aws SUMMIT

DevOps on AWS

Julien Simon

Principal Technical Evangelist

Amazon Web Services

@julsimon

Agenda

- Why and What of DevOps
- What is CI/CD?
- Enabling DevOps: AWS Services for CI/CD
- CI/CD in Practice: Demo

DevOps consists of culture, practices, & tools

Culture

- Dev & ops coming together
  - No more “silos”
- Shared responsibility
- Ownership
- Visibility and communication

Practices

- Microservices based architecture
- CI/CD – Continuous integration and continuous delivery
- Infrastructure as code
- Monitoring and logging

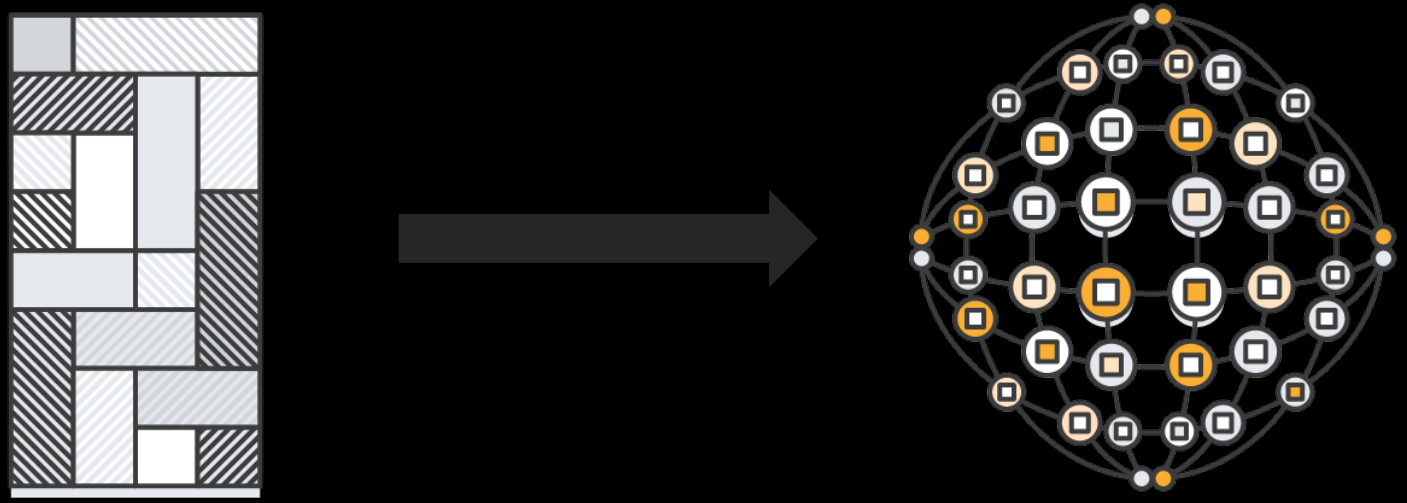
Tools

- Help you automate the major DevOps phases to support faster, smaller releases
  - Source
  - Build
  - Test
  - Deploy
  - Monitor

DevOps Practices

Microservices

Moving away from monolithic application architecture to many individual services



DevOps Practices

AWS CloudFormation

Infrastructure as code

Model your AWS resources using code

Parameters | Mappings | Conditions | Metadata | Outputs

template1

```
{
  "Parameters": {
    "KeyPairName": {
      "Description": "Public/private key pairs allow you to securely connect to your instance after it launches",
      "Type": "AWS::EC2::KeyPair::KeyName"
    },
    "ADInstanceType": {
      "Description": "Amazon EC2 instance type for the first Active Directory Instance",
      "Type": "String",
      "Default": "m4.xlarge",
      "AllowedValues": [
        "m4.large",
        "m4.xlarge",
        "m4.2xlarge",
        "m4.4xlarge"
      ]
    },
    "AD2InstanceType": {
      "Description": "Amazon EC2 instance type for the second Active Directory Instance",
      "Type": "String",
      "Default": "m4.xlarge",
      "AllowedValues": [
        "m4.large",
        "m4.xlarge",
        "m4.2xlarge",
        "m4.4xlarge"
```

Why does DevOps matter?

