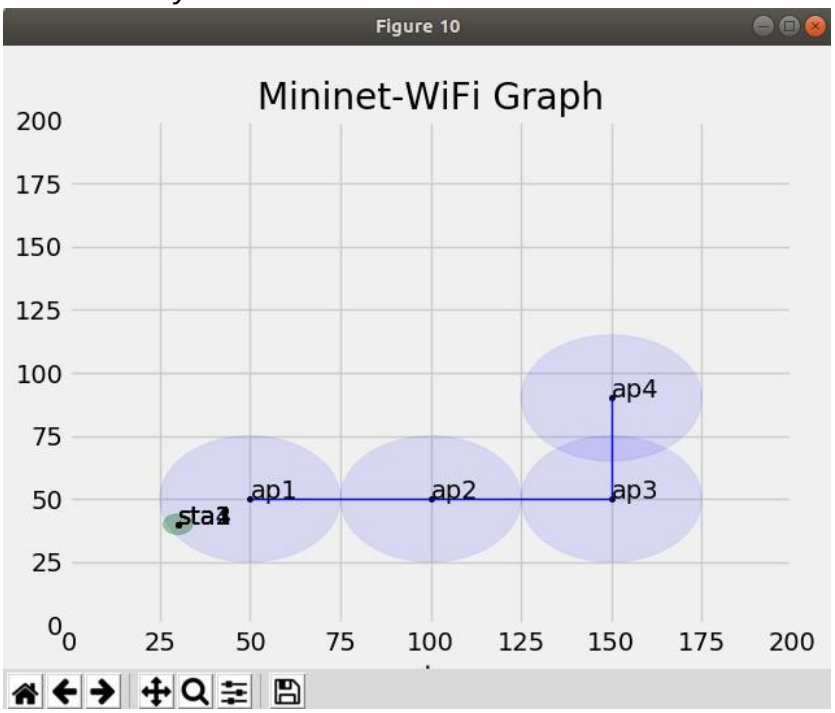
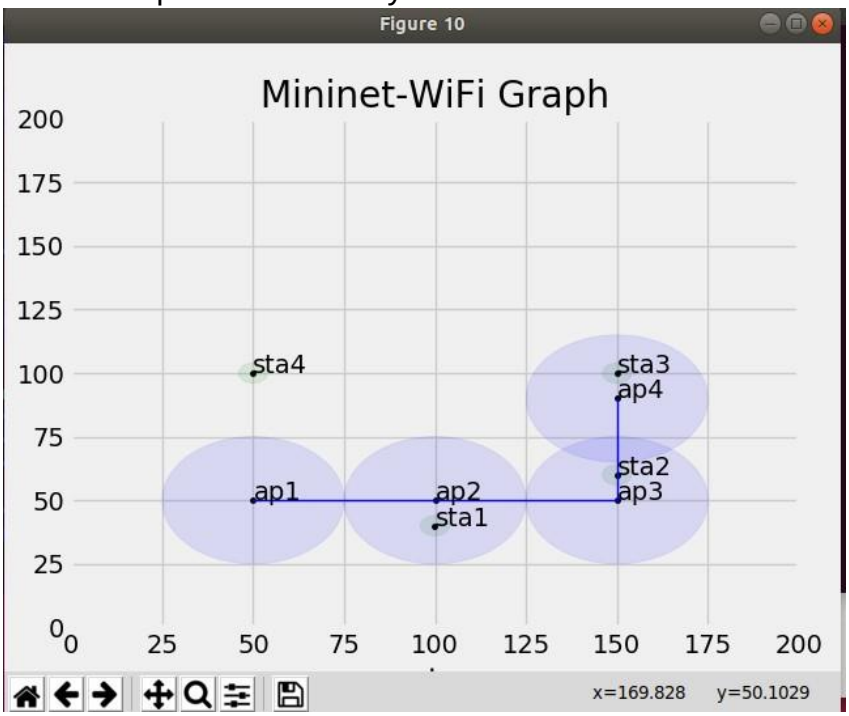
TASK 1

- Screenshot from the Mininet Wi-Fi GUI
  - Prior Mobility:

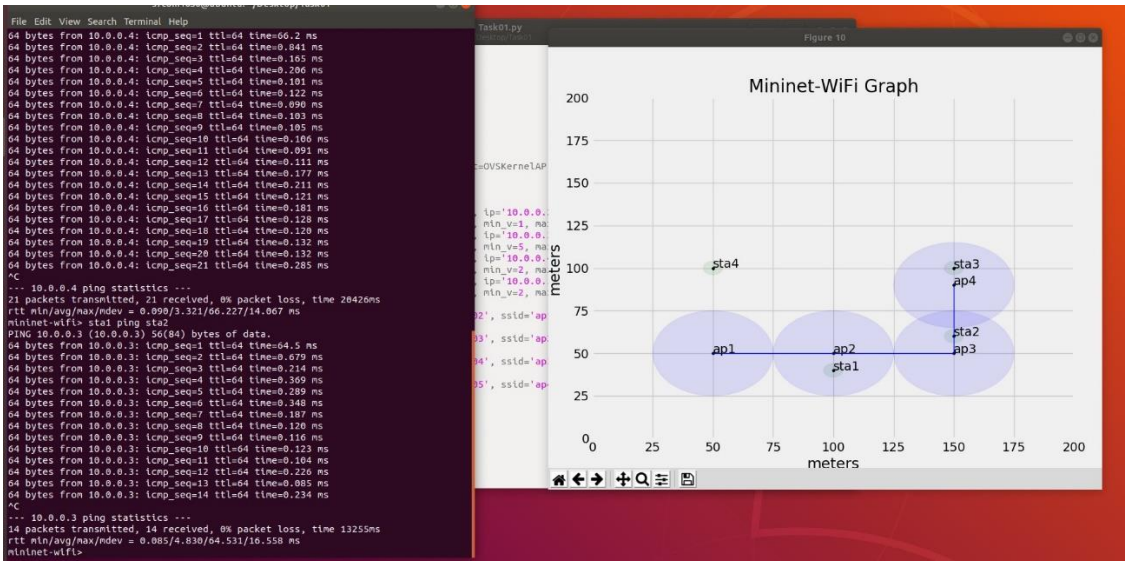


  - At the completion of mobility:

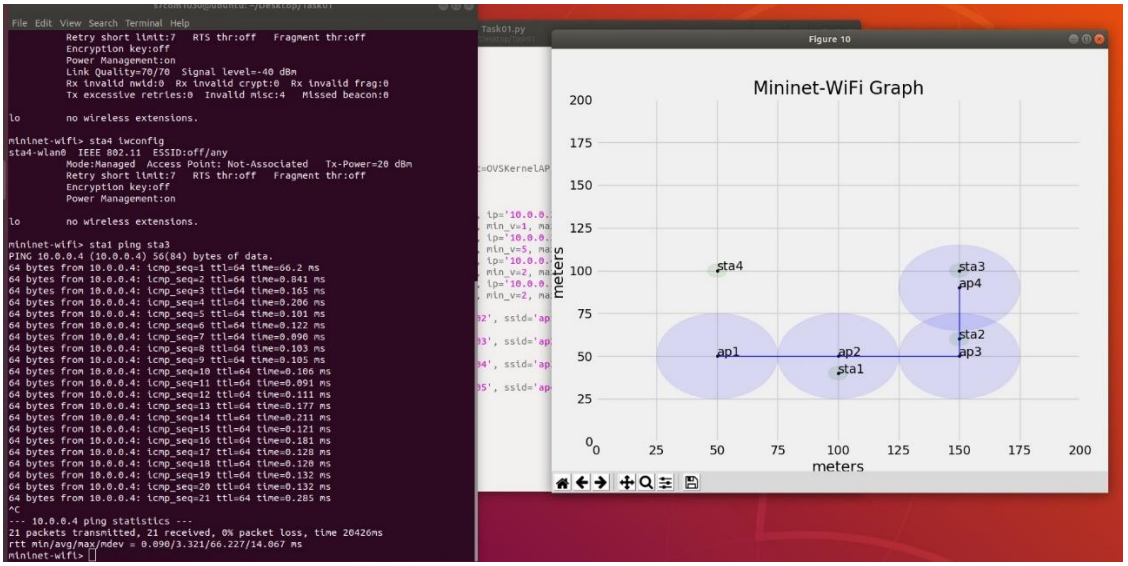


Ping results:

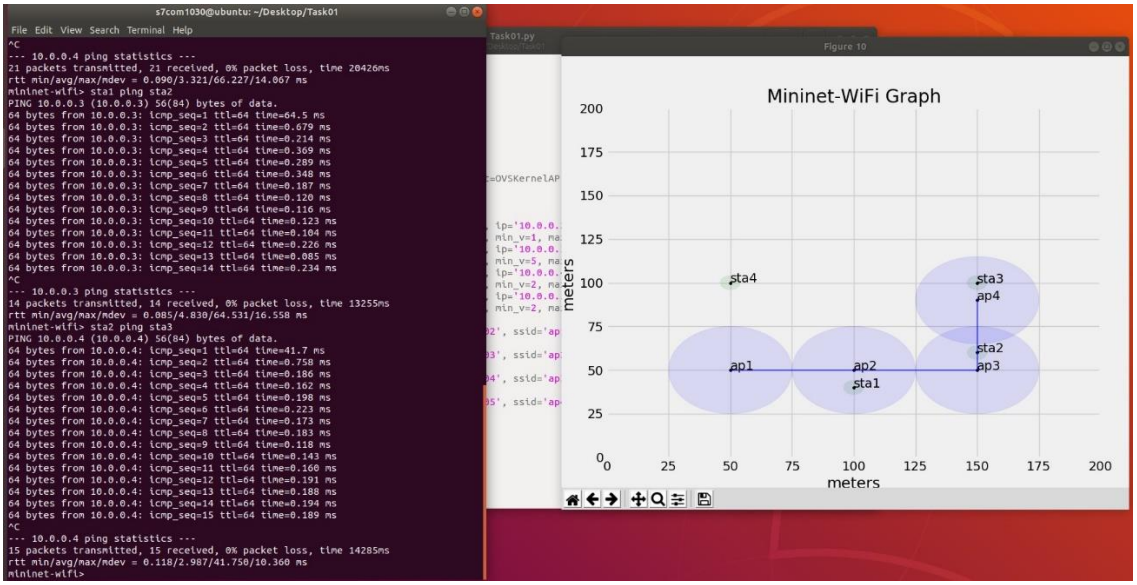
- STA1 <- - -> STA2



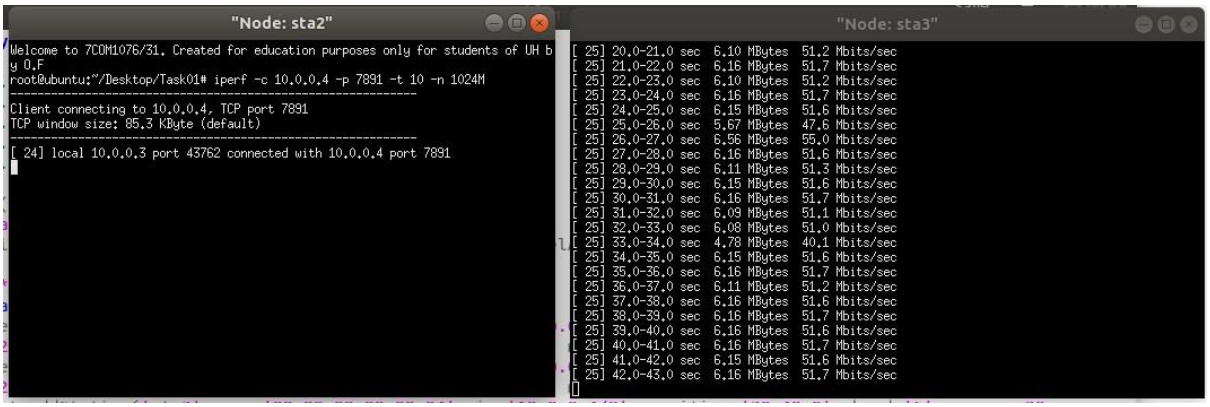
- STA2 <- - -> STA3



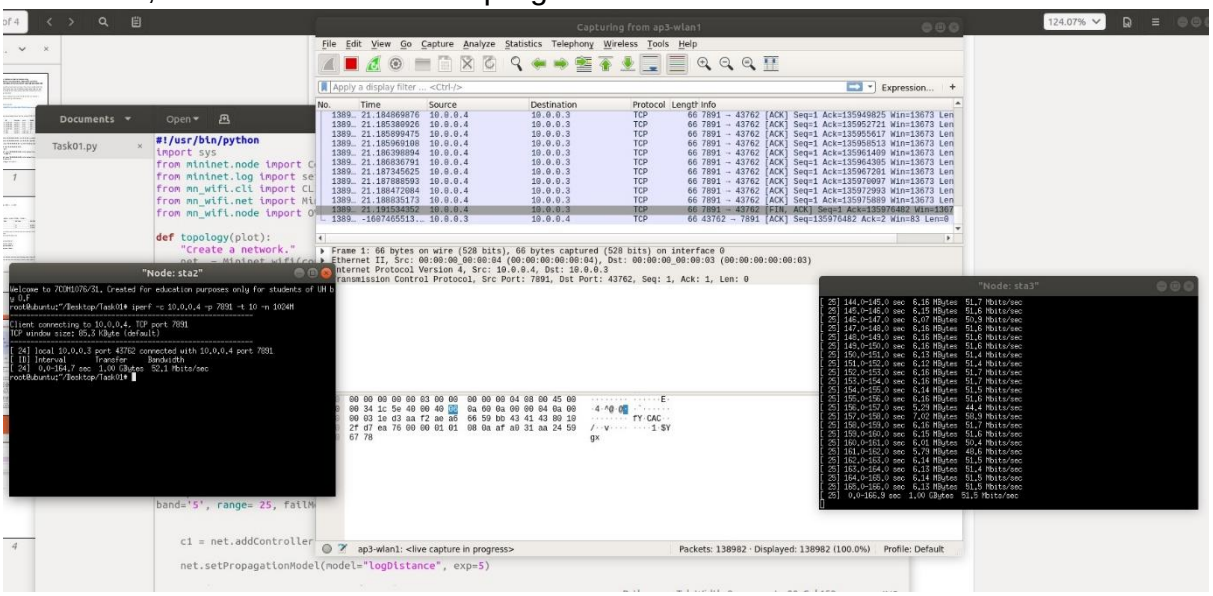
- STA1 <- - -> STA3



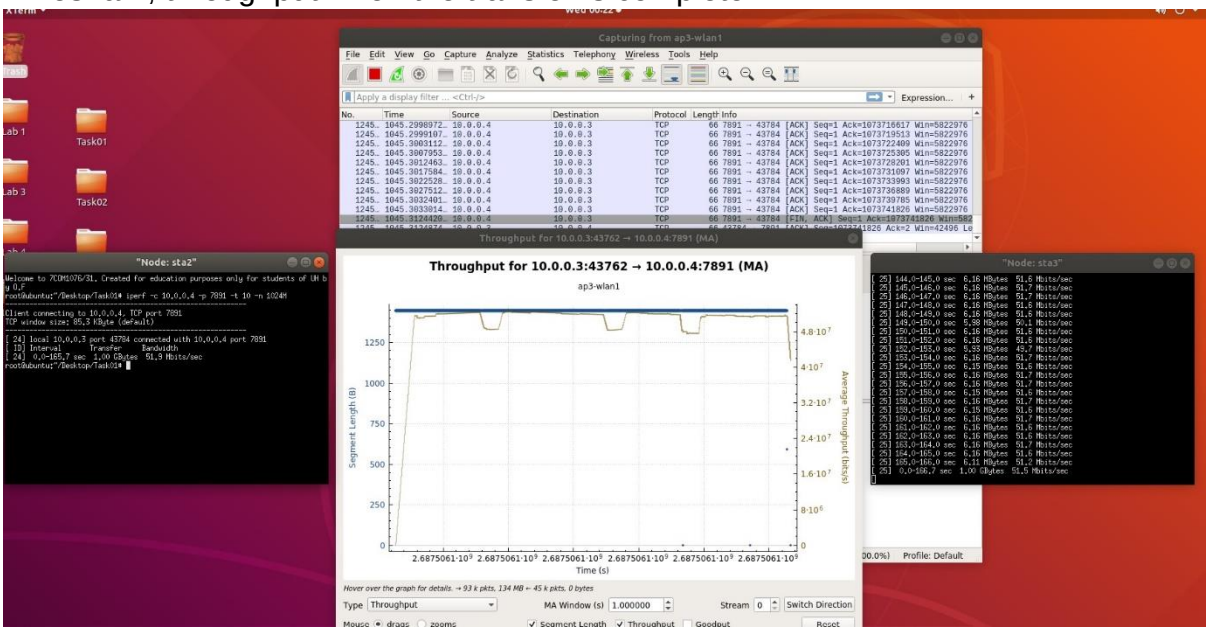
- A TCP flow of 1GB using the socket assigned:
  - The server and the client statistics



