

## DOCKER 01

1. Setup a virtual machine using Ubuntu image.

2. Install docker on ec2.

- Sudo yum install docker -y
- Docker get installed
- To verify
- Docker –version

```
Verifying      : iptables-nft-1.8.8-3.amzn2023.0.2.x86_64
Verifying      : libcgroup-3.0-1.amzn2023.0.1.x86_64
Verifying      : libnetfilter_conntrack-1.0.8-2.amzn2023.0.2.x86_64
Verifying      : libnftnetlink-1.0.1-19.amzn2023.0.2.x86_64
Verifying      : libnftnl-1.2.2-2.amzn2023.0.2.x86_64
Verifying      : pigz-2.5-1.amzn2023.0.3.x86_64
Verifying      : runc-1.3.3-2.amzn2023.0.1.x86_64

Installed:
  container-selinux-4:2.242.0-1.amzn2023.noarch
  iptables-libs-1.8.8-3.amzn2023.0.2.x86_64
  libnetfilter_conntrack-1.0.8-2.amzn2023.0.2.x86_64
  pigz-2.5-1.amzn2023.0.3.x86_64

Complete!
[root@ip-172-31-14-76 ec2-user]# docker --version
Docker version 25.0.13, build 0bab007
[root@ip-172-31-14-76 ec2-user]#
```

### i-0dcdbf34b21e5ebca (docker)

- PublicIPs: 54.215.249.147 PrivateIPs: 172.31.14.76

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

- Start docker
- Systemctl start docker
- Docker pull nginx

```
[root@ip-172-31-14-76 ec2-user]# docker pull nginx
Using default tag: latest
latest: Pulling from library/nginx
1733a4cd5954: Pull complete
aa8a9db0de30: Pull complete
7f0da823c3c6: Pull complete
1907fe38b1cf: Pull complete
b25e9944b727: Pull complete
8e5bb6a6b364: Pull complete
7cc422329a3e: Pull complete
Digest: sha256:2f4e10193b0c4f61472245e9d26cea78e7df7af26
Status: Downloaded newer image for nginx:latest
docker.io/library/nginx:latest
[root@ip-172-31-14-76 ec2-user]#
```

- 
- 

- **Docker pull tomcat**

```
download an image from a registry
[root@ip-172-31-14-76 ec2-user]# docker pull tomcat
Using default tag: latest
latest: Pulling from library/tomcat
20043066d3d5: Pull complete
627c55a201a9: Pull complete
378e3a6f165e: Pull complete
4f4fb700ef54: Pull complete
901b8cfcfd7: Pull complete
45e2e3388eeb: Pull complete
841c6b2bc7ed: Pull complete
Digest: sha256:689475f36b76708f19cc939d2d18689de23dd41abdb9e16
Status: Downloaded newer image for tomcat:latest
docker.io/library/tomcat:latest
[root@ip-172-31-14-76 ec2-user]#
```

- **Docker pull jenkins**

```
lts: Pulling from jenkins/jenkins
13cc39f8244a: Pull complete
dc2a77f462ea: Pull complete
33300af18dd0: Pull complete
c27509c3e53b: Pull complete
e4beac64dff4: Pull complete
a37b858bb47a: Pull complete
744b4792e083: Pull complete
05a7d9a8b608: Pull complete
8d2a75b252b2: Pull complete
65e4ba8066bc: Pull complete
5dc07232677a: Pull complete
7718ff514022: Pull complete
Digest: sha256:7b1c378278279c8688efd6168c25a1c2723a6bd6f0420beb5ccefab
Status: Downloaded newer image for jenkins/jenkins:lts
```

