Report

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- **Describe each step and how to run your program**

Task1:

Follow the step to set up the environment

Task2:

Create the topology like the pdf shown. I add two new hosts (h3,h4),and two new links(h2->s1,s2->h4) in topo.py.

Task3:

As requested, I generate two flows.one is h1 to h4 and the other is h2 to h3. And, there are two version, one is TCP, another is UDP. then, save those into .pcap files.

Task4:

Firstly, I get the path from the pcap. Secondly, I capture the time (t1) of the first packet was put and the time (t2) the last packet was put.

Then , I add the length of all packets all together to get the total length(N). Eventually, N / (t2-t1) becomes our final answer, which is the compute rate

Task5:

In the beginning, I push files to github and clone it to my own computer. Then, I open the pcap files using wireshark. After that, I check the statistic through wireshark as the pdf told me and save the screenshot, which will be presented below.

- **Describe your observations from the results in this lab**

I found out that TCP need more time than UDP. Additionally, I observe that some results I get from my computeRate.py and the statistic I check in wireshark is different, which is probably because there are some packets losing.

- **What does each iPerf command you used mean?**

-s run server

-i output interval in second

-t time in second

-c run client

-u UDP

-p port number

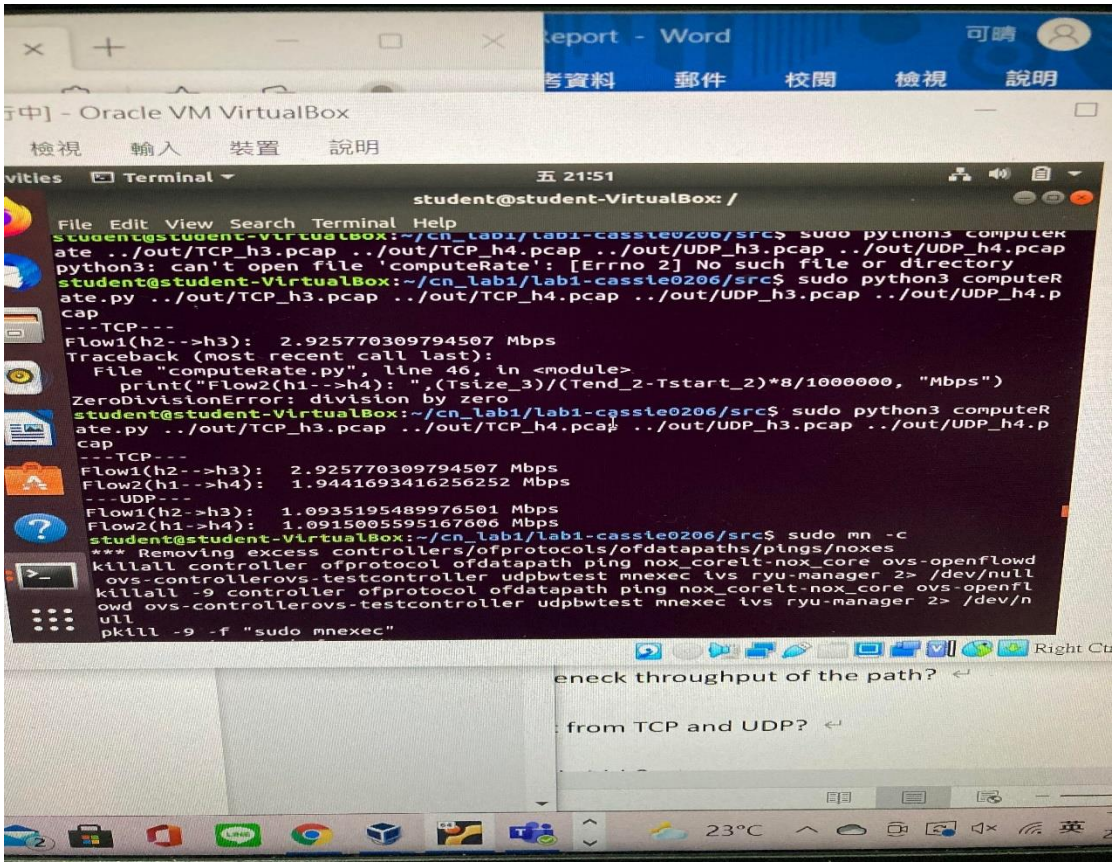
-w window size

- **What is your command to filter each flow in Wireshark?**

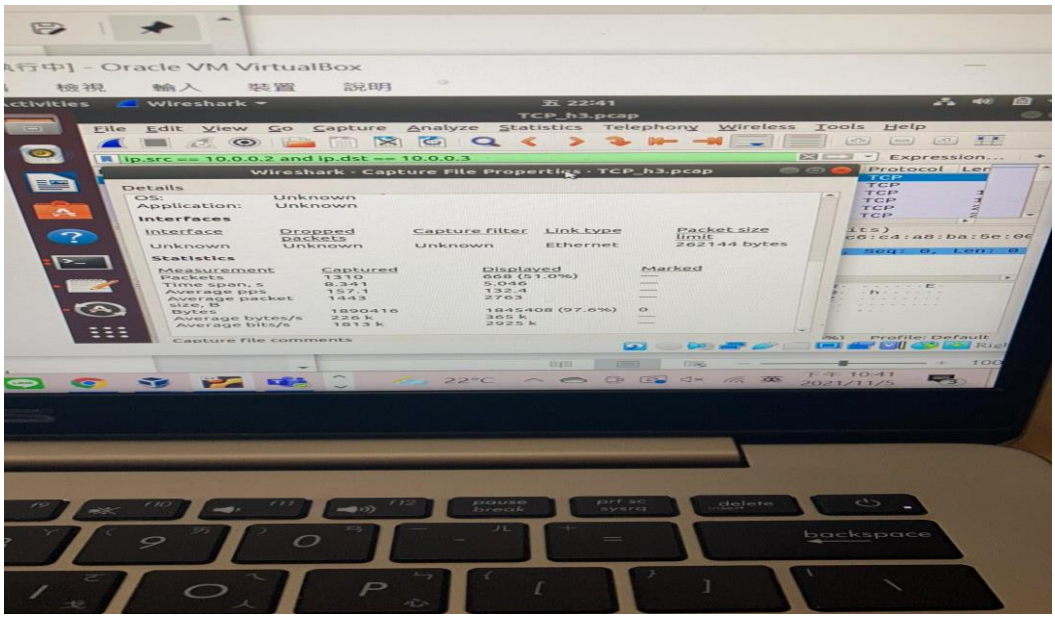
udp.port , tcp.port == 7777 (port number)

ip.dst == 10.0.0.3 or 10.0.0.4 (the IP of destination)

