OpenID Connect with Azure Blob Storage

Manual

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Introduction

OpenID Connect is an authentication protocol built on OAuth 2.0 that allows an application to request access on behalf of an end user.

As this document is only meant to provide a very basic overview, use the official documentation for further information, e.g.: https://docs.microsoft.com/en-us/azure/active-directory/develop/active-directory-v2-protocols

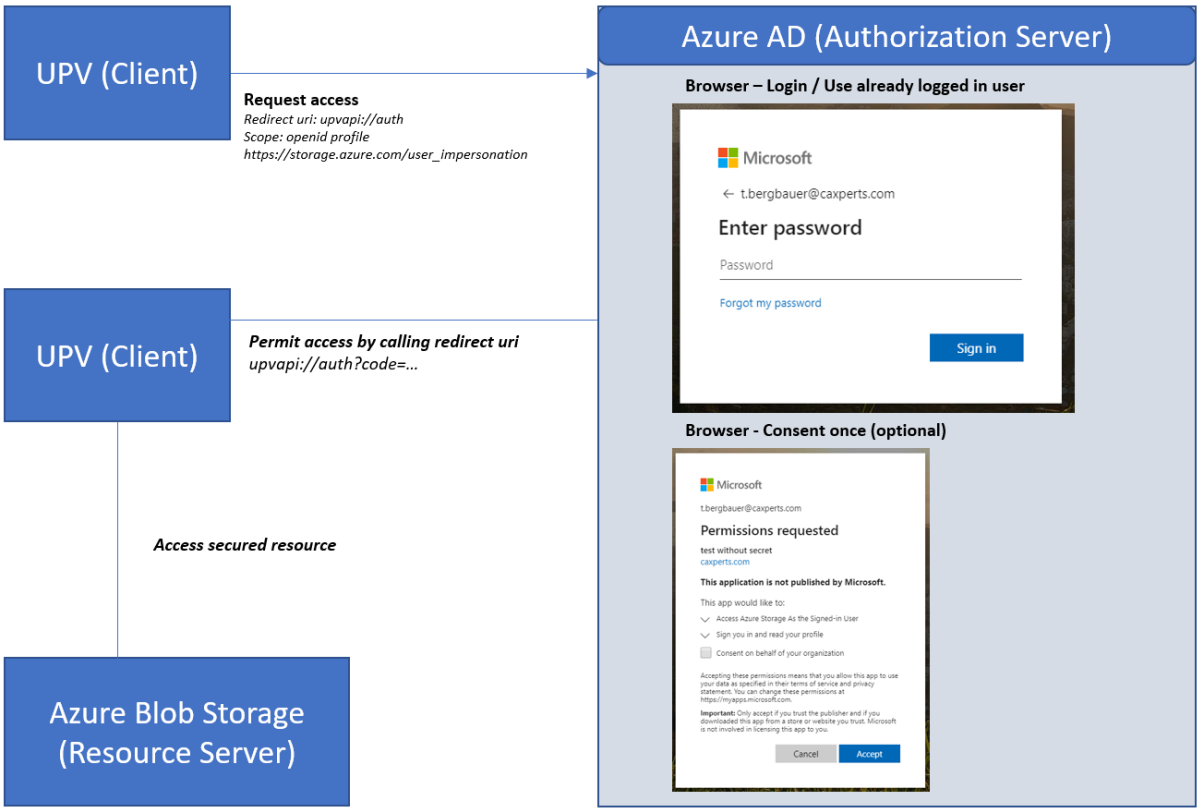
In short – OpenID Connect is a protocol for providing SSO (single sign-on) using the native browser via a common identity provider (the **Authorization Server**). It is built on top of OAuth 2.0 and allows an application to request access to a system on behalf of an end user. The **Client** is the application requesting access to the secured **Resource Server** on behalf of the end user (**Resource Owner**). Of course, every **Authorization Server** supporting OpenID Connect can be used in combination with UniversalPlantViewer. The **Resource Server** needs to support plain file access in a folder hierarchy (opposed to an API like for example in Google Drive).

