



React, JAVA e AWS cloud, criando um crud e fazendo upload de imagens para S3



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Agenda

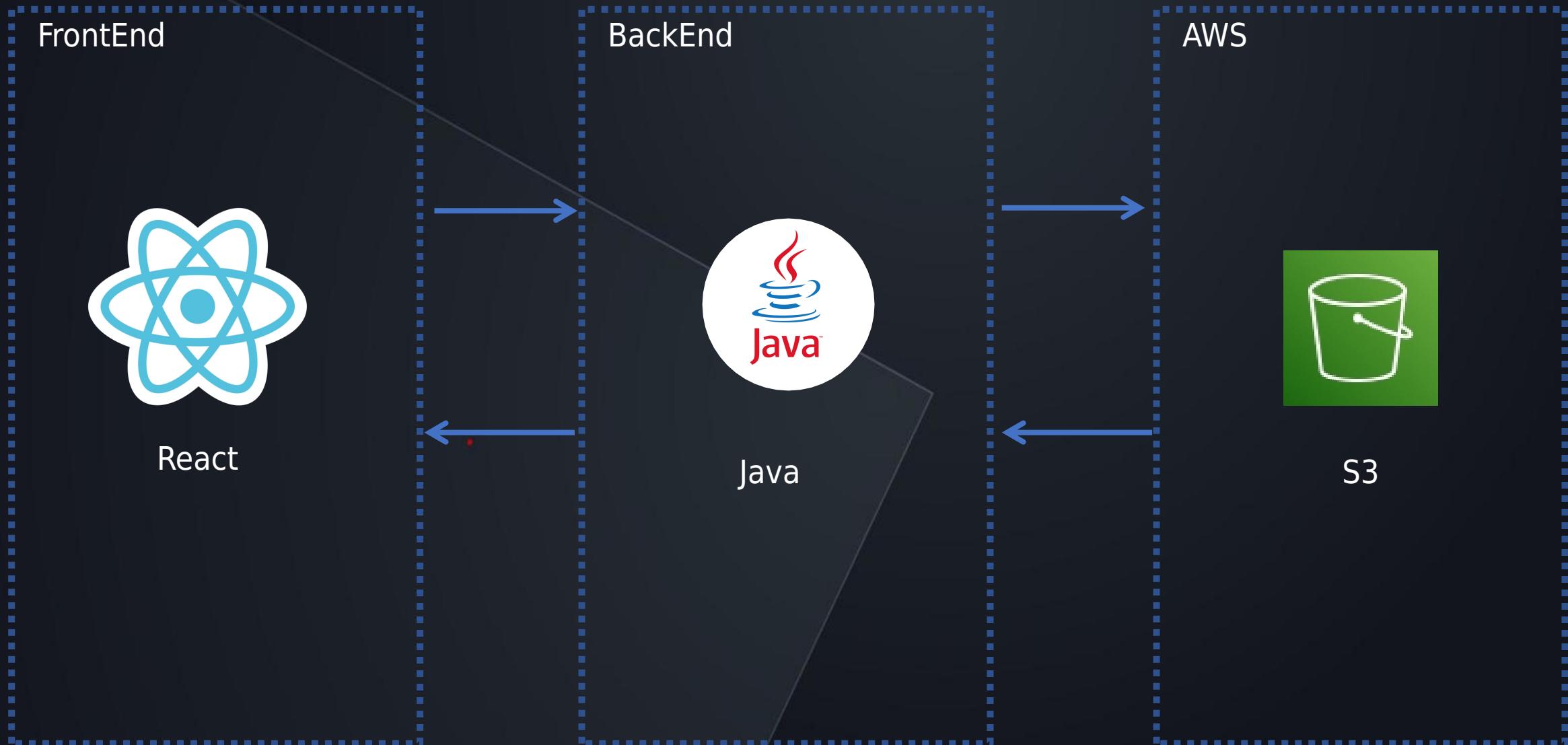
Building Apps

App Integration

AI/ML

CDK for Complex Enterprise Applications
Eric Z. Beard and Rico Huijbers

Archicteture



Archicteture



What is AWS CDK?

The AWS Cloud Development Kit (AWS CDK) is an open-source software development framework for defining cloud infrastructure as code with modern programming languages and deploying it through AWS CloudFormation.

