TALLER REDES EN DOCKER

Parte A – Red Bridge (local, por defecto)

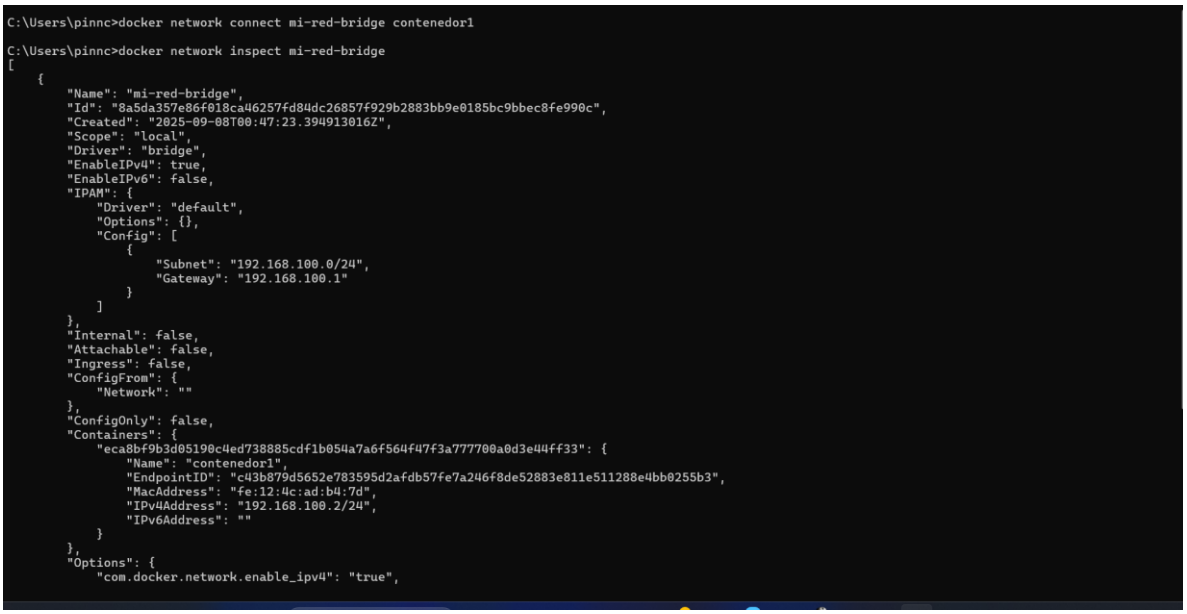
1. Crear una nueva red tipo **bridge** definiendo una subred y máscara distintas a las que vienen por defecto.

```
C:\Users\pinnc>docker network create --driver bridge --subnet=192.168.100.0/24 --gateway=192.168.100.1 mi-red-bridge
8a5da357e86f018ca46257fd84dc26857f929b2883bb9e0185bc9bbec8fe990c

C:\Users\pinnc>docker network ls
NETWORK ID     NAME                 DRIVER    SCOPE
087cd3a8f855   blogwaira_default    bridge    local
5fdeaa0a9670   bridge               bridge    local
7bda2d1bc7e9   host                 host      local
8a5da357e86f   mi-red-bridge        bridge    local
bbcd80e5be77   none                 null      local
a57821dc0f3d   red1                 bridge    local

C:\Users\pinnc>docker network inspect mi-red-bridge
[
    {
        "Name": "mi-red-bridge",
        "Id": "8a5da357e86f018ca46257fd84dc26857f929b2883bb9e0185bc9bbec8fe990c",
        "Created": "2025-09-08T00:47:23.394913016Z",
        "Scope": "local",
        "Driver": "bridge",
        "EnableIPv4": true,
        "EnableIPv6": false,
        "IPAM": {
            "Driver": "default",
            "Options": {},
            "Config": [
                {
                    "Subnet": "192.168.100.0/24",
                    "Gateway": "192.168.100.1"
```

