



从REST到GraphQL

2017 JavaScript 中国开发者大会

7月15 - 16日@上海



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@helferjs



GraphQL: 一个用于API的查询语言

一个简单的 GraphQL query

```
query {  
  top {  
    title  
    url  
    by {  
      id  
      karma  
    }  
  }  
}
```







蓝瘦香菇

页面加载时间

加载代码

+

加载数据

页面加载时间

加载代码

+

加载数据

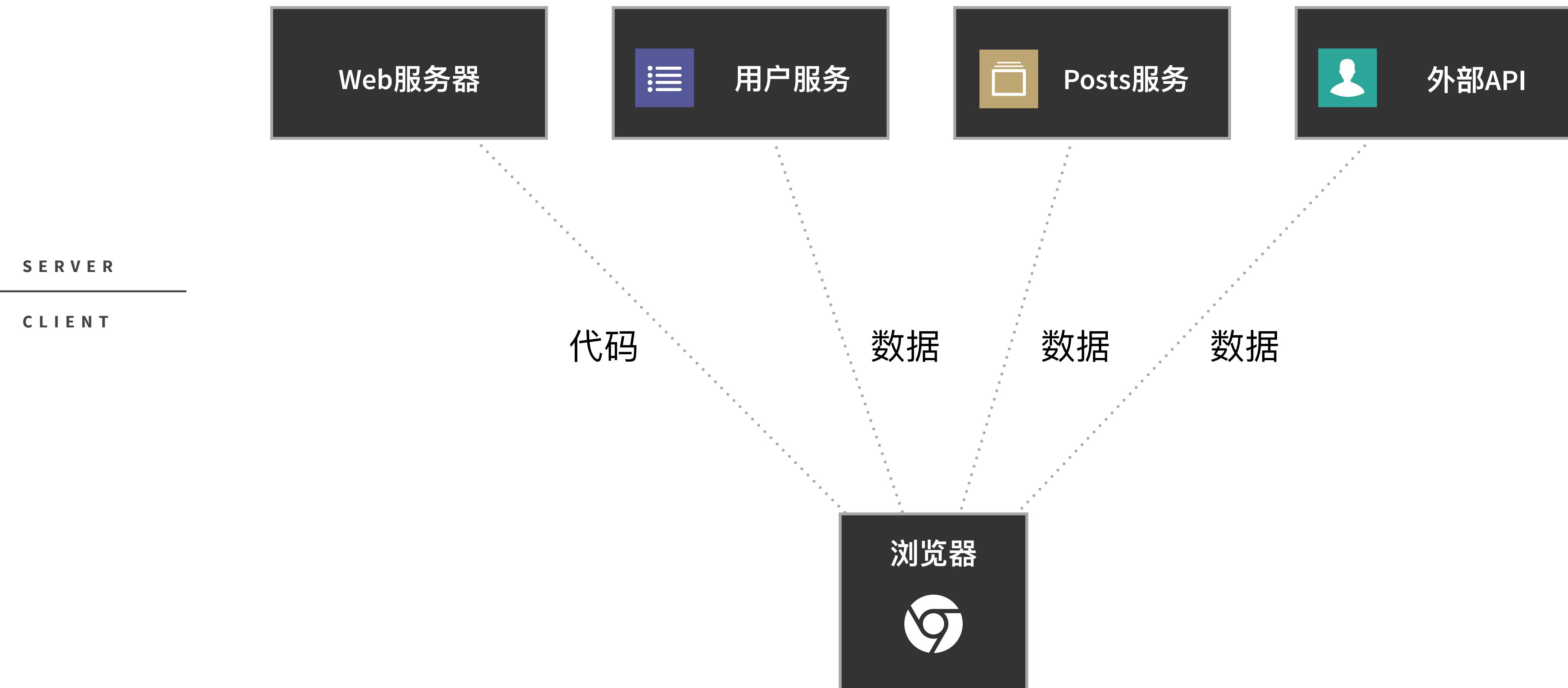
早期的web开发



↓
`<html>`

A black downward-pointing arrow with the text "`<html>`" positioned to its right.

