aws SUMMIT ONLINE

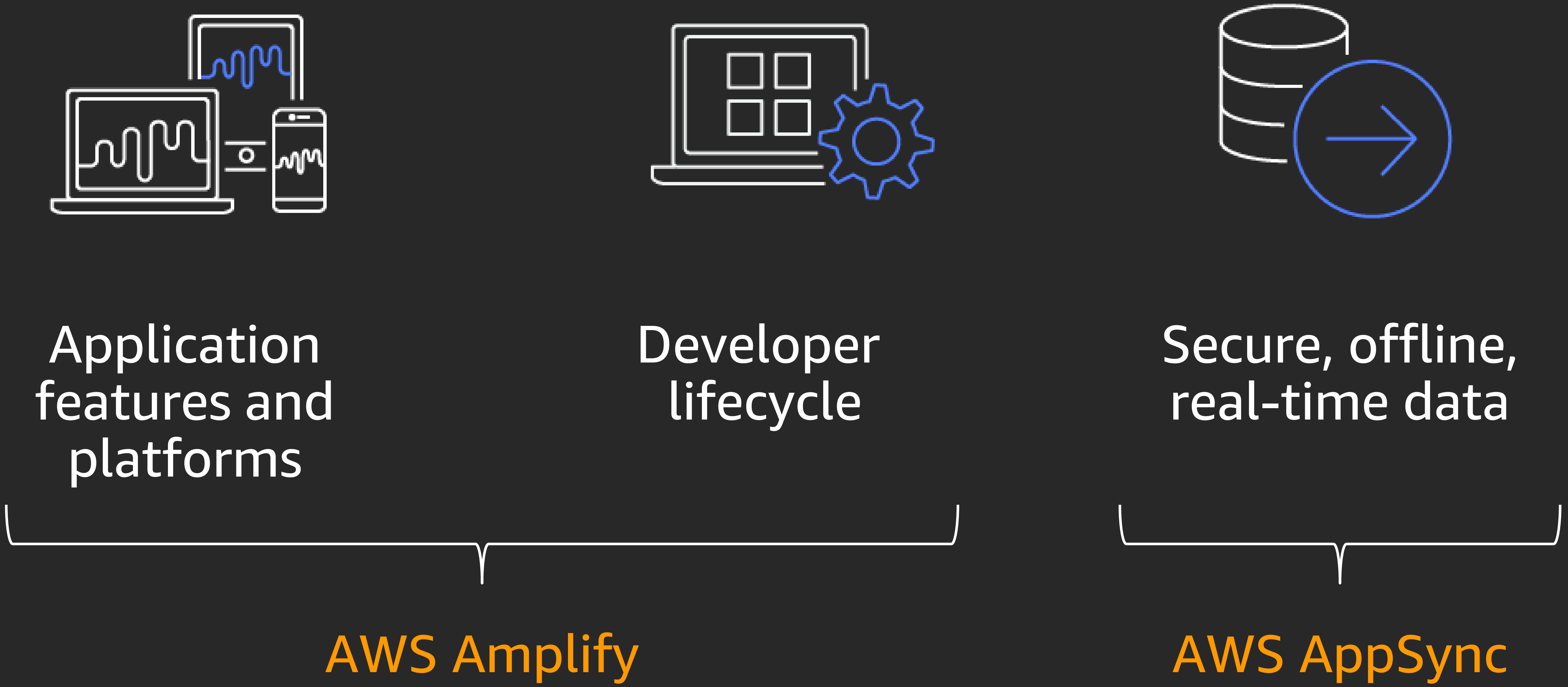
2 4

Full-stack mobile and web development with AWS AppSync and AWS Amplify

Marcia Villalba

Developer Advocate
AWS

AWS enables developers to exceed user expectations



Application features and platforms

Developer lifecycle

Secure, offline, real-time data

AWS Amplify

AWS AppSync

AWS Amplify

aws SUMMIT

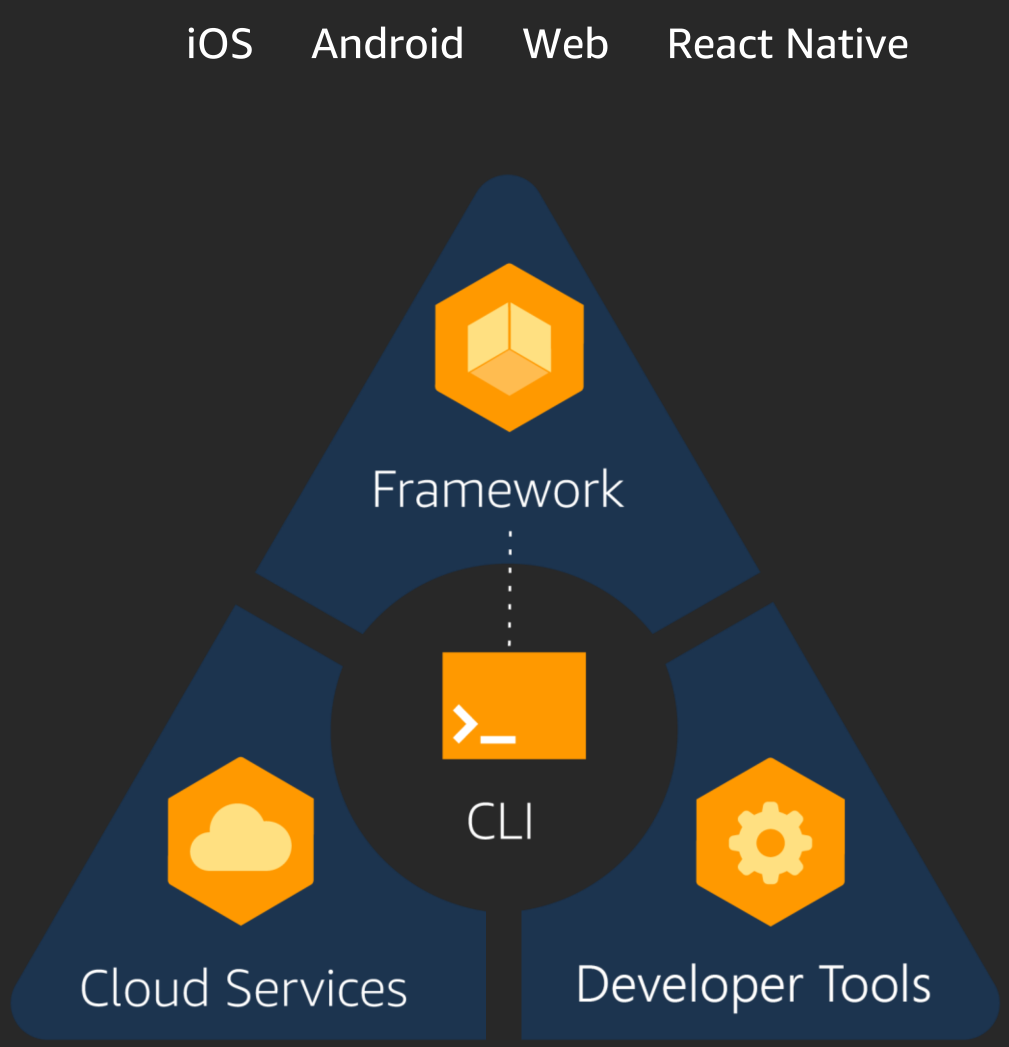
AWS Amplify recap

Broad support for the most popular OS platforms and frameworks

The **Amplify Framework**, an open-source client framework, includes libraries, a CLI toolchain, and UI components

The CLI toolchain enables easy integration with **AWS services**, such as Amazon Cognito, AWS AppSync, and Amazon Pinpoint

Developer tools for building, testing, deploying, and hosting the entire app – frontend and backend



Amplify Framework review

- Open source
- Among the top 5 fastest growing projects on GitHub
- Opinionated
- Best practices built-in
- Infrastructure as code
- Categories-based high-level abstractions

Amplify Framework review: Categories

DataStore NEW

On-device persistent storage that automatically synchronizes data between your apps and the cloud

Predictions NEW

Add AI/ML capabilities to your app, powered by cloud services

Analytics

Track user sessions, custom user attributes, and in-app metrics

API

HTTP requests using REST and GraphQL with support for real-time data

Auth

AuthN + AuthZ library with prebuilt UI components for your app

Interactions

Conversational bots powered by deep learning technologies

PubSub

Connect your app to message-oriented middleware on the cloud

Notifications

Push notifications with campaign analytics and targeting

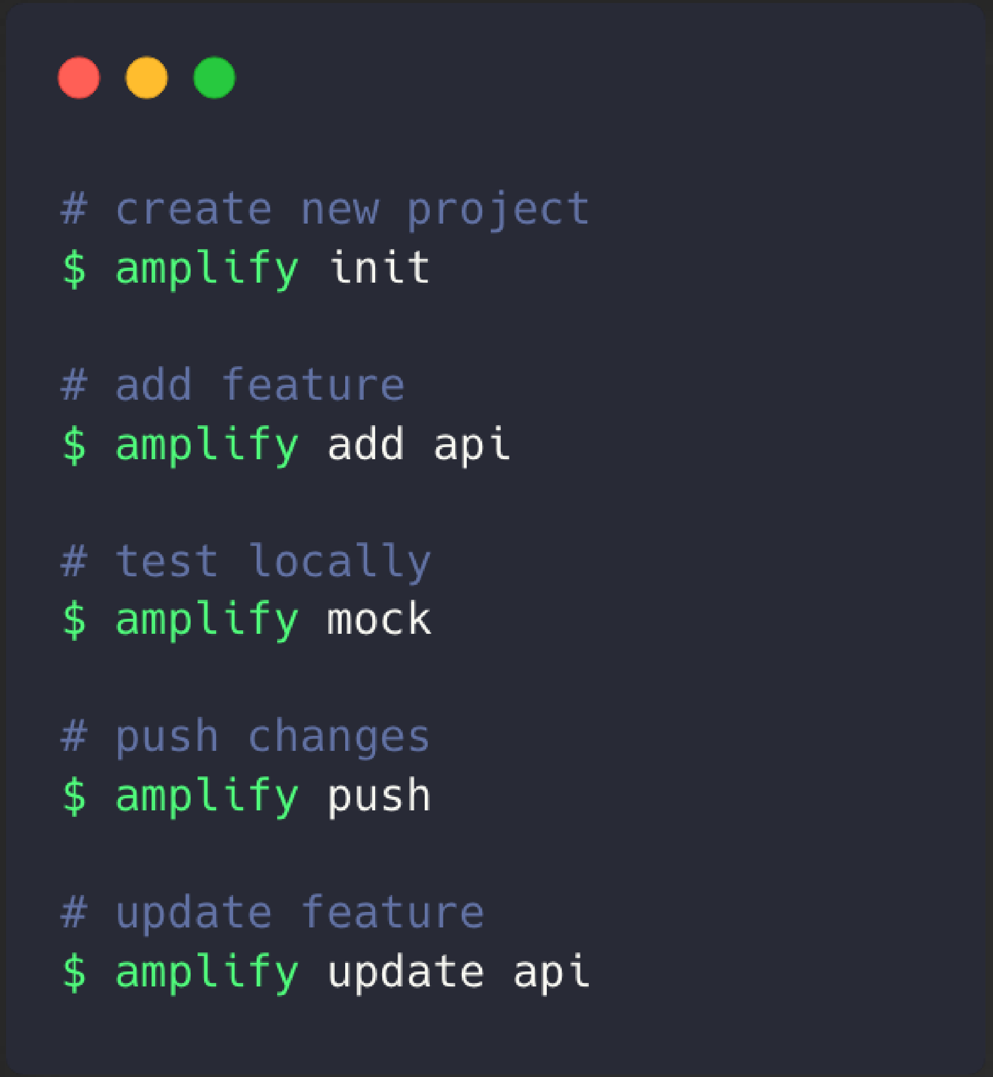
Storage

Securely manage user content in public, protected, and private storage

XR

Work with augmented reality and virtual reality content in your apps

Amplify Framework review: CLI



```
# create new project
$ amplify init

# add feature
$ amplify add api

# test locally
$ amplify mock

# push changes
$ amplify push

# update feature
$ amplify update api
```

