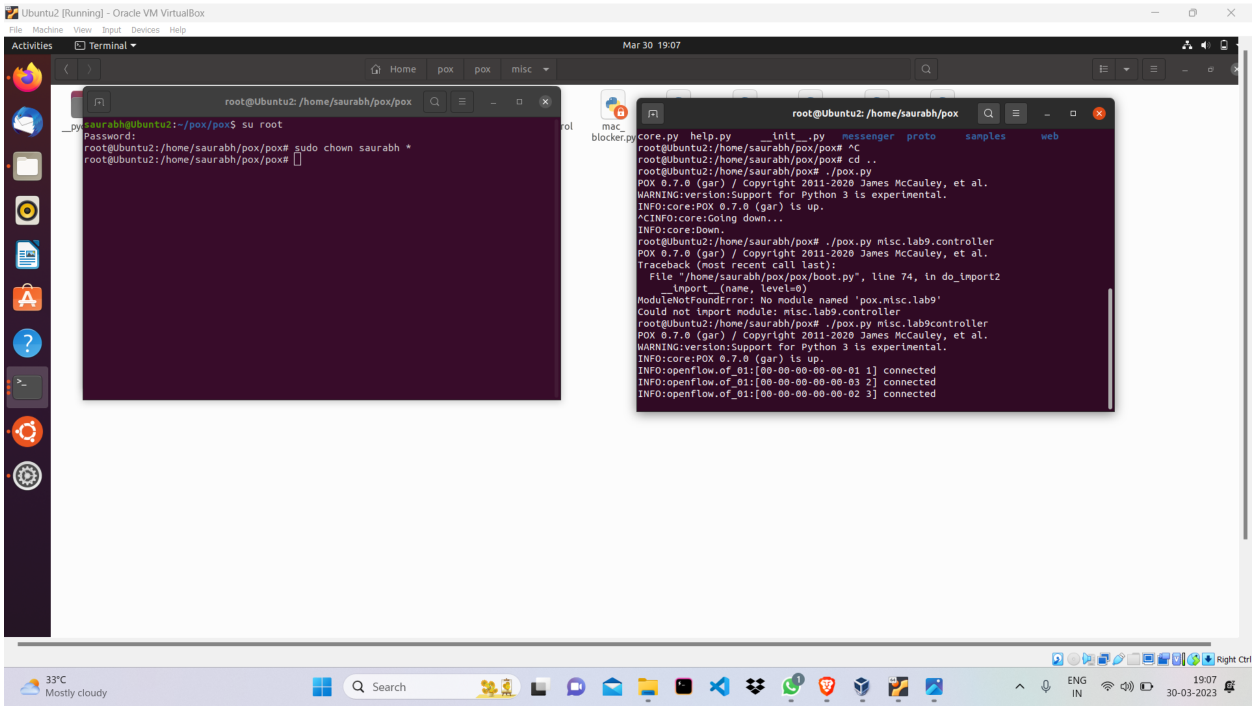
Assignment-9 21BCS138

QUESTION

To test your controller, first start the controller, then start the mininet script. When you are

prompted with the mininet CLI, run the following commands and take a screenshot of each: pingall : This should fail, since ICMP traffic should be blocked. dpctl dump-flows : This should show a few entries. These are the entries that you installed into the switch with of_flow_mod. You'll need to do this within the timeout you specified in your of_flow_mod for the entries to show up! iperf : This should succeed. Additionally, you must submit your firewall code. It should be named lab9controller.py.

