BEYONDIT
ZUKUNFTSSICHERE IT-PROJEKTE

INFORMATION

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Inhalt

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Introduction

The Cloud Connector is a Microsoft Dynamics 365 Business Central extension for connecting Azure BLOB Storage, Azure Files and Sharepoint. With the help of this connection, it is possible to store and link additional files, chaotically or structured, directly from Business Central to your own Microsoft Cloud, so that the corresponding files can be accessed quickly and easily from just one application. Depending on the connection, stored files can be viewed or downloaded directly in the web browser.

Storages

The following connectivity options and their definition are included in this extension:

1. Azure BLOB Storage:
   "Azure Blob Storage is Microsoft's object storage solution for the cloud. Blob storage is optimized for storing large amounts of unstructured data. Unstructured data is data that does not conform to any particular data model or definition (so, for example, text or binary data)."

   You can get more information from Microsoft's official site:
   What is Azure Blob storage?

2. Azure Files:
   "Azure Files provides fully managed file shares in the cloud that can be accessed via the industry standard Server Message Block (SMB) protocol as well as Network File System (NFS) protocol. Azure file shares can be mounted simultaneously via the cloud or through on-premises deployments. SMB file shares in Azure Files can be accessed from Windows, Linux and macOS clients. NFS file shares in Azure Files can be accessed from Linux or macOS clients. In addition, SMB file shares in Azure Files can be cached on Windows servers with Azure File Sync to provide fast access near the data usage location."

   You can get more information from Microsoft's official site:
   What is Azure Files?

3. Sharepoint:
   "Organizations use Microsoft SharePoint to create websites. They can use SharePoint as a secure place to store, structure, share and access information from virtually any device. All you need is a Web browser such as Microsoft Edge, Internet Explorer, Chrome or Firefox."

   You can get more information from Microsoft's official site:
   What is SharePoint?

With these 3 connectivity options, files can be conveniently stored in a separate cloud storage at your own discretion. On the one hand, this has the advantage that the actual database does not

increase in size unnecessarily and, on the other hand, that the files have a central storage location and can be accessed immediately from anywhere with all devices.

If multiple cloud services are available, it is up to you to assign the corresponding storage to a specific entity, so that in the end the service you prioritize can be used. All this can be defined and set up in Business Central.

Setup

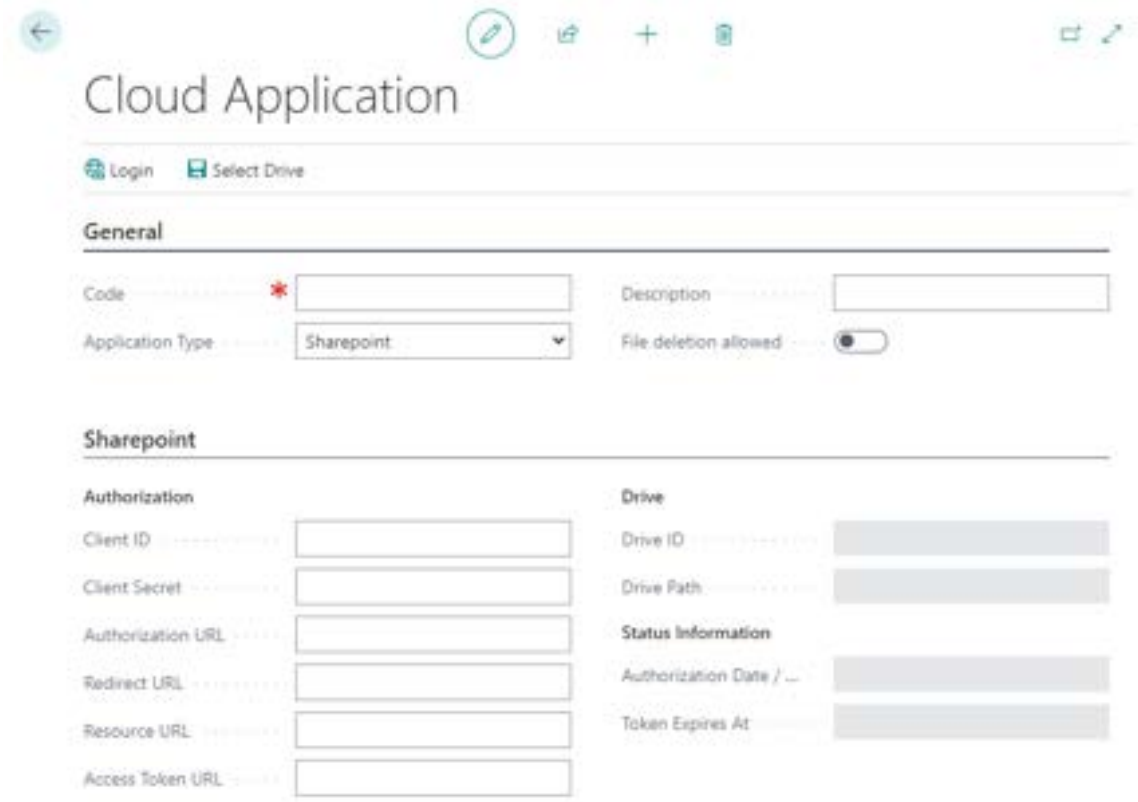
In order to use the Cloud Connector, it is necessary that the desired connections are deposited and set up in Business Central and in the Microsoft Azure Portal.

Cloud Applications:

The "Cloud applications" is used to define which type of cloud storage is to be used for data storage. With the search function and the input after the keyword "Cloud applications" the setup can be started.

Picture 1 – Search for Cloud Applications

A new window opens so that a new data set can be created. Depending on the connection, different information is required.



Azure BLOB Storage and Azure Files

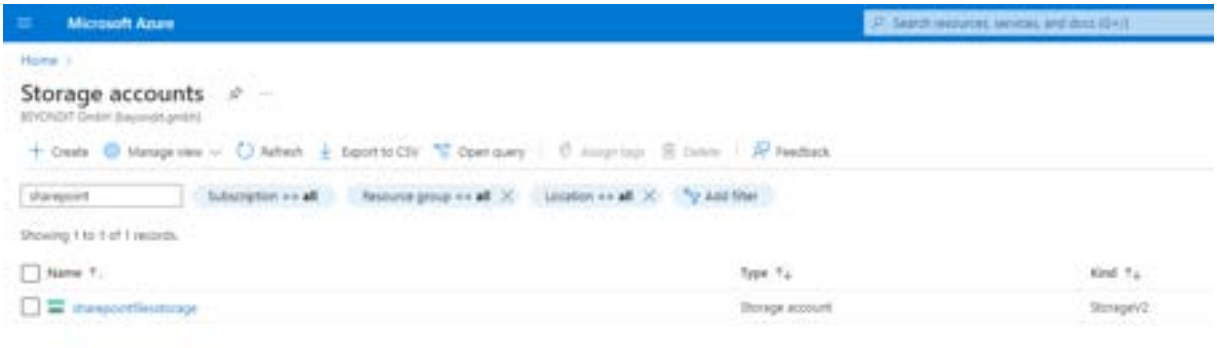
To establish connectivity between Business Central and Azure BLOB Storage or Azure Files, some setup is required in the Microsoft Azure Portal. Microsoft Azure Portal.

Setting up a storage account in the Azure Portal

To set up an Azure BLOB Storage or Azure File Storage it is necessary to create a new storage account in the Azure Portal. Either the item "Storage Accounts" is already listed for you below the search as well as visible in the screenshot or it is suggested to you during the search.

Picture 2 – Storage Accounts in Azure Portal

Create a new storage account or use an existing one where the files from Business Central will be stored.



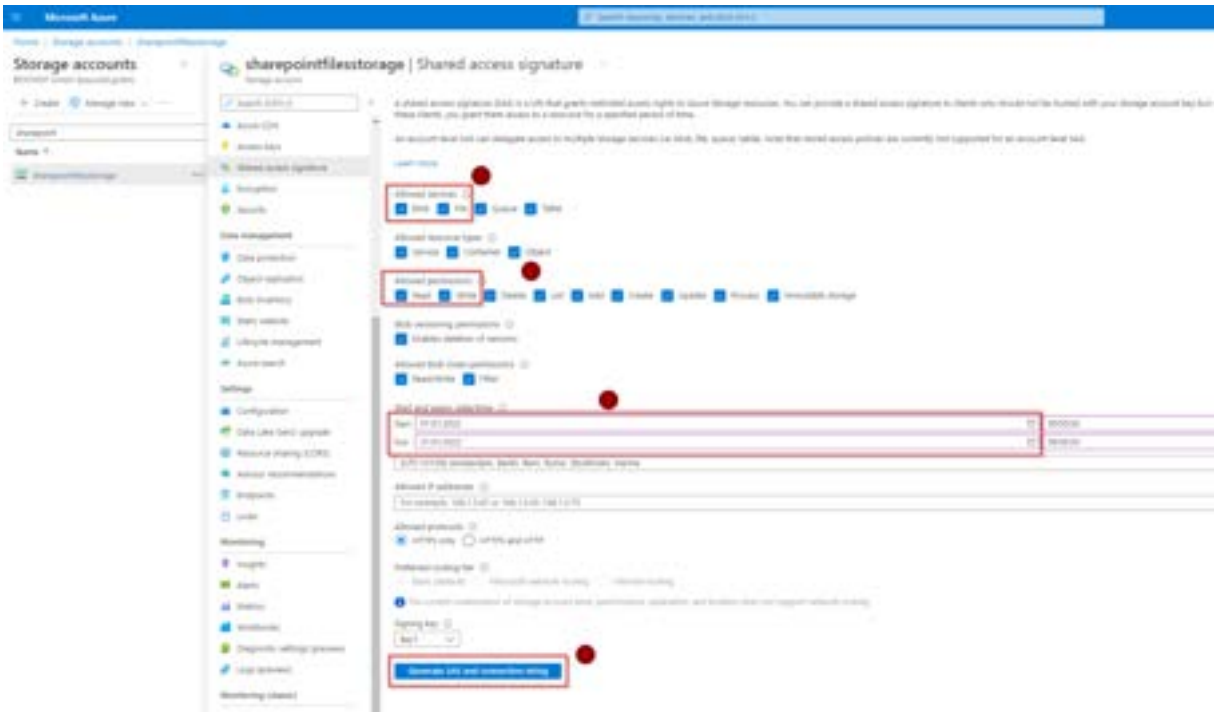
Picture 3 - New or existing Storage Accounts in Azure Portal

Create an SaS (Shared Access Signature)

For security reasons, an external application such as Business Central cannot access storage accounts in an organization's Azure portal without approval. For this, it is necessary to create a so-called SaS (Shares Access Signature).

