

GraphQL til folket

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Hva er GraphQL?

Et spørrespråk (query language)

- Ikke et databasespørrespråk
- Alternativ til REST
- Tatt i bruk av Facebook siden 2012
- Open source i 2015

REST

- Logisk eksponering av ressurser
- Bruker HTTP-metoder
- Tilstandsløst => Enkelt å skalere
- Støtter innhold på flere formater
- Lett å forstå og enkelt å teste

- **GET /events - Retrieves a list of events**
- **GET /events/1 - Retrieves a specific events**
- **POST /events - Creates a new event**
- **PUT /events/1 - Updates event #1**
- **PATCH /events/1 - Partially updates event #1**
- **DELETE /events/1 - Deletes event #1**

Utfordringer

- Henter unødvendig informasjon
- Mange kall => ett (aggregert) endepunkt for visning
- Du har mistet kontroll over API-et ditt!
- Versjonering?
- Må oppdatere dokumentasjon!
- REST? => ad hoc-endepunkter

GraphQL

Operasjoner

Query => Spør om data

Mutation => Endre data

GraphQL og query

```
{  
  events {  
    id  
    name  
  }  
}
```

```
{  
  "events": [  
    {  
      "id": "1",  
      "name": "Event no 1"  
    },  
    {  
      "id": "2",  
      "name": "Event no 2"  
    },  
    {  
      "id": "3",  
      "name": "Event no 3"  
    }  
  ]  
}
```

Query

```
{  
  events(id: "1") {  
    name  
  }  
}
```

```
{  
  "events":  
    {  
      "name": "Event no 1"  
    }  
}
```


Query

```
{  
  human(id: "1000") {  
    name  
    height(unit: FOOT)  
  }  
}
```

```
{  
  "human": {  
    "name": "Luke Skywalker",  
    "height": 5.6430448  
  }  
}
```

Mutation

```
{  
  createEvent(name: "Party")  
  {  
    id  
    name  
  }  
}
```

```
{  
  createEvent {  
    id: "1"  
    name: "Party"  
  }  
}
```

Variabler

```
mutation createEvent($name: String!) {  
  createEvent(name: $name) {  
    id  
  }  
}
```

Fragments

```
{  
  stopPlace(id: "NSR:StopPlace:8") {  
    ...myStop  
  }  
}
```

```
fragment myStop on StopPlace {  
  name {  
    value  
    lang  
  }  
  geometry {  
    type  
    coordinates  
  }  
  stopPlaceType  
}
```

Demo-tid

GraphQL på server

- Protokoll
- API-lag
- GraphQL-Implementasjon
- Schema
- Datalag

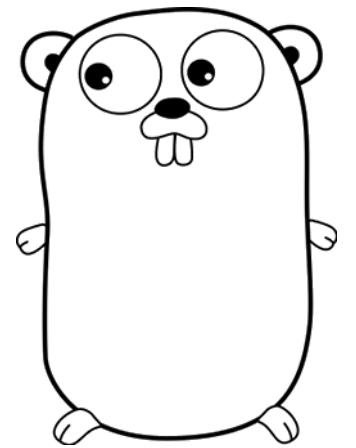
Implementasjoner



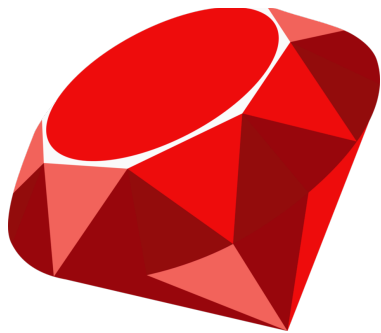
graphql-js



graphql-core + graphene



graphql-go



graphql-ruby



sangria



graphql-java

Server-implementasjon

- Lexer / parser: Query => AST (Abstract Syntax Tree)
- Type System => Støtte for å definere typer og schema
- Introspection
- Validering mot “Type system”
- Execution

GraphQL på klient

- Programmeringsspråk velger du selv
- Protokoll velger du selv
- Begrenset av serverens schema
- En GraphQL-klient!



