

Day 51: Your CI/CD pipeline on AWS - Part 2

On your journey of making a CI/CD pipeline on AWS with these tools, you completed AWS CodeCommit.

Next few days you'll learn these tools/services:

- CodeBuild
- CodeDeploy
- CodePipeline
- S3

What is CodeBuild ?

AWS CodeBuild is a fully managed build service in the cloud. CodeBuild compiles your source code, runs unit tests, and produces artifacts that are ready to deploy. CodeBuild eliminates the need to provision, manage, and scale your own build servers. It provides prepackaged build environments for popular programming languages and build tools such as Apache Maven, Gradle, and more. You can also customize build environments in CodeBuild to use your own build tools. CodeBuild scales automatically to meet peak build requests.

Task-01:

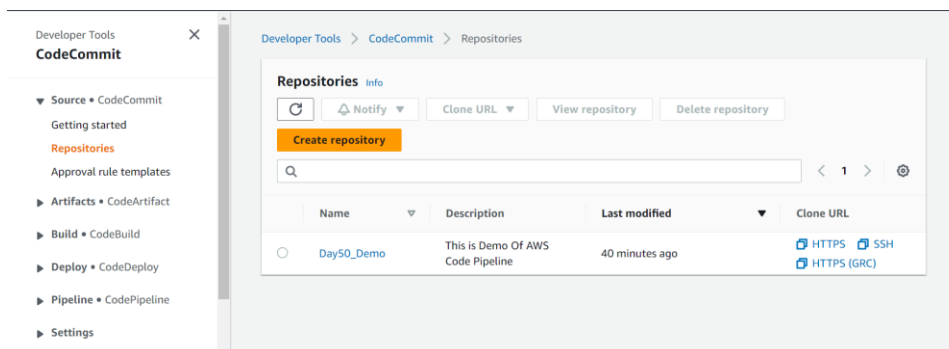
- Read about Buildspec file for Codebuild.

A buildspec is a collection of build commands and related settings, in YAML format, that CodeBuild uses to run a build. You can include a buildspec as part of the source code or you can define a buildspec when you create a build project.

By default, the buildspec file must be named buildspec.yml and placed in the root of your source directory but you can override the default buildspec file name and location.

- create a simple index.html file in CodeCommit Repository

Create a Repository in CodeCommit, same as Day50.



Create IAM USER and Generate Git Credentials, if you are not created already.

Note: - Suppose you again start creating the IAM USER and Git Credentials, then you will be facing this type of error

```
C:\Users\Rushikesh\Desktop\DevOps\Day50>git clone https://git-codecommit.us-east-1.amazonaws.com/v1/repos/Day50_Demo
Cloning into 'Day50_Demo'...
fatal: unable to access 'https://git-codecommit.us-east-1.amazonaws.com/v1/repos/Day50_Demo/': The requested URL returned error: 403
```

Solution: need to change the Git Credentials. Follow the site below as a Reference.

[Solve This Issue](#)

Clone the Repository and create an index.html file

```
Rushikesh@DESKTOP-OJSE6R3 MINGW64 ~/Desktop/DevOps/Day50/Day50_Demo (master)
$ touch index.html

Rushikesh@DESKTOP-OJSE6R3 MINGW64 ~/Desktop/DevOps/Day50/Day50_Demo (master)
$ vi index.html

Rushikesh@DESKTOP-OJSE6R3 MINGW64 ~/Desktop/DevOps/Day50/Day50_Demo (master)
$ cat index.html
<!DOCTYPE html>
<html>
  <head>
    <title>Basic Web Page</title>
  </head>
  <body>
Hello Rushikesh!
  </body>
</html>
```

