

GRAND Stack

Benoit Simard (@logisma)

Introduction

Benoit Simard



- **Graph addict**
- Data liberator
- Web developer
- Works at **Neo4j**
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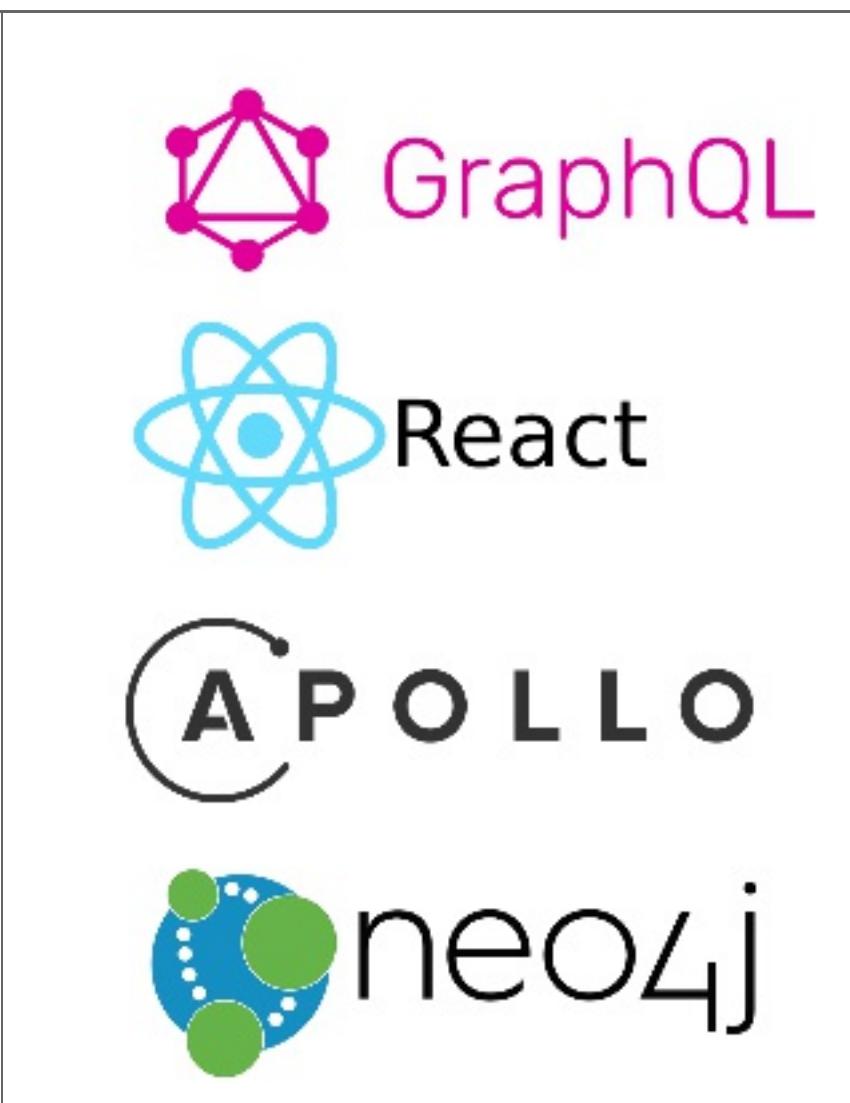
Agenda

- What is this Stack ?
- Why a new stack?
- How to use it ?

La stack

<http://grandstack.io>

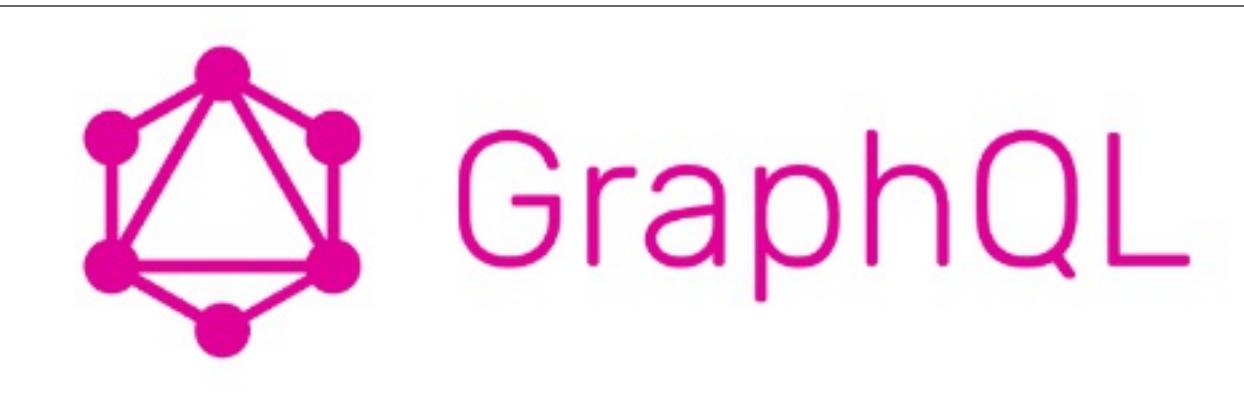
GRAND



GATAND



GraphQL



GraphIQL ▶ Prettify History

```
1 query($id:ID!) {
2   Movie(movieId:$id) {
3     movieId
4     title
5     plot
6     poster
7     imdbRating
8     genres{
9       name
10    }
11    directors {
12      name
13    }
14    actors {
15      name
16    }
17    similarByUser {
18      movieId
19      title
20      poster
21    }
22    similarByGenre {
23      movieId
24      title
25      poster
26    }
27  }
28 }

QUERY VARIABLES
1 {"id":8}
```

Schema Query

Search Query...
No Description

FIELDS

Genre(id: ID!): Genre
Movie(movieId: ID!): Movie
MovieSearch(
 search: String = ""
 skip: Int = 0
 limit: Int = 10
): [Movie]
MovieSearchInGenre(
 genre: ID!
 search: String = ""
 skip: Int = 0
 limit: Int = 10
): [Movie]
Actor(id: ID!): Actor
ActorSearch(search: String!): [Actor]
Director(id: ID!): Director
User(id: ID!): User

- A new paradigm for **building APIs**
- **Schema** definition
- Query language for APIs
- Community of tools