Lokka



Relay

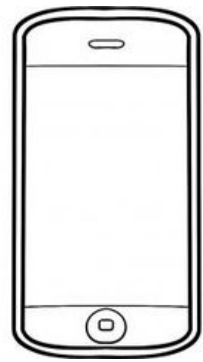


Hva gir klienten deg?

- Enkelt å bytte ut nettverkslaget
- Caching
- Refetching / synkronisering
- Løser problemene for deg!

HTTP

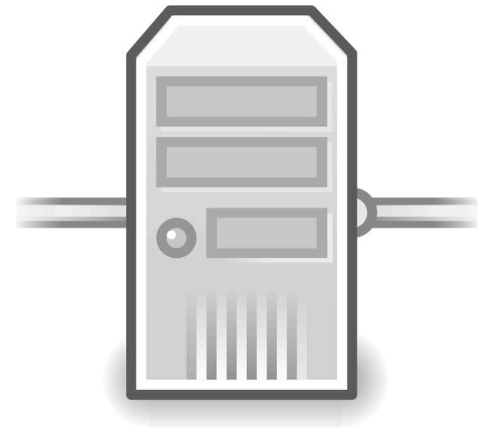
POST <https://localhost/graphql>



Klient

payload

query, variables, ...



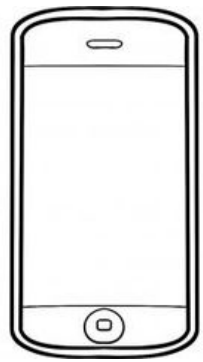
Server



HTTP

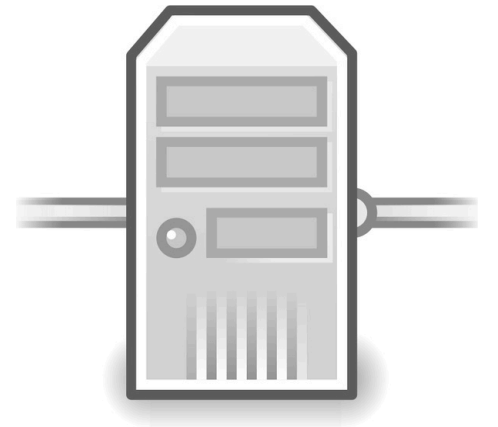
OK

200



Klient

```
{  
  "data": {  
    "stopPlace": [  
      {  
        "id": "NSR:StopPlace:1"  
      }  
    ]  
  }  
}
```

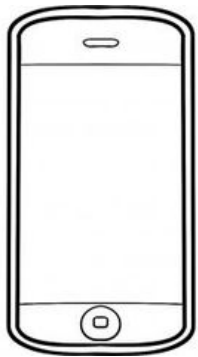


Server



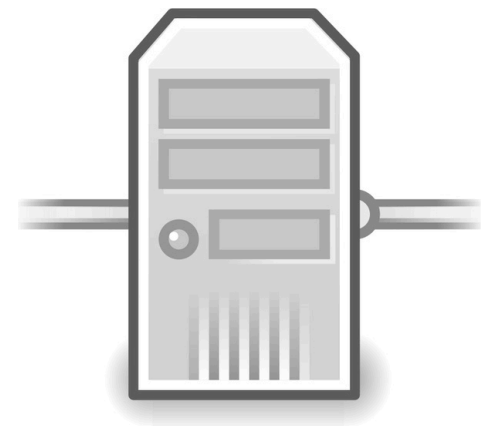
HTTP

Bad request 400



Klient

```
{  
  "errors": [  
    "Validation error of type FieldUndefined: Field tullefelt is undefined"  
  ]  
}
```



