Architecture Design

International Debt Statistics

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DOCUMENT CONTROL

Change Record:

VERSION	DATE	AUTHOR	COMMENTS
0.1	25- DEC - 2022	Amey Pathare	Introduction and architecture defined
0.2	26 - DEC - 2022	Amey Pathare	Architecture & Architecture description appended and updated.
0.3	28-DEC-2022	Amey Pathare	Deployment Of Power BI

Reviews:

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0.2	28- DEC - 2022	Amey Pathare	Unit test cases to be added

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Contents

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.

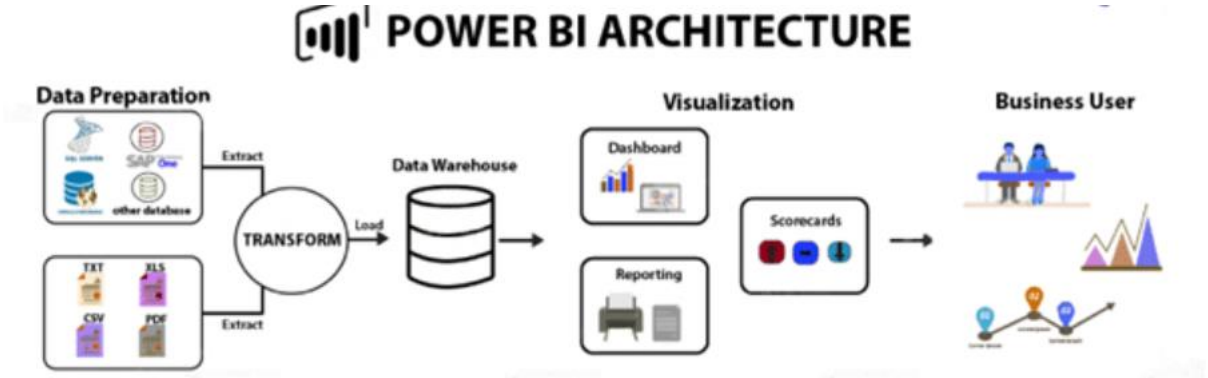
Each style will describe a system category that consists of :