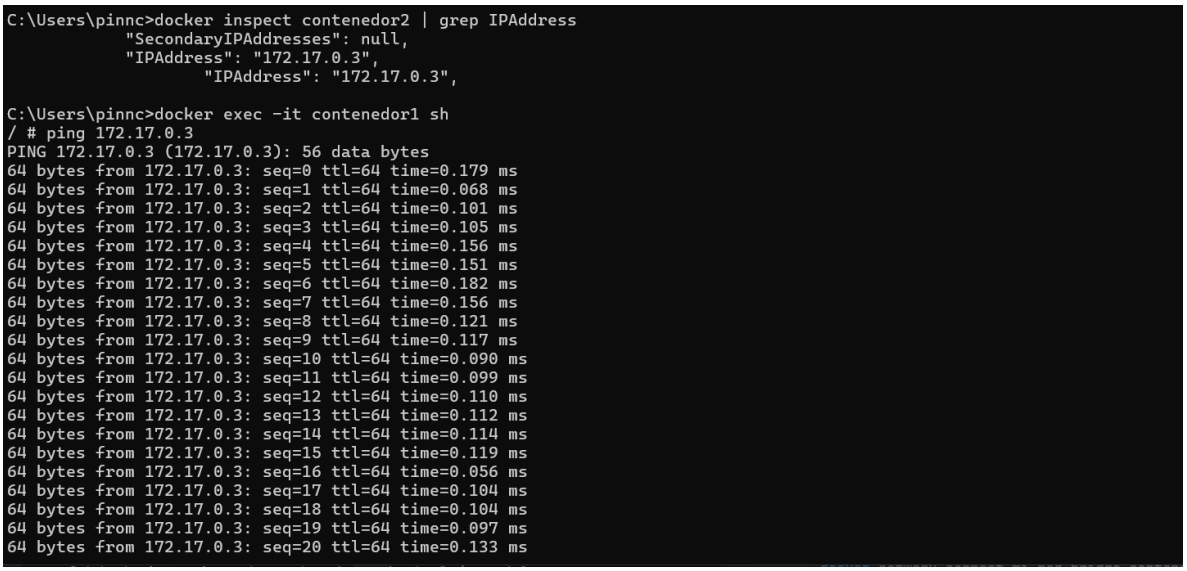
2. Crear dos contenedores a partir de una misma imagen.

```
C:\Users\pinnc>docker run -dit --name contenedor1 alpine:latest
Unable to find image 'alpine:latest' locally
latest: Pulling from library/alpine
9824c27679d3: Pull complete
Digest: sha256:4bcff63911fcb4448bd4fdacec207030997caf25e9bea4045fa6c8c44de311d1
Status: Downloaded newer image for alpine:latest
eca8bf9b3d05190c4ed738885cdf1b054a7a6f564f47f3a777700a0d3e44ff33

C:\Users\pinnc>docker run -dit --name contenedor2 alpine:latest
382ffb9a3a3fcd6e2952d7cf21439708953a7ead6aee0eec10f5be86b29430eb

C:\Users\pinnc>docker ps
CONTAINER ID   IMAGE          COMMAND                  CREATED          STATUS          PORTS
     NAMES
382ffb9a3a3f   alpine:latest   "/bin/sh"                28 seconds ago   Up 28 seconds
     contenedor2
eca8bf9b3d05   alpine:latest   "/bin/sh"                48 seconds ago   Up 48 seconds
     contenedor1
1b058fa9da86   mysql:8.0       "docker-entrypoint.s…"   7 weeks ago      Up 12 minutes   33060/tcp, 0.0.0.0:3307->3306/t
cp   blogwaira-db-1

C:\Users\pinnc>
```

3. Conectar uno de los contenedores a la red creada.



4. Desde un contenedor, intentar la comunicación con el otro (ping).



La comunicación fallar o tiene limitaciones porque están en redes diferentes se queda en un bucle infinito intentado establecer conexión.