Supporting specific Resource Server APIs will require additional development effort on CAXperts side and will have to be negotiated separately.

In this example we will specifically address Azure AD in combination with Azure Blob Storage.

The OpenID Connect protocol is supported in UniversalPlantViewer **version 05.02** and upwards.

High-level schema for Azure AD



Conceptually the UniversalPlantViewer does not handle any user secret. The **Authorization Server** handles the login independently and will issue a token which can be used by UniversalPlantViewer to access the gated resource.

Therefore, it is not possible for the **Client** (UniversalPlantViewer) to leak a user password. Only the token could be a target for attacks and when stolen be used to access the **Resource Server** for a limited time.

Refer to the **Authorization Server** documentation for further security measures for example Multi-Factor Authentication or specific authorization rules.

Configuration in UniversalPlantViewer

The UniversalPlantViewer uses the IdentityModel.OidcClient library internally (currently version 2.9.0.0). Please refer to the library's options.

The following extensions to the library's options are available:

- **FrontChannelExtraParameters**: set additional request query parameters for the auth request (i.e. the resource parameter)
- **BackChannelExtraParameters**
- **AuthorizationHeaders**: set static header values which should be sent when authenticated
- **EnableLog**: when set will include the OidcClient2-Log into the application

The configuration file example for Azure – Missing configuration options will be using the libraries default value.

You should set the **EnableLog** property while setting up the configuration. Authentication problems will then be logged to the general UniversalPlantViewer log.

When finished it is advisable to disable this setting so security relevant information is not persisted in the log file.

authenticationConfig.json

```
{
   "Oidc":{
      "FrontChannelExtraParameters":{
         "resource":https://upv.blob.core.windows.net
      },
      "AuthorizationHeaders":{
         "x-ms-version":"2017-11-09"
      },
      "EnableLog":true,
      "Authority":"https://sts.windows.net/e1765baf-2fe4-4b9e-87ee-d130dde50afa",
      "ClientId":"5c2f88a0-766f-464d-bdad-d40ec1d4fb33",
      "Scope":"openid profile offline_access
https://storage.azure.com/user_impersonation",
```

```
      "RedirectUri":"upvapi://auth",
      "RefreshDiscoveryDocumentForLogin":true,
      "RefreshDiscoveryOnSignatureFailure":false,
      "ResponseMode":1,
      "LoadProfile":false,
      "Flow":0,
      "TokenClientAuthenticationStyle":1,
      "Policy":{
         "Discovery":{
            "ValidateEndpoints":false
         },
         "RequireAccessTokenHash":false,
         "RequireIdentityTokenOnRefreshTokenResponse":false,
      },
   }
}
```

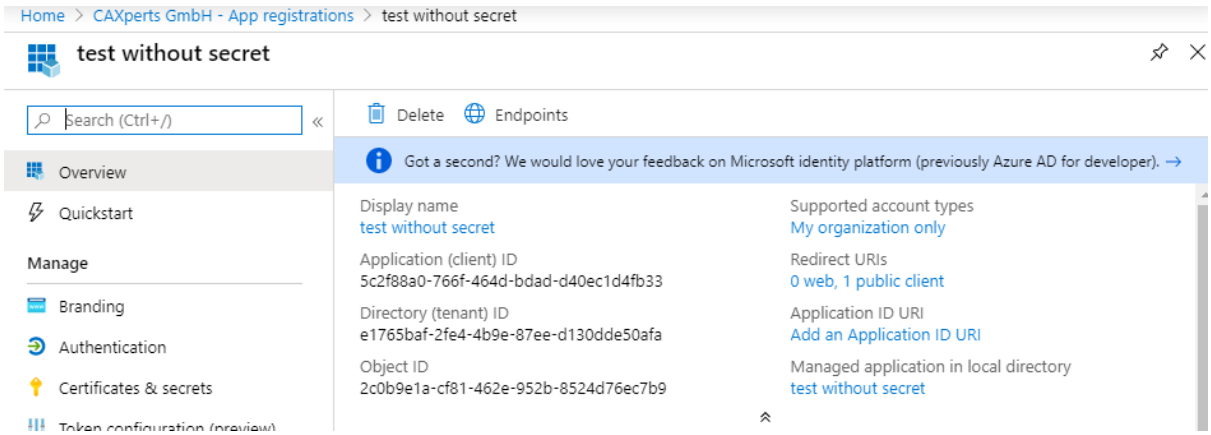
The marked options will require to be adjusted to your case:

