

Quiz #2

EE 852: Advanced Communication Networks

MSEE (Communication)
Dept of Electronics & Power Engineering
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Duration	05 Min	R.No	
Marks	150	Class	
Date	21/04/2009	Section	

Q1. It has been said that flow control and congestion control are equivalent. Is this true for the Internet's connection-oriented service? Are the objectives of flow control and congestion control the same?

A1. Flow control and congestion control are two distinct control mechanisms with distinct objectives. Flow control makes sure that neither end of a connection overwhelms the buffers in the other end of the connection by sending to many packets to fast. Congestion control regulates the amount of data that an application can send into the network, helping to prevent congestion in the network core (i.e., in the buffers in the network routers).

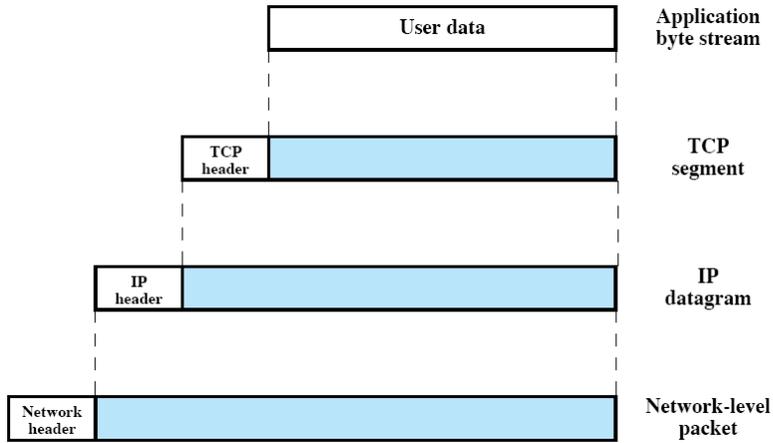
Q2. List two advantages and two disadvantages of having international standards for network protocols.

A2. Perhaps the major disadvantage is the processing and data overhead. There is processing overhead because as many as seven modules (OSI model) are invoked to move data from the application through the communications software. There is data overhead because of the appending of multiple headers to the data. Another possible disadvantage is that there must be at least one protocol standard per layer. With so many

Q3. List the major disadvantages with the layered approach to protocols.

A3. One advantage is that if everyone uses the standard, everyone can talk to everyone. Another advantage is that widespread use of any standard will give it economies of scale, as with VLSI chips. A disadvantage is that the political compromises necessary to achieve standardization frequently lead to poor standards. Another disadvantage is that once a standard has been widely adopted, it is difficult to change, even if new and better techniques or methods are discovered. Also, by the time it has been accepted, it may be obsolete.

Q4. In figure given below, exactly one protocol data unit (PDU) in layer N is encapsulated in a PDU at layer (N-1). It is also possible to break one N-level PDU into multiple (N-1)- level PUDs (segmentation) or to group multiple N-level PDUs into one (N-1)-level PDU (blocking).



Q4a. In the case of segmentation, is it necessary that each (N-1)-level segment contain a copy of the N-level header?

A4a. No. This would violate the principle of separation of layers. To layer (N – 1), the N-level PDU is simply data.
The (N – 1) entity does not know about the internal format of the N-level PDU. It breaks that PDU into
fragments and reassembles them in the proper order.

Q4b. In the case of blocking, is it necessary that each N-level PDU retain its own header, or can the data be consolidated into a single N-level PDU with a single N-level header?

A4b. Each N-level PDU must retain its own header, for the same reason given in 4(a).