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Semester: 2nd

Assignment: Fundamental of News Reporting

CHAPTER 15

Connecting LANS, Backbone Networks, and Virtual Networks

Solutions to Review Questions and Exercises

Review Questions

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.

2. Bridges have access to station physical addresses and can forward a packet to the

appropriate segment of the network. In this way. they filter traffic and help control

congestion.

3. A transparent bridge is a bridge in which the stations are completely unaware of

the bridge's existence. If a bridge is added or deleted from the system, reconfigura-

tion of the stations is unnecessary.

4. A I can only travel so far before it becomes corrupted. A repeater regenerates

the original signal; the signal can continue to travel andthe LAN length is thus

extended.

5. A hub is a multiport repeater.

6. Aforwarding port forwards a frame that it receives; a blocking port does not.

7. In a bus backbone, the topology of the backbone is a bus; in a star backbone, the

topology is a star.

8. A VLAN saves time and money because reconfiguration is done through software.

Physical reconfiguration is not necessary.

9. Members of a VLAN can send broadcast messages with the assurance that users in

other groups will not receive these messages.

10. A VLAN creates virtual workgroups. Each workgroup member can send broadcast

messages to others in the workgroup. This eliminates the need for multicasting and

all the overhead messages associated with it.

11. Stations can be grouped by port number, MAC address, IP address, or by a com-

bination of these characteristics.

- **Exercise :**

17. Although any router is also a bridge, replacing bridges with routers has the follow-

ing consequences:

a. Routers are more expensive than bridges.

b. Routers operate at the first three-layers; bridges operates at the first two layers.

Routers are not designed to provide direct filtering the way the bridges do. A

router needs to search a routing table which is normally longer and more time

consuming than a filtering table.

c. A router needs to decapsulate and encapsulate the frame and change physical

addresses in the frame because the physical addresses in the arriving frame

define the previous node and the current router: they must be changed to the

physical addresses of the current router and the next hop. A bridge does not

change the physical addresses. Changing addresses, and other fields, in the

frame means much unnecessary overhead

18. A fillering table is based on physical addresses; a routing table is based on the

logical addresses.

19.Figure 15.5 shows one possible solution. We have shows the network, the graph,the spanning trees, and the blocking ports.

20.A router has more overhead than a bridge.A router process the packet at three layers; a bridge processes a frame at only two layers. A router needs to search a routing table for finding the output port based on the best route to the final destination ;A bridge needs only to consult a filtering table based on the

location of stations in a local network . A routing table in normally longer than a filtering table searching a routing table needs more time than searching a filtering table. A router changes physical addresses ; a bridge does not .

ng ports.