

**Content :**

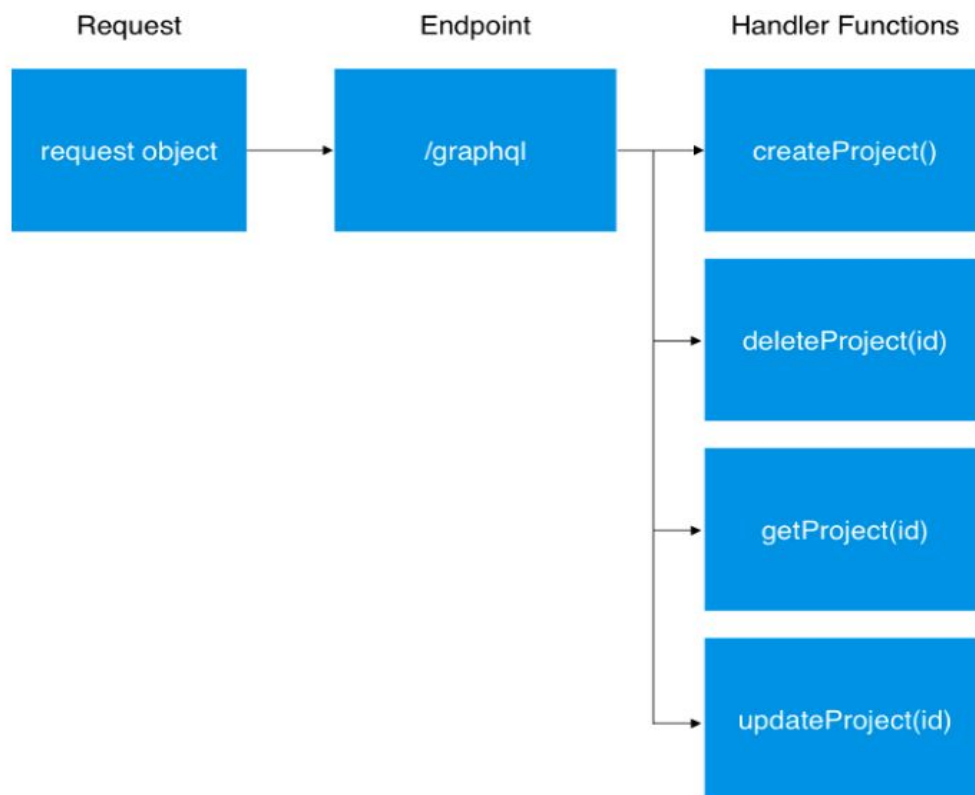
- GraphQL
- What is GraphQL?
- Key points related to GraphQL.
- When to go for GraphQL?
- REST vs GraphQL
- Working of GraphQL
- Advantages and Disadvantages of GraphQL.

- **GraphQL :**

Although it sounds like a query but GraphQL has nothing to do with sql or nosql queries. It was originally developed by Facebook and later in 2015 it became open source.

- **What is GraphQL?**

- It is an query language for API. i.e get what you need with only a single API.
- GraphQL is a query for APIS not a tool or a framework for designing API.



A GraphQL architecture example.

## Key Points Related to GraphQL :

- Schema Definition Language or SDL
- RunTime environment
- Query Language

### Schema Definition language or SDL :

Schema definition language is used to define a GraphQL.

A GraphQL schema is used to expose the functionalities that are available in an application to its users.

Example:

```
type Query{
    getBook(id:Int):Book
    getBooks:[Book]
}

Type Mutation{
    createBook(name:String,pages:int):Int
}

Type Book{
    id:Int
    name:String
    pages:Int
}
```

GraphQL schema contains :

- Types which are similar to class in java
- Operations which are performed on these.

Query - Read only Operation

Mutation - Write Operations.

