Jarvis

O gateway em graphql para as APIs do Globoplay

Marcelo Nalon

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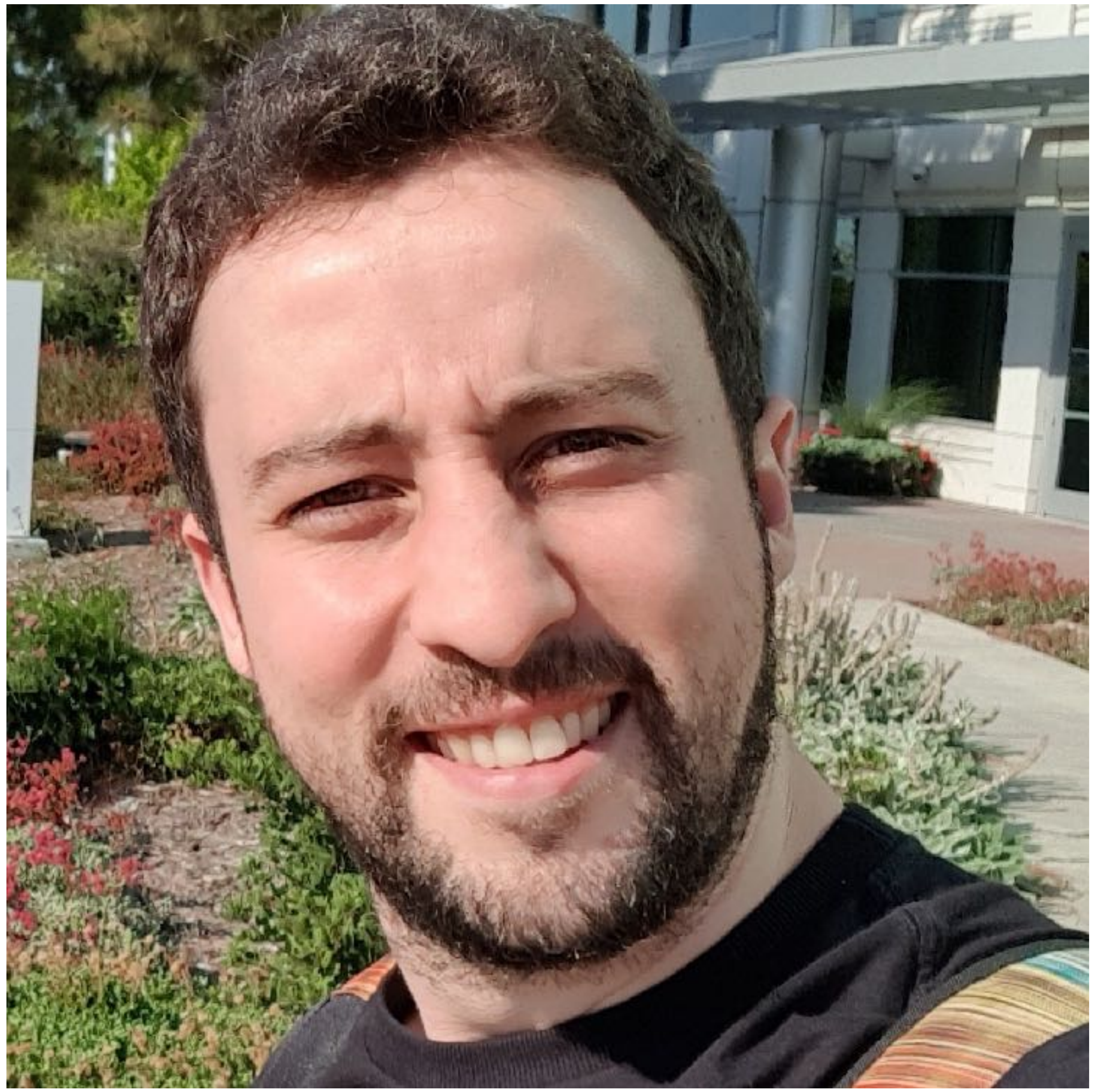
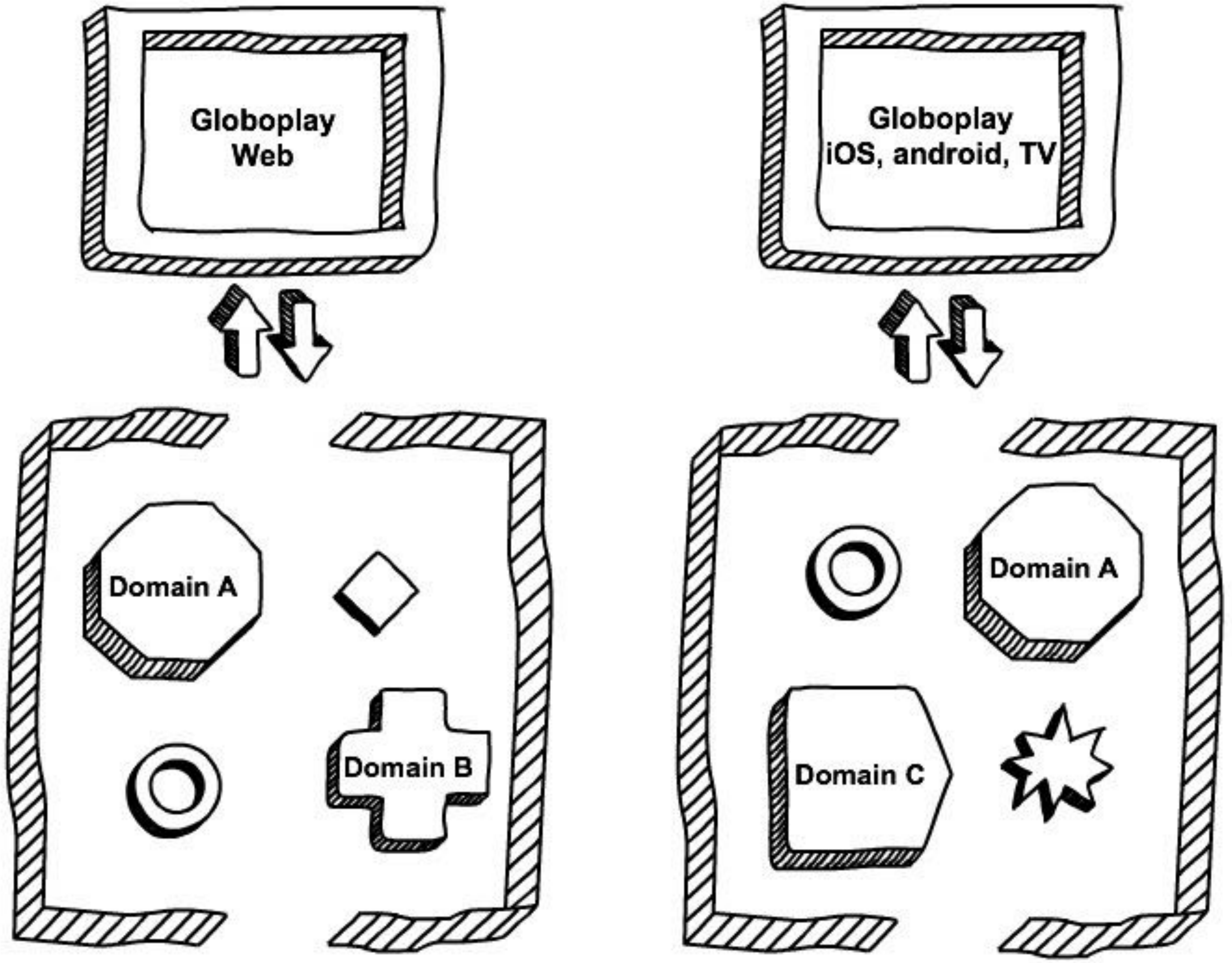


AGENDA

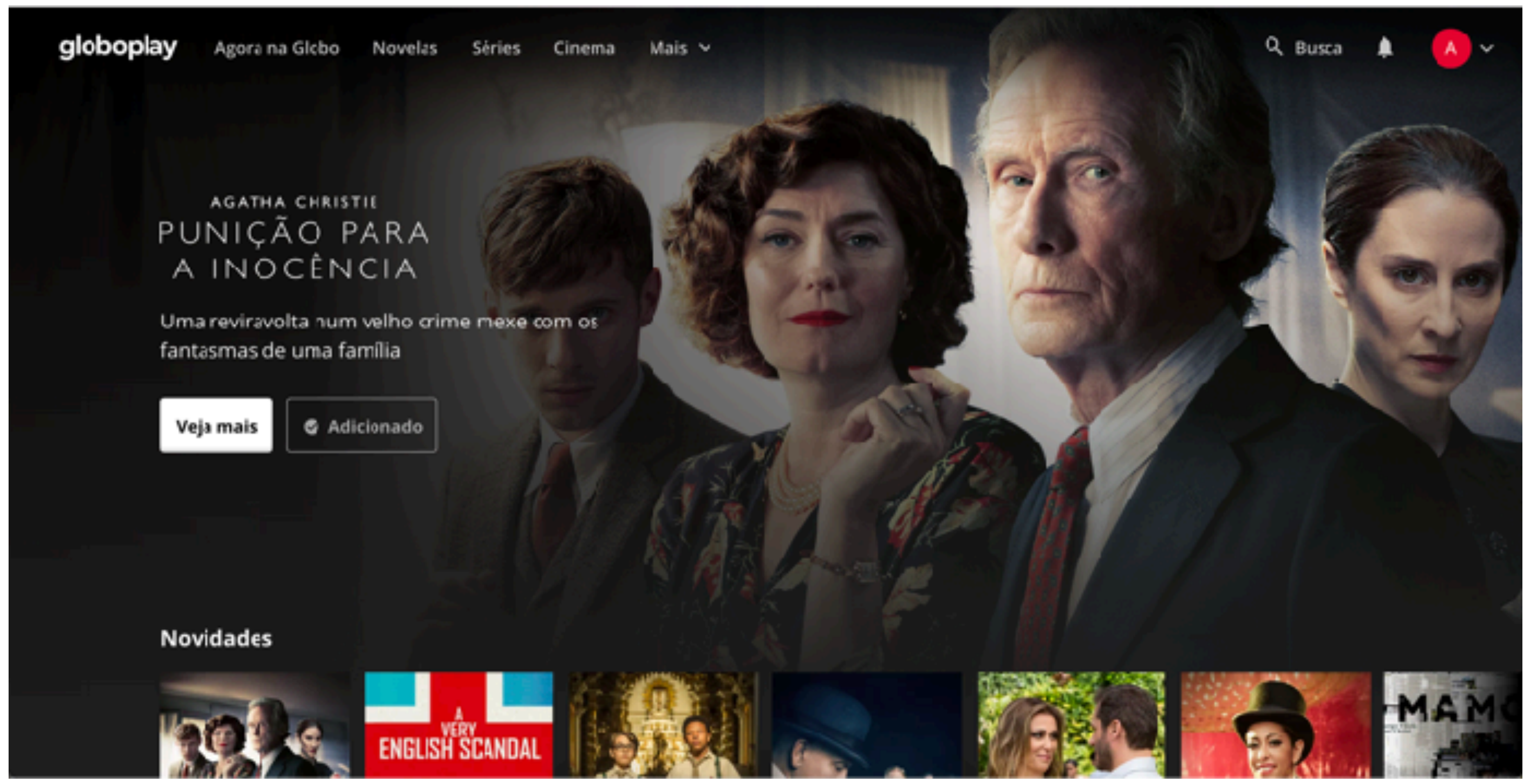
- Breve contexto e motivações para evoluir a arquitetura do BE
- Por que GRAPHQL?
- Principais features do Apollo Server

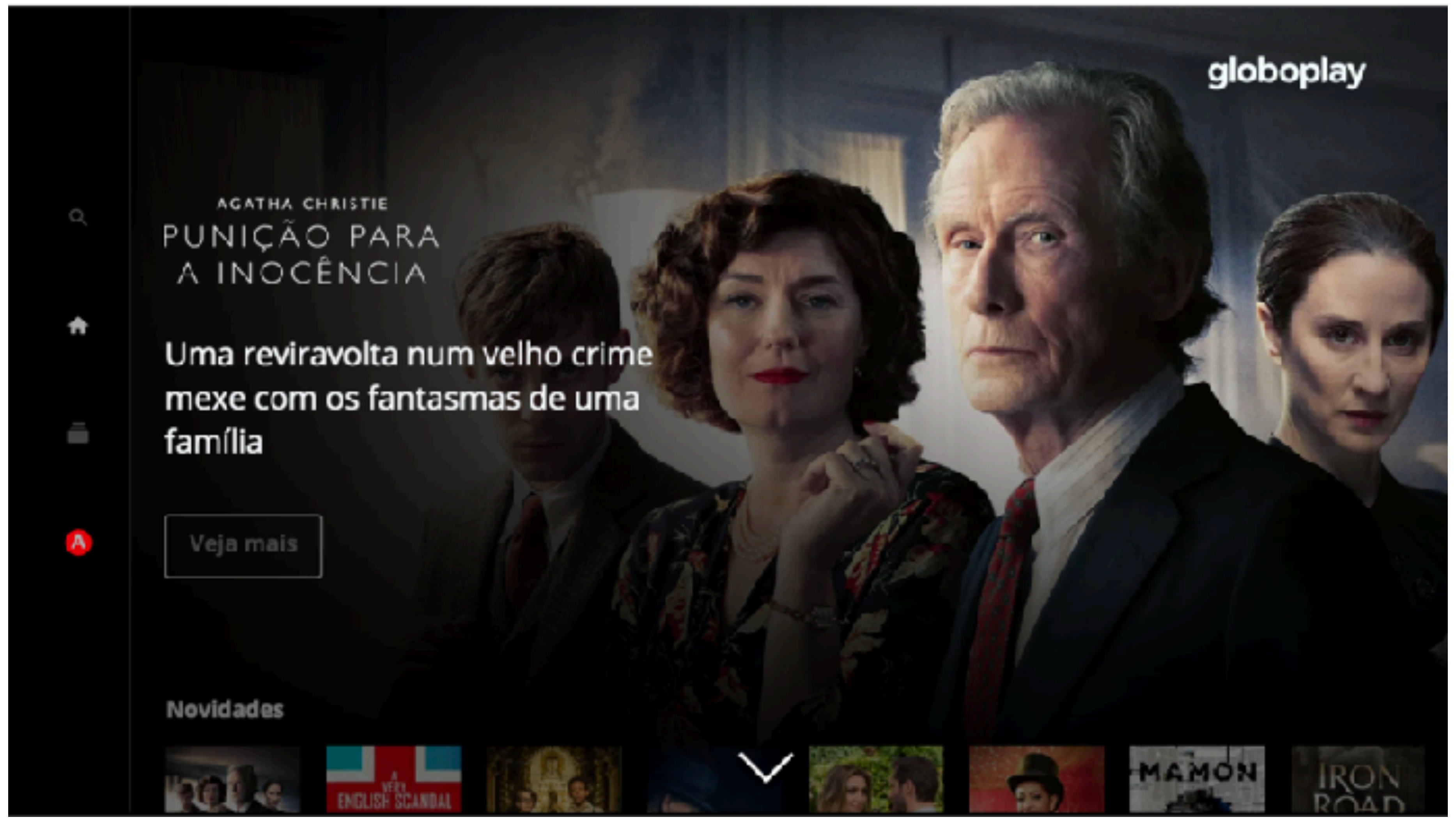
globoplay
the Voice Brasil
Meu Passado me Condena 2
O Filme
Segundo Sol
Tropa de Elite 2
O inimigo agora é outro
JN
The Good Doctor
No Ar
O Palhaço

Alguns meses atrás...

