

axians



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1 Introduction

File storage is an essential business process for companies from the very beginning. Keeping, securing, and sharing documents is essential for day-to-day coordination. In addition, laws require certain documents to be stored under specific rules.

The issue of document management is addressed in every ERP implementation, often with a requirement to link documentation to the corresponding ERP entities and answering a few questions.

Volume:

Some sectors, such as fashion, require the storage of heavy photos and design documents, and some industries require the storage of specific technical drawings and documents. In this context, the volume can be quite large.

Accessibility – availability:

Documents must be available and accessible quickly. A user must be able to find a document easily, and not have to wait a long time for files to open.

Security and confidentiality:

Storage must be secure and only people with the necessary level of permission should be able to consult the documents.

Compliance:

The law may in certain regions impose rules on file storage, location, time, access, integrity and modifications.

2 Business Central and file Storage

2.1 Solution evolution, from Nav to today

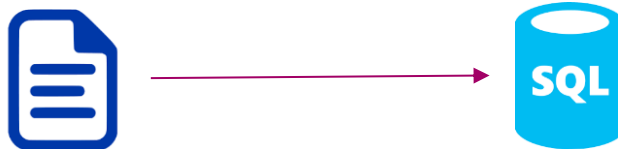
As Dynamics Nav was an on-prem solution, file storage was based on two technologies: storage in the ERP database, and/or in the local file system. This is also the case for on-prem Business Central installations. These landscapes have relatively few or no constraints when it comes to database or file server capacity.

Web protocols enable exchanges between two systems, and it was always possible to use a cloud storage solution.

The arrival of SaaS mode imposes new constraints on data storage, as Business Central Online does not natively have access to local file systems. In this context, Cloud solutions (Http based) such as OneDrive, SharePoint, Azure Storage, or others prove to be the best solutions, it obviously remains possible to store files in the database.

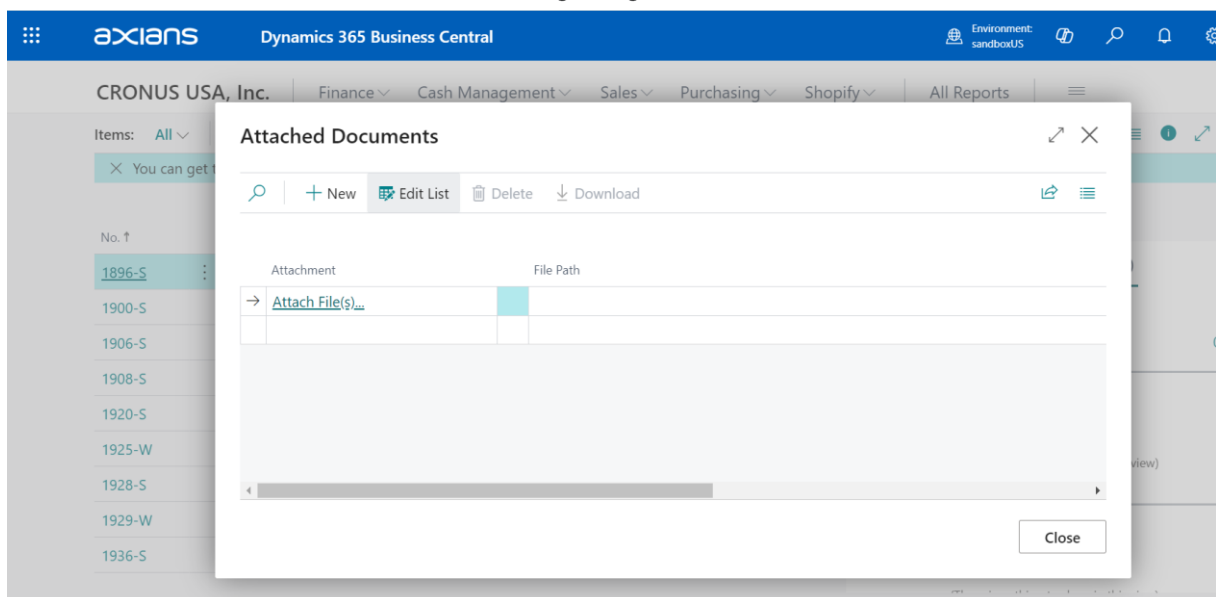
3 File storage solutions in a 100% Microsoft context.

3.1 Storage in the ERP database.



Basic data types in SQL reserve specific memory space allowing the storage of large binary files. Files, whether images or other file types. The Blob and media-set types allow file storage directly in the Business Central database.

By default, this is the standard solution used by Microsoft, we can use it when adding attachments to ERP entities, or when adding images at item level.



The main problems with this solution are in a context where the storage capacity in Business Central is limited to 80gb, and adding capacity can be expensive, adding files directly to the database is not recommended, also the performance of the database may be affected.

You start from a base entitlement of 80 GB per environment and then you add 3 GB per premium user and 2 GB per Essential users. This is the base space across environments in a tenant.

Adding additional capacity in slots of 1 GB cost about 10\$ per month, or 100 GB about 500\$ per month.

3.2 OneDrive Storage.



This variant uses OneDrive, without the need for other elements on the Online environments, it is necessary an Enterprise Application on Microsoft ENTRA ID to manage authentication for an On-premises installation.

<https://learn.microsoft.com/en-us/dynamics365/business-central/admin-onedrive-integration-onpremises>

Assisted Setup

Title	Completed	Learn more	Description
Set up a bank statement file import format	<input type="checkbox"/>	Read	Set up a bank statement file import format.
Invite your external accountant to the com...	<input type="checkbox"/>	Read	Send a link to your external accountant so...
Connect with other systems	<input type="checkbox"/>	Read	
Set up integration to Dynamics 365 Sales	<input type="checkbox"/>	Read	Connect your Dynamics 365 services for b...
Connect to Shopify and import data	<input type="checkbox"/>	Read	Check out how easy it is to set up the conn...
Set up integration to Field Service	<input type="checkbox"/>	Read	Connect your Dynamics 365 services for b...
Set up a connection to Dataverse	<input type="checkbox"/>	Read	Connect to Dataverse for better insights a...
Connect your files to the cloud	<input checked="" type="checkbox"/>	Read	Configure which features can work with O...
Do more with Business Central	<input type="checkbox"/>	Read	
Excel Add-in Centralized Deployment	<input type="checkbox"/>	Read	Deploy the Excel add-in for specific users, ...
Configure the Cash Flow Forecast chart	<input type="checkbox"/>	Read	Specify the accounts to use for the Cash FL...

OneDrive Setup

OneDrive Setup

Set up how to handle files with OneDrive for Business

Business Central automatically enables integration to OneDrive for each new environment.

Administrators can configure how Business Central users work with business files using their OneDrive, such as for sharing reports or exporting lists to Excel.

