

Course Name: A Level (2<sup>nd</sup> Sem)

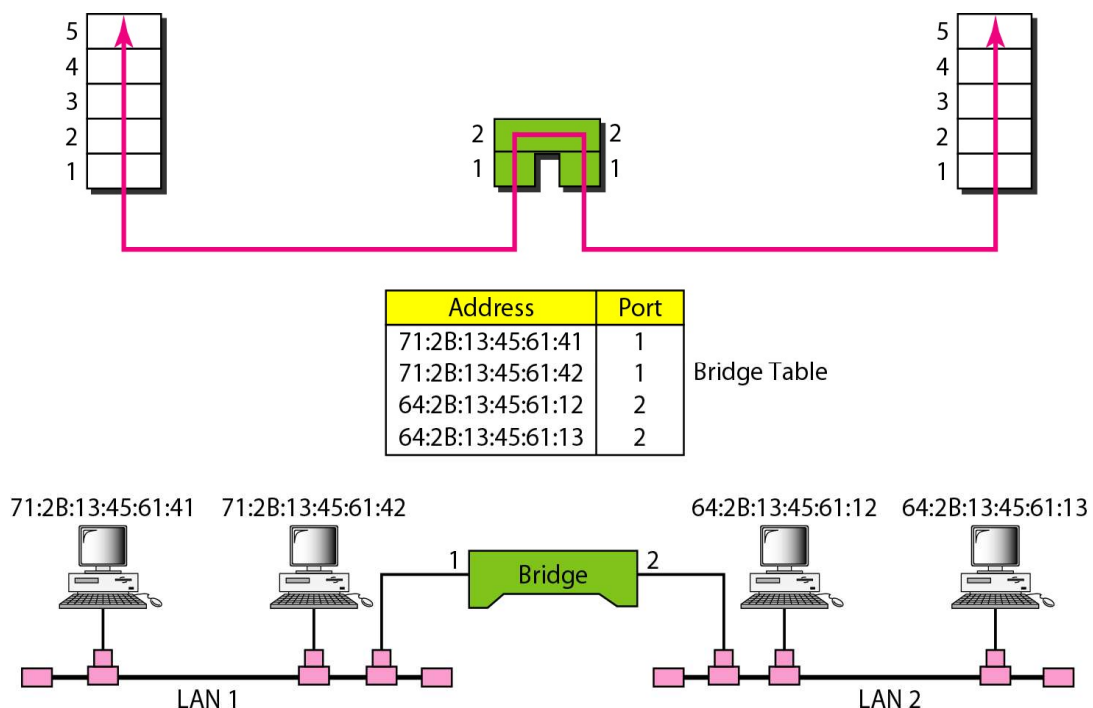
Subject: DCN

Topic: Connecting Devices contd.

Date: 02-06-20

## **Bridges:**

- A bridge operates in both the physical and the data link layer. As a physical layer device, it regenerates the signal it receives. As a data link layer device, the bridge can check the physical (MAC) addresses (source and destination) contained in the frame.
- A bridge has filtering capability. It can check the destination address of a frame and decide if the frame should be forwarded or dropped. If the frame is to be forwarded, the decision must specify the port. A bridge has a table that maps addresses to ports.
- Let us give an example. In Figure, two LANs are connected by a bridge. If a frame destined for station 712B13456142 arrives at port 1, the bridge consults its table to find the departing port. According to its table, frames for 712B13456142 leave through port 1; therefore, there is no need for forwarding, and the frame is dropped. On the other hand, if a frame for 712B13456141 arrives at port 2, the departing port is port 1 and the frame is forwarded. In the first case, LAN 2 remains free of traffic; in the second case, both LANs have traffic. A bridge does not change the physical addresses contained in the frame.

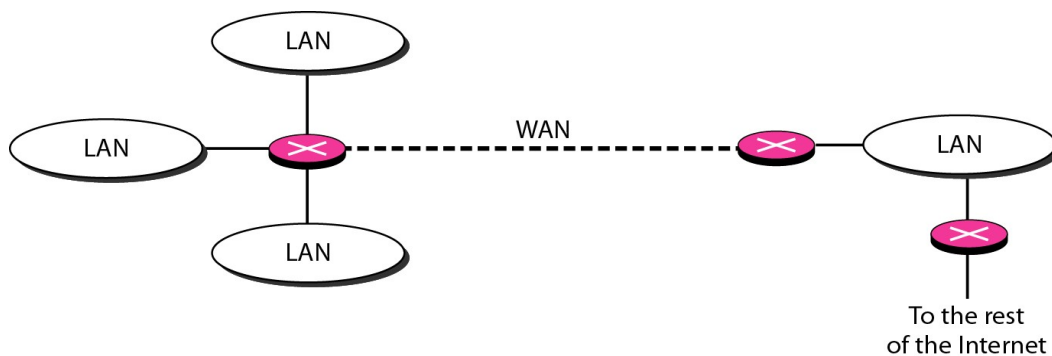


- A two-layer switch is a bridge, a bridge with many ports and a design that allows better (faster) performance. A bridge with a few ports can connect a few LANs together. A bridge with many ports may be able to allocate a unique port to each station, with each station on its own independent entity. This means no competing traffic (no collision).

- A two-layer switch, as a bridge does, makes a filtering decision based on the MAC address of the frame it received. It can have a buffer to hold the frames for processing. It can have a switching factor that forwards the frames faster. Some new two-layer switches, called cut-through switches, have been designed to forward the frame as soon as they check the MAC addresses in the header of the frame.

## **Routers:**

- A router is a three-layer device that routes packets based on their logical addresses (host-to-host addressing).
- A router normally connects LANs and WANs in the Internet and has a routing table that is used for making decisions about the route. The routing tables are normally dynamic and are updated using routing protocols.
- Figure shows a part of the Internet that uses routers to connect LANs and WANs.



## **Gateway**

- Although sometimes the term gateway and router are used interchangeably, but there are some differences between the two.
- A gateway is normally a computer that operates in all five layers of the Internet or seven layers of OSI model.
- A gateway takes an application message, reads it, and interprets it. This means that it can be used as a connecting device between two internetworks that use different models. For example, a network designed to use the OSI model can be connected to another network using the Internet model.
- The gateway connecting the two systems can take a frame as it arrives from the first system, move it up to the OSI application layer, and remove the message.

## **Exercises:**

1. What do we mean when we say that a bridge can filter traffic? Why is filtering important?
2. A bridge uses a filtering table; a router uses a routing table. Explain the difference.
3. Explain the working of Gateway. How is it differing from Router?