

## U0\_T6: Conexión de redes a contenedores

Deberemos realizar los siguiente pasos:

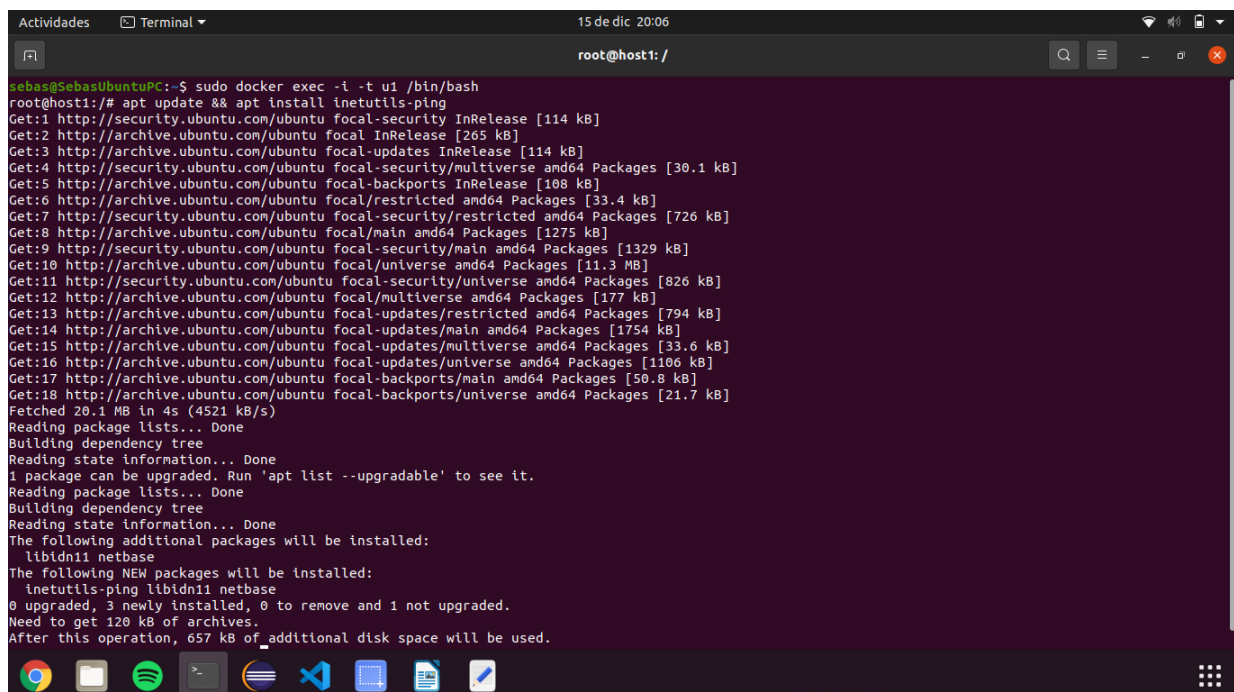
1. Poner en ejecución un contenedor de la imagen ubuntu:20.04 que tenga como hostname host1, como IP 172.30.0.10 y que esté conectado a la red1. Lo llamaremos u1.

```
sebas@SebasUbuntuPC:~$ sudo docker run -d -it --name=u1 --hostname=host1 --net=red1 --ip=172.30.0.10 ubuntu:20.04
0759d1f4eb76413b4244ca3640a729d3b94ca6755453d2ff1d178d2e0e9c737c
docker: Error response from daemon: Invalid address 172.30.0.10: It does not belong to any of this network's subnets.
sebas@SebasUbuntuPC:~$
```

No me deja la ip 172.30.0.10

```
sebas@SebasUbuntuPC:~$ sudo docker run -d -it --name=u1 --hostname=host1 --net=red1 --ip=172.28.0.10 ubuntu:20.04
72cf26d8ab1accd65964d1bf84e7b48ca1c8c349649bb04b9cf3d93d95e2a796
sebas@SebasUbuntuPC:~$
```

