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PRACTICAL 4

Aim: To understand Continouse Integration, install and Configure Jenkina with Maven/Ant/Gradle, to setup a build job

Problem Statement: To understand importance of Jenkins to build and deploy software applicaturs on server environment

Theory:

Continouse Integration:

Continouse Integration is a development practice where development team makes small frequent change to code. An automated build verifies the code each time developers check their changes into the version control repository. As a result development teams can detect problems early.

Continouse Integration is the first part of CI/CD a practice that enables application development teams to release incremental code changes to produc -tion Quickly and regularly

Importance OF Continouse Integration:
a) Reduced Integration risk
b) Higher code quality
c) The code in Version control works
D) Reduced Friction between team members
e) The Quality of life improvements for testers
f) less time Deploying
g) Increased Confidence and Morale

Jenkins:

Jenkins is an open source server that is written entirely in Java. It let you execute a series of actions to achieve the Continouse Integration process, that too in an automated Fashion.

This CI Server runs in Servlet container such as Apache Tomcat. Jenkins facilitates Continouse integration and Continouse delivery in software project by automating Part releated to build, test and deployment. This makes it easy for developer to continously work on the betterment of the product by intergating changes to the project.

Jenkins automate the software build in a Continouse manner and lets the developers know about the errors at an early stage. A strong Jenkins Community is one of the prime reasons for its popularity. Jenkins is not only extensible but also has a thriving pluging eco system.

Conclusion:

In this experiment, we Installed Jenkins along with Its prerequisites on our Ubuntu machine and created our first Freestyle build Job on Jenkins.

Output:

Starting Jenkins on Amazon Aws:

```
    https://ubuntu.com/aws/pro

Expanded Security Maintenance for Applications is not enabled.

10 updates can be applied immediately.
To see these additional updates run: apt list --upgradable

Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status


Last login: Mon Feb 27 05:25:15 2023 from 13.233.177.5
ubuntu@ip-172-31-0-149:~$
ubuntu@ip-172-31-0-149:~$
ubuntu@ip-172-31-0-149:~$
ubuntu@ip-172-31-0-149:~$
ubuntu@ip-172-31-0-149:~$
ubuntu@ip-172-31-0-149:~$
ubuntu@ip-172-31-0-149:~$
ubuntu@ip-172-31-0-149:~$ curl -fsSL https://pkg.jenkins.io/debian-stable/jenkins.io.key | sudo tee \
  /usr/share/keyrings/jenkins-keyring.asc > /dev/null
echo deb [signed-by=/usr/share/keyrings/jenkins-keyring.asc] \
  https://pkg.jenkins.io/debian-stable binary/ | sudo tee \
  /etc/apt/sources.list.d/jenkins.list > /dev/null
ubuntu@ip-172-31-0-149:~$
```

i-0d3044263430cd16a (DevOps-Jenkins)

PublicIPs: 43.204.216.114   PrivateIPs: 172.31.0.149

```
Last login: Mon Feb 27 05:25:15 2023 from 13.233.177.5
ubuntu@ip-172-31-0-149:~$
ubuntu@ip-172-31-0-149:~$
ubuntu@ip-172-31-0-149:~$
ubuntu@ip-172-31-0-149:~$
ubuntu@ip-172-31-0-149:~$
ubuntu@ip-172-31-0-149:~$
ubuntu@ip-172-31-0-149:~$
ubuntu@ip-172-31-0-149:~$ curl -fsSL https://pkg.jenkins.io/debian-stable/jenkins.io.key | sudo tee \
  /usr/share/keyrings/jenkins-keyring.asc > /dev/null
echo deb [signed-by=/usr/share/keyrings/jenkins-keyring.asc] \
  https://pkg.jenkins.io/debian-stable binary/ | sudo tee \
  /etc/apt/sources.list.d/jenkins.list > /dev/null
ubuntu@ip-172-31-0-149:~$
ubuntu@ip-172-31-0-149:~$
ubuntu@ip-172-31-0-149:~$
ubuntu@ip-172-31-0-149:~$
ubuntu@ip-172-31-0-149:~$ sudo apt-get update
Hit:1 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy InRelease
0% [Waiting for headers] [Connecting to security.ubuntu.com (185.125.190.36)] [Connec
t:2 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates InRelease [119 kB]
                                    0% [2 InRelease 14.2 kB/119 kB 12%] [Waiting for headers] [Connecte
                                    Ign:3 https://pkg.jenkins.io/debian-stable binary/ InRelease
                                    Hit:4 https://pkg.jenkins.io/debian-stable binary/ Release
```

i-0d3044263430cd16a (DevOps-Jenkins)

