aws CERTIFIED Developer Associate

aws CERTIFIED Solutions Architect Associate

aws CERTIFIED SysOps Administrator Associate

lab

lab title

Integrating CI/CD Build and Test Processes with AWS CodeBuild

V1.07

Course title

BackSpace Academy
AWS Certified Associate

BackSpace

▶ Table of Contents

Contents

About the Lab

Please note that not all AWS services are supported in all regions. Please use the US-East-1 (North Virginia) region for this lab.

These lab notes are to support the hands on instructional videos of the AWS Deployment Services section of the AWS Certified Associate Course.

Please note that AWS services change on a weekly basis and it is extremely important you check the version number on this document to ensure you have the lastest version with any updates or corrections.

Integrating CI/CD Build and Test Processes with CodeBuild

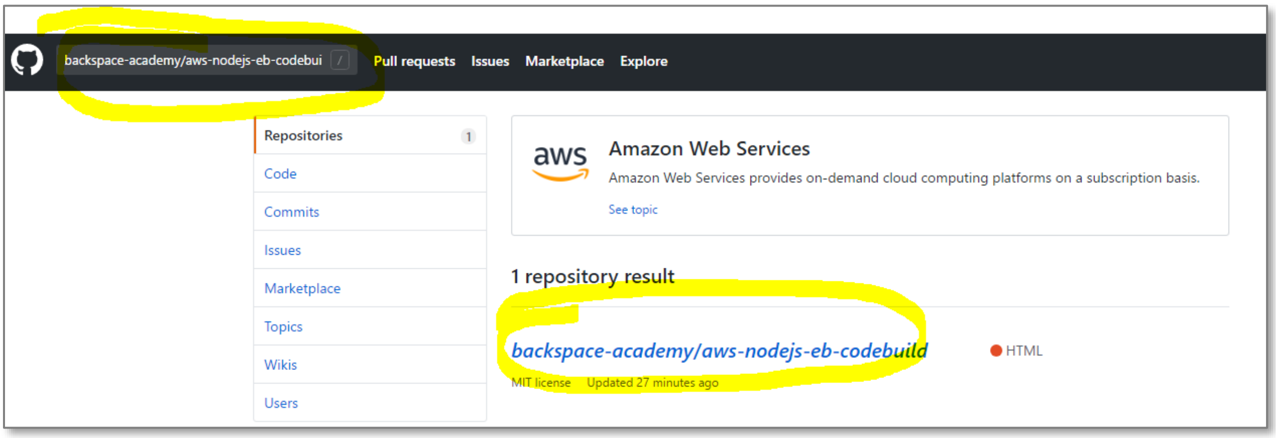
In this section, we will integrate the CodeBuild Service with CodePipeline to create build and test processes in our Continuous Integration and Continuous Delivery (CI/CD) pipeline.

Fork the GitHub Repository

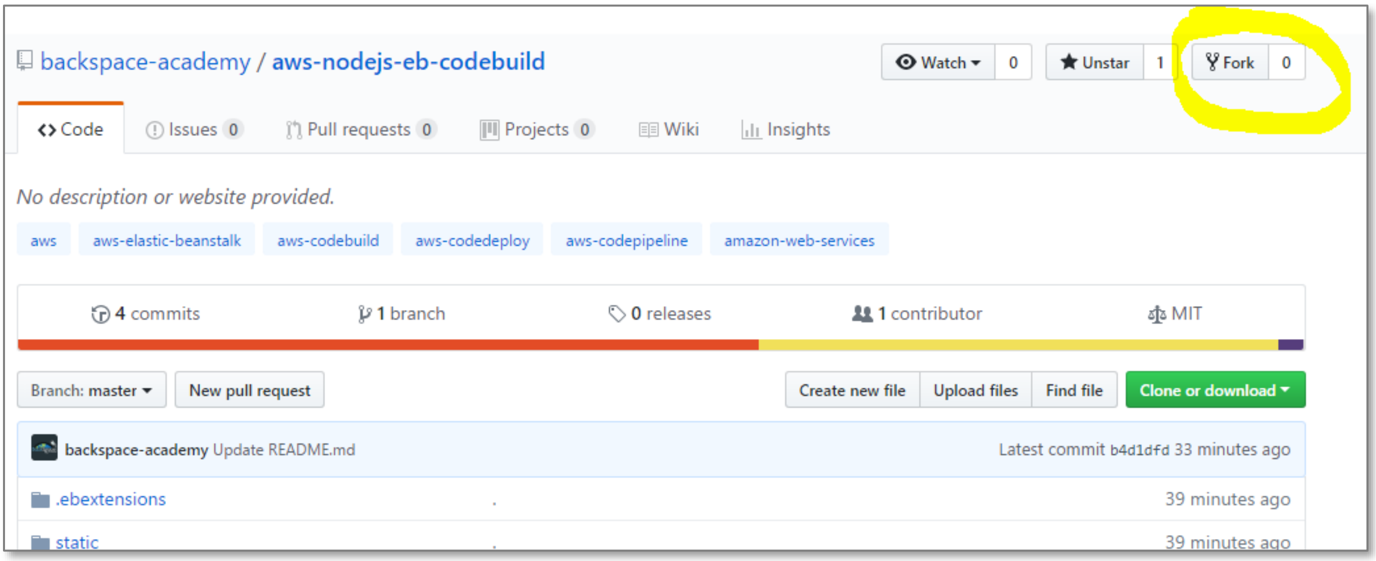
The code for this lab is located in a GitHub repository. We can save time and simply fork a copy of this to your GitHub account.

Sign in to your GitHub account.

Go to: https://github.com/backspace-academy/aws-nodejs-eb-codebuild



Click on “Star” then “Fork” to fork the repository.



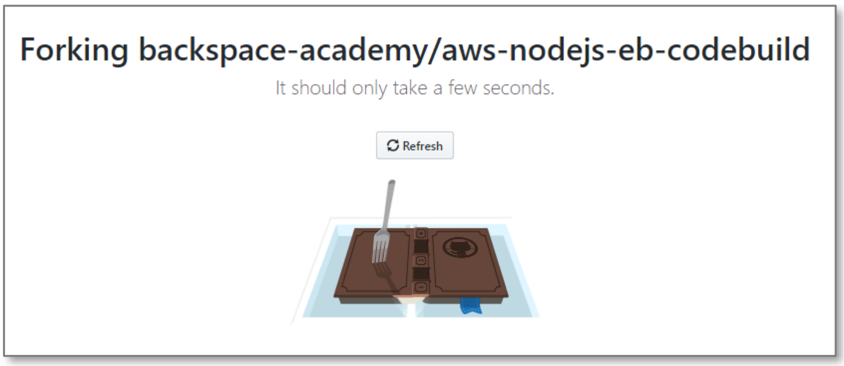
backspace-academy / aws-nodejs-eb-codebuild

No description or website provided.

backspace-academy Update README.md — Latest commit b4d1dfd 33 minutes ago

.ebextensions . 39 minutes ago

static . 39 minutes ago

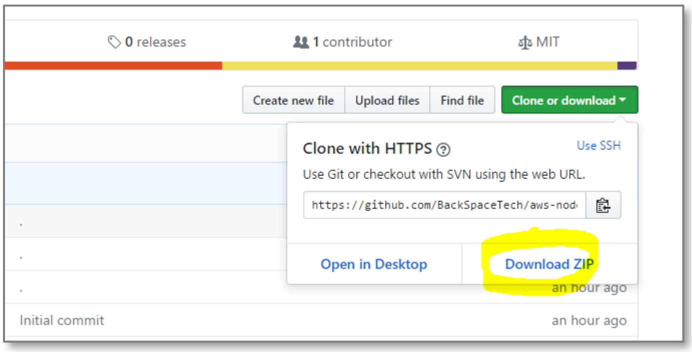


Forking backspace-academy/aws-nodejs-eb-codebuild

It should only take a few seconds.

You will now have a forked repository in your account that can be used to deploy the sample code.

