

Pipeline Project: EKS

Pipeline Project: Jenkins pipeline, docker, sonarCloud, ECR, and EKS:

Problem Statement:

-A client created a software project used by doctors and patients for geolocation. The doctors can see their patients through the app and the patients can seek medical assistance through the app too. The application is built using Java, HTML, and JavaScript for the source code and maven as the build tool. The client wants to set up a code analysis for the project and build a pipeline to deploy the application using Amazon EKS.

Solution Statement:

-I am going to create a Jenkins server to manage the pipeline and implement the tools to set up the code analysis process. Finally, integrate the Jenkins server with Amazon EKS to deploy the artifact from Amazon ECR to the EKS cluster.

Key components:

-Linux Centos7 server: For the Jenkins server

-GitHub: To store the source code

-Git: To access and manage the Github and the Jenkins server

-AWS: For providing cloud services

-Amazon ECR: To store the final artifact

-AWS IAM user: To provide access between the Jenkins server and the ECR repository

-Docker: To build the dockerfile

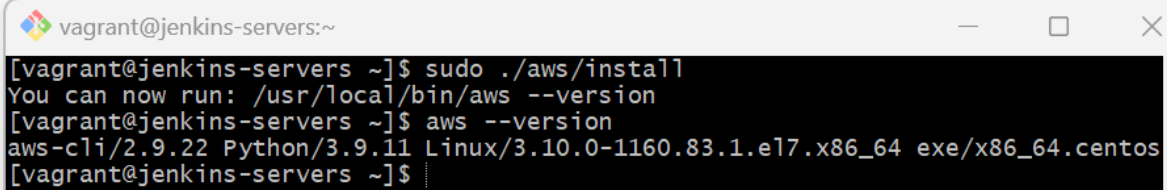
-Maven Pipeline: To automate the build of the project

-Jenkinsfile: For the maven pipeline

-Amazon EKS cluster: Running the cluster

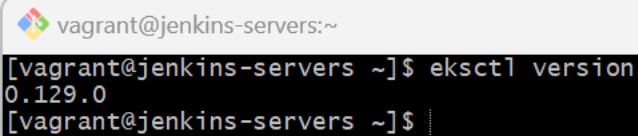
-more

Installing AWS CLI to Jenkins server

A terminal window titled 'vagrant@jenkins-servers:~' with standard window controls. The terminal shows the command 'sudo ./aws/install' being executed, followed by the instruction 'You can now run: /usr/local/bin/aws --version'. Then, the command 'aws --version' is run, resulting in the output 'aws-cli/2.9.22 Python/3.9.11 Linux/3.10.0-1160.83.1.el7.x86_64 exe/x86_64.centos'.

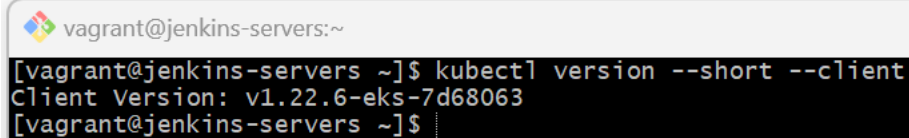
```
vagrant@jenkins-servers:~$ sudo ./aws/install
You can now run: /usr/local/bin/aws --version
[vagrant@jenkins-servers ~]$ aws --version
aws-cli/2.9.22 Python/3.9.11 Linux/3.10.0-1160.83.1.el7.x86_64 exe/x86_64.centos
[vagrant@jenkins-servers ~]$
```

Checking to see if I have eksctl service on the Jenkins server

A terminal window titled 'vagrant@jenkins-servers:~' with standard window controls. The terminal shows the command 'eksctl version' being executed, resulting in the output '0.129.0'.

```
vagrant@jenkins-servers:~$ eksctl version
0.129.0
[vagrant@jenkins-servers ~]$
```

Make sure that I have kubectl installed on the Jenkins server

A terminal window titled 'vagrant@jenkins-servers:~' with standard window controls. The terminal shows the command 'kubectl version --short --client' being executed, resulting in the output 'Client Version: v1.22.6-eks-7d68063'.

```
vagrant@jenkins-servers:~$ kubectl version --short --client
Client Version: v1.22.6-eks-7d68063
[vagrant@jenkins-servers ~]$
```

Cluster nodes

```
vagrant@jenkins-servers:~  
[vagrant@jenkins-servers ~]$ kubectl get nodes  
NAME                                STATUS    ROLES    AGE    VERSION  
ip-192-168-32-89.ec2.internal      Ready    <none>    37m    v1.24.9-eks-49d8fe8  
ip-192-168-5-146.ec2.internal      Ready    <none>    37m    v1.24.9-eks-49d8fe8  
[vagrant@jenkins-servers ~]$ kubectl get ns  
NAME              STATUS    AGE  
default           Active    46m  
kube-node-lease   Active    46m  
kube-public       Active    46m  
kube-system       Active    46m  
[vagrant@jenkins-servers ~]$
```

