Track 4|Session 4

如何藉由 CI/CD 流程管理容器化和無伺服器應用

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Amazon Web Services

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Agenda

Continuous integration/continuous deployment (CI/CD) foundations

CI/CD pipelines with AWS CodePipeline

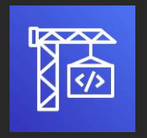
Infrastructure as code

AWS management and governance services

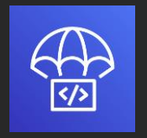
By way of introduction…

CI/CD tools


AWS CodeStar


AWS CodeBuild


AWS CodeCommit


AWS CodeDeploy


AWS CodePipeline

Infrastructure as code

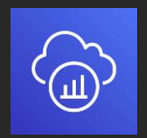

AWS CloudFormation

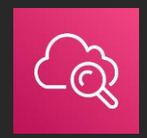

AWS CDK

IDE


AWS Cloud9

Monitoring & tracing


AWS X-Ray


Amazon CloudWatch

Web apps


AWS Elastic Beanstalk

IDE and DevOps toolkits


Visual Studio Code


IntelliJ


PyCharm


Visual Studio


Eclipse

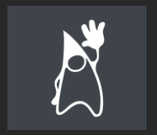

VSTS

CLI and scripting tools


AWS CLI


Tools for PowerShell

Languages


Amazon Corretto

Mobile


AWS Amplify

SDKs


JavaScript


Python


PHP


.NET


Ruby

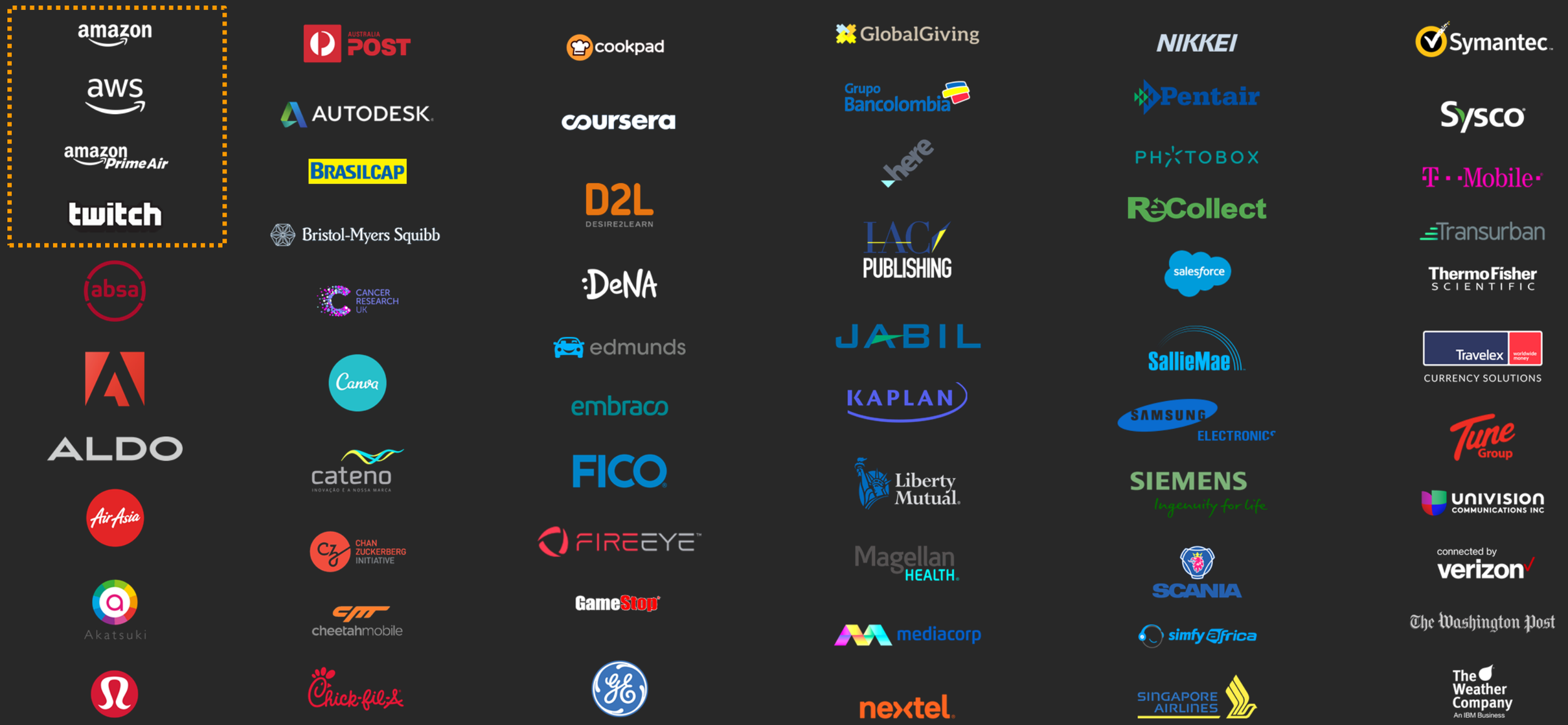

Java


Go


Node.js


C++

Internal and external customers across industries



Continuous integration/continuous deployment (CI/CD) foundations

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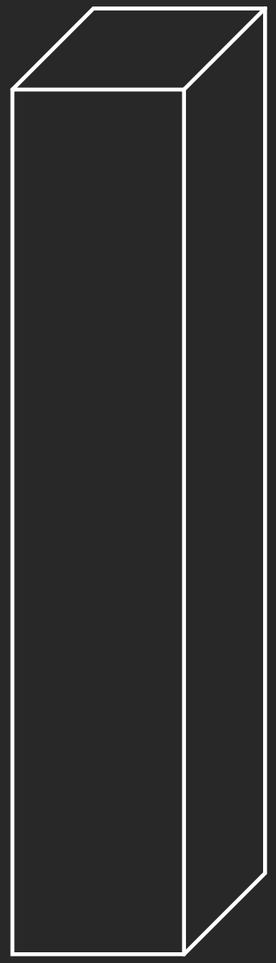
Key reasons for organizations to adopt CI/CD principles

- Accelerate the delivery of new, high-quality services
- Reduce the impact of changes
- Gain insight across resources and applications
- Protect customers and the business

