Installing Jenkins

Prerequisites

Before continuing with this tutorial, make sure you have ubuntu machine created and logged in as a user with sudo privileges.

To install Jenkins on your Ubuntu system, follow these steps:

1. Install Java.

   Since Jenkins is a Java application, the first step is to install Java. Update the package index and install the Java 8 OpenJDK package with the following commands:

   ```
   sudo apt update
   sudo apt install openjdk-8-jdk
   ```

2. Add the Jenkins Debian repository.

   Import the GPG keys of the Jenkins repository using the following wget command:

   ```
   wget -q -O - https://pkg.jenkins.io/debian/jenkins.io.key | sudo apt-key add -
   ```

   The command above should output OK which means that the key has been successfully imported and packages from this repository will be considered trusted.

   Next, add the Jenkins repository to the system with:

   ```
   sudo sh -c 'echo deb http://pkg.jenkins.io/debian-stable binary/ >
   /etc/apt/sources.list.d/jenkins.list'
   ```

3. Install Jenkins.

   Once the Jenkins repository is enabled, update the apt package list and install the latest version of Jenkins by typing:

   ```
   sudo apt update
   sudo apt install jenkins
   ```

Jenkins service will automatically start after the installation process is complete. You can verify it by printing the service status:

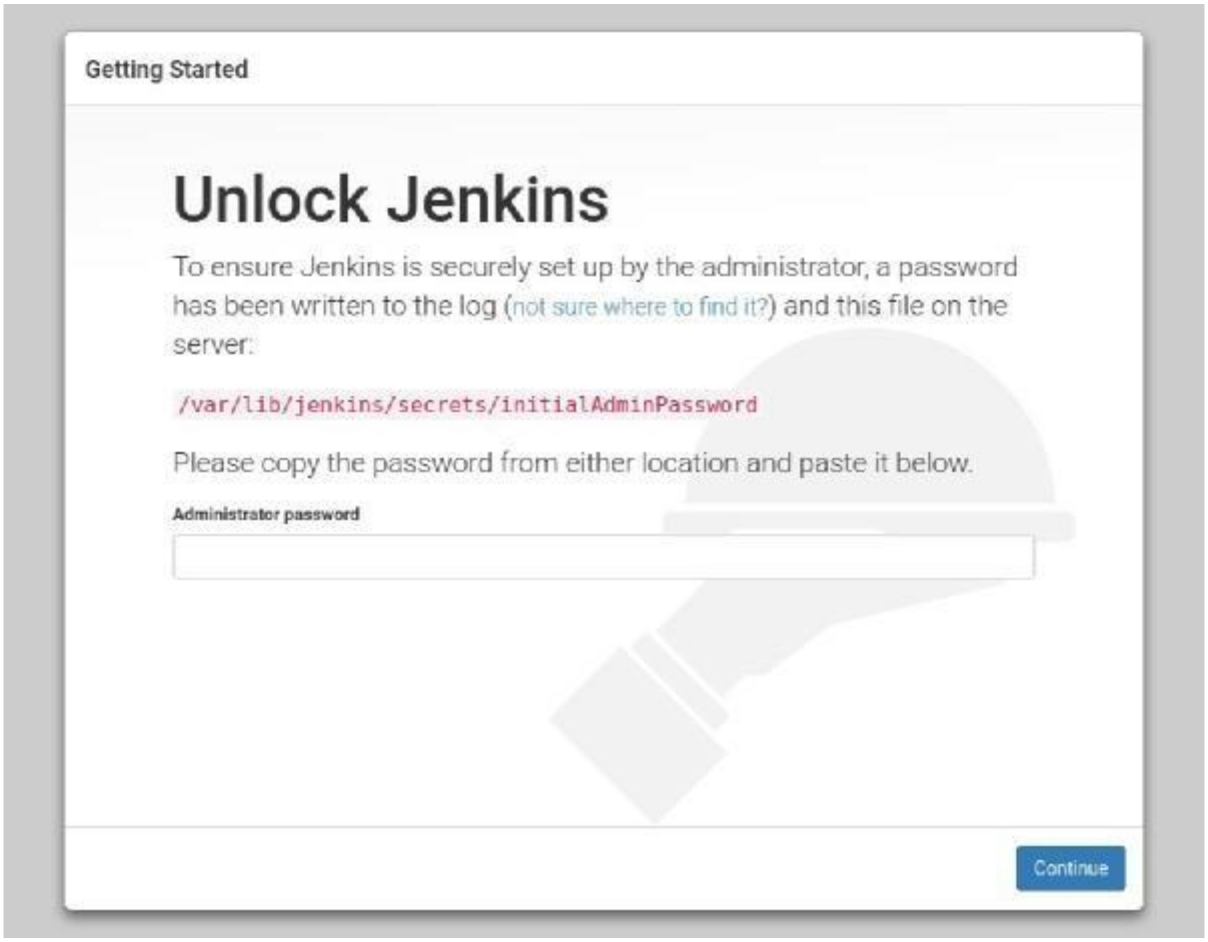
```
systemctl status jenkins
```

You should see something similar to this:

```
● jenkins.service - LSB: Start Jenkins at boot time
Loaded: loaded (/etc/init.d/jenkins; generated)
Active: active (exited) since Wed 2019-07-06 1308 PDT; 2min 16s ago
   Docs: man:systemd-sysv-generator(8)
   Tasks: 0 (limit: 2319)
CGroup: /system.slice/jenkins.service
```

Setting Up Jenkins

To set up your new Jenkins installation, open your browser, type your domain or IP address followed by port 8080 make sure you opened port 8080 in AWS security groups , http://your_ip_or_domain:8080 and screen similar to the following will be displayed:


Getting Started

Unlock Jenkins

To ensure Jenkins is securely set up by the administrator, a password has been written to the log (not sure where to find it?) and this file on the server:

```
/var/lib/jenkins/secrets/initialAdminPassword
```

Please copy the password from either location and paste it below.

