

⌚ Deadline: 05 Nov 2025 — till 5:00 PM

Tasks 01:

1. Docker Installation

Install Docker on your local system (Windows, macOS, or Linux).

Verify installation by running:

```
docker --version
```

```
docker info
```

```
Installed:
  containerd.io-1.7.28-1.el9.x86_64
  docker-buildx-plugin-0.29.1-1.el9.x86_64
  docker-ce-3:28.5.1-1.el9.x86_64
  docker-ce-cli-1:28.5.1-1.el9.x86_64
  docker-ce-rootless-extras-28.5.1-1.el9.x86_64
  docker-compose-plugin-2.40.3-1.el9.x86_64

Complete!
[root@localhost docker]#
[root@localhost docker]# systemctl start docker
[root@localhost docker]# systemctl status docker
● docker.service - Docker Application Container Engine
    Loaded: loaded (/usr/lib/systemd/system/docker.service; disabled; pres
      Active: active (running) since Wed 2025-11-05 14:18:14 IST; 3s ago
        Docs: https://docs.docker.com
     Main PID: 35184 (dockerd)
              ● docker.socket

[root@localhost docker]# systemctl enable docker
Created symlink /etc/systemd/system/multi-user.target.wants/docker.service →
/usr/lib/systemd/system/docker.service.
[root@localhost docker]#
[root@localhost docker]# docker --version
Docker version 28.5.1, build e180ab8
[root@localhost docker]# docker info
Client: Docker Engine - Community
  Version: 28.5.1
  Context: default
  Debug Mode: false
  Plugins:
    buildx: Docker Buildx (Docker Inc.)
      Version: v0.29.1
      Path: /usr/libexec/docker/cli-plugins/docker-buildx
    compose: Docker Compose (Docker Inc.)
      Version: v2.40.3
      Path: /usr/libexec/docker/cli-plugins/docker-compose
```

2. Working with Docker Images

Search for the official Ubuntu image on Docker Hub.

Pull it to your local system using docker pull.

List all available images using:

```
docker images
```

```
[root@localhost docker]# docker search ubuntu
NAME                           DESCRIPTION                                     STARS   OFFICIAL
ubuntu                         Ubuntu is a Debian-based Linux operating sys... 17718   [OK]
ubuntu/squid                   Squid is a caching proxy for the Web. Long-t... 119
ubuntu/nginx                   Nginx, a high-performance reverse proxy & we... 133
ubuntu/cortex                  Cortex provides storage for Prometheus. Long... 4
ubuntu/kafka                    Apache Kafka, a distributed event streaming ... 56
ubuntu/bind9                   BIND 9 is a very flexible, full-featured DNS... 116
ubuntu/docker                   Docker is a platform for building, shipping, and runn... 67
```

```
[root@localhost docker]# docker pull ubuntu
Using default tag: latest
latest: Pulling from library/ubuntu
4b3ffd8ccb52: Pull complete
Digest: sha256:66460d557b25769b102175144d538d88219c077c678a49af4afca6fbfc1b5252
Status: Downloaded newer image for ubuntu:latest
docker.io/library/ubuntu:latest
[root@localhost docker]# docker images
REPOSITORY      TAG          IMAGE ID      CREATED        SIZE
ubuntu          latest       97bed23a3497   4 weeks ago   78.1MB
[root@localhost docker]# |
```

3. Creating a Docker Container

Run a container using the Ubuntu image.

Execute a command inside the container:

```
echo "Hello, Docker!"
```

```
[root@localhost docker]# docker container run -it ubuntu
root@33c0148bf828:/# echo "Hello, Docker"
Hello, Docker
root@33c0148bf828:/# echo "Hello, Docker!"
Hello, Docker!
root@33c0148bf828:/# |
```

4. Inspect Container (Created State)

Verify that the Ubuntu container is in the "created" state.

```
[root@localhost docker]# docker create --name ubuntu_container ubuntu
5553577acbf517181de7ba15fb8a694fd4a36837746cc9fd28341d87744214cd
[root@localhost docker]# docker ps
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES
[root@localhost docker]# docker ps -a
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES
5553577acbf5  ubuntu  "/bin/bash"  5 seconds ago  Created
[root@localhost docker]# docker inspect ubuntu_container
[
  {
    "Id": "5553577acbf517181de7ba15fb8a694fd4a36837746cc9fd28341d87744214cd",
    "Created": "2025-11-05T09:02:10.262675698Z",
    "Path": "/bin/bash",
    "Args": [],
    "State": {
      "Status": "created",
      "Running": false,
```

5. Run Container (Running State)

Execute the Ubuntu container and confirm it's in the "running" state.

```
[root@localhost docker]# docker run -itd ubuntu:latest
5124c8ea320c83ffe5fd7062746a1efa029d1037914dfc25a25f736bec000310
[root@localhost docker]# docker ps -a
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES
5124c8ea320c  ubuntu:latest  "/bin/bash"  3 seconds ago  Up 3 seconds
5553577acbf5  ubuntu       "/bin/bash"  3 minutes ago  Exited (0) 22 seconds ago
[root@localhost docker]#
[root@localhost docker]# docker inspect 5124c8ea320c
[
  {
    "Id": "5124c8ea320c83ffe5fd7062746a1efa029d1037914dfc25a25f736bec000310",
    "Created": "2025-11-05T09:05:21.089983243Z",
    "Path": "/bin/bash",
    "Args": [],
    "State": {
```

6. Launch and Remove HTTP Container

Launch an HTTP container.

Verify its state.