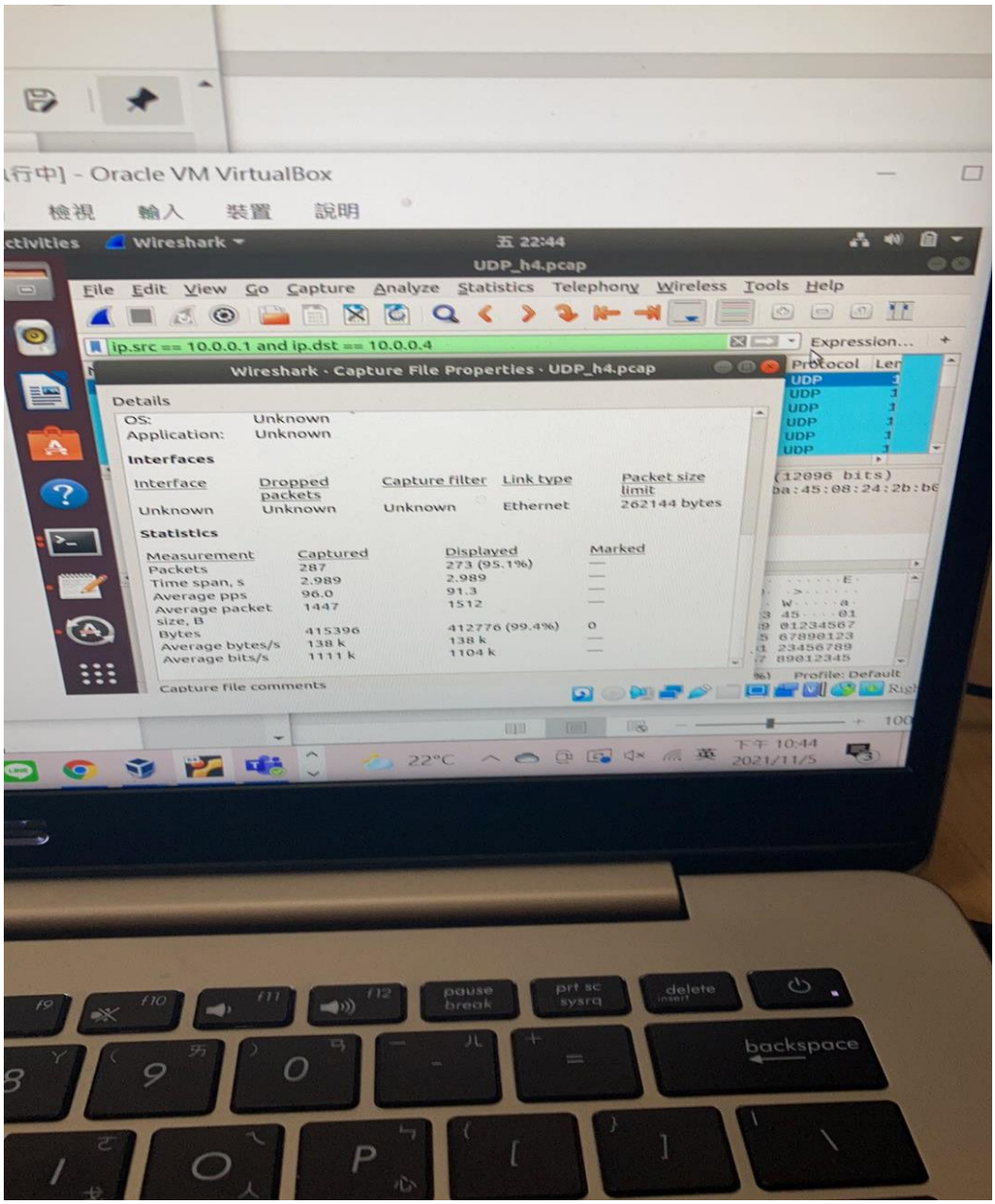
- **Show the results of computeRate.py and statistics of Wireshark**