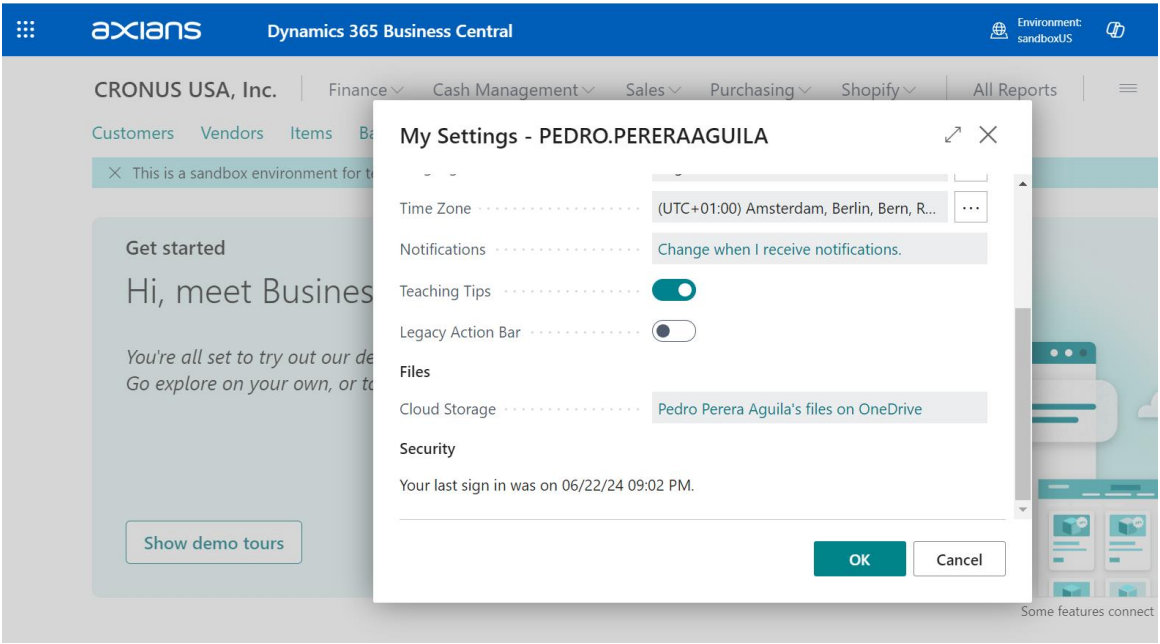
[Learn about working with Business Central files in OneDrive](#)

Let's go!

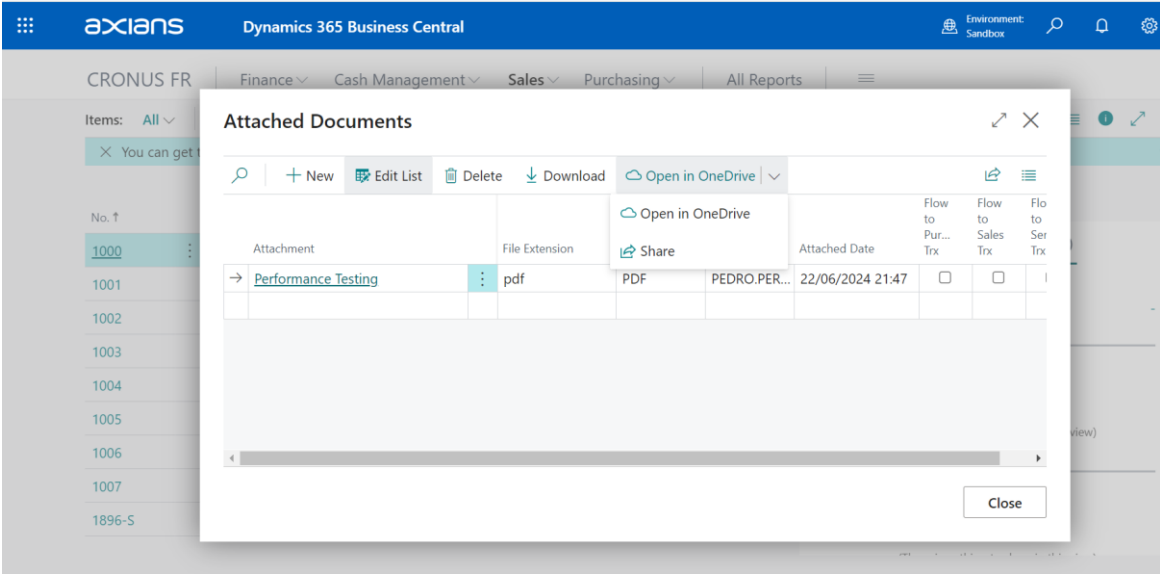
Choose Next to get started.

[Back](#) [Next](#)

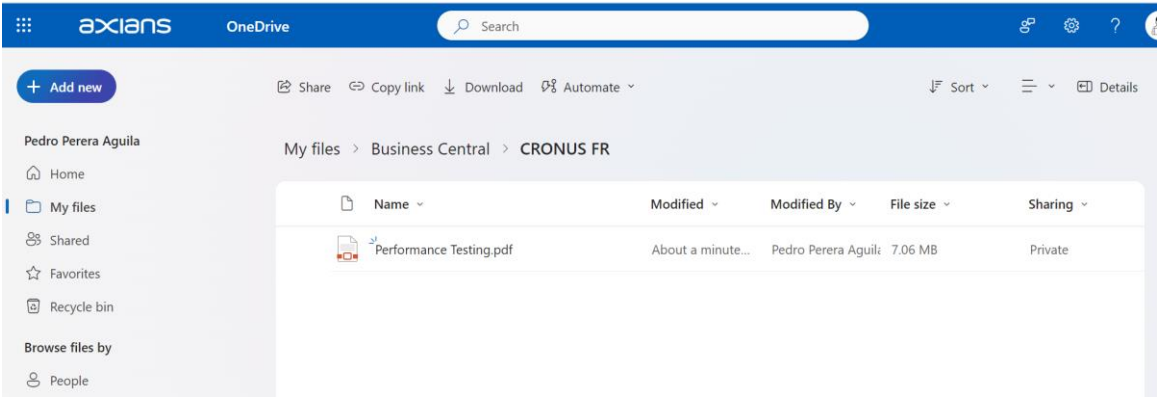
OneDrive Setup completed.



File storage in operation on Item Card.



