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CMPE 150
Due 03/04

Lab 3:

1. pingall

```
*** Ping: testing ping reachability
h1 -> X X X
h2 -> X X X
h3 -> X X X
h4 -> X X X
*** Results: 100% dropped (0/12 received)
```

As expected, pingall fails for all transfers. This is because pingall is an ICMPv4 protocol while the filter only accepts TCP(/ipv4) and ARP connections.

2. dpctl dump-flows

```
mininet> dpctl dump-flows
*** s1 ------------------------------------------------------------------------
NXST_FLOW reply (xid=0x4):
 cookie=0x0, duration=60.704s, table=0, n_packets=2, n_bytes=84, idle_timeout=1000, hard_timeout=3000, idle_age=31, arp,dl_src=00:00:00:00:00:04,dl_dst=00:00:00:00:00:03 actions=output:3
 cookie=0x0, duration=120.723s, table=0, n_packets=3, n_bytes=126, idle_timeout=1000, hard_timeout=3000, idle_age=51, arp,dl_src=00:00:00:00:00:01,dl_dst=00:00:00:00:00:04 actions=output:4
 cookie=0x0, duration=91.685s, table=0, n_packets=3, n_bytes=126, idle_timeout=1000, hard_timeout=3000, idle_age=41, arp,dl_src=00:00:00:00:00:02,dl_dst=00:00:00:00:00:04 actions=output:4
 cookie=0x0, duration=121.69s, table=0, n_packets=2, n_bytes=84, idle_timeout=1000, hard_timeout=3000, idle_age=51, arp,dl_src=00:00:00:00:00:04,dl_dst=00:00:00:00:00:01 actions=output:1
 cookie=0x0, duration=100.72s, table=0, n_packets=2, n_bytes=84, idle_timeout=1000, hard_timeout=3000, idle_age=71, arp,dl_src=00:00:00:00:00:03,dl_dst=00:00:00:00:00:02 actions=output:2
 cookie=0x0, duration=61.674s, table=0, n_packets=3, n_bytes=126, idle_timeout=1000, hard_timeout=3000, idle_age=31, arp,dl_src=00:00:00:00:00:03,dl_dst=00:00:00:00:00:04 actions=output:4
 cookie=0x0, duration=141.695s, table=0, n_packets=2, n_bytes=84, idle_timeout=1000, hard_timeout=3000, idle_age=111, arp,dl_src=00:00:00:00:00:02,dl_dst=00:00:00:00:00:01 actions=output:1
 cookie=0x0, duration=140.726s, table=0, n_packets=2, n_bytes=84, idle_timeout=1000, hard_timeout=3000, idle_age=111, arp,dl_src=00:00:00:00:00:01,dl_dst=00:00:00:00:00:02 actions=output:2
 cookie=0x0, duration=130.724s, table=0, n_packets=3, n_bytes=126, idle_timeout=1000, hard_timeout=3000, idle_age=81, arp,dl_src=00:00:00:00:00:01,dl_dst=00:00:00:00:00:03 actions=output:3
 cookie=0x0, duration=101.686s, table=0, n_packets=3, n_bytes=126, idle_timeout=1000, hard_timeout=3000, idle_age=71, arp,dl_src=00:00:00:00:00:02,dl_dst=00:00:00:00:00:03 actions=output:3
 cookie=0x0, duration=90.718s, table=0, n_packets=2, n_bytes=84, idle_timeout=1000, hard_timeout=3000, idle_age=41, arp,dl_src=00:00:00:00:00:04,dl_dst=00:00:00:00:00:02 actions=output:2
 cookie=0x0, duration=131.693s, table=0, n_packets=2, n_bytes=84, idle_timeout=1000, hard_timeout=3000, idle_age=81, arp,dl_src=00:00:00:00:00:03,dl_dst=00:00:00:00:00:01 actions=output:1
```

After the pingall command, this is the result of dpctl dump-flows. This is the result of the entries installed by switch via of_flow_mod. Timeout is set to 1000 for idle and 3000 for hard timeout.

3. iperf

```
mininet> iperf
*** Iperf: testing TCP bandwidth between h1 and h4
*** Results: ['23.9 Gbits/sec', '23.9 Gbits/sec']
```

As expected, iperf passes for TCP connection. Similar to pingall, except we have an exception for TCP connetions to go through, so we get above result with a sucessful transfer. The switch sees that the packet has a dl_type of 0x800 and a nw_proto of 6 so it lets it through.