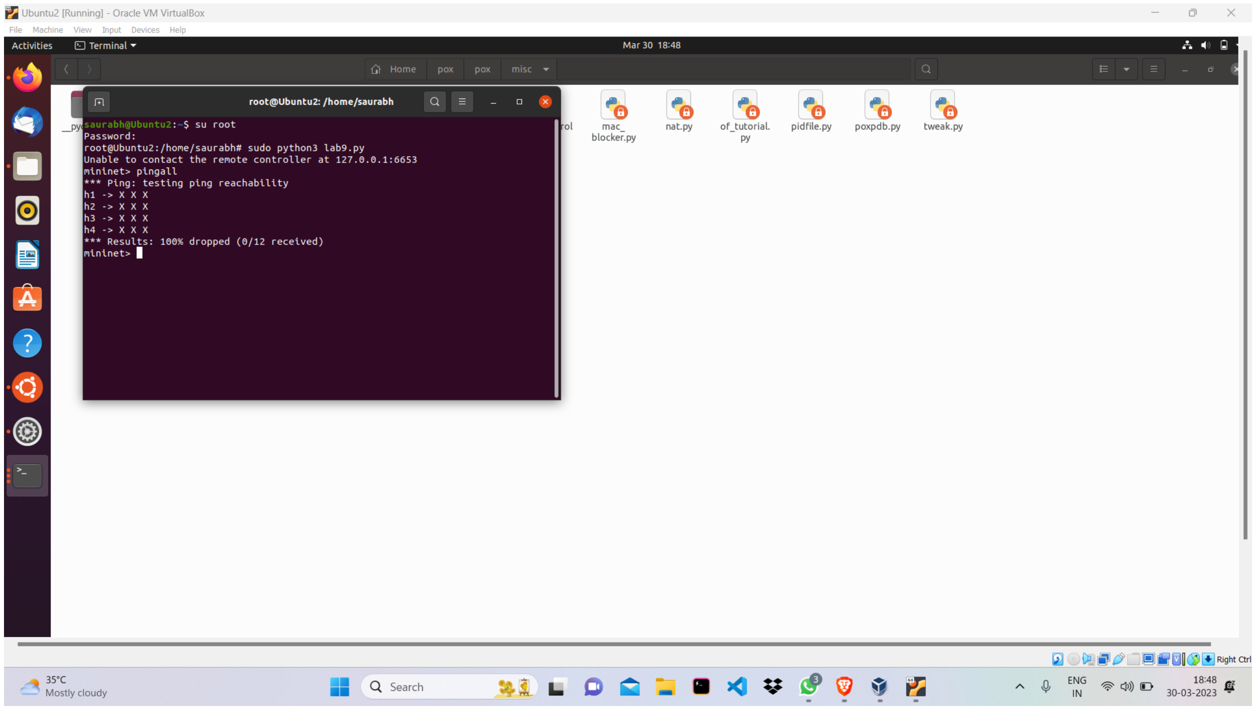
RUNNING LAB9CONTROLLER.PY


Ubuntu2 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Activities
Terminal
Mar 30 19:07
Home
pox
pox
misc
root@Ubuntu2: /home/saurabh/pox/pox
root@Ubuntu2: /home/saurabh/pox
mac_
blocker.py
33°C
Mostly cloudy
Search
ENG
IN
19:07
30-03-2023
Right Ctrl

```
saurabh@Ubuntu2:~/pox/pox$ su root
Password:
root@Ubuntu2:/home/saurabh/pox/pox# sudo chown saurabh *
root@Ubuntu2:/home/saurabh/pox/pox# 
```

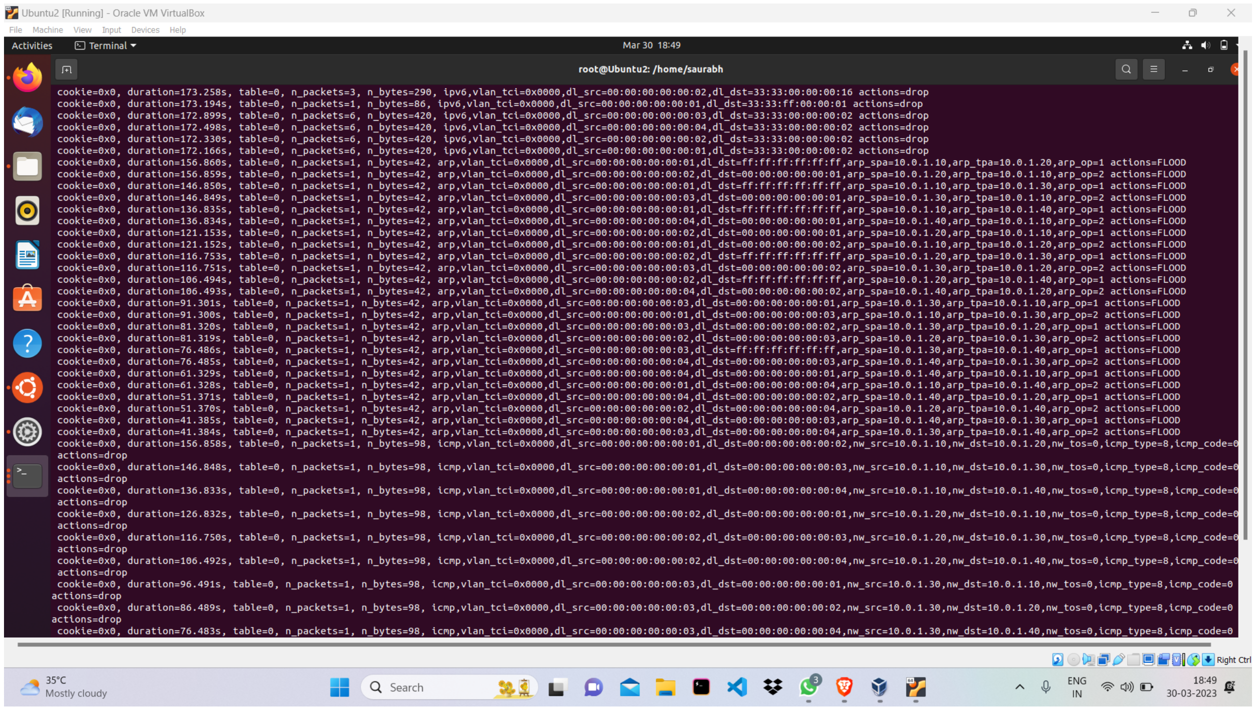
```
core.py  help.py     __init__.py   messenger  proto     samples      web
root@Ubuntu2:/home/saurabh/pox/pox# ^C
root@Ubuntu2:/home/saurabh/pox/pox# cd ..
root@Ubuntu2:/home/saurabh/pox# ./pox.py
POX 0.7.0 (gar) / Copyright 2011-2020 James McCauley, et al.
WARNING:version:Support for Python 3 is experimental.
INFO:core:POX 0.7.0 (gar) is up.
^CINFO:core:Going down...
INFO:core:Down.
root@Ubuntu2:/home/saurabh/pox# ./pox.py misc.lab9.controller
POX 0.7.0 (gar) / Copyright 2011-2020 James McCauley, et al.
Traceback (most recent call last):
  File "/home/saurabh/pox/pox/boot.py", line 74, in do_import2
    __import__(name, level=0)
ModuleNotFoundError: No module named 'pox.misc.lab9'
Could not import module: misc.lab9.controller
root@Ubuntu2:/home/saurabh/pox# ./pox.py misc.lab9controller
POX 0.7.0 (gar) / Copyright 2011-2020 James McCauley, et al.
WARNING:version:Support for Python 3 is experimental.
INFO:core:POX 0.7.0 (gar) is up.
