CGI Advantage® 4

Power BI Embedding Configuration Guide

CGI

© Copyright 2019, 2022 CGI Technologies and Solutions Inc. All rights reserved. These materials contain the intellectual property of CGI, Inc. and are therefore proprietary and confidential. Any copying and distribution of these materials is strictly prohibited.

CGI Advantage® is a registered trademark of CGI Technologies and Solutions Inc. Proprietary and Confidential. The names of actual companies and products mentioned herein may be the trademarks of their respective owners.

Table of Contents

1 Purpose 4

2 Assumptions 5

3 Embedded Analytic Setup 6

3.1 Overview 6
3.2 Setting up the Azure Application & Authentication 7
3.3 Creating a workspace to share reports 10
3.4 Changing the connection details on the created reports 11
3.5 Publishing the reports on the cloud to the workspace 14
3.6 Provide Workspace access for authentication 15
3.7 Setting up the Power BI Gateway & data sources 16
3.8 Import Power BI's SSL certificate into Advantage Keystore 17
3.9 Setting up the Power BI Widget configuration on the Advantage application 20

4 Appendix 22

1 Purpose

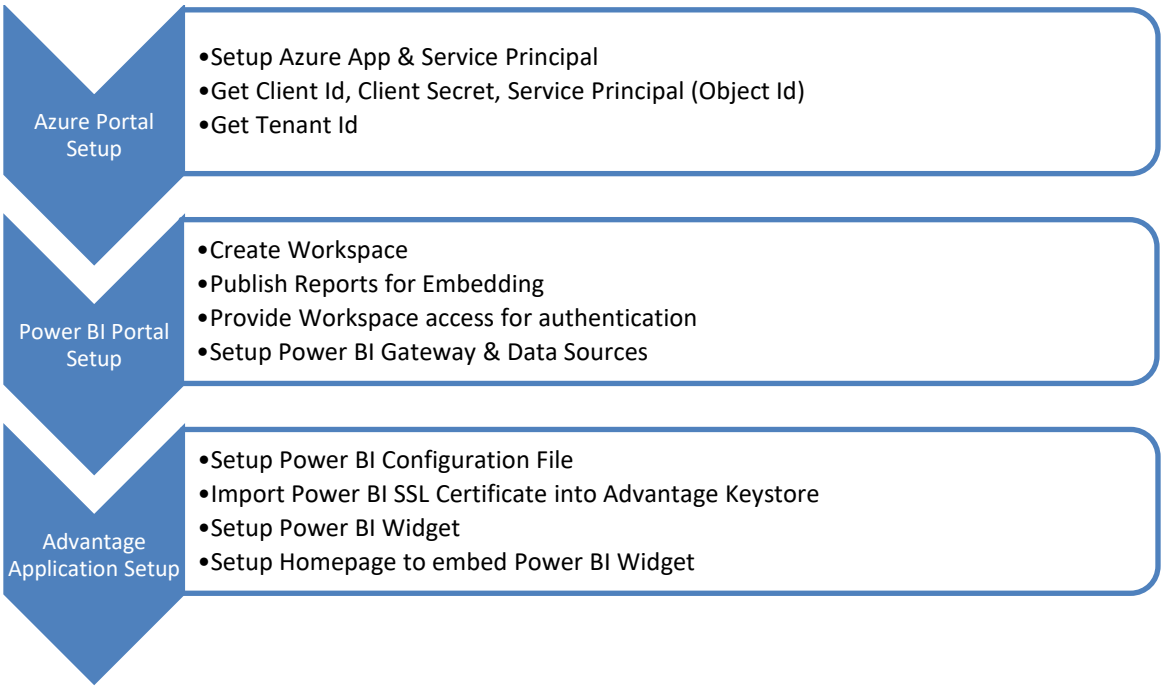
This guide provides information on the process to follow to display the reports created in Power BI to the Advantage application pages. This guide helps in embedding Power BI reports from CGI Resource Library.

2 Assumptions

1. This guide assumes Azure subscription is available and ready.
2. The Administrator has Power BI Pro license and required admin access rights.
3. The report publisher has Power BI Pro license.

3 Embedded Analytic Setup

3.1 Overview



3.2 Setting up the Azure Application & Authentication

To be performed by Power BI Administrator

There are two main scenarios for embedding the Power BI content:

- Embedding for your organization's users (who have Power BI licenses).
- Embedding for your users and customers without requiring Power BI licenses, that is, Power BI Embedded.

For Advantage, it is recommended to use Power BI Embedded, that is, embedding without the need of Power BI licenses for every application user.

With Power BI Embedded, there are two ways to embed Power BI resources (Reports) into the application:

1. Master Account (Power BI Pro)

   The Power BI Pro account acts as your application's master account (think of it as a proxy account). This account allows you to generate embedded tokens that provide access to your application's Power BI dashboards and reports.

2. Service Principal

   Service principal can embed Power BI content into an application using an app-only token. It also allows you to generate embedded tokens that provide access to your application's Power BI dashboards and reports.

   Service Principal is the recommended approach as it does not need Power BI account credentials to be set in the Advantage application.