- 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

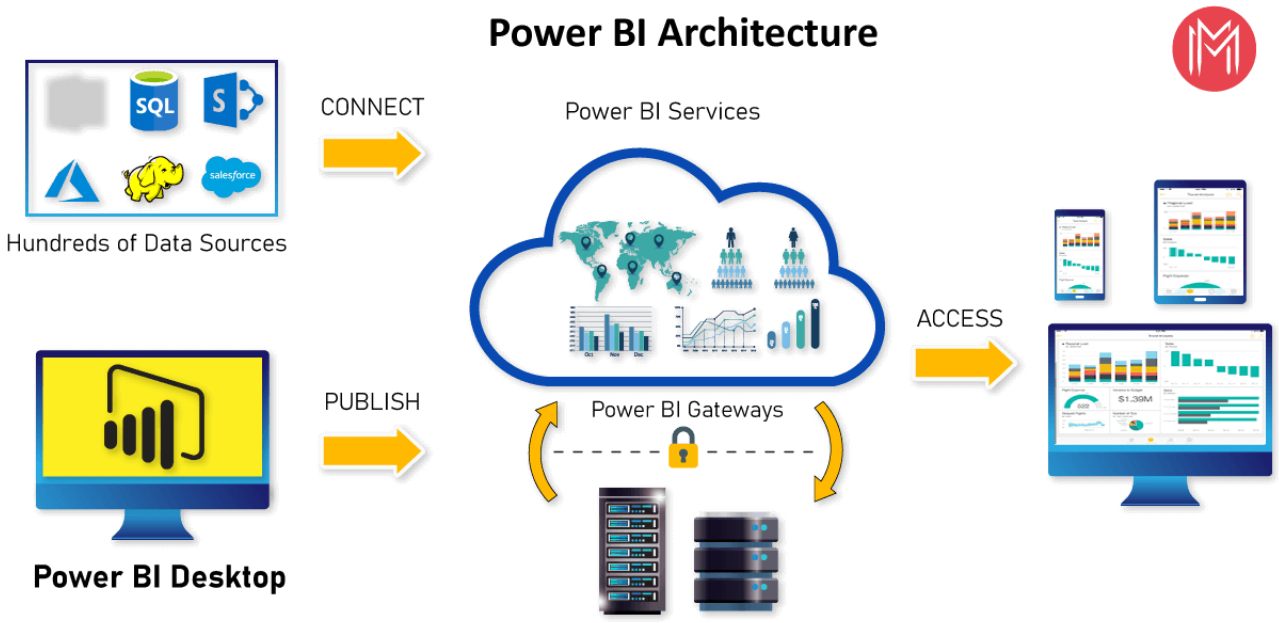


Power BI Server Architecture

Power BI architecture is a service built on top of Azure. There are multiple data sources that Power BI can connect to.

ARCHITECTURE DESIGN

The following diagram shows Tableau Server's architecture:



POWER BI Server is internally managed by the multiple server processes.

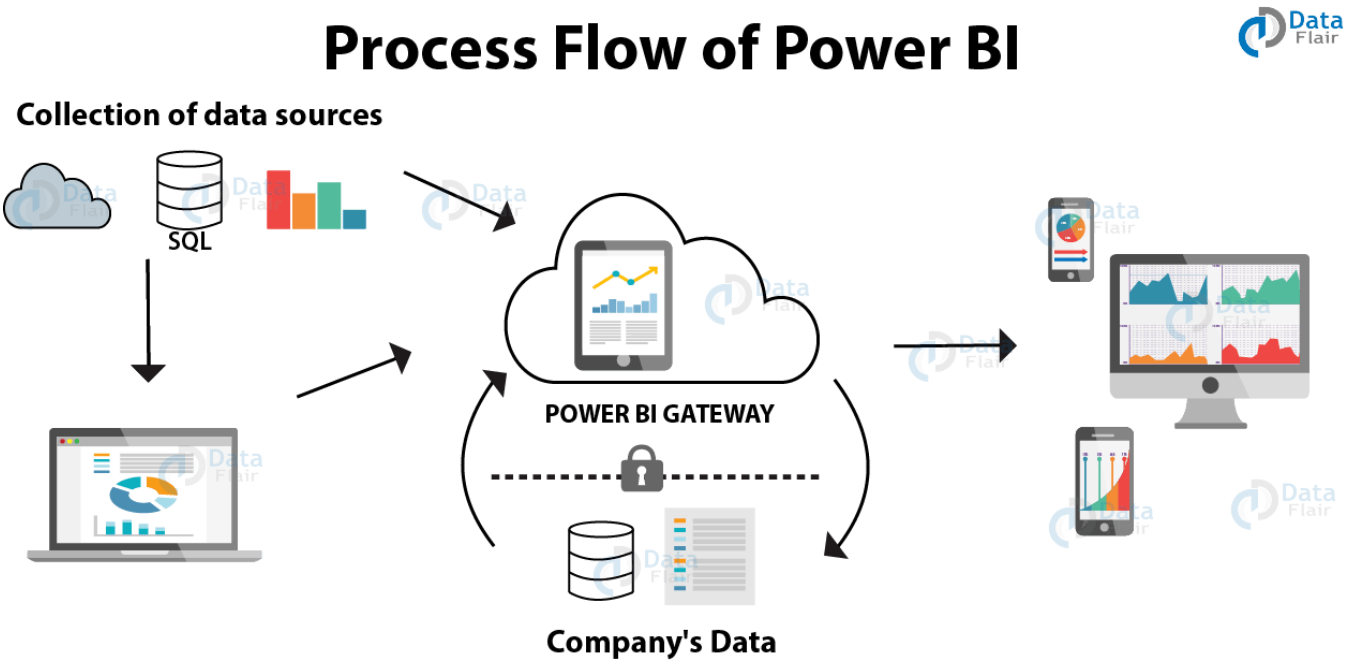
1. Data Integration:
Data is extracted from different sources which can be different servers or databases. The data from various sources can be in different types and formats. If you import the file into the Power BI, it compresses the data sets up to 1GB, and it uses a direct query if the compressed data sets exceed more than 1GB. Then the data is integrated into a standard format and stored at a place called a staging area. There are two choices for big data sets.

2 Data Transforming:
Integrated data is not ready to visualize data because the data should be transformed. To transform the data, it should be cleaned or pre-processed. For example, redundant or missing values are removed from the data sets. After data is pre-processed or cleaned, business rules are applied to transform the data. After processing the data, it is loaded into the data warehouse.

