Docker network

1)

DHCP

Range

docker
Container

NIC

Networking Software

Bridge

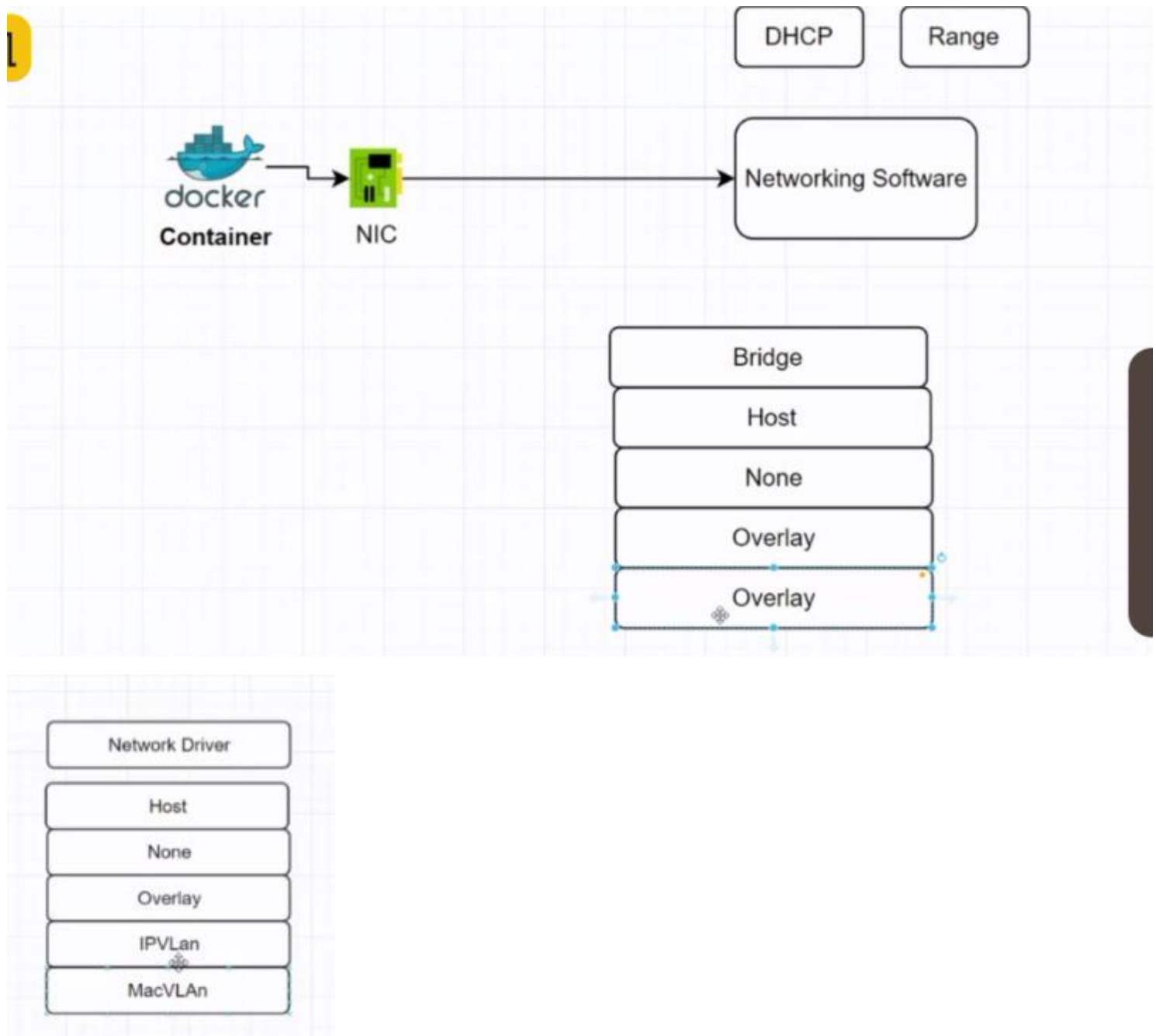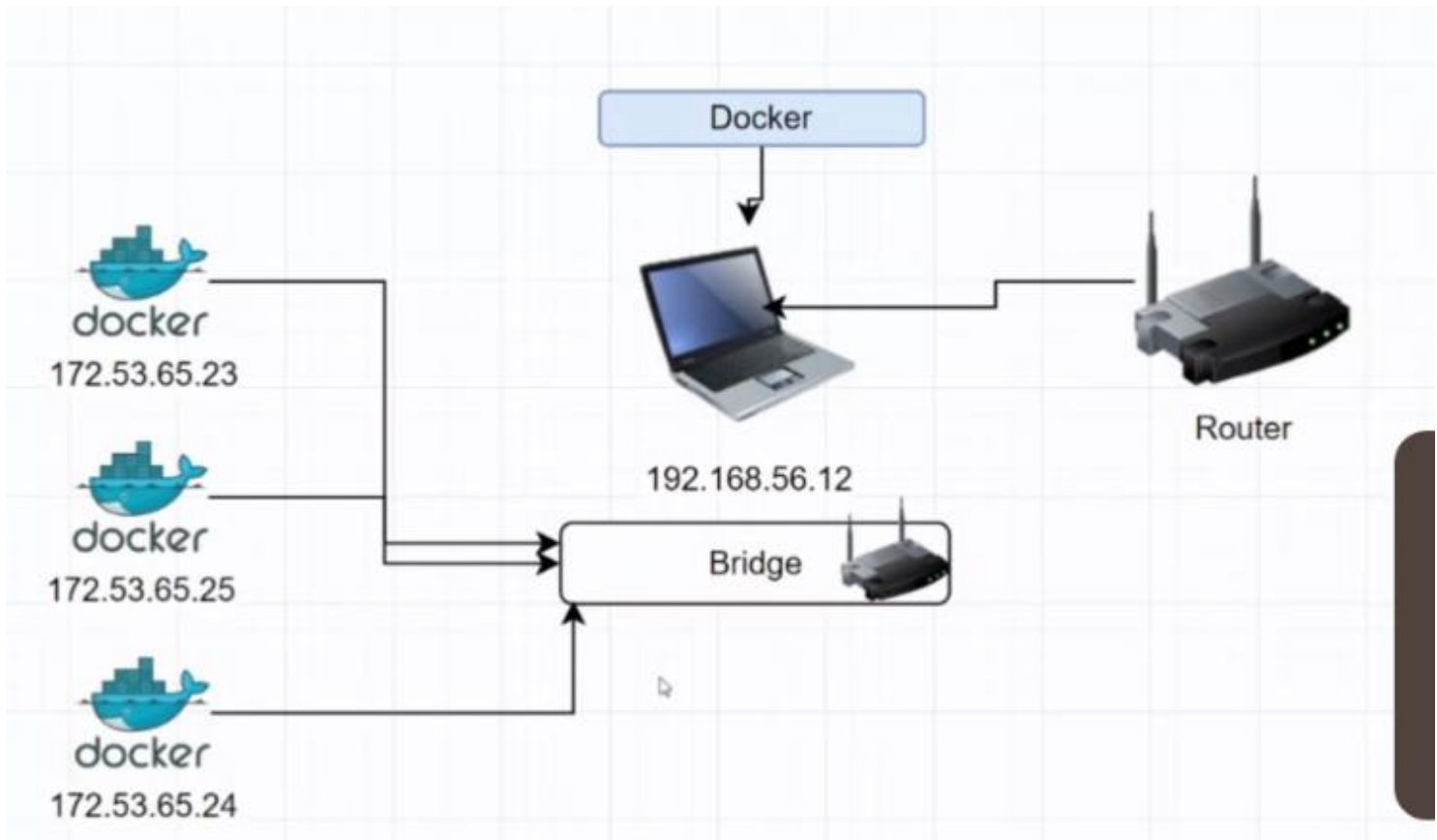Host