Push this Index.html file to the CodeCommit Repository using **git push** command.

```
Rushikesh@DESKTOP-OJSE6R3 MINGW64 ~/Desktop/DevOps/Day50/Day50_Demo (master)
$ git status
On branch master

No commits yet

Changes to be committed:
  (use "git rm --cached <file>..." to unstage)
    new file:   index.html

Changes not staged for commit:
  (use "git add <file>..." to update what will be committed)
  (use "git restore <file>..." to discard changes in working directory)
    modified:   index.html

Rushikesh@DESKTOP-OJSE6R3 MINGW64 ~/Desktop/DevOps/Day50/Day50_Demo (master)
$ git add index.html
warning: in the working copy of 'index.html', LF will be replaced by CRLF the next time Git touches it

Rushikesh@DESKTOP-OJSE6R3 MINGW64 ~/Desktop/DevOps/Day50/Day50_Demo (master)
$ git status
On branch master

No commits yet

Changes to be committed:
  (use "git rm --cached <file>..." to unstage)
    new file:   index.html

Rushikesh@DESKTOP-OJSE6R3 MINGW64 ~/Desktop/DevOps/Day50/Day50_Demo (master)
$ git commit -m "Added index" file
error: pathspec 'file' did not match any file(s) known to git

Rushikesh@DESKTOP-OJSE6R3 MINGW64 ~/Desktop/DevOps/Day50/Day50_Demo (master)
$ git commit -m "index file added"
[master (root-commit) b5073cb] index file added
1 file changed, 9 insertions(+)
create mode 100644 index.html
```

Task-02:

- Add buildspec.yaml file to CodeCommit Repository and complete the build process.

Create a buildspec.yaml file to build the index.html file using nginx server.

```
Rushikesh@DESKTOP-OJSE6R3 MINGW64 ~/Desktop/DevOps/Day50/Day50_Demo (master)
$ vi buildspec.yaml
```

```

Rushikesh@DESKTOP-0JSE6R3 MINGW64 ~/Desktop/DevOps/Day50/Day50_Demo (master)
$ cat buildspec.yml
version: 0.2

phases:
  install:
    commands:
      - echo Install Web Server to run Simple html file
      - sudo apt-get update
      - sudo apt-get install nginx -y
  build:
    commands:
      - echo Build started on `date`
      - cp index.html /var/www/html
  post_build:
    commands:
      - echo Build completed on `date`
artifacts:
  files:
    - /var/www/html/index.html

```

Here's what each step of the build does:

- **version: 0.2** - version represents the version of the build spec standard being used. This build spec declaration uses the latest version, 0.2
- **Phases** – phases represent the build phases during which you can instruct CodeBuild to run commands. These build phases are listed here as install, build, and post_build. You cannot change the spelling of these build phase names, and you cannot create more build phase names.
- **artifacts:** Specifies the location of the **index.html** file to be included in the build artifact.

