

**Topology code:**

```
from mininet.net import Mininet
from mininet.node import Controller, OVSController
from mininet.cli import CLI
from mininet.link import TCLink
from mininet.log import setLogLevel, info

net = Mininet()
h1 = net.addHost( 'h1' )
h2 = net.addHost( 'h2' )
h3 = net.addHost( 'h3' )
h4 = net.addHost( 'h4' )
s1 = net.addSwitch( 's1' )
s2 = net.addSwitch( 's2' )
net.addLink( h1, s1, bw=10, delay='10ms' )
net.addLink( h2, s1, bw=10, delay='10ms' )
net.addLink( h3, s2, bw=10, delay='10ms' )
net.addLink( h4, s2, bw=10, delay='10ms' )

net.addLink( s1, s2, bw=20, delay='10ms' )
net.start()
CLI( net )
net.stop()
```

**Server Code:**

```
import socket

HOST = '10.0.0.1'
PORT = 5000

with socket.socket(socket.AF_INET, socket.SOCK_STREAM) as s:
    s.bind((HOST, PORT))
    s.listen()
    conn, addr = s.accept()
    with conn:
        while True:
            data = conn.recv(1024).decode()
            print(f"[MESSAGE]: {data}")
            message = input("Type a message: ")
            conn.sendall(message.encode())
```

## Client Code:

```
import socket

HOST = '10.0.0.1'
PORT = 5000

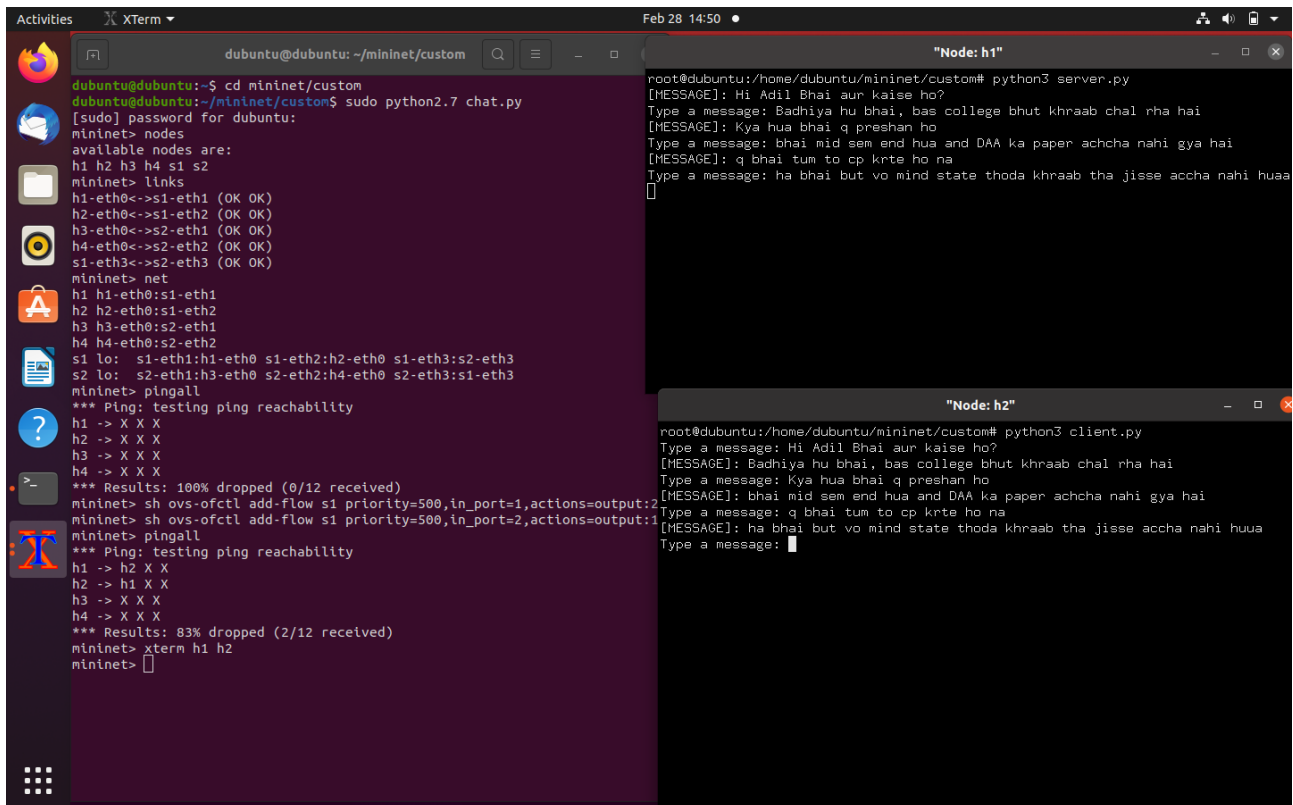
with socket.socket(socket.AF_INET, socket.SOCK_STREAM) as s:
    s.connect((HOST, PORT))
    while True:
        message = input("Type a message: ")
        s.sendall(message.encode())
        data = s.recv(1024).decode()
        print(f"[MESSAGE]: {data}")
```