What is a SaS: "A Shared Access Signature (SAS) is a URI that is used to grant restricted access rights to Azure storage resources. You can deploy a SAS to clients to whom you do not want to share your storage account key, but to whom you want to grant access to specific storage account resources. By distributing a SAS URI to these clients, you grant them access to a resource for a specified period of time."

Go to the Microsoft Azure portal of your sand go to the "Shared Access Signature (SAS)" menu item via the storage account to be used.

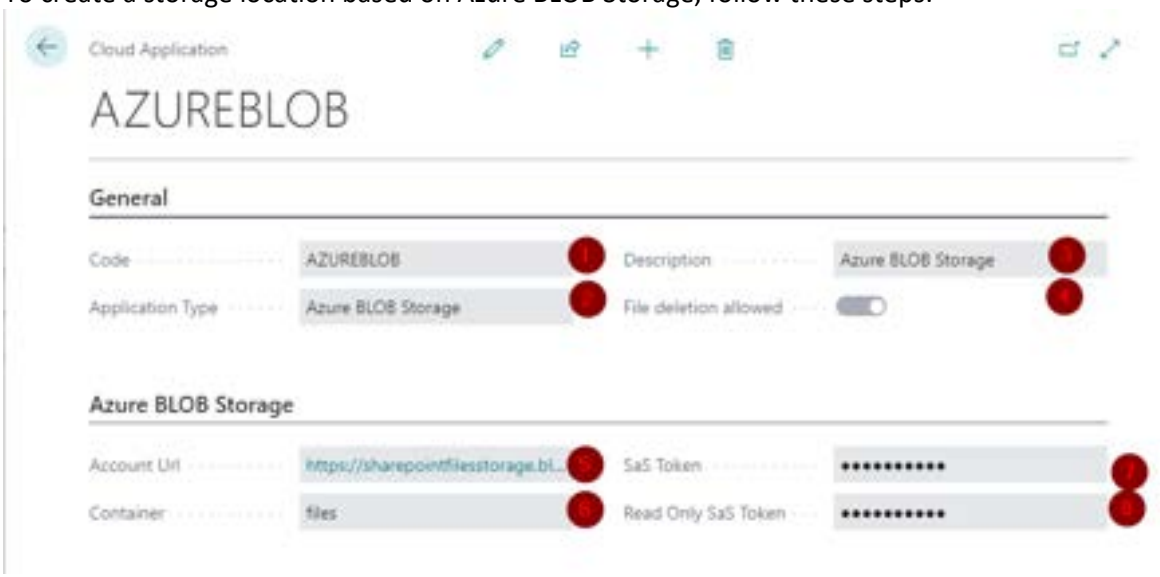


Picture 4 - SaS in Azure Portal

1. Allowed services: Here you specify for which storage account (Blob = Blob Storage or File = Azure Files) a SaS should be generated.
2. Allowed permissions: In Business Central, a read access permission is required for file preview. To drop, delete or download files, all other permissions are required. For both scenarios, a SaS must be generated for each and stored in the setup in Business Central. In theory, these can be identical. But should not be done for security reasons, as this information can be read by the browser during file preview.
3. Start and expiry date/time: Here you can decide how long a SaS should be valid. There is no default here, but this information should be updated frequently for security reasons.
4. generate SAS and connection string: This function generates a URL that establishes the connection between the storage account and Business Central. The input is done in Business Central.

Create a Blob Storage in Business Central

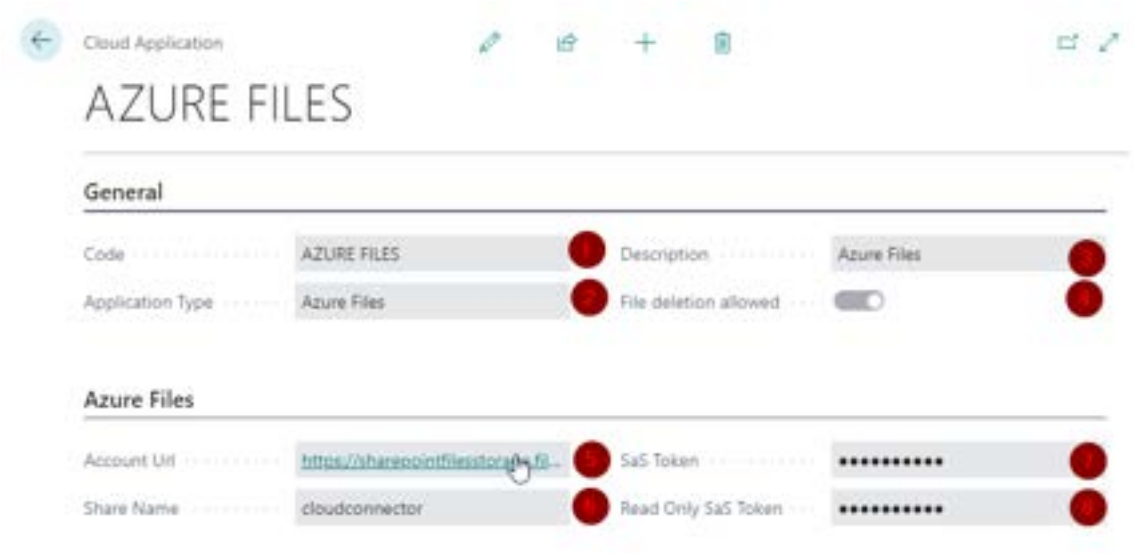
To create a storage location based on Azure BLOB Storage, follow these steps:



Picture 5 - Setup Azure BLOB Storage

1. Code: A meaningful code can be determined here. This can consist of letters and/or numbers.
2. Application Type: Here you can choose between the 3 connections Azure BLOB Storage, Azure Files and Sharepoint.
3. Description: Give it a description.
4. File deletion allowed: If this option is enabled, Business Central can be used to delete the selected file and its dependency in Azure BLOB Storage. It is not necessary to perform another deletion in the cloud. If the option is disabled, deletion of the file is prevented.
5. Account URL: This address comes from the Azure portal and is provided by Microsoft.
6. Container: This is the location where the files are stored, which is defined in the Azure Portal.
7. SaS Token: This is the access token to the BLOB storage. This token is used for read and write permission of the files. The token is given an expiration date, which can be generated and managed in the Azure Portal.
8. Read Only SaS token: For security reasons, this token is used for file previews and downloads, as it is visible to everyone in the page source text of the browser. Accordingly, the "Read access SaS token" must never be the same as the actual "SaS token".

To create a cloud storage for Azure Files, follow the steps below:



Picture 6 - Setup Azure Files

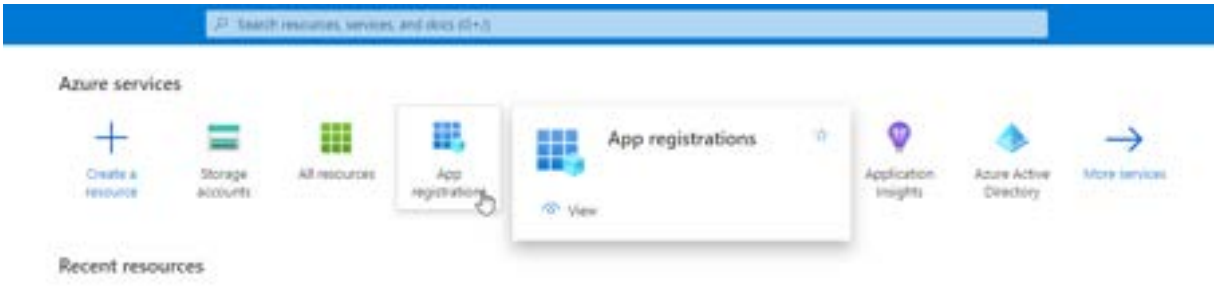
1. Code: A meaningful code can be determined here. This can consist of letters and/or numbers.
2. Application type: Here you can choose between the 3 connections Azure BLOB Storage, Azure Files and Sharepoint.
3. Description: Give it a description.
4. File deletion allowed: If this option is enabled, Business Central can be used to delete the selected file and its dependency in Azure Files. It is not necessary to perform another deletion in the cloud. If the option is disabled, deletion of the file is prevented.
5. Account URL: This address comes from the Azure portal and is provided by Microsoft.
6. Share Name: This is the location where the files are stored, which is defined in the Azure Portal.
7. SaS Token: This is the access token in Azure Files. This token is used for read and write permission of the files. The token is given an expiration date which can be generated and managed in Azure Portal.
8. Read only SaS token: For security reasons, this token is used for file previews and downloads, as it is visible to everyone in the page source code of the browser. Accordingly, the "Read access SaS token" must never be the same as the actual "SaS token".

