AWS re:Invent

NOV. 29 – DEC. 3, 2021 | LAS VEGAS, NV

DOP201

Provisioning, automating, and orchestrating IaC on AWS

Eric Z. Beard
Sr. Partner Solutions Architect
AWS

Kevin DeJong
Sr. Specialist Solutions Architect
AWS

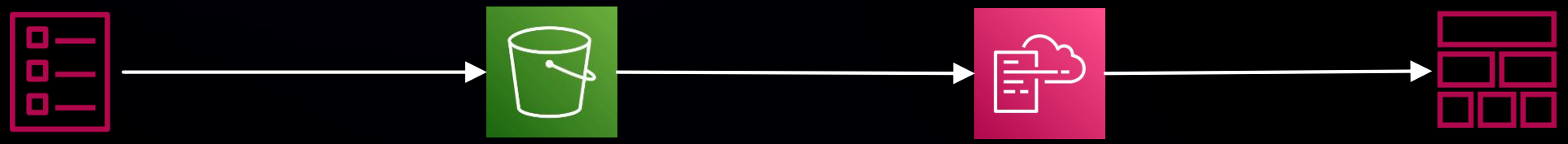
© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Evolution of infrastructure as code

Abstractions	AWS CDK, Pulumi
Generators	Troposphere, GoFormation
Declarative	AWS CloudFormation, Terraform
Scripted	#!/bin/bash
Manual	Wikis, playbooks, ask-Bob-he-knows

© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

AWS CloudFormation



Infrastructure as code written in YAML or JSON

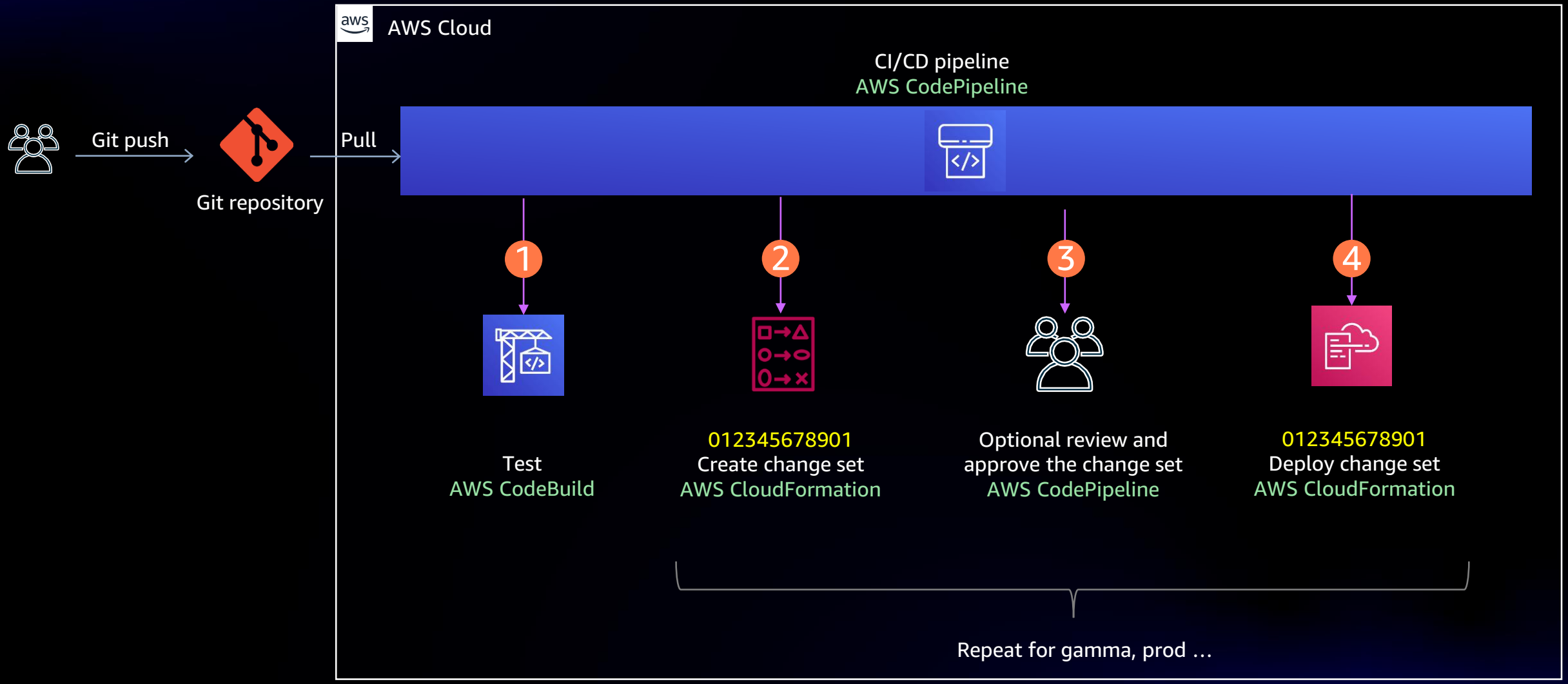
Upload local files or use an Amazon S3 bucket

