# 【高等電腦網路】

作業別 ： 【HW2】

學號、姓名 ：M043040026 蒲宏易

作業內容 ：

**Part1 : Mininet**

```
mininet> net
h1 h1-eth0:s1-eth1
h2 h2-eth0:s1-eth2
s1 lo:  s1-eth1:h1-eth0 s1-eth2:h2-eth0
c0
mininet>
```

**(1) h1 : s1-eth1 when ping h1->h2**

Capturing from s1-eth1 [Wireshark 1.10.6 (v1.10.6 from master-1.10)]

| No. | Time | Source | Destination | Protocol | Length | Info |
|---|---|---|---|---|---|---|
| 1 | 0.000000000 | 10.0.0.1 | 10.0.0.2 | ICMP | 98 | Echo (ping) request id=0x0e58, seq=1/256, ttl=64 (reply in 2) |
| 2 | 0.001970000 | 10.0.0.2 | 10.0.0.1 | ICMP | 98 | Echo (ping) reply id=0x0e58, seq=1/256, ttl=64 (request in 1) |
| 3 | 1.001432000 | 10.0.0.1 | 10.0.0.2 | ICMP | 98 | Echo (ping) request id=0x0e58, seq=2/512, ttl=64 (reply in 4) |
| 4 | 1.001760000 | 10.0.0.2 | 10.0.0.1 | ICMP | 98 | Echo (ping) reply id=0x0e58, seq=2/512, ttl=64 (request in 3) |
| 5 | 2.000434000 | 10.0.0.1 | 10.0.0.2 | ICMP | 98 | Echo (ping) request id=0x0e58, seq=3/768, ttl=64 (reply in 6) |
| 6 | 2.000462000 | 10.0.0.2 | 10.0.0.1 | ICMP | 98 | Echo (ping) reply id=0x0e58, seq=3/768, ttl=64 (request in 5) |
| 7 | 2.999427000 | 10.0.0.1 | 10.0.0.2 | ICMP | 98 | Echo (ping) request id=0x0e58, seq=4/1024, ttl=64 (reply in 8) |
| 8 | 2.999446000 | 10.0.0.2 | 10.0.0.1 | ICMP | 98 | Echo (ping) reply id=0x0e58, seq=4/1024, ttl=64 (request in 7) |
| 9 | 3.998435000 | 10.0.0.1 | 10.0.0.2 | ICMP | 98 | Echo (ping) request id=0x0e58, seq=5/1280, ttl=64 (reply in 10) |
| 10 | 3.998464000 | 10.0.0.2 | 10.0.0.1 | ICMP | 98 | Echo (ping) reply id=0x0e58, seq=5/1280, ttl=64 (request in 9) |
| 11 | 4.998364000 | 10.0.0.1 | 10.0.0.2 | ICMP | 98 | Echo (ping) request id=0x0e58, seq=6/1536, ttl=64 (reply in 12) |
| 12 | 4.998392000 | 10.0.0.2 | 10.0.0.1 | ICMP | 98 | Echo (ping) reply id=0x0e58, seq=6/1536, ttl=64 (request in 11) |
| 13 | 5.007420000 | d2:e8:37:9a:2a:da | 82:50:78:76:ba:57 | ARP | 42 | Who has 10.0.0.1? Tell 10.0.0.2 |
| 14 | 5.007430000 | 82:50:78:76:ba:57 | d2:e8:37:9a:2a:da | ARP | 42 | 10.0.0.1 is at 82:50:78:76:ba:57 |
| 15 | 5.998123000 | 10.0.0.1 | 10.0.0.2 | ICMP | 98 | Echo (ping) request id=0x0e58, seq=7/1792, ttl=64 (reply in 16) |
| 16 | 5.998314000 | 10.0.0.2 | 10.0.0.1 | ICMP | 98 | Echo (ping) reply id=0x0e58, seq=7/1792, ttl=64 (request in 15) |
| 17 | 6.998628000 | 10.0.0.1 | 10.0.0.2 | ICMP | 98 | Echo (ping) request id=0x0e58, seq=8/2048, ttl=64 (reply in 18) |
| 18 | 6.998656000 | 10.0.0.2 | 10.0.0.1 | ICMP | 98 | Echo (ping) reply id=0x0e58, seq=8/2048, ttl=64 (request in 17) |
| 19 | 7.998102000 | 10.0.0.1 | 10.0.0.2 | ICMP | 98 | Echo (ping) request id=0x0e58, seq=9/2304, ttl=64 (reply in 20) |
| 20 | 7.998153000 | 10.0.0.2 | 10.0.0.1 | ICMP | 98 | Echo (ping) reply id=0x0e58, seq=9/2304, ttl=64 (request in 19) |
| 21 | 8.998105000 | 10.0.0.1 | 10.0.0.2 | ICMP | 98 | Echo (ping) request id=0x0e58, seq=10/2560, ttl=64 (reply in 22) |
| 22 | 8.998132000 | 10.0.0.2 | 10.0.0.1 | ICMP | 98 | Echo (ping) reply id=0x0e58, seq=10/2560, ttl=64 (request in 21) |
| 23 | 18.73127600( | fe80::7cb9:a7ff:fe83:1 | ff02::fb | MDNS | 107 | Standard query 0x0000 PTR _ipps._tcp.local, "QM" question PTR _ipp._tcp.local, "QM" question |

