Agenda

• What is CI/CD?
• CI/CD in Practice: Amazon
• Using CI/CD on AWS
• Demo
What is CI/CD?
Five Major Phases of Releasing Software

- Source
- Build
- Test
- Deploy
- Monitor
Five Major Phases of Releasing Software

- Check-in source code such as .java files.
- Peer review new code
Five Major Phases of Releasing Software

**Source**
- Check-in source code such as .java files.
- Peer review new code

**Build**
- Compile code
- Unit tests
- Style checkers
- Code metrics
- Create container images

**Test**

**Deploy**

**Monitor**
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- Test
  - Integration tests with other systems
  - Load testing
  - UI tests
  - Penetration testing

- Deploy

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Deploy
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Monitor
- Monitor code in production to quickly detect unusual activity or errors
Release Process Levels

Source  Build  Test  Deploy
Release Process Levels

Source → Build → Test → Deploy

Continuous integration
Release Process Levels

Source → Build → Test → Deploy

Continuous integration

Continuous delivery
Release Process Levels

- Source
- Build
- Test
- Deploy

Continuous integration

Continuous delivery

Continuous deployment
Why does CI/CD matter?

440x

Faster from commit to deploy

Source: Puppet 2017 State of DevOps Report
Why does CI/CD matter?

Continuous integration

Continuous delivery

Continuous deployment
Why does CI/CD matter?

440x Faster from commit to deploy

46x More frequent deployments

Source: Puppet 2017 State of DevOps Report
Why does CI/CD matter?

- Continuous integration
- Continuous delivery
- Continuous deployment
Why does CI/CD matter?

- 440x Faster from commit to deploy
- 46x More frequent deployments
- 5x Lower change failure rate

Source: Puppet 2017 State of DevOps Report
Why does CI/CD matter?

- Continuous integration
- Continuous delivery
- Continuous deployment
Why does CI/CD matter?

- 440x Faster from commit to deploy
- 46x More frequent deployments
- 5x Lower change failure rate
- 44% More time spent on new features and code

Source: Puppet 2017 State of DevOps Report
CI/CD in Practice: Amazon
Our story: We realized we were just waiting.
Our story: We realized we were just waiting.

- Write Code
- Build Code
- Deploy to Test
- Deploy to Prod

Weeks

Mins  Days  Mins  Days  Mins  Days  Mins
Our story: We realized we were just waiting.
Our story: We realized we were just waiting.

Write Code Automate

Build Code Automate

Deploy to Test Automate

Deploy to Prod

Weeks

Hours

Mins

Mins

Mins

Mins

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Results
By 2014
• Thousands of teams across Amazon practicing continuous delivery
• Many environments (staging, beta, production) for many microservices

50 million deployments per year
1. CI/CD is a MUST!
CI/CD Best Practices of Amazon Developers

1. CI/CD is a MUST!
2. Everything is code and everything goes into a repository
CI/CD Best Practices of Amazon Developers

1. CI/CD is a MUST!
2. Everything is code and everything goes into a repository
3. Start with continuous delivery ("gated" promotion) and build up to continuous deployment
CI/CD Best Practices of Amazon Developers

1. CI/CD is a MUST!
2. Everything is code and everything goes into a repository
3. Start with continuous delivery ("gated" promotion) and build up to continuous deployment
4. Deploy small at first, then more broadly
Case Study: lululemon athletica

“Instead of taking two days to build a production account, we can do it in minutes using AWS CloudFormation templates and AWS CodePipeline.”
Case Study: 3M Health Information Systems

“Using AWS, we’ve gone from deployments taking six weeks to one per week, and very soon we expect that to be multiple deployments per day.”
Using CI/CD on AWS
AWS Code Services

Edit  Source  Build  Test  Deploy
AWS Code Services

Edit → Source → Build → Test → Deploy

AWS Cloud9
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 Code Services

- Edit
- Source
- Build
- Test
- Deploy

AWS Cloud9

AWS CodeCommit
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, and CloudWatch Events
AWS Code Services

Edit  Source  Build  Test  Deploy

AWS Cloud9  AWS CodeCommit  AWS CodeBuild  AWS CodeBuild
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
AWS Code Services

Edit  Source  Build  Test  Deploy

AWS Cloud9  AWS CodeCommit  AWS CodeBuild  AWS CodeBuild  AWS CodeDeploy
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
AWS Code Services

Edit  Source  Build  Test  Deploy

AWS Cloud9  AWS CodeCommit  AWS CodeBuild  AWS CodeBuild  AWS CodeDeploy

AWS CodePipeline
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
- Choose from a variety of project templates
Continuous Deployment for Containers

Edit ➔ Source ➔ Build ➔ Test ➔ Deploy

AWS CodeCommit

AWS CodeBuild

AWS CloudFormation

Amazon ECR ➔ Amazon ECS
Continuous Deployment for Serverless

AWS CodePipeline

Edit ➔ Source ➔ Build ➔ Test ➔ Deploy

AWS Cloud9
AWS CodeCommit
AWS CodeBuild
AWS CodeDeploy
AWS Lambda
AWS CloudFormation
Demo
CI/CD with AWS
Lunch Wheel
Lunch Wheel
Food Trucks Slack Bot

The lunch wheel chose food trucks!

What food trucks are there today?

I don’t know...
Food Trucks Slack Bot

Here are the food trucks in your area today:

**McGraw Square** *(map)*
- Charlie's Buns 'N' Stuff (Burgers, Sandwiches, and American)

**Johnny & Terry** *(map)*
- The Roll Pod (Indian)

**Thomas & 9th** *(map)*
- Tacos El Tajin (Mexican)
- NaanSense (Indian, Vegetarian, and Halal)

**John & Terry** *(map)*
- Poke Up (Hawaiian, Seafood, and Asian)

**6th & Olive** *(map)*
- Nach'Yo Average Food Truck (Mexican, Sandwiches, and Vegan)

**Terry & Thomas** *(map)*
- Spice On Curve (Indian)
- Seattle Mamak (Asian)

**Harrison & Westlak** *(map)*
- Athena's (Mediterranean)

**Westlak Park** *(map)*
- Roll OK Please (Indian)
- Mo Pockets (Asian and Sandwiches)
- Kemrick's Bizi Easy (Southern)
Food Trucks Slack Bot

Amazon API Gateway

AWS Lambda Function: Slack Bot

Amazon DynamoDB Table

Amazon CloudWatch Events Rule

AWS Lambda Function: Scrape Data

Store data

Retrieve data
Food Trucks Slack Bot

Amazon API Gateway

AWS Lambda Function Alias “live”
Food Trucks Slack Bot

- Amazon API Gateway
- AWS Lambda Function Alias "live"
- Slack Bot Code v1: 80%
- Slack Bot Code v2: 20%
Food Trucks Slack Bot

Amazon API Gateway → AWS Lambda Function Alias “live”

- Slack Bot Code v1 (0%)
- Slack Bot Code v2 (100%)
Food Trucks Slack Bot

- Amazon API Gateway
- Amazon CloudWatch Events Rule
- AWS Lambda Function Alias "live"
- Slack Bot Code v1
- Slack Bot Code v2

80%
20%
Live Demo!
Thank you!

Get started with CI/CD in under 5 minutes
https://aws.amazon.com/codestar/