Monolith development lifecycle

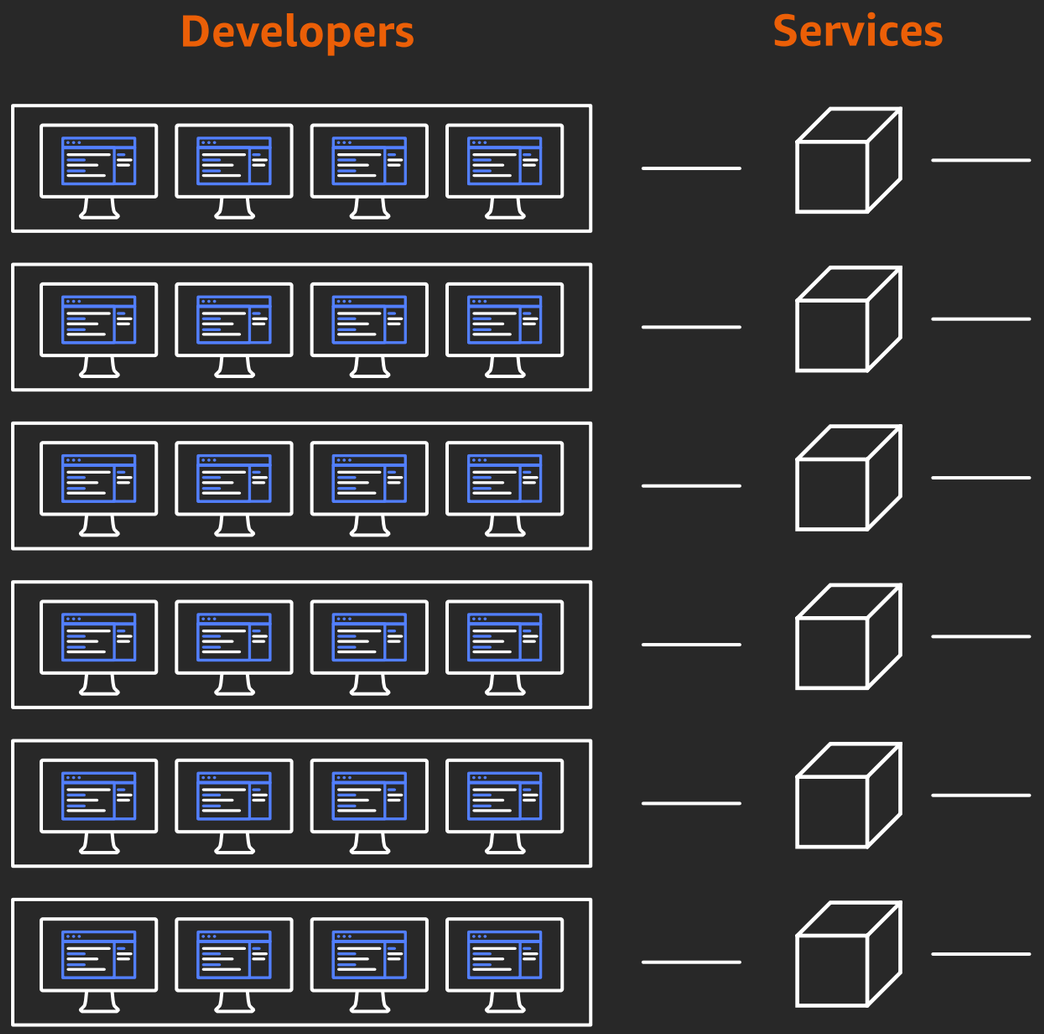
Developers

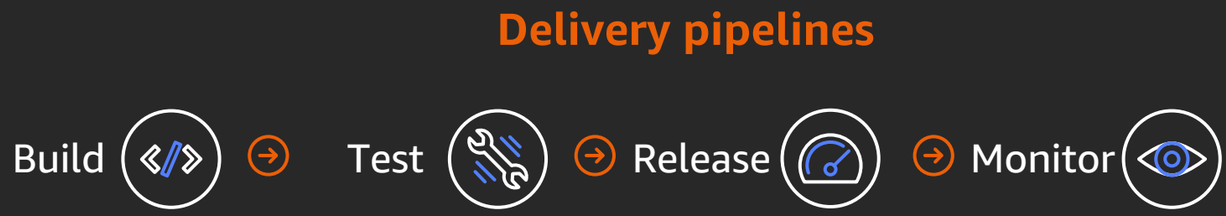
Services



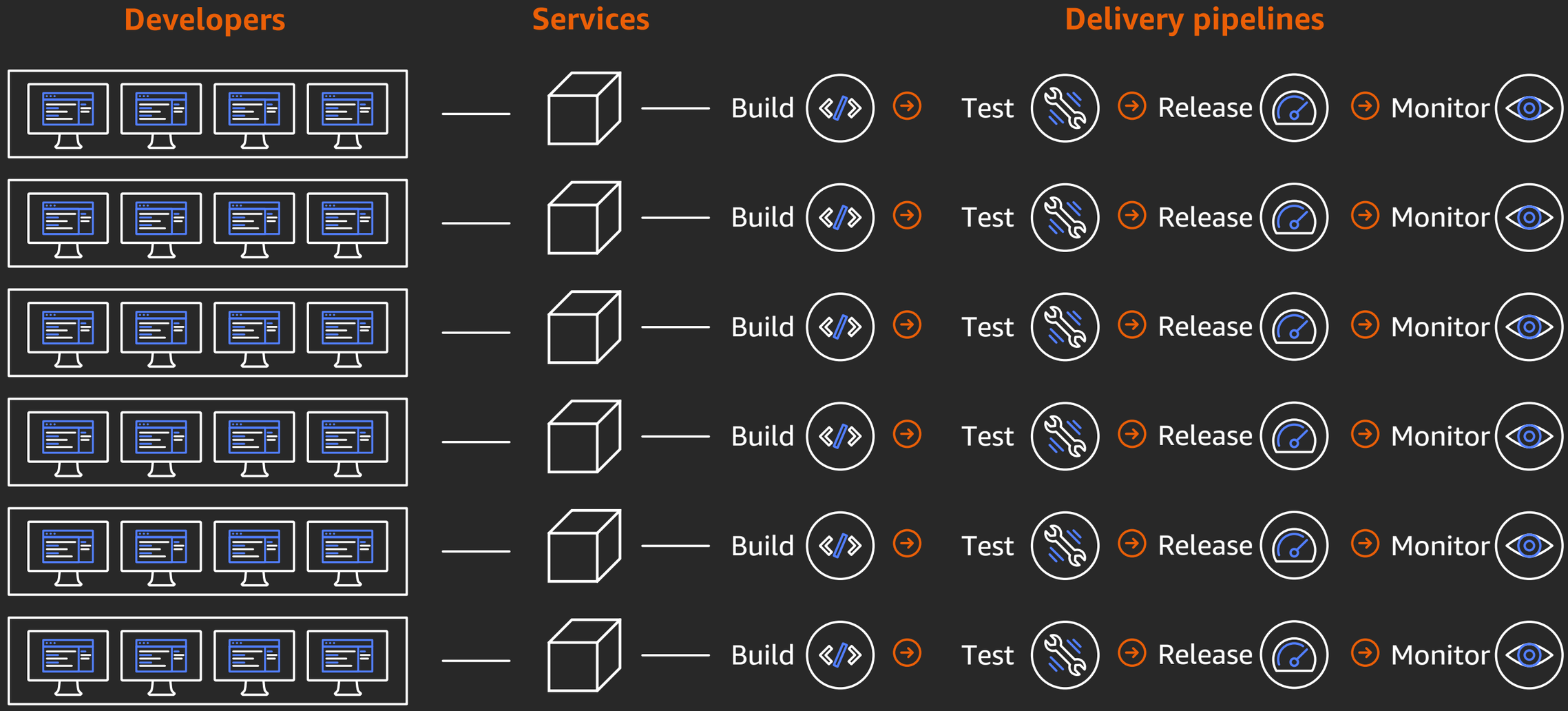
Delivery pipelines

Microservice development lifecycle

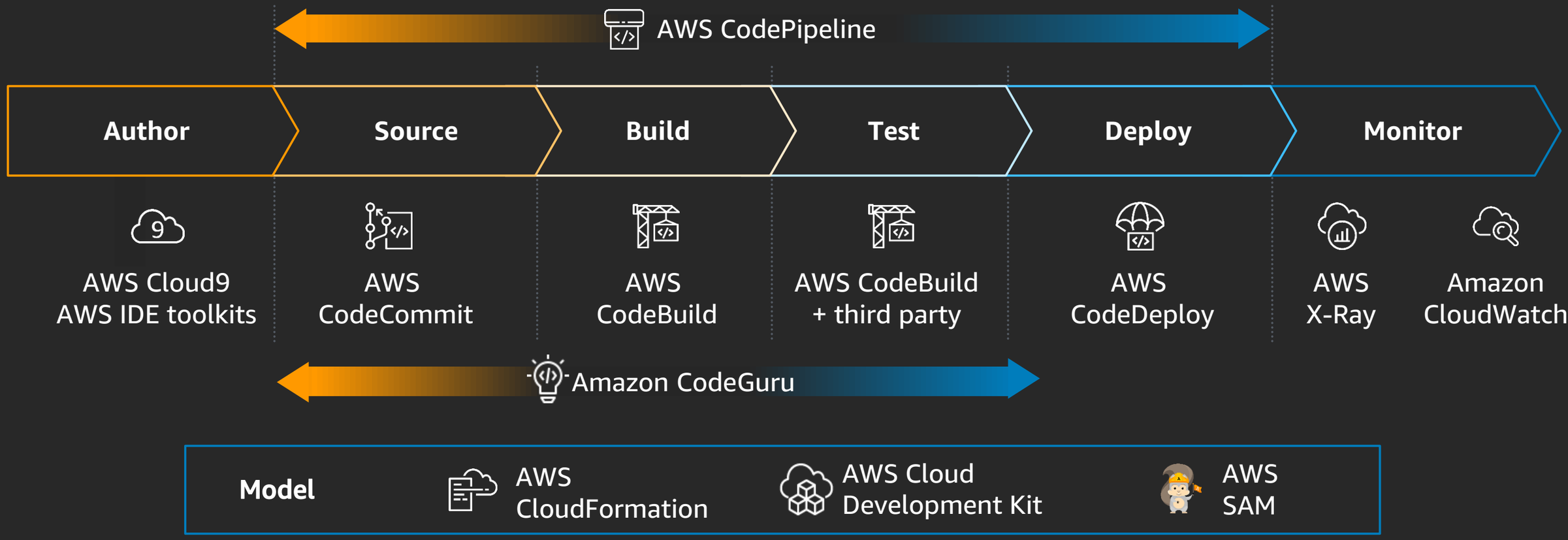




Microservice development lifecycle



CI/CD for modern software delivery



Effects of CI/CD

Deployment frequency	Weekly–monthly	→	Hourly–daily
Change lead time	1–6 months	→	1–7 days
Change failure rate	46%–60%	→	0%–15%

48% of software teams

Source: 2018 State of DevOps Report, DORA

Continuous integration goals

1. **Automatically** kick off a new build when new code is checked in
2. Build and test code in a **consistent, repeatable** environment
3. Continually have an artifact ready for deployment
4. Continually close feedback loop when build fails

Continuous deployment goals

1. **Automatically** deploy new changes to staging environments for testing