Sharepoint

In order to be able to establish connectivity between Business Central and the Sharepoint, some settings are required in the Microsoft Azure Portal..

Setup of the API in Microsoft Azure Portal

Go to the Microsoft Azure Portal and search for the term "App Registration". Either this item is already listed for you below the search as well as visible in the screenshot or it is suggested to you during the search.



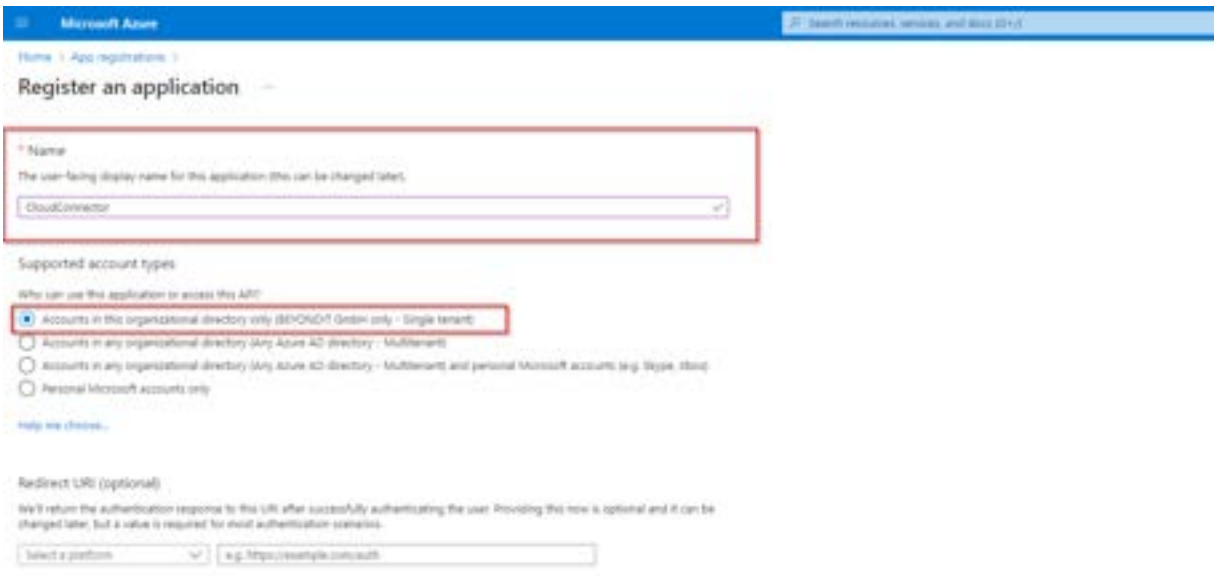
Picture 7 - App Registrations in Azure Portal

App Registration

Click the App Registration icon and create a new app using the “New Registration” Button.

Picture 8 - New App Registration in Azure Portal

Assign a name for this app and then click "Register".

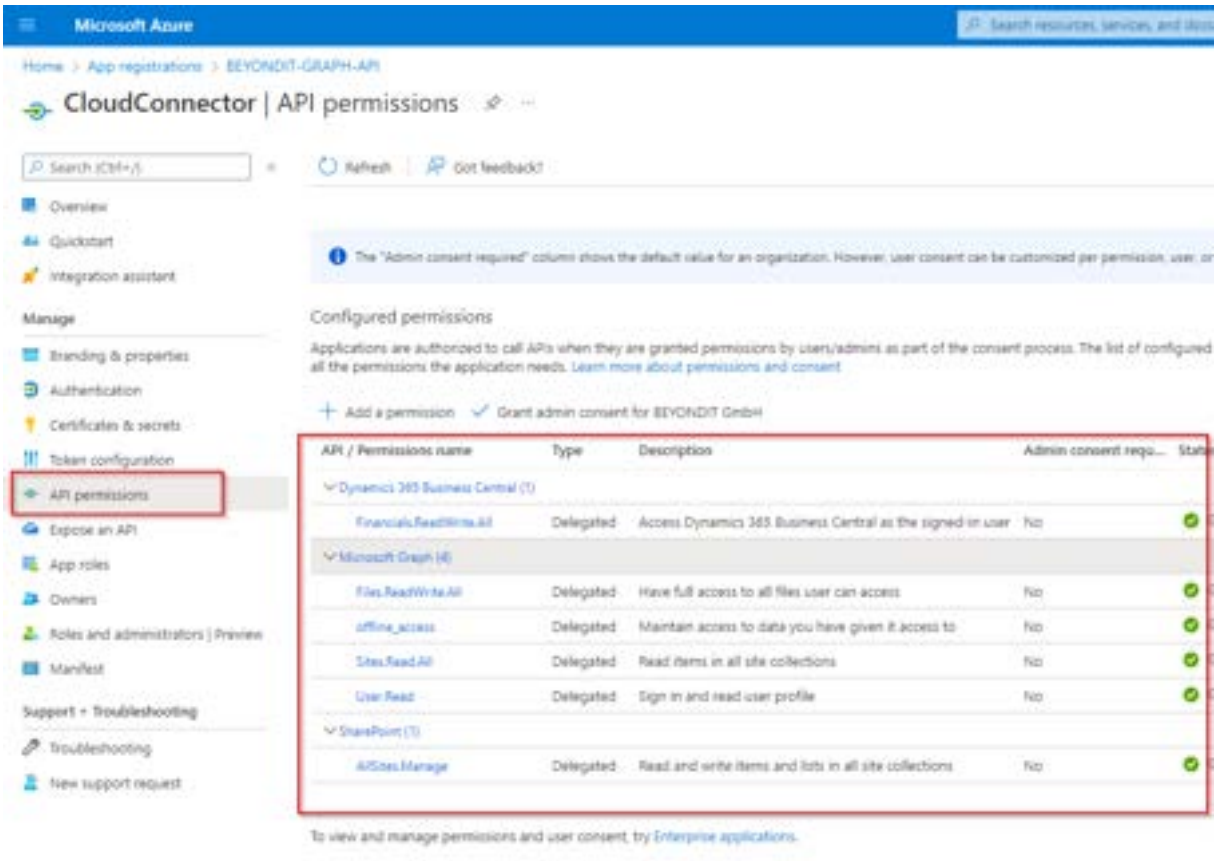


Picture 9 – Assign a Name in Azure Portal

After successful registration of the app, you have the possibility to add more parameters. You will get access to all the necessary information you will need later for the setup in Business Central.

API-Berechtigungen vergeben

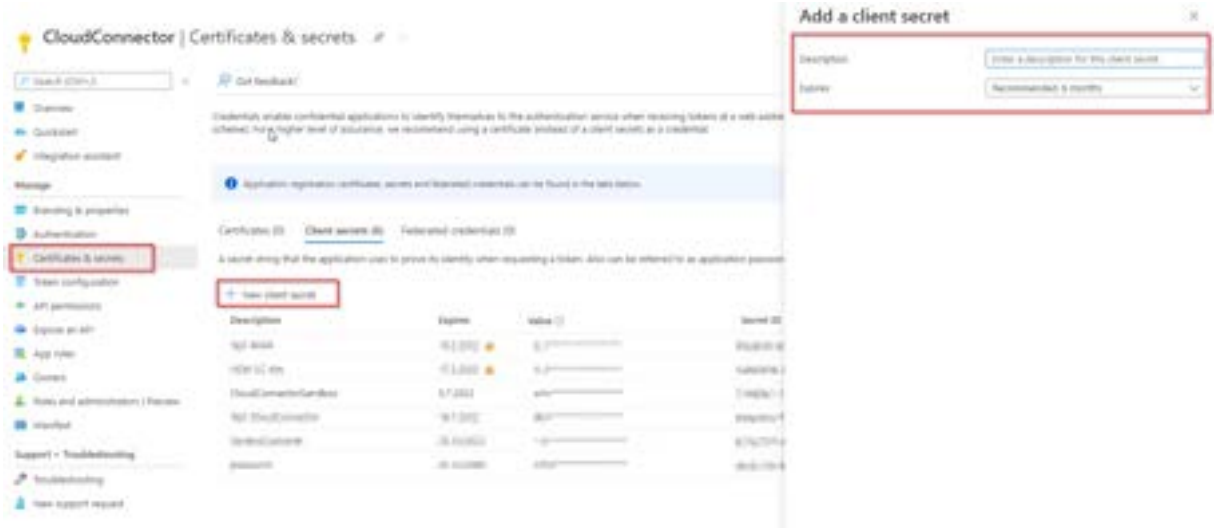
In order to be able to successfully store, access and download files via Business Central in Sharepoint, a permission assignment is required. This part of the setup is very similar to the assignment of SaS from Blob storage and Azure Files. However, for the Sharepoint, there are more decided areas and security measures that need to be taken to be allowed to store files. For this, the following API's must be addressed and provided with appropriate access rights:



Picture 10 - API permissions for Sharepoint

Certificates & Secrets

In addition to the API permissions, it is necessary for security reasons that so-called "Client Secrets" with a corresponding validity are generated in order to make the connection to the sharepoint as secure as possible. With the help of the function "New client secret", a new access token can be generated in the Azure Portal.

