

Antoine Rocha  
10/10/18

## CE 150 lab1

1)

```
switch1 = self.addSwitch('s1')    ## Adds a Switch
switch2 = self.addSwitch('s2')
switch3 = self.addSwitch('s3')

host1 = self.addHost('h1')        ## Adds a Host
host2 = self.addHost('h2')
host3 = self.addHost('h3')
host4 = self.addHost('h4')
host5 = self.addHost('h5')
host6 = self.addHost('h6')

self.addLink(host1, switch1)      ## Add a link
self.addLink(host2, switch2)
self.addLink(host3, switch1)
self.addLink(host4, switch2)
self.addLink(host5, switch3)
self.addLink(host6, switch3)
self.addLink(switch1, switch3)
self.addLink(switch2, switch3)
```

13,1

2) What is being shown is pingall a ping is used to verify that a particular IP address exist and can accept request. Pingall is a ping between all host and returns ploss packet loss percentage. Dump is a command that gives information about all nodes in this case the host name and pid and IP addresses.

```
mininet> pingall
*** Ping: testing ping reachability
h1 -> h2 h3 h4 h5 h6
h2 -> h1 h3 h4 h5 h6
h3 -> h1 h2 h4 h5 h6
h4 -> h1 h2 h3 h5 h6
h5 -> h1 h2 h3 h4 h6
h6 -> h1 h2 h3 h4 h5
*** Results: 0% dropped (30/30 received)
mininet> dump
<Host h1: h1-eth0:10.0.0.1 pid=2124>
<Host h2: h2-eth0:10.0.0.2 pid=2128>
<Host h3: h3-eth0:10.0.0.3 pid=2130>
<Host h4: h4-eth0:10.0.0.4 pid=2132>
<Host h5: h5-eth0:10.0.0.5 pid=2134>
<Host h6: h6-eth0:10.0.0.6 pid=2136>
<OVSSwitch s1: lo:127.0.0.1,s1-eth1:None,s1-eth2:None,s1-eth3:None pid=2141>
<OVSSwitch s2: lo:127.0.0.1,s2-eth1:None,s2-eth2:None,s2-eth3:None pid=2144>
<OVSSwitch s3: lo:127.0.0.1,s3-eth1:None,s3-eth2:None,s3-eth3:None,s3-eth4:None pid=2147>
<Controller c0: 127.0.0.1:6633 pid=2117>
mininet>
```

The connect is 28.4 Gbits/sec

3)

```
mininet> iperf
*** Iperf: testing TCP bandwidth between h1 and h6
*** Results: ['28.4 Gbits/sec', '28.4 Gbits/sec']
mininet>
```

4a) There are 5 packets transmitted in the terminal and there are 7 packets in messages in wireshark.

```
mininet> h1 ping -c 5 h6
PING 10.0.0.6 (10.0.0.6) 56(84) bytes of data:
64 bytes from 10.0.0.6: icmp_seq=1 ttl=64 time=102 ms
64 bytes from 10.0.0.6: icmp_seq=2 ttl=64 time=2.61 ms
64 bytes from 10.0.0.6: icmp_seq=3 ttl=64 time=0.090 ms
64 bytes from 10.0.0.6: icmp_seq=4 ttl=64 time=0.096 ms
64 bytes from 10.0.0.6: icmp_seq=5 ttl=64 time=0.091 ms

--- 10.0.0.6 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4011ms
rtt min/avg/max/mdev = 0.090/21.020/102.213/40.608 ms
```

2	0.000294000	10.0.0.1	10.0.0.6	OF 1.0	184 of packet in
3	0.000627000	127.0.0.1	127.0.0.1	OF 1.0	92 of packet out
9	0.000898000	10.0.0.1	10.0.0.6	OF 1.0	184 of packet in
10	0.001166000	127.0.0.1	127.0.0.1	OF 1.0	92 of packet out
18	0.001441000	10.0.0.6	10.0.0.1	OF 1.0	184 of packet in
19	0.001451000	10.0.0.1	10.0.0.6	OF 1.0	184 of packet in
20	0.001683000	127.0.0.1	127.0.0.1	OF 1.0	92 of packet out
22	0.001807000	127.0.0.1	127.0.0.1	OF 1.0	148 of flow add
28	0.002157000	10.0.0.6	10.0.0.1	OF 1.0	184 of packet in
29	0.002426000	127.0.0.1	127.0.0.1	OF 1.0	148 of flow add
34	1.002019000	10.0.0.1	10.0.0.6	OF 1.0	184 of packet in
35	1.003444000	127.0.0.1	127.0.0.1	OF 1.0	148 of flow add
39	1.004427000	10.0.0.1	10.0.0.6	OF 1.0	184 of packet in
40	1.005371000	127.0.0.1	127.0.0.1	OF 1.0	148 of flow add
71	4.025769000	127.0.0.1	127.0.0.1	OF 1.0	76 of echo request

