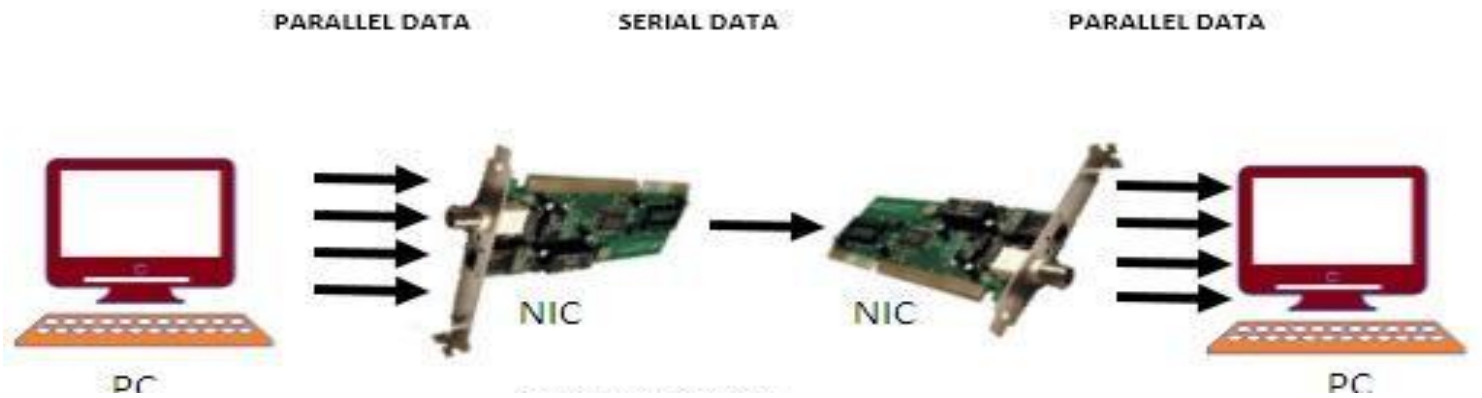
Network devices

Computer hardware devices which are used to connect computers, printers, or any other electronic device to a computer network are called network devices. These devices transfer data in a fast, secure and correct way with some specific functionality over same or different networks.

Some devices are installed on the device, like Internal modem, NIC card or RJ45 connector, whereas some are part of the network, like router, switch, etc.

Network devices

NIC – This is at top among other networking devices and mostly used networking device. This is also known as network adapter card, Ethernet Card and LAN card. It allows our PC to communicate with other PCs. A PC uses parallel data transmission to transmit data between its internal parts where as the media that connects this PC with other device/PCs uses serial data transmission. A NIC converts parallel data stream into serial data stream and vice versa.

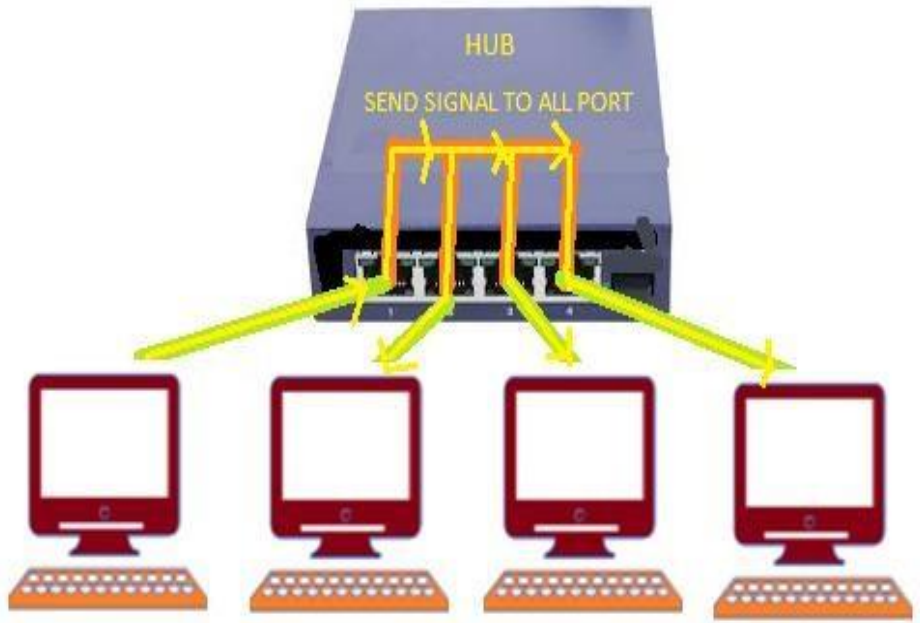


Network devices

RJ-45 (Registered Jack – 45) is an eight wired connector that is used to connect computers on a local area network (LAN), especially Ethernet.

Network devices

HUB – HUB is used to connect multiple computers in a single LAN network of one workgroup. Generally HUBs are available with 4,8,12,24,48 ports.
When a hub receives signal on its port, it repeats the signal and forwards that signal from all ports except the port on which the signal arrived.



Network devices

There are two types of HUB

Passive HUB:- It only forwards the signal on all ports without amplifying the signal.

Active HUB:- it forwards the signal with improvement in the quality of data signal by amplifying it.
That why such hubs need additional power supply.

Based on port type,

there are two types of HUB:-

Ethernet HUB :- All ports have RJ-45 connectors.

Combo HUB :- Several different types of connectors such RJ-45, BNC, and AUI available as ports in such HUB.

