# 1. Setup a virtual machine using Ubuntu image.

- Go to: https://ubuntu.com/download/desktop
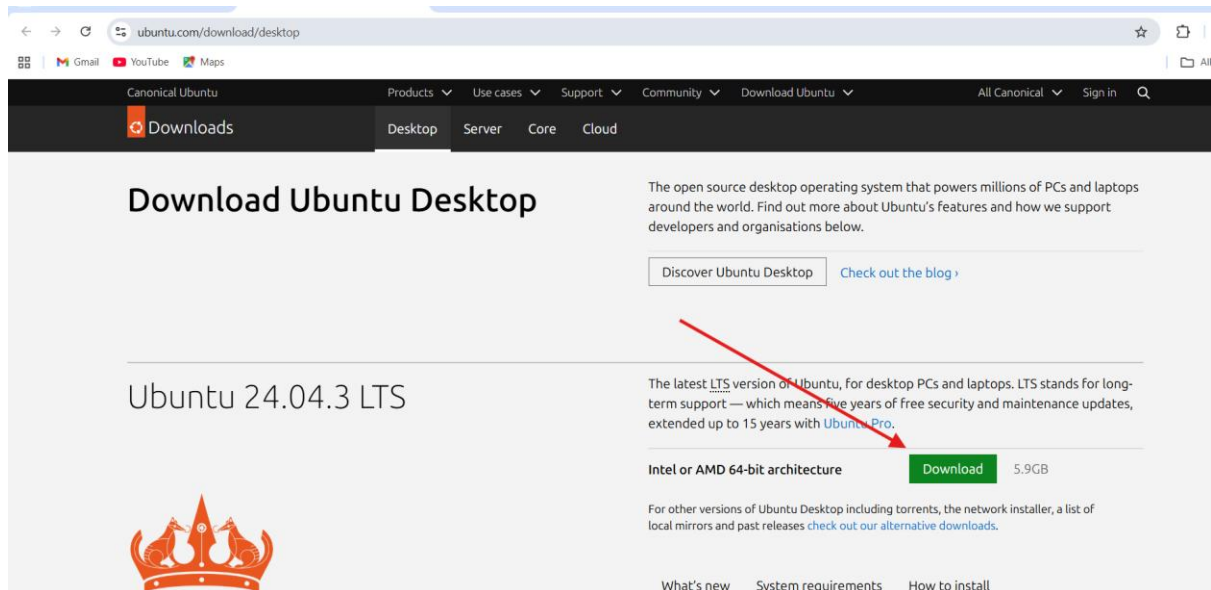


- Download and install from: https://www.virtualbox.org
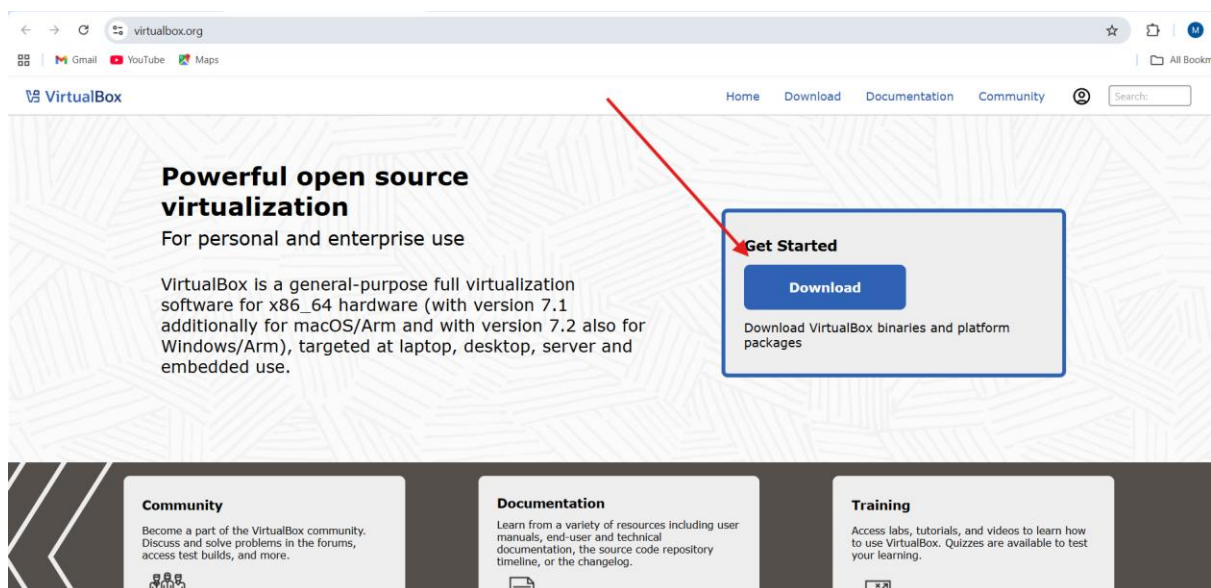