Convention over configuration

Manage single/multi-environment

Local mocking and testing

Code generation

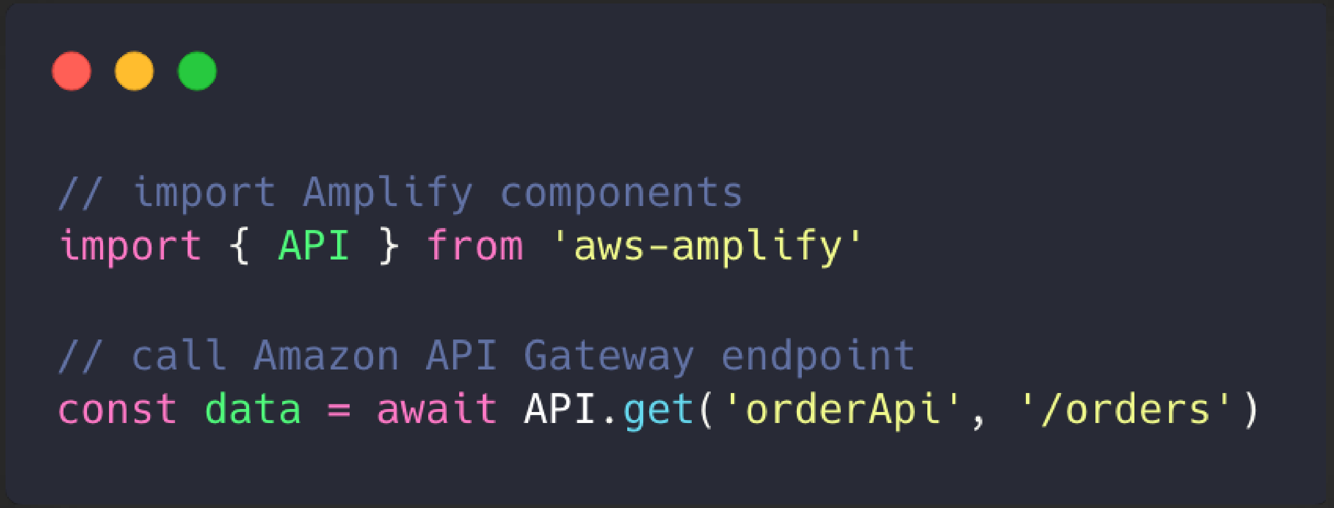
Android iOS

Native code

TS

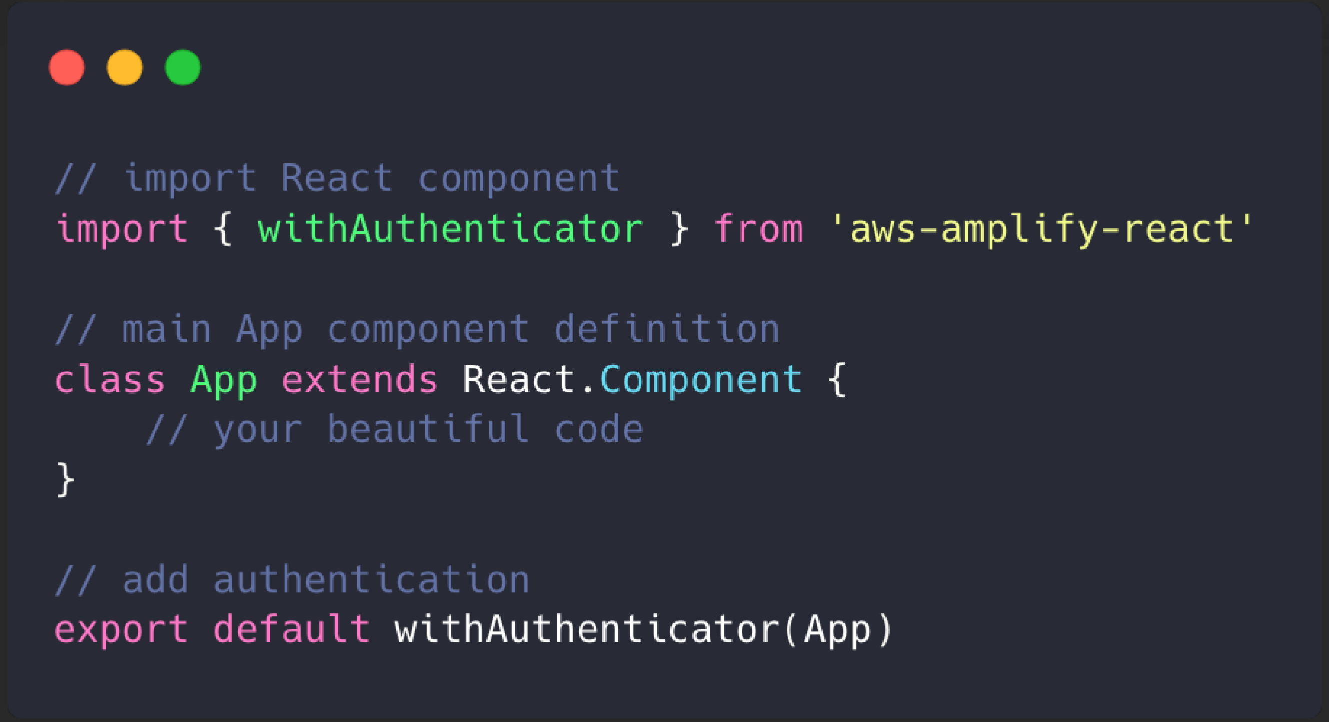
Types & statements

Amplify Framework recap: Libraries



```
// import Amplify components
import { API } from 'aws-amplify'

// call Amazon API Gateway endpoint
const data = await API.get('orderApi', '/orders')
```



```
// import React component
import { withAuthenticator } from 'aws-amplify-react'

// main App component definition
class App extends React.Component {
    // your beautiful code
}

// add authentication
export default withAuthenticator(App)
```

Interact with services via client-side

Amplify native for iOS and Android

JavaScript (JS) client for web and React Native

JS framework-specific components

Authentication

Amazon Cognito User Pools

Serverless Authentication and User Management

Add user sign-up and sign-in easily to your mobile and web apps without worrying about server infrastructure

Managed User Directory

Launch a simple, secure, low-cost, and fully managed service to create and maintain a user directory that scales to 100s of millions of users

Enhanced Security Features

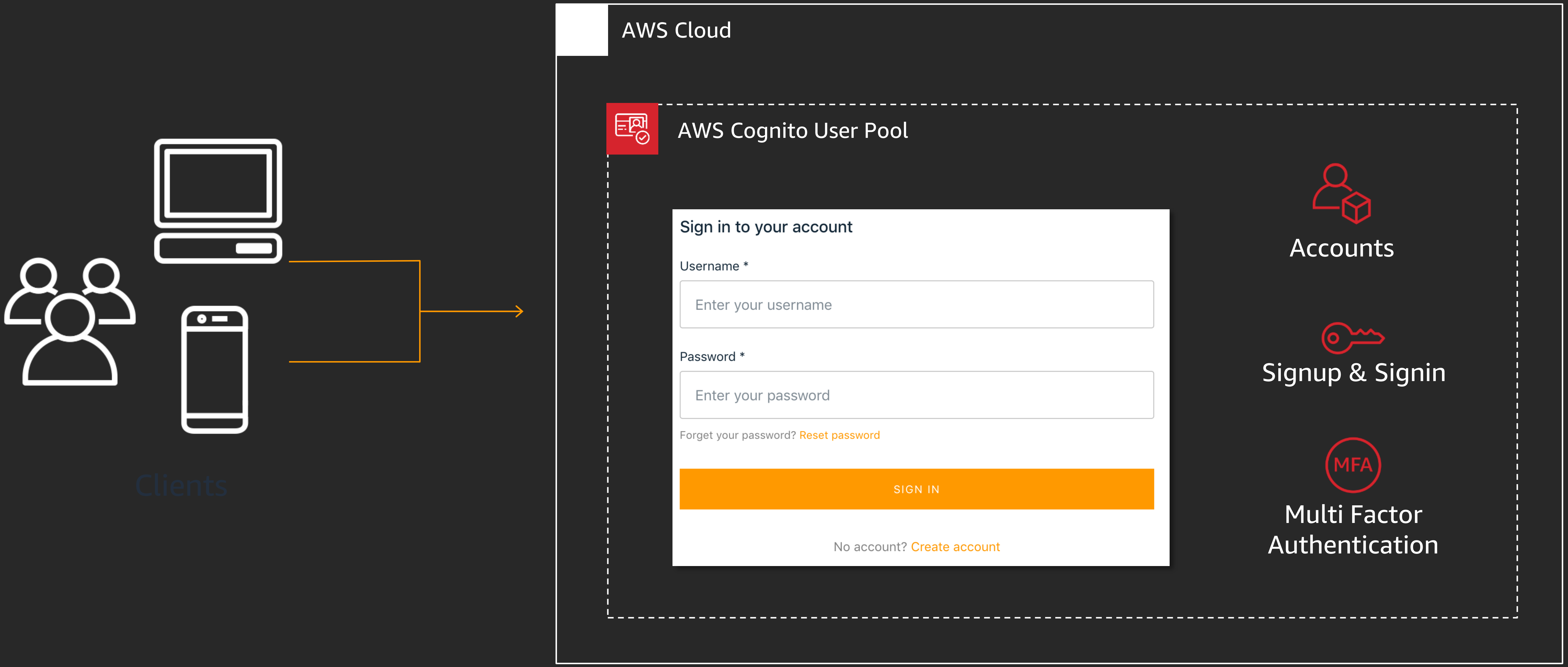
Verify phone numbers and email addresses and offer multi-factor authentication