2. Deploy to production safely without **impacting** customers
3. Deliver to customers faster: Increase deployment frequency and reduce change lead time and **change failure** rate

CI/CD pipelines with AWS CodePipeline

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AWS CodePipeline

- Continuous delivery service for fast and reliable application updates
- Model and visualize your software release process
- Builds, tests, and deploys your code every time there is a code change
- Integrates with third-party tools and AWS

AWS CodePipeline: Supported sources

Automatically kick off release and pull latest source code

Pick branch	Pick object or folder	Pick Docker tag
AWS CodeCommit	Amazon Simple Storage Service (Amazon S3)	Amazon Elastic Container Registry (Amazon ECR)
GitHub		

AWS CodePipeline: Supported deployment targets

Automatically kick off release and pull latest source code

Amazon Elastic Cloud Compute (Amazon EC2)

AWS CodeDeploy

AWS Elastic Beanstalk

AWS OpsWorks stacks

Containers

AWS CodeDeploy

Amazon Elastic Container Service (Amazon ECS)

Amazon ECS (blue/green)

AWS Fargate

Serverless

AWS CodeDeploy

AWS CloudFormation (AWS Serverless Application Model [AWS SAM])

AWS Lambda

AWS CodePipeline: Supported triggers

Automatically kick off release

Amazon EventBridge

- Scheduled (nightly release)
- AWS health events (AWS Fargate platform retirement)

Available in Amazon CloudWatch Events console, API, SDK, CLI, and AWS CloudFormation

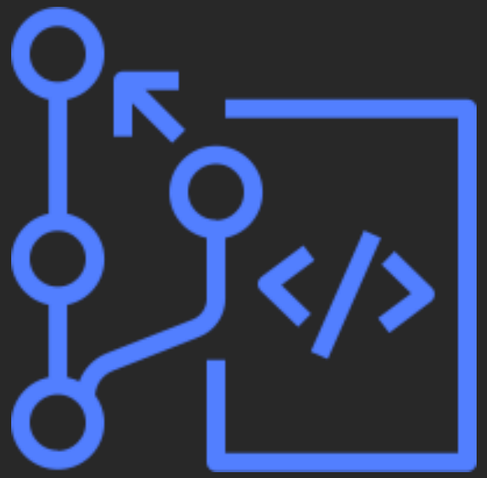
Webhooks

- Docker Hub
- Quay
- Artifactory

Available in AWS CodePipeline API, SDK, CLI, and AWS CloudFormation

AWS CodeCommit supports Approval Rules

NEW



AWS CodeCommit now supports **Approval Rules** that must be met before a pull request can be merged

