Chapter (6)

Connectivity & Networks

We have seen how hardware, software, and people work together to create effective information systems. With connectivity, such systems can be made available to a wide variety of users who may be employees within a single organization; people from different organizations, or any individuals who need access to central databases.

6-1 Connectivity & Communications

Connectivity- the technologies that enable computers to pass data, voice messages, and video electronically to one other - is the backbone of the information age.

Computers stationed at a considerable distance from each other use a special data communications technology called **telecommunications** that can **transmit** & **receive** data via communication facilities such as satellites.

Communications Hardware

❖ Hosts and nodes in a network

A network is the type of configuration that enables devices to communicate with one another.

The Host is a central computer or file server.

The Nodes in a network can be any devices such as a terminal, desktop, workstation, or even larger computer.

❖ Communications Channels

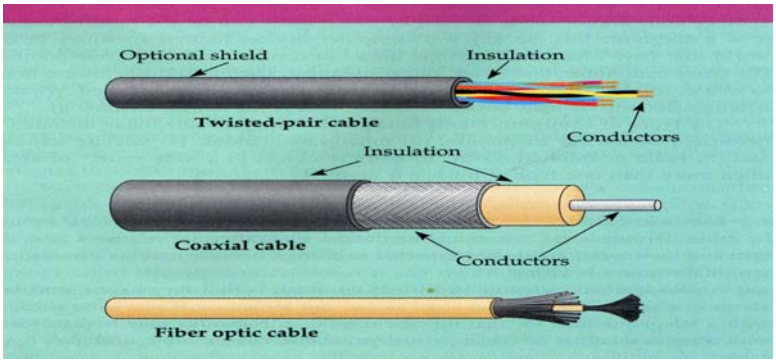
They are the linkages between nodes and a host in the network. The simplest type of channel is a direct cable.

There are different communications linkages, which are available today. They include hardwired cables**,** and radio waves including microwave stations and satellite stations.

To share resources in a wide variety of areas, often more than one type of linkage is used.

- Hardwired Cables

Hardwired terminals are directly linked to a CPU or host by cable. The basic types of cables are twisted-pair cable, coaxial cable, and fiber optic cable. See following. fig.



Following table shows its main features.

Twisted-pair cable	Coaxial cable	Fiber optic cable
- Most common type of hardwired cable for small networks. - Least reliable because it is subject to electrical interference: "noise". - Inexpensive.	- Used for high quality data transmission. - High speed. - Sturdy (they are laid without wiring conduits or mechanical support). - More expensive than	- Very high speed with a relatively low rate errors. - Highly reliable. - Not subject to electrical interference. - Becomes competitive

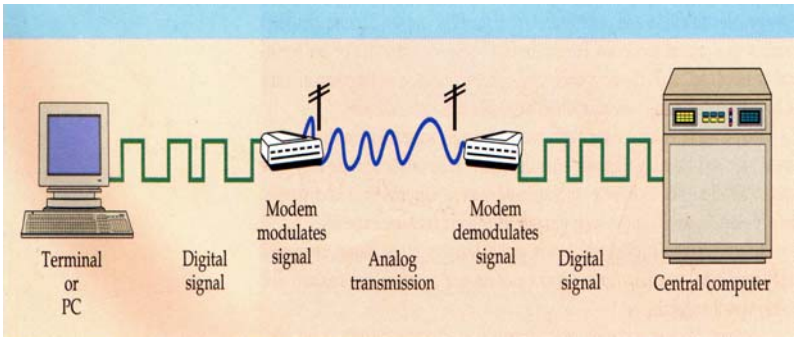
Data Transmission

- **Telephones for Data Communications**

Standard telephones commonly connect computers and terminals that are separated by long distances. Using a telephone, nodes located anywhere in the world can have access to a host computer.

To send computer data, which is in digital form (on – off electronic pulses), over the phone, users need additional interface equipment such as a modem or a communications controller to convert the signals.

Modem (<u>mod</u>ulator – <u>dem</u>odulator): is a device allowing to convert digital signal to analog signal, and to convert the analog signal back to a digital signal. See flg. Fig.



The Direct–connect modems are attached directly to the computers. They can be:

- Internal device (on a circuit board inside the computer).
- External device (in a unit separate from the computer). See flg. Fig.