- **Docker pull saonar qube**

```
[root@ip-172-31-14-76 ec2-user]# docker images
REPOSITORY      TAG      IMAGE ID      CREATED      SIZE
nginx          latest   177015cbaee5  14 hours ago  152MB
tomcat          latest   557466b563c2  17 hours ago  412MB
sonarqube       latest   d6e7a271e8d1  3 weeks ago   1.22GB
jenkins/jenkins lts     aa2bbbd632f3  3 weeks ago  490MB
ubuntu          latest   c3a134f2ace4  7 weeks ago  78.1MB
[root@ip-172-31-14-76 ec2-user]#
```

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

## Run Nginx and Expose on Port 81

```
docker run -d -p 81:80 --name nginx-server nginx
```

### Meaning:

- `-d` → run in background
- `-p 81:80` → **host port 81** mapped to **container port 80**
- `--name nginx-server` → gives container a name
- `nginx` → image to use
- 

## 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](http://nginx.org).  
Commercial support is available at [nginx.com](http://nginx.com).

*Thank you for using nginx.*

```
[ec2-user@ip-172-31-14-76 ~]$ sudo su
[ec2-user@ip-172-31-14-76 ec2-user]# docker ps
CONTAINER ID        IMAGE       COMMAND       CREATED      STATUS      PORTS      NAMES
7d0cc907998e        nginx      "/docker-entrypoint..."   3 minutes ago   Up 3 minutes   0.0.0.0:81->80/tcp, :::81->80/tcp   nginx-server
[ec2-user@ip-172-31-14-76 ec2-user]#
```

## 1. 5 . Delete the Apache tomcat image from local.

- Docker images
- Note down apache tomcat image id
- Now
- Docker rmi {image id }

```
[root@ip-172-31-14-76 ec2-user]# docker images
REPOSITORY      TAG      IMAGE ID      CREATED      SIZE
nginx          latest    177015cbaee5  14 hours ago  152MB
tomcat          latest    557466b563c2  17 hours ago  412MB
sonarqube       latest    d6e7a271e8d1  3 weeks ago   1.22GB
jenkins/jenkins lts      aa2bbbd632f3  3 weeks ago   490MB
ubuntu          latest    c3a134f2ace4  7 weeks ago   78.1MB
[root@ip-172-31-14-76 ec2-user]# docker rmi 557466b563c2
Untagged: tomcat:latest
Deleted: sha256:689475f36b76708f19cc939d2d18689de23dd41abdb9e1693c60410ccb7361d6
Deleted: sha256:557466b563c23c86c6db649833df1b5561f667df9bfa65bb2853b223590dc29a
Deleted: sha256:d814ca57d297155d323948baf89efddf7fec33c3bd486be03b79c4fcec49a01f
Deleted: sha256:7e64e5dcbe1adb788dd15cb3cc0e36493c12af6f05fe0fba6218a24a0d5e129
Deleted: sha256:0d97d8cec3eb00860bc47d5c1e63f699d7171b3beae9a3f7ed82b9c03e1318ce
Deleted: sha256:cb57e88d4b554c793a0d90a96ccc18edefa0ba0f23691aa8fd8964eaf980177d
Deleted: sha256:32e6f3850b416c8a0c10edcbe3e421f4ff13629a708e41ca8ed27b4000bdc0dd
Deleted: sha256:9ecc724c90ec7e3cf102b7f859abbee7ca2e16bd4713a98c46a75c3b29af312d
Deleted: sha256:11ddc12ca0f0de4760e1e3a0b18a0020b4d3f4e6a470394478e0997537adc542
Deleted: sha256:861e86e35eb54cc284ba33f897fa359c2f87fd6ab2790d37e8b29056e2067502
[root@ip-172-31-14-76 ec2-user]# docker images
REPOSITORY      TAG      IMAGE ID      CREATED      SIZE
nginx          latest    177015cbaee5  14 hours ago  152MB
sonarqube       latest    d6e7a271e8d1  3 weeks ago   1.22GB
jenkins/jenkins lts      aa2bbbd632f3  3 weeks ago   490MB
ubuntu          latest    c3a134f2ace4  7 weeks ago   78.1MB
[root@ip-172-31-14-76 ec2-user]#
```

