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GraphQL, FHIR, and JavaScript

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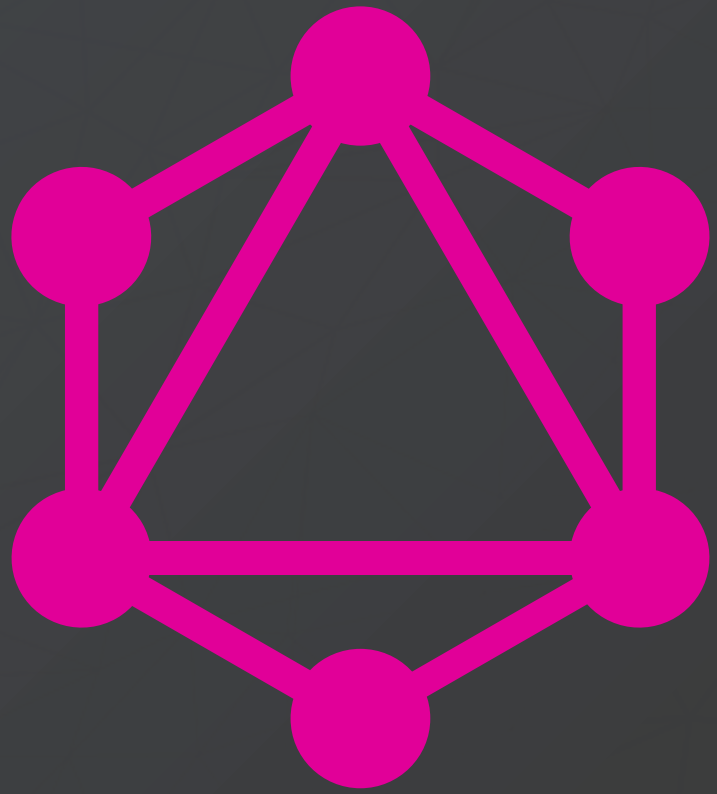
What is GraphQL?

- Specification designed and built by Facebook
- Implemented in many languages and database agnostic
- Query language for your API



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Describe your data

- GraphQL has it’s own type language
- Define your own custom scalar types
- Validation and type coercion

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Get exactly what you ask for

Query

```
{
  Patient(_id:"1"){
    id
    text{
      status
      div
    }
    name{
      given
    }
  }
}
```

Response

```
{
  "data": {
    "Patient": {
      "id": "1",
      "text": {
        "status": "generated",
        "div": "<div>...</div>"
      },
      "name": [{
        "given": [ "Peter" ]
      }]
    }
  }
}
```

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Sample REST response


```
{
 "resourceType": "Patient",
 "id": "example",
 "text": { ... },
 "identifier": [ ... ],
 "active": true,
 "name": [ ... ],
 "telecom": [ ... ],
 "gender": "male",
 "birthDate": "1974-12-25",
 "_birthDate": {
  "extension": [ ... ]
 },
 "deceasedBoolean": false,
 "address": [ ... ],
 "contact": [ ... ],
 "managingOrganization": {
  "reference": "Organization/1"
 }
}
```

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Multiple resources in one request

```
query {
  Patient (_id:"example") { ... }
  Observation { ... }
  MedicationRequest { ... }
}
```

