



DevOps by SATISH @ Sathya Technologies

Docker Network

- Docker Containers to communicate with each other and the outside world via the host machine, there has to be a layer of networking involved.
- Docker supports different types of networks, each fit for certain use cases.

Docker Network

Network Types

Docker comes with network drivers geared towards different use cases.

The most common network types being: **bridge**, **overlay**, and **macvlan**.

Docker Network

Bridge Networks:

Bridge networking is the most common network type. It is limited to containers within a single host running the Docker engine.

Bridge networks are easy to create, manage and troubleshoot.

Ex:

```
# docker network create -d bridge my-bridge-net
```

Docker Network

Overlay Networks:

An overlay network uses software virtualization to create additional layers of network abstraction running on top of a physical network.

In Docker, an overlay network driver is used for multi-host network communication.

Ex:

```
# docker network create -d overlay  
--subnet=192.168.10.0/24 my-overlay-net
```

Docker Network

Macvlan Networks:

The macvlan driver is used to connect Docker containers directly to the host network interfaces through layer 2 segmentation. .

Ex:

```
# docker network create -d macvlan \
--subnet=192.168.40.0/24 \
--gateway=192.168.40.1 \
-o parent=eth0 my-macvlan-net
```

Public IP address to Docker Container without port binding.

- * MACVLAN creates multiple virtual network interfaces with different MAC addresses.
- * This way if your system has multiple IP addresses with MAC addresses then we can create multiple virtual network interfaces each having their own IP address and MAC address.

Public IP address to Docker Container without port binding.

Problems with docker containers port binding / port Mapping:

- 1) If a container uses port 8000 of host then no other containers can use that port.**

- 2) Binding multiple ports to container can be done by specifying port range but this operation takes more time depending on no. of ports to bind.**

- 3) IPTables rules become cumbersome as no. of bindings increase.**

Public IP address to Docker Container without port binding.

Advantages of MACVLAN:

- 1) IPTables aren't affected.
- 2) No port binding.
- 3) Easy to setup.
- 4) Faster than bridge networking.

Public IP address to Docker Container without port binding.

Creating MACVLAN network:

Example:

Host IP: 188.40.102.103

Host subnet: 188.40.76.0

Host Mask: 26

Host gateway: 188.40.76.1

Host ethernet interface: eth0

Public IP address to Docker Container without port binding.

Creating MACVLAN network:

```
# docker network create -d macvlan  
  -o macvlan_mode=bridge  
  --subnet=188.40.76.0/26  
  --gateway=188.40.76.1  
  -o parent=eth0 macvlan_bridge
```

Public IP address to Docker Container without port binding.

Running a container using '**macvlan_bridge**' n/w

Example:

Host contains multiple publicly accessible IP addresses with MAC addresses.

Host additional IP/MAC:

88.99.102.115/00:50:56:00:60:42

```
# docker run --name cont1 --net=macvlan_bridge  
--ip=88.99.102.115  
--mac-address 00:50:56:00:60:42 -itd nginx
```