5x
Lower change failure rate

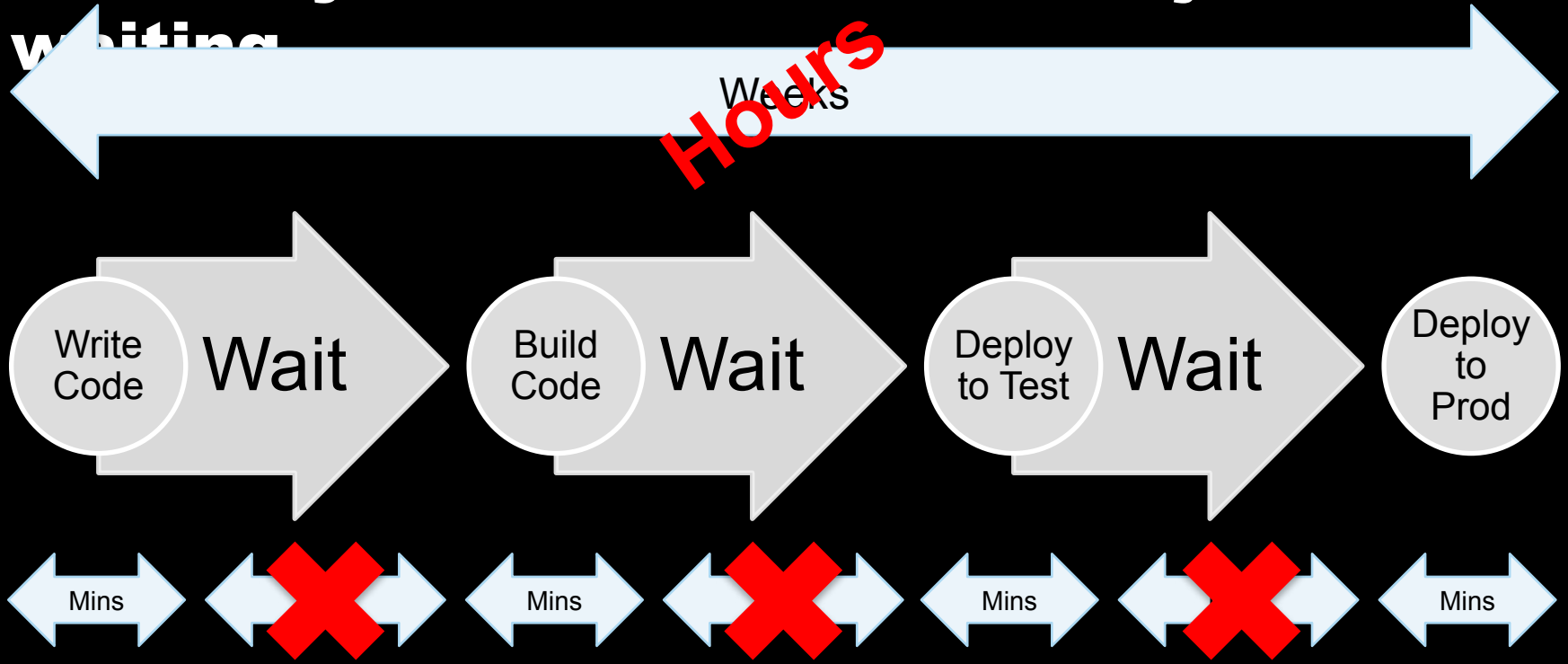
440x
Faster from commit to deploy

46x
More frequent deployments

44%
More time spent on new features and code

Source: Puppet 2017 State of DevOps Report

Our story: We realized we were just waiting



The Results Were Very Positive

By 2014

- Thousands of service teams across Amazon
- Building microservices
- Practicing continuous delivery
- Many environments (staging, beta, production)

50 million deployments

CI/CD Best Practices of Amazon Developers

CI/CD is a MUST!

