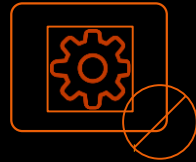# Agenda

What we mean by "serverless" apps

Introducing AWS Amplify to help stand up serverless apps

Adding Authentication, a GraphQL API, and CI/CD to a sample app

Where to learn more
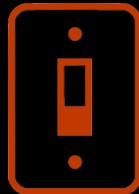
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What is "serverless"?

No infrastructure
provisioning or management

Automatic scaling

Pay for value

Highly available and secure

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Serverless is an operational model that spans many different categories of services

COMPUTE

AWS Lambda

AWS Fargate

DATA STORES

Amazon S3

Amazon Aurora Serverless

Amazon DynamoDB

INTEGRATION

Amazon API Gateway

Amazon SQS

Amazon SNS

AWS Step Functions

AWS AppSync

aws

As developers, we want…

Frontend support for multiple platforms and frameworks

Centralized config, cloud provisioning, and team workflow

Code generation to eliminate boilerplate

Secure and scalable apps

Offline data, network-optimized sync, and real-time updates

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

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Amplify Framework: Library, UI Components, & CLI

Libraries focused on frontend developers

Support for native apps with iOS and Android SDKs

Support for JavaScript incl. React, React Native, Angular, Ionic, and Vue

Category-based opinionated implementations: Auth, Analytics, API, Storage, Interactions, XR, PubSub

'Escape' hatches for all AWS services

UI components for React, React Native, Angular, and Ionic

Support for drop-in auth, photo pickers, and chatbots

CLI toolchain for rapidly integrating AWS services to projects

Iterative code & type generation for GraphQL APIs throughout the development cycle

aws

Authentication

- Sign up / Sign in / Sign out / Forgot password
- User management with custom attributes
- Third-party identity federation
- Two-factor authentication

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Adding Authentication with Amplify

```
$ amplify add auth

$ amplify push
```

aws

Demo

aws

Adding authentication to a JS front-end
(React JS shown below; other JS frameworks as well as iOS and Android also supported)

```javascript
import Amplify from 'aws-amplify'
import awsmobile from './aws-exports'
import { withAuthenticator } from 'aws-amplify-react'

Amplify.configure(awsmobile)

function App() {
  // . . .
}

export default withAuthenticator(App)
```
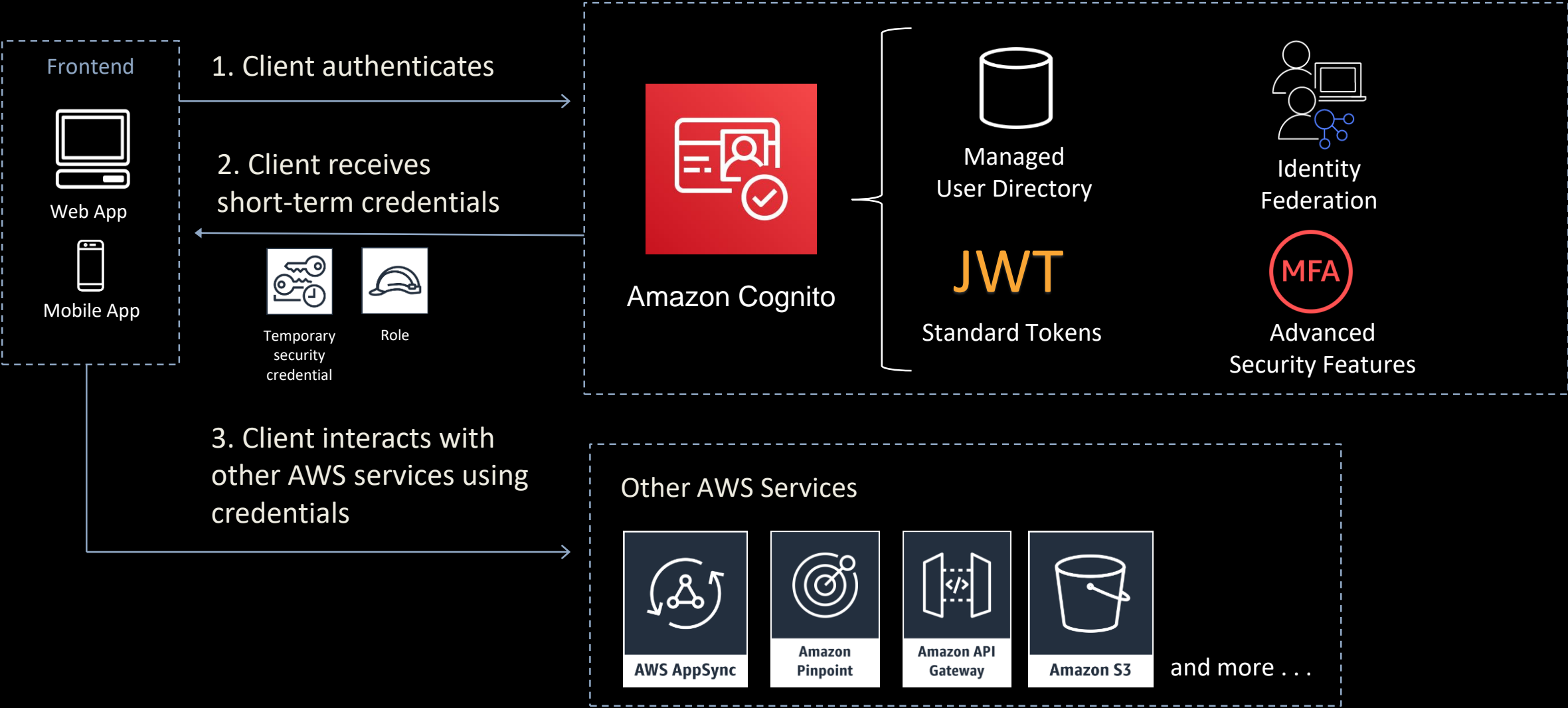
Demo