Administrator password

During the installation, the Jenkins installer creates an initial 32-character long alphanumeric password. Use the following command to print the password on your terminal:

```
sudo cat /var/lib/jenkins/secrets/initialAdminPassword
2115173b548f4e99a203ee99a8732a32
```

Copy the password from your terminal, paste it into the Administrator password field and click Continue and install Selected Plugins.

Setting Up Docker in Jenkins Server

1. Install Docker

```
curl -fsSL get.docker.com | /bin/bash
```

2. Add Jenkins User to docker group

```
sudo usermod -aG docker jenkins
```

3. Restart Jenkins

```
sudo systemctl restart jenkins
```

Setup Kubernetes Cluster

1. Create 2 ubuntu machines

   System Requirements
   Master Machine : 4 GB RAM , 2 Core Processer
   Worker Machines: 1 GB RAM , 1 Core Processer

2. Execute below commands in both master and slave machines.

```
==========COMMON FOR MASTER & SLAVES START ====

sudo apt-get update -y
sudo apt-get install -y apt-transport-https
sudo su -

curl -s https://packages.cloud.google.com/apt/doc/apt-key.gpg | apt-key add -

cat <<EOF >/etc/apt/sources.list.d/kubernetes.list
deb https://apt.kubernetes.io/ kubernetes-xenial main
EOF

apt-get update -y

swapoff -a
sed -i '/ swap / s/^\(.*\)$/#\1/g' /etc/fstab


modprobe br_netfilter
sysctl -p
sudo sysctl net.bridge.bridge-nf-call-iptables=1
```

```
apt install docker.io -y
usermod -aG docker ubuntu



systemctl restart docker
systemctl enable docker.service


apt-get install -y kubelet kubeadm kubectl kubernetes-cni

systemctl daemon-reload
systemctl start kubelet
systemctl enable kubelet.service

==========COMMON FOR MASTER & SLAVES END=====
```

3. Execute below commands only in master machine.

```
===========In Master Node Start====================

# Execute below command as root user

kubeadm init

#exit root user & execute as normal user

mkdir -p $HOME/.kube
sudo cp -i /etc/kubernetes/admin.conf $HOME/.kube/config
sudo chown $(id -u):$(id -g) $HOME/.kube/config

kubectl apply -f "https://cloud.weave.works/k8s/net?k8s-version=$(kubectl version |
base64 | tr -d '\n')"

kubectl get nodes
kubectl get pods --all-namespaces
# Get token

kubeadm token create --print-join-command

=========In Master Node End====================
```

4. Execute kubeadm join token in worker nodes to join into cluster.

=========In Worker Nodes Start==================

copy kubeadm join token and execute in Worker Nodes to join to cluster

=========In Worker Nodes End==================

Setup Jenkins Server to deploy applications into Kubernetes Cluster

~~We can deploy docker applications into Kubernetes cluster from Jenkins using be~~low 2 approaches.

1) Using Kubernetes Continues Deploy Plugin

- Go to Jenkins→ Manage Plugins → Available → Search for Kubernetes Continues Deploy → Select And Install.
- Add kube config information in Jenkins Credentials.
  Jenkins → Credentials → Add Credentials → Select Kind As Kubernates Configuration (Kubeconfig) → Select enter directly radio button → copy kubeconfig content from Kubenertes cluster
- Use KubernetesDeploy in pipeline script

```
Ex:
stage("Deploy To Kuberates Cluster"){
    kubernetesDeploy(
       configs: 'springBootMongo.yml',
       kubeconfigId: 'KUBERNATES_CONFIG',
       enableConfigSubstitution: true
      )
}
```

2) Install kubectl and add kubeconfig in Jenkins server

1. Install Kubectl in Jenkins Server

```
sudo apt-get update && sudo apt-get install -y apt-transport-https
curl -s https://packages.cloud.google.com/apt/doc/apt-key.gpg | sudo apt-key add -
```

```
echo "deb https://apt.kubernetes.io/ kubernetes-xenial main" | sudo tee -a
/etc/apt/sources.list.d/kubernetes.list
sudo apt-get update
sudo apt-get install -y kubectl
```

2. Switch to jenkins user

```
sudo -i -u jenkins
```

3. Create .kube folder in Jenkins home directory

```
cd ~
mkdir .kube
```

4. Create config file and copy config file content from Kubernetes Cluster master machine and save the content.

```
vi .kube/config
```

5. We can use kubectl commands directly in pipe line script , kubectl commands will get executed in Kubernetes cluster directly.

```
 stage("Deploy To Kuberates Cluster"){
   sh "kubectl apply -f springBootMongo.yml"
}
```

Commands

Kubernets get pods
Kubernetets get svc   #sevices
Kubernetes get node