Everything is code & Everything goes into a repository

Application, Infrastructure, Documentation

Start with Continuous Delivery ("Gated" Promotion) & build up to Continuous Deployment

Once clear evidence of a high level of excellence in testing

Deploy small at first, then more broadly

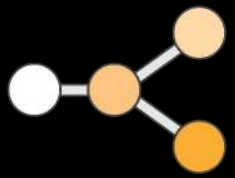
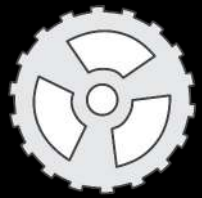
Deploy to canaries; **TEST**
Deploy to an AZ; **TEST**
Deploy to a Region; **TEST**

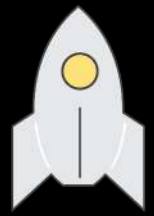
aws SUMMIT

What is CI/CD?

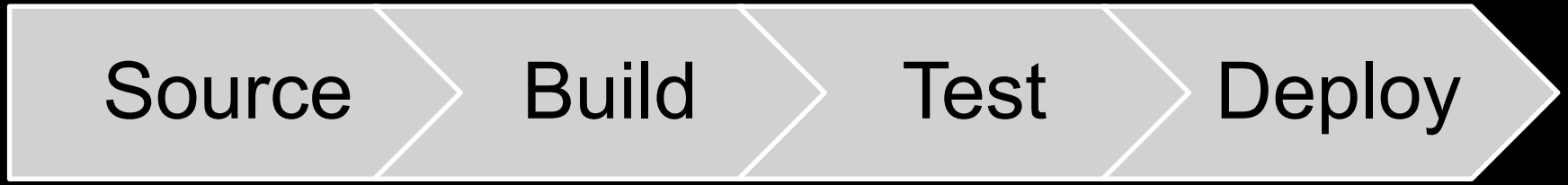
Five Major Phases of Release and Monitor

Source	Build	Test	Deploy	Monitor
• Check-in source code such as .java files. • Peer review new code	• Compile code • Unit tests • Style checkers • Code metrics • Create container images	• Integration tests with other systems • Load testing • UI tests • Penetration testing	• Deployment to production environments	• Monitor code in production to quickly detect unusual activity or errors