**(2)** h2 : s1-eth2 **when ping h1->h2**

Capturing from s1-eth2 [Wireshark 1.10.6 (v1.10.6 from master-1.10)]

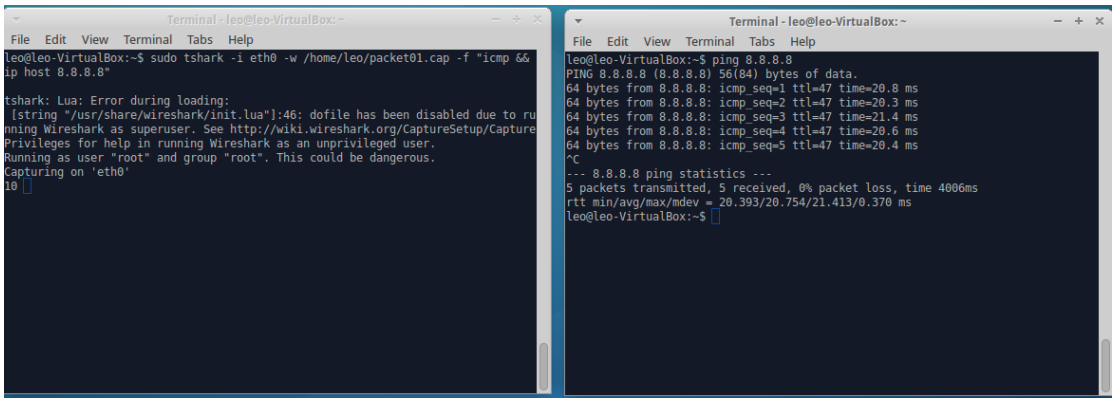
| No. | Time | Source | Destination | Protocol | Length | Info |
|---|---|---|---|---|---|---|
| 1 | 0.000000000 | 10.0.0.1 | 10.0.0.2 | ICMP | 98 | Echo (ping) request id=0x0e6e, seq=1/256, ttl=64 (reply in 2) |
| 2 | 0.000019000 | 10.0.0.2 | 10.0.0.1 | ICMP | 98 | Echo (ping) reply id=0x0e6e, seq=1/256, ttl=64 (request in 1) |
| 3 | 1.001010000 | 10.0.0.1 | 10.0.0.2 | ICMP | 98 | Echo (ping) request id=0x0e6e, seq=2/512, ttl=64 (reply in 4) |
| 4 | 1.001028000 | 10.0.0.2 | 10.0.0.1 | ICMP | 98 | Echo (ping) reply id=0x0e6e, seq=2/512, ttl=64 (request in 3) |
| 5 | 1.999920000 | 10.0.0.1 | 10.0.0.2 | ICMP | 98 | Echo (ping) request id=0x0e6e, seq=3/768, ttl=64 (reply in 6) |
| 6 | 1.999935000 | 10.0.0.2 | 10.0.0.1 | ICMP | 98 | Echo (ping) reply id=0x0e6e, seq=3/768, ttl=64 (request in 5) |
| 7 | 2.998908000 | 10.0.0.1 | 10.0.0.2 | ICMP | 98 | Echo (ping) request id=0x0e6e, seq=4/1024, ttl=64 (reply in 8) |
| 8 | 2.998925000 | 10.0.0.2 | 10.0.0.1 | ICMP | 98 | Echo (ping) reply id=0x0e6e, seq=4/1024, ttl=64 (request in 7) |
| 9 | 3.997908000 | 10.0.0.1 | 10.0.0.2 | ICMP | 98 | Echo (ping) request id=0x0e6e, seq=5/1280, ttl=64 (reply in 10) |
| 10 | 3.997924000 | 10.0.0.2 | 10.0.0.1 | ICMP | 98 | Echo (ping) reply id=0x0e6e, seq=5/1280, ttl=64 (request in 9) |
| 11 | 4.997557000 | 10.0.0.1 | 10.0.0.2 | ICMP | 98 | Echo (ping) request id=0x0e6e, seq=6/1536, ttl=64 (reply in 12) |
| 12 | 4.997575000 | 10.0.0.2 | 10.0.0.1 | ICMP | 98 | Echo (ping) reply id=0x0e6e, seq=6/1536, ttl=64 (request in 11) |
| 13 | 5.001877000 | d2:e8:37:9a:2a:da | 82:50:78:76:ba:57 | ARP | 42 | Who has 10.0.0.1? Tell 10.0.0.2 |
| 14 | 5.003895000 | 82:50:78:76:ba:57 | d2:e8:37:9a:2a:da | ARP | 42 | 10.0.0.1 is at 82:50:78:76:ba:57 |
| 15 | 5.998139000 | 10.0.0.1 | 10.0.0.2 | ICMP | 98 | Echo (ping) request id=0x0e6e, seq=7/1792, ttl=64 (reply in 16) |
| 16 | 5.998157000 | 10.0.0.2 | 10.0.0.1 | ICMP | 98 | Echo (ping) reply id=0x0e6e, seq=7/1792, ttl=64 (request in 15) |
| 17 | 6.997657000 | 10.0.0.1 | 10.0.0.2 | ICMP | 98 | Echo (ping) request id=0x0e6e, seq=8/2048, ttl=64 (reply in 18) |
| 18 | 6.997673000 | 10.0.0.2 | 10.0.0.1 | ICMP | 98 | Echo (ping) reply id=0x0e6e, seq=8/2048, ttl=64 (request in 17) |
| 19 | 7.997765000 | 10.0.0.1 | 10.0.0.2 | ICMP | 98 | Echo (ping) request id=0x0e6e, seq=9/2304, ttl=64 (reply in 20) |
| 20 | 7.997781000 | 10.0.0.2 | 10.0.0.1 | ICMP | 98 | Echo (ping) reply id=0x0e6e, seq=9/2304, ttl=64 (request in 19) |
| 21 | 8.997553000 | 10.0.0.1 | 10.0.0.2 | ICMP | 98 | Echo (ping) request id=0x0e6e, seq=10/2560, ttl=64 (reply in 22) |
| 22 | 8.997569000 | 10.0.0.2 | 10.0.0.1 | ICMP | 98 | Echo (ping) reply id=0x0e6e, seq=10/2560, ttl=64 (request in 21) |

