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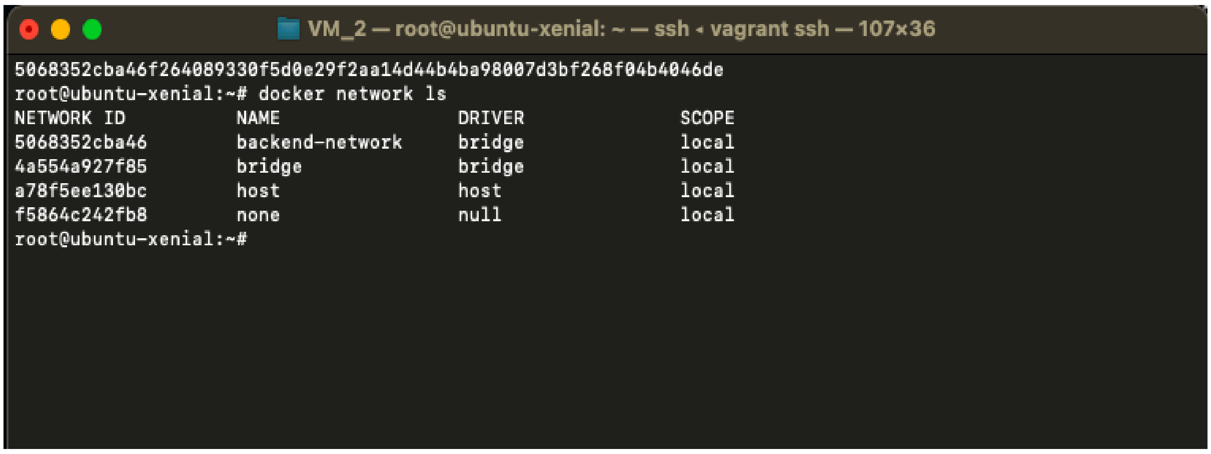
DevOps Batch-2 (6th Semester)
Subject – Application Containerization

Experiment- ***Creating Networks Between Containers using Networks***

- To start with we create the network with our predefined name.

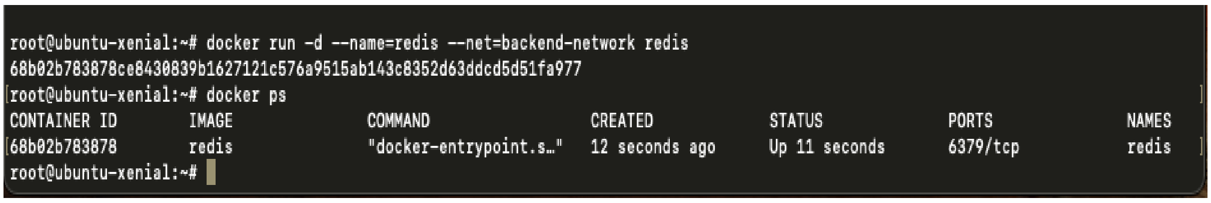
```
$ docker network create backend-network
```



```
5068352cba46f264089330f5d0e29f2aa14d44b4ba98007d3bf268f04b4046de
root@ubuntu-xenial:~# docker network ls
NETWORK ID          NAME                DRIVER              SCOPE
5068352cba46        backend-network     bridge              local
4a554a927f85        bridge              bridge              local
a78f5ee130bc        host                host                local
f5864c242fb8        none                null                local
root@ubuntu-xenial:~#
```

- When we launch new containers, we can use the "***--net***" attribute to assign which network they should be connected to.

