Architecture Design

Consumer Goods Ad-Hoc Insights

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Introduction

1.1 What is Architecture Design Document?

Any software needs the architectural design to represent the design of the 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 thesemany architectures.

Each style will describe a system category that consists of:

- A set of components (eg: a database, computational modules) that willperform 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 help the designer to understand the overall properties of the system.

1.2 Scope

Architecture Design Document (ADD) is an architectural 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 maybe defined during requirement analysis and then refined during architectural design work.

2 Architecture

2.1 MySQL Architecture

Architecture of MySQL describes the relation among the different components of MySQL System. MySQL follow Client-Server Architecture. It is designed so that end user that is Clients can access the resources from the computer which is a server using various networking services. The Architecture of MySQL contains the following major layers:

- Client Layer.

- Server Layer.

- Storage Layer.
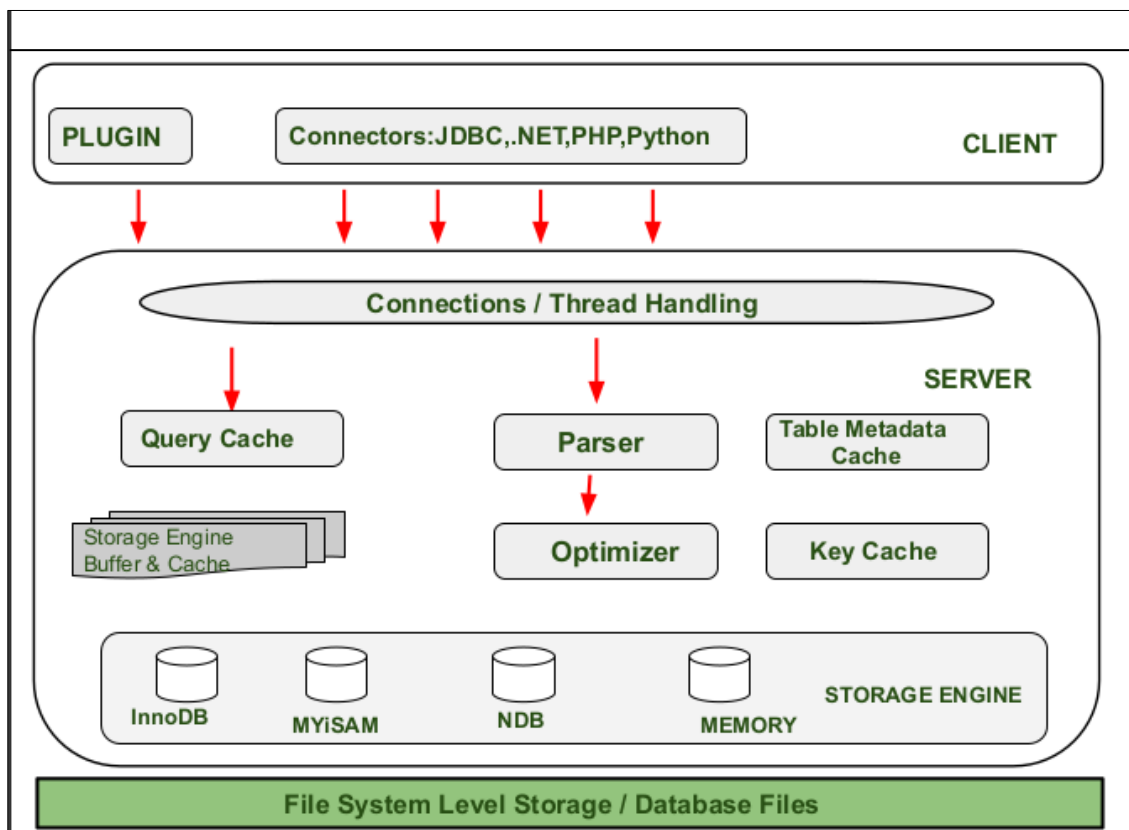
2.1.1 Client Layer

This layer is the topmost layer in the above diagram. The Client give request instructions to the Serve with the help of Client Layer .The Client make request through Command Prompt or through GUI screen by using valid MySQL commands and expressions .If the Expressions and commands are valid then the output is obtained on the screen. Some important services of client layer are:

1) Connection Handling:

    When a client sends a request to the server and server will accept the request and the client is connected. When the client is connected to the server at that time, a client gets its own thread for its connection. With the help of this thread, all the queries from the client side are executed.

2) Authentication:

    Authentication is performed on the server side when the client is connected to the MySQL server. Authentication is done with the help of a username and password.

3) Security:

    After authentication when the client gets connected successfully to the MySQL server, the server will check that a particular client has the privilege to issue certain queries against the MySQL server.