# Part 2:

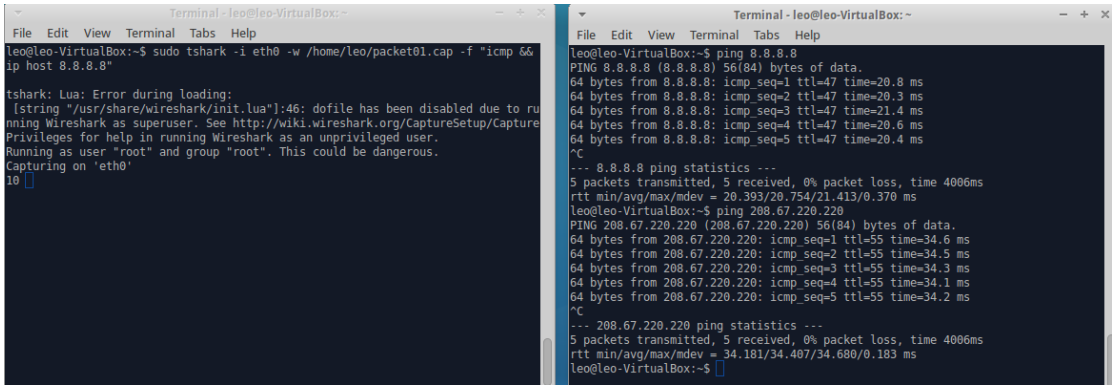
## 1. tshark

記錄指令 : **sudo tshark –i eth0 –w /home/leo/packet01.cap –f “icmp && ip host 8.8.8.8”**