### RunTime Environment :

Runtime environment performs 2 major operations :

- Parsing the GraphQL schema file :-

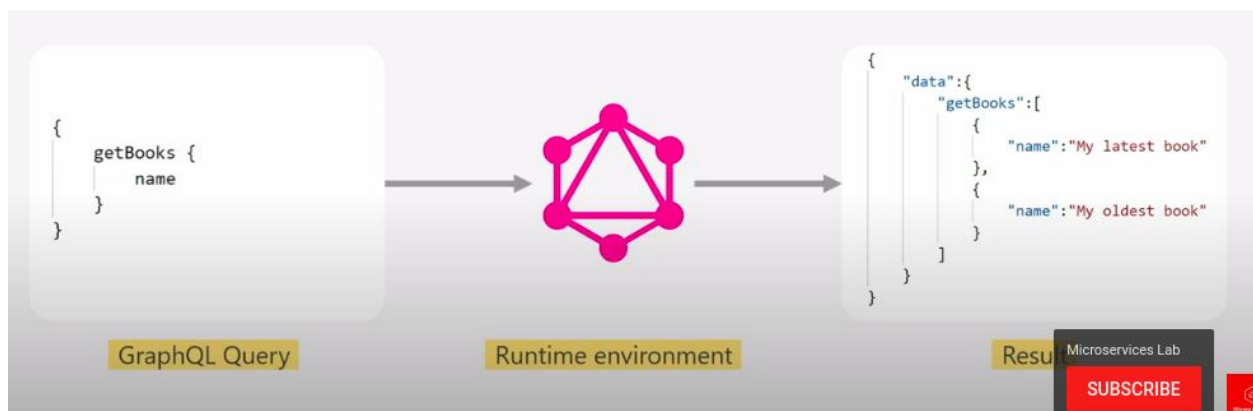
Reading information from a schema file again and again will be inefficient so the runtime environment creates an in-memory representation of the schema file that contains all information defined in that schema file.

- **Executing the operation**

A user can use any of the operations that were defined in the schema file. Runtime environment is responsible for handling the user's request. It looks for the operation specified in the request then it uses in- memory schema to check if that operation exists in the schema or not.

### Query Language:

- Query language is used by clients to use operation that are defined in the graphql schema
- QL enables a client to select any required fields from a set of fields.

