
COMP90007 Internet Technologies

Week 3 Workshop

Semester 2, 2024

Question 1 (Layers)

- Identify 2 ways in which the OSI reference model and the TCP/IP reference model are the same.
- Identify 2 ways in which these models differ.
(NB: You can use the textbook to solve this question)

Question 2 (Delay and bandwidth)

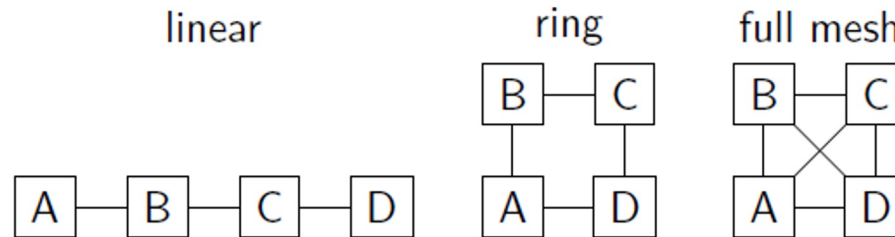
- Calculate the end-to-end transit time for a packet for
 - GEO (*Geostationary orbit*) (altitude: 35,800 km),
 - MEO (*Medium Earth orbit*) (altitude: 18,000 km) and
 - LEO (*Low Earth orbit*) (altitude: 750 km) satellites.

Question 3 (Delay and bandwidth)

- An image is 1600×1200 pixels with 3 bytes/pixel. Assume the image is uncompressed.
 - How long does it take to transmit it over a 56-kbps modem channel, assuming zero propagation delay over the channel?
 - Over a 1-Mbps cable modem? Over a 10-Mbps Ethernet?
 - Over 100-Mbps Ethernet? Over gigabit Ethernet?

Question 4 (Topology)

- Consider the following 3 network topologies for connecting N nodes. In the general case of an N node network:



- (a) How many links are there in each network?
- (b) What is the maximum delay between any pair of nodes, assuming each link has a delay of 10ms, and the shortest path is used between nodes?
- (c) What is the minimum number of links that need to be cut in order to isolate one or more nodes?
- (d) Which topology would you use to connect military command centres?

Question 5 (Multiplexing)

- Is an oil pipe a simplex system, a half-duplex system, a full duplex system or none of the above? Under which conditions?

Question 6 (Multiplexing)

- List two solutions that one can use for sharing a link between multiple senders and explain these solutions briefly.