Remove both the container and its image from your system.

```
[root@localhost docker]# docker image pull httpd
Using default tag: latest
latest: Pulling from library/httpd
d7ecded7702a: Pull complete
fab98c44430d: Pull complete
4f4fb700ef54: Pull complete
13c22d886563: Pull complete
4870f70a8556: Pull complete
233dec01418c: Pull complete
Digest: sha256:ecfd5ca1bfe1fc5e44a5836c5188bde7f397b50c7a5bb603a017543e29948a01
Status: Downloaded newer image for httpd:latest
docker.io/library/httpd:latest
```

```
[root@localhost docker]# docker container run -d httpd:latest
880020f24faf7d8cd1dd73e3ea889c83118047d8e0b0b3f332edbddd877ed24a9
[root@localhost docker]# docker ps -a
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES
880020f24faf httpd:latest "httpd-foreground" 3 seconds ago Up 3 seconds 80/tcp distracted_snyder
cld18563b220 httpd:latest "httpd-foreground" 48 seconds ago Exited (0) 24 seconds ago intelligent_leaky

[root@localhost docker]# docker container ps -a
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES
880020f24faf httpd:latest "httpd-foreground" 56 seconds ago Exited (0) 14 seconds ago distracted_snyder
cld18563b220 httpd:latest "httpd-foreground" About a minute ago Exited (0) About a minute ago intelligent_leaky
5124c8ea320c ubuntu:latest "/bin/bash" 5 minutes ago Exited (137) 5 seconds ago optimistic_chandrasekhar
5553577acbf5 ubuntu "/bin/bash" 8 minutes ago Exited (0) 6 minutes ago ubuntu_container
[root@localhost docker]# docker container rm distracted_snyder intelligent_leaky
distracted_snyder
intelligent_leaky
[root@localhost docker]# docker container ps -a
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES
5124c8ea320c ubuntu:latest "/bin/bash" 6 minutes ago Exited (137) 21 seconds ago optimistic_chandrasekhar
5553577acbf5 ubuntu "/bin/bash" 9 minutes ago Exited (0) 6 minutes ago ubuntu_container
[root@localhost docker]# docker image ls
REPOSITORY TAG IMAGE ID CREATED SIZE
httpd latest 6a4fe18d08d2 29 hours ago 117MB
ubuntu latest 97bed23a3497 4 weeks ago 78.1MB
[root@localhost docker]# docker image rm httpd:latest
Untagged: httpd:latest
Untagged: httpd@sha256:eecfd5ca1bfe1fc5e44a5836c5188bde7f397b50c7a5bb603a017543e29948a01
Deleted: sha256:6a4fe18d08d26a61b32d6aa5d17b217c4f4de63a8460abf4cd824b911b9de88
Deleted: sha256:c78f79d2236u3af30c382eefcd1efc285a99la2895a4fad225239a6c3e1d1797
Deleted: sha256:655ea42223e5a87df151e8f2a0199119176fdf645c5d1504467f12df46f66a09
Deleted: sha256:c9dccfd4d12e5bac98e0c53df0fb6964e2cc26920cbd4dcf57419961db1dcf6b
Deleted: sha256:ed6e1e3a72de02ccd775dc07b09bc098dc41bc1e683027f3b7ab8764977be78
Deleted: sha256:0061ccbeba5f22631ee410cb46c1c5293e3804f2e352dd3b99c3df49a26ae
Deleted: sha256:36d06fe0cbc654e5f67d58c960ed33e53127e4a328d8ce6f6a60a9c311794d4
[root@localhost docker]# docker image ls
REPOSITORY TAG IMAGE ID CREATED SIZE
ubuntu latest 97bed23a3497 4 weeks ago 78.1MB
[root@localhost docker]#
```

7. List Short Container IDs

Execute a command that displays only the short container IDs.

```
[root@localhost docker]# docker container ps -a
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES
5124c8ea320c ubuntu:latest "/bin/bash" 7 minutes ago Exited (137) About a minute ago optimistic_chandrasekhar
5553577acbf5 ubuntu "/bin/bash" 10 minutes ago Exited (0) 7 minutes ago ubuntu_container
[root@localhost docker]# docker container ls -aq
5124c8ea320c
5553577acbf5
[root@localhost docker]#
```

 Make sure to complete and test each task before the deadline.

Let's all stay consistent and help each other while learning Docker! 

Tasks 02:

8. Clone & Build Custom Image

Clone the repository: [lancachenet/ubuntu-nginx](https://github.com/lancachenet/ubuntu-nginx)

Build a Docker image using the provided Dockerfile.

Add relevant tags while building the image.

9. Run & Test the Webpage

Run a Docker container using the newly built image.

Use the curl command to verify that the webpage is accessible.

```
[root@localhost ubuntu-nginx]# docker container run -itd -p 88:80 ubuntu-nginx-server:latest
29ab6005c1818df5851b88542dd6f595c11cc4e09285c0c48649d885622c54e
[root@localhost ubuntu-nginx]# docker ps -a
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES
29ab6005c181 ubuntu-nginx-server:latest "/bin/bash -e /init/" 3 seconds ago Up 3 seconds 0.0.0.0:80->80/tcp, [::]:80->80/tcp eager_bell
[root@localhost ubuntu-nginx]# lsof -i :80
COMMAND PID USER FD TYPE DEVICE SIZE/OFF NODE NAME
docker-pr 38920 root 7u IPv4 92822 0t0 TCP *:http (LISTEN)
docker-pr 38925 root 7u IPv6 92823 0t0 TCP *:http (LISTEN)
[root@localhost ubuntu-nginx]# curl localhost
Welcome to the lancachenet/ubuntu-nginx docker container
[root@localhost ubuntu-nginx]#
```

10. Container Detach & Reattach

Launch an Ubuntu container.

Demonstrate the escape sequence (detach).

Reattach the container after detaching.