Network devices

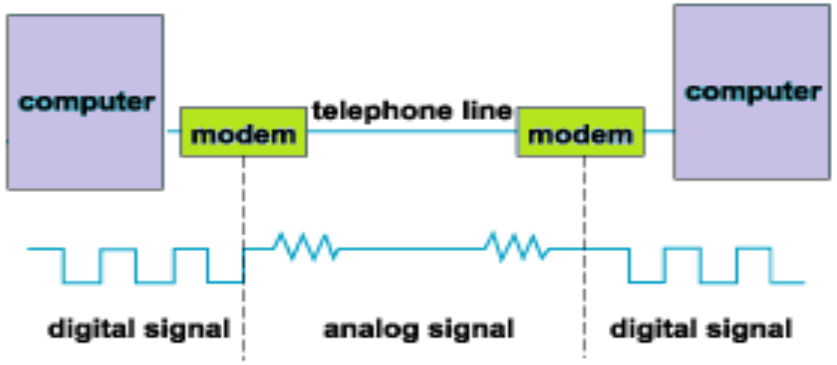
SWITCH –Switch is also used to connect multiple computers together in a LAN workgroup,just like hub. Switches are available with 4,8,12,24,48,64 ports. Switch makes their switching decisions by using application specific integrated circuits (ASICs).Due to switching decision capability, switch sends signal to recipient only and that's why switches are called as intelligent hub. In below diagram leftmost node sending signal to rightmost node.

Network devices

Modem – Modem is short for Modulator Demodulator.

It's an electronic device used to access the Internet that modulates carrier waves to encode information to be transmitted and also demodulates incoming carrier waves to decode the information they carry.

Modulation means digital to analog signal conversion and its vice versa is known as demodulation.

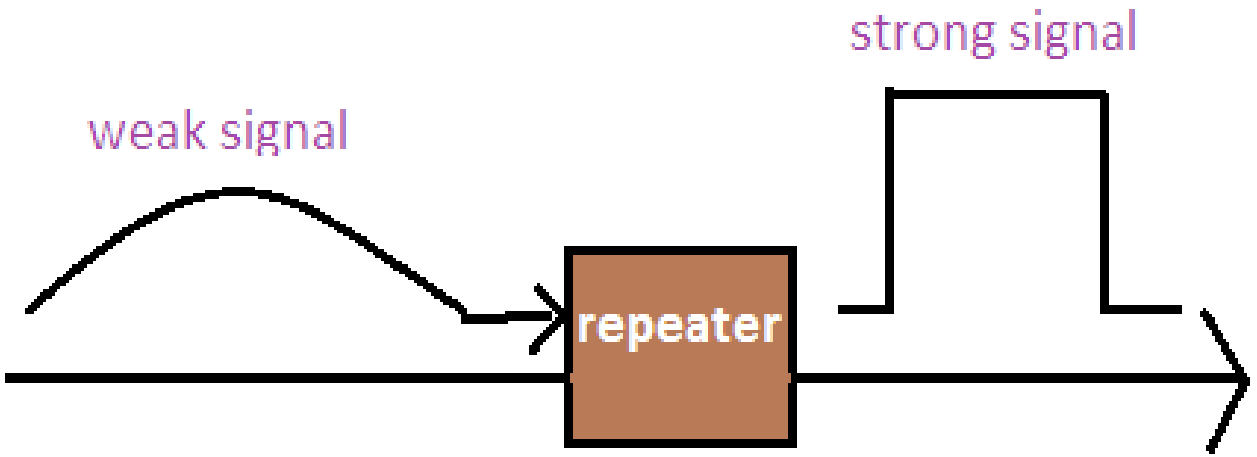


Network devices

Repeater – In a network signal travels a long distance in transmission media.

Due to resistance of media signal becomes weak.

Repeater is a networking device which regenerates the signal and forwards these signal with more power.



Network devices

Router – Routers operate in the physical, data link and network layers.

Router is a networking device which chooses the best optimal path from available pats to send the signals. It interconnects different networks.

The simplest function of a router is to received packets from one connected network and pass them to second connected network.

Network devices

Gateway –

A networking device capable to convert protocols so that two different network architecture based system can communicate with each other.

It works as protocol convertor.

Network devices

Hub Vs. Switch

1. A hub works on the physical layer (Layer 1) of OSI model while Switch works on the data link layer (Layer 2).
Switch is more efficient than the hub.

2. A switch can join multiple computers within one LAN,
and a hub just connects multiple Ethernet devices together as a single segment.

3. Switch is smarter than hub to determine the target of the forwarding data. Since switch has a higher performance, its cost will also become more expensive.

Network devices

Switch Vs. Router

1. In the OSI model, router is working on a higher level of network layer (Layer3) than switch.
2. Router is very different from the switch because it is for routing packet to other networks.
3. It is also more intelligent and sophisticated to serve as an intermediate destination to connect multiple area networks together.
4. A switch is only used for wired network, yet a router can also link with the wireless network.
5. A router costs higher than a switch.

Network devices

Router vs Gateway

1. Gateway regulates traffic between two dissimilar networks, while router regulator traffic between similar networks.

2. A router is a hardware device that forwards data packets between computer networks.

3. Routers perform the traffic directing functions on the Internet.

Network devices

Router vs Gateway

- Connection In One Network With Router - For example, there are 30 computers connected inside Network A. All these computers communicate with each other. In this situation, no gateway is needed. Because a router with a routing table that defines the hops within those 30 computers is enough.
- Connection Between Different Networks With Gateway - In another hand, we suppose that there are two networks, that are Network A and Network B. Computer X from Network A wants to send data to Computer Y from Network B, then there need to have both a Gateway A and a Gateway B so that the two networks will be able to communicate.