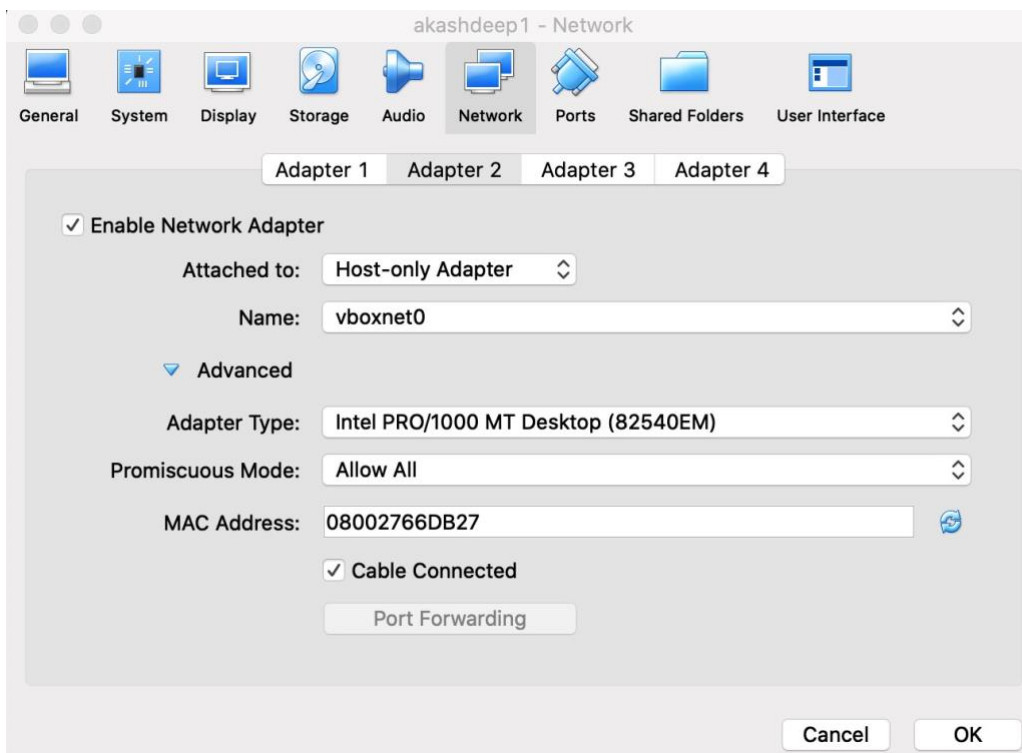
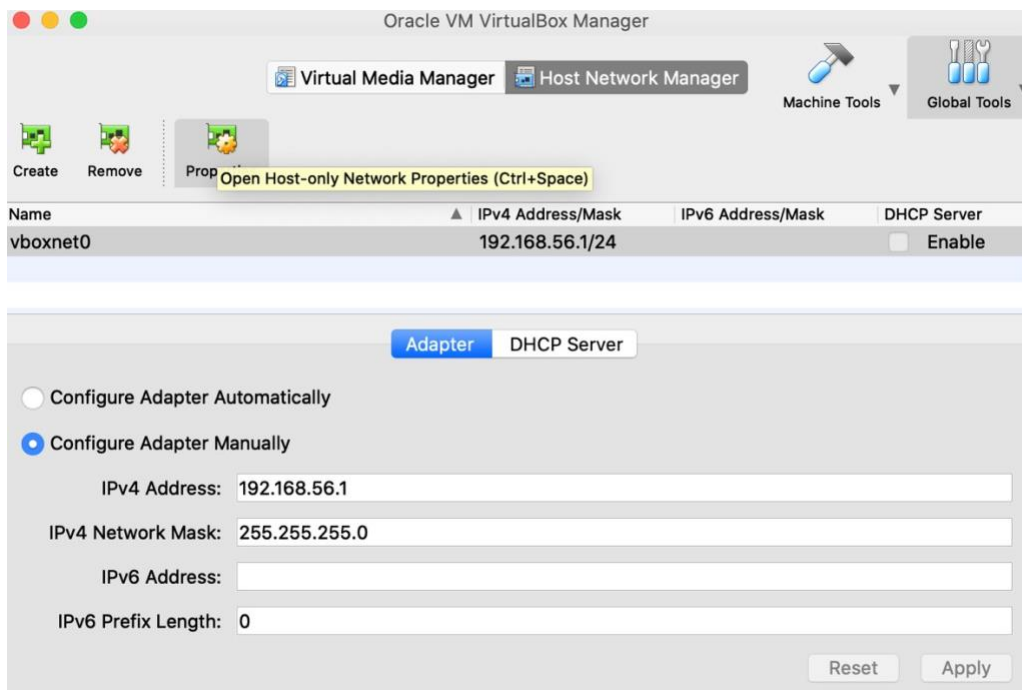