Check and note down the container's IP address.

```
[root@localhost docker]# docker images
REPOSITORY      TAG      IMAGE ID      CREATED      SIZE
ubuntu-nginx-server  latest  45ff1a8e9619  13 minutes ago  195MB
ubuntu          latest  97bed23a3497  4 weeks ago   78.1MB
[root@localhost docker]# docker container run -itd ubuntu
a292ca2d0d42d7c97a89384c4f0566805ffb17b4cc5605794f6569df0075b4b0
[root@localhost docker]# docker ps
CONTAINER ID  IMAGE      COMMAND      CREATED      STATUS      PORTS      NAMES
a292ca2d0d42  ubuntu     "/bin/bash"  31 seconds ago  Up 31 seconds  condensing_poitras
```

```
[root@localhost docker]# docker run -it ubuntu /bin/bash
root@250ed2f9b45c:/# echo "Exiting"
Exiting
root@250ed2f9b45c:/# [root@localhost docker]#
[root@localhost docker]# docker ps -a
CONTAINER ID  IMAGE      COMMAND      CREATED      STATUS      PORTS      NAMES
250ed2f9b45c  ubuntu     "/bin/bash"  2 minutes ago  Up 2 minutes  peaceful_hopper
[root@localhost docker]# |
```

```
"bridge": {
    "IPAMConfig": null,
    "Links": null,
    "Aliases": null,
    "MacAddress": "be:da:32:2d:cd:7c",
    "DriverOpts": null,
    "GwPriority": 0,
    "NetworkID": "0c0307888783336e0b262e05aca4adc74bb409bc7ba0c07f627cedbf0c013413",
    "EndpointID": "43d11db3b112282dd71a37d820dd8ad81f36a5581f0f094032b5c188d57a5d56",
    "Gateway": "172.17.0.1",
    "IPAddress": "172.17.0.2",
    "IPPrefixLen": 16,
    "IPv6Gateway": "",
    "GlobalIPv6Address": "",
    "GlobalIPv6PrefixLen": 0,
    "DNSNames": null
}
```

```
[root@localhost docker]# docker container attach condensing_poitras
root@a292ca2d0d42:/# ip r l
bash: ip: command not found
root@a292ca2d0d42:/# hostname -I
172.17.0.2
root@a292ca2d0d42:/# |
```

12. Inspect Host Configuration

Use a Docker command to inspect the hostname and the /etc/hosts file of the httpd container.

```
[root@localhost docker]# docker ps -a
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES
212dce1e650e httpd "httpd-foreground" 18 seconds ago Up 17 seconds 80/tcp adoring_nash

root@212dce1e650e:/usr/local/apache2# hostname -I
172.17.0.3
root@212dce1e650e:/usr/local/apache2# cat /etc/hosts
127.0.0.1      localhost
::1      localhost ip6-localhost ip6-loopback
fe00:: ip6-localnet
ff00:: ip6-mcastprefix
ff02::1 ip6-allnodes
ff02::2 ip6-allrouters
172.17.0.3      212dce1e650e
root@212dce1e650e:/usr/local/apache2# |

[root@localhost docker]# docker exec -it adoring_nash "hostname"
212dce1e650e
[...]
```

13. Monitor Container Stats

Inspect a container created with the lancachenet/ubuntu-nginx image.

Monitor its resource usage and stats using the top command.

```
[root@localhost docker]# docker container run -itd lancachenet/ubuntu-nginx
Unable to find image 'lancachenet/ubuntu-nginx:latest' locally
latest: Pulling from lancachenet/ubuntu-nginx
cfc57d2112d89: Already exists
9003887337ec: Already exists
97b162366492: Already exists
dd5c7a17daaa: Already exists
86154565fc0c: Pull complete
d91d1b6e30c9: Pull complete
cb9ce1fa8cf0: Pull complete
Digest: sha256:f3e165aebe33ae26261e8a31a1e19104f3c0775307170857cbffe18089276badc
Status: Downloaded newer image for lancachenet/ubuntu-nginx:latest
d8592cd9cde0f07f7468710e566e3a1c06858550a0ef67fc8a01260e927ab74
[root@localhost docker]# docker ps
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES
d8592cd9cde0    lancachenet/ubuntu-nginx "/bin/bash -e /init/..." 3 seconds ago Up 3 seconds 80/tcp wonderful_dhawan

[root@localhost docker]# docker top wonderful_dhawan
UID PID PPID C STIME TTY TIME CMD
root 408977 408977 1 15:25 pts/0 00:00:00 /usr/bin/python3 /usr/bin/supervisord -n -c /etc/supervisor/supervisord.conf -e WARN
root 408988 40877 0 15:25 pts/0 00:00:00 /bin/bash /opt/nginx/startnginx.sh
root 408989 408988 0 15:25 pts/0 00:00:00 nginx: master process /usr/sbin/nginx -g daemon off;
33 40910 40999 0 15:25 pts/0 00:00:00 nginx: worker process
[root@localhost docker]#
```

14. Nginx Containers Log Review

Start a new Nginx container.