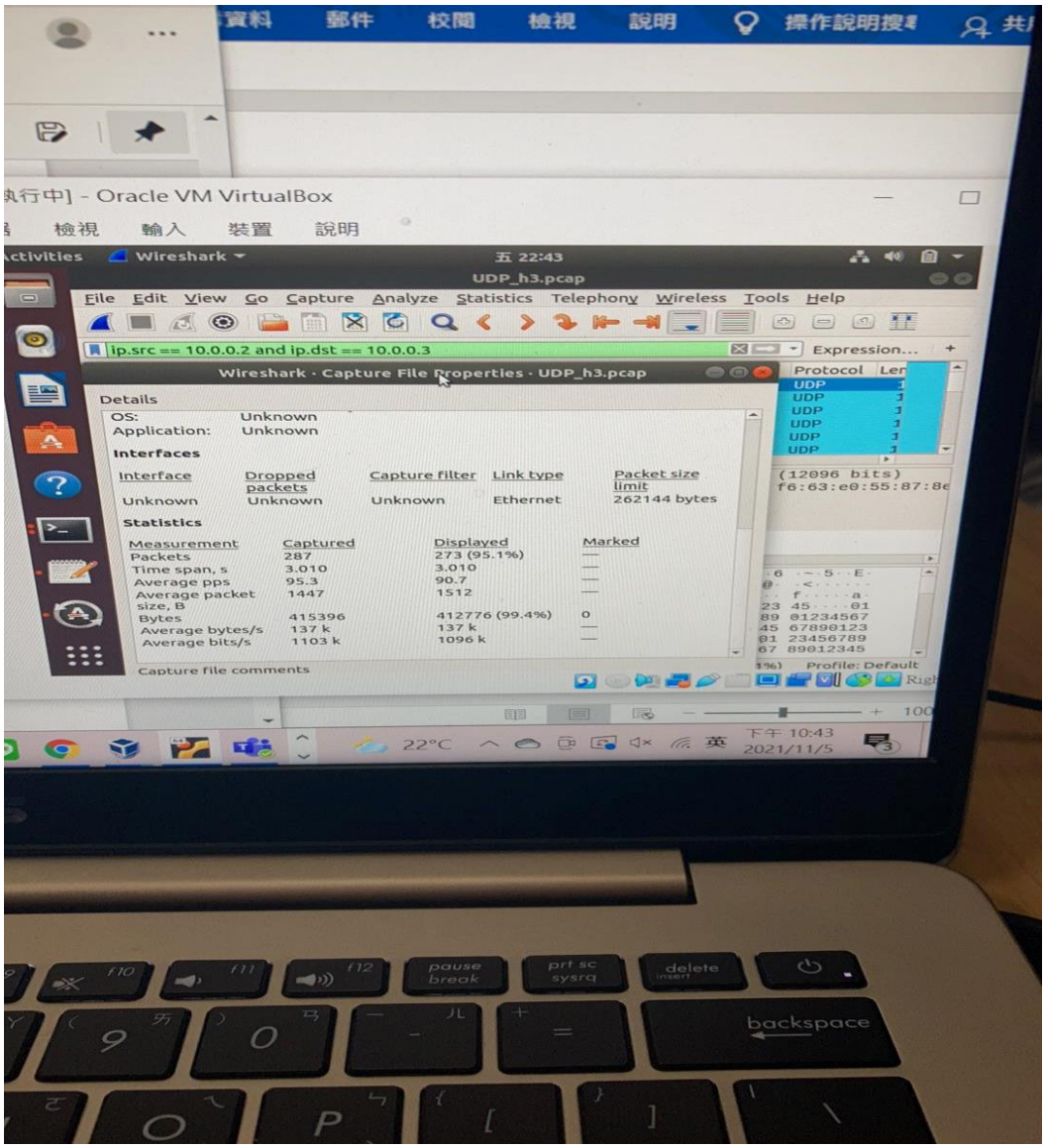
TCP(h2->h3)