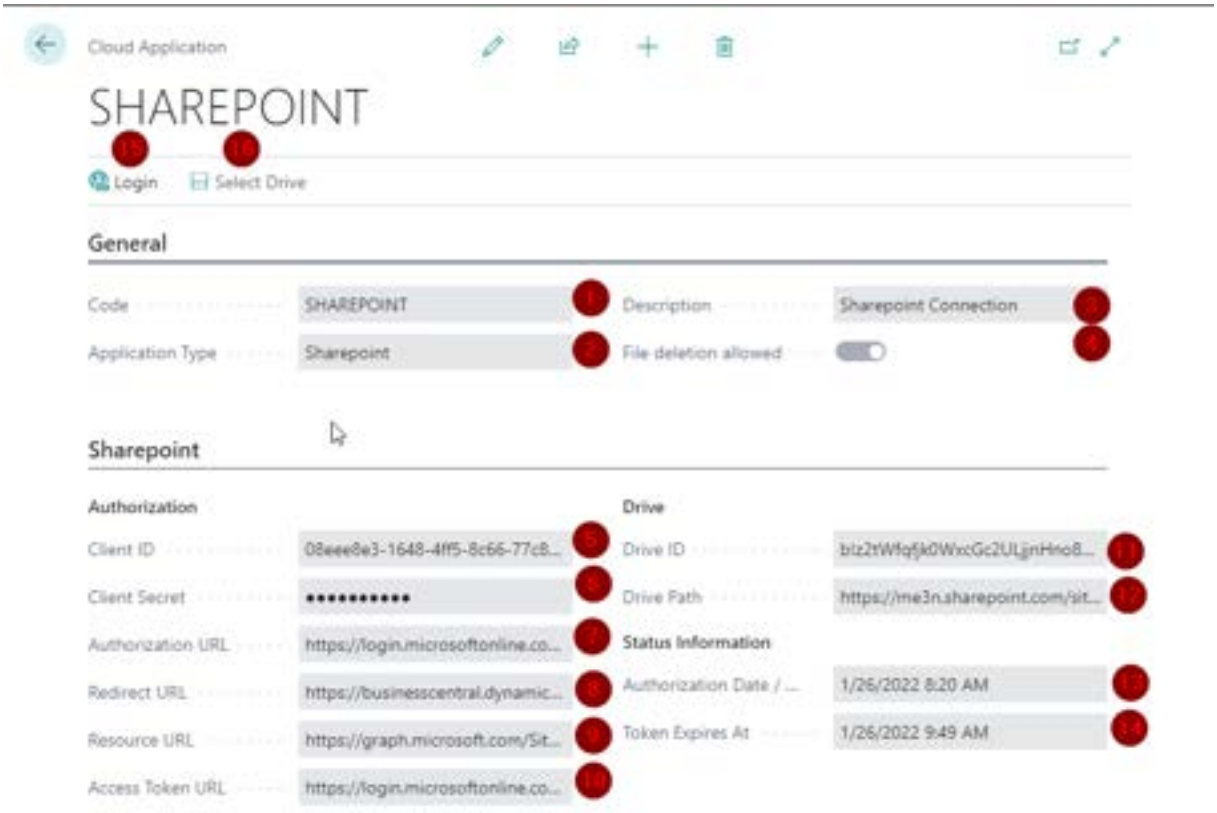


Picture 11 - New Client Secret

Depending on the entry in the "Valid until" field, the connection between Business Central and the sharepoint is valid. The "Secret Client Key" generated from this is required to authenticate against the sharepoint. After the validity expires, a new entry and thus a new "Secret Client Key" must be generated.

Setup in Business Central

To create a Sharepoint-cloud storage, follow these steps:

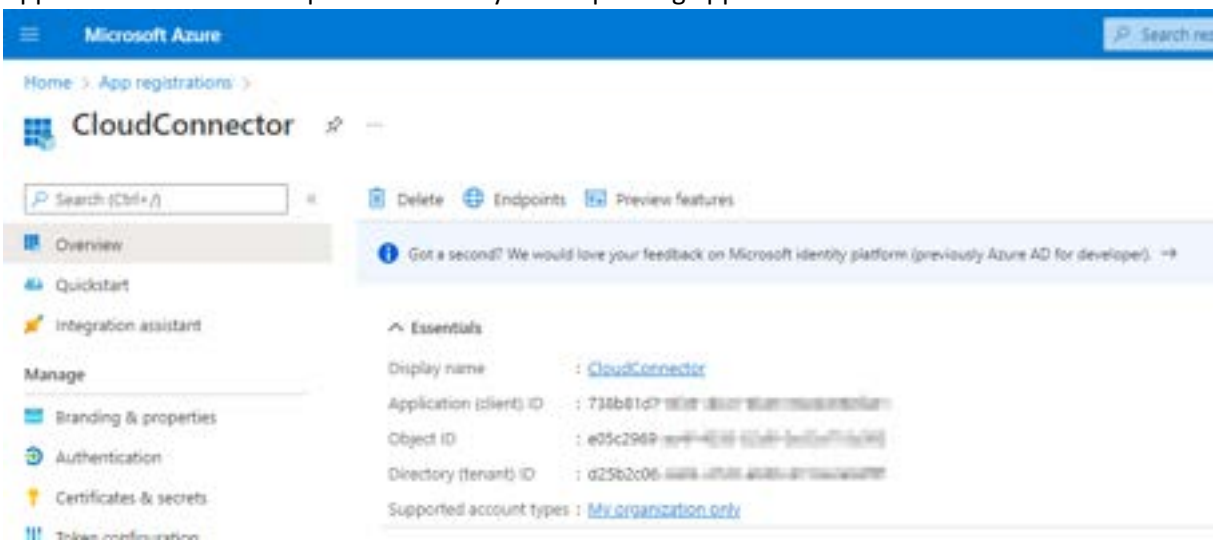


Picture 12 - Einrichtung Sharepoint

1. Code: A meaningful code can be determined here. This can consist of letters and/or numbers.
2. Application type: Here you can choose between the 3 connections Azure BLOB Storage, Azure Files and Sharepoint.
3. Description: Give it a description.
4. File deletion allowed: If this option is enabled, Business Central can be used to delete the selected file and its dependency in Sharepoint. It is not necessary to perform another deletion in the cloud. If the option is disabled, deletion of the file is prevented.

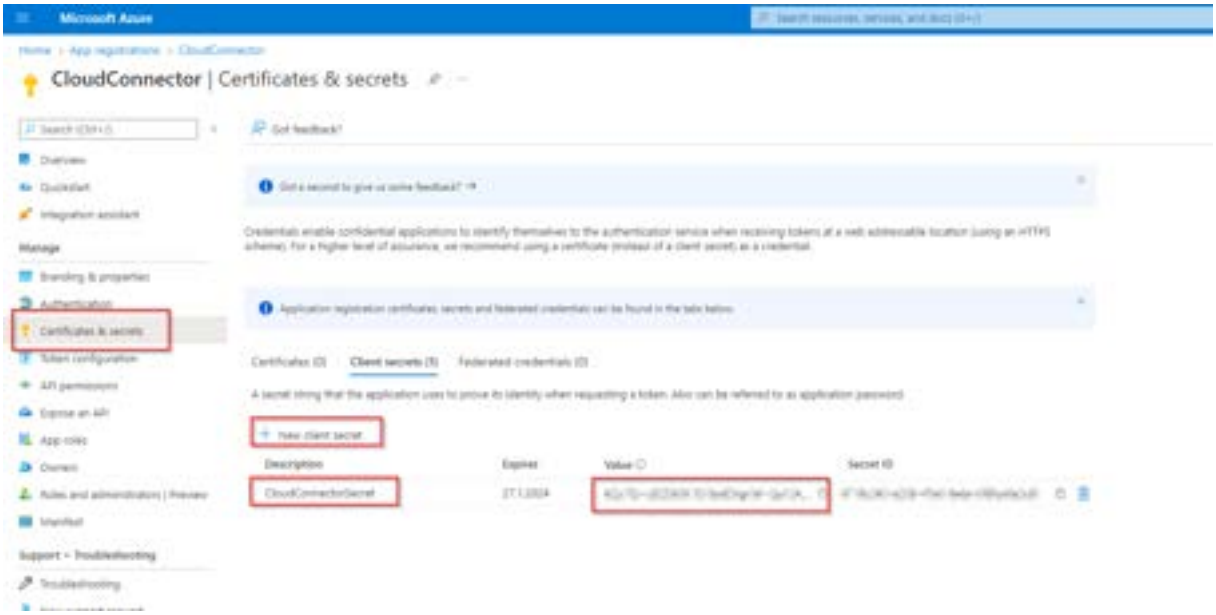
All the following information must be taken from the registered app from the Microsoft Azure portal.

5. Application client ID: Unique ID to identify the requesting application.



Picture 13 - Client ID for Sharepoint

6. Client Secret: Corresponding value of your client secret to authenticate the application.



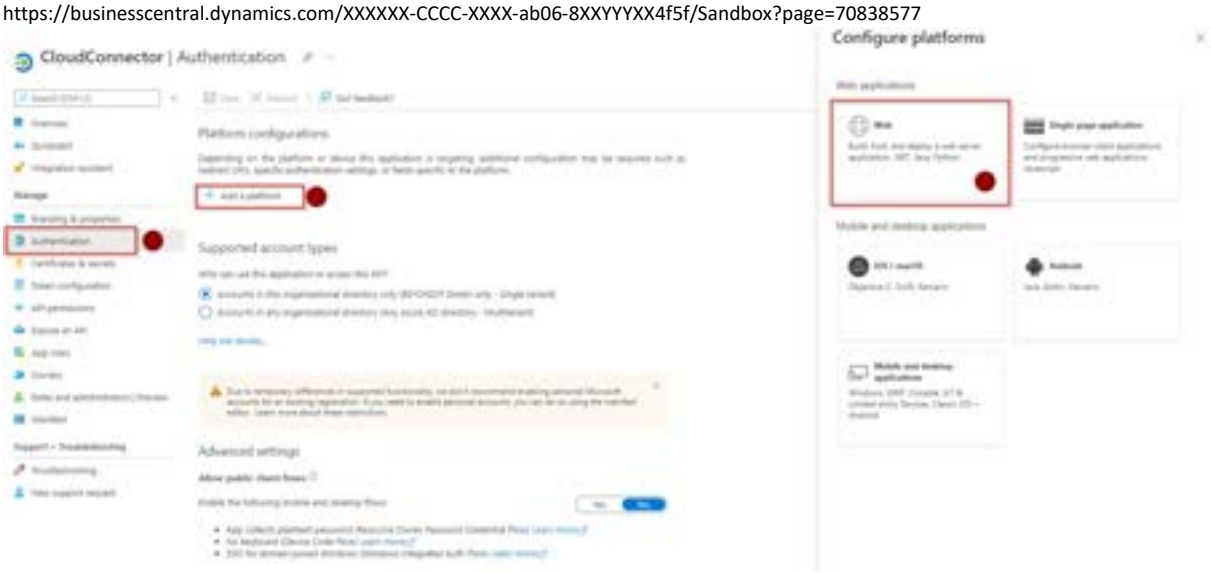
Picture 14 - Geheimer Schlüssel für Sharepoint Anbindung