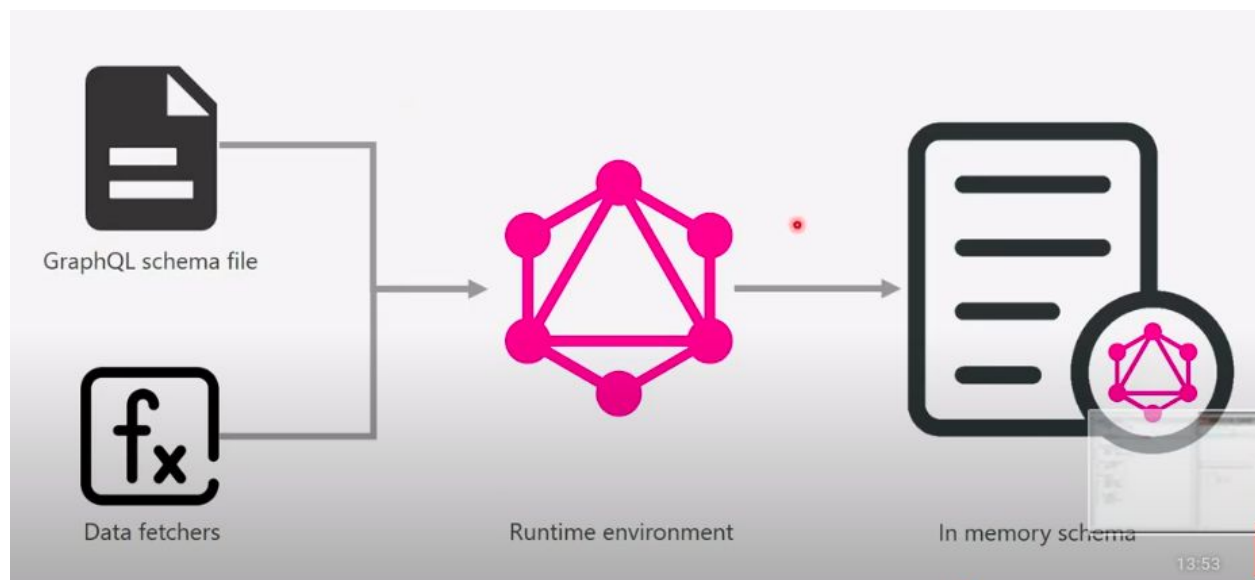


### DataFetcher :

- When a client uses an operation defined in a schema file then runtime environment invokes the data fetcher which is a call back function and linked with Query, Mutation and field.

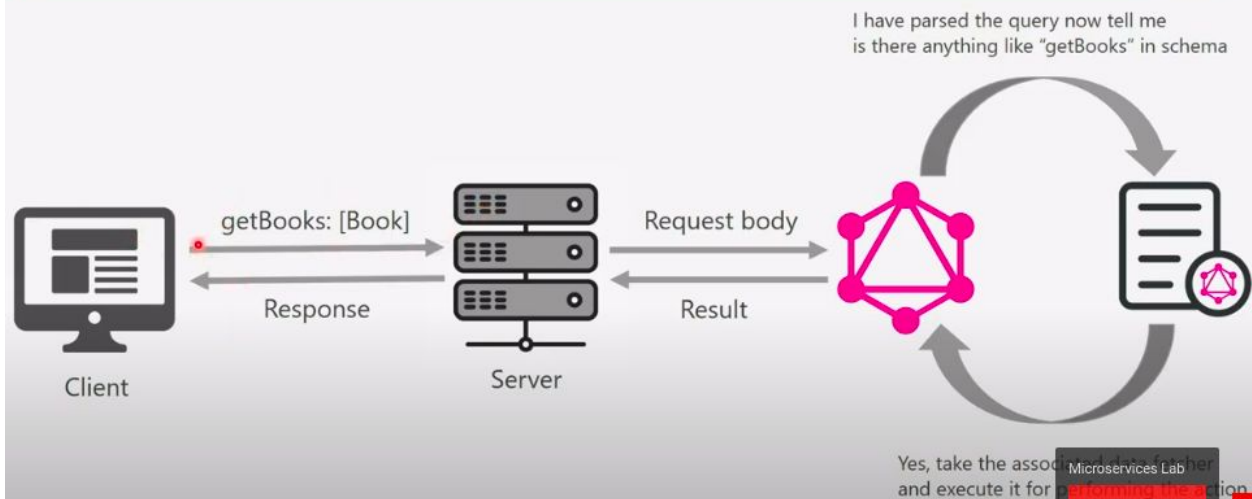
## How GraphQL Works in Java ?

- Schema File : Schema file provides types of operation that can be performed.
- Schema Parser : This is provided by GraphQL java API we create objects of the schema parser to create parse schema file.
- TypeDefinitionRegistry : This Registration is in memory representation of schema file.
- DataFetcher : Each data fetcher is associated with either operation or fields.
- TypeWiring : To make linkage between datafetcher and schema file we need an instance of type wiring.
- Runtime Wiring :To create instances of RuntimeWiring we need Type wiring.
- SchemaGenerator : After creating objects of typeDefinition and RunTime Wiring we need to generate a schemaGenerator.