For more detail on these methods, refer to the following links:

https://docs.microsoft.com/en-us/power-bi/developer/embedding#embedding-for-your-customers
https://docs.microsoft.com/en-us/power-bi/developer/embed-service-principal

Refer to the following steps, based on the method chosen:

Master Account

1. Register a Native application in Azure Active Directory (Azure AD).

   In either approach, an Azure application needs to be registered. The type of application depends on whether the site goes with Master Account or Service principal. For this approach, application type should be “Native”.

   For steps on how to register, refer to the following link:

   https://docs.microsoft.com/en-us/power-bi/developer/embed-sample-for-customers#register-an-application-in-azure-active-directory-azure-ad

   Note down the following while registering the application. It will be used in the Advantage Application configuration for authentication:

   - Client Id
   - Client Secret

Service Principal

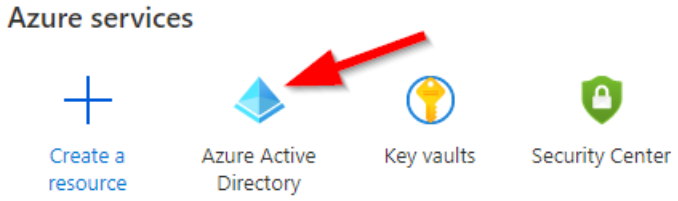
1. Register a **server-side** application in Azure Active Directory (Azure AD). For steps, refer to the following link:

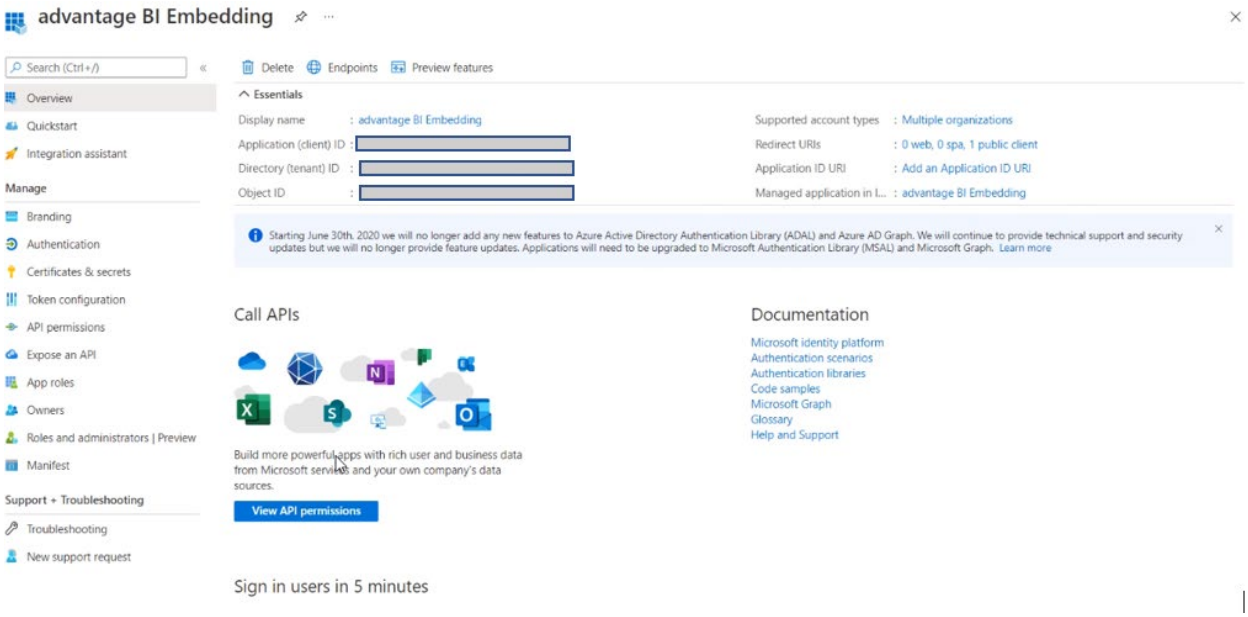
   https://docs.microsoft.com/en-us/power-bi/developer/embedded/register-app?tabs=customers%2CAzure#register-an-azure-ad-app

   Note down the following while registering the application. It will be used in the Advantage Application configuration for authentication:

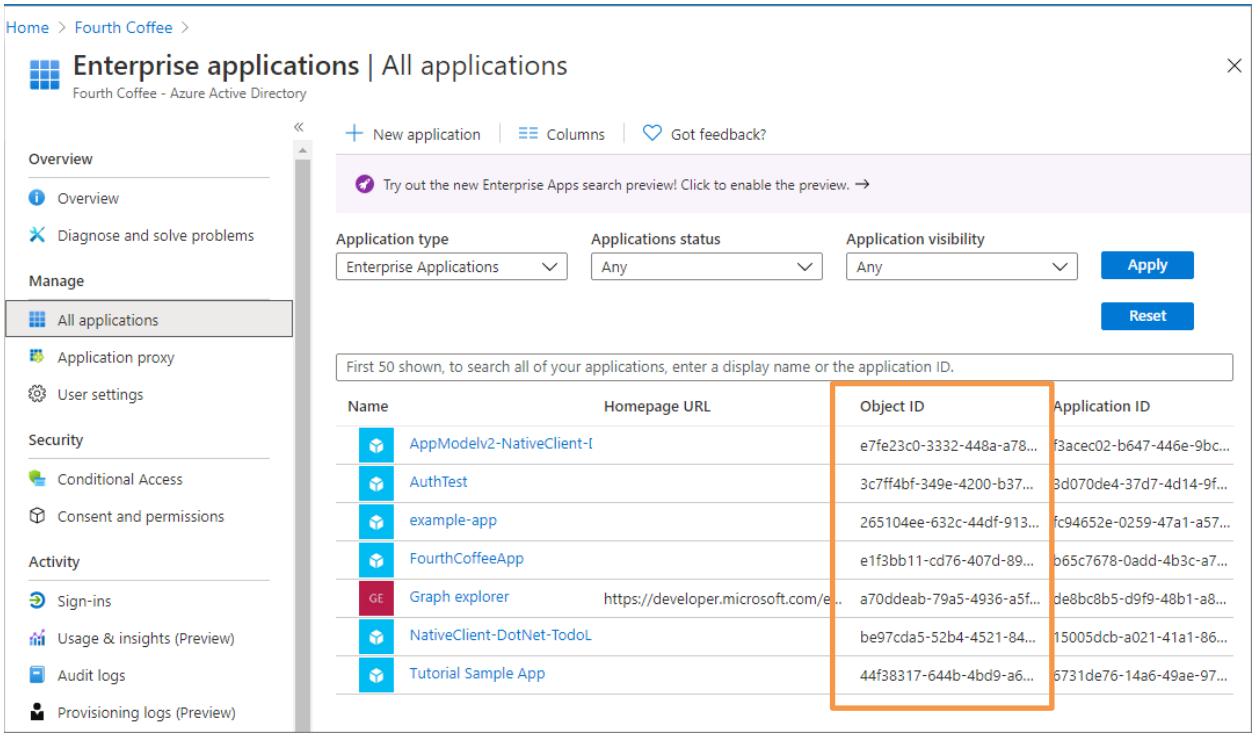
   - Client Id
   - Client Secret
   - Service Principal (Object Id)
   - Tenant Id

   The Service Principal Id and Tenant Id can be found under the Azure Active Directory.





Get Service Principal Object Id from the Enterprise application listing



2. Create a security group in Azure Active Directory (AAD)

   Create a security group in Azure Active Directory (AAD) and add the application you created to that security group. Refer to the steps at the following link:

   https://docs.microsoft.com/en-us/power-bi/developer/embedded/embed-service-principal#step-2---create-an-azure-ad-security-group

3. Enable service principal in the **Developer settings** in the Power BI admin portal. Refer to the steps at the following link:

   https://docs.microsoft.com/en-us/power-bi/developer/embedded/embed-service-principal#step-3---enable-the-power-bi-service-admin-settings

3.3 Creating a workspace to share reports

To be performed by Power BI Administrator

Workspace is an area which houses collections of dashboards, reports, and paginated reports created using Power BI to be shared across any application.

For embedding reports on the Advantage application, a workspace needs to be created first. Once created, access needs to be provided to users to access the said workspace and its artifacts.

The steps to create a workspace can be found under the Power BI link:

https://docs.microsoft.com/en-us/power-bi/service-create-the-new-workspaces

Note: For now, only one workspace can be configured per Application in Advantage (that is, one each for Financial, HRM & PB.)

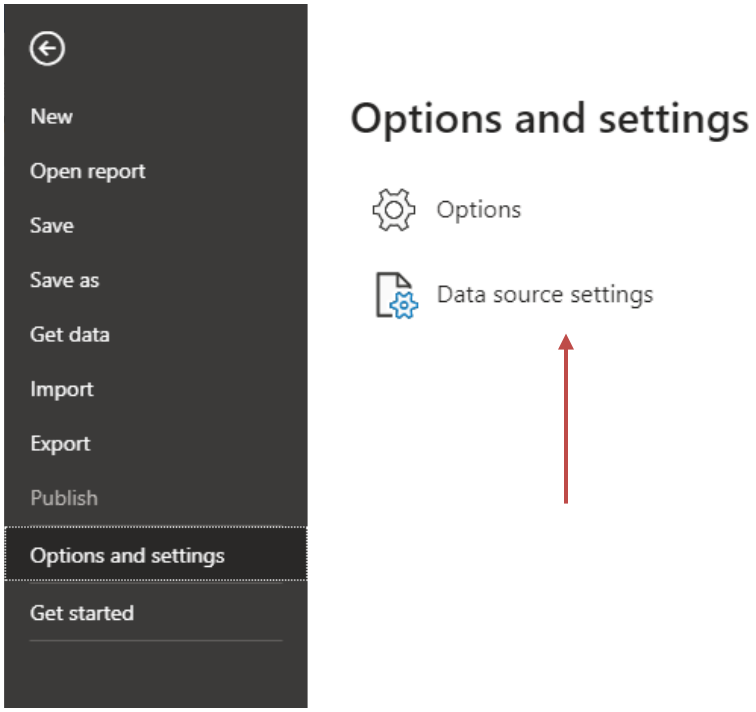
3.4 Changing the connection details on the created reports