<https://aws.amazon.com/cdk/faqs/>



https://aws.amazon.com/cdk/?nc1=h_ls

AWS Cloud Development Kit (CDK)

A multi-language software development framework for modeling cloud infrastructure as reusable components

```
package com.wsousa.awsimageupload.service;

import com.amazonaws.AmazonServiceException;
import com.amazonaws.services.s3.AmazonS3;
import com.amazonaws.services.s3.model.*;
import com.amazonaws.util.IOUtils;
import com.wsousa.awsimageupload.domain.BucketName;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.stereotype.Service;

import java.io.IOException;
import java.io.InputStream;
import java.util.List;
import java.util.Map;
import java.util.Optional;

3 usages  ▲ weder96
@Service
public class FileStore {
    9 usages
    private final AmazonS3 s3;

    ▲ weder96
    @Autowired
    public FileStore(AmazonS3 s3) { this.s3 = s3; }
```



Familiar



Tool Support



Abstraction



Main Components

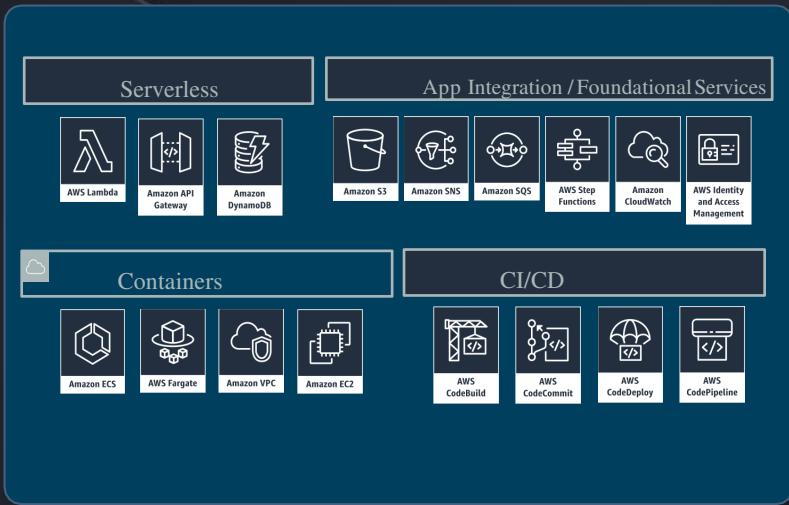
App

Stacks

Resources



Core Framework



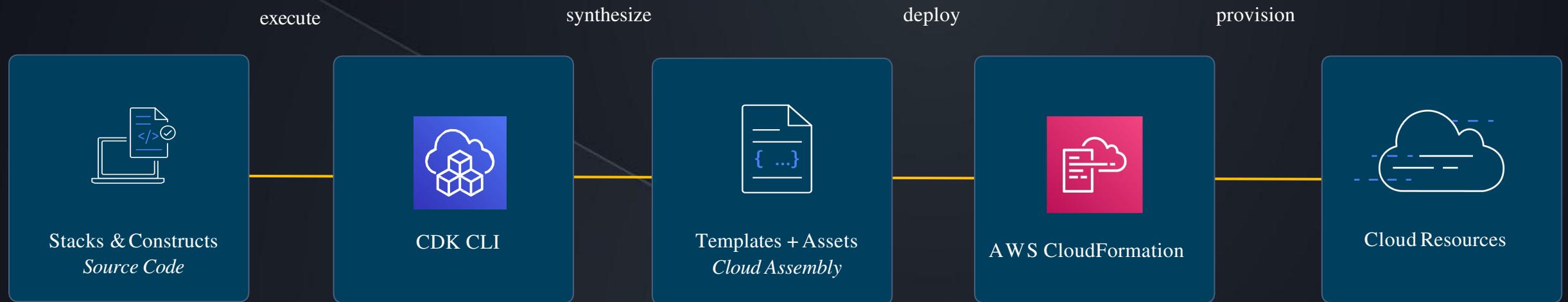
AWS ConstructLibrary

```
zsh
cdk-app on P master [?] is v0.1.0 via v14.2.0 using cdkAppStackCdkAppStack took 10s
+----+-----+
|   | IAM Statement Changes
+----+-----+
| Resource | Effect | Action | Principal | Condition |
| + ${CdAppQueue.Arn} | Allow | sqs:SendMessage | Service:sns.amazonaws.com | "ArnEquals": { "aws:SourceArn": "${CdAppTopic}" } |
+----+-----+
(NOTE: There may be security-related changes not in this list. See https://github.com/aws/aws-cdk/issues/1299)
Conditions:
[+] Condition CDKMetadataAvailable: {"Fn::Or": [{"Fn::Equals": {"Ref": "AWS::Region"}, "Fn::Equals": [{"Ref": "ap-east-1"}]}, {"Fn::Equals": [{"Ref": "AWS::Region"}, "ap-northeast-1"]}, {"Fn::Equals": [{"Ref": "AWS::Region"}, "ap-northeast-2"]}, {"Fn::Equals": [{"Ref": "AWS::Region"}, "ap-south-1"]}, {"Fn::Equals": [{"Ref": "AWS::Region"}, "ap-southeast-1"]}, {"Fn::Equals": [{"Ref": "AWS::Region"}, "ap-southeast-2"]}, {"Fn::Equals": [{"Ref": "AWS::Region"}, "ca-central-1"]}, {"Fn::Equals": [{"Ref": "AWS::Region"}, "cn-north-1"]}, {"Fn::Equals": [{"Ref": "AWS::Region"}, "cn-northwest-1"]}, {"Fn::Equals": [{"Ref": "AWS::Region"}, "eu-central-1"]}, {"Fn::Equals": [{"Ref": "AWS::Region