

# Install docker on EC2 and explore the docker commands (docker images, containers, volumes, network)

Techstacks needs to be used :

- AWS EC2
- Docker

## Installed the docker in the EC2

```
[ec2-user@ip-172-31-29-252 ~]$ docker --version
Docker version 25.0.13, build 0bab007
[ec2-user@ip-172-31-29-252 ~]$ sudo systemctl status docker
○ docker.service - Docker Application Container Engine
   Loaded: loaded (/usr/lib/systemd/system/docker.service; disabled; preset: disabled)
   Active: inactive (dead)
     TriggeredBy: ○ docker.socket
     Docs: https://docs.docker.com
[ec2-user@ip-172-31-29-252 ~]$ sudo systemctl start docker
[ec2-user@ip-172-31-29-252 ~]$ sudo systemctl enable docker
Created symlink /etc/systemd/system/multi-user.target.wants/docker.service → /usr/lib/systemd/system/docker.service.
[ec2-user@ip-172-31-29-252 ~]$ sudo systemctl status docker
● docker.service - Docker Application Container Engine
   Loaded: loaded (/usr/lib/systemd/system/docker.service; enabled; preset: disabled)
   Active: active (running) since Wed 2025-10-22 19:23:55 UTC; 17s ago
     TriggeredBy: ● docker.socket
     Docs: https://docs.docker.com
   Main PID: 7403 (dockerd)
   Tasks: 9
   Memory: 36.4M
   CPU: 372ms
   CGroup: /system.slice/docker.service
           └─7403 /usr/bin/dockerd -B 5d:/// --containerd=/run/containerd/containerd.sock --default-ulimits=52768:65536

Oct 22 19:23:54 ip-172-31-29-252.us-east-2.compute.internal systemd[1]: Starting docker.service - Docker Application Container Engine...
Oct 22 19:23:54 ip-172-31-29-252.us-east-2.compute.internal dockerd[7403]: time="2025-10-22T19:23:54.828640000Z" level=info msg="Starting up"
Oct 22 19:23:54 ip-172-31-29-252.us-east-2.compute.internal dockerd[7403]: time="2025-10-22T19:23:54.404568302Z" level=info msg="Loading containers: start."
Oct 22 19:23:54 ip-172-31-29-252.us-east-2.compute.internal dockerd[7403]: time="2025-10-22T19:23:54.958049920Z" level=info msg="Loading containers: done."
Oct 22 19:23:54 ip-172-31-29-252.us-east-2.compute.internal dockerd[7403]: time="2025-10-22T19:23:54.988632372Z" level=info msg="Docker daemon" commit="635b5e containerd-snapshotter=false storage-driver=overlay2 version=25.0.13
Oct 22 19:23:54 ip-172-31-29-252.us-east-2.compute.internal dockerd[7403]: time="2025-10-22T19:23:54.998863202Z" level=info msg="Daemon has completed initialization"
Oct 22 19:23:55 ip-172-31-29-252.us-east-2.compute.internal dockerd[7403]: time="2025-10-22T19:23:55.043689715Z" level=info msg="API listen on /run/docker.sock"
[ec2-user@ip-172-31-29-252 ~]$
```

