Network Devices

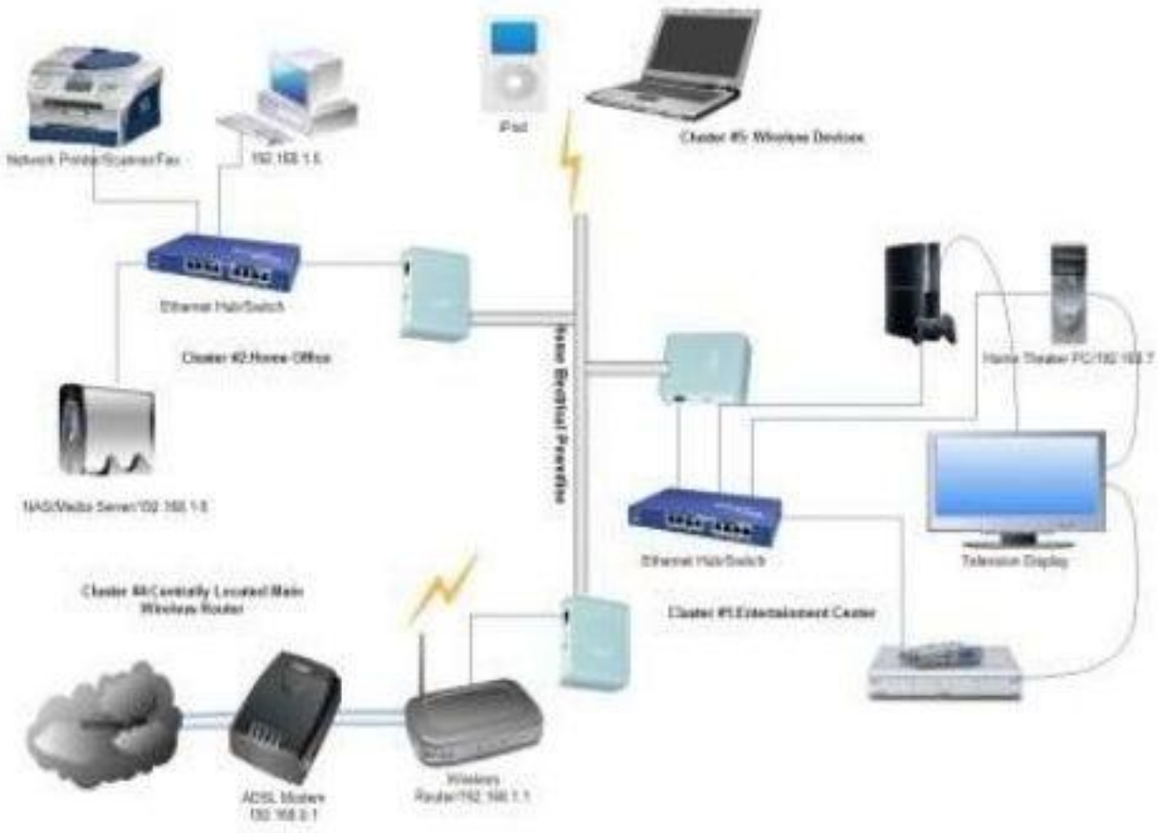
Topics

- Introduction
- Repeater
- Router
- Brouter
- Hub
- Switches
- Bridge
- NIC
- Gateway

