Introduction to AWS CDK (Infra-as-Code)

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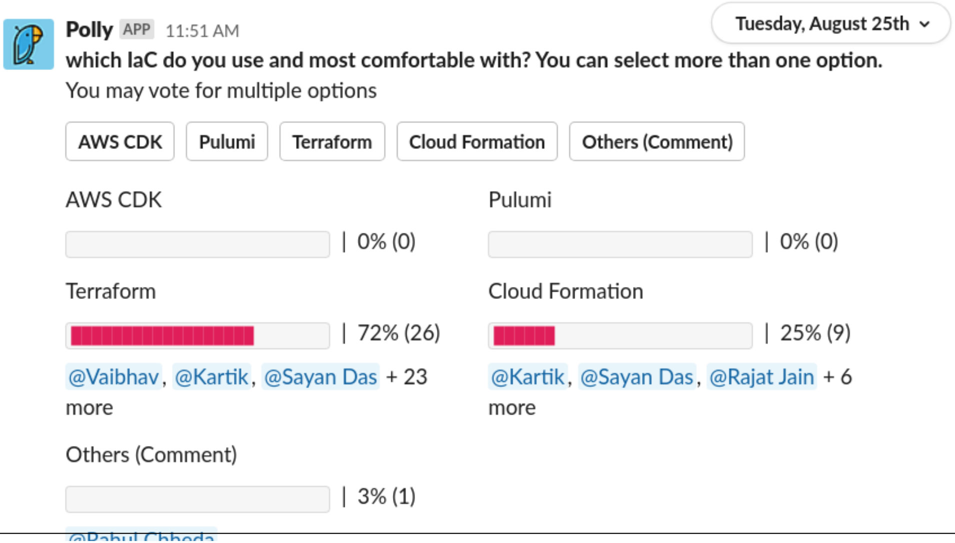
Agenda

- Introduction
- How it works?
- Pros & Cons
- Demo

Poll Result



Polly APP 11:51 AM

Tuesday, August 25th

which IaC do you use and most comfortable with? You can select more than one option.

You may vote for multiple options

AWS CDK | 0% (0)

Pulumi | 0% (0)

Terraform | 72% (26)
@Vaibhav, @Kartik, @Sayan Das + 23 more

Cloud Formation | 25% (9)
@Kartik, @Sayan Das, @Rajat Jain + 6 more

Others (Comment) | 3% (1)
@Rahul Chheda

Introduction

- AWS **Cloud Development Kit**(CDK) is an infrastructure-as-code framework to model the cloud application and resources using familier programming languages.
- Provides preconfigure components with proven defaults.
- Accelerate development: Use the power of programming language like objects, loops, and conditions
- Currently supports TypeScript, Python, Java, .NET.
- Generates CloudFormation under-the-hood.
- Good for modularity, sharing common constructs across organisation.

CDK vs CloudFormation/SAM

- AWS SAM works only for serverless, CDK is for all AWS services.
- CDK ultimately creates CloudFormation under the hood.
- CDK is good for modeling the cloud infrastructure.
- Cloudformation becomes messy and unproductive with growing number of components.

Other Similar Projects

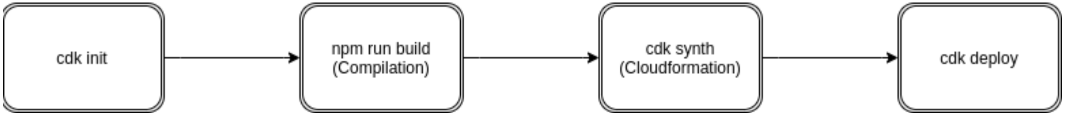
- Pulumi

How it works?

Prerequisites

- AWS CLI, AWS Account and Programmatic Access
- Node.js (>=10.3.0)
- Your favourite IDE (VS Code recommended)
- AWS CDK (`npm install -g aws-cdk`)
- Programming language environment that you want to use.

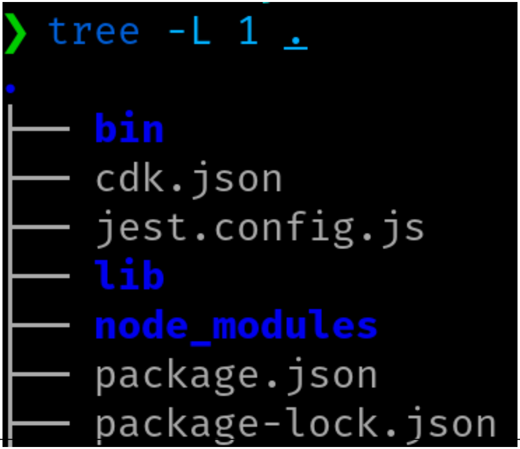
Workflow



workflow

Crash course

- `cdk init app --language typescript` – Initialize project in typescript



```
❯ tree -L 1 .
.
├── bin
├── cdk.json
├── jest.config.js
├── lib
├── node_modules
├── package.json
├── package-lock.json
```

- **lib/** - has the main stack
- **bin/** - entrypoint of the CDK app
- **package.json** - npm module manifest
- **cdk.json** - tells the toolkit, how to run your app (`npx ts-node bin/sample-cdk-nodejs.ts`)
- **node_modules** - all your project depedencies

Crash Course ...

bin/sample-cdk-nodejs.ts

```
#!/usr/bin/env node
import * as cdk from '@aws-cdk/core';
import { SampleCdkNodejsStack }
from '../lib/sample-cdk-nodejs-stack';

const app = new cdk.App();
new SampleCdkNodejsStack(app, 'SampleCdkNodejsStack');
```

Crash Course ...
lib/sample-cdk-nodejs-stack

```
import * as sns from '@aws-cdk/aws-sns';
import * as subs from '@aws-cdk/aws-sns-subscriptions';
import * as sqs from '@aws-cdk/aws-sqs';
import * as cdk from '@aws-cdk/core';

export class SampleCdkNodejsStack extends cdk.Stack {
  constructor(scope: cdk.App, id: string, props?: cdk.StackProps) {
    super(scope, id, props);

    const queue = new sqs.Queue(this, 'SampleCdkNodejsQueue', {
      visibilityTimeout: cdk.Duration.seconds(300)
    });

    const topic = new sns.Topic(this, 'SampleCdkNodejsTopic');
    topic.addSubscription(new subs.SqsSubscription(queue));
  }
```

Continued ...

- `npm run build` - compiles the code to js
- `cdk synth` - creates the *CloudFormation* templates
- `cdk bootstrap` - It bootstraps the stack by creating s3 bucket and pushing the templates to s3.
- `cdk deploy` - Deploy the stack
- `cdk destroy` - destroy the stack

Pros and Cons

Pros

- Elegant programmatic model
- Extensible and modular, promotes reusability
- predictable and repeatable
- Less code, more work
- Possible to import existing CloudFormation templates
- Native to AWS, better support
- Solution Constructs - Best practices, well architected patterns

Cons

- Works only with AWS
- Need to have programming skills

What to do next?

- Head up to cdkworkshop.com and try basic constructs in your preferred language
- Utilize patterns and libraries given at *Solution Constructs*
- Explore *Samples on Github*
- CDK API Documentation

Thank you

Questions?