Michael Lau
mlau10@ucsc.edu
1493231
Lab 3
2/27/18

1. Pingall failed because the firewall only allows ARP and TCP and therefore pingall (ICMP) is blocked.

```
*** 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)
```

2. dpctl dump-flows. I had to set idle and hard timeouts to a high number (35, 70) to show results. These are entries I installed for of_flow_mod and show things like packets, bytes, and timeout.

```
mininet> dpctl dump-flows
*** s1 ---------------------------------------------------------------
NXST_FLOW reply (xid=0x4):
 cookie=0x0, duration=12.209s, table=0, n_packets=440987, n_bytes=29123830, idle
_timeout=35, hard_timeout=70, idle_age=7, tcp,vlan_tci=0x0000,dl_src=00:00:00:00
:00:04,dl_dst=00:00:00:00:00:01,nw_src=10.0.1.40,nw_dst=10.0.1.10,nw_tos=0,tp_sr
c=5001,tp_dst=40799 actions=ALL
 cookie=0x0, duration=12.212s, table=0, n_packets=754663, n_bytes=33324684518, i
dle_timeout=35, hard_timeout=70, idle_age=7, tcp,vlan_tci=0x0000,dl_src=00:00:00
:00:00:01,dl_dst=00:00:00:00:00:04,nw_src=10.0.1.10,nw_dst=10.0.1.40,nw_tos=0,tp
_src=40799,tp_dst=5001 actions=ALL
 cookie=0x0, duration=12.222s, table=0, n_packets=4, n_bytes=272, idle_timeout=3
5, hard_timeout=70, idle_age=12, tcp,vlan_tci=0x0000,dl_src=00:00:00:00:00:01,dl
_dst=00:00:00:00:00:04,nw_src=10.0.1.10,nw_dst=10.0.1.40,nw_tos=16,tp_src=40798,
tp_dst=5001 actions=ALL
 cookie=0x0, duration=12.221s, table=0, n_packets=3, n_bytes=206, idle_timeout=3
5, hard_timeout=70, idle_age=12, tcp,vlan_tci=0x0000,dl_src=00:00:00:00:00:04,dl
_dst=00:00:00:00:00:01,nw_src=10.0.1.40,nw_dst=10.0.1.10,nw_tos=0,tp_src=5001,tp
_dst=40798 actions=ALL
 cookie=0x0, duration=12.226s, table=0, n_packets=1, n_bytes=42, idle_timeout=35
, hard_timeout=70, idle_age=12, arp,vlan_tci=0x0000,dl_src=00:00:00:00:00:04,dl_
dst=00:00:00:00:00:01,arp_spa=10.0.1.40,arp_tpa=10.0.1.10,arp_op=2 actions=ALL
 cookie=0x0, duration=12.231s, table=0, n_packets=1, n_bytes=42, idle_timeout=35
, hard_timeout=70, idle_age=12, arp,vlan_tci=0x0000,dl_src=00:00:00:00:00:01,dl_
dst=ff:ff:ff:ff:ff:ff,arp_spa=10.0.1.10,arp_tpa=10.0.1.40,arp_op=1 actions=ALL
```

3. Iperf succeeds because TCP is allowed and shows that throughput between switches is about 54.35Gbit/s.

```
mininet> iperf
*** Iperf: testing TCP bandwidth between h1 and h4
*** Results: ['54.3 Gbits/sec', '54.4 Gbits/sec']
```