Create or update a stack

Stack and resources are provisioned

© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

CloudFormation CI/CD



© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

AWS CloudFormation testing



Cfn-lint

- Test YAML/JSON CloudFormation templates against the spec
- Rules are created for best practices
- Rules are extendable to include an organization's best practices



AWS CloudFormation Guard

- Validate any YAML/JSON against self-defined rules using the Guard DSL
- Easy to write and create rules to look for an organization's best practices



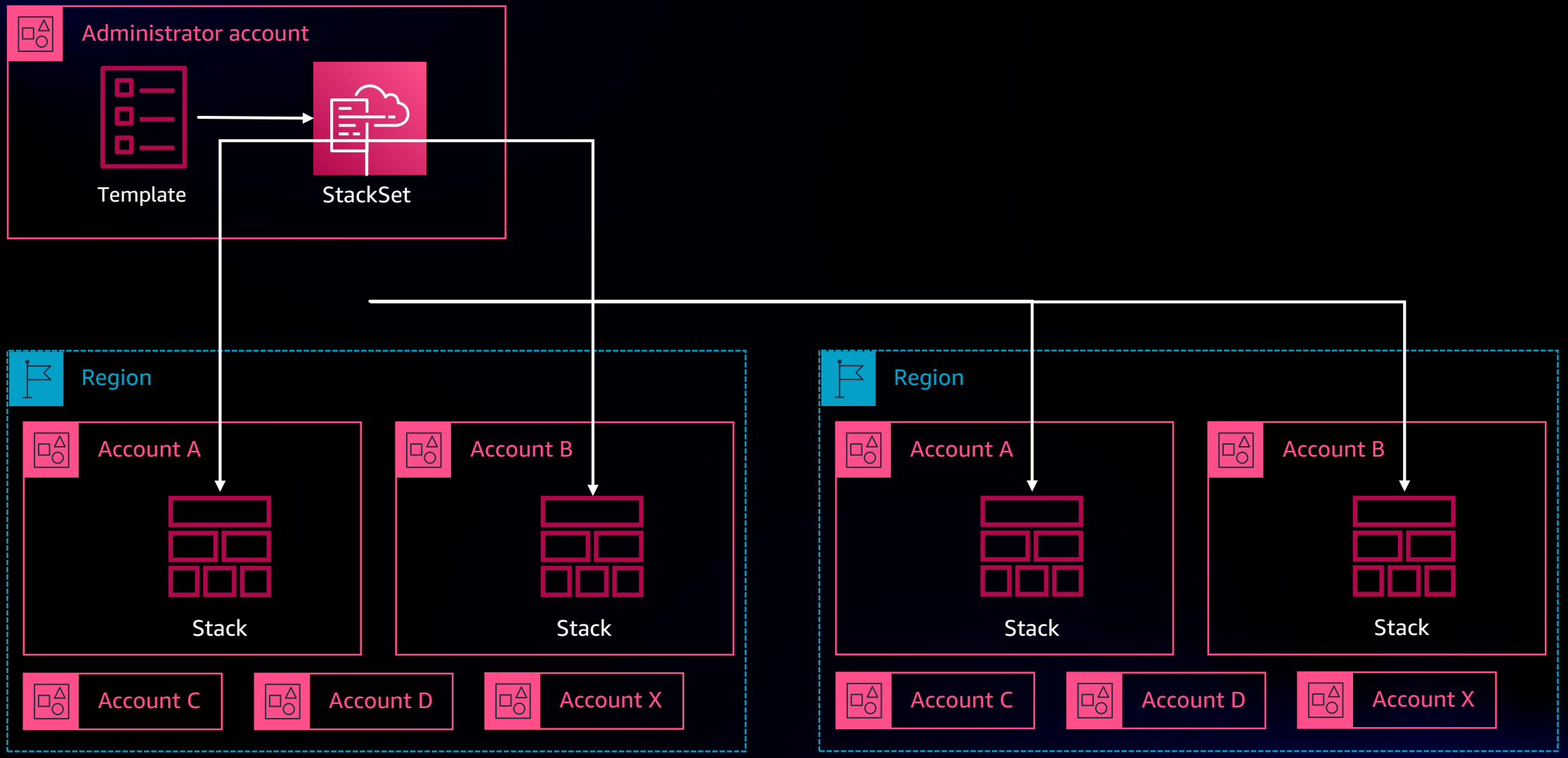
AWS TaskCat

- Facilitates deploying YAML/JSON templates to many regions
- Provides a report based on the success of the deployment

aws

© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

AWS CloudFormation StackSets



© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

AWS Cloud Development Kit (AWS CDK)

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

```
class UrlShortener extends Stack {