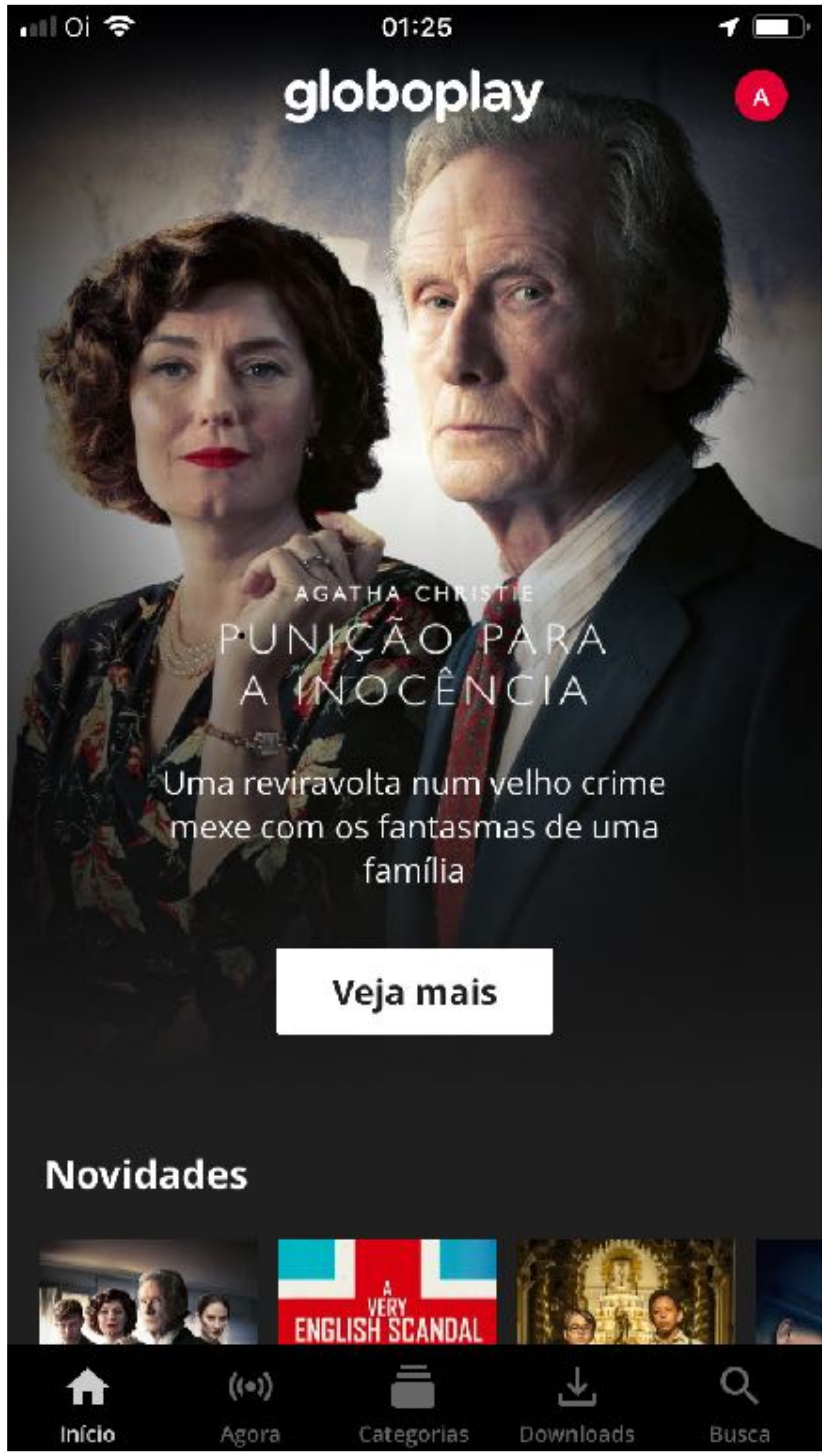


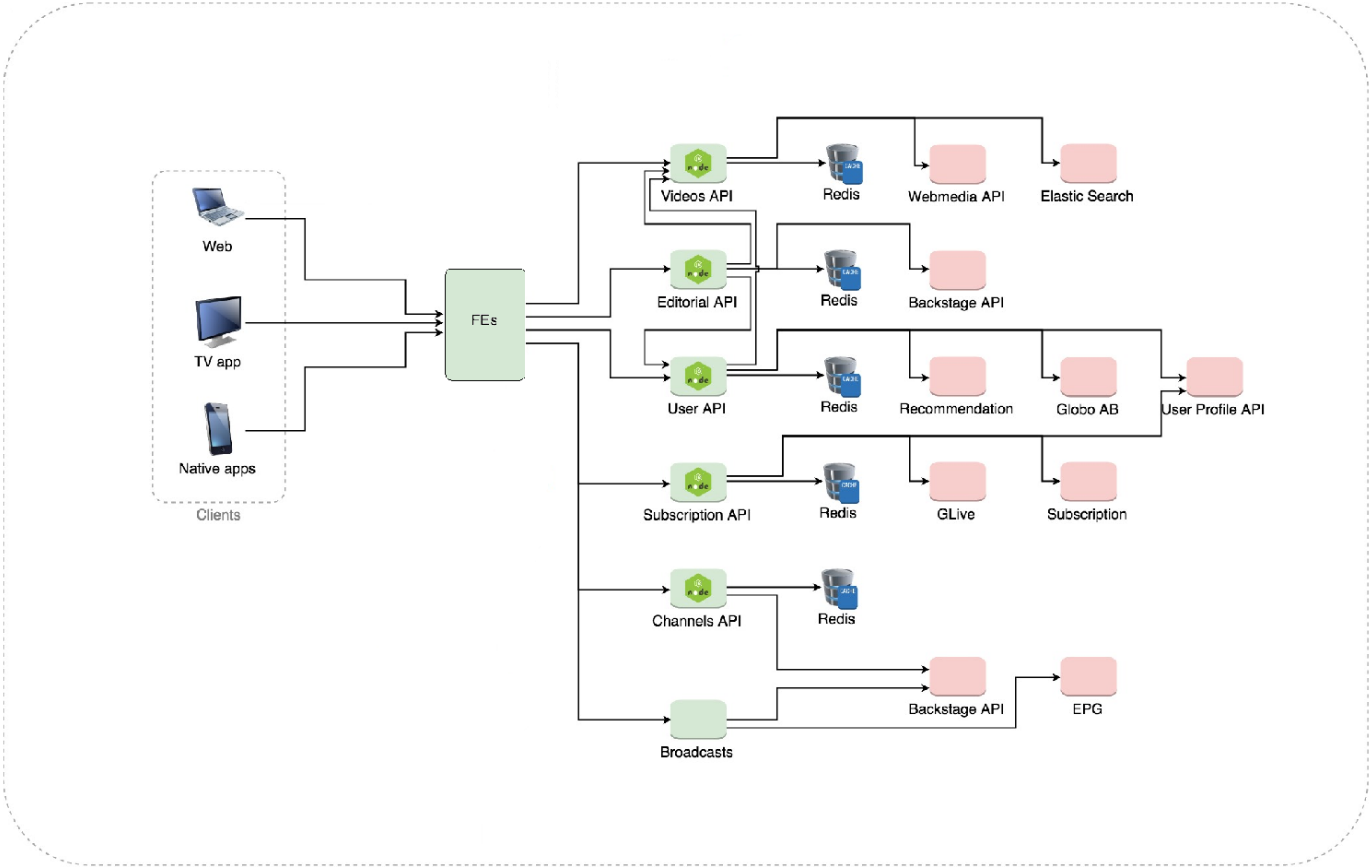
Ubiquidade!




globoplay
AGATHA CHRISTIE
PUNIÇÃO PARA A INOCÊNCIA
Uma reviravolta num velho crime mexe com os fantasmas de uma família
Veja mais
Novidades

SMART TV





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GraphQL

https://graphql.org/

ATLASSIAN

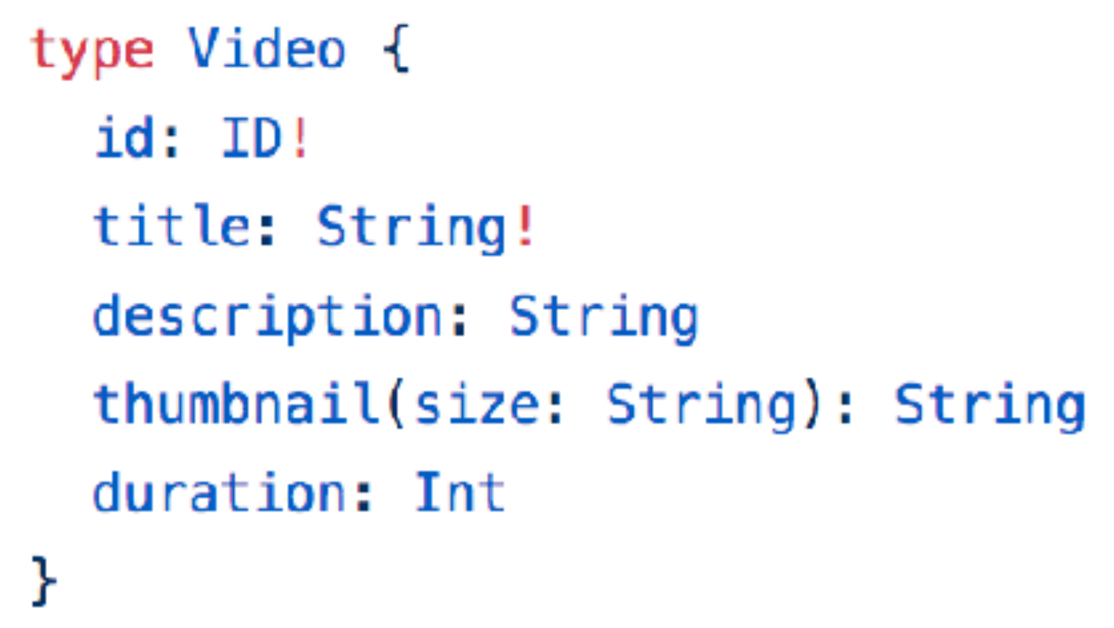
sky

GetNinjas

PayPal

coursera

- Descrição clara dos dados https://graphql.github.io/learn/schema/



```
type Video {
  id: ID!
  title: String!
  description: String
  thumbnail(size: String): String
  duration: Int
}
```

- Descrição clara dos dados https://graphql.github.io/learn/schema/

```
type Video {
  id: ID!
  title: String!
  description: String
  thumbnail(size: String): String
  duration: Int
}
```

- Fácil evolução da API (sem necessidade de versionamento)

```
type Video {
  id: ID!
  title: String!
  description: String
  thumbnail(size: String): String
  duration: Int
  program: String
}
```

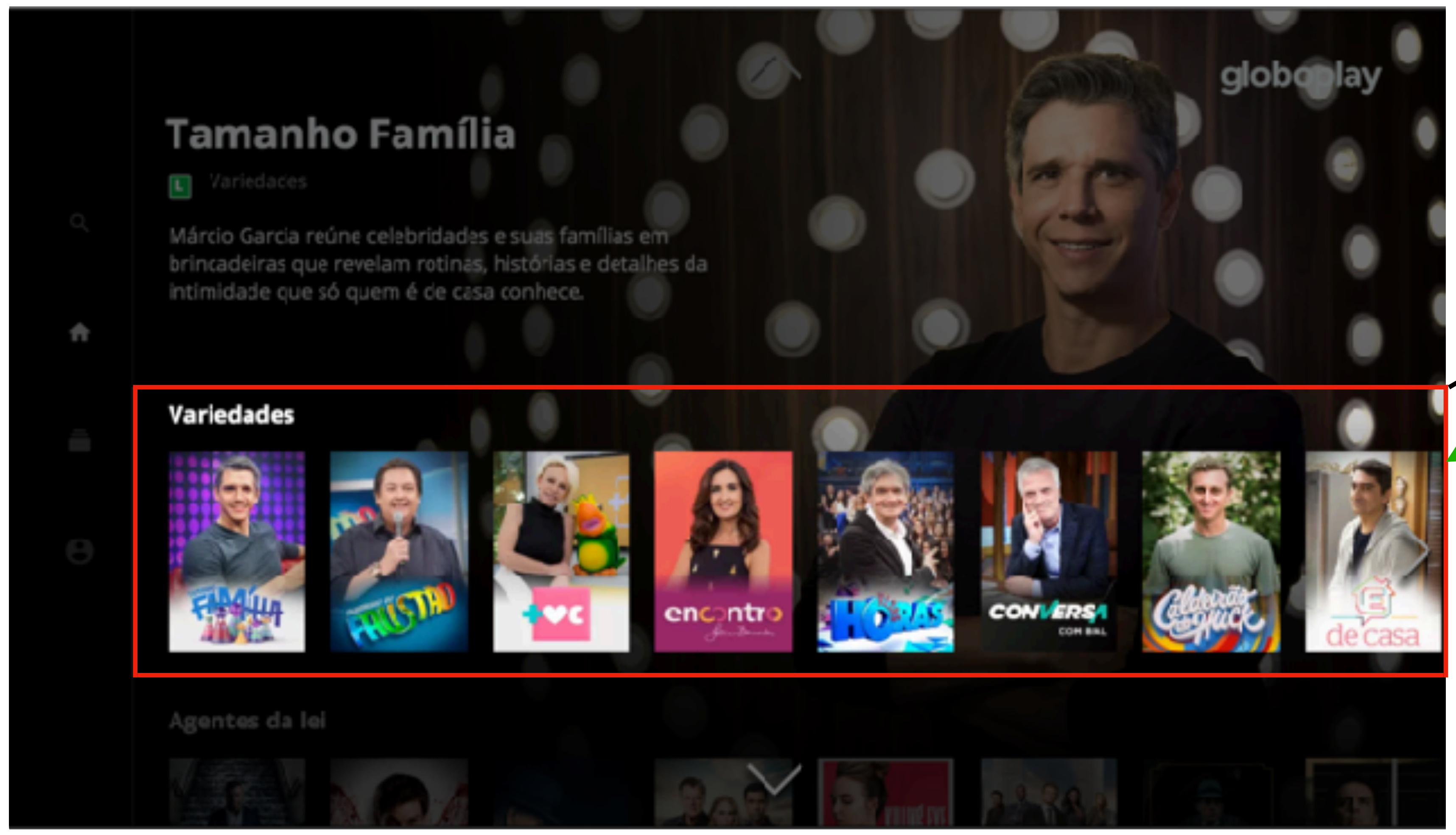
```
type Program {
  id: ID!
  title: String
}

type Video {
  id: ID!
  title: String!
  description: String
  thumbnail(size: String): String
  duration: Int
  program: String @deprecated
  relatedProgram: Program
}
```