File on OneDrive



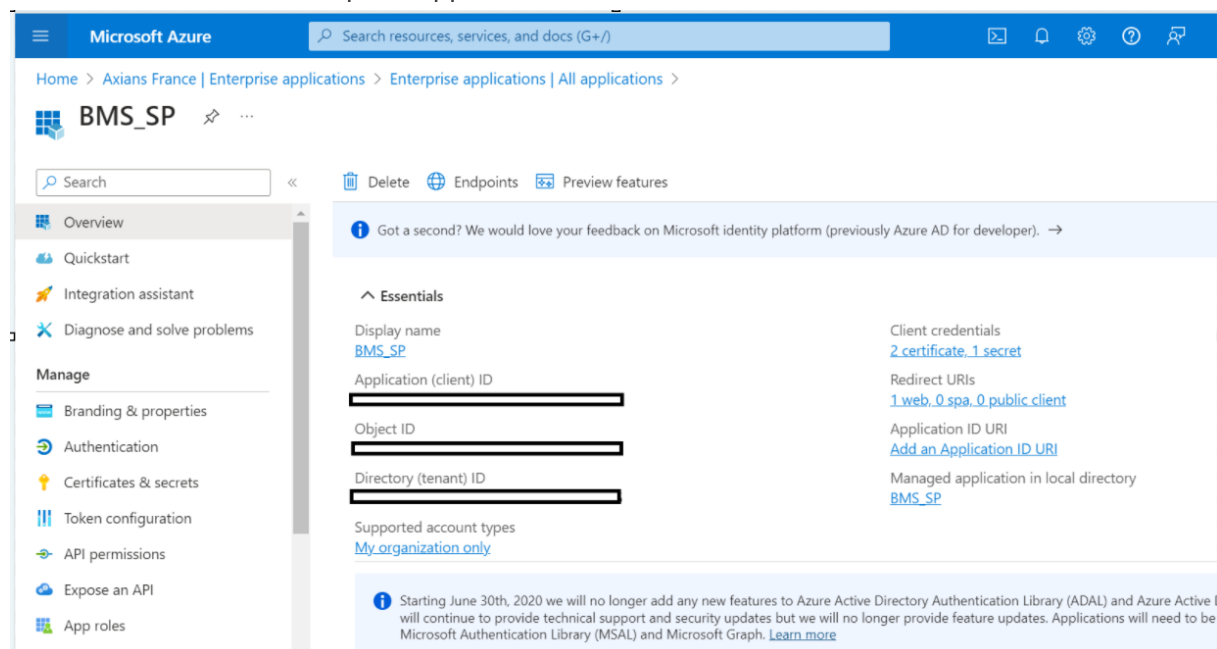
The disadvantages of this solution are multiple, user action is necessary to store the file and share it. Also, the file remains stored in the **private OneDrive space of the user who stored it**, this is a problem of confidentiality, accessibility, and centralized management.

3.3 SharePoint Storage.



Unlike the two previous solutions, storage in a SharePoint requires specific development as well as an Enterprise application in Azure ENTRA ID in order to manage the authentication of Business Central with SharePoint.

Microsoft ENTRA ID, Enterprise Application:



The main parameters for this enterprise application are:

- Create a secret (keep secret value)
- Give the following delegated API permissions (Microsoft Graph), sites.readwrite.all.

<https://learn.microsoft.com/en-us/sharepoint/dev/sp-add-ins-modernize/understanding-rsc-for-msgraph-and-sharepoint-online>

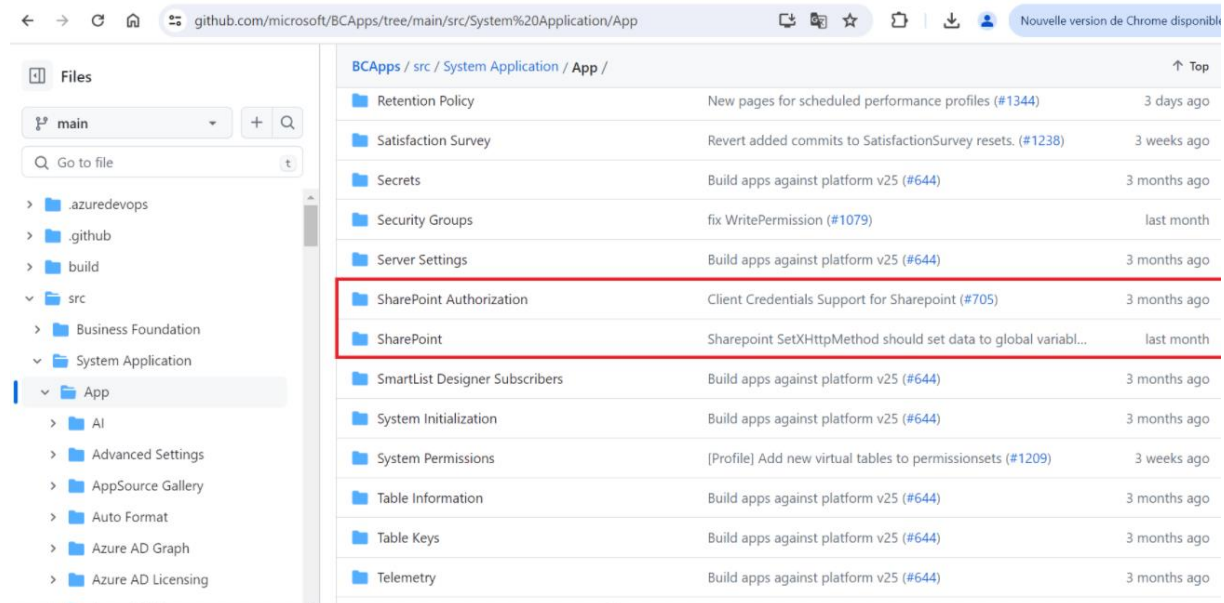
Specific development:

The specific development is based on an API rest connection between the ERP system and the SharePoint platform. This development has been facilitated by a framework introduced into the ERP since version 2022 wave 2(BC21) in Open source and available on GitHub.

<https://learn.microsoft.com/en-us/dynamics365-release-plan/2022wave2/smb/dynamics365-business-central/use-sharepoint-module-system-application-build-integrations-between-business-central-sharepoint>

Source code on GitHub:

<https://github.com/microsoft/BCApps/tree/main/src/System%20Application/App>



Just a few lines of code, including the use of objects, "SharePoint Client" (CU), "SharePoint Folder" (REC), "SharePoint File" (REC) for rapid integration with SharePoint.

We have developed an example which uses the same user interface as attached documents, this feature prevents the file from being saved in the database.

Directory structure and file naming rules:

To upload files to a SharePoint, a SharePoint site must first be created.

When a file is uploaded to the SharePoint from Business Central, the file deposit folder will be automatically created if it does not already exist.

Directory structure:

- Company (company Name)
 - o Customer
 - Record No. (Customer No.)
 - File 1. (File name is built as follows, <source table ID> <-> <original file name> ex. 36-customerorder.pdf.
 - File 2.
 - o Vendor
 - Record No. (Vendor No.)
 - File 1.
 - File 2.
 - o Project
 - Record No. (Project No.)

- File 1 .
- File 2.
- Others master data table Caption.
 - Record No.
 - File 1.
 - File 2.

Transactional data such as orders, invoices, credit memos, etc., will be stored in the customer or supplier folder, depending on the module concerned (purchasing or sales).

file naming follows the following structure:

<table Id>-<record No.>-<Original file name>.pdf

Ex.