Download the ZIP file of the code



Clone with HTTPS

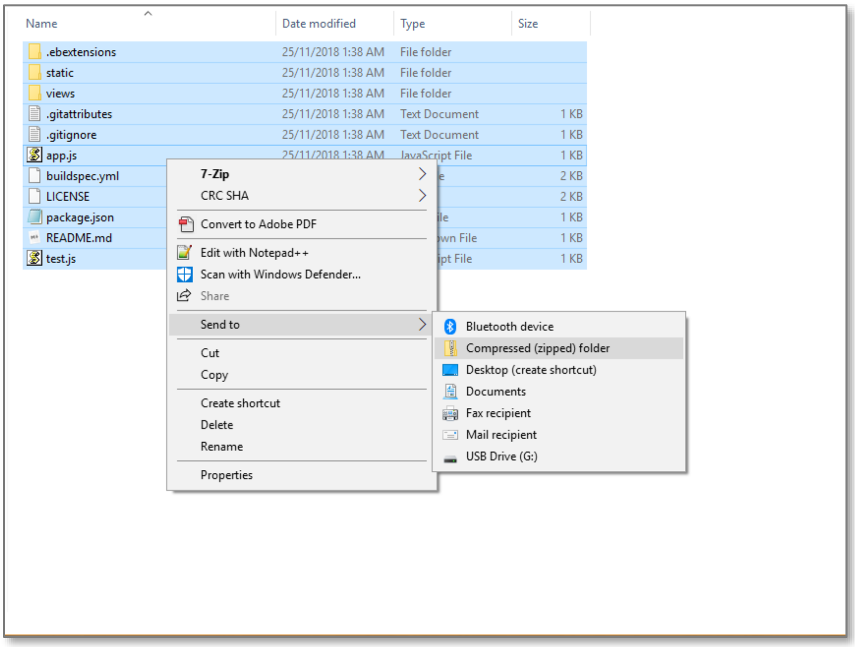
Use Git or checkout with SVN using the web URL.

https://github.com/BackSpaceTech/aws-nod

an hour ago

Initial commit an hour ago

The Zip can’t be used by Elastic Beanstalk as is because it is because the files are hidden inside a directory. Extract the zip file, open the folder and re-zip.



Name	Date modified	Type	Size
.ebextensions	25/11/2018 1:38 AM	File folder	
static	25/11/2018 1:38 AM	File folder	
views	25/11/2018 1:38 AM	File folder	
.gitattributes	25/11/2018 1:38 AM	Text Document	1 KB
.gitignore	25/11/2018 1:38 AM	Text Document	1 KB
app.js	25/11/2018 1:38 AM	JavaScript File	1 KB
buildspec.yml		e	2 KB
LICENSE			2 KB
package.json		le	1 KB
README.md		wn File	1 KB
test.js		ipt File	1 KB

AWS CodeBuild Files

The repository contains a modified copy of the AWS NodeJS sample application.

Additional files for AWS CodeBuild include:

test.js – code to test the application before deployment

package.json – modified to include an “npm async” package dependency (so that we have something to build!)

buildspec.yaml (see: Build Specification Reference for AWS CodeBuild)

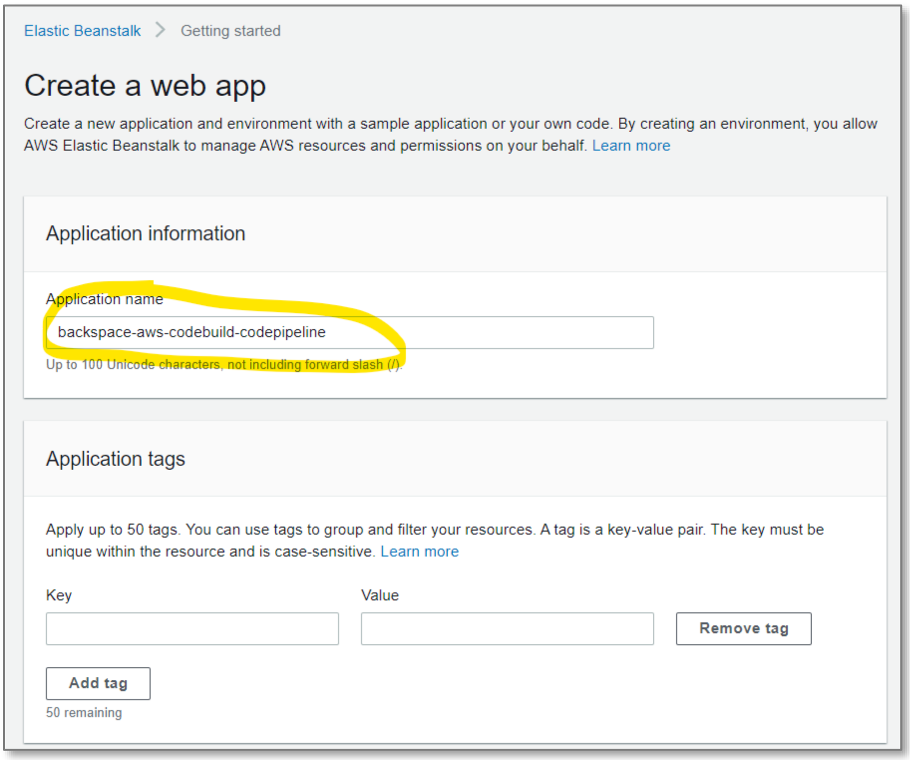
- Details NodeJS runtime environment
- Details build and test commands for CodeBuild
- Install package.json dependencies
- Install Mocha and UnitJS
- Test with Mocha
- Artifacts required for Elastic Beanstalk.

Deploy an Elastic Beanstalk Application

Go to the Elastic Beanstalk console

Click *Create application*

Name it *backspace-aws-codebuild-codepipeline*



Create a web app

Create a new application and environment with a sample application or your own code. By creating an environment, you allow AWS Elastic Beanstalk to manage AWS resources and permissions on your behalf. Learn more

Application information

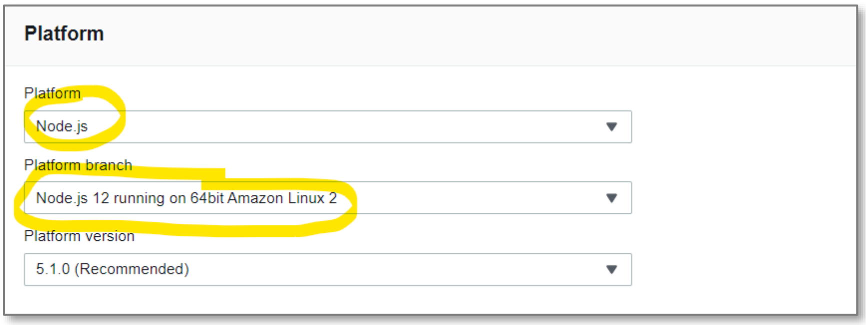
Application name: backspace-aws-codebuild-codepipeline

Up to 100 Unicode characters, not including forward slash (/).

Application tags

Apply up to 50 tags. You can use tags to group and filter your resources. A tag is a key-value pair. The key must be unique within the resource and is case-sensitive. Learn more

Select *NodeJS* and *Amazon Linux 2*



Platform

Platform: Node.js

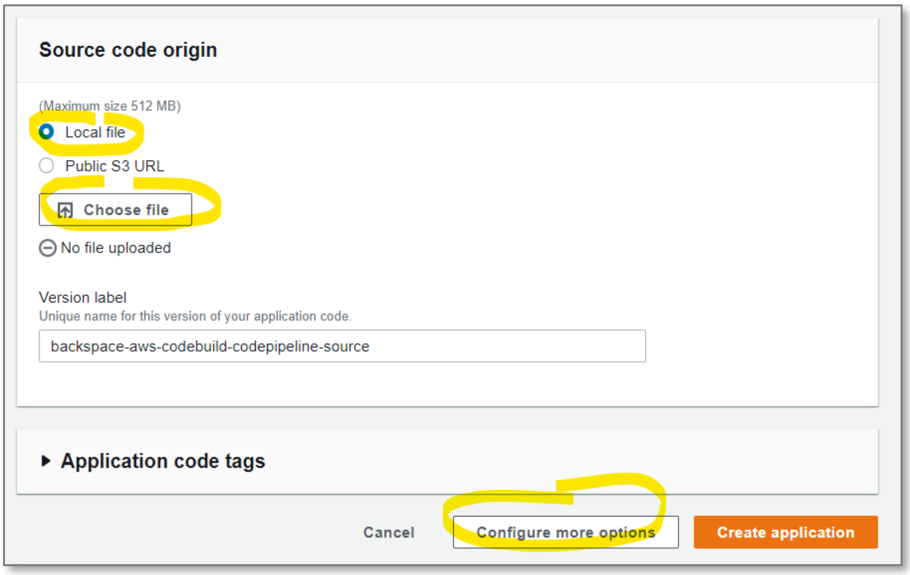
Platform branch: Node.js 12 running on 64bit Amazon Linux 2

Platform version: 5.1.0 (Recommended)

Click *Choose file*

Upload the zip file you created

Click *Configure more options*



Source code origin

(Maximum size 512 MB)

● Local file

○ Public S3 URL

Choose file

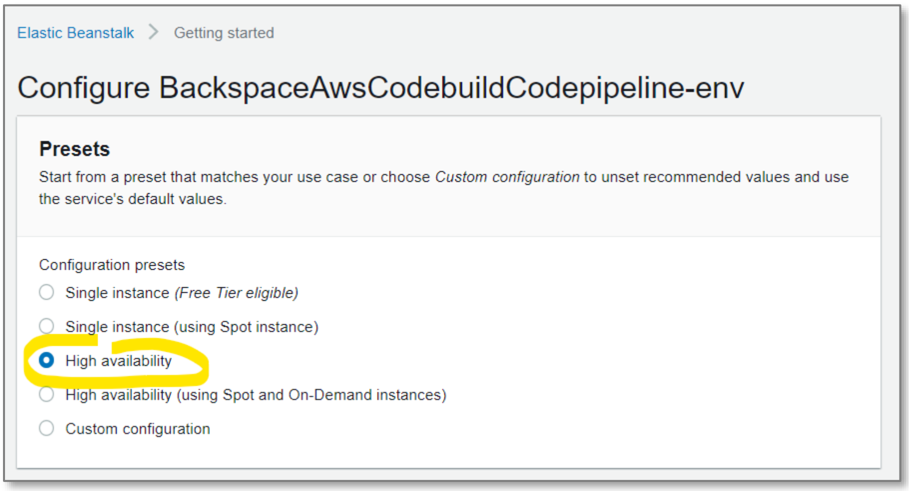
No file uploaded

Version label

Unique name for this version of your application code.

backspace-aws-codebuild-codepipeline-source

Select *High availability*



Configure BackspaceAwsCodebuildCodepipeline-env

Presets

Start from a preset that matches your use case or choose *Custom configuration* to unset recommended values and use the service's default values.

