

Chapter 6: Telecommunications Equipment

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Telecommunication Equipment

- Businesses need to be able to communicate data either between parts of the organization or with other businesses.
- A small computerized system switch the public line to any one of the internal phone lines
- Make connection between the extension and the public line

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Telephone

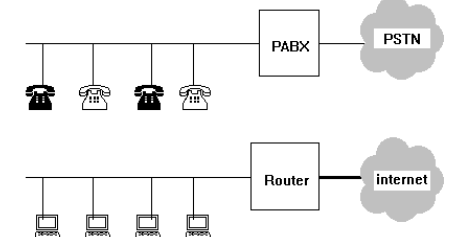
- Both vocal data and electronic communication of encoded data
- Voice converted to analog electrical signals
- Signal carried via electrical cable to a switching office then switch onto correct cables to reach the correct telephone

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Private Automated Branch Exchange (PABX)

- The **Private Automatic Branch Exchange (PABX)** is a small computerized system which controls the switching of extension lines with each other and with the public system.
- The telephonist has only to enter required extension number and the PABX will make the connection between the extension and the public line.
- It enable a few public exchange line to be shared amongst many in the organization



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Facilities of PABX

- When calls to an extension not answered, PABX can direct the call to another line, calls can also be redirected to the telephonist
- Memory of commonly used number for quick dial
- Temporarily redirect calls to another extension
- Enable pick up of another extension's call

Other Facilities of PABX

- The PABX also has other facilities which can be programmed in by users.
 - ◆ When a call is made to an individual in the company, and if this is not answered, the PABX can direct call to all the extensions in the same department. If there is still no answer, then the call can then be redirected back to the telephonist at the switchboard so that the caller can be informed of the lack of response.
 - ◆ Users can program a series of commonly used numbers into a memory so they can be dialed by pressing just one or two keys instead of the whole number.
 - ◆ If an individual is going to spend some time in another office, they can redirect their calls to the office where they will be temporarily.
 - ◆ Also, where people share an office, there is no need to get up to answer another person's extension if they are out. Punching a short code will cause the call to be transferred to the user's own desk.

Voice Services (Voice Mail)

- Enables a caller's spoken message to be recorded in a digital form in a 'voice mail box'
- User can access the message by phone and the message is converted back into voice
- Cheap but only one way

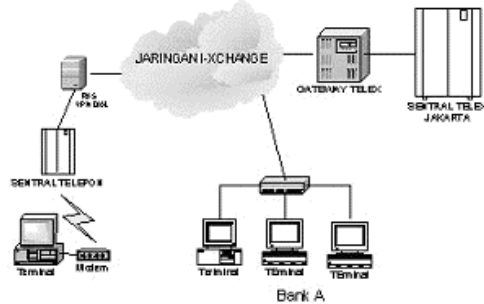
Tele-Facsimile (FAX)

- To send an exact copy of an original document including text and graphics to other fax subscribers
- Reliable, fast and cheap
- Used telephone lines



Telex

- Both sender and recipient must have telex terminal
- Data can be typed directly into telex terminal
- Confirmation that the message has been received

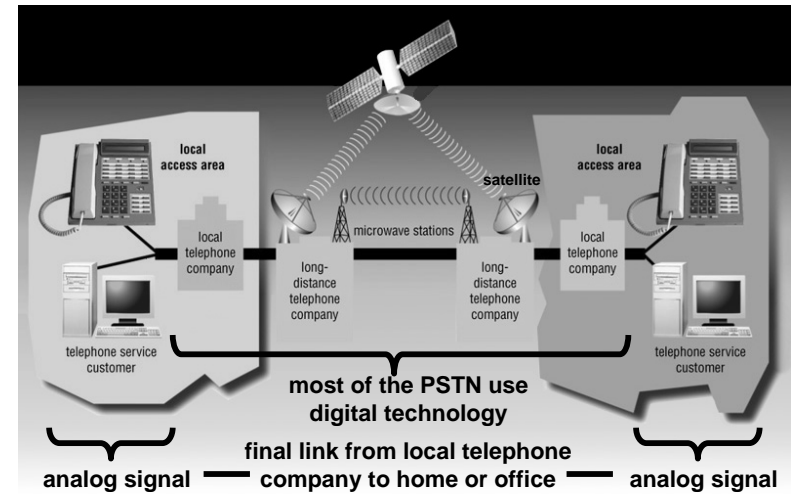


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Public Switched Telephone Network (PSTN)

