

DevOps on AWS: Getting Started with Continuous Delivery on AWS

Chris Munns, Business Development Manager - DevOps

April 27 2016

A photograph of a weathered brick wall. The wall is made of dark, aged bricks with some lighter patches. Faded graffiti is visible on the wall, including the letters 'L' and 'D'. A white downspout is on the right side. The text 'Why are we here today?' is overlaid in white.

**Why are we
here today?**

Software moves faster today

Software creation and distribution is easier and faster than ever:

- Startups can now take on giants with little to no funding ahead of time
- Getting your software into the hands of millions is a download away
- Your ability to move fast is paramount to your ability to fight off disruption



The software delivery model has drastically changed

Old software delivery model



New software delivery model



What tools do you need to move fast?

Releasing software in this new software driven world requires a number of things:

- Tools to manage the flow of your software development release process
- Tools to properly test and inspect your code for defects and potential issues
- Tools to deploy your applications



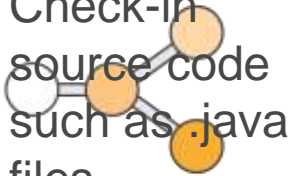
First, we need to
understand a little bit about
software release processes



Release processes have four major phases

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

- Integration test other systems
- Load testing
- UI tests
- Penetration testing

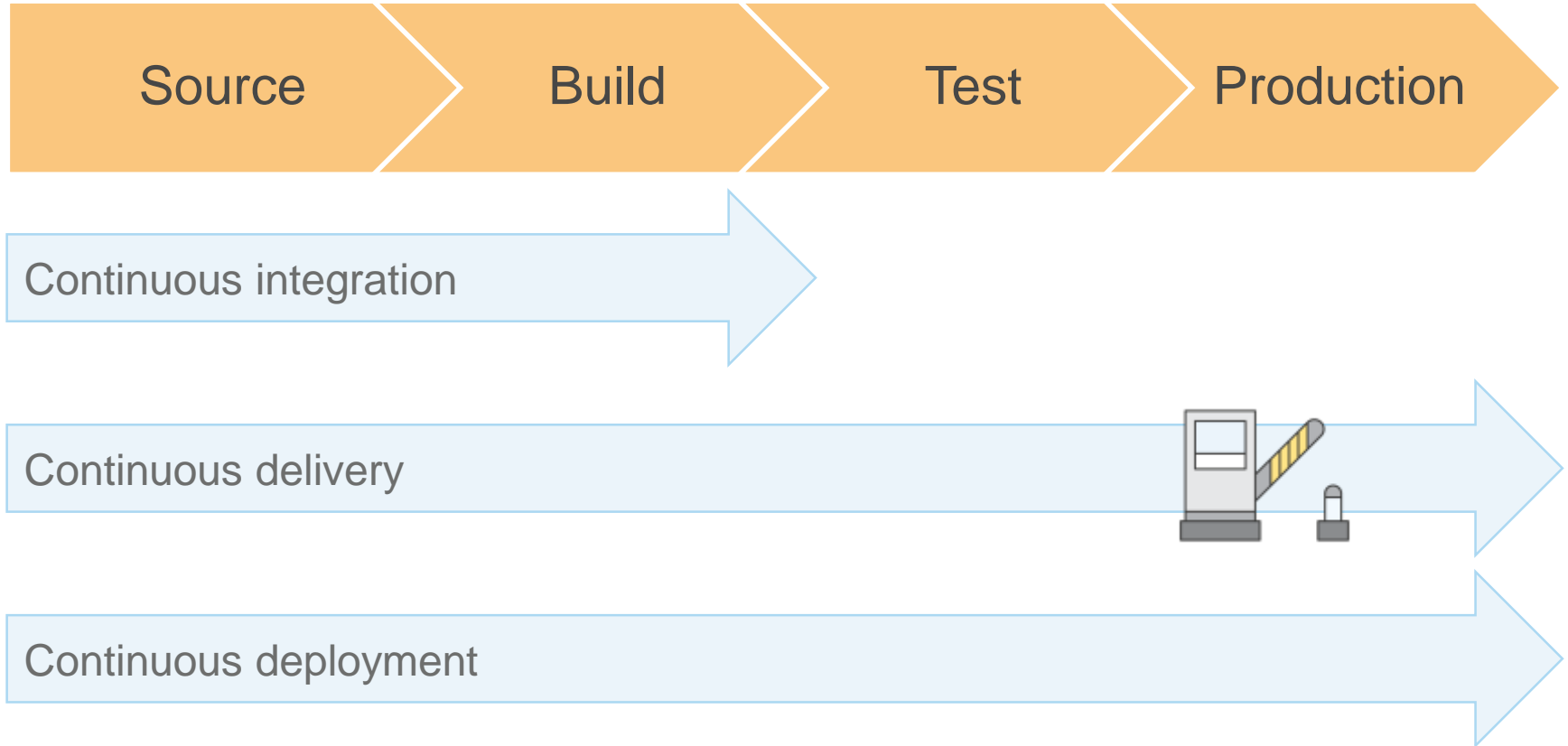


Production

- Deployment to production environments



Release processes levels



Release Processes levels

Source Build Test Production

Our focus today

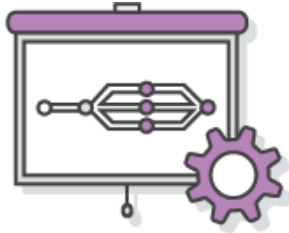
Continuous integration

Continuous delivery

Continuous deployment



Continuous Delivery Benefits



Automate the software
release process



Improve developer
productivity



Find and address
bugs quickly



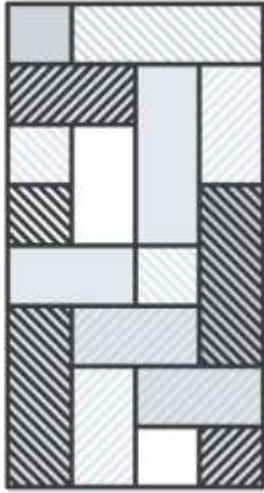
Deliver updates faster

The background image shows the interior of a grand, multi-story Victorian building, likely the Natural History Museum in London. It features a massive central staircase with ornate metal railings, high vaulted ceilings with intricate tracery, and large arched windows at the top. People are seen walking on the stairs and on the ground floor, providing a sense of scale to the enormous space.

