Test the effect of packet forwarding to CPU utilization

—Working Plan (Plan-B2)

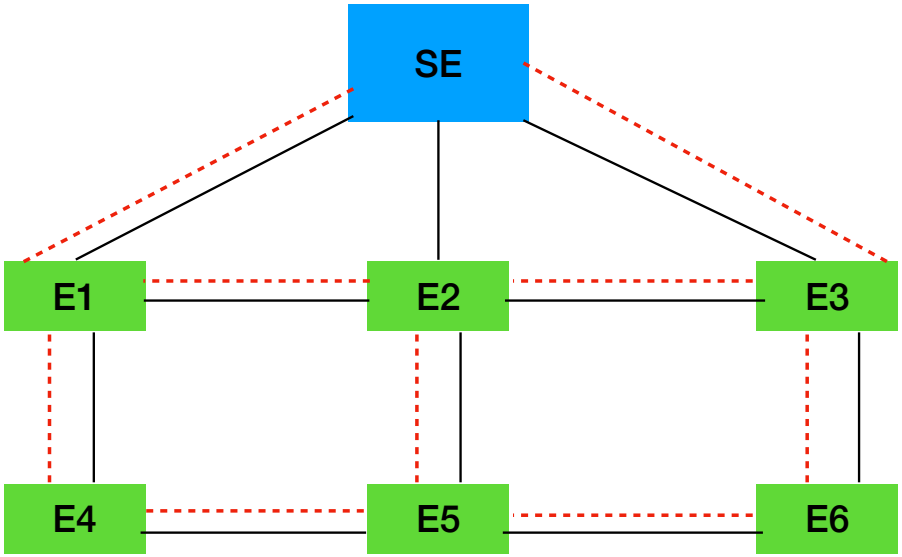
15 July 2021

Objective

- To find the relationship between the CPU utilization and the packet forwarding function in Rasp-Pi

Network Topology

- Definition & Setup



SE

Super Edge:

-> SDN controller

-> Ad-hoc mode

-> Flow rule

E3

Edge:

-> OVS

-> Ad-hoc mode

-> Forwarding

Control plane

Data plane

Antenna#1

Antenna#2

Antenna#1 : Use for the control plane

Antenna#2 : Use for the data plane

Experiment 1

- Maximum Throughput

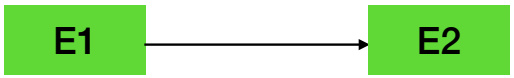
- Use iperf3 UDP

Iperf3 server => iperf3 -s -u

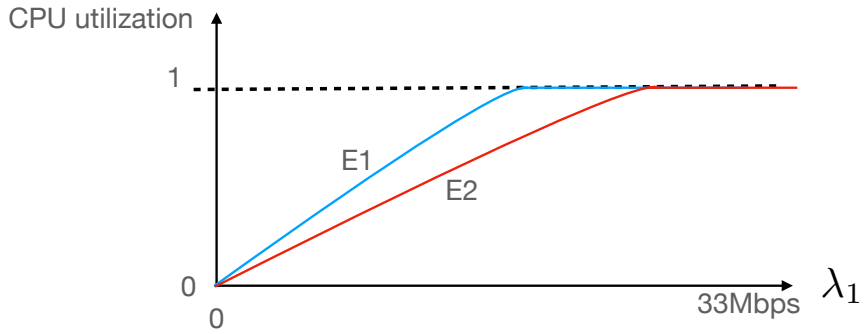
Iperf3 client => iperf3 -u -c IPaddress -b λ_1

λ_1 = [1M, 2M, 3M, 6M, 9M, 12M, 15M, 20M, 25M, 30M, 33M, 35M]

1. Find the cpu utilization of node E1 by sending packets from node E1 to E2



Run the socket function that PhooPhoo uses to send the cpu_uitilization information to SE at E1 and E2



Expected results

- 1 point of average of the CPU utilization is obtained from 20 sec measurement long. (Write the result in a log file.)
- Plot the graphs of the results
- Run each result of the average value of 5 times per point