Configuration presets

○ Single instance *(Free Tier eligible)*

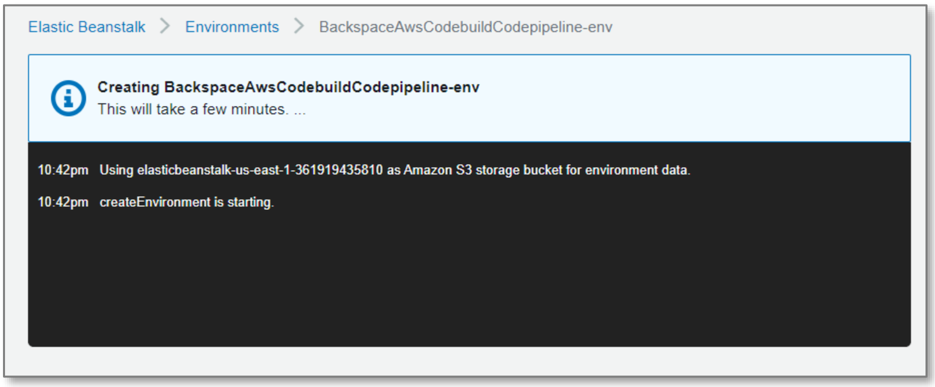
○ Single instance (using Spot instance)

● High availability

○ High availability (using Spot and On-Demand instances)

○ Custom configuration

Click *Create app*



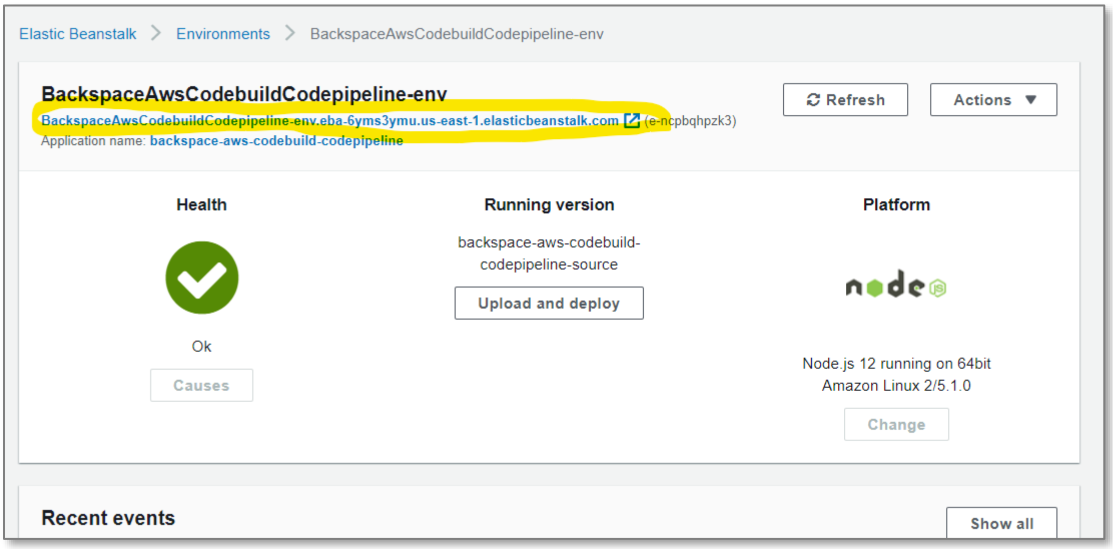
Elastic Beanstalk > Environments > BackspaceAwsCodebuildCodepipeline-env

Creating BackspaceAwsCodebuildCodepipeline-env

This will take a few minutes. ...

```
10:42pm  Using elasticbeanstalk-us-east-1-361919435810 as Amazon S3 storage bucket for environment data.
10:42pm  createEnvironment is starting.
```

After some time, the environment will be created. Click on the app URL to see the running app

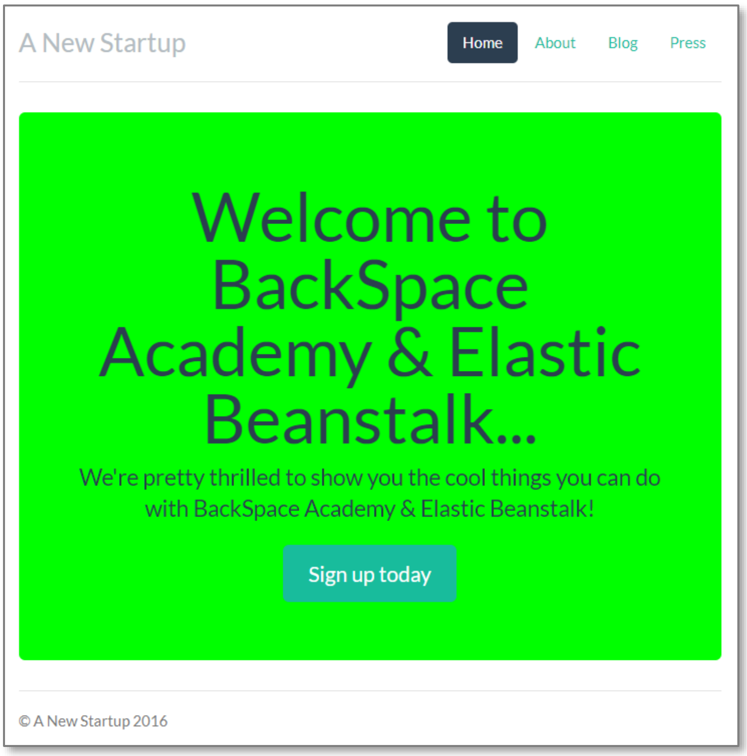


Elastic Beanstalk > Environments > BackspaceAwsCodebuildCodepipeline-env

BackspaceAwsCodebuildCodepipeline-env

BackspaceAwsCodebuildCodepipeline-env.eba-6yms3ymu.us-east-1.elasticbeanstalk.com (e-ncpbqhpzk3)

Application name: backspace-aws-codebuild-codepipeline



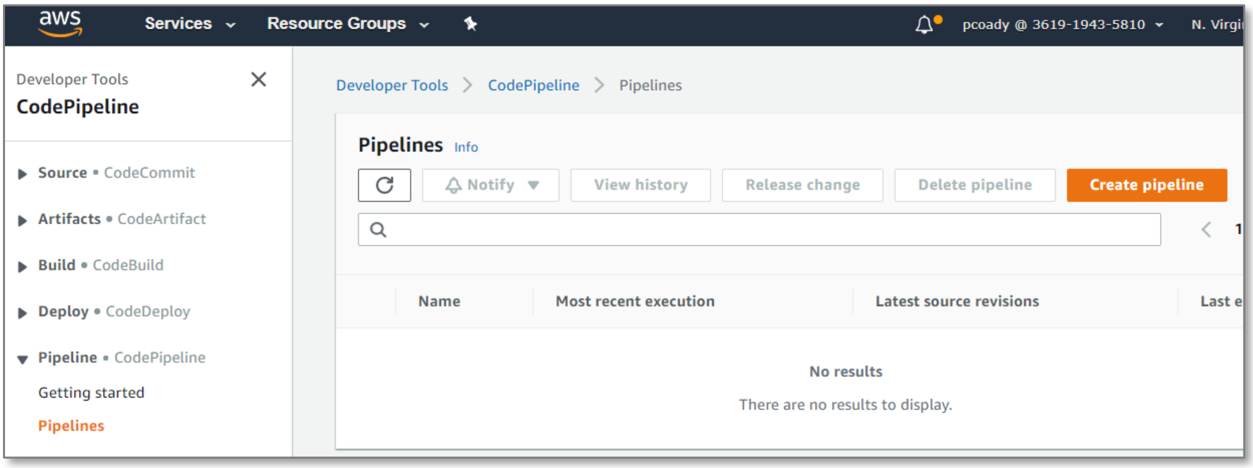
Welcome to BackSpace Academy & Elastic Beanstalk...

We're pretty thrilled to show you the cool things you can do with BackSpace Academy & Elastic Beanstalk!