2017年的web开发

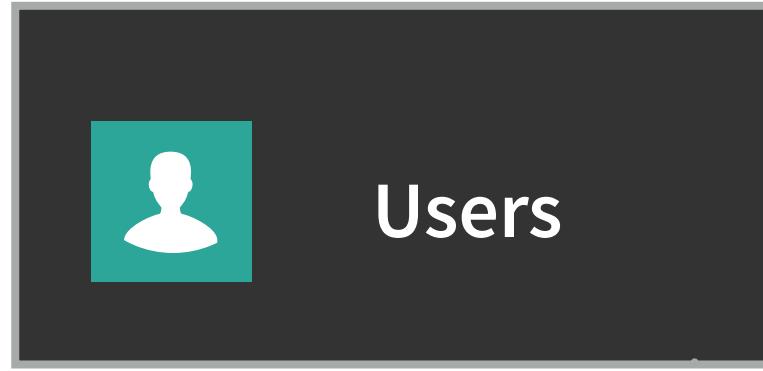


Many servers, many clients



纯REST - 一个endpoint对应一个资源

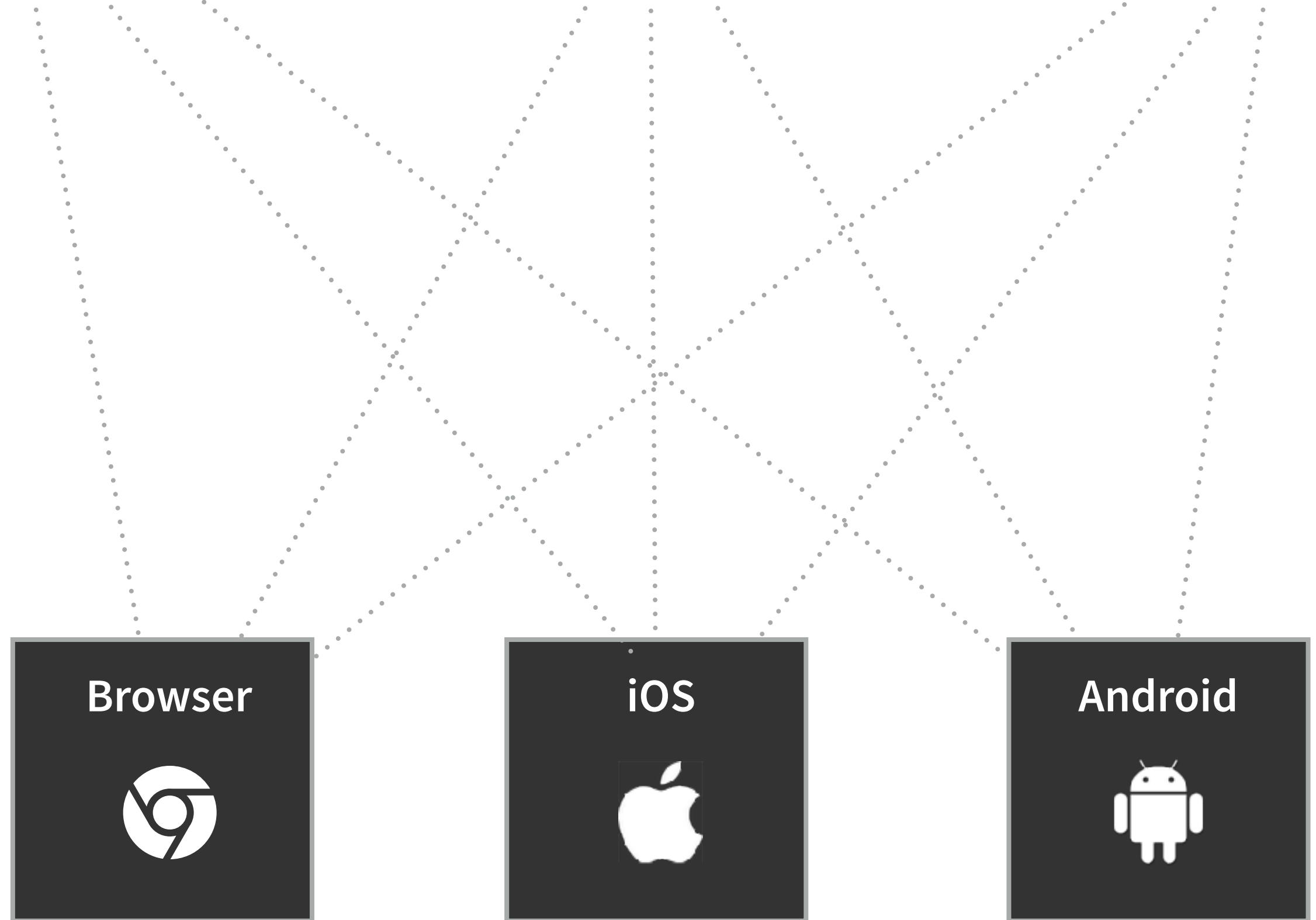
Endpoint 1



Endpoint 2



Endpoint 3



Pros

- 灵活
- 解耦

Cons

- 需要很多次请求
- 会获取到不需要的数据
- 复杂的客户端

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Hacker News REST API

GET <https://hacker-news.firebaseio.com/v0/topstories.json> HTTP/1.1

Hacker News REST API

GET <https://hacker-news.firebaseio.com/v0/topstories.json> HTTP/1.1

200 OK

```
[14776780, 14776903, 14776864, 14776357, 14776667, 14776743, 14775979, 14777034, 14776199, 14775382, 14774655, 14776020, 14775937, 14775395, 14776210, 14774167, 14776620, 14776538, 14772926, 14775701, 14773964, 14776420, 14776699, 14776345, 14774819, 14774817, 14776899, 1476331, 14771406, 14774163, 14773689, 14775229, 14771104, 14768761, 1472169, 14776597, 14774013, 14769758, 14771631, 14769332, 14769762, 14763802, ...]
```

Hacker News REST API

GET <https://hacker-news.firebaseio.com/v0/item/14774817.json>

Hacker News REST API

GET <https://hacker-news.firebaseio.com/v0/item/14774817.json>

200 OK

```
{"by": "theunamedguy", "descendants": 107, "id": 14774817, "kids": [14777336, 14776344, 14775060, 14774898, 14775125, 14775029, 14776172, 14775078, 14776656, 14776842, 14775352, 14775010, 14775936, 14776211, 14775121, 14775323, 14775879], "score": 185, "time": 1500087449, "title": "Australian PM Calls for End-To-End Encryption Ban", "type": "story", "url": "https://www.eff.org/deeplinks/2017/07/australian-pm-calls-end-end-encryption-ban-says-laws-mathematics-dont-apply-down"}
```