Introduction

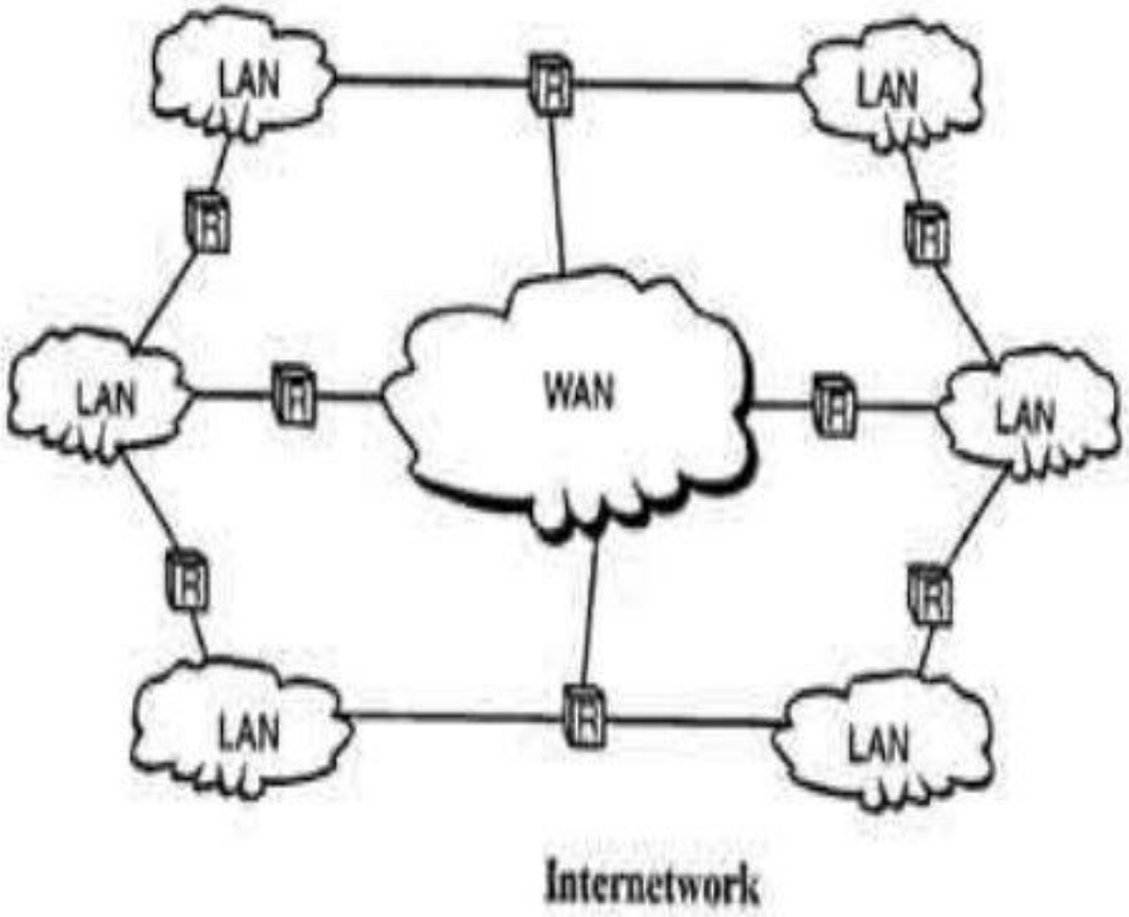
What is network?

When two or more devices are connected in such a way that they can share their data, information as well as their resources then it forms network.