5. Conectar el contenedor que estaba fuera de la red a la red creada.

6. Volver a probar la comunicación y registrar las diferencias observadas.

Se establece buena conexión tanto usando la ip como con el nombre del contenedor

7. Revisar los parámetros de configuración de la red y los contenedores conectados a ella.

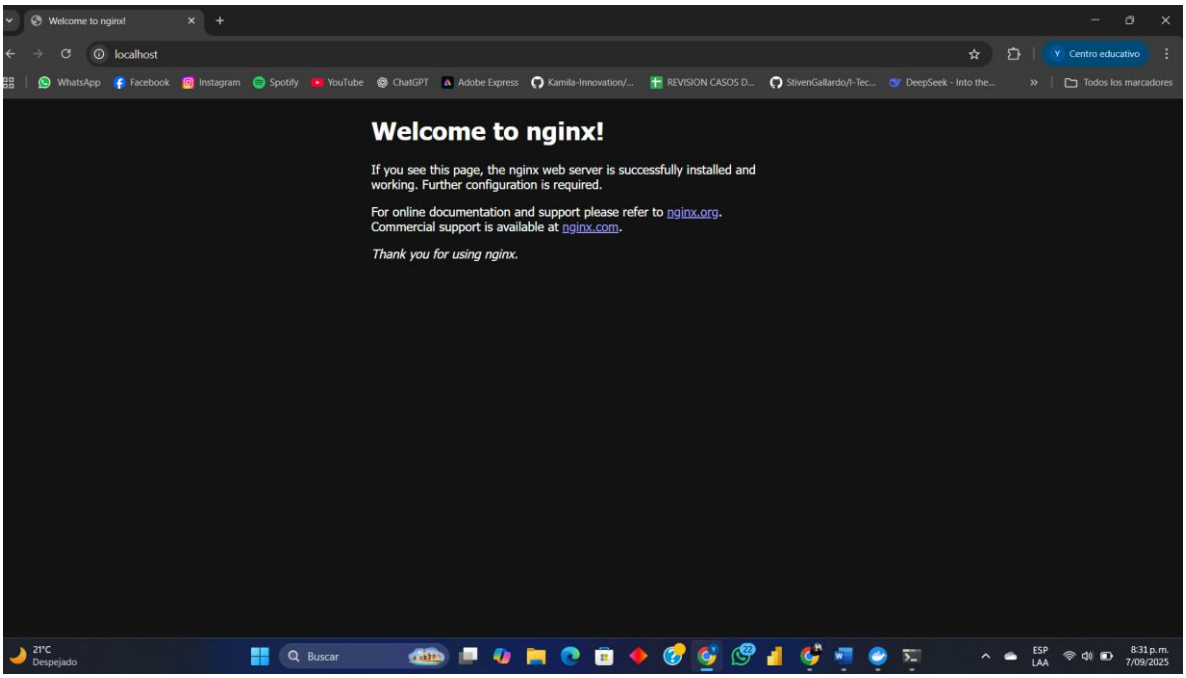
```
C:\Users\pinnc>docker network inspect mi-red-bridge
[
    {
        "Name": "mi-red-bridge",
        "Id": "8a5da357e86f018ca46257fd84dc26857f929b2883bb9e0185bc9bbec8fe990c",
        "Created": "2025-09-08T00:47:23.394913016Z",
        "Scope": "local",
        "Driver": "bridge",
        "EnableIPv4": true,
        "EnableIPv6": false,
        "IPAM": {
            "Driver": "default",
            "Options": {},
            "Config": [
                {
                    "Subnet": "192.168.100.0/24",
                    "Gateway": "192.168.100.1"
                }
            ]
        },
        "Internal": false,
        "Attachable": false,
        "Ingress": false,
        "ConfigFrom": {
            "Network": ""
        },
        "ConfigOnly": false,
        "Containers": {
            "382ffb9a3a3fcd6e2952d7cf21439708953a7ead6aee0eec10f5be86b29430eb": {
                "Name": "contenedor2",
                "EndpointID": "6b7f32f77ccc1016ad2c912c867127b304e7cfa65a75a70ff25b96af20abf0c0",
                "MacAddress": "fe:38:ee:2f:86:1e",
                "IPv4Address": "192.168.100.3/24",
                "IPv6Address": ""
            },
            "eca8bf9b3d05190c4ed738885cdf1b054a7a6f564f47f3a777700a0d3e44ff33": {
                "Name": "contenedor1",
                "EndpointID": "c43b879d5652e783595d2afdb57fe7a246f8de52883e811e511288e4bb0255b3",
                "MacAddress": "fe:12:4c:ad:b4:7d",
                "IPv4Address": "192.168.100.2/24",
                "IPv6Address": ""
            }
        },
        "Options": {
            "com.docker.network.enable_ipv4": "true",
            "com.docker.network.enable_ipv6": "false"
        },
        "Labels": {}
    }
```

