

< CONTINUOUS INTEGRATION ON AWS CLOUD >

IMPLEMENTATION PLAN

VERSION 1.0 | 26/05/2022 – 27/05/2022

Purpose

To perform Continuous Integration Using AWS Cloud.

Project Scenario

- Agile SDLC.
- Developer makes regular code changes.
- These commits need to be regularly Build and Tested.
- Build and Release Team will do this job.
- Or Developer job to merge and integrate code.

Problem Statement

- In Agile SDLC, there will be frequent code changes.
- Not so frequently code will be tested, which accumulates bugs and error in the code.
- Developer need to rework to fix these bugs and errors.
- Manual Build & release process.
- Inter Team Dependencies.

Solution

- Build & test for every commit.
- Automated process.
- Notify for every build status.
- Fix code if bugs or error found instantly rather than waiting.

Problem Statement – With CI Server

- CI Server maintenance.
- Operational overhead to maintain server like Jenkins, Nexus, Sonar, GIT etc.

Solution – For CI Server

- AWS Cloud services for CI to remove OPS overhead

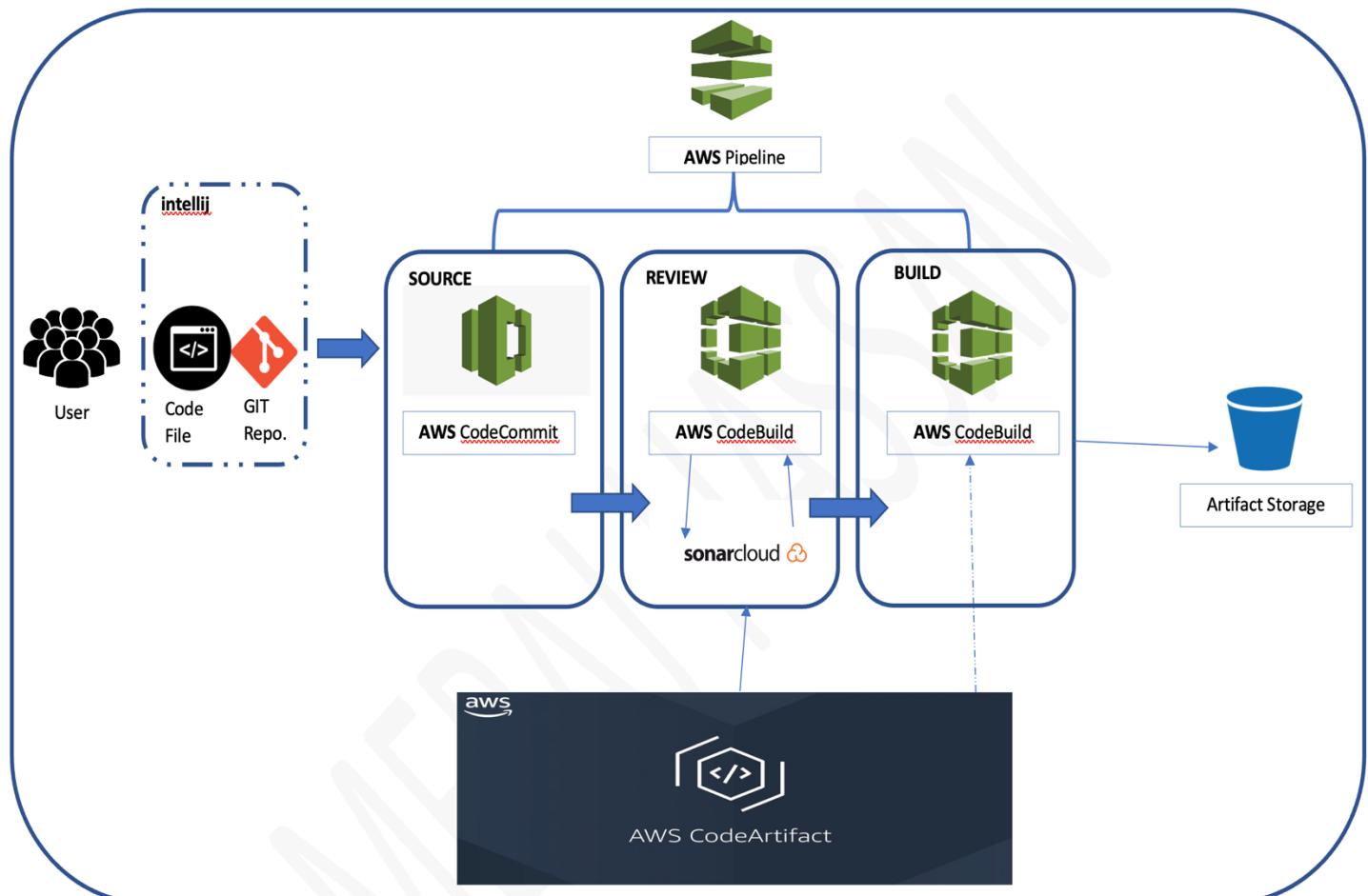
Benefits of CI Pipeline on AWS

- Fault Isolation
- Short MTTR
- Agile
- No OPS
- No Human Intervention

AWS Services

- Code Commit – Version Control System
- Code Artifact – Maven Repository for dependencies
- Code Build – Build Service from AWS
- Code Deploy – Artifact Deployment Service
- SonarCloud – SonarQube Cloud based tool
- Checkstyle – Code analysis from build job
- Codepipeline – Service to integrate all jobs together

Architecture Continuous Integration Pipeline



Flow of Execution

- *Login to AWS Account*
- *Code Commit*
 - *Create codecommit repo*
 - *Create IAM user with codecommit policy*
 - *Generate SSH key locally*
 - *Exchange keys with IAM user*
 - *Put source code from GITHUB Repo to CodeCommit repo and push*
- *Code Artifact*
 - *Create IAM user with code artifact access*
 - *Install AWS CLI , configure*
 - *Export auth token*
 - *Update settings.xml file in source code top level directory with below details*
 - *Update pom.xml file with repo details*
- *Sonar Cloud*
 - *Create SonarCloud Account*
 - *Generate Token*
 - *Create SSM parameters with sonar details*
 - *Create build project*
 - *Update codebuild role to access SSM parameterstore*
