CSC/ECE 573-002 Lab Exercise Instructions: Fall 2018

1. **Important note**
    a. **Please do not change any connections in Host Machine.** The connections are already setup for you, you should not need to change anything in VCL Instance.
    b. **You are responsible for saving/bookkeeping your own data.** You will need to observe some output and reproduce it in the homework. When the machines are restarted, they will lose all data.
    c. **Each student is supposed to complete the lab exercises by themselves**. You should give it a try yourself – refer to man pages, information on the course website and other sources, etc. before asking for help from fellow-students. Getting help or helping others (e.g. share information, give out tips) is a good thing for hands-on work, but you only get the expertise you will need in the future if you figure it out yourself – don't cheat yourself out of this opportunity. Read the references listed on the bottom of the lab-exercise handout or use Google search if you have to.
    d. **WARNING**: Failure to follow instructions above will lower your lab exercise grades!
2. Getting Started
    a. Students can sign up for slots via Google Calendar, **using the link provided on the course website. You should see appointment slots in each two-hour interval during the next several days – click on a slot to reserve it**. (The slots are much easier to see if you choose the daily view, rather than the weekly view.) Each student is required to sign up for at least one slot, but you can reserve more timeslots if you are not done with the exercise in the first timeslot you reserved. Please do not reserve a large number of slots up front. if we observe you booking slots and not attending, we shall cancel *all* your reservations in that timeslot, and you will need to start over.
    b. Virtual Lab is available for 24/7. You can Contact TA's for any help.
    c. **Please read: this has changed**: During the homework, you will boot the machines in which have Ubuntu 16.04 LTS

installed on them. When you logout from the machines, All the work performed till then will be saved.

d. You MUST leave at the conclusion of your timeslot, whether you finished the exercise or not. If you did not finish, reserve another timeslot and come back in at that time.

Instructions

1. Access **https://vcl.ncsu.edu** to reserve a VCL Instance.
2. Login to your account to reserve a VM under Reservations Tab.
3. Click on New Reservation and select "Ubuntu 16.04 LTS Base" and Select duration in such a way that you have it reserved for long duration.
4. Open Putty and Login into the reserved VM, Clone CSC573LAB file with below command and change directory to **CSC573LAB**:

   "**git clone https://github.com/CSC573LAB/CSC573LAB.git**"

   "**cd CSC573LAB**"
5. Give permissions to the file in CSC573LAB folder by using the command:

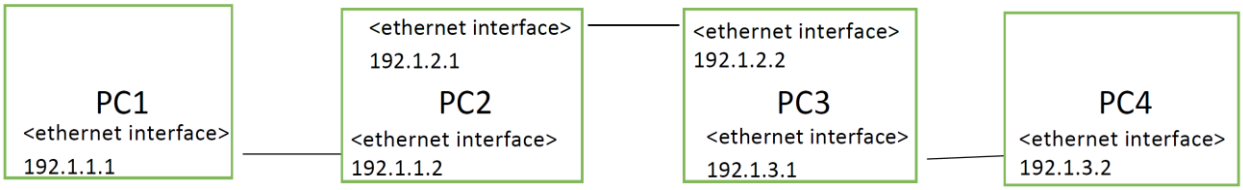
   "**chmod u+x docker-env.sh**"
6. In CSC573LAB folder, Run the below command to install setup, it will take few minutes:

   "**./docker-env.sh**"
7. Once setup is installed, you could see it as below:

```
**** Docker Installation done ****



******Environment setup completed! ****


******Creating Topology ****


******Find the below connections at connection.txt file ****


=======================================
Host      |            IP                |
=======================================|
PC1       |        172.17.0.2            |
          |                              |
PC2       |        172.17.0.3            |
          |                              |
PC3       |        172.17.0.4            |
          |                              |
PC4       |        172.17.0.5            |
          |                              |
=======================================

#Wireshark Connection Commands
Use below commands to perform wireshark captures at any interface, Replace ethx with your interface name

=================================================================================================
Host     |                                Wireshark Command                                     |
=================================================================================================|
PC1      |        "ssh -X root@152.46.17.205 -p 1702 tcpdump -U -s0 -n -w - -i ethx | wireshark -k -i -"
         |                                                                                        |
PC2      |        "ssh -X root@152.46.17.205 -p 1703 tcpdump -U -s0 -n -w - -i ethx | wireshark -k -i -"
         |                                                                                        |
PC3      |        "ssh -X root@152.46.17.205 -p 1704 tcpdump -U -s0 -n -w - -i ethx | wireshark -k -i -"
         |                                                                                        |
PC4      |        "ssh -X root@152.46.17.205 -p 1705 tcpdump -U -s0 -n -w - -i ethx | wireshark -k -i -"
         |                                                                                        |
=================================================================================================
Total setup completed...
```

LAB CONFIGURATION

1. The machines PC1 – PC4 are connected as in the topology shown below.



2. The IP address are to be assigned to the PC as per the exercise.
3. You can access the Management IP of the PC's (PC1, PC2, PC3, PC4) in sequence of 172.17.0.2 ..... 172.17.0.254 respectively.
4. You can login into the PC(PC1), Similarly others with username: root, password: passwd as below:
   "`ssh root@PC1`"
5. whenever done with a particular PC, you can logout by typing "exit" from that PC.

INSTRUCTIONS TO CAPTURE WIRESHARK

1. You can download wireshark at "`https://www.wireshark.org/download.html`" on to your Laptop.
2. Find the path where wireshark is installed (For Windows it would be mostly "C:\Program Files\Wireshark")
3. Open Command Prompt and enter below command in your Laptop:
   "`cd C:\Program Files\Wireshark`"
4. Open connection.txt file to view wireshark commands for respective PC.
5. In command prompt, To take wireshark capture at an interface(eth1) of a particular PC (PC1 - 172.17.0.2), the port number would be 1702(last four digits from its IP), similarly for PC2 with 172.17.0.3 it would be 1703. #Importantly we should use IP of the reserved host from VCL which is 152.46.19.96(in my example). The only parameter that varies for different PC's is the part after -p. Run this command in command prompt of your laptop.
"`ssh -X root@152.46.19.96 -p 1702 tcpdump -U -s0 -n -w - -i eth1 | wireshark -k -i –`"

6. After executing above command, you will notice wireshark application popping up in your laptop, Go to command prompt and provide password as "passwd" in command prompt for wireshark to get access to the PC(PC1).