Provision the service

```
$ amplify add auth

$ amplify push
```

$ amplify add auth & amplify push



Sign in to your account

Username *

Enter your username

Password *

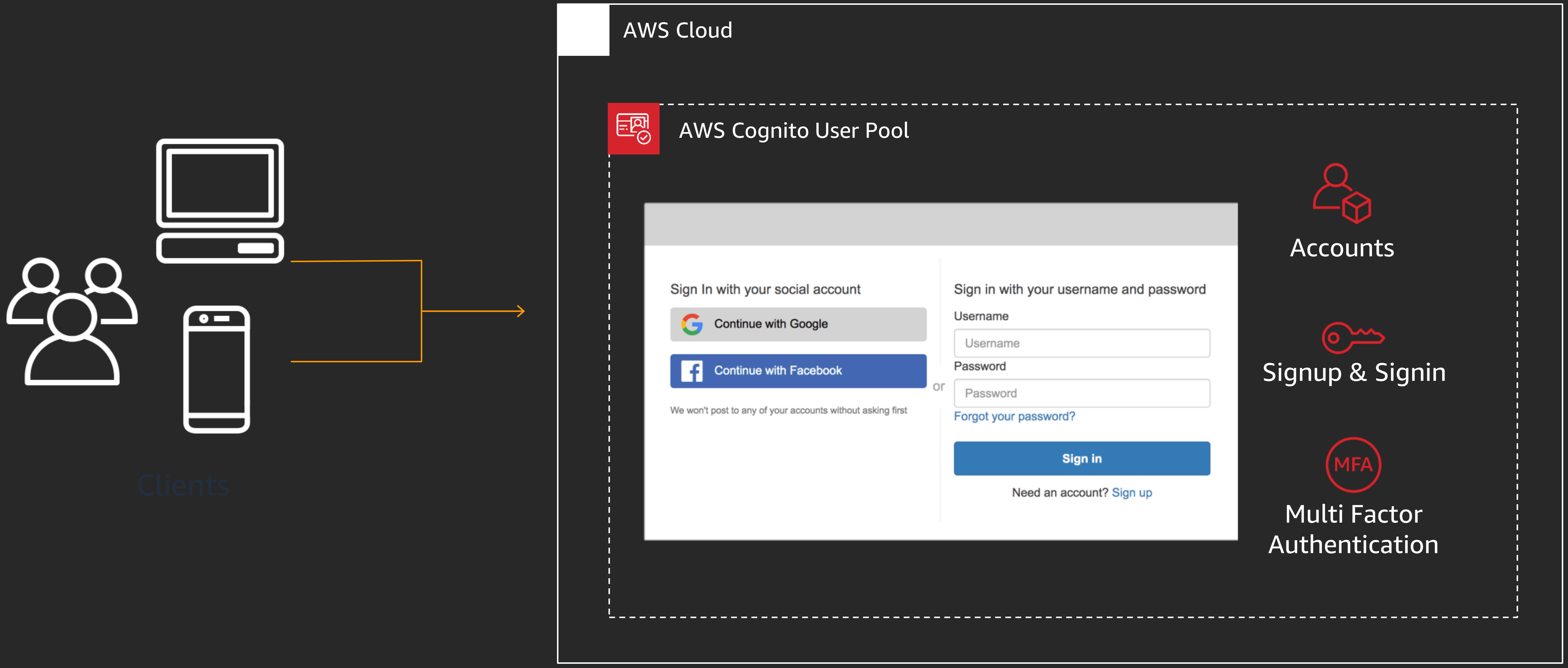
Enter your password

Forget your password? Reset password

SIGN IN

No account? Create account

Hosted UI & Federated Authentication



Sign In with your social account

Continue with Google

Continue with Facebook

We won't post to any of your accounts without asking first

or

Sign in with your username and password

Username

Username

Password

Password

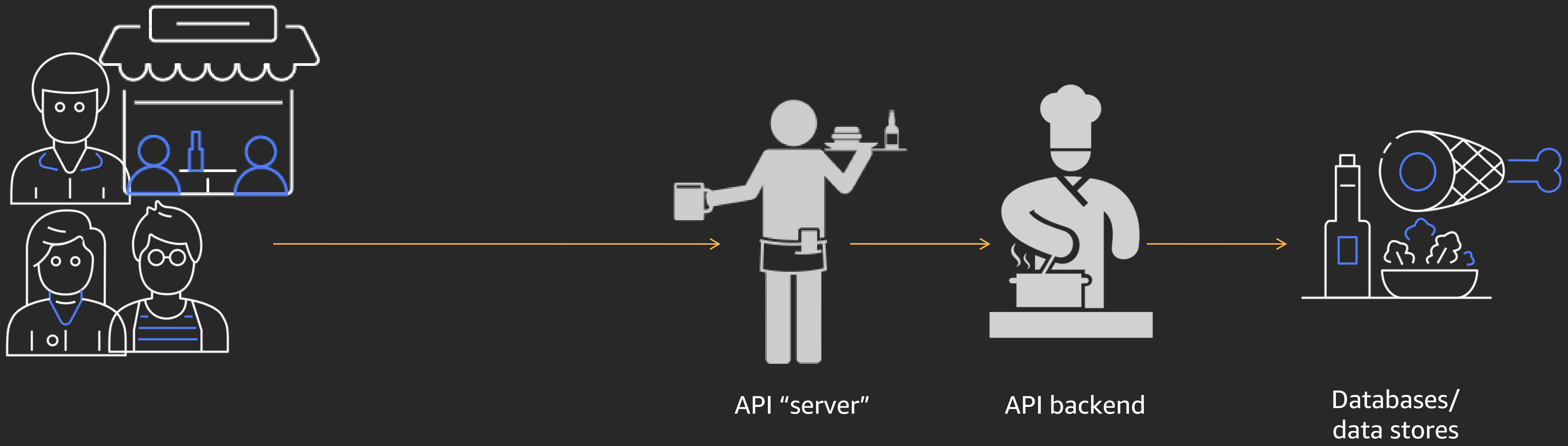
Forgot your password?