- *Create notification for SNS or Slack*
- *Build project*
 - *Update pom.xml file with artifact version and timestamp*
 - *Create variable in SSM => parameterstore*
 - *Create build projects*
 - *Update codebuild role to access SSM parameterstore*
- *Create Pipeline*
 - *Codecommit*
 - *Testcode*
 - *Build*
 - *Deploy to S3 bucket*
- *Test pipeline*

Prerequisite

1. *AWS Account*
2. *GITHUB Account – CI-AWS*
3. *IntelliJ*

Code Commit

CodeCommit > Create repository

Repositories		Info	C	Notify	Clone URL	View repository	Delete repository	Create repository
		Search				< 1 >		⚙️
Name	Description			Last modified			Clone URL	
eereeda-code-repo	-			7 minutes ago			HTTPS SSH HTTPS (GRC)	

Create policy & user with repository access.

User	Access key ID	Secret access key
eereeda-code-admin	AKIASL2YOSFBEZXYZMFL	***** Show

Generate SSH key locally and upload in IAM user for login.

Create config file – So that when codecommit is hostname then use this access key to login.

```
merajhassan@MERAJs-MacBook-Air .ssh % cat config
Host git-codecommit.*.amazonaws.com
  User APKASL2YOSFBBS5G2XA4
  IdentityFile ~/.ssh/eereeda-codecommit_rsa
```

```
% ssh git-codecommit.us-east-2.amazonaws.com
% git clone ssh://git-codecommit.us-east-1.amazonaws.com/v1/repos/eereeda-code-repo
% cd eereeda-code-repo
```

AWS CodeArtifact Setup & AWS System Manager Parameter Store

CodeArtifact > Create repository

Repositories Info			
Repository name	Domain	Domain owner	Repository description
eereeda-maven-repo	eereeda	162857390402	eereeda-maven-repo
maven-central-store	eereeda	162857390402	Provides Maven artifacts from Maven Central Repository.

Create User

User	Access key ID	Secret access key
eereeda-cdart-admin	AKIASL2YOSFBAS6XSWPK	***** Show

Add the credential of that user in AWS CLI

```
merajhassan@MERAJs-MacBook-Air Downloads % aws configure
AWS Access Key ID [*****UQ54]: AKIASL2YOSFBAS6XSWPK
AWS Secret Access Key [*****5r6r]: *****REDACTED*****
Default region name [ap-south-1]: us-east-1
Default output format [json]: json
```

```
% export CODEARTIFACT_AUTH_TOKEN=`aws codeartifact get-authorization-token --domain eereeda --
domain-owner 162857390402 --query authorizationToken --output text`
```

```
% echo $CODEARTIFACT_AUTH_TOKEN
```

```
[eyJ2ZXIiOXXXXXXxXXXXXXXXXXXXXXXcTLJpf8ehw]
```