7. Authorization-URL: Web address to verify the required authorization.

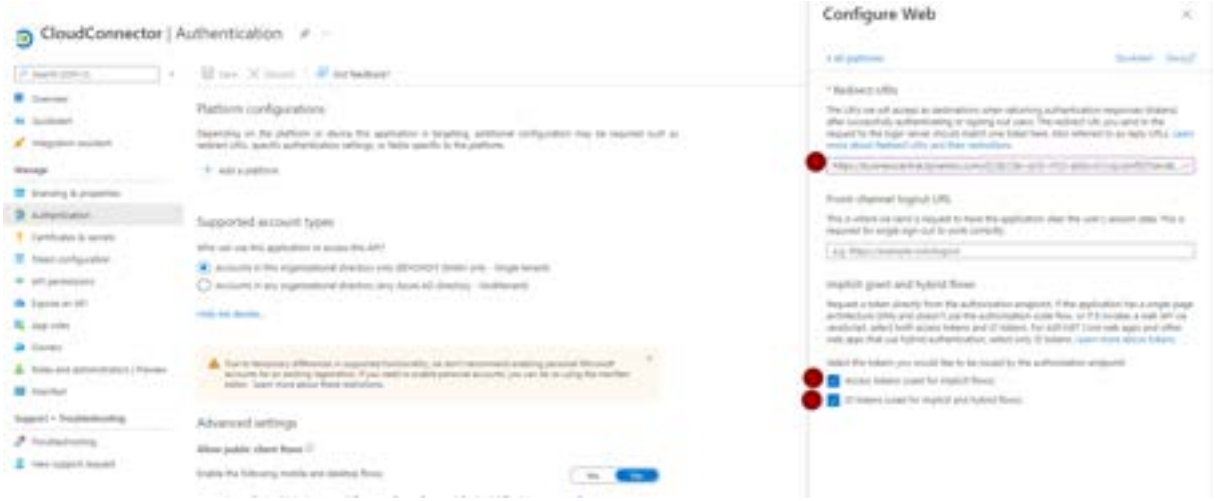
Picture 15 - Authorization-URL für Sharepoint Anbindung

8. Redirect-URL: Forwarding address to authenticate within Business Central.
https://businesscentral.dynamics.com/<YOUR TENANT>/<YOUR ENV>?page=70838577

Example:
https://businesscentral.dynamics.com/XXXXXX-CCCC-XXXX-ab06-8XXYYYXX4f5f/Sandbox?page=70838577



And then:



Picture 16 - Weiterleitungs-URL für Sharepoint Anbindung

9. Ressource-URL: This URL is automatically pre-populated with the following value when the cloud application is created: „https://graph.microsoft.com/Sites.Read.All+Files.ReadWrite.All+offline_access“
10. Access Token URL: This information must be taken from the registered app from the Azure portal. The access token is automatically updated over a period of time when a query is sent to the sharepoint using a generated refresh token.

Picture 17 – Access Token URL for Sharepoint

11. Drive-ID: This information is set automatically once a successful login (item 15) and a drive (item 16) have been selected.
12. Drive Path: This information is set automatically as soon as a successful login (item 15) and a drive (item 16) have been selected.
13. Authorization date / time: If a logon was successful, the corresponding date will be set in this field.
14. Token expires at: Information about the expiration date of the access token.
15. Login: If items 1-10 are set up, a user with administrative rights can authenticate to the sharepoint and connect.
16. Select drive: The last action is to select a storage location from the sharepoint. If this was selected, then point 11 and 12 are set automatically. Once data has been stored behind the defined drive, it is no longer possible to change it. Only after cleaning up this drive can the path be changed.

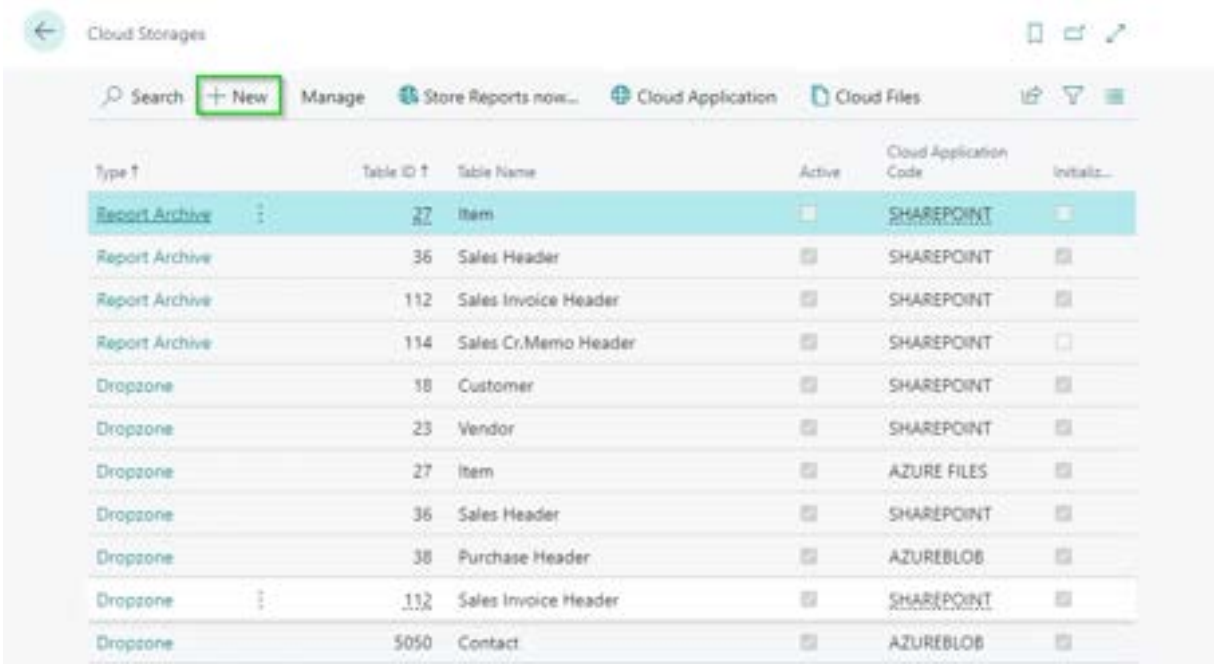
Especially when connected to Sharepoint, filing and opening files is very convenient, as authentication has already taken place and thus complete document management can be mapped within Business Central.

Cloud Storage:

Once the setup of the favored connections is complete, you can continue by calling up "Cloud storage" in the search mask.

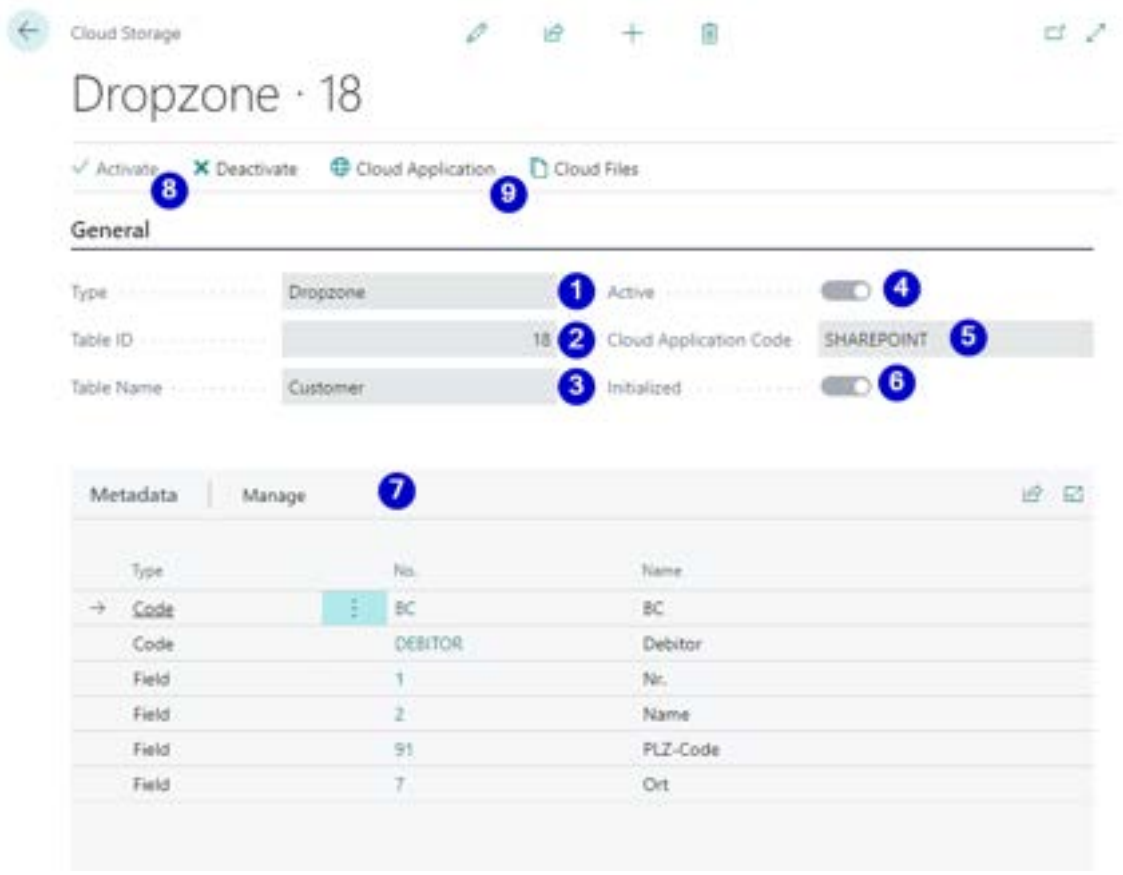
Picture 18 – Search forCloud Storage

A new window will open so that a new record can be created.



