# Tutorial 1

Instructions

1. Form ad-hoc groups of 2 to 3 students to solve this week's exercise.

2. Each group must answer the following review Q's and problems
3. Each group will use shared google docs to work with all group members and tutor. The document must include the group member's names and the tutorial sheet number.

Review Questions

1. Q1-1. Is transmission in a LAN with a common cable (Figure 1.1a) an example of broadcast (one to many) transmission? Explain.
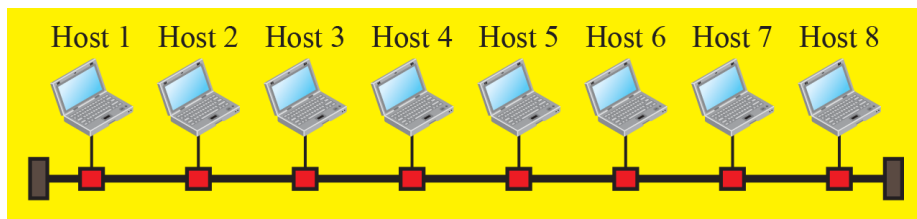
a. LAN with a common cable (past)

2. Q1-3. How many point-to-point WANs are needed to connect n LANs if each LAN should be able to directly communicate with any other LAN?

3. Q1-5. When a resident uses a dial-up or DLS service to connect to the Internet, what is the role of the telephone company?

4. Q1-7. Which layers of the TCPIIP protocol suite are involved in a link-layer switch?

5. Q1-15. If a port number is 16 bits (2 bytes), what is the minimum header size at the transport layer of the TCP/IP protocol suite?

6. Q1-16. What are the types of addresses (identifiers) used in each of the following layers?

    a. application layer
    b. network layer
    c. data-link layer

7. Q 1-17. When we say that the transport layer multiplexes and demultiplexes application layer messages, do we mean that a transport-layer protocol can combine several messages from the application layer in one packet? Explain.

8. Q1-19. Assume we want to connect two isolated hosts together to let each host communicate with the other. Do we need a link-layer switch between the two? Explain.

9. P1-5. Assume we have created a packet-switched internet. Using the TCP/IP protocol suite, we need to transfer a huge file. What is the advantage and disadvantage of sending large packets?

10. P1-7. Match the following to one or more layers of the TCPIIP protocol suite:

    a. creating user datagrams
    b. responsibility for handling frames between adjacent nodes
    c. transforming bits to electromagnetic signals

11. P1-9. Assume a private internet uses three different protocols at the data-link layer (Ll, L2, and L3). Redraw Figure 1.18 with this assumption. Can we say that, in the data-link layer, we have demultiplexing at the source node and multiplexing at the destination node?

a. Multiplexing at source   b. Demultiplexing at destination
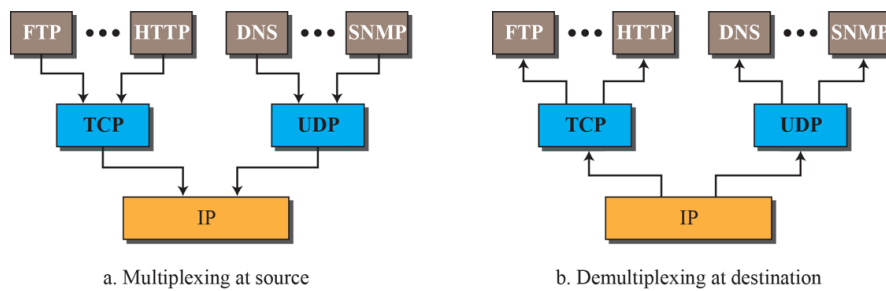
12. P1-15. Assume that an application-layer protocol is written to use the services of UDP. Can the application-layer protocol uses the services of TCP without change?

13. What is a protocol? What is a protocol data unit (PDU)?

14. What is a protocol architecture? What are some advantages to layering as seen in the TCP/IP architecture?

15. List the major disadvantages with the layered approach to protocols.