**End to End application deployment on EKS with Jenkins on AWS**

Steps to achieve:

1. Setup Jenkins Master and Salve on Ec2 Machines
2. Create Code Repo on GitHub
3. Build an EKS cluster

**Jenkins Setup**:

**Server/Master Setup**:

1. Spin up an Ec2 Machine (m4.large) with necessary security policies and name it as Jenkins Master
2. Connect to the instance via **SSH**
3. Install Jenkins on the Machine
   1. sudo yum update –y
   2. sudo wget -O /etc/yum.repos.d/jenkins.repo <http://pkg.jenkins-ci.org/redhat/jenkins.repo>
   3. sudo rpm --import <https://pkg.jenkins.io/redhat/jenkins.io.key>
   4. sudo yum install java-1.8.0-openjdk – y
   5. sudo yum install docker -y
   6. sudo yum install jenkins -y

After the installation, one need to show Jenkins the executable for Java.

1. sudo vi /etc/init.d/jenkins
2. Add this command at one the java executable paths probably ar line 16 of the file

**/usr/lib/jvm/java-1.8.0-openjdk-1.8.0.222.b10-0.amzn2.0.1.x86\_64**

This finish installing Jenkins. Now start the service with the command

* 1. sudo service jenkins start
  2. sudo systemctl enable docker.service
  3. sudo systemctl start docker.service

To view the status of the Jenkins server

* 1. sudo service jenkins status
  2. sudo systemctl status docker.service

To restart the Jenkins server

* 1. sudo service jenkins restart

1. Accessing Jenkins Server
   1. The first time you use the dashboard at http://:8080, you will be prompted to unlock Jenkins
   2. Retrive the password from this command:

**sudo cat /var/lib/jenkins/secrets/initialAdminPassword** on the server machine

* 1. After the password is entered follow the onscreen instructions to set up an admin user and additional users.

**Jenkins Slave Setup**:

Once the server is up, we need to create another Ec2 instance and attach the new machine to Jenkins master node as slave node.

1. Launch another Ec2 Machine in the same VPC of the master.
2. Attach a security group that can allow ingress from the Jenkins Master to this slave node.
3. Connect to Master vis SSH.
4. Cater a key-pair from the ~/.ssh directory
   1. cd ~/.ssh
   2. ssh-keygen -t rsa
5. Copy the public key
   1. cat ~/.ssh/id\_rsa.pub
6. In a new terminal connection to the slave Ec2 machine via SSH
7. Navigate to ~/.ssh folder
8. Edit the ~/.ssh/authorized keys file and add the public key copied in step 5
9. Return to the Master node connected terminal and SSH to the slave node from master node terminal.
10. If the connection is not successful please stop here and retry the steps to establish successful connection .

With this we created Jenkins Master / Slave configuration.   
But we need to add the salve node in the Jenkins UI so that Jenkins master can allocate work to the slave nodes.

**Attaching the Jenkins slave as worker node for Jenkins master**.

1. Login to Jenkins UI
2. Choose Manage Jenkins -> Manage Nodes -> New Node
3. Name the node and choose permanent node
4. Add necessary description and plan for two executors per core.
5. Set Remote root directory to /home/ec2-user/jenkins
6. Choose Launch method as Launch slave agents on Unix machines via SSH
7. Add credentials -> choose SSH username with private key
8. Set username as ec2-user
9. For private key choose enter directly and paste the private key from master node
   1. Private key for master can be copied from ~/.ssh/id\_rsa file by ssh into master Ec2 instance
10. Select the newly added node and **Launch Agent.**
11. Agent should be up and running. If the agent is not up please check if the right key is pasted and syntax issues on the key copied. Don’t go any further if the agent is not up, review the steps and get the agent online.

Tip:

1. Once the node is configures set the executors on master node to 0 so that all the actions are carried by slave nodes.
2. Choose Spot instances over dedicated instances to save money.

With this we had successfully configured a Jenkins Server on Ec2 machine which can be used to automate tasks and build pipelines to achieve CI/CD with EKS.

**Jenkins to Push images to ECR**:

**Jenkins to push changes to EKS**: