

LAB 05

Multipath Load Balancer

```
-----
Client connecting to 192.168.1.2, TCP port 5001
TCP window size: 442 KByte (default)
-----
[ 3] local 192.168.1.1 port 39848 connected with 192.168.1.2 port 5001
[ 4] local 192.168.1.1 port 39858 connected with 192.168.1.2 port 5001
[ 5] local 192.168.1.1 port 39864 connected with 192.168.1.2 port 5001
[ 6] local 192.168.1.1 port 39868 connected with 192.168.1.2 port 5001
[ 7] local 192.168.1.1 port 39876 connected with 192.168.1.2 port 5001
[ ID] Interval          Transfer          Bandwidth
[ 5]  0.0-60.2 sec    16.7 GBytes      2.39 Gbits/sec
[ 6]  0.0-60.2 sec    16.5 GBytes      2.35 Gbits/sec
[ 7]  0.0-60.2 sec    16.5 GBytes      2.35 Gbits/sec
[ 3]  0.0-60.2 sec    16.1 GBytes      2.29 Gbits/sec
[ 4]  0.0-60.2 sec    16.1 GBytes      2.30 Gbits/sec
[SUM] 0.0-60.2 sec    81.8 GBytes      11.7 Gbits/sec
mininet>
```

```
student@VM1:~$ sudo ovs-ofctl -O OpenFlow13 dump-flows s1
cookie=0x0, duration=59.428s, table=0, n_packets=1, n_bytes=70, priority=100,in_port="s1-eth1" actions=output:"s1-eth3"
cookie=0x0, duration=55.203s, table=0, n_packets=0, n_bytes=0, priority=100,in_port="s1-eth2" actions=output:"s1-eth3"
cookie=0x0, duration=47.074s, table=0, n_packets=0, n_bytes=0, priority=100,in_port="s1-eth3" actions=group:50
student@VM1:~$ sudo ovs-ofctl -O OpenFlow13 dump-flows s2
cookie=0x0, duration=296.464s, table=0, n_packets=3, n_bytes=247, priority=100,in_port="s2-eth1" actions=output:"s2-eth2"
cookie=0x0, duration=288.598s, table=0, n_packets=5, n_bytes=424, priority=100,in_port="s2-eth2" actions=output:"s2-eth1"
student@VM1:~$ sudo ovs-ofctl -O OpenFlow13 dump-flows s3
cookie=0x0, duration=285.781s, table=0, n_packets=2, n_bytes=177, priority=100,in_port="s3-eth1" actions=output:"s3-eth2"
cookie=0x0, duration=278.716s, table=0, n_packets=2, n_bytes=177, priority=100,in_port="s3-eth2" actions=output:"s3-eth1"
student@VM1:~$ sudo ovs-ofctl -O OpenFlow13 dump-flows s4
cookie=0x0, duration=276.082s, table=0, n_packets=6, n_bytes=494, priority=100,in_port="s4-eth1" actions=output:"s4-eth2"
cookie=0x0, duration=271.042s, table=0, n_packets=3, n_bytes=247, priority=100,in_port="s4-eth2" actions=output:"s4-eth1"
student@VM1:~$ sudo ovs-ofctl -O OpenFlow13 dump-flows s5
cookie=0x0, duration=48.327s, table=0, n_packets=2, n_bytes=140, priority=100,in_port="s5-eth1" actions=output:"s5-eth3"
cookie=0x0, duration=41.697s, table=0, n_packets=0, n_bytes=0, priority=100,in_port="s5-eth2" actions=output:"s5-eth3"
cookie=0x0, duration=34.376s, table=0, n_packets=0, n_bytes=0, priority=100,in_port="s5-eth3" actions=group:51
student@VM1:~$ sudo ovs-ofctl -O OpenFlow13 dump-group-stats s1
OFPST_GROUP reply (OF1.3) (xid=0x6):
  group_id=50,duration=316.808s,ref_count=1,packet_count=1773703,byte_count=87974445434,bucket0:packet_count=893598,byte_count=443986
  23480,bucket1:packet_count=880105,byte_count=43575821954
student@VM1:~$
```

Meter Table:

```
mininet> h1 iperf -u -c h2 -b 10m
-----
Client connecting to 10.0.0.2, UDP port 5001
Sending 1470 byte datagrams, IPG target: 1176.00 us (kalman adjust)
UDP buffer size: 208 KByte (default)
-----
[ 3] local 10.0.0.1 port 53621 connected with 10.0.0.2 port 5001
read failed: Connection refused
[ 3] WARNING: did not receive ack of last datagram after 5 tries.
[ ID] Interval          Transfer          Bandwidth
[ 3]  0.0-10.0 sec    11.9 MBytes      10.0 Mbits/sec
[ 3] Sent 8504 datagrams
mininet> h2 iperf -u -c h1 -b 10m
-----
Client connecting to 10.0.0.1, UDP port 5001
Sending 1470 byte datagrams, IPG target: 1176.00 us (kalman adjust)
UDP buffer size: 208 KByte (default)
-----
[ 3] local 10.0.0.2 port 48188 connected with 10.0.0.1 port 5001
read failed: Connection refused
[ 3] WARNING: did not receive ack of last datagram after 2 tries.
[ ID] Interval          Transfer          Bandwidth
[ 3]  0.0-10.0 sec    11.9 MBytes      10.0 Mbits/sec
[ 3] Sent 8504 datagrams
mininet>
```

```

student@VM1:~$ sudo ovs-ofctl -O OpenFlow13 dump-flows s1
cookie=0x0, duration=45.454s, table=0, n_packets=0, n_bytes=0, priority=100,dl_dst=ff:ff:ff:ff:ff:ff actions=FLOOD
cookie=0x0, duration=35.888s, table=0, n_packets=0, n_bytes=0, priority=100,dl_dst=00:00:00:00:00:01 actions=meter:1,output:"s1-eth1"
cookie=0x0, duration=31.912s, table=0, n_packets=0, n_bytes=0, priority=100,dl_dst=00:00:00:00:00:02 actions=output:"s1-eth2"
cookie=0x0, duration=124.853s, table=0, n_packets=4, n_bytes=280, priority=0 actions=CONTROLLER:65535
student@VM1:~$ sudo ovs-ofctl -O OpenFlow13 dump-meters s1
DPST_METER_CONFIG reply (OF1.3) (xid=0x2):
meter=1 kbps bands=
type=drop rate=1000
student@VM1:~$ ovs-ofctl -O OpenFlow13 meter-stats s1
ovs-ofctl: /var/run/openvswitch/s1.mgmt: failed to open socket (Permission denied)
student@VM1:~$ sudo ovs-ofctl -O OpenFlow13 meter-stats s1
DPST_METER reply (OF1.3) (xid=0x2):
meter:1 flow_count:1 packet_in_count:8527 byte_in_count:12871270 duration:222.042s bands:
0: packet_count:7596 byte_count:11485152
student@VM1:~$

```

FLOW MANAGER:

Packets being dropped for h1 from h3 or h4

```

mininet> h3 ping h1
PING 10.1.1.1 (10.1.1.1) 56(84) bytes of data.
^C
--- 10.1.1.1 ping statistics ---
9 packets transmitted, 0 received, 100% packet loss, time 8188ms

mininet> h4 ping h1
PING 10.1.1.1 (10.1.1.1) 56(84) bytes of data.
^C
--- 10.1.1.1 ping statistics ---
4 packets transmitted, 0 received, 100% packet loss, time 3069ms

mininet> pingall
*** Ping: testing ping reachability
h1 -> h2 X X
h2 -> h1 h3 h4
h3 -> X h2 h4
h4 -> X h2 h3
*** Results: 33% dropped (8/12 received)
mininet>

```

After deleting the flow we added before, h1 can ping h3 now

```

mininet> pingall
*** Ping: testing ping reachability
h1 -> h2 X X
h2 -> h1 h3 h4
h3 -> X h2 h4
h4 -> X h2 h3
*** Results: 33% dropped (8/12 received)
mininet> pingall
*** Ping: testing ping reachability
h1 -> h2 h3 h4
h2 -> h1 h3 h4
h3 -> h1 h2 h4
h4 -> h1 h2 h3
*** Results: 0% dropped (12/12 received)
mininet>


```

Deleting flow with OUTPUT Port number 1:

Flow Table 0

<div><input type="checkbox"/></div>	PRIORITY	MATCH FIELDS	COOKIE	DURATION	IDLE TIMEOUT	HARD TIMEOUT	INSTRUCTIONS	PACKET COUNT	BYTE COUNT	F
<div><input type="checkbox"/></div>	65535	eth_dst = 01:80:c2:00:00:0e eth_type = 35020	0	373	0	0	OUTPUT:CONTROLLER	830	49800	0
<div><input type="checkbox"/></div>	1	in_port = 1 eth_src = 00:00:00:00:00:01 eth_dst = 00:00:00:00:00:03	0	354	0	0	OUTPUT:2	9	546	0
<div><input type="checkbox"/></div>	1	in_port = 1 eth_src = 00:00:00:00:00:01 eth_dst = 00:00:00:00:00:04	0	354	0	0	OUTPUT:2	9	546	0
<div><input type="checkbox"/></div>	1	in_port = 1 eth_src = 00:00:00:00:00:02 eth_dst = 00:00:00:00:00:03	0	354	0	0	OUTPUT:2	10	700	0
<div><input type="checkbox"/></div>	1	in_port = 1 eth_src = 00:00:00:00:00:02 eth_dst = 00:00:00:00:00:04	0	354	0	0	OUTPUT:2	10	700	0
<div><input type="checkbox"/></div>	0	ANY	0	373	0	0	OUTPUT:CONTROLLER	110	10362	0

Deleting All Flows:



Flow Tables

Home

Flows

Groups

Meters

Flow Control

Group Control

Meter Control

SW_1

SW_2

SW_3

Not flows to show!