**Networks in Docker:**

```
rror response from daemon: pull access denied for nghix, repository does not exist or may require 'docker login': denied: requested access to the resource is denie
oot@ip-172-31-15-184:~# docker pull nginx
sing default tag: latest
atest: Pulling from library/nginx
e909acdb790: Pull complete
eaa34f5b9c2: Pull complete
17c4bccf534: Pull complete
7e0ca015e55: Pull complete
73fe654e984: Pull complete
7f5c0f51d43: Pull complete
22eb46e871a: Pull complete
igest: sha256:124b44bfc9ccd1f3cedf4b592d4d1e8bddb78b51ec2ed5056c52d3692baebc19
tatus: Downloaded newer image for nginx:latest
ocker.io/library/nginx:latest
oot@ip-172-31-15-184:~# docker run -itd --name docker_con1 -p 8080:80 nginx
c4321acac4cdad52bd3e9c641bb9974d05ba60ec981412439620a1f63481c89
oot@ip-172-31-15-184:~# docker ps
ONTAINER ID   IMAGE    COMMAND              CREATED         STATUS         PORTS                                         NAMES
c4321acac4c   nginx    "/docker-entrypoint.…"  8 seconds ago   Up 7 seconds   0.0.0.0:8080->80/tcp, [::]:8080->80/tcp   docker_con1
oot@ip-172-31-15-184:~# docker run -itd --name docker_con2 -p 8081:80 nginx
0cbcdbb6b66cd8ab1a7c42837c46648faf645a000d4617efe807064383a1254
oot@ip-172-31-15-184:~# docker ps
ONTAINER ID   IMAGE    COMMAND              CREATED         STATUS         PORTS                                         NAMES
0cbcdbb6b66   nginx    "/docker-entrypoint.…"  5 seconds ago   Up 5 seconds   0.0.0.0:8081->80/tcp, [::]:8081->80/tcp   docker_con2
c4321acac4c   nginx    "/docker-entrypoint.…"  31 seconds ago  Up 31 seconds  0.0.0.0:8080->80/tcp, [::]:8080->80/tcp   docker_con1
oot@ip-172-31-15-184:~# docker inspect a0cbcdbb6b66

    [
        "Id": "a0cbcdbb6b66cd8ab1a7c42837c46648faf645a000d4617efe807064383a1254",
        "Created": "2025-04-02T16:33:37.103141439Z",
        "Path": "/docker-entrypoint.sh",
        "Args": [
            "nginx",
            "-g",
            "daemon off;"
        ],
        "State": {
            "Status": "running",
            "Running": true,
            "Paused": false,
            "Restarting": false,
            "OOMKilled": false,
            "Dead": false,
```

**I created two containers in the default Docker network and used the docker inspect command to find their IP addresses.**

```
        }
]
root@ip-172-31-15-184:~# ^C
root@ip-172-31-15-184:~# docker exec -it fc4321acac4c /bin/bash
root@fc4321acac4c:/# ping 172.17.0.3
bash: ping: command not found
root@fc4321acac4c:/# apt update -y
Get:1 http://deb.debian.org/debian bookworm InRelease [151 kB]
Get:2 http://deb.debian.org/debian bookworm-updates InRelease [55.4 kB]
Get:3 http://deb.debian.org/debian-security bookworm-security InRelease [48.0 kB]
Get:4 http://deb.debian.org/debian bookworm/main amd64 Packages [8792 kB]
Get:5 http://deb.debian.org/debian bookworm-updates/main amd64 Packages [512 B]
Get:6 http://deb.debian.org/debian-security bookworm-security/main amd64 Packages [250 kB]
Fetched 9297 kB in 1s (6361 kB/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
2 packages can be upgraded. Run 'apt list --upgradable' to see them.
root@fc4321acac4c:/# apt install iputils-ping
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  libcap2-bin libpam-cap
The following NEW packages will be installed:
  iputils-ping libcap2-bin libpam-cap
0 upgraded, 3 newly installed, 0 to remove and 2 not upgraded.
Need to get 96.3 kB of archives.
After this operation, 312 kB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://deb.debian.org/debian bookworm/main amd64 libcap2-bin amd64 1:2.66-4 [34.7 kB]
Get:2 http://deb.debian.org/debian bookworm/main amd64 iputils-ping amd64 3:20221126-1+deb12u1 [47.2 kB]
Get:3 http://deb.debian.org/debian bookworm/main amd64 libpam-cap amd64 1:2.66-4 [14.5 kB]
Fetched 96.3 kB in 0s (562 kB/s)
debconf: delaying package configuration, since apt-utils is not installed
Selecting previously unselected package libcap2-bin.
(Reading database ... 7580 files and directories currently installed.)
Preparing to unpack .../libcap2-bin_1%3a2.66-4_amd64.deb ...
Unpacking libcap2-bin (1:2.66-4) ...
Selecting previously unselected package iputils-ping.
Preparing to unpack .../iputils-ping_3%3a20221126-1+deb12u1_amd64.deb ...
```

