

Sep.14th Homework (Computer Networking)

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R22. Which layers in the internet protocol stack does a router process? Which layers does a link-layer switch process? Which layers does a host process?

Ans: A router processes network, link and physical layers. A link-layer switch processes link and physical layers. A host processes all the five layers (Application, transport, network, link and physical).

R23. List five tasks that a layer can perform. Is it possible that one (or more) of these tasks could be performed by two (or more) layers?

Ans: Tasks:

1. error control
2. flow control
3. segmentation and reassembly
4. multiplexing
5. connection setup

Yes.

R25. What are the five layers in the Internet protocol stack? What are the principal responsibilities of each of these layers?

Ans: Top-down approach:

Application Layer It is where network applications and their application-layer protocols reside. e.g. HTTP, SMTP, FTP, etc.

Transport Layer It transports application-layer messages between application endpoints

*Network Layer It is responsible for moving network-layer packets known as **datagrams** from one host to another*

Link Layer It routes a datagram through a series of routers between the source and destination.

Physical Layer It moves individual bits within the frame from one node to another.

P20. Consider the airline travel analogy in our discussion of layering in Section 1.5, and the addition of headers to protocol data units as they flow down the protocol stack. Is there an equivalent notion of header information that is added to passengers and baggage as they move down the airline protocol stack?

Ans: When passengers check-in, their luggage needs to be stamped with a luggage tag with a barcode with destination and flight information, and passengers have to print their boarding pass and be stamped with a check stamp after security. When passengers aboard the plane, go back and tear off the corresponding part of the boarding pass. When the passenger picks up the luggage after the flight arrives, it is sometimes necessary to check the luggage tag affixed on the boarding pass.