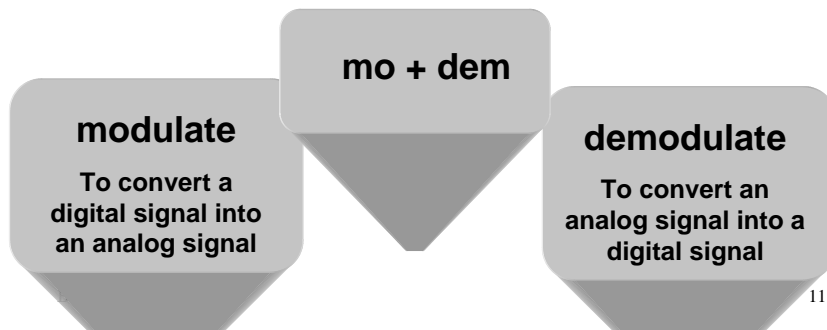
- Worldwide telephone system that handles voice-oriented telephone calls



Dial-up Modem



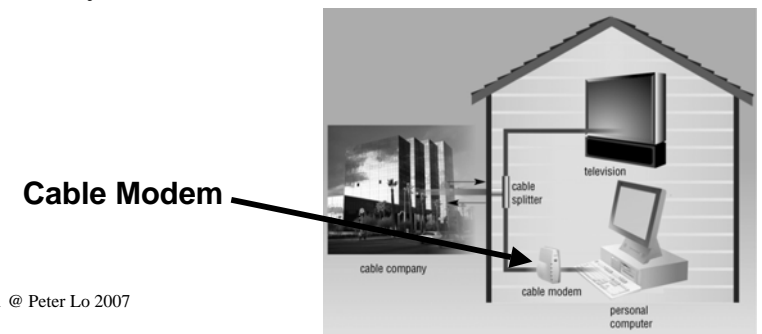
- Communications device that converts computer's digital signals to analog signals and analog signals to digital signals
- ISDN and DSL use digital modem with a digital telephone line



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Cable Modem

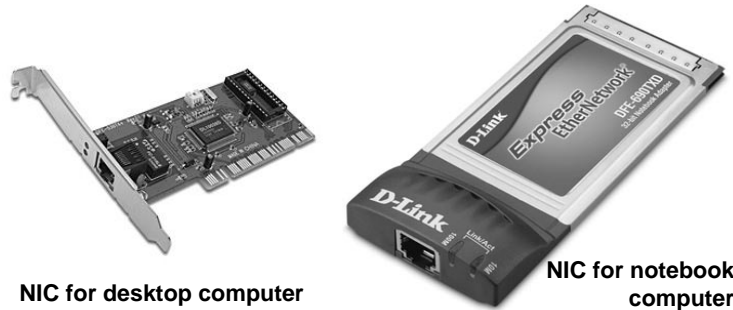
- Modem that sends and receives data over cable television network
- Much faster than modem or ISDN
- Usually attaches to network card



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Network Interface Card (NIC)

- Card inserted into expansion slot of personal computer or other device, enabling it to connect to a network



NIC for desktop computer

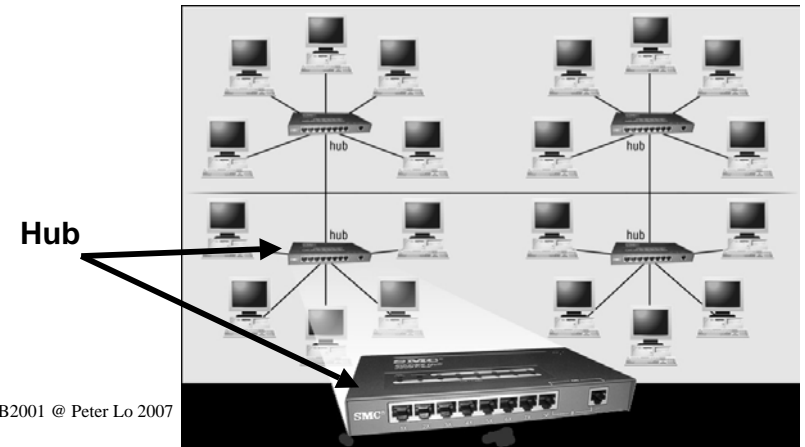
NIC for notebook computer

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Hub

- Device that provides a central point for cables in a network



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Physical Transmission Media

- Wire, cable, and other tangible (touchable) materials used to send communications signals

