

Practical 10

Title:

Create TCP server and client using mininet hosts and plot the speed graph.

Learning:

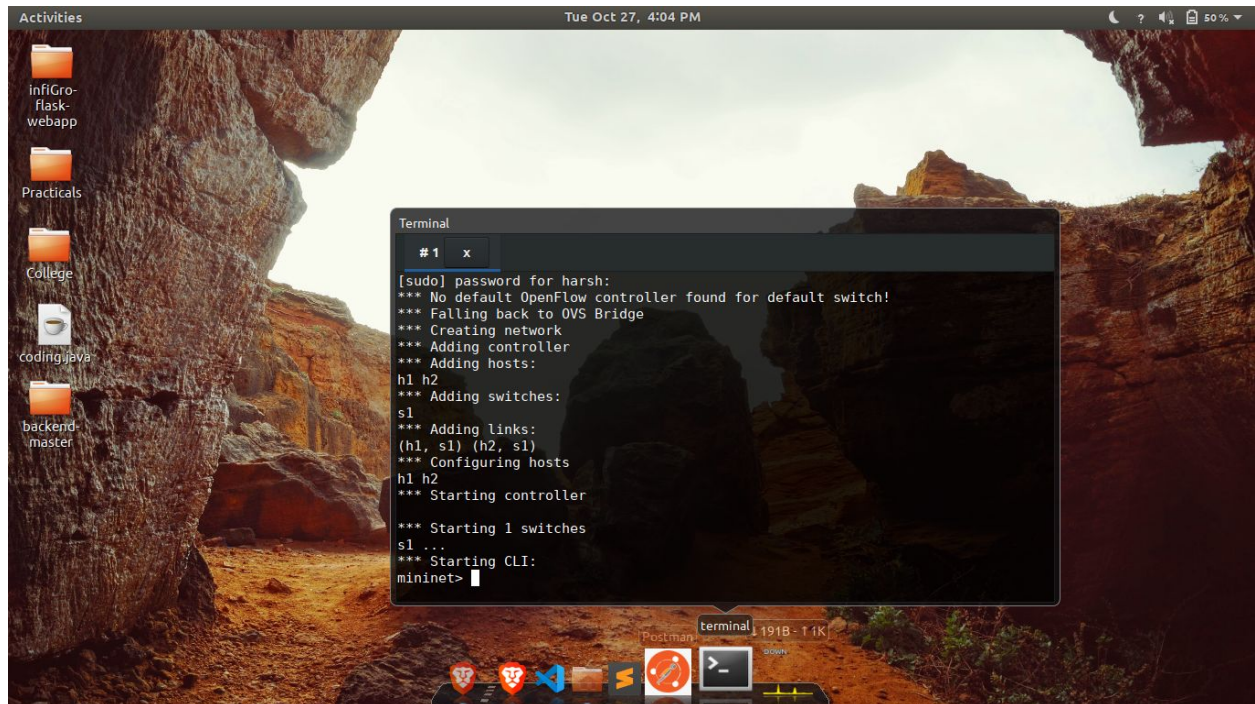
Open the terminal and run the mininet command:

```
$ sudo mn
```

Then your terminal will be mininet terminal. Now see all the switches, controllers and hosts on mininet.

```
mininet> nodes
```

Your output terminal would be:



Then start the xterm terminal for hosts h1 and h2 by running the following command:

```
mininet> xterm h1 h2
```

Now we will start a TCP server on host h2 and h1 will be the client sending the requests. To start the server on host h2, run the following command:

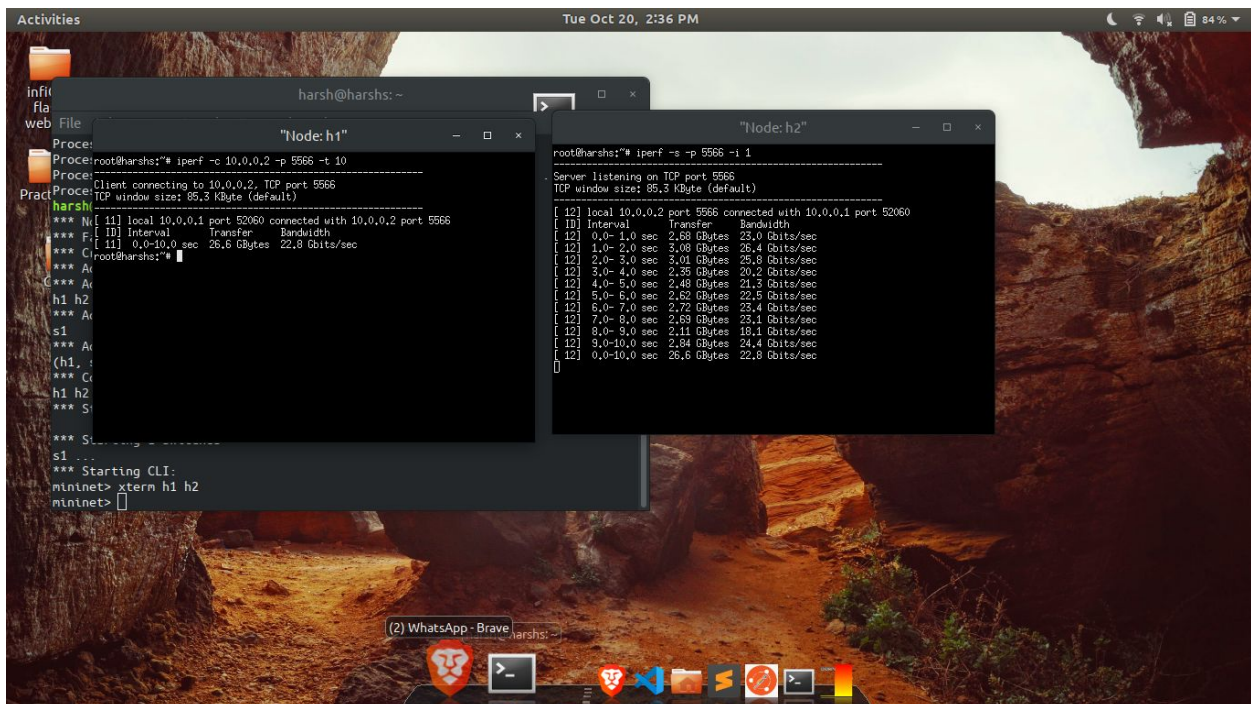
h2:

```
$ iperf -s -p 5566 -i 1
```

h1:

```
$ iperf -c 10.0.0.2 -p 5566 -t 15
```

This will create a TCP server and client on hosts h2 and h1 respectively and the output will be:



```
Activities Tue Oct 20, 2:36 PM
Node: h1
root@harshs:~# iperf -c 10.0.0.2 -p 5566 -t 10
Client connecting to 10.0.0.2, TCP port 5566
TCP window size: 85.3 KByte (default)
*** N: [11] local 10.0.0.1 port 52060 connected with 10.0.0.2 port 5566
*** F: [11] 0.0-10.0 sec 26.6 GBytes 22.8 Gbits/sec
*** C: root@harshs:~#

Node: h2
root@harshs:~# iperf -s -p 5566 -i 1
Server listening on TCP port 5566
TCP window size: 85.3 KByte (default)
[12] local 10.0.0.2 port 5566 connected with 10.0.0.1 port 52060
[12] Interval Transfer Bandwidth
[12] 0.0- 1.0 sec 2.68 GBytes 23.0 Gbits/sec
[12] 1.0- 2.0 sec 3.08 GBytes 26.4 Gbits/sec
[12] 2.0- 3.0 sec 3.01 GBytes 25.8 Gbits/sec
[12] 3.0- 4.0 sec 2.35 GBytes 20.2 Gbits/sec
[12] 4.0- 5.0 sec 2.48 GBytes 21.3 Gbits/sec
[12] 5.0- 6.0 sec 2.62 GBytes 22.5 Gbits/sec
[12] 6.0- 7.0 sec 2.72 GBytes 23.4 Gbits/sec
[12] 7.0- 8.0 sec 2.69 GBytes 23.1 Gbits/sec
[12] 8.0- 9.0 sec 2.11 GBytes 18.1 Gbits/sec
[12] 9.0-10.0 sec 2.84 GBytes 24.4 Gbits/sec
[12] 0.0-10.0 sec 26.6 GBytes 22.8 Gbits/sec
```

We will perform the above process again but this time we will store the output in “result” file using the command:

h2:

```
$ iperf -s -p 5566 -i 1 > result
```

h1:

```
$ iperf -c 10.0.0.2 -p 5566 -t 15
```

Then we will print the output in the terminal

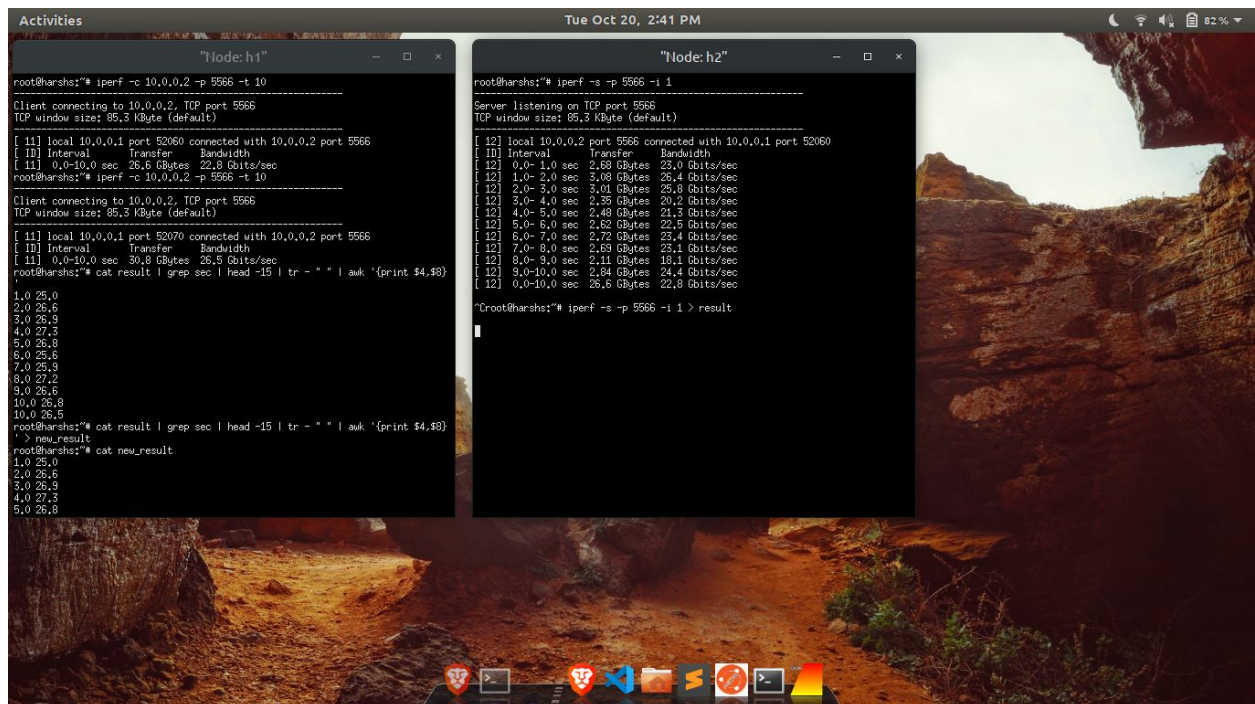
h2:

```
$ cat result | grep sec | head -15 | tr - " " | awk '{print $4,$8}'
```

This will show the result file with time and bandwidth at that time.
Now we will store this in “new_result” file.

h2:

```
$ cat result | grep sec | head -15 | tr - " " | awk '{print $4,$8}' > new_result
```



```
Activities
Tue Oct 20, 2:41 PM
82%

"Node: h1"
root@harshs:~# iperf -c 10.0.0.2 -p 5566 -t 10
Client connecting to 10.0.0.2, TCP port 5566
TCP window size: 85.3 KByte (default)
[ 11] local 10.0.0.1 port 52060 connected with 10.0.0.2 port 5566
[ ID] Interval      Transfer    Bandwidth
[ 11] 0.0-10.0 sec  26.6 GBytes  22.8 Gbits/sec
root@harshs:~# iperf -c 10.0.0.2 -p 5566 -t 10
Client connecting to 10.0.0.2, TCP port 5566
TCP window size: 85.3 KByte (default)
[ 11] local 10.0.0.1 port 52070 connected with 10.0.0.2 port 5566
[ ID] Interval      Transfer    Bandwidth
[ 11] 0.0-10.0 sec  30.8 GBytes  26.5 Gbits/sec
root@harshs:~# cat result | grep sec | head -15 | tr - " " | awk '{print $4,$8}'
1.0 25.0
2.0 26.6
3.0 26.9
4.0 27.3
5.0 26.8
6.0 25.6
7.0 25.9
8.0 27.2
9.0 26.6
10.0 26.8
10.0 26.5
root@harshs:~# cat result | grep sec | head -15 | tr - " " | awk '{print $4,$8}' > new_result
root@harshs:~# cat new_result
1.0 25.0
2.0 26.6
3.0 26.9
4.0 27.3
5.0 26.8

"Node: h2"
root@harshs:~# iperf -s -p 5566 -i 1
Server listening on TCP port 5566
TCP window size: 85.3 KByte (default)
[ 12] local 10.0.0.2 port 5566 connected with 10.0.0.1 port 52060
[ ID] Interval      Transfer    Bandwidth
[ 12] 0.0- 1.0 sec  2.68 GBytes  23.0 Gbits/sec
[ 12] 1.0- 2.0 sec  3.08 GBytes  26.4 Gbits/sec
[ 12] 2.0- 3.0 sec  3.01 GBytes  25.8 Gbits/sec
[ 12] 3.0- 4.0 sec  2.35 GBytes  20.2 Gbits/sec
[ 12] 4.0- 5.0 sec  2.48 GBytes  21.3 Gbits/sec
[ 12] 5.0- 6.0 sec  2.62 GBytes  22.5 Gbits/sec
[ 12] 6.0- 7.0 sec  2.72 GBytes  23.4 Gbits/sec
[ 12] 7.0- 8.0 sec  2.69 GBytes  23.1 Gbits/sec
[ 12] 8.0- 9.0 sec  2.11 GBytes  18.1 Gbits/sec
[ 12] 9.0-10.0 sec  2.94 GBytes  24.4 Gbits/sec
[ 12] 0.0-10.0 sec  26.6 GBytes  22.8 Gbits/sec
root@harshs:~# iperf -s -p 5566 -i 1 > result
```