Infrastructure as code

Infrastructure as code goals

Infrastructure as code goals

1. Make infrastructure changes **repeatable and predictable**
2. Release infrastructure changes using the same tools as code changes
3. Replicate production environment in a staging environment to enable continuous testing

Continuous testing with infrastructure as code

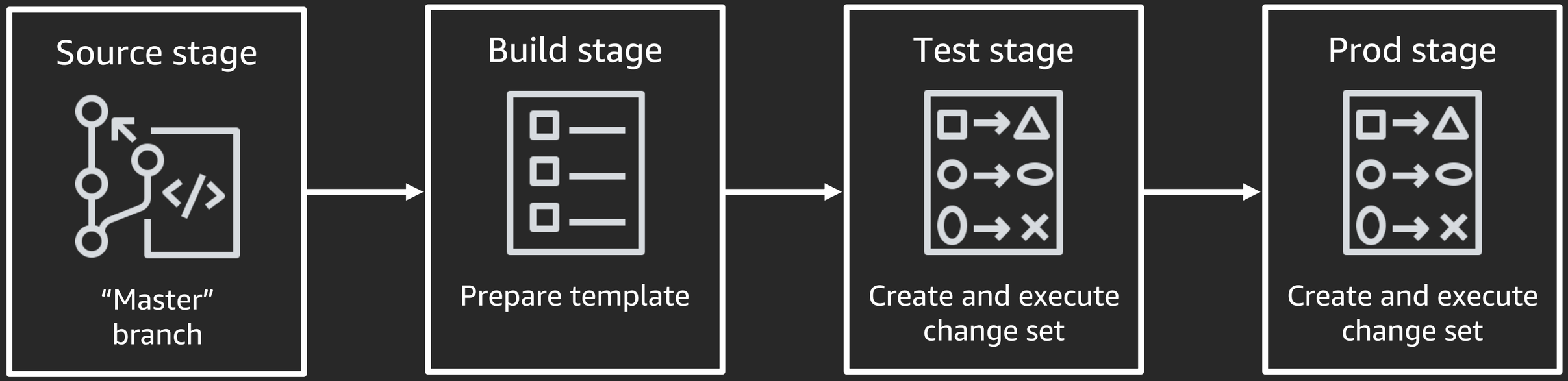
Validate an artifact (build stage)

- Unit tests
- Static analysis
- Mocked dependencies and environments
- Vulnerability image scans

Validate an environment (test stages)

- Integration tests against real dependencies and real environments
- Load testing
- Penetration testing
- Monitoring to test impact of deployments on environment