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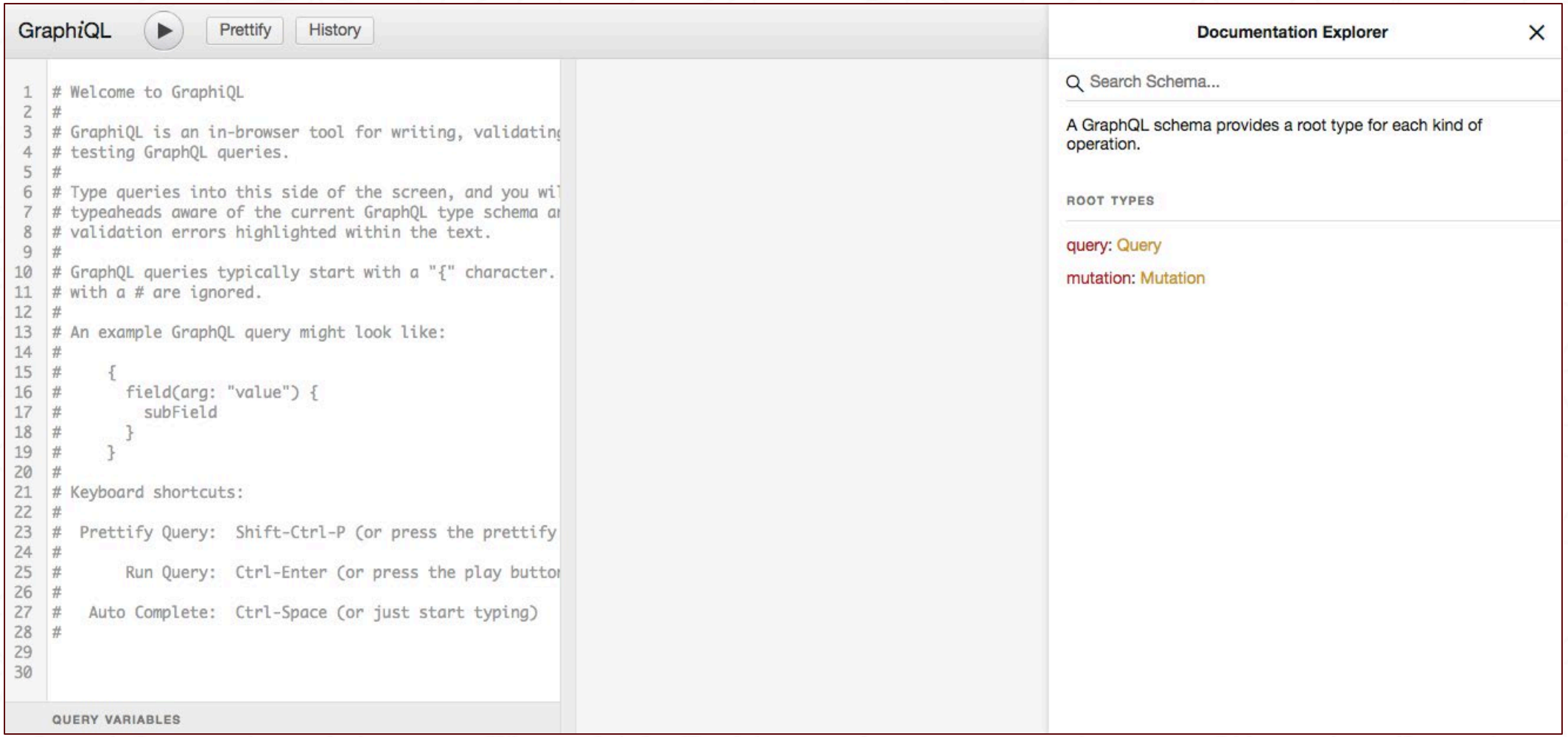
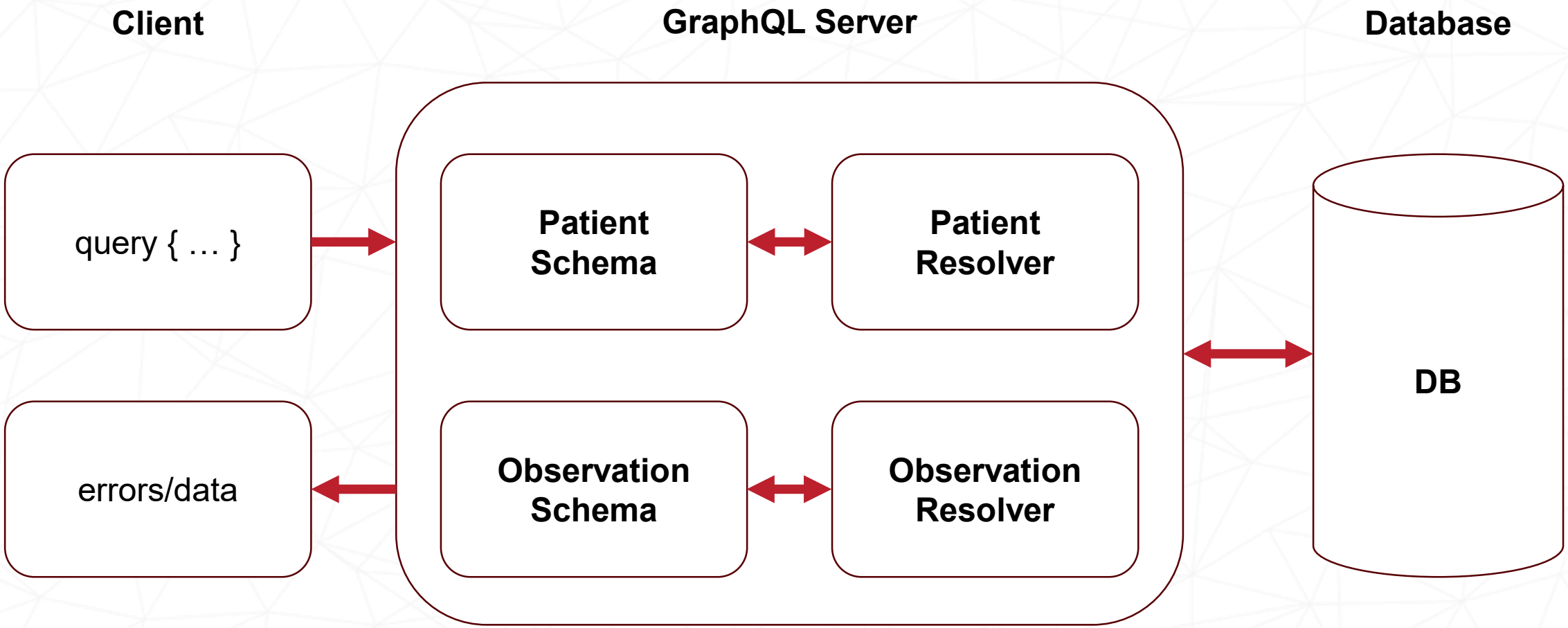
Partial error handling

```
{
  "errors": [{
    "path": [ ... ],
    "message": ...,
    "locations": [{ ... }],
    "extensions": {
      "resource": {
        "resourceType": "OperationOutcome",
        "issue": [{
          "severity": "error",
          "code": "forbidden",
          "diagnostics": "You do not have sufficient scope for read access on this Observation resource."
        }]
      }
    }
  }],
  "data": {
    "Patient": {
      "id": "123456789"
    },
    "Observation": null
  }
}
```