  - Wireshark, while the transfer is in progress

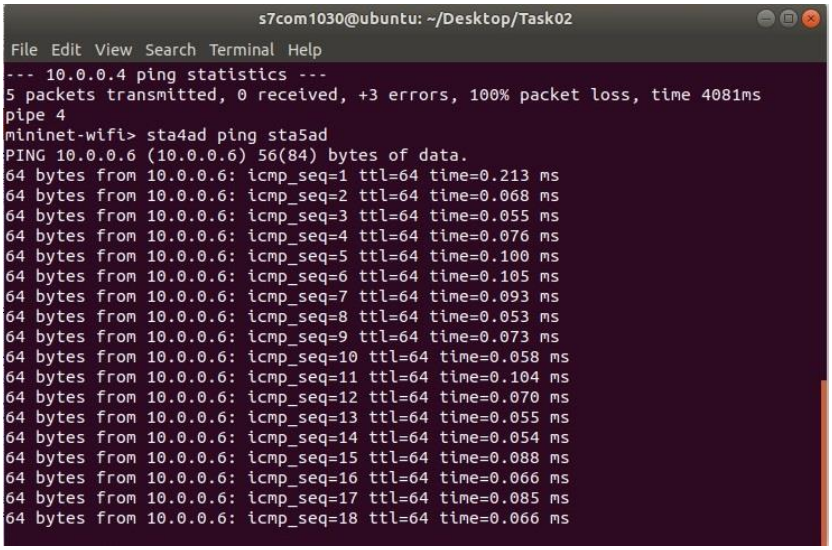


  - Wireshark, throughput when the transfer is complete

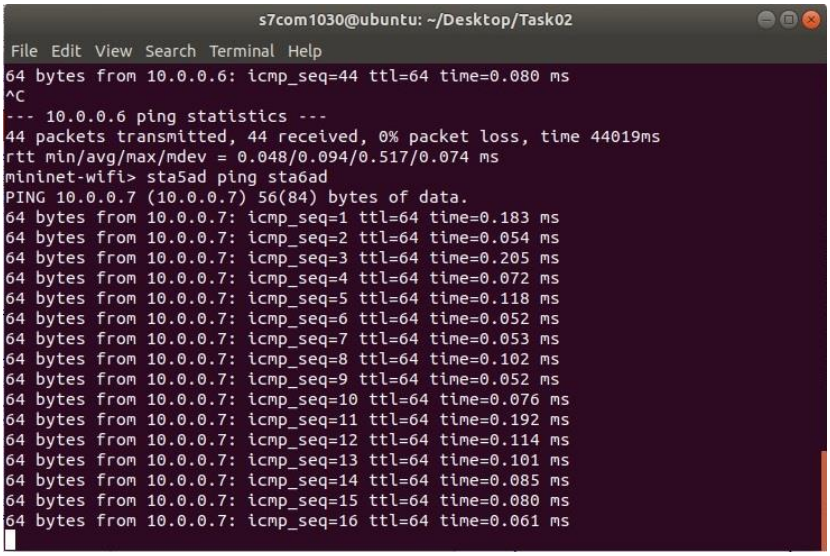


TASK 2

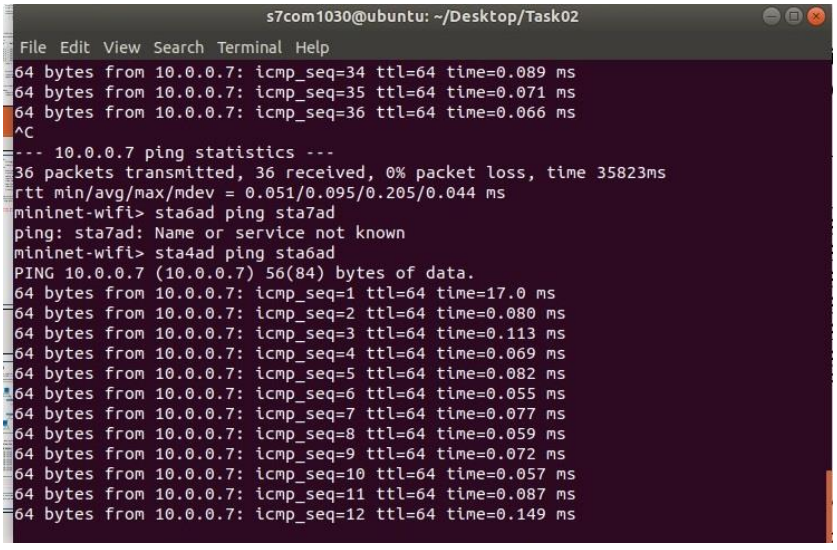
- ICMP stream
  - sta4ad < - - -> sta5ad