Hacker News REST API

GET <https://hacker-news.firebaseio.com/v0/user/theunamedguy.json>

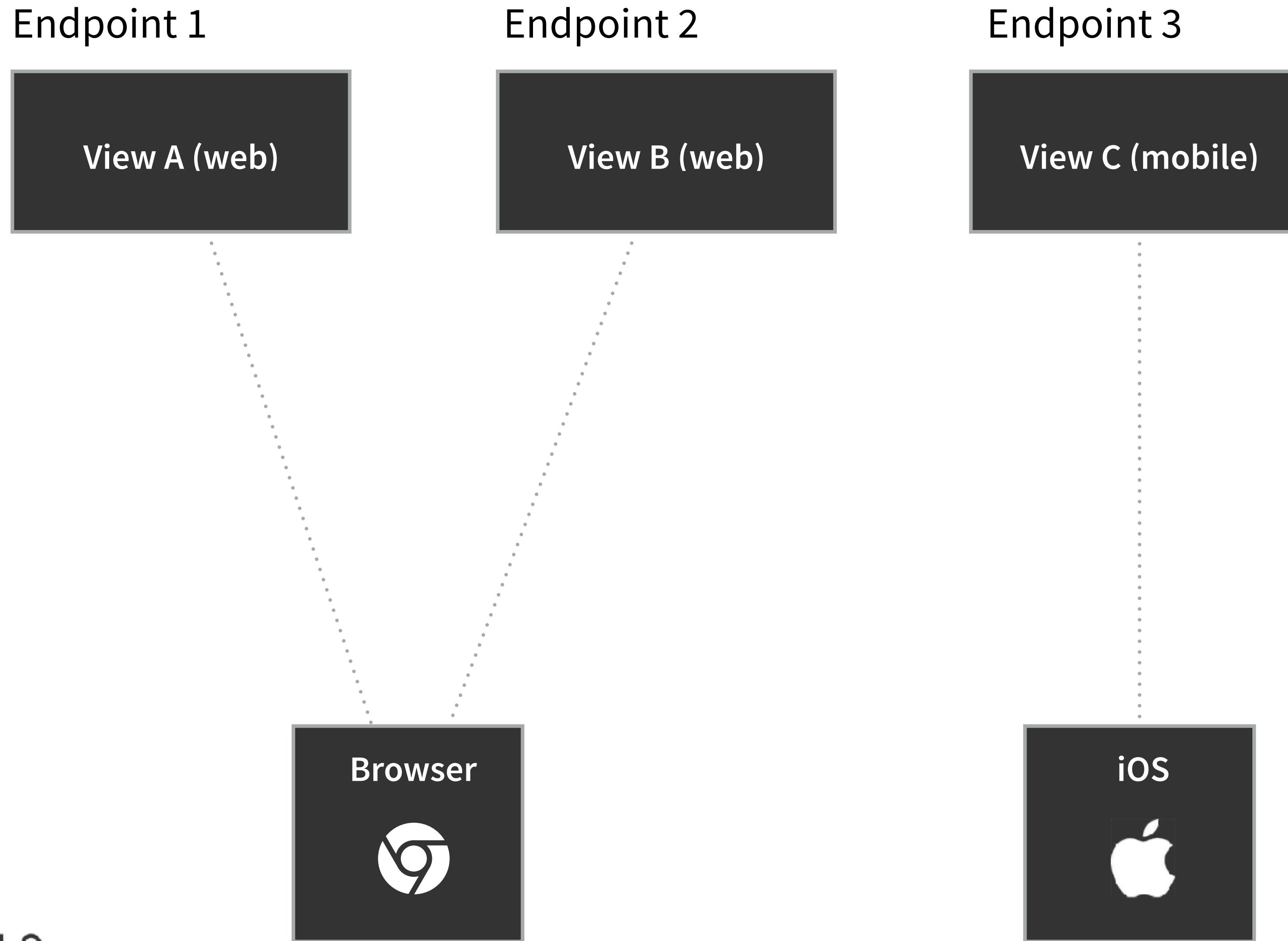
Hacker News REST API

GET <https://hacker-news.firebaseio.com/v0/user/theunamedguy.json>

200 OK

```
{ {"created":1404166451,"id":"theunamedguy","karma":  
657,"submitted":  
[14774817,14313299,14239482,14239474,14234866,14234683,1423452  
7,14233356,14188346,14144000,12821098,12812145,12812095,127844  
07,12402696,12082353,11864973,11856613,11849467,11849388,11843  
990,11832150,11741975,11727375,11703698,11702707,11696397,1165  
6060, ...]}  
}
```