- Ask for what you want

GraphQL

```
query getOffer{
  offer(id:"xyz"){
    headline
    items{
        poster{
           tv
        }
    }
  }
}
```

```
{
  "data": {
    "offer": {
      "headline": "Variedades",
      "items": [
        {
          "poster": {
            "tv": "http://foo.bar/tamanhofamilia.jpg"
          }
        },
        ...
      ]
    }
  }
}
```

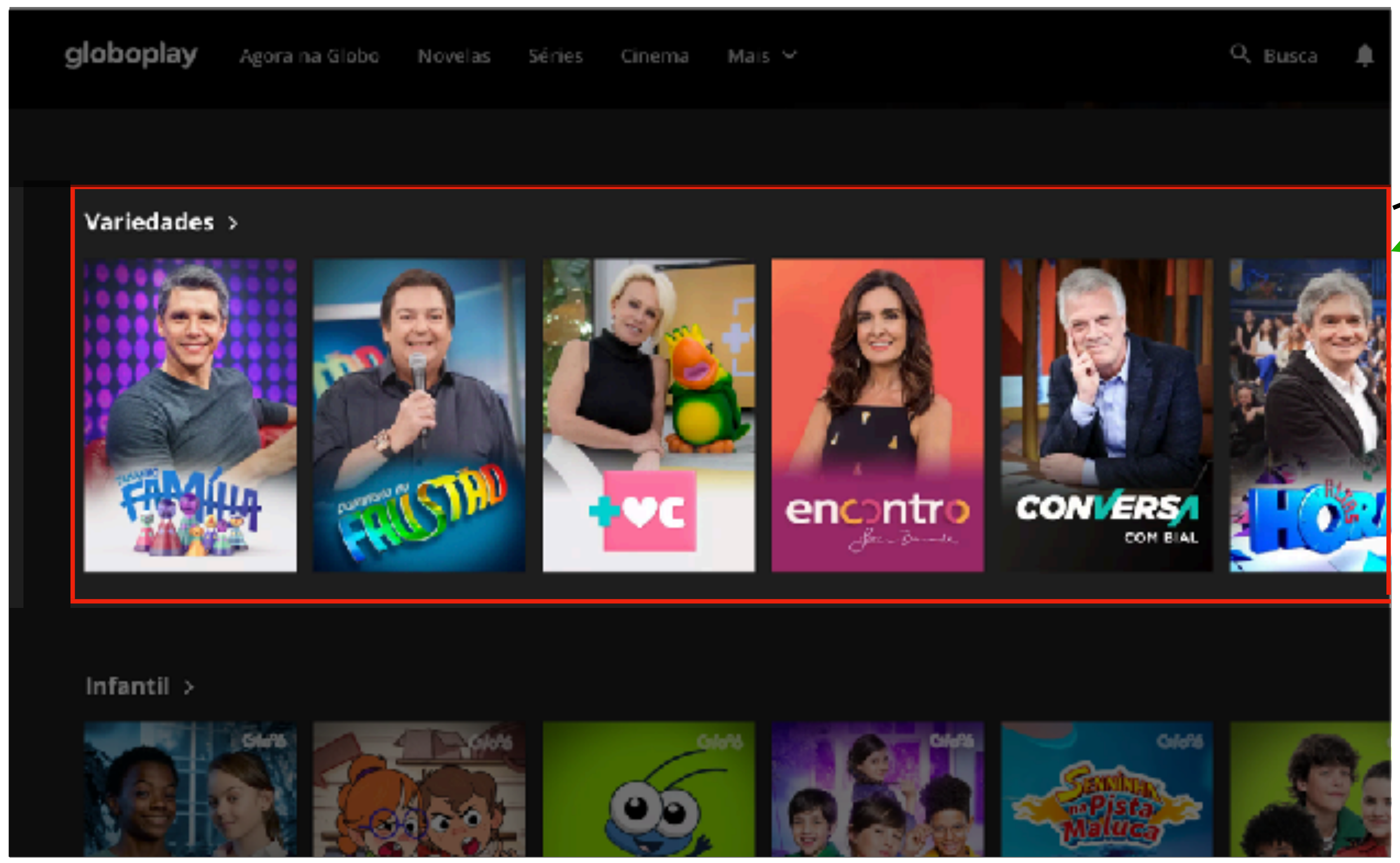


Márcio Garcia reúne celebridades e suas famílias em brincadeiras que revelam rotinas, histórias e detalhes da intimidade que só quem é de casa conhece.

- Ask for what you want

```
query getOffer{
    offer(id:"xyz"){
        headline
        url
        items{
            poster{
                web
            }
        }
    }
}
```

GraphQL



```
{
  "data": {
    "offer": {
      "headline": "Variedades",
      "url": "http://globoplay.com.br/variedades",
      "items": [
        {
          "id": "9529",
          "poster": {
            "web": "http://foo.bar/tamanhofamilia.jpg"
          }
        },
        ...
      ]
    }
  }
}
```

- Ask for what you want

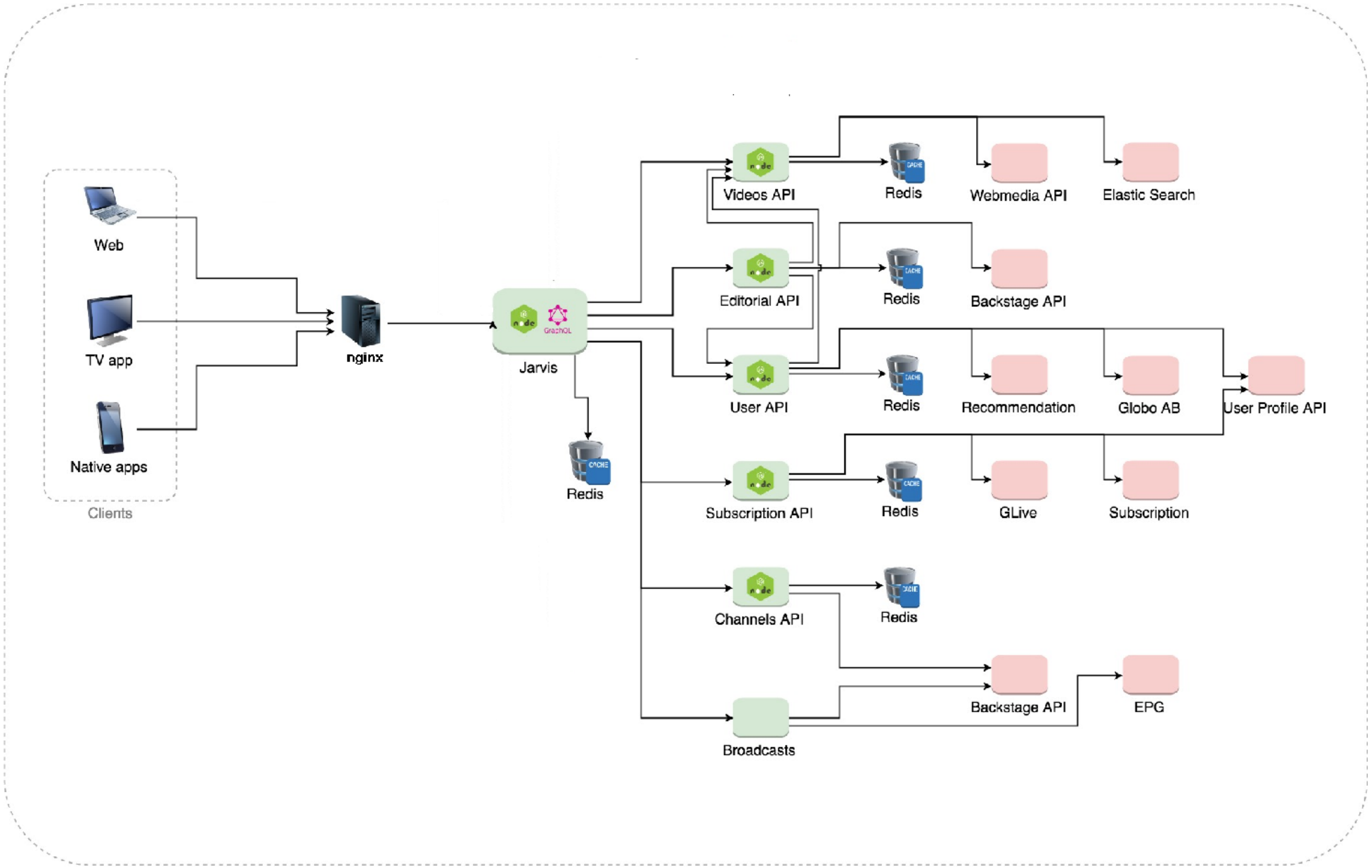
✓ Redução do payload (remoção de dados desnecessários na resposta)

✓ Resposta altamente previsível

✓ Possibilidade de obter vários recursos em uma única requisição

```
query getOfferAndHighlight{
  offer(id:"xyz"){
     items{
       poster{
         tv
       }
     }
  }
  highlight(id:"abc"){
     headline
     cover{
        tv
     }
  }
}
```

alright, what's our next move?



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APOLLO
PLATFORM
APOLLO SERVER
SCHEMA REGISTRY
OPERATION REGISTRY
EXECUTION GATEWAY
IDE PLUGINS
APOLLO CLIENT
TRACE WAREHOUSE

EXECUTION GATEWAY
APOLLO SERVER
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APOLLO CLIENT
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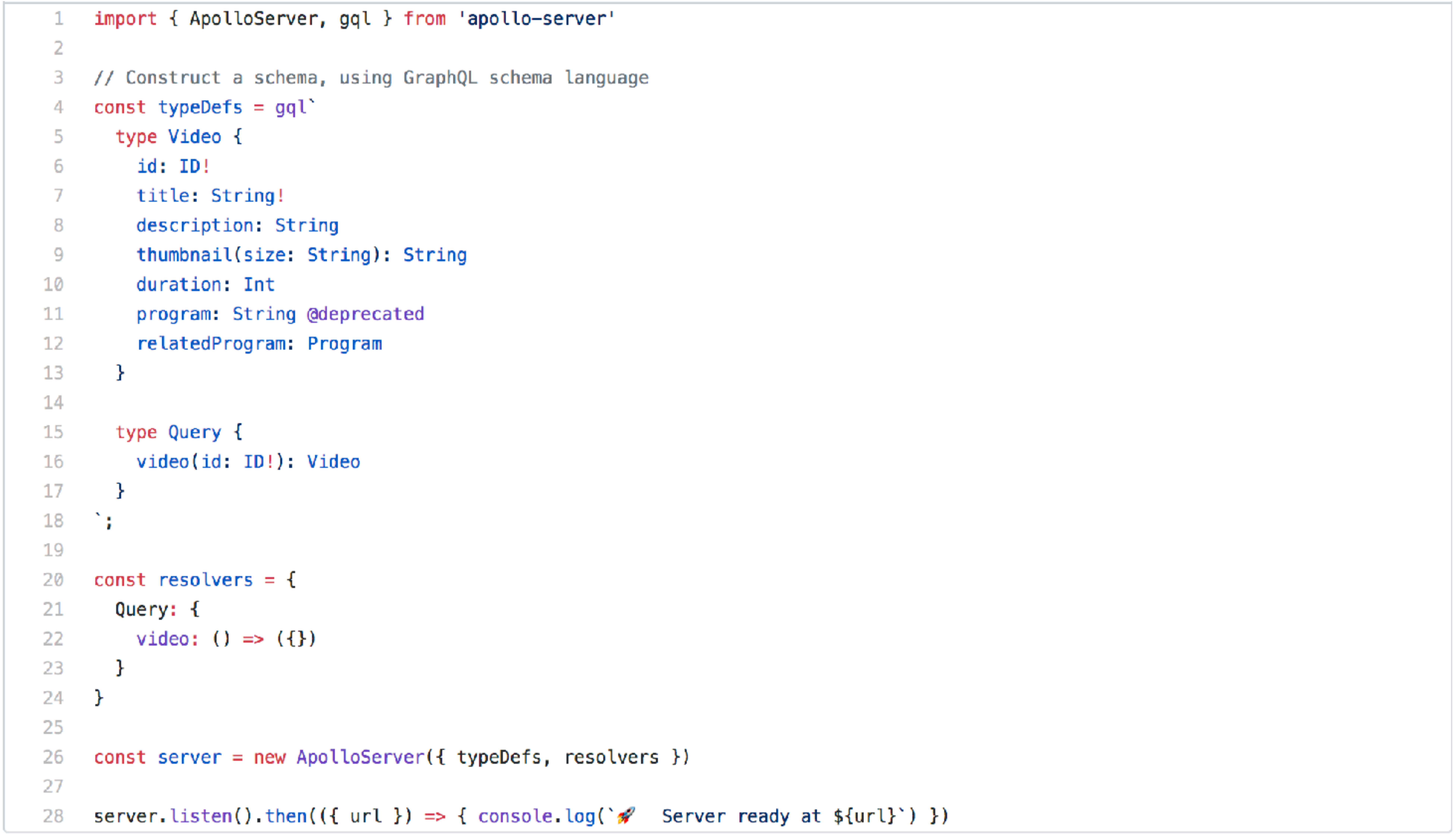
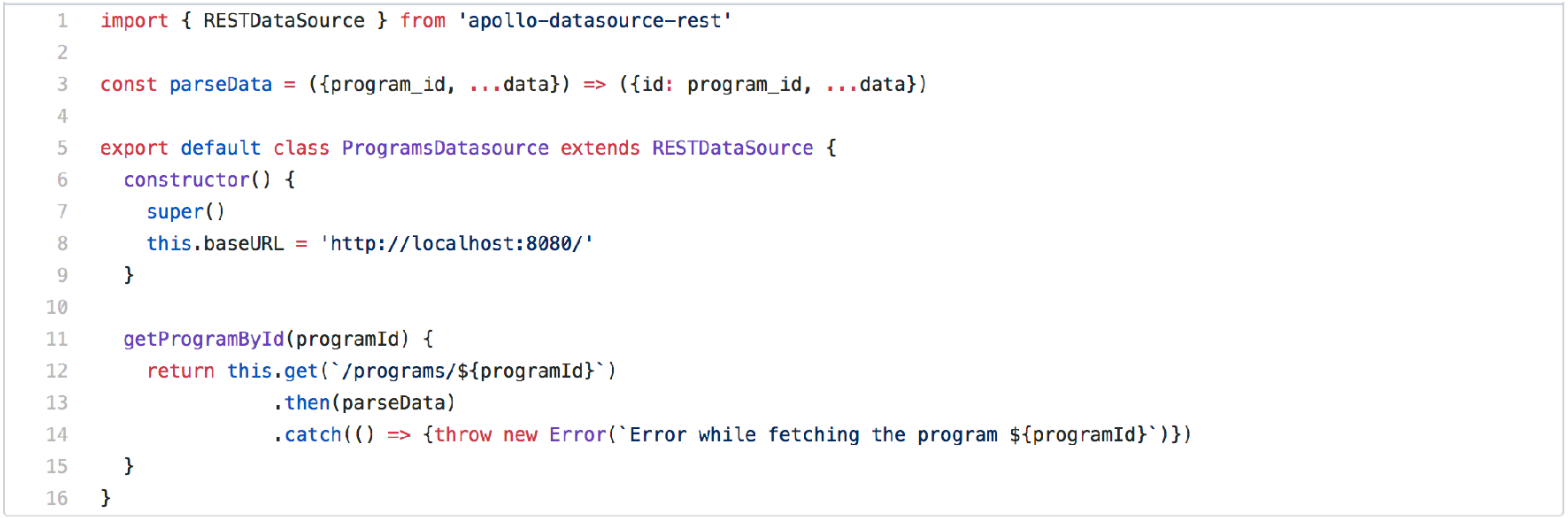
TRACE WAREHOUSE