## 6 . Inspect the Jenkins image, SonarQube image.

- Docker inspect {image ids }
- 

```
[root@ip-172-31-14-76 ec2-user]# docker inspect aa2bbbd632f3
[
  {
    "Id": "sha256:aa2bbbd632f38f6cd1c279d76d6900b59ec5d3b12d981dd929e0c4bd65bdfd26",
    "RepoTags": [
      "jenkins/jenkins:lts"
    ],
    "RepoDigests": [
      "jenkins/jenkins@sha256:7b1c378278279c8688efd6168c25a1c2723a6bd6f0420beb5ccefabee3cc3bb1"
    ],
    "Parent": "",
    "Comment": "buildkit.dockerfile.v0",
    "Created": "2025-11-12T16:13:33.972285345Z",
    "Container": "",
    "ContainerConfig": {
      "Hostname": "",
      "Domainname": "",
      "User": "",
      "AttachStdin": false,
```

Docker inspect sonarqube – format

Or

Docker inspect (image id)

```
    "sha256:0b467af0245c01cef82e55c3daa75faa5947e484892d8b79207301db91526a68",
    "sha256:09079bcbac751aab85ab44e08ebbb13918694e58fb5e8b4c01787ef31639648",
    "sha256:fbe1fa3dd382ef8a5141fd221159ff232df90f44386f783b35929c312f39c7b7",
    "sha256:5f70bf18a086007016e948b04aed3b82103a36bea41755b6cddfaf10ace3c6ef"
]
},
"Metadata": {
    "LastTagTime": "0001-01-01T00:00:00Z"
}
}
]
[root@ip-172-31-14-76 ec2-user]# docker inspect sonarqube --format='{{.Config.ExposedPorts}}'
map[9000/tcp:{}]
[root@ip-172-31-14-76 ec2-user]#
```

7 . Run Jenkins container and run one sample job.

docker run -d --name jenkins-server \

-p 8080:8080 -p 50000:50000 \

jenkins/jenkins:lts

now ,

copy ip And launch brower

now ,

get initial admin password from

location

command.

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

copy th e password andn loginto Jenkins page

```
[root@ip-172-31-14-76 ec2-user]# docker ps
CONTAINER ID        IMAGE               COMMAND             CREATED            STATUS              PORTS
 NAMES
b01c0fc1f6de      jenkins/jenkins:lts   "/usr/bin/tini -- /u..."   2 minutes ago     Up 2 minutes       0.0.0.0:8080->8080/tcp, :::8080->8080
50000->50000/tcp   jenkins-server
7d0cc907998e      nginx               "/docker-entrypoint..."  29 minutes ago    Up 29 minutes      0.0.0.0:81->80/tcp, :::81->80/tcp
nginx-server
[root@ip-172-31-14-76 ec2-user]# docker exec -it jenkins-server cat /var/jenkins_home/secrets/initialAdminPassword
10cccdcb9536e4c70a3661f678a870759
[root@ip-172-31-14-76 ec2-user]#
```

i-0dcdbf34b21e5ebca (docker)

Now run a sample job in Jenkins

Loginto

Create a job

Add execute shell in build steps and

Script

```
echo "Hello from Jenkins!"
```

```
echo "This is my first sample job."
```

```
echo "Date and Time:"
```

```
date
```

```
echo "System hostname:"
```

```
hostname
```

run the job

## Console Output

```
Started by user admin
Running as SYSTEM
Building in workspace /var/jenkins_home/workspace/sample
[sample] $ /bin/sh -xe /tmp/jenkins12603616228748194996.sh
+ echo Hello from Jenkins!
Hello from Jenkins!
+ echo This is my first sample job.
This is my first sample job.
+ echo Date and Time:
Date and Time:
+ date
Tue Dec  9 13:11:34 UTC 2025
+ echo System hostname:
System hostname:
```