None

Overlay

Overlay

Network Driver

Host

None

Overlay

IPVLan

MacVLAn

Bridge network aapke laptop me chalta hua ek local network hai just like router

Bridge network is isolated network

1) **docker network ls**

```
root@vmdocker:/home/azureuser# docker network ls
NETWORK ID      NAME        DRIVER      SCOPE
062db86bdcc8    bridge      bridge      local
bd28f1f37a78    host        host        local
44f50b70aa2b    none        null        local
root@vmdocker:/home/azureuser#
```

2) **docker run -it ubuntu bash** = creating ubuntu container and entering into it

```
root@vmdocker:/home/azureuser# docker run -it ubuntu bash
root@a22fcfc44211:/#
```

3) **docker run -d --name website1 nginx**

docker run -d --name website2 nginx

docker run -d --name website3 nginx

```
root@vmdocker:/home/azureuser# docker run -d --name website1 nginx
5c49991c5298f1c7793581edab1e8f85457a62490d7b8c051db05e6dbf43d756
root@vmdocker:/home/azureuser# docker run -d --name website2 nginx
9cd4c6987b714032da9dbcab6ae284bdc2eb5a69c05d821d91cc58f1766f9d2a
root@vmdocker:/home/azureuser# docker run -d --name website3 nginx
93721077e179bcdcb7fadb957a0d615c1b378d2db382565b9e4786c2b80accc6
root@vmdocker:/home/azureuser#
```

4) **docker ps**

```
root@vmdocker:/home/azureuser# docker ps
CONTAINER ID   IMAGE    COMMAND                  CREATED              STATUS              PORTS      NAMES
93721077e179   nginx    "/docker-entrypoint.…"   About a minute ago   Up About a minute   80/tcp     website3
9cd4c6987b71   nginx    "/docker-entrypoint.…"   About a minute ago   Up About a minute   80/tcp     website2
5c49991c5298   nginx    "/docker-entrypoint.…"   About a minute ago   Up About a minute   80/tcp     website1
a22fcfc44211   ubuntu   "bash"                   About an hour ago    Up About an hour               reverent_aryabhata
root@vmdocker:/home/azureuser#
```

5) docker network ls

```
root@vmdocker:/home/azureuser# docker network ls
NETWORK ID     NAME      DRIVER    SCOPE
062db86bdcc8   bridge    bridge    local
bd28f1f37a78   host      host      local
44f50b70aa2b   none      null      local
root@vmdocker:/home/azureuser#
```

6) docker inspect bridge

```
root@vmdocker:/home/azureuser# docker inspect bridge
[
    {
        "Name": "bridge",
        "Id": "062db86bdcc8da46af3c0d46562db5cb660e4d247ae160be1cebec67865ff34e",
        "Created": "2025-04-15T08:41:55.421152426Z",
        "Scope": "local",
        "Driver": "bridge",
        "EnableIPv6": false,
        "IPAM": {
            "Driver": "default",
            "Options": null,
            "Config": [
                {
                    "Subnet": "172.17.0.0/16",
                    "Gateway": "172.17.0.1"
                }
            ]
        },
        "Internal": false,
        "Attachable": false,
        "Ingress": false,
        "ConfigFrom": {
            "Network": ""
        },
        "ConfigOnly": false,
        "Containers": {
            "5c49991c5298f1c7793581edab1e8f85457a62490d7b8c051db05e6dbf43d756": {
                "Name": "website1",
```

