CS408 – Computer Networks – Spring 2023 - HW 1 – Due March 29, 2023, 23:59

Please submit SUCourse before due. No late submissions

Everyone must submit his/her own work! Plagiarized homework will be graded as minus 100 and will be reported to the Dean's office according to university regulations.

BE AWARE OF ALL TYPE OF UNIT CONVERSIONS. BE CAREFUL ABOUT THE ARITHMETIC!!!!!

Q1) 50 pts

Conduct a network analysis to investigate the connectivity issues between your computer and Purdue University, USA (www.purdue.edu) . Answer the following quetions:

(add screenshots of command results – at least 2 ping and 2 traceroute screenshots, one at noon and one at midnight. Don't forget to add your location info where you conducted the test - e.g. Sabancı Campus, Erzurum, Çorum, etc.).

a) Use the ping command to verify the basic connectivity to Purdue at two different hours of the day (one at noon and one at midnight). What is the output of the command, Find the average of the round-trip delays at each of the two hours. What does it indicate about the network connectivity?
b) Perform a Traceroute to Purdue at two different hours of the day (one at noon and one at midnight) to determine the network path to Purdue University from your computer. What is the output of the command, and what does it tell you about the network topology and potential bottlenecks at two different times of the day?
c) Find the number of routers in the path at each of the times. Did the paths change during any of the hours?

Q2) 50 pts

a) Calculate the air distance (or bird fly distance) from your location to Purdue University (You may ask to Google). If this was the fiber optic cable distance, what would be the propagation delay?
b) Also calculate approximate fiber optic cable distance from Istanbul to Purdue. Assume that your ping packages followed the path :

> Istanbul – Marmaris
>
> Marmaris – GoonHilly Downs, UK (through SeaMeWe-3 submarine cable https://www.submarinecablemap.com/submarine-cable/seamewe-3 You may use Google map Measure Distance command for multiple points)
>
> UK – Bellport, NY, USA (through Yellow submarine cable https://www.submarinecablemap.com/submarine-cable/yellow)
>
> NY, USA – Purdue

> What would be the propagation delay of this distance? What is RTT?

c) In Q1-a you found an average RTT value. Is it different than the the RTT in Q2-b? Why?