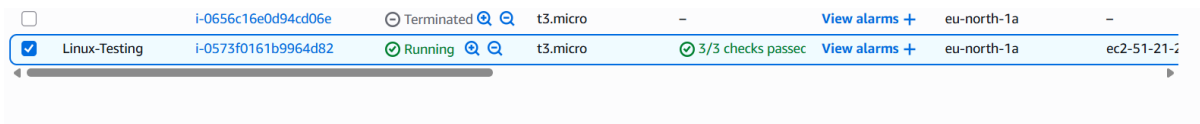


LINUX 03 (Class -03)

1. Launched one AWS ec2 and install Jenkins

Procedure: created server in AWS, searched EC2 then clicked launch, provided name Linux-testing, created key "linuxkey.pem". went download folder in windows opened gitbash.

Installed nginx after updating by using command 'sudo apt update -y', then paste path of ec2 in gitbash.



- Nginx installation using 'sudo apt install nginx'

```
Reading package lists... Done
root@ip-172-31-22-219:~# apt install nginx -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  nginx-common
Suggested packages:
  fcgiwrap nginx-doc ssl-cert
The following NEW packages will be installed:
  nginx nginx-common
0 upgraded, 2 newly installed, 0 to remove and 55 not upgraded.
Need to get 564 kB of archives.
After this operation, 1596 kB of additional disk space will be used.
Get:1 http://eu-north-1.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 nginx-common all 1.24.0-2ubuntu7.5 [43.4 kB]
Get:2 http://eu-north-1.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 nginx amd64 1.24.0-2ubuntu7.5 [520 kB]
Fetched 564 kB in 0s (21.7 MB/s)
Preconfiguring packages ...
Selecting previously unselected package nginx-common.
(Reading database ... 71718 files and directories currently installed.)
Preparing to unpack .../nginx-common_1.24.0-2ubuntu7.5_all.deb ...
Unpacking nginx-common (1.24.0-2ubuntu7.5) ...
Selecting previously unselected package nginx.
Preparing to unpack .../nginx_1.24.0-2ubuntu7.5_amd64.deb ...
Unpacking nginx (1.24.0-2ubuntu7.5) ...
Setting up nginx-common (1.24.0-2ubuntu7.5) ...
Created symlink /etc/systemd/system/multi-user.target.wants/nginx.service → /usr/lib/systemd/system/nginx.service.
Setting up nginx (1.24.0-2ubuntu7.5) ...
* Upgrading binary nginx
Processing triggers for man-db (2.12.0-4build2) ...
Processing triggers for ufw (0.36.2-6) ...
Scanning processes...
```

```
No user sessions are running outdated binaries.
No VM guests are running outdated hypervisor (qemu) binaries on this host.
root@ip-172-31-22-219:~# systemctl start nginx
root@ip-172-31-22-219:~# systemctl status nginx
● nginx.service - A high performance web server and a reverse proxy server
   Loaded: loaded (/usr/lib/systemd/system/nginx.service; enabled; preset: enabled)
   Active: active (running) since Thu 2025-10-30 13:51:43 UTC; 33s ago
     Docs: man:nginx(8)
    Process: 2825 ExecStartPre=/usr/sbin/nginx -t -q -g daemon on; master_process on; (code=exited, status=0/SUCCESS)
    Process: 2827 ExecStart=/usr/sbin/nginx -g daemon on; master_process on; (code=exited, status=0/SUCCESS)
   Main PID: 2857 (nginx)
      Tasks: 3 (limit: 1008)
     Memory: 2.4M (peak: 5.3M)
        CPU: 28ms
    CGroup: /system.slice/nginx.service
            └─2857 "nginx: master process /usr/sbin/nginx -g daemon on; master_process on;"
              └─2859 "nginx: worker process"
                └─2860 "nginx: worker process"

Oct 30 13:51:43 ip-172-31-22-219 systemd[1]: Starting nginx.service - A high performance web server and a reverse proxy server...
Oct 30 13:51:43 ip-172-31-22-219 systemd[1]: Started nginx.service - A high performance web server and a reverse proxy server.
root@ip-172-31-22-219:~#
```