Subnet shows range – 65536 ips

7) Now checking whether one container can ping another container or not

docker ps

```
root@vmdocker:/home/azureuser# docker ps
CONTAINER ID   IMAGE    COMMAND                  CREATED          STATUS              PORTS      NAMES
93721077e179   nginx    "/docker-entrypoint.…"   7 minutes ago    Up 7 minutes        80/tcp     website3
9cd4c6987b71   nginx    "/docker-entrypoint.…"   7 minutes ago    Up 7 minutes        80/tcp     website2
5c49991c5298   nginx    "/docker-entrypoint.…"   7 minutes ago    Up 7 minutes        80/tcp     website1
a22fcfc44211   ubuntu   "bash"                   About an hour ago   Up About an hour             reverent_aryabhata
root@vmdocker:/home/azureuser#
```

8) docker exec -it 93721077e179 bash = ek container me ghusa jaaye dusre containers ko ping krne ke liye

But ping nhi tha

9) docker inspect 93721077e179

Container ka ip - 172.17.0.5

10) busybox ke container se ping karate hai dusre containers ko

docker run -it busybox sh

ping **172.17.0.5 = command to create and go inside container**

```
root@vmdocker:/home/azureuser# docker run -it busybox sh
/ # ping 172.17.0.5
PING 172.17.0.5 (172.17.0.5): 56 data bytes
```

So docker container is listening to each other hence proved

11) **docker network create --help**

docker network create --driver bridge dhondhu_network

```
root@vmdocker:/home/azureuser# docker network create --driver bridge dhondhu_network
6c9d8a1c9680a99aab2c25f6b89281116ac23ff7b729ca6022c88cced57e14cd
root@vmdocker:/home/azureuser#
```
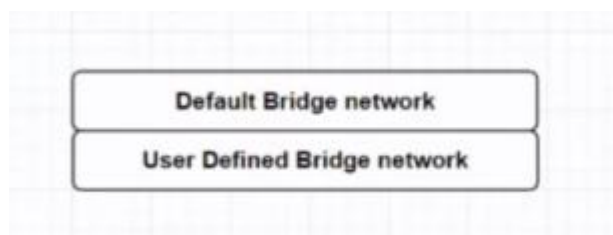
12) **docker network ls**

```
root@vmdocker:/home/azureuser# docker network ls
NETWORK ID      NAME              DRIVER    SCOPE
062db86bdcc8    bridge            bridge    local
6c9d8a1c9680    dhondhu_network   bridge    local
bd28f1f37a78    host              host      local
44f50b70aa2b    none              null      local
root@vmdocker:/home/azureuser#
```

13) **docker run -d --network dhondhu_network nginx**

```
root@vmdocker:/home/azureuser# docker run -d --network dhondhu_network nginx
3683afe2f657fd968971ca34378a0fcaf905d1a3ae12dbaeb76634873b80a8ea
root@vmdocker:/home/azureuser#
```

14) NOTE : Every container has it own NIC

```
Default Bridge network

User Defined Bridge network
```

15) **docker network create --driver bridge --gateway 172.20.0.1 --subnet 172.20.0.0/16 ankur_network**

```
root@vmdocker:/home/azureuser# docker network create --driver bridge --gateway 172.20.0.1 --subnet 172.20.0.0/16 ankur_network
dd2a7bc95ab43e308bb6386dea97f2b234370df5426d70dd84f57a0b862aa154
root@vmdocker:/home/azureuser#
```

**AGENA – Connecting with host**

docker network ls

```
root@vmdocker:/home/azureuser# docker network ls
NETWORK ID      NAME              DRIVER    SCOPE
dd2a7bc95ab4    ankur_network     bridge    local
062db86bdcc8    bridge            bridge    local
6c9d8a1c9680    dhondhu_network   bridge    local
bd28f1f37a78    host              host      local
44f50b70aa2b    none              null      local
root@vmdocker:/home/azureuser#
```
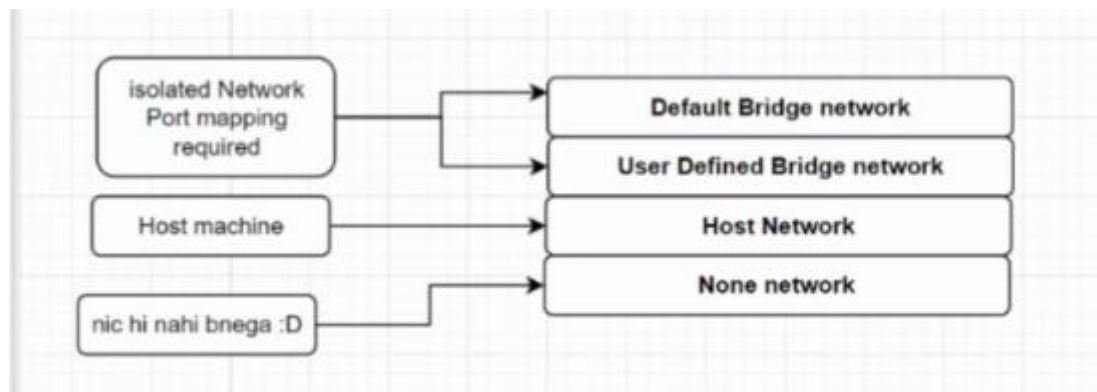
2) docker run -d --network host nginx

```
root@vmdocker:/home/azureuser# docker run -d --network host nginx
056dd0b4fb54889a863cbad6f249c873fc1cfe6f8827c1077c4b3e6aaad471ff
root@vmdocker:/home/azureuser#
```