"}, "eu-west-1"]}, {"Fn::Equals": [{"Ref": "AWS::Region"}, "eu-west-2"]}, {"Fn::Equals": [{"Ref": "AWS::Region"}, "sa-east-1"]}, {"Fn::Equals": [{"Ref": "AWS::Region"}, "eu-south-1"]}, {"Fn::Equals": [{"Ref": "AWS::Region"}, "us-west-1"]}, {"Fn::Equals": [{"Ref": "AWS::Region"}, "us-west-2"]}], {"Fn::Not": [{"Fn::Equals": {"Ref": "AWS::Region"}, "Fn::Equals": [{"Ref": "ap-east-1"}]}], {"Fn::Not": [{"Fn::Equals": {"Ref": "AWS::Region"}, "Fn::Equals": [{"Ref": "ap-northeast-1"}]}], {"Fn::Not": [{"Fn::Equals": {"Ref": "AWS::Region"}, "Fn::Equals": [{"Ref": "ap-northeast-2"}]}], {"Fn::Not": [{"Fn::Equals": {"Ref": "AWS::Region"}, "Fn::Equals": [{"Ref": "ap-south-1"}]}], {"Fn::Not": [{"Fn::Equals": {"Ref": "AWS::Region"}, "Fn::Equals": [{"Ref": "ap-southeast-1"}]}], {"Fn::Not": [{"Fn::Equals": {"Ref": "AWS::Region"}, "Fn::Equals": [{"Ref": "ap-southeast-2"}]}], {"Fn::Not": [{"Fn::Equals": {"Ref": "AWS::Region"}, "Fn::Equals": [{"Ref": "ca-central-1"}]}], {"Fn::Not": [{"Fn::Equals": {"Ref": "AWS::Region"}, "Fn::Equals": [{"Ref": "cn-north-1"}]}], {"Fn::Not": [{"Fn::Equals": {"Ref": "AWS::Region"}, "Fn::Equals": [{"Ref": "cn-northwest-1"}]}], {"Fn::Not": [{"Fn::Equals": {"Ref": "AWS::Region"}, "Fn::Equals": [{"Ref": "eu-central-1"}]}], {"Fn::Not": [{"Fn::Equals": {"Ref": "AWS::Region"}, "Fn::Equals": [{"Ref": "eu-west-1"}]}], {"Fn::Not": [{"Fn::Equals": {"Ref": "AWS::Region"}, "Fn::Equals": [{"Ref": "eu-west-2"}]}], {"Fn::Not": [{"Fn::Equals": {"Ref": "AWS::Region"}, "Fn::Equals": [{"Ref": "sa-east-1"}]}], {"Fn::Not": [{"Fn::Equals": {"Ref": "AWS::Region"}, "Fn::Equals": [{"Ref": "eu-south-1"}]}], {"Fn::Not": [{"Fn::Equals": {"Ref": "AWS::Region"}, "Fn::Equals": [{"Ref": "us-west-1"}]}], {"Fn::Not": [{"Fn::Equals": {"Ref": "AWS::Region"}, "Fn::Equals": [{"Ref": "us-west-2"}]}]}]}
Resources:
+ AWS::SQS::Queue CdAppQueue CdAppQueueFB2AGFBC
+ AWS::SQS::QueuePolicy CdAppQueuePolicy CdAppQueuePolicy6985FD2B0 CdAppQueueCdkAppStackCdkAppTopicA685FD2011CAC019
+ AWS::SNS::Subscription CdAppQueueCdkAppStackCdkAppTopicA685FD2B0 CdAppQueueCdkAppStackCdkAppTopicA685FD2011CAC019
+ AWS::SNS::Topic CdkAppTopic CdAppTopic4BDCC5F1

cdk-app on P master [?] is v0.1.0 via v14.2.0 using cdkAppStackCdkAppStack took 2s
```