PublicIPs: 43.204.216.114   PrivateIPs: 172.31.0.149

Installing Java:

```
ubuntu@ip-172-31-0-149:~$ sudo apt install openjdk-11-jre
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  openjdk-11-jre-headless
Suggested packages:
  libnss-mdns fonts-ipafont-gothic fonts-ipafont-mincho fonts-wqy-microhei | fonts-wqy-zenhei fonts-indic
The following packages will be upgraded:
  openjdk-11-jre openjdk-11-jre-headless
2 upgraded, 0 newly installed, 0 to remove and 36 not upgraded.
Need to get 41.8 MB of archives.
After this operation, 58.4 kB of additional disk space will be used.
Do you want to continue? [Y/n]
```

i-0d3044263430cd16a (DevOps-Jenkins)

PublicIPs: 43.204.216.114   PrivateIPs: 172.31.0.149

```
ubuntu@ip-172-31-0-149:~$ java -version
openjdk version "11.0.18" 2023-01-17
OpenJDK Runtime Environment (build 11.0.18+10-post-Ubuntu-0ubuntu122.04)
OpenJDK 64-Bit Server VM (build 11.0.18+10-post-Ubuntu-0ubuntu122.04, mixed mode, sharing)
ubuntu@ip-172-31-0-149:~$
```

i-0d3044263430cd16a (DevOps-Jenkins)

PublicIPs: 43.204.216.114   PrivateIPs: 172.31.0.149

Installing Jenkins:

```
ubuntu@ip-172-31-0-149:~$ sudo apt-get install jenkins
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
jenkins is already the newest version (2.375.3).
0 upgraded, 0 newly installed, 0 to remove and 38 not upgraded.
ubuntu@ip-172-31-0-149:~$
```

i-0d3044263430cd16a (DevOps-Jenkins)

PublicIPs: 43.204.216.114   PrivateIPs: 172.31.0.149

```
ubuntu@ip-172-31-0-149:~$ sudo systemctl enable jenkins
Synchronizing state of jenkins.service with SysV service script with /lib/systemd/systemd-sysv-install.
Executing: /lib/systemd/systemd-sysv-install enable jenkins
ubuntu@ip-172-31-0-149:~$
```

i-0d3044263430cd16a (DevOps-Jenkins)

PublicIPs: 43.204.216.114   PrivateIPs: 172.31.0.149

```
ubuntu@ip-172-31-0-149:~$ sudo systemctl start jenkins
ubuntu@ip-172-31-0-149:~$ sudo systemctl status jenkins
● jenkins.service - Jenkins Continuous Integration Server
     Loaded: loaded (/lib/systemd/system/jenkins.service; enabled; vendor preset: enabled)
     Active: active (running) since Fri 2023-03-03 13:41:02 UTC; 1min 42s ago
   Main PID: 2036 (java)
      Tasks: 40 (limit: 1143)
     Memory: 294.0M
        CPU: 16.763s
     CGroup: /system.slice/jenkins.service
             └─2036 /usr/bin/java -Djava.awt.headless=true -jar /usr/share/java/jenkins.war --webroot=/var/cache/jenkins/war --httpPort=8080

Mar 03 13:41:02 ip-172-31-0-149 jenkins[2036]:          at hudson.TcpSlaveAgentListener.<init>(TcpSlaveAgentListener.java:97)
Mar 03 13:41:02 ip-172-31-0-149 jenkins[2036]: Caused: java.net.BindException: Failed to listen on port 8080 because it's already in use.
Mar 03 13:41:02 ip-172-31-0-149 jenkins[2036]:          at hudson.TcpSlaveAgentListener.<init>(TcpSlaveAgentListener.java:99)
Mar 03 13:41:02 ip-172-31-0-149 jenkins[2036]:          at jenkins.model.Jenkins.launchTcpSlaveAgentListener(Jenkins.java:1330)
Mar 03 13:41:02 ip-172-31-0-149 jenkins[2036]:          at jenkins.model.Jenkins.<init>(Jenkins.java:1009)
Mar 03 13:41:02 ip-172-31-0-149 jenkins[2036]:          at hudson.model.Hudson.<init>(Hudson.java:86)
Mar 03 13:41:02 ip-172-31-0-149 jenkins[2036]:          at hudson.model.Hudson.<init>(Hudson.java:82)
Mar 03 13:41:02 ip-172-31-0-149 jenkins[2036]:          at hudson.WebAppMain$3.run(WebAppMain.java:247)
Mar 03 13:41:02 ip-172-31-0-149 jenkins[2036]: 2023-03-03 13:41:02.558+0000 [id=22]      INFO      hudson.lifecycle.Lifecycle#onReady: Jenkins is fully up and running
Mar 03 13:41:02 ip-172-31-0-149 systemd[1]: Started Jenkins Continuous Integration Server.
ubuntu@ip-172-31-0-149:~$
```
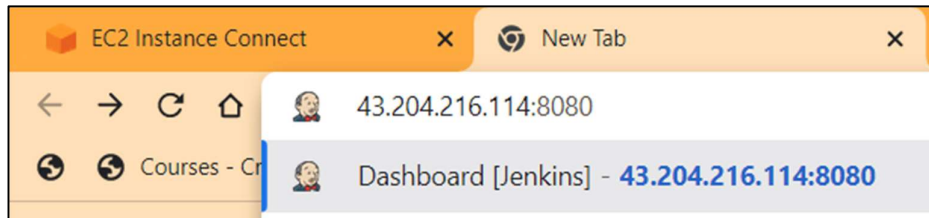
i-0d3044263430cd16a (DevOps-Jenkins)
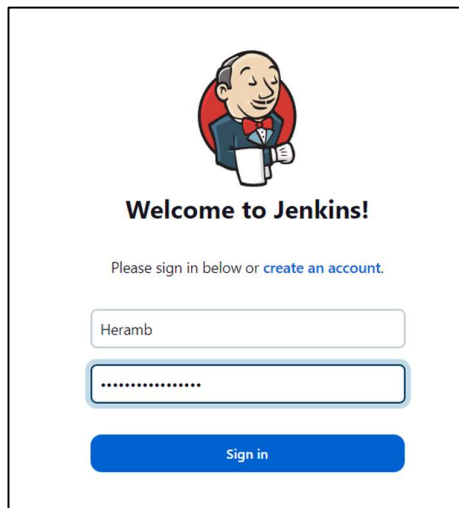PublicIPs: 43.204.216.114   PrivateIPs: 172.31.0.149