Review and compare the logs for both Nginx containers.

```
[root@localhost docker]# docker container run -itd nginx
f634b894d7a68e8439703b5b690bf53298ed6f29ef5b4530320c33e4ad49b
[root@localhost docker]# docker logs vigilant_almeida
Executing hook /hooks/entrypoint-pre.d/00_asiclologo.sh
[...]
Executing hook /hooks/supervisord-pre.d/00_log_files
Checking if /var/www/ is empty Directory not empty.. don't touch content
Executing hook /hooks/supervisord-pre.d/21_cleanup_log_files
Cleaning up log files older than 7 days
Starting Supervisord...
[root@localhost docker]# docker ps
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES
f634b894d67a nginx "/docker-entrypoint..." 18 seconds ago Up 18 seconds 80/tcp peaceful_ca
none
3dafe06cecb9a2 lancachenet/ubuntu-nginx:latest "/bin/bash -e /init/" 2 minutes ago Up 2 minutes 0.0.0.0:80->80/tcp, [::]:80->80/tcp vigilant_almeida
[root@localhost docker]# docker logs peaceful_cannon
/docker-entrypoint.sh: /docker-entrypoint.d/ is not empty, will attempt to perform configuration
/docker-entrypoint.sh: Looking for shell scripts in /docker-entrypoint.d/
/docker-entrypoint.sh: Launching /docker-entrypoint.d/10-listen-on-ipv6-by-default.sh
10-listen-on-ipv6-by-default.sh: info: Getting the checksum of /etc/nginx/conf.d/default.conf
10-listen-on-ipv6-by-default.sh: info: Enabled listen on IPv6 in /etc/nginx/conf.d/default.conf
/docker-entrypoint.sh: Sourcing /docker-entrypoint.d/15-local-resolvers.envsh
/docker-entrypoint.sh: Launching /docker-entrypoint.d/20-envsubst-on-templates.sh
/docker-entrypoint.sh: Launching /docker-entrypoint.d/30-tune-worker-processes.sh
/docker-entrypoint.sh: Configuration complete; ready for start up
2025/11/05 10:01:01 [notice] #1: using the "epoll" event method
2025/11/05 10:01:01 [notice] #1: nginx/1.29.3
2025/11/05 10:01:01 [notice] #1: built by gcc 14 2.0.0 (Debian 14.2.0-19)
2025/11/05 10:01:01 [notice] #1: OS: Linux 5.14.0-624.el9.x86_64
2025/11/05 10:01:01 [notice] #1: getrlimit(RLIMIT_NOFILE): 1073741816:1073741816
2025/11/05 10:01:01 [notice] #1: start worker processes
2025/11/05 10:01:01 [notice] #1: start worker process 29
[root@localhost docker]#
```

15. System Events & Filters

Examine Docker system events filtered by:

Specific date, and

The last 30 minutes.

Apply two filters simultaneously using name and event.

```
[root@localhost docker]# docker events --since "2025-11-05T15:00:00" --until "2025-11-05T15:30:00" --filter "name=my_container_name" --filter "event=start"
2025-11-05T15:03:35.682039513+05:30 container start 13500c347f2264e34a9718b7086ea/d87b0650c9aeab40063aa186152ef9881d33 (image=ubuntu-nginx-server:latest, main
tainer=LanCache.Net Team <team@lancache.net>, name=nginx-cont, org.opencontainers.image.ref.name=ubuntu, org.opencontainers.image.version=24.04)
2025-11-05T15:05:43.672039513+05:30 container start e2df7ccba3403dc4b2bc139245d66d15777b5deeb1314566a69f270a19f0b663 (image=ubuntu-nginx-server:latest, main
tainer=LanCache.Net Team <team@lancache.net>, name=nginx-cont, org.opencontainers.image.ref.name=ubuntu, org.opencontainers.image.version=24.04)
2025-11-05T15:07:29.672039513+05:30 container start 29ab60085c181af58838255155159595cfc09285e4c4849885a4c4f4995 (image=ubuntu-nginx-server:latest, main
tainer=LanCache.Net Team <team@lancache.net>, name=eager_beast, org.opencontainers.image.ref.name=ubuntu, org.opencontainers.image.version=24.04)
2025-11-05T15:10:29.963122089+05:30 container start 329504004942d7f07a923841f1f05669895ff1b174c5605794f6f5694f0075b4b0 (image=ubuntu, name=condescending_poir
as, org.opencontainers.image.ref.name=ubuntu, org.opencontainers.image.version=24.04)
2025-11-05T15:14:54.801365569405+05:30 container start 250cd149b15c3ed73be03a78753666f97e024454c9cf0317d822253b67d9c (image=ubuntu, name=peaceful_hopper, or
g.opencontainers.image.ref.name=ubuntu, org.opencontainers.image.version=24.04)
2025-11-05T15:18:35.685080682405+05:30 container start 989bebeads957f7b8326461f291854edca61cd63d97b621f981d66f863766257 (image=httpd, name=xenodochial_goodall)
2025-11-05T15:20:12.225659724+05:30 container start 212dc1e65b0e11f7f73398b05ceea839efb270c42e8c83a9e5aae46f0c9e05 (image=httpd, name=adoring_nash)
2025-11-05T15:25:44.460458146+05:30 container start d8592cd9c1e6f0f07f7468710e566e3a1c0685855099a0ef67fc8a01260e927ab74 (image=lancachenet/ubuntu-nginx, mainta
iner=LanCache.Net Team <team@lancache.net>, name=wonderful_dhawan, org.opencontainers.image.ref.name=ubuntu, org.opencontainers.image.version=24.04)
2025-11-05T15:28:54.499573925+05:30 container start 3dafe06cecb9a2525717d7ba04uf0ff4784f43bbd4326b6f227b69e321061a2f9ff (image=lancachenet/ubuntu-nginx:latest,
maintainer=LanCache.Net Team <team@lancache.net>, name=loving_bohr)
2025-11-05T15:29:33.976669880+05:30 container start 61b03426e0b2aa278e455045f7d0623c9a5cca0db883635c6749e4fc3990d282 (image=nginx, maintainer=NGINX Docker M
aintainers <docker-maint@nginx.com>, name=loving_bohr)
[root@localhost docker]#
```



```
[root@localhost docker]# docker events \
--since "2025-11-05T00:00:00" \
--until "2025-11-05T23:59:59" \
--filter "event=start" \
--filter "container=peaceful_cannon"
2025-11-05T15:31:01.316766363+05:30 container start f634b894d7a68e8439703b5b690bf53298ed6f29ef5b4530320c33e4ad49b (image=nginx, maintainer=NGINX Docker M
aintainers <docker-maint@nginx.com>, name=peaceful_cannon)
```

16. Custom Hostname & Logs

Create an Ubuntu container with:

A meaningful name, and

Hostname set to cloudethix.com.

Stop or kill the container.