AWS CDKCLI

Development Workflow



`cdk init` // create new project



`npm run build` // build project



`cdk synth` // create templates and assets

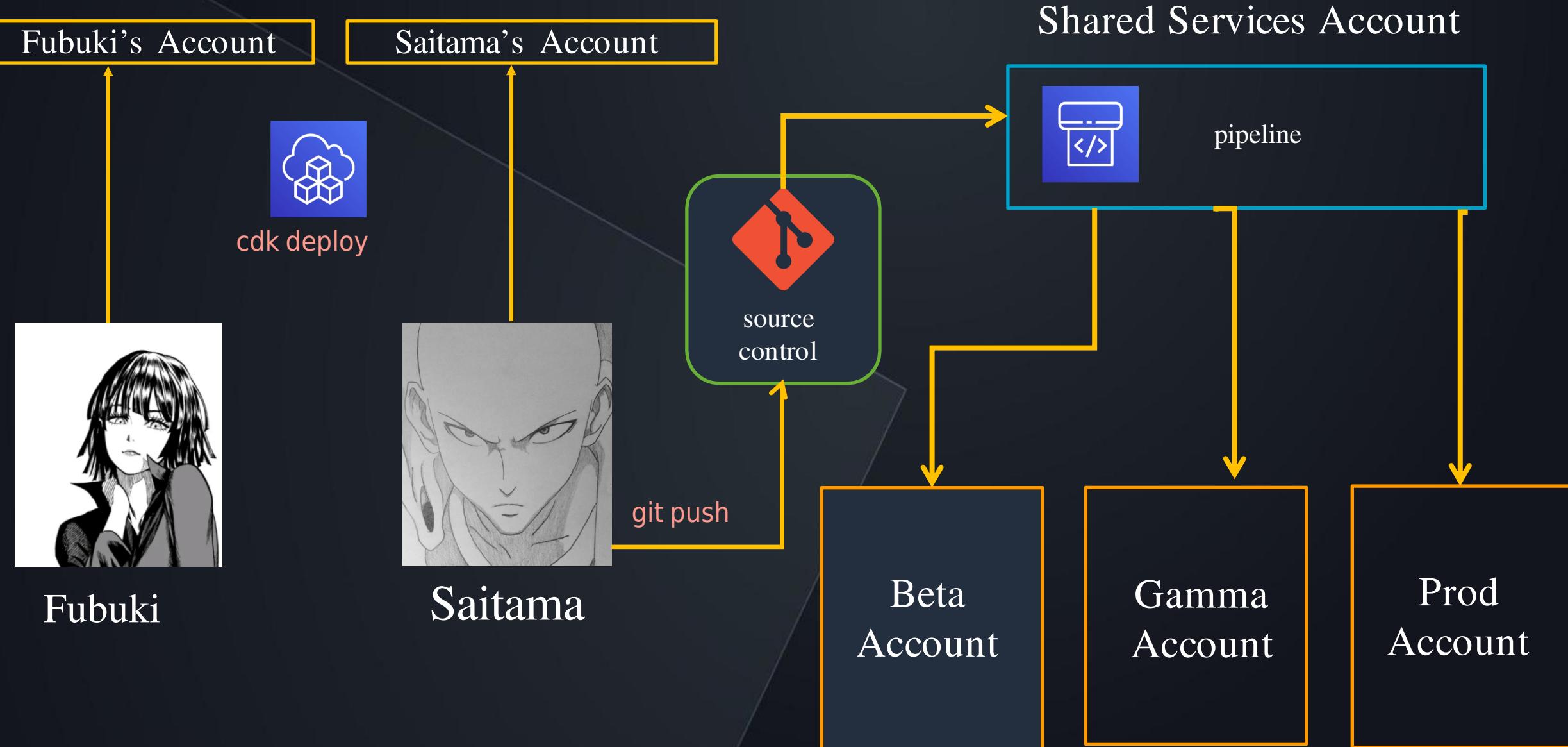


`cdk diff` // check what will change



`cdk deploy` // push changes to your account

Best Practice – Deploy to multiple accounts

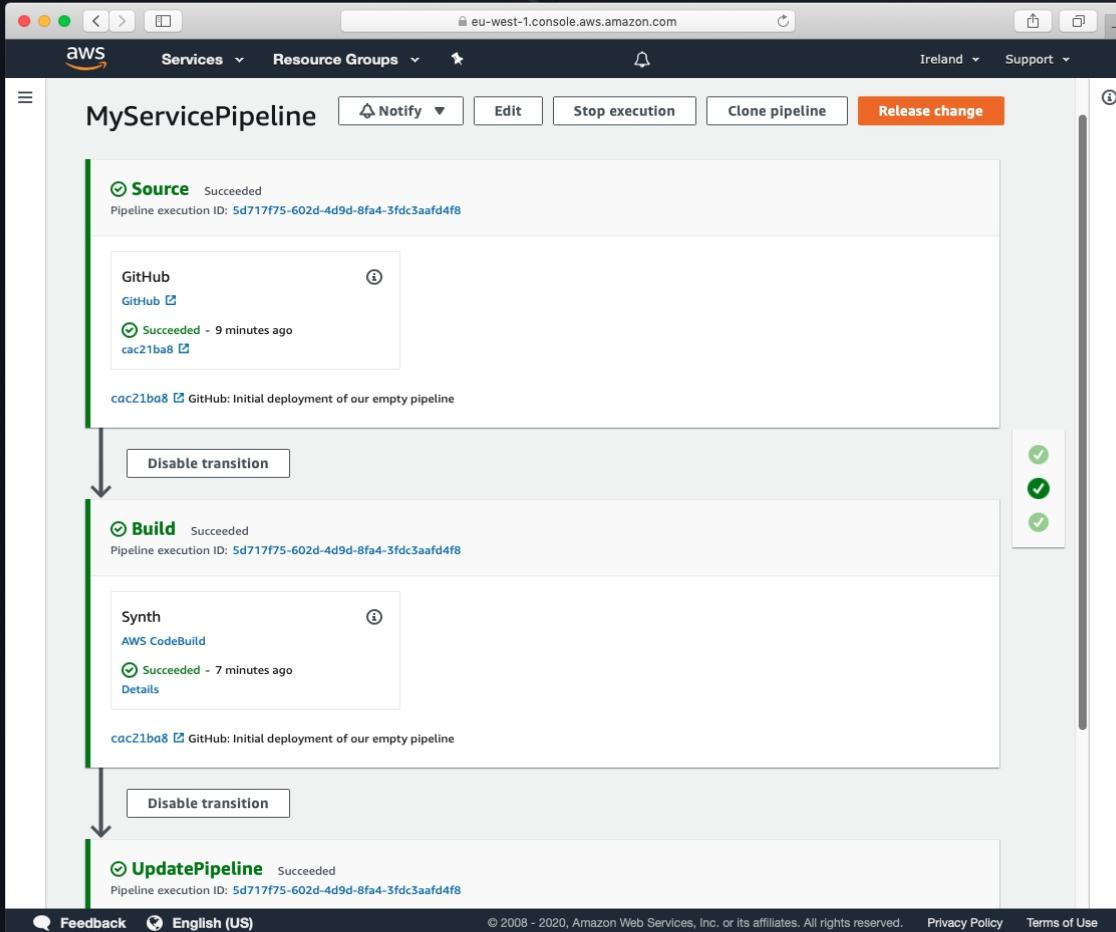


Application Development



CDK Pipelines

Continuous delivery for AWS CDK applications



Model continuous delivery pipelines as part of your infrastructure code.

Easily model **cross-account** and **cross-region** pipeline configurations.

Pipelines are **self modifying** as you push your CDK code to origin.

NEW

AWS Cloud Development Kit (CDK) v2

Consolidated construct library (`aws-cdk-lib`),
experimental modules distributed separately.
New CDK Watch functionality.

GENERALLY AVAILABLE TODAY

For JavaScript, TypeScript, Java, Python, .NET and Go.

Difference between v2 and v1

CDK v1

```
"dependencies": {  
    "@aws-cdk/aws-amplify": "^1.125.0",  
    "@aws-cdk/aws-appsync": "^1.125.0",  
    "@aws-cdk/aws-codepipeline": "^1.125.0",  
    "@aws-cdk/aws-cognito": "^1.125.0",  
    "@aws-cdk/aws-lambda": "^1.125.0",  
    "@aws-cdk/aws-sns": "^1.125.0",  
    "@aws-cdk/core": "1.125.0",  
    "@aws-cdk/pipelines": "^1.125.0",  
}
```

CDK v2

```
"dependencies": {  