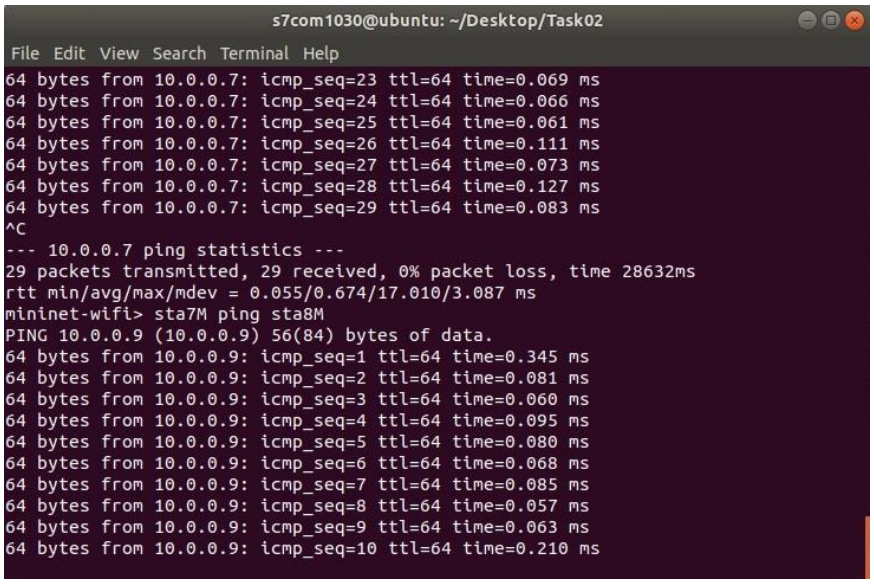
  - sta5ad < - - -> sta6ad



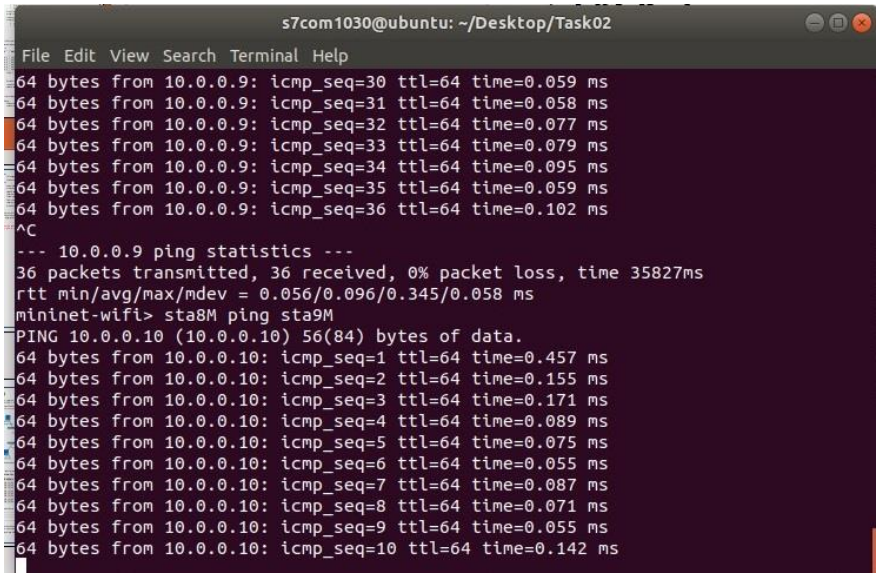
  - sta4ad < - - -> sta6ad



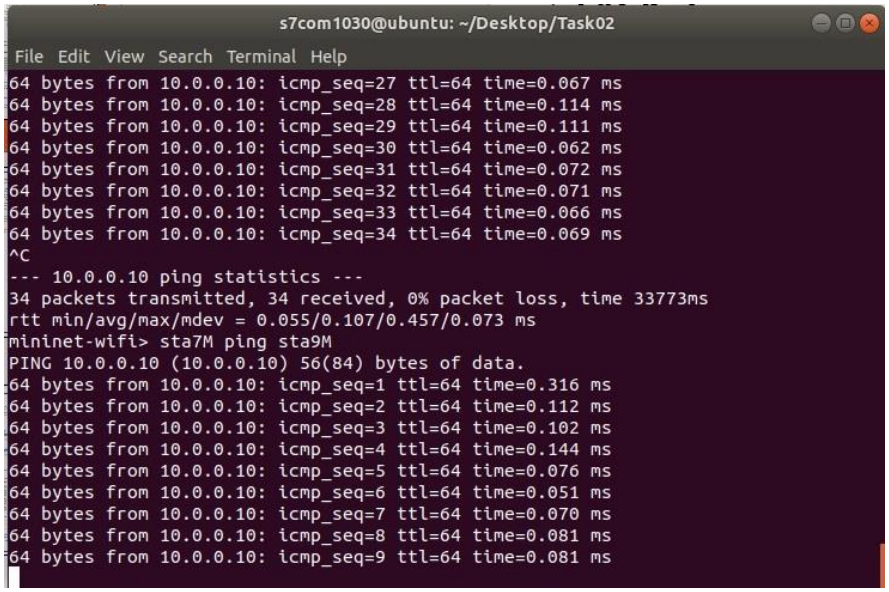
- sta7M < - - -> sta8M



- Sta8M < - - -> sta9M



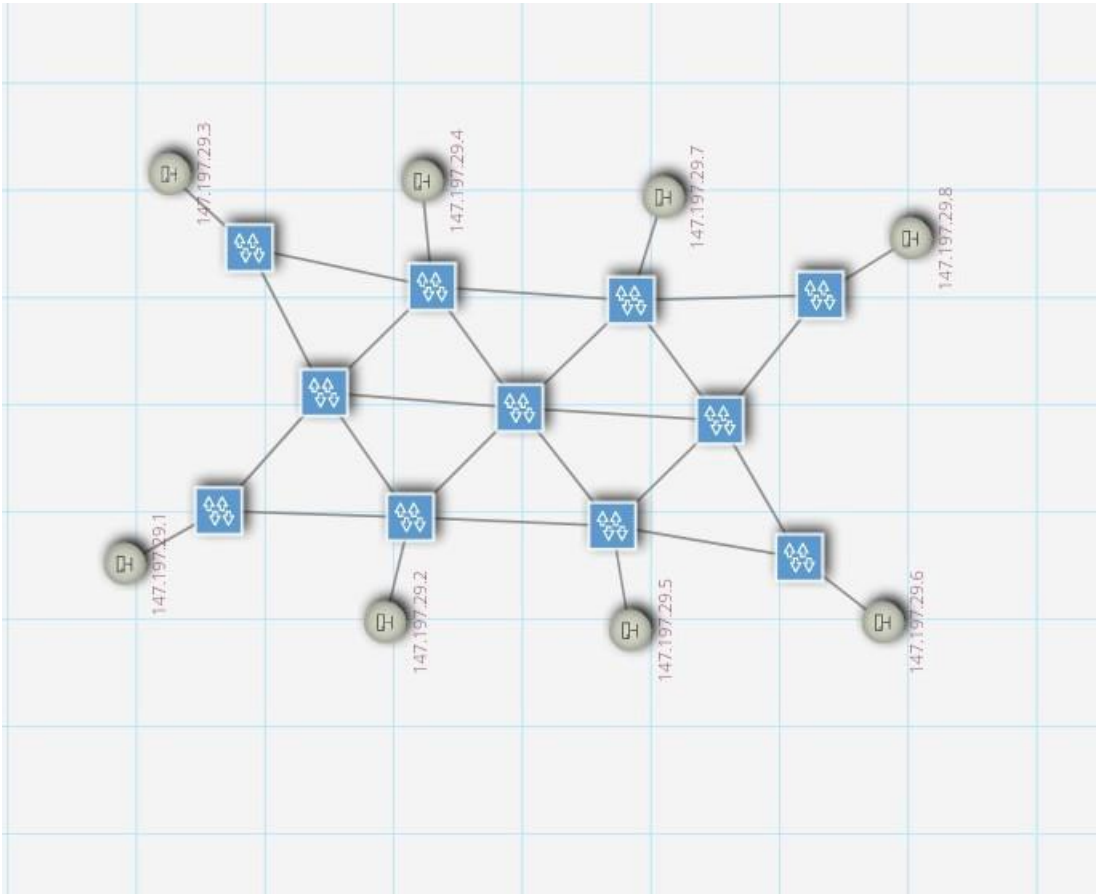
- sta7M < - - -> sta9M



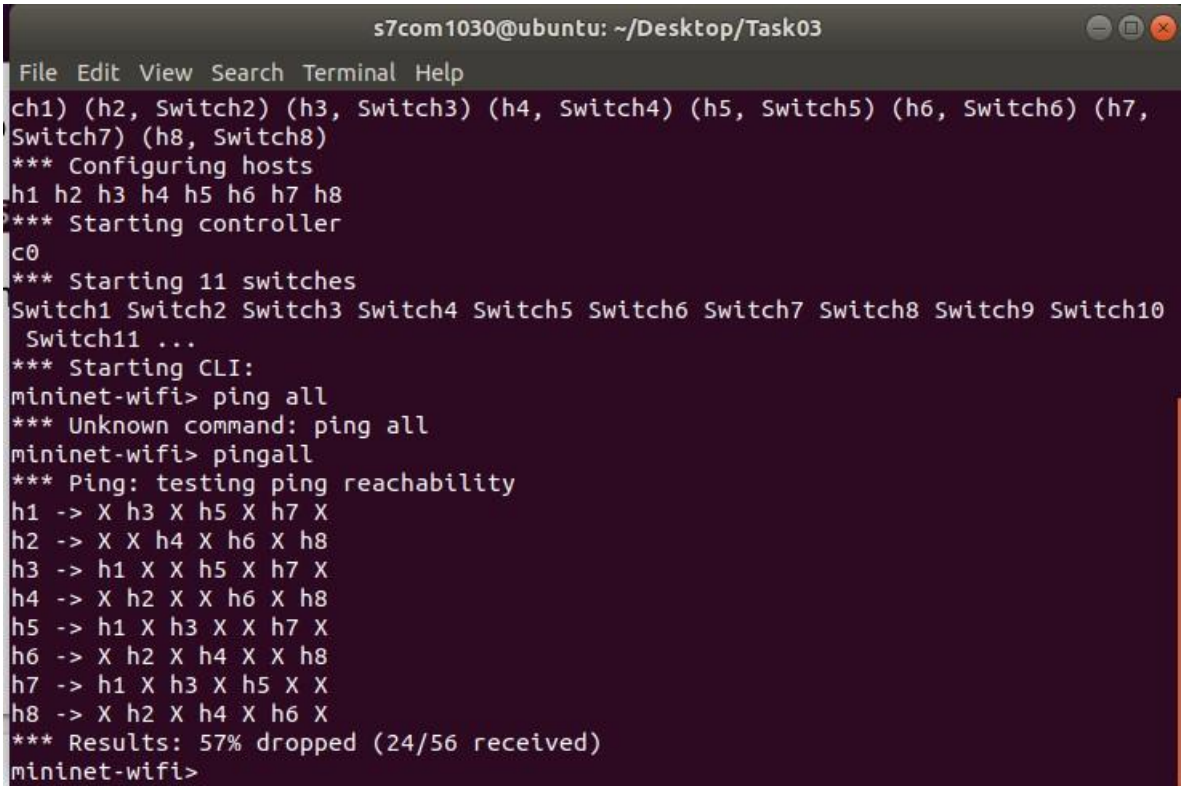
- Throughput, I/O graph, Total number of TCP packets and Total number of TCP flagged packets
  - Screenshot of the statistic file from Wireshark
- Analysis
  - Calculate TCP Success rate, this can be done by the statistics collected
  - Critically evaluate the reason for success or failure of the ICMP streams between sta4ad < - - -> sta6ad and sta7M < - - -> sta9M. Conduct a discussion of the results with evidence (screenshots) and reference.
  - If the nodes are in mobility during the transmission of the TCP stream, will the performance deviate from the collected in any way? Conduct a discussion based on this experiment. If needed add reference from background research to further support your claims.
  - Critically evaluate why STA1 < - - > STA4 ping fail in Task 1? How can a successful ping be achieved?