- Create new virtual machine

Open VirtualBox → **New**

 Name: Ubuntu-VM

 Type: **Linux**
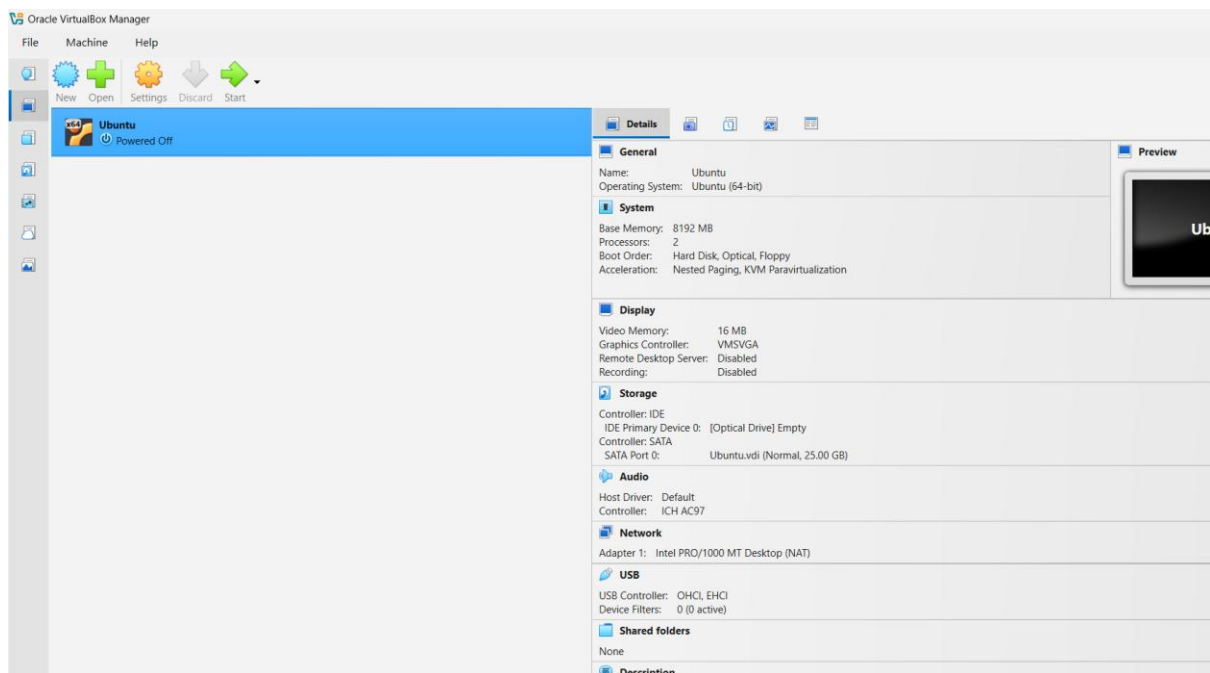
Version: **Ubuntu (64-bit)**