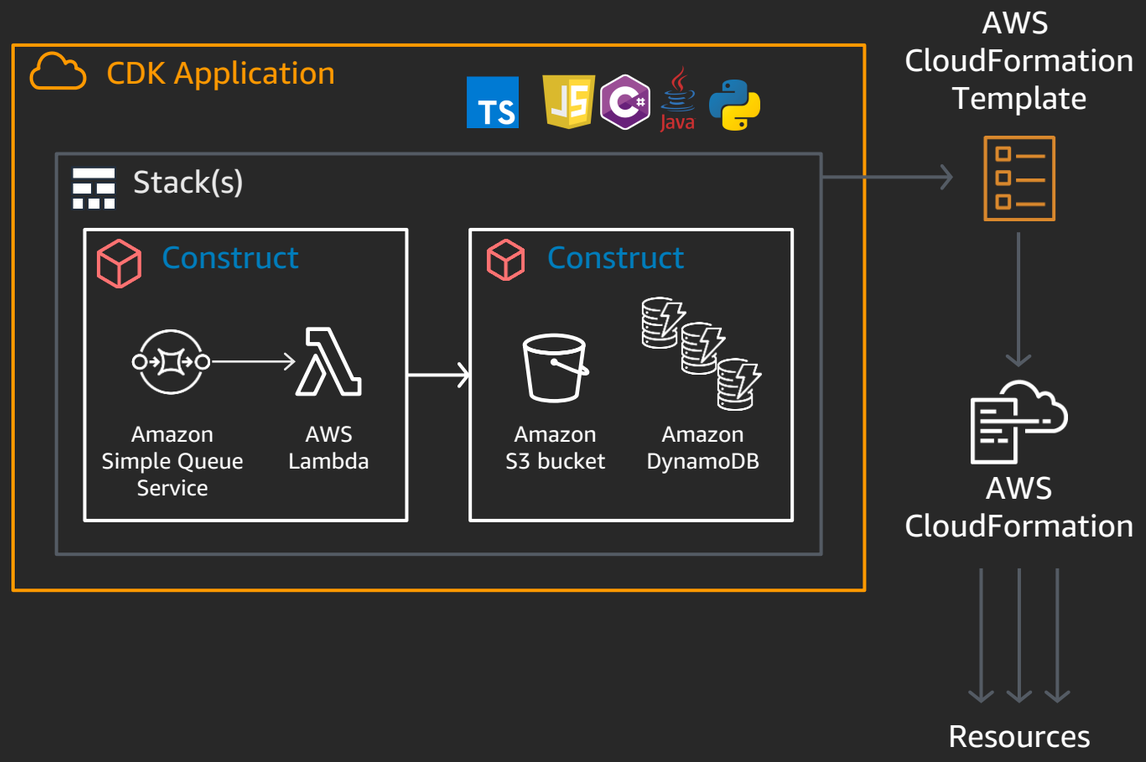
Release infrastructure as code



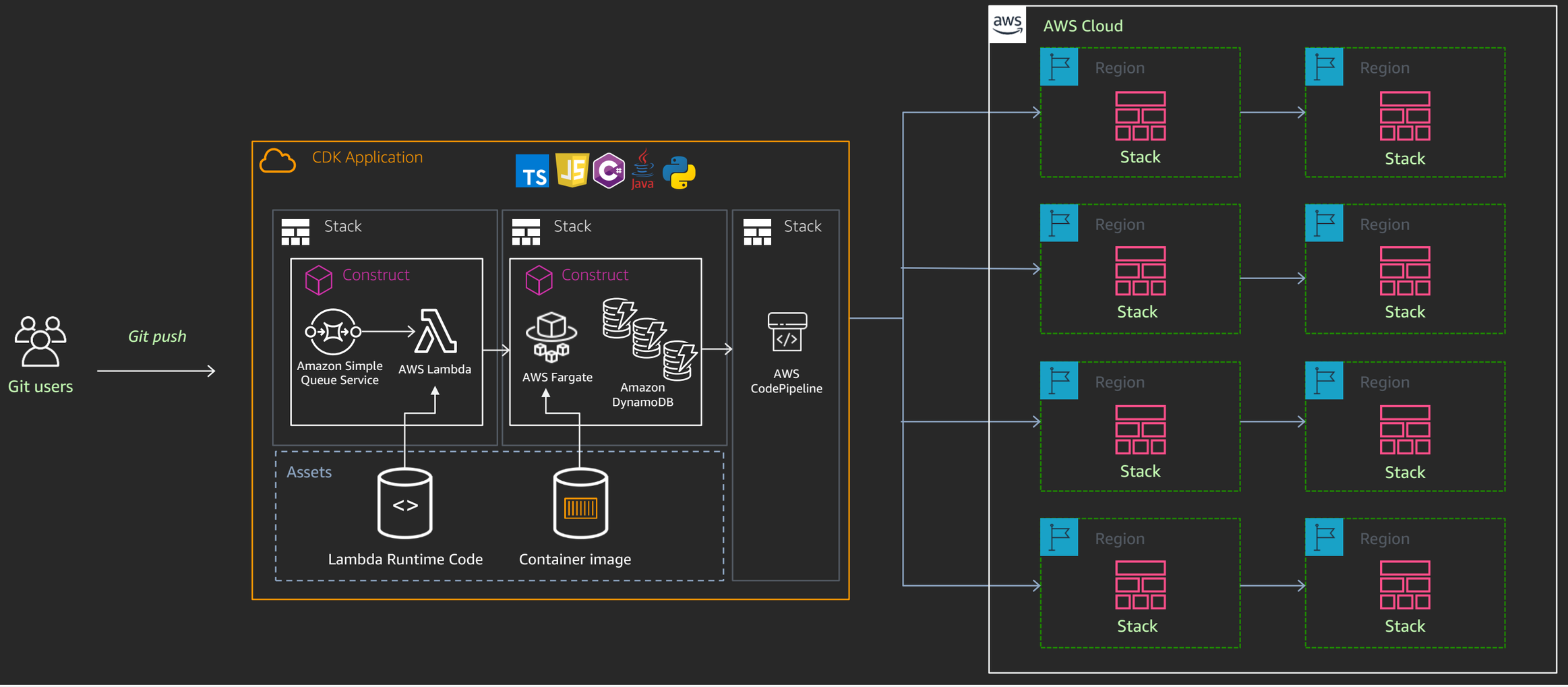
AWS Cloud Development Kit (AWS CDK)

Define cloud infrastructure using familiar programming languages

Higher-level components to preconfigure cloud resources



CI/CD with the AWS CDK



Under comment at CDK GitHub repo!

AWS management and governance services

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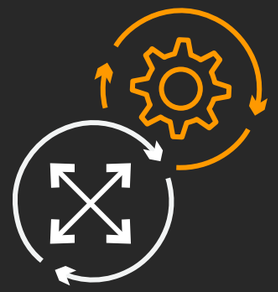
More innovation, greater agility, with control