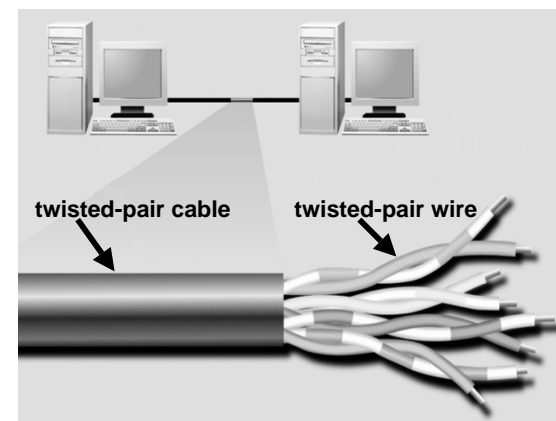
Type of Cable and LAN	Transfer Rates
Twisted Pair	
• 10Base-T (Ethernet)	10 Mbps
• 100Base-T (Fast Ethernet)	100 Mbps
• 1000Base-T (Gigabit Ethernet)	1000 Mbps
• Token ring	4 - 16 Mbps
Coaxial Cable	
• 10Base2 (ThinWire Ethernet)	10 Mbps
• 10Base5 (ThickWire Ethernet)	10 Mbps
Fiber-Optic Cable	
• 10Base-F (Ethernet)	10 Mbps
• 100Base-FX (Fast Ethernet)	100 Mbps
• FDDI (Fiber Distributed-Data Interface) token ring	100 Mbps

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Twisted-pair cable

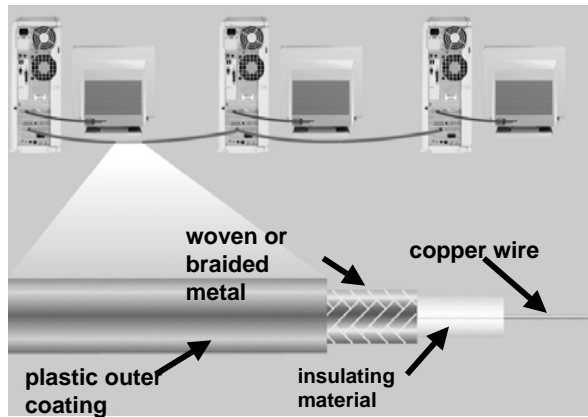
- Transmission media used by telephone system and network cabling



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Coaxial Cable

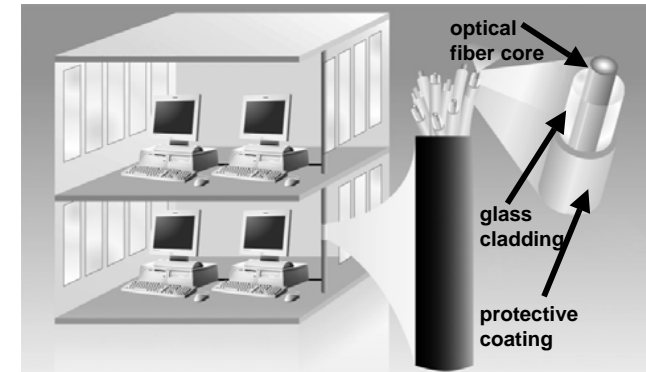
- Single copper wire surrounded by at least three layers
- Often used for cable television wiring



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Fiber-Optic Cable

- Contains core of dozens or hundreds of thin strands of glass or plastic
- Uses light to transmit signals



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Wireless Transmission Media

- Send communications signals through air or space
- Used when inconvenient, impractical, or impossible to install cables

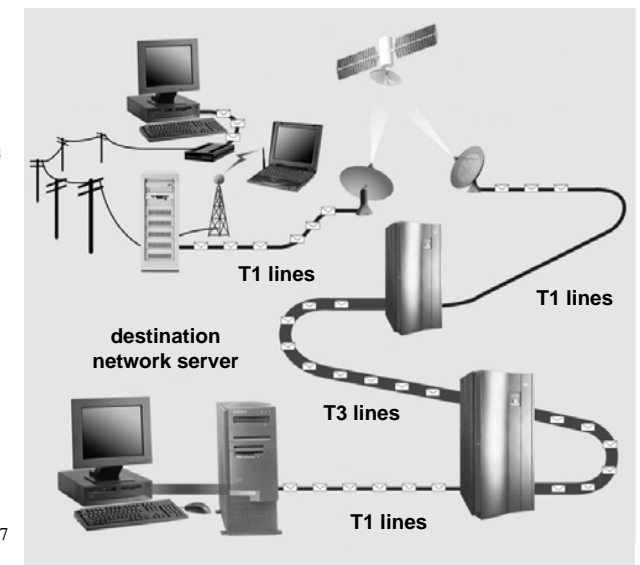
Channel	Transfer Rates
Broadcast radio	Up to 2 Mbps
Microwave radio	45 Mbps
Communications satellite	50 Mbps
Cellular radio	9,600 bps to 14.4 Kbps
Infrared	1 to 4 Mbps

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Sending a Request over the Internet

- 1: Sending device requests information
- 2: When request leaves the ISP, it travels over a variety of lines until it reaches Internet backbone
- 3: Request travels over T3 lines along Internet backbone
- 4: Request travels over T1 lines until it reaches destination network server



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