Push this buildspec.file to the CodeCommit Repository using **git push** command.

```

Rushikesh@DESKTOP-0JSE6R3 MINGW64 ~/Desktop/DevOps/Day50/Day50_Demo (master)
$ git status
On branch master
Your branch is up to date with 'origin/master'.

Untracked files:
  (use "git add <file>..." to include in what will be committed)
    buildspec.yml

nothing added to commit but untracked files present (use "git add" to track)
Rushikesh@DESKTOP-0JSE6R3 MINGW64 ~/Desktop/DevOps/Day50/Day50_Demo (master)
$ git add buildspec.yml
warning: in the working copy of 'buildspec.yml', LF will be replaced by CRLF the next time Git touches it
Rushikesh@DESKTOP-0JSE6R3 MINGW64 ~/Desktop/DevOps/Day50/Day50_Demo (master)
$ git status
On branch master
Your branch is up to date with 'origin/master'.

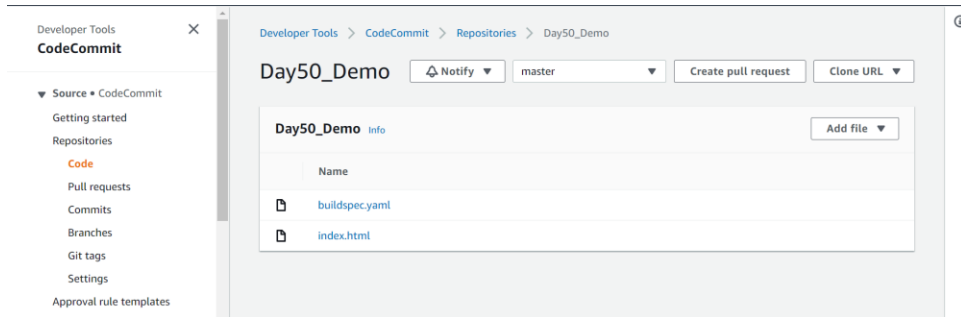
Changes to be committed:
  (use "git restore --staged <file>..." to unstage)
    new file:   buildspec.yml

Rushikesh@DESKTOP-0JSE6R3 MINGW64 ~/Desktop/DevOps/Day50/Day50_Demo (master)
$ git commit -m "Added BuildSpec file"
[master b25e3cb] Added BuildSpec file
1 file changed, 17 insertions(+)
create mode 100644 buildspec.yml

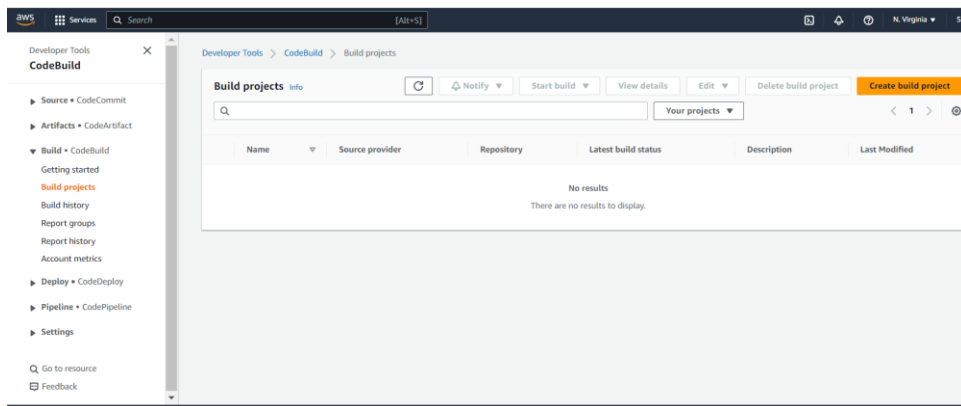
Rushikesh@DESKTOP-0JSE6R3 MINGW64 ~/Desktop/DevOps/Day50/Day50_Demo (master)
$ git push origin master
Enumerating objects: 4, done.
Counting objects: 100% (4/4), done.
Delta compression using up to 4 threads
Compressing objects: 100% (3/3), done.
Writing objects: 100% (3/3), 514 bytes | 257.00 KiB/s, done.
Total 3 (delta 0), reused 0 (delta 0), pack-reused 0
remote: Validating objects: 100%
To https://git-codecommit.us-east-1.amazonaws.com/v1/repos/Day50_Demo
b5073cb..b25e3cb master -> master

```

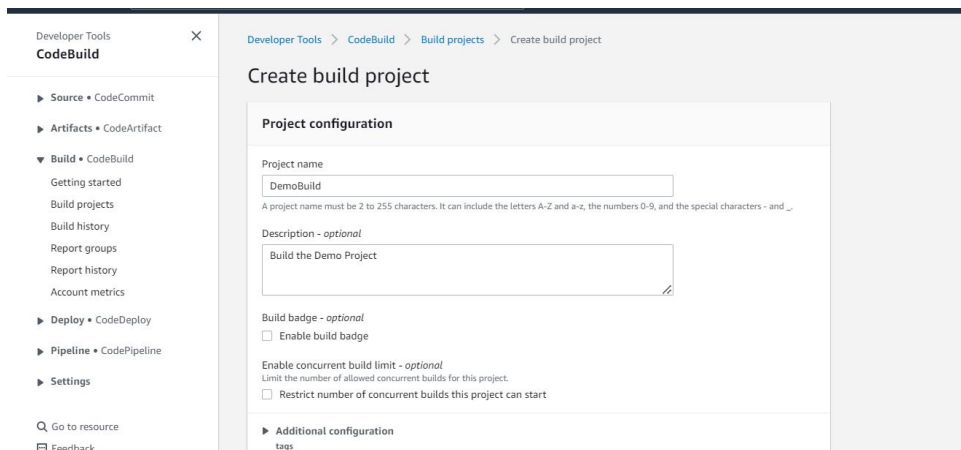
You have a buildspec.yml and index.html file in your CodeCommit repository



Go to the CodeBuild service. Click the "Create build project" button.



