

CS208 Cloud Computing and Cloud Networking

Assignment 1

Virtual Machine

The goal of this assignment is to give an introduction to Virtual machines.

Problem Statement

In this assignment, you will create two virtual machines and write a client-server socket program. You will run server program on one VM and client program on another VM. Once the client establishes a connection with the server, the server will send a file from the local filesystem, and the client will save it on the local system.

Server Application

1. Create a file “mydata.txt” of any size with random content. Note down its checksum.
2. When you run the server application, it will read a file “mydata.txt” from the local filesystem.

Client Application

1. The client application connects to the server running on a different VM, receives the file that the server sends, and saves it in its local filesystem “mydata_client_copy.txt”.
2. Open another terminal and verify that the file “mydata_client_copy.txt” is received properly by checking the checksum.

General instructions

- The client and server application itself can be built using any language you are comfortable with.
- You can use Virtual Box to create two VMs locally on your laptop or use Cloudlab experiment with the small-lan profile and use ubuntu-20.04 image and check VM box.

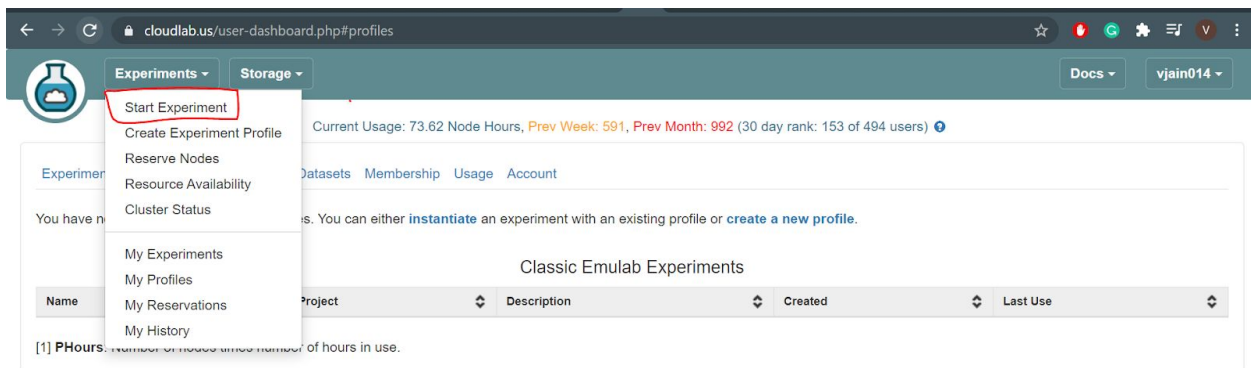
Grading

Grade Distribution

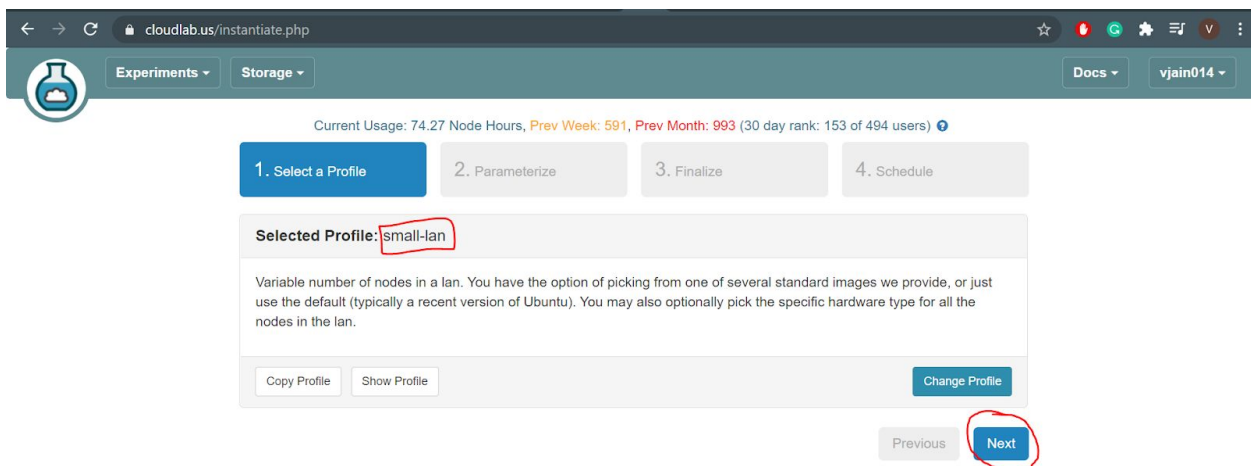
- Server and client programs - 30
- Screenshot of server application running on VM 1- 25 points
- Screenshot of client application running on VM 2- 25 points
- Checksum verification - 10 points
- Steps and screenshot to reproduce the experiment- 10 points

Creating VMs on Cloudlab

1. Make sure when you create the cloudlab account, you provide your public ssh key.
2. Login to the cloudlab portal and start an experiment



3. Use small-lan profile



4. Enter the number of VMs, OS version and Check “Use XEN VMs”

The screenshot shows the 'Parameterize' step of the CloudLab experiment instantiation process. The browser address bar shows 'cloudlab.us/instantiate.php'. At the top, it displays 'Current Usage: 74.27 Node Hours, Prev Week: 591, Prev Month: 993 (30 day rank: 153 of 494 users)'. Below this are four tabs: '1. Select a Profile', '2. Parameterize' (active), '3. Finalize', and '4. Schedule'. The main content area shows a message: 'This profile is parameterized; please make your selections below, and then click [Resource Availability](#) Defaults Last History Next.' Below this is a section titled '+ Show All Parameter Help' with four parameters: 'Number of Nodes' (set to 2), 'Select OS image' (set to UBUNTU 20.04), 'Optional physical node type' (empty), and 'Use XEN VMs' (checked). At the bottom right are 'Previous' and 'Next' buttons.

5. Press Next and select any cluster

6. After starting the experiment, you will get login details about VMs

The screenshot shows the 'Status' page of the CloudLab experiment. The browser address bar shows 'cloudlab.us/status.php?uid=75015869-50bf-11eb-b1eb-e4434b2381fc'. A green banner at the top says 'Your experiment is ready!'. Below this is a box containing experiment details: Name: CS208assignment, State: ready, Profile: small-lan, Creator: vjain014, Project: KKKProjects, Created: Jan 7, 2021 12:08 AM, Started: Jan 7, 2021 12:08 AM, Expires: Jan 7, 2021 4:08 PM (in 15 hours). Below this box are buttons for 'Logs', 'Performance History', 'Create Disk Image', 'Copy', 'Extend', and 'Terminate'. Below the buttons is a 'Profile Instructions' link. At the bottom is a table with tabs for 'Topology View', 'List View', 'Manifest', 'Graphs', and 'Bindings'. The table has columns: ID, Node, Type, Status, Startup, Image, SSH command (if you provided your own key), and Actions.

ID	Node	Type	Status	Startup	Image	SSH command (if you provided your own key)	Actions
vm0	c220g1-030802vm-1	pcvm	ready	n/a	emulab-ops/UBUNTU18-64-STD	ssh -p 26410 vjain014@c220g1-030802.wisc.cloudlab.us	<input type="checkbox"/>
vm1	c220g1-030802vm-2	pcvm	ready	n/a	emulab-ops/UBUNTU18-64-STD	ssh -p 26411 vjain014@c220g1-030802.wisc.cloudlab.us	<input type="checkbox"/>
c220g1-030802	c220g1-030802	c220g1	n/a	n/a	n/a	ssh -p 22 vjain014@c220g1-030802.wisc.cloudlab.us	<input type="checkbox"/>