Capturing from any [Wireshark 1.10.6 (v1.10.6 from master-1.10)]

File Edit View Go Capture Analyze Statistics Telephony Tools Internals Help

Filter: of Expression... Clear

	Source	Destination	Protocol	Length	Info
24946000	be:e9:25:ec:b4:66	Broadcast	OF 1.0	128	of packet in
25660000	127.0.0.1	127.0.0.1	OF 1.0	92	of packet out
25930000	be:e9:25:ec:b4:66	Broadcast	OF 1.0	128	of packet in
26183000	127.0.0.1	127.0.0.1	OF 1.0	92	of packet out
26512000	8e:20:6a:04:d5:fa	be:e9:25:ec:b4:66	OF 1.0	128	of packet in
26524000	be:e9:25:ec:b4:66	Broadcast	OF 1.0	128	of packet in
26759000	127.0.0.1	127.0.0.1	OF 1.0	92	of packet out
27049000	127.0.0.1	127.0.0.1	OF 1.0	148	of flow add
27286000	8e:20:6a:04:d5:fa	be:e9:25:ec:b4:66	OF 1.0	128	of packet in
27673000	127.0.0.1	127.0.0.1	OF 1.0	148	of flow add
28029000	10.0.0.1	10.0.0.6	OF 1.0	184	of packet in
28367000	127.0.0.1	127.0.0.1	OF 1.0	148	of flow add

any: <live capture in progress>... Profile: Default

4b)

1) For *Packet in* the source IP address are host1(10.0.0.1) and host4(10.0.0.6) and the destination IP addresses are reversed ex: host1 ping host 6.

Source( 10.0.0.1 ) -> destination(10.0.0.6).

2) For *packet out* the source IP(127.0.0.1) and Destination IP (127.0.0.1) are the same.

4c) there are over 30 entries generated in wireshark. And echo ping and echo(ping) and rely Entries are shown between the hosts.

```
mininet@mininet-vm: ~  
File Edit Tabs Help  
ovs-vsctl --timeout=1 list-br  
*** Removing all links of the pattern foo-ethX  
ip link show | egrep -o '([_.:alnum:]+-eth[[:digit:]]+)'  
ip link show  
*** Killing stale mininet node processes  
pkill -9 -f mininet:  
*** Shutting down stale tunnels  
pkill -9 -f Tunnel=Ethernet  
pkill -9 -f .ssh/mn  
rm -f ~/.ssh/mn/*  
*** Cleanup complete.  
mininet@mininet-vm:~$ sudo wireshark &  
[2] 4747  
mininet@mininet-vm:~$ sudo ./topo.py  
mininet> pingall  
*** Ping: testing ping reachability  
h1 -> h2 h3 h4 h5 h6  
h2 -> h1 h3 h4 h5 h6  
h3 -> h1 h2 h4 h5 h6  
h4 -> h1 h2 h3 h5 h6  
h5 -> h1 h2 h3 h4 h6  
h6 -> h1 h2 h3 h4 h5  
*** Results: 0% dropped (30/30 received)  
mininet>
```

Capturing from any (Wireshark 1.10.6 (v1.10.6 from master-1.10))