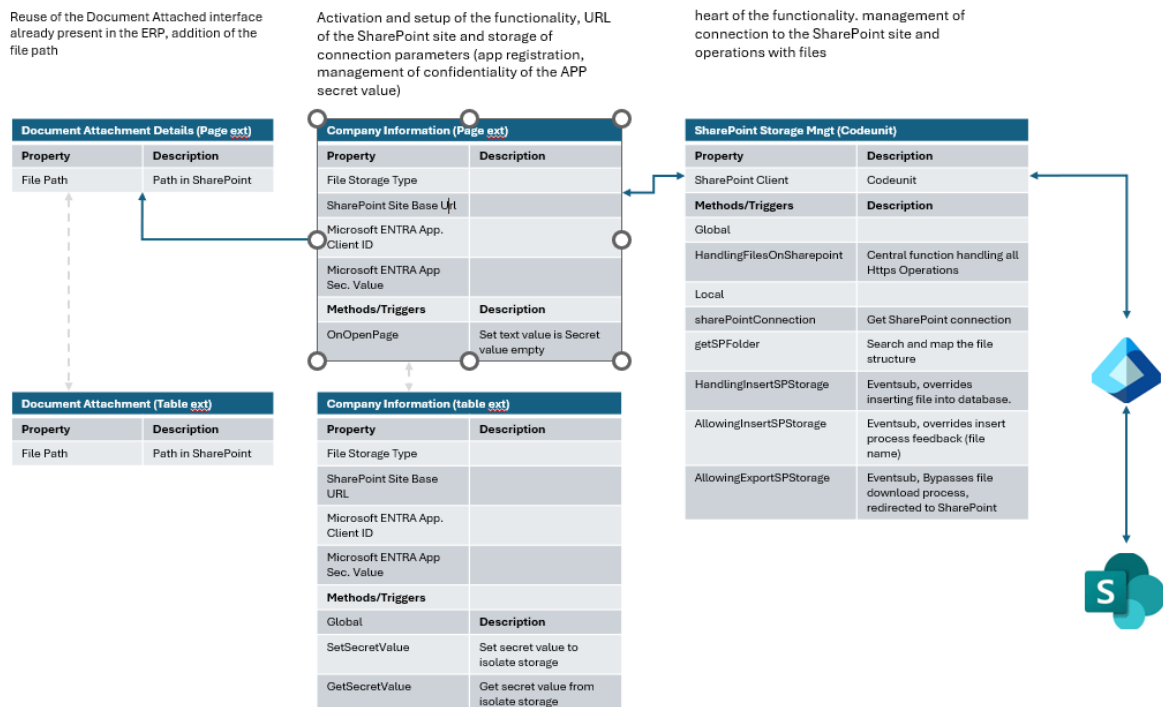
18-10000-customr contrat.pdf (file attached from customer card, customer 10000)

36-SO0000001-customer order.pdf (file attached from the sales order document).

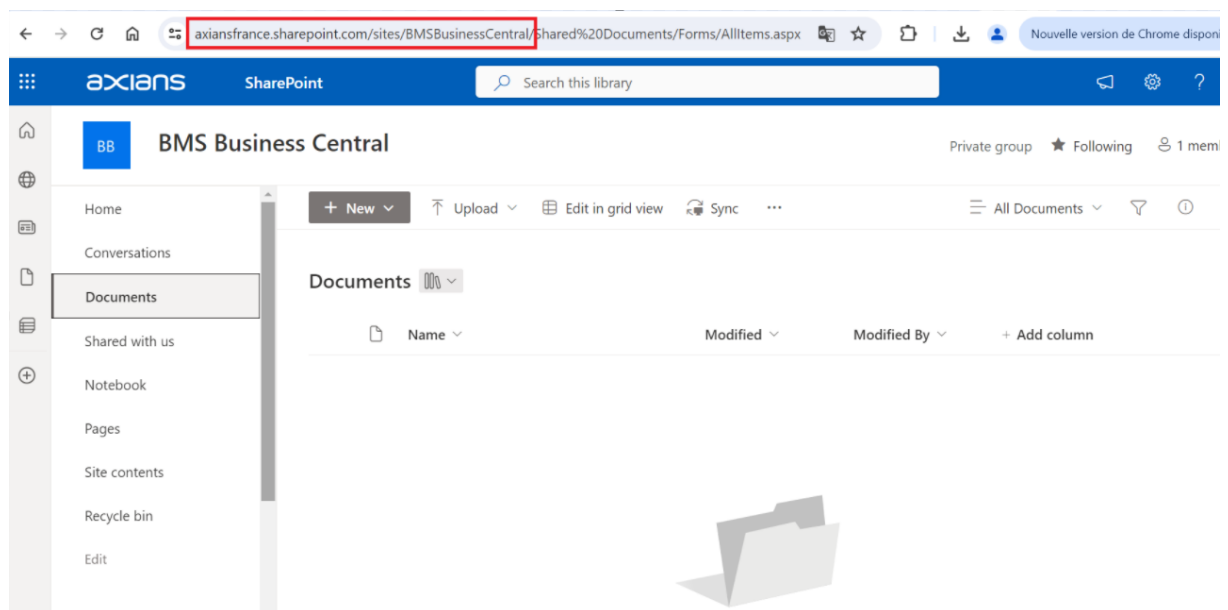
Setup.

In our example, to use SharePoint storage, once the SharePoint site has been created, you need to indicate the type of storage (select SharePoint) and the URL of the site in the company information table.

