

Introduction to GraphQL

<https://github.com/anak10thn>

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Overview

Apa itu GraphQL

Persepsi keliru tentang GraphQL

Siapa yang menggunakan?

Kenapa GraphQL?

GraphQL Operation

Schema Definition Language (SDL) Type

Tools Library

Demo

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- ▶ Dibuat oleh facebook pada 2012 dan diopen sourcekan pada 2015.
- ▶ Declarative Query language yang memungkinkan client melakukan request data yang diinginkan dari server.
- ▶ Backend for Frontend (BFF) pattern.
- ▶ Struktur data non-linier yang memiliki nodes & edges.

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- ▶ **GraphQL sebagai pengganti RestAPI.**
Kenyataannya GraphQL menggunakan RestAPI untuk mengirim Query request keserver.
- ▶ **GraphQL adalah bahasa untuk query database.**
Kenyataannya GraphQL tidak bisa melakukan query ke database.
- ▶ **GraphQL adalah sebuah teknologi.** *GraphQL bukan sebuah teknologi melainkan sebuah pattern.*

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<https://graphql.org/users>

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Rest API

- ▶ Satu API call untuk menampilkan list item.
- ▶ Beberapa API call untuk menampilkan detail masing-masing item.
- ▶ Under-fetching dan Over-fetching

```
1 GET /items
2 GET /items/123
3 GET /items/456
```

$O(n+1)$

GraphQL

- ▶ **Meminimalisir Under-fetching dan Over-fetching.**
- ▶ **Strongly type schema**
 - ▶ Schema dapat digunakan di client dan server.
 - ▶ Request dapat dengan mudah divalidasi.
 - ▶ Auto complete query dan mutation.
 - ▶ Sangat mudah di mocked.

```
1  POST /graphql
2  {
3      catalogs(last: 10) {
4          imgUrl(width:500)
5          name
6          likes
7      }
8  }
```

$O(1)$

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Queries

Read data

```
1 query{
2   search(q: "name"){
3     title
4     author
5   }
6 }
```

Mutations

Write data

```
1 mutation{
2   createBook(title: "Judul Buku"){
3     id
4   }
5 }
```

Subscriptions

Listen for data

```
1 subscription{
2   onCreateBook{
3     id
4     title
5     author
6   }
7 }
```

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Object Types

```
1  type Todo {  
2    id: ID!  
3    name: String!  
4    description: String  
5  }  
6  
7  type Query {  
8    todo(id: ID!): Todo  
9    allTodos: [Todo!]!  
10 }  
11  
12 type Mutation {  
13   addTodo(name: String!): Todo!  
14   removeTodo(id: ID!): Todo!  
15 }
```

Scalars

- ▶ String
- ▶ Float
- ▶ Int
- ▶ Boolean
- ▶ ID
- ▶ Custom scalars e.g. Date, Email

Enum

```
1 enum Priority {  
2     LOW  
3     MEDIUM  
4     HIGH  
5 }
```

Enum

```
1  enum Priority {
2      LOW
3      HIGH
4  }
5
6  type Todo {
7      id: ID!
8      name: String!
9      description: String
10     priority: Priority!
11 }
12
13 type Mutation {
14     addTodo(name: String!, priority: Priority = LOW): Todo!
15 }
```

Type Modifier

- ▶ `String`: nullable string.
- ▶ `String!`: Non-nullable string.
- ▶ `[String]`: Nullable list of nullable string values.
- ▶ `[String!]`: Nullable list of non-nullable string values.
- ▶ `[String!]!`: Non-nullable list of non-nullable string values.

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Library

- ▶ Async GraphQL (Rust)
- ▶ Graphene (Python)
- ▶ GraphQL Java (Java/Kotlin)
- ▶ GraphQL Go (Go)
- ▶ GraphQL.js (javascript)

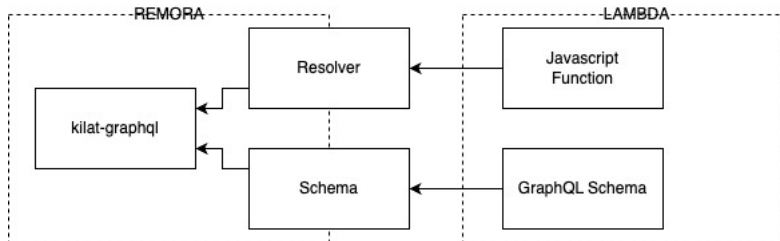
Playground

- ▶ Altair GraphQL
- ▶ GraphQL Bin
- ▶ GraphQL IDE

Framework & Gateway

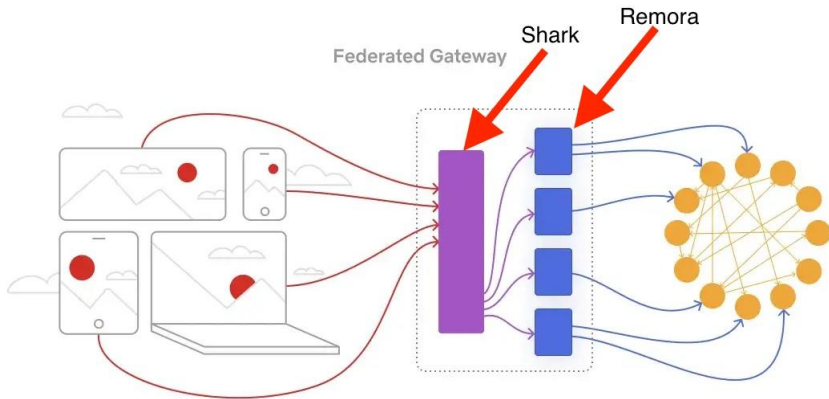
- ▶ Type GraphQL
- ▶ Remora
- ▶ Shark

Remora



<https://github.com/graphteon/remora>

Shark



<https://github.com/graphtheon/shark>

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