A look back at
development at
Amazon..

Development transformation at Amazon: 2001-2009

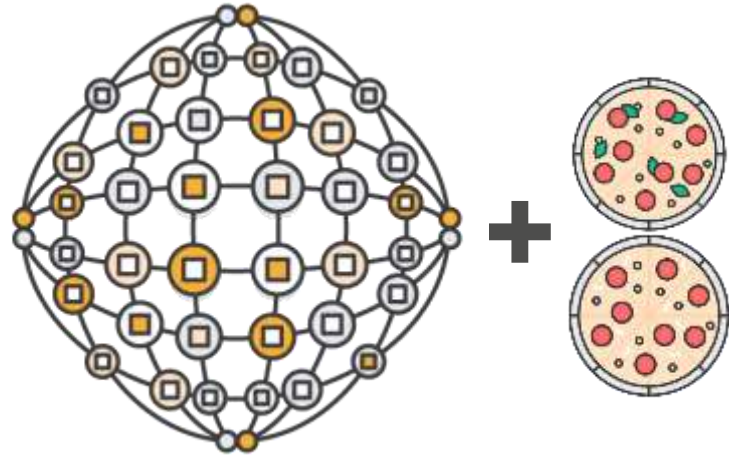
2001



monolithic
application + teams



2009



microservices + 2 pizza teams

Things went much better under this model and teams were developing features faster than ever, but we felt that we could still improve.



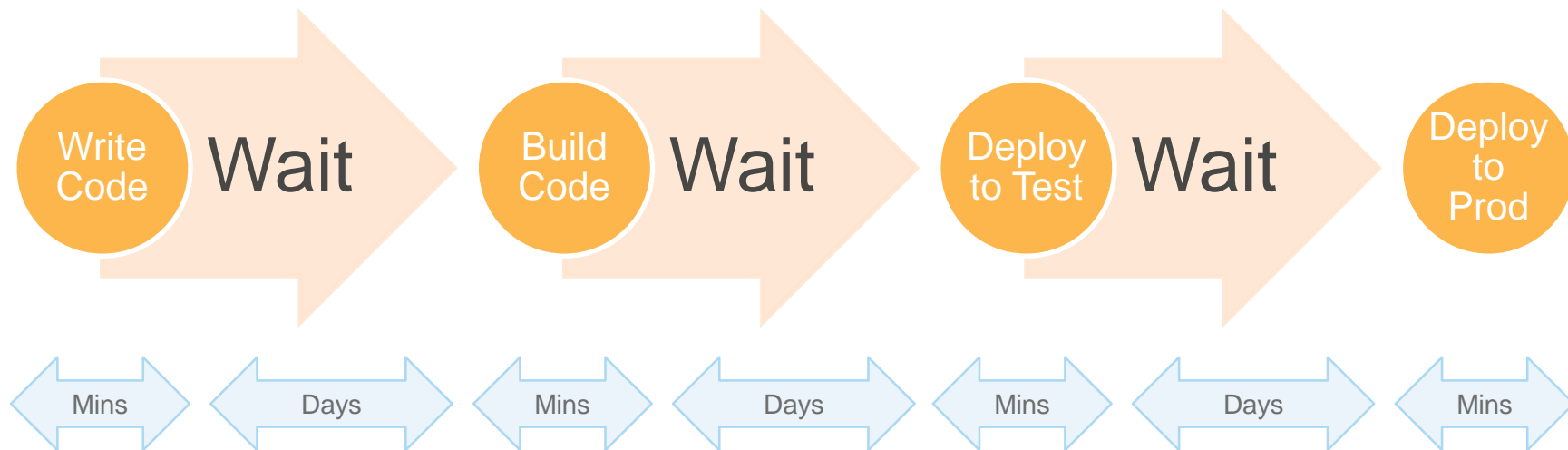


In 2009, we
ran a study to
find out where
inefficiencies
might still exist

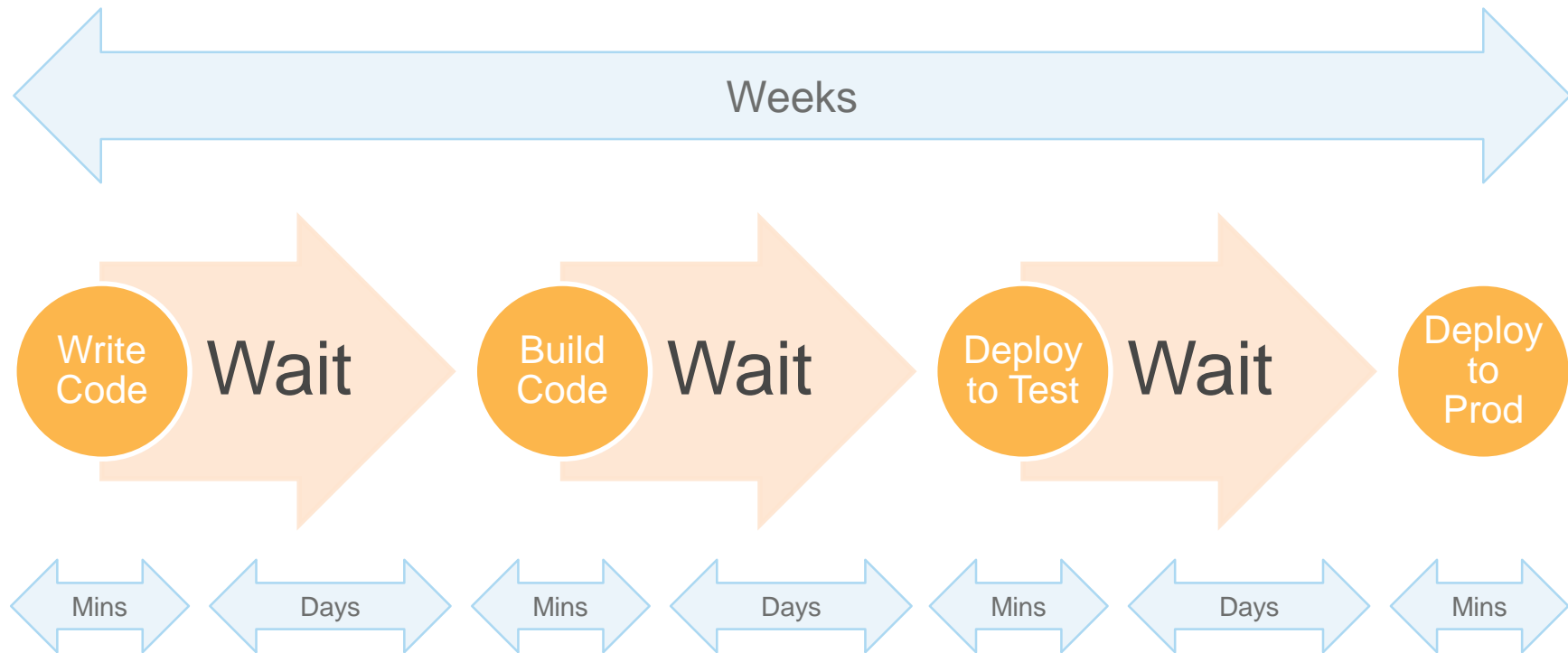
We were just waiting.