Fill in the details of your build project, including the project name, source provider (CodeCommit), repository, and branch.



In source section, select source provider AWS CodeCommit, select Repository that you created earlier and select branch master.

Developer Tools **CodeBuild**

- Source • CodeCommit
- Artifacts • CodeArtifact
- Build • CodeBuild
 - Getting started
 - Build projects
 - Build history
 - Report groups
 - Report history
 - Account metrics
- Deploy • CodeDeploy
- Pipeline • CodePipeline
- Settings

Q Go to resource
Feedback

☐ Restrict number of concurrent builds this project can start

Additional configuration tags

Source Add source

Source 1 - Primary

Source provider
AWS CodeCommit

Repository
Day50_Demo

Reference type
Choose the source version reference type that contains your source code.

☒ Branch
☐ Git tag
☐ Commit ID

Branch
Choose a branch that contains the code to build.

Commit ID - optional
Choose a commit ID. This can shorten the duration of your build.

Additional configuration
Git clone depth, Git submodules

Feedback Language

In Environment section, choose operating system, runtime ad image.

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Q Go to resource
Feedback

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:6.0

Image version
Always use the latest image for this runtime version

Environment type
Linux

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

Feedback Language

choose "Use a buildspec file" option, because by default CodeBuild looks for a file named buildspec.yaml in the source code root directory.

Developer Tools
CodeBuild

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▼ Build • CodeBuild

Getting started

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► Settings

Go to resource

Feedback

► Additional configuration

Timeout, certificate, VPC, compute type, environment variables, file systems

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).

Batch configuration

You can run a group of builds as a single execution. Batch configuration is also available in advanced option when starting build.

☐ Define batch configuration - *optional*
 You can also define or override batch configuration when starting a build batch.

Artifacts

Add artifact

Artifact 1 - Primary

Type

Click "Create build project" to create your project.

Developer Tools
CodeBuild

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► Artifacts • CodeArtifact

▼ Build • CodeBuild

Getting started

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Report groups

Report history

Account metrics

► Deploy • CodeDeploy

► Pipeline • CodePipeline

► Settings

Go to resource

Feedback

Type

No artifacts

You might choose no artifacts if you are running tests or pushing a Docker image to Amazon ECR.

► Additional configuration

Cache, encryption key

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.

Cancel

Create build project

Successfully build project is created.

Developer Tools
CodeBuild

► Source • CodeCommit

► Artifacts • CodeArtifact

▼ Build • CodeBuild

Getting started

Build projects

Build history

Report groups

Report history

Account metrics

► Deploy • CodeDeploy

► Pipeline • CodePipeline

► Settings

Go to resource

Feedback

Project created

You have successfully created the following project: DemoBuild

Create a notification rule for this project

Developer Tools > CodeBuild > Build projects > DemoBuild

Configuration

Source provider	Primary repository	Artifacts upload location	Build badge
AWS CodeCommit	Day50_Demo	-	Disabled
Public builds	Disabled		

Build history

Build run	Status	Build number	Source version	Submitter	Duration	Completed
No results						

Feedback

Language

AwsCodePipeline_...csv

Show all

Create a S3 Bucket

Create bucket Info

Buckets are containers for data stored in S3. [Learn more](#)

General configuration

Bucket name

Bucket name must be globally unique and must not contain spaces or uppercase letters. [See rules for bucket naming](#)

AWS Region

US East (N. Virginia) us-east-1

Copy settings from existing bucket - *optional*
Only the bucket settings in the following configuration are copied.

Choose bucket

Enable Bucket Versioning

Bucket Versioning

Versioning is a means of keeping multiple variants of an object in the same bucket. You can use versioning to preserve, retrieve, and restore every version of every object stored in your Amazon S3 bucket. With versioning, you can easily recover from both unintended user actions and application failures. [Learn more](#)

Bucket Versioning

☐ Disable

☒ Enable

Tags (0) - optional

You can use bucket tags to track storage costs and organize buckets. [Learn more](#)

No tags associated with this bucket.

