

Network System Capstone Homework 7 Report

1. When h1 ping h2, what will happen?

[illegible]

- ARP:
h1 send request -> h2 received and replied -> h1 received reply
- ICMP:
h1 send request -> h2 received and replied -> h1 received reply
-> ping SUCCESS!

2. When h1 ping h3, what will happen?

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"Node: h1" - □ ×
21:22:07.457326 IP6 fe80::acc2:ecff:febd:184e > ip6-allrouter root@nscap-vm1:/home/nscap# tcpdump
ers: ICMP6, router solicitation, length 16
21:22:15.638920 IP6 fe80::1944:b4ff:fe3a:731 > ip6-allrouter otocad.pir > ip6-allrouter listening on h3-eth0, link-type EN10MB (Ethernet), capture si
ers: ICMP6, router solicitation, length 16
21:22:23.197828 IP6 fe80::cd83:bfff:feaa:21b9.mdns > ff02::ze 262144 bytes
Fb.mdns: 0 [2q] PTR (QM?) _lpps._tcp.local, PTR (QM?) _lpps._tcp.local, length 16
21:22:27.925688 IP6 fe80::608a:2aff:fe67:bea0 > ip6-allrouter 1: ICMP6, router solicitation, length 16
ers: ICMP6, router solicitation, length 16
21:22:34.086222 IP6 fe80::cd83:bfff:feaa:21b9 > ip6-allrouter 21:22:39.315700 ARP, Request who-has 10.0.0.3 tell 10.0.0.1,
, length 28
ers: ICMP6, router solicitation, length 16
21:22:36.120137 IP6 fe80::cd0:b4ff:fe7b:39c3 > ip6-allrouter 21:22:39.315612 IP 10.0.0.1 > 10.0.0.3: ICMP echo request, id
ers: ICMP6, router solicitation, length 16
21:22:39.312555 ARP, Request who-has 10.0.0.3 tell 10.0.0.1 21:22:39.315637 IP 10.0.0.3 > 10.0.0.1: ICMP echo reply, id
, length 28
21:22:39.315246 ARP, Reply 10.0.0.3 is-at ae:c2:ecb2b:18:4e (oui Unknown), length 28
21:22:39.315257 IP 10.0.0.1 > 10.0.0.3: ICMP echo request,
id 49853, seq 1, length 64
21:22:45.086423 ARP, Request who-has 10.0.0.1 tell 10.0.0.3
, length 28
21:22:45.086440 ARP, Reply 10.0.0.1 is-at 62:8a:2a:67:be:a0
(oui Unknown), length 28
nscap@nscap-vm1: ~
nscap@nscap... x nscap@nscap... x nscap@nscap... x
mininet> h1 ping h3 -c 1
PING 10.0.0.3 (10.0.0.3) 56(84) bytes of data.

--- 10.0.0.3 ping statistics ---
1 packets transmitted, 0 received, 100% packet loss, time
0ms