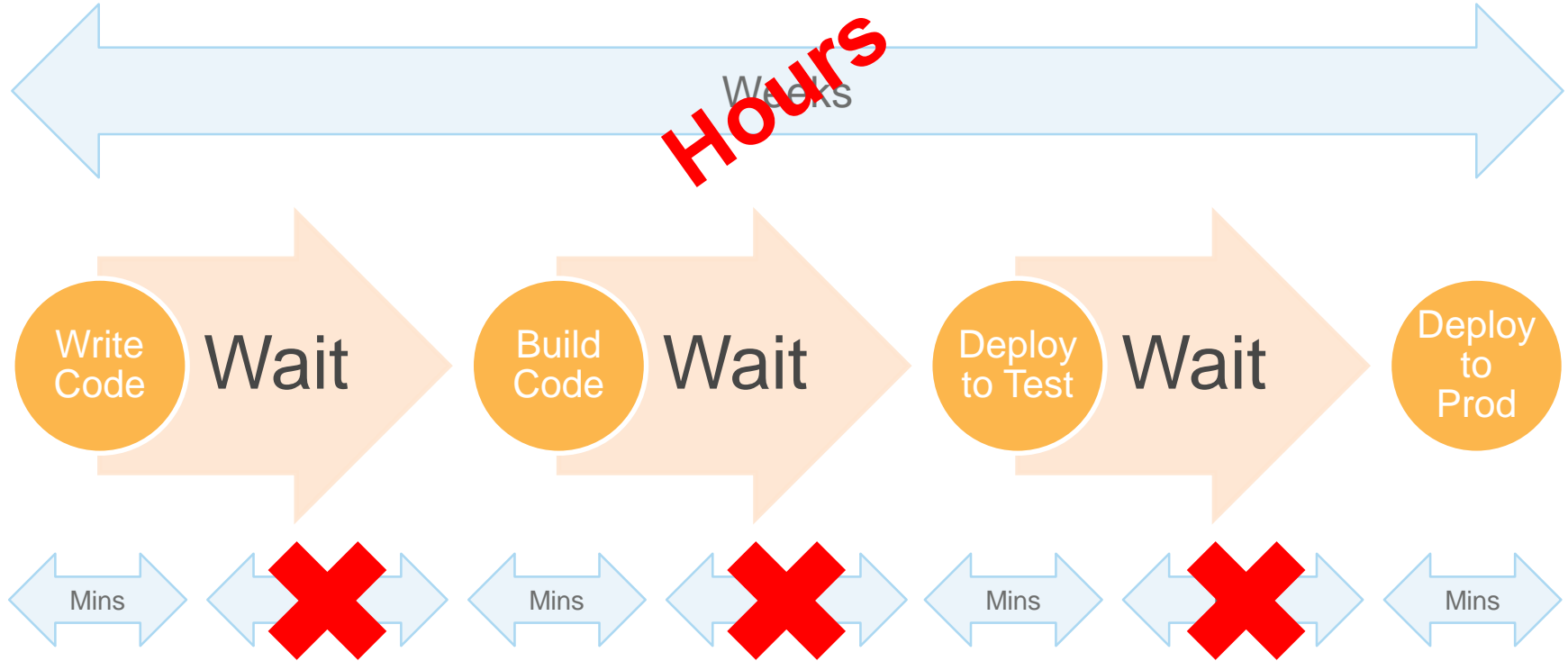
We were just waiting.



We were just waiting.



We were just waiting.





**We built tools to
automate our software
release process**



Pipelines

Automated actions and transitions; from check-in to production

Development benefits:

- Faster
- Safer
- Consistent & Standardized
- Visualization of the process

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 3rd party tools and AWS

AWS CodePipeline Benefits



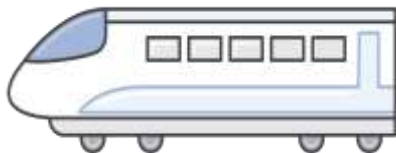
Configurable workflow



Easy to integrate



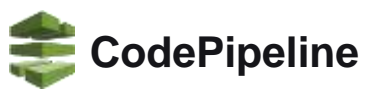
Improved quality



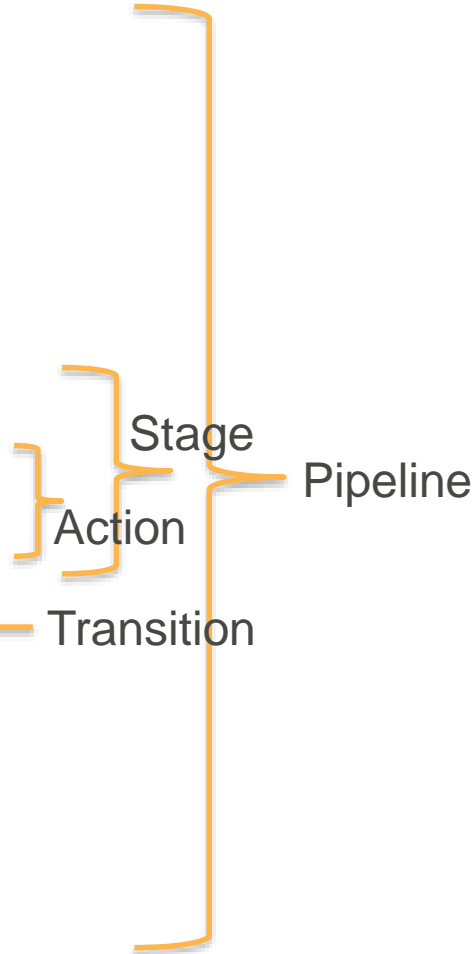
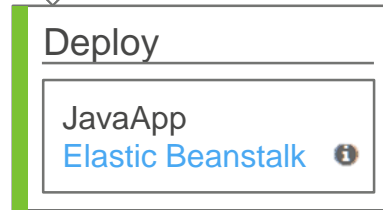
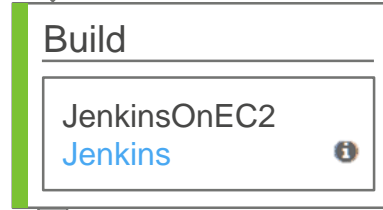
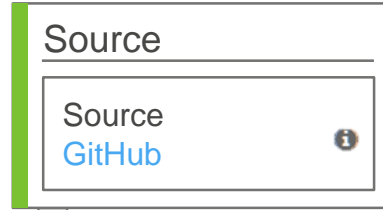
Rapid delivery

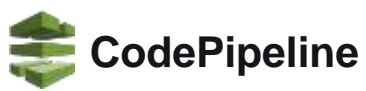


Get started fast

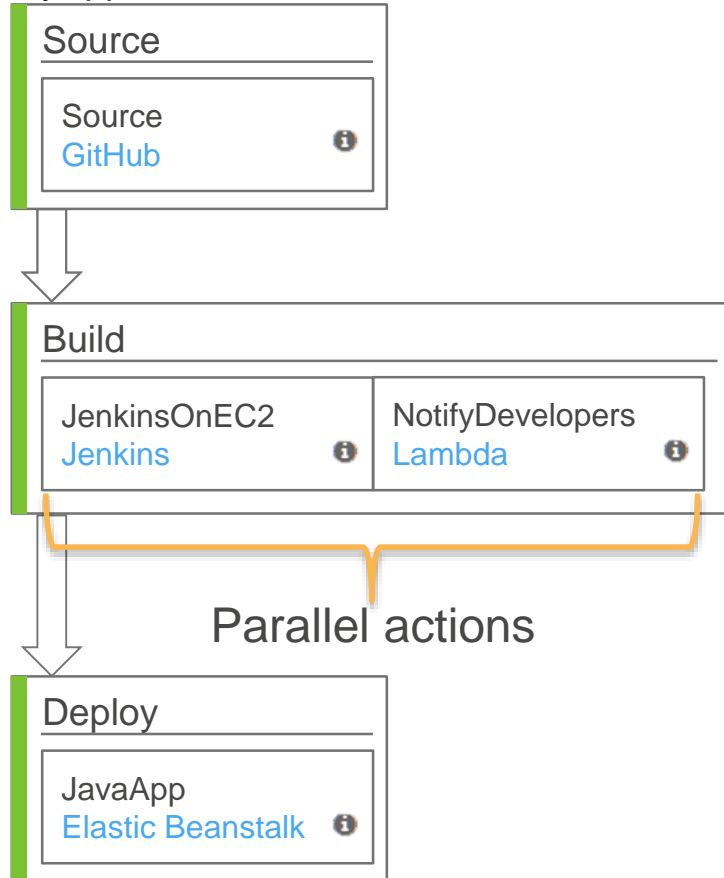


MyApplication



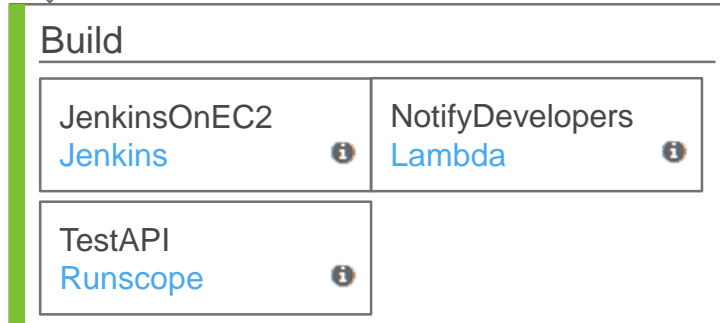
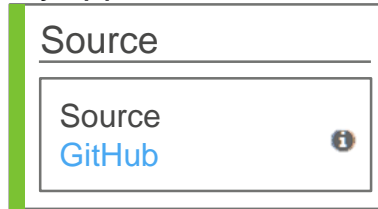


MyApplication

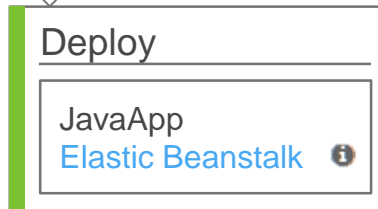
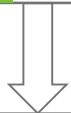




