Lab 1
Experimentation Task Design
Contents
Objective: ................................................................................................................................. 3
Submission: ............................................................................................................................ 3
Objective:

In this lab, students can create a simple network topology in CloudLab. Students will login the Cloudlab website, create an experiment profile, and create a topology that includes four instances of XEN VM (Virtual Machine) linked together. The student will then instantiate the topology by selecting a cluster that is available. After the topology is instantiated, the student then sends Ping from one node to every other node to confirm that the topology is created successfully.

Submission:

Complete step 1, 2, and 3. Attach the topology view screenshot. List the steps to create an experiment profile and explain how to test connectivity.

Students can refer to the link (http://docs.cloudlab.us/cloudlab-tutorial.html) for more details about creating profiles on CloudLab. Students should have an account with either CloudLab, GENI, or any other federated services like EmuLab to access CloudLab. If you want to sign up for a CloudLab account, you need to select a project to join in when you register at CloudLab. Then you need to wait for the leader of the project to accept your registration.

CloudLab Login page: https://www.cloudlab.us/login.php

1) Create Profile

Create a profile with 4 Xen VMs. You can select UBUNTU16 as your choice of Operating System. Hardware type can be any. Node type will be emulab-xen. For the links select Link type as Ethernet. Give a name to the topology with a description. Once the topology has been created click on Accept and then create. In the next window instantiate the profile.

![Create Experiment Profile](image)

Figure 1: Start to create experiment profile. Click “Create Topology” to start.
Figure 2: Drag to add nodes to your topology

Figure 3: To add a connection between two nodes, move mouse approach a node. A short black line appears. Then drag the line to the destination node.
Figure 4: Give details of each node by selecting Node type, Hardware type, and Disk image. Remember to check “Require Routable IP” so that we can connect those nodes to an SDN controller later.

Figure 5: Give details of each link. Select Ethernet for Link type for this lab.
2) Start Experiment

To start an experiment, select a cluster that is available. For this lab select the one that is available. You can check the availability by hovering on the Green dot next to each cluster name. Click on finish when done. It will take some time for the profile to boot up.

If you encountered an error when you try to start an experiment, you probably made some mistakes when you create the profile. In this case you should terminate the current experiment, though it has not been successfully started. This will release any resources it occupies. Then go back to your profile, check and modify it.
3) Test connectivity through ping

Students can open the terminals for each node by clicking the respective node and selecting shell. Use “ifconfig” command to get the IP address of each node. From node-0 ping all other nodes to test connectivity.
Figure 9: Open a new shell for each node.

Figure 10: Ping test

4) Terminate the experiment

Remember to terminate the experiment once all the tasks are completed.