    "aws-cdk-lib": "2.0.0",  
    "constructs": "^10.0.0",  
    "@aws-cdk/aws-iot-alpha": "^2.0.0-alpha.0"  
}
```

```
import { App, Stack } from "@aws-cdk/core";  
const lambda = require("@aws-cdk/aws-lambda");
```

```
import { App, Stack } from "aws-cdk-lib";  
const s3 = require("aws-cdk-lib/aws-s3");
```

NEW

AWS CDK Construct Hub

Share open-source construct
libraries with the wider cloud
development community.

GENERALLY AVAILABLE TODAY

<https://constructs.dev>

The screenshot shows the homepage of the AWS Construct Hub at https://constructs.dev. The page has a dark blue header with the title "Construct Hub" and links for "Getting Started", "Documentation", and "Contribute". Below the header is a search bar with the placeholder "Search 800+ construct libraries" and a "Find Constructs" button. The main content area features three columns: "One home for all CDKs" (describing libraries for AWS CDK, CDK8s, and CDKtf), "Support across languages" (listing TypeScript, Python, Java, and .NET), and "Provision a range of cloud resources" (listing Datadog, AWS, MongoDB, and Aqua Security). At the bottom, there's a "Search by use case" section with a list of categories: Monitoring, Containers, Serverless, Databases, Utilities, Deployment, Websites, Security, Compliance, Network, Artificial Intelligence (AI), and Cloud Services Integrations.