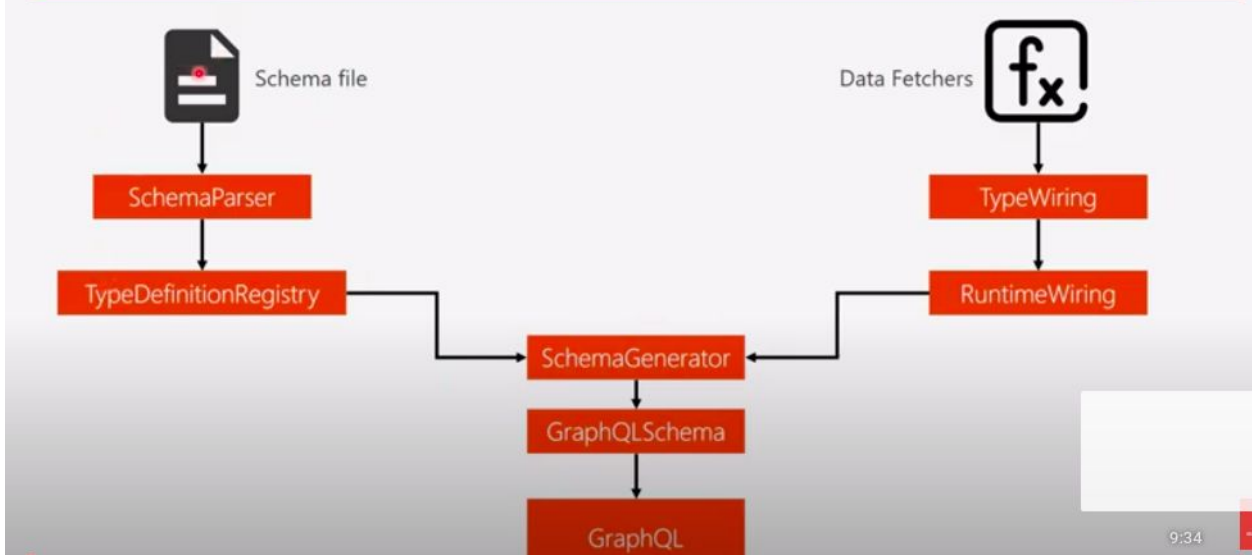
Overview diagram of GraphQL

## Executing the operation



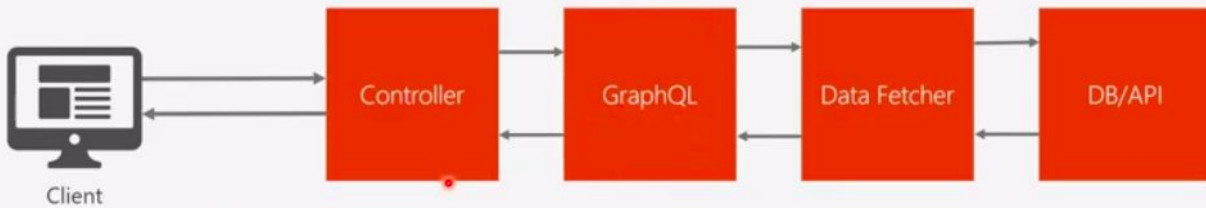
### Operation Working of GraphQL

## How GraphQL works in Java?



### GraphQL working

## How GraphQL works in Java?



**HighLevel overview of GraphQL**

### **Advantages and Disadvantages of GraphQL:**

- Best for complex systems and microservices
- No over-fetching and under-fetching problems
- Hierarchical Structure
- Code-sharing
- Strongly typed

### **Disadvantages of GraphQL :**

- GraphQL Query Complexity
- GraphQL Caching
- GraphQL Rate Limiting

### **References for comparison :**

- <https://medium.com/@JeffLombardJr/when-and-why-to-use-graphql-24f6bce4839d>
- <https://blog.logrocket.com/5-reasons-you-shouldnt-be-using-graphql-61c7846e7ed3/>
- <https://medium.com/@ajaysaini.official/why-graphql-886ba866ae75#:~:text=GraphQL%20is%20a%20data%20query%20language%20developed%20by%20Facebook%20under%20the%20response%20in%20JSON.>