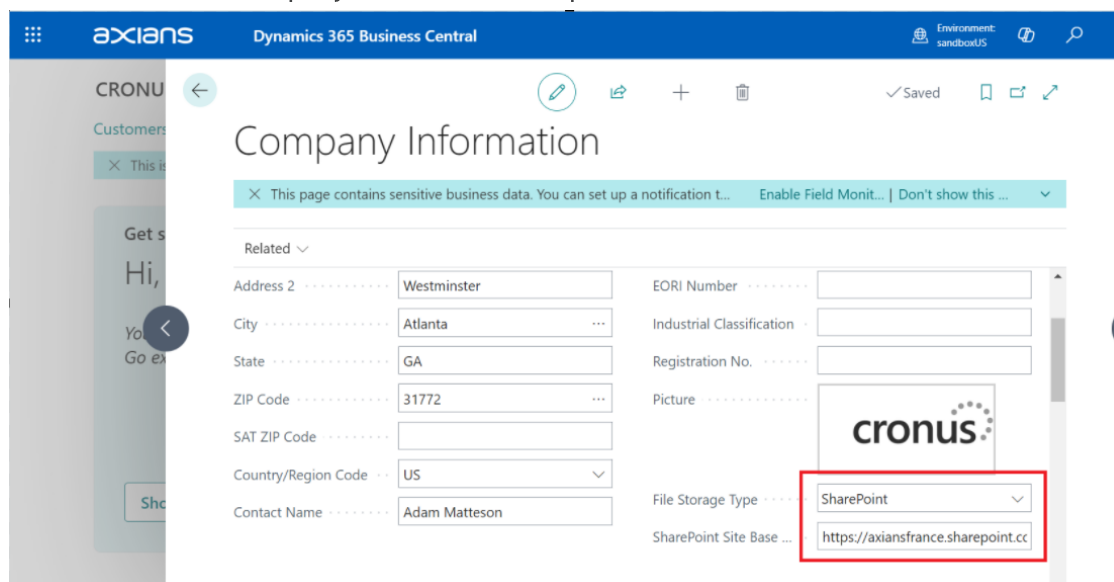
Development diagram



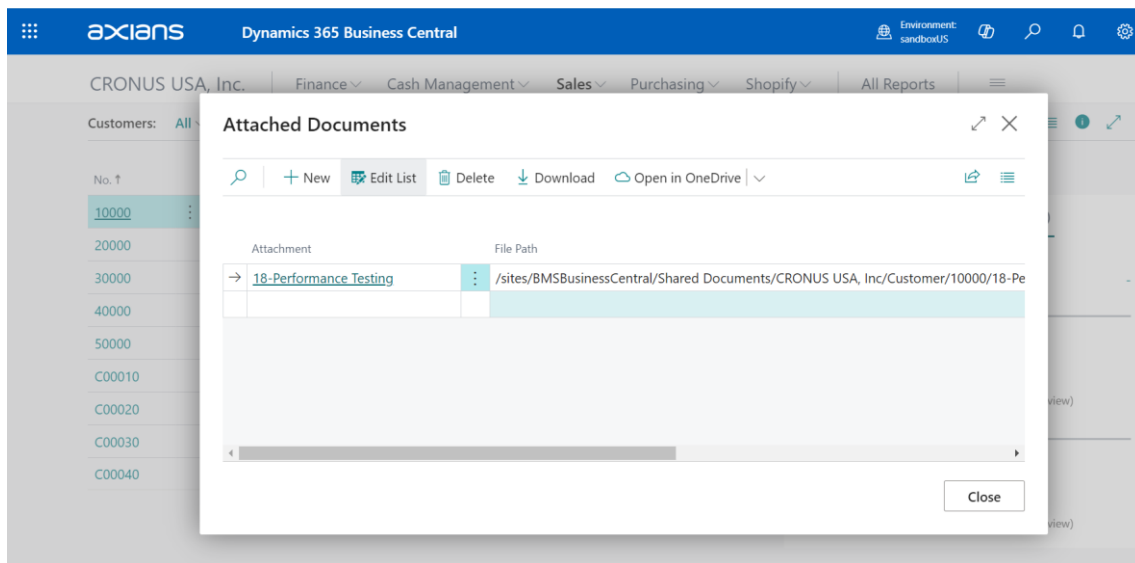
SharePoint Site



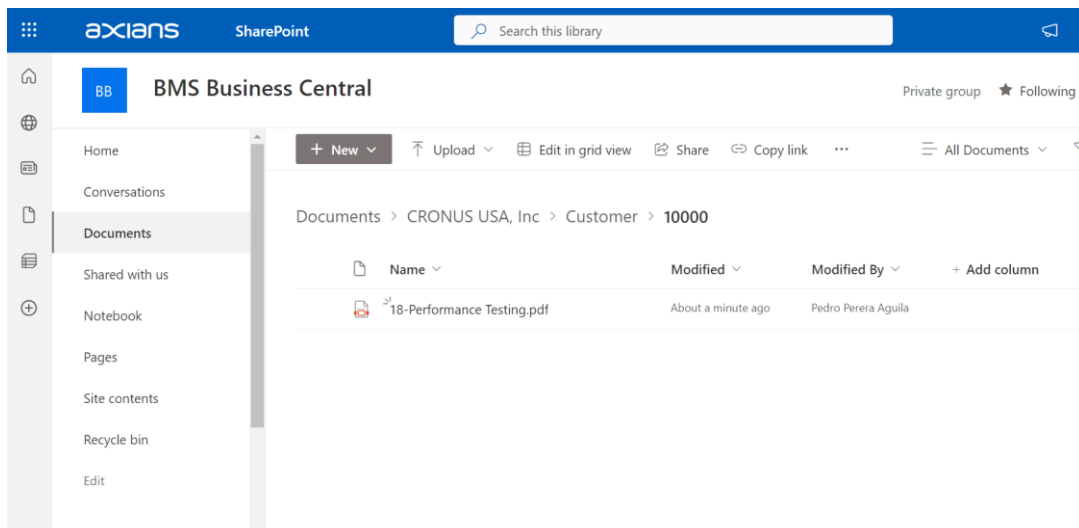
Business Central Company Information Setup



File storage in operation from customer Card.



File in SharePoint

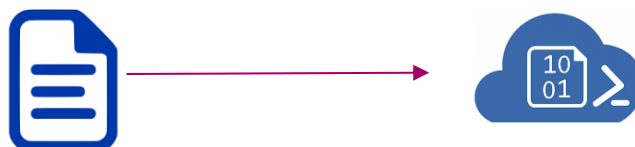


The advantage of this approach is to have a centralized location for file management with a simple, easy-to-understand structure. The disadvantage is to replicate management rules and legal requirements on this platform.

3.4 Azure Storage Account.

Microsoft offers a cloud-based data storage solution.

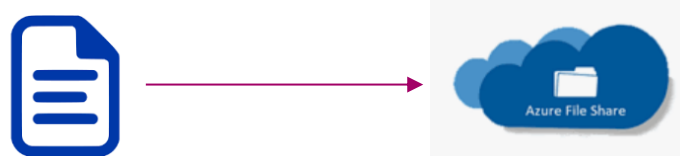
Azure Blob storage



Is a mass storage solution for unstructured data (without a defined data model) offering optimum performance at relatively low cost.

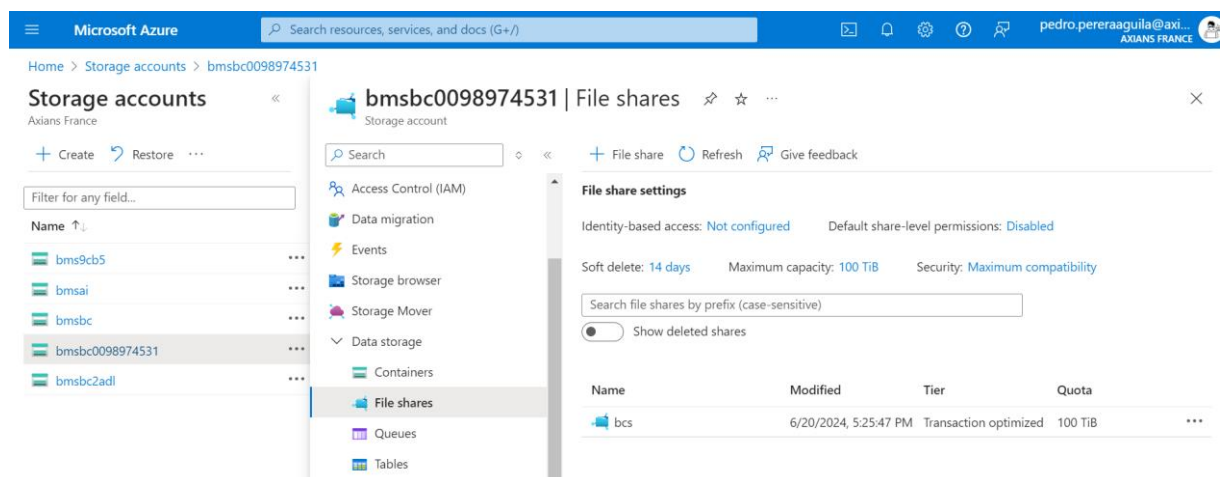
Azure Blob storage will not be discussed in this document; it is similar to Azure Share File storage.