Angular



- JavaScript library for building user interfaces
- Component based
 - Reusable
 - Composable
- Written in Typescript (type matters !)

```
import { Component, Input, OnInit } from '@angular/core';

@Component({
  selector: 'display-object',
  templateUrl: './display-object.component.html',
  styleUrls: ['./display-object.component.scss']
})
export class DisplayObjectComponent implements OnInit{

  @Input() object:any;
  @Input() blacklist:Array<String> = [];
  @Input() inlineSeparator:any = null;
  keys:any;

  constructor() {}

  ngOnInit() {
    // find keys that are not blacklisted and wherethe key has a value
    this.keys = Object.keys(this.object).filter( (key) =>{
      let result = true;

      if(key == '__typename'){
        result = false;
      }

      if(this.blacklist.includes(key)) {
        result = false;
      }

      if(this.object[key] == null || this.object[key] == ''){
        result = false;
      }
    })
    return result;
  }
}
```

Apollo



“A set of tools designed to leverage GraphQL and work together to create a great workflow”

Client-side tooling

- Frontend framework integrations
- Caching
- Code generation

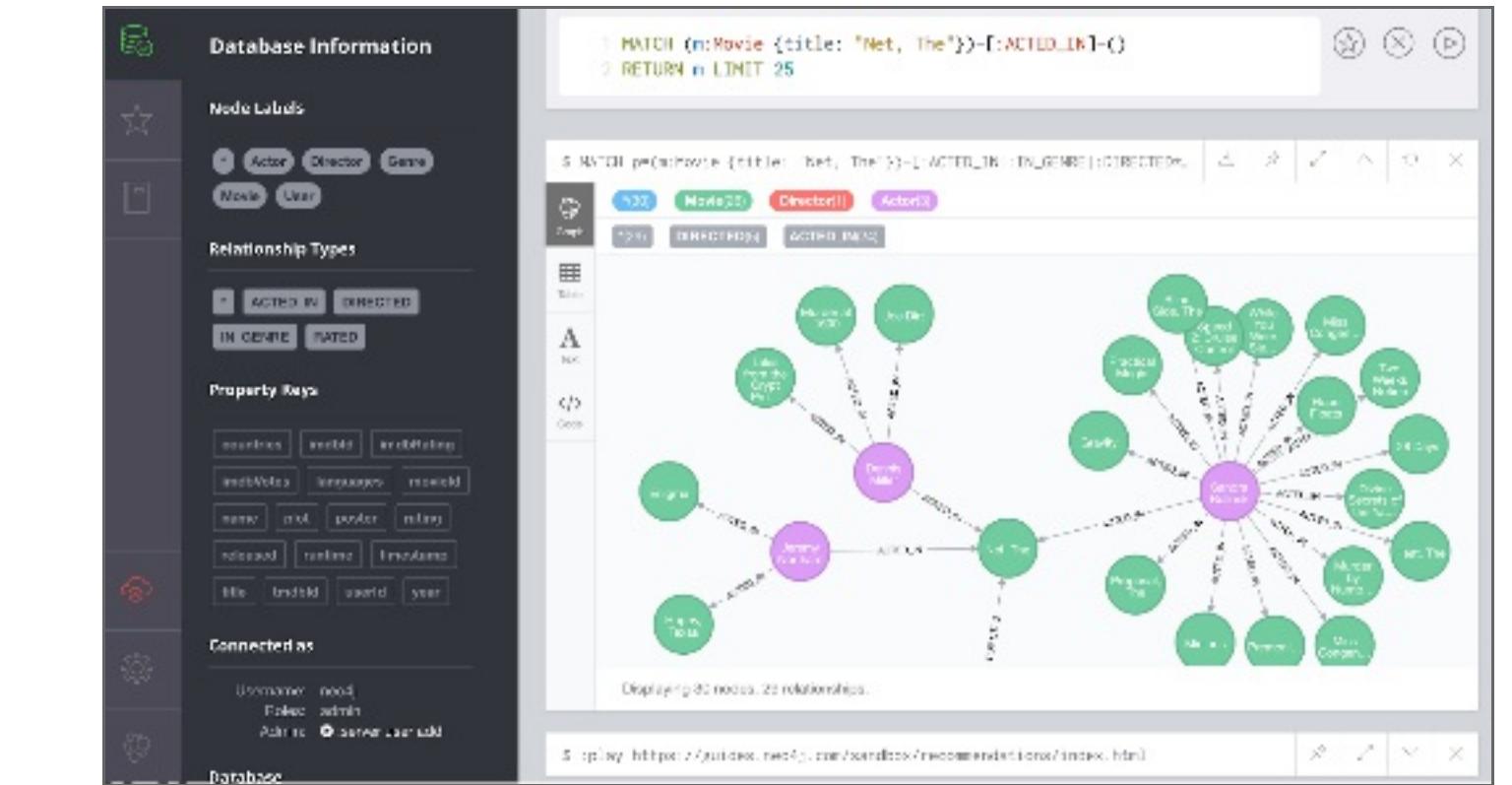
Server-side tooling

- Schema creation
- Mocking
- Schema stitching
- Performance monitoring

Neo4j



- Is a graph **database** (ACID compliant)
 - Is a **graph** database (Native)
 - Schema less
 - Exists since 2010



Example : a movie application

<https://github.com/sim51/grand-movies-example>

Matrix, The



Title

Matrix, The

Description

A computer hacker learns from mysterious rebels about the true nature of his reality and his role in the war against its controllers.