Picture 19 - Cloud Storage Setup

The next step to use the Cloud Connector is to store the different entities (tables) for specific records.



Picture 20 - New Cloud Storage

1. Type: In this field the method is deposited, how a file storage is to be accomplished. When creating a new data record, you can choose between the type "Dropzone" and "Report archive".
    a. Dropzone: If this option is selected, then a file storage is added to predefined tables (see ANNEX), so that one or more files can be stored by drag and drop or by pressing a button. The format of the file does not matter.
    b. Report archive: If this option is selected, then with the help of a "Save reports now" function or a task queue (background processing) at a self-defined time, an automatic storage of documents in the cloud can be performed. Thus, for example, invoices and credit notes can be automatically stored as PDFs in the sharepoint during the night.
2. Table ID: In this field, the source for archiving can be stored. Depending on the type, different tables are available.
3. table name: Shows the name of the table selected in point 2.
4. active: Indicates whether this cloud storage is used.
5. cloud application code: Indicates which storage is used for which table in combination with the type.
6. initialized: If a cloud storage is set up and used for the first time, then it will be initialized automatically. If this is the case, no more changes can be made, as corresponding structures have been created in the background in the cloud application and would therefore be invalid.
7. metadata: Freely defined metadata can be defined and stored behind each cloud storage and thus behind each entity. These can consist of constant values as well as field information.

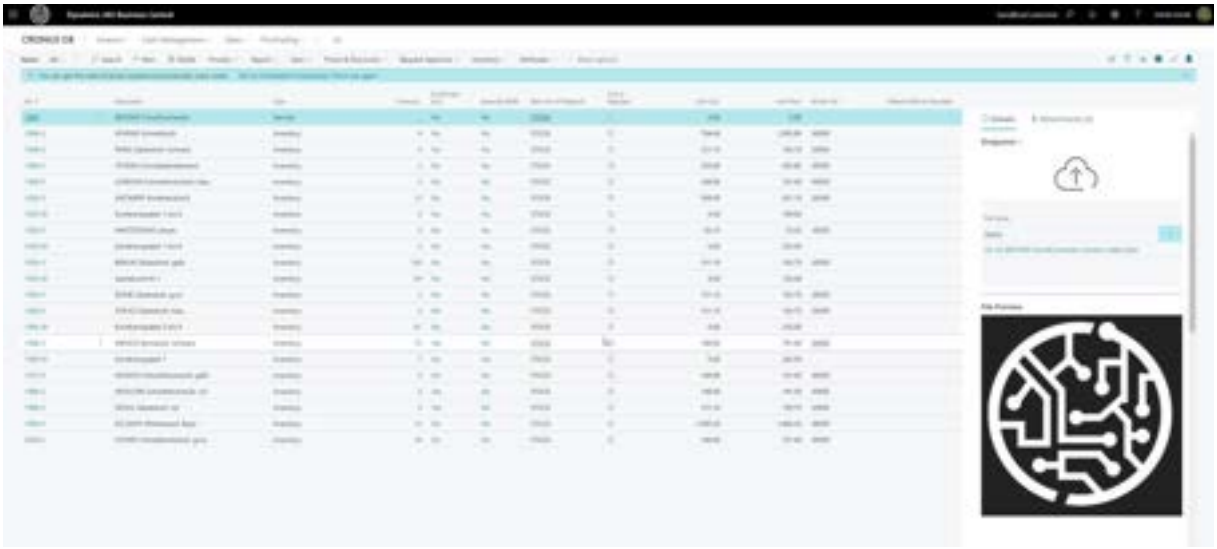
8. Enable/Disable: This function can be used to activate and deactivate the cloud storage. If this is deactivated, the drop zone at the respective entity disappears.
9. Cloud Application: From here, the user can jump to further Cloud Connector functionalities and does not necessarily have to go via the search mask.

If all steps of the setup for the desired cloud storage have been performed, the Cloud Connector can be used to store files outside the Business Central database.

Features of the Cloud Connector

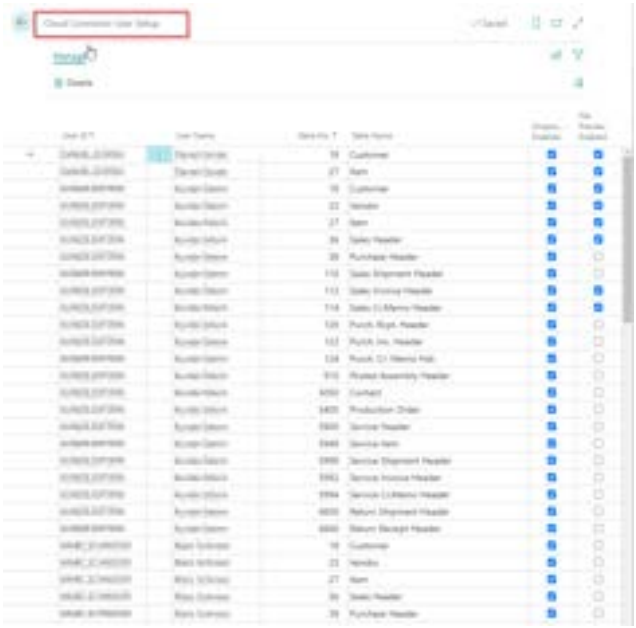
Save Files in the Cloud

The basic function of the Cloud Connector is the ability to store files of any format in a self-defined and set up cloud storage (Sharepoint, Azure Files & Azure BLOB Storage) at a specific record in Business Central.



Picture 21 – File Dropzone

Hint: Show or Hide the Dropzone or File Preview per User:



These stored files can be additionally enriched with metadata (manual assignment of special codes or automatic assignment of field information from the respective record) and stored in Business

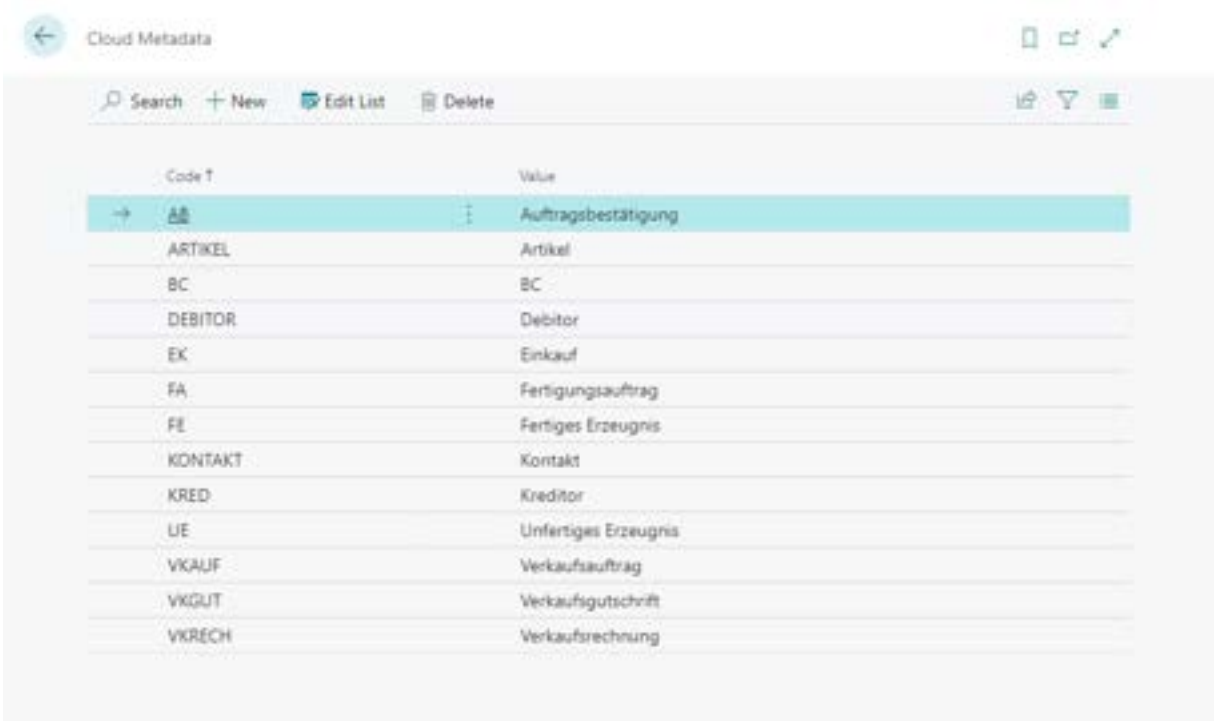
Central. The setup of the metadata can be stored individually for each "cloud storage". Constant values or record-dependent information can be selected and set up here.