Add tag

Default encryption Info

Server-side encryption is automatically applied to new objects stored in this bucket.

Encryption key type Info

☒ Amazon S3 managed keys (SSE-S3)

☐ AWS Key Management Service key (SSE-KMS)

Bucket Key
When KMS encryption is used to encrypt new objects in this bucket, the bucket key reduces encryption costs by lowering calls to AWS KMS. [Learn more](#)

☐ Disable

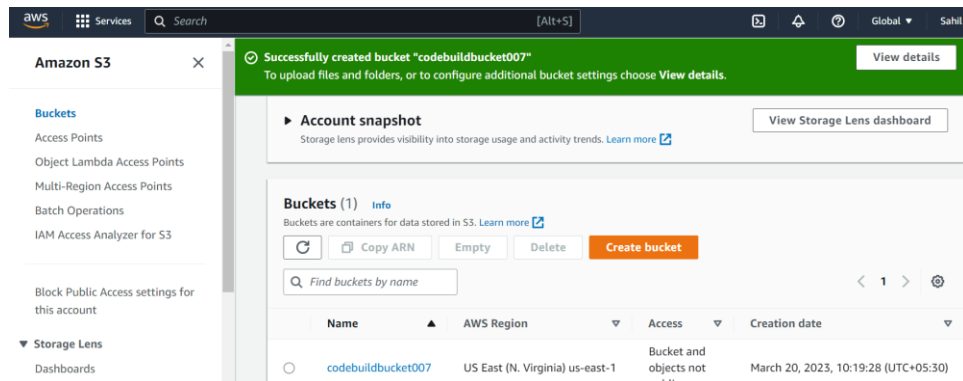
☒ Enable

► Advanced settings

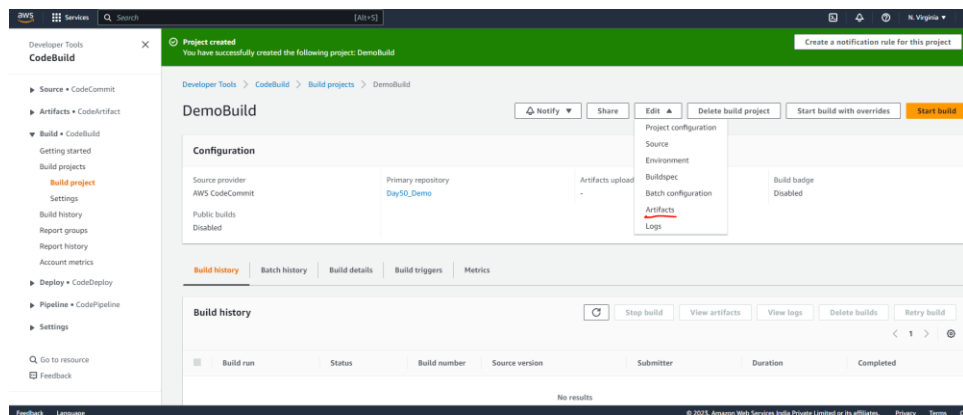
Feedback Language

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Bucket is Created Successfully.



Goto CodeBuild Service and Edit the Artifacts.



In Artifacts, add BucketName and Folder Name

Developer Tools > CodeBuild > Build projects > DemoBuild > Edit Artifacts

Edit Artifacts

Artifacts

Add artifact

Artifact 1 - Primary

Type

Amazon S3

You might choose no artifacts if you are running tests or pushing a Docker image to Amazon ECR.

Bucket name

codebuildbucket007

Name

The name of the folder or compressed file in the bucket that will contain your output artifacts. Use Artifacts packaging under Additional configuration to choose whether to use a folder or compressed file. If the name is not provided, defaults to project name.

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☐ Enable semantic versioning

Use the artifact name specified in the buildspec file

Path - optional

The path to the build output ZIP file or folder.

Example: MyPath/MyArtifact.zip.

Namespace type - optional

Click on 'Update artifacts'.

Use the artifact name specified in the buildspec file

Path - optional

The path to the build output ZIP file or folder.

Example: MyPath/MyArtifact.zip.

Namespace type - optional

None

Choose Build ID to insert the build ID into the path to the build output ZIP file or folder, e.g. MyPath/MyBuildID/MyArtifact.zip. Otherwise, choose None.