## OpenFlow creation and running:

```
dubuntu@dubuntu:~/mininet/custom$ sudo python2.7 chat.py
[sudo] password for dubuntu:
mininet> nodes
available nodes are:
h1 h2 h3 h4 s1 s2
mininet> links
h1-eth0<->s1-eth1 (OK OK)
h2-eth0<->s1-eth2 (OK OK)
h3-eth0<->s2-eth1 (OK OK)
h4-eth0<->s2-eth2 (OK OK)
s1-eth3<->s2-eth3 (OK OK)
mininet> net
h1 h1-eth0:s1-eth1
h2 h2-eth0:s1-eth2
h3 h3-eth0:s2-eth1
h4 h4-eth0:s2-eth2
s1 lo: s1-eth1:h1-eth0 s1-eth2:h2-eth0 s1-eth3:s2-eth3
s2 lo: s2-eth1:h3-eth0 s2-eth2:h4-eth0 s2-eth3:s1-eth3
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> sh ovs-ofctl add-flow s1 priority=500,in_port=1,actions=output:2
mininet> sh ovs-ofctl add-flow s1 priority=500,in_port=2,actions=output:1
mininet> pingall
*** Ping: testing ping reachability
h1 -> h2 X X
h2 -> h1 X X
```

```
h3 -> X X X
h4 -> X X X
*** Results: 83% dropped (2/12 received)
mininet> xterm h1 h2
mininet>
```

Screenshot:



```
dubuntu@dubuntu: ~/mininet/custom
dubuntu@dubuntu:~/mininet/custom$ sudo python2.7 chat.py
[sudo] password for dubuntu:
mininet> nodes
available nodes are:
h1 h2 h3 h4 s1 s2
mininet> links
h1-eth0<->s1-eth1 (OK OK)
h2-eth0<->s1-eth2 (OK OK)
h3-eth0<->s2-eth1 (OK OK)
h4-eth0<->s2-eth2 (OK OK)
s1-eth3<->s2-eth3 (OK OK)
mininet> net
h1 h1-eth0:s1-eth1
h2 h2-eth0:s1-eth2
h3 h3-eth0:s2-eth1
h4 h4-eth0:s2-eth2
s1 lo: s1-eth1:h1-eth0 s1-eth2:h2-eth0 s1-eth3:s2-eth3
s2 lo: s2-eth1:h3-eth0 s2-eth2:h4-eth0 s2-eth3:s1-eth3
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> sh ovs-ofctl add-flow s1 priority=500,in_port=1,actions=output:2
mininet> sh ovs-ofctl add-flow s1 priority=500,in_port=2,actions=output:1
mininet> pingall
*** Ping: testing ping reachability
h1 -> h2 X X
h2 -> h1 X X
h3 -> X X X
h4 -> X X X
*** Results: 83% dropped (2/12 received)
mininet> xterm h1 h2
mininet>
```

```
root@dubuntu:/home/dubuntu/mininet/custom# python3 server.py
[MESSAGE]: Hi Adil Bhai aur kaise ho?
Type a message: Badhiya hu bhai, bas college bhut khraab chal rha hai
[MESSAGE]: Kya hua bhai q preshan ho
Type a message: bhai mid sem end hua and DAA ka paper achcha nahi gya hai
[MESSAGE]: q bhai tum to cp krte ho na
Type a message: ha bhai but vo mind state thoda khraab tha jisse accha nahi huua
[]

root@dubuntu:/home/dubuntu/mininet/custom# python3 client.py
Type a message: Hi Adil Bhai aur kaise ho?
[MESSAGE]: Badhiya hu bhai, bas college bhut khraab chal rha hai
Type a message: Kya hua bhai q preshan ho
[MESSAGE]: bhai mid sem end hua and DAA ka paper achcha nahi gya hai
Type a message: q bhai tum to cp krte ho na
[MESSAGE]: ha bhai but vo mind state thoda khraab tha jisse accha nahi huua
Type a message: []
```