Architecture Design

Airbnb Data Analysis

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1. Introduction

1.1 What is Architecture design document?

Any software needs the architectural design to represents the design of software. IEEE defines architectural design as “the process of defining a collection of hardware and software components and their interfaces to establish the framework for the development of a computer system.” The software that is built for computer-based systems can exhibit one of these many architectures.

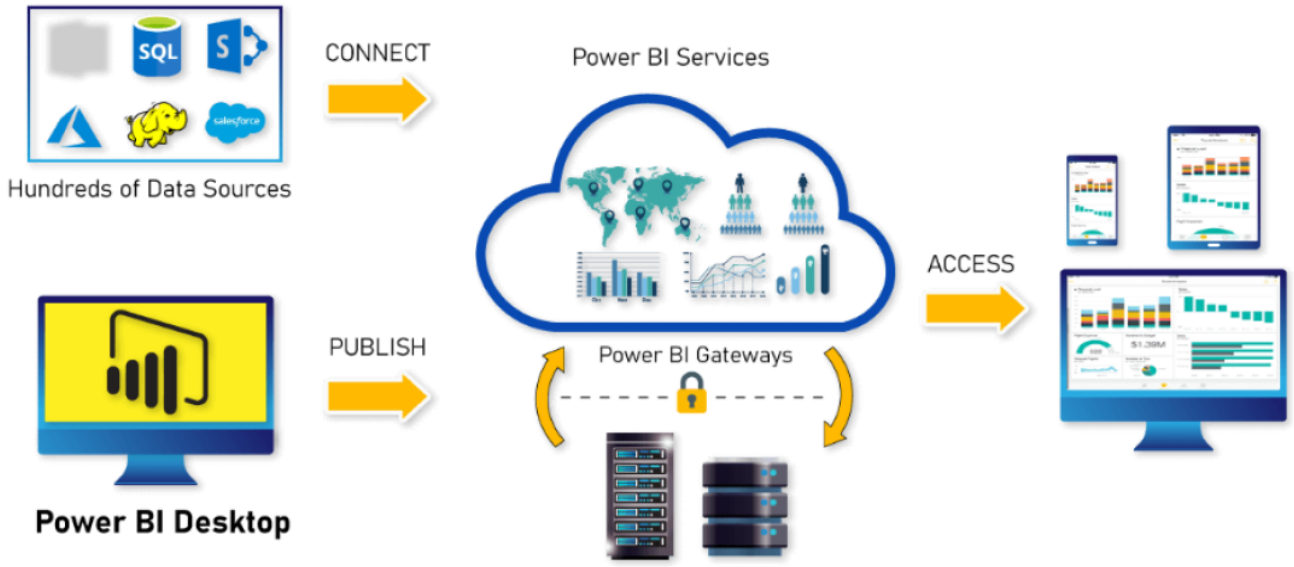
Each style will describe a system category that consists of :

- A set of components (eg: a database, computational modules) that will perform a function required by the system.
- The set of connectors will help in coordination, communication, and cooperation between the components.
- Conditions that how components can be integrated to form the system.
- Semantic models that help the designer to understand the overall properties of the system.

1.2 Scope

Architecture Design Document (ADD) is an architecture design process that follows a step-by-step refinement process. The process can be used for designing data structures, required software architecture, source code and ultimately, performance algorithms. Overall, the design principles may be defined during requirement analysis and then refined during architectural design work.

2. Architecture



#1. Data Sources

Power BI can supply information from different online sources and file types.

Import the information into the Power BI or establish a live service to receive the information. If you import the file into the Power BI, it compresses the data sets up to 1GB and, uses a direct query if the compressed data sets exceed more than 1GB.

#2. Power BI Desktop

It is free software that enables you to connect, transform and visualize the data on your desktop.

You can connect to various data sources with the help of Power BI Desktop and combine the data into a data model. This data model allows you to create a collection of images and graphics that make you share the information within the organization as records.

The majority of the users who work on Business Intelligence projects use Power BI Desktop to create and share their reports with others.

#3. Power BI Service

Power BI Service is an On-Cloud service with a web-based platform and used to share and publish the reports made on Power BI Desktop.