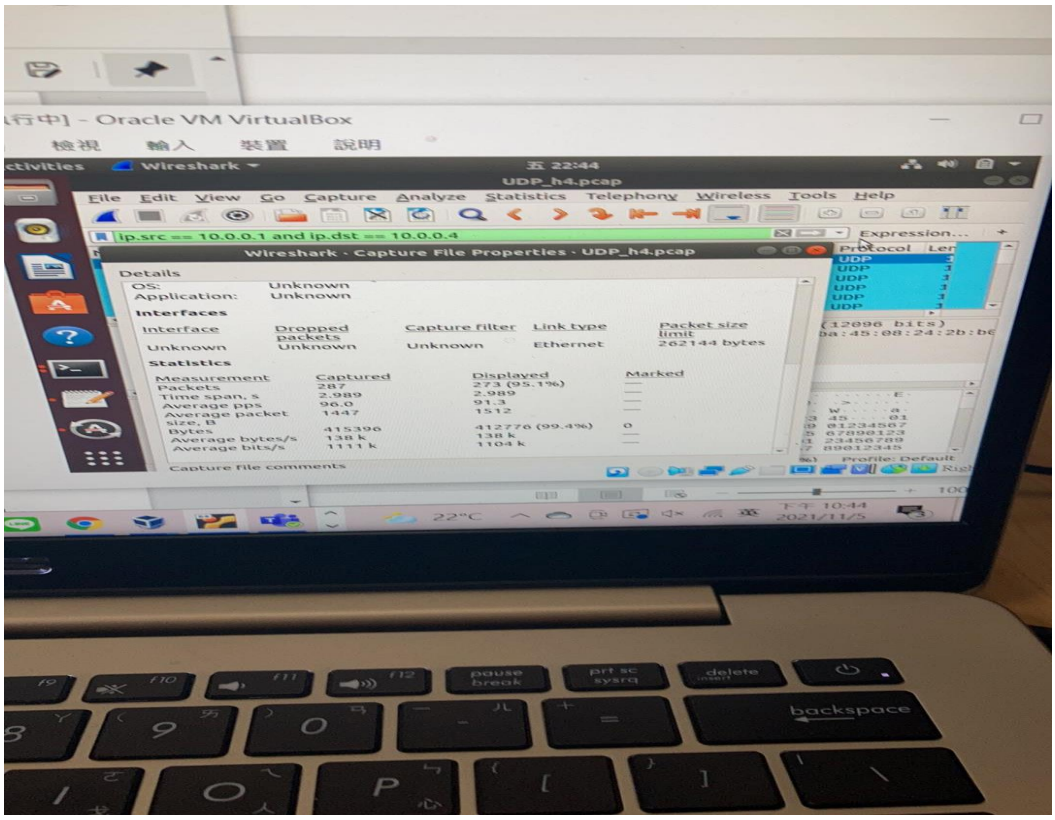
TCP(h1->h4)


Oracle VM VirtualBox
檢視 輸入 裝置 說明
Wireshark
五 22:44
UDP_h4.pcap
File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help
ip.src == 10.0.0.1 and ip.dst == 10.0.0.4
Expression...
Wireshark · Capture File Properties · UDP_h4.pcap
Details
OS: Unknown
Application: Unknown
Interfaces
Interface Dropped packets Capture filter Link type Packet size limit
Unknown Unknown Unknown Ethernet 262144 bytes
Statistics
Measurement Captured Displayed Marked
Packets 287 273 (95.1%)
Time span, s 2.989 2.989
Average pps 96.0 91.3
Average packet size, B 1447 1512
Bytes 415396 412776 (99.4%) 0
Average bytes/s 138 k 138 k
Average bits/s 1111 k 1104 k
Capture file comments
Protocol
UDP
(12096 bits)
Profile: Default
22°C
下午 10:44
2021/11/5
pause break
prt sc sysrq
delete
backspace

UDP(h2->h3)


Oracle VM VirtualBox
Wireshark
UDP_h3.pcap
File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help
ip.src == 10.0.0.2 and ip.dst == 10.0.0.3
Wireshark · Capture File Properties · UDP_h3.pcap
Details
OS: Unknown
Application: Unknown
Interfaces
Interface Dropped packets Capture filter Link type Packet size limit
Unknown Unknown Unknown Ethernet 262144 bytes
Statistics
Measurement Captured Displayed Marked
Packets 287 273 (95.1%)
Time span, s 3.010 3.010
Average pps 95.3 90.7
Average packet size, B 1447 1512
Bytes 415396 412776 (99.4%) 0
Average bytes/s 137 k 137 k
Average bits/s 1103 k 1096 k
Capture file comments
Protocol
UDP
backspace

UDP(h1->h4)



- **Does the throughput match the bottleneck throughput of the path?**

  yes

- **Do you observe the same throughput from TCP and UDP?**

  No

- **Can both flows equally share the bandwidth?**

  TCP can't. UDP can.

- **What you have learned from this lab?**

  I learn a lot from this lab. For example, Learn how to use virtual box and wireshark. In addition, I learn more about how to write python.

- **What difficulty you have met in this lab?**

  There are lots of difficulties. The most impressive difficulties for me is to compute the compute rate in task 4. Moreover, solving the token I need to get through github also cost me lots time. Last but not least, I will be confused when switching using virtual box and my pc.