

108062586 楊子儀

1) Network topology:

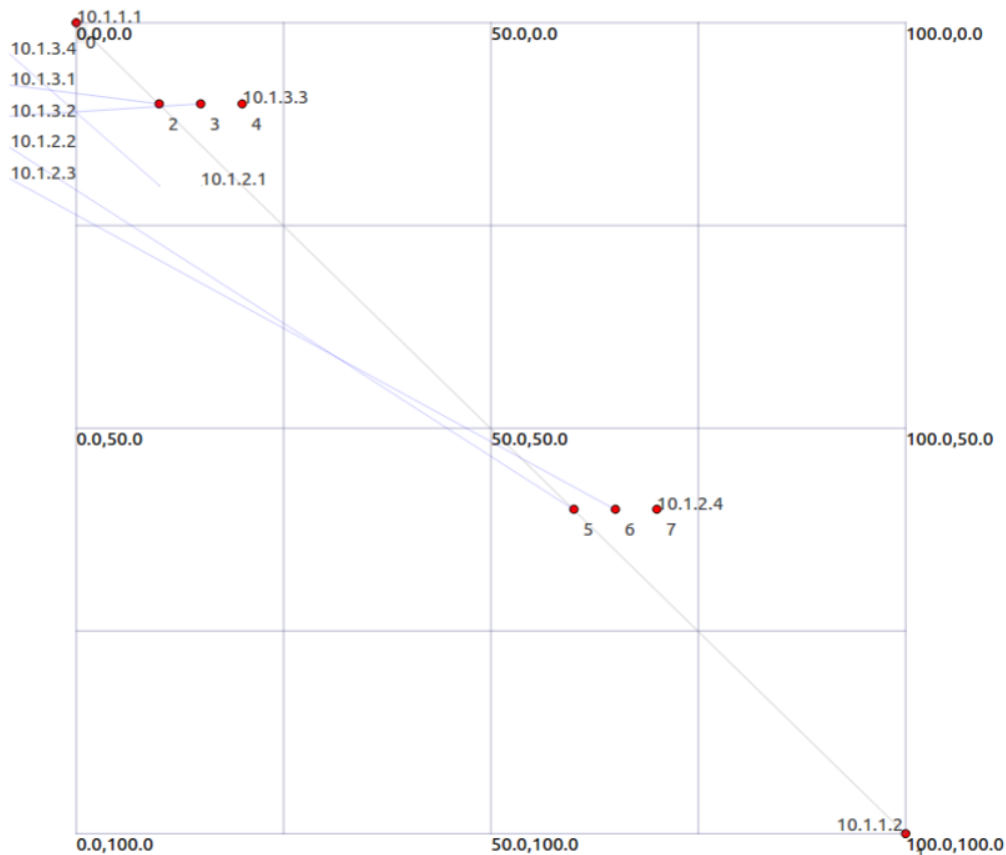
```

      Rank 0 | Rank 1
-----|-----
Wifi 10.1.3.0
      *      *      *      *
      |      |      |      |
n5      n6      n7      n0  10.1.1.0  AP
      |      |      |      |
      |      |      |      |
point-to-point | n1      n2      n3      n4
                  |      |      |      |
                  *      *      *      *
                  LAN 10.1.2.0

```

node 2, 3, 4 -> STA node

node 5, 6, 7 -> STA node



2) Using PointToPointHelper to build p2p connection

- 2 AP nodes build p2p network (10.1.1.x).
- 3) Using UdpEchoHelper to build applications
- 1 client (node 2) to multi server (node 6, 7)
- at time 2s:

server-> node 7 (10.1.2.4:12)
client-> node 2 (10.1.3.1:49153)

at time 7s

server-> node 6 (10.1.2.3:15)
client-> node 2 (10.1.3.1:49154)

```
At time 2s client sent 1024 bytes to 10.1.2.4 port 12
At time 2.02192s server received 1024 bytes from 10.1.3.1 port 49153
At time 2.02192s server sent 1024 bytes to 10.1.3.1 port 49153
At time 2.03984s client received 1024 bytes from 10.1.2.4 port 12
At time 7s client sent 1024 bytes to 10.1.2.3 port 15
At time 7.01513s server received 1024 bytes from 10.1.3.1 port 49154
At time 7.01513s server sent 1024 bytes to 10.1.3.1 port 49154
At time 7.02855s client received 1024 bytes from 10.1.2.3 port 15
```

- **My observation (.pcap file, animation and etc)**

1) pcap file:

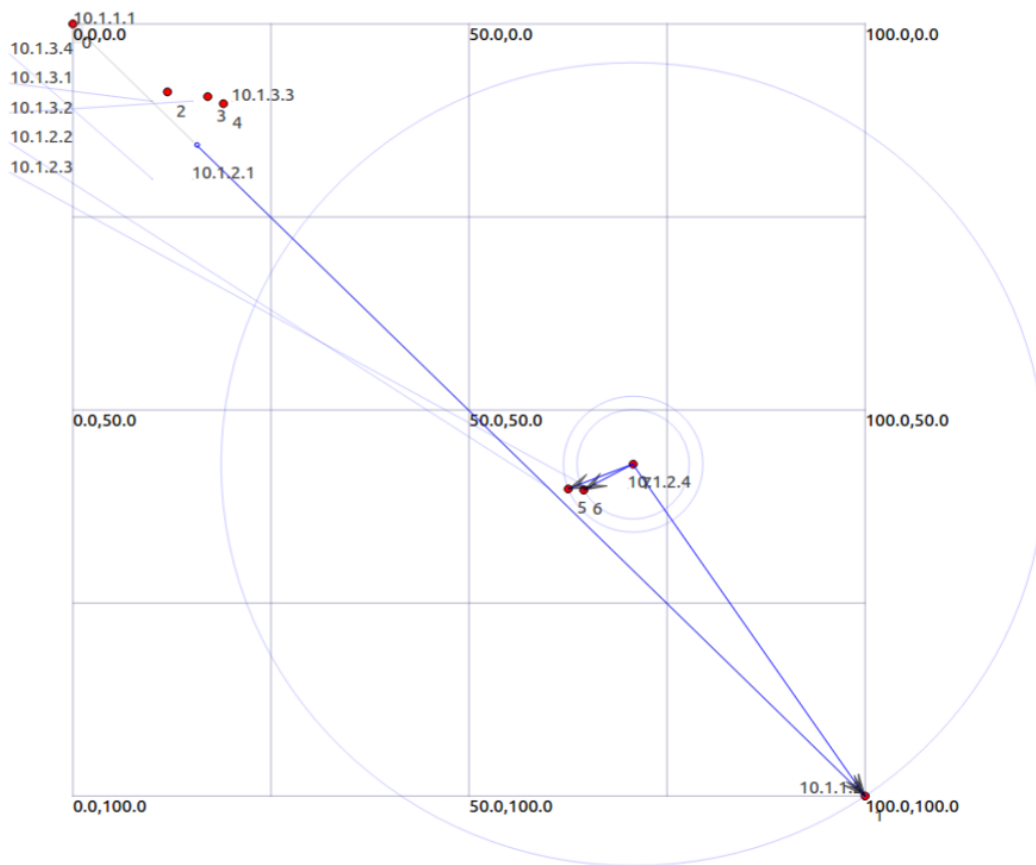
ap node 1 (10.1.1.1) -> p2p-0-0.pcap

```
hw1@hw1-Standard-PC-i440FX-PIIX-1996:~/Downloads/ns-allinone-3.26/ns-3.26$ tcpdump -nn -tt -r p2p-0-0.pcap
reading from file p2p-0-0.pcap, link-type PPP (PPP)
2.009169 IP 10.1.3.1.49153 > 10.1.2.4.12: UDP, length 1024
2.032791 IP 10.1.2.4.12 > 10.1.3.1.49153: UDP, length 1024
7.001476 IP 10.1.3.1.49154 > 10.1.2.3.15: UDP, length 1024
7.027071 IP 10.1.2.3.15 > 10.1.3.1.49154: UDP, length 1024
```

ap node 2 (10.1.1.2) -> p2p-1-0.pcap

```
hw1@hw1-Standard-PC-i440FX-PIIX-1996:~/Downloads/ns-allinone-3.26/ns-3.26$ tcpdump -nn -tt -r p2p-1-0.pcap
reading from file p2p-1-0.pcap, link-type PPP (PPP)
2.012855 IP 10.1.3.1.49153 > 10.1.2.4.12: UDP, length 1024
2.029105 IP 10.1.2.4.12 > 10.1.3.1.49153: UDP, length 1024
7.005162 IP 10.1.3.1.49154 > 10.1.2.3.15: UDP, length 1024
7.023385 IP 10.1.2.3.15 > 10.1.3.1.49154: UDP, length 1024
```

2) animation:



- **What you learn**

使用 NS-3 simulator 建立網路的拓撲，以及了解如何建立和執行一份 script，還有將模擬結果輸出成 animation 和 pcap。從中讓我大致了解 NS-3 抽象化描述現實生活中網路設備和連線建立的方式，最後完成兩個不同無線網路中的節點，能做到彼此 UDP 封包傳送。