Architecture Design

Bank Marketing Campaign Analytics

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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.

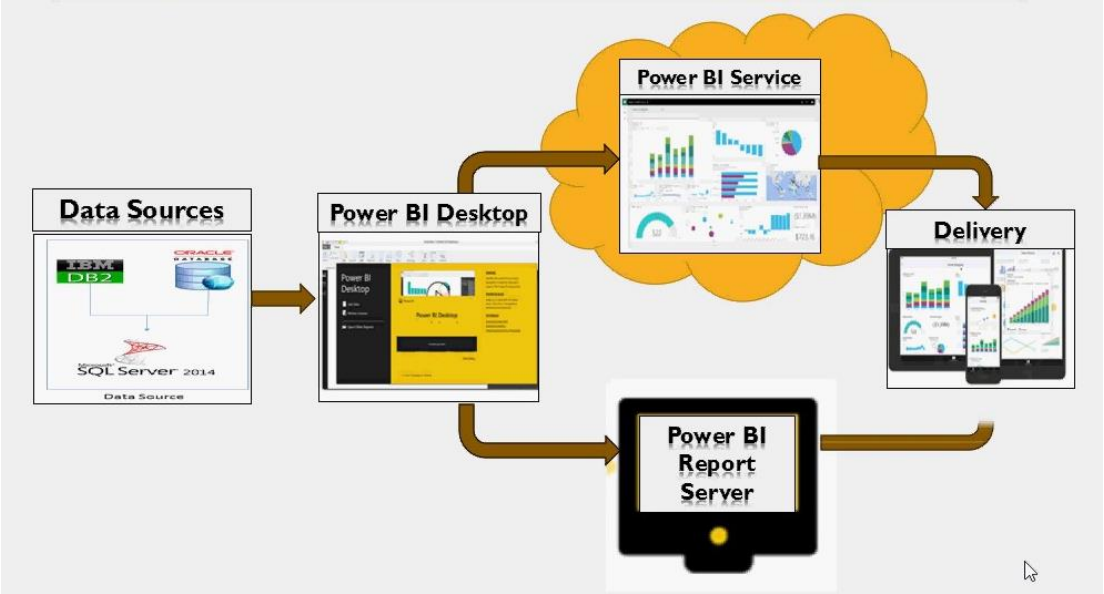
1.2 SCOPE

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

Power BI is a business analytics service provided by Microsoft that lets us visualize our data and share insights. It converts data from different sources to build interactive dashboards and Business Intelligence reports.

2.1 POWER BI ARCHITECTURE



Power BI architecture is a service built on top of Azure. There are multiple data sources that Power BI can connect to. Power BI Desktop allows to create reports and data visualizations on the dataset. Power BI report server is connected to on-premise data sources to get continuous data for reporting and analytics. Power BI services refer to the cloud services that are used to publish Power BI reports and data visualizations. Using Power BI mobile apps, one can stay connected to data from anywhere. Power BI apps are available for Windows, iOS, and Android platforms.

2.2 COMPONENTS OF POWER BI

Power Query

Power Query is the data transformation and mash up the engine. It enables to discover, connect, combine, and refine data sources to meet analysis needs. It can be downloaded as an add-in for Excel or can be used as part of the Power BI Desktop.

Power Pivot

Power Pivot is a data modeling technique that allows to create data models, establish relationships, and create calculations. It uses Data Analysis Expression (DAX) language to model simple and complex data.

Power View

Power View is a technology that is available in Excel, Sharepoint, SQL Server, and Power BI. It lets you create interactive charts, graphs, maps, and other visuals that bring your data to life. It can connect to data sources and filter data for each data visualization element or the entire report.

Power Map

Microsoft's Power Map for Excel and Power BI is a 3-D data visualization tool that lets you map your data and plot more than a million rows of data visually on Bing maps in 3-D format from an Excel table or Data Model in Excel. Power Map works with Bing maps to get the best visualization based on latitude, longitude, or country, state, city, and street address information.

Power BI Desktop

Power BI Desktop is a development tool for Power Query, Power Pivot, and Power View. Power BI Desktop brings everything under the same solution, and it is easier to develop BI and data analysis experience.

Power Q&A

The Q&A feature in Power BI lets explore your data in your own words. It is the fastest way to get an answer from your data using natural language.

Power BI Dashboard

Power BI Dashboard is a single page visualization to tell a story. The visualizations on a dashboard are generated from reports, and each report is based on one dataset. A single page dashboard is known as a Canvas. The visualizations you see on the dashboard are called Tiles and are pinned to the dashboard by report designers. Power BI allows you to create different reports on Power BI Desktop. These reports can be published on the Power BI dashboard using the Power BI service. A Power BI report created on Power BI Desktop can be published on to Power BI Service by clicking on the Publish button.

