

NSCAP HW6

Created @May 28, 2024 10:20 PM

Q1. h1 ping h2

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root@nscap2:/home/nscap2/shared# tcpdump -i h2-eth0 'icmp or arp'
tcpdump: verbose output suppressed, use -v or -vv for full protocol decode
listening on h2-eth0, link-type EN10MB (Ethernet), capture size 262144 bytes
22:19:11.443223 ARP, Request who-has 10.0.0.2 tell 10.0.0.1, length 28
22:19:11.443248 ARP, Reply 10.0.0.2 is-at be:33:9e:6b:7b:28 (oui Unknown), length 28
h 28
22:19:11.453559 IP 10.0.0.1 > 10.0.0.2: ICMP echo request, id 5579, seq 1, length 64
h 64
22:19:11.453583 IP 10.0.0.2 > 10.0.0.1: ICMP echo reply, id 5579, seq 1, length 64
22:19:12.443182 IP 10.0.0.1 > 10.0.0.2: ICMP echo request, id 5579, seq 2, length 64
h 64
22:19:12.443207 IP 10.0.0.2 > 10.0.0.1: ICMP echo reply, id 5579, seq 2, length 64
22:19:16.474307 ARP, Request who-has 10.0.0.1 tell 10.0.0.2, length 28
22:19:16.475376 ARP, Reply 10.0.0.1 is-at 22:a1:6c:00:0f:c3 (oui Unknown), length 28

"Node: h1"
root@nscap2:/home/nscap2/shared# tcpdump -i h1-eth0 'icmp or arp'
tcpdump: verbose output suppressed, use -v or -vv for full protocol decode
listening on h1-eth0, link-type EN10MB (Ethernet), capture size 262144 bytes
22:19:11.441384 ARP, Request who-has 10.0.0.2 tell 10.0.0.1, length 28
22:19:11.451505 ARP, Reply 10.0.0.2 is-at be:33:9e:6b:7b:28 (oui Unknown), length 28
h 28
22:19:11.451517 IP 10.0.0.1 > 10.0.0.2: ICMP echo request, id 5579, seq 1, length 64
h 64
22:19:11.454612 IP 10.0.0.2 > 10.0.0.1: ICMP echo reply, id 5579, seq 1, length 64
22:19:12.442940 IP 10.0.0.1 > 10.0.0.2: ICMP echo request, id 5579, seq 2, length 64
h 64
22:19:12.443212 IP 10.0.0.2 > 10.0.0.1: ICMP echo reply, id 5579, seq 2, length 64
22:19:16.475326 ARP, Request who-has 10.0.0.1 tell 10.0.0.2, length 28
22:19:16.475335 ARP, Reply 10.0.0.1 is-at 22:a1:6c:00:0f:c3 (oui Unknown), length 28
h 28

Connecting to remote controller at 127.0.0.1:6653
*** Adding hosts:
h1 h2 h3 h4
*** Adding switches:
s1
*** Adding links:
(s1, h1) (s1, h2) (s1, h3) (s1, h4)
*** Configuring hosts
h1 h2 h3 h4
*** Starting controller
c0
*** Starting 1 switches
s1 ...