Cloud Metadata

Using the search window and the keyword "Cloud metadata", a list of existing metadata can be called up and expanded as required.

Picture 22 – Search for Cloud Metadata

Freely definable codes for constant values are stored here, which are saved when files are stored on the data set and can be found later via the "Cloud file search"..



Picture 23 - Cloud Metadata Setup

Cloud File Search

With the help of the "Cloud File Search", files that have been stored in a data set via the Cloud Connector can be searched for and called up using metadata or the file name. Here, any number of search criteria can be used according to Business Central standard entries, so that the resulting result is as exact as possible. As soon as a search criterion has been entered, another field for further entries is automatically displayed. Once all entries have been made, the "Search" action searches the system for these criteria and outputs the results.

In the following example, a search was made for a sales invoice of customer "10000" with invoice number 1032*. The result shows all related files in connection with the search criteria.

Picture 24 - Cloud File Search

1. search criteria: Dynamic display of fields for entering search criteria. These are interdependent by means of an "AND" operation.
2. search: Used to search the files based on the specified criteria.
3. results list: This area displays all files that match the search criteria. From each individual record the file can be called.
4. Metadata: If special metadata has been stored on the data sets in the "Cloud storage", these are also displayed in the "Cloud search" and also serve as a possible search criterion.

Functions: The "Show records" function points to the actual record in Business Central where this file was stored. The "Reset" function clears all search criteria and results so that the search can be started from the beginning.

In the example, you can see that invoices were listed that contain the value "10000" in the metadata. In this case, the field "Sales to Deb No.", which was automatically filled by the system, has this number and is therefore part of the search result. It is identical for the invoice number. Here it is not unique, because only fragments of the number are known, and thus several results result from it.

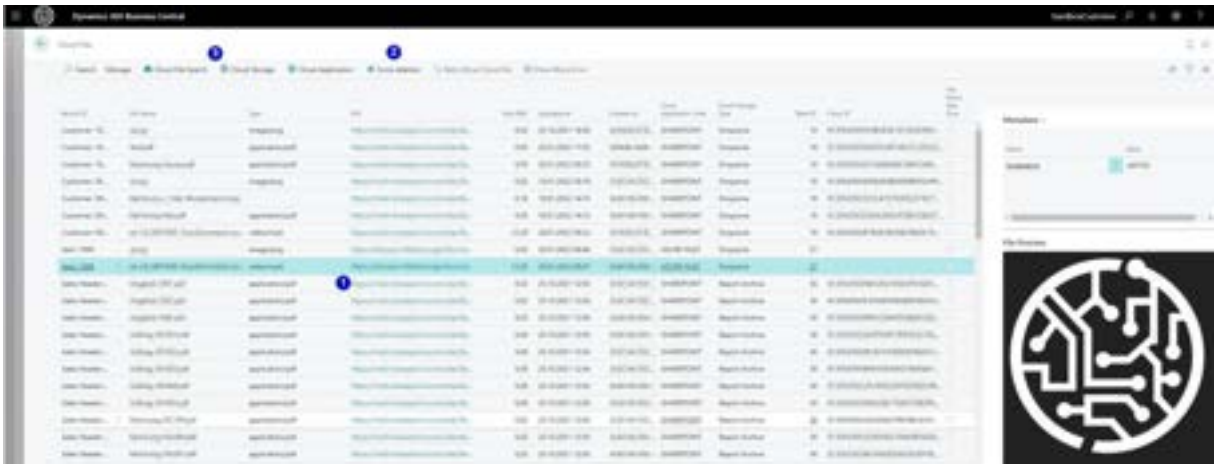
Each term stored in the search criteria is used to search in the file name as well as in the metadata. The search currently treats each value as text. For example, if a posting date is searched for, then it must be entered exactly as it was stored in the system. Since the search criterion is a simple text, no Business Central formulas apply.

Cloud Files

In addition to the "Cloud File Search", there is an overview of all cloud files.

Picture 25 – Search for Cloud Files

This overview contains all files currently stored in Business Central. It does not matter to which cloud storage they are assigned. All necessary information, metadata and the link to the cloud storage can be viewed.

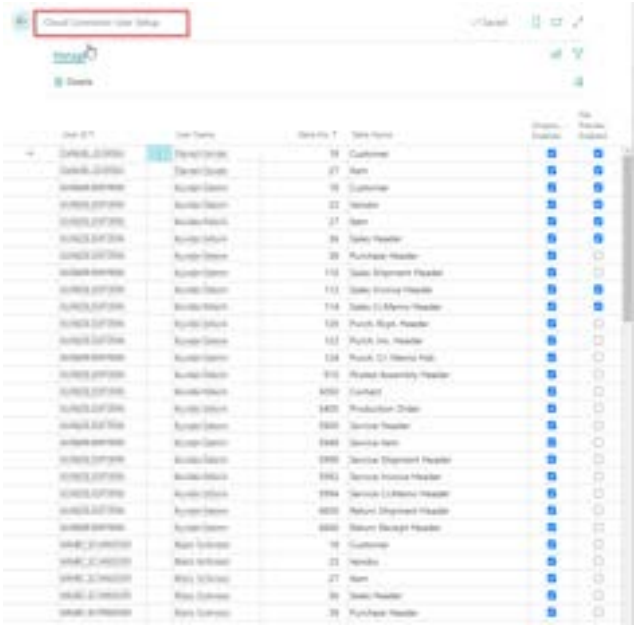


Picture 26 - Cloud Files

1. cloud files: Display of all cloud files. This list is not suitable for file search, because only standard filters from Business Central can be used and thus metadata cannot be searched.
2. Force Delete: This list is more for managing files. From here, single or multiple records can be deleted from the cloud storage at the same time. For administrators, there is even the possibility with the "Force Delete" function to delete files that no longer exist in the cloud storage and thus have an invalid link in Business Central.
3. other Cloud Connector functionalities: From this overview, the user has the ability to jump into other Cloud Connector facilities.

Cloud Connector user setup

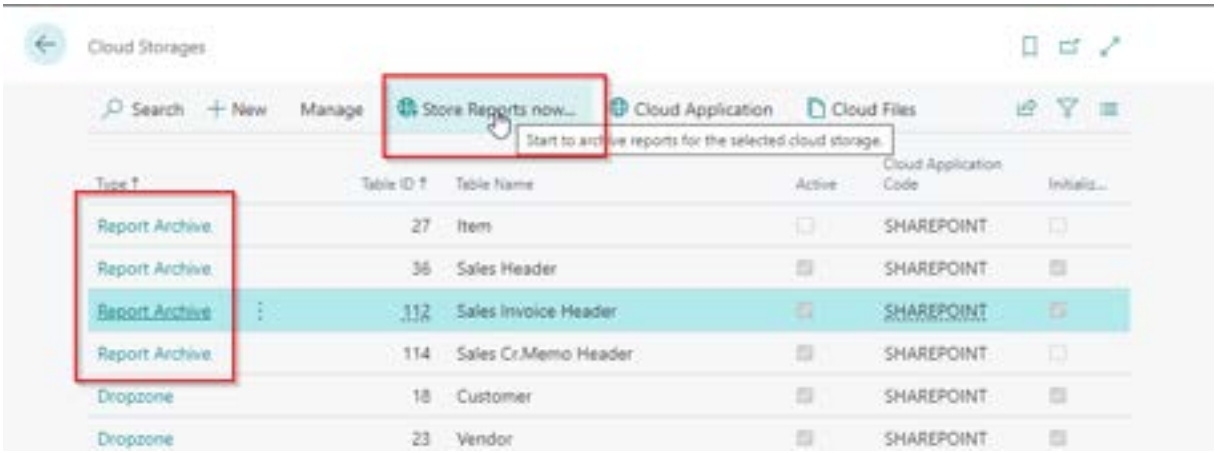
With the help of the "Cloud Connector User Setup", the functionality of the drop zone and the file preview can be controlled per user, so that permissions do not necessarily have to be controlled with access permissions. Depending on which options are set for which user in relation to the various tables, the drop zone and the file preview are shown or hidden.