## Created / Pulled the image from the docker hub and created the container out of it

```
[root@ip-172-31-29-252 ec2-user]# docker run -d -p 100:80 --name demo-nginx nginx:alpine
Unable to find image 'nginx:alpine' locally
alpine: Pulling from library/nginx
2d35ebdb57d9: Pull complete
f80aba050ead: Pull complete
621a51978ed7: Pull complete
03e63548f209: Pull complete
83ce83cd9960: Pull complete
e2d0ea5d3690: Pull complete
7fb80c2f28bc: Pull complete
76c9bcaa4163: Pull complete
Digest: sha256:61e01287e546aac28a3f56839c136b31f590273f3b41187a36f46f6a03bbfe22
Status: Downloaded newer image for nginx:alpine
e6cb5654ef0016849e6fda0eacf9d915f4d3c5f9ec7e69c2b26bff6db499f022
```

```
[root@ip-172-31-29-252 ec2-user]# docker images
REPOSITORY TAG IMAGE ID CREATED SIZE
nginx alpine Se7abccd2021 2 weeks ago 52.8MB
[root@ip-172-31-29-252 ec2-user]# docker ps
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES
e6cb5654ef00 nginx:alpine "/docker-entrypoint..." About a minute ago Up About a minute 0.0.0.0:100->80/tcp, :::100->80/tcp demo-nginx
```

```
[root@ip-172-31-29-252 ec2-user]# docker pull nginx:mainline
mainline: Pulling from library/nginx
3b513bd72563: Pull complete
10d18f44ee97: Pull complete
a8d825a0683a: Pull complete
a131b0c1d4bd5: Pull complete
3819929ed19f: Pull complete
1498b1cfd015: Pull complete
c50c840ed4d: Pull complete
Digest: sha256:029d4461bd98f124e531380505ceea2072418fdf28752aa73b7b273ba3048903
Status: Downloaded newer image for nginx:mainline
docker.io/library/nginx:mainline
[root@ip-172-31-29-252 ec2-user]# docker images
REPOSITORY    TAG       IMAGE ID       CREATED        SIZE
nginx         alpine    5e7abdc4d2021 2 weeks ago   52.8MB
nginx         mainline  657fddc1c365 2 weeks ago   152MB
[root@ip-172-31-29-252 ec2-user]# docker ps
CONTAINER ID   IMAGE     COMMAND                  CREATED        STATUS        PORTS                               NAMES
ec6b5654ef00  nginx:alpine  "/docker-entrypoint..." 8 minutes ago Up 8 minutes  0.0.0.0:100->80/tcp, :::100->80/tcp  demo-nginx
[root@ip-172-31-29-252 ec2-user]# docker run -d -p 200:81 nginx
Unable to find image 'nginx:latest' locally
latest: Pulling from library/nginx
Digest: sha256:029d4461bd98f124e531380505ceea2072418fdf28752aa73b7b273ba3048903
Status: Downloaded newer image for nginx:latest
bb37651e9fcbda1625b4cb75c8f23bec210f3e253494bb3b643e11f1b55ff47e
[root@ip-172-31-29-252 ec2-user]# docker ps
CONTAINER ID   IMAGE     COMMAND                  CREATED        STATUS        PORTS                               NAMES
bb37651e9fcb  nginx     "/docker-entrypoint..." 11 seconds ago Up 10 seconds  80/tcp, 0.0.0.0:200->81/tcp, :::200->81/tcp  gracious_villani
ec6b5654ef00  nginx:alpine  "/docker-entrypoint..." 9 minutes ago Up 9 minutes  0.0.0.0:100->80/tcp, :::100->80/tcp        demo-nginx
[root@ip-172-31-29-252 ec2-user]# docker images
REPOSITORY    TAG       IMAGE ID       CREATED        SIZE
nginx         alpine    5e7abdc4d2021 2 weeks ago   52.8MB
nginx         latest    657fddc1c365 2 weeks ago   152MB
nginx         mainline  657fddc1c365 2 weeks ago   152MB
[root@ip-172-31-29-252 ec2-user]# docker run -d -p 300:82 nginx:mainline
18b4222a7757b540fac3fci12115c9ae8853af4e3f11d90a1e20e9c3bfb313
[root@ip-172-31-29-252 ec2-user]# docker ps
CONTAINER ID   IMAGE     COMMAND                  CREATED        STATUS        PORTS                               NAMES
18b4222a7757  nginx:mainline  "/docker-entrypoint..." 6 seconds ago Up 5 seconds  80/tcp, 0.0.0.0:300->82/tcp, :::300->82/tcp  funny_solomon
bb37651e9fcb  nginx     "/docker-entrypoint..." About a minute ago Up About a minute  80/tcp, 0.0.0.0:200->81/tcp, :::200->81/tcp  gracious_villani
ec6b5654ef00  nginx:alpine  "/docker-entrypoint..." 10 minutes ago Up 10 minutes  0.0.0.0:100->80/tcp, :::100->80/tcp        demo-nginx
```