Date

Mar 31, 1999

Directors

Lana Wachowski Andy Wachowski

Actors

Hugo Weaving Carrie-Anne Moss Laurence Fishburne Keanu Reeves

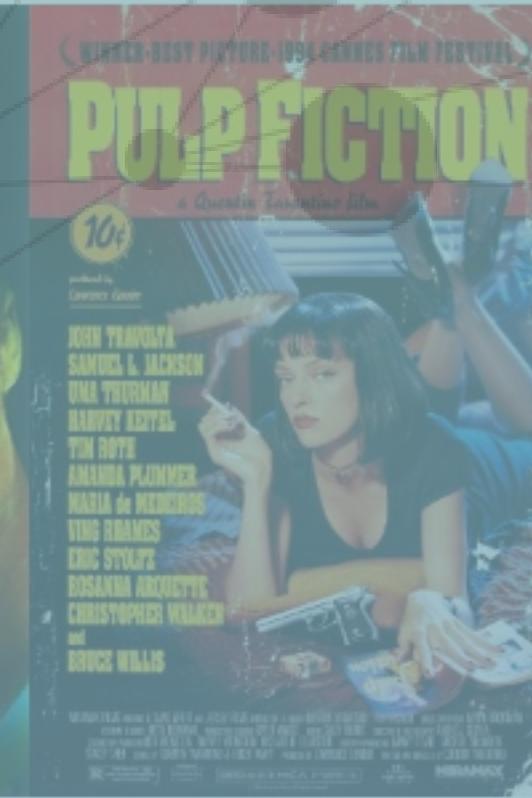
Genres

Thriller Sci-Fi Action

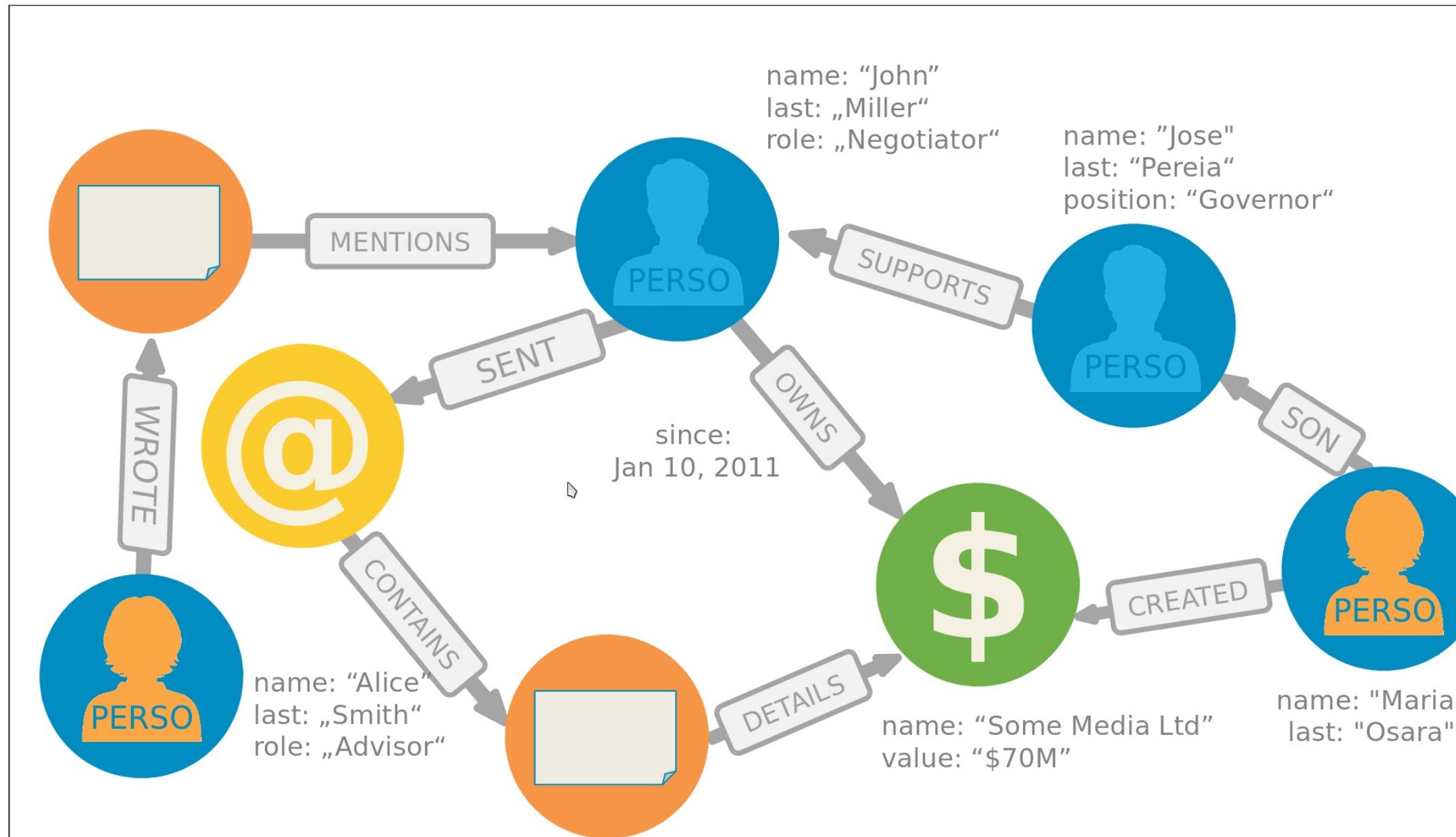
Focus on Neo4j

Recommendations

Star Wars: Episode IV - A New Hope - 8.7 Star Wars: Episode V - The Empire Strikes Back - 8.8 Jurassic Park - 8.1