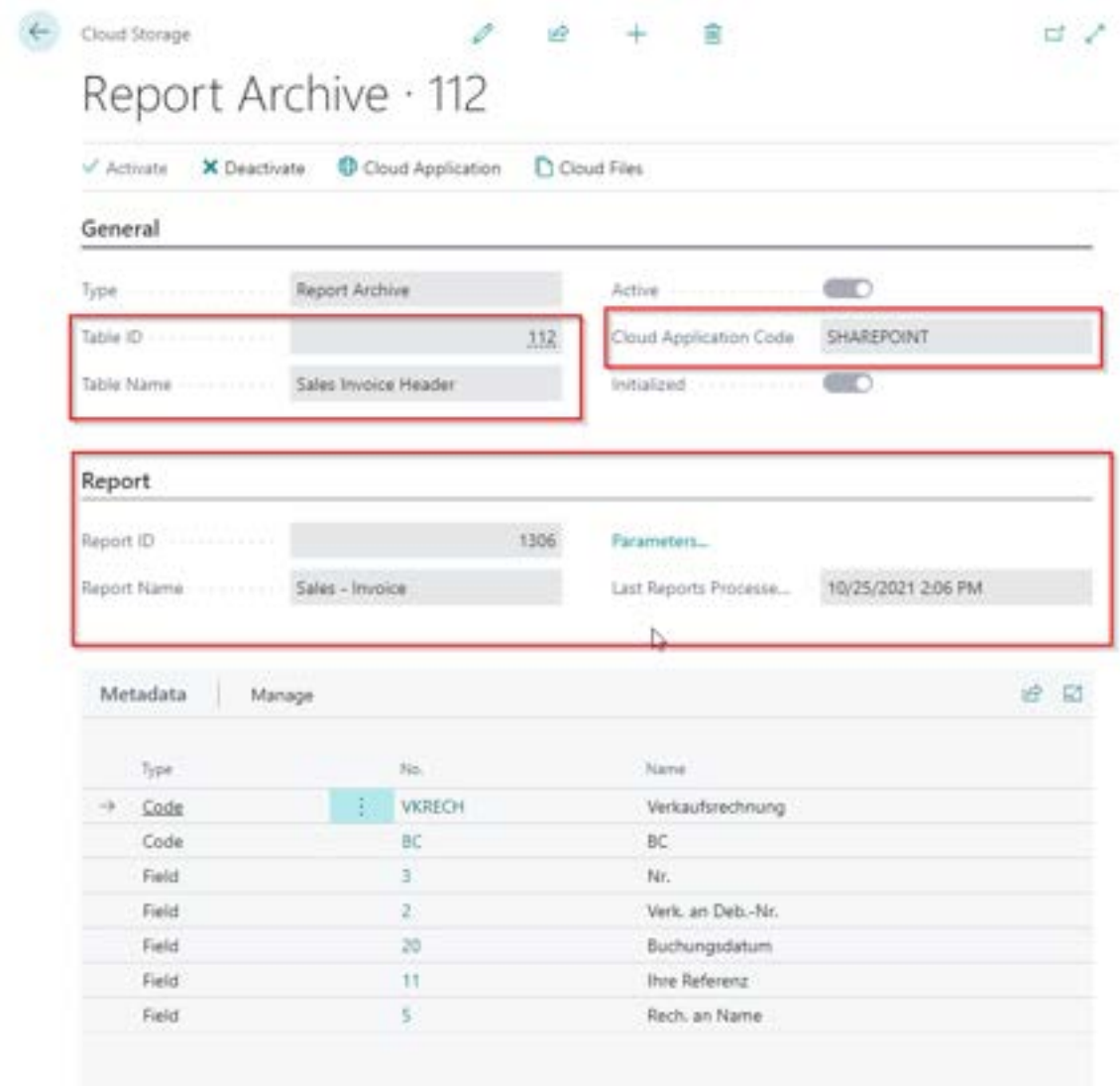


Picture 27 - Cloud Connector User Setup

Cloud Report Archive

Reports (invoices, purchase orders, credit notes, etc.) can be created automatically - at the desired time as PDF files and stored in the cloud storage using a job queue. After initial archiving, the system remembers the documents that have already been saved, so that according to the task queue setup, only the reports that have not yet been transferred are stored.



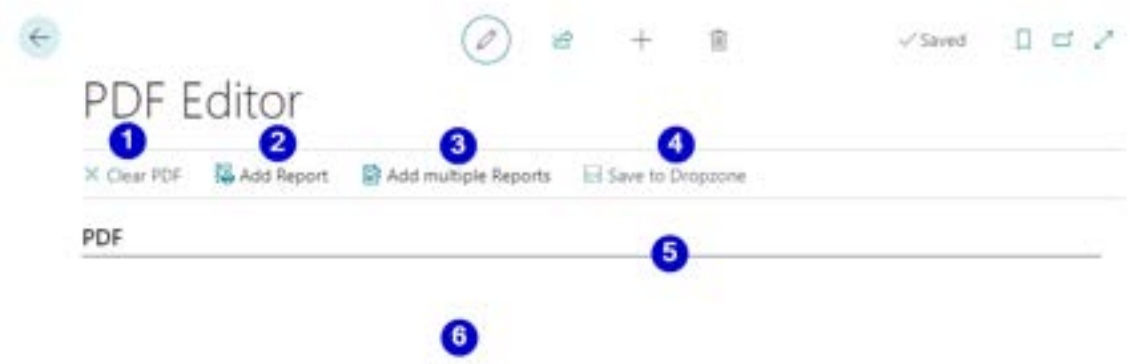


PDF-Editor

Another function is editing, combining or creating PDF files. For this purpose there is a function "PDF Editor" behind the dropzone of the Cloud Connector.

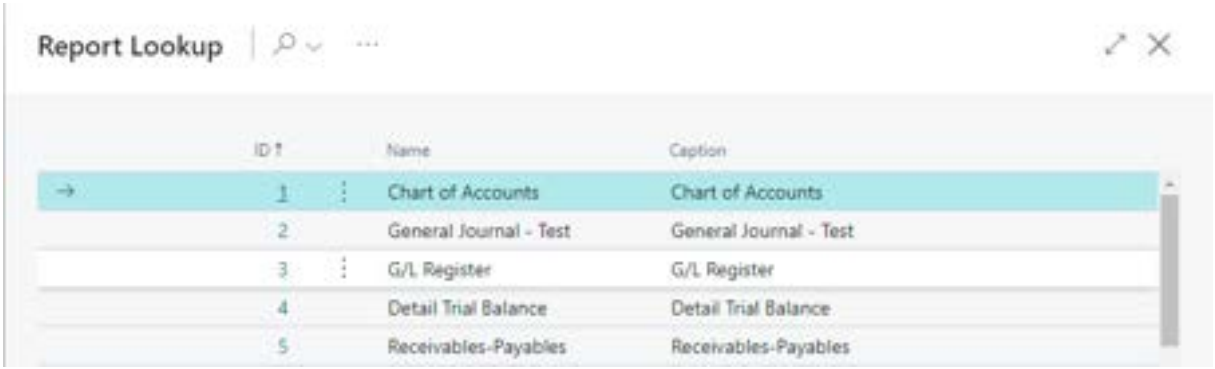
Picture 28 - PDF Editor

Using the "PDF Editor" function, a new or existing PDF file can be edited as follows:



Picture 29 - PDF File Add and Edit

1. Clear PDF: If the user is standing on an existing PDF file in the cloud storage, it can be used as the basis of editing. If a new PDF is to be created, the current page can be emptied using the "Empty PDF" function.
2. Add report: If the current page displays a PDF or if it is empty, then a new report can be generated at runtime with the help of this function. When the "Append Report" function is executed, a new window opens where any reports from Business Central can be searched and executed.



Picture 30 - Berichte hinzufügen im PDF Editor

If a report is selected, it will be displayed as a new page in the PDF area. If this function was performed on an existing PDF, the newly created report will be appended to the existing file.

3. Add multiple reports: Identical to the "Append Report" function, except that here multiple reports can be selected and appended at the same time.
4. Save to Dropzone: The newly created or existing PDF can be saved directly to the cloud storage.
5. in the lower area the PDF is displayed with and without attachment and can be edited with the help of standard tools of the browser (marking, highlighting etc.).
6. PDF area: In this area existing or newly created reports are displayed as PDF. These can be edited, printed or saved to another storage medium.

Cloud Datei Import Entries

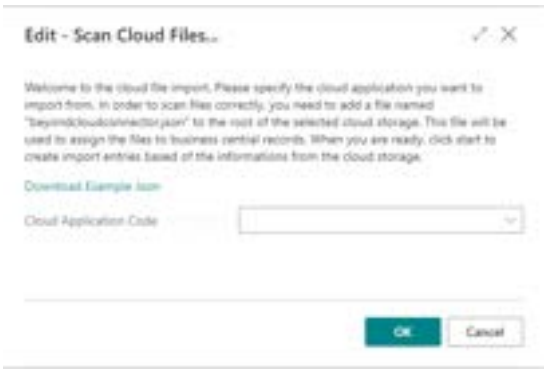
It is possible to transfer files from an existing Azure Files Cloud to Business Central. For this purpose, the system can search the cloud storage mentioned for data via the search mask and the keyword "Cloud file import item".

Picture 31 – Search for Cloud Import Entries

With the help of a so-called JSON file (a sample file can be downloaded via the application), existing files can be imported from an existing cloud storage (currently no Sharepoint is supported). It is necessary that the JSON file already contains an assignment of the data records. Such an assignment can be simplified via a PowerShell script and automated depending on the database. However, this is not part of this function.

Picture 32 - Cloud File Import Entry

1. Scan cloud storage: A new window opens where the user can select a cloud storage from which to import the files.



Picture 33 - Cloud Speicher Scannen

2. Start import: If a cloud storage has been selected, the system will try to read these files and assign them to the records according to the "beyondcloudconnector.json" file. The result will be listed in the table below.
3. Select target record (optional): If the datasets were not recognized correctly or stored incorrectly in the JSON file, the user can use this function to assign a special file or multiple files simultaneously to a dataset in the system.
4. Status: The status is set the first time when files are imported from a cloud storage. Another time when the data is tried to be linked to the data set via point 2 "Start import". If errors occur in this process, they can be corrected using point 3 "Select target data set". If there are incorrect data records in the table, these can also be deleted.

NOTE!

Moving or deleting data in the cloud storage must be prevented under all circumstances, as a link to Business Central is present and corresponding links thus become irreparable and thus unusable. Administrators have the option to delete files that are no longer linked from the data sets (see item "Cloud files"). This is the case, for example, if a file has been removed from the cloud storage but is still linked in Business Central.

If you want to make a change to the structure, then you should save the affected data, delete it in Business Central and also in the cloud storage and rebuild it in the desired structure.

The "Cloud File Search" becomes slower with each additional search criterion, since each term has to search the data records again, including all metadata, and temporarily store the partial result in the database.

Cloud storage "Sharepoint Online" is included in an Office 365 subscription and would not incur additional costs up to a certain size. BLOB storage or Azure Files storage would incur additional costs as needed.

ATTACHMENTS

1. Standard Cloud Storage Tables (which can be extended by Developers):