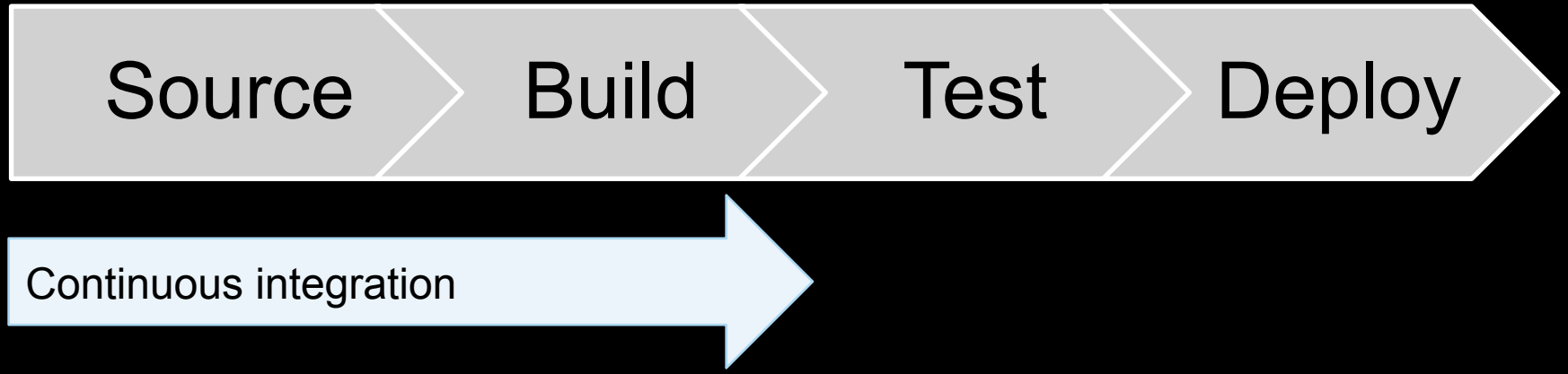





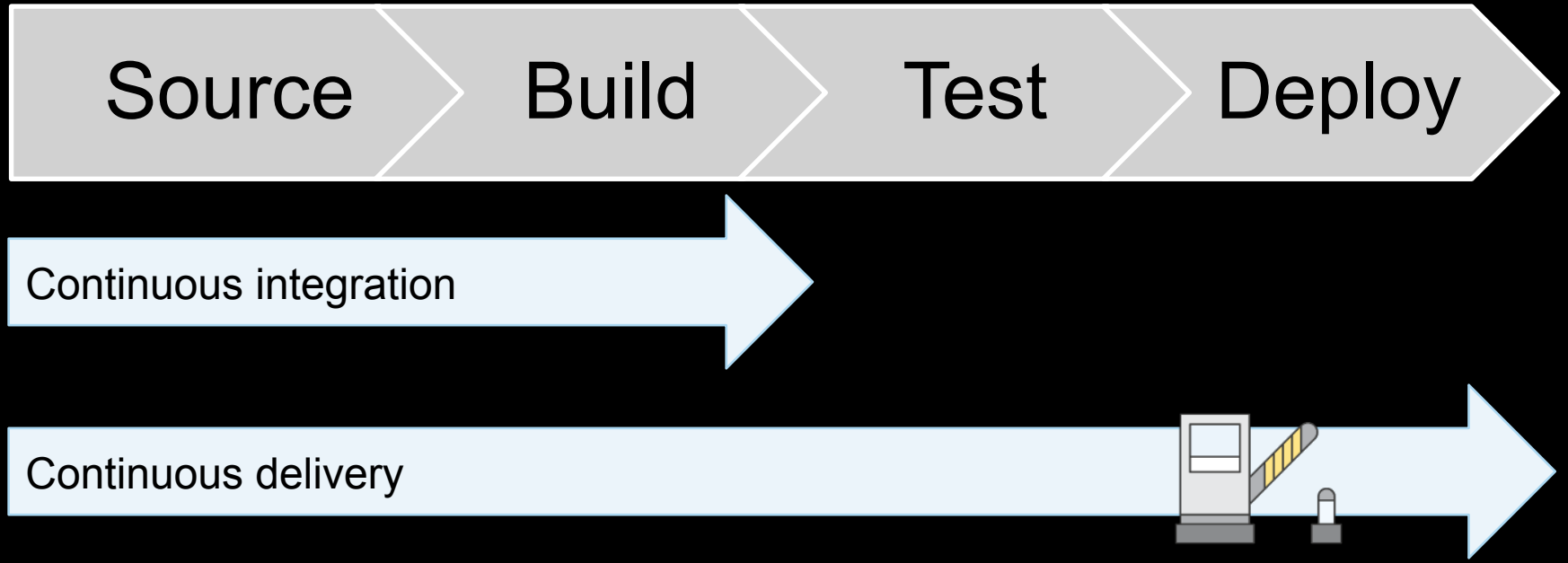

Release Process Levels



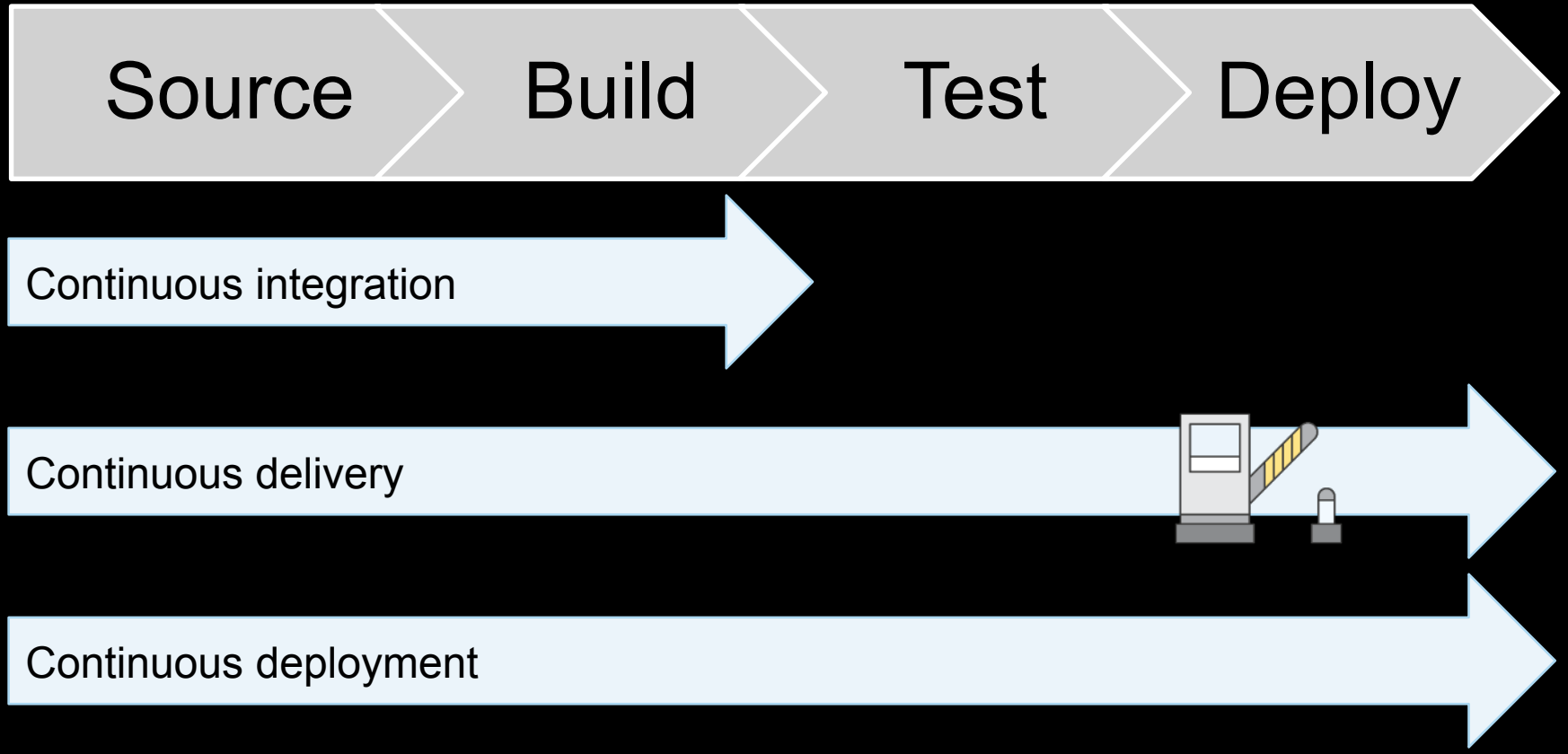
Release Process Levels



Release Process Levels



Release Process Levels



aws SUMMIT

Enabling DevOps

AWS Services for CI/CD

AWS DevOps Portfolio

Enabling Release and Monitor phases

Software Development and Continuous Delivery Toolchain

AWS CodeStar

AWS CodeCommit

AWS CodeBuild

AWS CodeDeploy

AWS CodePipeline

Infrastructure as Code