© A New Startup 2016

Create the CI/CD Pipeline

Go to the CodePipeline console

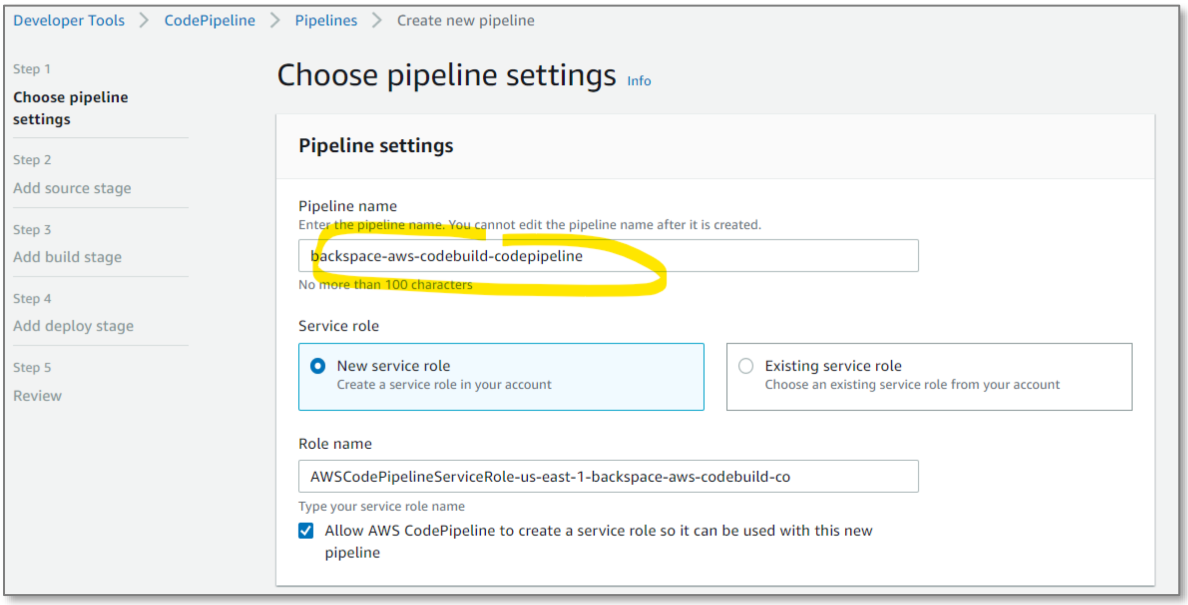


No results

There are no results to display.

Click *Create pipeleline*

Name it *backspace-aws-codebuild-codepipeline*



Choose pipeline settings

Pipeline settings

Pipeline name

Enter the pipeline name. You cannot edit the pipeline name after it is created.

backspace-aws-codebuild-codepipeline

No more than 100 characters

Service role

● New service role
Create a service role in your account

○ Existing service role
Choose an existing service role from your account

Role name

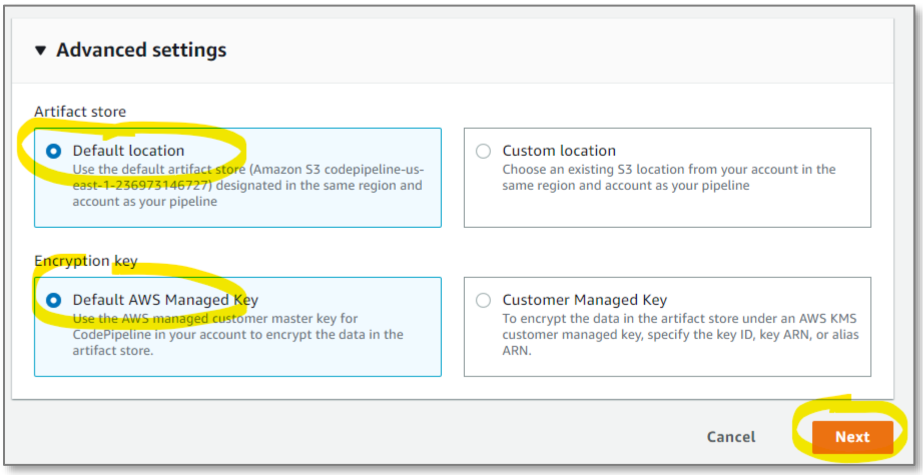
AWSCodePipelineServiceRole-us-east-1-backspace-aws-codebuild-co

Type your service role name

☑ Allow AWS CodePipeline to create a service role so it can be used with this new pipeline

Select default *Artifact store* and *Encryption key*

Click *Next*



▼ **Advanced settings**

Artifact store

● Default location
Use the default artifact store (Amazon S3 codepipeline-us-east-1-236973146727) designated in the same region and account as your pipeline

○ Custom location
Choose an existing S3 location from your account in the same region and account as your pipeline

Encryption key

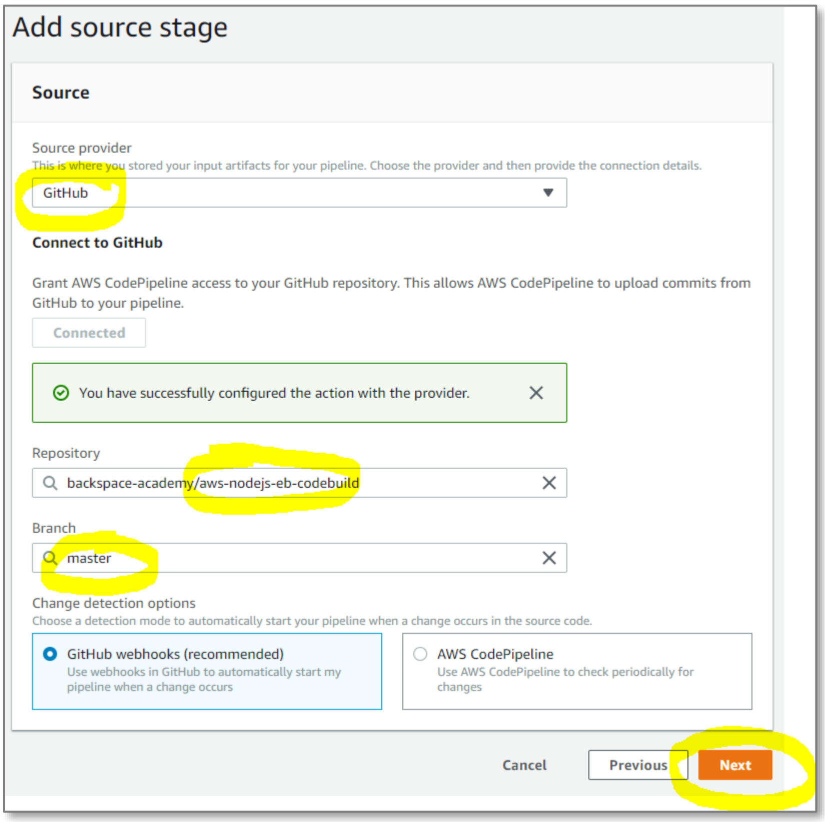
● Default AWS Managed Key
Use the AWS managed customer master key for CodePipeline in your account to encrypt the data in the artifact store.

○ Customer Managed Key
To encrypt the data in the artifact store under an AWS KMS customer managed key, specify the key ID, key ARN, or alias ARN.

Select GitHub as Source provider.

Connect to GitHub and select the forked repository and master branch.

Click *Next*



Add source stage

Source

Source provider
This is where you stored your input artifacts for your pipeline. Choose the provider and then provide the connection details.
GitHub

Connect to GitHub

Grant AWS CodePipeline access to your GitHub repository. This allows AWS CodePipeline to upload commits from GitHub to your pipeline.

Connected

You have successfully configured the action with the provider.

Repository
backspace-academy/aws-nodejs-eb-codebuild

Branch
master

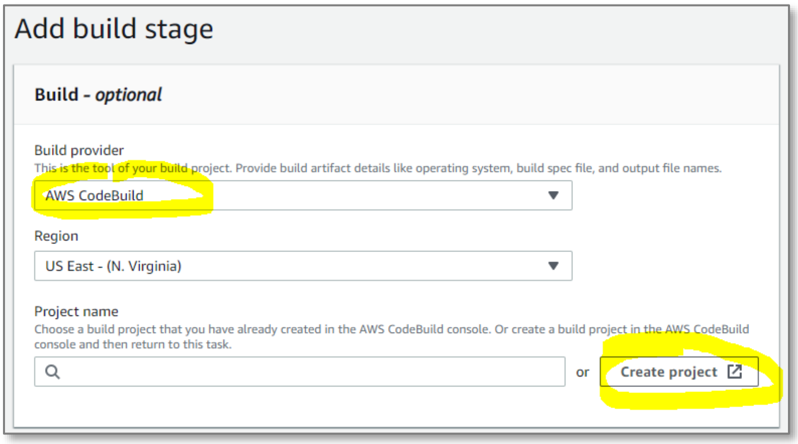
Change detection options
Choose a detection mode to automatically start your pipeline when a change occurs in the source code.