It collaborates the data with other users and creates dashboards. Power BI Service is also called “Power BI Workspace”, “Power BI Web Portal”, and “Power BI Site”.

Power BI Service offers wonderful features like alerts and natural language Q&A.

#4. Power BI Report Server

Power BI Report Server is similar to the Power BI Service. It is an On-Premises server platform. UsingPower BI Report Server, organizations can secure their data.

It enables the users to create reports and dashboards and allows you to share the reports with other users or organizations with proper security protocols. To use this service, you need to have a Power BI premium license.

#5. Power BI Gateway

Power BI Gateway is used to maintain fresh information by connecting to your on-site data sources without transferring the data.

It provides secure data and allows you to transfer the data between Microsoft cloud services and on-premise services.

Microsoft cloud services include PowerApps, Power BI, Azure Analysis Services,Microsoft Flow, and Azure logic apps. By using a gateway, organizations can maintain the databases and other data sources securely in cloud services.

#6. Power BI Mobile Apps

Using Power BI Mobile Apps, you can stay connected with on-premises data from anywhere. Power BI apps are available for iOS, Windows, and Android platforms.

#7. Power BI Embedded

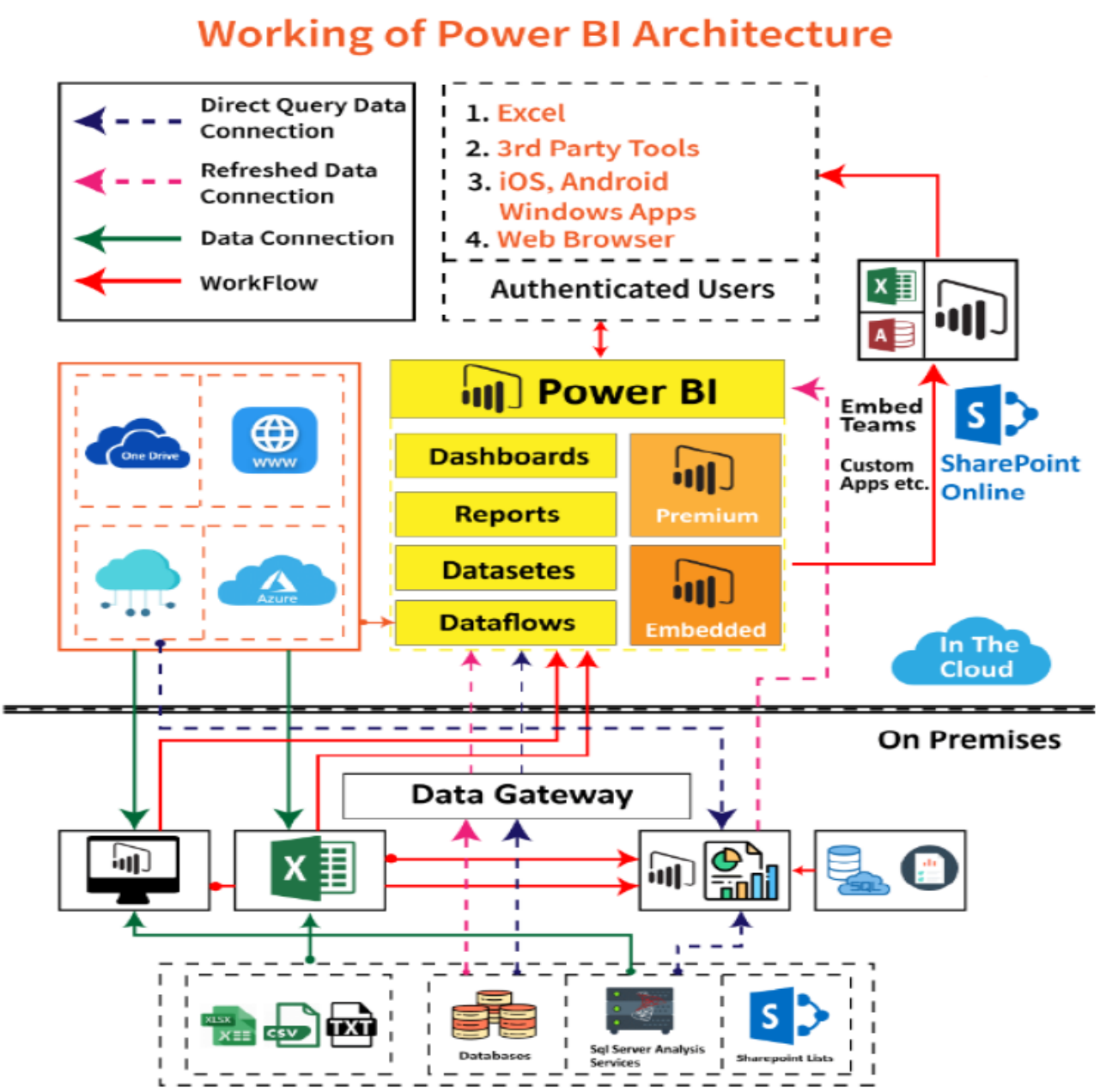
Power BI Embedded is an On-premises service in Azure.