  constructor(scope: App, id: string, props?: UrlShortenerProps) {
    super(scope, id, props);

    const vpc = new ec2.Vpc(this, 'vpc', { maxAzs: 2 });
    const cluster = new ecs.Cluster(this, 'cluster', { vpc: vpc });
    const service = new patterns.NetworkLoadBalancedFargateService(this, 'sample-app', {
      cluster,
      taskImageOptions: {
        image: ecs.ContainerImage.fromAsset('ping'),
      },
      dom
    });
    // Setup AutoScaling policy
    const scaling = service.service.autoScaleTas
    scaling.scaleOnCpuUtilization('CpuScaling',
      targetUtilizationPercent: 50,
      scaleInCooldown: Duration.seconds(60),
      scaleOutCooldown: Duration.seconds(60)
    });
  }
}
```

```
domainName
domainZone
```

```
(property) patterns.NetworkLoadBala
ncedServiceBaseProps.domainName?: s
tring | undefined

The domain name for the service, e.g.
"api.example.com."

@default

- No domain name.
```

Familiar
Your language
Just code

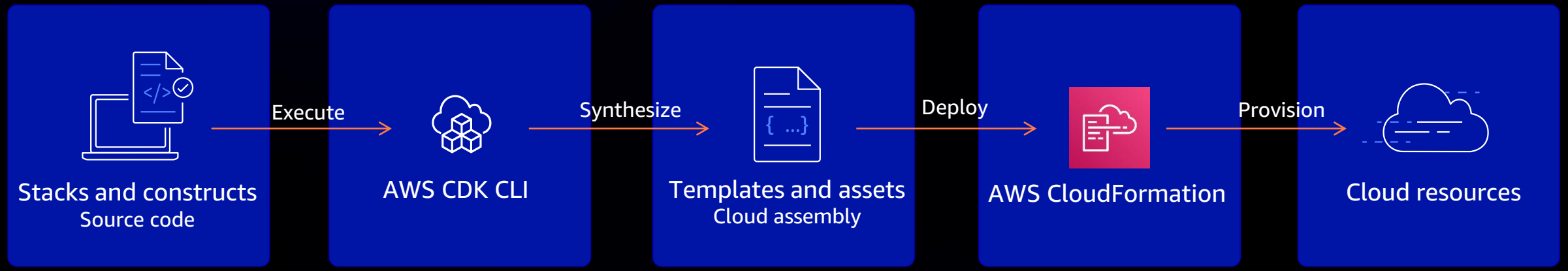
Tool support
Autocomplete
Inline documentation