apollo-server



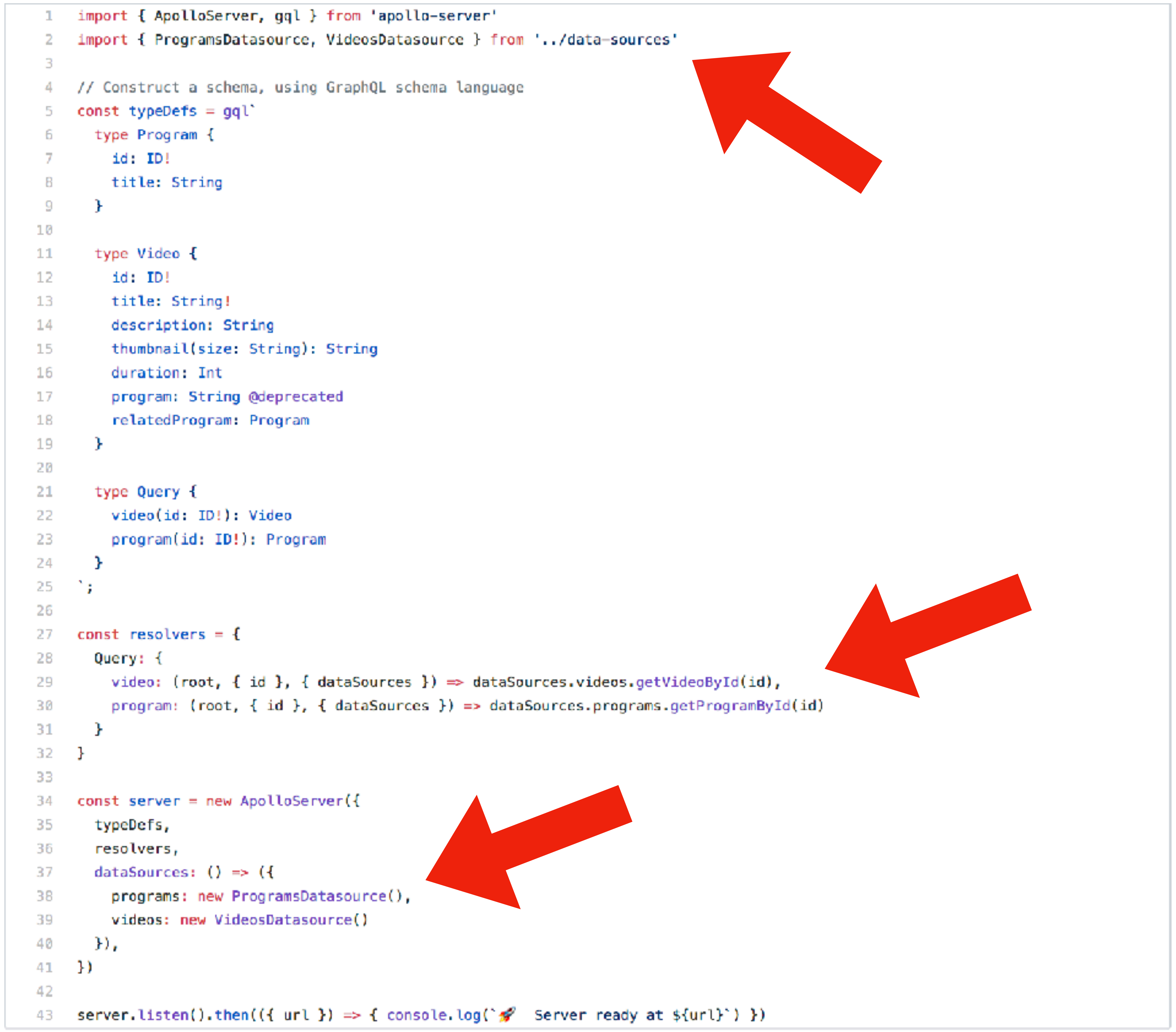
```
import { ApolloServer, gql } from 'apollo-server'

// Construct a schema, using GraphQL schema language
const typeDefs = gql`
  type Video {
    id: ID!
    title: String!
    description: String
    thumbnail(size: String): String
    duration: Int
    program: String @deprecated
    relatedProgram: Program
  }

  type Query {
    video(id: ID!): Video
  }
`;

const resolvers = {
  Query: {
    video: () => ({})
  }
}

const server = new ApolloServer({ typeDefs, resolvers })

server.listen().then(({ url }) => { console.log(`🚀  Server ready at ${url}`) })
```

apollo-datasource-rest



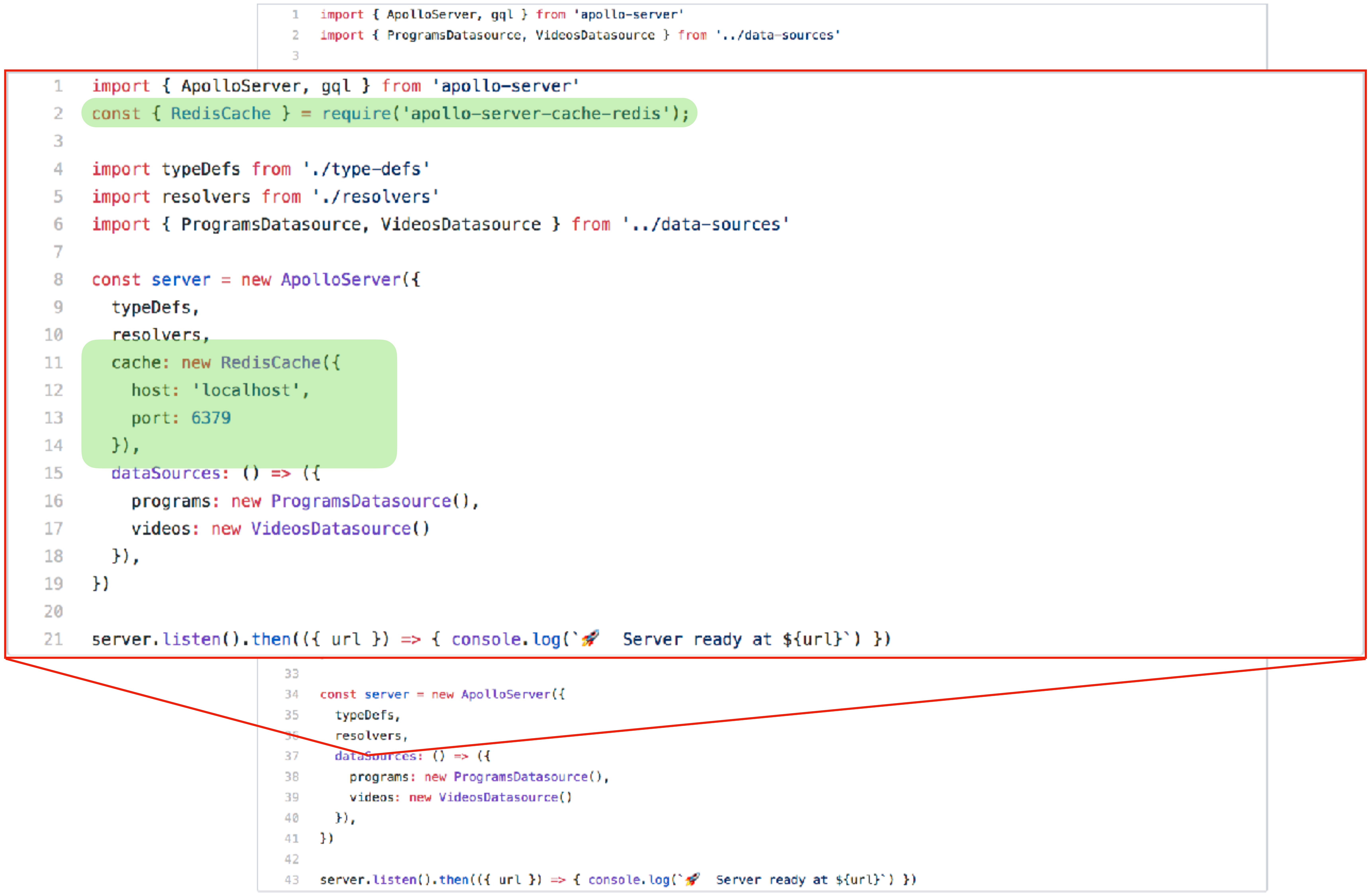
```
import { RESTDataSource } from 'apollo-datasource-rest'

const parseData = ({program_id, ...data}) => ({id: program_id, ...data})

export default class ProgramsDatasource extends RESTDataSource {
  constructor() {
    super()
    this.baseURL = 'http://localhost:8080/'
  }

  getProgramById(programId) {
    return this.get(`/programs/${programId}`)
             .then(parseData)
             .catch(() => {throw new Error(`Error while fetching the program ${programId}`)})
  }
}
```

apollo-datasource-rest



```
import { ApolloServer, gql } from 'apollo-server'
import { ProgramsDatasource, VideosDatasource } from '../data-sources'

// Construct a schema, using GraphQL schema language
const typeDefs = gql`
  type Program {
    id: ID!
    title: String
  }

  type Video {
    id: ID!
    title: String!
    description: String
    thumbnail(size: String): String
    duration: Int
    program: String @deprecated
    relatedProgram: Program
  }

  type Query {
    video(id: ID!): Video
    program(id: ID!): Program
  }
`;

const resolvers = {
  Query: {
    video: (root, { id }, { dataSources }) => dataSources.videos.getVideoById(id),
    program: (root, { id }, { dataSources }) => dataSources.programs.getProgramById(id)
  }
}

const server = new ApolloServer({
  typeDefs,
  resolvers,
  dataSources: () => ({
    programs: new ProgramsDatasource(),
    videos: new VideosDatasource()
  }),
})

server.listen().then(({ url }) => { console.log(`🚀  Server ready at ${url}`) })
```

apollo-datasource-rest

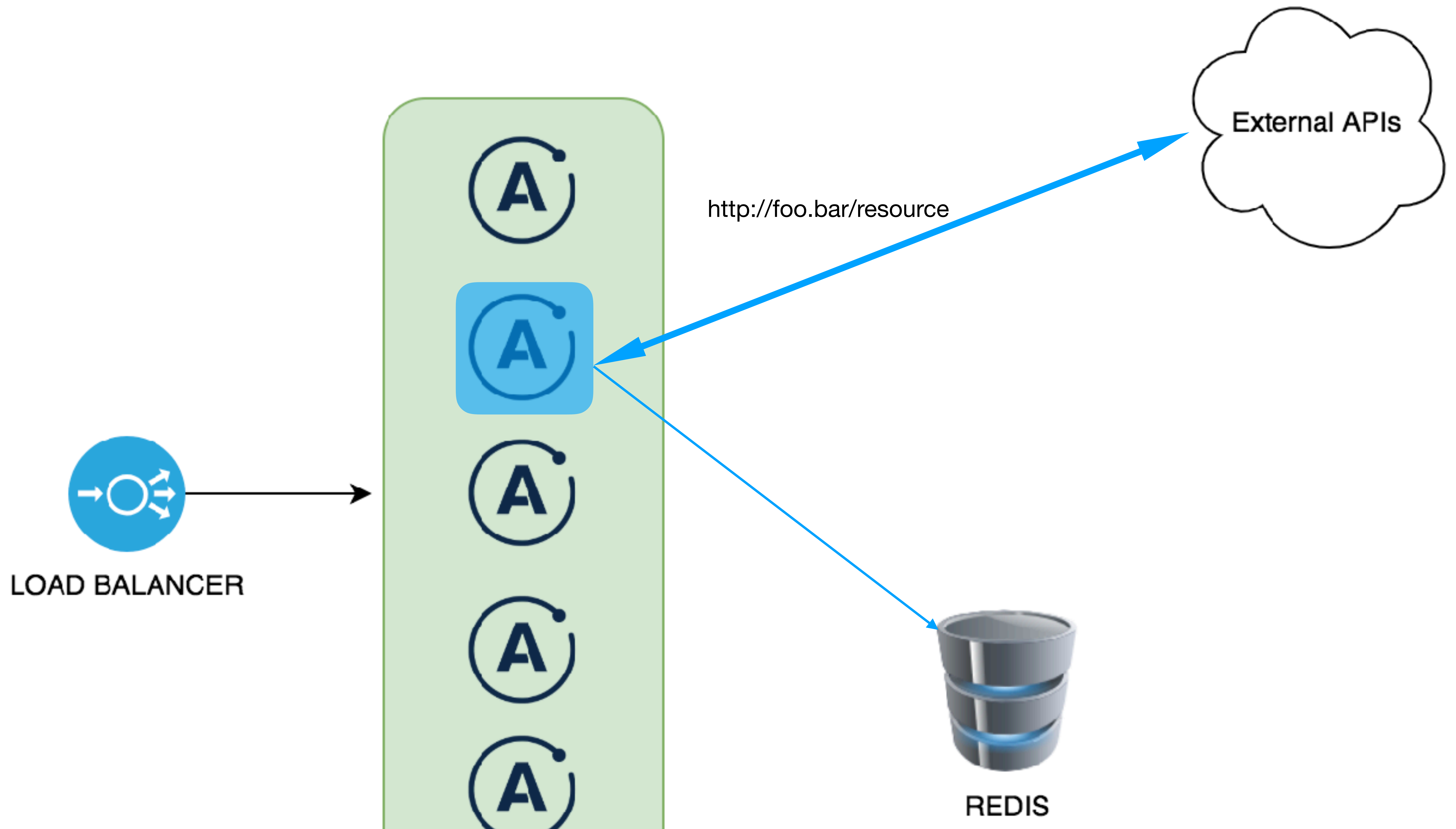


```
import { ApolloServer, gql } from 'apollo-server'
import { ProgramsDatasource, VideosDatasource } from '../data-sources'