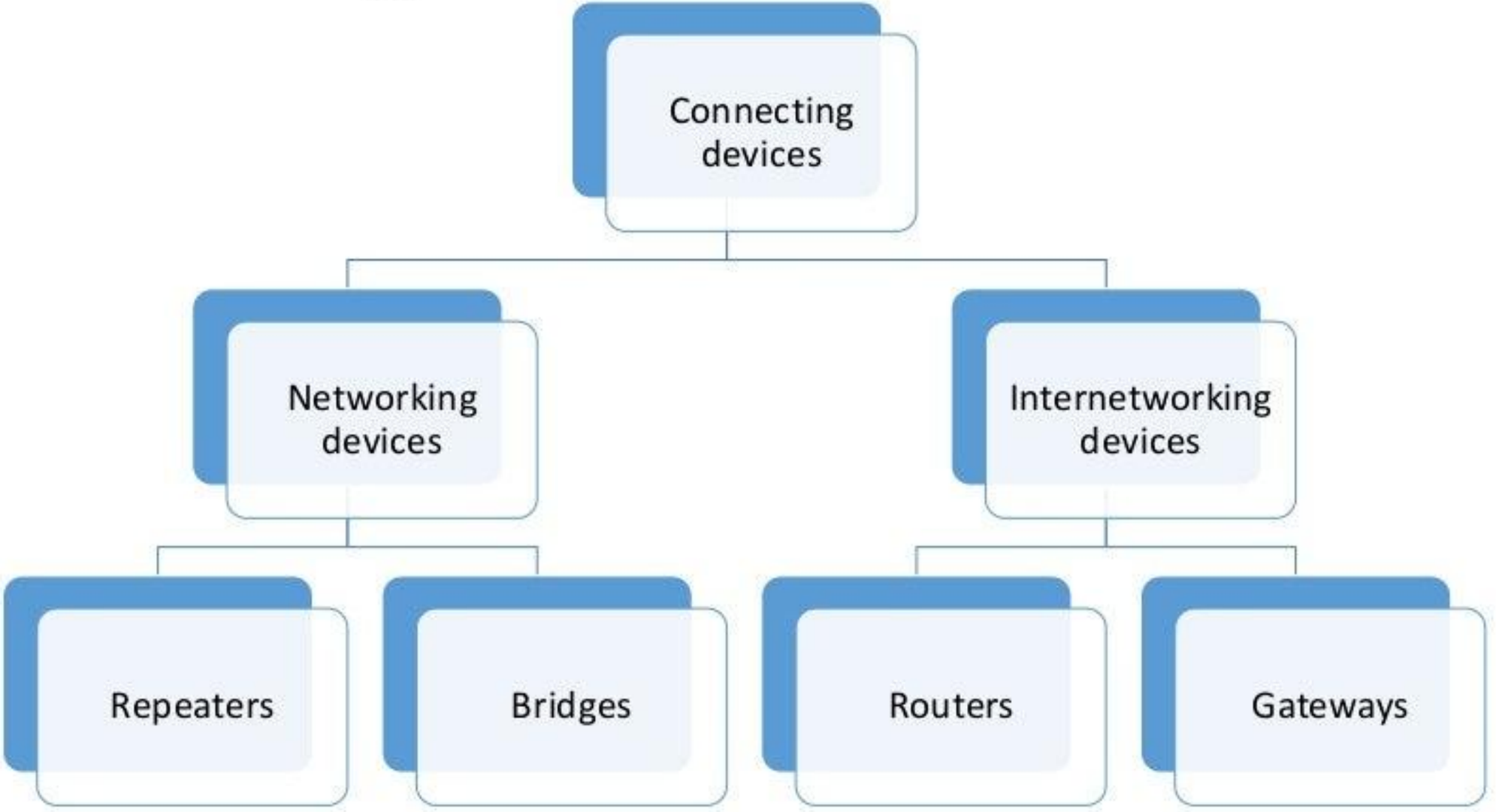
What is internetwork?

When two or more networks or subnets connected to each other for communication between hosts on different types of network then it forms internetwork.