Azure File Share



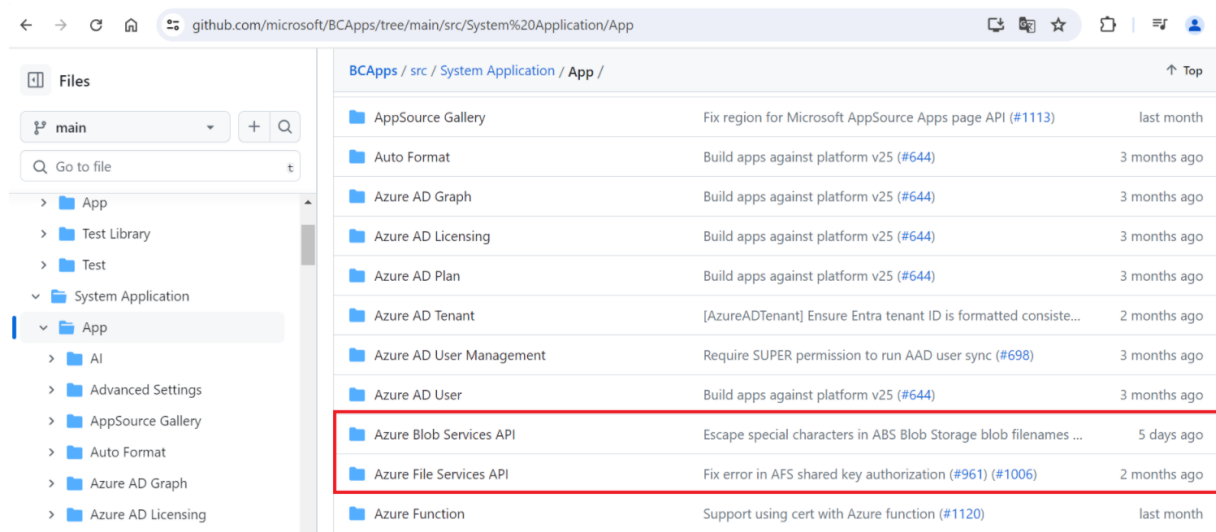
Is a classic cloud file system compatible with the NFS and SMB protocols. Data is structured and can be consulted from a web client or even synchronized with a conventional file explorer. This solution is less powerful and more expensive than Azure Blob.

To implement this solution, you need to create an Azure storage account and an Azure File share instance.



Specific development:

The specific development is based on an API rest connection between the ERP system and the Azure Storage platform. This development has been facilitated by a framework introduced into the ERP since version 2022 wave 2(BC21) in Open source and available on GitHub.



The screenshot shows the GitHub repository for `BCApps / src / System Application / App`. The left sidebar displays a file tree with the following structure:

- main
 - App
 - Test Library
 - Test
 - System Application
 - App (selected)
 - AI
 - Advanced Settings
 - AppSource Gallery
 - Auto Format
 - Azure AD Graph
 - Azure AD Licensing

The main content area shows a list of files in the `App` directory:

File Name	Description	Last Commit
AppSource Gallery	Fix region for Microsoft AppSource Apps page API (#1113)	last month
Auto Format	Build apps against platform v25 (#644)	3 months ago
Azure AD Graph	Build apps against platform v25 (#644)	3 months ago
Azure AD Licensing	Build apps against platform v25 (#644)	3 months ago
Azure AD Plan	Build apps against platform v25 (#644)	3 months ago
Azure AD Tenant	[AzureADTenant] Ensure Entra tenant ID is formatted consiste...	2 months ago
Azure AD User Management	Require SUPER permission to run AAD user sync (#698)	3 months ago
Azure AD User	Build apps against platform v25 (#644)	3 months ago
Azure Blob Services API	Escape special characters in ABS Blob Storage blob filenames ...	5 days ago
Azure File Services API	Fix error in AFS shared key authorization (#961) (#1006)	2 months ago
Azure Function	Support using cert with Azure function (#1120)	last month

Just a few lines of code, including the use of objects, "AFS file Client" (CU), "AFS Directory Content" (REC) for rapid integration with SharePoint.

We have developed an example which uses the same user interface as attached documents, this feature prevents the file from being saved in the database.

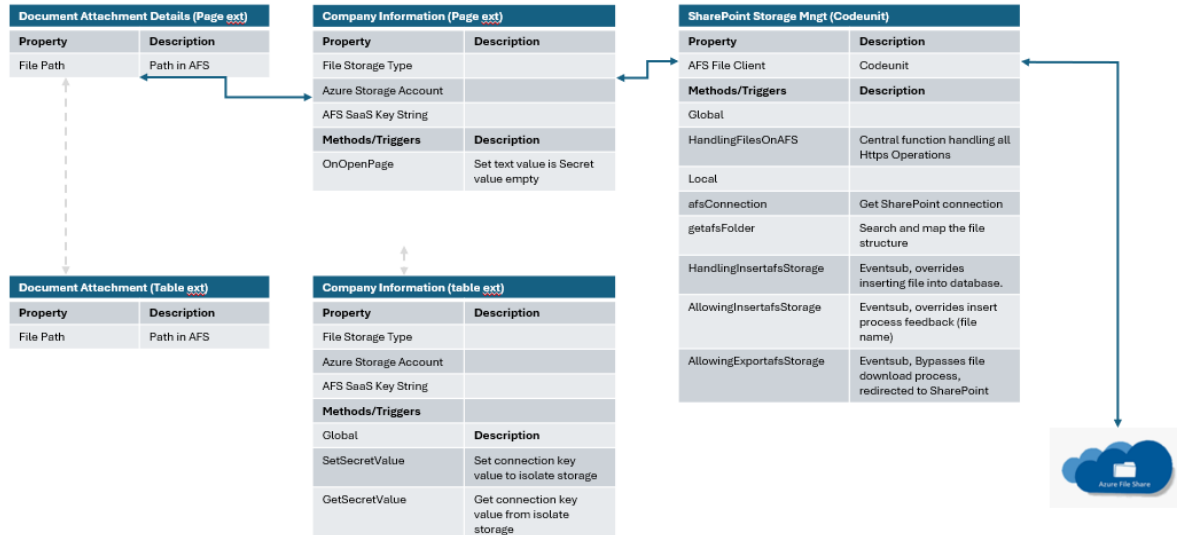
Directory structure and file names are the same as in the SharePoint solution (above).

Development diagram

Reuse of the Document Attached interface already present in the ERP, addition of the file path

Activation and setup of the functionality, site and storage of connection parameters (app registration, management of confidentiality of the SaaS connection key)

heart of the functionality. management of connection to the Azure File Share site and operations with files



Business Central Company Information Setup

axians Dynamics 365 Business Central

Environment: sandboxUS

Company Information

× This page contains sensitive business data. You can set up a notification t... Enable Field Monit... | Don't show this ...

Related

Address 2 Westminster

City Atlanta ...

State GA

ZIP Code 31772 ...

SAT ZIP Code

Country/Region Code .. US

Contact Name Adam Matteson

Phone No. +1 425 555 0100

Industrial Classification

Registration No.

