

Title: CICD pipeline using Jenkins and AWS code deploy

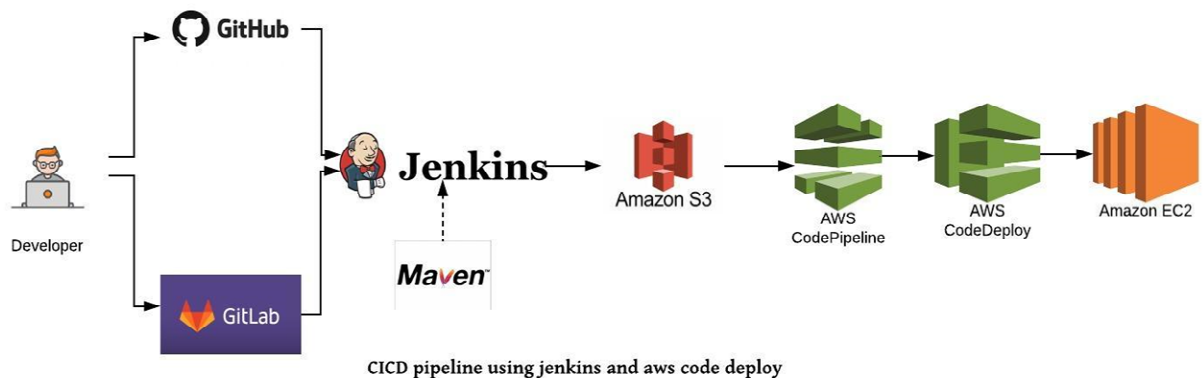
Objective:

Anyone having an application which requires a **static** infrastructure, this is the pipeline which meets their requirement.

Components/Tools:

- 1) AWS EC2
- 2) AWS Simple Storage Service
- 3) AWS Code Pipeline
- 4) AWS Code Deploy
- 5) AWS IAM
- 6) Jenkins
- 7) GitHub/Gitlab

Architecture Diagram:



Description:

- 1) Developer pushes the code to GitHub/Gitlab as per their convenience and requirement.
- 2) Once code will be in GitHub/Gitlab which will trigger a Jenkins job.

3) Jenkins will build the code using maven and send it to S3 bucket.

4) once the code is in S3, Code Deploy will deploy the code to EC2 Instance based on Tags.

Installation and Configuration:

1) Launch a one EC2 Instance for Jenkins, one for Gitlab and one for Application Server

2) Setup Jenkins:

<https://docs.aws.amazon.com/aws-technical-content/latest/jenkins-on-aws/installation.html>

3) In case of Gitlab, Setup Gitlab:

<https://about.gitlab.com/install/#centos-7>

4) Create a IAM user with programmatic access. we require "Access key" and "Secret access key" to integrate S3 to Jenkins:

<http://devopsjourney.com/2015/08/integrate-jenkins-with-s3/>

5) Install below Jenkins Plugins:

- S3 Publisher
- Git
- Maven

6) Configuration of Jenkins Job:

Click on New Item

← → ↻ ⓘ Not secure | 10.38.10.68/jenkins/ 🔍 ☆ 📄 🔑 👤 ⋮

Apps IESS Login Amex Imported From IE My Training udeemy Linux Academy

Jenkins 2 🔍 search ⓘ Pradeep Shinde | log out

Jenkins > [ENABLE AUTO REFRESH](#)

New Item [add description](#)

People
Build History
Project Relationship
Check File Fingerprint
Manage Jenkins
My Views
Lockable Resources
Credentials
New View

Build Queue —
No builds in the queue.