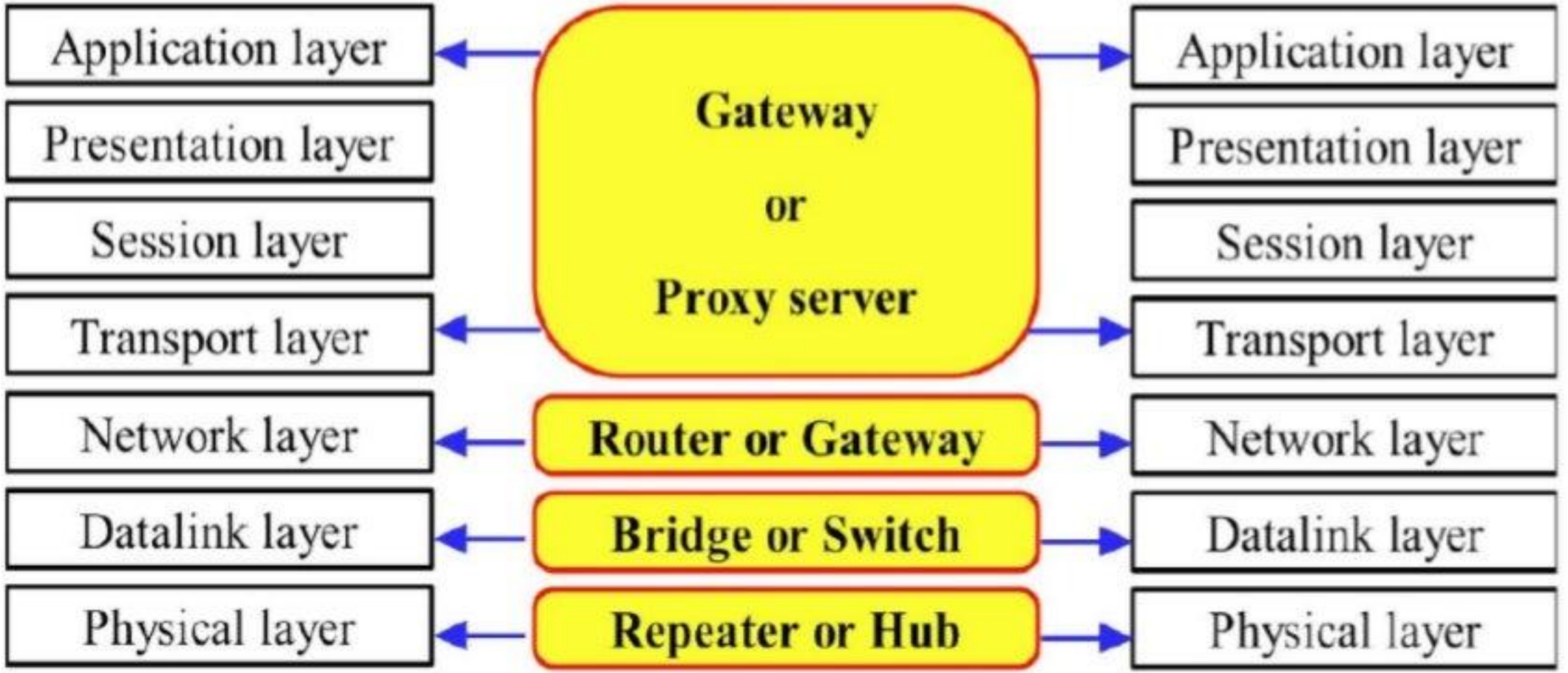


Internetwork

Connecting devices

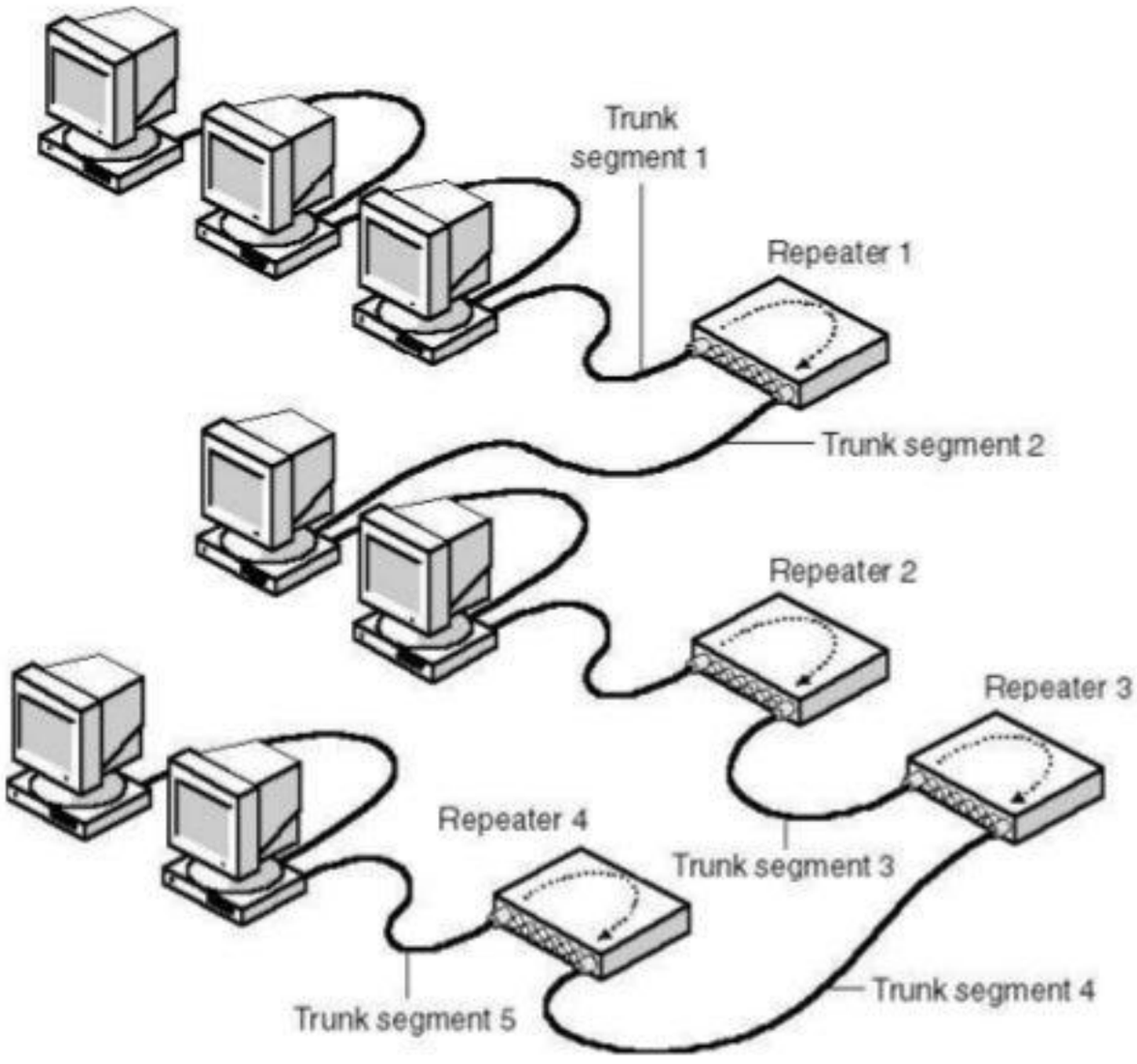


Connecting devices and OSI model



Repeater

- Repeater operates on physical layer.
- It receives the signal before it becomes corrupted and regerates the original bit pattern.