TASK 3

- Screenshot from the ONOS GUI



- Screenshot of the ICMP stream



- Screenshot of the Link configurations

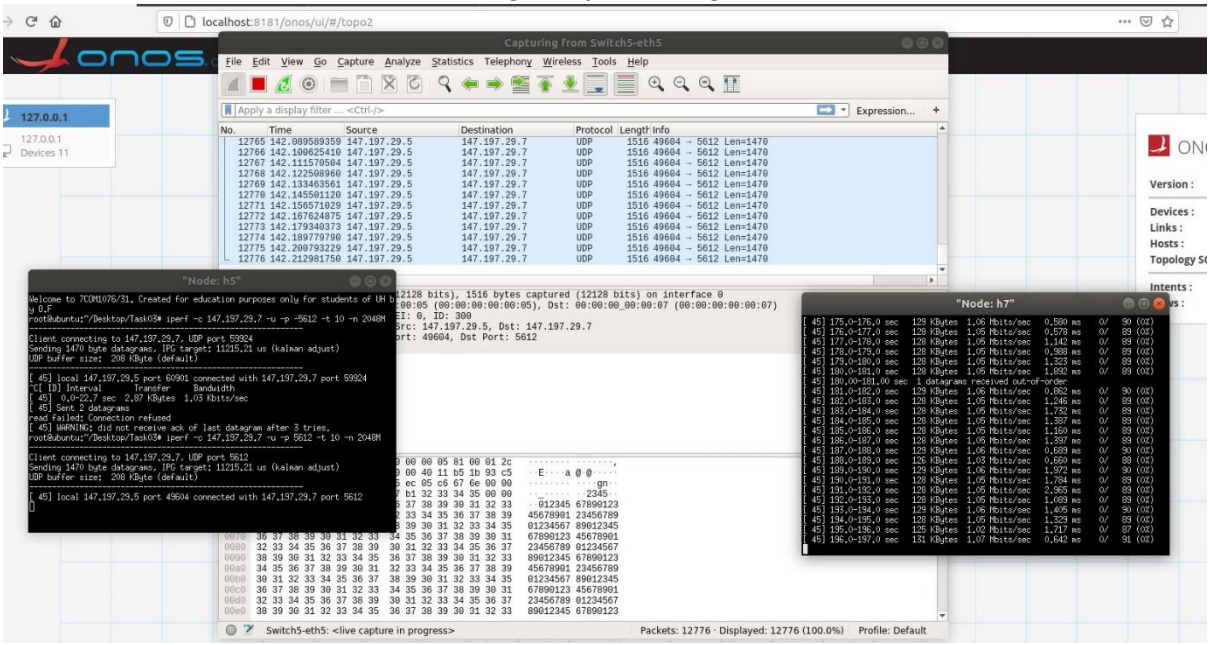
```
s7com1030@ubuntu: ~/Desktop/Task03
File  Edit  View  Search  Terminal  Help
s7com1030@ubuntu:~/Desktop/Task03$ sudo mn --controller remote,ip=127.0.0.1 --custom Task03.py --topo mytopo
*** Creating network
*** Adding controller
Connecting to remote controller at 127.0.0.1:6653
*** Adding hosts:
h1 h2 h3 h4 h5 h6 h7 h8
*** Adding switches:
Switch1 Switch2 Switch3 Switch4 Switch5 Switch6 Switch7 Switch8 Switch9 Switch10 Switch11
*** Adding links:
(Switch1, Switch2) (Switch1, Switch9) (Switch2, Switch5) (Switch2, Switch9) (Switch2, Switch10) (Switch4, Switch3) (Switch5, Switch
6) (Switch5, Switch10) (Switch5, Switch11) (Switch6, Switch11) (Switch7, Switch4) (Switch8, Switch7) (Switch9, Switch3) (Switch9, S
witch4) (Switch9, Switch10) (Switch10, Switch4) (Switch10, Switch7) (Switch10, Switch11) (Switch11, Switch7) (Switch11, Switch8) (h
1, Switch1) (h2, Switch2) (h3, Switch3) (h4, Switch4) (h5, Switch5) (h6, Switch6) (h7, Switch7) (h8, Switch8)
*** Configuring hosts
h1 h2 h3 h4 h5 h6 h7 h8
*** Starting controller
c0
*** Starting 11 switches
Switch1 Switch2 Switch3 Switch4 Switch5 Switch6 Switch7 Switch8 Switch9 Switch10 Switch11 ...
*** Starting CLI:
mininet-wifi> ping all
```

- Links:

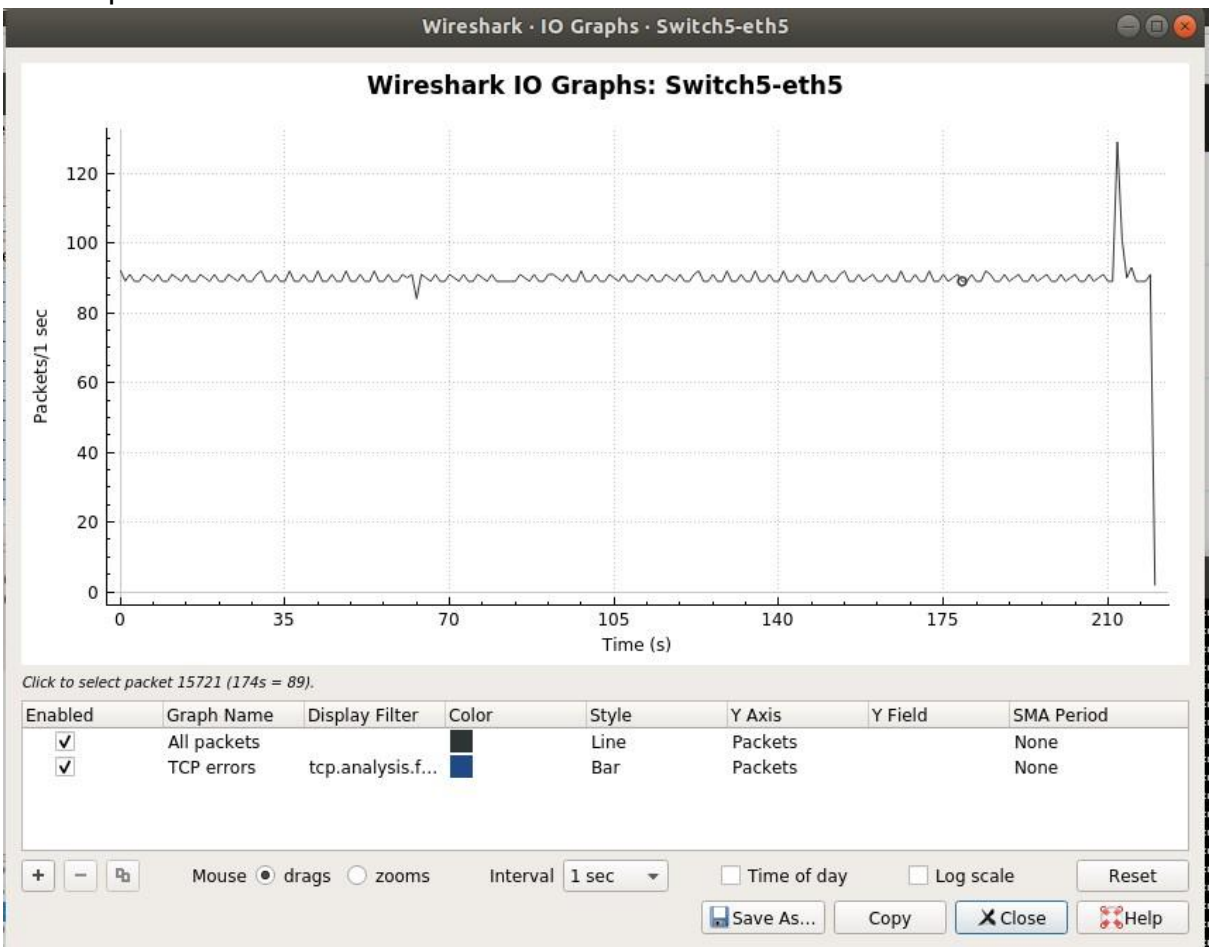
```
c0
mininet-wifi> links
Switch1-eth1<->Switch2-eth1 (OK OK)
Switch1-eth2<->Switch9-eth1 (OK OK)
Switch2-eth4<->Switch5-eth1 (OK OK)
Switch2-eth2<->Switch9-eth2 (OK OK)
Switch2-eth3<->Switch10-eth1 (OK OK)
Switch4-eth3<->Switch3-eth2 (OK OK)
Switch5-eth4<->Switch6-eth1 (OK OK)
Switch5-eth2<->Switch10-eth2 (OK OK)
Switch5-eth3<->Switch11-eth1 (OK OK)
Switch6-eth2<->Switch11-eth2 (OK OK)
Switch7-eth3<->Switch4-eth4 (OK OK)
Switch8-eth2<->Switch7-eth4 (OK OK)
Switch9-eth3<->Switch3-eth1 (OK OK)
Switch9-eth4<->Switch4-eth1 (OK OK)
Switch9-eth5<->Switch10-eth3 (OK OK)
Switch10-eth4<->Switch4-eth2 (OK OK)
Switch10-eth5<->Switch7-eth1 (OK OK)
Switch10-eth6<->Switch11-eth3 (OK OK)
Switch11-eth4<->Switch7-eth2 (OK OK)
Switch11-eth5<->Switch8-eth1 (OK OK)
h1-eth0.300<->Switch1-eth3 (OK OK)
h2-eth0.400<->Switch2-eth5 (OK OK)
h3-eth0.300<->Switch3-eth3 (OK OK)
h4-eth0.400<->Switch4-eth5 (OK OK)
h5-eth0.300<->Switch5-eth5 (OK OK)
h6-eth0.400<->Switch6-eth3 (OK OK)
h7-eth0.300<->Switch7-eth5 (OK OK)
h8-eth0.400<->Switch8-eth3 (OK OK)
mininet-wifi>
```