```

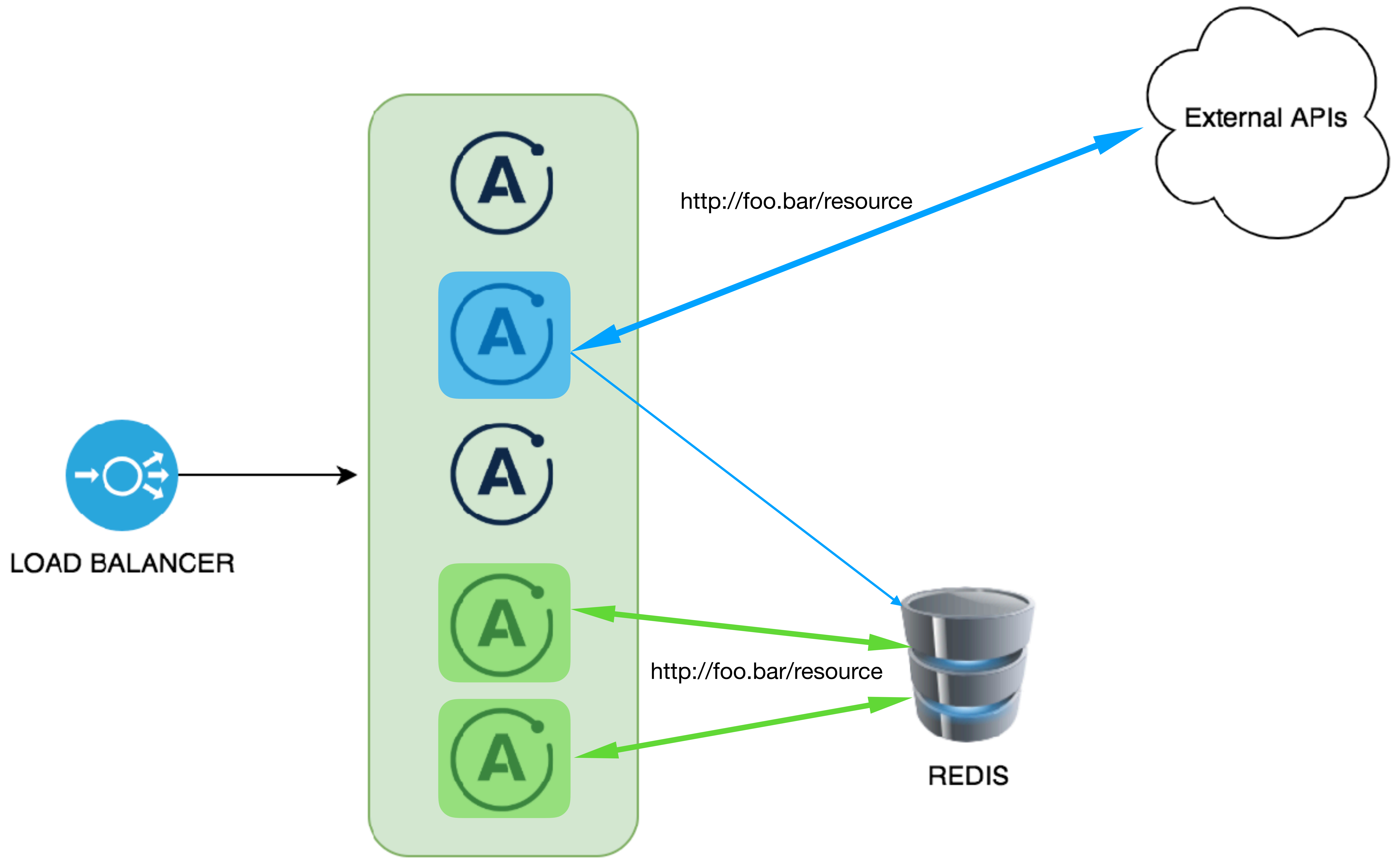
```
import { ApolloServer, gql } from 'apollo-server'
const { RedisCache } = require('apollo-server-cache-redis');

import typeDefs from './type-defs'
import resolvers from './resolvers'
import { ProgramsDatasource, VideosDatasource } from '../data-sources'

const server = new ApolloServer({
  typeDefs,
  resolvers,
  cache: new RedisCache({
    host: 'localhost',
    port: 6379
  }),
  dataSources: () => ({
    programs: new ProgramsDatasource(),
    videos: new VideosDatasource()
  }),
})

server.listen().then(({ url }) => { console.log(`🚀  Server ready at ${url}`) })
```

```

const server = new ApolloServer({
  typeDefs,
  resolvers,
  dataSources: () => ({
    programs: new ProgramsDatasource(),
    videos: new VideosDatasource()
  }),
})

server.listen().then(({ url }) => { console.log(`🚀  Server ready at ${url}`) })
```

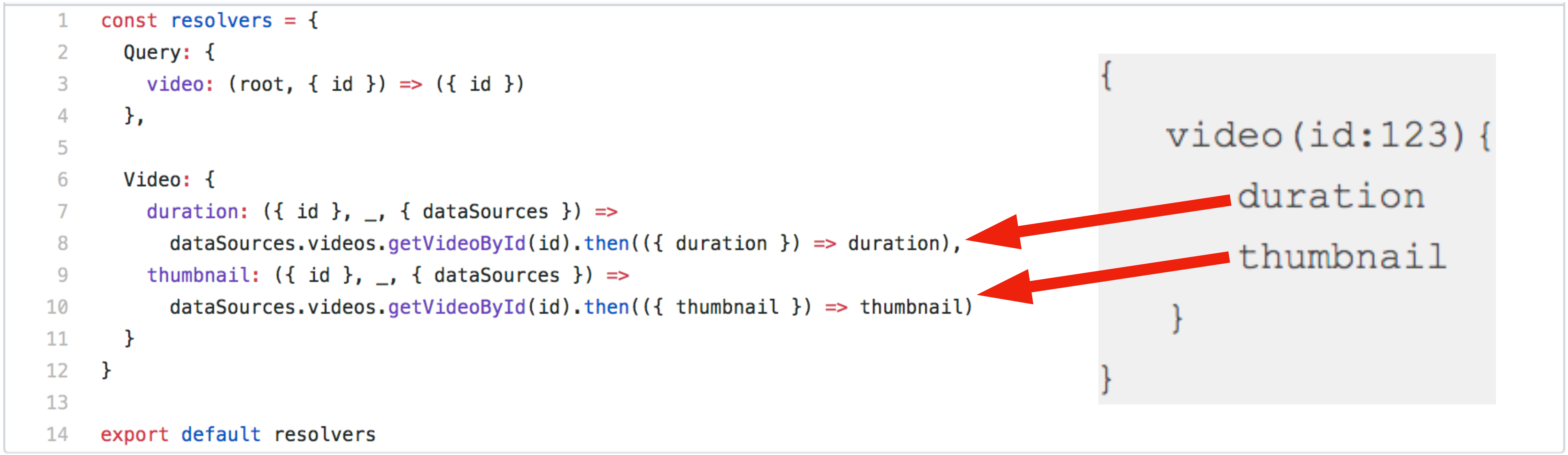
apollo-datasource-rest (cache)



apollo-datasource-rest (cache)



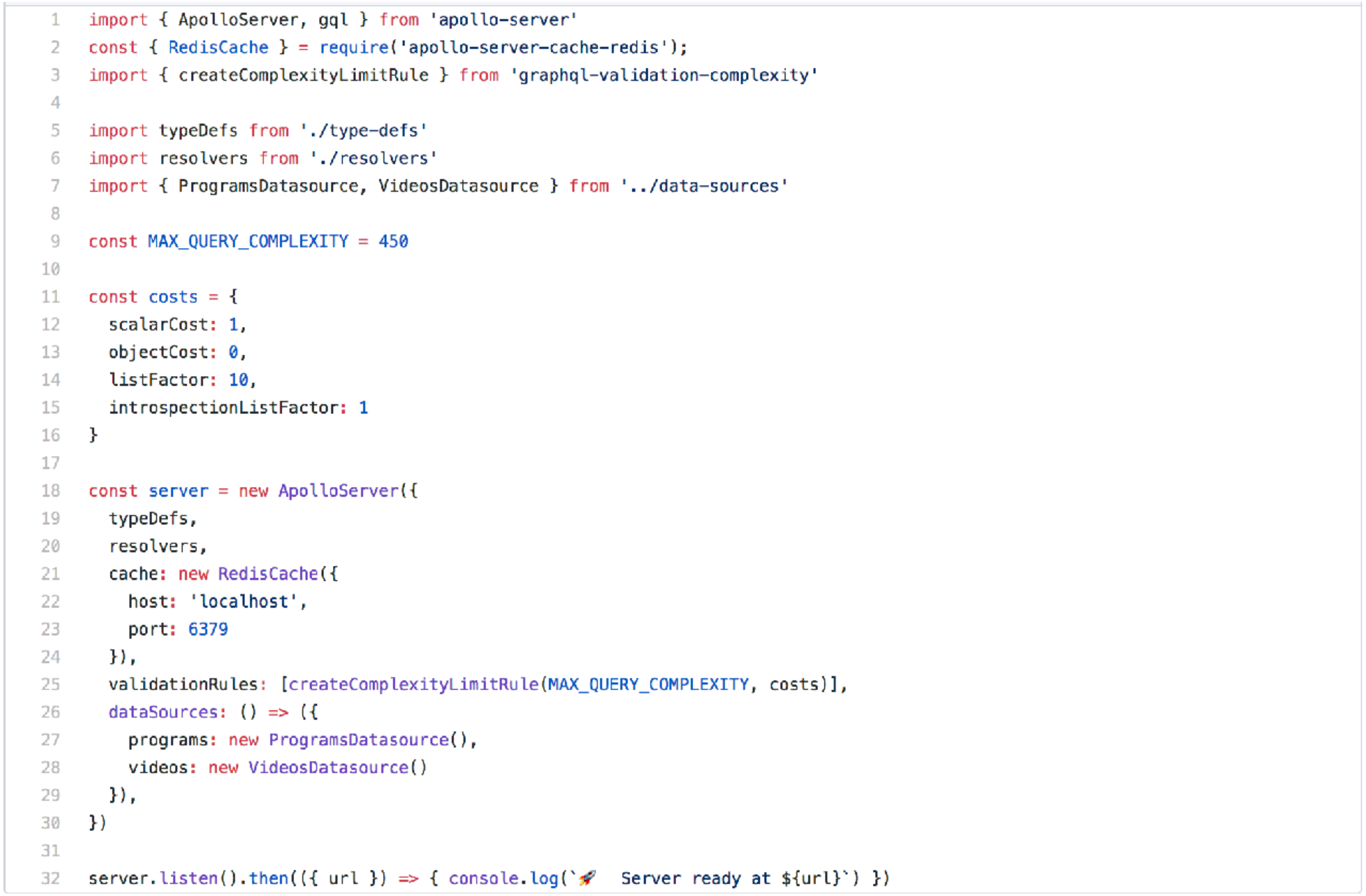
apollo-datasource-rest (memoization)



```
const resolvers = {
  Query: {
    video: (root, { id }) => ({ id })
  },

  Video: {
    duration: ({ id }, _, { dataSources }) =>
      dataSources.videos.getVideoById(id).then(({ duration }) => duration),
    thumbnail: ({ id }, _, { dataSources }) =>
      dataSources.videos.getVideoById(id).then(({ thumbnail }) => thumbnail)
  }
}

export default resolvers
```

```
{
  video(id:123){
    duration
    thumbnail
  }
}
```

análise de custo da query de consulta



```javascript
import { ApolloServer, gql } from 'apollo-server'
const { RedisCache } = require('apollo-server-cache-redis');
import { createComplexityLimitRule } from 'graphql-validation-complexity'

import typeDefs from './type-defs'
import resolvers from './resolvers'
import { ProgramsDatasource, VideosDatasource } from '../data-sources'

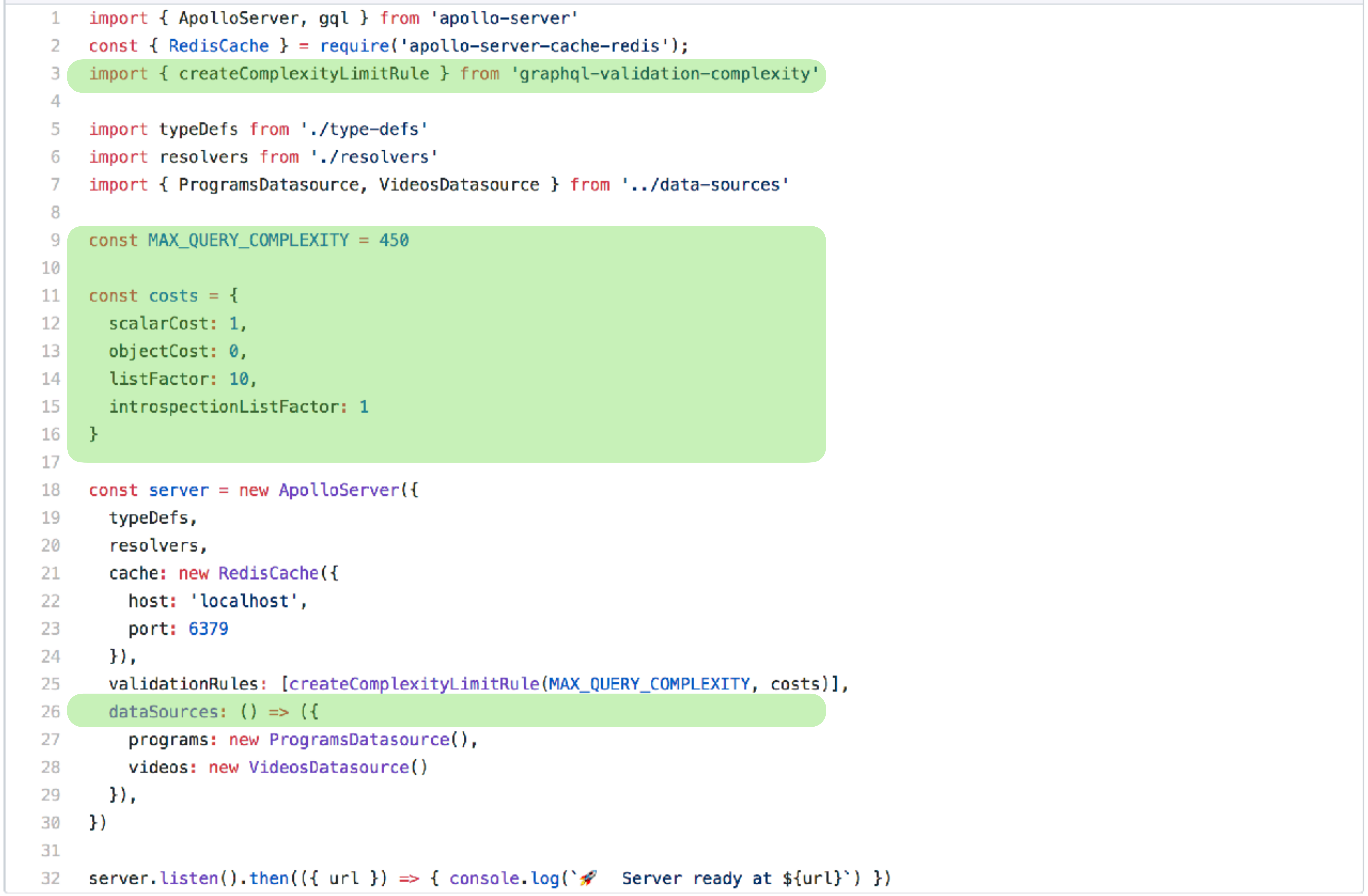
const MAX_QUERY_COMPLEXITY = 450

const costs = {
  scalarCost: 1,
  objectCost: 0,
  listFactor: 10,
  introspectionListFactor: 1
}

const server = new ApolloServer({
  typeDefs,
  resolvers,
  cache: new RedisCache({
    host: 'localhost',
    port: 6379
  }),
  validationRules: [createComplexityLimitRule(MAX_QUERY_COMPLEXITY, costs)],
  dataSources: () => ({
    programs: new ProgramsDatasource(),
    videos: new VideosDatasource()
  }),
})

server.listen().then(({ url }) => { console.log(`🚀  Server ready at ${url}`) })
```