Sign in

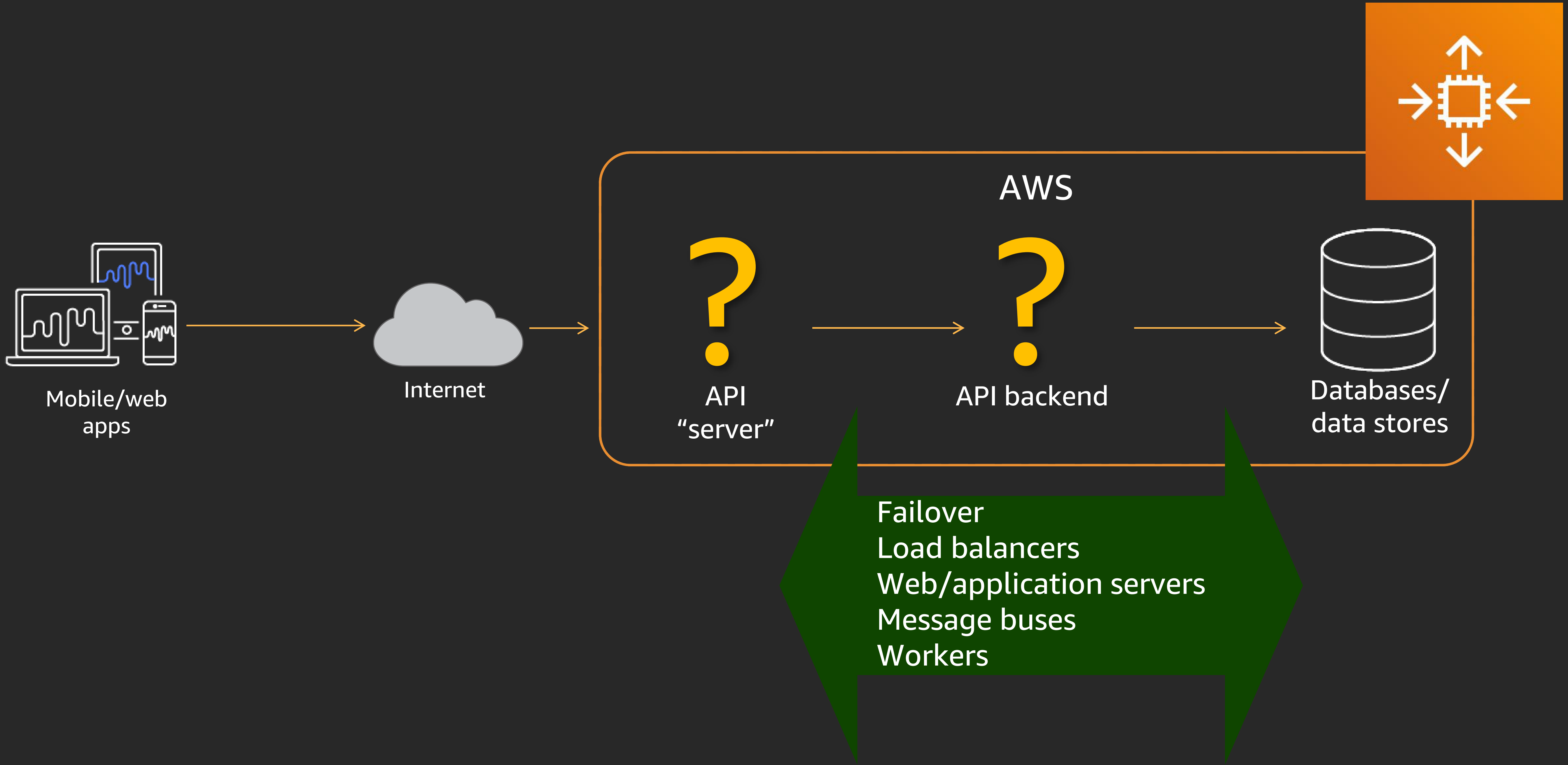
Need an account? Sign up

Data requirements

Basic API technology stack

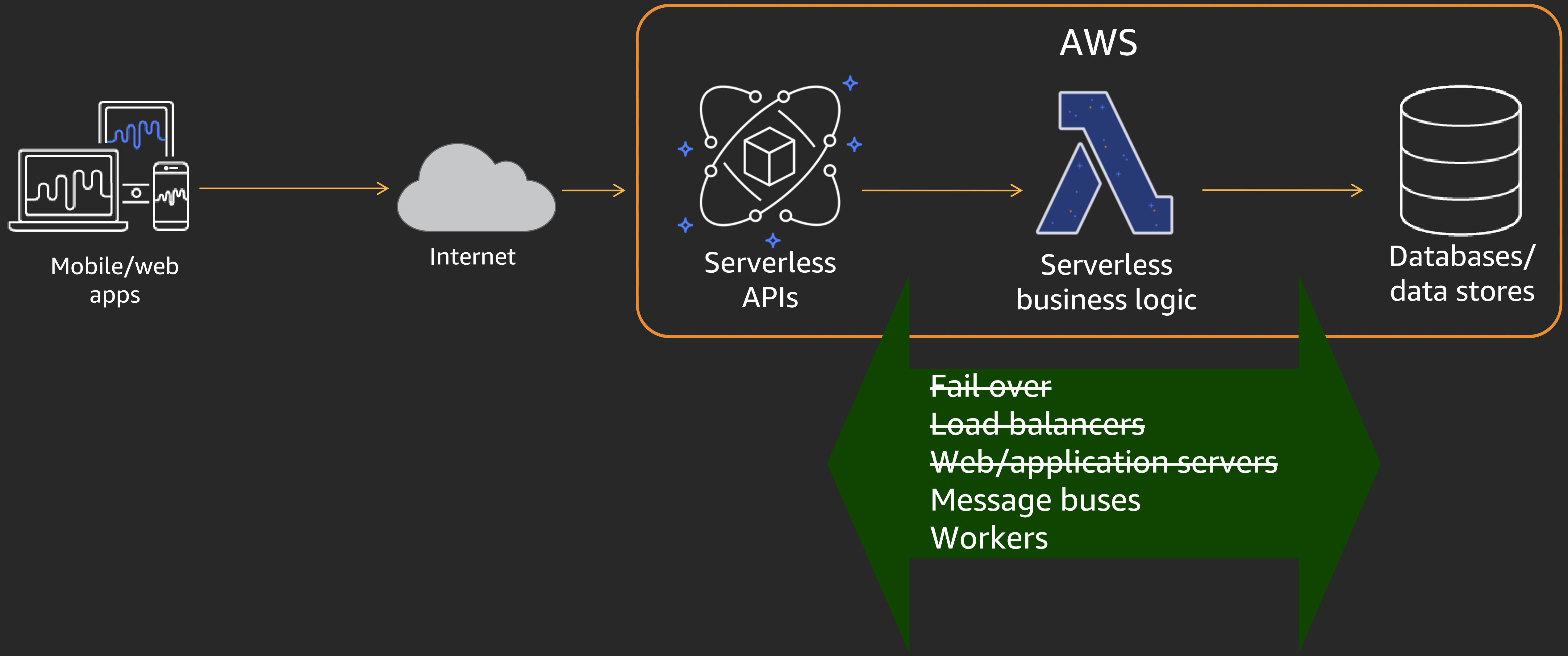


Basic API technology stack



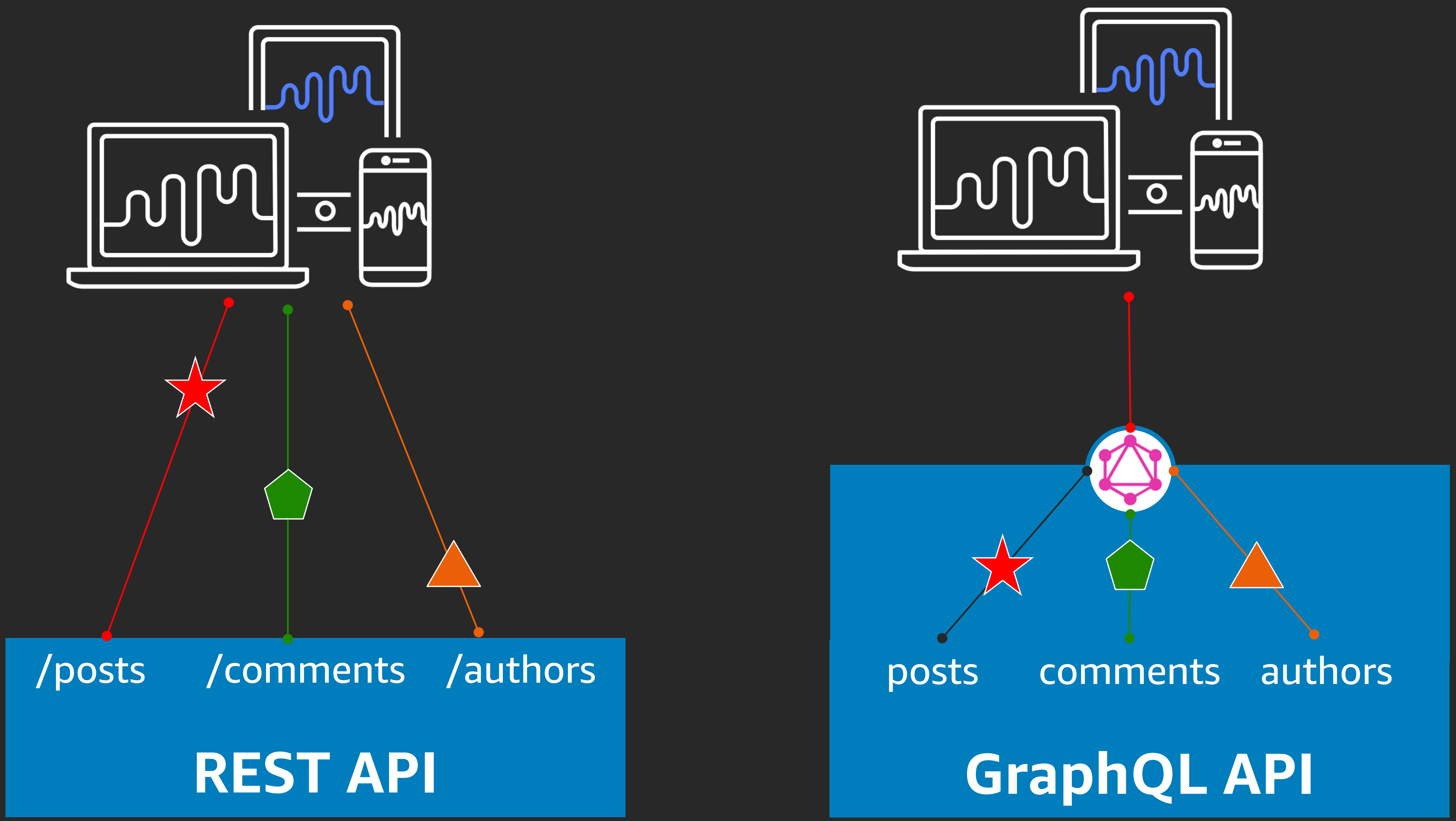
Failover
Load balancers
Web/application servers
Message buses
Workers

Basic serverless API technology stack

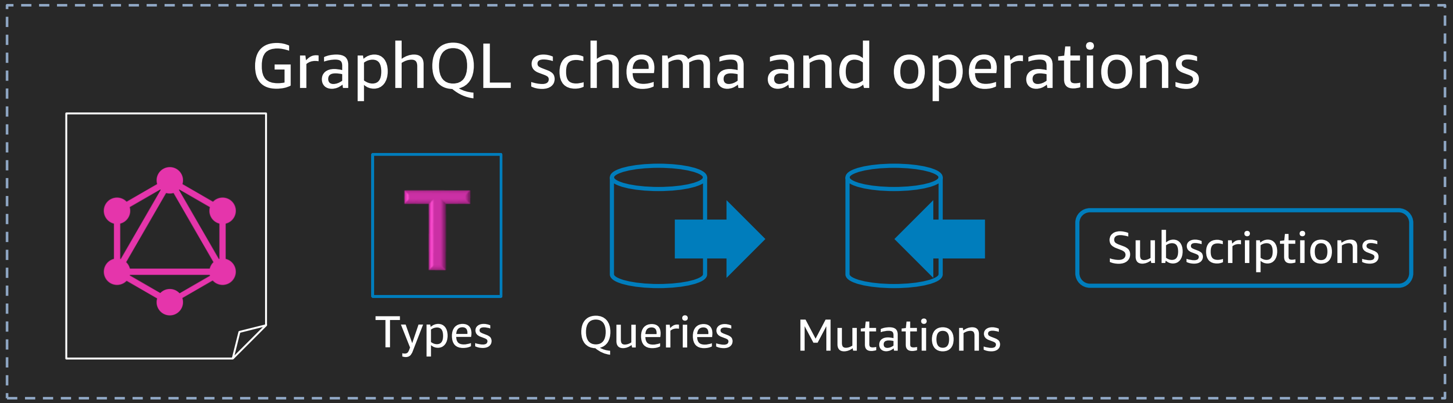


~~Fail over~~
~~Load balancers~~
~~Web/application servers~~
Message buses
Workers

What is GraphQL?



A query language for APIs . . . and a runtime!



```
type User {
  id: ID!
  username: String!
  firstName: String
  lastName: String
  daysActive: Int
}
```

A query language for APIs . . .

Queries

```
query GetPost {
  getPost(id: ”1”) {
    id
    title
  }
}
```

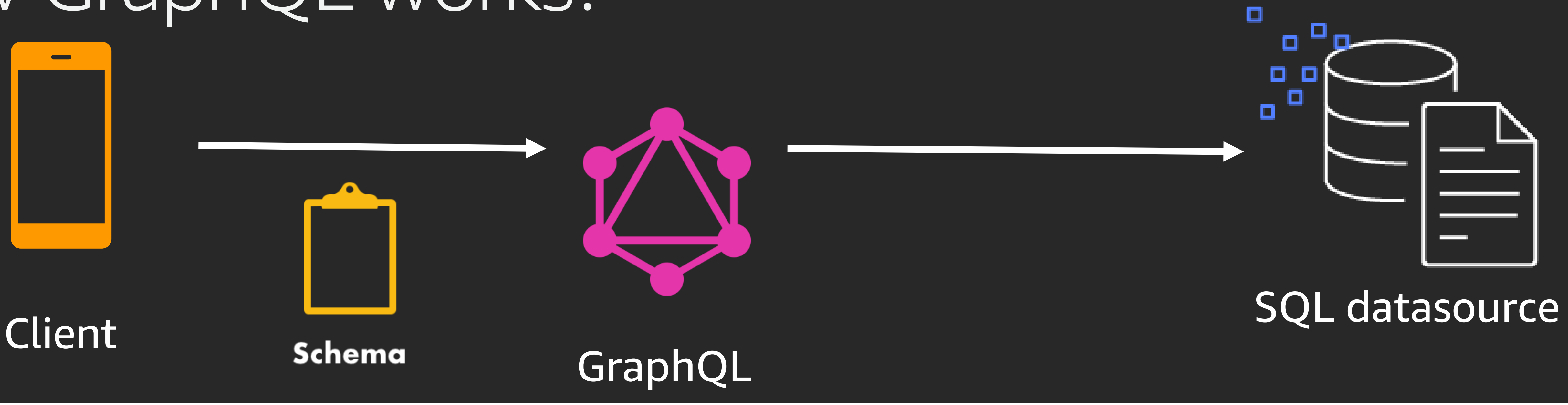
Mutations

```
mutation CreatePost {
  createPost(title: “Summit”) {
    id
    title
  }
}
```

Subscriptions

```
subscription OnCreatePost {
  onCreatePost {
    id
    title
  }
}
```

How GraphQL works?