- Ec2 connection evidence

```
root@ip-172-31-22-219:~# [[200~ssh -i "linuxkey.pem" ubuntu@ec2-51-21-224-224.eu-north-1.compute.amazonaws.com~
ssh: command not found
root@ip-172-31-22-219:~# ssh -i "linuxkey.pem" ubuntu@ec2-51-21-224-224.eu-north-1.compute.amazonaws.com
Warning: Identity file linuxkey.pem not accessible: No such file or directory.
ubuntu@ec2-51-21-224-224.eu-north-1.compute.amazonaws.com: Permission denied (publickey).
root@ip-172-31-22-219:~# pwd
/root
```

- Updated system using `sudo apt update -y` then install java using `sudo apt install openjdk-17-jdk -y`

```
ArjumandM@Arjumand MINGW64 ~/Downloads
$ ssh -i "linuxkey.pem" ubuntu@ec2-51-21-224-224.eu-north-1.compute.amazonaws.com
The authenticity of host 'ec2-51-21-224-224.eu-north-1.compute.amazonaws.com (51.21.224.224)' can't be established.
ED25519 key fingerprint is SHA256:TPb3jXueHBxQC25yURmmrN3HeZNI/gzavoZooiGvqQ.
This host key is known by the following other names/addresses:
  ~/.ssh/known_hosts:1: 51.21.224.224
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added 'ec2-51-21-224-224.eu-north-1.compute.amazonaws.com' (ED25519) to the list of known hosts.
Welcome to Ubuntu 24.04.3 LTS (GNU/Linux 6.14.0-1011-aws x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:       https://ubuntu.com/pro

System information as of Thu Oct 30 16:50:59 UTC 2025

System load:  0.08           Temperature:   -273.1 C
Usage of /:   42.1% of 6.71GB Processes:      116
Memory usage: 31%           Users logged in: 0
Swap usage:   0%            IPv4 address for ens5: 172.31.22.219

Expanded Security Maintenance for Applications is not enabled.

0 updates can be applied immediately.

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

*** System restart required ***
Last login: Thu Oct 30 13:28:51 2025 from 14.192.14.53
ubuntu@ip-172-31-22-219:~$ sudo apt update -y
Hit:1 http://eu-north-1.ec2.archive.ubuntu.com/ubuntu noble InRelease
Hit:2 http://eu-north-1.ec2.archive.ubuntu.com/ubuntu noble-updates InRelease
Hit:3 http://eu-north-1.ec2.archive.ubuntu.com/ubuntu noble-backports InRelease
Get:4 http://security.ubuntu.com/ubuntu noble-security InRelease [126 kB]
Ign:5 https://pkg.jenkins.io/debian-stable binary/ InRelease
Get:6 https://pkg.jenkins.io/debian-stable binary/ Release [2044 B]
Get:7 https://pkg.jenkins.io/debian-stable binary/ Release.gpg [833 B]
Ign:7 https://pkg.jenkins.io/debian-stable binary/ Release.gpg
Get:8 http://security.ubuntu.com/ubuntu noble-security/main amd64 Packages [1270 kB]
Reading package lists... Done
W: GPG error: https://pkg.jenkins.io/debian-stable binary/ Release: The following signatures couldn't be verified because the public key is not available: NO_PUBKEY
E: The repository 'https://pkg.jenkins.io/debian-stable binary/ Release' is not signed.
N: Updating from such a repository can't be done securely, and is therefore disabled by default.
N: See apt-secure(8) manpage for repository creation and user configuration details.
ubuntu@ip-172-31-22-219:~$ sudo apt install openjdk-17-jdk -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
openjdk-17-jdk is already the newest version (17.0.16+8-us1-0ubuntu1~24.04.1).
0 upgraded, 0 newly installed, 0 to remove and 1 not upgraded.
ubuntu@ip-172-31-22-219:~$ java -version
openjdk version "17.0.16" 2025-07-15
OpenJDK Runtime Environment (build 17.0.16+8-Ubuntu-0ubuntu124.04.1)
OpenJDK 64-Bit Server VM (build 17.0.16+8-Ubuntu-0ubuntu124.04.1, mixed mode, sharing)
```