2. Entrar en ese contenedor e instalar la aplicación ping (apt update && apt install inetutils-ping).



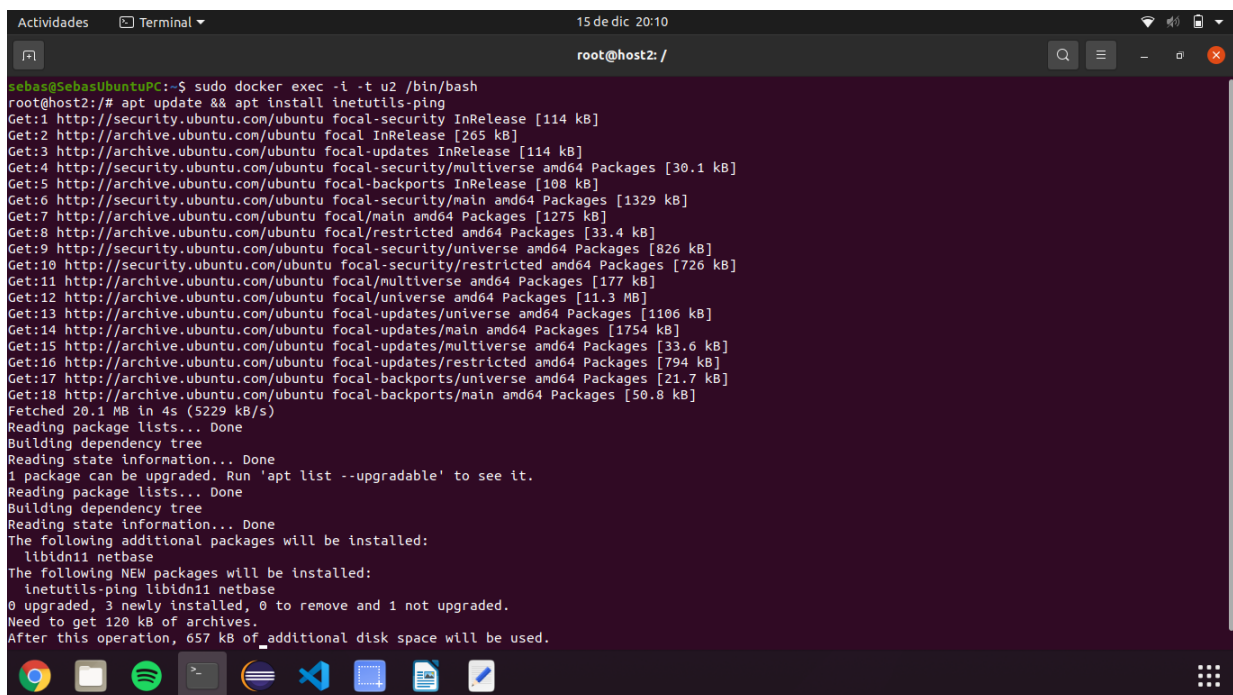
```
Actividades Terminal 15 de dic 20:06
root@host1: /

sebas@SebasUbuntuPC:~$ sudo docker exec -i -t u1 /bin/bash
root@host1:/# apt update && apt install inetutils-ping
Get:1 http://security.ubuntu.com/ubuntu focal-security InRelease [114 kB]
Get:2 http://archive.ubuntu.com/ubuntu focal InRelease [265 kB]
Get:3 http://archive.ubuntu.com/ubuntu focal-updates InRelease [114 kB]
Get:4 http://security.ubuntu.com/ubuntu focal-security/multiverse amd64 Packages [30.1 kB]
Get:5 http://archive.ubuntu.com/ubuntu focal-backports InRelease [108 kB]
Get:6 http://archive.ubuntu.com/ubuntu focal/restricted amd64 Packages [33.4 kB]
Get:7 http://security.ubuntu.com/ubuntu focal-security/restricted amd64 Packages [726 kB]
Get:8 http://archive.ubuntu.com/ubuntu focal/main amd64 Packages [1275 kB]
Get:9 http://security.ubuntu.com/ubuntu focal-security/main amd64 Packages [1329 kB]
Get:10 http://archive.ubuntu.com/ubuntu focal/universe amd64 Packages [11.3 MB]
Get:11 http://security.ubuntu.com/ubuntu focal-security/universe amd64 Packages [826 kB]
Get:12 http://archive.ubuntu.com/ubuntu focal/multiverse amd64 Packages [177 kB]
Get:13 http://archive.ubuntu.com/ubuntu focal-updates/restricted amd64 Packages [794 kB]
Get:14 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 Packages [1754 kB]
Get:15 http://archive.ubuntu.com/ubuntu focal-updates/multiverse amd64 Packages [33.6 kB]
Get:16 http://archive.ubuntu.com/ubuntu focal-updates/universe amd64 Packages [1106 kB]
Get:17 http://archive.ubuntu.com/ubuntu focal-backports/main amd64 Packages [50.8 kB]
Get:18 http://archive.ubuntu.com/ubuntu focal-backports/universe amd64 Packages [21.7 kB]
Fetched 20.1 MB in 4s (4521 kB/s)
Reading package lists... Done
Building dependency tree
Reading state information... Done
1 package can be upgraded. Run 'apt list --upgradable' to see it.
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  libidn11 netbase
The following NEW packages will be installed:
  inetutils-ping libidn11 netbase
0 upgraded, 3 newly installed, 0 to remove and 1 not upgraded.
Need to get 120 kB of archives.
After this operation, 657 kB of additional disk space will be used.
```