<https://aws.amazon.com/pt/blogs/developer/construct-hub-preview/>

AWS CDK Construct Hub

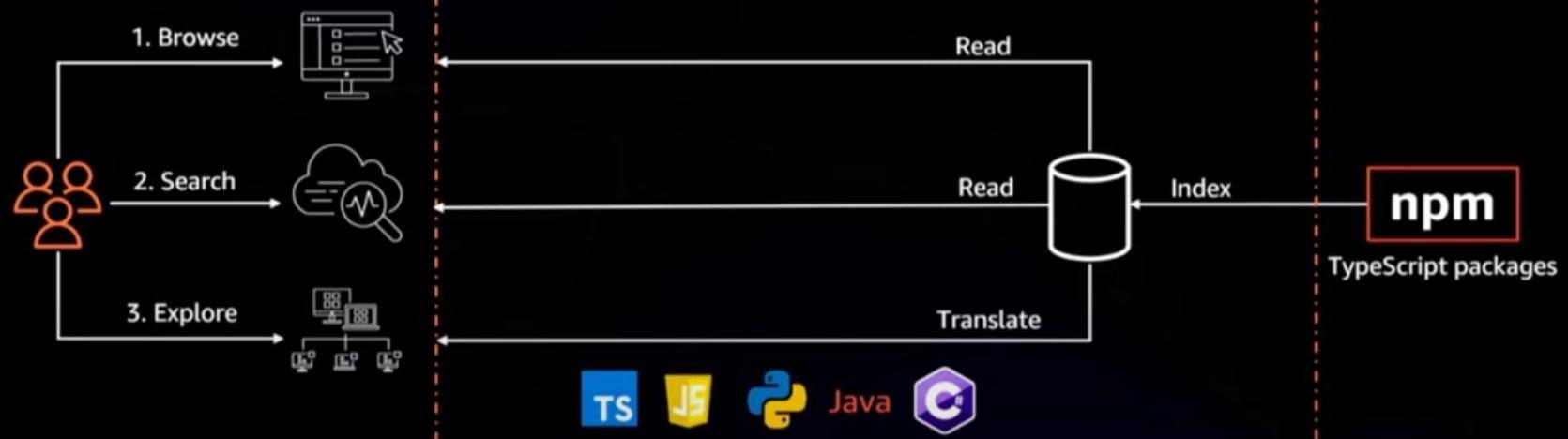
GENERALLY AVAILABLE TODAY

NEW

Discover Construct Libraries

CONSTRUCT HUB

<https://constructs.dev>



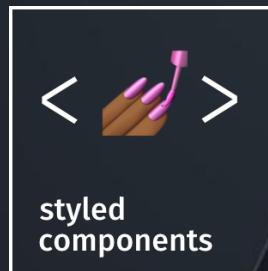
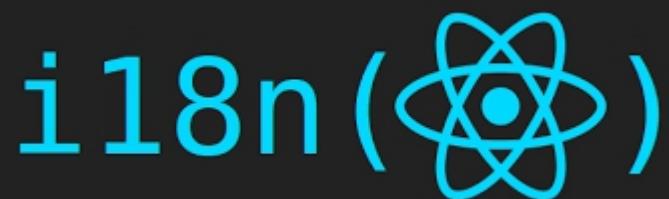
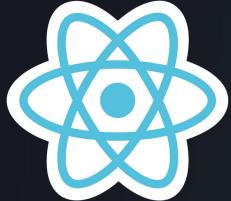
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<https://aws.amazon.com/pt/blogs/developer/construct-hub-preview/>

Talking is easy,
show me the code.

Archicteture FrontEnd

FrontEnd



Mode Dark
Breadcrumbs
Loading
Toast Messages

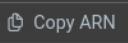
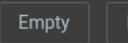
MY-HERO	
>	.storybook
>	node_modules
>	public
▽	src
>	__mocks__
>	_assets
▽	_config
>	_translate
>	common
>	components
>	constants
>	containers
>	features
>	helpers
>	services
>	shared
>	store
>	stories
>	styles
>	utils
⤒	index.css
⤒	index.tsx
⤒	logo.svg
⤒	react-app-env.d.ts
⤒	reportWebVitals.ts
⤒	setupTests.ts
⤒	.gitignore
{}	db.json
⤒	package-lock.json
⤒	package.json
⤒	README.md
⤒	tsconfig.json

List Buckets

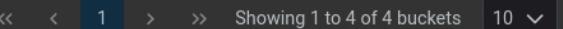
Campus Party 2022 

Home / Buckets

Buckets (4) Info
Buckets are containers for data stored in S3. Learn more

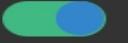
Name	AWS Region	Access	Owner	Creation Date
data-lake-crime-results	US East (N. Virginia) us-east-1	Não informado	wmarians	27-04-2022 09:54:41
data-lake-crimes	US East (N. Virginia) us-east-1	Não informado	wmarians	27-04-2022 09:51:08
heroes-marvel	US East (N. Virginia) us-east-1	Não informado	wmarians	10-06-2022 15:36:53
heroes-marvel-iron-men	US East (N. Virginia) us-east-1	Não informado	wmarians	16-06-2022 15:17:48

 Showing 1 to 4 of 4 buckets 

Upload About: Seja Bem Vindo!!!

List Objects

Campus Party 2022 

Amazon S3 / Buckets / data-lake-crimes

data-lake-crimes
info

ViewBuckets: Seja Bem Vindo!!!