- Then installed all jenkins packages by visiting site pkg.jenkins.io and installed all the packages from there then enter `sudo apt install Jenkins -y` and checked with `'sudo systemctl status jenkins'`

```
Preparing to unpack .../net-tools_2.10-0ubuntu4.4_amd64.deb ...
Unpacking net-tools (2.10-0ubuntu4.4) ...
Selecting previously unselected package jenkins.
Preparing to unpack .../jenkins_2.528.1_all.deb ...
Unpacking jenkins (2.528.1) ...
Setting up net-tools (2.10-0ubuntu4.4) ...
Setting up jenkins (2.528.1) ...
Created symlink /etc/systemd/system/multi-user.target.wants/jenkins.service → /usr/lib/systemd/system/jenkins.service.
Processing triggers for man-db (2.12.0-4build2) ...
Scanning processes...
Scanning candidates...
Scanning linux images...

Pending kernel upgrade!
Running kernel version:
  6.14.0-1011-aws
Diagnostics:
  The currently running kernel version is not the expected kernel version 6.14.0-1016-aws.

Restarting the system to load the new kernel will not be handled automatically, so you should consider rebooting.

Restarting services...

Service restarts being deferred:
/etc/needrestart/restart.d/bus.service
systemctl restart getty@tty1.service
systemctl restart networkd-dispatcher.service
systemctl restart serial-getty@tty0.service
systemctl restart systemd-logind.service
systemctl restart unattended-upgrades.service

No containers need to be restarted.

No user sessions are running outdated binaries.

No VM guests are running outdated hypervisor (qemu) binaries on this host.
ubuntu@ip-172-31-22-219:~$ sudo systemctl status jenkins
● jenkins.service - Jenkins Continuous Integration Server
   Loaded: loaded (/usr/lib/systemd/system/jenkins.service; enabled; preset: enabled)
   Active: active (running) since Thu 2025-10-30 16:59:46 UTC; 1min 15s ago
     Main PID: 18975 (java)
       Tasks: 38 (limit: 1008)
      Memory: 284.8M (peak: 313.7M)
         CPU: 20.460s
      CGroup: /system.slice/jenkins.service
              └─18975 /usr/bin/java -Djava.awt.headless=true -jar /usr/share/java/jenkins.war --webroot=/var/cache/jenkins/war --httpPort=8080

Oct 30 16:59:40 ip-172-31-22-219 jenkins[18975]: [LF]> This may also be found at: /var/lib/jenkins/secrets/initialAdminPassword
Oct 30 16:59:40 ip-172-31-22-219 jenkins[18975]: [LF]>
Oct 30 16:59:40 ip-172-31-22-219 jenkins[18975]: [LF]> *****
Oct 30 16:59:40 ip-172-31-22-219 jenkins[18975]: [LF]> *****
Oct 30 16:59:46 ip-172-31-22-219 jenkins[18975]: 2025-10-30 16:59:46.732+0000 [id=33] INFO jenkins.InitReactorRunner$1:onAttained: Completed initialization
Oct 30 16:59:46 ip-172-31-22-219 jenkins[18975]: 2025-10-30 16:59:46.765+0000 [id=23] INFO hudson.lifecycle.Lifecycle:LifecycleReady: Jenkins is fully up and running
Oct 30 16:59:46 ip-172-31-22-219 systemd[1]: Started jenkins.service - Jenkins Continuous Integration Server.
Oct 30 16:59:47 ip-172-31-22-219 jenkins[18975]: 2025-10-30 16:59:47.577+0000 [id=49] INFO hudson.DownloadService$Downloadable$load: Obtained the updated data file for hudson.tasks.Reven MavenInstal
Oct 30 16:59:47 ip-172-31-22-219 jenkins[18975]: 2025-10-30 16:59:47.577+0000 [id=49] INFO hudson.util.Retrier$start: Performed the action check updates server successfully at the attempt #1

lines 1-20/20 (END)
```

2. Setup Apache tomcat on ubuntu virtual machine

Steps: Downloaded & extracted Tomcat

```
sudo tar -xvzf apache-tomcat-10.1.14.tar.gz -C /opt/
```