**I accessed one of the containers using the docker exec command and attempted to perform a ping test using the IP address of the other container, but the ping command was not found, so I**

**installed the iputils-ping package to enable ping functionality**

```
Setting up iputils-ping (3:20221126-1+deb12u1) ...
root@fc4321acac4c:/# ping 172.17.0.3
PING 172.17.0.3 (172.17.0.3) 56(84) bytes of data.
64 bytes from 172.17.0.3: icmp_seq=1 ttl=64 time=0.042 ms
64 bytes from 172.17.0.3: icmp_seq=2 ttl=64 time=0.038 ms
64 bytes from 172.17.0.3: icmp_seq=3 ttl=64 time=0.038 ms
64 bytes from 172.17.0.3: icmp_seq=4 ttl=64 time=0.048 ms
64 bytes from 172.17.0.3: icmp_seq=5 ttl=64 time=0.039 ms
64 bytes from 172.17.0.3: icmp_seq=6 ttl=64 time=0.039 ms
64 bytes from 172.17.0.3: icmp_seq=7 ttl=64 time=0.038 ms
64 bytes from 172.17.0.3: icmp_seq=8 ttl=64 time=0.036 ms
64 bytes from 172.17.0.3: icmp_seq=9 ttl=64 time=0.038 ms
^C
--- 172.17.0.3 ping statistics ---
9 packets transmitted, 9 received, 0% packet loss, time 8205ms
rtt min/avg/max/mdev = 0.036/0.039/0.048/0.003 ms
root@fc4321acac4c:/# ping docker_con2
ping: docker_con2: Name or service not known
root@fc4321acac4c:/# exit
exit
```

While performing a ping test using the container name, I encountered an error because, by default, containers on the same default bridge network cannot resolve each other's names; to overcome this issue, I created a custom bridge network."