MyApplication

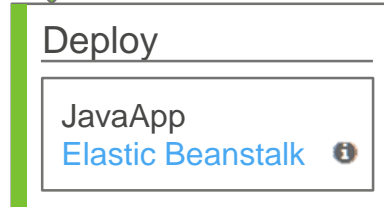
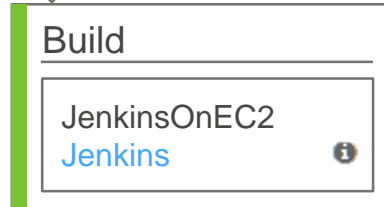
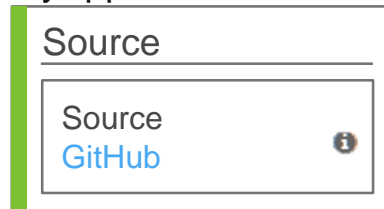


Sequential actions



CodePipeline

MyApplication



1. Get Changes

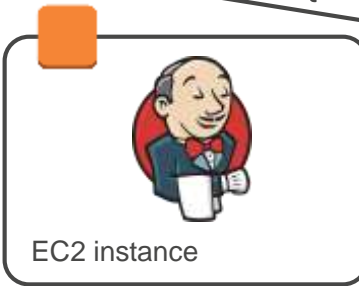


2. Store source artifact

3. Poll for Job

4. Acknowledge Job

7. Put Success



5. Get source artifact

S3

6. Store build artifact

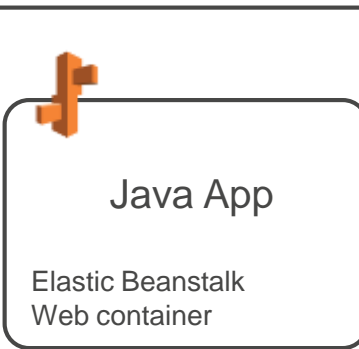
Source Artifact

S3

Build Artifact

8. Retrieve build artifact

9. Deploy build artifact



We have a strong partner list, and it's growing

Source

Build

Test

Deploy

GitHub


CloudBees

 **Apica**

XebiaLabs
Deliver Faster

 **Jenkins**

 **BlazeMeter**

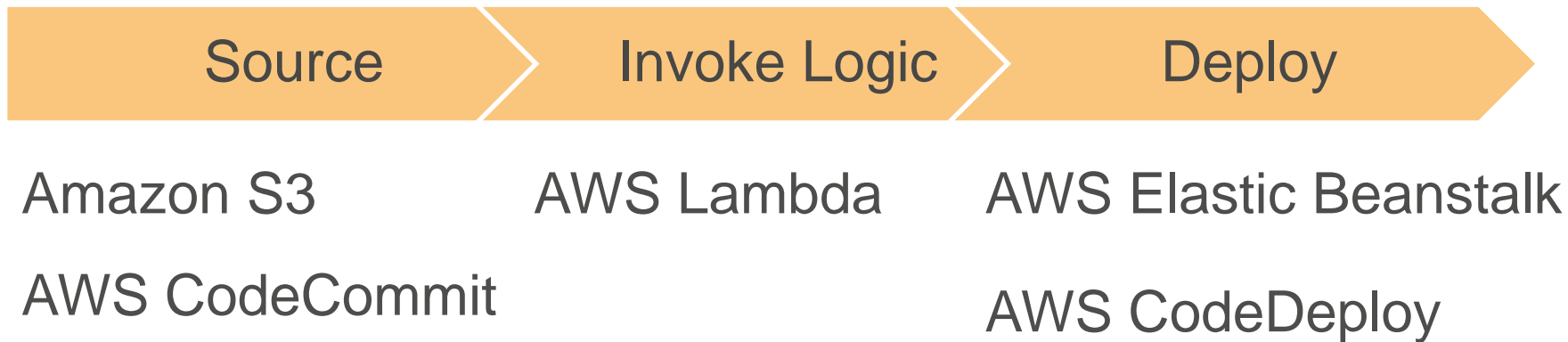

Solano Labs

 Ghost Inspector

 **HPE StormRunner**

 **Runscope**

AWS service integrations





Building your application development release pipeline



AWS CodePipeline

Visualize and automate the different stages of your software release process, and watch your code go.

[Get started](#)



Automate

Build, test, and deploy your code, your way.



Track

Know how your code is doing at every step of the release.



Learn

Learn more about how pipelines work and how you can use them.



Create pipeline

Step 1: Name[Step 2: Source](#)[Step 3: Build](#)[Step 4: Beta](#)[Step 5: Service Role](#)[Step 6: Review](#)

Getting started with AWS CodePipeline ?

These steps will help you set up your first pipeline. Begin by giving your pipeline a name.

Pipeline name*

* Required

[Cancel](#)[Next step](#)



Create pipeline

Step 1: Name

Step 2: Source

Step 3: Build

Step 4: Beta

Step 5: Service Role

Step 6: Review

Source location ?

Specify where your source code is stored. Choose the provider, and then provide connection details for that provider.

Source provider*

✓

AWS CodeCommit

Amazon S3

GitHub

* Required

Cancel

Previous

Next step



Create pipeline

[Step 1: Name](#)**Step 2: Source**[Step 3: Build](#)[Step 4: Beta](#)[Step 5: Service Role](#)[Step 6: Review](#)

Source location ?

Specify where your source code is stored. Choose the provider, and then provide connection details for that provider.

Source provider*AWS CodeCommit ▾

AWS CodeCommit i

Choose a repository and a branch to use as the source location.