CodeArtifact > Repositories > maven-central-store > View connection instructions

Change below parameter in setting .xml file

```
<repository>
  <id>codeartifact</id>
  <url>https://eereeda-162857390402.d.codeartifact.us-east-1.amazonaws.com/maven/maven-central-store/</url>
</repository>
</repositories>
</profile>
</profiles>
<activeProfiles>
  <activeProfile>default</activeProfile>
</activeProfiles>
<mirrors>
<mirror>
  <id>codeartifact</id>
  <name>eereeda--maven-central-store</name>
  <url>https://eereeda-162857390402.d.codeartifact.us-east-1.amazonaws.com/maven/maven-central-store/</url>
<mirrorOf></mirrorOf>
,
```

Developer Tools > CodeCommit > Repositories > eereeda-code-repo

eereeda-code-repo

Notify ▾

CI-AWS ▾

Create pull request

Clone URL ▾

eereeda-code-repo Info

Add file ▾

Name

- aws-files
- src
- .DS_Store
- pom.xml
- settings.xml

MERAUHAS

SonarCloud Setup

Account > Security > create token

Analyse new project > create project manually

AWS Systems Manager > Parameter Store > Create parameter

The screenshot shows a table titled "My parameters" with the following data:

Name	Tier	Type	Last modified
HOST	Standard	String	Fri, 27 May 2022 05:02:28 GMT
Organization	Standard	String	Fri, 27 May 2022 05:02:07 GMT
Project	Standard	String	Fri, 27 May 2022 05:02:48 GMT
codeartifact-token	Standard	SecureString	Fri, 27 May 2022 05:04:44 GMT
sonartoken	Standard	SecureString	Fri, 27 May 2022 05:03:23 GMT

CodeBuild > Build projects

The screenshot shows the "eereeda-build" build project configuration with the following details:

- Developer Tools > CodeBuild > Build projects > eereeda-build
- Build project name: eereeda-build
- Action buttons: Notify, Share, Edit, Delete build project, Start build with overrides, Start build
- Configuration section:
 - Source provider: AWS CodeCommit
 - Primary repository: eereeda-code-repo
 - Artifacts upload location: -
 - Build badge: Disabled

Click on > Start Build

<input type="checkbox"/>	eereeda-build:aa249 d92-72d6-47c8-9bdb-af484523ea e2	✔ Succeeded	eereeda-build	3	refs/heads/CI-AWS	meraj	6 minutes 36 seconds	1 hour ago
<input type="checkbox"/>	eereeda-build:141ae 781-f6a8-4639-9e31-55de41c930 57	✖ Failed	eereeda-build	2	refs/heads/CI-AWS	meraj	31 seconds	2 hours ago
<input type="checkbox"/>	eereeda-build:bd748 465-1046-4384-9cfb-d2245aa03 2f9	✖ Failed	eereeda-build	1	refs/heads/CI-AWS	meraj	31 seconds	2 hours ago

Screenshot

Name	Status	Context	Duration	Start time	End time
SUBMITTED	✔ Succeeded	-	<1 sec	May 27, 2022 10:58 AM (UTC+5:30)	May 27, 2022 10:58 AM (UTC+5:30)
QUEUED	✔ Succeeded	-	3 secs	May 27, 2022 10:58 AM (UTC+5:30)	May 27, 2022 10:58 AM (UTC+5:30)
PROVISIONING	✔ Succeeded	-	18 secs	May 27, 2022 10:58 AM (UTC+5:30)	May 27, 2022 10:58 AM (UTC+5:30)
DOWNLOAD_SOURCE	✔ Succeeded	-	7 secs	May 27, 2022 10:58 AM (UTC+5:30)	May 27, 2022 10:58 AM (UTC+5:30)
INSTALL	✔ Succeeded	-	<1 sec	May 27, 2022 10:58 AM (UTC+5:30)	May 27, 2022 10:58 AM (UTC+5:30)
PRE_BUILD	✔ Succeeded	-	23 secs	May 27, 2022 10:58 AM (UTC+5:30)	May 27, 2022 10:59 AM (UTC+5:30)
BUILD	✔ Succeeded	-	340 secs	May 27, 2022 10:59 AM (UTC+5:30)	May 27, 2022 11:04 AM (UTC+5:30)
POST_BUILD	✔ Succeeded	-	<1 sec	May 27, 2022 11:04 AM (UTC+5:30)	May 27, 2022 11:04 AM (UTC+5:30)
UPLOAD_ARTIFACTS	✔ Succeeded	-	<1 sec	May 27, 2022 11:04 AM (UTC+5:30)	May 27, 2022 11:04 AM (UTC+5:30)
FINALIZING	✔ Succeeded	-	2 secs	May 27, 2022 11:04 AM (UTC+5:30)	May 27, 2022 11:04 AM (UTC+5:30)
COMPLETED	✔ Succeeded	-	-	May 27, 2022 11:04 AM (UTC+5:30)	-