INFO:openflow.of_01:[00-00-00-00-00-01 1] connected
INFO:openflow.of_01:[00-00-00-00-00-03 2] connected
INFO:openflow.of_01:[00-00-00-00-00-02 3] connected
```

Running lab.9and running Pingall



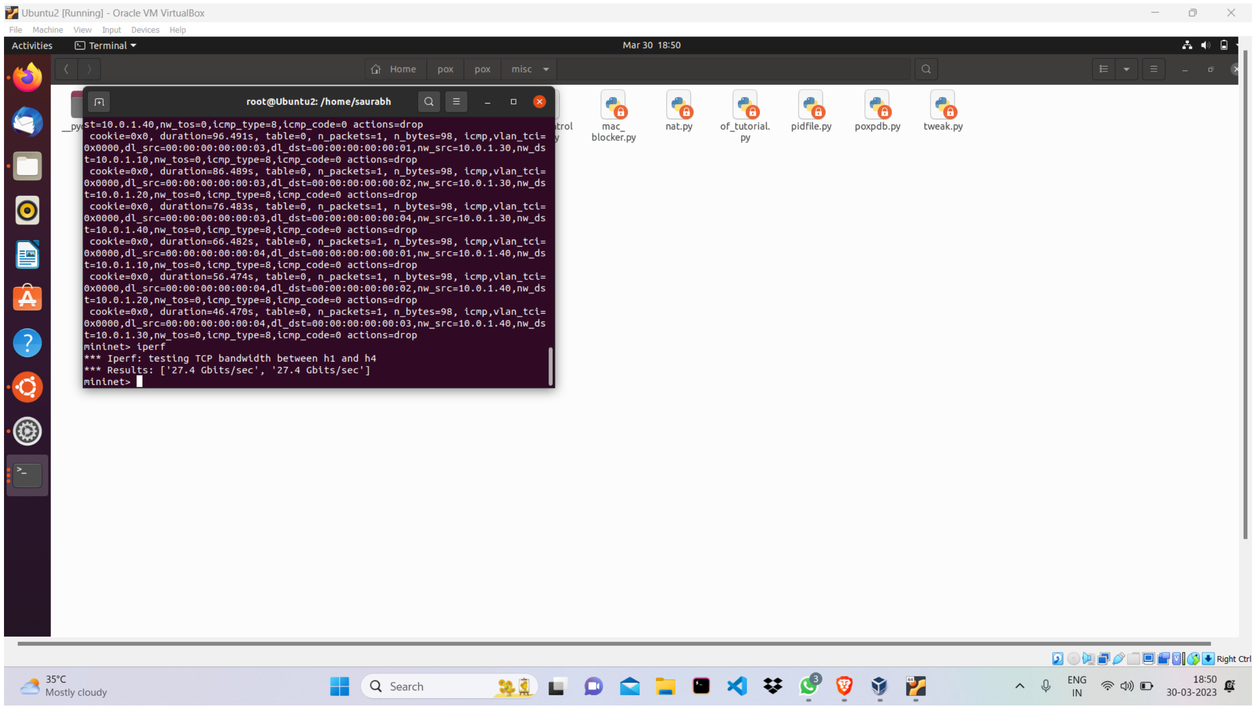
```
saurabh@Ubuntu2:~$ su root
Password:
root@Ubuntu2:/home/saurabh# sudo python3 lab9.py
Unable to contact the remote controller at 127.0.0.1:6653
mininet> pingall
*** Ping: testing ping reachability
h1 -> X X X
h2 -> X X X
h3 -> X X X
h4 -> X X X
*** Results: 100% dropped (0/12 received)
mininet> 
```

RUNNING DPCTL DUMP FLOWs



```
 cookie=0x0, duration=173.258s, table=0, n_packets=3, n_bytes=290, ipv6,vlan_tci=0x0000,dl_src=00:00:00:00:00:02,dl_dst=33:33:00:00:00:16 actions=drop
 cookie=0x0, duration=173.194s, table=0, n_packets=1, n_bytes=86, ipv6,vlan_tci=0x0000,dl_src=00:00:00:00:00:01,dl_dst=33:33:ff:00:00:01 actions=drop
 cookie=0x0, duration=172.899s, table=0, n_packets=6, n_bytes=420, ipv6,vlan_tci=0x0000,dl_src=00:00:00:00:00:03,dl_dst=33:33:00:00:00:02 actions=drop
 cookie=0x0, duration=172.498s, table=0, n_packets=6, n_bytes=420, ipv6,vlan_tci=0x0000,dl_src=00:00:00:00:00:04,dl_dst=33:33:00:00:00:02 actions=drop
 cookie=0x0, duration=172.330s, table=0, n_packets=6, n_bytes=420, ipv6,vlan_tci=0x0000,dl_src=00:00:00:00:00:02,dl_dst=33:33:00:00:00:02 actions=drop
 cookie=0x0, duration=172.166s, table=0, n_packets=6, n_bytes=420, ipv6,vlan_tci=0x0000,dl_src=00:00:00:00:00:01,dl_dst=33:33:00:00:00:02 actions=drop
 cookie=0x0, duration=156.860s, table=0, n_packets=1, n_bytes=42, arp,vlan_tci=0x0000,dl_src=00:00:00:00:00:01,dl_dst=ff:ff:ff:ff:ff:ff,arp_spa=10.0.1.10,arp_tpa=10.0.1.20,arp_op=1 actions=FLOOD
 cookie=0x0, duration=156.859s, table=0, n_packets=1, n_bytes=42, arp,vlan_tci=0x0000,dl_src=00:00:00:00:00:02,dl_dst=00:00:00:00:00:01,arp_spa=10.0.1.20,arp_tpa=10.0.1.10,arp_op=2 actions=FLOOD
 cookie=0x0, duration=146.850s, table=0, n_packets=1, n_bytes=42, arp,vlan_tci=0x0000,dl_src=00:00:00:00:00:01,dl_dst=ff:ff:ff:ff:ff:ff,arp_spa=10.0.1.10,arp_tpa=10.0.1.30,arp_op=1 actions=FLOOD
 cookie=0x0, duration=146.849s, table=0, n_packets=1, n_bytes=42, arp,vlan_tci=0x0000,dl_src=00:00:00:00:00:03,dl_dst=00:00:00:00:00:01,arp_spa=10.0.1.30,arp_tpa=10.0.1.10,arp_op=2 actions=FLOOD