- It allows to extend the physical length of the network.
- It doesn't change the functionality of network.



Has three basic functions:

1.Receives a signal which it cleans up

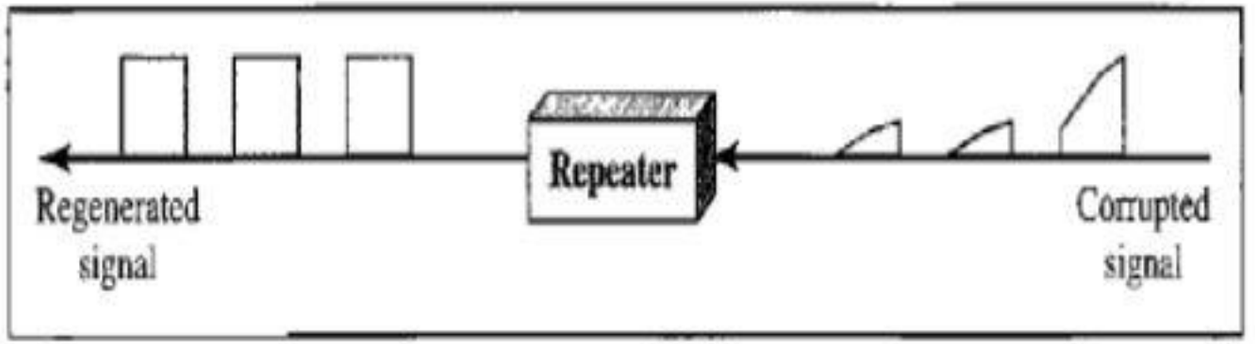
2.Re-times the signal to avoid collisions