Parte B – Red Host (uso del stack de red del host)

8. Crear un contenedor utilizando la red **host**.

```
C:\Users\pinnc>docker run -dit --name contenedor-host --network host nginx:alpine
Unable to find image 'nginx:alpine' locally
alpine: Pulling from library/nginx
cb1ff4086f82: Pull complete
c9ebe2ff2d2c: Pull complete
6bc572a340ec: Pull complete
403e3f251637: Pull complete
9adfbae99cb7: Pull complete
a992fbc61ecc: Pull complete
7a8a46741e18: Pull complete
Digest: sha256:42a516af16b852e33b7682d5ef8acbd5d13fe08fecadc7ed98605ba5e3b26ab8
Status: Downloaded newer image for nginx:alpine
3579da8396496b7799f39047d9700c4471339dfe1426a5ac8af0b08b6e622b92

C:\Users\pinnc>docker ps
CONTAINER ID   IMAGE          COMMAND                  CREATED          STATUS          PORTS                               NAMES
3579da839649   nginx:alpine   "/docker-entrypoint.…"   10 seconds ago   Up 10 seconds                                       contenedor-host
382ffb9a3a3f   alpine:latest  "/bin/sh"                29 minutes ago   Up 29 minutes                                       contenedor2
eca8bf9b3d05   alpine:latest  "/bin/sh"                30 minutes ago   Up 30 minutes                                       contenedor1
1b058fa9da86   mysql:8.0      "docker-entrypoint.s…"   7 weeks ago      Up 42 minutes   33060/tcp, 0.0.0.0:3307->3306/tcp   blogwaira-db-1

C:\Users\pinnc>
```

9. Verificar cómo se comporta respecto a la interfaz de red del host (por ejemplo, levantar un servidor web dentro del contenedor y acceder desde el navegador del host).