2.1.2 Server Layer

The second layer of MYSQL architecture is responsible for all logical functionalities of the relational database management system of MYSQL. This Layer of the MySQL System is also known as the Brain of MySQL Architecture. When the Client gives request instructions to the Server and the server gives the output as soon as the instruction is matched. The various sub-components of the MySQL server are:

1) Thread Handling:

    When a client sends a request to the server and server will accept the request and the client is connected. When the client is connected to the server at that time, a client gets its own thread for its connection. This thread is provided by thread handling of the server Layer. Also, the queries of the client side which are executed by the thread are also handled by the Thread Handling module.

2) Parser:

    A Parser is a type of Software Component that built a data structure (parse tree) of the given input. Before parsing lexical analysis is done i.e., input is broken into a number of tokens. After the data is available in the smaller elements parser

performs Syntax Analysis, Semantics Analysis after that parse tree is generated as output.

3) Optimizer:

As soon as the parsing is done, various types of optimization techniques are applied at Optimizer Block. These techniques may include rewriting the query, order of scanning of tables, and choosing the right indexes to use.

4) Query Cache:

Query Cache stores the complete result set for an inputted query statement. Even before parsing, MySQL Server consults the query cache. When a client writes a query, if the query written by the client is identified in the cache, then the server simply skips the parsing, optimization, and even execution, it just simply displays the output from the cache.

5) Buffer and Cache:

Cache and will buffer store the previous query or problem asked by the user. When a user writes a query then it first goes to Query Cache then the query cache will check that the same query or problem is available in the cache. If the same query is available then it will provide output without interfering Parser, Optimizer.

6) Table Metadata Cache:

The metadata cache is a reserved area of memory used for tracking information on databases, indexes, or objects. The greater the number of open databases, indexes, or objects, the larger the metadata cache size.

7) Table Cache:

A key cache is an index entry that uniquely identifies an object in a cache. By default, edge servers cache content based on the entire resource path and a query string.

2.1.3 Storage Layer

This Storage Engine Layer of MySQL Architecture makes it unique and preferable for developers to this Layer MySQL layer is counted as the most used RDBMS and is widely used. In MySQL server for different situations and requirements different types of storage engines are used which are InnoDB, MYiSAM, NDB, Memory etc. These storage engines are used as pluggable storage engineer where tables created by user are plugged with them.

2.2 Power BI Architecture

Power BI is a business suite that includes several technologies that work together. To deliver outstanding business intelligence solutions.
Microsoft Power BI technology consists of a group of components such as:

Power Query (for data mash-up and transformation)
Power BI Desktop (a companion development tool)
Power BI Mobile (for Android, iOS, Windows phones)
Power Pivot (for in-memory tabular data modelling)
Power View (for viewing data visualizations)
Power Map (for visualizing 3D geo-spatial data)
Power Q&A (for natural language Q&A)

In simple terms, a Power BI user takes data from various data sources such as files, Azure source, online services, Direct Query or gateway sources.
Then, they work with that data on a client development tool such as Power BI Desktop.
Here, the imported data is cleaned and transformed according to the user's needs.

Once the data is transformed and formatted, it is ready to use in making visualizations in a report. A report is a collection of visualizations like graphs, charts, tables, filters, and slicers.