Created image and container and intentionally stopped and deleted the container.

```
[root@ip-172-31-29-252 ec2-user]# docker ps
CONTAINER ID   IMAGE     COMMAND                  CREATED        STATUS        PORTS                               NAMES
bb37651e9fcb  nginx     "/docker-entrypoint..." 11 seconds ago Up 10 seconds  80/tcp, 0.0.0.0:200->81/tcp, :::200->81/tcp  gracious_villani
ec6b5654ef00  nginx:alpine  "/docker-entrypoint..." 9 minutes ago Up 9 minutes  0.0.0.0:100->80/tcp, :::100->80/tcp        demo-nginx
[root@ip-172-31-29-252 ec2-user]# docker images
REPOSITORY    TAG       IMAGE ID       CREATED        SIZE
nginx         alpine    5e7abdc4d2021 2 weeks ago   52.8MB
nginx         latest    657fddc1c365 2 weeks ago   152MB
nginx         mainline  657fddc1c365 2 weeks ago   152MB
[root@ip-172-31-29-252 ec2-user]# docker run -d -p 300:82 nginx:mainline
18b4222a7757b540fac3fci12115c9ae8853af4e3f11d90a1e20e9c3bfb313
[root@ip-172-31-29-252 ec2-user]# docker ps
CONTAINER ID   IMAGE     COMMAND                  CREATED        STATUS        PORTS                               NAMES
18b4222a7757  nginx:mainline  "/docker-entrypoint..." 6 seconds ago Up 5 seconds  80/tcp, 0.0.0.0:300->82/tcp, :::300->82/tcp  funny_solomon
bb37651e9fcb  nginx     "/docker-entrypoint..." About a minute ago Up About a minute  80/tcp, 0.0.0.0:200->81/tcp, :::200->81/tcp  gracious_villani
ec6b5654ef00  nginx:alpine  "/docker-entrypoint..." 10 minutes ago Up 10 minutes  0.0.0.0:100->80/tcp, :::100->80/tcp        demo-nginx
[root@ip-172-31-29-252 ec2-user]# docker stop $(docker ps -a -q)
18b4222a7757
bb37651e9fcb
ec6b5654ef00
[root@ip-172-31-29-252 ec2-user]# docker ps
CONTAINER ID   IMAGE     COMMAND                  CREATED        STATUS        PORTS   NAMES
[root@ip-172-31-29-252 ec2-user]# docker ps -a
CONTAINER ID   IMAGE     COMMAND                  CREATED        STATUS        PORTS   NAMES
18b4222a7757  nginx:mainline  "/docker-entrypoint..." About a minute ago Exited (0) 21 seconds ago          funny_solomon
bb37651e9fcb  nginx     "/docker-entrypoint..." 2 minutes ago Exited (0) 21 seconds ago          gracious_villani
ec6b5654ef00  nginx:alpine  "/docker-entrypoint..." 11 minutes ago Exited (0) 21 seconds ago          demo-nginx
[root@ip-172-31-29-252 ec2-user]# docker rm $(docker ps -a -q)
bash: syntax error near unexpected token '('
[root@ip-172-31-29-252 ec2-user]# docker rm $(docker ps -a -q)
18b4222a7757
bb37651e9fcb
ec6b5654ef00
[root@ip-172-31-29-252 ec2-user]# docker ps -a
CONTAINER ID   IMAGE     COMMAND                  CREATED        STATUS        PORTS   NAMES
[root@ip-172-31-29-252 ec2-user]# ||
```

Created the volume in the docker and mounted it into the container

```
[root@ip-172-31-29-252 ec2-user]# docker volume create my-volume
my-volume
[root@ip-172-31-29-252 ec2-user]# docker volume ls
DRIVER    VOLUME NAME
local     my-volume
```

```
[root@ip-172-31-29-252 ~]# docker volume ls
DRIVER      VOLUME NAME
local       my-volume
[root@ip-172-31-29-252 ~]# docker run -d --name dev-prod -p 1000:80 -v my-volume:/usr/share/nginx nginx:mainline
Unable to find image 'nginx:mainline' locally
mainline: Pulling from library/nginx
38513bd72563: Pull complete
10d18f46ee87: Pull complete
a8d825a0683a: Pull complete
a131bcd4bd5: Pull complete
3818929ac19f: Pull complete
1498b1cfd415: Pull complete
c50c84d0ed4d: Pull complete
Digest: sha256:029d4461bd98f124e531380505ceea2072418fdf28752aa73b7b273ba3048903
Status: Downloaded newer image for nginx:mainline
2be31ce4d4ab8d9944c1042f4b20982bb0009b7a7bf944594ca4b69ec3ea0b6
[root@ip-172-31-29-252 ~]# docker ps
CONTAINER ID   IMAGE      COMMAND                  CREATED        STATUS        PORTS                               NAMES
2be31ce4d4ab   nginx:mainline "/docker-entrypoint..." 11 seconds ago Up 10 seconds 0.0.0.0:1000->80/tcp, :::1000->80/tcp dev-prod
```