To be performed by Power BI Developer

The reports should point to the schemas against which reporting needs to be done. To replace or change the existing connection (same database type, that is, Oracle to Oracle or SQL Server to SQL Server) on the analytic, perform the following steps:

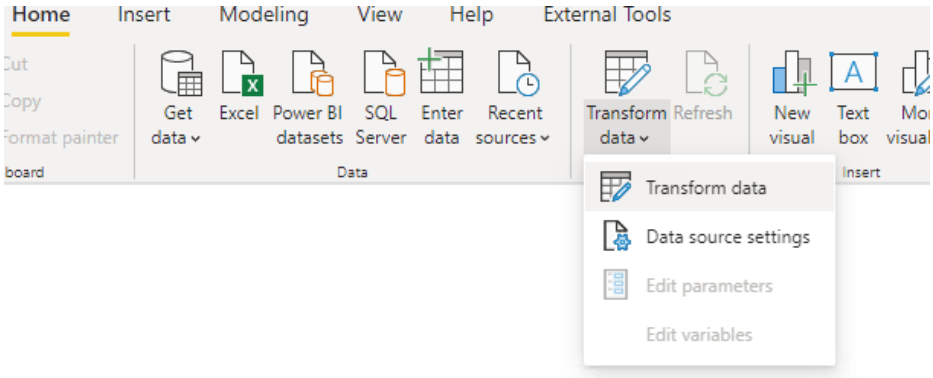
In the Power BI desktop client, go to query editor, select your table, and click the Settings icon under the applied steps on the right hand side. or

1. Go to File -> Options and settings -> Data source settings >Right click data sources and change source.

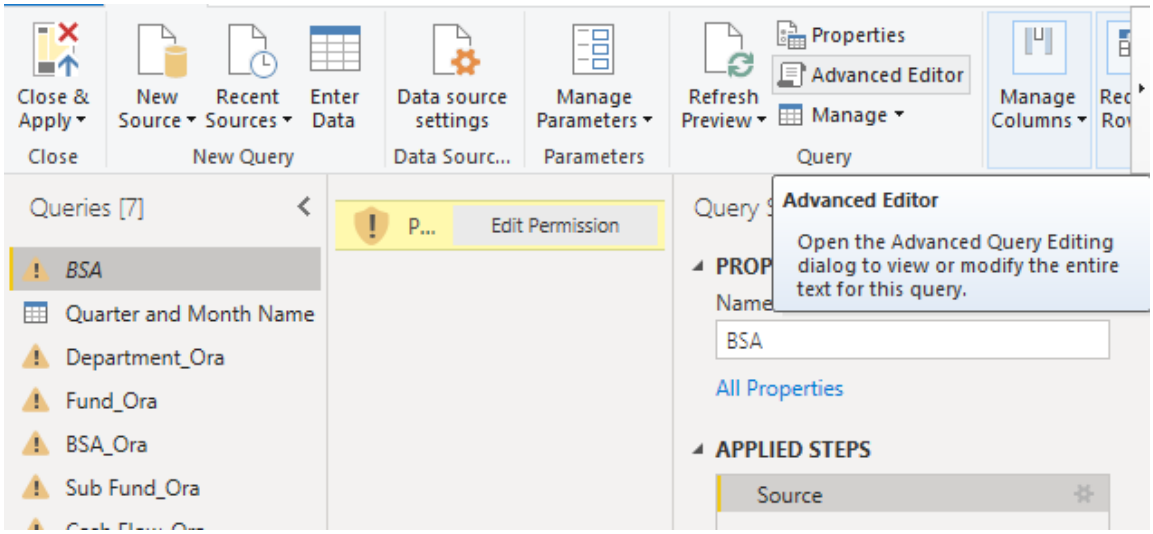


However, if the source points to an Oracle database and needs to be changed to a SQL Server connection or vice-versa, perform the following steps:

2. Select **Transform data** from the tool bar.

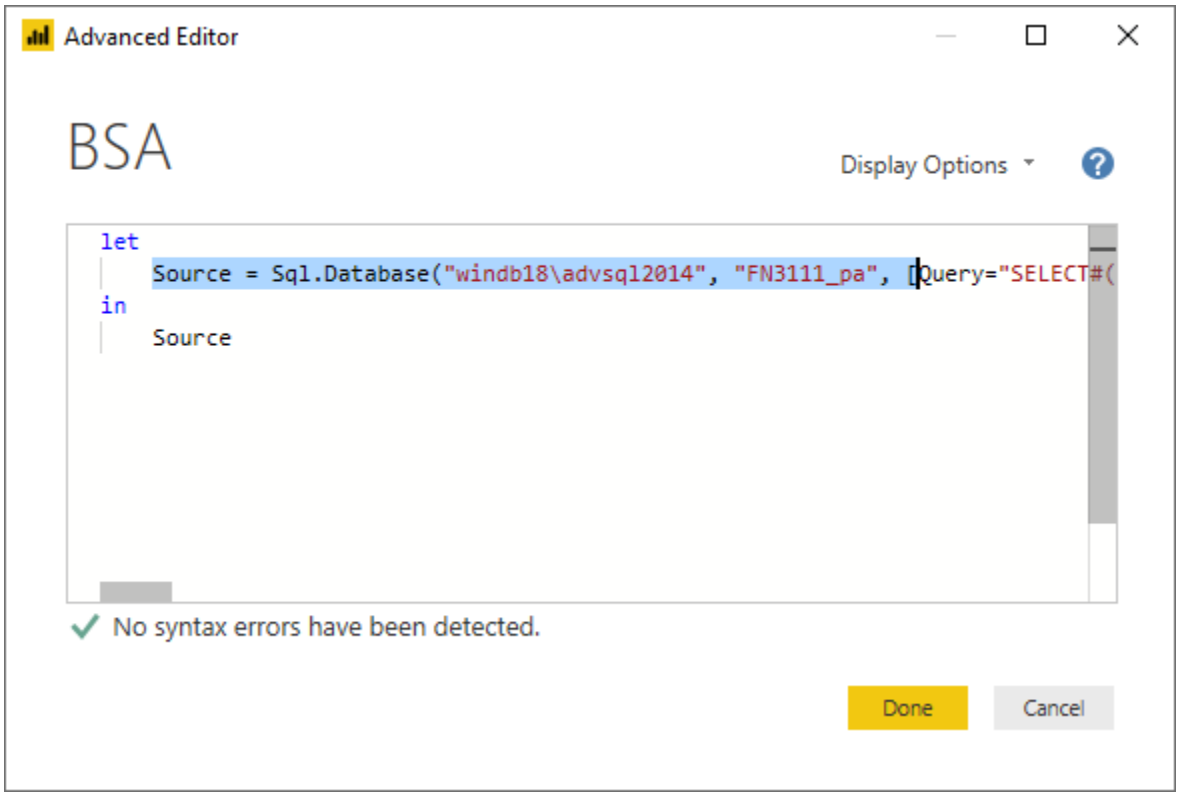


3. Select the table for which you need to change the query source and click **Advanced Editor**.



- An Oracle query connection string looks like:
  Source = Oracle.Database("<Server Name\SID>", [HierarchicalNavigation=true, Query="
- While a SQL Server query connection string looks like,
  Source = Sql.Database("<Server Name\SID>", "<Schema_Name>", [Query="

4. After opening the Advanced editor, change the string to your respective connection string and click **Done**.

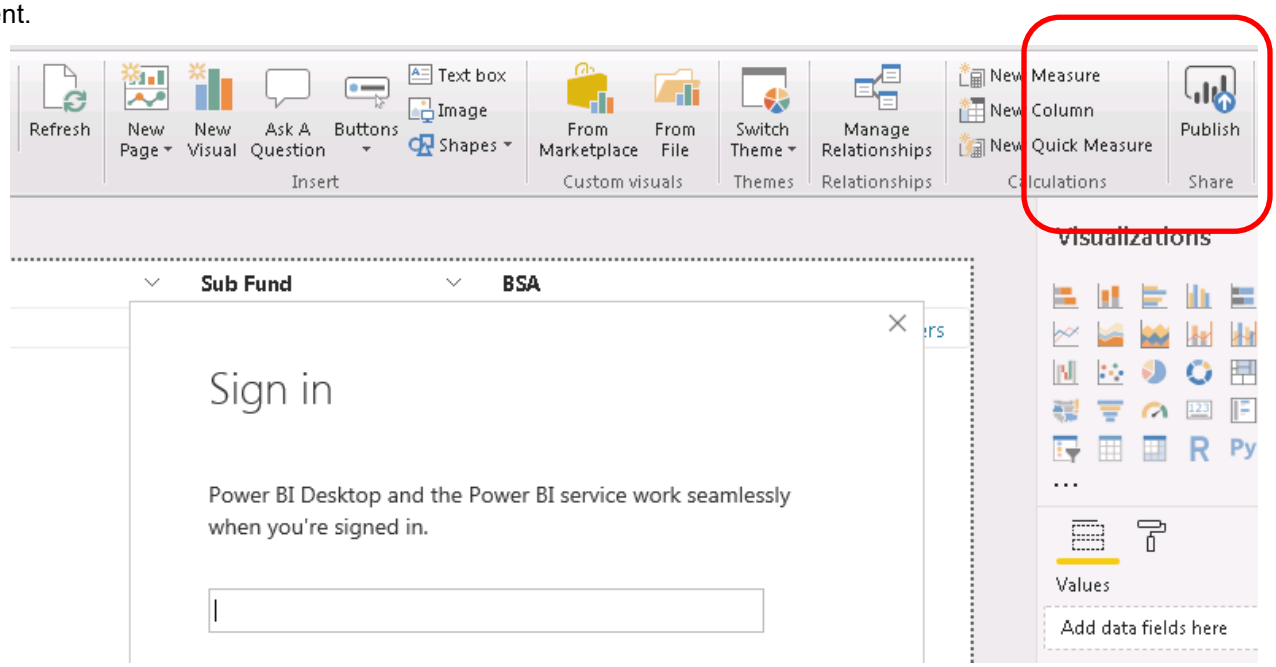


5. You will be prompted to enter the username and password following which the connection will be successfully changed.

3.5 Publishing the reports on the cloud to the workspace

To be performed by Power BI Developer

Once connections are changed, the reports need to be published to the workspace created in the previous step on the cloud, which would make them accessible to the other users or applications where they need to be embedded (Advantage). The Power BI Report is published via the Power BI desktop client.