mininet>
```


- ARP:
h1 send request -> h7 received and replied -> h1 received reply
- ICMP:
h1 send request -> h7 received and replied ->
Dropped by switch..... -> ping FAILED!

7. When h7 ping h1, what will happen?

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Node: h7
22:20:49.946660 IP6 fe80::c475:f5ff:fe45:dcfd > ip6-allrouters: ICMP6, router solicitation, length 16
22:20:56.168500 IP6 fe80::b851:7ff:feed:279a > ip6-allrouters: ICMP6, router solicitation, length 16
22:21:00.353314 IP6 fe80::80c0:75ff:fe0b:f851 > ip6-allrouters: ICMP6, router solicitation, length 16
22:21:02.241093 IP6 fe80::e0f0:71ff:fead:1658 > ip6-allrouters: ICMP6, router solicitation, length 16
22:21:04.285766 IP6 fe80::74a0:f1ff:fe92:5134 > ip6-allrouters: ICMP6, router solicitation, length 16
22:21:06.332760 IP6 fe80::40d1:c6ff:feaf:250c > ip6-allrouters: ICMP6, router solicitation, length 16
22:21:07.521387 IP6 fe80::c475:f5ff:fe45:dcfd.mdns > ff02::fb.mdns: 0 [2q] PTR (QM)? _ipps._tcp.local. PTR (QM)? _ipp._tcp.local. (45)
22:21:10.507090 IP6 fe80::2f:64ff:feee:e283 > ip6-allrouters: ICMP6, router solicitation, length 16
22:21:17.207126 ARP, Request who-has 10.0.0.1 tell 10.0.0.7, length 28
22:21:17.218491 ARP, Reply 10.0.0.1 is-at ba:51:07:ed:27:9a (oui Unknown), length 28
22:21:17.218518 IP 10.0.0.7 > 10.0.0.1: ICMP echo request, id 33722, seq 1, length 64
22:21:20.668562 IP6 fe80::28a8:19ff:fe48:d822 > ip6-allrouters: ICMP6, router solicitation, length 16

Node: h1
22:20:43.872372 IP6 fe80::9007:1bfff:fe72:17fd > ip6-allrouters: ICMP6, router solicitation, length 16
22:20:54.101539 IP6 fe80::44ae:6eff:fe2f:cf17 > ip6-allrouters: ICMP6, router solicitation, length 16
22:20:56.161394 IP6 fe80::b851:7ff:feed:279a > ip6-allrouters: ICMP6, router solicitation, length 16
22:21:00.347535 IP6 fe80::80c0:75ff:fe0b:f851 > ip6-allrouters: ICMP6, router solicitation, length 16
22:21:01.163790 IP6 fe80::44ae:6eff:fe2f:cf17.mdns > ff02::fb.mdns: 0 [2q] PTR (QM)? _ipps._tcp.local. PTR (QM)? _ipp._tcp.local. (45)
22:21:02.238257 IP6 fe80::e0f0:71ff:fead:1658 > ip6-allrouters: ICMP6, router solicitation, length 16
22:21:04.286039 IP6 fe80::74a0:f1ff:fe92:5134 > ip6-allrouters: ICMP6, router solicitation, length 16
22:21:06.330181 IP6 fe80::40d1:c6ff:feaf:250c > ip6-allrouters: ICMP6, router solicitation, length 16
22:21:10.501599 IP6 fe80::2f:64ff:feee:e283 > ip6-allrouters: ICMP6, router solicitation, length 16
22:21:17.208097 ARP, Request who-has 10.0.0.1 tell 10.0.0.7, length 28
22:21:17.208121 ARP, Reply 10.0.0.1 is-at ba:51:07:ed:27:9a (oui Unknown), length 28
22:21:20.666217 IP6 fe80::28a8:19ff:fe48:d822 > ip6-allrouters: ICMP6, router solicitation, length 16

nscap@nscap-vm2: ~
mininet> h7 ping h1 -c 1
PING 10.0.0.1 (10.0.0.1) 56(84) bytes of data.

--- 10.0.0.1 ping statistics ---
1 packets transmitted, 0 received, 100% packet loss, time 0ms

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- ARP:
h7 send request -> h1 received and replied -> h7 received reply
- ICMP:
h7 send request ->
Dropped by switch..... -> ping FAILED!

8. If the packet in question 6 or 7 is dropped in some part of the network, are the outcome and explanation the same as that of question 4? (use screenshot to prove)

以實驗結果來講，他們是不同階段被Drop掉的(圖請看上方各小題):

Q4是因為s1, s2之間當時還沒有GRE Tunnel, 所以ARP連Reply都沒有
Q6Q7時已經建立switch間的GRE Tunnel, 但被Drop掉的階段稍有不同, Q6是因為ICMP Reply是來自switch port3所以被Drop, Q7是因為ICMP Req就是來自switch port3所以被Drop。

9. Change filter_table2 rule

From: packets coming from port_3 or port_4 will be dropped, while other packets will be allowed to pass.

To: packets coming from port_1 or port_2 will be allowed to pass, while other packets will be dropped.

Will the outcome of questions 5, 6, and 7 differ? (no need to print screenshot) explain why or why not.

應該是一樣的, 因為s1, s2只有接1-4號port, filter_table2又只有ICMP Packets, 因此結果一樣。