类REST - 一个endpoint对应一个视图



Pros

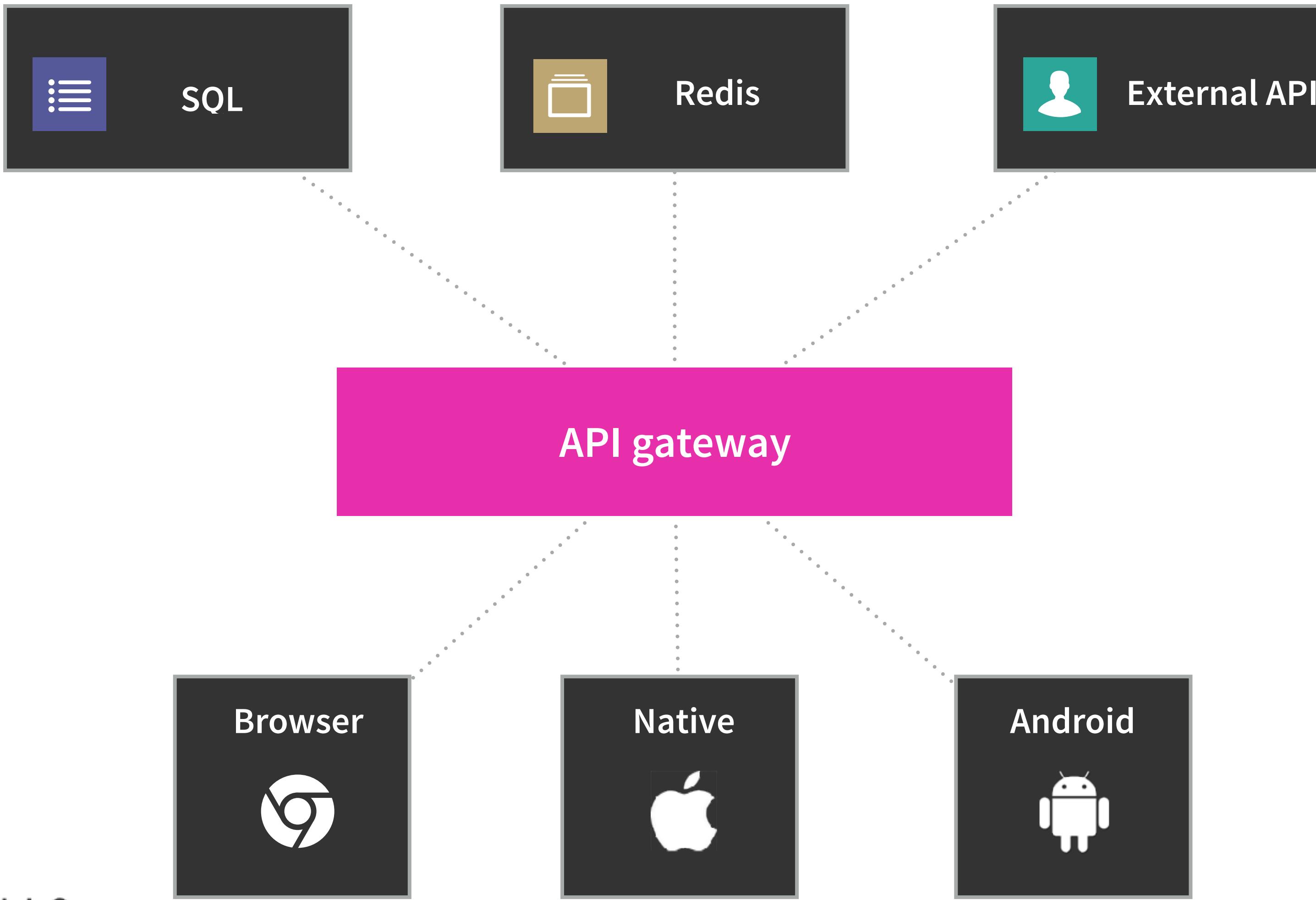
- 一次请求
- 所得即所需

Cons

- 不够灵活
- 高度耦合
- 很高的维护代价
- 迭代缓慢



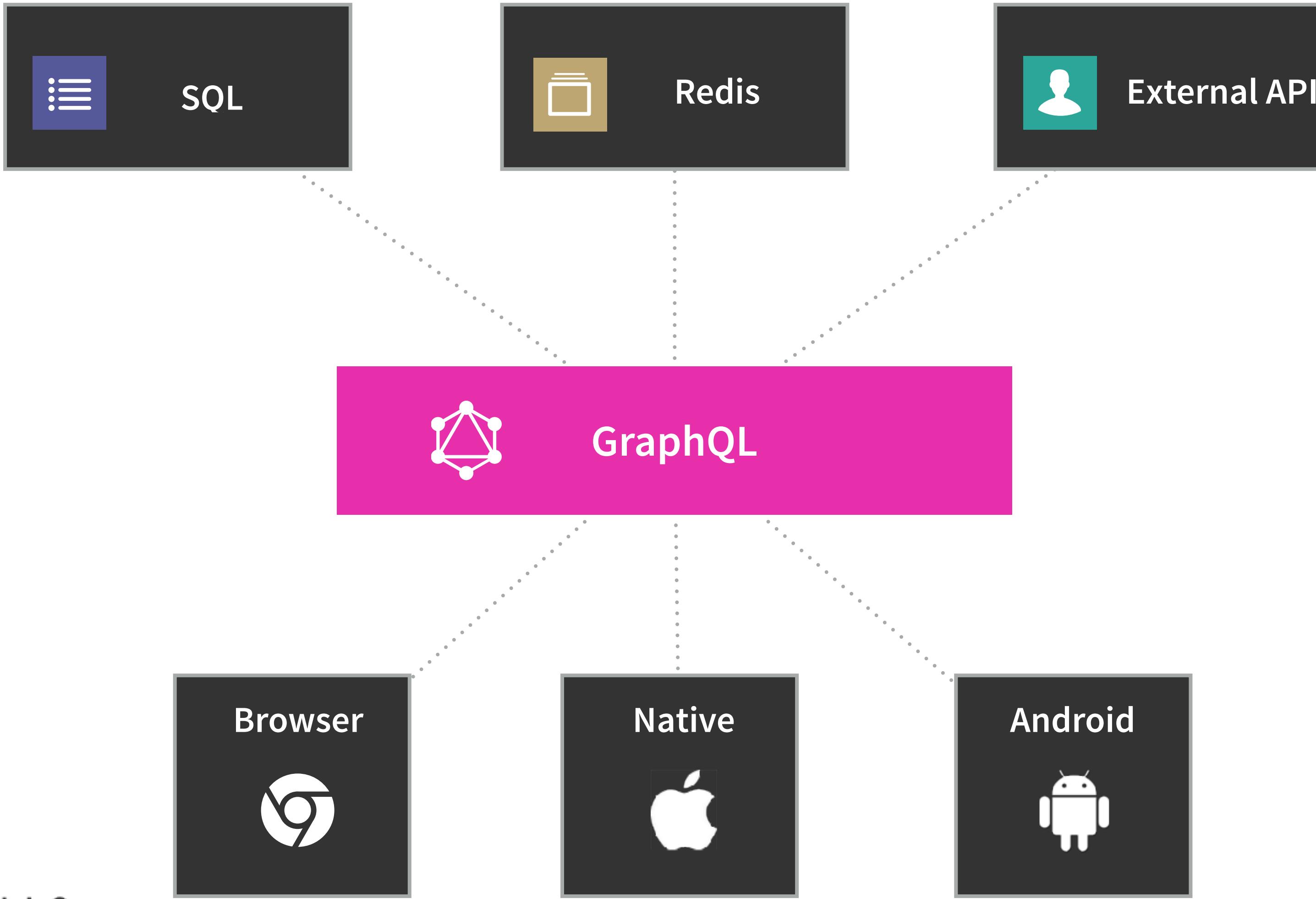
我们需要一个标准的API层



Requirements

- 只需要一次请求
- 所得即所需
- 灵活
- 解耦合

GraphQL就是这样一个标准的API层