A graph of properties



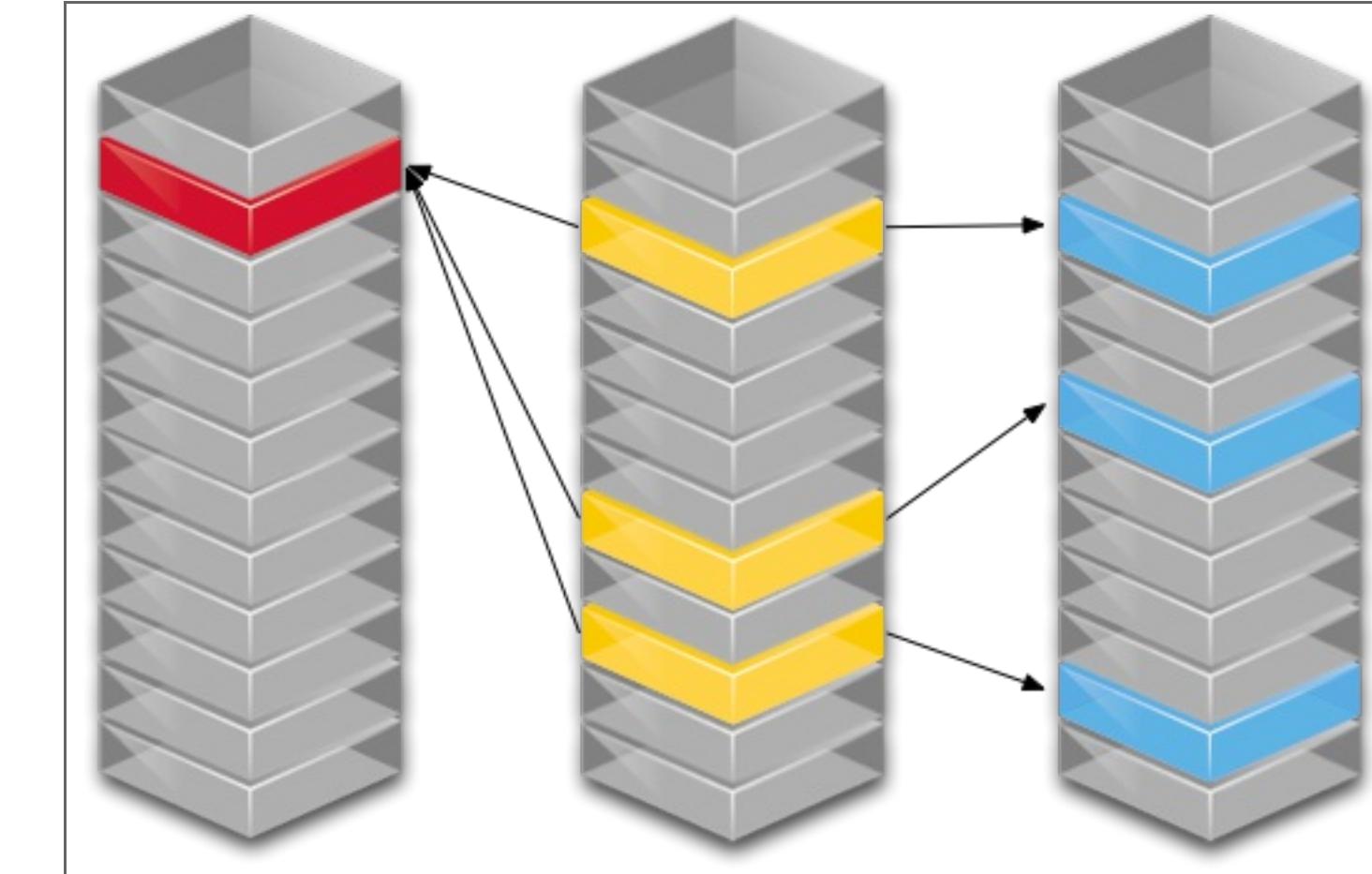
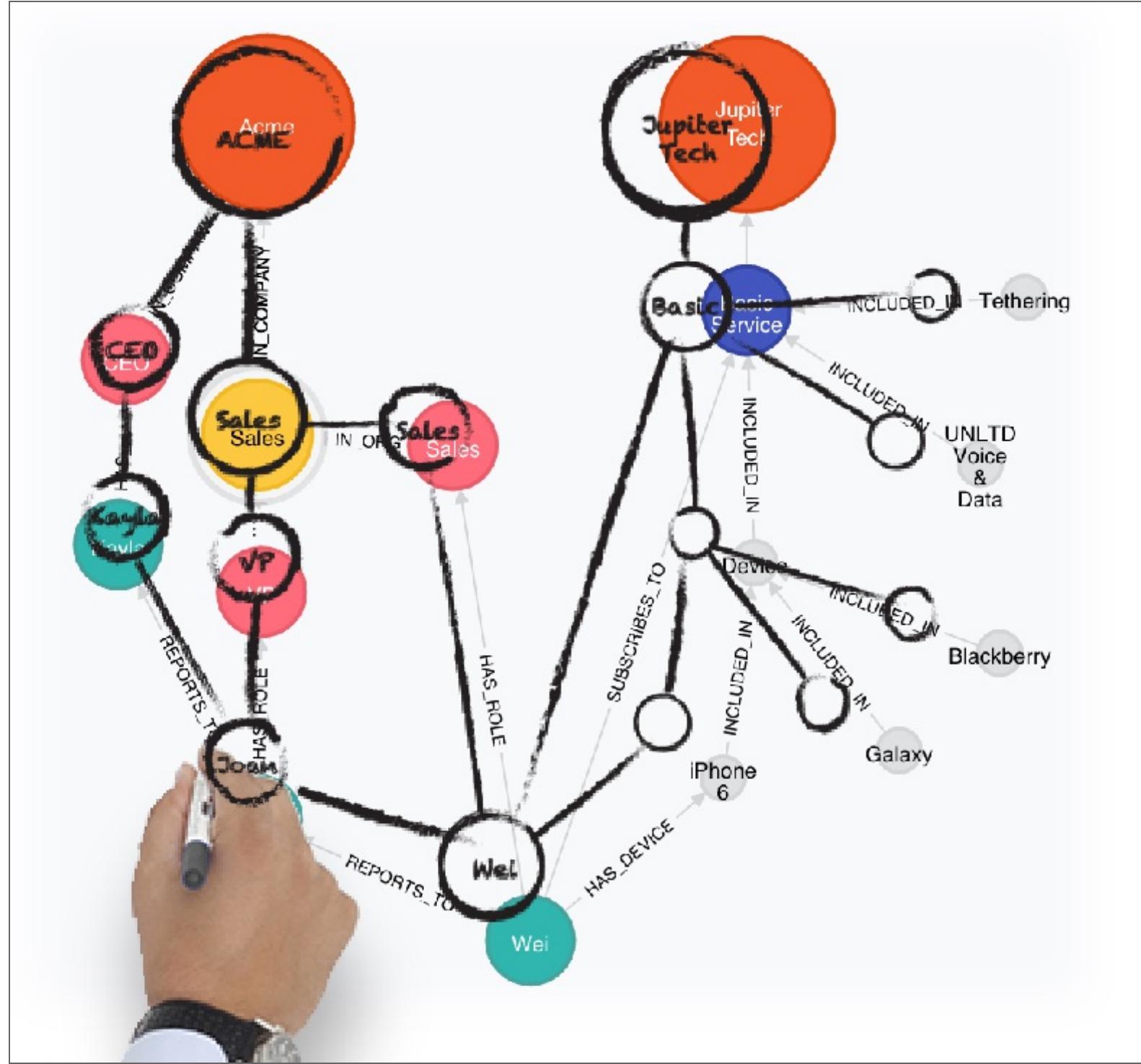
Nodes