Repository name*

Suits4Dogs

**Branch name***

master



* Required

[Cancel](#)[Previous](#)[Next step](#)



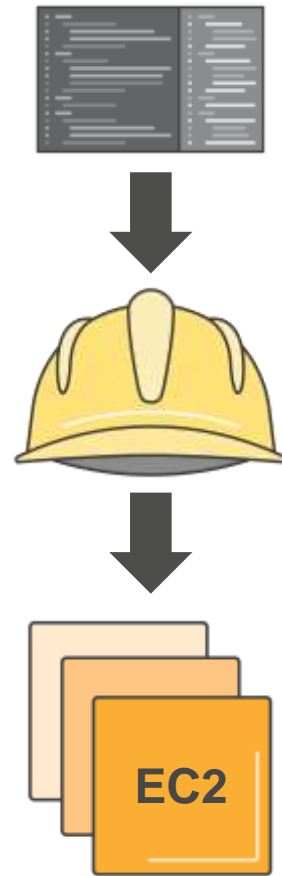
**Build & test your
application**

Building Your Code

“Building” code typically refers to languages that require compiled binaries:

- .NET languages: C#, F#, VB.net, etc.
- Java and JVM languages: Java, Scala, JRuby
- Go
- iOS languages: Swift, Objective-C

We also refer to the process of creating Docker container images as “building” the image.

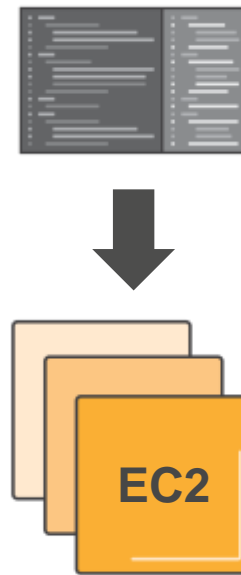


No Building Required!

Many languages don't require building. These are considered interpreted languages:

- PHP
- Ruby
- Python
- Node.js

You can just deploy your code!



Testing Your Code

Testing is both a science and an art form!

Goals for testing your code:

- Want to confirm desired functionality
- Catch programming syntax errors
- Standardize code patterns and format
- Reduce bugs due to non-desired application usage and logic failures
- Make applications more secure



Create pipeline

[Step 1: Name](#)[Step 2: Source](#)**Step 3: Build**[Step 4: Beta](#)[Step 5: Service Role](#)[Step 6: Review](#)

Build



Choose the build provider that you want to use or that you are already using.

Build provider*

Add Jenkins



Add Jenkins

Use the template below to connect a Jenkins instance as a build provider for pipelines in your AWS account. Before you connect your Jenkins instance, you should set up the AWS CodePipeline Plugin for Jenkins and configure it for your project. [Learn more](#)

Provider name*

april26demo-Jenkins

This name must match the name configured in the plugin.

Server URL*

http://54.210.188.9

Project name*

april26demo

* Required

[Cancel](#)[Previous](#)[Next step](#)

Deploying your applications

AWS CodeDeploy



Automates code deployments to any instance

Handles the complexity of updating your applications

Avoid downtime during application deployment

Deploy to Amazon EC2 or on-premises servers, in any language and on any operating system

Integrates with 3rd party tools and AWS

appspec.yml Example

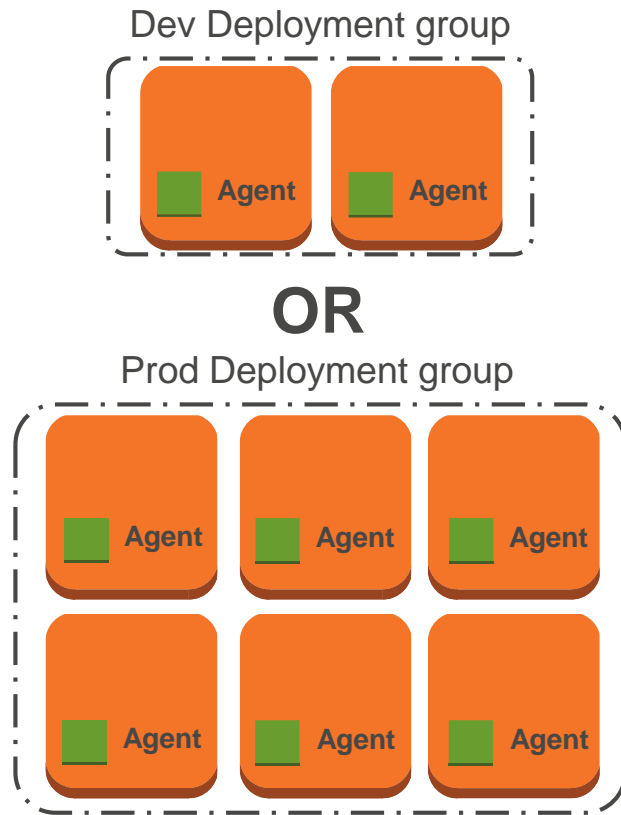
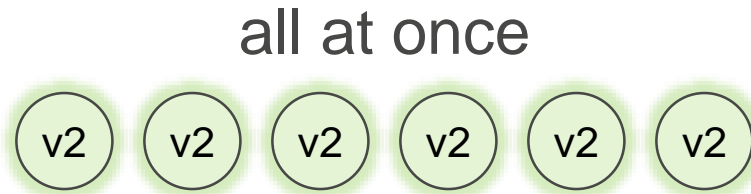
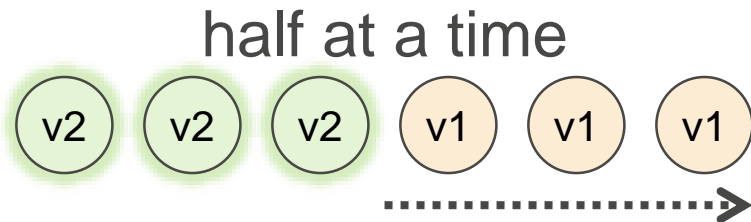
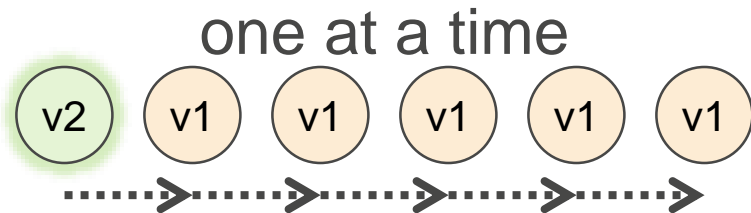
```
version: 0.0
os: linux
files:
  - source: /
    destination: /var/www/html
permissions:
  - object: /var/www/html
    pattern: "*.html"
    owner: root
    group: root
    mode: 755
hooks:
  ApplicationStop:
    - location: scripts/deregister_from_elb.sh
  BeforeInstall:
    - location: scripts/install_dependencies.sh
  ApplicationStart:
    - location: scripts/start_httpd.sh
  ValidateService:
    - location: scripts/test_site.sh
    - location: scripts/register_with_elb.sh
```