Artifacts packaging

☒ None

The artifact files will be uploaded to the bucket.

☐ Zip

AWS CodeBuild will upload artifacts into a compressed file that is put into the specified bucket.

☐ Disable artifact encryption

Disable encryption if using the artifact to publish a static website or sharing content with others

Service role permissions

☒ Allow AWS CodeBuild to modify this service role so it can be used with this build project

arn:aws:iam::534497365850:role/service-role/codebuild-DemoBuild-service-role

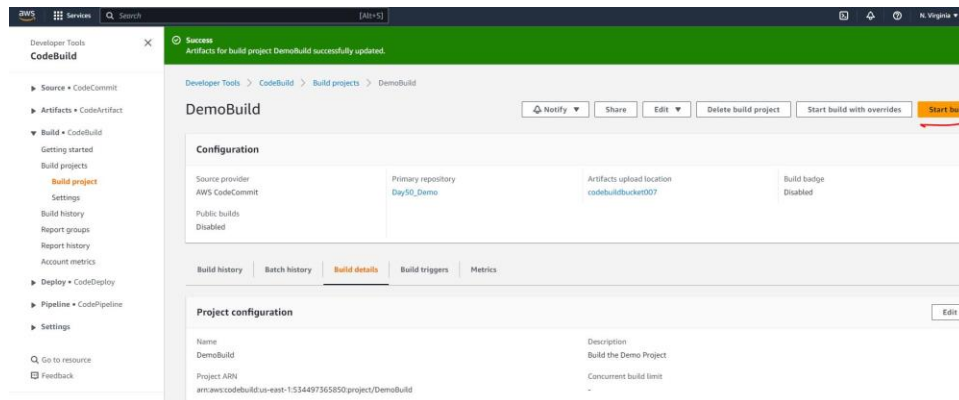
► Additional configuration

Cache, encryption key

Cancel

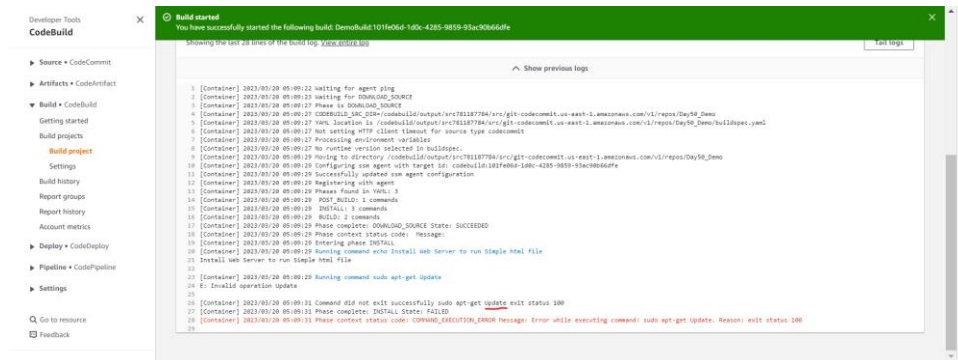
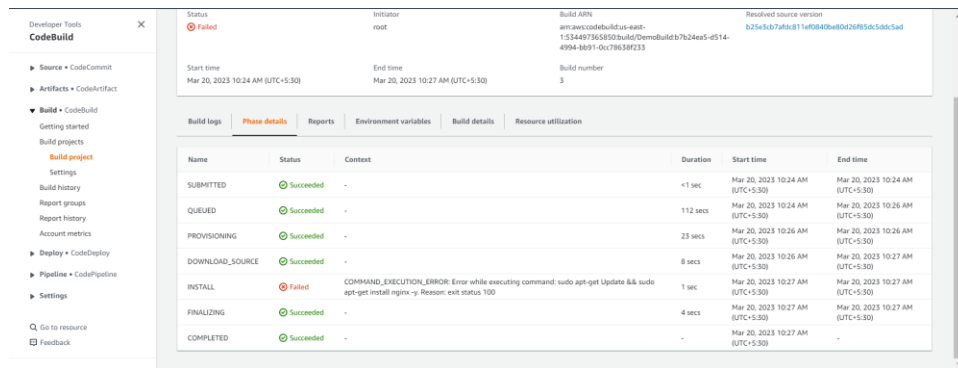
Update artifacts

Click the "Start build" button to start a new build.