Abstraction
Sane defaults
Reusable classes

Java

© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

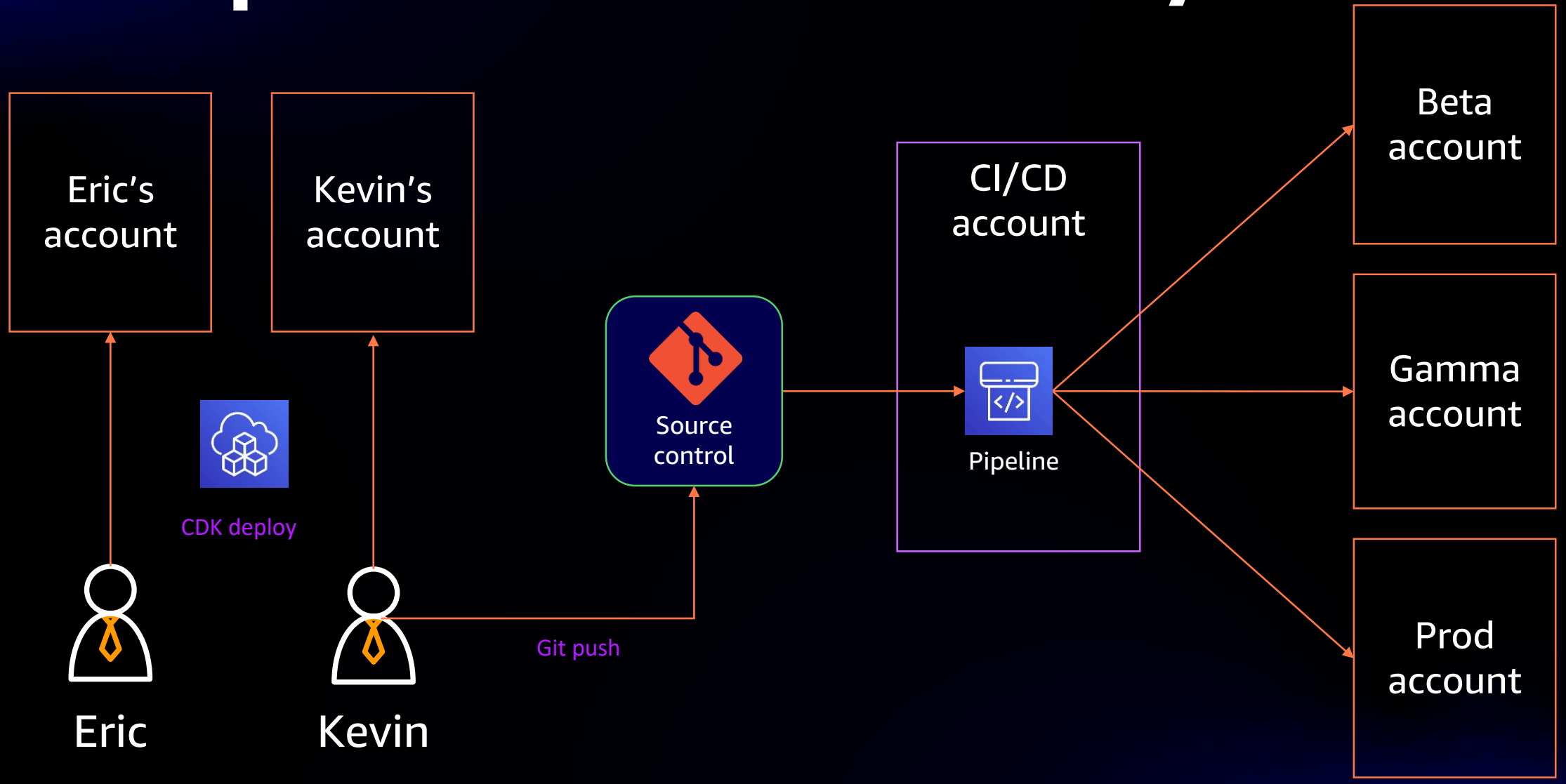
Development workflow




```
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
```