3) Host:nginx port = 74.226.140.248:80
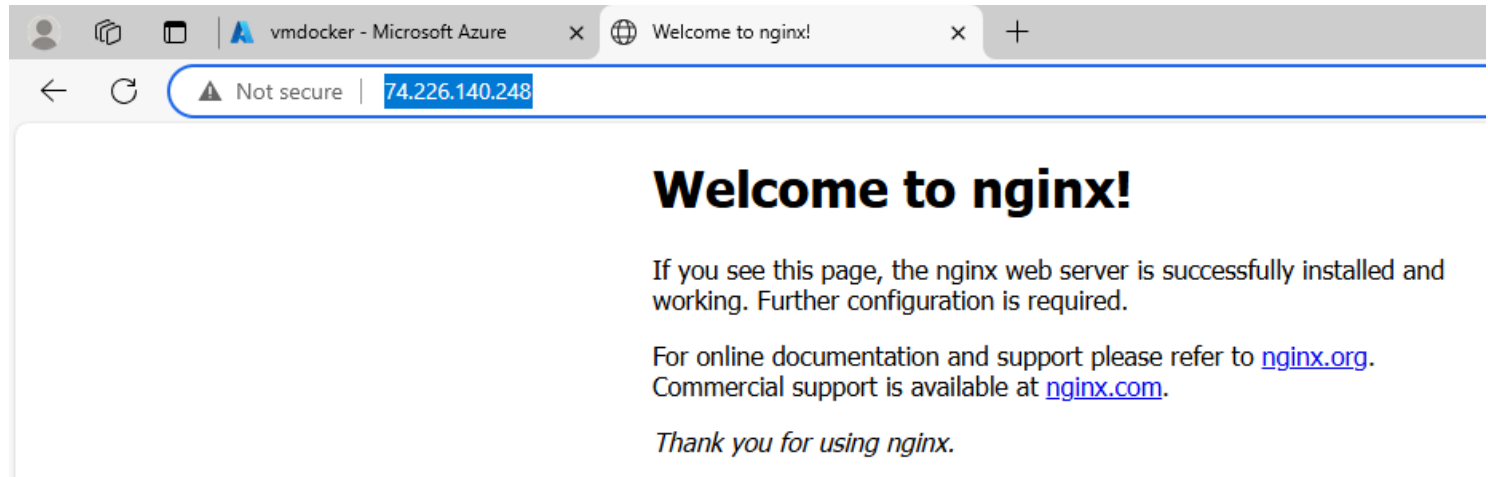
4)

AGENDA – None network

None is a highly secured container no one can access it

1) docker run -d --network none nginx

```
root@vmdocker:/home/azureuser# docker run -d --network none nginx
4be9a0edd87b02a2553502df6352e4ddcf43d5e7cf189f886825a0b871c5f688
root@vmdocker:/home/azureuser#
```