3.Transmits the signal on to the next segment

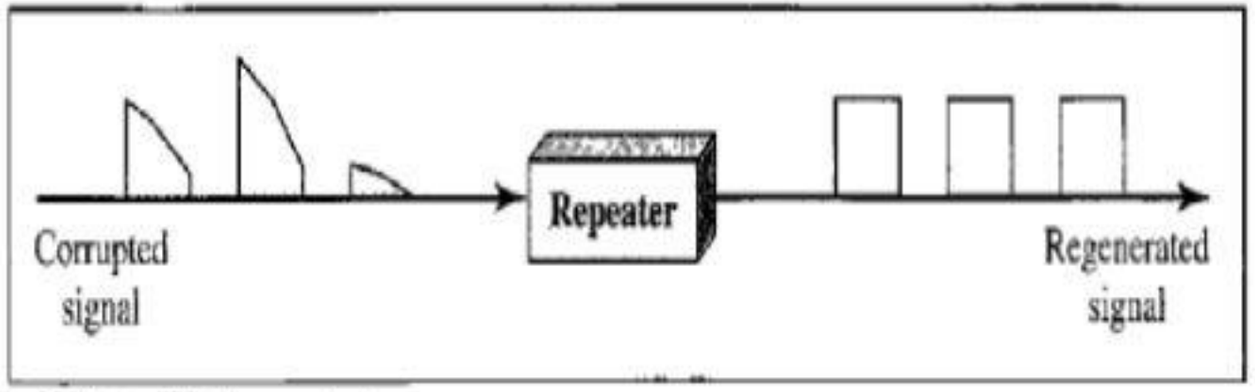
Not an amplifier

- An amplifier cant discriminate between the intended signal and noise; it amplifies equally everything fed in to it.

- A repeater does not amplify the signal, it regenerates it.



a. Right-to-left transmission.



b. Left-to-right transmission.

Advantages

- Can connect different types of media
- Can extend the network in terms of distance

Disadvantages

- Can not filter the data
- Can not connect different network architectures

Router

- Routers operate in the physical,datalink and network layers.
- It chooses the best optimum path from available paths.
- Can interconnect different networks.
- Simplest function of routers is to receive packets from one connected network and pass them to second connected network.

A router determines how information is passed in the most efficient manner.

Two primary functions:

1.To determine the best path

2.To share details of routes with other router.

Routers consults with a routing table.

Routing table

- Routers forward packets to other network by maintaining information about other networks in a database called a routing table

Types of routers

Static router

Routes are manually configured by a network administrator.

Dynamic router

Adjust automatically to changes in network topology and informations it receives from other routers.

Routing concepts:

Least-cost routing

In this, decision is based on efficiency of network, cheapest and shortest path.

Non-adaptive routing

In non adaptive routing in which once a path way to destination has been selected, the router sends all packets for that destination along that one route.

Adaptive routing

In adaptive routing router send the packets depending on which route is most efficient at the moment.