Filter: icmp && not of Expression... Clear Apply Save

No.	Time	Source	Destination	Protocol	Length	Info
935	24.310011000	10.0.0.1	10.0.0.6	ICMP	100	Echo (ping) reply id=0x1430, seq=1/256, ttl=64
936	24.310027000	10.0.0.1	10.0.0.6	ICMP	100	Echo (ping) reply id=0x1430, seq=1/256, ttl=64
939	24.310050000	10.0.0.1	10.0.0.6	ICMP	100	Echo (ping) reply id=0x1430, seq=1/256, ttl=64
940	24.312587000	10.0.0.6	10.0.0.2	ICMP	100	Echo (ping) request id=0x1431, seq=1/256, ttl=64
943	24.313072000	10.0.0.6	10.0.0.2	ICMP	100	Echo (ping) request id=0x1431, seq=1/256, ttl=64
944	24.313115000	10.0.0.6	10.0.0.2	ICMP	100	Echo (ping) request id=0x1431, seq=1/256, ttl=64
947	24.313570000	10.0.0.6	10.0.0.2	ICMP	100	Echo (ping) request id=0x1431, seq=1/256, ttl=64 (reply i
948	24.313592000	10.0.0.2	10.0.0.6	ICMP	100	Echo (ping) reply id=0x1431, seq=1/256, ttl=64 (request
951	24.313956000	10.0.0.2	10.0.0.6	ICMP	100	Echo (ping) reply id=0x1431, seq=1/256, ttl=64
952	24.313976000	10.0.0.2	10.0.0.6	ICMP	100	Echo (ping) reply id=0x1431, seq=1/256, ttl=64
955	24.314517000	10.0.0.2	10.0.0.6	ICMP	100	Echo (ping) reply id=0x1431, seq=1/256, ttl=64
956	24.316623000	10.0.0.6	10.0.0.3	ICMP	100	Echo (ping) request id=0x1432, seq=1/256, ttl=64
959	24.317219000	10.0.0.6	10.0.0.3	ICMP	100	Echo (ping) request id=0x1432, seq=1/256, ttl=64
960	24.317230000	10.0.0.6	10.0.0.3	ICMP	100	Echo (ping) request id=0x1432, seq=1/256, ttl=64
963	24.317919000	10.0.0.6	10.0.0.3	ICMP	100	Echo (ping) request id=0x1432, seq=1/256, ttl=64 (reply i
964	24.317946000	10.0.0.3	10.0.0.6	ICMP	100	Echo (ping) reply id=0x1432, seq=1/256, ttl=64 (request
967	24.320306000	10.0.0.3	10.0.0.6	ICMP	100	Echo (ping) reply id=0x1432, seq=1/256, ttl=64
968	24.320404000	10.0.0.3	10.0.0.6	ICMP	100	Echo (ping) reply id=0x1432, seq=1/256, ttl=64
971	24.320877000	10.0.0.3	10.0.0.6	ICMP	100	Echo (ping) reply id=0x1432, seq=1/256, ttl=64
972	24.322733000	10.0.0.6	10.0.0.4	ICMP	100	Echo (ping) request id=0x1433, seq=1/256, ttl=64
975	24.323417000	10.0.0.6	10.0.0.4	ICMP	100	Echo (ping) request id=0x1433, seq=1/256, ttl=64
976	24.323419000	10.0.0.6	10.0.0.4	ICMP	100	Echo (ping) request id=0x1433, seq=1/256, ttl=64
979	24.323807000	10.0.0.6	10.0.0.4	ICMP	100	Echo (ping) request id=0x1433, seq=1/256, ttl=64 (reply i
980	24.323817000	10.0.0.4	10.0.0.6	ICMP	100	Echo (ping) reply id=0x1433, seq=1/256, ttl=64 (request
983	24.324271000	10.0.0.4	10.0.0.6	ICMP	100	Echo (ping) reply id=0x1433, seq=1/256, ttl=64
984	24.324272000	10.0.0.4	10.0.0.6	ICMP	100	Echo (ping) reply id=0x1433, seq=1/256, ttl=64
987	24.324790000	10.0.0.4	10.0.0.6	ICMP	100	Echo (ping) reply id=0x1433, seq=1/256, ttl=64
988	24.328944000	10.0.0.6	10.0.0.5	ICMP	100	Echo (ping) request id=0x1434, seq=1/256, ttl=64
991	24.329420000	10.0.0.6	10.0.0.5	ICMP	100	Echo (ping) request id=0x1434, seq=1/256, ttl=64 (reply i
992	24.329445000	10.0.0.5	10.0.0.6	ICMP	100	Echo (ping) reply id=0x1434, seq=1/256, ttl=64 (request
995	24.330074000	10.0.0.5	10.0.0.6	ICMP	100	Echo (ping) reply id=0x1434, seq=1/256, ttl=64