GraphQL带给我们

- 只需一次请求
- 所得即所需
- 解耦合

GraphQL has three main “ingredients”

1. 一个用来描述数据类型和关系的**API定义语言**
2. 一个可以描述具体需要获取那些数据的**查询语言**
3. 一个可以**resolve**到数据单个属性的可执行模型

Schema (API definition)

```
type Story {  
    title: String  
    author: Author  
    comments: [Comment]  
    score: Int  
}
```

```
type Query {  
    top(limit: Int): [Story]  
}
```

...

Query

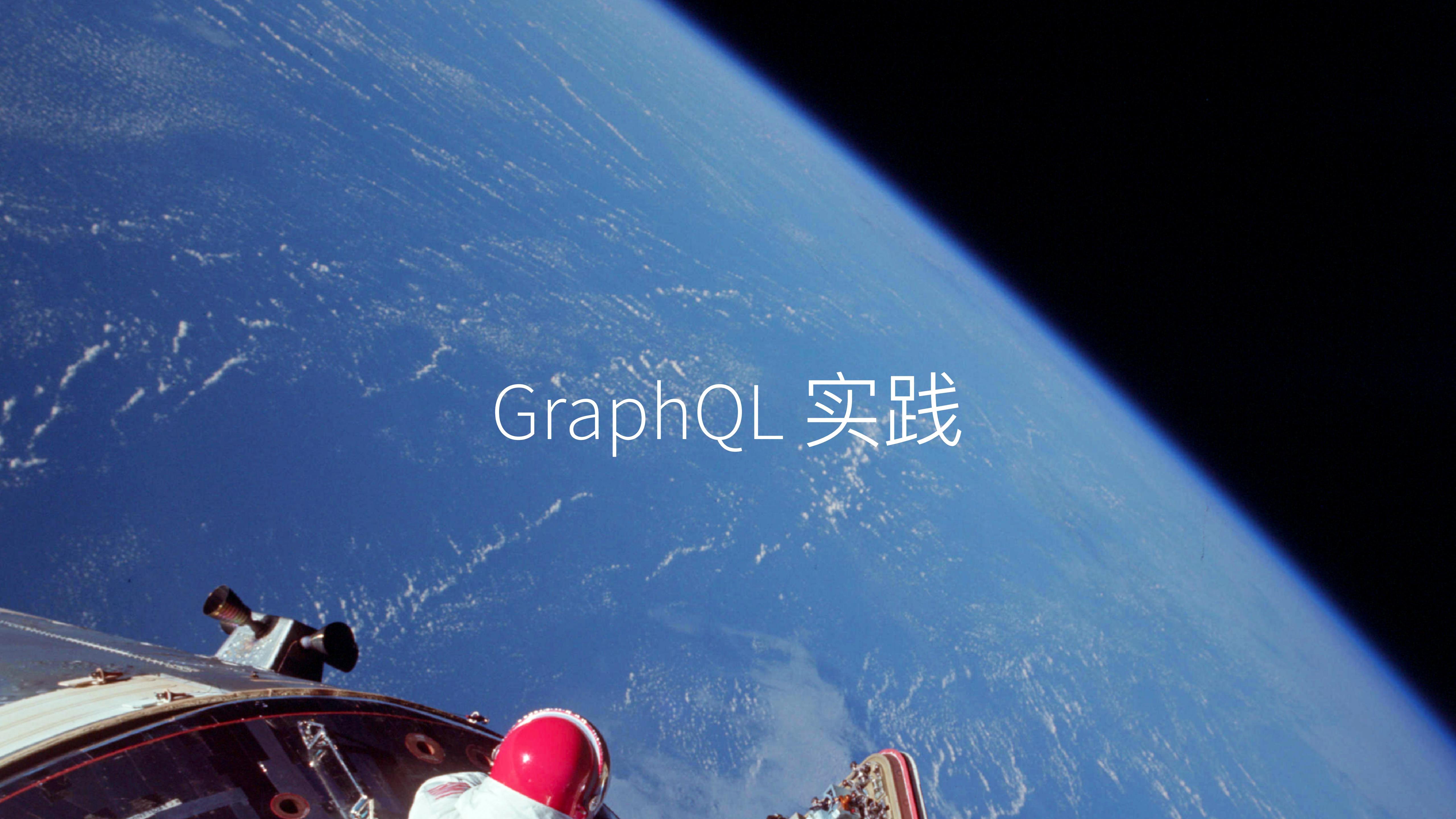
```
query {  
  top {  
    title  
    url  
    by {  
      id  
      karma  
    }  
  }  
}
```

