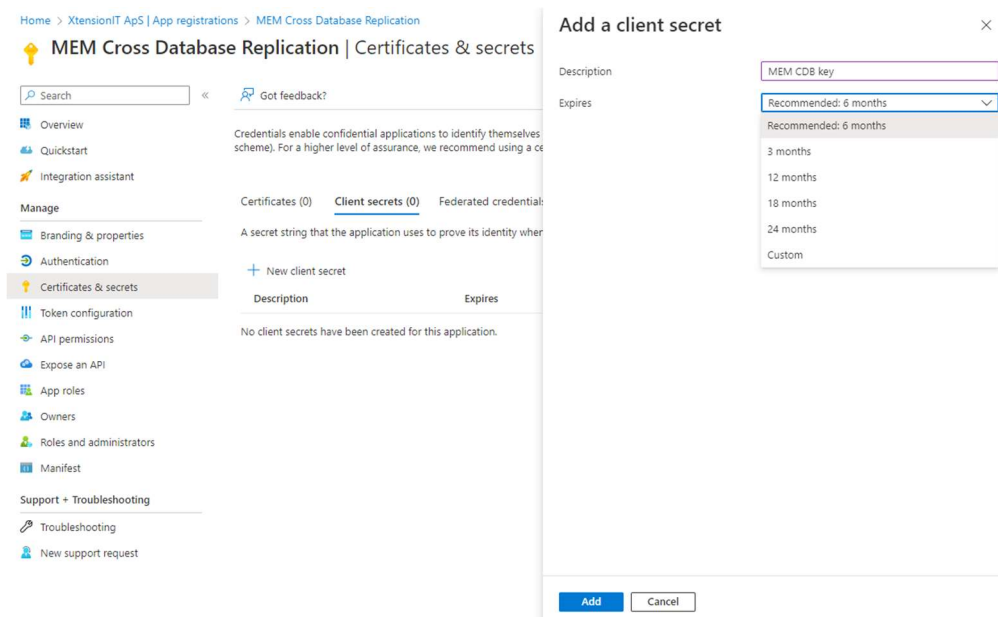
Certificates (0)   Client secrets (1)   Federated credentials (0)

A secret string that the application uses to prove its identity when requesting a token. Also can be referred to as application password.
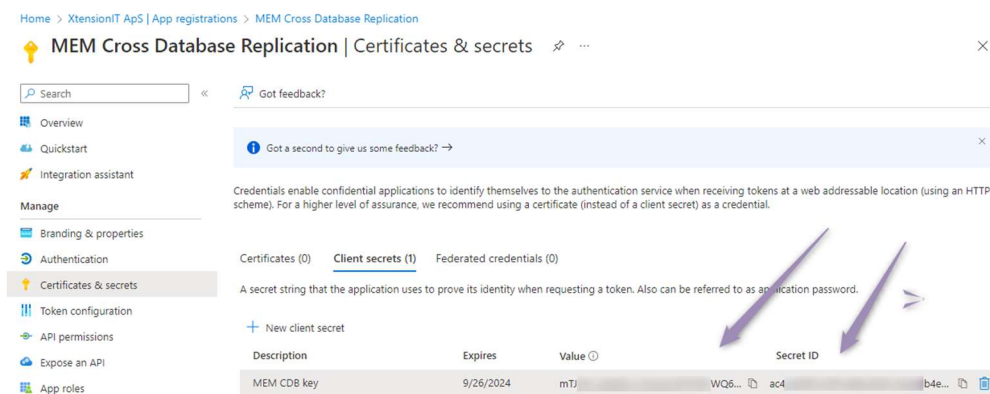
+ New client secret

Description	Expires	Value ⓘ	Secret ID
MEM CDB key	9/26/2024	mTJ⋯ WQ6… ▢	ac4⋯ b4e… ▢ 🗑

1.4.3.2   *Grant access in Business Central*

The Business Central Environment that receives/subscribe data from a publisher Environment / Database must be setup to receive data and grant access.