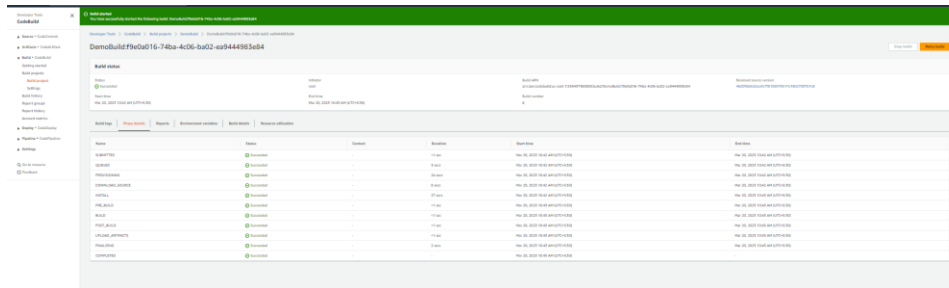
See in Phase Details, one phase is failed.

Go to Build Logs and see the Error and try to Resolve it.

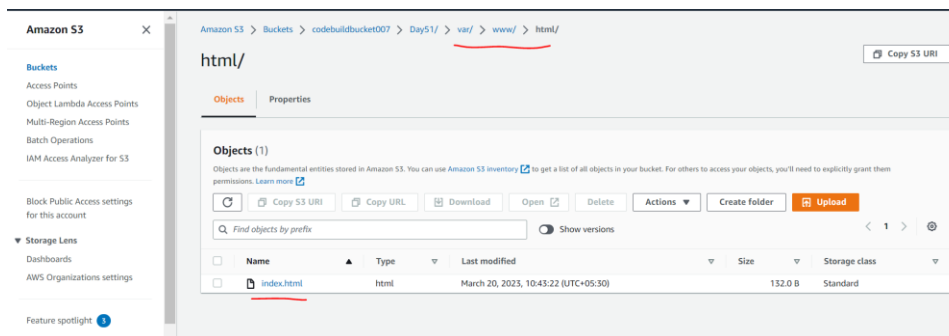


Again, click on Retry Build, and see the next time all build process is complete.

The artifacts will be uploaded to the specified S3 bucket location.

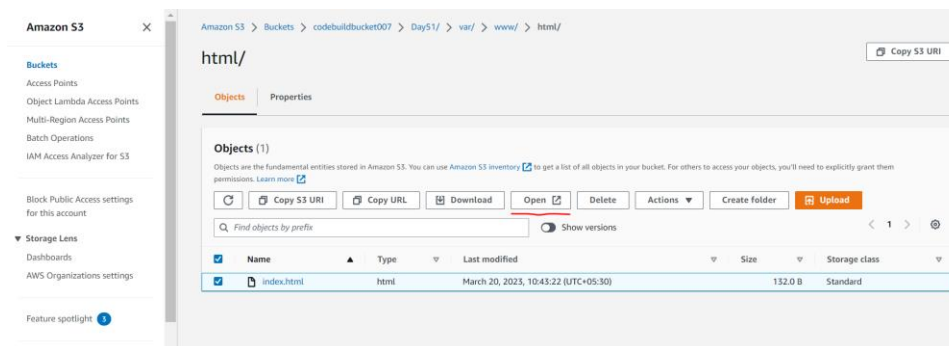


In buildspec.yml file, inside artifacts phase there is a location of file which is **/var/www/html/index.html**. You can check that folders and index.html file inside **s3 bucket**.









Click on 'index.html' file, below you can see properties of file.

Click on 'open' on the right-hand side.



Here is an output of index.html file.

← → ↻  https://codebuildbucket007.s3.us-east-1.amazonaws.com/Day51/var/www/html/index.ht

 algorithm - Calculat...  C programming Exe...  Top 50 Java Progra...  Sanjay Ghodawat U...  10 minu

Hello Rushikesh!

Happy Learning :)