

Setup VirtualBox for Multi Node K8S Cluster

Prerequisites

- Ubuntu 16 running in VirtualBox

VirtualBox Preferences

In VirtualBox Preferences define Host-only adaptor (should already exist and default to the following)

- Ip: 192.168.56.1
- Netmask: 255.255.255.0
- DHCP: Enabled

Create K8Master Node

Create VM

Create a VM with the following:

- 2 GB MEM
- 10 GB disk
- user: test

For Networking assign the following:

Adaptor 1: NATNet

Adaptor 2: Host-only adapter (vboxnet0)

For Audio: Disable

Start VM and install Ubuntu Server 16

Networking Setup

Log into the VM and issue the following commands.

Determine your network interfaces

> ifconfig -a

```
enp0s3      Link encap:Ethernet  HWaddr 08:00:27:ff:1a:7b
            inet addr:10.0.2.15  Bcast:10.0.2.255  Mask:255.255.255.0
...

enp0s8      Link encap:Ethernet  HWaddr 08:00:27:eb:d0:60
            BROADCAST MULTICAST  MTU:1500  Metric:1
            RX packets:0 errors:0 dropped:0 overruns:0 frame:0
            TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
            collisions:0 txqueuelen:1000
            RX bytes:19723 (19.7 KB)  TX bytes:0 (0.0 B)

lo          Link encap:Local Loopback
            inet addr:127.0.0.1  Mask:255.0.0.0
...
```

From the above we can see that our vm has 2 network interfaces but only one is configured. The first interface is using NAT and has been assigned an IP address. We will need to add the second interface which is using the host-only network.

We are going to set this second interface (host-only) to a specific IP address: (192.168.56.100)

We might as well change the first interface to a static one too.

```
> sudo vi /etc/network/interfaces
```

```
# This file describes the network interfaces available on your system
# and how to activate them. For more information, see interfaces(5).

source /etc/network/interfaces.d/*

# The loopback network interface
auto lo
iface lo inet loopback

# The primary network interface
auto enp0s3
#iface enp0s3 inet dhcp
iface enp0s3 inet static
    address 10.0.2.100
    netmask 255.255.255.0
    network 10.0.2.0
    broadcast 10.0.2.255
    gateway 10.0.2.1
    dns-nameservers 10.0.2.1 8.8.8.8

auto enp0s8
iface enp0s8 inet static
    address 192.168.56.100
    netmask 255.255.255.0
    network 192.168.56.0
    broadcast 192.168.56.255
```

```
> reboot
```

After reboot, we should be able to confirm that the ip address is static by issuing the ifconfig command once more.

SSH into your VM from your host:

```
> ssh test@192.168.56.100
```

From the VM, confirm that you can resolve DNS by issuing the following command:

```
> nslookup google.com
```

We can also setup port forwarding via our NAT network to access our VM using

```
> ssh -p PORT test@localhost
```

Appendix - Virtual Box

Network Configurations

	VM <-> Host	VM1 <-> VM2	VM -> Internet	VM <- Internet
HostOnly	Yes	Yes	No	No
Internal	No	Yes	No	No
Bridged	Yes	Yes	Yes	Yes
NAT	No	No	Yes	Port forward
NATNet	No	Yes	Yes	Port forward

Reference

Reference	URL
Kubernetes on Ubuntu	https://kubernetes.io/docs/getting-started-guides/ubuntu/
Install Kubernetes On Ubuntu	https://www.youtube.com/watch?v=UWg3ORRRF60
Building a Kubernetes Cluster in VirtualBox with Ubuntu	https://medium.com/@KevinHoffman/building-a-kubernetes-cluster-in-virtualbox-with-ubuntu-22cd338846dd
Kubernetes cluster setup using virtual machines	https://www.profiq.com/kubernetes-cluster-setup-using-virtual-machines/