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Authentication with Amazon Cognito

Frontend

Web App

Mobile App

1. Client authenticates

2. Client receives short-term credentials

Temporary security credential

Role

Amazon Cognito

Managed User Directory

JWT

Standard Tokens

Identity Federation

MFA

Advanced Security Features

3. Client interacts with other AWS services using credentials

Other AWS Services

AWS AppSync

Amazon Pinpoint

Amazon API Gateway

Amazon S3

and more . . .

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API
& Data store

- REST or GraphQL
- SQL / No-SQL / Document store, or serverless functions for data
- Client & Back-end code generation for request / retrieval
- Integrated with Authentication

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Adding a GraphQL + NoSQL Backend with Amplify

$ amplify add api

$ amplify push

```
# schema.graphql

type Todo @model {
    id: ID!

    description: String!
    completed: Boolean!
}
```

aws

Demo

aws

Integrating a JS frontend with the GraphQL API
(JS shown below with Amplify client; iOS, Android, and other JS SDKs also supported)

```javascript
import Amplify, {API, graphqlOperation} from 'aws-amplify'

import * as queries from './graphql/queries'

import * as mutations from './graphql/mutations'


// Get all TODOs

await API.graphql(graphqlOperation(queries.listTodos))


// Add a new TODO

const input = { description: 'New ToDo', completed: false }

await API.graphql(graphqlOperation(mutations.createTodo, {input}))
```

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Scoping Data Per-User

```
# Update schema.graphql
type Todo @model @auth(rules: [{allow: owner}]) {
    id: ID!
    description: String!
    completed: Boolean!
}


# Re-push to generate new code and deploy
$ amplify push
```

