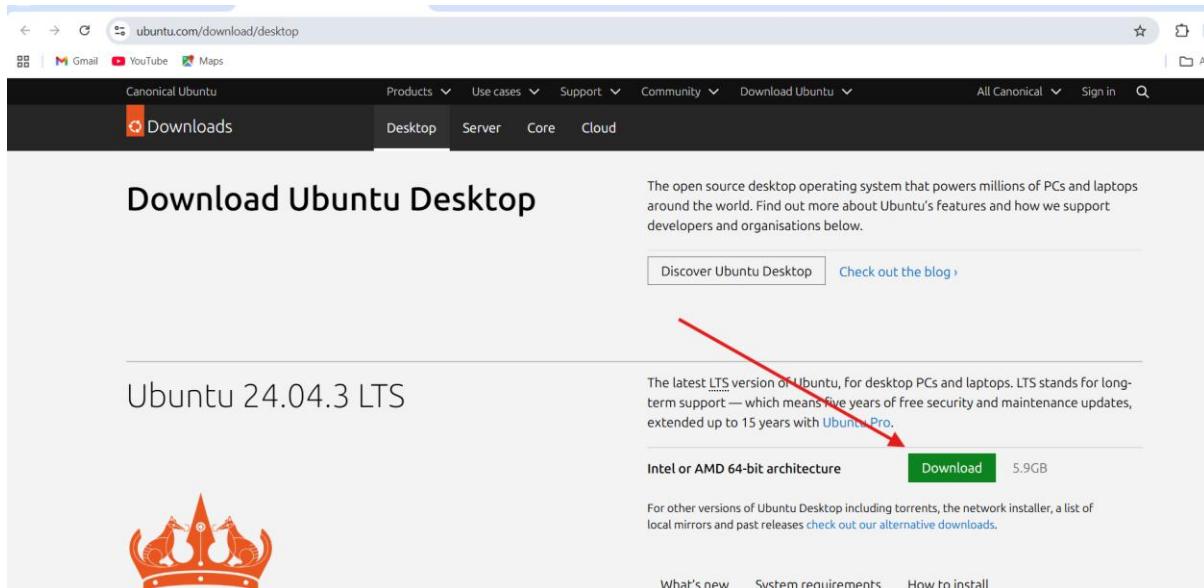


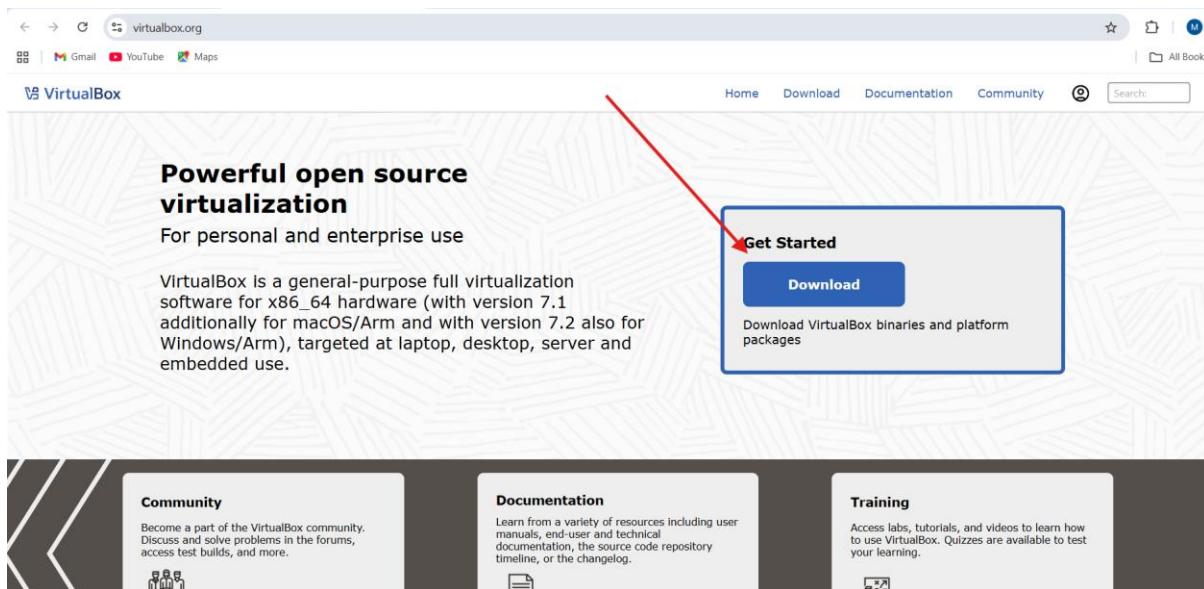
1. Setup a virtual machine using Ubuntu image.