AWS CloudFormation

AWS OpsWorks

AWS OpsWorks for Chef Automate

Monitoring & Logging

AWS X-Ray

Amazon CloudWatch

AWS CloudTrail

AWS Config

AWS Code Services

Enabing CI/CD and Software Development

AWS CodeStar

Edit | Source | Build | Test | Deploy

AWS Cloud9

AWS CodeCommit

AWS CodeBuild

AWS CodeBuild

AWS CodeDeploy

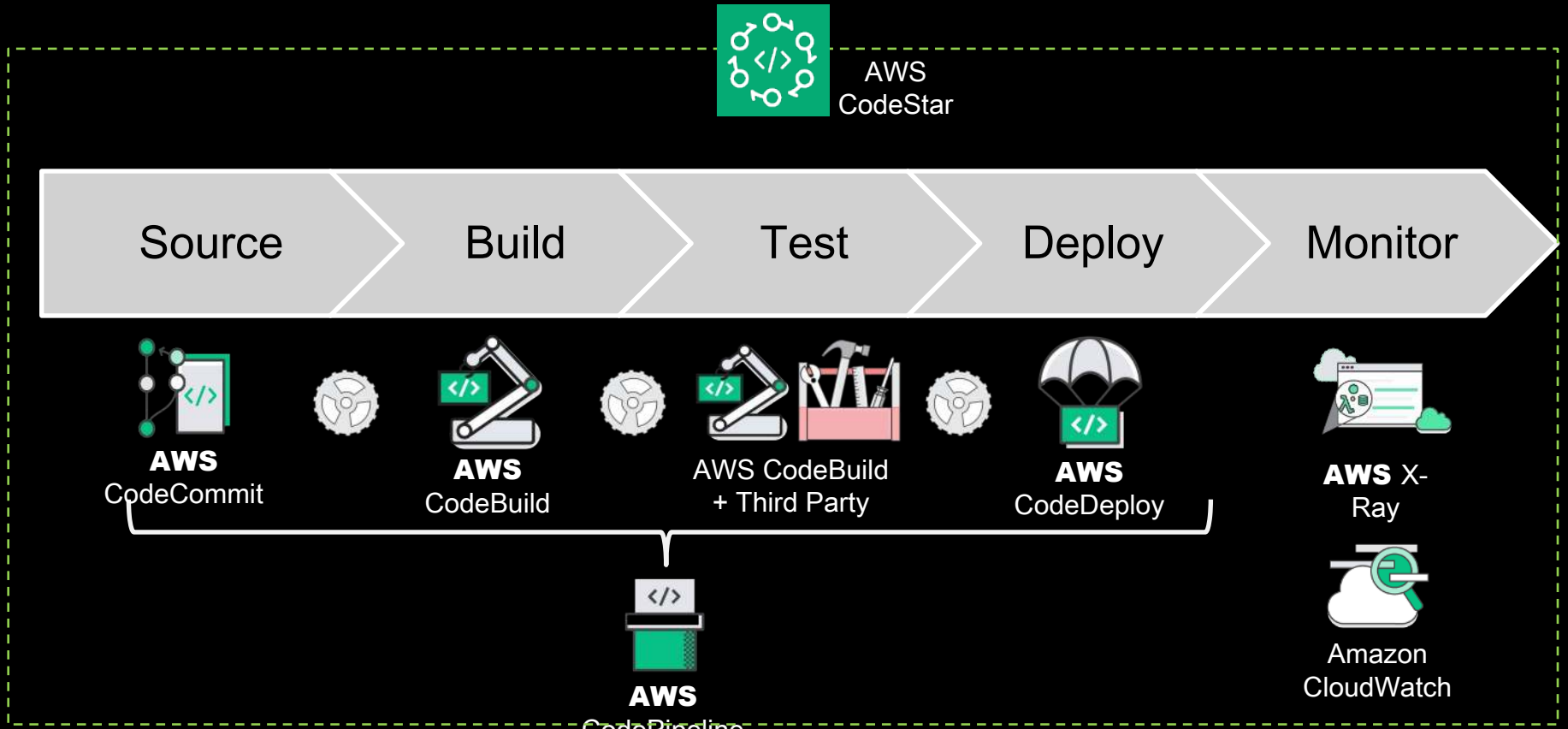
or

AWS CodePipeline

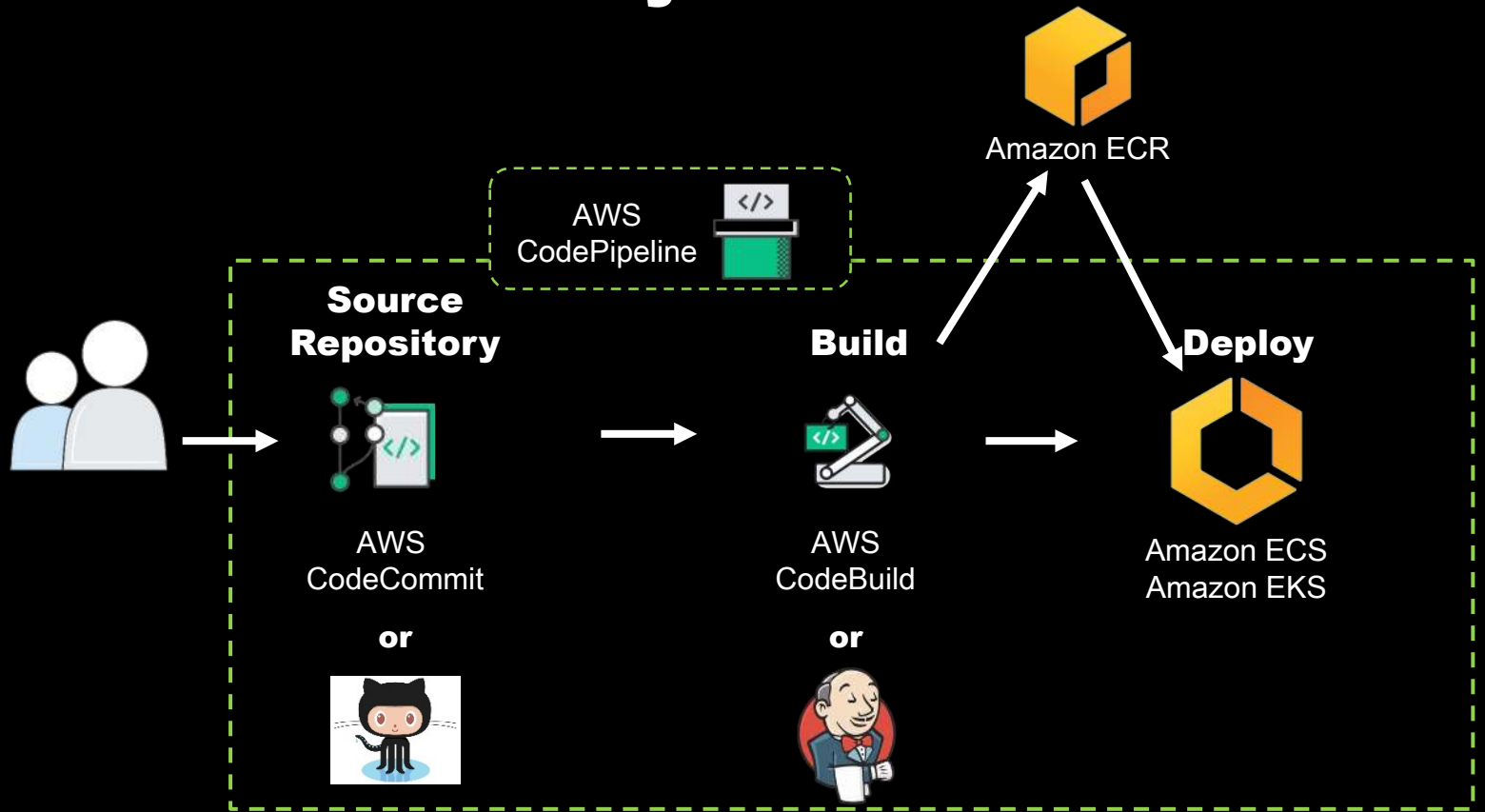
Start developing on AWS in minutes

AWS Code Services

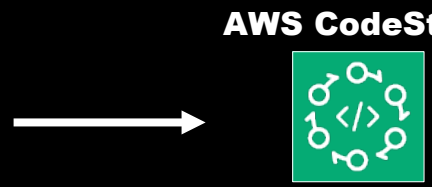
Enabing CI/CD and Software Release steps



Continuous Delivery for Containers



Continuous Delivery for Serverless Applications



Author (IDE)

AWS
Cloud9

or

Source Repository

AWS
CodeCommit

or

Build

AWS
CodeBuild

Deploy

AWS Lambda

Monitor

AWS X-Ray

And / or

Amazon
CloudWatch

AWS CodeCommit

- Secure, scalable, and managed Git source control
- Use standard Git tools
- Scalability, availability, and durability of Amazon S3
- Encryption at rest with customer-specific keys
- No repo size limit
- Post commit hooks to call out to SNS/Lambda

AWS CodeBuild

- Fully managed build service that compiles source code, runs tests, and produces software packages
- Scales continuously and processes multiple builds concurrently
- You can provide custom build environments suited to your needs via Docker images
- Only pay by the minute for the compute resources you use
- Launched with AWS CodePipeline and Jenkins integration