Ensure that the user logged in to the desktop client has access to the workspace created in the above step.

3.6 Provide Workspace access for authentication

To be performed by Power BI Administrator

Master Account

The Power BI Pro user identified as the Master user needs to be provided access to the Workspace created above. This allows the Master user to get embed tokens for reports within the workspace and embed it in the application.

Service Principal

Add the service principal as an **admin** to the workspace created above. Steps to follow are under the link,

https://docs.microsoft.com/en-us/power-bi/developer/embedded/embed-service-principal#step-4--- add-the-service-principal-to-your-workspace

3.7 Setting up the Power BI Gateway & data sources

To be performed by Power BI Administrator

The Power BI reports when published are stored in the Azure cloud. In order to access the on-premise database, Power BI gateway software needs to be setup on the machine which has network access to the on-premise database. The on-premises data gateway acts as a bridge to provide quick and secure data transfer between the on-premises data (data that is not in the cloud) and several Power BI cloud services.

Perform the steps mentioned under the following link to setup the Gateway:

The steps for using a gateway are

1. Download and install the gateway on a local computer.
2. Configure the gateway based on your firewall and other network requirements.
3. Add gateway admins who can also manage and administer other network requirements.
4. Use the gateway to refresh an on-premises data source.
5. Troubleshoot the gateway in case of errors.

Configure data sources

Once the Gateway is setup, it can be accessed under the Power BI portal to setup data sources to be used in Power BI datasets\reports. Follow the steps provided in the link below to setup the data sources:

https://docs.microsoft.com/en-us/power-bi/service-gateway-data-sources

In case of embedding with Service Principal, the gateway admin should use the Add Datasource User REST API to give the service principal the *ReadOverrideEffectiveIdentity* permission for the SSAS data source.

This step would need Service Principal Id from Azure steps above.

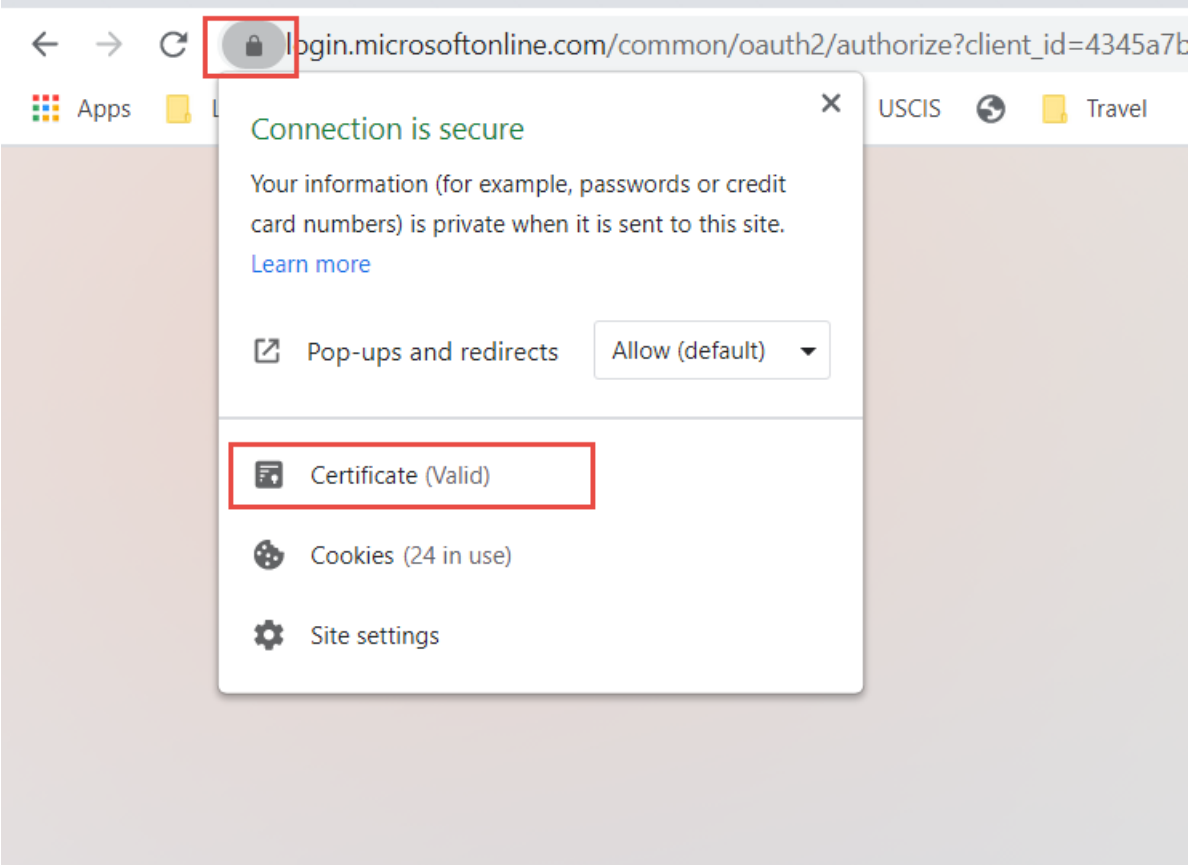
3.8 Import Power BI's SSL certificate into Advantage Keystore