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



The screenshot shows the Ubuntu Desktop download page. At the top, there's a navigation bar with links like 'Products', 'Use cases', 'Support', 'Community', 'Download Ubuntu', 'All Canonical', 'Sign in', and a search icon. Below the navigation is a main header 'Download Ubuntu Desktop'. To the right of the header is a brief description of Ubuntu: 'The open source desktop operating system that powers millions of PCs and laptops around the world. Find out more about Ubuntu's features and how we support developers and organisations below.' Below this is a button labeled 'Discover Ubuntu Desktop' and a link 'Check out the blog'. A large red arrow points from the top of the image down to the 'Ubuntu 24.04.3 LTS' section. In this section, there's a large orange crown icon, the text 'Ubuntu 24.04.3 LTS', a description of it being the latest LTS version, and a 'Download' button. The 'Download' button is highlighted with a green box and has the text 'Intel or AMD 64-bit architecture' above it and '5.9GB' to its right. Below the download button is a note: 'For other versions of Ubuntu Desktop including torrents, the network installer, a list of local mirrors and past releases [check out our alternative downloads](#)'. At the bottom of the page, there are links for 'What's new', 'System requirements', and 'How to install'.

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



The screenshot shows the VirtualBox website. At the top, there's a navigation bar with links for 'Home', 'Download', 'Documentation', 'Community', and a search bar. The main heading is 'Powerful open source virtualization' with the subtext 'For personal and enterprise use'. Below this is a detailed description of what VirtualBox is: 'VirtualBox is a general-purpose full virtualization software for x86_64 hardware (with version 7.1 additionally for macOS/Arm and with version 7.2 also for Windows/Arm), targeted at laptop, desktop, server and embedded use.' A large red arrow points from the top of the image down to the 'Get Started' button. This button is enclosed in a blue box and has a subtext 'Download VirtualBox binaries and platform packages'. At the bottom of the page, there are three cards: 'Community' (with a forum icon), 'Documentation' (with a book icon), and 'Training' (with a video camera icon).

- Create new virtual machine

Open VirtualBox → New

Name: Ubuntu-VM

Type: Linux

Version: Ubuntu (64-bit)