 cookie=0x0, duration=136.835s, table=0, n_packets=1, n_bytes=42, arp,vlan_tci=0x0000,dl_src=00:00:00:00:00:01,dl_dst=ff:ff:ff:ff:ff:ff,arp_spa=10.0.1.10,arp_tpa=10.0.1.40,arp_op=1 actions=FLOOD
 cookie=0x0, duration=136.834s, table=0, n_packets=1, n_bytes=42, arp,vlan_tci=0x0000,dl_src=00:00:00:00:00:04,dl_dst=00:00:00:00:00:01,arp_spa=10.0.1.40,arp_tpa=10.0.1.10,arp_op=2 actions=FLOOD
 cookie=0x0, duration=121.153s, table=0, n_packets=1, n_bytes=42, arp,vlan_tci=0x0000,dl_src=00:00:00:00:00:02,dl_dst=00:00:00:00:00:01,arp_spa=10.0.1.20,arp_tpa=10.0.1.10,arp_op=1 actions=FLOOD
 cookie=0x0, duration=121.152s, table=0, n_packets=1, n_bytes=42, arp,vlan_tci=0x0000,dl_src=00:00:00:00:00:01,dl_dst=00:00:00:00:00:02,arp_spa=10.0.1.10,arp_tpa=10.0.1.20,arp_op=2 actions=FLOOD
 cookie=0x0, duration=116.753s, table=0, n_packets=1, n_bytes=42, arp,vlan_tci=0x0000,dl_src=00:00:00:00:00:02,dl_dst=ff:ff:ff:ff:ff:ff,arp_spa=10.0.1.20,arp_tpa=10.0.1.30,arp_op=1 actions=FLOOD
 cookie=0x0, duration=116.751s, table=0, n_packets=1, n_bytes=42, arp,vlan_tci=0x0000,dl_src=00:00:00:00:00:03,dl_dst=00:00:00:00:00:02,arp_spa=10.0.1.30,arp_tpa=10.0.1.20,arp_op=2 actions=FLOOD
 cookie=0x0, duration=106.494s, table=0, n_packets=1, n_bytes=42, arp,vlan_tci=0x0000,dl_src=00:00:00:00:00:02,dl_dst=ff:ff:ff:ff:ff:ff,arp_spa=10.0.1.20,arp_tpa=10.0.1.40,arp_op=1 actions=FLOOD
 cookie=0x0, duration=106.493s, table=0, n_packets=1, n_bytes=42, arp,vlan_tci=0x0000,dl_src=00:00:00:00:00:04,dl_dst=00:00:00:00:00:02,arp_spa=10.0.1.40,arp_tpa=10.0.1.20,arp_op=2 actions=FLOOD
 cookie=0x0, duration=91.301s, table=0, n_packets=1, n_bytes=42, arp,vlan_tci=0x0000,dl_src=00:00:00:00:00:03,dl_dst=00:00:00:00:00:01,arp_spa=10.0.1.30,arp_tpa=10.0.1.10,arp_op=1 actions=FLOOD
 cookie=0x0, duration=91.300s, table=0, n_packets=1, n_bytes=42, arp,vlan_tci=0x0000,dl_src=00:00:00:00:00:01,dl_dst=00:00:00:00:00:03,arp_spa=10.0.1.10,arp_tpa=10.0.1.30,arp_op=2 actions=FLOOD
 cookie=0x0, duration=81.320s, table=0, n_packets=1, n_bytes=42, arp,vlan_tci=0x0000,dl_src=00:00:00:00:00:03,dl_dst=00:00:00:00:00:02,arp_spa=10.0.1.30,arp_tpa=10.0.1.20,arp_op=1 actions=FLOOD