2) docker ps

```
root@vmdocker:/home/azureuser# docker ps
CONTAINER ID   IMAGE    COMMAND                CREATED          STATUS          PORTS      NAMES
4be9a0edd87b   nginx    "/docker-entrypoint.…" 54 seconds ago   Up 53 seconds              adoring_mcclintock
056dd0b4fb54   nginx    "/docker-entrypoint.…" 16 minutes ago   Up 16 minutes              zen_fermi
3683afe2f657   nginx    "/docker-entrypoint.…" 55 minutes ago   Up 55 minutes   80/tcp     cranky_yalow
93721077e179   nginx    "/docker-entrypoint.…" 2 hours ago      Up 2 hours      80/tcp     website3
9cd4c6987b71   nginx    "/docker-entrypoint.…" 2 hours ago      Up 2 hours      80/tcp     website2
5c49991c5298   nginx    "/docker-entrypoint.…" 2 hours ago      Up 2 hours      80/tcp     website1
a22fcfc44211   ubuntu   "bash"                 4 hours ago      Up 4 hours                 reverent_aryabhata
root@vmdocker:/home/azureuser#
```
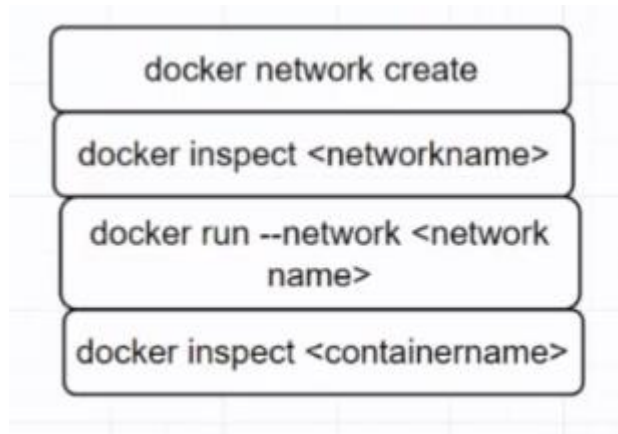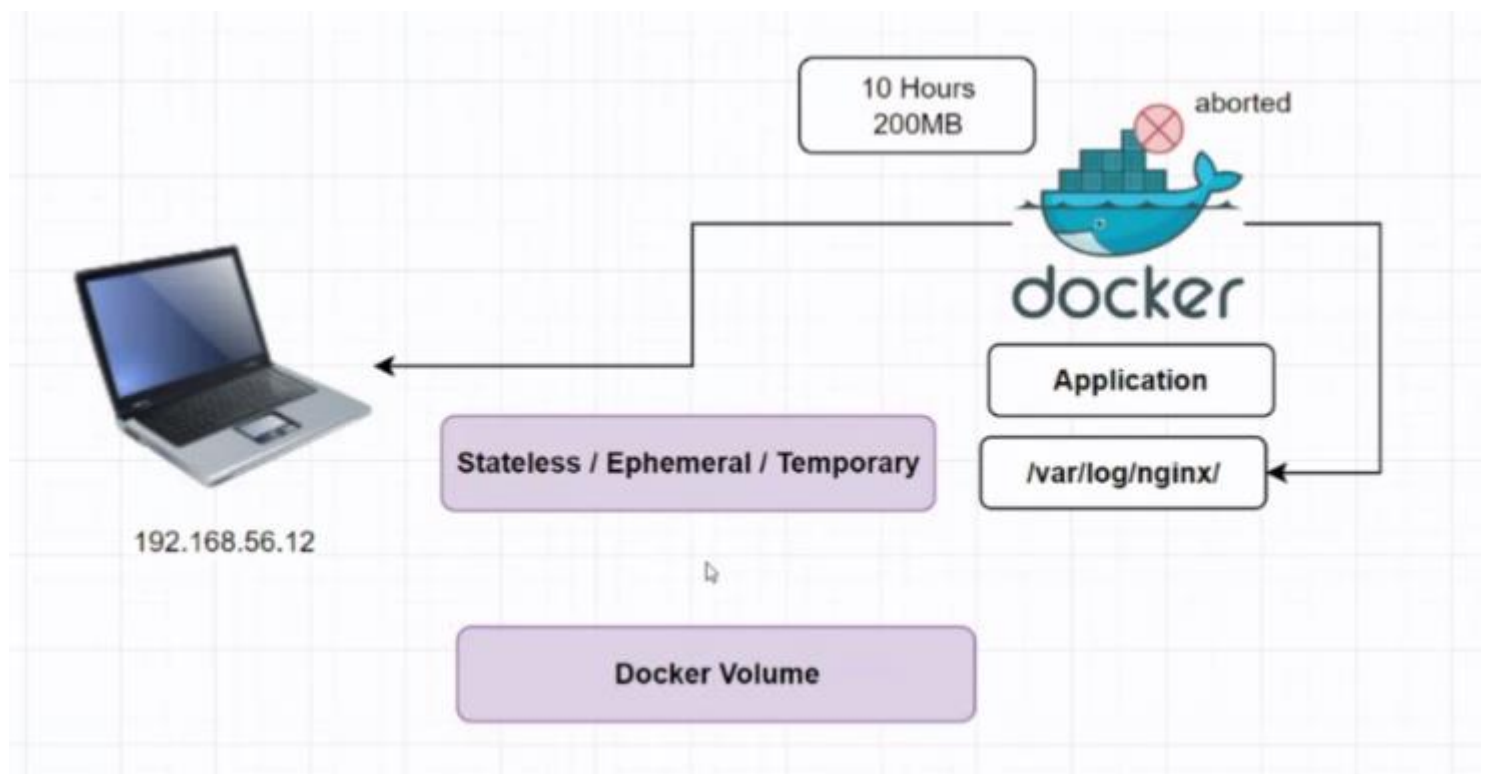
3) docker run -d --network none --name nonenginx nginx

```
root@vmdocker:/home/azureuser# docker run -d --network none --name nonenginx nginx
433c90b396b64d1eca76b914b2f08f4fd6343b072aabe112e401640658e1d104
root@vmdocker:/home/azureuser#
```

AGENDA – Agar host hi alag alag hoga to containers kaise communicate krenge

AGENDA – Docker volume

1) Container bhale hi mar jaaye but uska data lost nhi hona chahiye balki persist hona chahiye

2) **docker run -d -p 8081:80 -v <hostpath> <container path> name =**

   docker run -d -p 8081:80 -v /home/azureuser:/var/logs/nginx nginx

```
root@vmdocker:/home/azureuser# docker run -d -p 8081:80 -v /home/azureuser:/var/logs/nginx nginx
cf7915166d17b81bf146f5998eb131667914e3118573a79ca669c1e38c7cb275
root@vmdocker:/home/azureuser#
```

3) **docker ps**

```
root@vmdocker:/home/azureuser# docker ps
CONTAINER ID   IMAGE    COMMAND                CREATED            STATUS           PORTS                                         NAMES
cf7915166d17   nginx    "/docker-entrypoint…"  4 minutes ago      Up 4 minutes     0.0.0.0:8081->80/tcp, [::]:8081->80/tcp        nostalgic_mahavira
433c90b396b6   nginx    "/docker-entrypoint…"  45 minutes ago     Up 45 minutes                                                  nonenginx
4be9a0edd87b   nginx    "/docker-entrypoint…"  52 minutes ago     Up 52 minutes                                                  adoring_mcclintock
056d0b4fb54    nginx    "/docker-entrypoint…"  About an hour ago  Up About an hour                                               zen_fermi
3683afe2f657   nginx    "/docker-entrypoint…"  2 hours ago        Up 2 hours       80/tcp                                        cranky_yalow
93721077e179   nginx    "/docker-entrypoint…"  3 hours ago        Up 3 hours       80/tcp                                        website3
9cd4c6987b71   nginx    "/docker-entrypoint…"  3 hours ago        Up 3 hours       80/tcp                                        website2
5c49991c5298   nginx    "/docker-entrypoint…"  3 hours ago        Up 3 hours       80/tcp                                        website1
a22fcfc44211   ubuntu   "bash"                 4 hours ago        Up 4 hours                                                     reverent_aryabhata
root@vmdocker:/home/azureuser# docker inspect cf7915166d17
```