1.

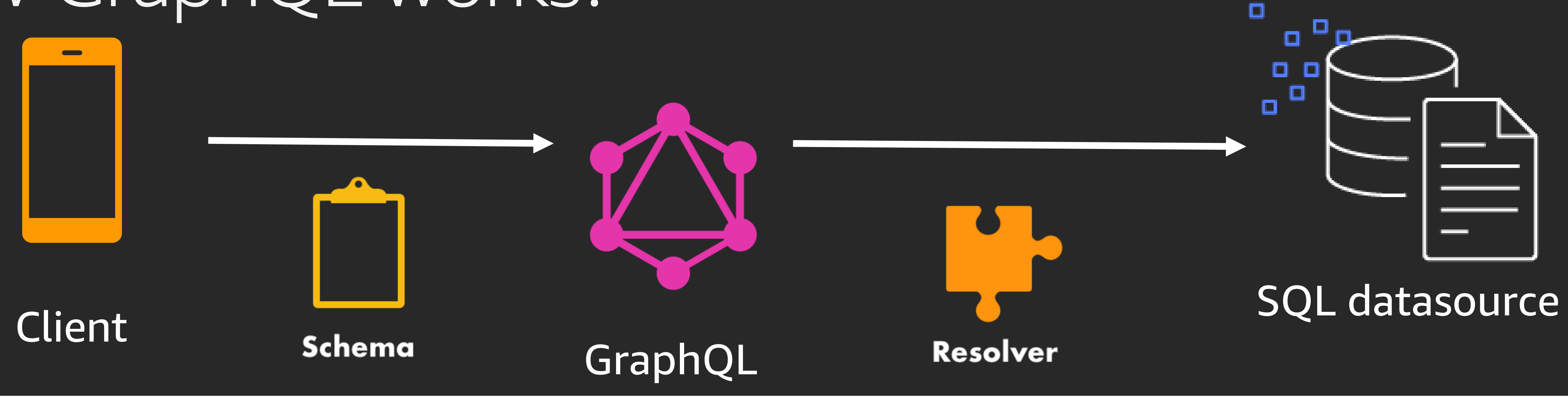
Create the schema.

Describe all the available types and operations

```
type video {
    id: String!
    name: String!
    url: String!
    channels: [channel]
}

type channel {
  id: String!
  name: String!
}
```

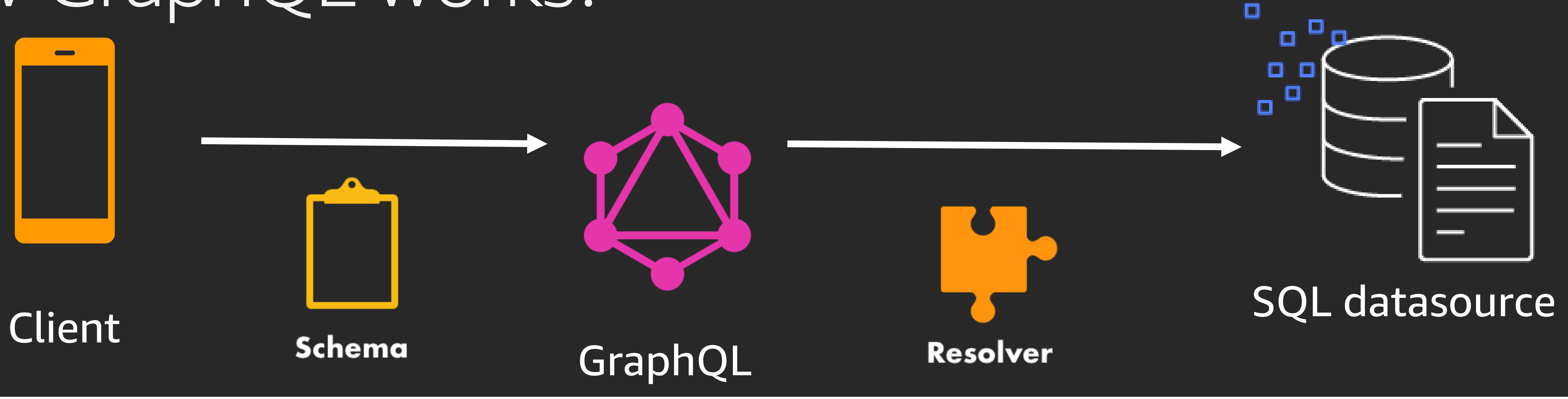
How GraphQL works?



2.

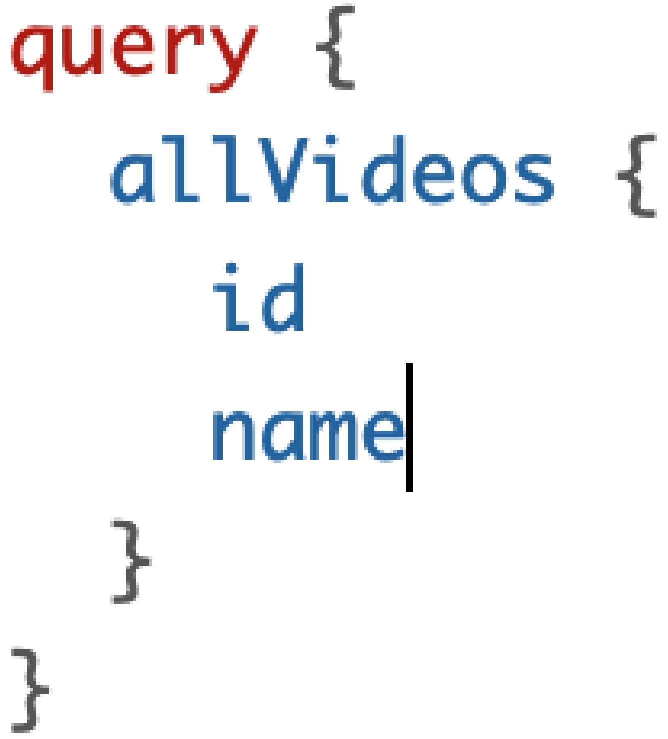
Define all your resolvers, to be able to serve all the operations defined in the schema

How GraphQL works?



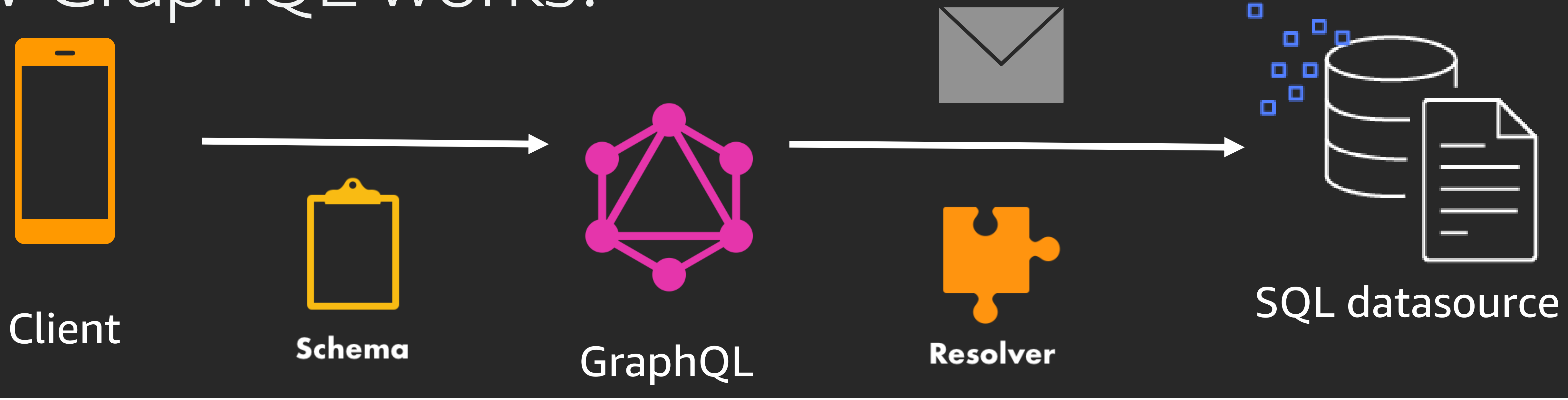
3.

The client makes a request



```
query {
  allVideos {
    id
    name
  }
}
```

How GraphQL works?



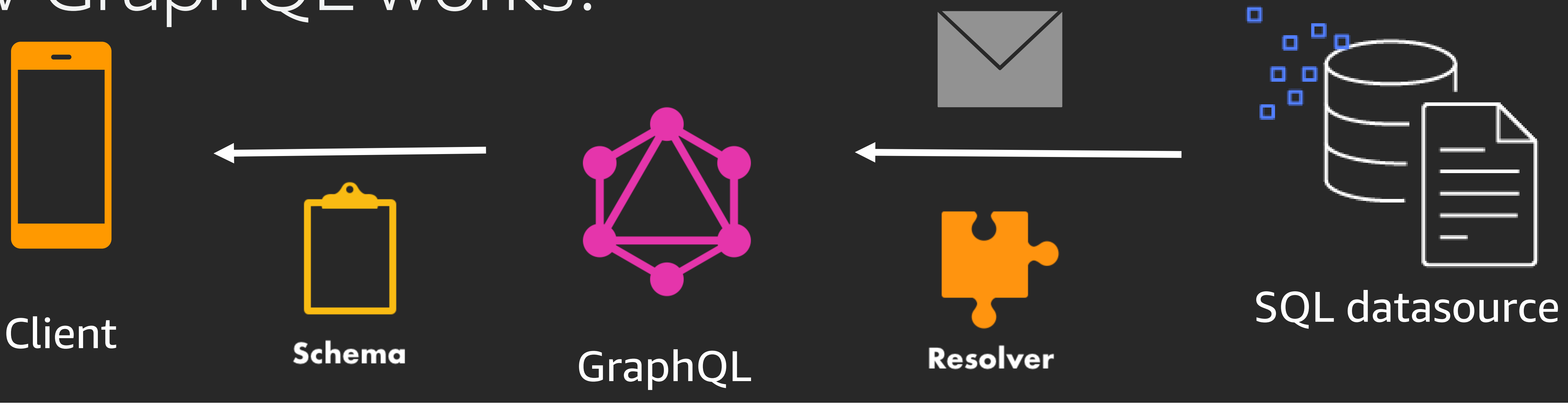
4.

GraphQL uses the request resolver to translate the client query and get data from the datasource

```
Translate GraphQL query into


SELECT video_id, video_name FROM videos
```

How GraphQL works?