Accessing Virtual machine Through browser:
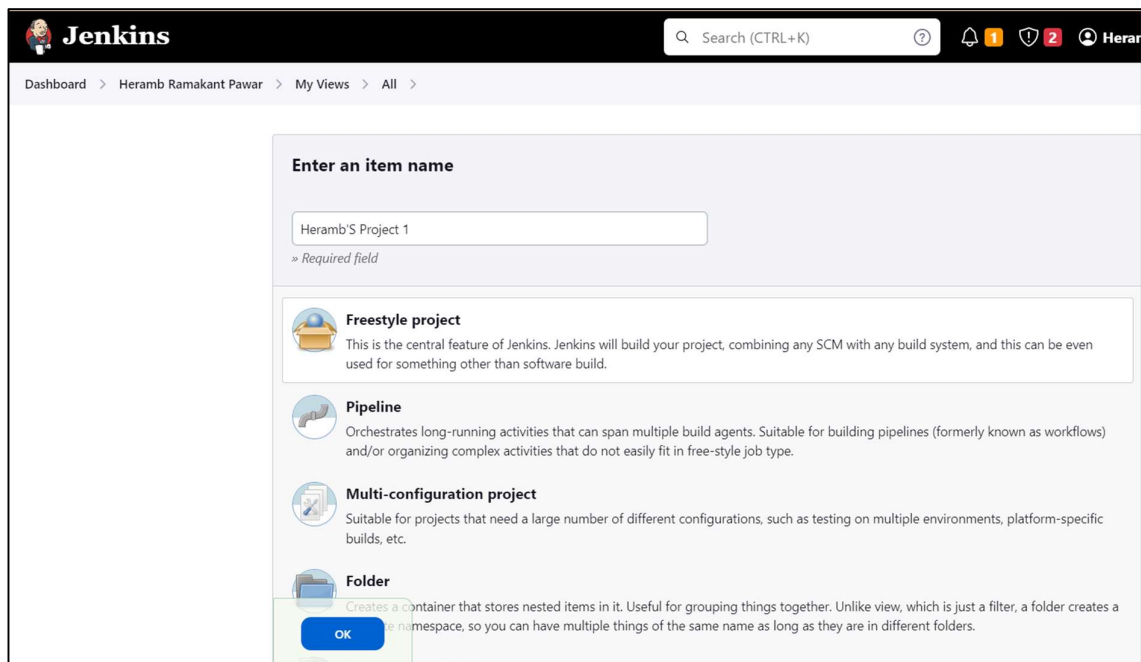
i-0d3044263430cd16a (DevOps-Jenkins)

PublicIPs: 43.204.216.114   PrivateIPs: 172.31.0.149

Jenkins Startup:

Creating First Project In Jenkins:

Jenkins

Search (CTRL+K)

Heramb Ramakant Pawar

log out

Configure

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

General

Enabled

Description

Hi this is my First Project on Jenkins

[Plain text] Preview

- [ ] Discard old builds ?
- [ ] GitHub project
- [ ] This project is parameterized ?
- [ ] Throttle builds ?
- [ ] Execute concurrent builds if necessary ?

Advanced...

Save   Apply

Jenkins

Search (CTRL+K)

- Status
- Changes
- Console Output
  - View as plain text
- Edit Build Information
- Delete build '#4'
- ← Previous Build

✓ Console Output

```
Started by user Heramb Ramakant Pawar
Running as SYSTEM
Building in workspace /var/lib/jenkins/workspace/Heramb'S Project 1
[Heramb'S Project 1] $ /bin/sh -xe /tmp/jenkins14787935132883631758.sh
+ echo Hello Heramb
Hello Heramb
Finished: SUCCESS
```