Agility

Experiment

Be productive

Empower distributed team

Don’t choose between agility **or** control

Customers want both

Governance

Enable

Provision

Operate

Your service management framework

Security & IAM

Developer portal

gitops GitHub

Cloud center of excellence

Cloud Conformity servicenow bmc ATLASSIAN

Monitoring and logging

New Relic. APPDYNAMICS splunk> PagerDuty sumologic

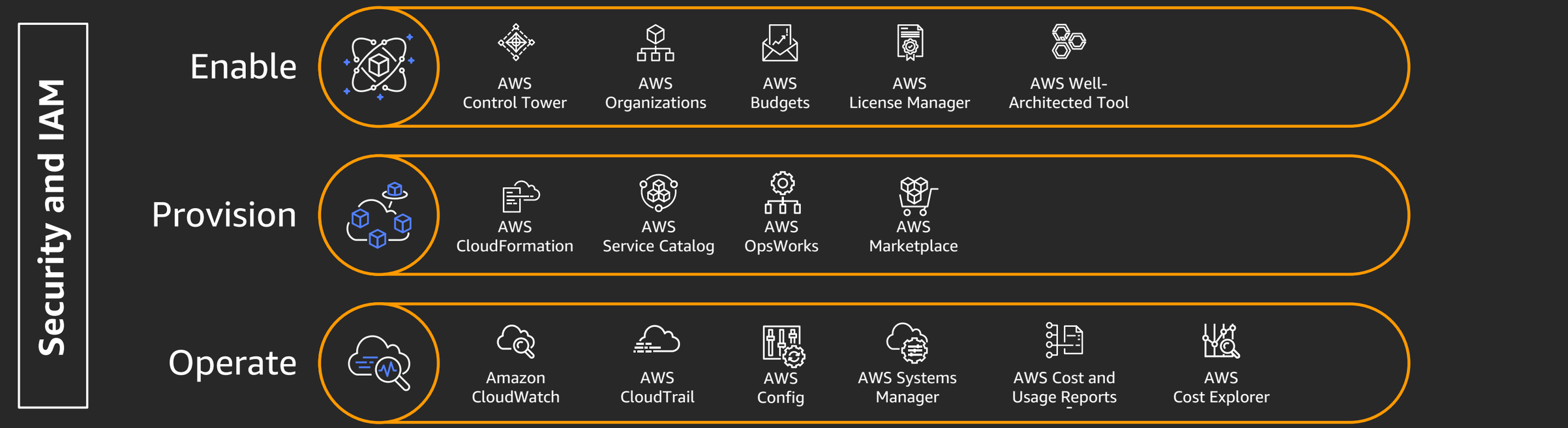
Management and governance

Amazon CloudWatch
AWS CloudTrail
AWS Config
AWS Systems Manager
AWS CloudFormation
AWS Service Catalog
AWS Organizations
AWS Control Tower
AWS Marketplace

