

Pipeline maven, Jenkinsfile, and AWS ECR

What is Jenkins Pipeline?

-Jenkins Pipeline is a suite of plugins for describing a set of steps for implementing continuous integration and continuous delivery in the software development process. Pipeline provides an extensible set of tools for modeling simple to complex delivery pipelines as code via the pipeline DSL (Domain specific language).

Problem Statement:

A client wants to build a Jenkins pipeline with maven, that uses a predefined Jenkinsfile and Dockerfile. He wants everything to be built on a Jenkins server and the result of the build which is going to be a Docker image for the project to be sent to the company's AWS account and stored in the file into ECR (Elastic Container Registry).

Solution Statement:

The goal here is to create a Jenkins server and connect the project repository from GitHub to the Jenkins server. Also, I am going to create an IAM user in AWS with credentials to connect to the Jenkins server. Lastly, I am going to create a repository in ECR for the project and put the ECR repository information in the Jenkinsfile.

Project key processes:

- GitHub stores a repository that contains the application code and a Jenkinsfile
- Through a Jenkins server, I am going to build the pipeline using the repository and the Jenkinsfile.
- The Jenkins server will create the docker images and store them in AWS ECR each time a build is performed.

Technology tools used in the project:

- Linux Centos server
- Git
- GitHub
- Jenkins
- Maven
- Jenkins Pipeline
- Docker
- AWS
- Amazon IAM user
- Amazon ECR

Jenkinsfile Stages:

The Jenkinsfile is going to have 5 stages:

- 'Checkout' stage: To connect and pull the Github repository, especially the main branch.
- 'Code Build' stage: To build the application from the code using maven.
- 'Test' stage: To unit test the code using maven.
- 'Build Image' stage: To build a docker image for the application
- 'Deploy Image' stage: To send the docker image to the ECR repository.

Creating the IAM user in AWS to enable the connection to the Jenkins server

[IAM](#) > [Users](#) > [jenkins-ecr](#)

jenkins-ecr

Delete

Summary

ARN



arn:aws:iam::868016059835:user/jenkins-ecr

Console access

Disabled

Access key 1

AKIA4UGOJ6W5433JFO73 - Active

Never used. Created today.

Created

January 23, 2023, 13:04 (UTC-06:00)

Last console sign-in

-

Access key 2

Not enabled

Permissions

Groups (1)

Tags (1)

Security credentials

Access Advisor

Creating the ECR (Elastic Container Registry) to store the Dockerfiles.

Create repository

General settings

Visibility settings [Info](#)

Choose the visibility setting for the repository.

☒ **Private**

Access is managed by IAM and repository policy permissions.

☐ **Public**

Publicly visible and accessible for image pulls.

Repository name

Provide a concise name. A developer should be able to identify the repository contents by the name.

868016059835.dkr.ecr.us-east-1.amazonaws.com/

16 out of 256 characters maximum (2 minimum). The name must start with a letter and can only contain lowercase letters, numbers, hyphens, underscores, periods and forward slashes.

Tag immutability [Info](#)

Enable tag immutability to prevent image tags from being overwritten by subsequent image pushes using the same tag. Disable tag immutability to allow image tags to be overwritten.

☐ **Disabled**

Creating the Jenkins Pipeline project

Enter an item name

» *Required field*



Freestyle project

This is the central feature of Jenkins. Jenkins will build your project, combining any SCM with something other than software build.



Maven project

Build a maven project. Jenkins takes advantage of your POM files and drastically reduces



Pipeline

Orchestrates long-running activities that can span multiple build agents. Suitable for building and organizing complex activities that do not easily fit in free-style job type.



Multi-configuration project

OK

Useful for projects that need a large number of different configurations, such as testing different versions of a library, etc.

Using the Pipeline script from SCM to pull the GitHub repository into the Jenkins server

Configure

General

Advanced Project Options

Pipeline

Advanced Project Options

Advanced...