● GitHub webhooks (recommended)
Use webhooks in GitHub to automatically start my pipeline when a change occurs

○ AWS CodePipeline
Use AWS CodePipeline to check periodically for changes

Select “AWS CodeBuild” as the Build provider.

Click *Create project*



Add build stage

Build - *optional*

Build provider

This is the tool of your build project. Provide build artifact details like operating system, build spec file, and output file names.

AWS CodeBuild

Region

US East - (N. Virginia)

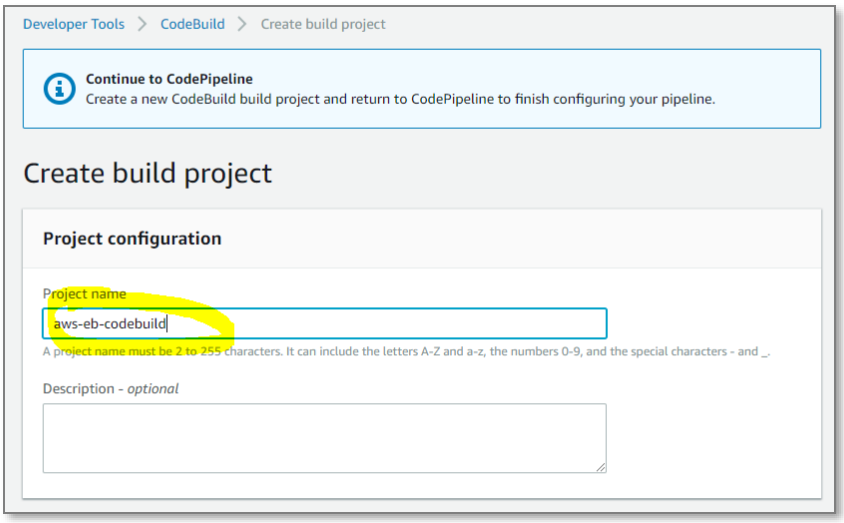
Project name

Choose a build project that you have already created in the AWS CodeBuild console. Or create a build project in the AWS CodeBuild console and then return to this task.

or Create project

A new window will open with the CodeBuild console

Give the project a name



Continue to CodePipeline

Create a new CodeBuild build project and return to CodePipeline to finish configuring your pipeline.

Create build project

Project configuration

Project name

aws-eb-codebuild

A project name must be 2 to 255 characters. It can include the letters A-Z and a-z, the numbers 0-9, and the special characters - and _.

Description - *optional*

Select *Managed image*

Select *Amazon Linux 2* for Operating system

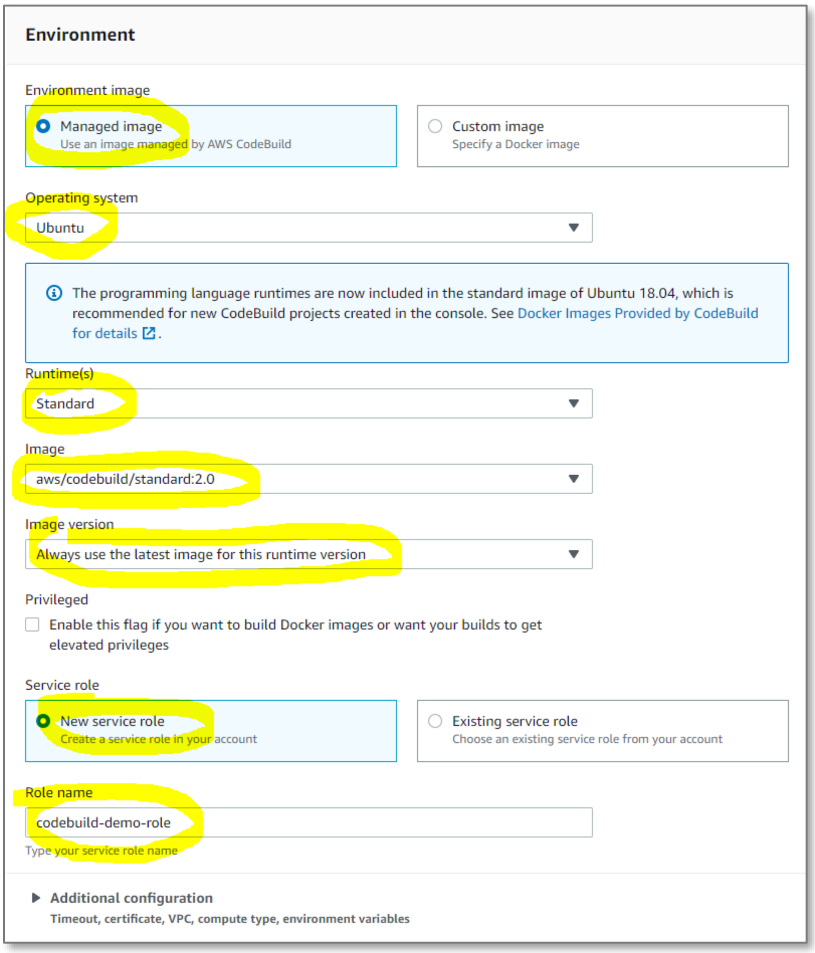
Select *Standard* for Runtime

Select *standard:3.0* for Image

Select *Always use the latest image for this runtime version* for Image Version

Select *New service role*

Give the role a name



Environment

Environment image

● Managed image
Use an image managed by AWS CodeBuild

○ Custom image
Specify a Docker image

Operating system

Ubuntu

The programming language runtimes are now included in the standard image of Ubuntu 18.04, which is recommended for new CodeBuild projects created in the console. See Docker Images Provided by CodeBuild for details.

Runtime(s)

Standard

Image

aws/codebuild/standard:2.0

Image version

Always use the latest image for this runtime version

Privileged

□ Enable this flag if you want to build Docker images or want your builds to get elevated privileges

Service role

● New service role
Create a service role in your account

○ Existing service role
Choose an existing service role from your account

Role name

codebuild-demo-role

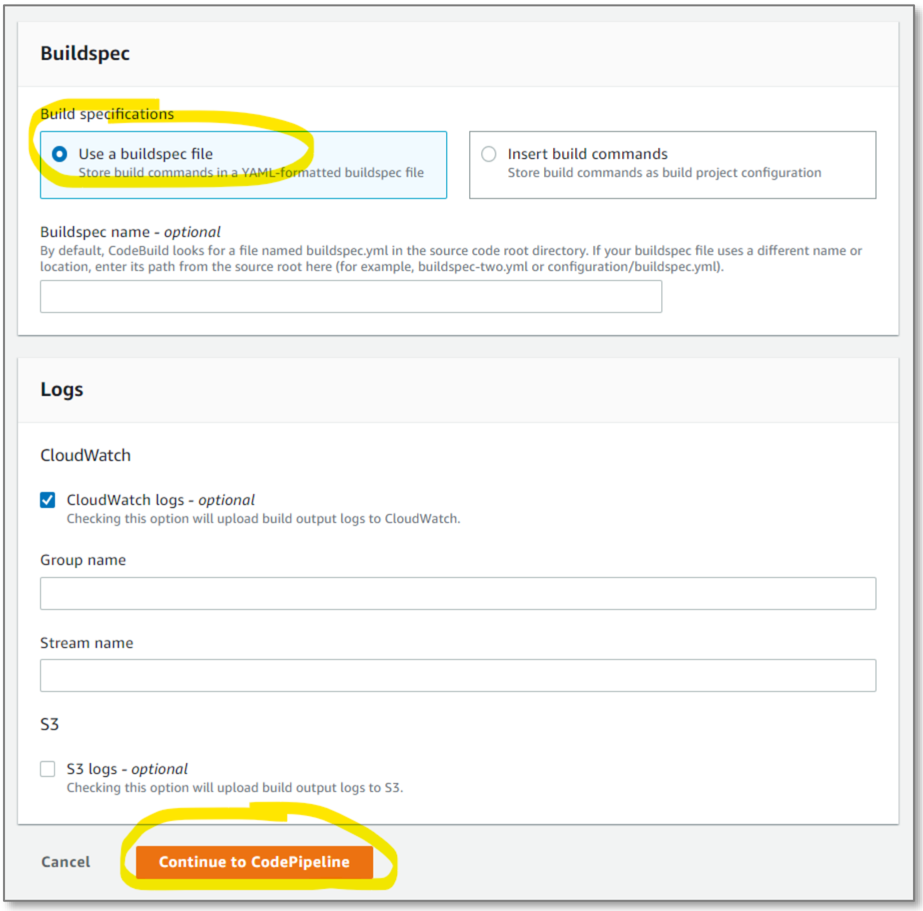
Type your service role name

▶ Additional configuration
Timeout, certificate, VPC, compute type, environment variables

Select *Use a buildspec file*

Click *Continue to CodePipeline*

DO NOT CLOSE THE WINDOW, IT WILL CLOSE WHEN COMPLETED



Buildspec

Build specifications

● Use a buildspec file
Store build commands in a YAML-formatted buildspec file

○ Insert build commands
Store build commands as build project configuration

Buildspec name - *optional*
By default, CodeBuild looks for a file named buildspec.yml in the source code root directory. If your buildspec file uses a different name or location, enter its path from the source root here (for example, buildspec-two.yml or configuration/buildspec.yml).