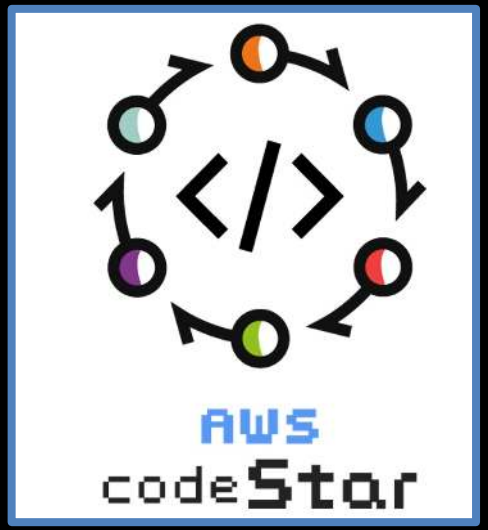
AWS CodeDeploy

- Automates code deployments to any instance or Lambda function
- Handles the complexity of updating your applications
- Avoid downtime during application deployment
- Rollback automatically if failure detected
- Deploy to Amazon EC2, Lambda, or on-premises servers
- Integrates with third-party tools and AWS

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 CodeStar



- Quickly develop, build, and deploy applications on AWS
- Start developing on AWS in minutes
- Securely work across your team
- Manage software delivery easily
- Choose from a variety of project templates

AWS X-Ray

Debug and analyze production applications in cloud or on-premises

Visualize service graph to identify performance bottlenecks

Troubleshoot and fix performance issues

Quantify customer impact

Integration with Lambda enables you to monitor serverless applications

X-Ray SDK available in Java, .NET, Node.js, and Python

AWS Cloud9

- Cloud-based integrated development environment (IDE)
- Lets you write, run, and debug your code with just a browser
- Share your environment with your team to pair-program in real time
- Direct terminal access to AWS
- Provides great serverless experience: enables local testing and preconfigures the development environment with all SDKs, libraries, and plugins

aws SUMMIT

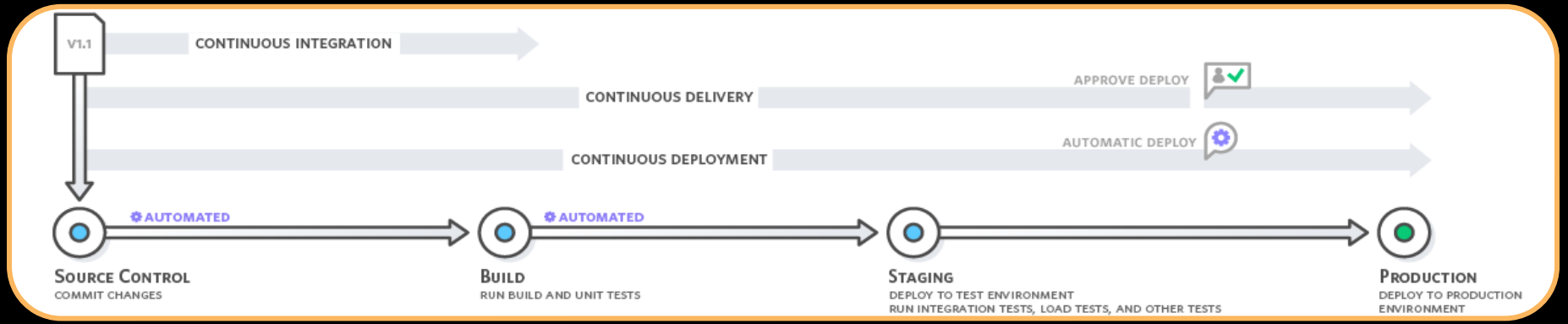
Demo

CI/CD with AWS

Summary

Learn More

- ✓ DevOps on AWS: http://aws.amazon.com/devops/
- ✓ Continuous Integration with AWS: http://aws.amazon.com/devops/continuous-integration/
- ✓ Continuous Delivery with AWS: http://aws.amazon.com/devops/continuous-delivery/
- ✓ Get started with CI/CD in under 5 minutes: http://aws.amazon.com/codestar/



aws SUMMIT

Julien Simon

Principal Technical Evangelist

Amazon Web Services

@julsimon