4) **docker inspect cf7915166d17**

```
                "UpperDir": "/var/snap/docker/common/var-lib-docker/overlay2/384f08
                "WorkDir": "/var/snap/docker/common/var-lib-docker/overlay2/384f08d
            },
            "Name": "overlay2"
        },
        "Mounts": [
            {
                "Type": "bind",
                "Source": "/home/azureuser",
                "Destination": "/var/logs/nginx",
                "Mode": "",
                "RW": true,
                "Propagation": "rprivate"
            }
        ],
```

5) **docker exec -it cf7915166d17 bash** – let us enter inside that container

ls

```
root@vmdocker:/home/azureuser# docker exec -it cf7915166d17 bash
root@cf7915166d17:/# ls
bin  boot  dev  docker-entrypoint.d  docker-entrypoint.sh  etc  home  lib  lib64  media  mnt  opt  proc  root  run  sbin  srv  sys  tmp  usr  var
```

cd var

cd logs

cd nginx

ls

touch hola ls

```
root@vmdocker: /home/azureuser
root@84d1c7636de1:/var/logs/nginx# ls
PyTodoBackendMonolith   ReactTodoUIMonolith   snap   todobackendmysql
root@84d1c7636de1:/var/logs/nginx# mkdir hola
root@84d1c7636de1:/var/logs/nginx# ls
PyTodoBackendMonolith   ReactTodoUIMonolith   hola   snap   todobackendmysql
root@84d1c7636de1:/var/logs/nginx#
```

6) **docker stop cf7915166d17**

docker rm cf7915166d17

```
root@vmdocker:/home/azureuser# docker stop cf7915166d17
cf7915166d17
root@vmdocker:/home/azureuser# docker rm cf7915166d17
cf7915166d17
```

7) Again creating a new container to check whether file **hola** is still there or not

8) docker run -d -p 8081:80 -v /home/azureuser:/var/logs/nginx nginx = created again new container

```
root@vmdocker:/home/azureuser# docker run -d -p 8081:80 -v /home/azureuser:/var/logs/nginx nginx
84d1c7636de14ef512f7cdf0ca3b03502351bcee5529097a4b4de2ede7065431
root@vmdocker:/home/azureuser#
```

9) docker ps

```
84d1c7636de14ef512f7cdf0ca3b03502351bcee5529097a4b4de2ede7065431
root@vmdocker:/home/azureuser# docker ps
CONTAINER ID   IMAGE   COMMAND                CREATED           STATUS             PORTS                                              NAMES
84d1c7636de1   nginx   "/docker-entrypoint.…" About a minute ago Up 59 seconds     0.0.0.0:8081->80/tcp, [::]:8081->80/tcp            condescending_haibt
433c90b396b6   nginx   "/docker-entrypoint.…" About an hour ago  Up About an hour                                                     nonenginx
4be9a0edd87b   nginx   "/docker-entrypoint.…" About an hour ago  Up About an hour                                                     adoring_mcclintock
056dd0b4fb54   nginx   "/docker-entrypoint.…" About an hour ago  Up About an hour                                                     zen_fermi
3683afe2f657   nginx   "/docker-entrypoint.…" 2 hours ago        Up 2 hours         80/tcp                                             cranky_yalow
```

10) docker exec -it 45e2bc6c0219 bash

cd var

cd logs

cd nginx

ls

```
root@vmdocker:/home/azureuser# docker exec -it 45e2bc6c0219 bash
root@45e2bc6c0219:/# ls
bin  boot  dev  docker-entrypoint.d  docker-entrypoint.sh  etc  home  lib  lib64  media  mnt  opt  proc  root  run  sbin  srv  sys  tmp  usr  var
root@45e2bc6c0219:/# cd var
root@45e2bc6c0219:/var# ls
backups  cache  lib  local  lock  log  logs  mail  opt  run  spool  tmp
root@45e2bc6c0219:/var# cd logs
root@45e2bc6c0219:/var/logs# ls
nginx
root@45e2bc6c0219:/var/logs# cd nginx
root@45e2bc6c0219:/var/logs/nginx# ls
PyTodoBackendMonolith  ReactTodoUIMonolith  hola  snap  todobackendmysql
root@45e2bc6c0219:/var/logs/nginx#
```