Logs

CloudWatch

☑ CloudWatch logs - *optional*
Checking this option will upload build output logs to CloudWatch.

Group name

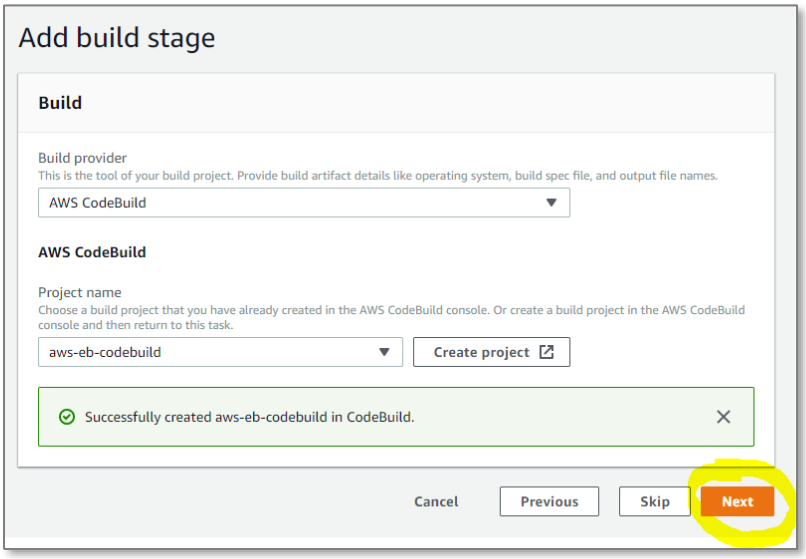
Stream name

S3

□ S3 logs - *optional*
Checking this option will upload build output logs to S3.

The window will eventually close and return to the CodePipeline console

Click *Next*



Add build stage

Build

Build provider
This is the tool of your build project. Provide build artifact details like operating system, build spec file, and output file names.
AWS CodeBuild

AWS CodeBuild

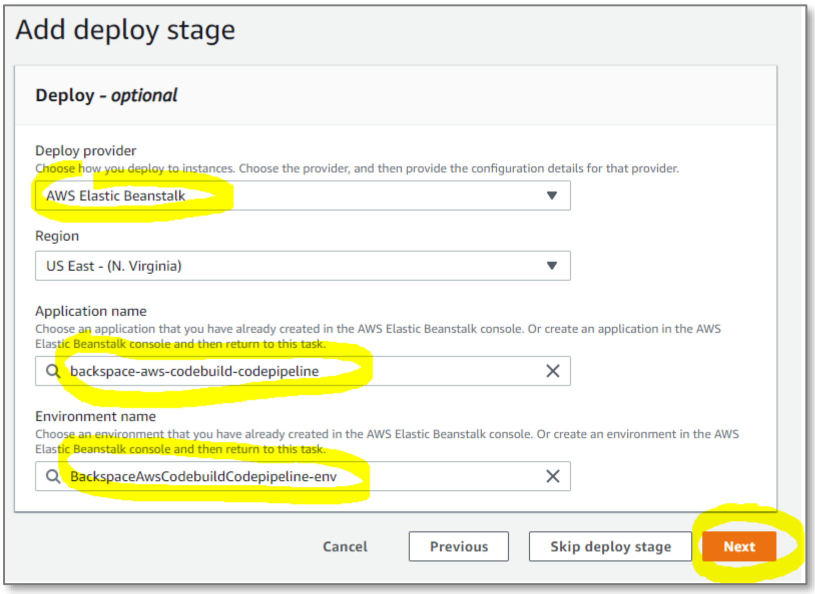
Project name
Choose a build project that you have already created in the AWS CodeBuild console. Or create a build project in the AWS CodeBuild console and then return to this task.
aws-eb-codebuild

Successfully created aws-eb-codebuild in CodeBuild.

Select *AWS Elastic Beanstalk* as Deploy provider.

Select the application and environment created by Elastic Beanstalk.

Click "Next step"



Add deploy stage

Deploy - *optional*

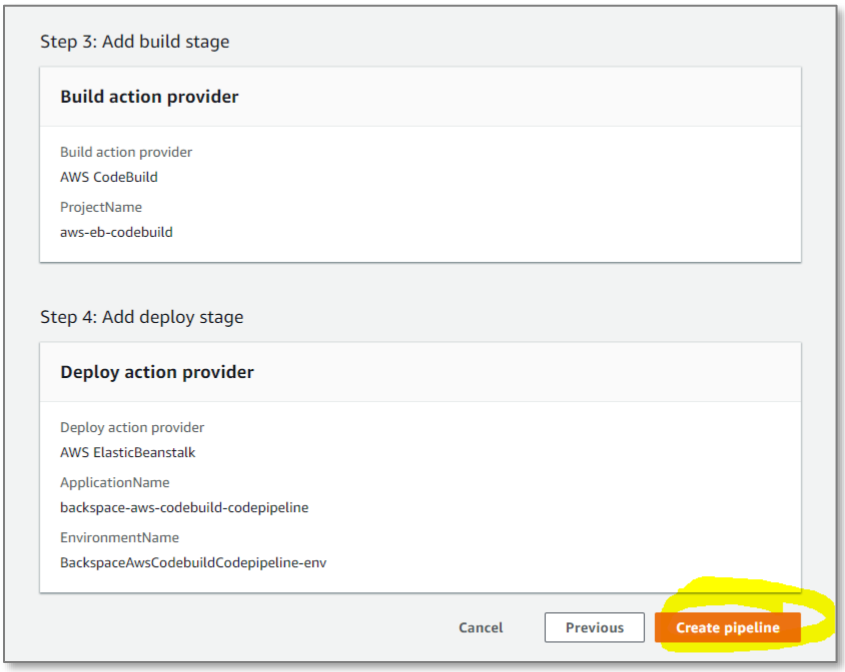
Deploy provider
Choose how you deploy to instances. Choose the provider, and then provide the configuration details for that provider.
AWS Elastic Beanstalk

Region
US East - (N. Virginia)

Application name
Choose an application that you have already created in the AWS Elastic Beanstalk console. Or create an application in the AWS Elastic Beanstalk console and then return to this task.
backspace-aws-codebuild-codepipeline

Environment name
Choose an environment that you have already created in the AWS Elastic Beanstalk console. Or create an environment in the AWS Elastic Beanstalk console and then return to this task.
BackspaceAwsCodebuildCodepipeline-env

Check the review page and click *Create pipeline*



Step 3: Add build stage

Build action provider

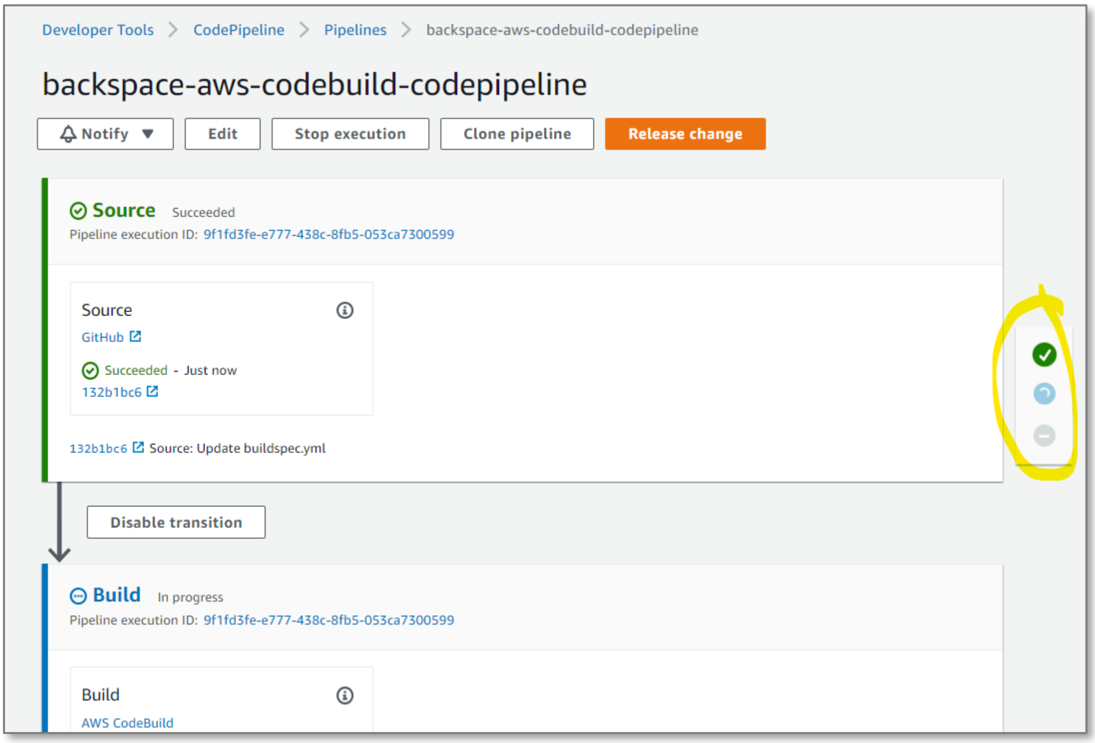
Build action provider
AWS CodeBuild
ProjectName
aws-eb-codebuild