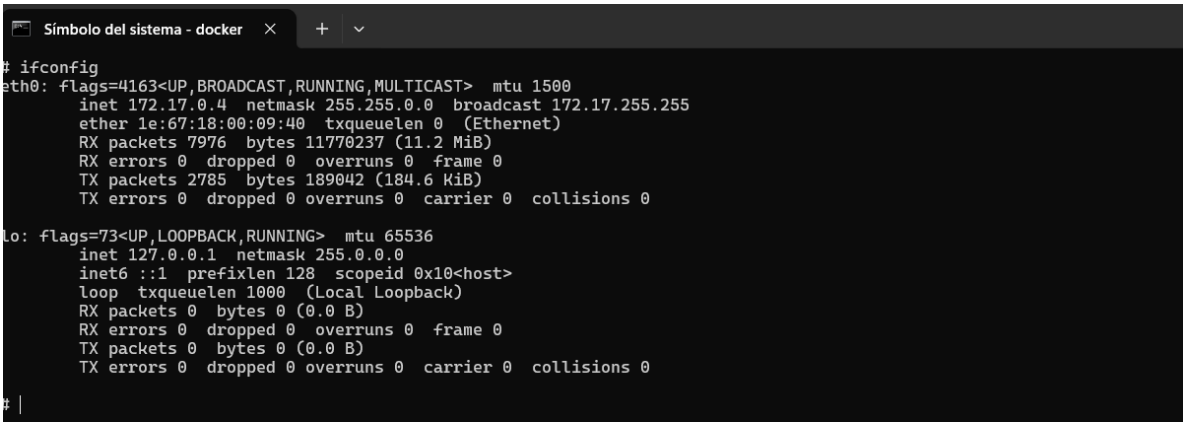


10. Comparar la salida de ifconfig/ip a dentro del contenedor con la del host.

Instalación net-tools

```
C:\Users\pinnc>docker exec -it contenedor-host sh
# ifconfig
sh: 1: ifconfig: not found
# ip addr show
sh: 2: ip: not found
# apt update && apt install -y net-tools iproute2
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 [8791 kB]
Get:5 http://deb.debian.org/debian bookworm-updates/main amd64 Packages [6924 B]
Get:6 http://deb.debian.org/debian-security bookworm-security/main amd64 Packages [277 kB]
Fetched 9330 kB in 2s (5931 kB/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
29 packages can be upgraded. Run 'apt list --upgradable' to see them.
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  libatm1 libbpf1 libcap2 libcap2-bin libelf1 libmnl0 libpam-cap libtirpc-common libtirpc3 libxtables12
Suggested packages:
  iproute2-doc python3:any
The following NEW packages will be installed:
  iproute2 libatm1 libbpf1 libcap2-bin libelf1 libmnl0 libpam-cap libtirpc-common libtirpc3 libxtables12 net-tools
The following packages will be upgraded:
  libcap2
1 upgraded, 11 newly installed, 0 to remove and 28 not upgraded.
Need to get 1896 kB of archives.
After this operation, 6773 kB of additional disk space will be used.
Get:1 http://deb.debian.org/debian bookworm/main amd64 libcap2 amd64 1:2.66-4+deb12u2 [27.2 kB]
Get:2 http://deb.debian.org/debian bookworm/main amd64 libelf1 amd64 0.188-2.1 [174 kB]
Get:3 http://deb.debian.org/debian bookworm/main amd64 libbpf1 amd64 1:1.1.2-0+deb12u1 [145 kB]
Get:4 http://deb.debian.org/debian bookworm/main amd64 libmnl0 amd64 1.0.4-3 [12.5 kB]
Get:5 http://deb.debian.org/debian bookworm/main amd64 libtirpc-common all 1.3.3+ds-1 [14.0 kB]
Get:6 http://deb.debian.org/debian bookworm/main amd64 libtirpc3 amd64 1.3.3+ds-1 [85.2 kB]
Get:7 http://deb.debian.org/debian bookworm/main amd64 libxtables12 amd64 1.8.9-2 [30.8 kB]
Get:8 http://deb.debian.org/debian bookworm/main amd64 libcap2-bin amd64 1:2.66-4+deb12u2 [34.9 kB]
Get:9 http://deb.debian.org/debian bookworm/main amd64 iproute2 amd64 6.1.0-3 [1046 kB]
Get:10 http://deb.debian.org/debian bookworm/main amd64 libatm1 amd64 1:2.5.1-4+b2 [68.3 kB]
Get:11 http://deb.debian.org/debian bookworm/main amd64 libpam-cap amd64 1:2.66-4+deb12u2 [14.7 kB]
Get:12 http://deb.debian.org/debian bookworm/main amd64 net-tools amd64 2.10-0.1+deb12u2 [243 kB]
Fetched 1896 kB in 0s (7806 kB/s)
```