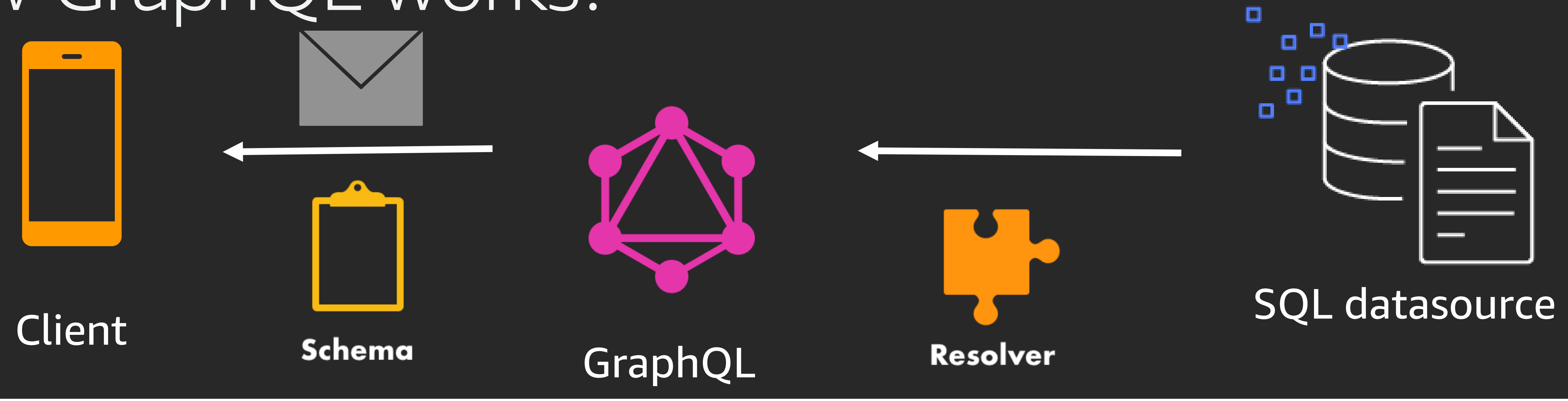


5.

GraphQL uses the response resolver to return data from the datasource to the client

In this case the resolver will translate SQL into JSON

How GraphQL works?



Client

Schema

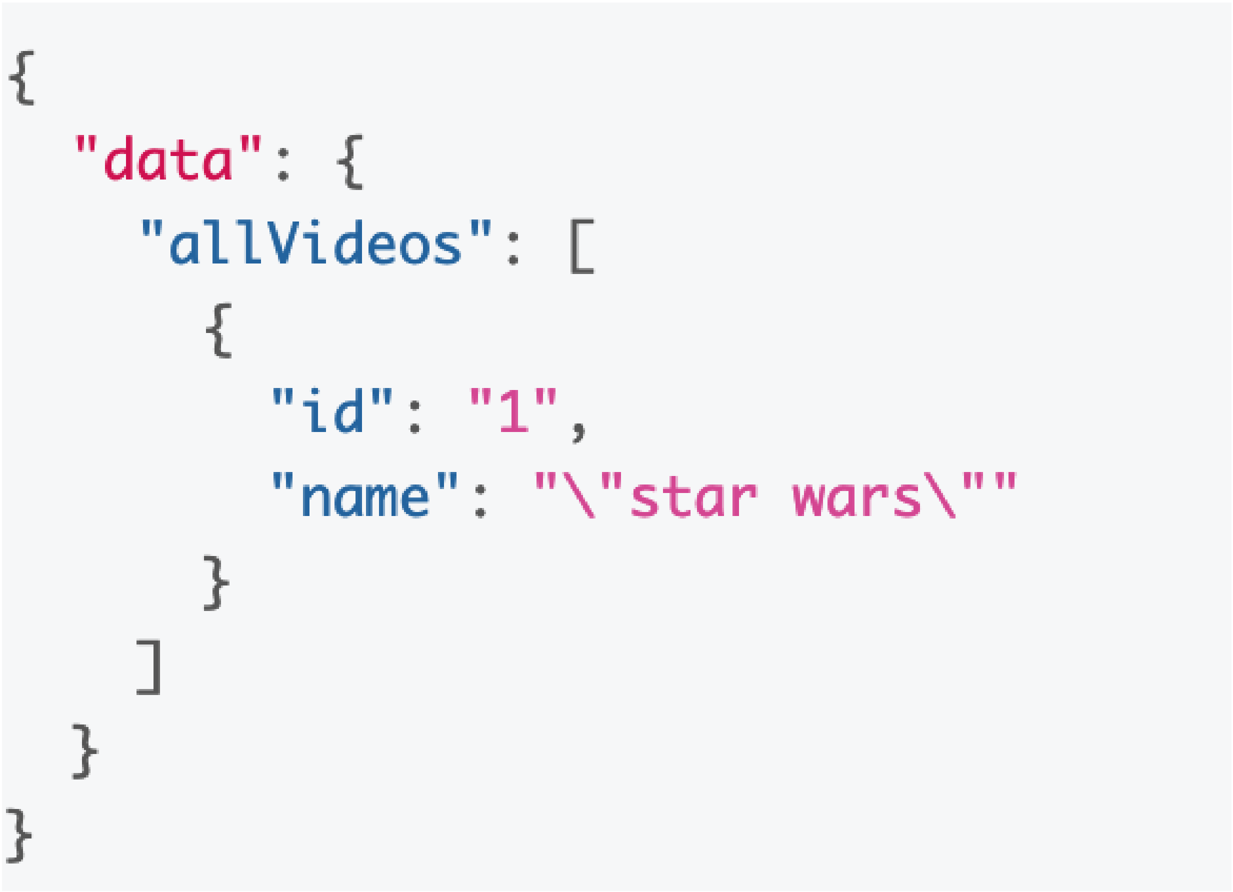
GraphQL

Resolver

SQL datasource

6.

GraphQL returns the JSON response to the client



```
{
  "data": {
    "allVideos": [
      {
        "id": "1",
        "name": "\"star wars\""
      }
    ]
  }
}
```

AWS AppSync

Build scalable applications
on a range of data sources,
including those requiring
real-time updates and
offline data access

AWS AppSync

Managed serverless GraphQL service

Connect to data sources in your account

Add data sync, real-time, and offline capabilities for any data source or API

GraphQL facade for any AWS service

Conflict detection and resolution in the cloud

Enterprise security features: AWS Identity and Access Management (IAM), Amazon Cognito, OIDC, API keys

CLI: GraphQL Transform: @model transformer

```
$ amplify add api
```

```
# schema.graphql
type Post @model {
  id: ID!
  title: String!
}
```

CLI: GraphQL Transform: Other transformers

`@model`
Top-level entity; creates Amazon DynamoDB table, resolvers, and additional schema (queries, mutations, and subscriptions) for base type

`@connection`
Enables relationships between `@model` types

`@auth`
Enables set of authorization rules

`@searchable`
Handles streaming the data of an `@model` object type to Amazon Elasticsearch Service and configures search resolvers

`@versioned`
Enables versioning

`@function`
Enables adding an AWS Lambda function as a data source

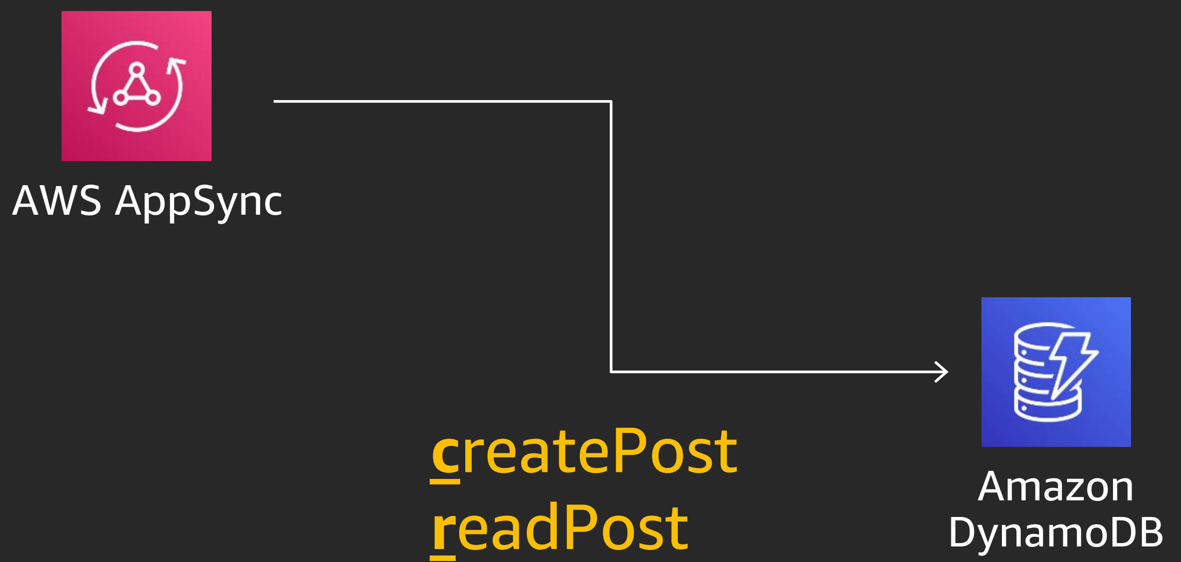
`@key`
Enables configuring custom indexes for `@model` types

GraphQL Transform: Mix and match data sources

```
type Post {
    id: ID!
    content: String
    description: String
    ups: Int
    downs: Int
}
```