2.3 POWER BI SERVICE

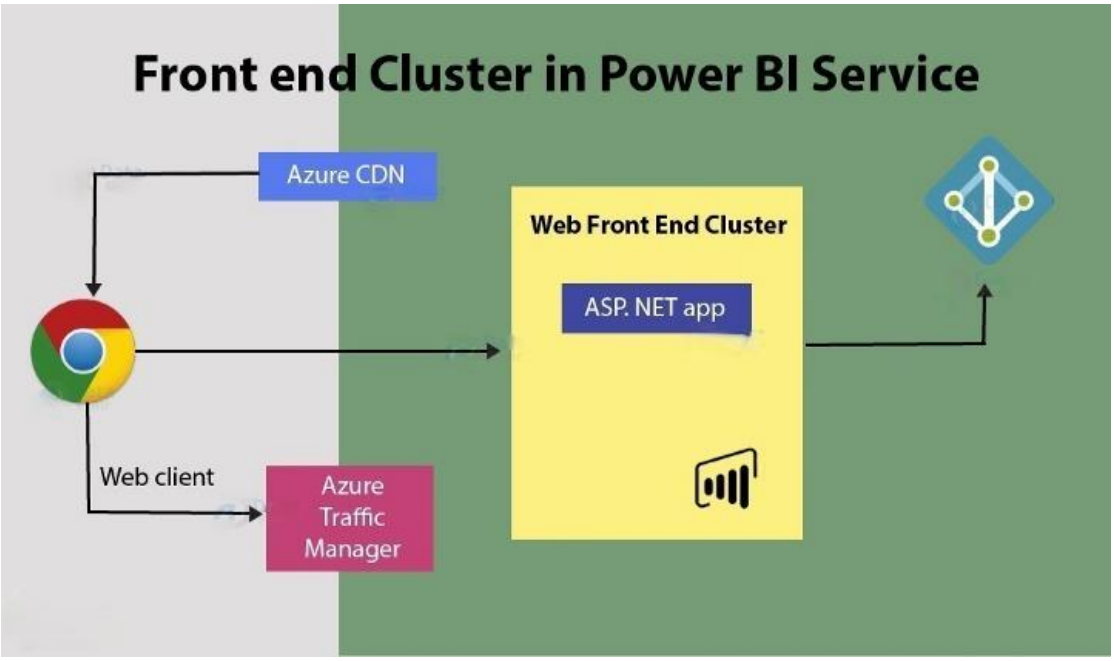
All the reports created in Power BI Desktop are published on a cloud platform known as Power BI Service.

Users can access the reports and dashboards from Power BI Service using client platforms like websites, mobile devices, etc. This means that every client who wants to access content created on Power BI needs to interact with Power BI Service.
Power BI Service's architecture consists of two parts:

- A front end
- A back end

Front End cluster

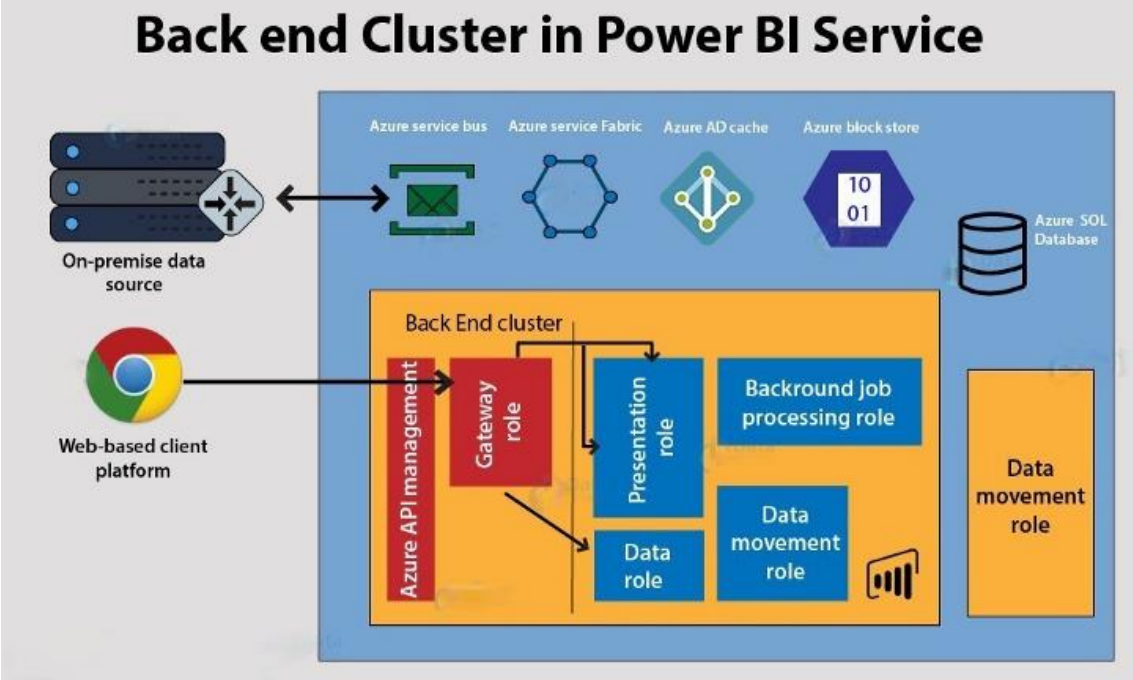
The front end also called the web front-end cluster acts as an intermediary between clients and the back end. The front end services are used for establishing an initial connection and authenticating clients using Azure Active Directory. The Azure Active Directory stores user identities.



Along with this, Azure Traffic Manager is used to direct user requests to the nearest data center after authentication. Once a client/user is authenticated, the Azure Content Delivery Network (CDN) distributes static Power BI content/files to users.
This project aims to use various visuals in Power BI to get insights and also get a visual understanding of the data.

Back End Cluster

The Power BI services at the back end take care of visualizations, datasets, storage, reports, data connections, data refreshing, and other interactions with Power BI. At the back-end, a web client has only two direct points of interaction, Azure API Management, and Gateway Role. These two components are responsible for load balancing, authentication, authorization, routing, etc.


Back end Cluster in Power BI Service
Azure service bus
Azure service Fabric
Azure AD cache
Azure block store
10
01
Azure SQL Database
On-premise data source
Web-based client platform
Back End cluster
Azure API management
Gateway role
Presentation role
Backround job processing role
Data role
Data movement role
Data movement role