**(1)ping 8.8.8.8**




**(2)ping 208.67.220.220**



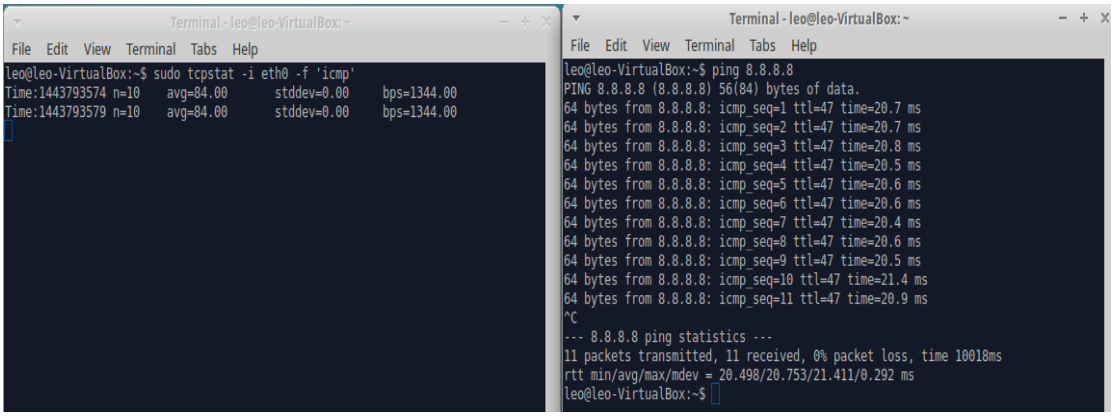

讀取指令 : **sudo tshark –r /home/leo/packet01.cap**

```
leo@leo-VirtualBox:~$ sudo tshark -r /home/leo/packet01.cap
tshark: Lua: Error during loading:
 [string "/usr/share/wireshark/init.lua"]:46: dofile has been disabled due to ru
nning Wireshark as superuser. See http://wiki.wireshark.org/CaptureSetup/Capture
Privileges for help in running Wireshark as an unprivileged user.
Running as user "root" and group "root". This could be dangerous.
  1 0.000000000 192.168.2.101 -> 8.8.8.8      ICMP 98 Echo (ping) request  id=0x
0b09, seq=1/256, ttl=64
  2 0.020789000      8.8.8.8 -> 192.168.2.101 ICMP 98 Echo (ping) reply    id=0x
0b09, seq=1/256, ttl=47 (request in 1)
  3 1.001294000 192.168.2.101 -> 8.8.8.8      ICMP 98 Echo (ping) request  id=0x
0b09, seq=2/512, ttl=64
  4 1.021669000      8.8.8.8 -> 192.168.2.101 ICMP 98 Echo (ping) reply    id=0x
0b09, seq=2/512, ttl=47 (request in 3)
  5 2.002558000 192.168.2.101 -> 8.8.8.8      ICMP 98 Echo (ping) request  id=0x
0b09, seq=3/768, ttl=64
  6 2.023951000      8.8.8.8 -> 192.168.2.101 ICMP 98 Echo (ping) reply    id=0x
0b09, seq=3/768, ttl=47 (request in 5)
  7 3.004566000 192.168.2.101 -> 8.8.8.8      ICMP 98 Echo (ping) request  id=0x
0b09, seq=4/1024, ttl=64
  8 3.025225000      8.8.8.8 -> 192.168.2.101 ICMP 98 Echo (ping) reply    id=0x
0b09, seq=4/1024, ttl=47 (request in 7)
  9 4.006656000 192.168.2.101 -> 8.8.8.8      ICMP 98 Echo (ping) request  id=0x
0b09, seq=5/1280, ttl=64
 10 4.027121000      8.8.8.8 -> 192.168.2.101 ICMP 98 Echo (ping) reply    id=0x
0b09, seq=5/1280, ttl=47 (request in 9)
leo@leo-VirtualBox:~$
```