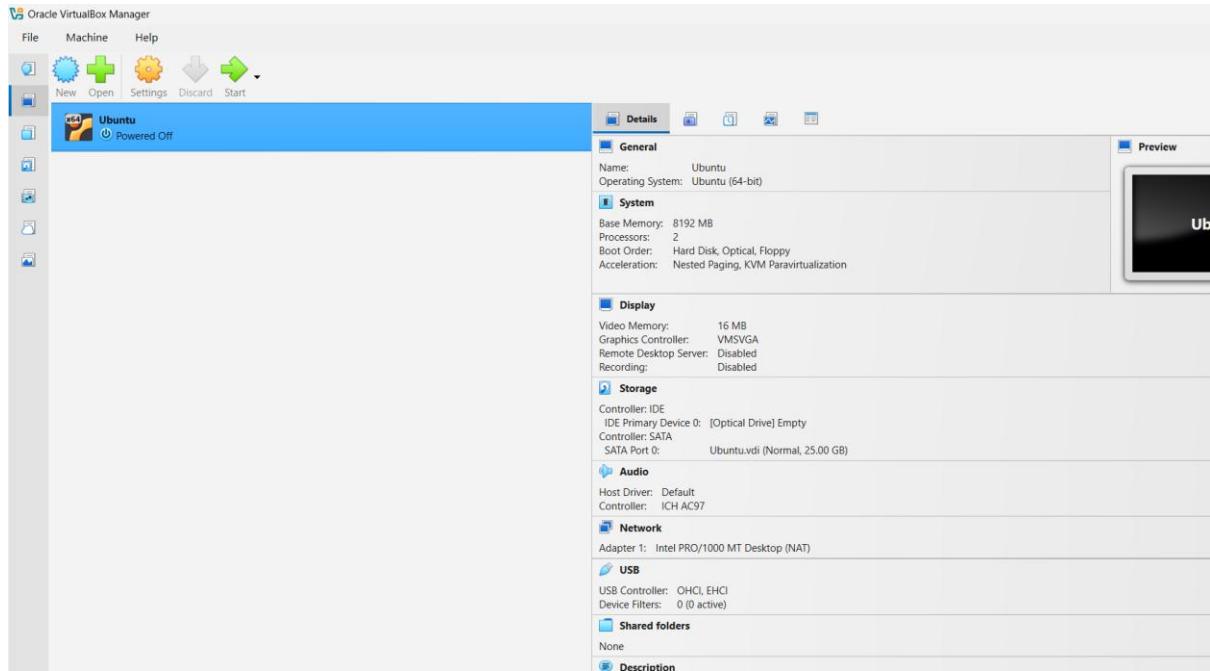
Memory: 4096 MB (4 GB) recommended

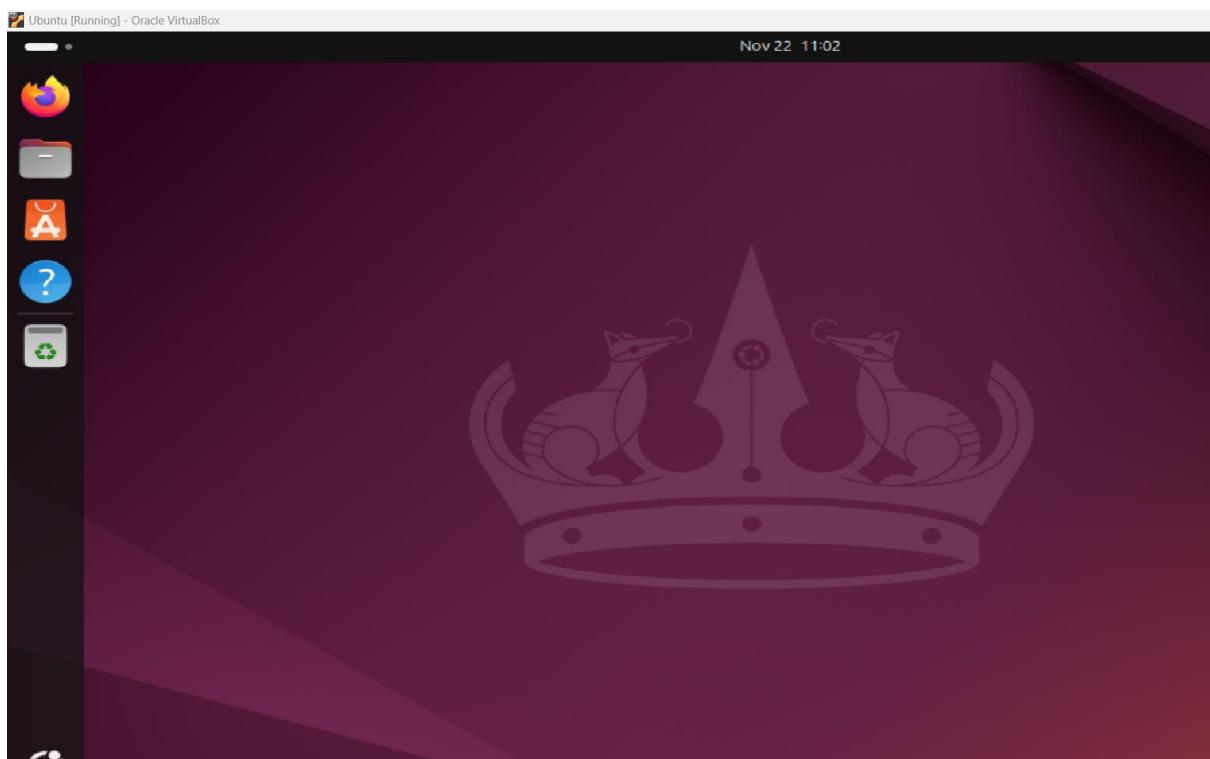
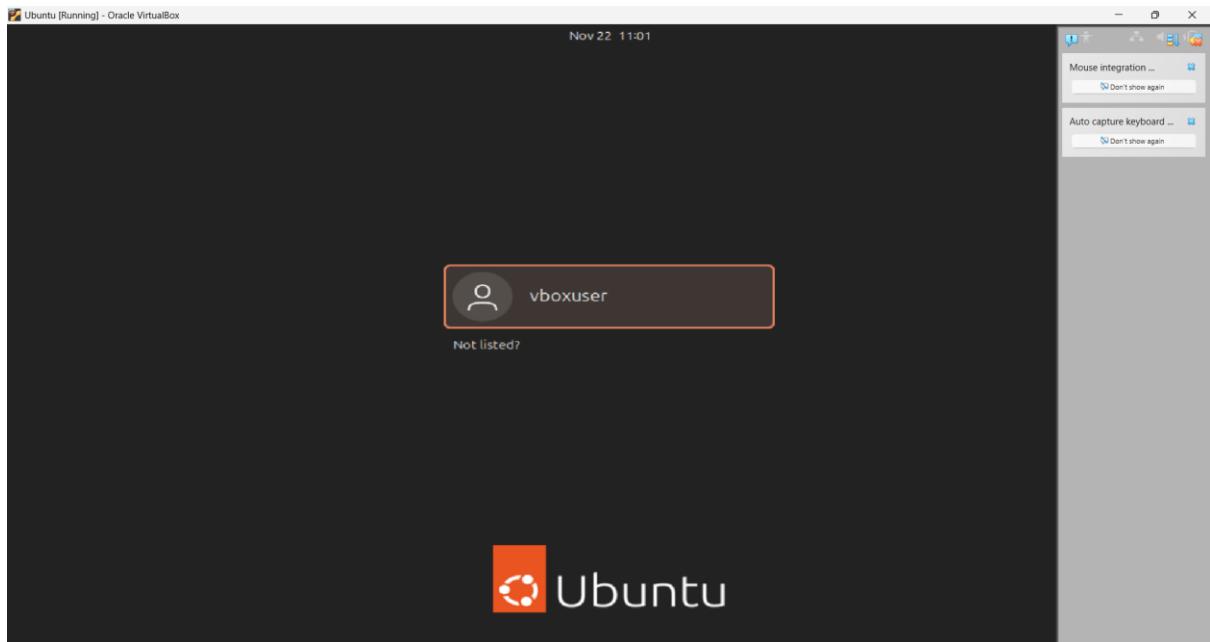
Hard Disk:

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

Start ubuntu:

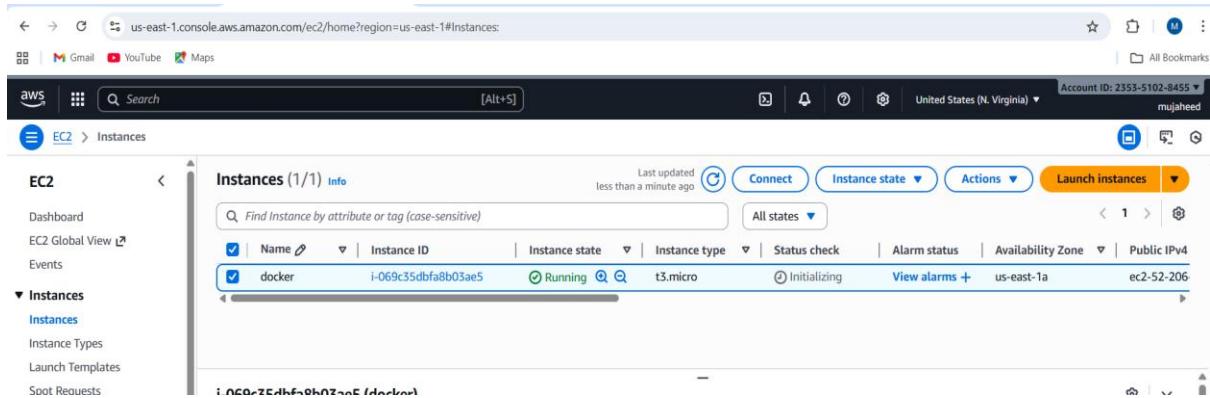
- Click on start
- Create username and password