2.2.1 Components of Power BI Architecture
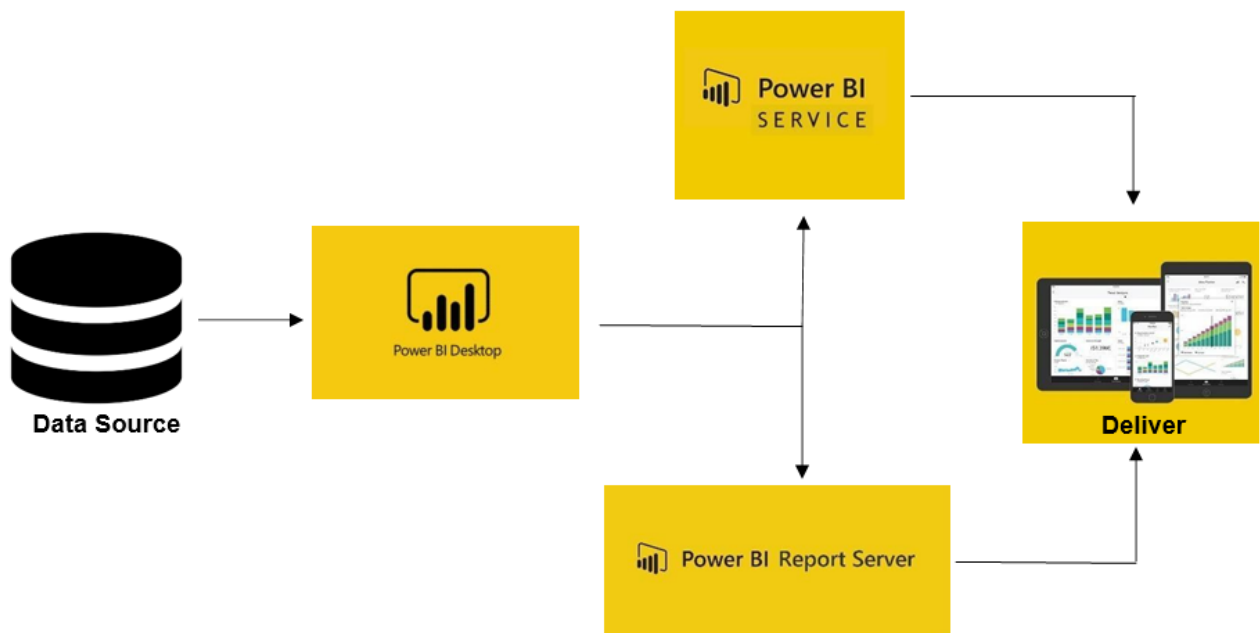
2.2.2 Data Sources

An important component of Power BI is its vast range of data sources. You can import data from files in your system, cloud-based online data sources or connect directly to live connections. If you import from data on-premise or online services there is a limit of 1 GB. Some commonly used data sources in Power BI are:

- Excel
- Text/CSV
- XML
- JSON
- Oracle Database
- IBM DB2 Database
- MySQL Database
- PostgreSQL Database
- Sybase Database
- Teradata Database
- SAP HANA Database
- SAP Business Warehouse server
- Amazon Redshift
- Impala
- Google Big Query (Beta)
- Azure SQL Database
- Salesforce Reports
- Google Analytics
- Facebook
- GitHub

2.2.3 Power BI Desktop

Power BI Desktop is a client-side tool known as a companion development and authoring tool. This desktop-based software is loaded with tools and functionalities to connect todata sources, transform data, data modelling and create reports.

2.2.4 Power BI Service

Power BI Service is a web-based platform from where you can share reports made on Power BI Desktop, collaborate with other users, and create dashboards. It is available in three versions:
Free version, Pro version, Premium version.

2.2.5 Power BI Report Server

The Power BI Report Server is similar to the Power BI Service. The only difference between these two is that Power BI Report Server is an on-premise platform. It is used by organizations who do not want to publish their reports on the cloud and are concerned about the security of their data.

3 Deployment

3.1 Power BI Deployment

The deployment process lets you clone content from one stage in the pipeline to another, typically from development to test, and from test to production.

During deployment, Power BI copies the content from the current stage, into the target one. The connections between the copied items are kept during the copy process. Power BI also applies the configured deployment rules to the updated content in the target stage. Deploying content may take a while, depending on the number of items being deployed. During this time, you can navigate to other pages in the Power BI portal, but you cannot use the content in the target stage.

3.2 Publish datasets and reports from Power BI Desktop

When you publish a Power BI Desktop file to the Power BI service, you publish the data in the model to your Power BI workspace. The same is true for any reports you created in Report view. You'll see a new dataset with the same name, and any reports in your Workspace navigator.

Publishing from Power BI Desktop has the same effect as using Get Data in Power BI to connect to and upload a Power BI Desktop file.
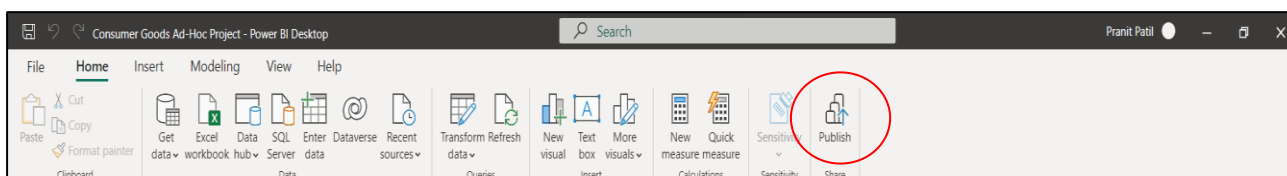
Request 1

Provide the list of markets in which customer "Atliq Exclusive" operates its business in the APAC region.

Market
Australia
Bangladesh
India
Indonesia
Japan
market
Newzealand
Philiphines
South Korea

Publish to Power BI

×

Select a destination

Search

My workspace

Select   Cancel

Request 1

Provide the list of markets in which customer "Atliq Exclusive" operates its business in the APAC region.

Market
Australia
Bangladesh
India
Indonesia
Japan
market
Newzealand
Philiphines
South Korea

Publishing to Power BI

×

✓ Success!

Open 'Consumer Goods Ad-Hoc Project.pbix' in Power BI

Get Quick Insights

Did you know?
You can create a portrait view of your report, tailored for mobile phones. On the **View** tab, select **Mobile Layout**. Learn more

Got it