*** Starting CLI:
mininet> xterm h1 h2
mininet> h1 ping h2 -c 2
PING 10.0.0.2 (10.0.0.2) 56(84) bytes of data:
64 bytes from 10.0.0.2: icmp_seq=1 ttl=64 time=13.3 ms
64 bytes from 10.0.0.2: icmp_seq=2 ttl=64 time=0.309 ms

--- 10.0.0.2 ping statistics ---
2 packets transmitted, 2 received, 0% packet loss, time 1002ms
rtt min/avg/max/ndev = 0.309/6.781/13.253/6.472 ms
mininet>
```

ARP :

h1 sent request

h2 received and replied

h1 received the reply

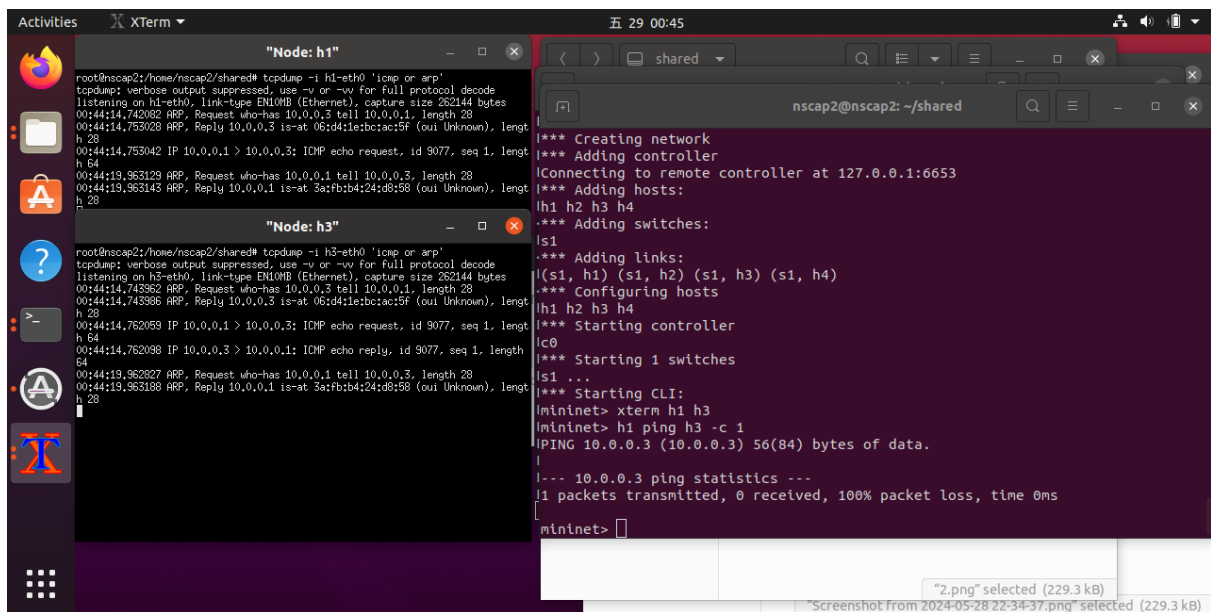
ICMP :

h1 sent request

h2 received and replied

h1 received the reply

Q2. h1 ping h3



ARP :

h1 sent request

h3 received and replied