To verify the mounting the volumes in container :

```
[root@ip-172-31-29-252 ~]# docker ps
CONTAINER ID   IMAGE      COMMAND                  CREATED        STATUS        PORTS                               NAMES
2be31ce4d4ab   nginx:mainline "/docker-entrypoint..." 11 seconds ago Up 10 seconds 0.0.0.0:1000->80/tcp, :::1000->80/tcp dev-prod
[root@ip-172-31-29-252 ~]# docker inspect ^C
[root@ip-172-31-29-252 ~]# docker inspect 2be31ce4d4ab
```

```
},
  "Mounts": [
    {
      "Type": "volume",
      "Name": "my-volume",
      "Source": "/var/lib/docker/volumes/my-volume/_data",
      "Destination": "/usr/share/nginx",
      "Driver": "local",
      "Mode": "z",
      "RW": true,
      "Propagation": ""
    }
  ]
}
```

Deleted the persistence volume intentionally by stopping and removing the container

```
[root@ip-172-31-29-252 ec2-user]# docker volume ls
DRIVER      VOLUME NAME
local       my-volume
[root@ip-172-31-29-252 ec2-user]# docker volume prune
WARNING! This will remove anonymous local volumes not used by at least one container.
Are you sure you want to continue? [y/N] y
Total reclaimed space: 0B
[root@ip-172-31-29-252 ec2-user]# docker volume ls
DRIVER      VOLUME NAME
local       my-volume
[root@ip-172-31-29-252 ec2-user]# docker volume rm my-volume
my-volume
[root@ip-172-31-29-252 ec2-user]# docker volume ls
DRIVER      VOLUME NAME
[root@ip-172-31-29-252 ec2-user]# | |
```

Created the docker network, attached it to the container and deleted it intentionally

```
[root@ip-172-31-29-252 ec2-user]# docker network create my-network
411269b9249b47d1c7726378323284f2e019a0cafa1a5023fc4391381afc2eec2
[root@ip-172-31-29-252 ec2-user]# docker network ls
NETWORK ID          NAME                DRIVER              SCOPE
3f9717469f11        bridge              bridge              local
555d16fbfd08        host                host                local
411269b9249b        my-network          bridge              local
1c788abe8b26        none                null                local
[root@ip-172-31-29-252 ec2-user]# docker network inspect my-network
[
  {
    "Name": "my-network",
    "Id": "411269b9249b47d1c7726378323284f2e019a0cafa1a5023fc4391381afc2eec2",
    "Created": "2025-10-22T21:11:28.585513882Z",
    "Scope": "local",
    "Driver": "bridge",
    "EnableIPv6": false,
    "IPAM": {
      "Driver": "default",
      "Options": {},
      "Config": [
        {
          "Subnet": "172.18.0.0/16",
          "Gateway": "172.18.0.1"
        }
      ]
    },
    "Internal": false,
    "Attachable": false,
    "Ingress": false,
    "ConfigFrom": {
      "Network": ""
    },
    "ConfigOnly": false,
    "Containers": {},
    "Options": {},
    "Labels": {}
  }
]
```

```
[root@ip-172-31-29-252 ec2-user]# docker run -d --name web1 --network my-network nginx:alpine
Unable to find image 'nginx:alpine' locally
alpine: Pulling from library/nginx
2d35ebdb57d9: Pull complete
f80aba050ead: Pull complete
621a51978ed7: Pull complete
03e63548f209: Pull complete
83ce83cd9960: Pull complete
e2d0ea5d3690: Pull complete
7fb80c2f28bc: Pull complete
76c9bcaa4163: Pull complete
Digest: sha256:61e01287e546aac28a3f56839c136b31f590273f3b41187a36f46f6a03bbfe22
Status: Downloaded newer image for nginx:alpine
9c569febae21df16e46174e2004e19758fe84bbfff8b5a445c12e39aca6b3ac7
```

```
[root@ip-172-31-29-252 ec2-user]# docker ps
CONTAINER ID   IMAGE          COMMAND                  CREATED        STATUS        PORTS        NAMES
9c569febae21   nginx:alpine   "/docker-entrypoint..." 3 minutes ago  Up 3 minutes  80/tcp       web1
```

```
[root@ip-172-31-29-252 ec2-user]# docker stop 9c569febae21
9c569febae21
```

```
[root@ip-172-31-29-252 ec2-user]# docker network ls
NETWORK ID          NAME                DRIVER              SCOPE
3f9717469f11        bridge              bridge              local
555d16fbfd08        host                host                local
411269b9249b        my-network          bridge              local
1c788abe8b26        none                null                local
[root@ip-172-31-29-252 ec2-user]# docker rm my-network
Error response from daemon: No such container: my-network
[root@ip-172-31-29-252 ec2-user]# docker network rm my-network
my-network
```

---