SDN - Lab 2

Yi-Ting Shih (111550013)
National Yang Ming Chaio Tung University
ytshih@cs.nycu.edu.tw

1. Part 1: Answer Questions

1. How many distinct OpenFlow headers with type “OFPT_FLOW_MOD” and command “OFPFC_ADD” are there among all the packets?

There are 6 distinct OpenFlow headers.

2. Following question 1, what are the match fields, and what are the corresponding actions?

Match fields	actions	Timeout values
ETH_TYPE=LLDP	output port=controller	0
ETH_TYPE=ARP	output port=controller	0
ETH_TYPE=BDDP	output port=controller	0
ETH_TYPE=IPv4	output port=controller	0
IN_PORT=1, ETH_DST=0a:01:ca:16:e6:f2, ETH_SRC=16:e8:32:bf:62:44	output port=2	0
IN_PORT=2, ETH_DST=16:e8:32:bf:62:44, ETH_SRC=0a:01:ca:16:e6:f2	output port=1	0

3. What are the Idle Timeout values for all flow rules on s1 in the GUI?

10

2. Part 2: Install Flow Rules

> arping

```
mininet> h1 arping h2
ARPING 10.0.0.2
42 bytes from ae:5b:e8:aa:27:2c (10.0.0.2): index=0 time=202.952 usec
42 bytes from ae:5b:e8:aa:27:2c (10.0.0.2): index=1 time=3.418 usec
42 bytes from ae:5b:e8:aa:27:2c (10.0.0.2): index=2 time=3.050 usec
42 bytes from ae:5b:e8:aa:27:2c (10.0.0.2): index=3 time=3.796 usec
42 bytes from ae:5b:e8:aa:27:2c (10.0.0.2): index=4 time=3.305 usec
42 bytes from ae:5b:e8:aa:27:2c (10.0.0.2): index=5 time=3.392 usec
42 bytes from ae:5b:e8:aa:27:2c (10.0.0.2): index=6 time=3.051 usec
42 bytes from ae:5b:e8:aa:27:2c (10.0.0.2): index=7 time=3.893 usec
42 bytes from ae:5b:e8:aa:27:2c (10.0.0.2): index=8 time=3.105 usec
^C
--- 10.0.0.2 statistics ---
9 packets transmitted, 9 packets received,   0% unanswered (0 extra)
rtt min/avg/max/std-dev = 0.003/0.026/0.203/0.063 ms
```

> ping

```
mininet> h1 ping h2
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=0.356 ms
64 bytes from 10.0.0.2: icmp_seq=2 ttl=64 time=0.031 ms
64 bytes from 10.0.0.2: icmp_seq=3 ttl=64 time=0.034 ms
64 bytes from 10.0.0.2: icmp_seq=4 ttl=64 time=0.032 ms
^C
--- 10.0.0.2 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3099ms
rtt min/avg/max/mdev = 0.031/0.113/0.356/0.140 ms
mininet>
```

3. Part 3: Trace ReactiveForwarding

[C] - Control Plane [D] - Data Plane

- [D] h1 send ARP request with broadcast.

- [C] s1 sends the ARP request with packet-in to ONOS controller.
- [C] Controller choose to flood the ARP request and send packet-out.
- [D] s1 floods the ARP request.
- [D] h2 replies h1 with ARP reply.
- [C] s1 sends the ARP request with packet-in to ONOS controller.
- [C] Controller choose to send the ARP reply to h1 and send packet-out.
- [D] s1 sends the ARP reply to h1.
- [D] h1 sends ICMP echo request to h2.
- [C] s1 sends ICMP echo request with packet-in to ONOS controller.
- [C] Controller install rules for ICMP traffic.
- [D] s1 forwards the ICMP packet to h2.