Objects(5)
Objects are the fundamental entities stored in Amazon S3. You can use Amazon S3 inventory to get a list of all objects in your bucket. For others to access your objects, you'll need to explicitly grant them permissions. Learn more

 Copy S3 URI  Copy URL  Download  Open  Delete  Actions  Create Folder  Upload

<input type="checkbox"/>	Name	Type	Last Modify	Owner	Storage Class
<input type="checkbox"/>	Crime_Incidents_in_2019.csv	File	27-04-2022 10:30:58		STANDARD
<input type="checkbox"/>	SampleCSVFile_1109kb.csv	File	27-04-2022 11:05:00		STANDARD
<input type="checkbox"/>	Test Send Image 02-4faf0987-5810-4df6-a124-3551a2c279e9/	Folder	17-06-2022 12:40:58		STANDARD
<input checked="" type="checkbox"/>	csvjson.json	File	27-04-2022 09:52:12		STANDARD
<input type="checkbox"/>	emails.csv	File	27-04-2022 10:57:24		STANDARD

<< < 1 > >> Showing 1 to 5 of 5 Objects

Upload Files - S3

localhost:3000/s3/upload/data-lake-crimes

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Upload: Seja Bem Vindo!!!

0 B / 1 MB

AWS-CDK-Main.jpg 17/06/2022 39.561 KB

✓ Cancel

Create Bucket

Campus Party 2022



Amazon S3 / Buckets / Create Bucket

Create Bucket

General configuration

Name Bucket

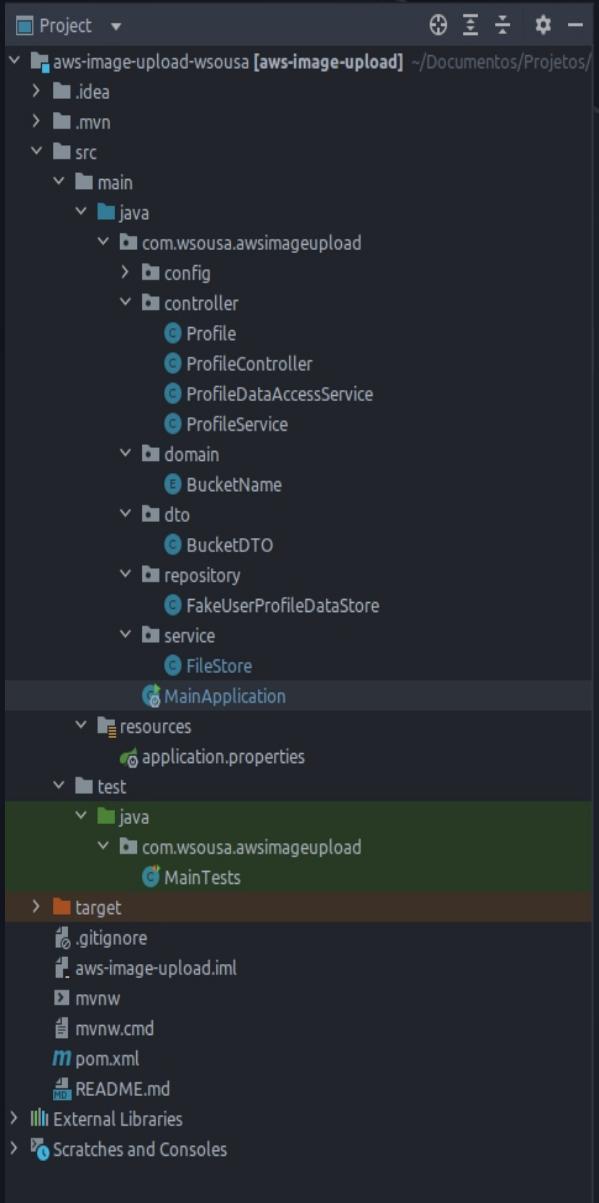
marvel-bucket-s3

Bucket name must be unique and must not contain spaces or uppercase letters. See rules for bucket naming

✓ Cancel

✓ Create Bucket

Archicteture BackEnd



BackEnd



Upload File Bucket

```
@Service
public class FileStore {
    9 usages
    private final AmazonS3 s3;
    ▲ weder96
    @Autowired
    public FileStore(AmazonS3 s3) { this.s3 = s3; }

    1 usage ▲ weder96 *
    public void save(String path, String fileName, InputStream inputStream,
                     Optional<Map<String, String>> optionalMetadata) {
        ObjectMetadata metadata = new ObjectMetadata();
        optionalMetadata.ifPresent(map -> {
            if (!map.isEmpty()) { map.forEach(metadata::addUserMetadata);}
        });
        try {
            s3.putObject(path, fileName, inputStream, metadata);
        } catch (AmazonServiceException e) {
            throw new IllegalStateException("Failed to store file to s3", e);
        }
    }
}
```