- The entity of your model
- Can have labels
- Can have properties

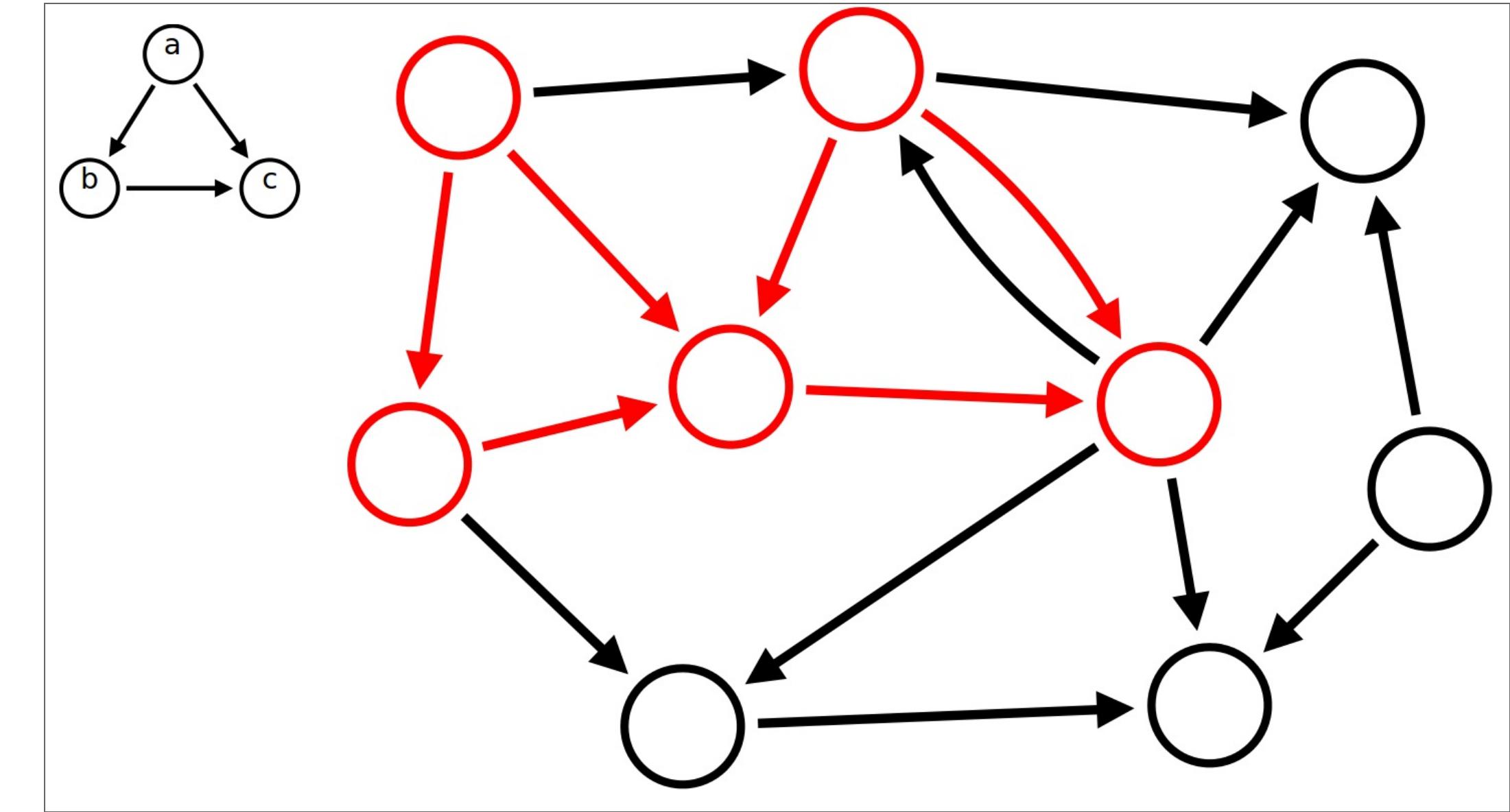
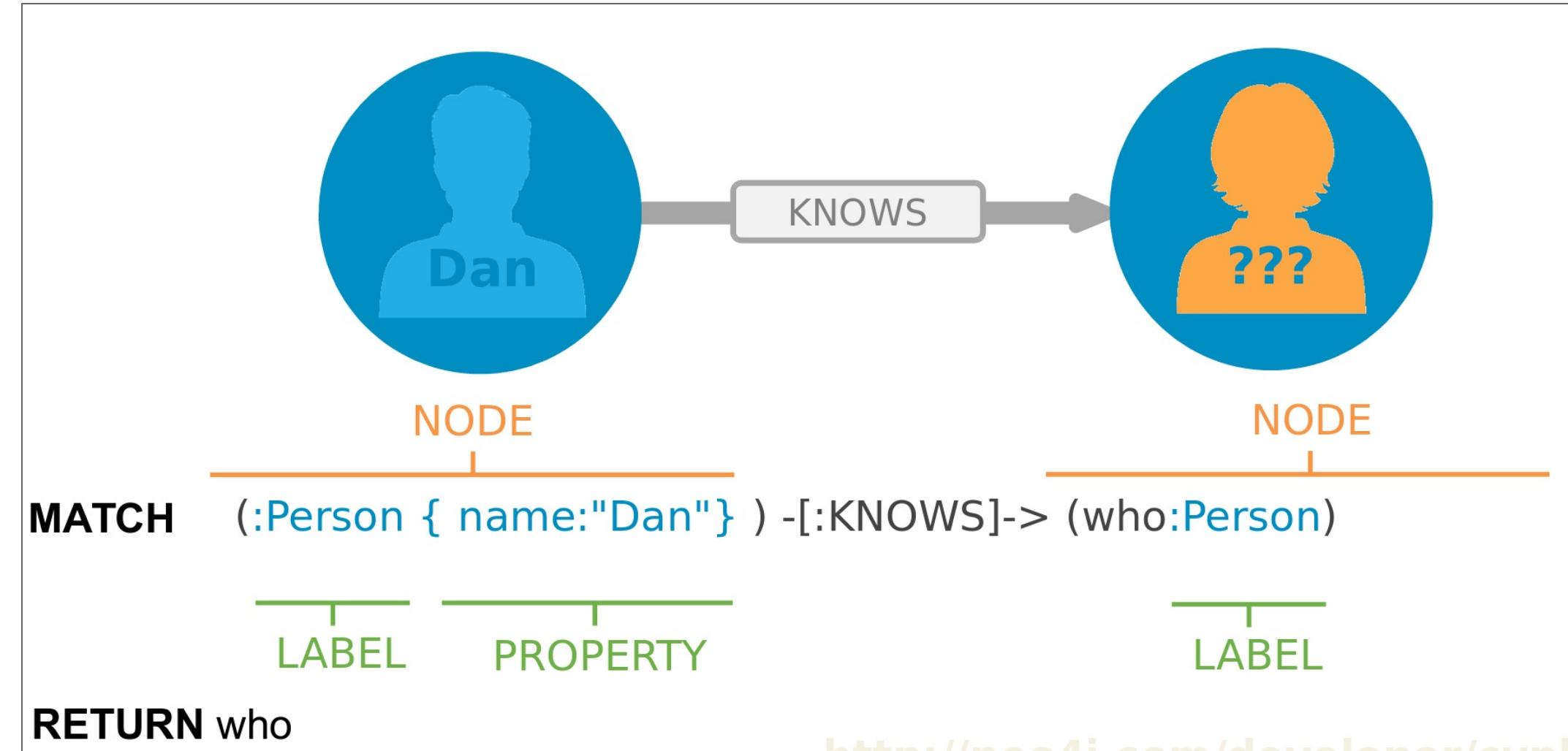
Relationships

