NIELIT GORAKHPUR

Course Name: O Level (2nd Sem) **Subject:** Introduction to ICT Resources
Topic: Computer Network – Devices(Part 1) **Date:** 16-06-2020

Computer Network

Network Devices

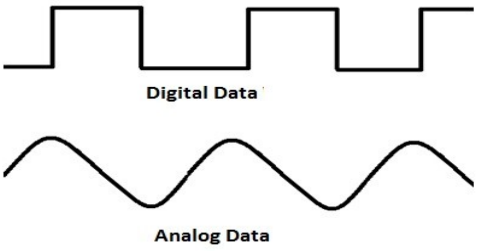
Hardware devices that are used to connect computers, printers, fax machines and other electronic devices to a network are called network devices. These devices transfer data in a fast, secure and correct way over same or different networks. Network devices may be used for inter-network or intra-network. Some devices are installed on the device, like NIC card or RJ45 connector, whereas some are part of the network, like router, switch, etc. Let us explore some of these devices in greater detail. There is the common network device list:

- Modem
- RJ45 Connector
- Ethernet Card
- Hub
- Switch
- Router
- Bridge
- Gateway
- Modem
- Repeater
- Access Point

Modem

Modem is a device that enables a computer to send or receive data over telephone or cable lines. The data stored on the computer is digital whereas a telephone line or cable wire can transmit only analog data.

The main function of the modem is to convert digital signal into analog and vice versa. Modem is a combination of two devices − modulator and demodulator. The modulator converts digital data into analog data when the data is being sent by the computer. The demodulator converts analog data signals into digital data when it is being received by the computer.



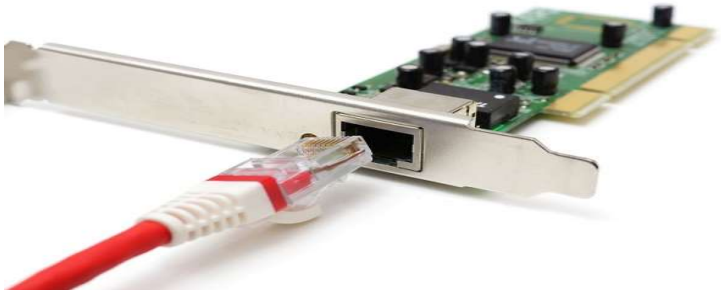
Analog-Digital Waveform

RJ45 Connector

RJ45 is the acronym for Registered Jack 45. RJ45 connector is an 8-pin jack used by devices to physically connect to Ethernet based local area networks (LANs). Ethernet is a technology that defines protocols for establishing a LAN. The cable used for Ethernet LANs are twisted pair ones and have RJ45 connector pins at both ends. These pins go into the corresponding socket on devices and connect the device to the network.

Ethernet Card

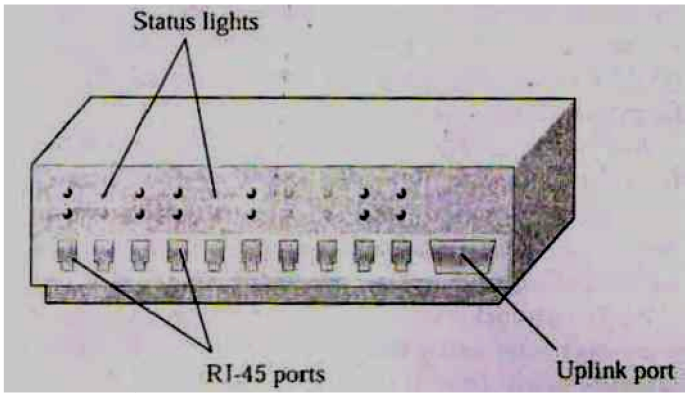
Ethernet card, also known as network interface card (NIC), is a hardware component used by computers to connect to Ethernet LAN and communicate with other devices on the LAN. The earliest Ethernet cards were external to the system and needed to be installed manually. In modern computer systems, it is an internal hardware component. The NIC has RJ45 socket where network cable is physically plugged in.



Hub

A hub is a device where data arrives from one or more nodes (computers in a network) and is forwarded to one or more other nodes.

Hubs generally have 4 to 24 RJ-45 ports for twisted pair cabling and one or more uplink ports for connecting the hub to other hubs. Also, hubs have indicator lights to indicate the status of the port link status, collisions and so on. Hubs receive signals from each station (node) and repeat the signals to all other stations connected to the hub. Some hubs, called active hubs, also amplify the signal before transmitting it to other nodes. Hence, hubs are also known as multiport repeaters.



Switch

A switch is a network device that selects a path or circuit for sending a data unit to its next destination. In smaller networks, a switch is not required. It is required in large internetworks, where there can be multiple ways of transmitting a message from a sender to a destination. The purpose of the switch is to select the best possible path.

Switches use a feature called address storing, which checks the destination for each data packet and sends it directly to the computer. Thus, switch can be compared to a telephone exchange, making direct connections between the originators of a call and the receiver. Because switches establish a direct connection between the originating and receiving PC, they also provide the full bandwidth of the network to each port. Hubs, by contrast, must subdivide the network's bandwidth by the number of active connections on the network, meaning that the bandwidth rises and falls depending on network activity.

Table: Comparison of Hub and Switch		
Feature	**Hub**	**Switch**
Bandwidth	Divides by total number of ports in use	Dedicated to each port in use
Data transmission	Broadcast to all connected computers	Broadcast only to the receiving computer.
Duplex support	Half duplex	Full-duplex when used with full duplex NICs

Exercise:

Q1: What is modem?

Q2: What is Switch?

Q3: Write sort note on Ethernet Card and RJ45 Connector.