CS447 – Networks and Data Communications
Spring 2024

Exercise Question on January 10th

EXERCISE #1:

Assume the three-layer protocol suite architecture as used in the Internet (transport, network, and physical layers).

If a network application generates 40 MB (M = 10^6 and 'B' means "bytes") of the payload traffic where the three layers attach the following headers and trailers, what is the actual network traffic load the physical layer in the destination host computer will receive (in number of bytes)?

- The transport layer attaches a 24-byte header to each of its packet.
- The network layer attaches a 24-byte header to each of its packet.
- The physical layer attaches a 40-byte header and a 16-byte trailer to each of its frame (packet).
- The maximum packet size at the transport layer is 456 bytes.
- The maximum packet (and frame) size at the transport and the physical layer is larger than 456 bytes.

EXERCISE #2:

For packet-switching datagram networks, where network packets can be dropped at routers at any time, identify the advantages and disadvantages in using a small packet size vs. a large packet size. Mention at least two for each of the advantages and disadvantages.