★ eereeda-devops-projects / Visualpathit VProfile Webapp NEW Not computed

PUBLIC

Last analysis: May 27, 2022, 11:03 AM

37 E
 Bugs

2 D
 Vulnerabilities

0.0% E
 Hotspots Reviewed

112 A
 Code Smells

0.0% C
 Coverage

13.3% S
 Duplications
JSP, XML, ...

AWS CodeBuild for Build Artifact

CodeBuild > Build projects

	Name	Source provider	Repository	Latest build status	Description	Last Modified
<input type="radio"/>	eereeda-build-artifact	AWS CodeCommit	eereeda-code-repo	Succeeded	-	6 minutes ago
<input type="radio"/>	eereeda-build	AWS CodeCommit	eereeda-code-repo	Succeeded	-	31 minutes ago

Click on > Start Build

Name	Status	Context	Duration	Start time	End time
SUBMITTED	Succeeded	-	<1 sec	May 27, 2022 11:25 AM (UTC+5:30)	May 27, 2022 11:25 AM (UTC+5:30)
QUEUED	Succeeded	-	2 secs	May 27, 2022 11:25 AM (UTC+5:30)	May 27, 2022 11:26 AM (UTC+5:30)
PROVISIONING	Succeeded	-	21 secs	May 27, 2022 11:26 AM (UTC+5:30)	May 27, 2022 11:26 AM (UTC+5:30)
DOWNLOAD_SOURCE	Succeeded	-	7 secs	May 27, 2022 11:26 AM (UTC+5:30)	May 27, 2022 11:26 AM (UTC+5:30)
INSTALL	Succeeded	-	<1 sec	May 27, 2022 11:26 AM (UTC+5:30)	May 27, 2022 11:26 AM (UTC+5:30)
PRE_BUILD	Succeeded	-	12 secs	May 27, 2022 11:26 AM (UTC+5:30)	May 27, 2022 11:26 AM (UTC+5:30)
BUILD	Succeeded	-	127 secs	May 27, 2022 11:26 AM (UTC+5:30)	May 27, 2022 11:28 AM (UTC+5:30)
POST_BUILD	Succeeded	-	<1 sec	May 27, 2022 11:28 AM (UTC+5:30)	May 27, 2022 11:28 AM (UTC+5:30)
UPLOAD_ARTIFACTS	Succeeded	-	<1 sec	May 27, 2022 11:28 AM (UTC+5:30)	May 27, 2022 11:28 AM (UTC+5:30)
FINALIZING	Succeeded	-	2 secs	May 27, 2022 11:28 AM (UTC+5:30)	May 27, 2022 11:28 AM (UTC+5:30)
COMPLETED	Succeeded	-	-	May 27, 2022 11:28 AM (UTC+5:30)	-

AWS Code Pipeline

eereeda-ci-pipeline-1

⌚ Source Succeeded

Pipeline execution ID: [4dd2438e-786b-455f-ae6d-e487a43cb779](#)

Source

AWS CodeCommit

⌚ Succeeded - 15 minutes ago

[58fbcb37](#)

[58fbcb37](#) Source: mm



[Disable transition](#)

⌚ Test Succeeded

Pipeline execution ID: [4dd2438e-786b-455f-ae6d-e487a43cb779](#)

Sonar-Code-Analysis

AWS CodeBuild

⌚ Succeeded - 6 minutes ago

[Details](#)



[58fbcb37](#) Source: mm

[Disable transition](#)

⌚ Build Succeeded

Pipeline execution ID: [4dd2438e-786b-455f-ae6d-e487a43cb779](#)

Build

AWS CodeBuild

⌚ Succeeded - 1 minute ago

[Details](#)



[58fbcb37](#) Source: mm

DO NOT
DISAN

1. References

The following table summarizes the documents referenced in this plan.

DOCUMENT NAME	INSTRUCTOR	LOCATION
DevOps Beginners to Advanced	Imran Teli	https://www.udemy.com/course/decodingdevops/learn/lecture/28273912?start=0#overview