Check its exit code and review its logs for details.

```
[root@localhost docker]# docker container run -itd --name cloudethix-cont --hostname cloudethix.com ubuntu
34ae1ce6f80f706726a28f2a886ca2f7270533c07473c0887dcac5eaa4f3c76d
[root@localhost docker]# docker ps
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES
34ae1ce6f80f "bin/bash" 3 seconds ago Up 2 seconds
ubuntu
f634b894dd7a "nginx" 10 minutes ago Up 19 minutes 80/tcp
peaceful_cannon
3daa06ceb0a2 "lanchonet/ubuntu-nginx:latest" "/bin/bash -e /init/" 21 minutes ago Up 21 minutes 0.0.0.0:80->80/tcp, [::]:80->80/tcp
vigilant_almeida
```

```
[root@localhost docker]# docker container stop cloudethix-cont
cloudethix-cont
[root@localhost docker]# docker container inspect cloudethix-cont
[
  {
    "Id": "34ae1ce6f80f706726a28f2a886ca2f7270533c07473c0887dcac5eaa4f3c76d",
    "Created": "2025-11-05T10:20:14.731290964Z",
    "Path": "/bin/bash",
    "Args": [],
    "State": {
      "Status": "exited",
      "Running": false,
      "Paused": false,
      "Restarting": false,
      "OOMKilled": false,
      "Dead": false,
      "Pid": 0,
      "ExitCode": 137,
      "Error": "",
      "StartedAt": "2025-11-05T10:20:14.832508976Z",
      "FinishedAt": "2025-11-05T10:20:43.648303637Z"
    },
    ...
  }
]
```

```
[root@localhost docker]# lsof -i :80
COMMAND PID USER FD TYPE DEVICE SIZE/OFF NODE NAME
docker-pr 43684 root 7u IPv4 106055 0t0 TCP *:http (LISTEN)
docker-pr 43689 root 7u IPv6 106056 0t0 TCP *:http (LISTEN)
[root@localhost docker]# docker container logs cloudethix-cont
/docker-entrypoint.sh: /docker-entrypoint.d/ is not empty, will attempt to perform configuration
/docker-entrypoint.sh: Looking for shell scripts in /docker-entrypoint.d/
/docker-entrypoint.sh: Launching /docker-entrypoint.d/10-listen-on-ipv6-by-default.sh
10-listen-on-ipv6-by-default.sh: info: Getting the checksum of /etc/nginx/conf.d/default.conf
10-listen-on-ipv6-by-default.sh: info: Enabled listen on IPv6 in /etc/nginx/conf.d/default.conf
/docker-entrypoint.sh: Sourcing /docker-entrypoint.d/15-local-resolvers.envsh
/docker-entrypoint.sh: Launching /docker-entrypoint.d/20-envsubst-on-templates.sh
/docker-entrypoint.sh: Launching /docker-entrypoint.d/30-tune-worker-processes.sh
/docker-entrypoint.sh: Configuration complete; ready for start up
2025/11/05 10:29:50 [notice] 1#1: using the "epoll" event method
2025/11/05 10:29:50 [notice] 1#1: nginx/1.29.3
2025/11/05 10:29:50 [notice] 1#1: built by gcc 14.2.0 (Debian 14.2.0-19)
2025/11/05 10:29:50 [notice] 1#1: OS: Linux 5.14.0-624.el9.x86_64
2025/11/05 10:29:50 [notice] 1#1: getrlimit(RLIMIT_NOFILE): 1073741816:1073741816
2025/11/05 10:29:50 [notice] 1#1: start worker processes
2025/11/05 10:29:50 [notice] 1#1: start worker process 28
[root@localhost docker]#
```

17. Container Management Operations

Create and start an Ubuntu container with a random name, then rename it to Ubuntu01.

Launch another container named Ubuntu02.

Check the hostname for both containers.

Perform the following:

Pause and unpause Ubuntu02.

Stop, start, and restart Ubuntu01.

Inspect stats and system events for both.

Finally, kill and delete the containers, ensuring all created directories are removed.

```
[root@localhost docker]# docker images
REPOSITORY          TAG      IMAGE ID      CREATED       SIZE
ubuntu-nginx-server    latest   45ff1a8e9619  About an hour ago  195MB
httpd                latest   6a4fe18d08d2  30 hours ago   117MB
nginx                latest   d261fd19cb63  30 hours ago   152MB
lancachenet/ubuntu-nginx  latest   1d0a8df5d47  4 days ago    195MB
ubuntu                latest   97bed23a3497  4 weeks ago    78.1MB
[root@localhost docker]# docker container run -itd ubuntu
92459dbb1ec7503e241809ebfd999ad81ad1d754b564687327e79609f28d2bbe
[root@localhost docker]# docker ps
CONTAINER ID  IMAGE      COMMAND      CREATED      STATUS      PORTS      NAMES
92459dbb1ec7  ubuntu     "/bin/bash"  3 seconds ago  Up 2 seconds
[root@localhost docker]# docker container rename reverent_feistel Ubuntu01
[root@localhost docker]# |
```

```
[root@localhost docker]# docker container run -itd --name Ubuntu02 ubuntu
9af5a5fcb45064609903719ef675d656e7d81454081e74595a393cc16c429720
[root@localhost docker]# docker ps
CONTAINER ID  IMAGE      COMMAND      CREATED      STATUS      PORTS      NAMES
9af5a5fcb450  ubuntu     "/bin/bash"  2 seconds ago  Up 2 seconds
92459dbb1ec7  ubuntu     "/bin/bash"  About a minute ago  Up About a minute
[root@localhost docker]# |
```

```
[root@localhost docker]# docker ps
CONTAINER ID  IMAGE      COMMAND      CREATED      STATUS      PORTS      NAMES
9af5a5fcb450  ubuntu     "/bin/bash"  2 seconds ago  Up 2 seconds
92459dbb1ec7  ubuntu     "/bin/bash"  About a minute ago  Up About a minute
[root@localhost docker]#
[root@localhost docker]# docker exec -it Ubuntu01 hostname
92459dbb1ec7
[root@localhost docker]# docker exec -it Ubuntu02 hostname
9af5a5fcb450
[root@localhost docker]# docker container attach Ubuntu01
root@92459dbb1ec7:/# hostname
92459dbb1ec7
root@92459dbb1ec7:/# read escape sequence
[root@localhost docker]# docker container attach Ubuntu02
root@9af5a5fcb450:/# hostname
9af5a5fcb450
root@9af5a5fcb450:/# |
```

```
[root@localhost docker]# docker container pause Ubuntu02
Ubuntu02
[root@localhost docker]# docker container unpause Ubuntu02
Ubuntu02
[root@localhost docker]#
[root@localhost docker]# docker ps
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES
d3f1f9ac9dcf ubuntu "/bin/bash" About a minute ago Up About a minute
92459dbb1ec7 ubuntu "/bin/bash" 6 minutes ago Up 6 minutes
[root@localhost docker]# docker container u
```

```
[root@localhost docker]# docker container stop Ubuntu01
Ubuntu01
[root@localhost docker]# docker ps
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES
d3f1f9ac9dcf ubuntu "/bin/bash" About a minute ago Up About a minute
[root@localhost docker]# docker container start Ubuntu01
Ubuntu01
[root@localhost docker]# docker ps
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES
d3f1f9ac9dcf ubuntu "/bin/bash" About a minute ago Up About a minute
92459dbb1ec7 ubuntu "/bin/bash" 7 minutes ago Up 1 second
[root@localhost docker]# docker container restart Ubuntu01
Ubuntu01
[root@localhost docker]# |
```