Resolve function

```
function top(root, args) {  
  return StoriesCollection.find()  
    .sort({ score: -1 })  
    .limit(args.limit);  
}
```

GraphQL resolvers ≈ REST endpoints

GraphQL 实践



Goal

Current API - HN REST API [<https://github.com/HackerNews/API>]

—> **Final API** - GraphQL API (on top of HN REST API)

Current App - A simple HN clone [<https://codesandbox.io/s/9n4kMx8x>]

—> **Final App** - Simple HN clone with GraphQL (replacing REST requests)

The screenshot shows the Launchpad GraphQL interface. On the left, there is a code editor with a GraphQL schema definition. The schema includes types for User, Post, and Query, with fields like id, title, name, and author. On the right, there is a GraphiQL playground where a query can be run against the schema.

```

1 // Welcome to Launchpad!
2 // Log in to edit and save pads, and run queries in GraphiQL on the right.
3
4 import {
5   makeExecutableSchema,
6   addMockFunctionsToSchema,
7 } from 'graphql-tools';
8
9 // Construct a schema the usual way, using GraphQL schema language.
10 // This already contains all the information we need to create mocks
11 // of the correct types for any query.
12 const typeDefs = `
13   type User {
14     id: Int!
15     name: String!
16     posts(limit: Int): [Post]
17   }
18
19   type Post {
20     id: Int!
21     title: String!
22     views: Int!
23     author: User!
24   }
25
26   type Query {
27     strings: String!
28     allBoolean: Boolean!
29     anInt: Int!
30     author(id: Int!): User!
31     topPosts(limit: Int): [Post]
32   }
33
34 export const schema = makeExecutableSchema({ typeDefs });
35
36 const mocks = [
37

```

GraphQL **Prettify**

Save Reset Headers

GraphiQL

GraphQL Endpoint: <https://98tq.vzBr.lp.gql.zone/graphql>

New Save Download Fork

Simple mocking example

heller Sign out

The screenshot shows the CodeSandbox interface. It features a sidebar for project management and a main area for editing code. The code in the editor is a React component named index.js that uses the `isomorphic-fetch` library to load data from the HN REST API and render it using a `StoriesListWithData` component.

```

1 import React from 'react';
2 import { render } from 'react-dom';
3 import { isomorphicFetch } from 'isomorphic-fetch';
4 import StoriesListWithData from './StoriesListWithData';
5
6 const styles = {
7   fontFamily: 'sans-serif',
8   textAlign: 'center',
9 };
10
11 const App = () =>
12   <div style={styles}>
13     <StoriesListWithData />
14   </div>;
15
16 render(<App />, document.getElementById('root'));
17

```

Project

Title: HN REST example

Description: Example of loading data from the HN REST API for a React component

Author: heller

Statistics: 0 likes, 1 fork, 1 view

Files

- HN REST example
 - StoriesList.js
 - StoriesListWithData.js
 - index.html
 - index.js

Dependencies

How to make a friend fast by trurl42
Linus: "I no longer feel like I can trust 'init' to do the same thing" by cmst
When not to use deep learning by jpn
Underrated Startup Success Factors by yinso
California Health and Human Services Open Data Portal by ruffrey
Show HN: Using functions to construct Regex in Python by logf
Show HN: Very basic blockchain-free cryptocurrency PoC in Python by Graa
Pterodactyl - An Open-Source Game Server Management Panel by daneeverit
Introductory bulletlist detection for non-technical managers by sambeau
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Using chip memory more efficiently by redtuesday
Ten years after first shipping Openmoko Neo1973 by richardboegli
Binary co-founder blames "corrupted" media for his resignation offer by craigkersiens
Counterintuitive problem: People In a room keep giving dollars to random others by agsalose
Porting NetBSD to Allwinner H3 SoCs by zdw
Sea Peacock by bane
A (Detailed) Elliptic Curve Cryptography Tutorial by 60c12c16
How startups such as Dropbox, Airbnb, Groupon acquired their first users by catherinezng
Show HN: Console based email client with Lua scripting by stevekemp