3. Poner en ejecución un contenedor de la imagen ubuntu:20.04 que tenga como hostname host2 y que esté conectado a la red2. En este caso será docker el que le de una IP correspondiente a esa red. Lo llamaremos u2.

```
sebas@SebasUbuntuPC:~$ sudo docker run -d -it --name=u2 --hostname=host2 --net=red2 ubuntu:20.04
5340eda825ef4ea8c2de09107367581a5a016daa821e6e5f431a5c2b8331d611
sebas@SebasUbuntuPC:~$
```

4. Entrar en ese contenedor e instalar la aplicación ping (apt update && apt install inetutils-ping).

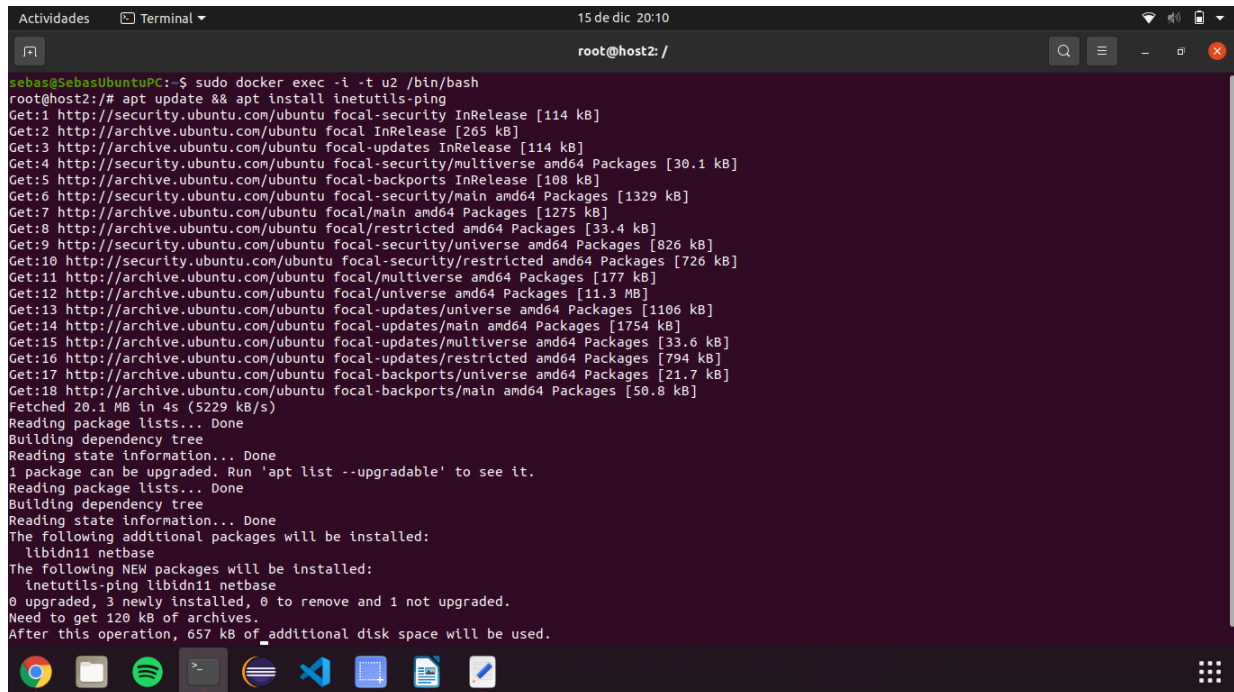


```
Actividades Terminal 15 de dic 20:10
root@host2: /

sebas@SebasUbuntuPC:~$ sudo docker exec -i -t u2 /bin/bash
root@host2:/# apt update && apt install inetutils-ping
Get:1 http://security.ubuntu.com/ubuntu focal-security InRelease [114 kB]
Get:2 http://archive.ubuntu.com/ubuntu focal InRelease [265 kB]
Get:3 http://archive.ubuntu.com/ubuntu focal-updates InRelease [114 kB]
Get:4 http://security.ubuntu.com/ubuntu focal-security/multiverse amd64 Packages [30.1 kB]
Get:5 http://archive.ubuntu.com/ubuntu focal-backports InRelease [108 kB]
Get:6 http://security.ubuntu.com/ubuntu focal-security/main amd64 Packages [1329 kB]
Get:7 http://archive.ubuntu.com/ubuntu focal/main amd64 Packages [1275 kB]
Get:8 http://archive.ubuntu.com/ubuntu focal/restricted amd64 Packages [33.4 kB]
Get:9 http://security.ubuntu.com/ubuntu focal-security/universe amd64 Packages [826 kB]
Get:10 http://security.ubuntu.com/ubuntu focal-security/restricted amd64 Packages [726 kB]
Get:11 http://archive.ubuntu.com/ubuntu focal/multiverse amd64 Packages [177 kB]
Get:12 http://archive.ubuntu.com/ubuntu focal/universe amd64 Packages [11.3 MB]
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Get:16 http://archive.ubuntu.com/ubuntu focal-updates/restricted amd64 Packages [794 kB]
Get:17 http://archive.ubuntu.com/ubuntu focal-backports/universe amd64 Packages [21.7 kB]
Get:18 http://archive.ubuntu.com/ubuntu focal-backports/main amd64 Packages [50.8 kB]
Fetched 20.1 MB in 4s (5229 kB/s)
Reading package lists... Done
Building dependency tree
Reading state information... Done
1 package can be upgraded. Run 'apt list --upgradable' to see it.
Reading package lists... Done
Building dependency tree
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The following additional packages will be installed:
  libidn11 netbase
The following NEW packages will be installed:
  inetutils-ping libidn11 netbase
0 upgraded, 3 newly installed, 0 to remove and 1 not upgraded.
Need to get 120 kB of archives.
After this operation, 657 kB of additional disk space will be used.
```