 cookie=0x0, duration=81.319s, table=0, n_packets=1, n_bytes=42, arp,vlan_tci=0x0000,dl_src=00:00:00:00:00:02,dl_dst=00:00:00:00:00:03,arp_spa=10.0.1.20,arp_tpa=10.0.1.30,arp_op=2 actions=FLOOD
 cookie=0x0, duration=76.486s, table=0, n_packets=1, n_bytes=42, arp,vlan_tci=0x0000,dl_src=00:00:00:00:00:03,dl_dst=ff:ff:ff:ff:ff:ff,arp_spa=10.0.1.30,arp_tpa=10.0.1.40,arp_op=1 actions=FLOOD
 cookie=0x0, duration=76.485s, table=0, n_packets=1, n_bytes=42, arp,vlan_tci=0x0000,dl_src=00:00:00:00:00:04,dl_dst=00:00:00:00:00:03,arp_spa=10.0.1.40,arp_tpa=10.0.1.30,arp_op=2 actions=FLOOD
 cookie=0x0, duration=61.329s, table=0, n_packets=1, n_bytes=42, arp,vlan_tci=0x0000,dl_src=00:00:00:00:00:04,dl_dst=00:00:00:00:00:01,arp_spa=10.0.1.40,arp_tpa=10.0.1.10,arp_op=1 actions=FLOOD
 cookie=0x0, duration=61.328s, table=0, n_packets=1, n_bytes=42, arp,vlan_tci=0x0000,dl_src=00:00:00:00:00:01,dl_dst=00:00:00:00:00:04,arp_spa=10.0.1.10,arp_tpa=10.0.1.40,arp_op=2 actions=FLOOD
 cookie=0x0, duration=51.371s, table=0, n_packets=1, n_bytes=42, arp,vlan_tci=0x0000,dl_src=00:00:00:00:00:04,dl_dst=00:00:00:00:00:02,arp_spa=10.0.1.40,arp_tpa=10.0.1.20,arp_op=1 actions=FLOOD
 cookie=0x0, duration=51.370s, table=0, n_packets=1, n_bytes=42, arp,vlan_tci=0x0000,dl_src=00:00:00:00:00:02,dl_dst=00:00:00:00:00:04,arp_spa=10.0.1.20,arp_tpa=10.0.1.40,arp_op=2 actions=FLOOD
 cookie=0x0, duration=41.385s, table=0, n_packets=1, n_bytes=42, arp,vlan_tci=0x0000,dl_src=00:00:00:00:00:04,dl_dst=00:00:00:00:00:03,arp_spa=10.0.1.40,arp_tpa=10.0.1.30,arp_op=1 actions=FLOOD
 cookie=0x0, duration=41.384s, table=0, n_packets=1, n_bytes=42, arp,vlan_tci=0x0000,dl_src=00:00:00:00:00:03,dl_dst=00:00:00:00:00:04,arp_spa=10.0.1.30,arp_tpa=10.0.1.40,arp_op=2 actions=FLOOD
 cookie=0x0, duration=156.858s, table=0, n_packets=1, n_bytes=98, icmp,vlan_tci=0x0000,dl_src=00:00:00:00:00:01,dl_dst=00:00:00:00:00:02,nw_src=10.0.1.10,nw_dst=10.0.1.20,nw_tos=0,icmp_type=8,icmp_code=0
 actions=drop
 cookie=0x0, duration=146.848s, table=0, n_packets=1, n_bytes=98, icmp,vlan_tci=0x0000,dl_src=00:00:00:00:00:01,dl_dst=00:00:00:00:00:03,nw_src=10.0.1.10,nw_dst=10.0.1.30,nw_tos=0,icmp_type=8,icmp_code=0
 actions=drop
 cookie=0x0, duration=136.833s, table=0, n_packets=1, n_bytes=98, icmp,vlan_tci=0x0000,dl_src=00:00:00:00:00:01,dl_dst=00:00:00:00:00:04,nw_src=10.0.1.10,nw_dst=10.0.1.40,nw_tos=0,icmp_type=8,icmp_code=0
