

## ASSIGNMENT – 3

- PART – B1:

- Routing tables:

- R1:

```
mininet> r1 route
Kernel IP routing table
Destination      Gateway         Genmask         Flags Metric Ref    Use Iface
120.0.0.0        0.0.0.0        255.255.0.0     U        0      0      0 r1-eth0
120.0.0.0        0.0.0.0        255.255.0.0     U        32     0      0 r1-eth0
121.0.0.0        0.0.0.0        255.255.0.0     U        0      0      0 r1-eth1
121.0.0.0        0.0.0.0        255.255.0.0     U        32     0      0 r1-eth1
122.0.0.0        0.0.0.0        255.255.0.0     U        0      0      0 r1-eth2
122.0.0.0        0.0.0.0        255.255.0.0     U        32     0      0 r1-eth2
123.0.0.0        121.0.0.1      255.255.0.0     UG       32     0      0 r1-eth1
124.0.0.0        122.0.0.1      255.255.0.0     UG       32     0      0 r1-eth2
125.0.0.0        121.0.0.1      255.255.0.0     UG       32     0      0 r1-eth1
mininet>
```

- R2:

```
mininet> r2 route
Kernel IP routing table
Destination      Gateway         Genmask         Flags Metric Ref    Use Iface
120.0.0.0        121.0.0.2      255.255.0.0     UG       32     0      0 r2-eth0
121.0.0.0        0.0.0.0        255.255.0.0     U        0      0      0 r2-eth0
121.0.0.0        0.0.0.0        255.255.0.0     U        32     0      0 r2-eth0
122.0.0.0        121.0.0.2      255.255.0.0     UG       32     0      0 r2-eth0
123.0.0.0        0.0.0.0        255.255.0.0     U        0      0      0 r2-eth1
123.0.0.0        0.0.0.0        255.255.0.0     U        32     0      0 r2-eth1
124.0.0.0        123.0.0.2      255.255.0.0     UG       32     0      0 r2-eth1
125.0.0.0        123.0.0.2      255.255.0.0     UG       32     0      0 r2-eth1
mininet>
```

- R3:

```
mininet> r3 route
Kernel IP routing table
Destination      Gateway         Genmask         Flags Metric Ref    Use Iface
120.0.0.0        122.0.0.2      255.255.0.0     UG       32     0      0 r3-eth1
121.0.0.0        122.0.0.2      255.255.0.0     UG       32     0      0 r3-eth1
122.0.0.0        0.0.0.0        255.255.0.0     U        0      0      0 r3-eth1
122.0.0.0        0.0.0.0        255.255.0.0     U        32     0      0 r3-eth1
123.0.0.0        124.0.0.2      255.255.0.0     UG       32     0      0 r3-eth0
124.0.0.0        0.0.0.0        255.255.0.0     U        0      0      0 r3-eth0
124.0.0.0        0.0.0.0        255.255.0.0     U        32     0      0 r3-eth0
125.0.0.0        124.0.0.2      255.255.0.0     UG       32     0      0 r3-eth0
mininet> _
```

- R4:

```
mininet> r4 route
Kernel IP routing table
Destination      Gateway         Genmask         Flags Metric Ref    Use Iface
120.0.0.0        123.0.0.1      255.255.0.0     UG       32     0      0 r4-eth0
121.0.0.0        123.0.0.1      255.255.0.0     UG       32     0      0 r4-eth0
122.0.0.0        124.0.0.1      255.255.0.0     UG       32     0      0 r4-eth1
123.0.0.0        0.0.0.0        255.255.0.0     U        0      0      0 r4-eth0
123.0.0.0        0.0.0.0        255.255.0.0     U        32     0      0 r4-eth0
124.0.0.0        0.0.0.0        255.255.0.0     U        0      0      0 r4-eth1
124.0.0.0        0.0.0.0        255.255.0.0     U        32     0      0 r4-eth1
125.0.0.0        0.0.0.0        255.255.0.0     U        0      0      0 r4-eth2
125.0.0.0        0.0.0.0        255.255.0.0     U        32     0      0 r4-eth2
mininet> _
```

