

CNT 4007 Computer Network Fundamentals, Spring 2017
Homework Assignment 1

given by
Jonathan C.L. Liu

Out: Jan. 20 (Friday)

Due: 10:40am (Hard Deadline) Friday Jan. 27

- The problem sets form an important part of the learning in this course. Thus you are required to do them in order to pass.
- Try to be as clear and precise as possible in your presentation. Sloppy answers may be at a disadvantage, i.e., likely to receive fewer points.
- Please submit your answers via CANVAS system.
- No late assignments are accepted !!

Problem 1

What are the five layers in the Internet protocol stack? What are the principal responsibilities of each of these layers?

Problem 2

List six access technologies. Classify each one as residential access, company access, or mobile access.

Problem 3

Compare the delay in sending an x -bit message over a k -hop path in a circuit-switched network and a (lightly loaded) packet-switched network. The circuit setup time is s seconds, the propagation delay is d seconds per hop, the packet size is p bits, and the data rate is b bps. Under what conditions does the circuit-switched network have a shorter delay? [NOTE: you need to explain the reasoning process on how you come out the final answer.]

Problem 4

List the four broad classes of services that a transport protocol can provide. For each of the service classes, indicate if either UDP or TCP (or both) provides such a service.