- Go to Multi Entity Management > Cross Database > Cross Database Setup

- o Insert the **Application (client) ID** into the **API Client Id** field in the API section at the Cross Database Setup page.

- Go to the Azure Active Directory Applications page and create a new application with **+New**

- Insert the **Application (client) ID** into the **Client ID** at the Azure Active Directory Application Card

- Insert the **User Groups** and **User Permissions Sets**

User Groups	User Permissions Sets
D365 ADMINISTRATOR	XTEMEM BASE
D365 AUTOMATION	XTEMEM BASIC
D365 BASIC ISV	XTEMEM MDSETUP
D365 BUS PREMIUM	
D365 EXTENSION MGT	
D365 FULL ACCESS	

1.5 Notes on Cross Database replication

Please be aware, when using Cross Database replication between Databases through SOAP Web Services, The Subscriber Database will not be able to show which Companies that are Dependent Companies.

On the other hand, the Publisher Database, will show which if Cross Database replication is available

1.6   Troubleshooting

1.6.1   Publisher Database is "C/SIDE" based and the Subscriber Database is AL based.

- IF the Publisher Database is "C/SIDE" based and the Subscriber Database is AL based. The "Content Encoding" must be removed from Codeunit "Subscription Web Request Mgt."

  Disable the line:

  // HttpWebRequest.Headers.Add('Content-Encoding','gzip, deflate');

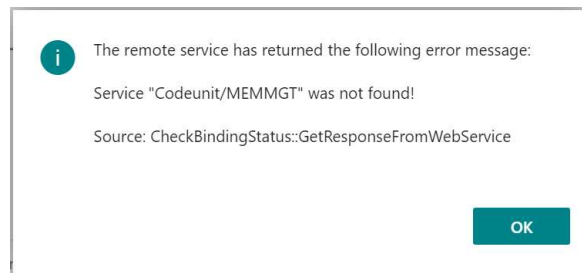### 1.6.2   OnPrem Databases both Publisher and Subscriber.

- OnPrem Databases both Publisher and Subscriber, must have the following added to "Service Tier Configuration".
    - Set Checkmark in "Use NTLM Authentication"
    - Set the field "Max Message Size" to minimum 5120

1.6.3   The Subscriber Database is setup with "Windows Authentication".

- Setup one Service Tier to handle all users with Windows Authentication.
- Setup another Service Tier to handle the Webservice access with NavUserPassword.

1.6.4   SOAP Exception Business Central 16

- The Cross Database Replication suddenly stop working.
    - 2 example of error messages

The remote service has returned the following error message:

Message is closed.

Source: CheckBindingStatus::GetResponseFromWebService

OK

The remote service has returned the following error message:

Service "Codeunit/MEMMGT" was not found!

Source: CheckBindingStatus::GetResponseFromWebService

OK
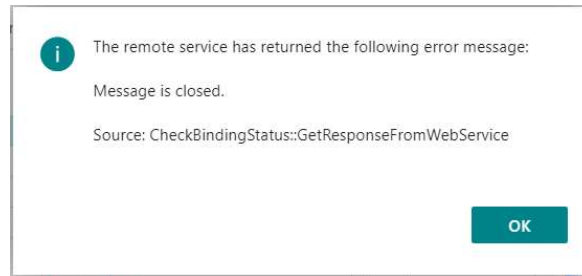
- Solution: Restart of the instance.

1.6.5   SOAP URL containing "default" more than once.

- The automatic created SOAP URL contains "default" more than once

  o   Example of incorrect url

  http://<environment_name>-default:7047/BC/WS/DE Subscriber
  Master/Codeunit/MemSubDataService?tenant=<environment_name>-default

- Solution change the above url to

  http://<environment_name>:7047/BC/WS/DE Subscriber
  Master/Codeunit/MemSubDataService?tenant=default