CONTAINER ID	NAME	CPU %	MEM USAGE / LIMIT	MEM %	NET I/O	BLOCK I/O	PIDS
d3f1f9ac9dcf	Ubuntu02	0.00%	1.508MiB / 1.668GiB	0.09%	2.16kB / 126B	24.6kB / 0B	2

```
[root@localhost docker]# docker system events
2025-11-05T16:13:08.965[73117+05:30] container kill d3f1f9ac9dcbf337751cf131e1c988c7bc4b86edeb0b03824b1b33ee28090e8 (image=ubuntu, name=Ubuntu02, org.opencontainers.image.ref.name=ubuntu, org.opencontainers.image.version=24.04, signal=15)
2025-11-05T16:13:18.994[025973+05:30] container kill d3f1f9ac9dcbf337751cf131e1c988c7bc4b86edeb0b03824b1b33ee28090e8 (image=ubuntu, name=Ubuntu02, org.opencontainers.image.ref.name=ubuntu, org.opencontainers.image.version=24.04, signal=15)
2025-11-05T16:13:18.994[025973+05:30] network disconnect 0c0307888783336e0b262e05aca4adc74b409bc7ba0c07f627cedbf0c013413 (container=d3f1f9ac9dcbf337751cf131e1c988c7bc4b86edeb0b03824b1b33ee28090e8, name=bridge, type=bridge)
2025-11-05T16:13:19.188[375510+05:30] container stop d3f1f9ac9dcbf337751cf131e1c988c7bc4b86edeb0b03824b1b33ee28090e8 (image=ubuntu, name=Ubuntu02, org.opencontainers.image.ref.name=ubuntu, org.opencontainers.image.version=24.04)
2025-11-05T16:13:19.188[375510+05:30] container die d3f1f9ac9dcbf337751cf131e1c988c7bc4b86edeb0b03824b1b33ee28090e8 (execDuration=38, exitCode=137, image=ubuntu, name=Ubuntu02, org.opencontainers.image.ref.name=ubuntu, org.opencontainers.image.version=24.04)
2025-11-05T16:13:19.387[124944+05:30] network connect 0c0307888783336e0b262e05aca4adc74b409bc7ba0c07f627cedbf0c013413 (container=d3f1f9ac9dcbf337751cf131e1c988c7bc4b86edeb0b03824b1b33ee28090e8, name=bridge, type=bridge)
2025-11-05T16:13:19.415[917162+05:30] container start d3f1f9ac9dcbf337751cf131e1c988c7bc4b86edeb0b03824b1b33ee28090e8 (image=ubuntu, name=Ubuntu02, org.opencontainers.image.ref.name=ubuntu, org.opencontainers.image.version=24.04)
2025-11-05T16:13:19.415[917162+05:30] container restart d3f1f9ac9dcbf337751cf131e1c988c7bc4b86edeb0b03824b1b33ee28090e8 (image=ubuntu, name=Ubuntu02, org.opencontainers.image.ref.name=ubuntu, org.opencontainers.image.version=24.04)
```

```
[root@localhost docker]# docker ps -a
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES
d3f1f9ac9dcf ubuntu "/bin/bash" 7 minutes ago Up About a minute Ubuntu02
92459dbb1ec7 ubuntu "/bin/bash" 12 minutes ago Up 4 minutes Ubuntu01
[root@localhost docker]# docker container rm $(docker container stop $(docker ps -aq))
d3f1f9ac9dcf
92459dbb1ec7
[root@localhost docker]# |
```

18. DockerHub Repository Setup

Create a DockerHub account.

Set up a repository with a meaningful name.

Repositories / [cloudethix](#) / General

ajinkyap009/cloudethix ⓘ

Created in less than a minute • ⭐0 • ↓0

Repository to have images for tasks performed in CloudEthix. ⚪

Add a category ⚪ ⓘ

General Tags Image Management BETA Collaborators Webhooks Settings

Tags ⓘ INCOMPLETE ⚪ DOCKER SCOUT INACTIVE [Activate](#)

Pushed images appear here.