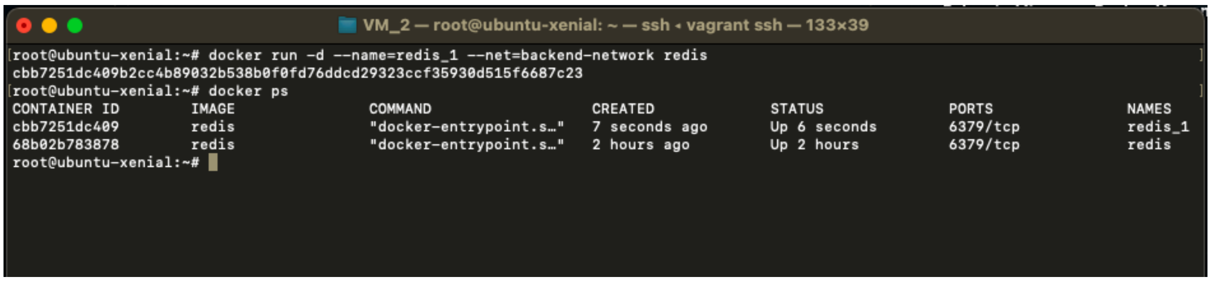
```
$ docker run -d --name=redis --net=backend-network redis
```



```
root@ubuntu-xenial:~# docker run -d --name=redis --net=backend-network redis
68b02b783878ce8430839b1627121c576a9515ab143c8352d63ddcd5d51fa977
root@ubuntu-xenial:~# docker ps
CONTAINER ID        IMAGE               COMMAND                  CREATED             STATUS              PORTS               NAMES
68b02b783878        redis               "docker-entrypoint.s…"   12 seconds ago      Up 11 seconds       6379/tcp            redis
root@ubuntu-xenial:~#
```

- Create another redis container with name "***redis_1***" under the "***backend-network***" network.

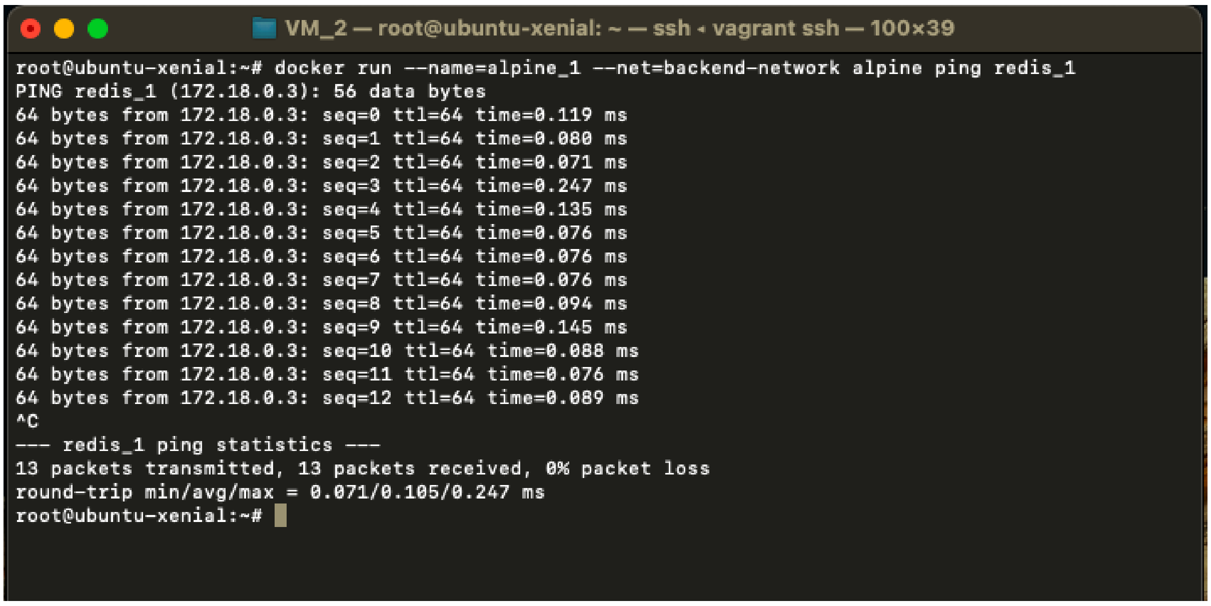
```
$ docker run -d --name=redis_1 --net=backend-network redis
```



```
root@ubuntu-xenial:~# docker run -d --name=redis_1 --net=backend-network redis
cbb7251dc409b2cc4b89032b538b0f0fd76ddcd29323ccf35930d515f6687c23
root@ubuntu-xenial:~# docker ps
CONTAINER ID        IMAGE               COMMAND                  CREATED             STATUS              PORTS               NAMES
cbb7251dc409        redis               "docker-entrypoint.s…"   7 seconds ago       Up 6 seconds        6379/tcp            redis_1
68b02b783878        redis               "docker-entrypoint.s…"   2 hours ago         Up 2 hours          6379/tcp            redis
root@ubuntu-xenial:~#
```

- Now ping the redis (***redis_1***) container from the newly created alpine (***alpine_1***) container with in the same network (***backend-network***).