This correction clarifies that the issue arises from the default bridge network's limitations regarding container name resolution, and creating a custom bridge network resolves this issue.

```
exit
root@ip-172-31-15-184:~# docker network create --driver bridge --subnet 182.12.0.0/16 custom_bridge_network
520ae704d9cd3d64862c5f5cce01ca0cd7a28085bc6f5b5a981eafce0babb1b6
root@ip-172-31-15-184:~# docker network ls
NETWORK ID     NAME                   DRIVER    SCOPE
8f6f90b1013f   bridge                 bridge    local
520ae704d9cd   custom_bridge_network  bridge    local
8279560705f6   host                   host      local
2a8c34b39d82   none                   null      local
root@ip-172-31-15-184:~# docker run -itd --name con1 --network=custom_bridge_network nginx
557176c9c1af47a07d26a700265847e705cc977a100ca277a40d95027cbafce5
root@ip-172-31-15-184:~# docker ps
CONTAINER ID   IMAGE   COMMAND                CREATED        STATUS         PORTS                                       NAMES
557176c9c1af   nginx   "/docker-entrypoint..."  5 seconds ago  Up 4 seconds   80/tcp                                      con1
a0cbcdbb6b66   nginx   "/docker-entrypoint..."  9 minutes ago  Up 9 minutes   0.0.0.0:8081->80/tcp, [::]:8081->80/tcp     docker_con2
fc4321acac4c   nginx   "/docker-entrypoint..."  9 minutes ago  Up 9 minutes   0.0.0.0:8080->80/tcp, [::]:8080->80/tcp     docker_con1
root@ip-172-31-15-184:~# docker run -itd --name con2 --network=custom_bridge_network nginx
2d8d80b80c1f4495948ec06702a9d855636580186c4f9eee2422d78943237e5f
root@ip-172-31-15-184:~# docker ps
CONTAINER ID   IMAGE   COMMAND                CREATED        STATUS         PORTS                                       NAMES
2d8d80b80c1f   nginx   "/docker-entrypoint..."  5 seconds ago  Up 5 seconds   80/tcp                                      con2
557176c9c1af   nginx   "/docker-entrypoint..."  21 seconds ago Up 20 seconds  80/tcp                                      con1
a0cbcdbb6b66   nginx   "/docker-entrypoint..."  9 minutes ago  Up 9 minutes   0.0.0.0:8081->80/tcp, [::]:8081->80/tcp     docker_con2
fc4321acac4c   nginx   "/docker-entrypoint..."  9 minutes ago  Up 9 minutes   0.0.0.0:8080->80/tcp, [::]:8080->80/tcp     docker_con1
root@ip-172-31-15-184:~# docker exec -it 2d8d80b80c1f  /bin/bash
root@2d8d80b80c1f:/# apt update -y
Get:1 http://deb.debian.org/debian bookworm InRelease [151 kB]
Get:2 http://deb.debian.org/debian bookworm-updates InRelease [55.4 kB]
Get:3 http://deb.debian.org/debian-security bookworm-security InRelease [48.0 kB]
Get:4 http://deb.debian.org/debian bookworm/main amd64 Packages [8792 kB]
Get:5 http://deb.debian.org/debian bookworm-updates/main amd64 Packages [512 B]
Get:6 http://deb.debian.org/debian-security bookworm-security/main amd64 Packages [250 kB]
Fetched 9297 kB in 1s (6386 kB/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
2 packages can be upgraded. Run 'apt list --upgradable' to see them.
root@2d8d80b80c1f:/# apt install  iputils-ping
Reading package lists... Done
Building dependency tree... Done
```
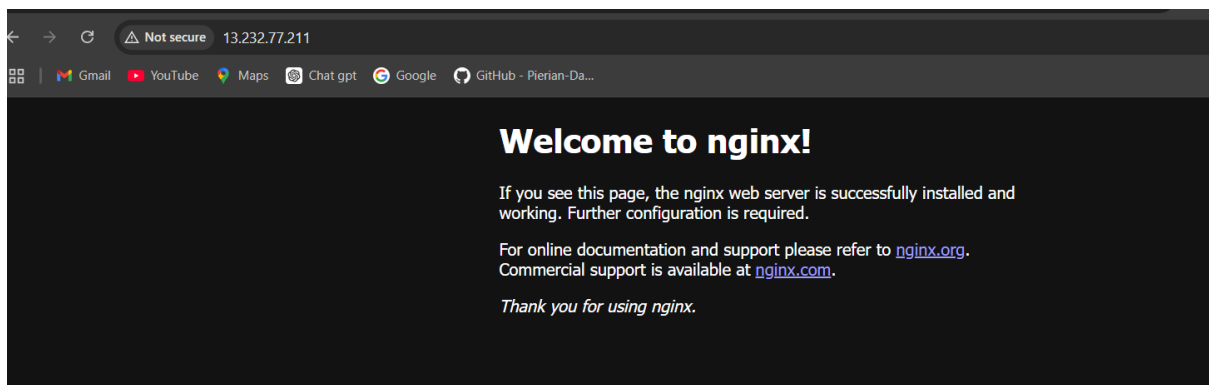
```
Setting up iputils-ping (3:20221126-1+deb12u1) ...
root@2d8d80b80c1f:/# ping con1
PING con1 (182.12.0.2) 56(84) bytes of data.
64 bytes from con1.custom_bridge_network (182.12.0.2): icmp_seq=1 ttl=64 time=0.045 ms
64 bytes from con1.custom_bridge_network (182.12.0.2): icmp_seq=2 ttl=64 time=0.043 ms
64 bytes from con1.custom_bridge_network (182.12.0.2): icmp_seq=3 ttl=64 time=0.044 ms
64 bytes from con1.custom_bridge_network (182.12.0.2): icmp_seq=4 ttl=64 time=0.050 ms
64 bytes from con1.custom_bridge_network (182.12.0.2): icmp_seq=5 ttl=64 time=0.044 ms
64 bytes from con1.custom_bridge_network (182.12.0.2): icmp_seq=6 ttl=64 time=0.044 ms
64 bytes from con1.custom_bridge_network (182.12.0.2): icmp_seq=7 ttl=64 time=0.044 ms
64 bytes from con1.custom_bridge_network (182.12.0.2): icmp_seq=8 ttl=64 time=0.041 ms
64 bytes from con1.custom_bridge_network (182.12.0.2): icmp_seq=9 ttl=64 time=0.053 ms
64 bytes from con1.custom_bridge_network (182.12.0.2): icmp_seq=10 ttl=64 time=0.045 ms
64 bytes from con1.custom_bridge_network (182.12.0.2): icmp_seq=11 ttl=64 time=0.044 ms
64 bytes from con1.custom_bridge_network (182.12.0.2): icmp_seq=12 ttl=64 time=0.045 ms
64 bytes from con1.custom_bridge_network (182.12.0.2): icmp_seq=13 ttl=64 time=0.045 ms
^C
--- con1 ping statistics ---
```

