

Computer Network

Network Devices

Bridge

Bridges are devices (computers) that can transmit data between two heterogeneous LANs. Bridges divide a large network into smaller segments. They also filter data and keep the traffic separate for each segment. When a packet enters a bridge, it reads the address contained in the frame and compares that address with a table (containing addresses of all the nodes in both the segments). When the bridge finds a match, it sends the packet to the destination segment.

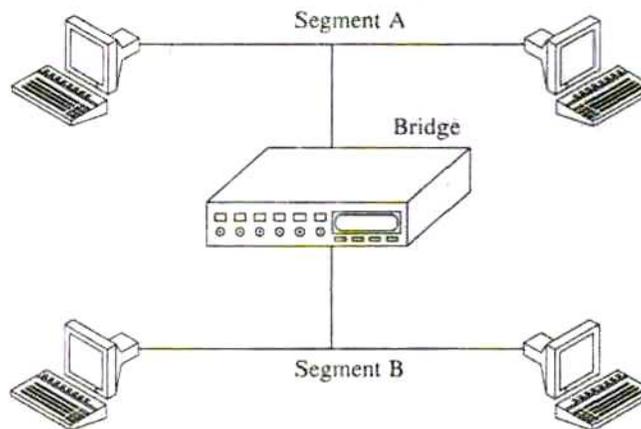


Figure: The bridge connecting two segments of PCs

A bridge operates in the following manner:

- (a) It receives all the signals from both segment A and B.
- (b) It reads the addresses and discards (filters) all signals from segment A that are addressed to the segment, because they need not cross the bridge.
- (c) Signals from Segment A addressed to a computer on Segment B are transmitted to Segment B.
- (d) The signals from Segment B are treated in a similar way. Only those signals that are meant for segment A are re-transmitted.

Repeater

All transmission media attenuate (weaken) the electro-magnetic waves that travel through the media. Attenuation, therefore, limits the distance any medium can carry data. Adding a device that amplifies the signal can allow it to travel farther, increasing the size of the network. For example, if one is connecting computers that are more than 100 meters apart using Ethernet cable, one will need a device that amplifies signals to ensure data transmission. Devices that amplify signals in this way are called repeaters. Repeaters fall into the following two categories:

- (a) Amplifiers
- (b) signal-regenerating devices (Repeaters)

- **Amplifiers**

Amplifiers increase the power of the incoming signal, i.e., both signal and the noise. These can improve signal to noise in analog types of systems only.

- **Signal regenerating repeaters**

Signal-regenerating repeaters create an exact duplicate of the incoming digital data by identifying it amidst the noise, reconstructing it and passing only the desired information. In this manner, the original signal is duplicated, boosted to its original strength and then sent.

Why Repeaters?

Repeaters extend the distance of a single network. So, if you are using an Ethernet LAN but need to go farther than you are usually able to, you can install a repeater to achieve the added distance. When a repeater is installed, it creates a physical break in the cable. The signal is received on one side of the repeater, regenerated and passed on to the next section of cable. Repeaters copy individual bits between cable segments; Bridges store and forward frames between LANs; and Gateways store and forward packets between dissimilar networks.

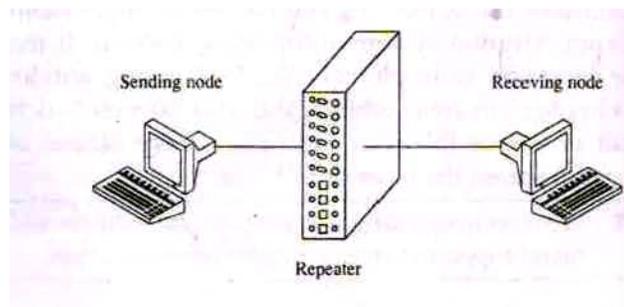


Figure: Repeater connecting two computers and regenerating digital signal

Exercise:

- 1: What is Bridge Device?
- 2: What is Repeater Device?
- 3: Write Comparison between bridge and repeater ?