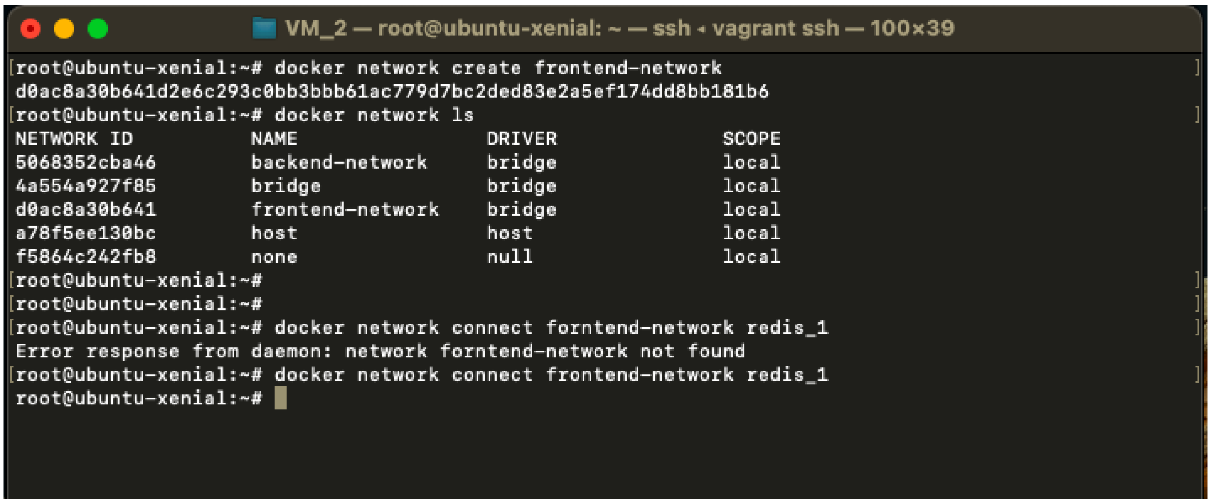
```
$ docker run --name=alpine_1 --net=backend-network alpine ping redis_1
```


VM_2 — root@ubuntu-xenial: ~ — ssh ◂ vagrant ssh — 100×39

```
root@ubuntu-xenial:~# docker run --name=alpine_1 --net=backend-network alpine ping redis_1
PING redis_1 (172.18.0.3): 56 data bytes
64 bytes from 172.18.0.3: seq=0 ttl=64 time=0.119 ms
64 bytes from 172.18.0.3: seq=1 ttl=64 time=0.080 ms
64 bytes from 172.18.0.3: seq=2 ttl=64 time=0.071 ms
64 bytes from 172.18.0.3: seq=3 ttl=64 time=0.247 ms
64 bytes from 172.18.0.3: seq=4 ttl=64 time=0.135 ms
64 bytes from 172.18.0.3: seq=5 ttl=64 time=0.076 ms
64 bytes from 172.18.0.3: seq=6 ttl=64 time=0.076 ms
64 bytes from 172.18.0.3: seq=7 ttl=64 time=0.076 ms
64 bytes from 172.18.0.3: seq=8 ttl=64 time=0.094 ms
64 bytes from 172.18.0.3: seq=9 ttl=64 time=0.145 ms
64 bytes from 172.18.0.3: seq=10 ttl=64 time=0.088 ms
64 bytes from 172.18.0.3: seq=11 ttl=64 time=0.076 ms
64 bytes from 172.18.0.3: seq=12 ttl=64 time=0.089 ms
^C
--- redis_1 ping statistics ---
13 packets transmitted, 13 packets received, 0% packet loss
round-trip min/avg/max = 0.071/0.105/0.247 ms
root@ubuntu-xenial:~#
```

- Create another network (frontend-network) and connect the redis (***redis_1***) container with is network.

