

Setting up the table on the switch CLI.

```
RuntimeCmd: table_add MyIngress.ipv4_lpm MyIngress.ipv4_forward 192.168.10.0/24 => 0c:37:96:5f:8a:0b
0
Adding entry to lpm match table MyIngress.ipv4_lpm
match key:          LPM-c0:a8:0a:00/24
action:             MyIngress.ipv4_forward
runtime data:       0c:37:96:5f:8a:0b  00:00
Entry has been added with handle 67108864
```

We see that there is a duplicate ping when we try to ping our host machine.

```
pi@p4pi:~/daoxin/CWM-ProgNets/assignment3$ ping 192.168.10.1
PING 192.168.10.1 (192.168.10.1) 56(84) bytes of data.
64 bytes from 192.168.10.1: icmp_seq=1 ttl=64 time=0.500 ms
64 bytes from 192.168.10.1: icmp_seq=1 ttl=64 time=1.63 ms (DUP!)
64 bytes from 192.168.10.1: icmp_seq=2 ttl=64 time=0.417 ms
64 bytes from 192.168.10.1: icmp_seq=2 ttl=64 time=0.792 ms (DUP!)
64 bytes from 192.168.10.1: icmp_seq=3 ttl=64 time=0.452 ms
64 bytes from 192.168.10.1: icmp_seq=3 ttl=64 time=0.799 ms (DUP!)
64 bytes from 192.168.10.1: icmp_seq=4 ttl=64 time=0.553 ms
64 bytes from 192.168.10.1: icmp_seq=4 ttl=64 time=0.807 ms (DUP!)
```

If we set up the Raspberry PI as the iperf server and ping it from the lab machine.

```
manc2957@engs-labb27:~/CWM-ProgNets/assignment3$ iperf -c 192.168.10.2 -i 1 -t 10
-----
Client connecting to 192.168.10.2, TCP port 5001
TCP window size: 1.06 MByte (default)
-----
[ 3] local 192.168.10.1 port 52282 connected with 192.168.10.2 port 5001
[ ID] Interval           Transfer     Bandwidth
[ 3] 0.0- 1.0 sec      104 MBytes  872 Mbits/sec
[ 3] 1.0- 2.0 sec      105 MBytes  882 Mbits/sec
[ 3] 2.0- 3.0 sec      104 MBytes  869 Mbits/sec
[ 3] 3.0- 4.0 sec      105 MBytes  880 Mbits/sec
[ 3] 4.0- 5.0 sec      105 MBytes  881 Mbits/sec
[ 3] 5.0- 6.0 sec      104 MBytes  869 Mbits/sec
[ 3] 6.0- 7.0 sec      105 MBytes  883 Mbits/sec
[ 3] 7.0- 8.0 sec      105 MBytes  882 Mbits/sec
[ 3] 8.0- 9.0 sec      105 MBytes  878 Mbits/sec
[ 3] 9.0-10.0 sec      104 MBytes  871 Mbits/sec
[ 3] 0.0-10.0 sec      1.02 GBytes  876 Mbits/sec
```

We notice that the data bandwidth is now slower than before, averaging around 890 Mbits/sec.

```

manc2957@engs-labb27:~/CWM-ProgNets/assignment3$ iperf -c 192.168.10.2 -i 1 -t 10 -d
-----
Server listening on TCP port 5001
TCP window size: -1.00 Byte (default)
-----
Client connecting to 192.168.10.2, TCP port 5001
TCP window size: 348 KByte (default)
-----
[ 4] local 192.168.10.1 port 52284 connected with 192.168.10.2 port 5001
[ 5] local 192.168.10.1 port 5001 connected with 192.168.10.2 port 46028
[ ID] Interval      Transfer    Bandwidth
[ 4] 0.0- 1.0 sec   105 MBytes  879 Mbits/sec
[ 5] 0.0- 1.0 sec   88.5 MBytes 742 Mbits/sec
[ 4] 1.0- 2.0 sec   108 MBytes 909 Mbits/sec
[ 5] 1.0- 2.0 sec   95.6 MBytes 802 Mbits/sec
[ 4] 2.0- 3.0 sec   111 MBytes 933 Mbits/sec
[ 5] 2.0- 3.0 sec   86.7 MBytes 727 Mbits/sec
[ 4] 3.0- 4.0 sec   112 MBytes 944 Mbits/sec
[ 5] 3.0- 4.0 sec   78.2 MBytes 656 Mbits/sec
[ 4] 4.0- 5.0 sec   110 MBytes 919 Mbits/sec
[ 5] 4.0- 5.0 sec   97.1 MBytes 815 Mbits/sec
[ 4] 5.0- 6.0 sec   108 MBytes 909 Mbits/sec
[ 5] 5.0- 6.0 sec   96.3 MBytes 808 Mbits/sec
[ 4] 6.0- 7.0 sec   110 MBytes 923 Mbits/sec
[ 5] 6.0- 7.0 sec   99.6 MBytes 835 Mbits/sec
[ 4] 7.0- 8.0 sec   110 MBytes 921 Mbits/sec
[ 5] 7.0- 8.0 sec   93.5 MBytes 784 Mbits/sec
[ 5] 8.0- 9.0 sec   81.5 MBytes 684 Mbits/sec
[ 4] 8.0- 9.0 sec   112 MBytes 937 Mbits/sec
[ 4] 9.0-10.0 sec   110 MBytes 927 Mbits/sec
[ 4] 0.0-10.0 sec   1.07 GBytes 920 Mbits/sec
[ 5] 9.0-10.0 sec   91.5 MBytes 767 Mbits/sec
[ 5] 0.0-10.0 sec   908 MBytes 762 Mbits/sec
[SUM] 0.0-10.0 sec   997 MBytes 836 Mbits/sec

```

The delay becomes more apparent if we ping the machine in bi-directional mode.

If we set up the lab machine as the iperf server and ping it from the Raspberry PI.

```
pi@p4pi:~/daoxin/CWM-ProgNets/assignment3$ iperf -c 192.168.10.1 -i 1 -t 10 -d
-----
Server listening on TCP port 5001
TCP window size: 128 KByte (default)
-----
Client connecting to 192.168.10.1, TCP port 5001
TCP window size: 85.0 KByte (default)
-----
[ 3] local 192.168.10.2 port 46038 connected with 192.168.10.1 port 5001
[ ID] Interval           Transfer     Bandwidth
[ 3] 0.0000-1.0000 sec    108 MBytes  908 Mbits/sec
[ 3] 1.0000-2.0000 sec    108 MBytes  905 Mbits/sec
[ 3] 2.0000-3.0000 sec    107 MBytes  900 Mbits/sec
[ 3] 3.0000-4.0000 sec    104 MBytes  869 Mbits/sec
[ 3] 4.0000-5.0000 sec    105 MBytes  884 Mbits/sec
[ 3] 5.0000-6.0000 sec    104 MBytes  877 Mbits/sec
[ 3] 6.0000-7.0000 sec    106 MBytes  886 Mbits/sec
[ 3] 7.0000-8.0000 sec    111 MBytes  928 Mbits/sec
[ 3] 8.0000-9.0000 sec    112 MBytes  940 Mbits/sec
[ 3] 9.0000-10.0000 sec   112 MBytes  940 Mbits/sec
[ 3] 10.0000-10.0077 sec   256 KBytes  272 Mbits/sec
[ 3] 0.0000-10.0077 sec   1.05 GBytes  903 Mbits/sec
```

We can see that no handshaking occurs. The bitrate of the link is also not significantly affected.