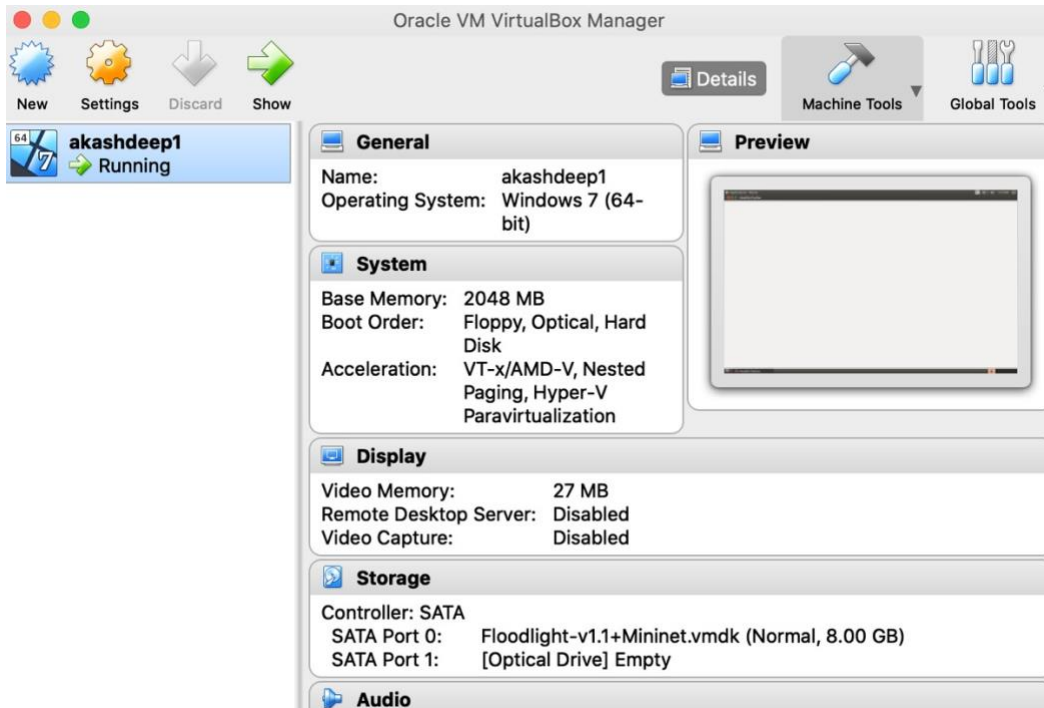
### Step1:

Made a new network adaptor (Host-only) with promiscuous mode as Allow all in Virtualbox for out downloaded virtual hard drive that has floodlight and Mininet preinstalled.



### Step 2:

Start the linux machine. Machine has only one user floodlight with password as floodlight



Step 3:

Open Terminal on linux machine and perform the command ifconfig. Our host-only adaptor (eth1) has the ip 192.168.56.3

```
floodlight@floodlight: ~  
File Edit View Search Terminal Help  
  
RX packets:105 errors:0 dropped:0 overruns:0 frame:0  
TX packets:152 errors:0 dropped:0 overruns:0 carrier:0  
collisions:0 txqueuelen:1000  
RX bytes:26063 (26.0 KB) TX bytes:61536 (61.5 KB)  
  
eth1      Link encap:Ethernet  HWaddr 08:00:27:1e:66:52  
          inet addr:192.168.56.3  Bcast:192.168.56.255  Mask:255.255.255.0  
          inet6 addr: fe80::a00:27ff:fe1e:6652/64 Scope:Link  
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1  
          RX packets:28 errors:0 dropped:0 overruns:0 frame:0  
          TX packets:24 errors:0 dropped:0 overruns:0 carrier:0  
          collisions:0 txqueuelen:1000  
          RX bytes:9647 (9.6 KB) TX bytes:4561 (4.5 KB)  
  
lo        Link encap:Local Loopback  
          inet addr:127.0.0.1  Mask:255.0.0.0  
          inet6 addr: ::1/128 Scope:Host  
          UP LOOPBACK RUNNING  MTU:65536  Metric:1  
          RX packets:1642 errors:0 dropped:0 overruns:0 frame:0  
          TX packets:1642 errors:0 dropped:0 overruns:0 carrier:0  
          collisions:0 txqueuelen:0  
          RX bytes:84711 (84.7 KB) TX bytes:84711 (84.7 KB)  
  
floodlight@floodlight:~$
```

Step 4:

Compiling and running floodlight. We use the commands in sequence.