Sign in with GitHub

launchpad.graphql.com

codesandbox.io

REST

```
function fetchAndParse(uri) {
  return fetch(uri).then(res => res.json());
}

function fetchTopstories() {
  return fetchAndParse(`${
    HN_URI
  }/topstories.json`)
    .then(result => result.slice(0, NUM_RESULTS))
    .then(result => Promise.all(result.map(item => fetchItem(item))));
}

function fetchItem(itemId) {
  return fetchAndParse(`${
    HN_URI
  }/item/${itemId}.json`).then(res => {
    return fetchUser(res.by).then(user => {
      res.by = user;
      return res;
    });
  });
}

function fetchUser(userId) {
  return fetchAndParse(`${
    HN_URI
  }/user/${userId}.json`);
}

export default class StoriesListWithData extends React.Component {
  constructor(props) {
    super(props);
    this.state = {
      data: {
        loading: true,
      },
    };
  }

  componentDidMount() {
    this.loadData();
  }

  render() {
    return <StoriesList data={this.state.data} />;
  }

  loadData() {
    fetchTopstories().then(result => {
      this.setState({
        data: {
          loading: false,
          top: result,
        },
      });
    });
  }
}
```

GraphQL



```
graphql(gql`{  
  top {  
    title  
    url  
    by {  
      id  
      about  
    }  
  }  
}`)(StoriesList)
```



Demo

当前前端工程师听到GraphQL时



GraphQL: 是一个规范, 不是一个实现

S E R V E R S

- Node.js
- Ruby
- Python
- Scala
- Java
- Erlang

C L I E N T S

- Plain HTTP request
- Apollo
- Relay
- Apollo iOS
- Apollo Android

...and more

T O O L S

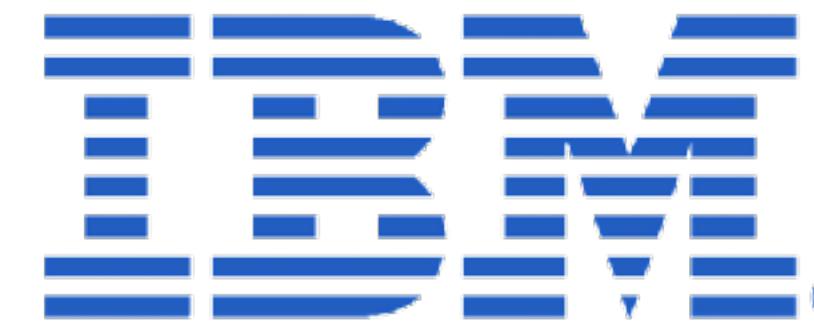
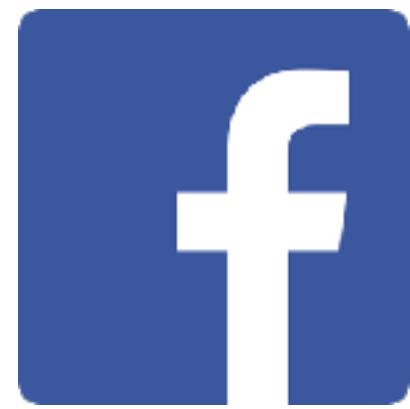
- API explorer (GraphiQL)
- Editor autocomplete
- Query validation
- Mocking
- Performance analysis
- Code generation

Apollo: a community building GraphQL tools and libraries

- **apollo-client**: JS, React, Angular, Ember, Vue, etc.
- **apollo-ios**: A GraphQL client for iOS
- **apollo-android**: A GraphQL client for Android
- **graphql-server**: A GraphQL server for Node.js
- **graphql-tools**: A library of useful tools for GraphQL
- **apollo-codegen**: Generates Flow, Typescript typings for GraphQL



Who is using GraphQL?



The New York Times

intuit.



P Product Hunt

ticketmaster

credit karma™



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graphql.org

apollodata.com

howtographql.com



@helperjs

成功!





Jonas Helper
@helperjs
github.com/helper

