

# Answers to the quiz #4 in Computer Networks

Christian Rinderknecht

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## Questions.

1. What advantage does a circuit-switched network have over a packet-switched network? What advantage does TDM have over FDM in a circuit-switched network?
2. Why is it that packet switching is said to employ statistical multiplexing? Contrast statistical multiplexing with the multiplexing that takes place in TDM.
3. What is meant by connection state information in a virtual circuit network?
4. Suppose you are developing a standard for a new type of network. You need to decide whether your network will use VCs or datagram routing. What are the pros and cons for using VCs?
5. What are the advantages of message segmentation in packet-switched networks? What are the disadvantages?
6. Is HFC bandwidth dedicated or shared among users? Are collisions possible in a downstream HFC channel?
7. Consider sending a series of packets from a sending host to a receiving host over a fixed route. List the delay components in the end-to-end delay for a single packet. Which of these delays are constant and which are variable?
8. Consider an application that transmits data at a steady rate: it generates an  $N$ -bit unit of data every  $k$  time units, where  $k$  is small and fixed. Also, when such an application starts, it will continue running for a long period of time. Answer the following questions, briefly justifying your answer.
  - (a) Would a packet-switched network or a circuit-switched network be more appropriate for this application? Why?

- (b) Suppose that a packet-switched network is used and the only traffic in this network comes from such applications as described above. Furthermore, assume that the sum of the application data rates is less than the capacities of each and every link. Is some form of congestion control needed? Why?