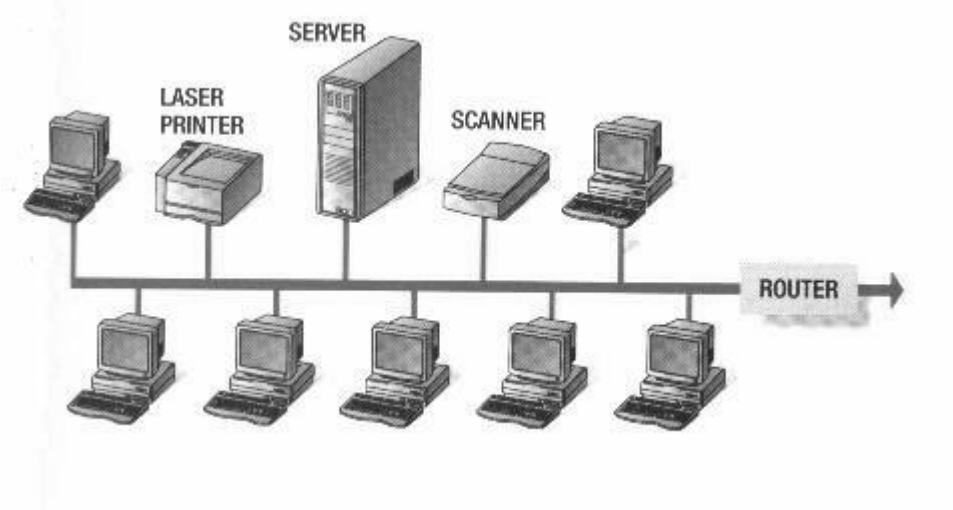
Computer Communications and Networks

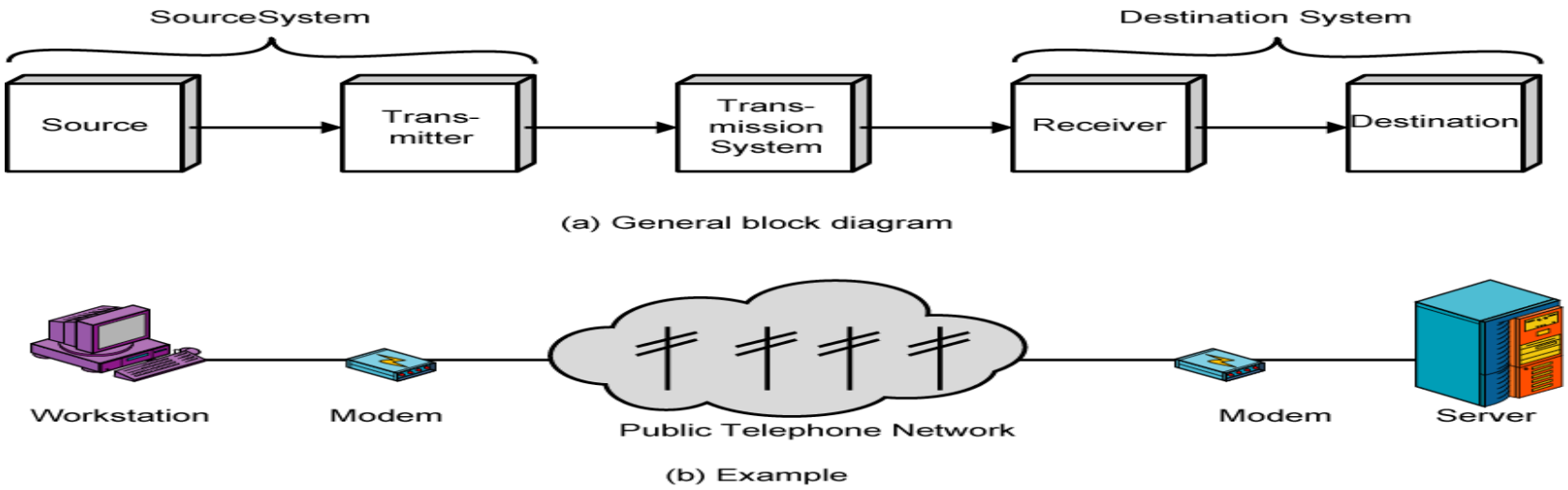
- An interconnected group of independent computer systems that communicate with one another for the purpose of sharing hardware and software resources.



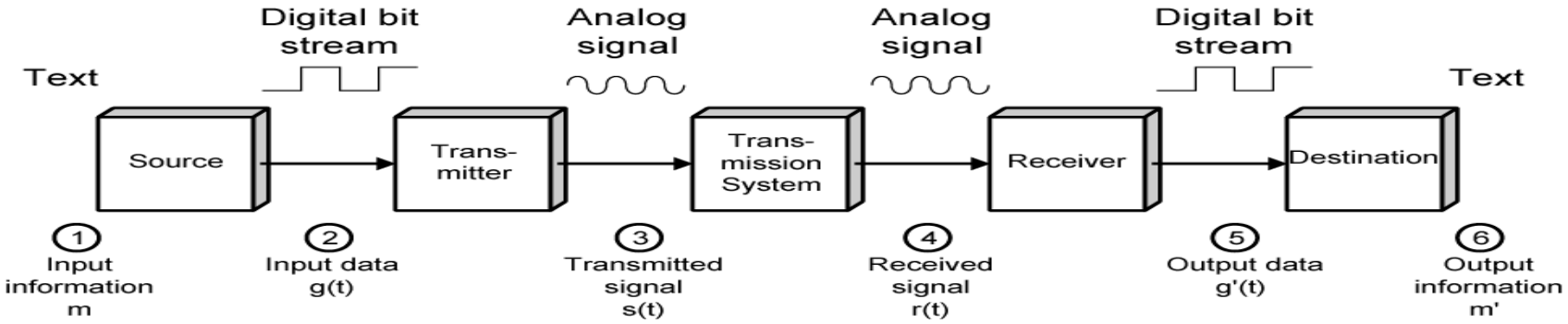
- Data communications deals with the transmission of signals in a reliable and efficient manner.
- Networking deals with the technology and architecture of the communications networks used to interconnect communicating devices.

A Communications Model

The fundamental purpose of a communications system is the exchange of data between two parties.



Data Communications Model



Data Communications

- Currently a subset of telecommunications, although the differences are beginning to blur
- Telecommunications includes television, telegraphy, and telephony
- Data communications focuses primarily on the transmission of data between computing devices

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Transmission Media

- Data transmission occurs between a transmitter & receiver via some medium.
- Transmission media may be classified as guided or unguided. In both cases, communication is in the form of electromagnetic waves.
- With **guided media**, the waves are guided along a physical path.
  - eg. twisted pair, coaxial cable, optical fiber
- **Unguided media**, also called **wireless**, provide a means for transmitting electromagnetic waves but do not guide them.
- Examples are propagation through air, vacuum, and seawater.

Transmission Terminology

- **direct link**
  - no intermediate devices (other than repeaters)
- **point-to-point**
  - direct link
  - only 2 devices share link
- **multi-point**
  - more than two devices share the link

- **Simplex**
  - signals are transmitted in only one direction;
  - one station is transmitter and the other is receiver eg. Television
- **Half duplex**
  - both stations may transmit, but only one at a time eg. police radio
- **Full duplex**

  both stations may transmit simultaneously, and the medium is carrying signals in both directions at the same time. eg. telephone