Tasks 03:

19. Run four HTTPD Docker containers with distinct, meaningful names, and apply restart policies (NO, On-Failure, Always, and Unless-Stopped) to each of the four containers, respectively. Demonstrate that the restart policies function as expected.

```
root@Ajinkyapame:~# docker container run -d --name no-container -p 80:80 --restart=never httpd
root@Ajinkyapame:~# docker container run -d --name on-failure-container -p 90:80 --restart on-failure httpd
e29b7bb641c9e23ab46dd6770424a64f8ea01f1809b78d198507f4ddab52b
root@Ajinkyapame:~# docker ps
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES
e29b7bb641c9 httpd "httpd-foreground" 13 seconds ago Up 13 seconds 0.0.0.0:90->80/tcp, [::]:90->80/tcp on-failure-container
46c93f4041ec httpd "httpd-foreground" 43 seconds ago Up 43 seconds 0.0.0.0:80->80/tcp, [::]:80->80/tcp no-container
root@Ajinkyapame:~# docker container run -d --name always-container -p 8080:80 --restart always httpd
464c3c434934c851399ac5a53764135aa182aa3160c56cd3bd2cc4b453baabe3
root@Ajinkyapame:~# docker container run -d --name unless-container -p 9090:80 --restart unless-stopped httpd
8a2470a6e5af597dc36645b297fd6373547c31691512e5b58bf483f04be3f22f8
root@Ajinkyapame:~# docker ps
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES
8a2470a6e5af httpd "httpd-foreground" 3 seconds ago Up 2 seconds 0.0.0.0:9090->80/tcp, [::]:9090->80/tcp unless-container
464c3c434934 httpd "httpd-foreground" 12 minutes ago Up 12 minutes 0.0.0.0:8880->80/tcp, [::]:8880->80/tcp always-container
e29b7bb641c9 httpd "httpd-foreground" 13 minutes ago Up 13 minutes 0.0.0.0:90->80/tcp, [::]:90->80/tcp on-failure-container
46c93f4041ec httpd "httpd-foreground" 14 minutes ago Up 14 minutes 0.0.0.0:80->80/tcp, [::]:80->80/tcp no-container
root@Ajinkyapame:~#
```

Check for NO:

```
root@AjinkyaPame:~# systemctl restart docker.service
root@AjinkyaPame:~# docker ps -a
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES
8a247bae65af httpd "httpd-foreground" 18 minutes ago Up 1 second 0.0.0.0:9090->80/tcp, [::]:9090->80/tcp 0.0.0.0:8080->80/tcp, [::]:8080->80/tcp unless-container always-container on-failure-container no-container
464c3c434934 httpd "httpd-foreground" 31 minutes ago Up 1 second
e29b7bb641c9 httpd "httpd-foreground" 32 minutes ago Exited (0) 5 minutes ago 0.0.0.0:9090->80/tcp, [::]:9090->80/tcp 0.0.0.0:8080->80/tcp, [::]:8080->80/tcp
46c93f4041ec httpd "httpd-foreground" 32 minutes ago Exited (0) 5 minutes ago
root@AjinkyaPame:~# |
```

Check for always:

```
root@AjinkyaPame:~# sudo systemctl restart docker
docker ps
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES
8a247bae65af httpd "httpd-foreground" 13 minutes ago Up Less than a second 0.0.0.0:9090->80/tcp, [::]:9090->80/tcp 0.0.0.0:8080->80/tcp, [::]:8080->80/tcp unless-container always-container
464c3c434934 httpd "httpd-foreground" 25 minutes ago Up Less than a second
root@AjinkyaPame:~# |
root@AjinkyaPame:~# |
```

Check for On-failure:

```
root@AjinkyaPame:~# docker ps -a
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES
8a247bae65af httpd "httpd-foreground" 34 minutes ago Exited (137) 48 seconds ago 0.0.0.0:8080->80/tcp, [::]:8080->80/tcp unless-container always-container on-failure-contai
464c3c434934 httpd "httpd-foreground" 47 minutes ago Up 16 minutes
e29b7bb641c9 httpd "httpd-foreground" 48 minutes ago Exited (137) About a minute ago
root@AjinkyaPame:~# docker ps -a
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES
8a247bae65af httpd "httpd-foreground" 35 minutes ago Exited (137) About a minute ago 0.0.0.0:8080->80/tcp, [::]:8080->80/tcp unless-container always-container on-failure-contai
464c3c434934 httpd "httpd-foreground" 47 minutes ago Up 2 seconds 0.0.0.0:90->80/tcp, [::]:90->80/tcp
e29b7bb641c9 httpd "httpd-foreground" 48 minutes ago Up 2 seconds
root@AjinkyaPame:~# docker ps -a
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES
46c93f4041ec httpd "httpd-foreground" 49 minutes ago Exited (0) 22 minutes ago
root@AjinkyaPame:~# |
```

Check for unless-stopped:

```
root@AjinkyaPame:~# docker exec unless-container /bin/sh -c "kill -s TERM 1"
root@AjinkyaPame:~# docker ps -a
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES
8a247bae65af httpd "httpd-foreground" 38 minutes ago Up 1 second 0.0.0.0:9090->80/tcp, [::]:9090->80/tcp 0.0.0.0:8080->80/tcp, [::]:8080->80/tcp unless-container always-contai
464c3c434934 httpd "httpd-foreground" 50 minutes ago Up 2 minutes 0.0.0.0:8080->80/tcp, [::]:8080->80/tcp 0.0.0.0:90->80/tcp, [::]:90->80/tcp on-failure-contai
e29b7bb641c9 httpd "httpd-foreground" 51 minutes ago Up 2 minutes
46c93f4041ec httpd "httpd-foreground" 55 minutes ago Exited (0) 24 minutes ago
root@AjinkyaPame:~# |
```

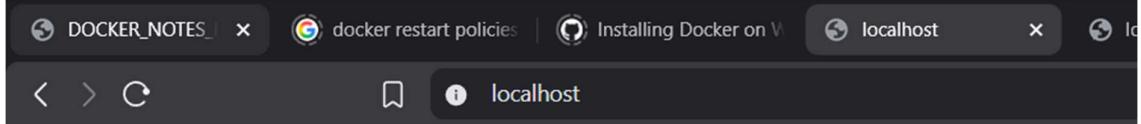
20. Change the restart policy of a above running container from the default to a custom policy using the docker update command.