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
 libnfnetwork                         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
c0cbb5ac747: 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: sha256:48dd0e946ad6481dde43bb31d1a7af09c22f59be6399b195dcc
Status: Downloaded newer image for sonarqube:latest
docker.io/library/sonarqube:latest
```

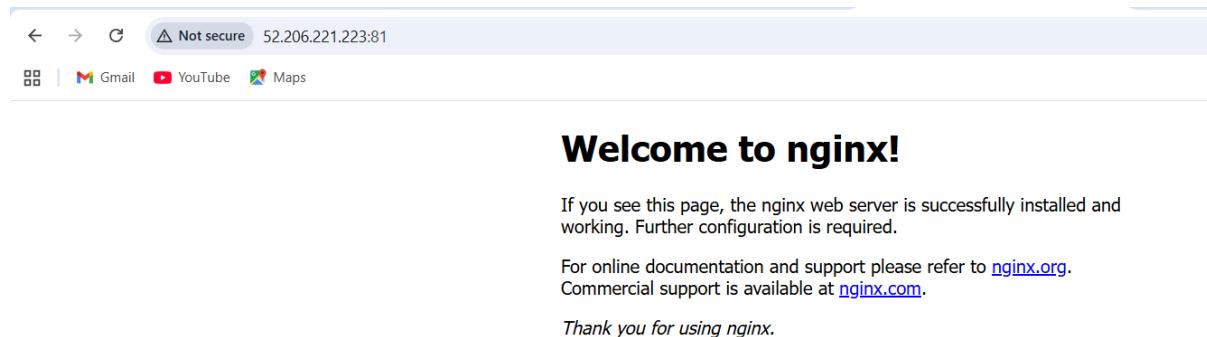
- docker images

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORT
[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 ~]# |
```



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:c363a86be80f380e04f80b16eab44a293b1dec802a5644f5ad085847bab8749
Deleted: sha256:7bfd2675f18277f04e48c7e95fc2e1845e8b0088f0ee673b592c167e5d1ab938
Deleted: sha256:32e6f3850b416c8a0c10edcbe3e421f4ff13629a708e41ca8ed27b4000bcd0dd
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:d6e7a271e8d12ef26636b186ee43184efec6ac3b63995f0583c233",
    "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

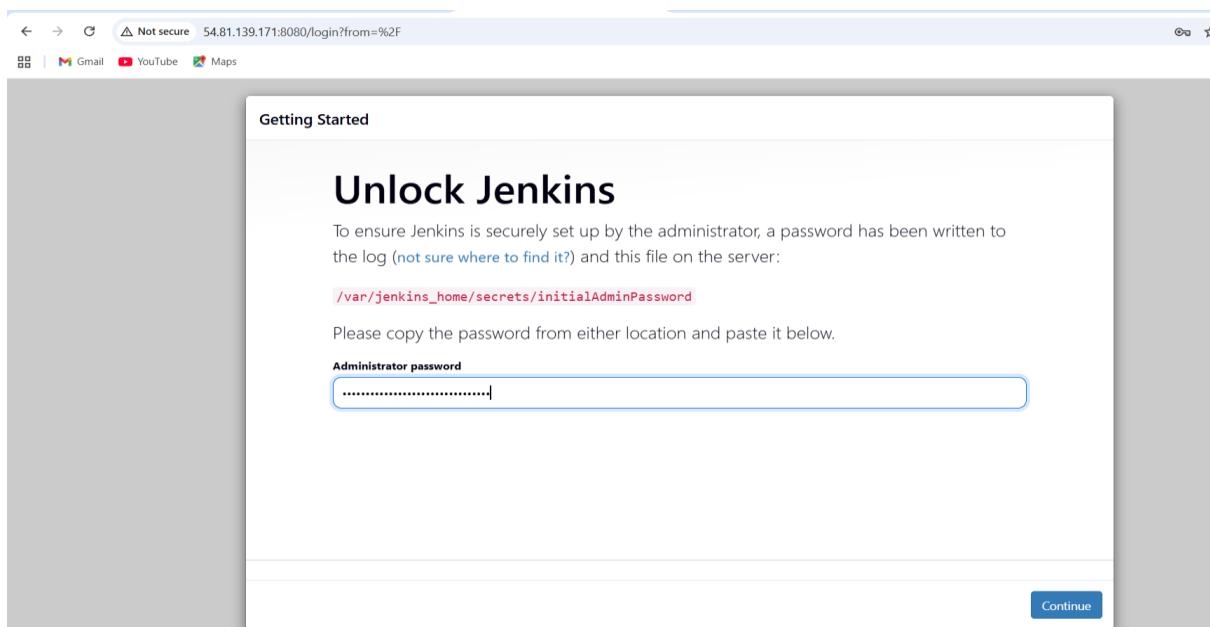
```
[root@ip-172-31-88-66 ~]# docker run -d --name jenkins \
-p 8080:8080 -p 50000:50000 \
-v jenkins_home:/var/jenkins_home \
jenkins/jenkins:lts
Unable to find image 'jenkins/jenkins:lts' locally
lts: Pulling from jenkins/jenkins
13cc39f8244a: Pull complete
dc2a77f462ea: Pull complete
33300af18dd0: Pull complete
c27509c3e53b: Pull complete
e4beac64dfffa: 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 ~]# |
```