So we can see hola file has come in new container as well

11) Now creating index.html file in the source path **/home/azureuser**

Ls

mkdir html

ls

cd html

touch index.html

ls

🖥️ root@vmdocker: /home/azureuser/html

```
root@vmdocker:/home/azureuser# mkdir /home/azureuser/html
root@vmdocker:/home/azureuser# ls
PyTodoBackendMonolith  ReactTodoUIMonolith  hola  html  snap  todobackendmysql
root@vmdocker:/home/azureuser# cd html
root@vmdocker:/home/azureuser/html# ls
root@vmdocker:/home/azureuser/html# touch index.html
root@vmdocker:/home/azureuser/html# ls
index.html
```

nano index.html

from chatgpt write - can you create a love calculator in index.html file

```
  GNU nano 7.2                                                                                    index.html
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8" />
  <meta name="viewport" content="width=device-width, initial-scale=1.0" />
  <title>Love Calculator 💕</title>
  <style>
    body {
      font-family: Arial, sans-serif;
      background: #ffe6e6;
      display: flex;
      flex-direction: column;
      align-items: center;
      justify-content: center;
      height: 100vh;
      margin: 0;
    }

    h1 {
      color: #e60073;
    }

    .container {
      background: white;
      padding: 30px;
      border-radius: 15px;
      box-shadow: 0 0 15px rgba(0, 0, 0, 0.2);
      text-align: center;
    }

    input {
      padding: 10px;
      margin: 10px;
      border: 1px solid #ccc;
      border-radius: 5px;
      width: 200px;
    }

    button {
      padding: 10px 20px;
      background-color: #e60073;
      color: white;
      border: none;
```
```
                                                                                          [ Read 88 lines ]
^G Help        ^O Write Out    ^W Where Is    ^K Cut        ^T Execute    ^C Location      M-U Und
^X Exit        ^R Read File    ^\ Replace     ^U Paste      ^J Justify    ^/ Go To Line    M-E Red
```

docker run -d -p 8081:80 -v /home/azureuser/html:/usr/share/nginx/html nginx– again run container by changing destination path i.e. /usr/share/nginx/html nginx

```
root@vmdocker:/home/azureuser/html# nano index.html
root@vmdocker:/home/azureuser/html# docker run -d -p 8081:80 -v /home/azureuser/html:/usr/share/nginx/html nginx
d3a9c5400540a35e0611309e0acb5899554603a2f81e4f79e34ddf41a46aa004
root@vmdocker:/home/azureuser/html# docker ps
CONTAINER ID   IMAGE    COMMAND                  CREATED        STATUS        PORTS                                      NAMES
d3a9c5400540   nginx    "/docker-entrypoint.…"   8 seconds ago  Up 7 seconds  0.0.0.0:8081->80/tcp, [::]:8081->80/tcp     youthful_ardinghelli
433c90b396b6   nginx    "/docker-entrypoint.…"   4 hours ago    Up 4 hours                                               nonenginx
4be9a0edd87b   nginx    "/docker-entrypoint.…"   4 hours ago    Up 4 hours                                               adoring_mcclintock
056dd0b4fb54   nginx    "/docker-entrypoint.…"   4 hours ago    Up 4 hours                                               zen_fermi
3683afe2f657   nginx    "/docker-entrypoint.…"   5 hours ago    Up 5 hours    80/tcp                                     cranky_yalow
93721077e179   nginx    "/docker-entrypoint.…"   6 hours ago    Up 6 hours    80/tcp                                     website3
9cd4c6987b71   nginx    "/docker-entrypoint.…"   6 hours ago    Up 6 hours    80/tcp                                     website2
5c49991c5298   nginx    "/docker-entrypoint.…"   6 hours ago    Up 6 hours    80/tcp                                     website1
a22fcfc44211   ubuntu   "bash"                   8 hours ago    Up 8 hours                                               reverent_aryabhata
root@vmdocker:/home/azureuser/html#
```
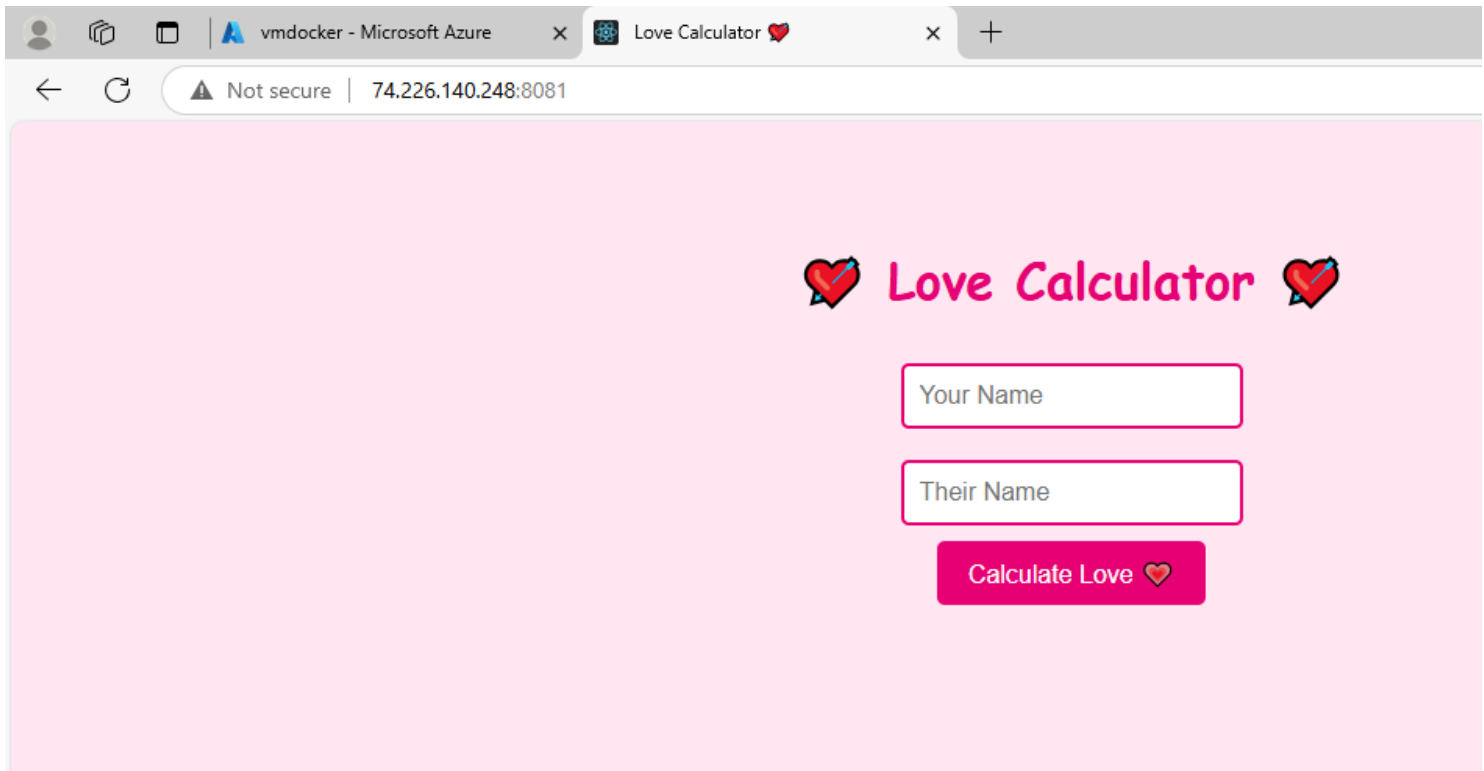
74.226.140.248:8081