3. Report & Publish:
After sourcing and cleaning the data, you can create the reports. Reports are the visualization of the data in the form of slicers, graphs, and charts. Power BI offers a lot of custom visualization to create the reports. After creating reports, you can publish them to power bi services and also publish them to an on-premise power bi server.

4. Creating Dashboards:
You can create dashboards after publishing reports to Power BI services, by holding the individual elements. The visual retains the filter when the report is holding the individual elements to save the report. Pinning the live report page allows the dashboard users to interact with the visual by selecting slicers and filters.

8) Power BI Communication Flow



3. Deployment Description

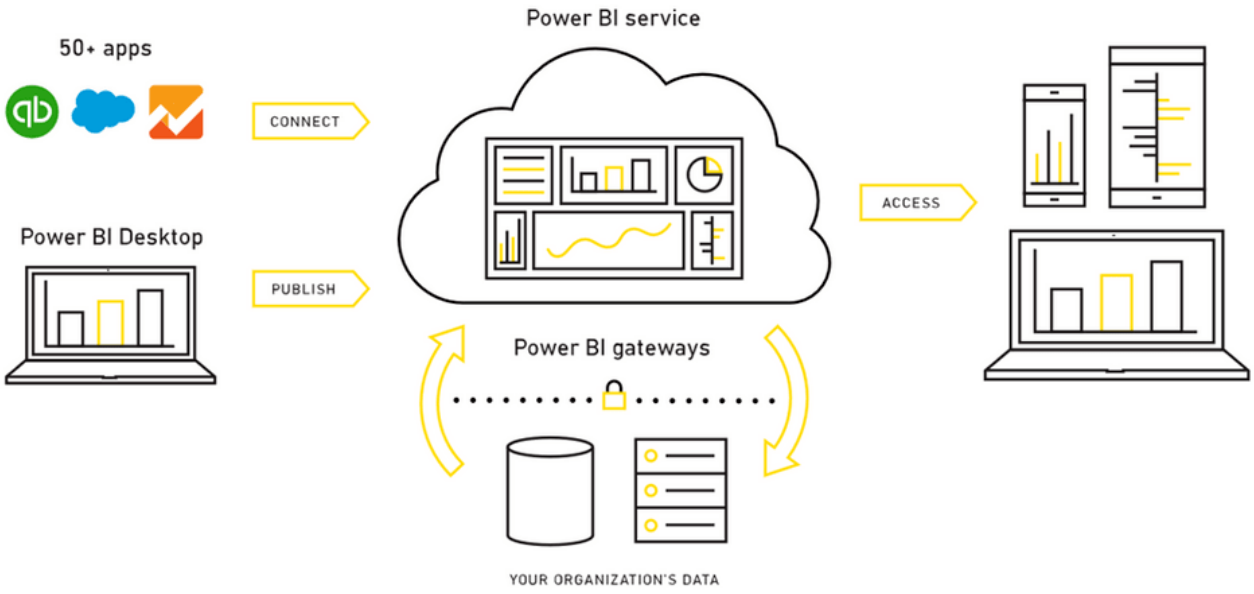
3.1 Deployment in Power BI

1. Data sourcing - Here the source of data is Microsoft Dynamics 365 online which can be ingested into Power BI. It can be further enhanced with data from other data sources, online or on premise using a data gateway.

2. Datasets and reports - The data modelling, enhancements and reports are created using Power BI Desktop. They are then published into PowerBI.com online service and on mobile applications.