- Links two nodes, with a **direction** and a **type**
- Can have properties

A local approach



Cypher

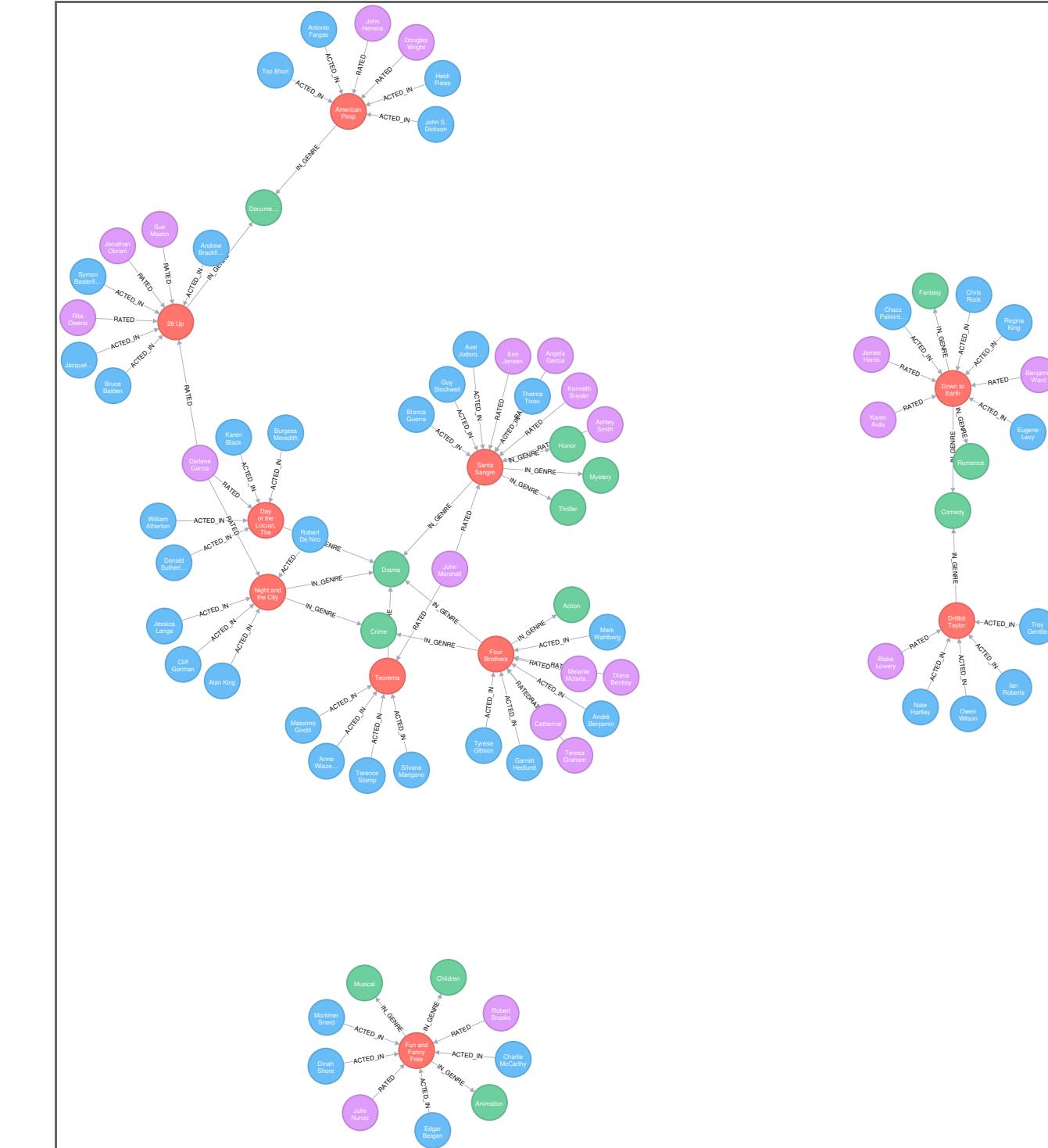


The movie dataset



<https://neo4j.com/sandbox-v2/>

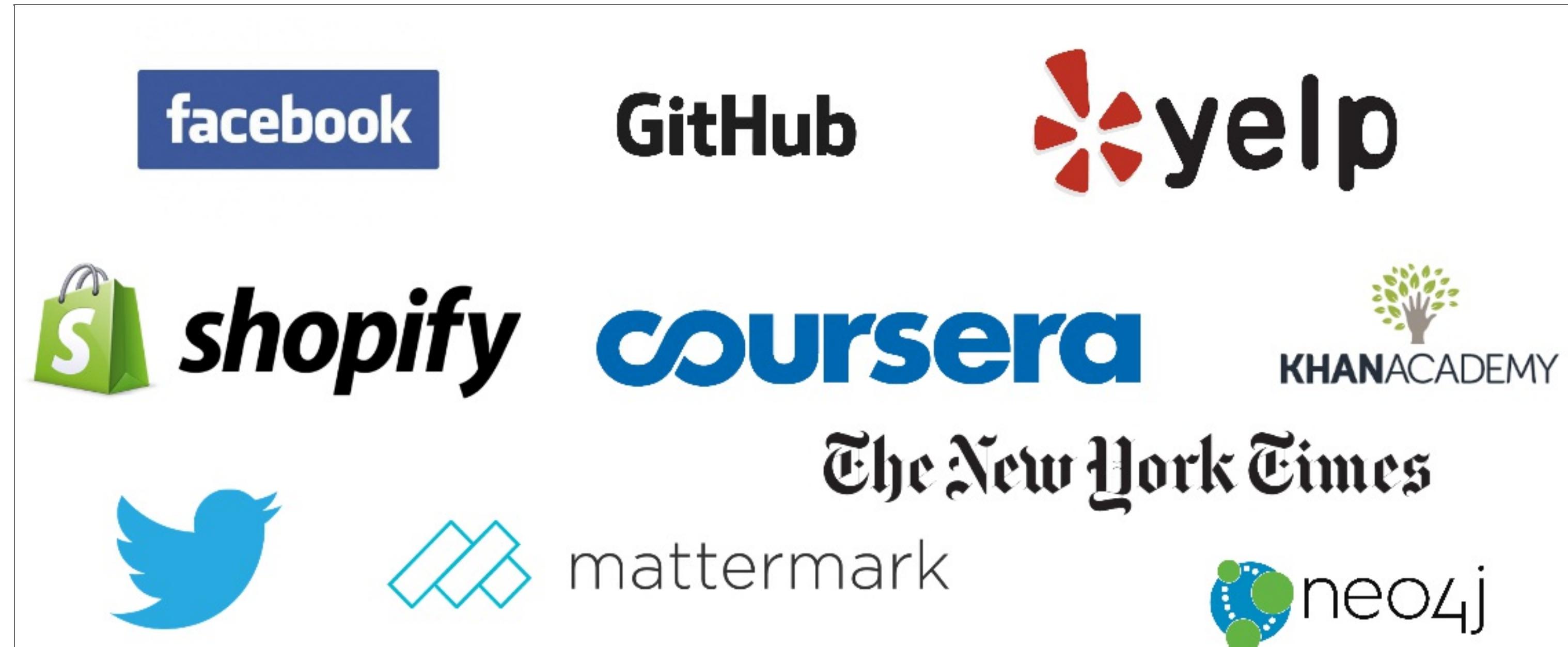
Recommendations
Generate personalized real-time
recommendations using a dataset of movie
reviews.



Recommendation

Focus on GraphQL

A large adoption



GraphQL

“A query language for your API, and a server-side runtime for executing queries by using a type system you define for your data”

“GraphQL isn’t tied to any specific database or storage engine”

“A GraphQL service is created by defining types and fields on those types, then providing resolver functions for each field on each type”

Thinking in Graphs

It's Graphs All the Way Down *

With GraphQL, you model your business domain as a graph

Your application model is a Graph !

movie graphql



Your application model is a Graph !

Schema Definition Language

GraphQL Cheat Sheet

- **Type** : The graph model definition
- **Resolvers** : How to fetch data from datasource
- **Query** : What queries you can do
- **Mutations** : What changes you can do

Type

Movie

Actor

