Chapter # 12 and Chapter #13 Exercises

Due on August 2nd, 2019
Computer Organization & Programming
CS550WS—Summer I
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Problem II. How many connections are required for 30 nodes to be connected in a full mesh topology?

Solution

$$\text{Number of Connections} = \text{nodes} \times (\text{nodes} - 1)/2$$
$$\text{Number of Connections} = 30 \times (30 - 1)/2$$
$$\textbf{Number of Connections} = \textbf{435}$$

Problem III. Each individual link channel is characterized by a number of different properties. Some of them are a) type of medium, b) signaling method, c) directionality of signals, d) nature of the interfaces with the end nodes and with other links. What are the other properties?

Solution

The other properties that characterize individual link channels are link bandwidth, the length of channel restrictions, the time delay between the data recieved from incoming node and the time it releases it to an outgoing node, the number of shared connections in the channel, the noise characteristics, if its guided or unguided, and the electrical and optical properties of the channel.

Englander, I. (2014). *The architecture of computer hardware, systems software, & networking: An information technology approach* (Fifth ed.). Hoboken, NJ: John Wiley & Sons.

Problem 2, Chapter 13. Suppose a higher layer application wants to send a file 12MB in size across an Ethernet LAN. How many Ethernet frames are needed? Assume the largest Ethernet payload is 1500 bytes.

Solution

$$12 \text{ MB} \times 1,048,576 \text{ bytes} = 12,582,912 \text{ bytes}$$
$$12,582,912 bytes \div 1500 \text{ bytes} = 8388.608 \approx \textbf{8389 frames}$$