h1 received the reply

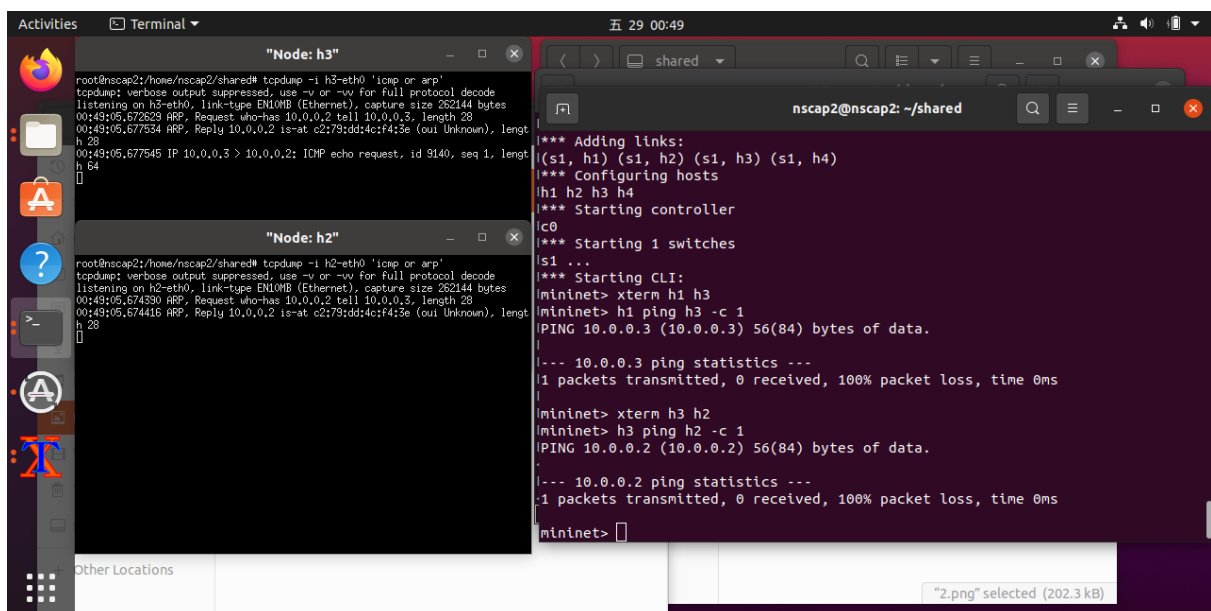
ICMP :

h1 sent request

h3 received and replied

h1 didn't received since the switch block the ICMP from port 3

Q3. h3 ping h2



ARP :

h3 sent request

h2 received and replied

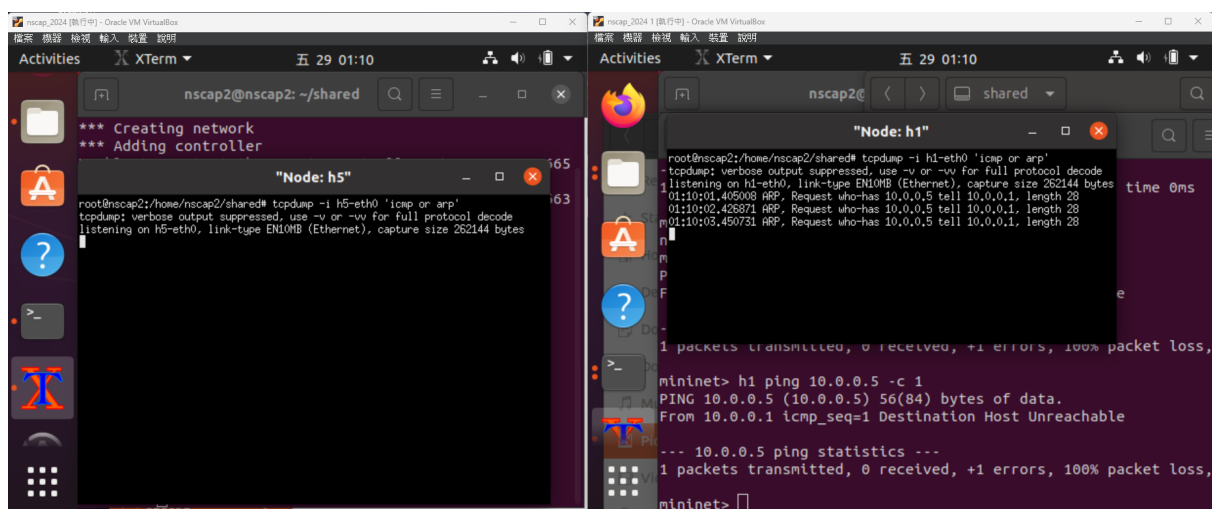
h3 received the reply

ICMP :

h3 sent request

h2 didn't received since the switch block the ICMP from port 3

Q4. h1 ping h5



ARP :

h1 sent request

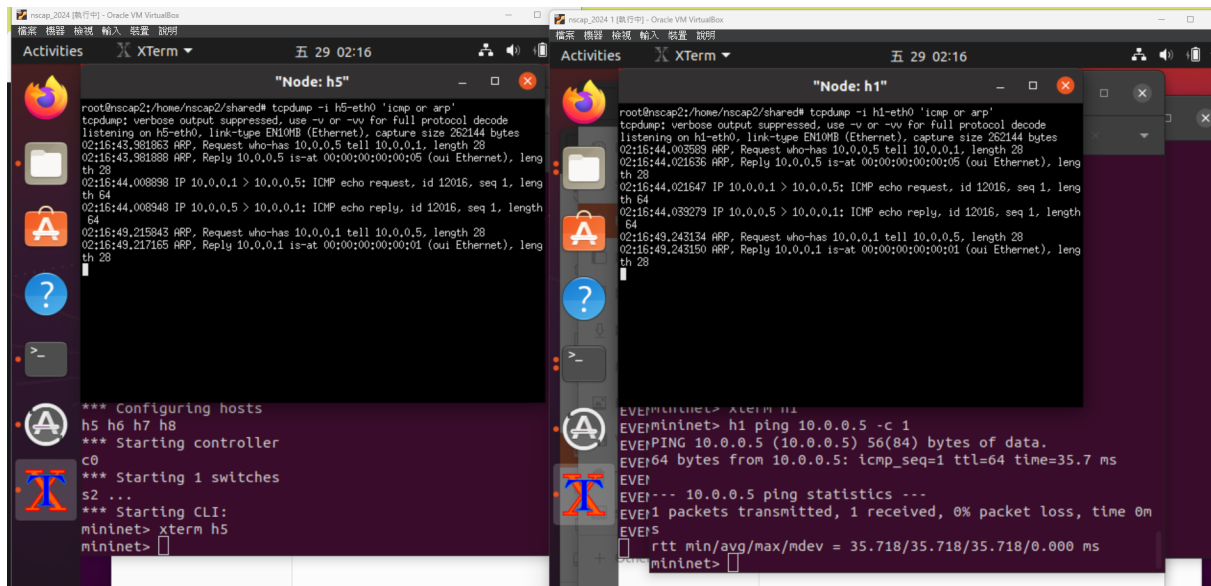
h1 sent request

h1 sent request

h5 didn't received since there is no tunnel between two topology

ICMP :

Q5. h1 ping h5



ARP :