 actions=drop
 cookie=0x0, duration=126.832s, table=0, n_packets=1, n_bytes=98, icmp,vlan_tci=0x0000,dl_src=00:00:00:00:00:02,dl_dst=00:00:00:00:00:01,nw_src=10.0.1.20,nw_dst=10.0.1.10,nw_tos=0,icmp_type=8,icmp_code=0
 actions=drop
 cookie=0x0, duration=116.750s, table=0, n_packets=1, n_bytes=98, icmp,vlan_tci=0x0000,dl_src=00:00:00:00:00:02,dl_dst=00:00:00:00:00:03,nw_src=10.0.1.20,nw_dst=10.0.1.30,nw_tos=0,icmp_type=8,icmp_code=0
 actions=drop
 cookie=0x0, duration=106.492s, table=0, n_packets=1, n_bytes=98, icmp,vlan_tci=0x0000,dl_src=00:00:00:00:00:02,dl_dst=00:00:00:00:00:04,nw_src=10.0.1.20,nw_dst=10.0.1.40,nw_tos=0,icmp_type=8,icmp_code=0
 actions=drop
 cookie=0x0, duration=96.491s, table=0, n_packets=1, n_bytes=98, icmp,vlan_tci=0x0000,dl_src=00:00:00:00:00:03,dl_dst=00:00:00:00:00:01,nw_src=10.0.1.30,nw_dst=10.0.1.10,nw_tos=0,icmp_type=8,icmp_code=0
actions=drop
 cookie=0x0, duration=86.489s, table=0, n_packets=1, n_bytes=98, icmp,vlan_tci=0x0000,dl_src=00:00:00:00:00:03,dl_dst=00:00:00:00:00:02,nw_src=10.0.1.30,nw_dst=10.0.1.20,nw_tos=0,icmp_type=8,icmp_code=0
actions=drop
 cookie=0x0, duration=76.483s, table=0, n_packets=1, n_bytes=98, icmp,vlan_tci=0x0000,dl_src=00:00:00:00:00:03,dl_dst=00:00:00:00:00:04,nw_src=10.0.1.30,nw_dst=10.0.1.40,nw_tos=0,icmp_type=8,icmp_code=0
```

RUNNING IPERF



```
st=10.0.1.40,nw_tos=0,icmp_type=8,icmp_code=0 actions=drop
 cookie=0x0, duration=96.491s, table=0, n_packets=1, n_bytes=98, icmp,vlan_tci=
0x0000,dl_src=00:00:00:00:00:03,dl_dst=00:00:00:00:00:01,nw_src=10.0.1.30,nw_ds
t=10.0.1.10,nw_tos=0,icmp_type=8,icmp_code=0 actions=drop
 cookie=0x0, duration=86.489s, table=0, n_packets=1, n_bytes=98, icmp,vlan_tci=
0x0000,dl_src=00:00:00:00:00:03,dl_dst=00:00:00:00:00:02,nw_src=10.0.1.30,nw_ds
t=10.0.1.20,nw_tos=0,icmp_type=8,icmp_code=0 actions=drop
 cookie=0x0, duration=76.483s, table=0, n_packets=1, n_bytes=98, icmp,vlan_tci=
0x0000,dl_src=00:00:00:00:00:03,dl_dst=00:00:00:00:00:04,nw_src=10.0.1.30,nw_ds
t=10.0.1.40,nw_tos=0,icmp_type=8,icmp_code=0 actions=drop
 cookie=0x0, duration=66.482s, table=0, n_packets=1, n_bytes=98, icmp,vlan_tci=