Experiment 2

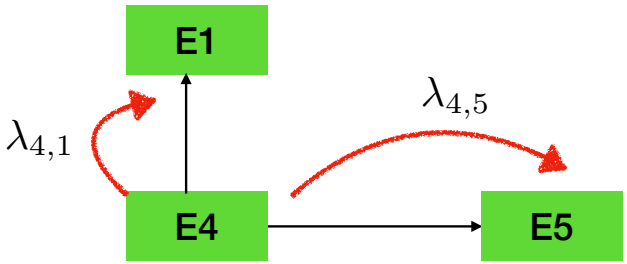
Iperf3 server => iperf3 -s -u

Iperf3 client => iperf3 -u -c IPaddress -b

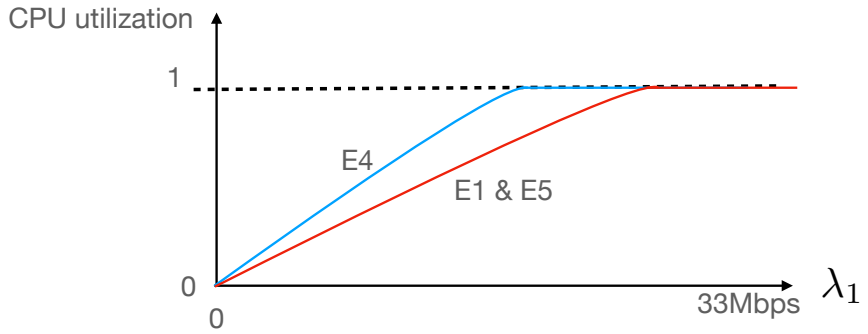
- Use iperf3 UDP

1. Find the maximum throughput by sending packets from node E4 to E1, while E4 forwards packet to E5.

λ_1 = [1M, 2M, 3M, 6M, 9M, 12M, 15M, 20M, 25M, 30M, 33M, 35M]



Run the socket function that PhooPhoo uses to send the cpu_uitilization information to SE at E1, E4, E5



Expected results

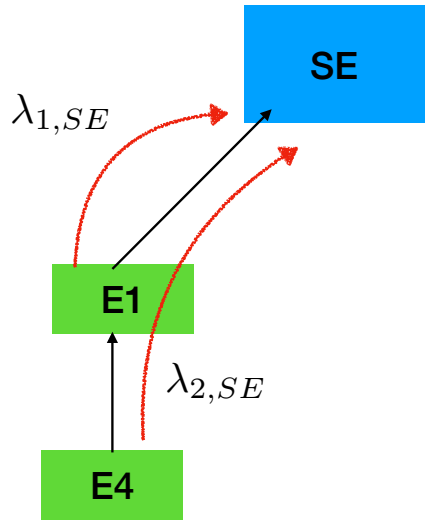
- 1 point of average of the CPU utilization is obtained from 20 sec measurement long. (Write the result in a log file.)
- Plot the graphs of the results
- Run each result of the average value of 5 times per point

Experiment 3

- Maximum Throughput

- Use iperf3 UDP

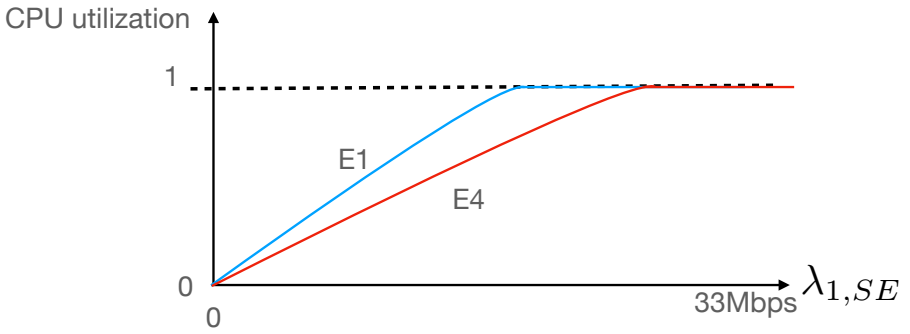
1. Find the CPU utilization by sending packets from node E1 to SE, while E4 forwards the packets to E1 and E1 forwards the packets of E4 to SE.



Run the socket function that PhooPhoo uses to send the cpu_uitilization information to SE at E1, and E4

$\lambda_{1,SE}$ = [1M, 2M, 3M, 6M, 9M, 12M, 15M, 20M, 25M, 30M, 33M, 35M]

$\lambda_{2,SE}$ = [15M]



$\lambda_{2,SE}$ = [1M, 2M, 3M, 6M, 9M, 12M, 15M, 20M, 25M, 30M, 33M, 35M]

$\lambda_{1,SE}$ = [15M]