GraphQL Transform: Mix and match data sources

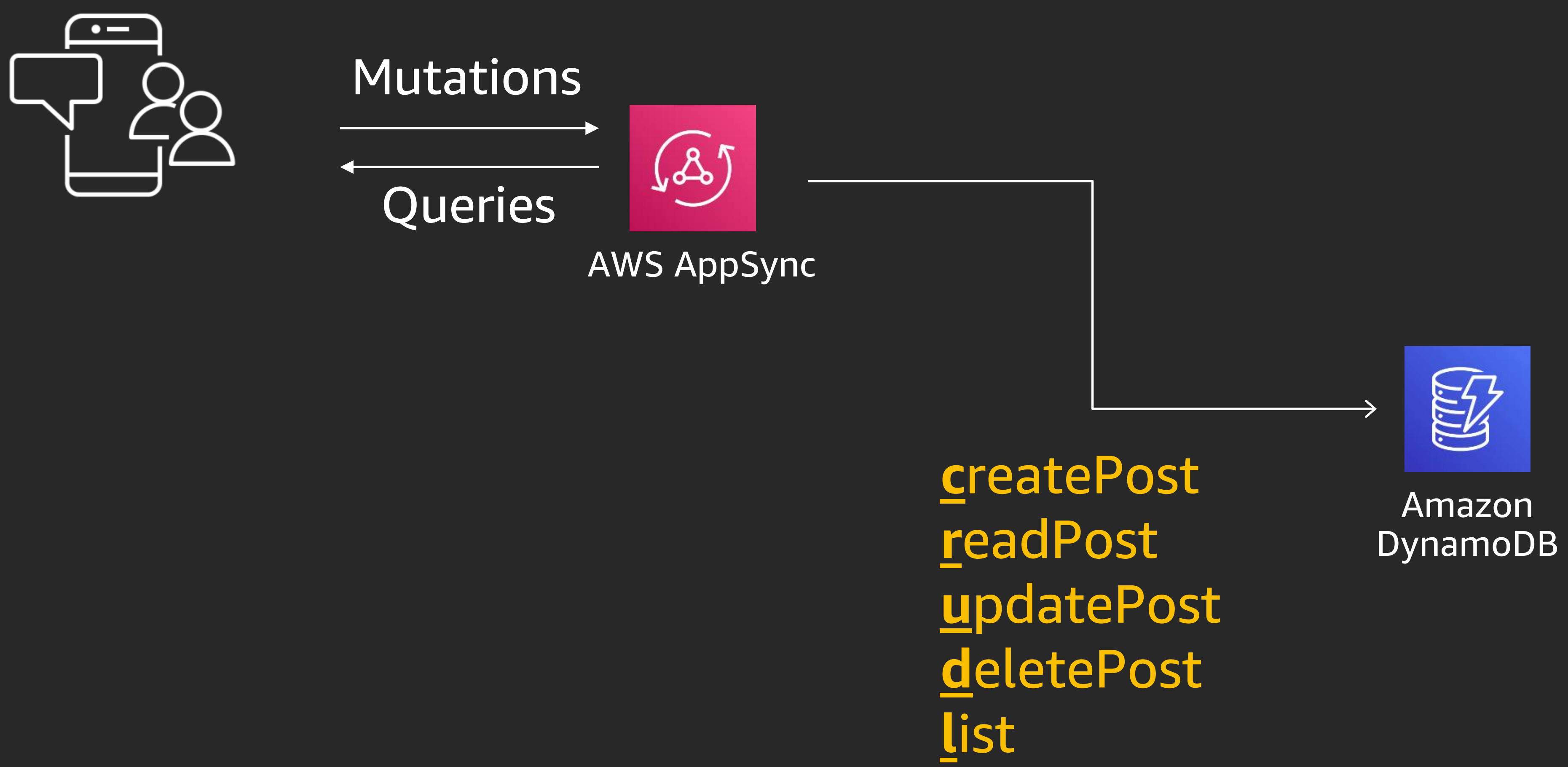
```
type Post
@model {
    id: ID!
    content: String
    description: String
    ups: Int
    downs: Int
}
```



createPost
readPost
updatePost
deletePost
list

GraphQL Transform: Mix and match data sources

```
type Post
@model {
    id: ID!
    content: String
    description: String
    ups: Int
    downs: Int
}
```



Mutations

Queries

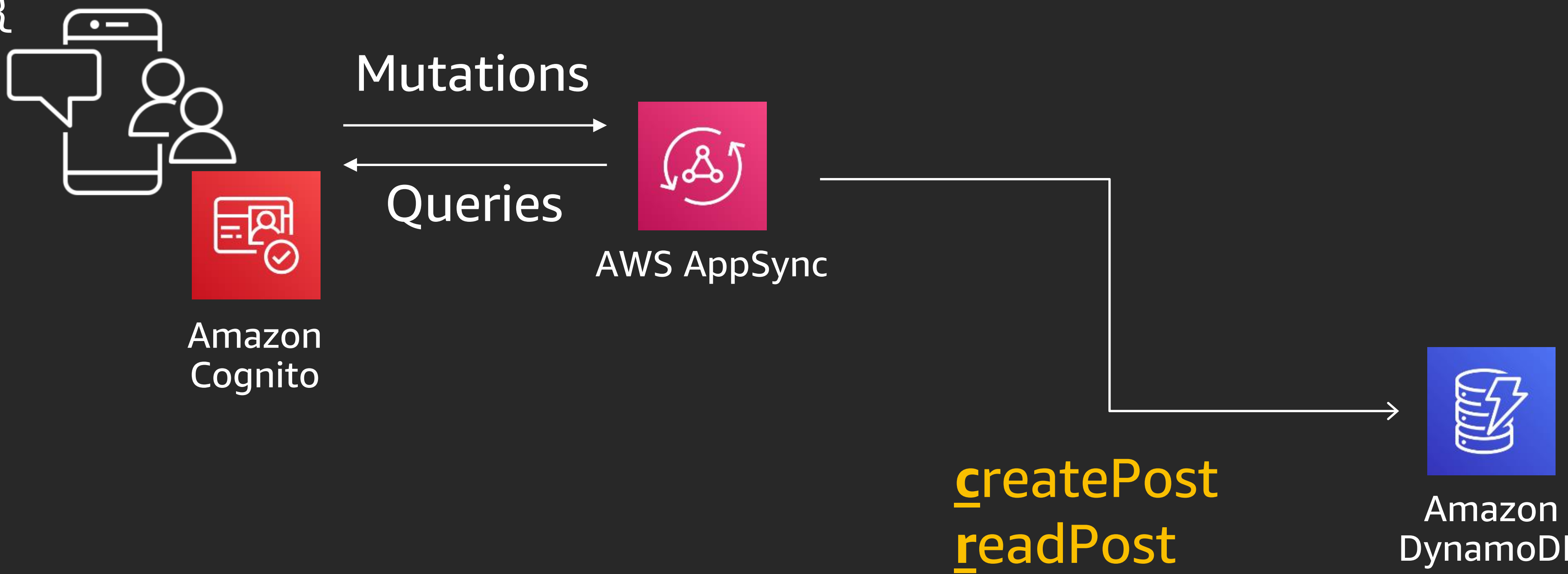
AWS AppSync

Amazon DynamoDB

createPost
readPost
updatePost
deletePost
list

GraphQL Transform: Mix and match data sources

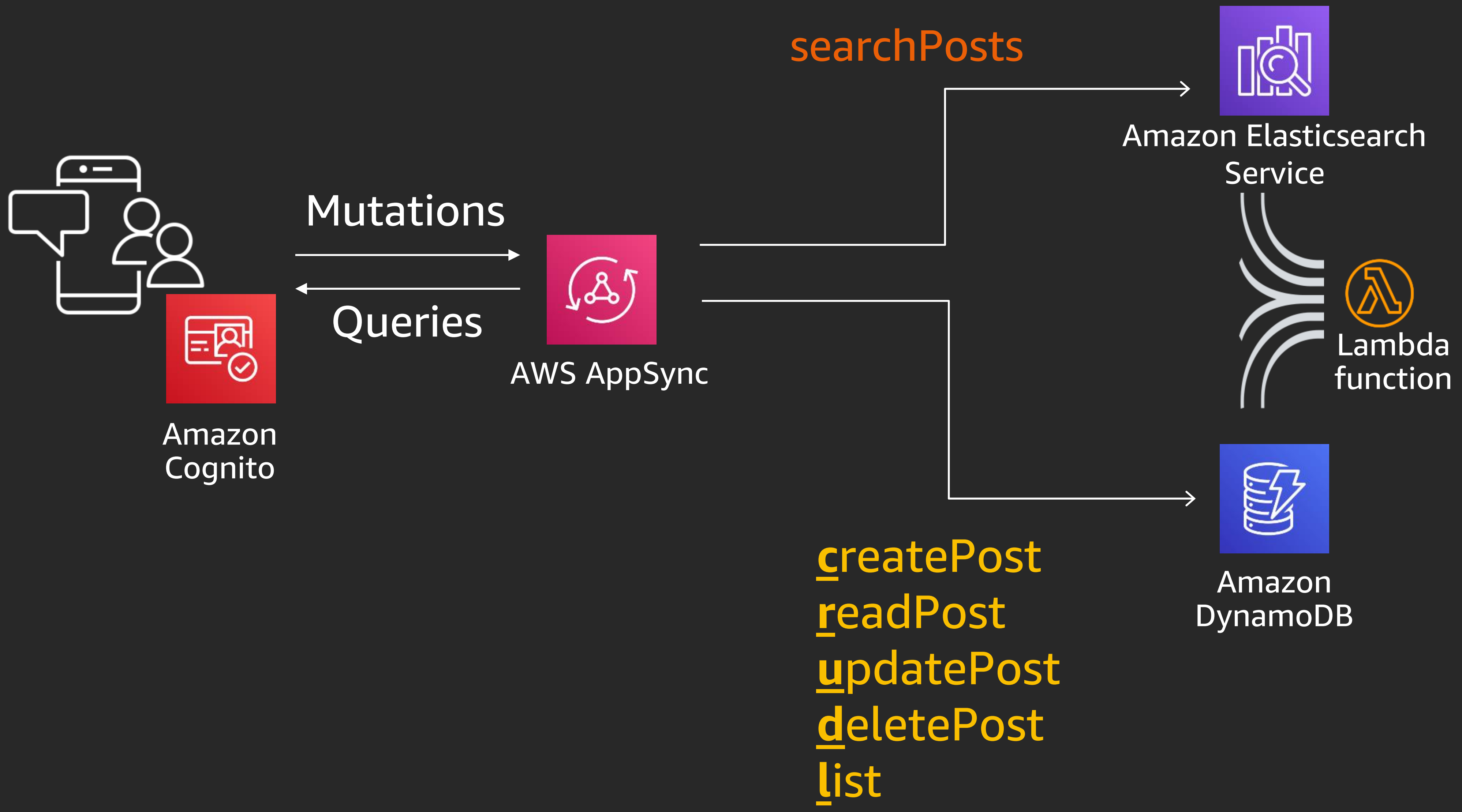
```
type Post
@model
@auth(rules: [{allow: owner}]){
    id: ID!
    content: String
    description: String
    ups: Int
    downs: Int
}
```



createPost
readPost
updatePost
deletePost
list

GraphQL Transform: Mix and match data sources

```
type Post
@model
@auth(rules: [{allow: owner}])
@searchable{
    id: ID!
    content: String
    description: String
    ups: Int
    downs: Int
}
```