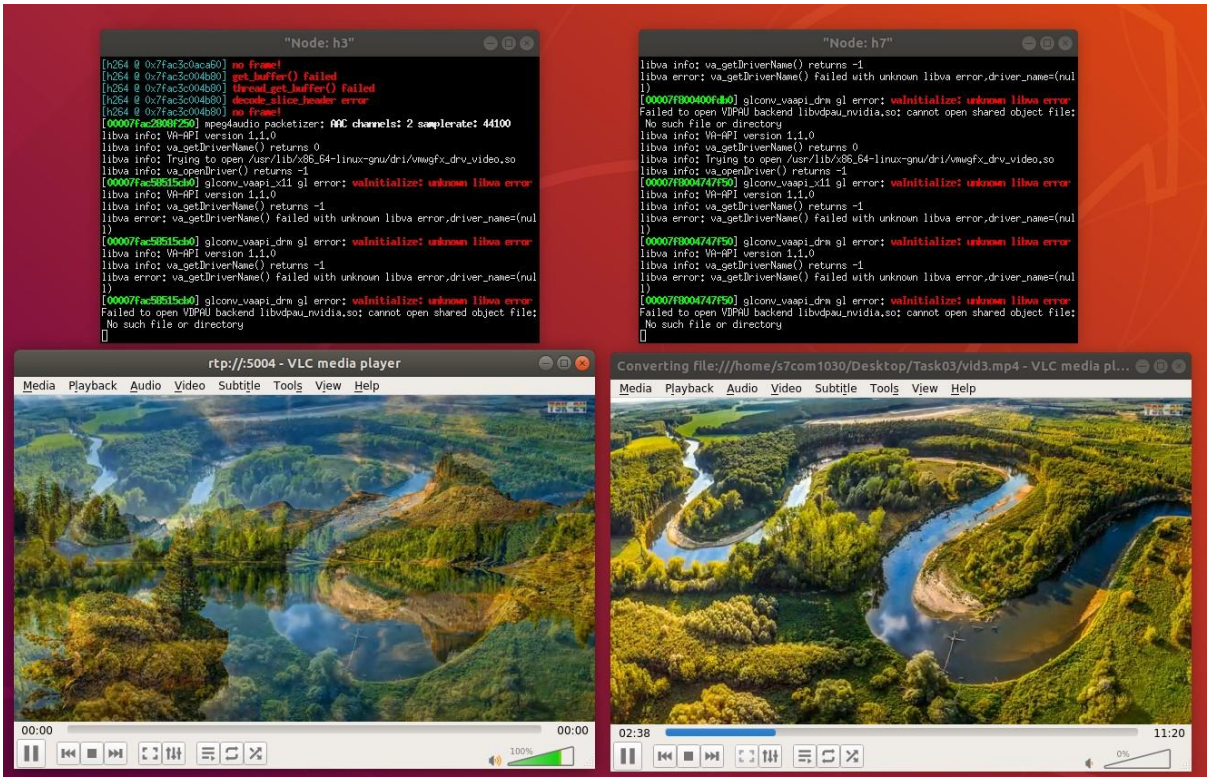
TASK 4

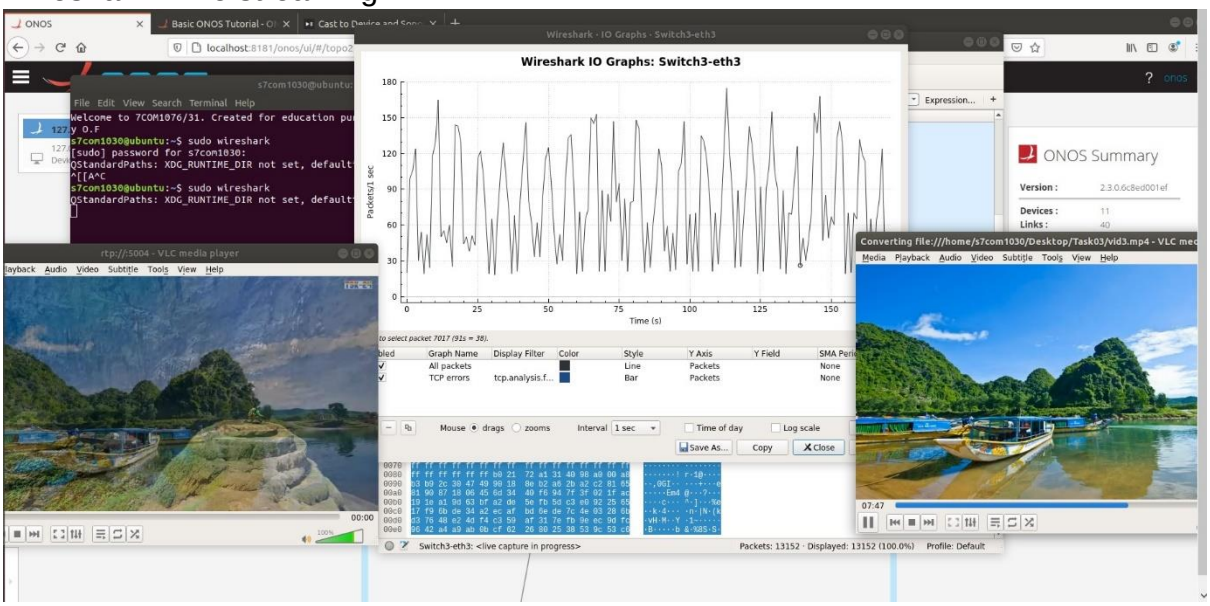
- UDP flow to total of 2GB traffic using the port assigned



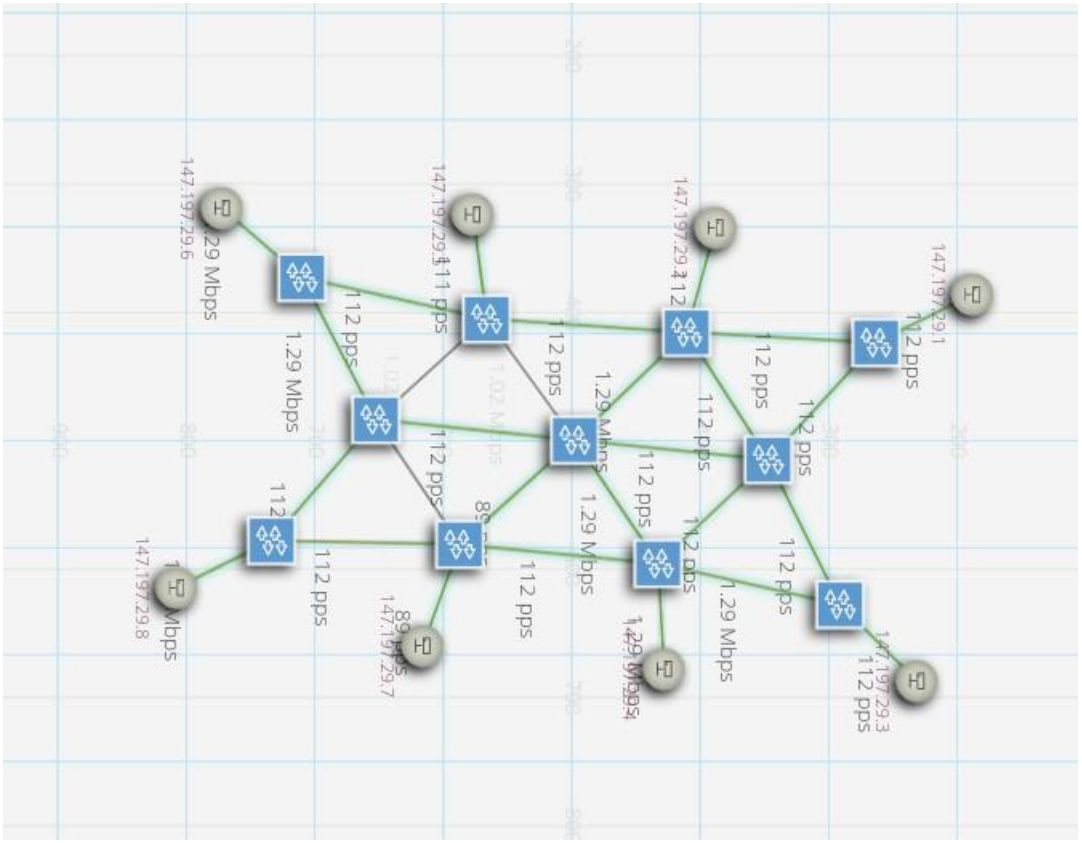
- I/O Graph



- Video stream
- 

- Wireshark while streaming
- 

- Packets route while streaming



Report:

- Your report must include the following:
  - Modelling
    - A brief introduction to the environments (Mininet, ONOS, Wireshark, iPerf) not exceeding half a page.
    - Screenshots as mentioned in the deliverable section in each task, totalling the number of screenshots but not limited to 6
  - Results
    - Mean throughput and mean jitter of the UDP transfer according to your statistic files in Task 4.1
    - Throughput graph obtained from video stream using Wireshark.
    - Total number of Packet loss from the video stream, screenshot of the statistic file from Wireshark
  - Analysis
    - Should there be more packet loss and delay, should you expect the results to deviate from what you have acquired? Evaluate with references.
    - Comment on how the variables such as packet loss and delay have contributed towards the overall performance of your network. Evaluate with reference