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PRACTICE SET

Questions

Q17-1. An *amplifier* amplifies the signal, as well as noise that may come with the signal, whereas a *repeater* regenerates the signal, bit for bit, at the original strength.

Q17-3. A *transparent switch* is a switch in which the stations are completely unaware of the switch's existence. If a switch is added or deleted from the system, reconfiguration of the stations is unnecessary.

Q17-5. A *forwarding port* forwards a frame that it receives; a *blocking port* does not.

Q17-7. Members of a *VLAN* can send broadcast messages with the assurance that users in other groups will not receive these messages.

Q17-9. Stations can be grouped by *port number*, *MAC address*, *IP address*, or by a combination of these characteristics.

Q17-11. A *router* has more overhead than a switch.

    a. A router process the packet at three layers; a switch processes a frame at only two layers.

    b. A router needs to search a routing table for finding the output port based on the best route to the final destination; A switch needs only to consult a filtering table based on the location of stations in a local network.

    c. A routing table is normally longer than a filtering table; searching a routing table needs more time than searching a filtering table.

    d. A router changes the link-layer addresses; a switch does not.

Problems

P17-1.

    a. A filtering table is based on the link-layer destination address of the arrived frame.

    b. A routing table is based on the network-layer destination address of the arrived packet (datagram).

P17-3. See the following figure.
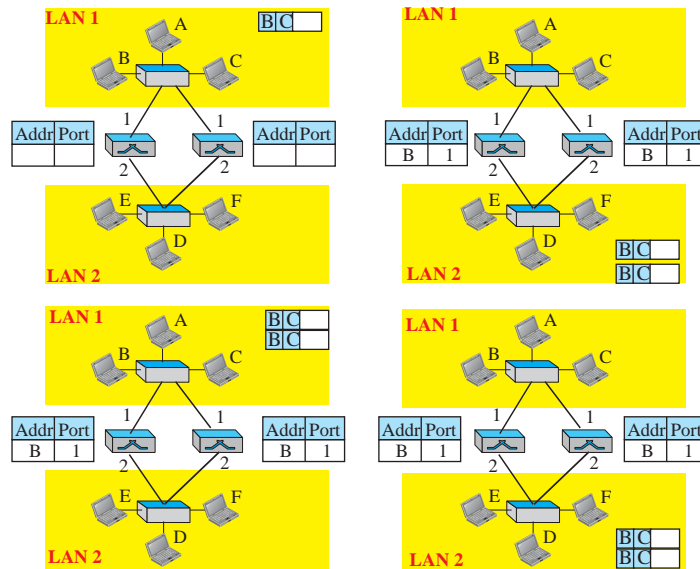
P17-5. The looping problem comes from redundancy (two switches between the LANs instead of just one). If we change the hub in both LANs, it reduces the traffic in each LAN, but the switches between the two LANs still forward the frame in both direction.

P17-7. The following figure shows one solution.

a. Spanning Tree

b. Logical connection with blocking port
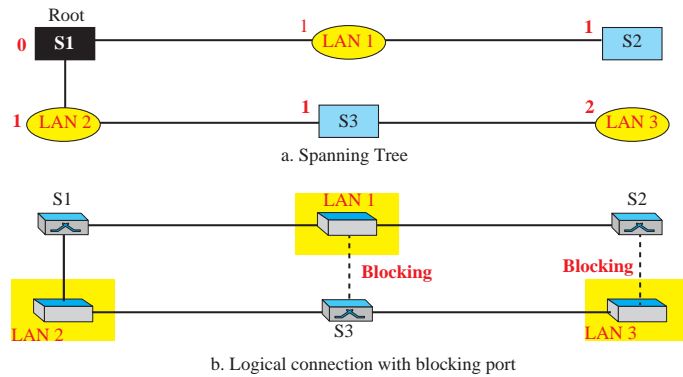
P17-9. The router in this case acts as a link-layer switch and needs a link-layer address.