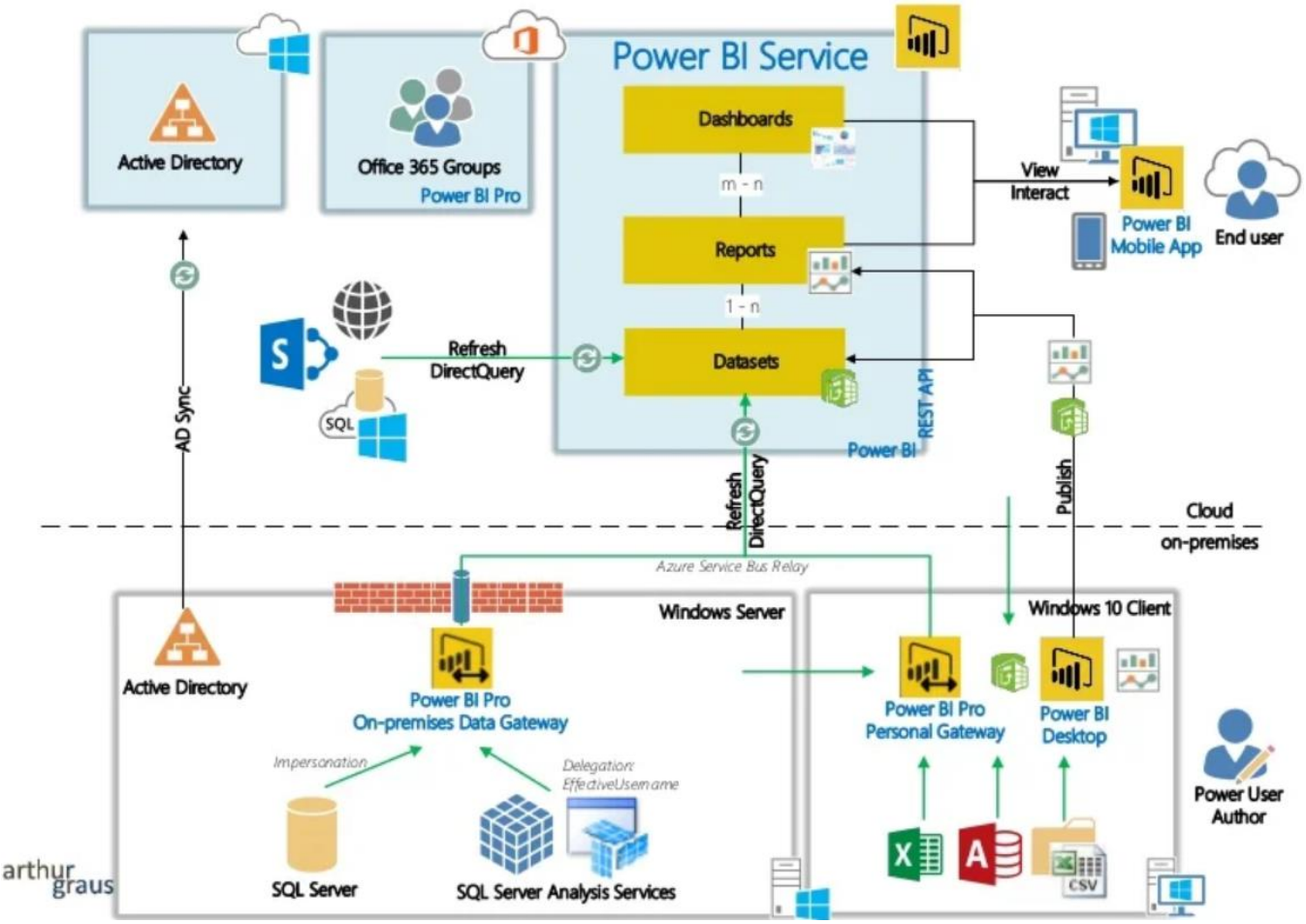
3. Dashboard and Data Insights - The dashboards are created in PowerBI.com PowerBI.com also allows users to get quick insights from their data using algorithms developed by Microsoft. The data insights visuals can also be added to the dashboards.

3.2 Single Node Architecture



This architecture is a single node architecture. This is the most simple deployment topology.

3.3) 5 Node Architecture



- Power BI Desktop is accomplished with the authenticating, development and publishing tools. You can transfer the data from data sources to Power BI Desktop. And also, it allows users to create and publish reports on the Power BI Report Server or Power BI Service. Power BI Publisher allows you to publish the Excel workbooks to the Power BI Report Server. Report Publisher and SQL server Data tools help in creating the KPIs, datasets, paginated reports, mobile reports . All kinds of reports are published at the Power BI Report Server, and from there, reports are distributed to the end-users.

- Cloud side architecture consists of a lot of components including Power suite having datasets, dashboards, reports, Power BI Premium, Power BI Embedded, etc. Users can embed the dashboards, reports into applications, SharePoint, Teams, etc. There are Cloud data sources and they are connected to the Power BI tools.