Memory: **4096 MB (4 GB)** recommended
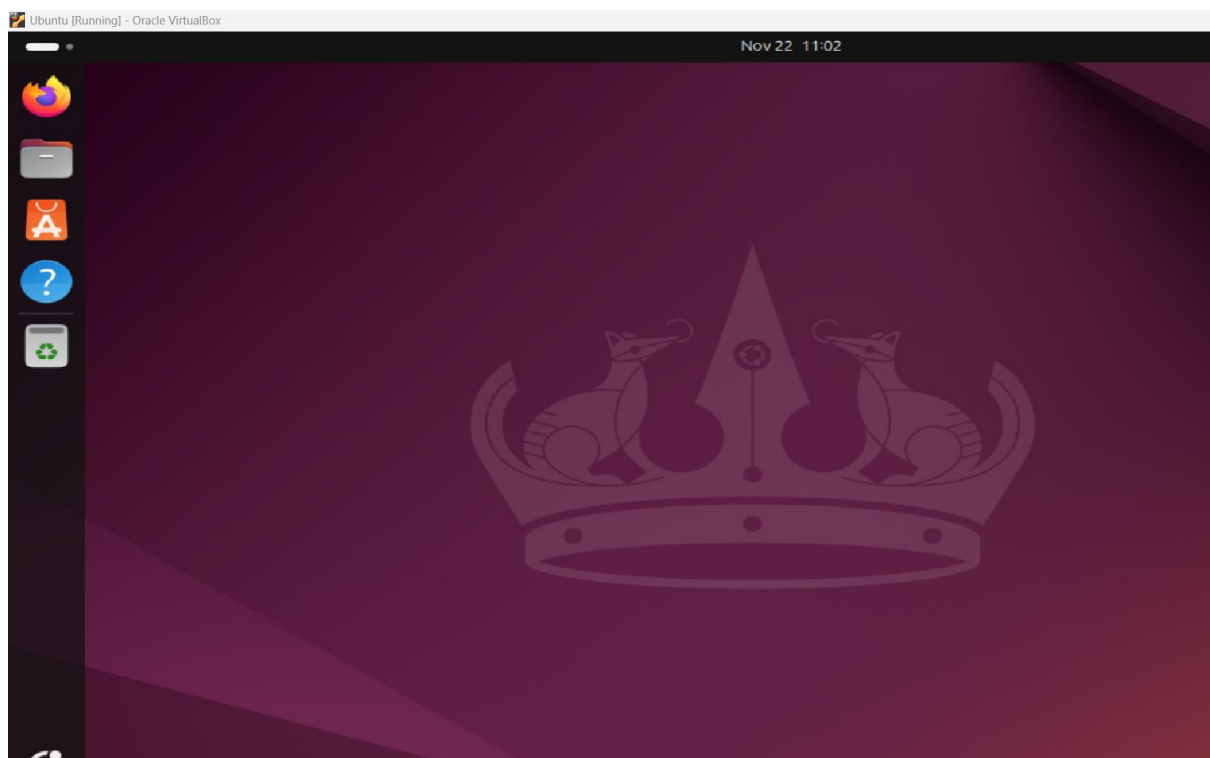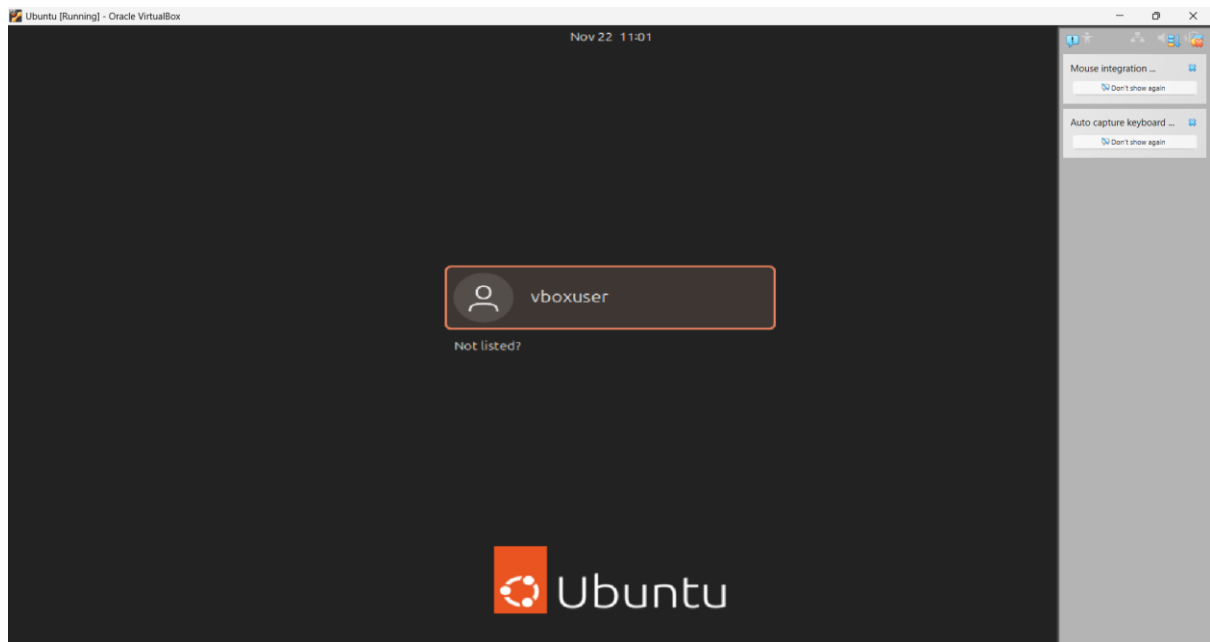
Hard Disk:

- Create new VDI disk
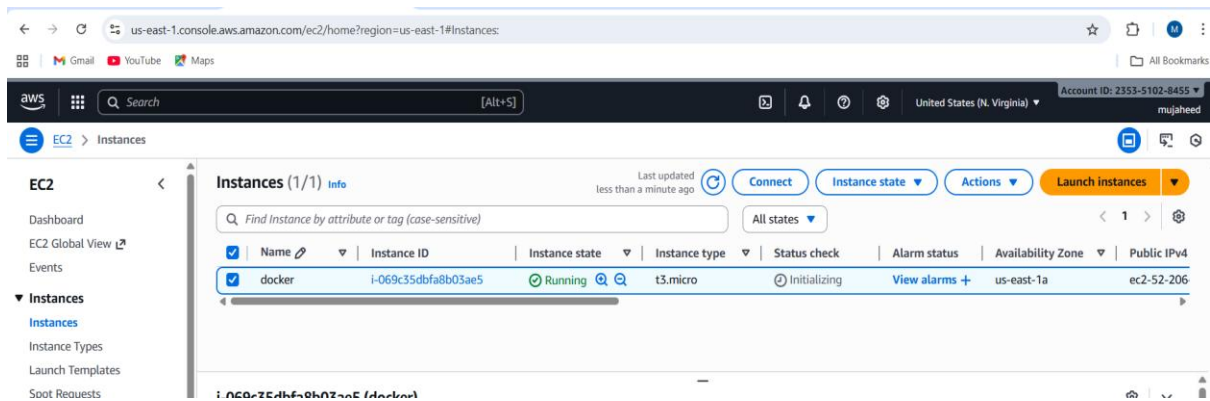- Size: **20–40 GB** (dynamically allocated)

Start ubuntu:

- Click on start
- Create username and password

## 2. Install docker on ec2.

Create an ec2 instance named as docker.

Open docker instance and install docker by using

- yum install docker -y

```
[root@ip-172-31-94-153 ~]# yum install docker -y
Amazon Linux 2023 Kernel Livepatch repository
Dependencies resolved.
================================================================================
 Package                     Architecture        Version
================================================================================
Installing:
 docker                      x86_64              25.0.13-1.amzn2
Installing dependencies:
 container-selinux           noarch              4:2.242.0-1.amz
 containerd                  x86_64              2.1.4-1.amzn202
 iptables-libs               x86_64              1.8.8-3.amzn202
 iptables-nft                x86_64              1.8.8-3.amzn202
 libcgroup                   x86_64              3.0-1.amzn2023.
 libnetfilter_conntrack      x86_64              1.0.8-2.amzn202
 libnfnetlink                x86_64              1.0.1-19.amzn20
 libnftnl                    x86_64              1.2.2-2.amzn202
 pigz                        x86_64              2.5-1.amzn2023.
 runc                        x86_64              1.3.3-2.amzn202

Transaction Summary
================================================================================
Install  11 Packages

Total download size: 74 M
Installed size: 280 M
Downloading Packages:
(1/11): container-selinux-2.242.0-1.amzn2023.noarch.rpm
(2/11): iptables-libs-1.8.8-3.amzn2023.0.2.x86_64.rpm
```