Queries / Mutation

Movie

Actor

Resolvers

Use The Schema, Luke

neo4j-graphql-js

Translate your schema directly in Cypher, thanks to annotation.

```
{  
  Movie(title: "River Runs Through It, A") {  
    title  
    year  
    imdbRating  
    actors {  
      name  
    }  
  }  
}  

```

```
MATCH (movie:Movie {title:"River Runs Through It, A"})  
RETURN movie { .title , .year , .imdbRating,  
  actors: [(:movie)-[ACTED_IN]-(movie_actors:Actor) | movie_actors { .name } ] }  
AS movie  
SKIP 0
```

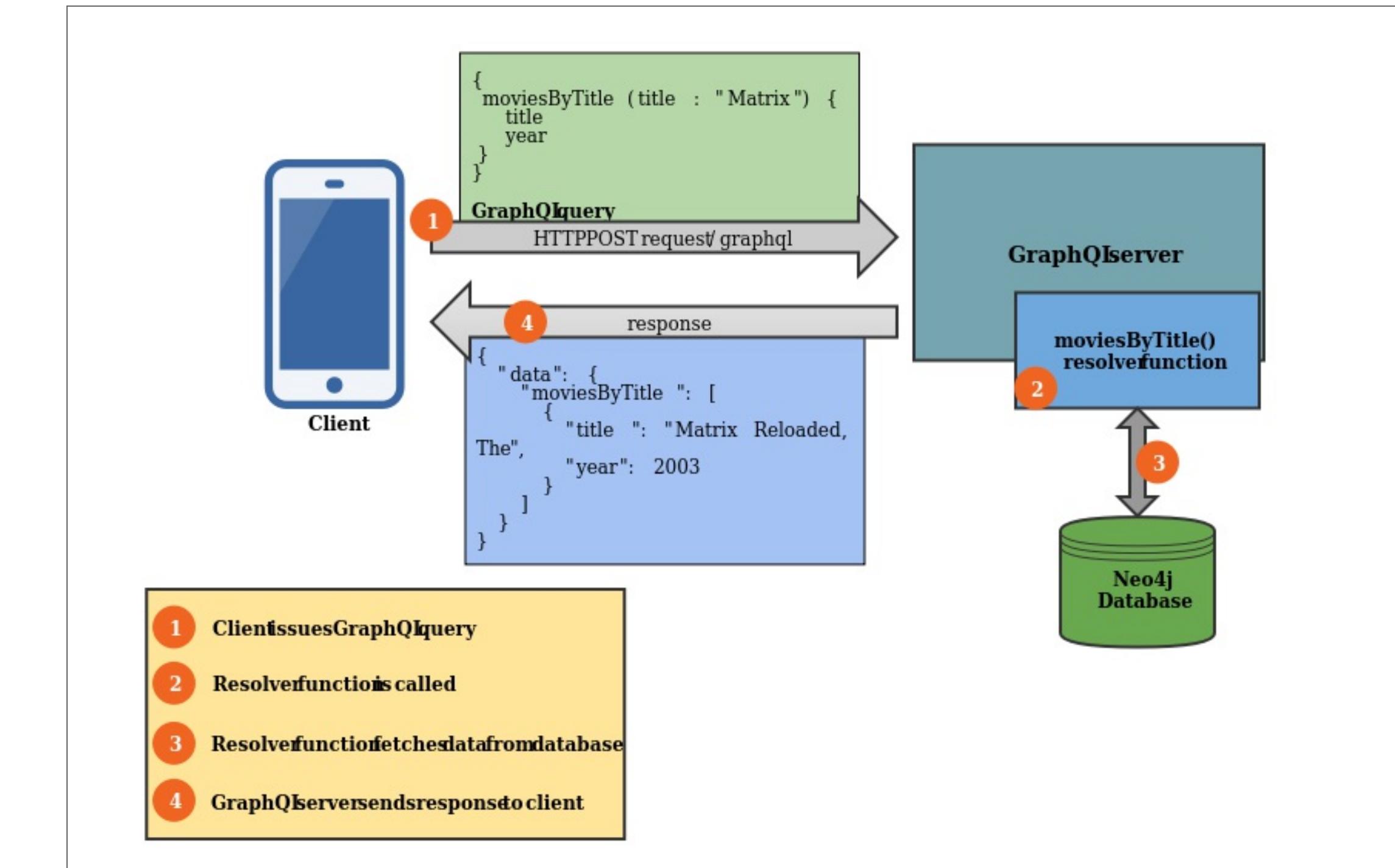
openCypher

```
@type Movie {  
  movieId: ID!  
  title: String  
  year: Int  
  plot: String  
  poster: String  
  imdbRating: Float  
  genres: [String]  
  similar(first: Int = 3, offset: Int = 0): [Movie] @cypher(statement: "WITH {this} AS this MATCH (this)--(:Genre)--(o:Movie) RETURN o")  
  mostSimilar: Movie @cypher(statement: "WITH {this} AS this RETURN this")  
  degree: Int @cypher(statement: "WITH {this} AS this RETURN SIZE((this)--())")  
  actors(first: Int = 3, offset: Int = 0): [Actor] @relation(name: "ACTED_IN", direction: "IN")  
  avgStars: Float  
  filmedIn: State @relation(name: "FILMED_IN", direction: "OUT")  
}
```