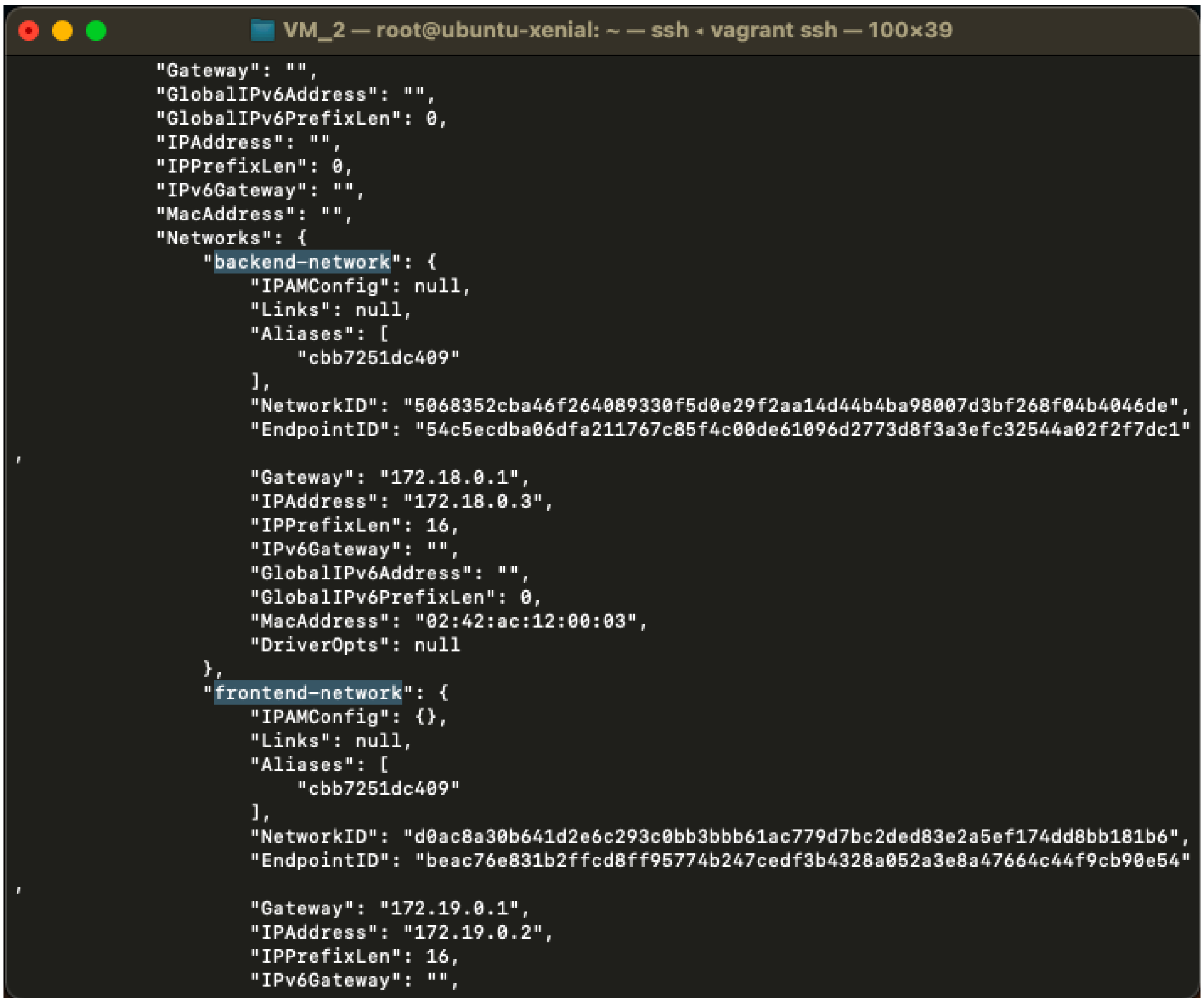
```
$ docker network connect frontend-network redis_1
```


