# 《计算机网络》作业题目

## 第一次作业：（英文版教材第一章 2，3，9，10，11，16，17，18，30）

2. (Network performance parameters) The performance of a client-server system is strongly influenced by two major network characteristics: the bandwidth of the network (that is, how many bits/sec it can transport) and the latency (that is, how many seconds it takes for the first bit to get from the client to the server). Give an example of a network that exhibits high bandwidth but also high latency. Then give an example of one that has both low bandwidth and low latency.

3. (Network performance parameters) Besides bandwidth and latency, what other parameter is needed to give a good characterization of the quality of service offered by a network used for (i) digitized voice traffic? (ii) video traffic? (iii) financial transaction traffic?

9. (Collision of time division system) A disadvantage of a broadcast subnet is the capacity wasted when multiple hosts attempt to access the channel at the same time. As a simplistic example, suppose that time is divided into discrete slots, with each of the n hosts attempting to use the channel with probability p during each slot. What fraction of the slots will be wasted due to collisions?

10. What are two reasons for using layered protocols? What is one possible disadvantage of using layered protocols?

11. What is the principle difference between connectionless communication and connection-oriented communication? Give one example of a protocol that uses
1) connectionless communication 2)connection-oriented communication.

16. Which of the OSI layers and TCP/IP layers handles each of the following:
1) Dividing the transmitted bit stream into frames
2) Determining which route through the subnet to use.

17. (Encapsulation between 2 layers) If the unit exchanged at the data link level is called a frame and the unit exchanged at the network level is called a packet, do frames encapsulate packets or do packets encapsulate frames? Explain your answer.

18. (PDU-header) A system has an n-layer protocol hierarchy. Applications generate messages of length M bytes. At each of the layers, an h-byte header is added. What fraction of the network bandwidth is filled with headers?

30. (Impact of adjacent layers) Suppose there is a change in the service (set of operations) provided by layer k. How does this impact services at layers k-1 and k+1?