**3. Pull 5 docker images. (nginx, Apache tomcat, ubuntu, Jenkins, SonarQube)**

- systemctl start docker
- docker pull nginx
- docker pull tomcat
- docker pull ubuntu
- docker pull jenkins:2.60.3
- docker pull sonarqube

```
[root@ip-172-31-94-153 ~]# systemctl start docker
[root@ip-172-31-94-153 ~]# docker pull nginx
Using default tag: latest
latest: Pulling from library/nginx
0e4bc2bd6656: Pull complete
b5feb73171bf: Pull complete
108ab8292820: Pull complete
53d743880af4: Pull complete
77fa2eb06317: Pull complete
192e2451f875: Pull complete
de57a609c9d5: Pull complete
Digest: sha256:553f64aecdc31b5bf944521731cd70e35da4faed96b2b7548a3d8e2598c52a42
Status: Downloaded newer image for nginx:latest
docker.io/library/nginx:latest
[root@ip-172-31-94-153 ~]#
```

```
[root@ip-172-31-94-153 ~]# docker pull tomcat
Using default tag: latest
latest: Pulling from library/tomcat
20043066d3d5: Pull complete
627c55a201a9: Pull complete
378e3a6f165e: Pull complete
4f4fb700ef54: Pull complete
901b8cfcfda7: Pull complete
bf838a1c9d58: Pull complete
73925432dbfd: Pull complete
Digest: sha256:3d41d69cc052d14ed03211520d15a6391e426cecc041b66715b4e32710bf4f72
Status: Downloaded newer image for tomcat:latest
docker.io/library/tomcat:latest
```

```
[root@ip-172-31-94-153 ~]# docker pull jenkins
Using default tag: latest
Error response from daemon: manifest for jenkins:latest not found: m
[root@ip-172-31-94-153 ~]# docker pull jenkins:2.60.3
2.60.3: Pulling from library/jenkins
55cbf04beb70: Pull complete
1607093a898c: Pull complete
9a8ea045c926: Pull complete
d4eee24d4dac: Pull complete
c58988e753d7: Pull complete
794a04897db9: Pull complete
70fcfa476f73: Pull complete
0539c80a02be: Pull complete
54fefc6dcf80: Pull complete
911bc90e47a8: Pull complete
38430d93efed: Pull complete
7e46ccda148a: Pull complete
c0cbcb5ac747: Pull complete
35ade7a86a8e: Pull complete
aa433a6a56b1: Pull complete
841c1dd38d62: Pull complete
b865dcb08714: Pull complete
5a3779030005: Pull complete
12b47c68955c: Pull complete
1322ea3e7bfd: Pull complete
Digest: sha256:eeb4850eb65f2d92500e421b430ed1ec58a7ac909e91f518926e0
Status: Downloaded newer image for jenkins:2.60.3
docker.io/library/jenkins:2.60.3
```

```
[root@ip-172-31-94-153 ~]# docker pull sonarqube
Using default tag: latest
latest: Pulling from library/sonarqube
20043066d3d5: Already exists
f878172f1ac3: Pull complete
0b92fa77023f: Pull complete
1321ce5b3e3a: Pull complete
4a0e444f3c26: Pull complete
f0e656fd3d7c: Pull complete
8fd6319e1acb: Pull complete
4f4fb700ef54: Pull complete
Digest: sha256:48dd0e946ad6481dde43bb31d1a7af09c22f59be6399b195dc0
Status: Downloaded newer image for sonarqube:latest
docker.io/library/sonarqube:latest
```
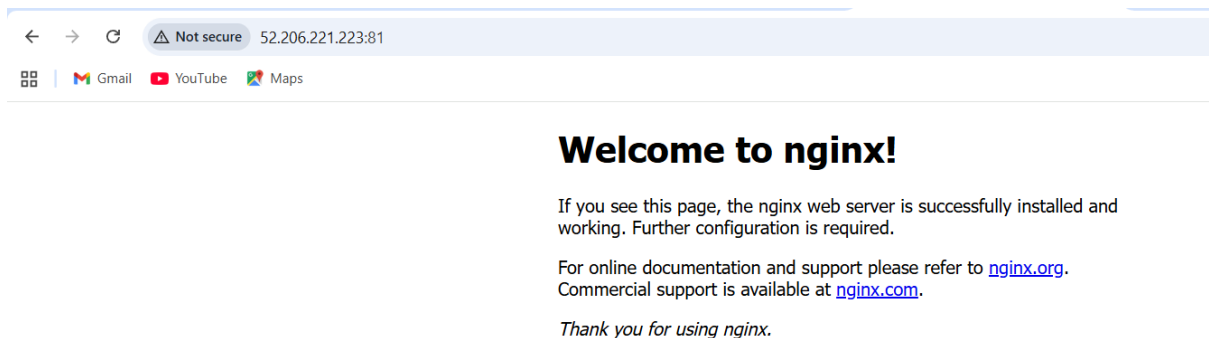
- docker images

```
[root@ip-172-31-94-153 ~]# docker images
REPOSITORY     TAG        IMAGE ID        CREATED         SIZE
nginx          latest     60adc2e137e7    4 days ago      152MB
tomcat         latest     391829227220    8 days ago      412MB
sonarqube      latest     d6e7a271e8d1    8 days ago      1.22GB
ubuntu         latest     c3a134f2ace4    5 weeks ago     78.1MB
jenkins        2.60.3     cd14cecfdb3a    7 years ago     696MB
[root@ip-172-31-94-153 ~]#
```

## 4. Run nginx container and expose on port 81.

* docker run -d -p 81:80 nginx

```
[root@ip-172-31-94-153 ~]# docker run -d -p 81:80 nginx
588ed5808de179d7845e2bef406fa041b2a9491d98019e6e33913ea3adb65cef
[root@ip-172-31-94-153 ~]# 
```

Not secure  52.206.221.223:81

Gmail    YouTube    Maps

**Welcome to nginx!**

If you see this page, the nginx web server is successfully installed and working. Further configuration is required.

For online documentation and support please refer to nginx.org.
Commercial support is available at nginx.com.

