Power BI Custom Connectors: Detailed Overview

Introduction

Power BI Custom Connectors are a powerful tool that enables connections to a vast variety of services not readily available through pre-built connectors. These connectors act as bridges, facilitating the retrieval, interaction, and manipulation of data from an array of external data sources, significantly enhancing the capabilities and versatility of Power BI.

Understanding Custom Connectors

A connector operates as an interface or wrapper around an Application Programming Interface (API) that facilitates communication between the underlying service and Power BI. Essentially, a connector forms the bridge that allows Power BI to communicate with the API of the external data source. In this context, a custom connector is a user-defined connector, tailor-made by developers to meet specific requirements.

Custom Connectors offer actions and triggers: actions being operations that can be executed within apps and workflows, whereas triggers initiate notifications to your app when a specific event occurs.

Despite the substantial number of connectors available (over 700+) in Power BI, not every service is covered. For these instances, developers have the ability to create their own custom connectors, offering increased versatility and personalized data solutions.

Building Custom Connectors

The process of creating a custom connector can be initiated from scratch, or they can be

imported from an OpenAPI definition, or a Postman collection. Power Query SDK, available in

Visual Studio, offers an M language service which includes functionalities like syntax

highlighting, error checking, and IntelliSense support. It provides a sturdy foundation for building

custom connectors.

Step-by-step guide to Create a Custom Connector:

Position the custom connector file (.pqx, .pq, .m, or .mez) in your local [Documents]\Power BI
Desktop\Custom Connectors folder.

To tweak the data extension security settings, in Power BI Desktop, select File > Options and
settings > Options > Security.

Under Data Extensions, select (Not Recommended) Allow any extension to load without
validation or warning.

Click OK, and then restart Power BI Desktop.

Please note, to use non-certified custom connectors developed by you or another party, you
must alter your Power BI Desktop security settings to allow these extensions to load without
validation or warning. It's crucial to ensure the full trustworthiness of your custom connectors.

Authentication Methods for Custom Connectors

Custom connectors offer a range of authentication methods to integrate with other services

securely. These include unauthenticated REST API, basic authentication, API key, or OAuth
2.0.

The choice of the authentication method largely depends on the data source's security

requirement.

Moreover, Power BI has gateways that allow data refresh over an encrypted connection to

on-premises databases, offering an added layer of security for some data sources.

Custom Connector Distribution and Certification

While developers typically distribute custom connectors individually, once a custom connector has been created, validated, and put to use by end-users, the data source owner can submit it for Microsoft certification. Certified connectors are disseminated publicly within Power BI, making them readily accessible to all Power BI users.

Microsoft offers a Power Query Connector Certification program to validate that connectors meet certain standards and criteria for public distribution. Before starting the certification process, developers should thoroughly review the certification requirements.

Advantages and Disadvantages of Custom Connectors

Advantages:

Flexibility: Custom connectors can be tailored to meet specific business needs, making them an incredibly flexible tool.

Expanded Access: With a custom connector, businesses can connect to data sources that are not covered by the built-in connectors in Power BI.

Improved Functionality: Custom connectors can offer improved functionality and efficiency compared to using built-in connectors for certain complex scenarios.

Disadvantages:

Maintenance Responsibility: Once you've built a custom connector, you're responsible for maintaining it. This involves ensuring compatibility with updates to Power BI and the data source.

Security Risks: Custom connectors can potentially pose security risks if not correctly implemented or if used without appropriate validation and warning. It's crucial to ensure your custom connectors are secure.

Complexity: Building a custom connector requires technical expertise. This could make the process challenging for those unfamiliar with APIs and coding.

Conclusion

Power BI custom connectors can significantly enhance the functionality of Power BI by enabling it to connect with a wide variety of data sources. Developing an understanding of how to create, distribute, and certify these connectors can vastly improve the efficiency and effectiveness of your data analysis and reporting tasks. However, it is important to weigh the pros and cons of custom connectors before implementation to ensure they are the right fit for your specific needs.

Despite their potential advantages, the security concerns associated with custom connectors, particularly those that are uncertified, can be a significant deterrent. In our current project, we have carefully evaluated these risks and weighed them against the benefits of using custom connectors. Considering the sensitivity and importance of the data we are working with, we've decided not to implement custom connectors in our current architecture due to potential security risks.

Instead, we have chosen more secured alternatives which are regularly maintained and updated by Microsoft, reducing potential security vulnerabilities. We have also focused on

enhancing our data architecture and operations to optimize the use of available connectors and mitigate the need for custom connectors.

While the decision may vary based on the project requirements, scope, data sensitivity, and available resources, a risk-conscious approach to data management and reporting should always be at the forefront when integrating external data sources into Power BI.