

# 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

# Apa itu GraphQL

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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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- ▶ 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

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