Step 4: Add deploy stage

Deploy action provider

Deploy action provider
AWS ElasticBeanstalk
ApplicationName
backspace-aws-codebuild-codepipeline
EnvironmentName
BackspaceAwsCodebuildCodepipeline-env

The build process will start



Developer Tools > CodePipeline > Pipelines > backspace-aws-codebuild-codepipeline

backspace-aws-codebuild-codepipeline

Notify ▼ | Edit | Stop execution | Clone pipeline | Release change

✓ Source Succeeded
Pipeline execution ID: 9f1fd3fe-e777-438c-8fb5-053ca7300599

Source
GitHub
✓ Succeeded - Just now
132b1bc6

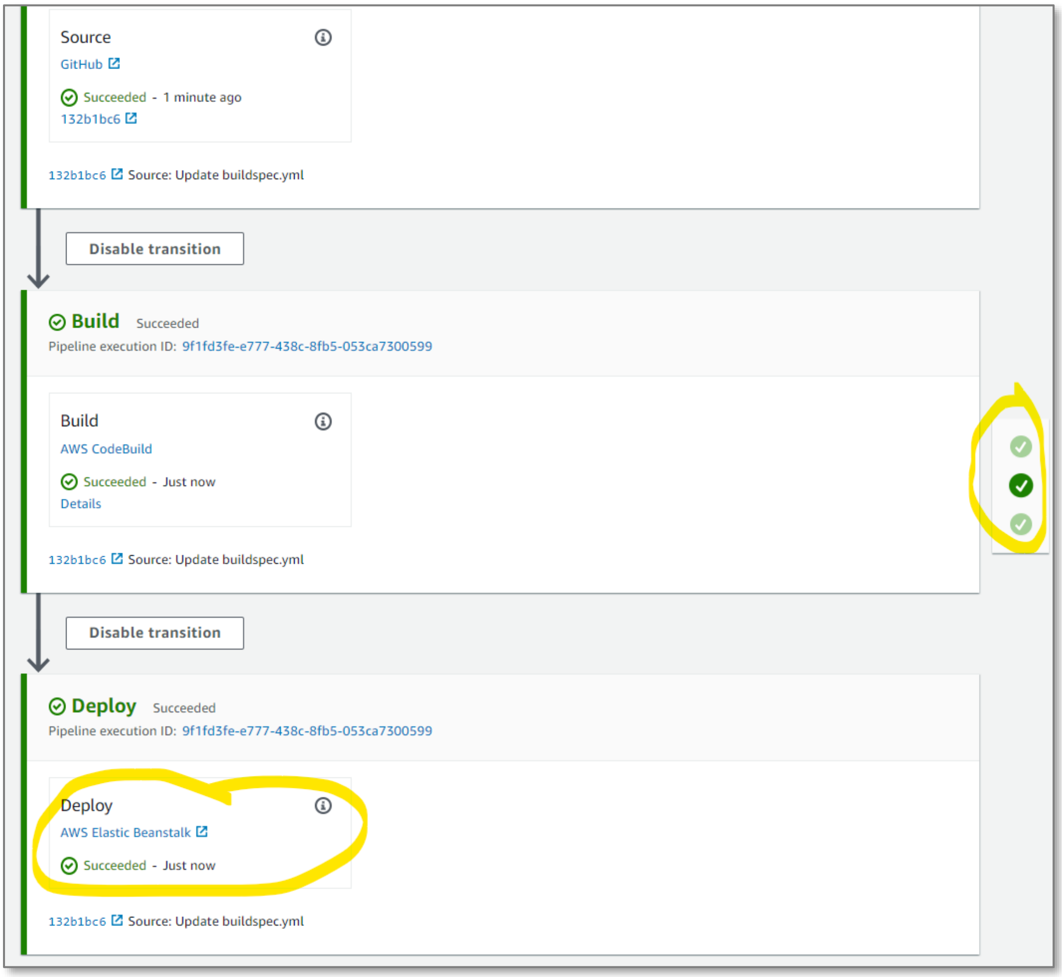
132b1bc6 Source: Update buildspec.yml

Disable transition

Build In progress
Pipeline execution ID: 9f1fd3fe-e777-438c-8fb5-053ca7300599

Build
AWS CodeBuild

After some time, the deploy process will be completed.



Source
GitHub
✓ Succeeded - 1 minute ago
132b1bc6

132b1bc6 Source: Update buildspec.yml

Disable transition

✓ Build Succeeded
Pipeline execution ID: 9f1fd3fe-e777-438c-8fb5-053ca7300599

Build
AWS CodeBuild
✓ Succeeded - Just now
Details

132b1bc6 Source: Update buildspec.yml

Disable transition

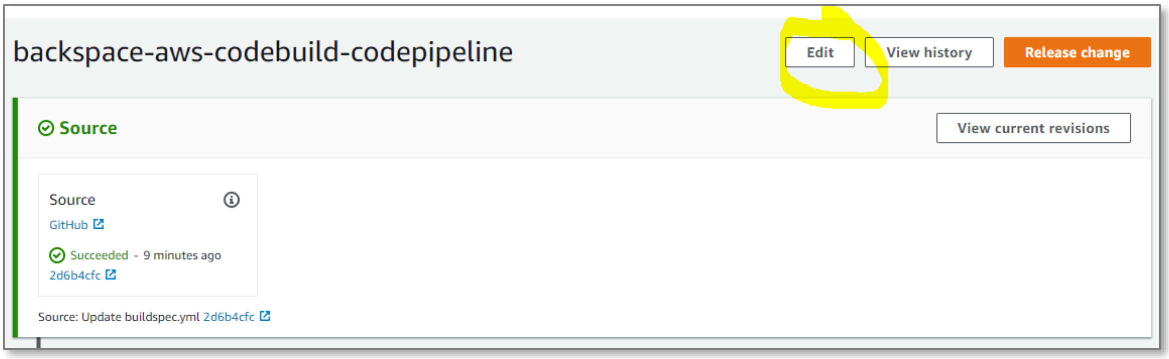
✓ Deploy Succeeded
Pipeline execution ID: 9f1fd3fe-e777-438c-8fb5-053ca7300599

Deploy
AWS Elastic Beanstalk
✓ Succeeded - Just now

132b1bc6 Source: Update buildspec.yml

Clean Up

Go back to the Code Pipeline console and click *Edit*

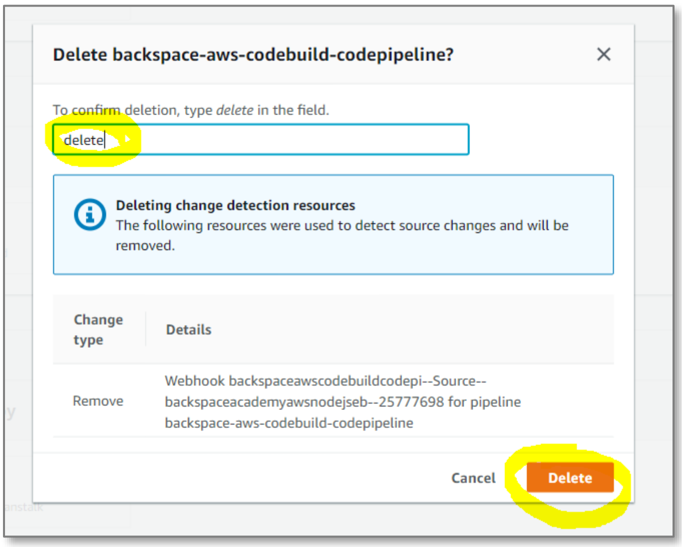


backspace-aws-codebuild-codepipeline

Source
GitHub
Succeeded - 9 minutes ago
2d6b4cfc

Source: Update buildspec.yml 2d6b4cfc

Click *Delete*



Delete backspace-aws-codebuild-codepipeline?