VM_2 — root@ubuntu-xenial: ~ — ssh ◂ vagrant ssh — 100×39

```
root@ubuntu-xenial:~# docker network create frontend-network
d0ac8a30b641d2e6c293c0bb3bbb61ac779d7bc2ded83e2a5ef174dd8bb181b6
root@ubuntu-xenial:~# docker network ls
NETWORK ID          NAME                DRIVER              SCOPE
5068352cba46        backend-network     bridge              local
4a554a927f85        bridge              bridge              local
d0ac8a30b641        frontend-network    bridge              local
a78f5ee130bc        host                host                local
f5864c242fb8        none                null                local
root@ubuntu-xenial:~#
root@ubuntu-xenial:~#
root@ubuntu-xenial:~# docker network connect forntend-network redis_1
Error response from daemon: network forntend-network not found
root@ubuntu-xenial:~# docker network connect frontend-network redis_1
root@ubuntu-xenial:~#
```

- Now inspect the "***redis_1***" container to check the network connectivity.

```
$ docker inspect redis_1
```

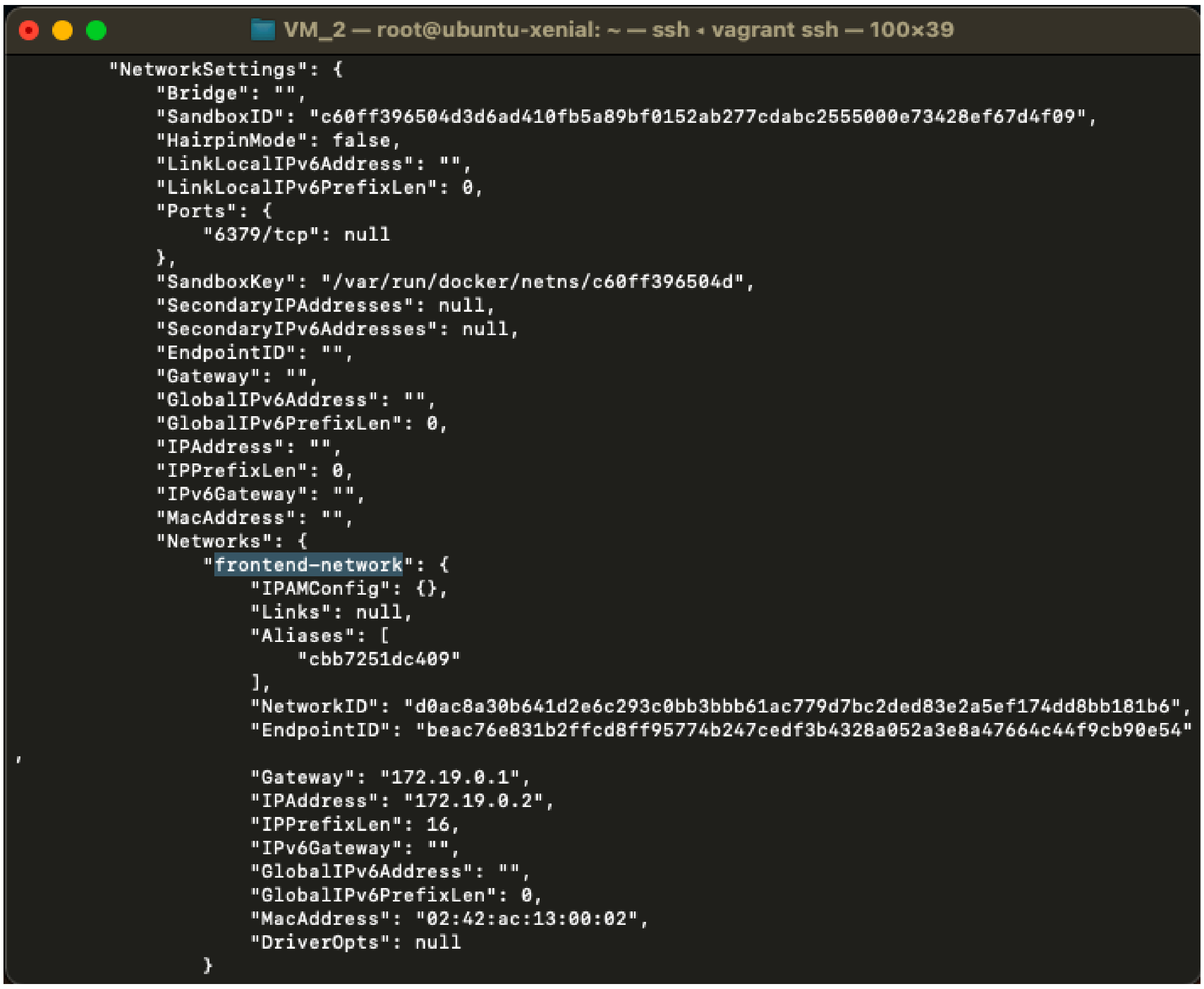


```
            "Gateway": "",
            "GlobalIPv6Address": "",
            "GlobalIPv6PrefixLen": 0,
            "IPAddress": "",
            "IPPrefixLen": 0,
            "IPv6Gateway": "",
            "MacAddress": "",
            "Networks": {
                "backend-network": {
                    "IPAMConfig": null,
                    "Links": null,
                    "Aliases": [
                        "cbb7251dc409"
                    ],
                    "NetworkID": "5068352cba46f264089330f5d0e29f2aa14d44b4ba98007d3bf268f04b4046de",
                    "EndpointID": "54c5ecdba06dfa211767c85f4c00de61096d2773d8f3a3efc32544a02f2f7dc1"
,
                    "Gateway": "172.18.0.1",
                    "IPAddress": "172.18.0.3",
                    "IPPrefixLen": 16,
                    "IPv6Gateway": "",
                    "GlobalIPv6Address": "",
                    "GlobalIPv6PrefixLen": 0,
                    "MacAddress": "02:42:ac:12:00:03",
                    "DriverOpts": null
                },
                "frontend-network": {
                    "IPAMConfig": {},
                    "Links": null,
                    "Aliases": [
                        "cbb7251dc409"
                    ],
                    "NetworkID": "d0ac8a30b641d2e6c293c0bb3bbb61ac779d7bc2ded83e2a5ef174dd8bb181b6",
                    "EndpointID": "beac76e831b2ffcd8ff95774b247cedf3b4328a052a3e8a47664c44f9cb90e54"
,
                    "Gateway": "172.19.0.1",
                    "IPAddress": "172.19.0.2",
                    "IPPrefixLen": 16,
                    "IPv6Gateway": "",
```