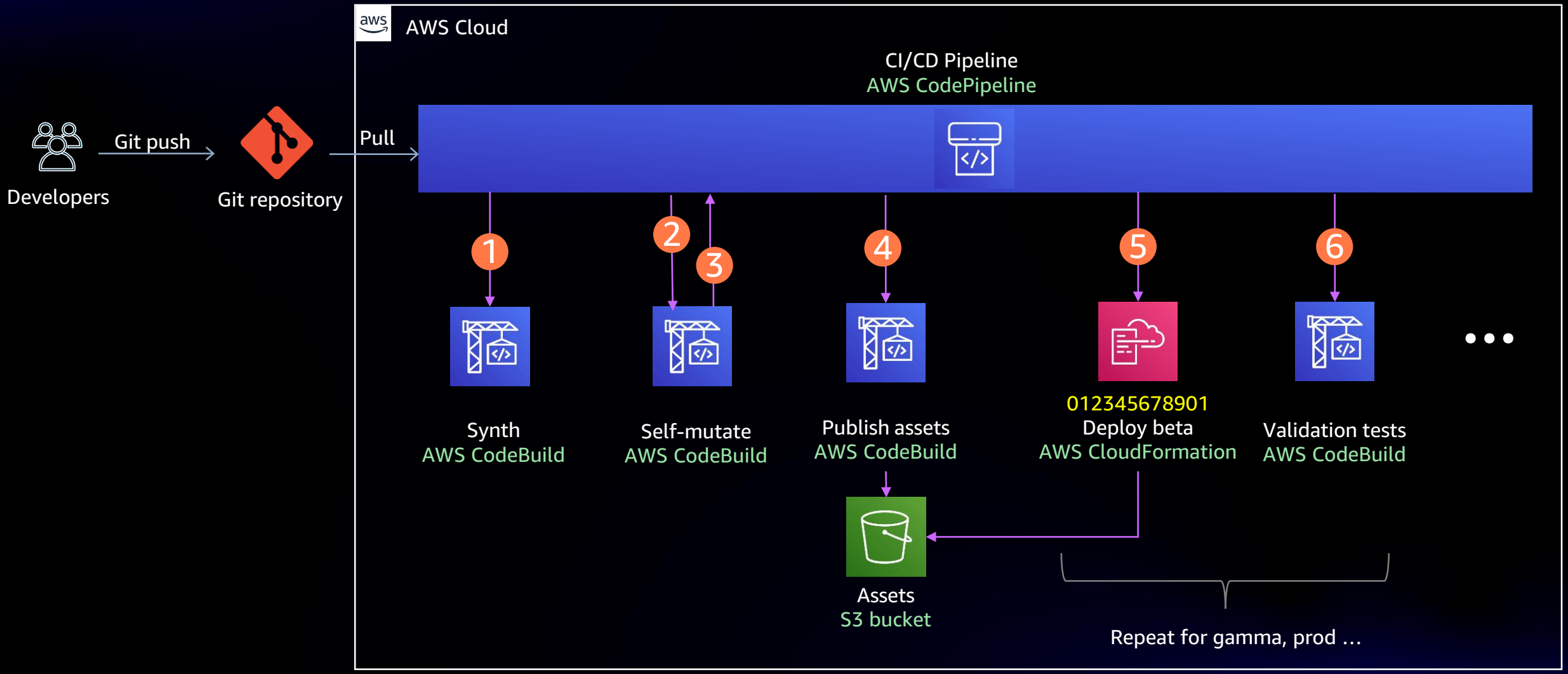
© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

CDK Pipelines – Multi-account CI/CD



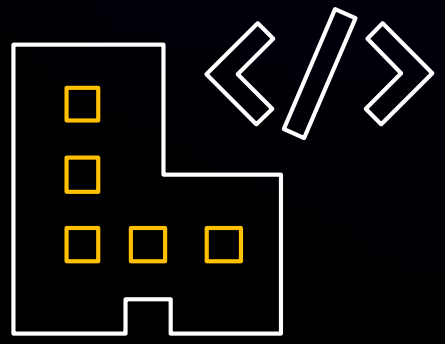
© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