Advantages

- Can function in LAN or WAN
- Connects differing media
- Can determine best path or route

Disadvantages

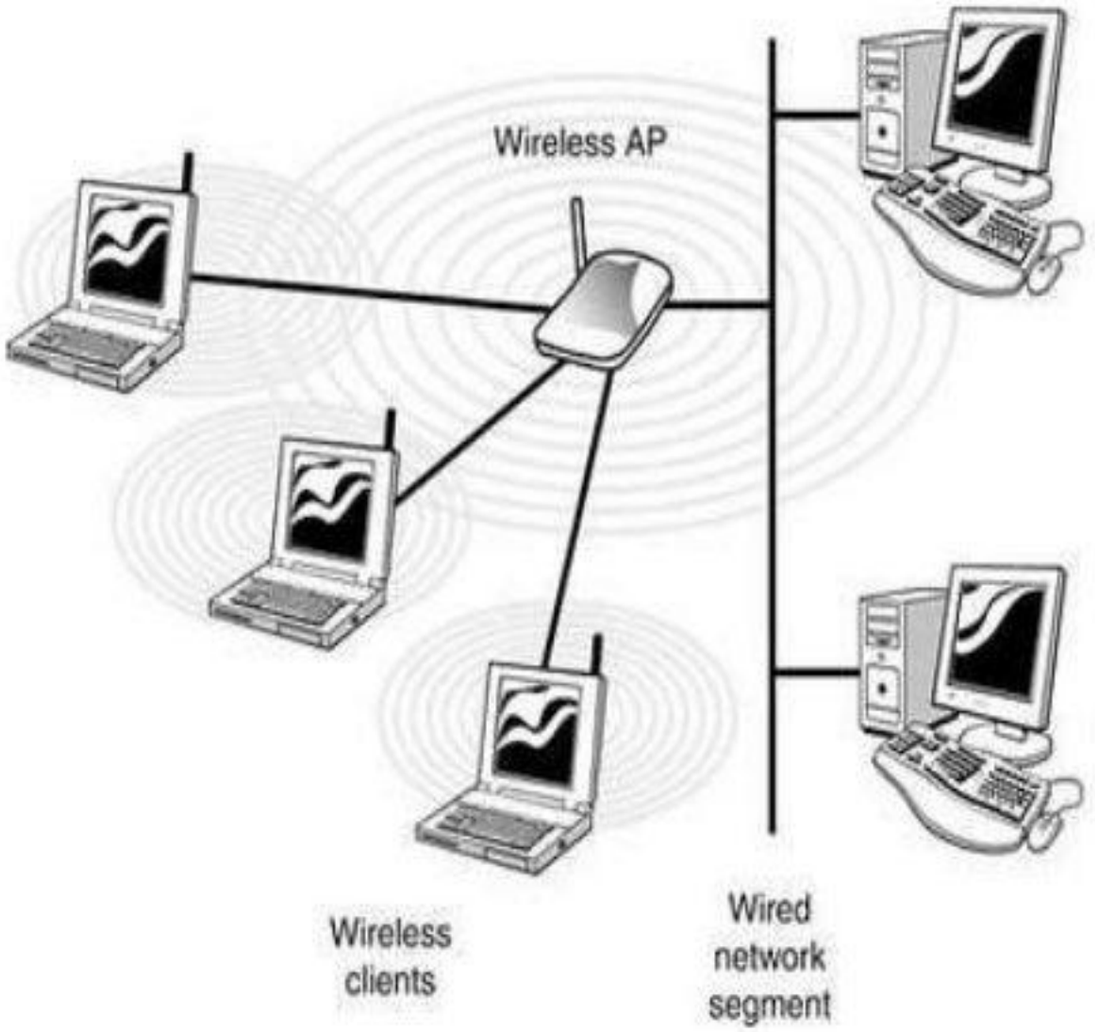
- Expensive
- Must use routable protocols
- Slower than a bridge

Brouters

- Brouters are a combination of router and bridge.
- Brouters are operated in network layer(routable protocols) & data link layer(non-routable protocols).
- Brouter provides combine features of router for routing protocol & bridge for non-routable protocol.