Gave permission

```
sudo chown -R $USER:$USER /opt/tomcat
```

Started Tomcat server

```
cd /opt/tomcat/bin
```

```
./startup.sh
```

Verified running process

```
ps aux | grep tomcat
```

Result: Apache Tomcat successfully installed and running on port 8080

```
apache-tomcat-10.1.14/bin/Shutdown.sh
apache-tomcat-10.1.14/bin/startup.sh
apache-tomcat-10.1.14/bin/tool-wrapper.sh
apache-tomcat-10.1.14/bin/version.sh
ubuntu@ip-172-31-22-218:/opt$ sudo mv apache-tomcat-10.1.14 tomcat
ubuntu@ip-172-31-22-218:/opt$ sudo chown -R $USER:$USER /opt/tomcat
ubuntu@ip-172-31-22-218:/opt$ cd /opt/tomcat/bin
./startup.sh
Using CATALINA_BASE:   /opt/tomcat
Using CATALINA_HOME:   /opt/tomcat
Using CATALINA_TMPDIR:  /opt/tomcat/temp
Using JRE_HOME:        /usr
Using CLASSPATH:        /opt/tomcat/bin/bootstrap.jar:/opt/tomcat/bin/tomcat-juli.jar
Using CATALINA_OPTS:
Tomcat started.
ubuntu@ip-172-31-22-218:/opt/tomcat/bin$ ls -la /var/lib/jenkins
total 16
drwxr-xr-x 2 root root 4096 Dec 22 14:45 .
drwxr-xr-x 1 root root 4096 Dec 22 14:45 ..
-rw-r--r-- 1 root root 1024 Dec 22 14:45 jenkins.model.JenkinsController.war
-rw-r--r-- 1 root root 1024 Dec 22 14:45 jenkins.model.JenkinsController.war.plugins
-rw-r--r-- 1 root root 1024 Dec 22 14:45 jenkins.model.JenkinsController.war.plugins.secret.key.secret.key.not-so-secret.secrets
-rw-r--r-- 1 root root 1024 Dec 22 14:45 jenkins.model.JenkinsController.war.plugins.userContent.users
ubuntu@ip-172-31-22-218:/opt/tomcat/bin$ sudo cat /var/lib/jenkins/secrets/initialAdminPassword
1344162444f2c89627244570e
ubuntu@ip-172-31-22-218:/opt/tomcat/bin$ ps aux | grep tomcat
Command 'tomcat' not found, did you mean:
Command 'tomcat' from deb tomcat (4.5-3)
Try: sudo apt install 
ubuntu@ip-172-31-22-218:/opt/tomcat/bin$ ps aux | grep tomcat
error: process ID list syntax error
Usage:
ps [options]
Try 'ps --help '
or 'ps --help '
for additional help text.
For more details see ps(1).
ubuntu@ip-172-31-22-218:/opt/tomcat/bin$ ps aux | grep tomcat
root      18837  0.2 10.4 277392 87602 ?        Ssl  17:53   0:10 /usr/bin/java -Djava.util.logging.config.file=/opt/apache-tomcat-10.1.14/conf/logging.properties -Djava.util.logging.manager=org.apache.juli.ClassLoaderLogManager -Djdk.tls.ssemmakerAlgorithmSize=2048 -Djava.protocol.handler.pkcs=org.apache.catalina.webresources -Dorg.apache.catalina.security.SecurityListener=IMDS002 --add-opens=java.base/java.lang=ALL-UNNAMED --add-opens=java.base/java.lang.reflect=ALL-UNNAMED --add-opens=java.base/java.sql=ALL-UNNAMED --add-opens=java.base/java.util.concurrent=ALL-UNNAMED --add-opens=java.naming=ALL-UNNAMED --add-opens=java.rmi.transport=ALL-UNNAMED -classpath /opt/apache-tomcat-10.1.14/bin/bootstrap.jar:/opt/apache-tomcat-10.1.14/bin/tomcat-juli.jar -Dcatalina.base=/opt/apache-tomcat-10.1.14 -Dcatalina.home=/opt/apache-tomcat-10.1.14 -Djava.io.tmpdir=/opt/apache-tomcat-10.1.14/temp org.apache.catalina.startup.Bootstrap start
ubuntu      21154  0.0  0.2  7036  2120 pts/0    Ss   19:06   0:00 grep --color=auto tomcat
ubuntu@ip-172-31-22-218:/opt/tomcat/bin$ ./startup.sh
Using CATALINA_BASE:   /opt/tomcat
Using CATALINA_HOME:   /opt/tomcat
Using CATALINA_TMPDIR:  /opt/tomcat/temp
Using JRE_HOME:        /usr
Using CLASSPATH:        /opt/tomcat/bin/bootstrap.jar:/opt/tomcat/bin/tomcat-juli.jar
Using CATALINA_OPTS:
Tomcat started.
```