h1 sent request

h5 received and replied

h1 received the reply

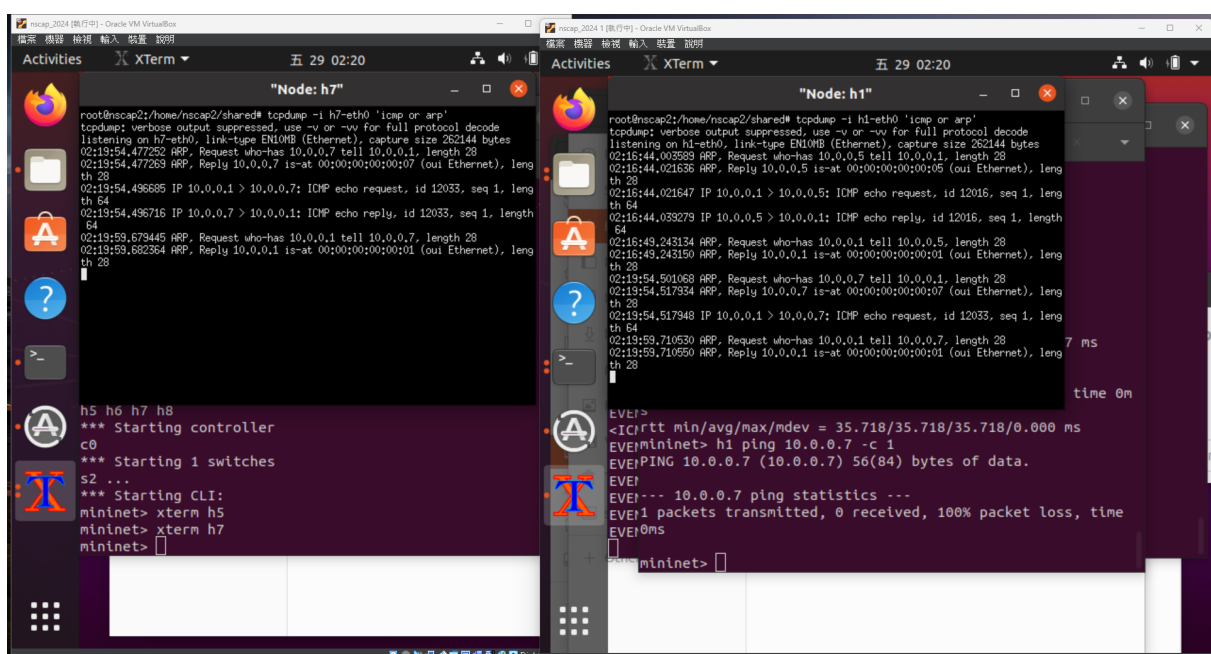
ICMP :

h1 sent request

h2 received and replied

h1 received the reply

Q6 h1 ping h7



ARP :

h1 sent request

h7 received and replied

h1 received the reply

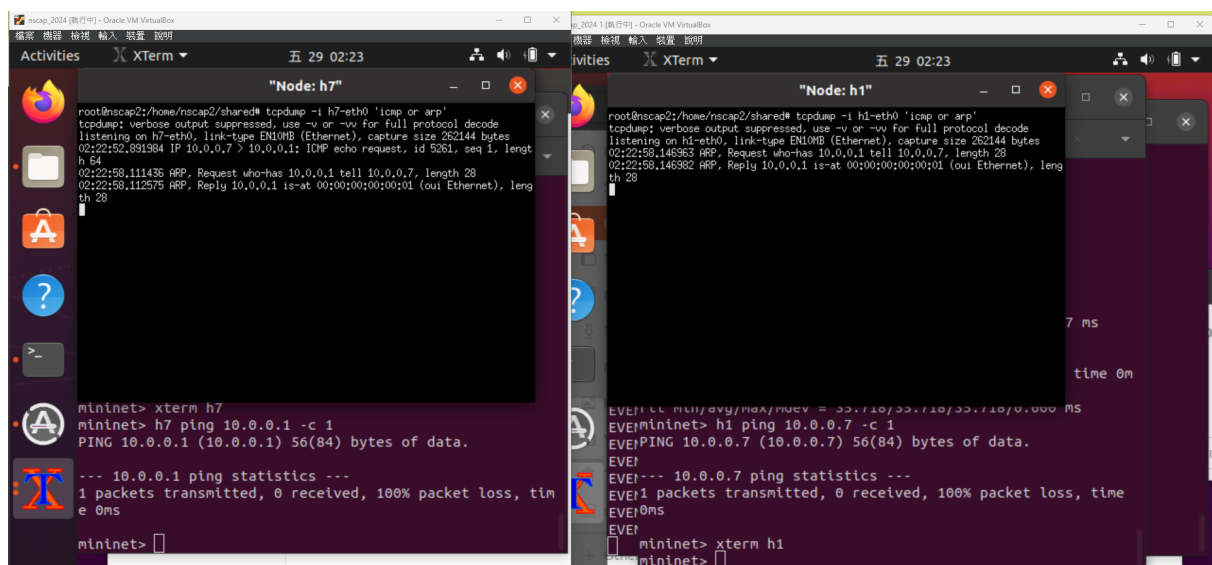
ICMP :

h1 sent request

h7 received and replied

h1 didn't receive the reply since the controller block the ICMP pkt to port3 in s2

Q7. h7 ping h1



ARP :

h1 sent request

h7 received and replied

h1 received the reply

ICMP :

h7 sent request

h1 didn't receive the request since controller will block ICMP pkt to port3 in s2

Q8. Are Q4 and Q6 or Q7 the same?

NO.

They are not the same since all pkt in Q4 was dropped by

no tunnel. On the other hand, only ICMP pkt in Q6 and Q7 dropped by switch 2.

Their different outcome:

→ Q4 has 3 ARP requests.

→ Q6 or Q7 can complete ARP requests.

Q9. Change Rule

If the rule change that ICMP pkt from port1 and port2 would be dropped, will the outcome of Q5, Q6, Q7 become different?

Yes.

- Q5 → original Q7 since it will dropped when the first time h1 want to send ICMP.
- Q6 and Q5 will become the same situation.
- Q7 → original Q5 since the ICMP reply of h1 will block by switch rule.