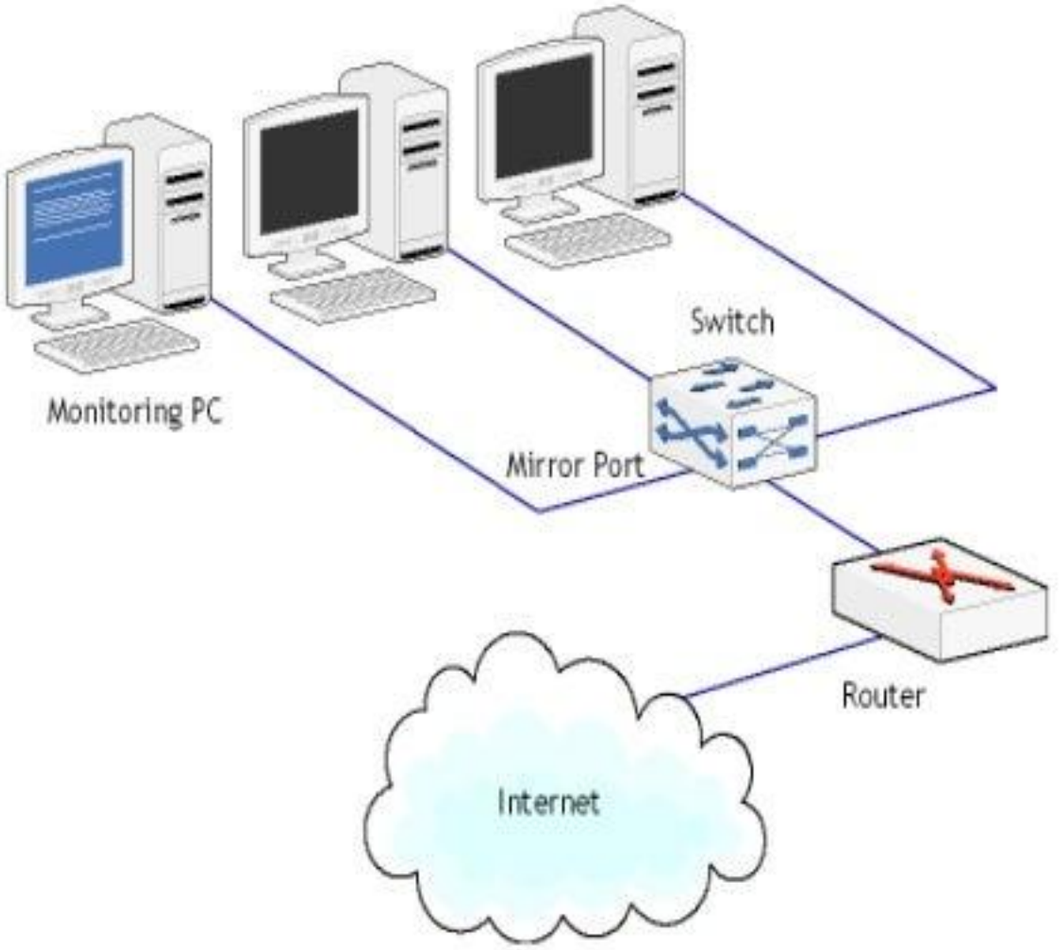
Access point:

- It is hardware or software that acts as a communication hub for users of wireless device to connect to wired LANs.
- It provides higher wireless security.



Workstation:

- It is an individual single user computer which is connected with server.
- It has communication capabilities.
- It has two types:
  1. Diskless
  2. Computer with hard disk



Hubs

- A Hub interconnects two or more stations in a star topology.
- Multiple inputs and output to all active devices at a time.
- Enables high speed communication.
- It uses different media types like co-axial, fiber optic, twisted pair.
- Hub is operated in physical layer of the OSI model.

Types of Hub

1.Active Hub

- Also called multiport repeater.
- Need electrical power supply to run repeater.