- **Resource**: The name of the blob storage
- **Authority**: The Microsoft authorization endpoint for your company using e.g. the Directory (tenant) ID below – please refer to Microsoft documentation for further options
- **ClientId**: The identifier for the application registration – Application (client) ID below

Azure-specific settings:

- **ValidateEndpoints**: set to false when the endpoint is on a different host than the authority
- **AuthorizationHeader**: x-ms-version – determines the Azure API version
- **RequireAccessTokenHash**: false
- **LoadProfile**: false (not required by UniversalPlantViewer – needs additional permission)

You can find the necessary configuration IDs in the app registrations overview:



The configuration file will be recognized automatically in the Data folder of the UniversalPlantViewer model at **Data\authenticationConfig.json**. It needs to be accessible without authentication (anonymous access).

It is not possible to set single files to anonymous access in Azure Blob Storage.

As a workaround the file can be stored at any other location for example in a separate blob storage container with global anonymous access. The name of the file does not matter in this context.

The user will have to open the model using an upvapi:// link like below once. The configuration will be persisted on the user device and automatically recognized for the next attempts in the specified domain.

```
upvapi://https://upv.blob.core.windows.net/$web/demoplantModel/?CMD!SetAuthConfig=
https%3A%2F%2Fupv.blob.core.windows.net%2F%24web%2FdemoplantModel%2F!https%3A%2F%2
Fupv.blob.core.windows.net%2FauthenticationConfig.json
```

1) https://upv.blob.core.windows.net/$web/demoplantModel/
   → Model location for opening directly over the link
2) SetAuthConfig (Parameter 1)
   `https%3A%2F%2Fupv.blob.core.windows.net%2F%24web%2FdemoplantModel%2F`
   → Domain where the configuration is relevant (subroutes will use the provided configuration when no other is specified)
3) SetAuthConfig (Parameter 2)
   `https%3A%2F%2Fupv.blob.core.windows.net%2FauthenticationConfig.json`
   → Path to the configuration file (needs to be accessible without authentication) – Supports file/web or URI paths

The parameters of SetAuthConfig need to be UrlEncoded.

Configuration in Azure

Azure Blob storage

For a general overview see https://docs.microsoft.com/en-us/azure/storage/blobs/

Set up a storage account

https://docs.microsoft.com/en-us/azure/storage/common/storage-account-create?tabs=azure-portal

Set up the containers

https://docs.microsoft.com/en-us/azure/storage/blobs/storage-quickstart-blobs-portal

You will need a container for the configuration file – Set the access level to anonymous.

Upload the UniversalPlantViewer configuration file here.

You will need another container for the secured UniversalPlantViewer model data – Set the access level to private.

Uploading multiple files/folders can be accomplished using the Azure Storage Explorer.