appspec.yml Example

```
version: 0.0
os: linux
files:
  - source: /
    destination: /var/www/html
permissions:
  - object: /var/www/html
    pattern: "*.html"
    owner: root
    group: root
    mode: 755
hooks:
  ApplicationStop:
    - location: scripts/deregister_from_elb.sh
  BeforeInstall:
    - location: scripts/install_dependencies.sh
  ApplicationStart:
    - location: scripts/start_httpd.sh
  ValidateService:
    - location: scripts/test_site.sh
    - location: scripts/register_with_elb.sh
```

- Send application files to one directory and configuration files to another
- Set specific permissions on specific directories & files
- Remove/add instance to ELB
- Install dependency packages
- Start Apache
- Confirm successful deploy
- More!

Choose Deployment Speed and Group



Create pipeline

[Step 1: Name](#)[Step 2: Source](#)[Step 3: Build](#)**Step 4: Beta**[Step 5: Service Role](#)[Step 6: Review](#)

Beta



Choose how you deploy to instances. Choose the provider, and then provide the configuration details for that provider.

Deployment provider*

AWS Elastic Beanstalk
✓ AWS CodeDeploy

AWS CodeDeploy

Choose one of your existing applications, or [create a new one in AWS CodeDeploy](#).

Application name*

april26demo



Choose one of your existing deployment groups, or [create a new one in AWS CodeDeploy](#).

Deployment group*

april26demo-DevEnv



* Required

[Cancel](#)

[Previous](#)

[Next step](#)



Create pipeline

[Step 1: Name](#)[Step 2: Source](#)[Step 3: Build](#)[Step 4: Beta](#)**Step 5: Service Role**[Step 6: Review](#)

AWS Service Role ?

Create a service role in IAM to give AWS CodePipeline permission to use resources in your account. If you already have a service role configured for this purpose, you can choose it from the list instead of creating a role. However, if that role is not configured correctly, AWS CodePipeline might not work as expected.

Role name***Create role***** Required**[Cancel](#)[Previous](#)[Next step](#)



AWS

Services



Edit

Chris Munns

N. Virginia



AWS CodePipeline

Create pipeline

[Step 1: Name](#)[Step 2: Source](#)[Step 3: Build](#)[Step 4: Beta](#)[Step 5: Service Role](#)**Step 6: Review**

Review your pipeline



We will create your pipeline with the following resources.

Source Stage

Source provider AWS CodeCommit

Repository name Suits4Dogs

Branch name master

Build Stage

Would you like to create this pipeline?

[Cancel](#)[Previous](#)[Create pipeline](#)

✓ Pipeline created

Congratulations! The pipeline Webinar-Pipeline has been created. Now that you have a pipeline, here are some different ways to start using it.

- Edit your pipeline to add more stages or actions, such as a test or production stages. [Learn more](#)
- Enable or disable transitions between stages to control what stages run automatically in a pipeline. [Learn more](#)
- Manually start a run through your pipeline. [Learn more](#)

Webinar-Pipeline

View progress and manage your pipeline.

[Edit](#)[Release change](#)

Source

Source

AWS CodeCommit

 In Progress just now

Build

Build

april26demo-Jenkins

No executions yet

Webinar-Pipeline



View progress and manage your pipeline.

[Edit](#)[Release change](#)

Source

Source

[AWS CodeCommit](#) ⓘ

✓ Succeeded 3 min ago f2d4a64

Build

Build

[april26demo-Jenkins](#) ⓘ

✓ Succeeded 2 min ago [Details](#)

Beta

[april26demo-DevEnv](#)

[AWS CodeDeploy](#) ⓘ

✓ Succeeded just now [Details](#)

A photograph of a SpaceX Falcon Heavy rocket launch at night. The rocket is ascending from the left, leaving a bright, curved trail of light against a dark blue sky. The launch is reflected in the water at the bottom of the frame. The text "Launching to Production" is overlaid in the center in a large, white, sans-serif font.

Launching to Production

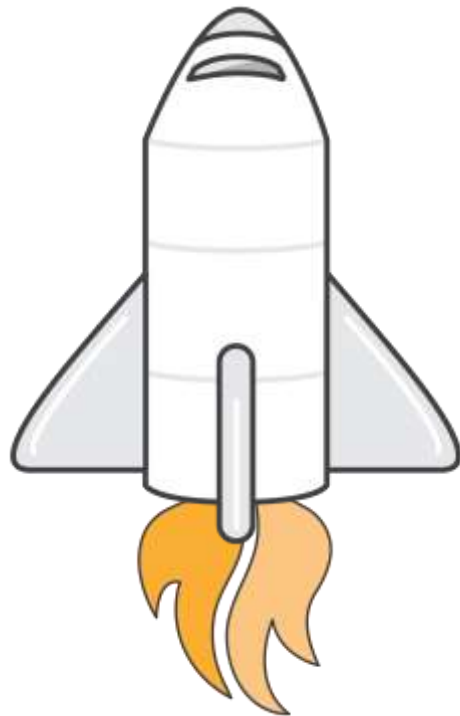
Launching to Production

After you've built and tested your code and hopefully gone through a few pre-production deploys, its time for the real thing!

You'll want think about:

- Impact to customers
- Impact to infrastructure
- Impact to business

How can we track these and communicate deploys?