aws

More advanced querying from the frontend
(JS shown below with Amplify client; iOS, Android, and other JS SDKs also supported)

```js
// Get all un-completed TODOs

const queryArgs = { filter: { completed: { eq: false } } }

await API.graphql(graphqlOperation(queries.listTodos, queryArgs))
```
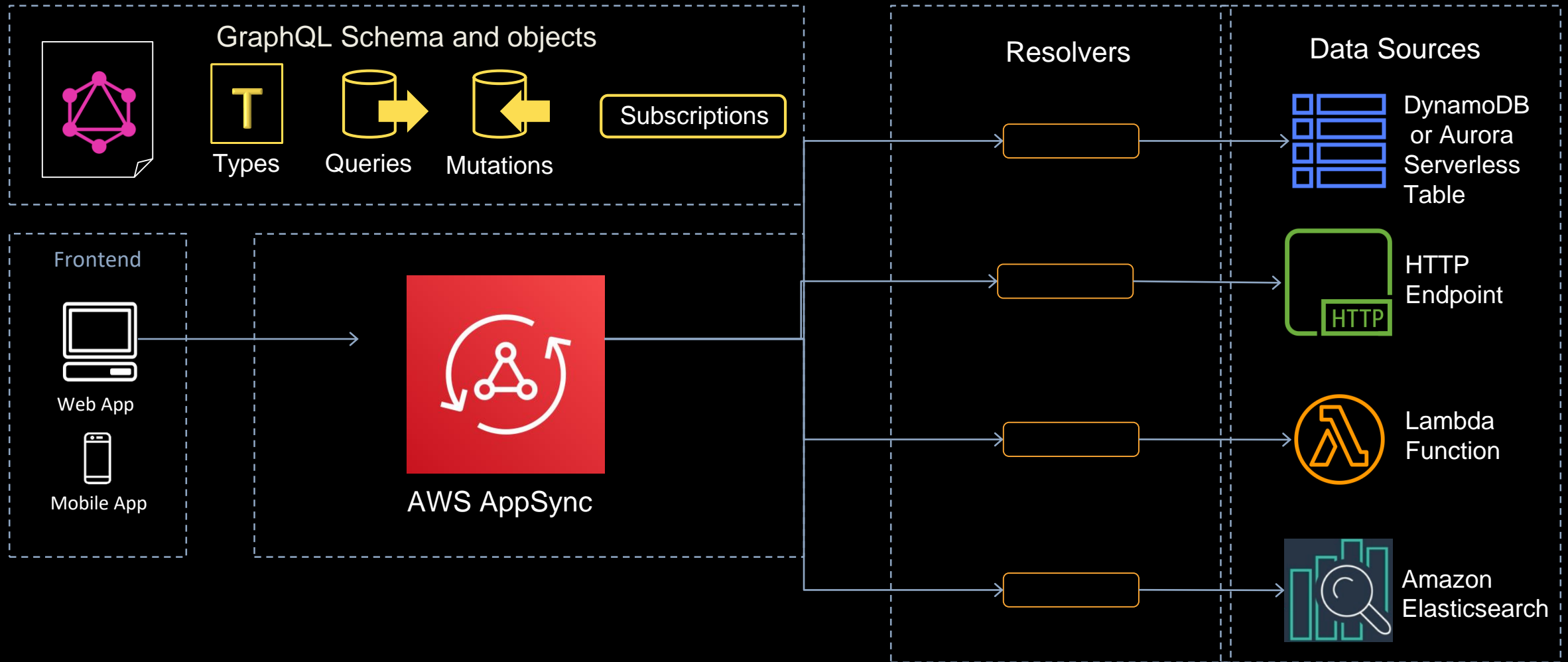
Built-in Filtering Syntax & Comparators

```
{
  filter: {
    attribute: {
      comparator: value
    },
    [...]
  }
}
```

ne	!=
eq	==
lt / lte	< / <=
gt / gte	> / >=
contains	string contains
notContains	string doesn't contain
between	number is between
beginsWith	string begins with

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Demo

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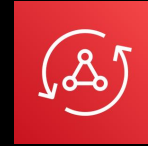# GraphQL APIs with AWS AppSync

Amplify GraphQL Transforms

`@model`   – top-level entity, creates `DynamoDB` table, resolvers & additional schema
                (queries, mutations & subscriptions) for base type

`@connection` - enables relationships between `@model` types

`@auth`   – enables set of authorization rules

`@function`   – binds an `AWS` `Lambda` function to resolve a field

`@searchable` - handles streaming the data of an `@model` object type to
                `Amazon` `Elasticsearch` `Service` & configures search resolvers

`@versioned` – enables versioning

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ALDO + AWS AppSync

"Not only does AppSync solve our real-time needs, but it has also enabled us to quickly build a GraphQL API Layer and standardize our data schema to be used across applications.

The result is a scalable platform for our global stores that we are able to extend for our franchise partners worldwide."

- Roberto Lancione, Director Digital Technology, ALDO Group

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CI/CD
& Hosting

- Set up builds and deployment per-branch
- Integration with existing Amplify backends
- Blue/Green atomic deployments
- Easy custom domains for hosting

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AWS Amplify Console

Globally available

Your app is served via AWS's reliable content delivery network with 175+ points of presence globally.
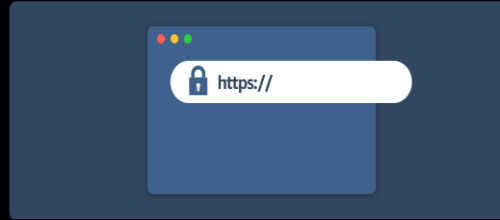
Easy custom domain setup

Set up custom domains managed in Amazon Route 53 with a single click plus get a free HTTPS certificate.
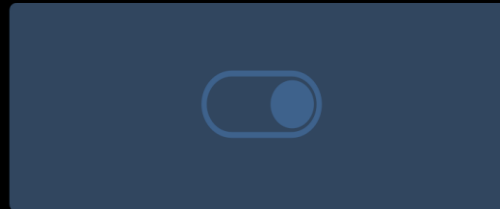
Continuous Workflow

Connect your repository to 'git push' changes to your frontend and backend in a single workflow.