- H1 and H2:

```
mininet> h1 route
Kernel IP routing table
Destination    Gateway         Genmask         Flags Metric Ref    Use Iface
120.0.0.0      0.0.0.0         255.255.0.0     U         0      0          0 h1-eth0
120.0.0.0      0.0.0.0         255.255.0.0     U        32      0          0 h1-eth0
121.0.0.0      120.0.0.2       255.255.0.0     UG        32      0          0 h1-eth0
122.0.0.0      120.0.0.2       255.255.0.0     UG        32      0          0 h1-eth0
123.0.0.0      120.0.0.2       255.255.0.0     UG        32      0          0 h1-eth0
124.0.0.0      120.0.0.2       255.255.0.0     UG        32      0          0 h1-eth0
125.0.0.0      120.0.0.2       255.255.0.0     UG        32      0          0 h1-eth0
mininet> h2 route
Kernel IP routing table
Destination    Gateway         Genmask         Flags Metric Ref    Use Iface
120.0.0.0      125.0.0.2       255.255.0.0     UG        32      0          0 h2-eth0
121.0.0.0      125.0.0.2       255.255.0.0     UG        32      0          0 h2-eth0
122.0.0.0      125.0.0.2       255.255.0.0     UG        32      0          0 h2-eth0
123.0.0.0      125.0.0.2       255.255.0.0     UG        32      0          0 h2-eth0
124.0.0.0      125.0.0.2       255.255.0.0     UG        32      0          0 h2-eth0
125.0.0.0      0.0.0.0         255.255.0.0     U         0      0          0 h2-eth0
125.0.0.0      0.0.0.0         255.255.0.0     U        32      0          0 h2-eth0
mininet>
```

- Traceroute:

```
mininet> h1 traceroute h2
traceroute to 125.0.0.1 (125.0.0.1), 30 hops max, 60 byte packets
 1 120.0.0.2 (120.0.0.2)  0.025 ms  0.006 ms  0.005 ms
 2 122.0.0.1 (122.0.0.1)  0.013 ms  0.007 ms  0.008 ms
 3 124.0.0.2 (124.0.0.2)  0.012 ms  0.008 ms  0.007 ms
 4 125.0.0.1 (125.0.0.1)  0.015 ms  0.010 ms  0.010 ms
mininet> h2 traceroute h1
traceroute to 120.0.0.1 (120.0.0.1), 30 hops max, 60 byte packets
 1 125.0.0.2 (125.0.0.2)  0.023 ms  0.005 ms  0.004 ms
 2 124.0.0.1 (124.0.0.1)  0.010 ms  0.006 ms  0.006 ms
 3 122.0.0.2 (122.0.0.2)  0.058 ms  0.010 ms  0.008 ms
 4 120.0.0.1 (120.0.0.1)  0.013 ms  0.009 ms  0.009 ms
mininet>
```

- PART – B2:

- It took the route from r1 -> r3
- Therefore, I brought that link down using the command “link r1 r3 down”.
- New Traceroute:

```
mininet> link r1 r3 down
mininet> h2 traceroute h1
traceroute to 120.0.0.1 (120.0.0.1), 30 hops max, 60 byte packets
 1 125.0.0.2 (125.0.0.2)  0.021 ms  0.005 ms  0.004 ms
 2 123.0.0.1 (123.0.0.1)  0.010 ms  0.006 ms  0.006 ms
 3 121.0.0.2 (121.0.0.2)  0.011 ms  0.007 ms  0.007 ms
 4 120.0.0.1 (120.0.0.1)  0.013 ms  0.009 ms  0.009 ms
mininet> h1 traceroute h2
traceroute to 125.0.0.1 (125.0.0.1), 30 hops max, 60 byte packets
 1 120.0.0.2 (120.0.0.2)  0.024 ms  0.005 ms  0.005 ms
 2 121.0.0.1 (121.0.0.1)  0.012 ms  0.006 ms  0.007 ms
 3 123.0.0.2 (123.0.0.2)  0.012 ms  0.008 ms  0.007 ms
 4 125.0.0.1 (125.0.0.1)  0.013 ms  0.009 ms  0.009 ms
mininet> _
```

- After getting the link back up using the command “link r1 r3 up”, the trace route is as follows,

```

mininet> link r1 r3 up
mininet> h1 traceroute h2
traceroute to 125.0.0.1 (125.0.0.1), 30 hops max, 60 byte packets
 1 120.0.0.2 (120.0.0.2) 0.027 ms 0.005 ms 0.005 ms
 2 122.0.0.1 (122.0.0.1) 0.013 ms 0.006 ms 0.006 ms
 3 124.0.0.2 (124.0.0.2) 0.013 ms 0.008 ms 0.007 ms
 4 125.0.0.1 (125.0.0.1) 0.015 ms 0.010 ms 0.010 ms
mininet> h2 traceroute h1
traceroute to 120.0.0.1 (120.0.0.1), 30 hops max, 60 byte packets
 1 125.0.0.2 (125.0.0.2) 0.024 ms 0.006 ms 0.005 ms
 2 124.0.0.1 (124.0.0.1) 0.012 ms 0.007 ms 0.008 ms
 3 122.0.0.2 (122.0.0.2) 0.014 ms 0.009 ms 0.008 ms
 4 120.0.0.1 (120.0.0.1) 0.015 ms 0.009 ms 0.009 ms
mininet>

```

- 
- It used the old route again.