https://docs.microsoft.com/en-us/azure/vs-azure-tools-storage-explorer-blobs

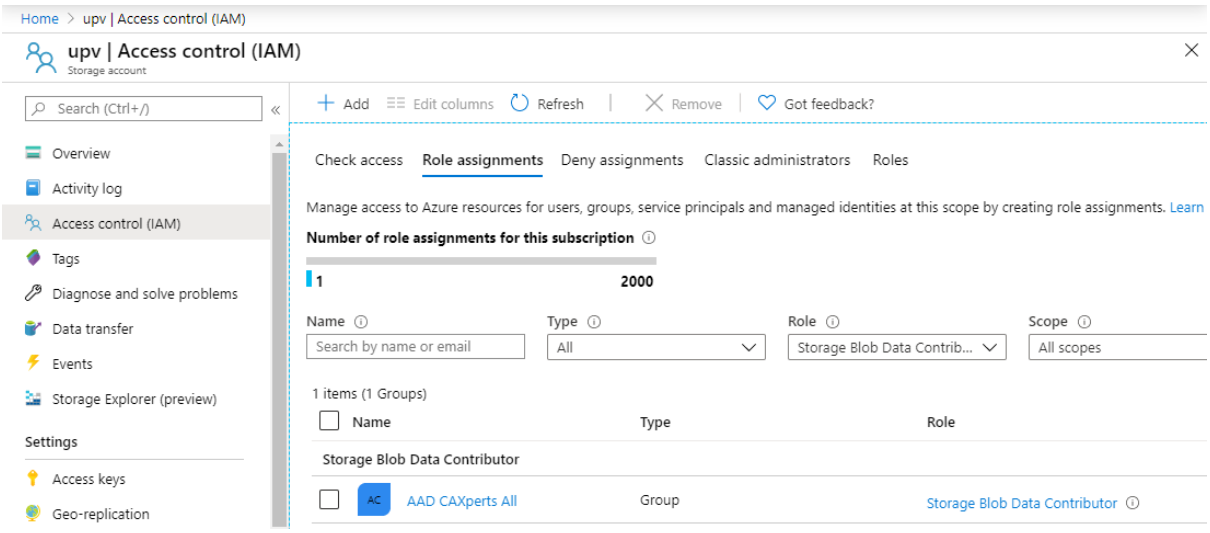
Add user permissions

https://docs.microsoft.com/en-us/azure/storage/common/storage-auth-aad-rbac-portal

For the container you will have to set up user and group permissions.

For allowing delegated access to the storage account you will have to set the **Storage Blob Data Reader** role for read-only access.

Depending on your needs you can of course use other roles in the **Storage Blob Data** group.



App registration in Azure Active Directory

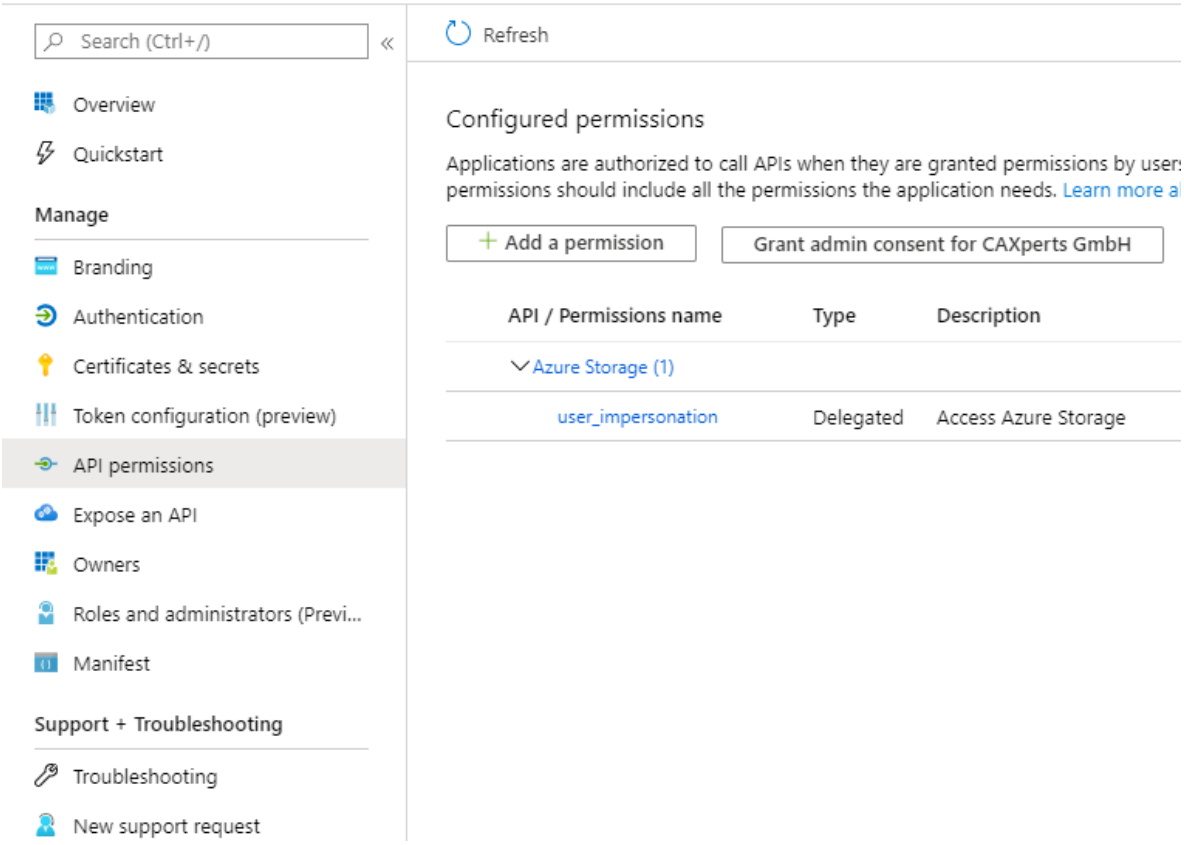
https://docs.microsoft.com/en-us/azure/active-directory/develop/quickstart-register-app