0x0000,dl_src=00:00:00:00:00:04,dl_dst=00:00:00:00:00:01,nw_src=10.0.1.40,nw_ds
t=10.0.1.10,nw_tos=0,icmp_type=8,icmp_code=0 actions=drop
 cookie=0x0, duration=56.474s, table=0, n_packets=1, n_bytes=98, icmp,vlan_tci=
0x0000,dl_src=00:00:00:00:00:04,dl_dst=00:00:00:00:00:02,nw_src=10.0.1.40,nw_ds
t=10.0.1.20,nw_tos=0,icmp_type=8,icmp_code=0 actions=drop
 cookie=0x0, duration=46.470s, table=0, n_packets=1, n_bytes=98, icmp,vlan_tci=
0x0000,dl_src=00:00:00:00:00:04,dl_dst=00:00:00:00:00:03,nw_src=10.0.1.40,nw_ds
t=10.0.1.30,nw_tos=0,icmp_type=8,icmp_code=0 actions=drop
mininet> iperf
*** Iperf: testing TCP bandwidth between h1 and h4
*** Results: ['27.4 Gbits/sec', '27.4 Gbits/sec']
mininet> 
```

Final result
(27.4 GBits?sec, 27.4 Gbits/sec
Code -# Lab 9 Skeleton

```python
#


from pox.core import core
import pox.openflow.libopenflow_01 as of

log = core.getLogger()

class Firewall (object):
  """
  A Firewall object is created for each switch that connects.
  A Connection object for that switch is passed to the __init__ function.
  """
  def __init__ (self, connection):
    # Keep track of the connection to the switch so that we can
    # send it messages!
    self.connection = connection

    # This binds our PacketIn event listener
    connection.addListeners(self)
  def do_firewall (self, packet, packet_in):
    msg = of.ofp_flow_mod()
    msg.match = of.ofp_match.from_packet(packet)
    msg.data = packet_in


    if((packet.find('tcp')is not None)or(packet.find('arp')is not None)):
        msg.actions.append(of.ofp_action_output(port = of.OFPP_FLOOD))
        self.connection.send(msg)
    else:
        self.connection.send(msg)

  def _handle_PacketIn (self, event):
    """
    Handles packet in messages from the switch.
    """

    packet = event.parsed # This is the parsed packet data.
    if not packet.parsed:
      log.warning("Ignoring incomplete packet")
      return

    packet_in = event.ofp # The actual ofp_packet_in message.
    self.do_firewall(packet, packet_in)

def launch ():
  """
  Starts the component
  """
  def start_switch (event):
    log.debug("Controlling %s" % (event.connection,))
    Firewall(event.connection)
  core.openflow.addListenerByName("ConnectionUp", start_switch)
```