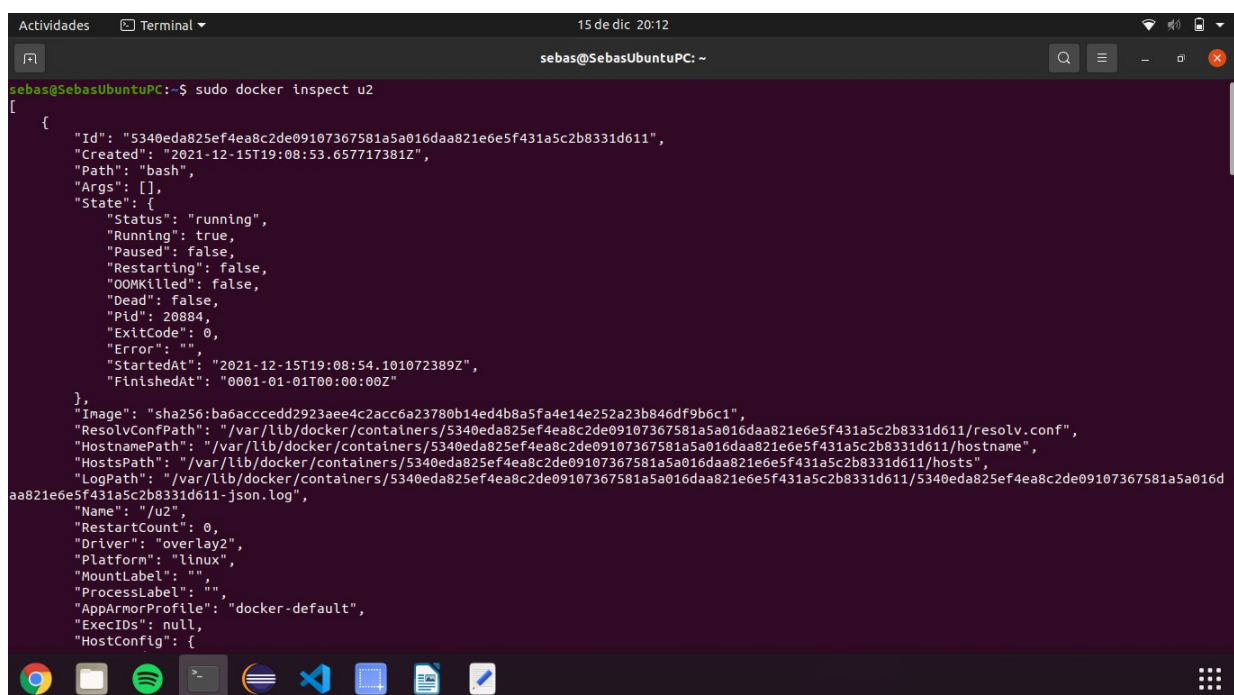
Una vez preparados estos contenedores debemos capturar los siguiente pantallazos:

- Pantallazo donde se vea la configuración de red del contenedor u1.



```
sebas@SebasUbuntuPC:~$ sudo docker exec -i -t u2 /bin/bash
root@host2:/# apt update && apt install inetutils-ping
Get:1 http://security.ubuntu.com/ubuntu focal-security InRelease [114 kB]
Get:2 http://archive.ubuntu.com/ubuntu focal InRelease [265 kB]
Get:3 http://archive.ubuntu.com/ubuntu focal-updates InRelease [114 kB]
Get:4 http://security.ubuntu.com/ubuntu focal-security/multiverse amd64 Packages [30.1 kB]
Get:5 http://archive.ubuntu.com/ubuntu focal-backports InRelease [108 kB]
Get:6 http://security.ubuntu.com/ubuntu focal-security/main amd64 Packages [1329 kB]
Get:7 http://archive.ubuntu.com/ubuntu focal/main amd64 Packages [1275 kB]
Get:8 http://archive.ubuntu.com/ubuntu focal/restricted amd64 Packages [33.4 kB]
Get:9 http://security.ubuntu.com/ubuntu focal-security/universe amd64 Packages [826 kB]
Get:10 http://security.ubuntu.com/ubuntu focal-security/restricted amd64 Packages [726 kB]
Get:11 http://archive.ubuntu.com/ubuntu focal/multiverse amd64 Packages [177 kB]
Get:12 http://archive.ubuntu.com/ubuntu focal/universe amd64 Packages [11.3 MB]
Get:13 http://archive.ubuntu.com/ubuntu focal-updates/universe amd64 Packages [1106 kB]
Get:14 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 Packages [1754 kB]
Get:15 http://archive.ubuntu.com/ubuntu focal-updates/multiverse amd64 Packages [33.6 kB]
Get:16 http://archive.ubuntu.com/ubuntu focal-updates/restricted amd64 Packages [794 kB]
Get:17 http://archive.ubuntu.com/ubuntu focal-backports/universe amd64 Packages [21.7 kB]
Get:18 http://archive.ubuntu.com/ubuntu focal-backports/main amd64 Packages [50.8 kB]
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Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  libidn11 netbase
The following NEW packages will be installed:
  inetutils-ping libidn11 netbase
0 upgraded, 3 newly installed, 0 to remove and 1 not upgraded.
Need to get 120 kB of archives.
After this operation, 657 kB of additional disk space will be used.
```

- Pantallazo donde se vea la configuración de red del contenedor u2.



```
sebas@SebasUbuntuPC:~$ sudo docker inspect u2
[
  {
    "Id": "5340eda825ef4ea8c2de09107367581a5a016daa821e6e5f431a5c2b8331d611",
    "Created": "2021-12-15T19:08:53.657717381Z",
    "Path": "bash",
    "Args": [],
    "State": {
      "Status": "running",
      "Running": true,
      "Paused": false,
      "Restarting": false,
      "OOMKilled": false,
      "Dead": false,
      "Pid": 20884,
      "ExitCode": 0,
      "Error": "",
      "StartedAt": "2021-12-15T19:08:54.101072389Z",
      "FinishedAt": "0001-01-01T00:00:00Z"
    },
    "Image": "sha256:ba6accdd2923aee4c2acc6a23780b14ed4b8a5fa4e14e252a23b846df9b6c1",
    "ResolvConfPath": "/var/lib/docker/containers/5340eda825ef4ea8c2de09107367581a5a016daa821e6e5f431a5c2b8331d611/resolv.conf",
    "HostnamePath": "/var/lib/docker/containers/5340eda825ef4ea8c2de09107367581a5a016daa821e6e5f431a5c2b8331d611/hostname",
    "HostsPath": "/var/lib/docker/containers/5340eda825ef4ea8c2de09107367581a5a016daa821e6e5f431a5c2b8331d611/hosts",
    "LogPath": "/var/lib/docker/containers/5340eda825ef4ea8c2de09107367581a5a016daa821e6e5f431a5c2b8331d611/5340eda825ef4ea8c2de09107367581a5a016daa821e6e5f431a5c2b8331d611-json.log",
    "Name": "/u2",
    "RestartCount": 0,
    "Driver": "overlay2",
    "Platform": "linux",
    "MountLabel": "",
    "ProcessLabel": "",
    "AppArmorProfile": "docker-default",
    "ExecIDs": null,
    "HostConfig": {
```