Pipeline

Definition

Pipeline script from SCM

SCM ?

Git

Repositories ?

Repository URL ?

Building the job in the Jenkins server

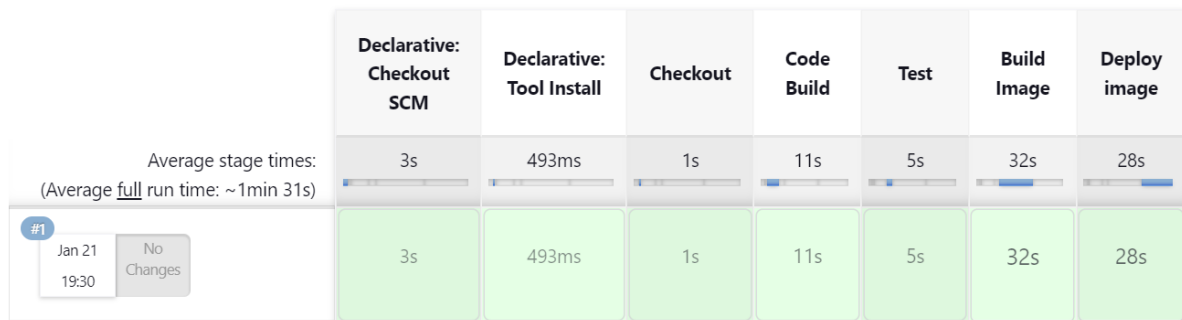
Pipeline devops-ci

This is a Jenkins Pipeline project with maven and Amazon ECR.

Edit description

Disable Project

Stage View



Output of the build

```
[Pipeline] withDockerRegistry
$ docker login -u AWS -p ***** https://868016059835.dkr.ecr.us-east-1.amazonaws.com/devop\_repository
Login Succeeded
[Pipeline] {
[Pipeline] isUnix
[Pipeline] withEnv
[Pipeline] {
[Pipeline] sh
+ docker tag 868016059835.dkr.ecr.us-east-1.amazonaws.com/devop_repository:1 868016059835.dkr.ecr.us-east-1.amazonaws.com/devop_repository:1
[Pipeline] }
[Pipeline] // withEnv
[Pipeline] isUnix
[Pipeline] withEnv
[Pipeline] {
[Pipeline] sh
+ docker push 868016059835.dkr.ecr.us-east-1.amazonaws.com/devop_repository:1
The push refers to a repository [868016059835.dkr.ecr.us-east-1.amazonaws.com/devop_repository]
eb6b090f371e: Preparing
2f4221e8765b: Preparing
```

More consoles output

```
1: digest: sha256:b46bbb6c2faed9d664731382a61e7e0a290b57d8c7dbf2fa7b6b63d5775e00d9 size: 1997
[Pipeline] }
[Pipeline] // withEnv
[Pipeline] }
[Pipeline] // withDockerRegistry
[Pipeline] }
[Pipeline] // withEnv
[Pipeline] }
[Pipeline] // script
[Pipeline] }
[Pipeline] // withEnv
[Pipeline] }
[Pipeline] // stage
[Pipeline] }
[Pipeline] // withEnv
[Pipeline] }
[Pipeline] // withEnv
[Pipeline] }
[Pipeline] // withEnv
[Pipeline] }
[Pipeline] // node
[Pipeline] End of Pipeline
Finished: SUCCESS
```

Now I can see an Image stored in the ECR repository

Amazon ECR > Repositories > devop_repository



devop_repository

View push commands

Images (1)

Search artifacts

< 1

<input type="checkbox"/>	Image tag ▾	Artifact type	Pushed at ▾	Size (MB) ▾	Image URI	Digest	Scan status	
<input type="checkbox"/>	3, 2, 1	Image	January 23, 2023, 13:45:44 (UTC-06)	96.37	 Copy URI	 sha256:b46bbb6c2faed9...	-	-