

CS447- Computer Networks and Data Communication

Possible Quiz Questions for Quiz #2 on January 17th/22nd, 2024

The following is a list of possible questions for our Quiz #2 on January 22nd (for section 003) or January 17th (for section 002). Some of the questions will not be asked in the quiz. All the questions that will appear in the quiz will appear exactly as shown below (however, parameters may be changed). The quiz is closed textbook, closed notes and closed neighbors. Note that the questions, which did not appear in this quiz, still may appear in the exams.

#1: Why we want “networks” instead of full mesh of one-to-one communication channels? Explain with an example (using some mathematical formula).

#2: If a computer system (not necessarily limited to computer networks) can grow for a larger system without a serious problem in explosive increase in components, how is it called?

Good _____ (one word after ”good”).

#3: Network has good scalability compared to full mesh of one-to-one communication channels, but what are the two disadvantages (tradeoffs) in network?

#4: What are “circuit-switching networks”? Mention one example for circuit-switching networks.

- **(Physical) transmission path is set up prior to the beginning of payload transmission (your payload will be transmitted in the same order as a continuous stream if signals as transmitted at a sender)**
- **Transmission quality (bandwidth and delay) is guaranteed (no overhead after a transmission starts).**
- **Resource is reserved (not shared). Thus most expensive.**

#5: What are “packet-switching networks”?

#6: What are “virtual-circuit packet-switching networks”?

- **(Physical) transmission path is set up prior to the beginning of payload transmission (your payload will be transmitted as packets in the same order as it is transmitted at a sender)**
- **Transmission quality (bandwidth and delay) is guaranteed (little overhead after a transmission starts).**
- **Resource is shared (when you are not using the resource you reserved, others can use them)**

#7: What are “datagram packet-switching networks”? Mention one example for datagram packet-switching networks.

- **(Physical) transmission path is NOT set up prior to the beginning of payload transmission (your payload may not be transmitted in the same order as it is transmitted at a sender, packets can take different paths) + (high overhead after a transmission starts)**
- **Transmission quality (bandwidth and delay) is NOT guaranteed.**
- **Resource is shared**
- **Cheapest**

#8: What are the primary advantages and disadvantages in “circuit-switching networks”?

#9: What are the primary advantages and disadvantages in “datagram packet-switching networks”?

#10: What are “blocking services (in telecommunication)” (definition of “blocking services”)? Mention one example of blocking telecommunication services.

#11: Complete the following table that compares circuit switching networks, packet switching networks, and virtual circuit networks.

Factors	Circuit-Switching	Virtual Circuit	Datagram
No overhead after TX starts?			
Routing delay?			
Guaranteed Tx Bandwidth?			
Advantages			
Disadvantages			
Applications			

#12: What is a protocol (define "network protocol" by providing the three keywords)?

A protocol is (1) _____, (2) _____ and (3) _____.

Give two examples of the existing network protocols.

#13: What is an interface (define "network protocol" by providing the three keywords)?

An interface is (1) _____, (2) _____ and (3) _____.

#14: What is “layered structure” for a protocol?

#15: Why we want “layered structure” for a protocol? Name the three benefits (please mention those we discussed in the class – you do NOT have to describe them).

#16: What is the primary tradeoff in using “layered architecture”?

#17: Why do some computer networks use packets to transmit data? Provide one primary advantage and disadvantage in using packets for data transmission.

#18: Answer the following questions to describe what packet header: is:

(1) What do packets consist of?

(2) Where is the packet header?

(3) What kind of information is in the packet header (you need to name at least two different types of information)?

#19: What is “packet encapsulation”? What is it for (i.e., what is the purpose of “packet encapsulation”)?

#20: If network protocols are implemented without “packet encapsulation”, what problems would we have?