Focus on Apollo

GraphQL tool box

- **Server** : Apollo server helps you to create GraphQL server
- **Client**: Apollo client helps you to communicate with a GraphQL server



Server

Just an express.js server with some custom endpoints.

Server - II

Client - Angular - I

In your application module :

Client - Angular - II

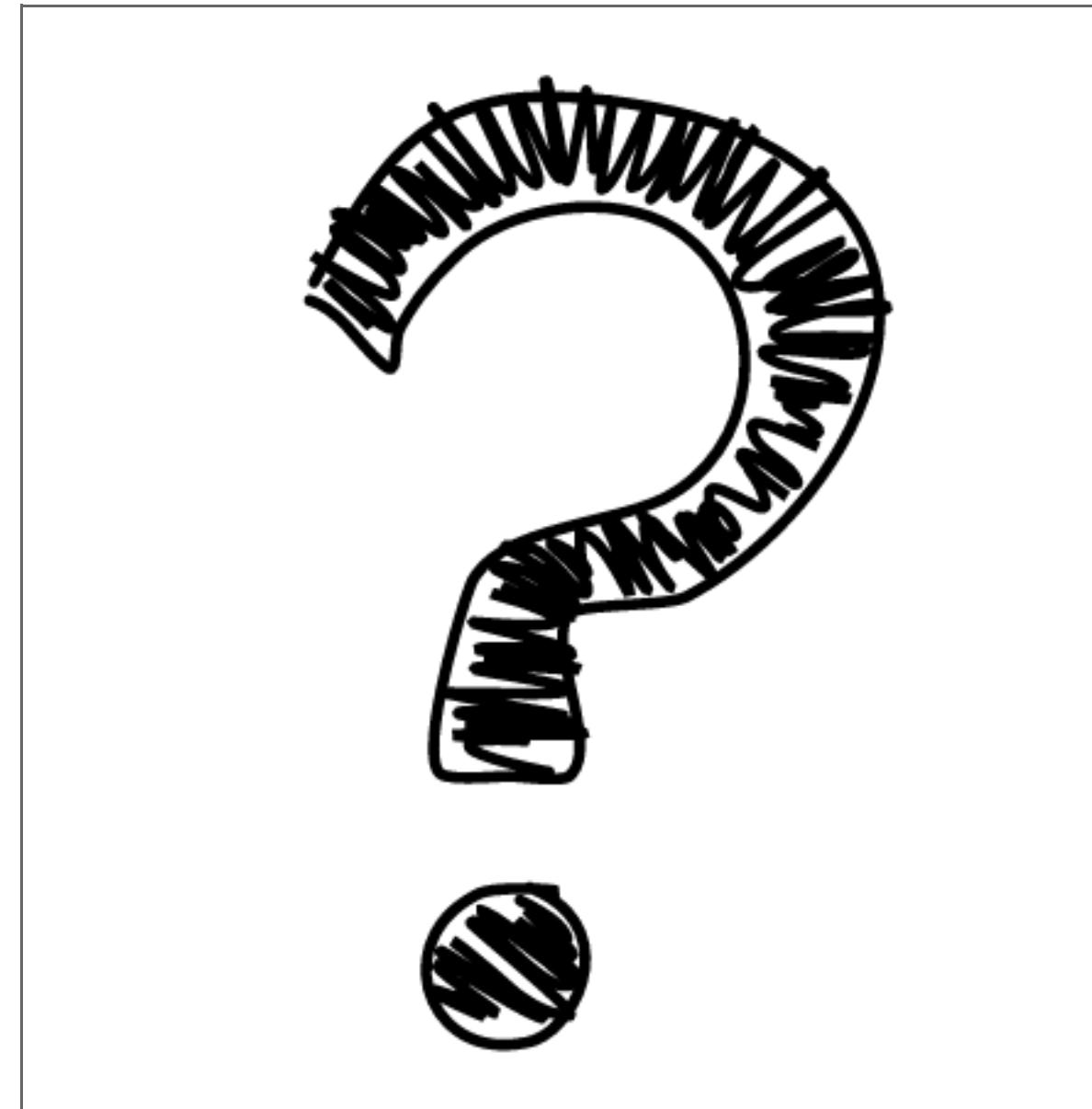
In your components :

TypeScript generation

[**https://github.com/apollographql/apollo-codegen**](https://github.com/apollographql/apollo-codegen)

Demo

Any questions ?



Thanks

Resource

Thanks to Will Lyon from Neo4j for the help