12) to check volume

docker volume ls

```
root@vmdocker:/home/azureuser/html# docker volume ls
DRIVER    VOLUME NAME
local     4b3aa7b5696cb783c2d2e26e2148af22de9eb3ac816aed2568b1c0387e63c4f2
local     d360bf67cd474b01fa4e86afcd4d80930f6c3af4a4b9b875742d27001c73853a
root@vmdocker:/home/azureuser/html#
```

AGENDA – Create 25 containers

1) Go to chatpgt search - Can you create script to create 25 nginx containers using docker run command. no port mapping required

Sure! Here's a simple shell script that uses a loop to create **25 Nginx containers** using `docker run`, without port mapping:

```bash
#!/bin/bash

# Loop to create 25 nginx containers
for i in {1..25}
do
    docker run -d --name nginx_container_$i nginx
done
```

mkdir script

```
root@vmdocker:/home/azureuser# ls
PyTodoBackendMonolith   ReactTodoUIMonolith   hola   html   snap   todobackendmysql
root@vmdocker:/home/azureuser# mkdir script
root@vmdocker:/home/azureuser# ls
PyTodoBackendMonolith   ReactTodoUIMonolith   hola   html   script   snap   todobackendmysql
root@vmdocker:/home/azureuser#
```

cd script

touch script.sh

ls

```
root@vmdocker:/home/azureuser/script# touch script.sh
root@vmdocker:/home/azureuser/script# ls
script.sh
root@vmdocker:/home/azureuser/script#
```

nano script.sh

```
root@vmdocker: /home/azureuser/script
  GNU nano 7.2
#!/bin/bash

# Loop to create 25 nginx containers
for i in {1..25}
do
  docker run -d --name nginx_container_$i nginx
done
```

chmod +x script.sh

./script.sh

```
hmod: cannot access 'start_nginx_containers.sh': No such file or directory
oot@vmdocker:/home/azureuser/script# chmod +x script.sh
oot@vmdocker:/home/azureuser/script# ./script.sh
831c481c3bc5d8eafb1e4e8aa812712406edbee94ad85dd95359f7a333c6606
c70866e3cfad2a9a9cbacd3dce4f8b25212eba2a4e70417c128f3dc0da21e91
3a9a5d299f8d75065d7e6f63c2c19a163ab883775e0504c580439abe86aaacf
3c77fbf062081b58abf0228acb0cb7475696eced65485720f70ed2b339e847c
2201ac9b04a5ea926ada95d1ff0decb4f7ab0240b2750c5feada5c8631f4f8c
6b6add469abf481d396256ffea10effd03614896fe054619e6250e3b24af047
f7e19518cc61403dbe972770d3d5aace98115164f8ada85d7e9a86ab6ad1c7f
df5b1d6e254f5516c24767d618817e9824022e9cf289d3bd50ecae286f3e170
1442f1e4d435dcbb788ca37a7f50a62729db0b70a040b32c8f93fcc9033ef25
79119b1f19756b3fdf0c4844401aeefe9baecdf2aa0dc71e26359f0ba97d6f9
38ddc4efbce7240cdfcdb897b2c63fc16bdff51ef9e9835341bbec468d34d7c
929513edb199ef87a66101e5f74499b2775c517c3c1fdf8d2c4a8d7af40e6e8
9078f3f2246d1bce6a39ef595345856b1c793c22b6b6c74db9d67d86c986603
227ee086bb1039c75c2c817950c0126512aaa2a214f2d76c3d8a5fcf1f1fd19
88d82b0010e4f1a4d96f6caf3c57226521455acc032985ed4d26a2c149a9471
955f47f971acbe9472e24ca4264f455cfac987bf250d4925d32b3b99bc78916
8e57ac59c52b5400f3b4e1b0a8e8ada3de8292f924662bfb2389b3722341f04
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