Picture

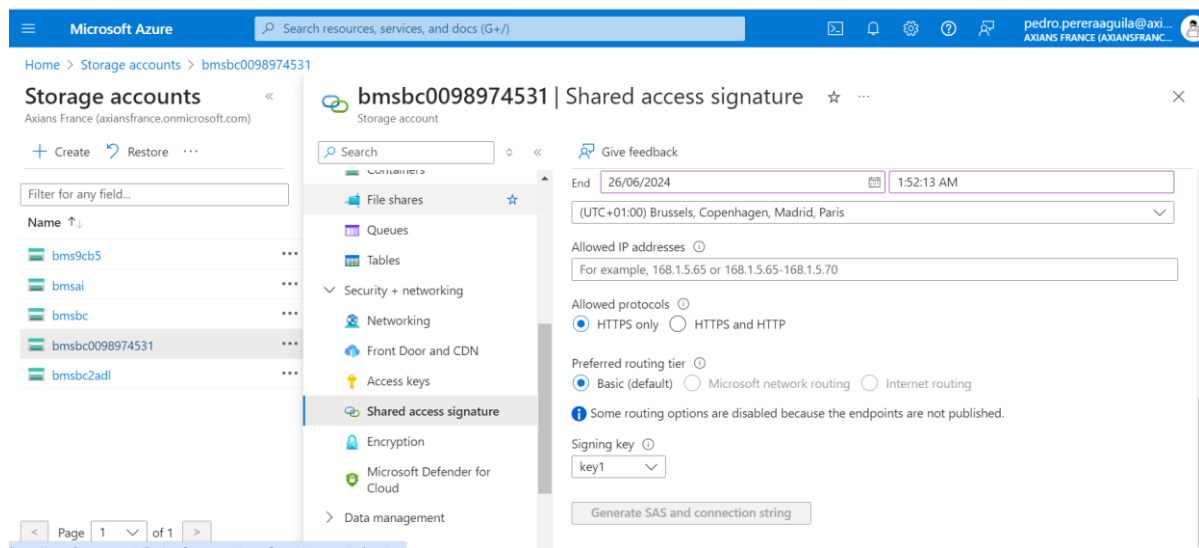
File Storage Type Azure File Share

Azure Storage Account bmsbc0098974531/bcs

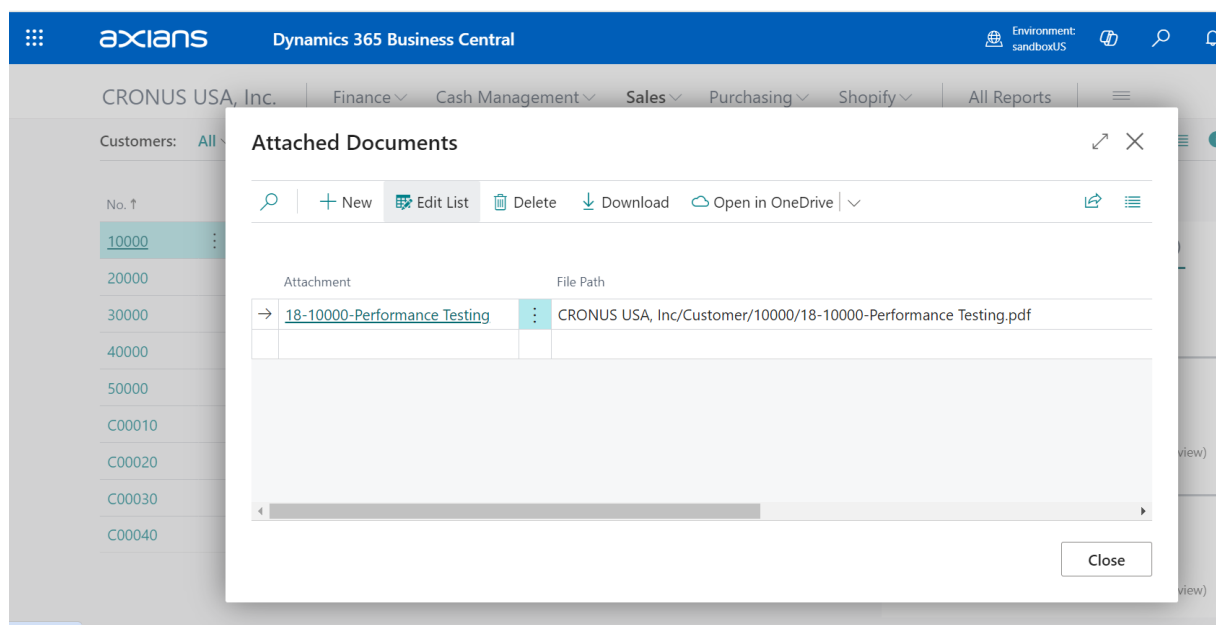
Azure File Share SaaS... ..

Azure Storage Account: follow the format account/azure File share name.

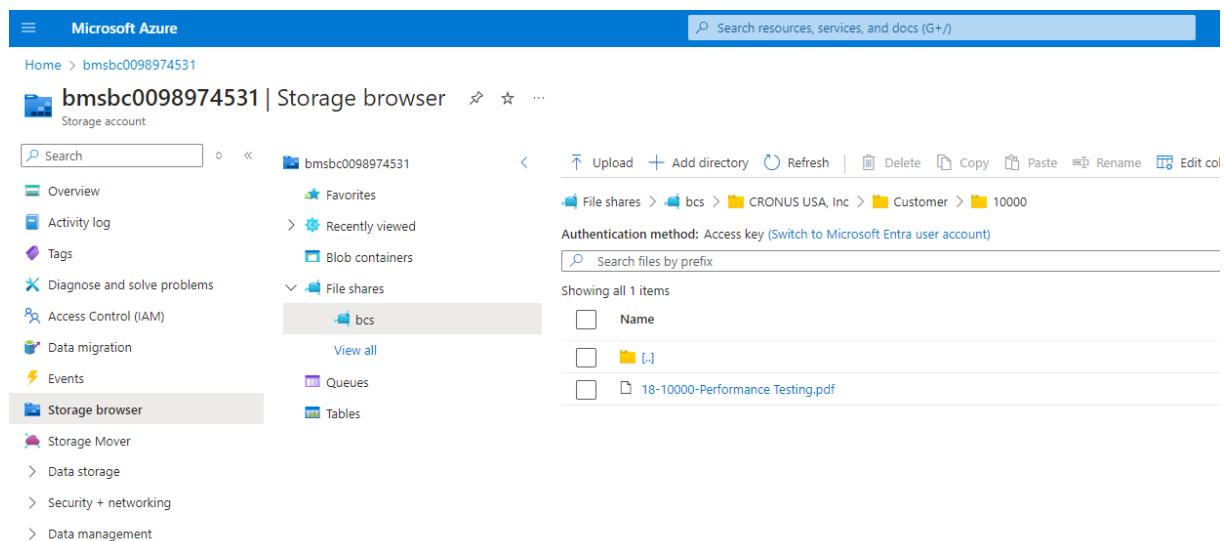
Azure File Share SaaS Connection String: Recovering the key from Azure Storage. (Shared signature).



File Storage in operation from the Customer Card.



File in Azure File Share



The advantage of this approach is to have a centralized location for file management with a simple, easy-to-understand structure. The advantage of this solution is that it integrates functions that enable the principle of the audit trail to be respected, i.e. storage with probative value.

3.5 What does the law say about electronic file storage? examples.

National legislation imposes certain rules in terms of file storage. These rules are formalized in legal texts and ISO standards.

The rules covering security, data localization and encryption of exchanges are among the references in the ISO27001, the azure platform complies with this standard.

<https://learn.microsoft.com/fr-fr/azure/governance/policy/samples/iso-27001>

and also, with other European legislation such as RGDP or local rules.

<https://learn.microsoft.com/en-us/azure/compliance/>

Also, in response to specific requests concerning the legality of file storage, Microsoft has introduced the notion of **immutable storage that enables users to store business-critical data in a WORM** (Write Once, Read Many) state. While in a WORM state, data can't be modified or deleted for a user-specified interval. By configuring immutability policies for blob data, you can protect your data from overwrites and deletes.