Steps Followed in AWS & Browser

Created an EC2 Instance

Launched an Ubuntu instance in AWS.

Selected key pair (linuxkey.pem) for SSH access.

Edited Inbound Rules

Opened port 8080 (for Jenkins/Tomcat) and port 22 (for SSH).

Saved the security group changes.

Connected to EC2 from Git Bash

```
ssh -i "linuxkey.pem" ubuntu@<public-ip>
```

Installed Java and Jenkins

Installed Java (required for Jenkins).

Installed Jenkins and started the Jenkins service.

Accessed Jenkins in Browser

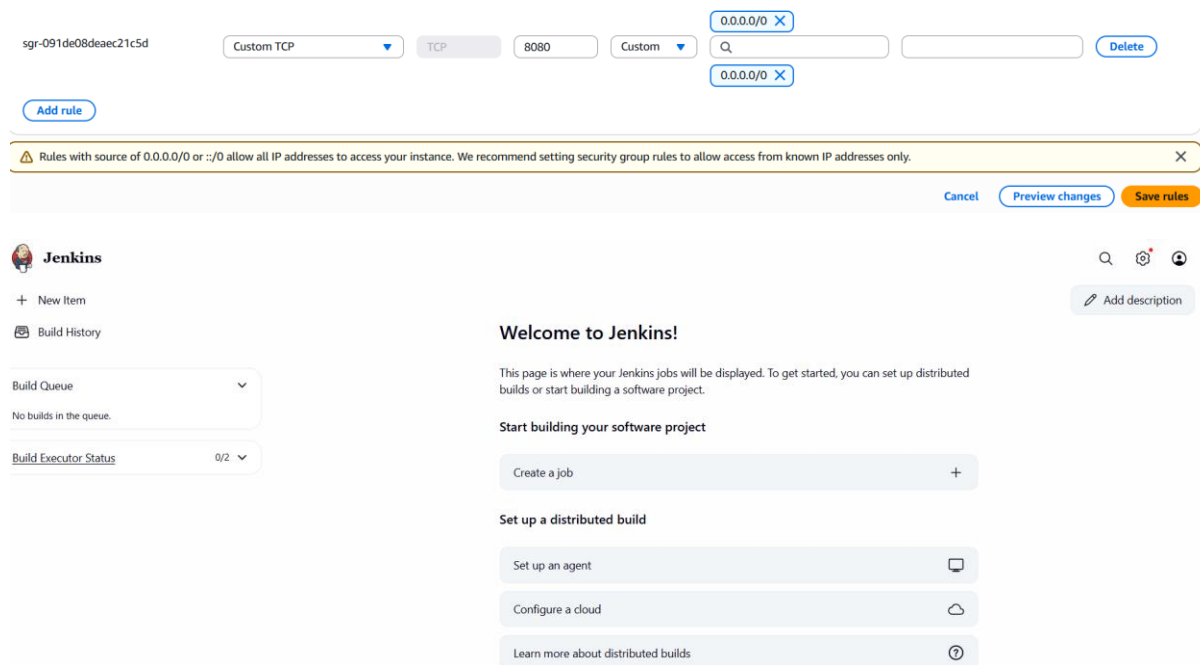
Opened `http://<public-ip>:8080` in browser.

Entered the initial admin password (from terminal).

Completed Jenkins Setup

Clicked “Install suggested plugins.”

Created admin user (entered name, username, password).



3. Downloaded docker, successfully installed and opened on windows system.