Build Executor Status —

master
1 Idle
2 Idle

awscli-node

S	W	Name ↓	Last Success	Last Failure	Last Duration	
🌱	☀️	ansible	N/A	N/A	N/A	🔄
🌱	☀️	aws-instances-tagging	5 mo 22 days - #3	N/A	1.7 sec	🔄
🌱	☁️	CloudCustodian	8 mo 21 days - #7	11 mo - #4	14 ms	🔄
🌱	☀️	Continuous-Deploy	5 mo 4 days - #19	5 mo 25 days - #5	0.91 sec	🔄
🌱	☀️	create instance	N/A	N/A	N/A	🔄
🌱	☁️	demo	N/A	3 days 1 hr - #3	10 sec	🔄
🌱	☀️	demo_aws_deploy	3 days 21 hr - #12	N/A	35 ms	🔄
🌱	☀️	javac	1 day 19 hr - #27	3 days 23 hr - #16	12 sec	🔄
🌱	☁️	Javawar	5 mo 4 days - #27	3 days 1 hr - #44	19 sec	🔄
🌱	☀️	jenkinscreateinstance	7 days 21 hr - #1	N/A	4.7 sec	🔄
🌱	☀️	MDWiki	7 mo 9 days - #5592	9 mo 18 days - #5587	1 sec	🔄
🌱	☀️	Okta-Assume-Role	8 mo 21 days - #51	11 mo - #37	9.9 sec	🔄
🌱	☀️	SampleDev	N/A	N/A	N/A	🔄

Give a Name of your Project and Select “Freestyle Project”, Click on OK

Jenkins 2 🔍 search ⓘ Pradeep Shinde | log out

Jenkins > All >

Enter an item name

» This field cannot be empty, please enter a valid name

Freestyle project
This is the central feature of Jenkins. Jenkins will build your project, combining any SCM with any build system, and this can be even used for something other than software build.

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

Pipeline
Orchestrates long-running activities that can span multiple build agents. Suitable for building pipelines (formerly known as workflows) and/or organizing complex activities that do not easily fit in free-style job type.

External Job
This type of job allows you to record the execution of a process run outside Jenkins, even on a remote machine. This is designed so that you can use Jenkins as a dashboard of your existing automation system.

Multi-configuration project
This type of job is suitable for projects that need a large number of different configurations, such as testing on multiple environments, platform specific builds, etc.

General Source Code Management Build Triggers Build Environment Pre Steps Build Post Steps Build Settings Post-build Actions

Description

[Plain text] [Preview](#)

- ☐ Commit agent's Docker container
- ☐ Run the build inside Docker containers
- ☐ Define a Docker template
- ☐ Discard old builds
- ☐ GitHub project
- GitLab Connection Gitlab_ITIO
- ☐ Permission to Copy Artifact
- ☐ This build requires lockable resources
- ☐ This project is parameterized
- ☐ Throttle builds
- ☐ Disable this project
- ☒ Execute concurrent builds if necessary

JDK (System)

JDK to be used for this project

☐ Restrict where this project can be run

Advanced...

Enter your Git credentials in source code management

General Source Code Management Build Triggers Build Environment Pre Steps Build Post Steps Build Settings Post-build Actions

Source Code Management

☐ None

☒ Git

Repositories

Repository URL http://10.38.10.19/nrathi/javawar.git

Credentials nrathi/***** Add

Advanced...

Add Repository

Branches to build

Branch Specifier (blank for 'any') master

Add Branch

Repository browser (Auto)

Additional Behaviours Add

Configure build trigger

General

Source Code Management

Build Triggers

Build Environment

Pre Steps

Build

Post Steps

Build Settings

Post-build Actions

☐ Trigger builds remotely (e.g., from scripts)

☐ Build after other projects are built

☐ Build periodically

☒ Build when a change is pushed to GitLab. GitLab webhook URL:

Enabled GitLab triggers

Push Events☒

Opened Merge Request Events☒

Accepted Merge Request Events☐

Closed Merge Request Events☐

Rebuild open Merge Requests

Approved Merge Requests (EE-only)☒

Comments☒

Comment (regex) for triggering a build

Enable [ci-skip]☒

Ignore WIP Merge Requests☒

Set build description to build cause (eg. Merge request or Git Push)☒

Build on successful pipeline events☐

Pending build name for pipeline

Cancel pending merge request builds on update☐

Allowed branches

☒ Allow all branches to trigger this job

☐ Filter branches by name

☐ Filter branches by regex

☐ Filter merge request by label

Secret token

Generate

Clear

☐ GitHub Pull Request Builder

☐ GitHub hook trigger for GITScm polling

☐ Poll SCM

The Script is for making the Zip of a build

General

Source Code Management

Build Triggers

Build Environment

Pre Steps

Build

Post Steps

Build Settings

Post-build Actions

Post Steps

☒ Run only if build succeeds ☐ Run only if build succeeds or is unstable ☐ Run regardless of build result

Should the post-build steps run only for successful builds, etc.

Execute shell

Command

```
echo "We have build it..Successfully"
cd target
#tar -czvf demo.tar.gz *.war
zip demo.zip *.war
```

See [the list of available environment variables](#)

Advanced...

Add post-build step

Build Settings

☐ E-mail Notification

Post Build Action will send the artifact to S3

General

Source Code Management

Build Triggers

Build Environment

Pre Steps

Build

Post Steps

Build Settings

Post-build Actions

Post-build Actions

Publish artifacts to S3 Bucket

X

?

S3 profile

jenkins3demo

▼

Files to upload

Source

target*.zip

X

?

Exclude

?

Destination bucket

jenkinsdemoestbucket

?

Storage class

STANDARD

▼

Bucket Region

us-east-1

▼

No upload on build failure

☒

?

Publish from Slave

☐

?

Manage artifacts

☐

?

Server side encryption

☒

?

Flatten directories

☐

?

GZIP files

☒

?

Keep files forever

☐

?

Show content directly in browser

☐

?

Metadata tags

Add

Add

Metadata tags

Add

Publish Failure Result Constraint

FAILURE

▼

☐ Don't wait for completion of concurrent builds before publishing to S3

?

Build console log level

INFO

▼

Add post-build action ▼

Save

Apply

Build your Job

Jenkins ▾javac ▸

ENABLE AUTO REFRESH

Back to Dashboard

Status

Changes

Workspace

Build Now

Delete Maven project

Configure

Modules

Rename

Build History

trend ▾

find

#27

Jan 16, 2019 10:59 AM

#26

Jan 16, 2019 4:50 AM

#25

Jan 15, 2019 4:34 AM

Started by GitLab push by Navneet Rathil

Maven project javac

add description

Disable Project

Workspace

Recent Changes

Permalinks

- Last build (#27), 1 day 19 hr ago
- Last stable build (#27), 1 day 19 hr ago
- Last successful build (#27), 1 day 19 hr ago
- Last failed build (#16), 3 days 23 hr ago
- Last unsuccessful build (#16), 3 days 23 hr ago
- Last completed build (#27), 1 day 19 hr ago

Success message on console output

Jenkins ▾javac ▾#28

```
/var/lib/jenkins/.m2/repository/sparkjava-hello-world/sparkjava-hello-world/1.0/sparkjava-hello-world-1.0.war
[INFO] Installing /var/lib/jenkins/workspace/javac/pom.xml to /var/lib/jenkins/.m2/repository/sparkjava-hello-world/sparkjava-hello-world/1.0/sparkjava-hello-world-1.0.pom
[INFO] -----
[INFO] BUILD SUCCESS
[INFO] -----
[INFO] Total time: 3.292 s
[INFO] Finished at: 2019-01-18T06:52:13Z
[INFO] -----
Waiting for Jenkins to finish collecting data
[JENKINS] Archiving /var/lib/jenkins/workspace/javac/pom.xml to sparkjava-hello-world/sparkjava-hello-world/1.0/sparkjava-hello-world-1.0.pom
[JENKINS] Archiving /var/lib/jenkins/workspace/javac/target/sparkjava-hello-world-1.0.war to sparkjava-hello-world/sparkjava-hello-world/1.0/sparkjava-hello-world-1.0.war
channel stopped
[javac] $ /bin/sh -xe /tmp/jenkins1855658289308659386.sh
+ echo We have build it..Successfully
We have build it..Successfully
+ cd target
+ zip demo.zip sparkjava-hello-world-1.0.war
  adding: sparkjava-hello-world-1.0.war (deflated 0%)
Publish artifacts to S3 Bucket Build is still running
Publish artifacts to S3 Bucket Using S3 profile: jenkins3demo
Publish artifacts to S3 Bucket buckets=jenkinsdemotestbucket, file=demo.zip region=us-east-1, will be uploaded from slave=false managed=false , server encryption true
Finished: SUCCESS
```

