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SDN Project Part II

In this part you will build two network topologies using Mininet and the Linux kernel virtualisation respectively. You should write your findings at the end of the report for part I. You should include all code/commands for all the steps of the configurations.

Task I, Mininet.

You shall write a Python program and use the Mininet high-level API to generate a topology according to Figure 1. The tree topology is commonly used in both data centers and ISP networks. After creating the topology, the task is to investigate how network planning and service placement can affect the behaviour in the network.
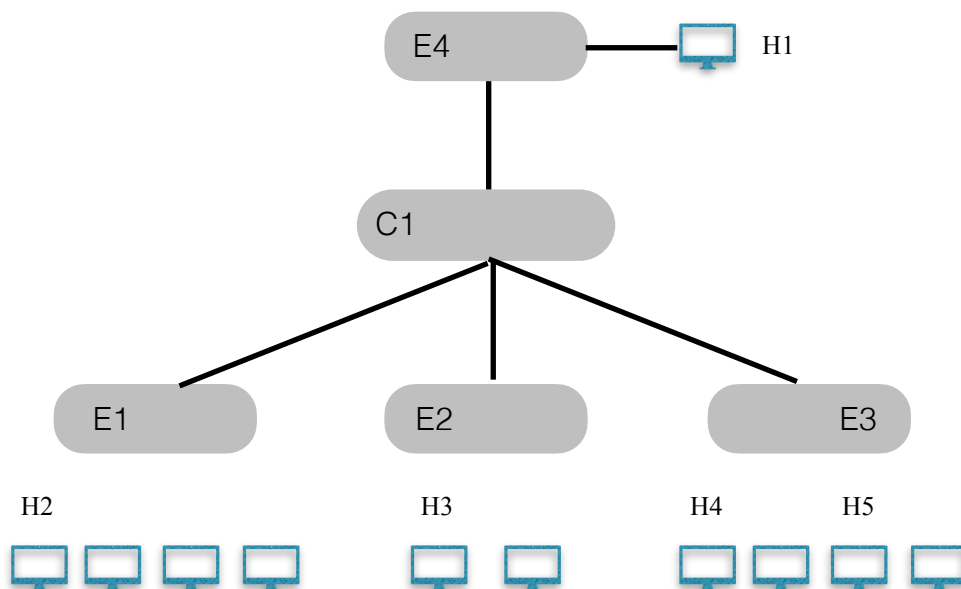
Since we don't want to work with thousands of nodes, we use somewhat unrealistic parameters for our links. Switch C1 is a core switch and E{1…4} are edge switches. The hosts under each switch are attached to that switch in a LAN. The links between a host and an edge switch has the rate 5 Mbps and delay 1ms, and the links between the core switch and an edge switch has the rate 3 Mbps and delay 10 ms.

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You will now emulate placing a content cache in the core network or closer to the users at the edge.
Using iperf, create a 1Mbps background flow to H1 from each of H2, H3 and H4, representing TV streaming. Once the flows have been started, measure the round trip time from H5 to H1 and H2 respectively using ping and. also measure the available bandwidth using iPerf.

Note, instead of using the python script, you can open a terminal on each host and generate the background traffic. In this case, read the iPerf manual pages how to use it in a terminal.

In the light of the configuration parameters, explain why you get the results you get.

Task II, Linux kernel.

In this task you will implement a topology with there switches and four hosts according to the figure below. For the sake of simplicity, assume that the hosts H1-H4 belong to the same subnet.
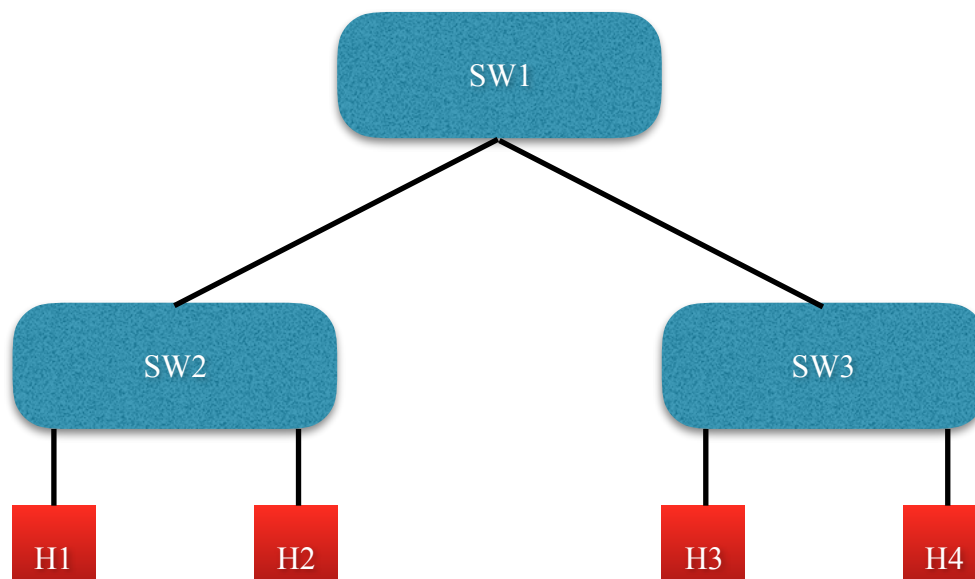
Check that you have configured correctly by testing the connectivity between all nodes in the network.

Submit a listing of all commands you have used to configure the networks, and a figure detailing all the addresses of the nodes in the network.