<https://learn.microsoft.com/en-us/azure/storage/blobs/immutable-storage-overview>

Other texts in France complement the references cited above. The definition of storage with probative value, or reliable audit trail, following the following rules:

- The authenticity of the archived document, which must resemble the paper original in every way. We need to know who created it and when
- The integrity of the archived document, which must be identical to the original. It must not be altered, modified, or distorted.

- The intelligibility of the archived document, which must be legible over time thanks to a standard format (PDF or PDF A/3).

<https://bofip.impots.gouv.fr/bofip/8865-PGP.html/identifiant%3DBOI-TVA-DECLA-30-20-30-20-20180207>

<https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000034307622>

in summary only, the Azure Share File solution complies with all the above rules.

3.6 Solutions summary - conclusions.

No.	Solution	Cost	Benefits	Drawbacks
1	ERP Database	When 80gb is exceeded, the cost varies according to the volume, but it's expensive.	Standard ERP solution, no development required	database volumes can increase rapidly, generating a cost if the initial volume given by Microsoft is exceeded, as well as an impact on system performance. Impossible to implement complex management rules
2	OneDrive	Included in Office 365 storage capacity management.	Standard ERP solution, no development required	Requires a user action to store the file and share it. Duplicates database storage. Files are stored in the user's personal space. Impossible to apply management rules.
3	SharePoint	Included in Office 365 storage capacity management.	Enables centralized file management without storing them in the database	Requires specific development, even if not complex. Not possible to implement legal requirements.

4	Azure Storage (Azure share file)		<p>Enables centralized file management without storing them in the database.</p> <p>Azure storage complies with legal requirements in terms of file storage, other complex rules can be implemented without further development.</p> <p>It is possible to synchronize the space with a server or a local computer (Windows file explorer).</p>	Requires specific development, even if not complex.
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Room for improvement

Given that Business central relies on Azure security groups, in certain contexts it would be useful when create directories in Azure File Share, replicate access permissions to these folders from the ERP.

Full project sources on GitHub: <https://github.com/BMSPedro/BCFileStorage.git>

3.7 Bonus, PDF display in the Business Central client.

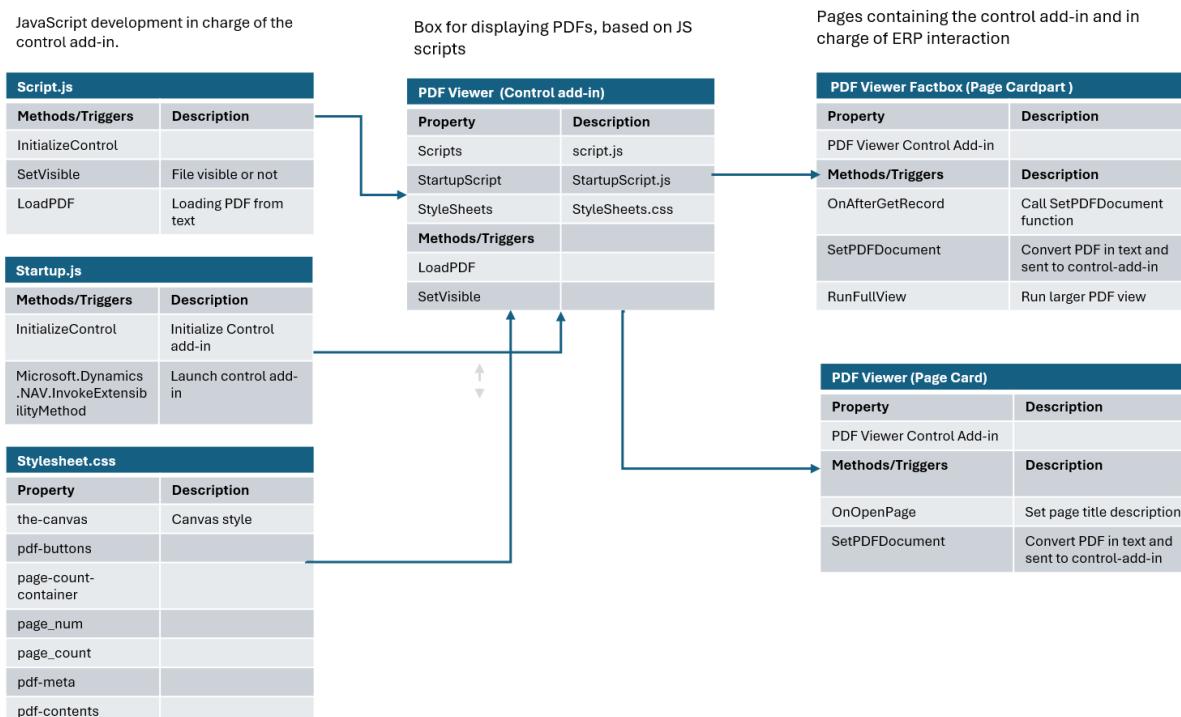
To avoid systematically downloading files (only PDFs) to view their content, a specific FactBox and a dedicate page for a wider view have been added.

The display is handled by a controlAdd-in based on JS libraries (open source).

<https://mozilla.github.io/pdf.js/>

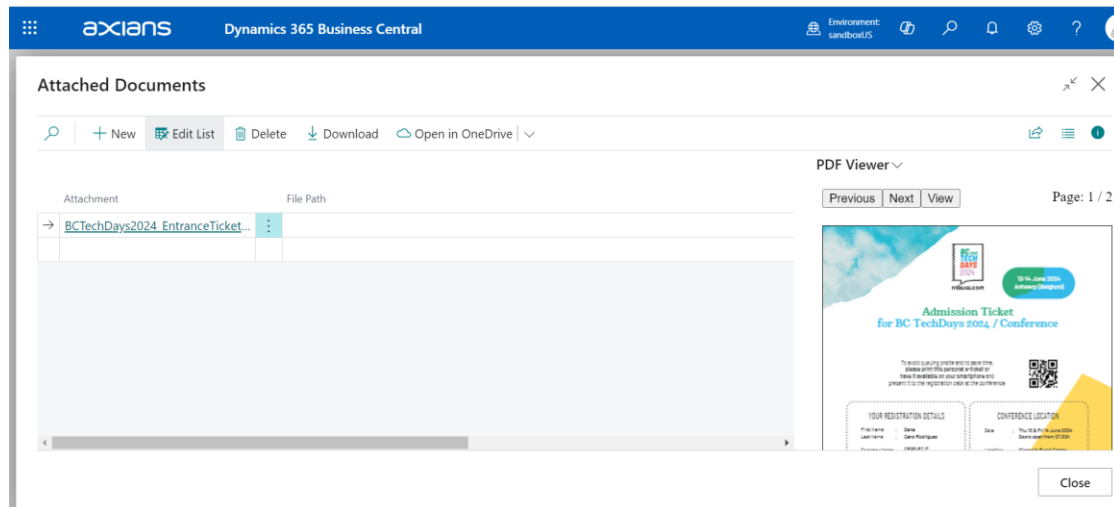
<https://cdnjs.com/libraries/pdf.js>

<https://jsfiddle.net/pdfjs/wagvs9Lf/> (to see how work and test the library)



Business Central screenshots

Factbox



Large Page (full view)