*Thank you for using nginx.*

## 5. Delete the Apache tomcat image from local.

* docker images

* docker rmi tomcat/image_id

* docker images

```
[root@ip-172-31-94-153 ~]# docker images
REPOSITORY      TAG         IMAGE ID        CREATED         SIZE
nginx           latest      60adc2e137e7    4 days ago      152MB
tomcat          latest      391829227220    8 days ago      412MB
sonarqube       latest      d6e7a271e8d1    8 days ago      1.22GB
ubuntu          latest      c3a134f2ace4    5 weeks ago     78.1MB
jenkins         2.60.3      cd14cecfdb3a    7 years ago     696MB
[root@ip-172-31-94-153 ~]# docker rmi tomcat
Untagged: tomcat:latest
Untagged: tomcat@sha256:3d41d69cc052d14ed03211520d15a6391e426cecc041b66715b4e32710bf4f72
Deleted: sha256:391829227220213970a4f0ed126ac656beeb22fea6ce494d92da22ada4faa573
Deleted: sha256:9c4f63c83deb4b167ede2bf26d386d15e9f6c36061685ff8cd7899ff3a70dd7f
Deleted: sha256:4dc5aa8cf2af2b063f7b1d47c3c73487ba1ab5b1a0fd4779c9b45a075541eb43
Deleted: sha256:c363a86be80f380e04f80b16eab44a293b1dec802a5644f5ad085847babc8749
Deleted: sha256:7bfd2675f18277f04e48c7e95fc2e1845e8b0088f0ee673b592c167e5d1ab938
Deleted: sha256:32e6f3850b416c8a0c10edcbe3e421f4ff13629a708e41ca8ed27b4000bdc0dd
Deleted: sha256:9ecc724c90ec7e3cf102b7f859abbee7ca2e16bd4713a98c46a75c3b29af312d
Deleted: sha256:11ddc12ca0f0de4760e1e3a0b18a0020b4d3f4e6a470394478e0997537adc542
Deleted: sha256:861e86e35eb54cc284ba33f897fa359c2f87fd6ab2790d37e8b29056e2067502
[root@ip-172-31-94-153 ~]# docker images
REPOSITORY      TAG         IMAGE ID        CREATED         SIZE
nginx           latest      60adc2e137e7    4 days ago      152MB
sonarqube       latest      d6e7a271e8d1    8 days ago      1.22GB
ubuntu          latest      c3a134f2ace4    5 weeks ago     78.1MB
jenkins         2.60.3      cd14cecfdb3a    7 years ago     696MB
[root@ip-172-31-94-153 ~]#
```

# 6. Inspect the Jenkins image, SonarQube image.

* docker image inspect Jenkins:2.60.3

```
[root@ip-172-31-94-153 ~]# docker images
REPOSITORY      TAG         IMAGE ID        CREATED         SIZE
nginx           latest      60adc2e137e7    4 days ago      152MB
sonarqube       latest      d6e7a271e8d1    8 days ago      1.22GB
ubuntu          latest      c3a134f2ace4    5 weeks ago     78.1MB
jenkins         2.60.3      cd14cecfdb3a    7 years ago     696MB
[root@ip-172-31-94-153 ~]# docker image inspect jenkins:2.60.3
[
    {
        "Id": "sha256:cd14cecfdb3a657ba7d05bea026e7ac8b9abafc6e5c66253ab327c7211fa6
        "RepoTags": [
            "jenkins:2.60.3"
        ],
        "RepoDigests": [
            "jenkins@sha256:eeb4850eb65f2d92500e421b430ed1ec58a7ac909e91f518926e024
        ],
        "Parent": "",
        "Comment": "",
        "Created": "2018-07-17T16:20:34.183816595Z",
        "Container": "a3e3890f6333066d464113032a93622a8a12305fa1cf7a29e57ad29cbde66
        "ContainerConfig": {
            "Hostname": "a3e3890f6333",
```

- docker image inspect sonarqube

```
[root@ip-172-31-94-153 ~]# docker image inspect sonarqube
[
    {
        "Id": "sha256:d6e7a271e8d12ef26636b186ee43184efec6ac3b63995f0583c2337
        "RepoTags": [
            "sonarqube:latest"
        ],
        "RepoDigests": [
            "sonarqube@sha256:48dd0e946ad6481dde43bb31d1a7af09c22f59be6399b19
        ],
        "Parent": "",
        "Comment": "buildkit.dockerfile.v0",
        "Created": "2025-11-14T00:39:38.776449354Z",
        "Container": "",
        "ContainerConfig": {
            "Hostname": "",
            "Domainname": "",
            "User": "",
            "AttachStdin": false,
            "AttachStdout": false,
            "AttachStderr": false,
            "Tty": false,
            "OpenStdin": false,
            "StdinOnce": false,
            "Env": null
```

## 7. Run Jenkins container and run one sample job.

To run Jenkins container.