Feature Branch Deployments

Work on new features without impacting production. Create branch deployments linked to each feature branch.

Atomic Deployments

All deployments either rollout successfully or fail without requiring maintenance windows.
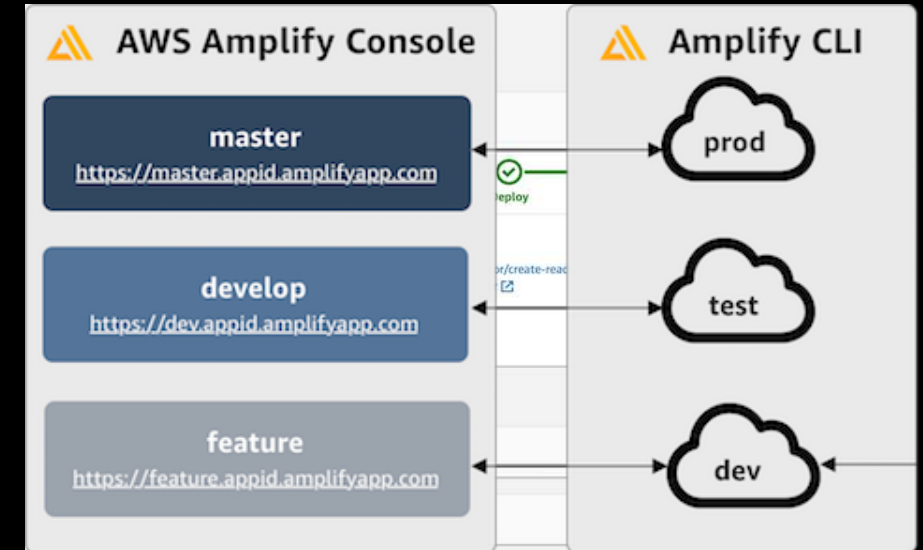
Password Protection

Share yet-to-be released features with internal stakeholders by setting a username and password

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Configuring CI/CD & Hosting with Amplify

1. Open Amplify Console

2. Connect & choose repository

3. Deploy application

4. Make changes to app and commit locally

5. Push changes to a branch

   New build is kicked off by Amplify Console

Review

- AWS Amplify greatly simplifies provisioning and configuring cloud resources for your apps (authentication, APIs, data stores, and more)

- Amazon Cognito lets you add user authentication and authorization to your web and mobile apps quickly and easily

- AWS AppSync is a fully-managed GraphQL service with powerful and convenient code generation capabilities when used with AWS Amplify

- The AWS Amplify Console makes it easy to trigger CI/CD builds and deployments to unique environments for each branch of your source repository

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Where to learn more

- AWS Amplify
  https://aws-amplify.github.io/

- AWS AppSync
  https://aws.amazon.com/appsync/

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AWS Digital Training
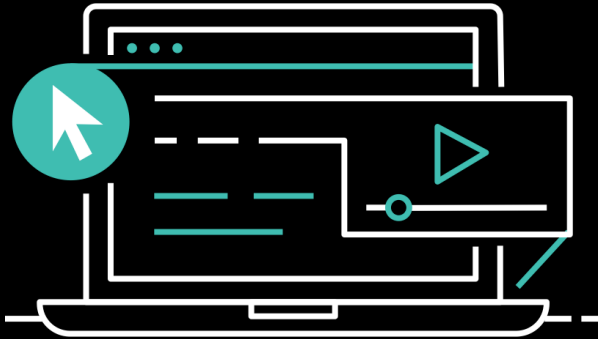
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Featured Courses

- **AWS Cloud Practitioner Essentials (Second Edition)**
  Learn the fundamentals of the AWS Cloud and prepare for the AWS Certified Cloud Practitioner exam.

- **Amazon DynamoDB for Serverless Architectures**
  An introduction to Amazon DynamoDB and how it's leveraged in building a serverless architecture

- **AWS Security Fundamentals**
  Learn fundamental cloud computing and AWS security concepts, including AWS access control and management, governance, logging, and encryption methods.

- **Getting Started with Amazon Simple Storage Service (Amazon S3)**
  Learn the knowledge to determine when to use Amazon S3 by reviewing typical use cases and understanding how the service provides object storage for your applications

aws.training

Thank you for attending AWS Builders Online Series

We hope you found it interesting! A kind reminder to **complete the survey.**
Let us know what you thought of today's event and how we can improve the event experience for you in the future.

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