Download File Bucket

```
1 usage  ✘ weder96
public byte[] download(String path, String key) {
    try {
        S3Object object = s3.getObject(path, key);
        return IOUtils.toByteArray(object.getObjectContent());
    } catch (AmazonServiceException | IOException e) {
        throw new IllegalStateException("Failed to download image from s3", e);
    }
}
```

List Objects and Bucket

```
1 usage  ✘ weder96 *

public List<S3ObjectSummary> listObjects() {
    final String USAGE = "ListObjects <bucket-name> \n";
    String bucket_name = BucketName.PROFILE_IMAGE.getBucketName();
    System.out.format("Objects in S3 bucket %s:\n", bucket_name);
    ListObjectsV2Result result = s3.listObjectsV2(bucket_name);
    List<S3ObjectSummary> objects = result.getObjectSummaries();
    return objects;
}
```

```
1 usage  ✘ weder96 *

public List<Bucket> listBuckets() {
    List<Bucket> buckets = s3.listBuckets();
    System.out.println("Your Amazon S3 buckets are:");
    buckets.forEach(b -> System.out.println("* " + b.getName()));
    return buckets;
}
```

Swagger - Open ui v3

The screenshot shows the Swagger-UI v3 interface running at `localhost:9090/swagger-ui/index.html#/`. The top navigation bar includes the Swagger logo, the path `/api-docs`, and a prominent green `Explore` button. Below the header, the title `AWS S3 API` is displayed with a `2.0` version indicator and an `OAS3` badge. A sub-header `/api-docs` and a link to `AWS S# Information` are also present.

The main content area is titled `profile-controller`. It lists several API endpoints:

- `POST /api/v1/profile/{profileId}/image/upload`
- `POST /api/v1/profile/createBucket`
- `GET /api/v1/profile`
- `GET /api/v1/profile/{profileId}/image/download`
- `GET /api/v1/profile/listObjects`
- `GET /api/v1/profile/listBuckets`
- `GET /api/v1/profile/bucket/{bucket}` Get a Bucket by name Bucket

At the bottom, there is a section labeled `Schemas`.

And finally...



Best Practice: Contribute

The screenshot shows the GitHub repository page for `aws / aws-cdk`. The repository has 200 stars, 1.3k forks, and 126 pull requests. The `Code` tab is selected, showing a list of recent commits from the `master` branch. The commits are as follows:

Commit	Message	Time Ago
dscpinheiro fix(kinesis)	Unable to use retention periods l...	16 minutes ago
.dependabot	chore: remove semver exclusion from dependabot updates	7 months ago
.github	chore: update assign action to include prs (#11686)	7 days ago
.vscode	chore: add a base VSCode config (#8184)	6 months ago
design	Updated DESIGN_GUIDELINES	5 months ago
logo	chore: apply white background on default logos (#9634)	4 months ago
packages	fix(kinesis): Unable to use retention periods longer than 7 day...	16 minutes ago
scripts	chore: backport fix for syntax error in merge-forward script (...)	12 days ago
tools	docs(core): make examples compile (#11273)	20 hours ago
.devcontainer.json	feat: add configuration for GitHub CodeSpaces (#10470)	2 months ago
.dockerignore	chore(cdk): Change Docker base image to Amazon Linux (#2...	2 years ago
.gitallowed	feat(region-info): added AppMesh ECR account for eu-south...	25 days ago
.gitattributes	chore: fix typo in comment in .gitattributes (#3978)	15 months ago
.gitignore	chore: remove parcel cache directory from gitignore files (#11...	yesterday

On the right side, there is an **About** section with a brief description of the AWS Cloud Development Kit and its purpose. It also lists the repository URL (`aws.amazon.com/cdk`), tags (`aws`, `infrastructure-as-code`, `typescript`, `cloud-infrastructure`, `hacktoberfest`), and links to `Readme` and `Apache-2.0 License`. Below that is a **Releases** section showing the latest release (`v1.75.0`) and a link to `+ 144 releases`. At the bottom, there is a **Packages** section.

Resources

Get Started with the AWS CDK

AWS CDK Online Workshop

<https://cdkworkshop.com>

AWS CDK Samples on GitHub

<https://github.com/aws-samples/aws-cdk-examples>

Dive Deeper

GitHub

<https://github.com/aws/aws-cdk>

CDK Pipelines

<https://aws.amazon.com/blogs/developer/cdk-pipelines-continuous-delivery-for-aws-cdk-applications/>

Sample Code in this presentation

<https://github.com/rix0rrr/devoops-sample>

A Landing Zone Implemented with CDK

<https://github.com/aws-samples/aws-secure-environment-accelerator>

Testing infrastructure with the CDK

<https://aws.amazon.com/blogs/developer/testing-infrastructure-with-the-aws-cloud-development-kit-cdk/>



- Weder Mariano de Sousa
Center Leader Specialist Senior - NTTDATA

GOJava
AWS User Group Goiânia

<https://www.linkedin.com/in/wedermarianodesousa/>

<https://github.com/weder96>

Q & A

THANK YOU