- docker run -d --name jenkins \
  -p 8080:8080 -p 50000:50000 \
  -v jenkins_home:/var/jenkins_home \
  jenkins/jenkins:lts
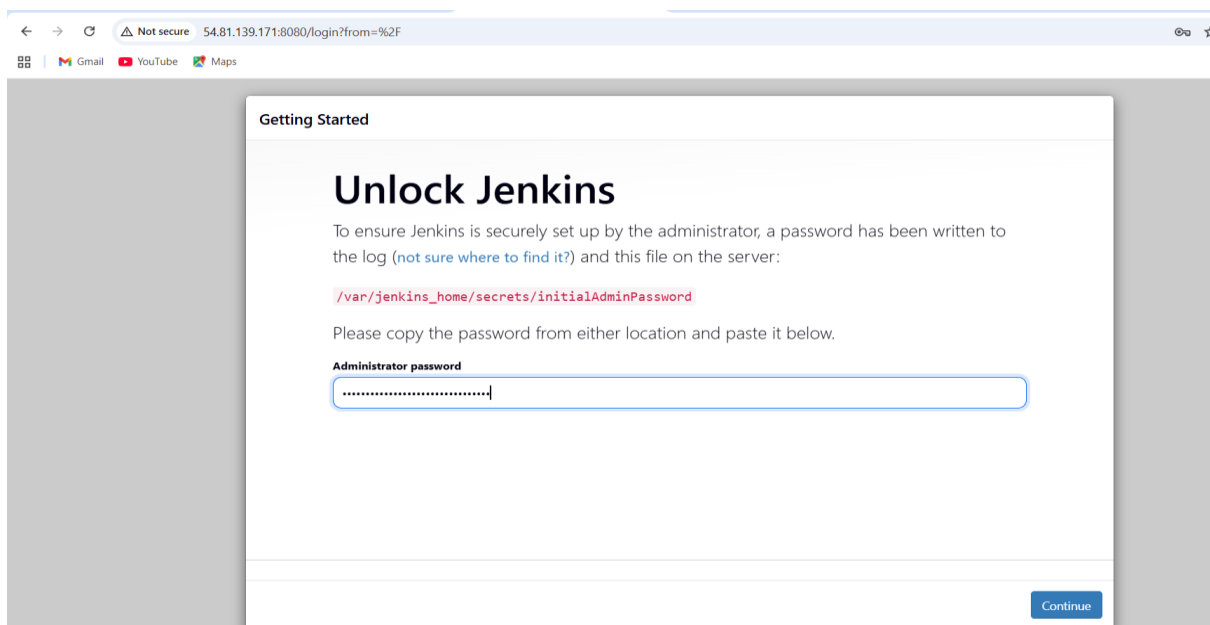
```
[root@ip-172-31-88-66 ~]# docker run -d --name jenkins \
  -p 8080:8080 -p 50000:50000 \
  -v jenkins_home:/var/jenkins_home \
  jenkins/jenkins:lts
Unable to find image 'jenkins/jenkins:lts' locally
lts: Pulling from jenkins/jenkins
13cc39f8244a: Pull complete
dc2a77f462ea: Pull complete
33300af18dd0: Pull complete
c27509c3e53b: Pull complete
e4beac64dffa: Pull complete
a37b858bb47a: Pull complete
744b4792e083: Pull complete
05a7d9a8b608: Pull complete
8d2a75b252b2: Pull complete
65e4ba8066bc: Pull complete
5dc07232677a: Pull complete
7718ff514022: Pull complete
Digest: sha256:7b1c378278279c8688efd6168c25a1c2723a6bd6f0420beb5ccefabee3cc3bb1
Status: Downloaded newer image for jenkins/jenkins:lts
3e5ea6357c5dcc24f0044cdea11146715c3f64fe31b778b777b51d4012ff0540
[root@ip-172-31-88-66 ~]#
```

Get intial admin password

- docker exec -it jenkins cat
  /var/jenkins_home/secrets/initialAdminPassword

```
[root@ip-172-31-88-66 ~]# docker exec -it jenkins cat /var/jenkins_home/secrets/initialAdminPassword
9379cbc19a864882b5ca31261b27729a
[root@ip-172-31-88-66 ~]#
```