- Now disconnect the "***redis_1***" container from the "***backend-network***" network.

```
$ docker network disconnect backend-network redis_1
```

```
$ docker inspect redis_1
```



```
        "NetworkSettings": {
            "Bridge": "",
            "SandboxID": "c60ff396504d3d6ad410fb5a89bf0152ab277cdabc2555000e73428ef67d4f09",
            "HairpinMode": false,
            "LinkLocalIPv6Address": "",
            "LinkLocalIPv6PrefixLen": 0,
            "Ports": {
                "6379/tcp": null
            },
            "SandboxKey": "/var/run/docker/netns/c60ff396504d",
            "SecondaryIPAddresses": null,
            "SecondaryIPv6Addresses": null,
            "EndpointID": "",
            "Gateway": "",
            "GlobalIPv6Address": "",
            "GlobalIPv6PrefixLen": 0,
            "IPAddress": "",
            "IPPrefixLen": 0,
            "IPv6Gateway": "",
            "MacAddress": "",
            "Networks": {
                "frontend-network": {
                    "IPAMConfig": {},
                    "Links": null,
                    "Aliases": [
                        "cbb7251dc409"
                    ],
                    "NetworkID": "d0ac8a30b641d2e6c293c0bb3bbb61ac779d7bc2ded83e2a5ef174dd8bb181b6",
                    "EndpointID": "beac76e831b2ffcd8ff95774b247cedf3b4328a052a3e8a47664c44f9cb90e54"
,
                    "Gateway": "172.19.0.1",
                    "IPAddress": "172.19.0.2",
                    "IPPrefixLen": 16,
                    "IPv6Gateway": "",
                    "GlobalIPv6Address": "",
                    "GlobalIPv6PrefixLen": 0,
                    "MacAddress": "02:42:ac:13:00:02",
                    "DriverOpts": null
                }
```