Server



Schema og typer

- Hva er tilgjengelig
- På hvilket format - typestrengt

```
schema {  
    query: Query  
}
```

```
type Query {  
    hello: String  
}
```



```
var schema = buildSchema(`
  type Query {
    hello: String
  }
`);

var root = { hello: () => 'Hello world!' };

graphql(schema, '{ hello }', root).then((response)
=> {
  console.log(response); // { data: { hello: 'Hello world!' } }
});
```

```
GraphQLObjectType queryType = newObject()  
    .name("helloWorldQuery")  
    .field(newFieldDefinition()  
        .type(GraphQLString)  
        .name("hello")  
        .staticValue("world"))  
    .build();  
  
GraphQLSchema schema = GraphQLSchema.newSchema()  
    .query(queryType)  
    .build();  
  
Map<String, Object> result = new  
GraphQL(schema).execute("{hello}").getData();  
  
System.out.println(result); //{hello=world}
```

Scalar

- Int
- Float
- String
- Boolean
- ID

Enum

```
enum AnimalType {  
    Cat  
    Dog  
    Horse  
}
```

```
type Child {  
    name: String  
    pet: AnimalType  
}
```

Interface

```
interface Character {  
    id: ID!  
    name: String!  
    friends: [Character]  
    appearsIn: [Episode]!  
}
```

```
type Human implements Character {  
    id: ID!  
    name: String!  
    friends: [Character]  
    appearsIn: [Episode]!  
    starships: [Starship]  
    totalCredits: Int  
}
```

**LET'S BE HONEST
HERE**

TYPES ARE USEFUL

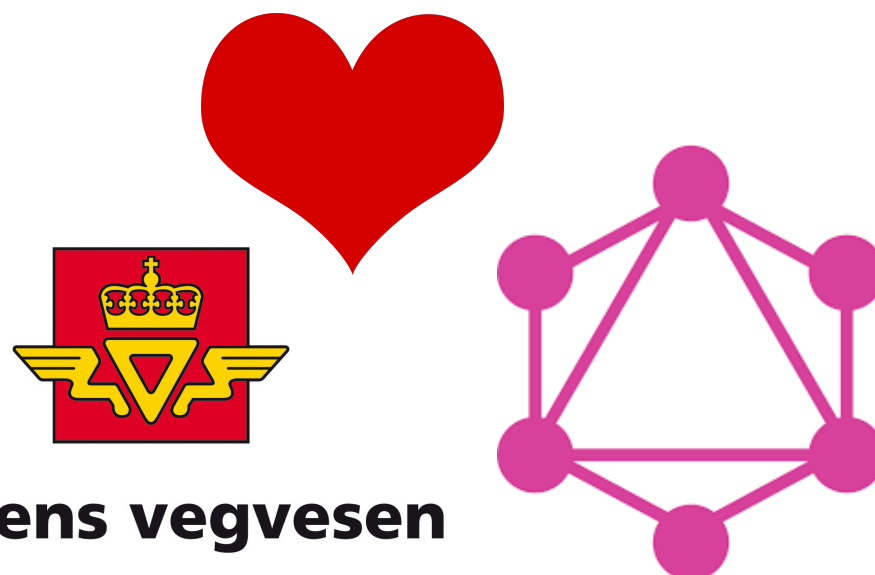
memegenerator.net

Når trenger du GraphQL?

- Når hastighet og kort ventetid teller
- Du har mange klienter (apper, websider ...)
- Når data er sentralisert og eksponert ett sted
- Dokumentasjon og versjonering er viktig

GraphQL i Statens Vegvesen

- Digitransit-UI / www.dit.no
- Nasjonalt Stoppestedsregister



Come an!

- Nanokurs i GraphQL - <https://learngraphql.com/>
- God oversikt - <https://github.com/chentsulin/awesome-graphql>
- Den offisielle siden - <http://graphql.org/>
- GraphQL Europe, Twitter og Github!

Tusen takk!

Spørsmål?