Export PowerBI's SSL certificate for following URL's and import into Advantage keystore

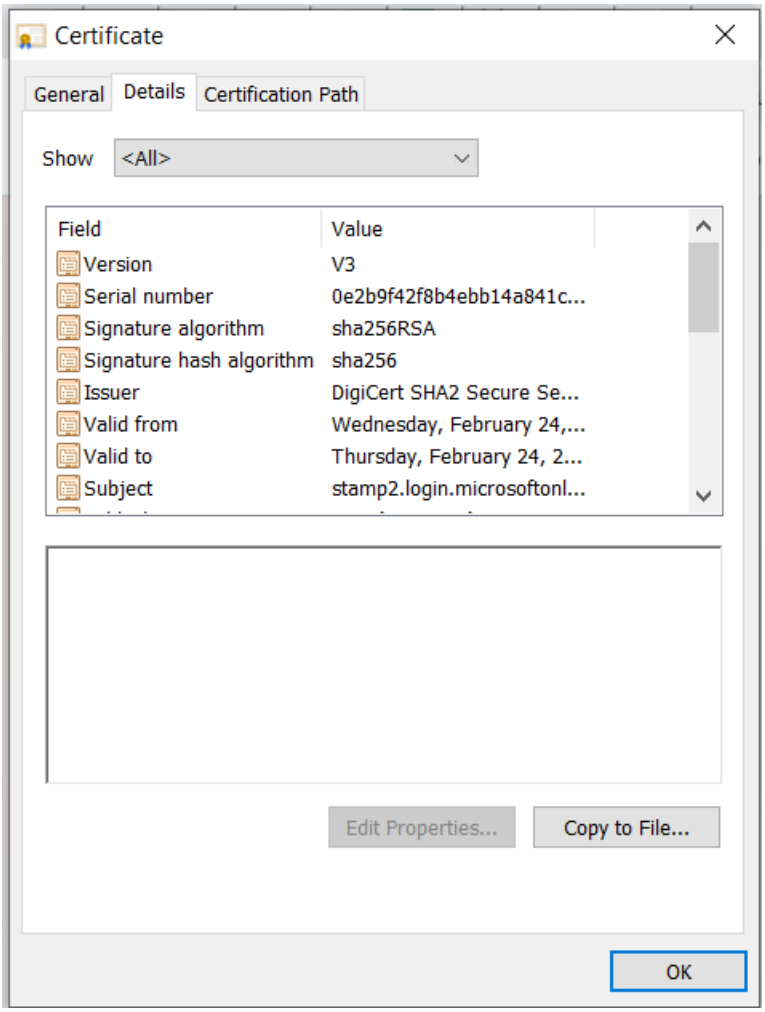
- Oauth URL https://login.microsoftonline.com/
- Power BI App URL
  - For Power BI Commercial - https://app.powerbi.com/
  - For Power BI Government - https://app.powerbigov.us/

Below are the steps to Import PowerBI's SSL certificate into Advantage keystore:

1. Access the Oauth URL https://login.microsoftonline.com/ in your browser, click the **lock** icon and then click **Certificate (Valid)**.