análise de custo da query de consulta



```
import { ApolloServer, gql } from 'apollo-server'
const { RedisCache } = require('apollo-server-cache-redis');
import { createComplexityLimitRule } from 'graphql-validation-complexity'

import typeDefs from './type-defs'
import resolvers from './resolvers'
import { ProgramsDatasource, VideosDatasource } from '../data-sources'

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  scalarCost: 1,
  objectCost: 0,
  listFactor: 10,
  introspectionListFactor: 1
}

const server = new ApolloServer({
  typeDefs,
  resolvers,
  cache: new RedisCache({
    host: 'localhost',
    port: 6379
  }),
  validationRules: [createComplexityLimitRule(MAX_QUERY_COMPLEXITY, costs)],
  dataSources: () => ({
    programs: new ProgramsDatasource(),
    videos: new VideosDatasource()
  }),
})

server.listen().then(({ url }) => { console.log(`🚀  Server ready at ${url}`) })
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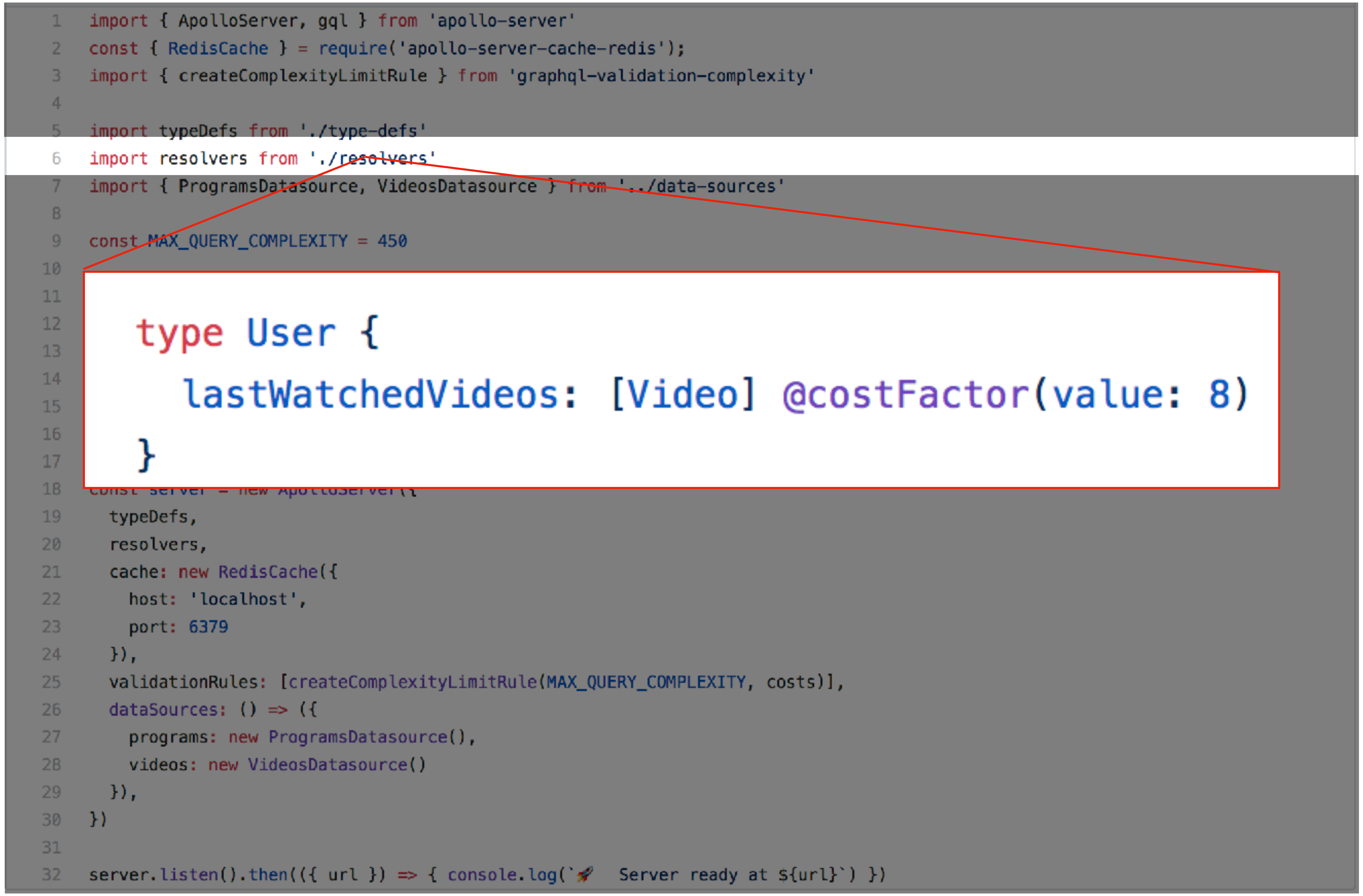
análise de custo da query de consulta



```
import { ApolloServer, gql } from 'apollo-server'
const { RedisCache } = require('apollo-server-cache-redis');
import { createComplexityLimitRule } from 'graphql-validation-complexity'

import typeDefs from './type-defs'
import resolvers from './resolvers'
import { ProgramsDatasource, VideosDatasource } from '../data-sources'

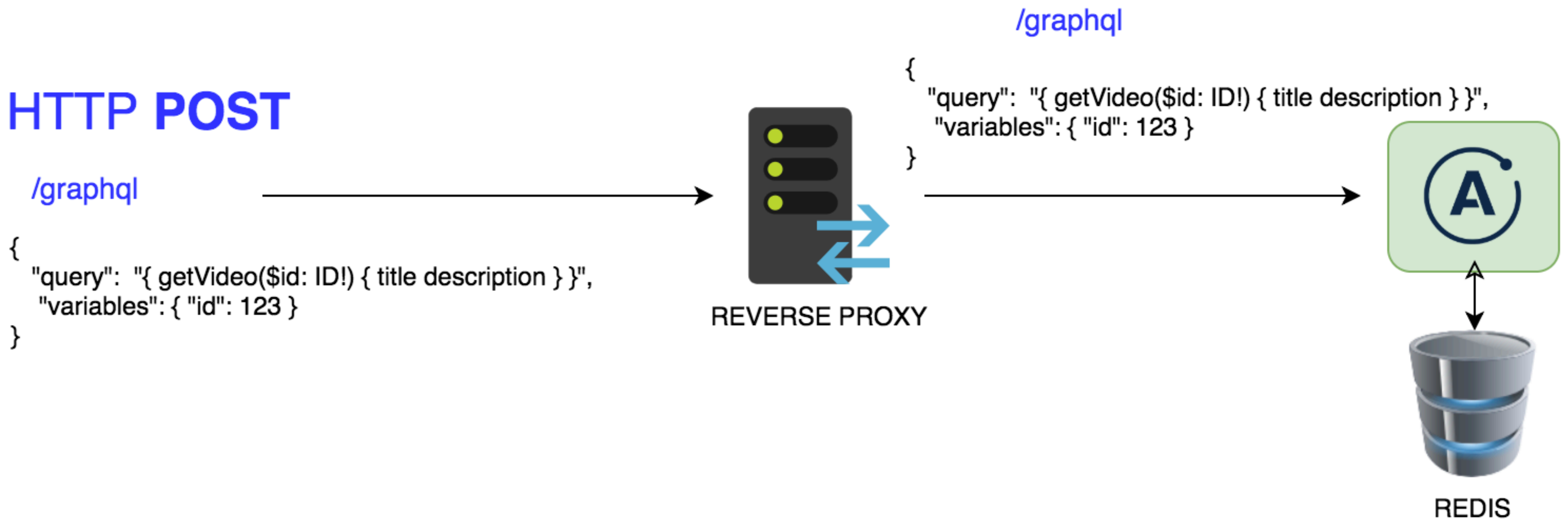
const MAX_QUERY_COMPLEXITY = 450
```

```
type User {
  lastWatchedVideos: [Video] @costFactor(value: 8)
}
```

```
const server = new ApolloServer({
  typeDefs,
  resolvers,
  cache: new RedisCache({
    host: 'localhost',
    port: 6379
  }),
  validationRules: [createComplexityLimitRule(MAX_QUERY_COMPLEXITY, costs)],
  dataSources: () => ({
    programs: new ProgramsDatasource(),
    videos: new VideosDatasource()
  }),
})

server.listen().then(({ url }) => { console.log(`🚀  Server ready at ${url}`) })
```

cache http



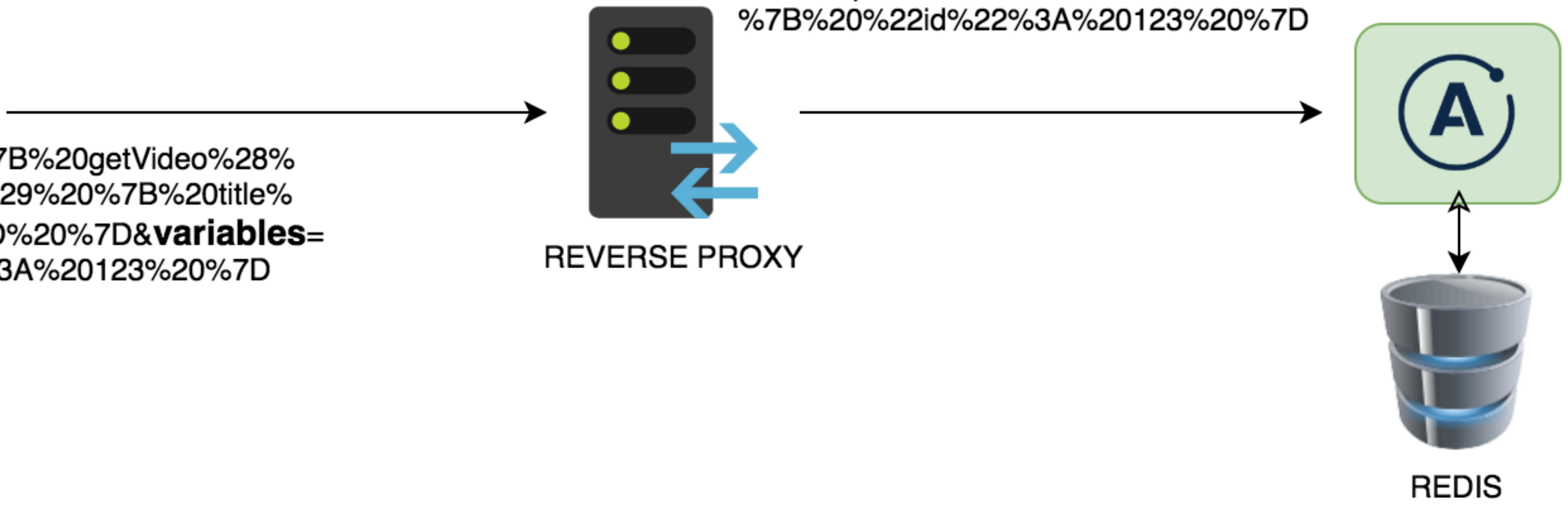
```
{
  "query":  "{ getVideo($id: ID!) { title description } }",
   "variables": { "id": 123 }
}
```

```
{
  "query":  "{ getVideo($id: ID!) { title description } }",
   "variables": { "id": 123 }
}
```

cache http

HTTP **GET**

/graphql?**query**=%7B%20getVideo%28%
24id%3A%20ID%21%29%20%7B%20title%
20description%20%7D%20%7D&**variables**=
%7B%20%22id%22%3A%20123%20%7D



/graphql?**query**=%7B%20getVideo%28%
24id%3A%20ID%21%29%20%7B%20title%
20description%20%7D%20%7D&**variables**=
%7B%20%22id%22%3A%20123%20%7D

cache http (cache-control header)

1. **default max-age**

cache http (cache-control header)

1. default max-age

```
const server = new ApolloServer({
  typeDefs,
  resolvers,
  cache: new RedisCache({
    host: 'localhost',
    port: 6379
  }),
  cacheControl: {
    defaultMaxAge: 300
  },
  validationRules: [createComplexityLimitRule(MAX_QUERY_COMPLEXITY, costs)],
  dataSources: () => ({
    programs: new ProgramsDatasource(),
    videos: new VideosDatasource()
  }),
})
```

cache http (cache-control header)

1. **default max-age**
2. **cache hints**

cache http (cache-control header)

1. **default max-age**

2. **cache hints**

