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Pass: Networks

1-How long does it take a packet of length 1,000 bytes to propagate over a link of distance 2,500 km, propagation speed 250'000'000 m/s, and transmission rate 2 Mbps? More generally, how long does it take a packet of length L to propagate over a link of distance d, propagation speed s, and transmission rate R bps? Does this delay depend on packet length? Does this delay depend on transmission rate?

2-Suppose end system A wants to send a large file to end system B. At a very high level, describe how end system A creates packets from the file. When one of these packets arrives to a router, what information in the packet does the router use to determine the link onto which the packet is forwarded? Why is packet switching in the Internet analogous to driving from one city to another and asking directions along the way?

3-What are the five layers in the Internet protocol stack? What are the principal responsibilities of each of these layers?

4-What information is used by a process running on one host to identify a process running on another host?

5-You have the network of 10.10.10.0/24, divide this network into eight subnets. Write down the Network ID and Broadcast ID of the first 3 subnets. What is the new subnet mask?

6-You have the class A network ID of 14.0.0.0, and you need to divide this network into eight subnets. Use some paper and calculate the network ID, first valid address, last valid address,

and broadcast address of each of the eight subnets. Don't forget to determine the new subnet mask of these networks as well.

7-You have the class B network ID of 150.87.0.0, and you need to divide this network into 6 subnets. Use some paper and calculate the network ID, first valid address, last valid address, and broadcast address of each of the *first six subnets ofthe 16*. Don't forget to determine the new subnet mask of these networks as well

8- You have the network of 141.85.0.0 divide this network into 4 subnets. Write down the Network ID and Broadcast ID of subnets. What is the new subnet mask?