Creating an ECR repository to store the Docker image


```
vagrant@jenkins-servers:~  
[vagrant@jenkins-servers ~]$ aws ecr create-repository --repository-name geolocation_ecr_rep  
{  
  "repository": {  
    "repositoryArn": "arn:aws:ecr:us-east-1:868016059835:repository/geolocation_ecr_rep",  
    "registryId": "868016059835",  
    "repositoryName": "geolocation_ecr_rep",  
    "repositoryUri": "868016059835.dkr.ecr.us-east-1.amazonaws.com/geolocation_ecr_rep",  
    "createdAt": "2023-02-09T02:35:44+00:00",  
    "imageTagMutability": "MUTABLE",  
    "imageScanningConfiguration": {  
      "scanOnPush": false  
    },  
    "encryptionConfiguration": {  
      "encryptionType": "AES256"  
    }  
  }  
}  
[vagrant@jenkins-servers ~]$
```

Amazon ECR console


Private repositories (2)					
<input type="text" value="Find repositories"/>					
<input type="checkbox"/>	Repository name ▲	URI	Create d at ▼	Tag immutabilit y	Scan frequenc y
<input type="checkbox"/>	devop_repository	868016059835.dkr.ecr.us-east-1.amazonaws.com/devop_repository	February 02, 2023, 19:42:56 (UTC-06)	Disabled	Manual
<input type="checkbox"/>	geolocation_ecr_rep	868016059835.dkr.ecr.us-east-1.amazonaws.com/geolocation_ecr_rep	February 08, 2023, 20:35:44 (UTC-06)	Disabled	Manual

Creating the project in the Jenkins console


» Required field




Freestyle project
This is the central feature of Jenkins. Jenkins will build your project, combining for something other than software build.



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



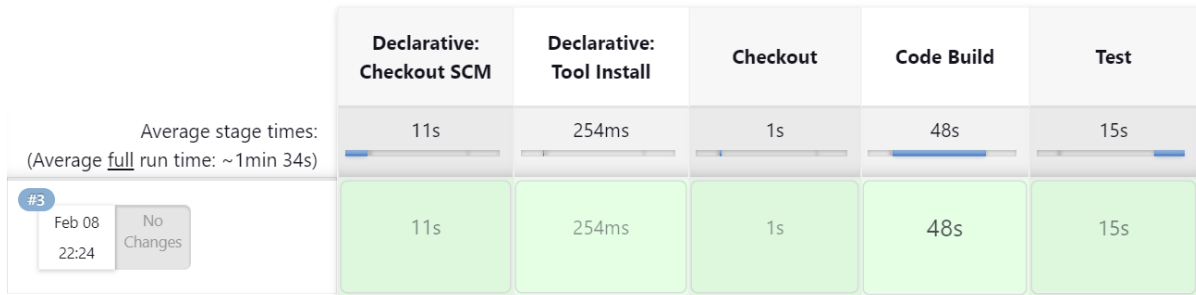
Pipeline
Orchestrates long-running activities that can span multiple build agents. Suitable and/or organizing complex activities that do not easily fit in free-style job type.



Multi-configuration project
Suitable for projects that need a large number of different configurations, such as builds, etc.

Testing the pipeline through stages

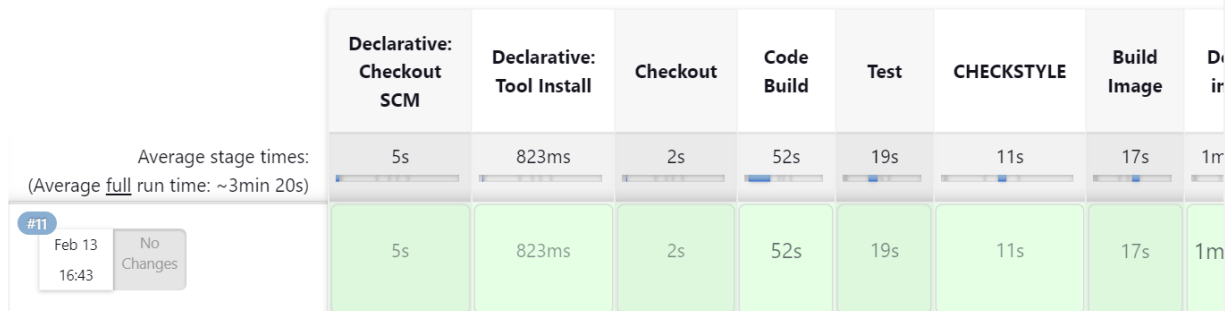
Stage View



Permalinks

Deploying the application through Jenkins



Stage View



Permalinks

geolocation_ecr_rep

Images (2)

<input type="checkbox"/>	Image tag ▾	Artifact type	Pushed at ▾	Size (MB) ▾	Image URI	Digest
<input type="checkbox"/>	latest	Image	February 13, 2023, 16:46:50 (UTC-06)	297.55	 Copy URI	 sha256:6c8b...

Active cluster in the AWS account

Clusters (1) [Info](#)

<input type="radio"/>	Cluster name ▲	Status ▾	Kubernetes version ▾	Provider
<input type="radio"/>	geolocation-eks	✔ Active	1.24	EKS

The application is now running in the cluster.