CS536 Homework 1 (Spring 2023)

(Due Date: 11:59:59PM EDT, Jan 23, 2023, Total: 30 points)

Q1 (10 points) Use your computer when it is connected to Purdue campus network via PAL3.0 or Ethernet. Run *Traceroute* to the following three destinations: (1) www.cs.purdue.edu, (2) www.google.com, and (3) www.ntu.edu.sg.
(**Hint**: if you cannot be at the campus, please use remote access (ssh any server at our CS department).)

(a) (3 points) Submit a traceroute printout per each destination.
(b) (3 points) Find the number of hops and the average of the round trip delays to each destination. If you can't, please explain why not.
(c) (2 points) Compare all the hops to all the destinations. Have you seen any hop in common? If yes, please show it and explain why. If no, please explain why not.
(d) (2 points) In the traceroute experiment to www.ntu.edu.sg, where does the largest delay on one hop occur?

Q2 (20 points) Install Wireshark. Please run *traceroute* to the above two destinations (www.cs.purdue.edu and www.google.com) while turning on Wireshark to capture packets. You need to start packet capturing before you run *traceroute* and you need to collect packet traces per each destination.

(a) (10 points) Please submit two pcap files named as `purdue.pcap` and `google.pcap`.
(b) (5 points) Please pick one packet trace and use Wireshark to locate the records to each traceroute's response (**Hint**: use the IP address of the routers on the way to locate the traces). Please print only these records.
(c) (5 points) Please find an intermediate router with three delay values and locate all the packets to/from this router.

Bonus (5 points) Please pick an intermediate router and use Wireshark to capture packet traces while running *ping [router]*. Please submit the packet trace as `ping.pcap`. Please figure out what protocols are used for ping.

How to turn in?

Please zip all the files into hw1.zip and submit it to Gradescope. Do not forget your name and PUID at the answer page. If you need to use any late day, please send an email to cs536-ta@cs.purdue.edu.