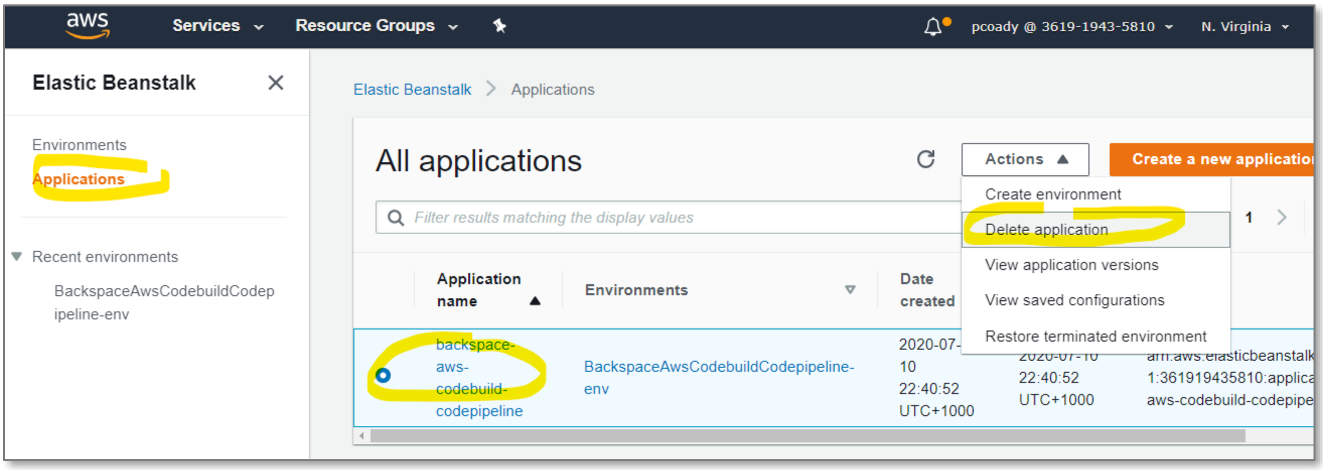
To confirm deletion, type *delete* in the field.

delete

Deleting change detection resources
The following resources were used to detect source changes and will be removed.

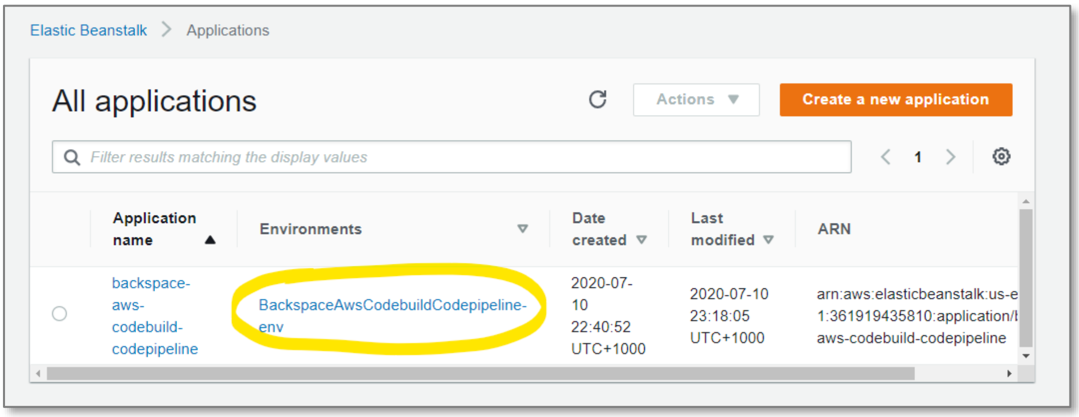
Change type	Details
Remove	Webhook backspaceawscodebuildcodepi--Source--backspaceacademyawsnodejseb--25777698 for pipeline backspace-aws-codebuild-codepipeline

Go back to the Elastic Beanstalk console and delete the application.

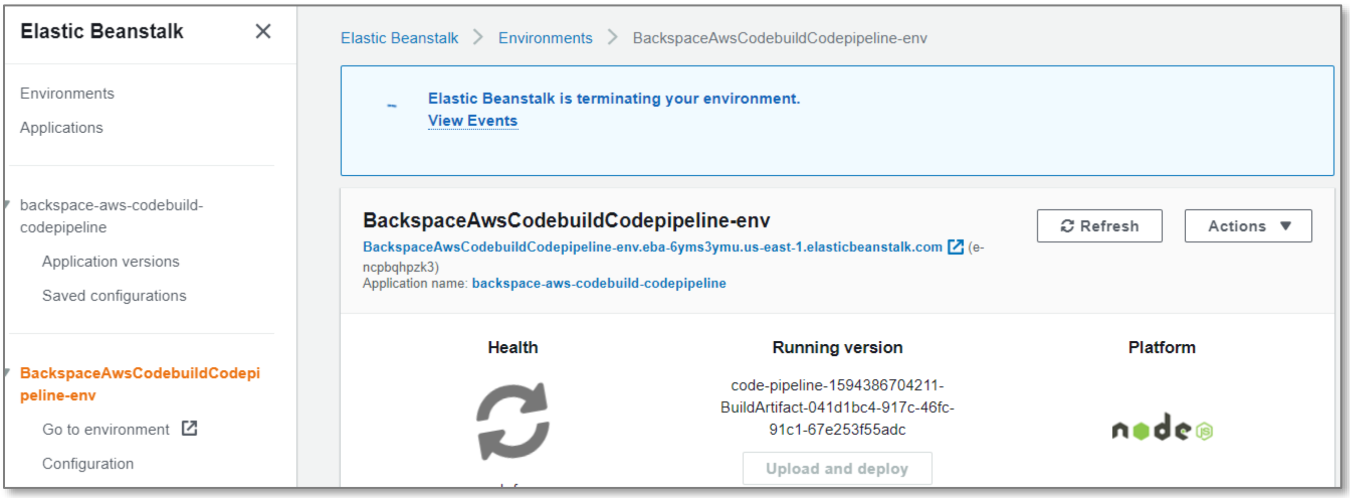


	Application name	Environments	Date created		
●	backspace-aws-codebuild-codepipeline	BackspaceAwsCodebuildCodepipeline-env	2020-07-10 22:40:52 UTC+1000	2020-07-10 22:40:52 UTC+1000	arn:aws:elasticbeanstalk 1:361919435810:applica aws-codebuild-codepipe

Click on the environment to confirm delete is in progress


Elastic Beanstalk > Applications
All applications
Actions
Create a new application
Filter results matching the display values
1

	Application name	Environments	Date created	Last modified	ARN
○	backspace-aws-codebuild-codepipeline	BackspaceAwsCodebuildCodepipeline-env	2020-07-10 22:40:52 UTC+1000	2020-07-10 23:18:05 UTC+1000	arn:aws:elasticbeanstalk:us-e 1:361919435810:application/l aws-codebuild-codepipeline

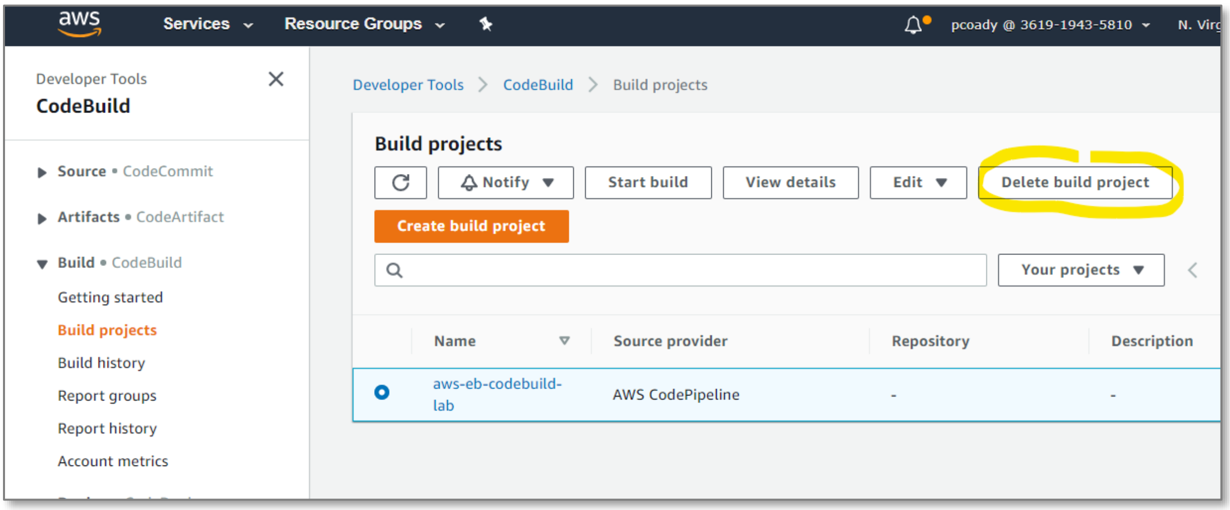


Elastic Beanstalk is terminating your environment.
View Events

BackspaceAwsCodebuildCodepipeline-env
BackspaceAwsCodebuildCodepipeline-env.eba-6yms3ymu.us-east-1.elasticbeanstalk.com (e-ncpbqhpzk3)
Application name: backspace-aws-codebuild-codepipeline

Running version: code-pipeline-1594386704211-BuildArtifact-041d1bc4-917c-46fc-91c1-67e253f55adc

Go Back to AWS CodeBuild and delete the project



Name	Source provider	Repository	Description
aws-eb-codebuild-lab	AWS CodePipeline	-	-