

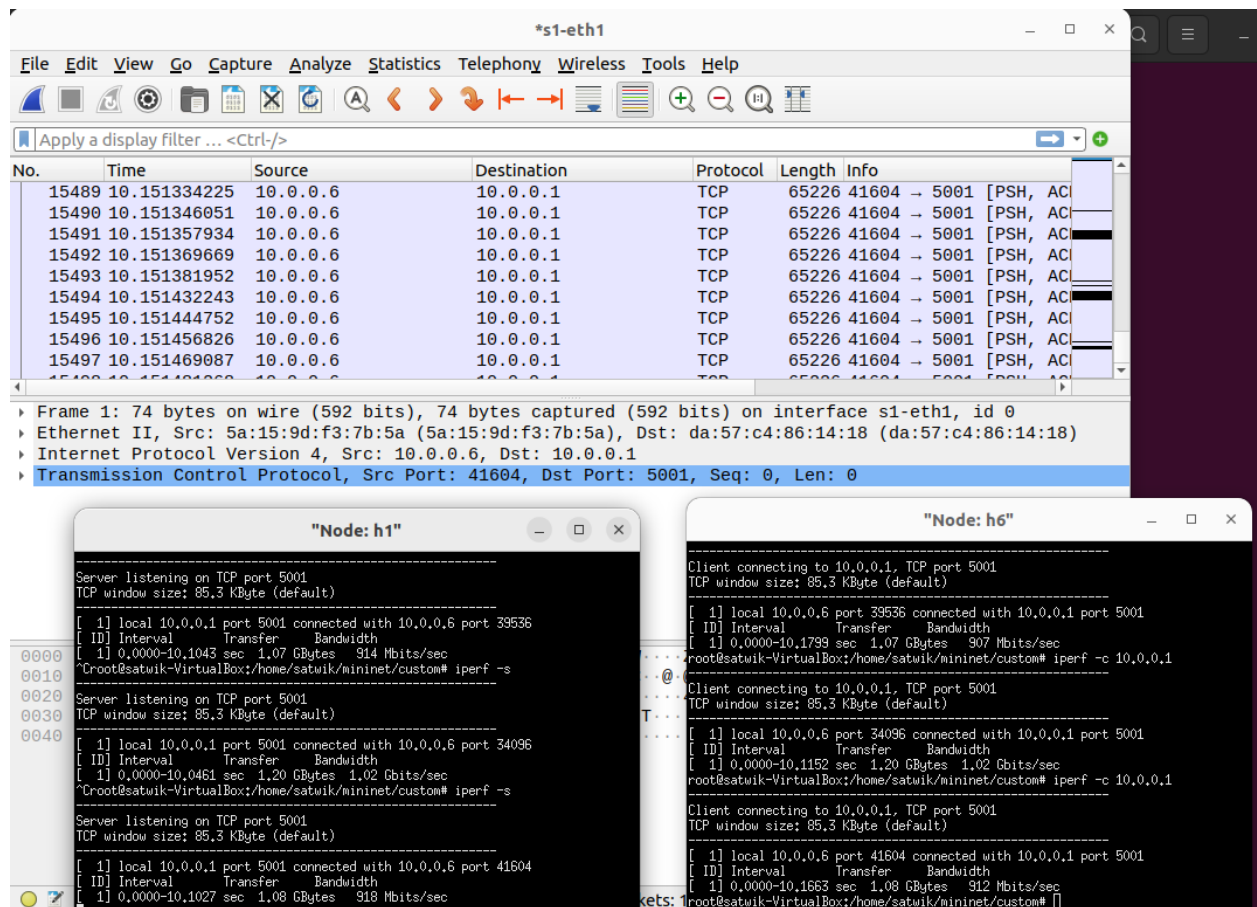
1) in order to create a custom network shown in the assignment . the command “sudo mn --custom topo-2sw-2host.py --topo mytopo” is used to establish the link between 8 hosts and their respective switches and between the 3 switch. I used net command to configure the network.

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Completed in 21.761 seconds
satwik@satwik-VirtualBox:~/mininet/custom$ sudo mn --custom topo-2sw-2host.py --topo mytopo
*** Creating network
*** Adding controller
*** Adding hosts:
h1 h2 h3 h4 h5 h6 h7 h8
*** Adding switches:
s1 s2 s3
*** Adding links:
(h1, s1) (h2, s1) (h3, s2) (h4, s2) (h5, s2) (h6, s3) (h7, s3) (h8, s3) (s1, s2) (s2, s3)
*** Configuring hosts
h1 h2 h3 h4 h5 h6 h7 h8
*** Starting controller
c0
*** Starting 3 switches
s1 s2 s3 ...
*** Starting CLI:
mininet> net
h1 h1-eth0:s1-eth1
h2 h2-eth0:s1-eth2
h3 h3-eth0:s2-eth1
h4 h4-eth0:s2-eth2
h5 h5-eth0:s2-eth3
h6 h6-eth0:s3-eth1
h7 h7-eth0:s3-eth2
h8 h8-eth0:s3-eth3
s1 lo: s1-eth1:h1-eth0 s1-eth2:h2-eth0 s1-eth3:s2-eth4
s2 lo: s2-eth1:h3-eth0 s2-eth2:h4-eth0 s2-eth3:h5-eth0 s2-eth4:s1-eth3 s2-eth5:s3-eth4
s3 lo: s3-eth1:h6-eth0 s3-eth2:h7-eth0 s3-eth3:h8-eth0 s3-eth4:s2-eth5
c0
```

2a),b)i used the command “h1 tc qdisc add dev h1-eth0 root netem delay 50ms” to create a bottleneck at the interface of host h1 using tc and i used the command “iperf h1 h6 “ to generate the traffic between the hosts h1 and h6.

```
c0
mininet> h1 tc qdisc add dev h1-eth0 root netem delay 50ms
mininet> iperf h1 h6
*** Iperf: testing TCP bandwidth between h1 and h6
*** Results: ['818.4 Mbits/sec', '808.3 Mbits/sec']
mininet> █
```

2c) In the Mininet environment, executing the command xterm h1 h6 will launch two separate terminal windows, one for h1, the server side (iperf -c 10.0.0.1), and the other for h6, the client side (iperf h6). This command establishes a connection between h1 and h6, allowing for the transmission of data packets from h1 to h6. The traffic between h1 and h6 can be captured and analyzed using Wireshark.



2d) The figure below illustrates the relationship between window size and time for the pcap file generated by Wireshark for the aforementioned data packet transmission. The figure shows how the window size fluctuates over time, providing insights into how the

network protocol dynamically adjusts the window size to optimize data transfer.