"I created a custom bridge network and launched two containers connected to this network; then, I accessed one container and successfully performed a ping test to the other container using its container name."

This correction highlights the success of the ping test between containers using their names, made possible by the custom bridge network.

```
c25195eb893be26aeba8598b2c5d3ce8c71e0eabb694ce59365cef6d1170ae00
root@ip-172-31-15-184:~# docker run -itd --name host_con --network=host nginx
docker: Error response from daemon: Conflict. The container name "/host_con" is already in use by container "c25195eb893be26aeba8598b2c5d3ce8c71e
emove (or rename) that container to be able to reuse that name.

Run 'docker run --help' for more information
root@ip-172-31-15-184:~# docker run -itd --name host_con1 --network=host nginx
aef3ccd13aacf63df148c866385ef52a97664e0e84a59d1d83a658d6c5b0654d
root@ip-172-31-15-184:~# docker ps
CONTAINER ID   IMAGE    COMMAND                  CREATED          STATUS              PORTS                                         NAMES
aef3ccd13aac   nginx    "/docker-entrypoint..."  6 seconds ago    Up 5 seconds                                                      host_con1
c25195eb893b   nginx    "/docker-entrypoint..."  About a minute ago  Up About a minute  80/tcp                                     host_con
2d8d80b80c1f   nginx    "/docker-entrypoint..."  13 minutes ago   Up 13 minutes       80/tcp                                        con2
557176c9c1af   nginx    "/docker-entrypoint..."  13 minutes ago   Up 13 minutes       80/tcp                                        con1
a0cbcdbb6b66   nginx    "/docker-entrypoint..."  22 minutes ago   Up 22 minutes       0.0.0.0:8081->80/tcp, [::]:8081->80/tcp        docker_con2
fc4321acac4c   nginx    "/docker-entrypoint..."  22 minutes ago   Up 22 minutes       0.0.0.0:8080->80/tcp, [::]:8080->80/tcp        docker_con1
root@ip-172-31-15-184:~#
```



⚠ Not secure  13.232.77.211

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# 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.
Commercial support is available at nginx.com.

*Thank you for using nginx.*

I created a container using the host network mode without explicit port mapping, and yet, I was still able to access the container from outside the host machine.