```
type User {
  lastWatchedVideos: [Video] @costFactor(value: 8) @cacheControl(maxAge: 5, scope: PRIVATE)
}
```

cache http (cache-control header)

1. default max-age
2. cache hints
3. cache hint dinâmico

cache http (cache-control header)

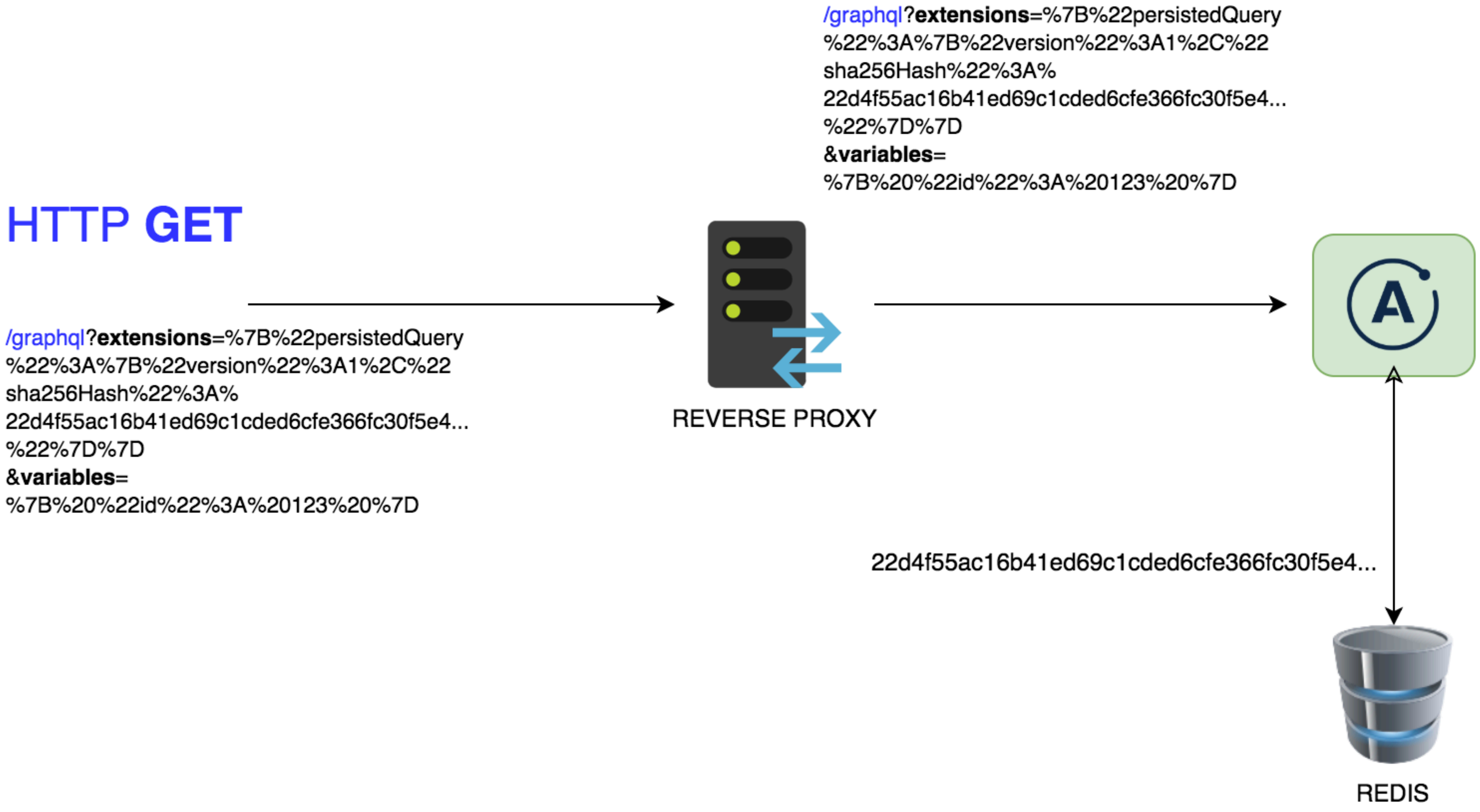
1. default max-age

2. cache hints

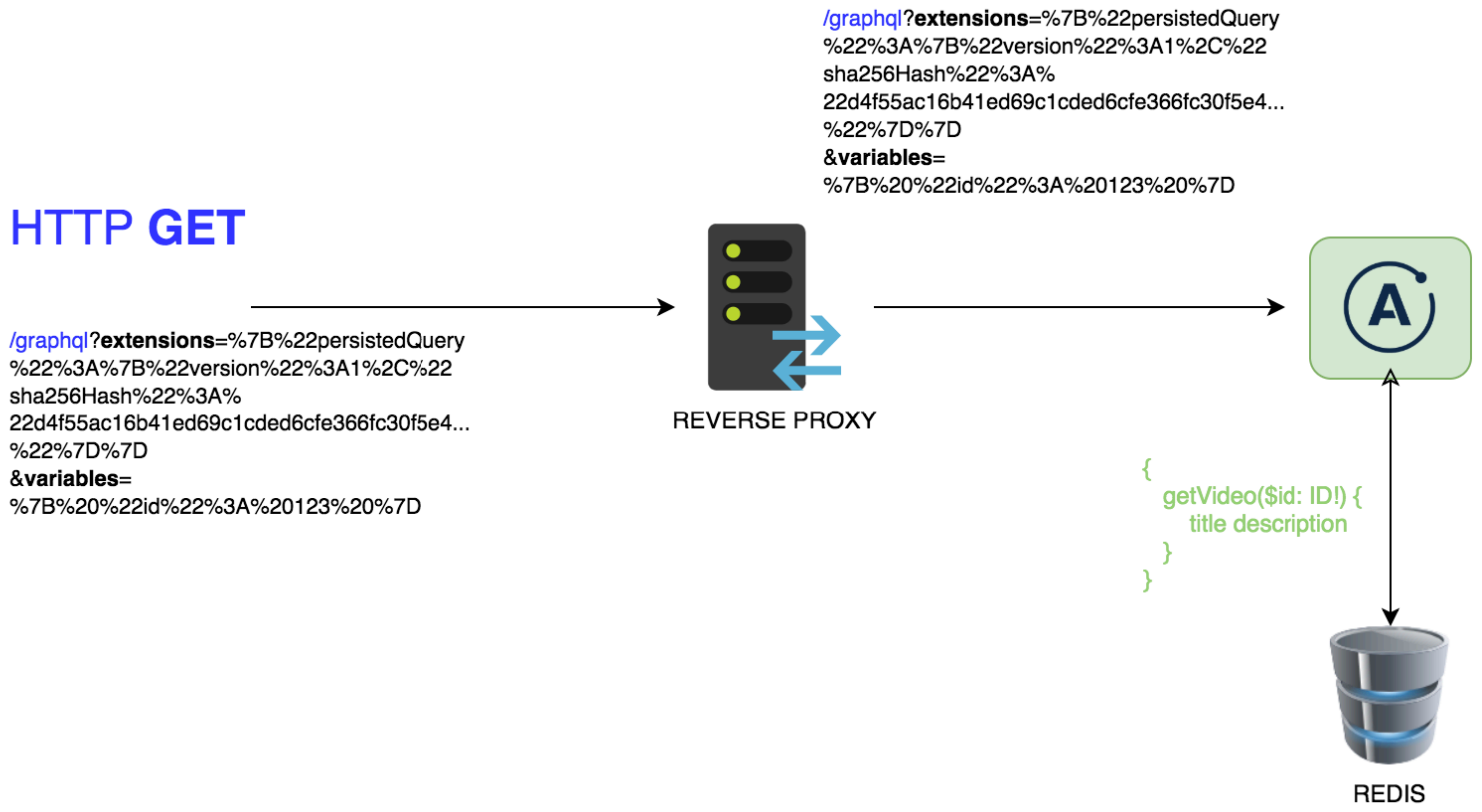
3. cache hint dinâmico

```
User: {
  lastWatchedVideos: (videos, variables, context, { cacheControl }) => {
    if('something happens...') cacheControl.setCacheHint({ maxAge: 300 })
    return videos
  }
}
```

persisted query


HTTP GET
/graphql?extensions=%7B%22persistedQuery%22%3A%7B%22version%22%3A1%2C%22sha256Hash%22%3A%22d4f55ac16b41ed69c1cded6cfe366fc30f5e4...%22%7D%7D&variables=%7B%20%22id%22%3A%20123%20%7D
REVERSE PROXY
/graphql?extensions=%7B%22persistedQuery%22%3A%7B%22version%22%3A1%2C%22sha256Hash%22%3A%22d4f55ac16b41ed69c1cded6cfe366fc30f5e4...%22%7D%7D&variables=%7B%20%22id%22%3A%20123%20%7D
22d4f55ac16b41ed69c1cded6cfe366fc30f5e4...
REDIS

persisted query



HTTP **GET**

```
/graphql?extensions=%7B%22persistedQuery
%22%3A%7B%22version%22%3A1%2C%22
sha256Hash%22%3A%
22d4f55ac16b41ed69c1cded6cfe366fc30f5e4...
%22%7D%7D
&variables=
%7B%20%22id%22%3A%20123%20%7D
```

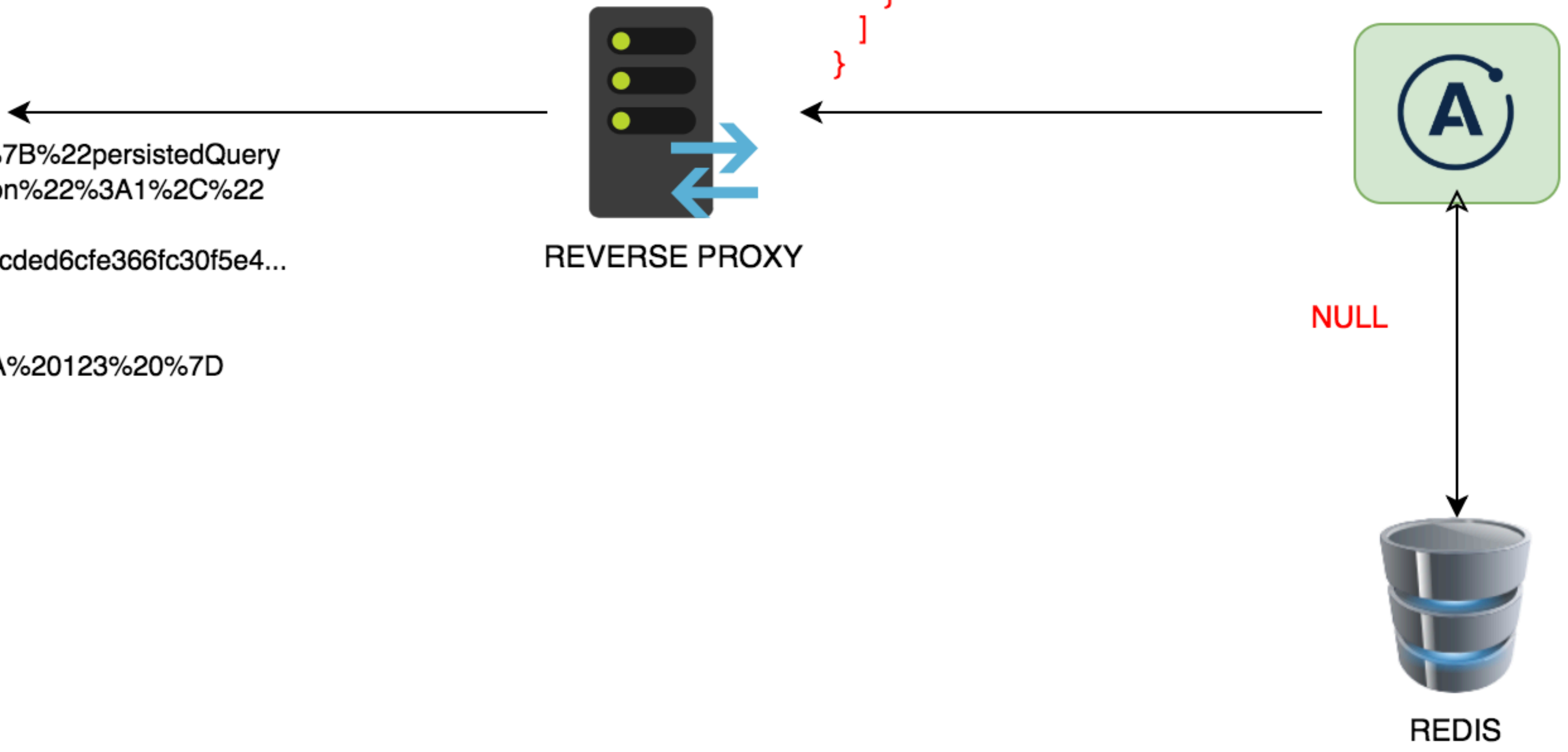
```
/graphql?extensions=%7B%22persistedQuery
%22%3A%7B%22version%22%3A1%2C%22
sha256Hash%22%3A%
22d4f55ac16b41ed69c1cded6cfe366fc30f5e4...
%22%7D%7D
&variables=
%7B%20%22id%22%3A%20123%20%7D
```