Uso ifconfig

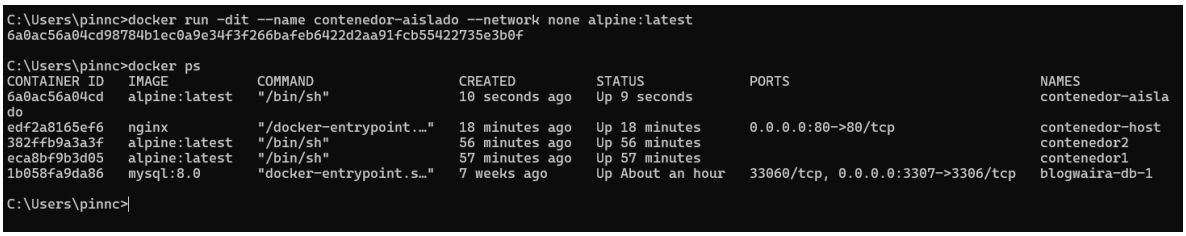


11. Responder: ¿qué implicaciones de seguridad y de rendimiento tiene este modo?

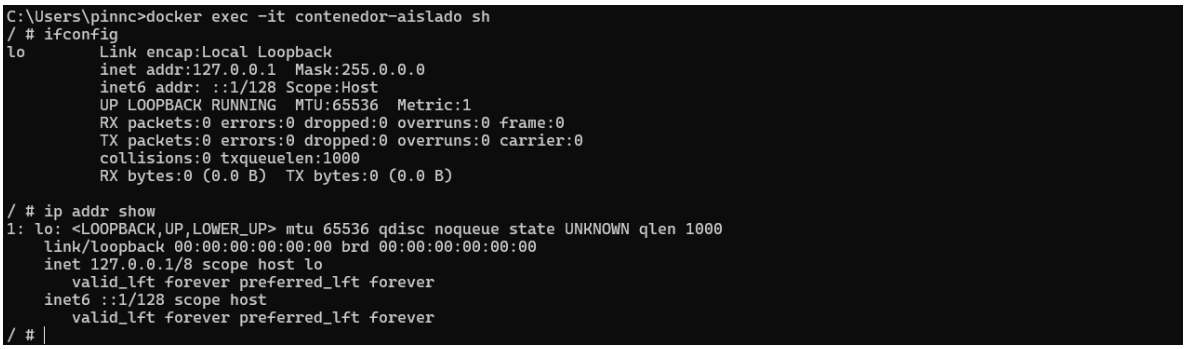
    - Comparte el stack de red del host completamente
    - Mejor rendimiento, mayores riesgos de seguridad
    - Sin aislamiento de red
    - Posibles conflictos de puertos entre contenedores
    - Mejor rendimiento de red

Parte C – Red None (aislamiento total)

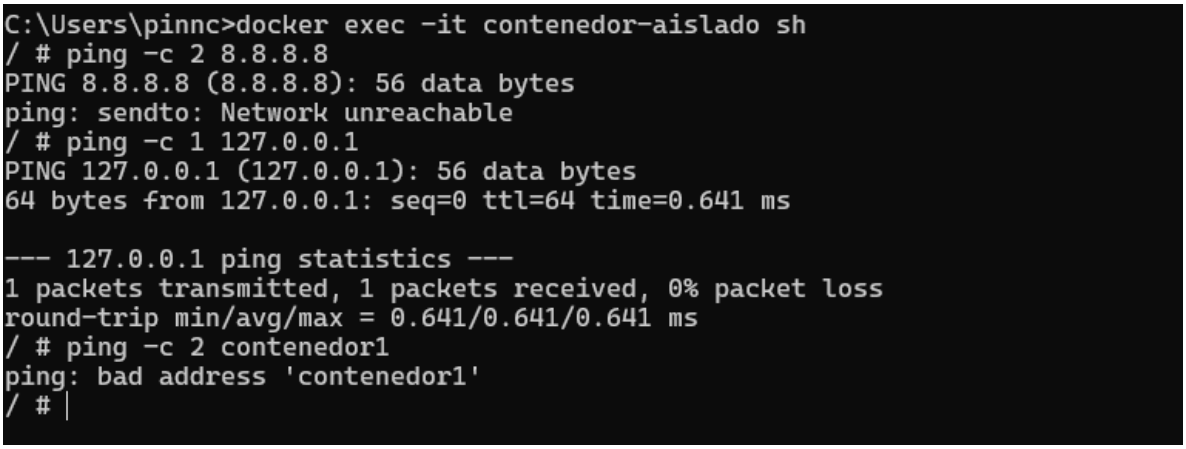
12. Crear un contenedor con la red **none**.



13. Comprobar la ausencia de interfaces de red configuradas más allá de loopback.



14. Intentar hacer ping a otro contenedor o al host. ¿Qué sucede?



15. Reflexionar: ¿para qué casos de uso podría servir este tipo de red?

- Para tareas específicas sin requerimientos de red
- Solo para compartir volúmenes
- Ideal para procesamiento sin conectividad
- Cuando se requiere aislamiento total de red
- Para probar aplicaciones sin dependencias de red

Enviar al correo nicolas.jurado@itp.edu.co

Fecha máxima de entrega martes 9 de septiembre