Then we will run the command Gnuplot (ensure that Gnuplot is installed (sudo apt-get install gnuplot)).

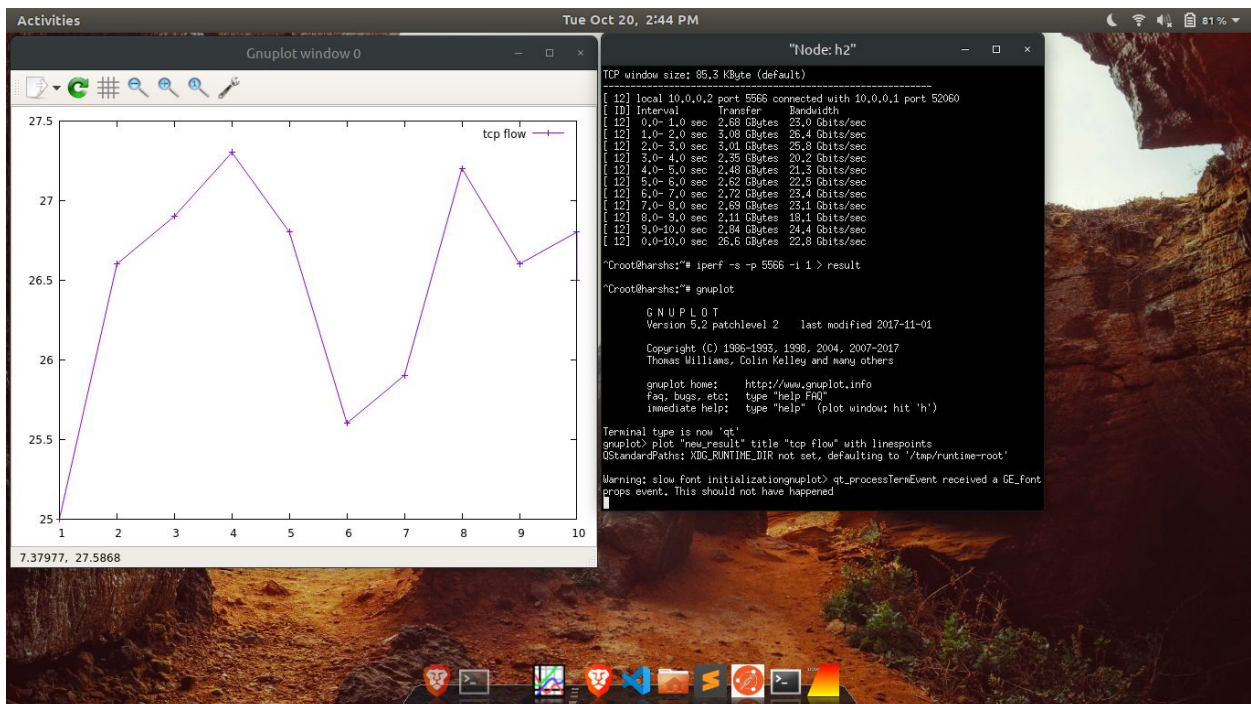
h2:

```
$ gnuplot
```

Now our terminal will be gnuplot terminal. Now we will first set the terminal to xterm and the plot the time vs bandwidth graph.

```
gnuplot> set terminal xterm
gnuplot> plot "new_result" title "tcp flow" with linespoints
```

The output would be like:



Conclusion:

We have learnt to create a local server and client and ping them using mininet. We also observed the time vs bandwidth trends.