```
{
  getVideo($id: ID!) {
    title description
  }
}
```

persisted query

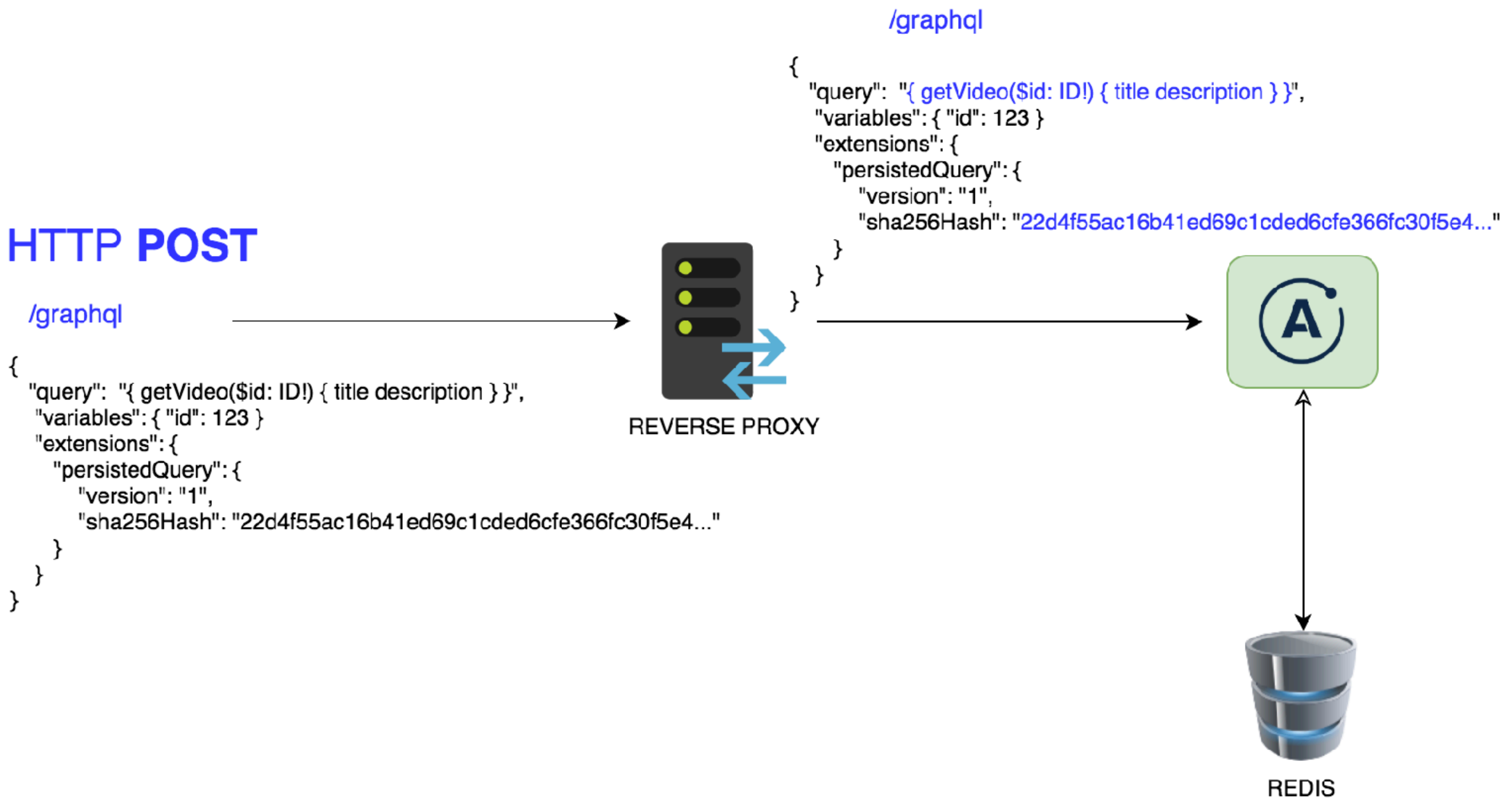
```
{
  "errors":[
    {
      "message": "PersistedQueryNotFound",
      "extensions": {
        "code": "PERSISTED_QUERY_NOT_FOUND"
      }
    }
  ]
}
```

HTTP **GET**



/graphql?**extensions**=%7B%22persistedQuery
%22%3A%7B%22version%22%3A1%2C%22
sha256Hash%22%3A%
22d4f55ac16b41ed69c1cded6cfe366fc30f5e4...
%22%7D%7D
&variables=
%7B%20%22id%22%3A%20123%20%7D

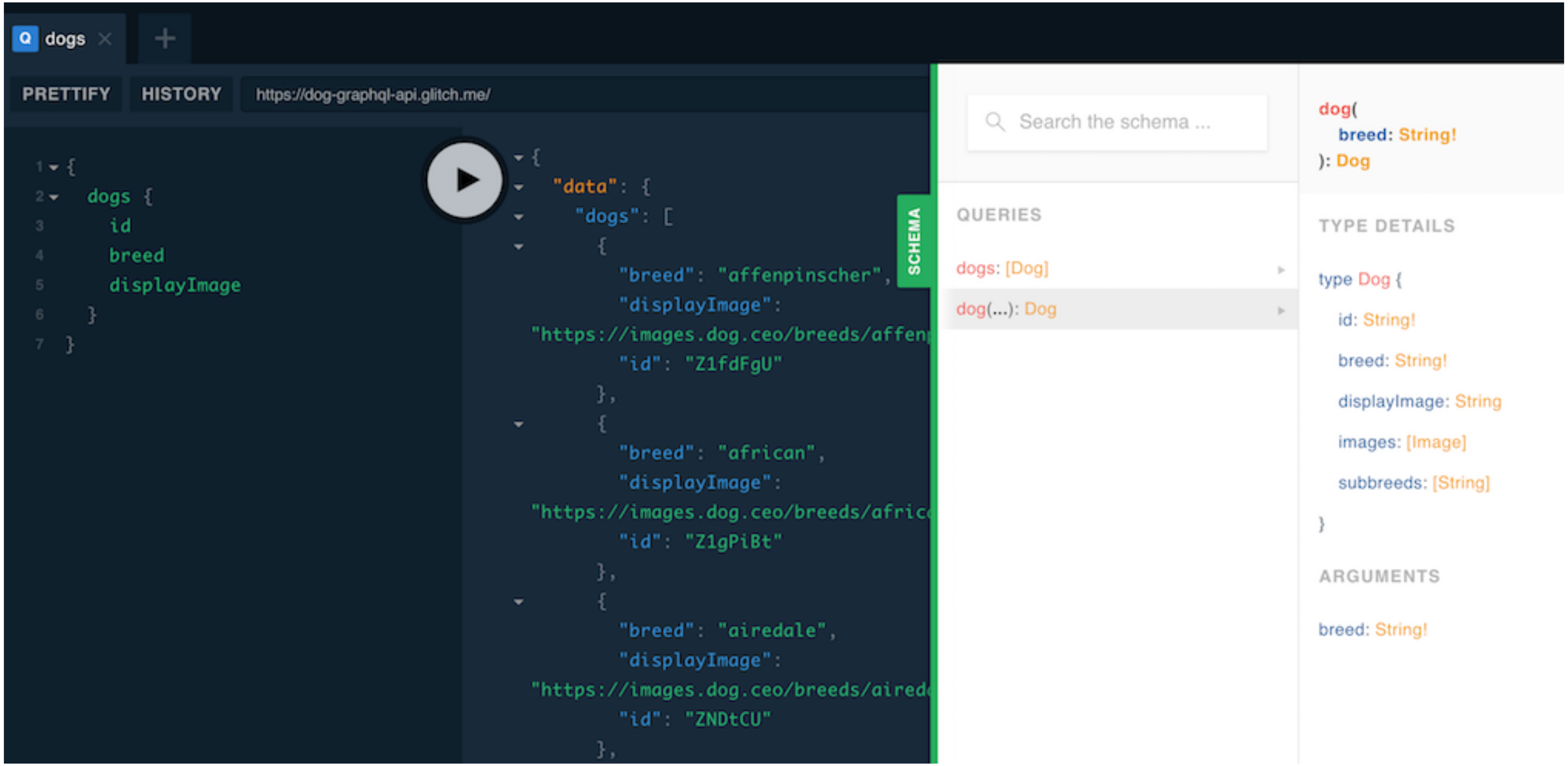
persisted query



```
{
  "query":  "{ getVideo($id: ID!) { title description } }",
   "variables": { "id": 123 }
   "extensions": {
     "persistedQuery": {
        "version": "1",
        "sha256Hash": "22d4f55ac16b41ed69c1cded6cfe366fc30f5e4..."
     }
   }
}
```

```
{
  "query":  "{ getVideo($id: ID!) { title description } }",
   "variables": { "id": 123 }
   "extensions": {
     "persistedQuery": {
        "version": "1",
        "sha256Hash": "22d4f55ac16b41ed69c1cded6cfe366fc30f5e4..."
     }
   }
}
```

tooling - Playground



```
{
  dogs {
    id
    breed
    displayImage
  }
}
```

```
{
  "data": {
    "dogs": [
      {
        "breed": "affenpinscher",
        "displayImage":
"https://images.dog.ceo/breeds/affen
        "id": "Z1fdFgU"
      },
      {
        "breed": "african",
        "displayImage":
"https://images.dog.ceo/breeds/afric
        "id": "Z1gPiBt"
      },
      {
        "breed": "airedale",
        "displayImage":
"https://images.dog.ceo/breeds/aired
        "id": "ZNDtCU"
      },
```

QUERIES

dogs: [Dog]

dog(...): Dog

```
dog(
  breed: String!
): Dog
```

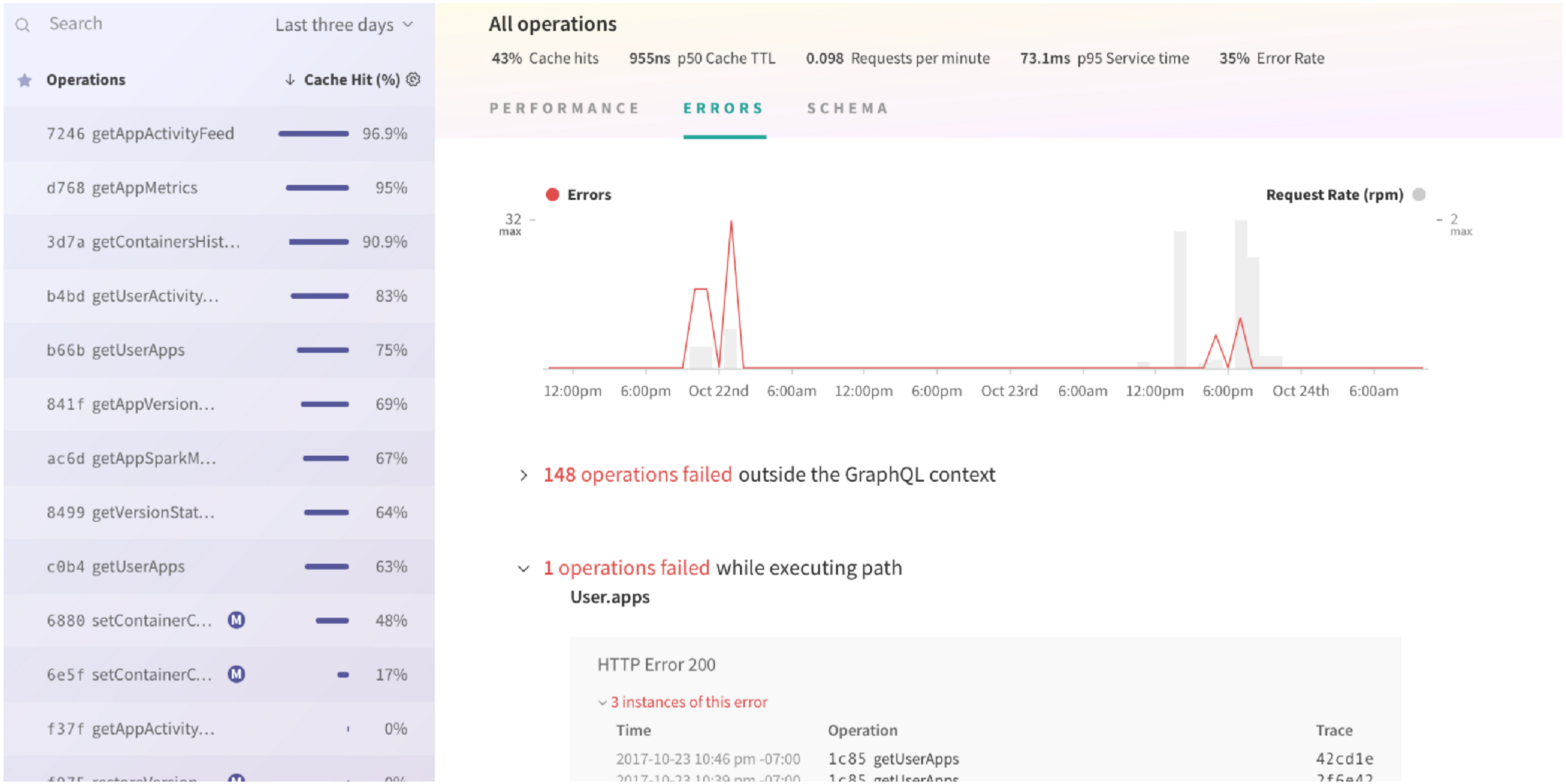
TYPE DETAILS

```
type Dog {
  id: String!
  breed: String!
  displayImage: String
  images: [Image]
  subbreeds: [String]
}
```

ARGUMENTS

breed: String!

tooling - Apollo Engine



Search | Last three days

Operations	Cache Hit (%)
7246 getActivityFeed	96.9%
d768 getAppMetrics	95%
3d7a getContainersHist...	90.9%
b4bd getUserActivity...	83%
b66b getUserApps	75%
841f getAppVersion...	69%
ac6d getAppSparkM...	67%
8499 getVersionStat...	64%
c0b4 getUserApps	63%
6880 setContainerC... (M)	48%
6e5f setContainerC... (M)	17%
f37f getAppActivity...	0%

All operations

43% Cache hits | 955ns p50 Cache TTL | 0.098 Requests per minute | 73.1ms p95 Service time | 35% Error Rate

PERFORMANCE | ERRORS | SCHEMA

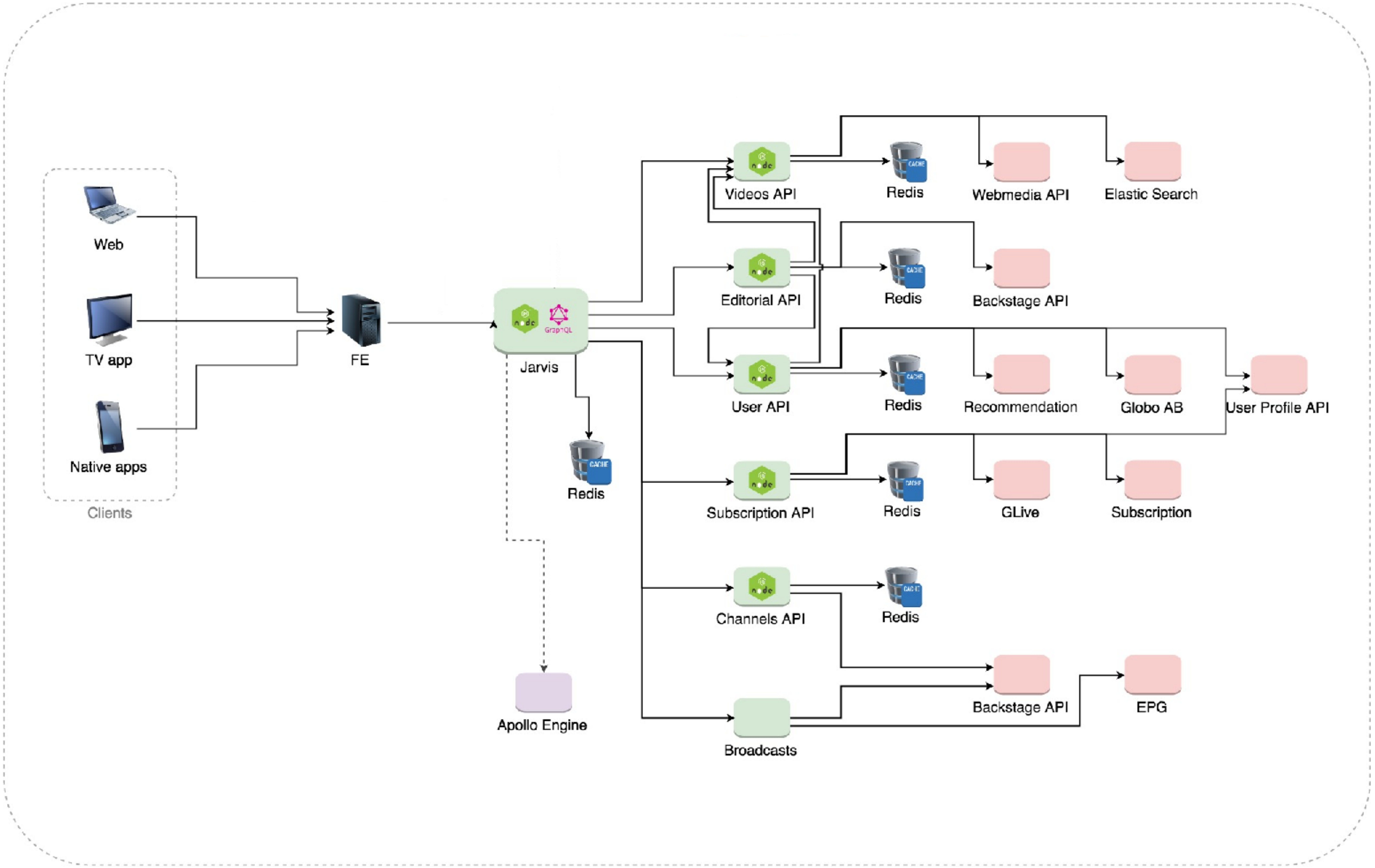
148 operations failed outside the GraphQL context

1 operations failed while executing path
User.apps

HTTP Error 200

3 instances of this error

Time	Operation	Trace
2017-10-23 10:46 pm -07:00	1c85 getUserApps	42cd1e



🟩 Produto 🟥 Other teams 🟪 External

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