It offers APIs for embedding the reports and dashboards into custom applications. We have been discussing major components of the Power BI, and now, we will talk about the remaining components of Power BI as well.

#8. Power BI Query

Power Query is the data connectivity that enables the business users to access the data which is stored in multiple data sources and redesign it to satisfy their business requirements.

Power Query offers custom connectors SDK so that third-party users can create their data connectors.


Working of Power BI Architecture
Direct Query Data Connection
Refreshed Data Connection
Data Connection
WorkFlow
1. Excel
2. 3rd Party Tools
3. iOS, Android Windows Apps
4. Web Browser
Authenticated Users
Power BI
Dashboards
Reports
Datasetes
Dataflows
Premium
Embedded
Embed Teams
Custom Apps etc.
SharePoint Online
One Drive
www
Azure
In The Cloud
On Premises
Data Gateway
XLSX
CSV
TXT
Databases
Sql Server Analysis Services
Sharepoint Lists

3. Deployment Description

3.1 Deployment Options in Power-Bi

> On-Premises:

Refers to data, applications and infrastructure entirely owned by client at client data centre and client has complete control over it.

> Cloud:

Refers to data, infrastructure and/or services residing in a public cloud environment and completely managed /controlled by third party. Microsoft Azure and web-based Power BI service are examples of the cloud offerings.

> Hybrid:

This denotes to the implementation which spans both on premises and cloud sources which can be services, infrastructure and data sources

3.2 On-Premises Deployment:

> Option 1

File Share – The first on-premises option involves usage of a file share:

• Data preparation and report creation is done in client tools: Power BI Desktop/ Excel.

• The completed Power BI Desktop file is published to a file share or a document collaboration area /repository.

• To view the report, Power BI desktop has to be installed on the viewer's system.

>Option 2:

Third Party Integration

The third on-premises option involves a third party which integrates with Power BI.

- Data preparation and report creation occurs in Power BI Desktop.
- The completed Power BI Desktop file is published to the third-party server.

3.3 Hybrid Deployment

Option 1: Power BI Service

- Data is either from the on premises corporate applications or it might be born in cloud. It can even mix of these two.
- Data preparation and report creation occurs in Power BI Desktop or excel.
- Completed Power BI reports are then published to Power BI service.
- Report consumption, sharing, security, collaboration, data refresh happens in Power BI service.
- Dashboards are created in Power BI service and reports can also be edited or created in Power BI service.

Option 2: Custom Application Integration

- Data is either from the on premises corporate applications or it might be born in cloud. It can even mix of these two.
- Data preparation and report creation occurs in Power BI Desktop.
- With Power BI API, these reports can be published in custom web application or mobile app within iFrame.
- If user interacts with this report, he/she will be redirected to Power BI service

Option 3: Public Website

- Data is either from the on premises corporate applications or it might be born in cloud. It can even mix of these two.
- Data preparation and report creation occurs in Power BI Desktop.
- Completed Power BI reports are then published to Power BI service.
- An embed code is generated by Power BI service for selected report and this code can be embedded in web page of the website within iFrame.
- Here no security is maintained as its public website, hence suitable for the data which can be made publicly available.