- Pantallazo donde desde cualquiera de los dos contenedores se pueda ver que no podemos hacer ping al otro ni por ip ni por nombre.

```
sebas@SebasUbuntuPC:~$ sudo docker exec -i -t u2 /bin/bash
root@host2:/# ping 172.28.0.10
PING 172.28.0.10 (172.28.0.10): 56 data bytes

^C--- 172.28.0.10 ping statistics ---
71 packets transmitted, 0 packets received, 100% packet loss
root@host2:/# ping u1
ping: unknown host
root@host2:/# ping host1
ping: unknown host
root@host2:/#
```

5. Una vez hemos constatado que los dos contenedores están en redes diferentes y aisladas, conectar la red2 al contenedor u1 mediante la orden docker network connect.

```
sebas@SebasUbuntuPC:~$ sudo docker network connect red2 u1
sebas@SebasUbuntuPC:~$
```

- Comprobar esta última conexión y capturar un último pantallazo donde se pueda comprobar que ahora, desde el contenedor u1, tenemos acceso al contenedor u2 mediante ping, tanto por nombre como por ip.

```
sebas@SebasUbuntuPC:~$ sudo docker network connect red2 u1
sebas@SebasUbuntuPC:~$ sudo docker exec -i -t u1 /bin/bash
root@host1:/# ping host2
PING host2 (172.18.0.2): 56 data bytes
64 bytes from 172.18.0.2: icmp_seq=0 ttl=64 time=0.263 ms
64 bytes from 172.18.0.2: icmp_seq=1 ttl=64 time=0.193 ms
64 bytes from 172.18.0.2: icmp_seq=2 ttl=64 time=0.194 ms
64 bytes from 172.18.0.2: icmp_seq=3 ttl=64 time=0.192 ms
64 bytes from 172.18.0.2: icmp_seq=4 ttl=64 time=0.074 ms
64 bytes from 172.18.0.2: icmp_seq=5 ttl=64 time=0.170 ms
64 bytes from 172.18.0.2: icmp_seq=6 ttl=64 time=0.206 ms
64 bytes from 172.18.0.2: icmp_seq=7 ttl=64 time=0.150 ms
64 bytes from 172.18.0.2: icmp_seq=8 ttl=64 time=0.209 ms
^C--- host2 ping statistics ---
9 packets transmitted, 9 packets received, 0% packet loss
round-trip min/avg/max/stddev = 0.074/0.183/0.263/0.048 ms
root@host1:/#
```

```
sebas@SebasUbuntuPC:~$ sudo docker exec -i -t u1 /bin/bash
root@host1:/# ping 172.18.0.2
PING 172.18.0.2 (172.18.0.2): 56 data bytes
64 bytes from 172.18.0.2: icmp_seq=0 ttl=64 time=0.223 ms
64 bytes from 172.18.0.2: icmp_seq=1 ttl=64 time=0.194 ms
64 bytes from 172.18.0.2: icmp_seq=2 ttl=64 time=0.170 ms
64 bytes from 172.18.0.2: icmp_seq=3 ttl=64 time=0.186 ms
64 bytes from 172.18.0.2: icmp_seq=4 ttl=64 time=0.198 ms
64 bytes from 172.18.0.2: icmp_seq=5 ttl=64 time=0.196 ms
64 bytes from 172.18.0.2: icmp_seq=6 ttl=64 time=0.195 ms
64 bytes from 172.18.0.2: icmp_seq=7 ttl=64 time=0.195 ms
^C--- 172.18.0.2 ping statistics ---
8 packets transmitted, 8 packets received, 0% packet loss
round-trip min/avg/max/stddev = 0.170/0.195/0.223/0.000 ms
root@host1:/#
```