Lab Exercise – CSC/ECE 573-002, Fall, 2018

For this question, you will need to work in the VCL. Please refer Lab-Instructions document to know how to reserve VCL Instance and proceed with the lab Exercise. Your objective is to create a simple 4-node path topology as below. The four machines have multiple Virtual Network Interface Cards wired up to create precisely this topology. However, each machine simply boots up as a standalone node. The IP addresses that each interface takes on is shown in the lab instructions document – for this homework, do not change these addresses.

In turn, perform the following procedure, and submit the output of each step.

For many or all of the steps, you will first have to learn how to perform these steps, by self-guided inquiry such as consulting man pages. While man pages are sufficient, sometimes online books, manuals, blogs can also be helpful.

1. Examine the arp table of each
2. Examine the routing table of each
3. Ping B, C and D from A
4. Examine the arp table of each
5. Add routes at B and C to allow packets to be forwarded along the path
6. Make sure forwarding is turned “on” at each machine
7. Ping B, C and D from A
8. Examine the arp table of each
9. Clear the ARP table on all nodes, run wireshark on each node, and repeat the exercise
10. From A, run "curl www.ncsu.edu", and observe the wireshark output
11. (Food for thought: ungraded) Reboot all the machines. Login to each, and change some of the IP addresses as follows:

    PC2’s ethernet interface that connects with PC3: 192.1.1.3
    PC3’s ethernet interface that connects with PC2: 192.1.1.4
    PC3’s ethernet interface that connects with PC4: 192.1.1.5
    PC4’s ethernet interface that connects with PC3: 192.1.1.6

Attempt to ping as before, add routing table entries as before. Can you make the ping work? If not, can you explain why? If yes, did you have to do anything different?