## 2. tcpstat

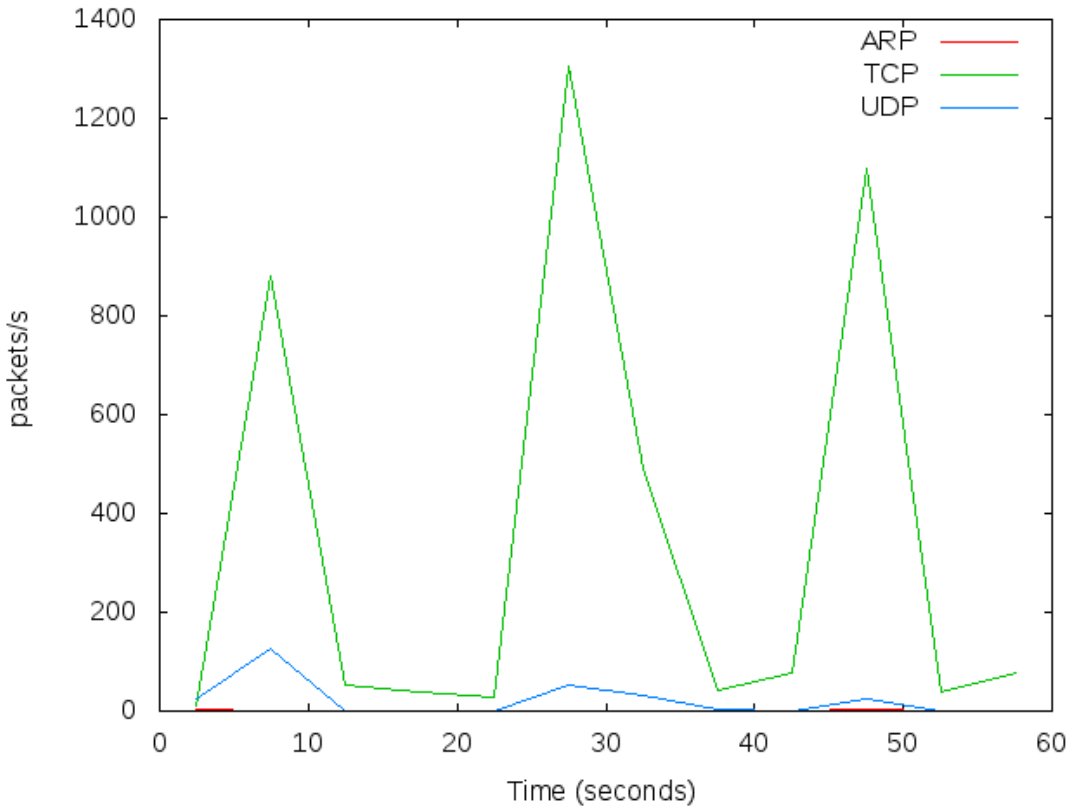
指令 ：**tcpstat –i eth0 –f ‘icmp’**

**When ping 8.8.8.8**



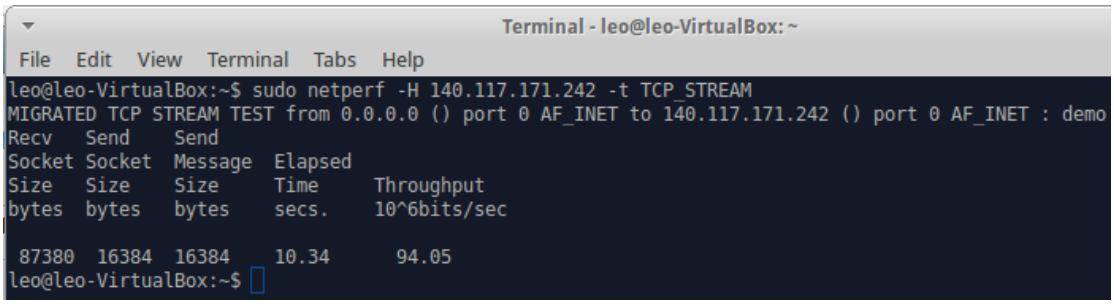

## 3. tcpdump & tcpstat & gnupolt

產生圖表如下圖 ：



# 4. netperf

**(1) TCP指令 : sudo netperf –H 140.117.171.242 –t TCP_STREAM**




**(2) UDP指令 : sudo netperf –H 140.117.171.242 –t UDP_STREAM - - -R1**