Lab Exercise 3- Working with Docker Networking

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Step 1: Understanding Docker Default Networks

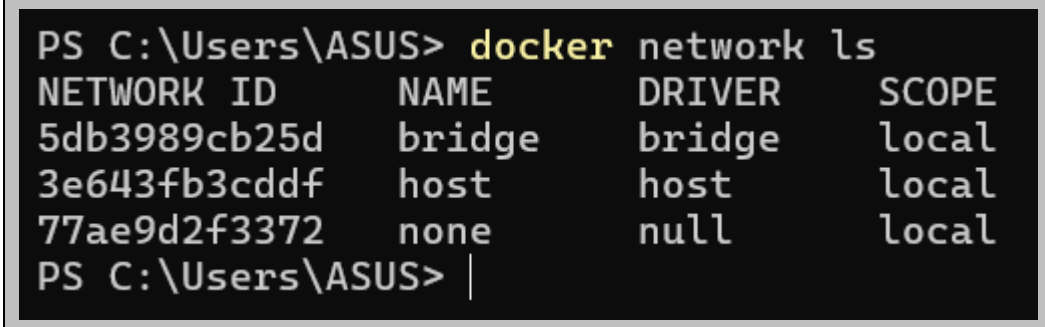
Docker provides three default networks:

- bridge: The default network when a container starts.
- host: Bypasses Docker's network isolation and attaches the container directly to the host network.
- none: No networking is available for the container.

1.1. Inspect Default Networks

Check Docker's default networks using:

docker network ls



1.2. Inspect the Bridge Network

```
docker network inspect bridge
```

```
PS C:\Users\ASUS> docker network inspect bridge
[
    {
        "Name": "bridge",
        "Id": "5db3989cb25d33338bd9be290d2f83f5779ed6e3666c01150787827c14ef6435",
        "Created": "2026-02-02T13:20:32.036884652Z",
        "Scope": "local",
        "Driver": "bridge",
        "EnableIPv4": true,
        "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": {},
        "Options": {
            "com.docker.network.bridge.default_bridge": "true",
            "com.docker.network.bridge.enable_icc": "true",
            "com.docker.network.bridge.enable_ip_masquerade": "true",
            "com.docker.network.bridge.host_binding_ipv4": "0.0.0.0",
            "com.docker.network.bridge.name": "docker0",
            "com.docker.network.driver.mtu": "1500"
        },
        "Labels": {}
    }
]
PS C:\Users\ASUS>
```

This command will show detailed information about the bridge network, including the connected containers and IP address ranges.

Step 2: Create and Use a Bridge Network

2.1. Create a User-Defined Bridge Network

A user-defined bridge network allows containers to communicate by name instead of IP.

```
docker network create my_bridge
```

```
PS C:\Users\ASUS> docker network create my_bridge
5895a1cafca5b7c2f5ae9534eb737849191fdde14dbbe9b7f787de60f9c80415
PS C:\Users\ASUS>
```

2.2. Run Containers on the User-Defined Network

Start two containers on the newly created my_bridge network:

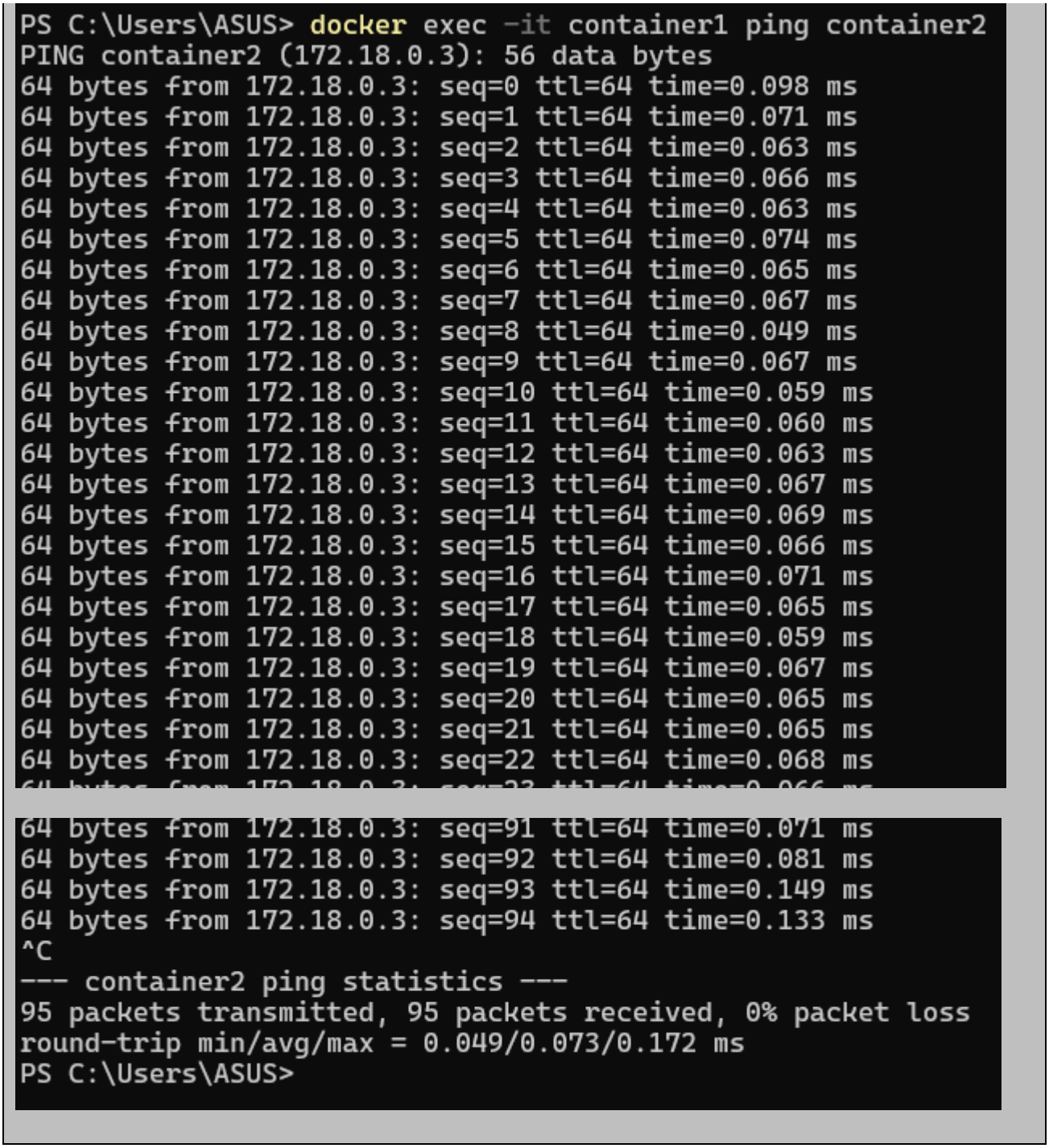
```
docker run -dit --name container1 --network my_bridge busybox

docker run -dit --name container2 --network my_bridge busybox
```

```
PS C:\Users\ASUS> docker run -dit --name container1 --network my_bridge busybox
Unable to find image 'busybox:latest' locally
latest: Pulling from library/busybox
61dfb50712f5: Pull complete
Digest: sha256:e226d6308690dbe282443c8c7e57365c96b5228f0fe7f40731b5d84d37a06839
Status: Downloaded newer image for busybox:latest
4d529b4b01df0eb630f4c3595bb3d0e27b0ea7adcdc74a5bc7c7b454437f7559
PS C:\Users\ASUS> docker run -dit --name container2 --network my_bridge busybox
4598e2c30567707ea60a0b47fdf73a649af9d964b5c32f18087a662faf8691d0
PS C:\Users\ASUS>
```

2.3. Test Container Communication

Execute a ping command from container1 to container2 using container names:

```
docker exec -it container1 ping container2
```



The containers should be able to communicate since they are on the same network.

Step 3: Disconnect and Remove Networks

3.1. Disconnect Containers from Networks

To disconnect container1 from my_bridge:

docker network disconnect my_bridge container1

```
PS C:\Users\ASUS> docker network disconnect my_bridge container1
PS C:\Users\ASUS>
```

4.2. Remove Networks

To remove the user-defined network:

docker network rm my_bridge

```
PS C:\Users\ASUS> docker network rm my_bridge
Error response from daemon: error while removing network: network my_bridge has active endp
oints (name:"container2" id:"1351adf6d123")
exit status 1
PS C:\Users\ASUS>
```

Step 4: Clean Up

Stop and remove all containers created during this exercise:

docker rm -f container1 container2

```
exit status 1
PS C:\Users\ASUS> docker rm -f container1 container2
container1
container2
PS C:\Users\ASUS>
```