CLI: GraphQL codegen

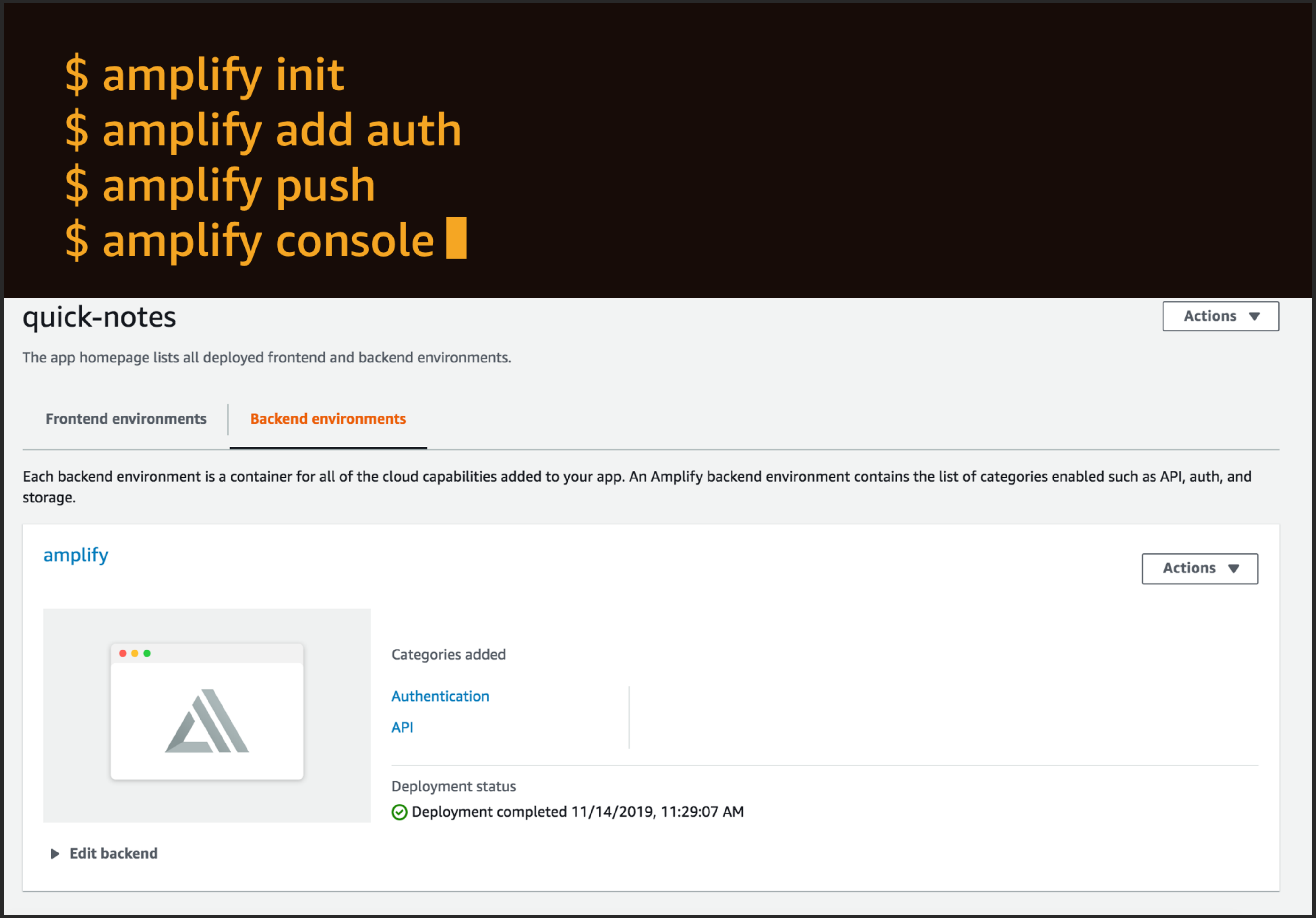
```
$ amplify codegen [--apiId <api-id>]


// Will generate GraphQL statements
// (queries, mutations, subscriptions)
```

Full stack deployments

Amplify console: Full-stack deployments

NEW FEATURE



```
$ amplify init
$ amplify add auth
$ amplify push
$ amplify console
```

quick-notes

The app homepage lists all deployed frontend and backend environments.

Each backend environment is a container for all of the cloud capabilities added to your app. An Amplify backend environment contains the list of categories enabled such as API, auth, and storage.

amplify

Categories added

Authentication

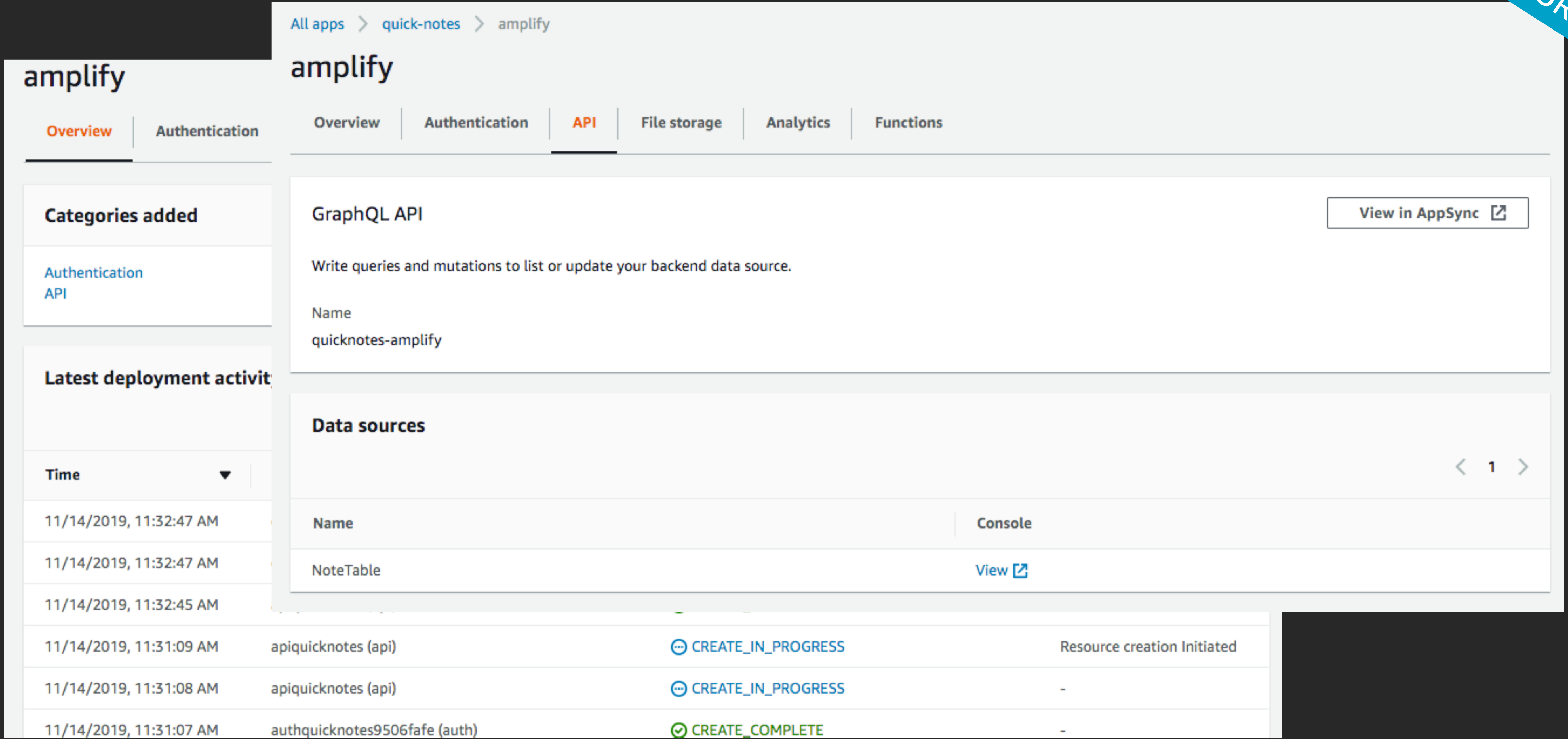
API

Deployment status

✓ Deployment completed 11/14/2019, 11:29:07 AM

Amplify console: Full-stack deployments

NEW FEATURE



amplify

GraphQL API

Write queries and mutations to list or update your backend data source.

Name
quicknotes-amplify

Data sources

Name	Console
NoteTable	View

amplify

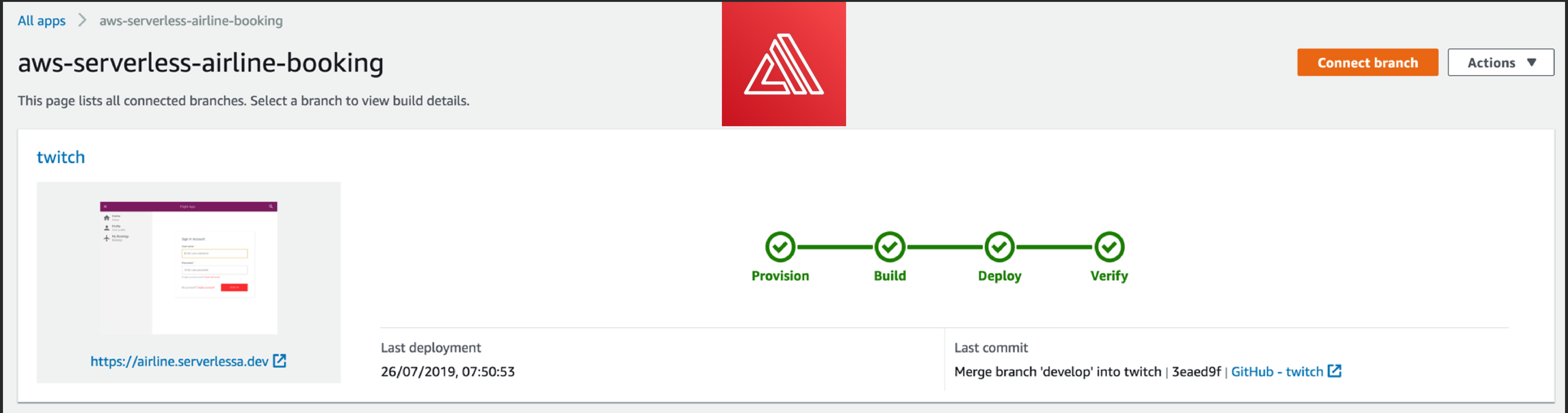
Categories added

Authentication
API

Latest deployment activit

Time			
11/14/2019, 11:32:47 AM			
11/14/2019, 11:32:47 AM			
11/14/2019, 11:32:45 AM			
11/14/2019, 11:31:09 AM	apiquicknotes (api)	CREATE_IN_PROGRESS	Resource creation Initiated
11/14/2019, 11:31:08 AM	apiquicknotes (api)	CREATE_IN_PROGRESS	-
11/14/2019, 11:31:07 AM	authquicknotes9506fafe (auth)	CREATE_COMPLETE	-

AWS Amplify console recap



All apps > aws-serverless-airline-booking

aws-serverless-airline-booking

This page lists all connected branches. Select a branch to view build details.

twitch

https://airline.serverlessa.dev

Last deployment
26/07/2019, 07:50:53

Last commit
Merge branch 'develop' into twitch | 3eaed9f | GitHub - twitch

Git-based CI/CD for full-stack serverless apps

See a live demo in the following session

Title: Live Coding with Amplify

Track: I want to read code

Thank you!

Marcia Villalba

@mavi888uy

YouTube Channel: https://youtube.com/foobar_codes

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