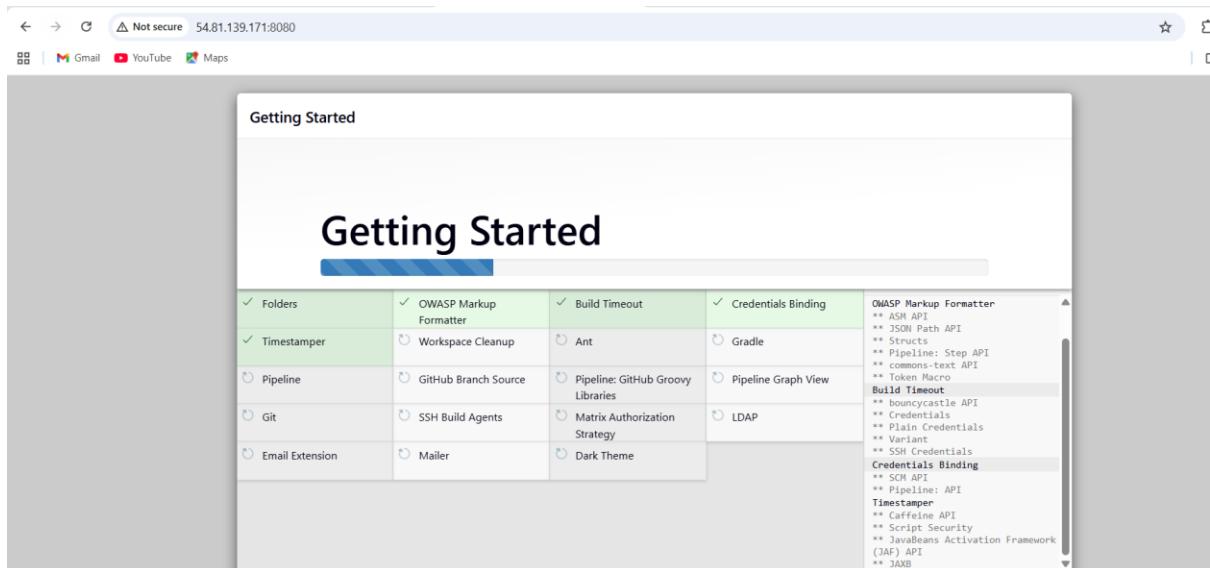
Get initial admin password

- 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





The screenshot shows the Jenkins dashboard. On the left, there's a sidebar with links like 'New Item', 'Build History', 'Build Queue' (which shows 'No builds in the queue.'), and 'Build Executor Status' (which shows '0/2').

The main area has a heading 'Welcome to Jenkins!' and a message: 'This page is where your Jenkins jobs will be displayed. To get started, you can set up distributed builds or start building a software project.'

Below that, there's a section titled 'Start building your software project' with a 'Create a job' button and a '+' icon.

At the bottom, there's a section titled 'Set up a distributed build' with three buttons: 'Set up an agent' (with a laptop icon), 'Configure a cloud' (with a cloud icon), and 'Learn more about distributed builds' (with a question mark icon).

Click on create new job, give the name and select free style project as type.

New Item

Enter an item name

sample-job

Select an item type

Freestyle project

Classic, general-purpose job type that checks out from up to one SCM, executes build steps serially, followed by post-build steps like archiving artifacts and sending email notifications.

Pipeline

Orchestrates long-running activities that can span multiple build agents. Suitable for building pipelines (formerly known as workflows) and/or organizing complex activities that do not easily fit in free-style job type.

Multi-configuration project

Suitable for projects that need a large number of different configurations, such as testing on multiple environments, platform-specific builds, etc.

Folder

Creates a container that stores nested items in it. Useful for grouping things together. Unlike view, which is just a filter, a folder creates a separate namespace, so you can have multiple things of the same name as long as they are in different folders.

OK

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.

Configure

General

Source Code Management

Triggers

Environment

Build Steps

Post-build Actions

Build Steps

Automate your build process with ordered tasks like code compilation, testing, and deployment.

Execute shell

Command

See the list of available environment variables

```
echo "Hello from Jenkins Demo Job"
```

Advanced

+ Add build step

Save

Apply

← → ⌂ Not secure 54.81.139.171:8080/job/sample-job/1/console

Gmail YouTube Maps

 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
```