Artifact to S3

Amazon S3 ▸ jenkinsdemotestbucket

Overview

Properties

Permissions

Management

Q Type a prefix and press Enter to search. Press ESC to clear.

Upload

Create folder

Download

Actions ▾

Versions

Hide

Show

US East (N. Virginia) ↻

Viewing 1 to 2

<input type="checkbox"/>	Name ▾	Last modified ▾	Size ▾	Storage class ▾
<input type="checkbox"/>	demo.zip	Jan 18, 2019 12:22:14 PM GMT+0530	1.8 MB	Standard

7) Code Deploy Setup & Configuration:

<https://docs.aws.amazon.com/codedeploy/latest/userguide/tutorials-github-create-application.html>

8) Code Pipeline Setup & Configuration:

Follow the “step 4” from below documentation:

<https://docs.aws.amazon.com/codepipeline/latest/userguide/tutorials-simple-s3.html>

=====END=====

Important notes and attachments:

- you required a IAM role to be attached to application server as below

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Effect": "Allow",
      "Action": [
        "s3:Get*",
        "s3:List*"
      ],
      "Resource": [
        "arn:aws:s3:::jenkinsdemotestbucket/*",
        "arn:aws:s3:::aws-codedeploy-us-east-1/*",
        "arn:aws:s3:::aws-codedeploy-us-east-2/*",
        "arn:aws:s3:::aws-codedeploy-us-west-1/*",
        "arn:aws:s3:::aws-codedeploy-us-west-2/*",
        "arn:aws:s3:::aws-codedeploy-ap-northeast-1/*",
        "arn:aws:s3:::aws-codedeploy-ap-northeast-2/*",
        "arn:aws:s3:::aws-codedeploy-ap-south-1/*",
        "arn:aws:s3:::aws-codedeploy-ap-southeast-1/*",
        "arn:aws:s3:::aws-codedeploy-ap-southeast-2/*",
        "arn:aws:s3:::aws-codedeploy-eu-central-1/*",
        "arn:aws:s3:::aws-codedeploy-eu-west-1/*",
        "arn:aws:s3:::aws-codedeploy-sa-east-1/*"
      ]
    }
  ]
}
```



```
    }  
  ]  
}
```

➤ appspec.yml file:

version: 0.0

os: linux

files:

- source: sparkjava-hello-world-1.0.war
- destination: /tmp/

permissions:

- object: ApplicationStart.sh
mode: 755
- object: ApplicationStop.sh
mode: 755
- object: AfterInstall.sh
mode: 755

hooks:

ApplicationStop:

- location: ./tmp/demo/ApplicationStop.sh

timeout: 60

runas: root

BeforeInstall:

- location: ./ApplicationStop.sh

timeout: 60

runas: root

AfterInstall:

- location: ./AfterInstall.sh

timeout: 60

runas: root

ApplicationStart:

- location: ./ApplicationStart.sh

timeout: 60

runas: root

Video Reference:

<https://linuxacademy.com/cp/modules/view/id/71>

Future Scope:

We can add Auto-scaling group along with ALB/ELB for cost saving and high availability.

Efforts:

PRADEEP SHINDE

NAVNEET RATHI