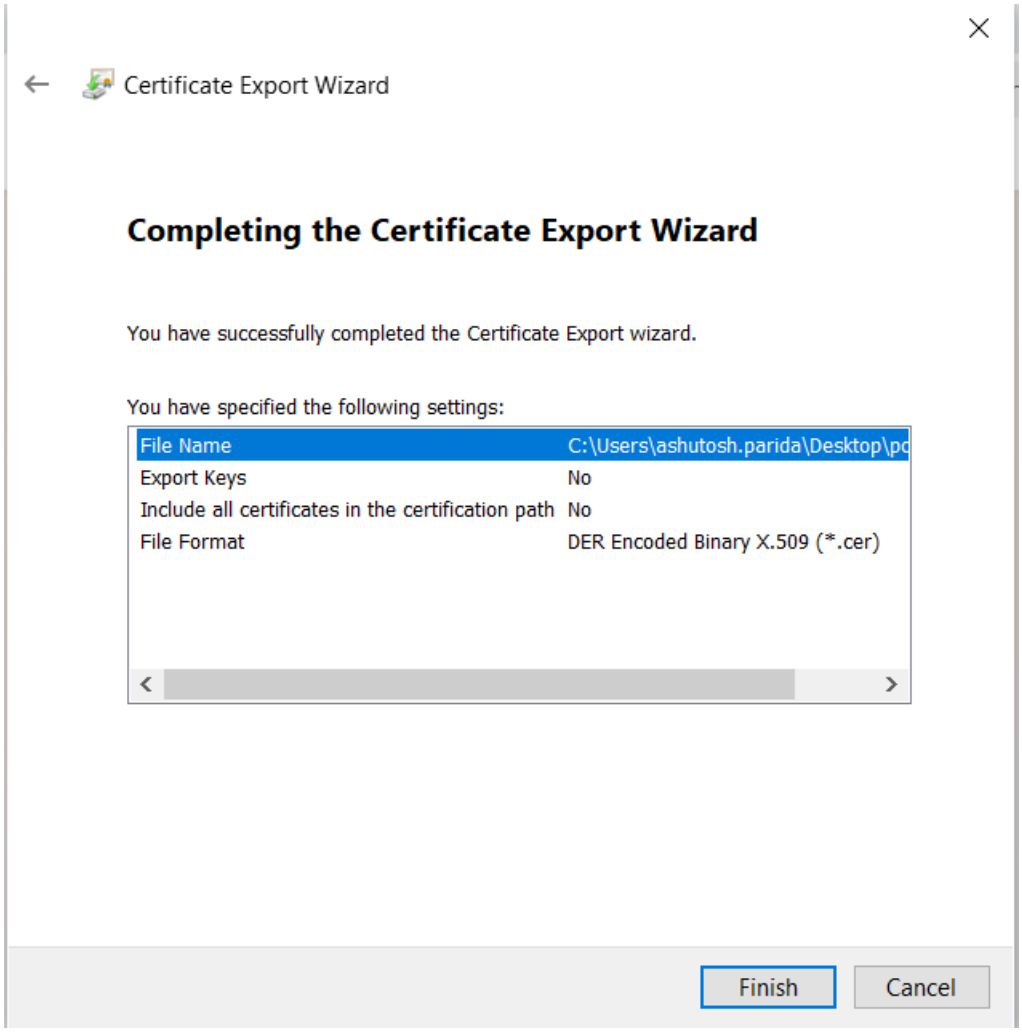


2. Once you see the Certificate window, click on the Details tab on the window and click *Copy to File...*



3. On the Certificate Export Wizard, click next, choose DER encoded binary X.509 (.cer), click browse, provide a file name, and click next.

4. Click Finish and the certificate will be exported to the file path provided



5. Now import the certificate into ADV3.keystore using the keytool command

```
C:\CGIADM\RTFiles\VLS1>keytool -import -alias powerbianalytics -keystore ADV3.keystore -file powerbi.cer
Enter keystore password:
```

6. Enter the password and type ‘yes’ to trust the certificate

PowerBI SSL certificate is successfully added to ADV3.keystore

3.9 Setting up the Power BI Widget configuration on the Advantage application

To be performed by Advantage Administrator

For the reports to show up on Advantage page, widget & Power BI authentication properties setup needs to be done in Advantage application.

1. Setup Power BI configuration file

   The Power BI configuration file, i.e., powerbi_config.properties (VLS\bin) needs to be updated for the following properties. This is just a one-time configuration per application unless there is change in the Power BI setup.

Property	Value
global_auth_flow_type	servicePrinciple , masterAccount The Oauth Grant flow type is based on this embed method chosen. i.e. # Master Account: grant_type = Password # Service Principal: grant_type=client_credentials
global_oauth_url	# Master Account - https://login.microsoftonline.com/common/oauth2/token # Service Principal - https://login.microsoftonline.com/<tenant_id>/oauth2/token <tenant_id> Azure AD directory. This directory is your *tenant*.
global_client_id	This is the client id for the registered application.
global_client_secret	This is the client secret for the registered application.
global_username	Username of the Master Power BI Pro account. Not required for Service principal
global_password	Password of the Master Power BI Pro account. Not required for Service principal
global_workspace_name	Power BI Workspace name
global_auth_flow_type	servicePrinciple , masterAccount The Oauth Grant flow type is based on this embed method chosen. i.e. # Master Account: grant_type = Password # Service Principal: grant_type=client_credentials
global_oauth_url	# Master Account - https://login.microsoftonline.com/common/oauth2/token # Service Principal - https://login.microsoftonline.com/<tenant_id>/oauth2/token <tenant_id> Azure AD directory. This directory is your *tenant*.
global_powerbi_resource	# For Power BI Commercial https://analysis.windows.net/powerbi/api

	# For Power BI Government https://analysis.usgovcloudapi.net/powerbi/api
global_embed_endpoint	# For Power BI Commercial https://app.powerbi.com/reportEmbed # For Power BI Government https://app.powerbigov.us/reportEmbed
global_generate_token_endpoint	# For Power BI Commercial https://api.powerbi.com/v1.0/myorg # For Power BI Government https://api.powerbigov.us/v1.0/myorg
proxy_url	Proxy Server URL (Optional) - When specified, the system re-directs network traffic via a proxy server. Useful when network firewall restrictions block web access to Power BI API's (login.microsoftonline.com etc.).
proxy_port	Proxy server port (Optional) - Used along with proxy_url

2. Setup Power BI widget on Advantage page

   The high level steps are:

   a. Add a Widget for the Power BI Report to the Widget library

   b. Setup the Widget Parameters for Power BI RLS Role

   c. Configure the Homepage to add the widget

4 Appendix

The table below provides a quick guide to view the shipped reports in the application.

Steps	Comments
Download reports from the CGI Resource Library.	Per Report.
Create a workspace in the Power BI Cloud for uploading Analytics.	This is a one-time activity.
Open the downloaded analytic in Power BI Desktop client to change database connections.	Per Report.
Select Edit Query and change the data source details as required.	Per Report.
Publish the report from the client.	Per Report.
Setup the gateway with the schema details that the analytics need to be pointed.	This is a one-time activity.
Azure application & Embed setup.	This is a one-time activity.
Power BI Configuration in the Advantage application.	This is a one-time activity.