CDK Pipelines

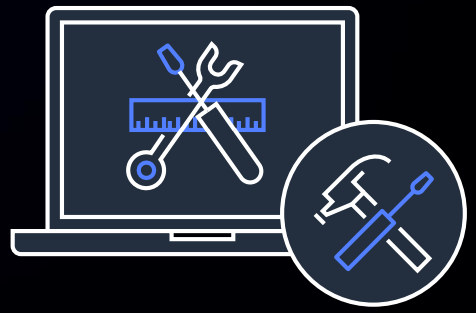


© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

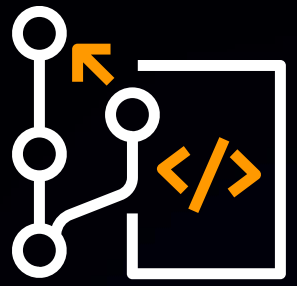
CDK philosophy – From this …



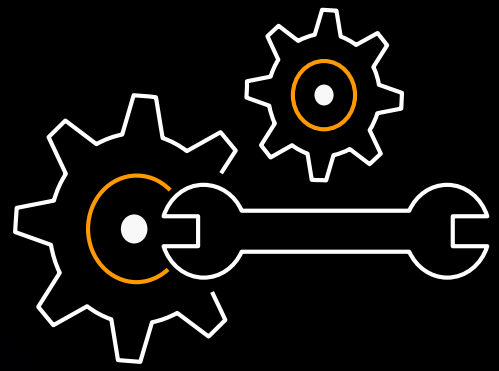
Infrastructure



Application code



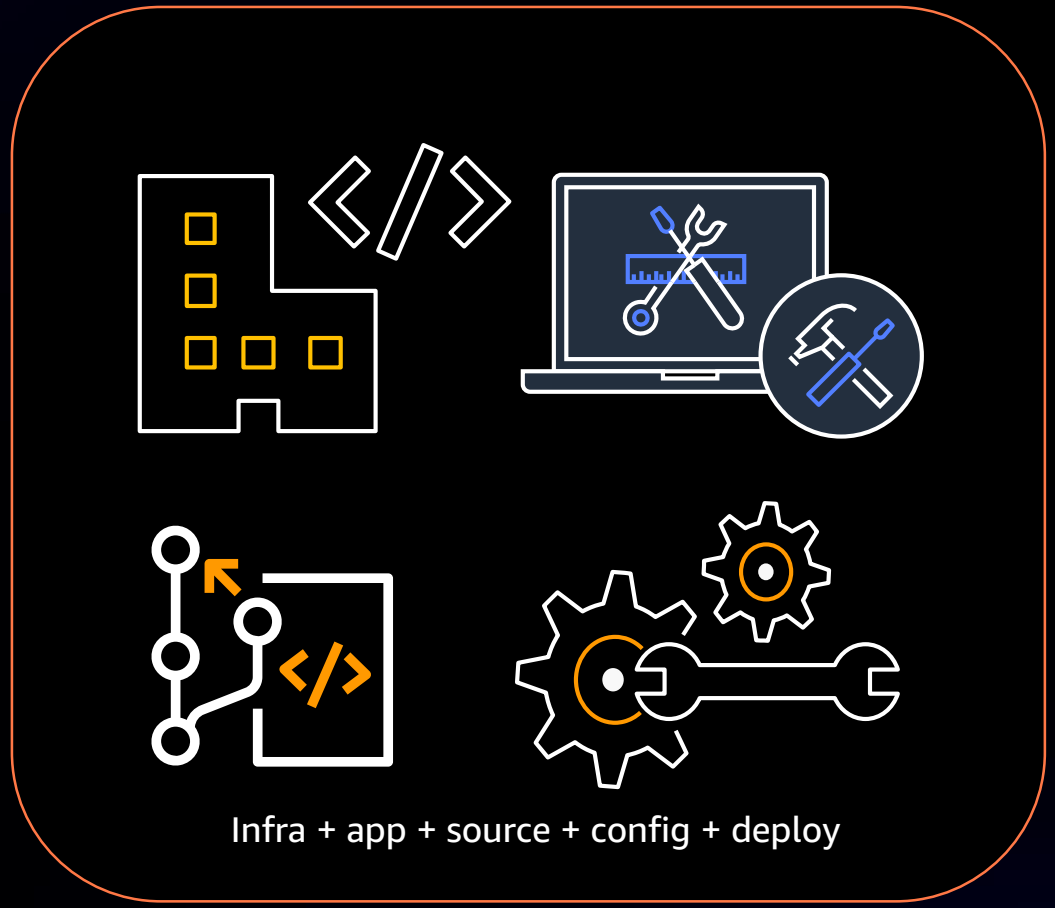
Source control



Config and deployment

© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

CDK philosophy – To this



© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

https://cdkworkshop.com

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

© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Thank you!

Eric Z. Beard

Twitter: @ericzbeard

© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.