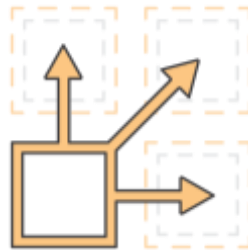
Extend AWS CodePipeline Using Custom Actions



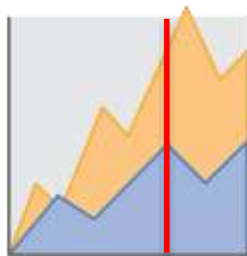
Mobile testing



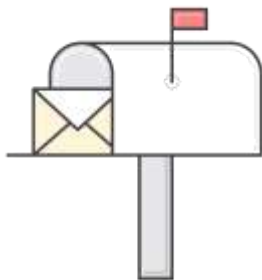
Update tickets



Provision resources



Update dashboards



Send notifications



Security scan

What Extension Method Should I Use?

Lambda	Custom Action
Short-running tasks are easy to build	Can perform any type of workload
Long-running tasks need more work	Control over links displayed in console
Node.js, Python, and Java support	Any language support
Runs on AWS	Can run on-premises
No servers to provision or manage	Requires compute resources

Webinar-Pipeline



View progress and manage your pipeline.

[Edit](#)[Release change](#)

Source

Source

[AWS CodeCommit](#) ⓘ

✓ Succeeded 3 min ago f2d4a64

Build

Build

[april26demo-Jenkins](#) ⓘ

✓ Succeeded 2 min ago [Details](#)

Beta

[april26demo-DevEnv](#)

[AWS CodeDeploy](#) ⓘ

✓ Succeeded just now [Details](#)

Edit: Webinar-Pipeline



Add or edit a stage in a pipeline or actions in a stage. [Learn more](#)

Save pipeline changes

Delete

Cancel

Source



Source
AWS CodeCommit



+ Stage

Build



Build
april26demo-Jenkins



+ Stage

Beta



april26demo-Dev...
AWS CodeDeploy



Source

Source
AWS CodeCommit

Stage

Build

Build
april26demo-Jenkins

Stage

Beta

april26demo-Dev...
AWS CodeDeploy

Stage

Production

Action

Stage

Add action

Choose a serial action from the action category list.

Action category*

Deploy

Configure where your application is deployed.

Deploy actions

Choose how you deploy to instances. Choose the provider, and then provide the configuration details for that provider.

Action name*

april26demo-ProdDeploy

Deployment provider*

AWS CodeDeploy

AWS CodeDeploy

Choose one of your existing applications, or [create a new one in AWS CodeDeploy](#).

Application name*

april26demo

Choose one of your existing deployment groups, or [create a new one in AWS CodeDeploy](#).

Deployment group*

april26demo-ProdEnv

april26demo-DevEnv

Input artifacts

Choose one or more input artifacts from the list of artifacts. Artifacts can be the input of this action. [Learn more](#)

* Required

Cancel

Add action

+ Stage

Beta



april26demo-Dev...

[AWS CodeDeploy](#)



+ Stage

Production



Action

april26demo-Pro...

[AWS CodeDeploy](#)



Action



Action

+ Stage

Source

Source

[AWS CodeCommit](#) ⓘ

✔ Succeeded 54 min ago

[f2d4a64](#)

Build

Build

[april26demo-Jenkins](#) ⓘ

✔ Succeeded 53 min ago [Details](#)

Beta

[april26demo-DevEnv](#)

[AWS CodeDeploy](#) ⓘ

✔ Succeeded 51 min ago [Details](#)

Production

[april26demo-ProdDeploy](#) ⓘ

[AWS CodeDeploy](#)

No executions yet

Webinar-Pipeline

View progress and manage your pipeline.

[Edit](#)
[Release change](#)

Source

Source

AWS CodeCommit

✓ Succeeded 3 min ago f2d4a64

Build

Build

april26demo-Jenkins

✓ Succeeded 2 min ago Details

Beta

april26demo-DevEnv

AWS CodeDeploy

✓ Succeeded just now Details

Release change

Releasing a change will detect the most recent change in each location configured in your source action(s), and run that change through the pipeline. Do you want to continue?

[Cancel](#)
[Release](#)

Source

Source

[AWS CodeCommit](#)



✔ Succeeded 5 min ago [f2d4a64](#)

Build

Build

[april26demo-Jenkins](#)



✔ Succeeded 4 min ago [Details](#)

Beta

[april26demo-DevEnv](#)

[AWS CodeDeploy](#)



✔ Succeeded 2 min ago [Details](#)

Production

[april26demo-ProdDeploy](#)

[AWS CodeDeploy](#)



✔ Succeeded just now [Details](#)

FIN, ACK

We've seen a quick run through today of the benefits of continuous delivery on our software release process:

- Continuous integration (build/test) helps shrink our feedback loop greatly
- We can get our software out in front of our users much more rapidly
- By moving faster we can actually ensure better quality
- CodePipeline allows for integration with almost any service or tool you can think of!
 - Plus visualization of what's going on!

Try it out today

Test out CodePipeline and spin up a full continuous delivery pipeline using the Starter Kit

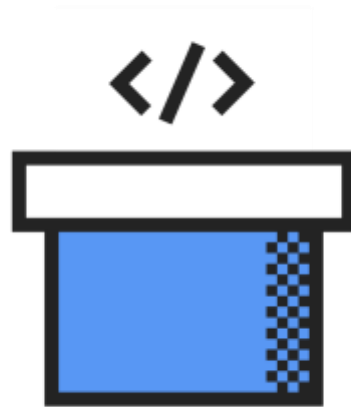
bit.ly/AWSCodeStarterKit

But wait, there's more!

Resources to learn more:

- Continuous integration: <https://aws.amazon.com/devops/continuous-integration/>
- Continuous delivery: <https://aws.amazon.com/devops/continuous-delivery/>
- CodePipeline
 - <https://aws.amazon.com/codepipeline/>
 - <https://aws.amazon.com/documentation/codepipeline/>
- CodeDeploy
 - <https://aws.amazon.com/codedeploy/>
 - <https://aws.amazon.com/documentation/codedeploy/>
 - <https://github.com/awslabs/aws-codedeploy-samples>
- Code Services Starter Kit: <http://bit.ly/AWSCodeStarterKit>

Thank you!



Happy Deploying!