e.g. docker update --help

```
root@AjinkyaPame:~# docker ps -a
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES
8a247bae65af httpd "httpd-foreground" 41 minutes ago Up 3 minutes 0.0.0.0:9090->80/tcp, [::]:9090->80/tcp 0.0.0.0:8080->80/tcp, [::]:8080->80/tcp unless-container always-contai
464c3c434934 httpd "httpd-foreground" 53 minutes ago Up 6 minutes
e29b7bb641c9 httpd "httpd-foreground" 54 minutes ago Up 6 minutes 0.0.0.0:90->80/tcp, [::]:90->80/tcp on-failure-contai
46c93f4041ec httpd "httpd-foreground" 55 minutes ago Exited (0) 28 minutes ago
root@AjinkyaPame:~# docker update --restart always no-container
no-container
root@AjinkyaPame:~# docker ps -a
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES
8a247bae65af httpd "httpd-foreground" 41 minutes ago Up 3 minutes 0.0.0.0:9090->80/tcp, [::]:9090->80/tcp 0.0.0.0:8080->80/tcp, [::]:8080->80/tcp unless-container always-contai
464c3c434934 httpd "httpd-foreground" 53 minutes ago Up 6 minutes
e29b7bb641c9 httpd "httpd-foreground" 54 minutes ago Up 6 minutes 0.0.0.0:90->80/tcp, [::]:90->80/tcp on-failure-contai
46c93f4041ec httpd "httpd-foreground" 55 minutes ago Exited (0) 28 minutes ago
root@AjinkyaPame:~# systemctl restart docker.service
root@AjinkyaPame:~# docker ps -a
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES
8a247bae65af httpd "httpd-foreground" 41 minutes ago Up 2 seconds 0.0.0.0:9090->80/tcp, [::]:9090->80/tcp 0.0.0.0:8080->80/tcp, [::]:8080->80/tcp unless-container always-contai
464c3c434934 httpd "httpd-foreground" 54 minutes ago Up 2 seconds
e29b7bb641c9 httpd "httpd-foreground" 55 minutes ago Exited (0) 2 seconds ago 0.0.0.0:90->80/tcp, [::]:90->80/tcp on-failure-contai
46c93f4041ec httpd "httpd-foreground" 55 minutes ago Up 2 seconds 0.0.0.0:80->80/tcp, [::]:80->80/tcp no-container
root@AjinkyaPame:~# |
```

21. Launch an NGINX container with a meaningful name and expose it on the host's port 80. Create an "index.html" file containing the text "Hello there, Let's be the Team CloudEthiX," and copy the file to the container's "/usr/share/nginx/html/" location. Access the container in a browser to verify that the webpage displays correctly.

```
root@AjinkyaPame:~/Docker# docker image ls
REPOSITORY      TAG      IMAGE ID      CREATED      SIZE
httpd          latest   6a4fe18d08d2  2 days ago   117MB
nginx          latest   d261fd19cb63  2 days ago   152MB
docker-compose-db latest   890f0a9fcada  6 months ago  859MB
root@AjinkyaPame:~/Docker# nano index.html
root@AjinkyaPame:~/Docker# docker container run -d --name nginx-cont -p 80:80 nginx:latest
c751f37f85f8b2e7acecd03c9a1bdb2b1482a2c9f081d5a5df33cb204e0089c5
root@AjinkyaPame:~/Docker# docker cp index.html c751f37f85f8b2e:/usr/share/nginx/html/
Successfully copied 2.05kB to c751f37f85f8b2e:/usr/share/nginx/html/
root@AjinkyaPame:~/Docker# |
```



Hello There, Let's be the Team CloudEthiX!!

22. Run a docker container with CPU and Memory limit.

docker container run --help

ref links :-

<https://phoenixnap.com/kb/docker-memory-and-cpu-limit>

<https://www.baeldung.com/ops/docker-memory-limit>

```
root@AjinkyaPame:~/Docker# docker container run -d --memory=512m --cpu
--cpu-count      (CPU count (Windows only))           --cpu-rt-runtime  (Limit CPU real-time runtime in microseconds)
--cpu-percent    (CPU percent (Windows only))         --cpu-shares     (CPU shares (relative weight))
--cpu-period     (Limit CPU CFS (Completely Fair Scheduler) period)  --cpus          (Number of CPUs)
--cpu-quota      (Limit CPU CFS (Completely Fair Scheduler) quota)   --cpuset-cpus   (CPUs in which to allow execution (0-3, 0,1))
--cpu-rt-period   (Limit CPU real-time period in microseconds)    --cpuset-mems  (MEMs in which to allow execution (0-3, 0,1))
root@AjinkyaPame:~/Docker# docker container run -dit --memory=512m --cpus=2 nginx:latest
485216a5798ee3838b7b5f020bf21ef19a9265aced5d1f037ff8834a9b42401
root@AjinkyaPame:~/Docker# docker container inspect | grep -i Memory
always-containr elegant_jang      nginx-cont      no-container      on-failure-test      unless-containr
root@AjinkyaPame:~/Docker# docker container inspect | grep -i Memory
always-containr elegant_jang      nginx-cont      no-container      on-failure-test      unless-containr
root@AjinkyaPame:~/Docker# docker container inspect elegant_jang | grep -i Memory
  "Memory": 536870912,
  "MemoryReservation": 0,
  "MemorySwap": 1073741824,
  "MemorySwappiness": null,
root@AjinkyaPame:~/Docker# docker container inspect elegant_jang | grep -i cpu
  "CpuShares": 0,
  "NanoCpus": 2000000000,
  "CpuPeriod": 0,
  "CpuQuota": 0,
  "CpuRealtimePeriod": 0,
  "CpuRealtimeRuntime": 0,
  "CpusetCpus": "",
  "CpusetMems": "",
  "CpuCount": 0,
  "CpuPercent": 0,
root@AjinkyaPame:~/Docker# |
```