Powerful developer tools



Example query



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GraphQL + FHIR

- Not yet a formal standard
- Very much in the early phases of development
- Can be standalone or an add on to your current stack

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Data

The data kind of looks like FHIR, but it's not exactly FHIR

```
{
  "errors": [ ... ],
  "data": {
    "Patient": {
      ...
    }
  }
}
```

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Errors – GraphQL vs FHIR

- GraphQL returns errors in an errors property in the response.
- Every error must contain an entry with the key “message”.

```
{
  "errors": [{
    "message": "Error"
  }],
  "data": { ... }
}
```

- Errors return an Operation Outcome.
- Operation outcomes are often returned with http status codes.

```
{
  "resourceType": "OperationOutcome",
  "issue": [{
    "severity": "error",
    "code": "forbidden",
    "diagnostics": " ... "
  }]
}
```

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Errors – FHIR in GraphQL

```
{
  "errors": [{
    "path": [ ... ],
    "message": ...,
    "locations": [{ ... }],
    "extensions": {
      "resource": {
        "resourceType": "OperationOutcome",
        "issue": [{
          "severity": "error",
          "code": "forbidden",
          "diagnostics": "You do not have sufficient scope for read access on this Observation resource."
        }]
      }
    }
  }],
  "data": { ... }
}
```

Bundles

- Bundles aren’t as easy in GraphQL as they are in REST.
- Reading a bundle in GraphQL requires a union and a different query syntax
- Writing a Bundle in GraphQL may require some more thought

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Querying a Bundle

```
query {
  PatientList(identifier:"example"){
    entry {
      resource {
        ... on Patient { id }
        ... on Observation { id }
      }
    }
  }
}
```

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Bundles in Mutations

```
mutation {
  BundleCreate(
    resource: {
      resourceType: Bundle
      type: ”transaction"
      entry: {
        patientResource: { ... },
        observationResource: { ... }
      }
    }
  ){
    id
  }
}
```

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Bundles in Mutations

```
mutation {
  BundleCreate(
    resource: {
      resourceType: Bundle
      type: ”transaction"
      entry: {
        resource: " ... "
      }
    }
  ){
    id
  }
}
```

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Demo

Thank You!

https://asymmetrik.com/fhir

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