Login with public ip with port number 8080
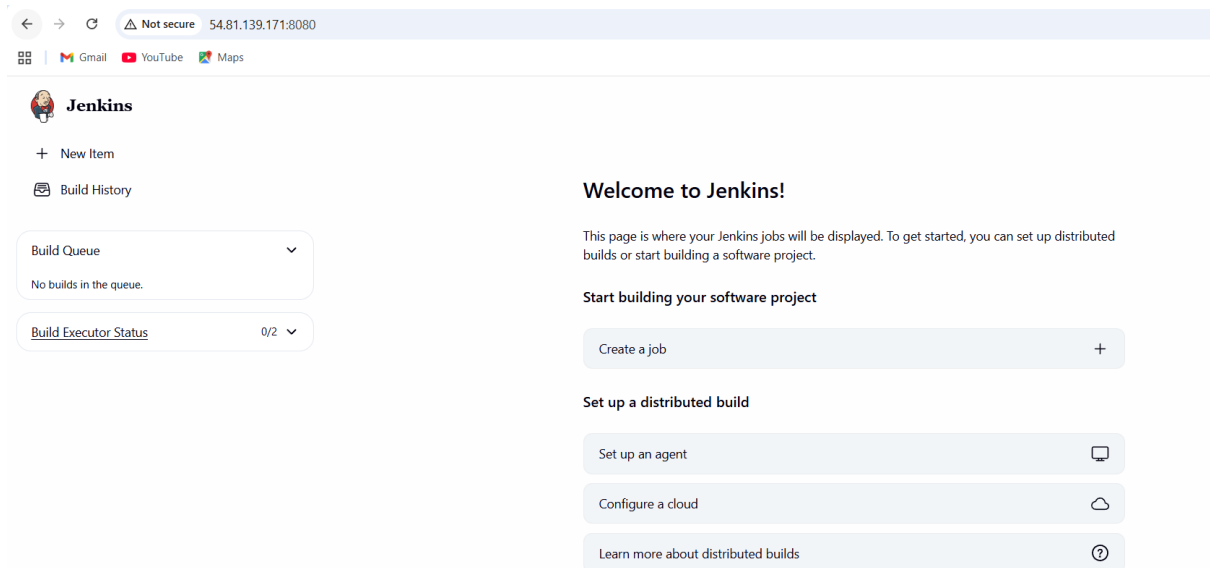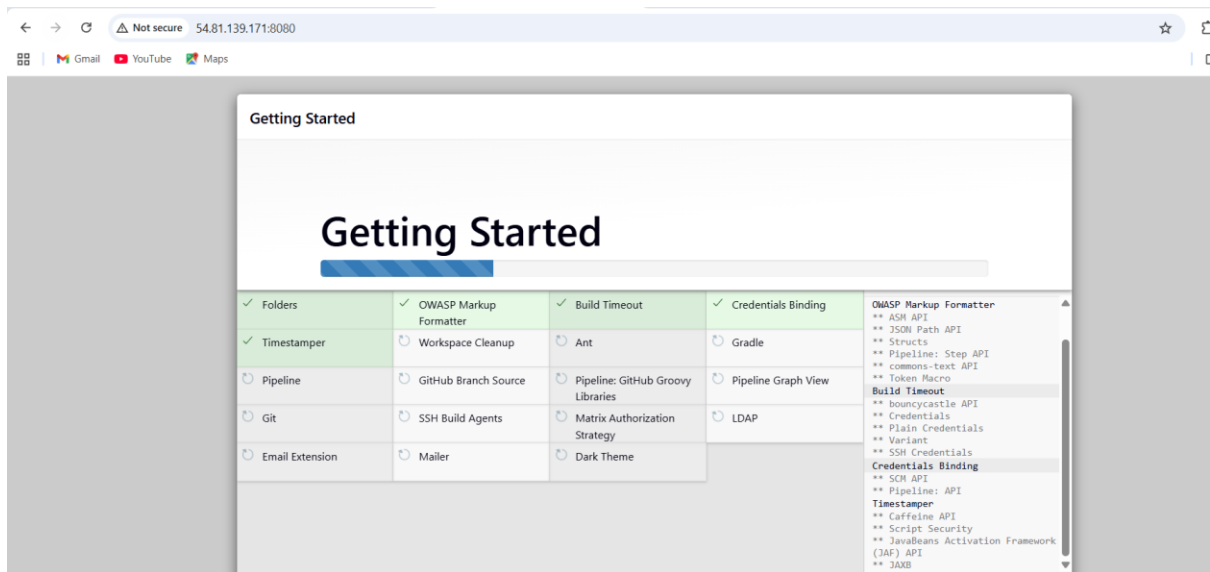
Click on create new job, give the name and select free style project as type.

Go to build steps and click execute shell give the text – echo "Hello from Jenkins Demo Job"

Click on save and click on build now.

**Jenkins** / sample-job ⌄ / #1 ⌄ / Console Output

- Status
- Changes
- Console Output
- Edit Build Information
- Delete build '#1'
- Timings

✓ **Console Output**

```
Started by user SHAIK MOHAMMAD MUJAHEED
Running as SYSTEM
Building in workspace /var/jenkins_home/workspace/sample-job
[sample-job] $ /bin/sh -xe /tmp/jenkins10577817402241334150.sh
+ echo Hello from Jenkins Demo Job
Hello from Jenkins Demo Job
Finished: SUCCESS
```