\$cd ~/floodlight

\$ant

\$java -jar target/floodlight.jar

The floodlight service starts running.

```
Floodlight@floodlight: ~/floodlight
File Edit View Search Terminal Help
floodlight@floodlight:~/floodlight$ clear

floodlight@floodlight:~/floodlight$ java -jar target/floodlight.jar
15:27:22.500 INFO [n.f.c.m.FloodlightModuleLoader:main] Loading modules from src/main/resources/floodlightdefault.properties
15:27:22.654 WARN [n.f.r.RestApiServer:main] HTTPS disabled; HTTPS will not be used to connect to the REST API.
15:27:22.654 WARN [n.f.r.RestApiServer:main] HTTP enabled; Allowing unsecure access to REST API on port 8080.
15:27:23.662 WARN [n.f.c.i.OFSwitchManager:main] SSL disabled. Using unsecure connections between Floodlight and switches.
15:27:23.662 INFO [n.f.c.i.OFSwitchManager:main] Clear switch flow tables on initial handshake as master: TRUE
15:27:23.663 INFO [n.f.c.i.OFSwitchManager:main] Clear switch flow tables on each transition to master: TRUE
15:27:23.663 INFO [n.f.c.i.OFSwitchManager:main] Setting 0x4 as the default max table to receive table-miss flow
15:27:23.672 INFO [n.f.c.i.OFSwitchManager:main] Setting max table to receive table-miss flow to 0x4 for DPID 00:00:00:00:00:00:00:01
15:27:23.672 INFO [n.f.c.i.OFSwitchManager:main] Setting max table to receive table-miss flow to 0x4 for DPID 00:00:00:00:00:00:00:02
15:27:23.674 INFO [n.f.c.i.Controller:main] Controller role set to ACTIVE
15:27:23.691 INFO [n.f.f.Forwarding:main] Default hard timeout not configured. Using 0.
15:27:23.692 INFO [n.f.f.Forwarding:main] Default idle timeout not configured. Using 5.
15:27:23.692 INFO [n.f.f.Forwarding:main] Default priority not configured. Using 1.
15:27:23.692 INFO [n.f.f.Forwarding:main] Default flags will be empty.
15:27:23.692 INFO [n.f.f.Forwarding:main] Default flow matches set to: VLAN=true, MAC=true, IP=true, TPPT=true
15:27:24.070 INFO [o.s.s.i.c.FallbackCCProvider:main] Cluster not yet configured; using fallback local configuration
15:27:24.071 INFO [o.s.s.i.SyncManager:main] [32767] Updating sync configuration ClusterConfig [allNodes={32767=Node [hostname=localhost, port=6642, nodeId=32767, domainId=32767]}, authScheme=CHALLENGE_RESPONSE, keyStorePath=/etc/floodlight/auth_credentials.jceks, keyStorePassword is unset]
15:27:24.195 INFO [o.s.s.i.r.RPCService:main] Listening for internal floodlight RPC on localhost/127.0.0.1:6642
15:27:24.256 INFO [n.f.c.i.OFSwitchManager:main] Listening for switch connections on 0.0.0.0/0.0.0.0:6653
```

Step 5:

Open a new terminal and run the following command:



```
$sudo mn --controller=remote,ip=192.168.56.3,port=6653 --switch=ovsk,protocols=OpenFlow13
```