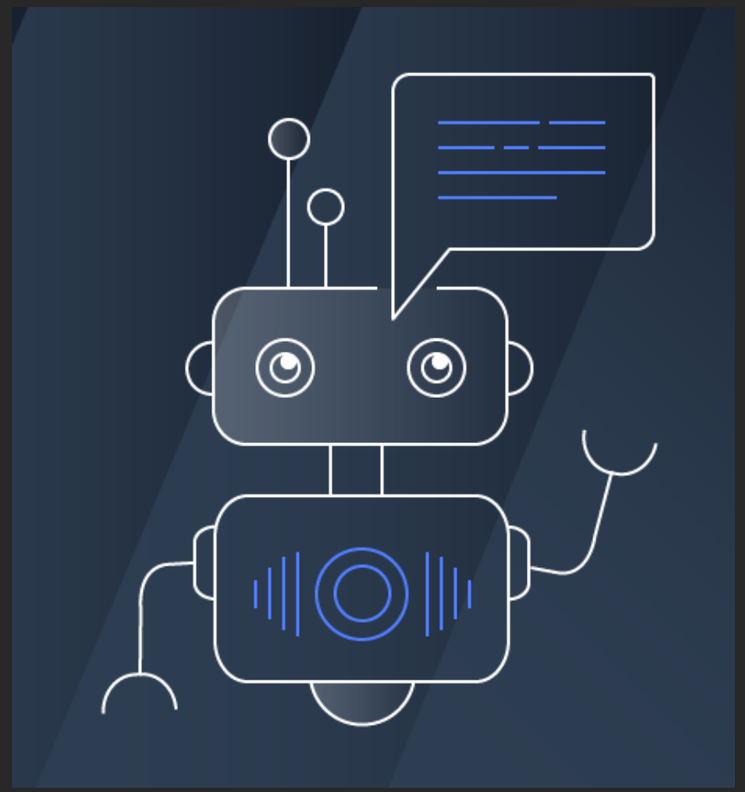
AWS resources

Compute
Database
Storage

AWS management and governance services



AWS Chatbot (beta) can now run commands



AWS Chatbot

Interactive agent for ChatOps on AWS

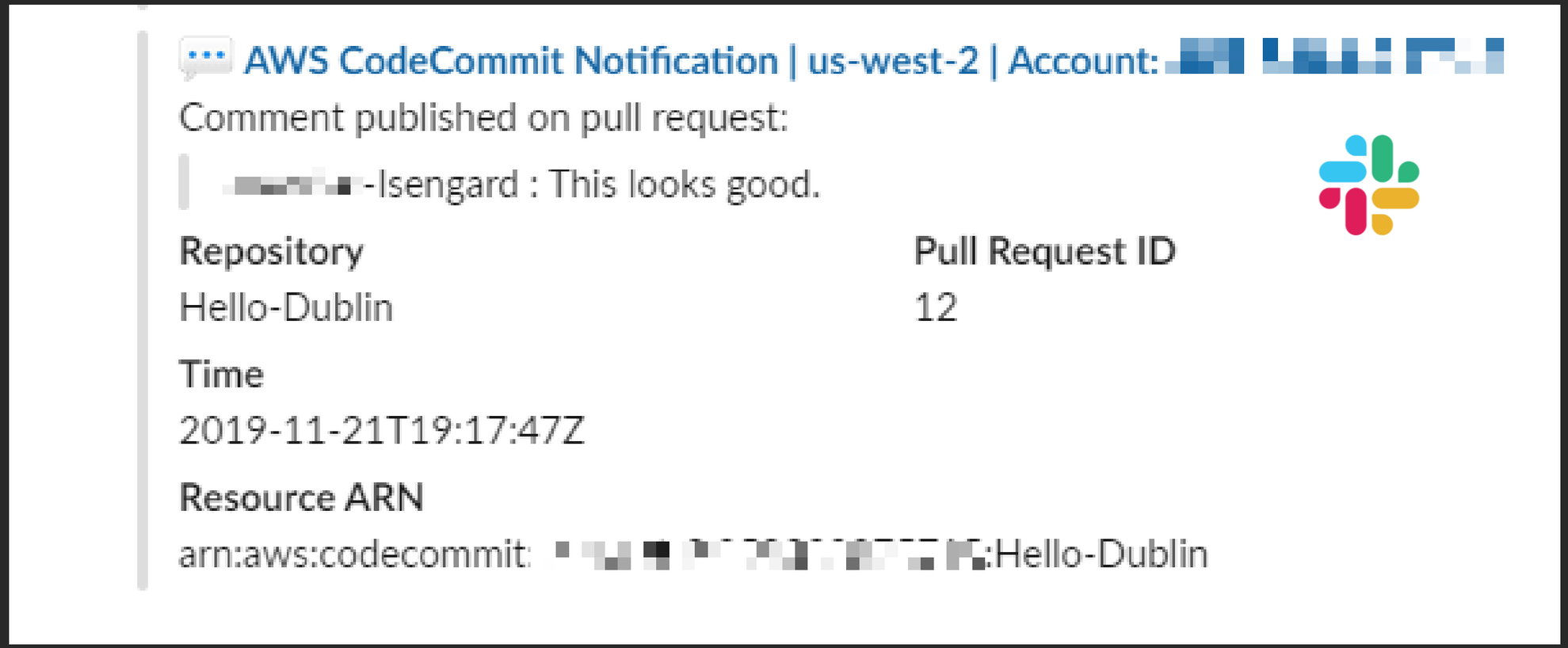
- Receive notifications
- **Run commands for diagnostic information**
- Predefined IAM policy templates
- Support for Slack and Chime

New!

Send notifications from an AWS Code* service

New!

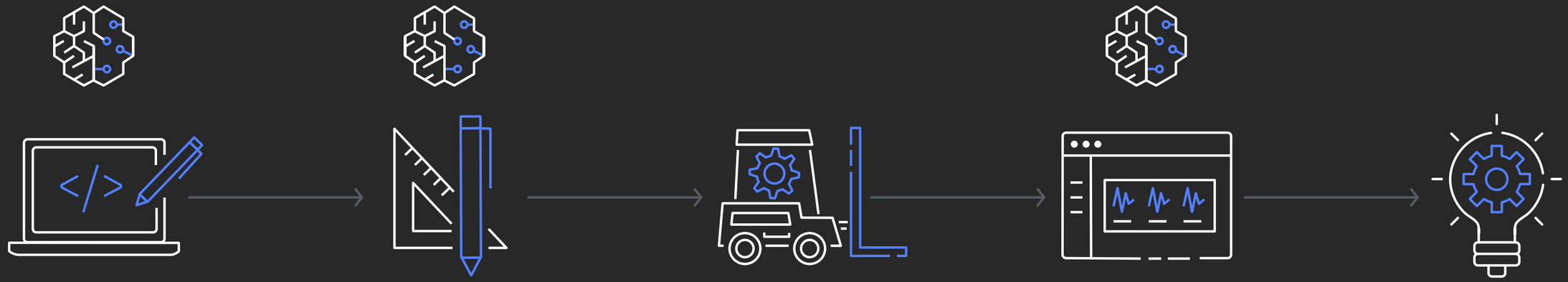
Subscribe AWS Code* services to Amazon SNS topics
to receive notifications; integrated with AWS Chatbot



Amazon CodeGuru

Using machine learning (ML) to build and run high-performing applications

New!



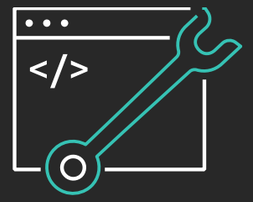
Built-in **code reviews** with intelligent recommendations

Detect and **optimize** the expensive lines of code pre-production

Easily identify **application inefficiencies** in production environment

Learn to build modern applications on AWS

Resources created by the experts at AWS to help you build and validate developer skills



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Thank you!

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