Set Redirect URI to upvapi://auth

Redirect URI must match the one provided in the configuration file.

A secret is not necessary as UniversalPlantViewer is a public client.

Add required permission



The UniversalPlantViewer needs to access the storage on behalf of the user, therefor add following permission to the registration: **Azure Storage – user_impersonation**

Optionally you can grant admin consent so the end user will no longer have to consent independently.

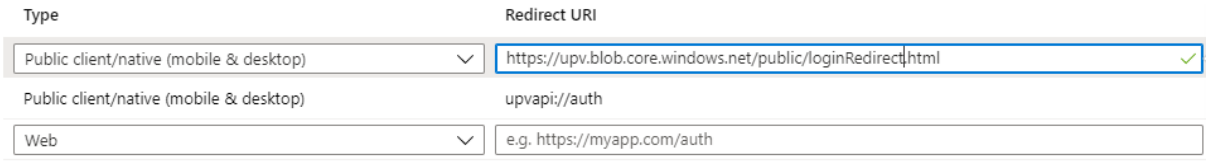
Add relay page (optional)

In chrome we observed some calls to upvapi:// being silently ignored when the browser does not have focus which can for example happen when the user is already logged in.

Chrome regards this as a security feature.

As an additional problem there is no indicator in the browser when the login is finished and it is possible to close the browser window.

As a workaround to this problem, it is possible to use a relay webpage as an additional Redirect URI (see attached example site).



The redirect URI in the UniversalPlantViewer configuration file will have to be adjusted accordingly.

loginRedirect.html (example code)

```
<html>

    <head>
        <title>UniversalPlantViewer Login</title>
    </head>

    <body>
        <p>
            UniversalPlantViewer login should be succeeded <br/>
            You can close this window now
        </p>


        <p> If there was a problem, you can reissue the login request with
        below link </p>
        <a id="#authLink">Login</a>
    </body>

    <script>
        var url = 'upvapi://auth' + window.location.search;

        function login(){
            window.location.assign(url);
        }

        window.onload = function() {
            var link = document.getElementById('#authLink');

            link.href = url;

            login();
        }
    </script>

</html>
```

Case sensitivity of urls

Urls in Azure Blob Storage are – unlike other systems - case sensitive. Therefor your UPV model needs to have unchanged file casings.

Regarding additional configuration files following casing needs to be considered:

- defaultConfig.upv
- authenticationConfig.json

- volumes.xls/xlsx
- attributes.xls/xlsx
- intelliPidAttributes.xls/xlsx
- attributeData.xlsx
- intelliPidAttributeData.xlsx
- links.xls/xlsx/txt
- intelliPidLinks.xls/xlsx/txt
- defaultPackages.json/xlsx
- upvcolorindex.txt
- ReportDefinition.xls/xlsx
- intelliPidReportDefinition.xls/xlsx
- upvobjectsindex.txt
- upvsketchitemindex.txt
- upvintellipidsketchitemindex.txt
- Meassurements.xlsx
- Endpreps.xlsx
- projectMessage.png/jpg/jpeg

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