Now our floodlight controller is set at ip 192.168.56.3 and port=6653

```
Floodlight@floodlight: ~/Documents
File Edit View Search Terminal Help
exists del-br s8 -- --if-exists del-br s9
ovs-vsctl --timeout=1 list-br
*** Removing all links of the pattern foo-ethX
ip link show | egrep -o '([_.:alnum:]]+-eth[[:digit:]]+)'
( ip link del s2-eth1;ip link del s1-eth2;ip link del s4-eth1;ip link del s1-eth
3;ip link del s3-eth1;ip link del s2-eth2;ip link del s5-eth1;ip link del s3-eth
2;ip link del s6-eth1;ip link del s5-eth2;ip link del s7-eth1;ip link del s2-eth
3;ip link del s8-eth1;ip link del s7-eth2;ip link del s9-eth1;ip link del s7-eth
3;ip link del s10-eth1;ip link del s9-eth2;ip link del s11-eth1;ip link del s10-
eth2;ip link del s12-eth1;ip link del s11-eth2;ip link del s13-eth1;ip link del
s9-eth3;ip link del s14-eth1;ip link del s13-eth2 ) 2> /dev/null
ip link show
*** Killing stale mininet node processes
pkill -9 -f mininet:
*** Shutting down stale tunnels
pkill -9 -f Tunnel=Ethernet
pkill -9 -f .ssh/mn
rm -f ~/.ssh/mn/*
*** Cleanup complete.
floodlight@floodlight:~/Documents$ sudo mn --controller=remote,ip=192.168.56.3,port=6653 --switch ovsk,protocols=OpenFlow13
*** Creating network
*** Adding controller
*** Adding hosts:
h1 h2
*** Adding switches:
s1
*** Adding links:
(h1, s1) (h2, s1)
*** Configuring hosts
h1 h2
*** Starting controller
c0
*** Starting 1 switches
s1 ...
*** Starting CLI:
mininet> exit
```

## Step 6:

Remove all previous mininet related adaptors with the command:

```
sudo mn -c
```

```
Floodlight@floodlight:~
File Edit View Search Terminal Help
UP LOOPBACK RUNNING: MTU:65536 Metric:1
RX packets:5004 errors:0 dropped:0 overruns:0 frame:0
TX packets:5004 errors:0 dropped:0 overruns:0 carrier:0
collisions:0 txqueuelen:0
RX bytes:261368 (261.3 KB) TX bytes:261368 (261.3 KB)

Floodlight@floodlight:~$ sudo mn -c
[sudo] password for floodlight:
*** Removing excess controllers/ofdatapaths/pings/noxes
killall controller ofprotocol ofdatapath ping nox_corelt-nox_core ovs-openflow ovs-contr
ollerovs-testcontroller udptwtest mnexec ivs ryu-manager 2> /dev/null
killall -9 controller ofprotocol ofdatapath ping nox_corelt-nox_core ovs-openflow ovs-co
ntrollerovs-testcontroller udptwtest mnexec ivs ryu-manager 2> /dev/null
pkill -9 -f "sudo mnexec"
*** Removing junk from /tmp
rm -f /tmp/vconn* /tmp/vlogs* /tmp/*.out /tmp/*.log
*** Removing old X11 tunnels
*** Removing excess kernel datapaths
ps ax | egrep -o "dp[0-9]t*" | sed 's/dp/nl:/'
*** Removing OVS datapaths
ovs-vsctl --timeout=1 list-br
ovs-vsctl --if-exists del-br s1 -- --if-exists del-br s10 -- --if-exists del-br s11 -- --
if-exists del-br s12 -- --if-exists del-br s13 -- --if-exists del-br s14 -- --if-exists d
el-br s2 -- --if-exists del-br s3 -- --if-exists del-br s4 -- --if-exists del-br s5 -- --
if-exists del-br s6 -- --if-exists del-br s7 -- --if-exists del-br s8 -- --if-exists del-
br s9
ovs-vsctl --timeout=1 list-br
*** Removing all links of the pattern foo-ethX
ip link show | egrep -o '([_.:alnum:]]+-eth[[:digit:]]+)'
ip link show
*** Killing stale mininet node processes
pkill -9 -f mininet:
*** Shutting down stale tunnels
pkill -9 -f Tunnel=Ethernet
pkill -9 -f .ssh/mn
rm -f ~/.ssh/mn/*
*** Cleanup complete.
Floodlight@floodlight:~$
```

## Step 7:

The python file is stored in Documents with name network.py. So, we type the following command to change directory to Documents:

```
$cd ~/Documents
```

Create folders cap, err and out in Documents

To compile and run the file we type the command:

[illegible]

Note: h1 is set at ip 192.168.56.11 and h7 is set at ip 192.168.56.17 according to network.py

Running this, we get:

Latency=10.5105ms

12% Packet loss

Jitter=0.606ms

Throughput = 5.49Mbps