CSE 350
DATA COMMUNICATIONS

Lecture 1: Overview

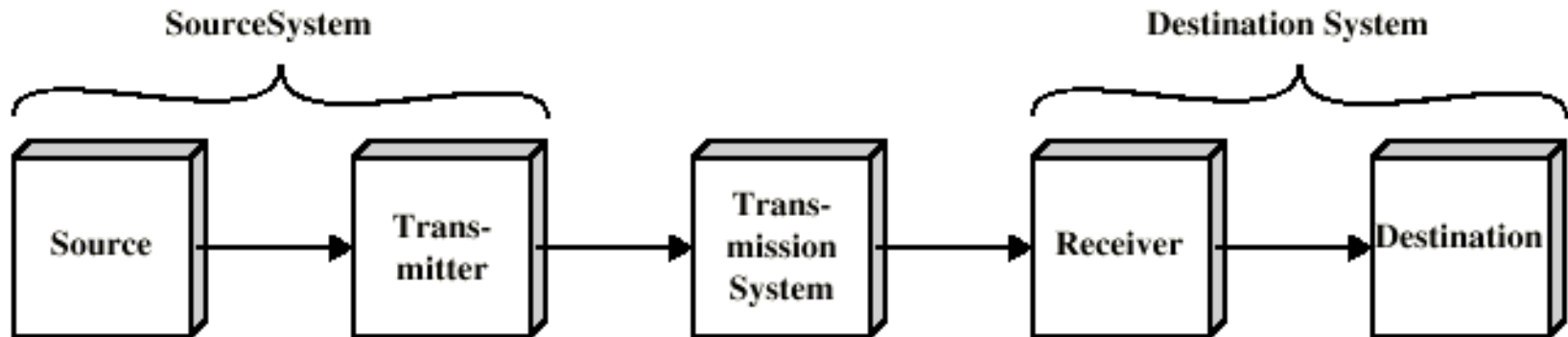Maheen Islam

Lecture Overview

- A Communications Model

- Data Communications

- Networking

- Protocol Architecture

- A Simple Protocol Architecture

- TCP/IP Protocol Architecture
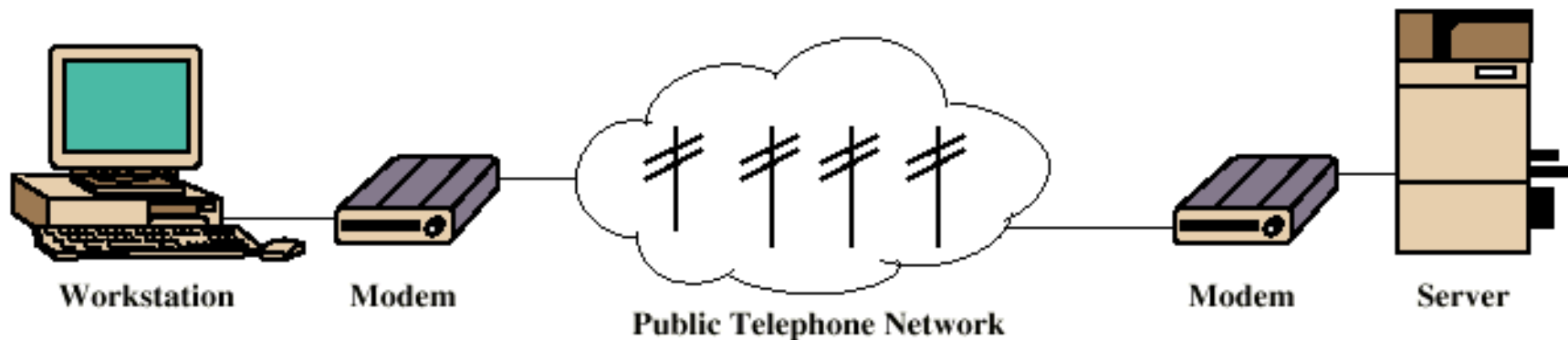
- OSI Model

A Communications Model

- Source
  - generates data to be transmitted
- Transmitter
  - Converts data into transmittable signals
- Transmission System
  - Carries data
- Receiver
  - Converts received signal into data
- Destination
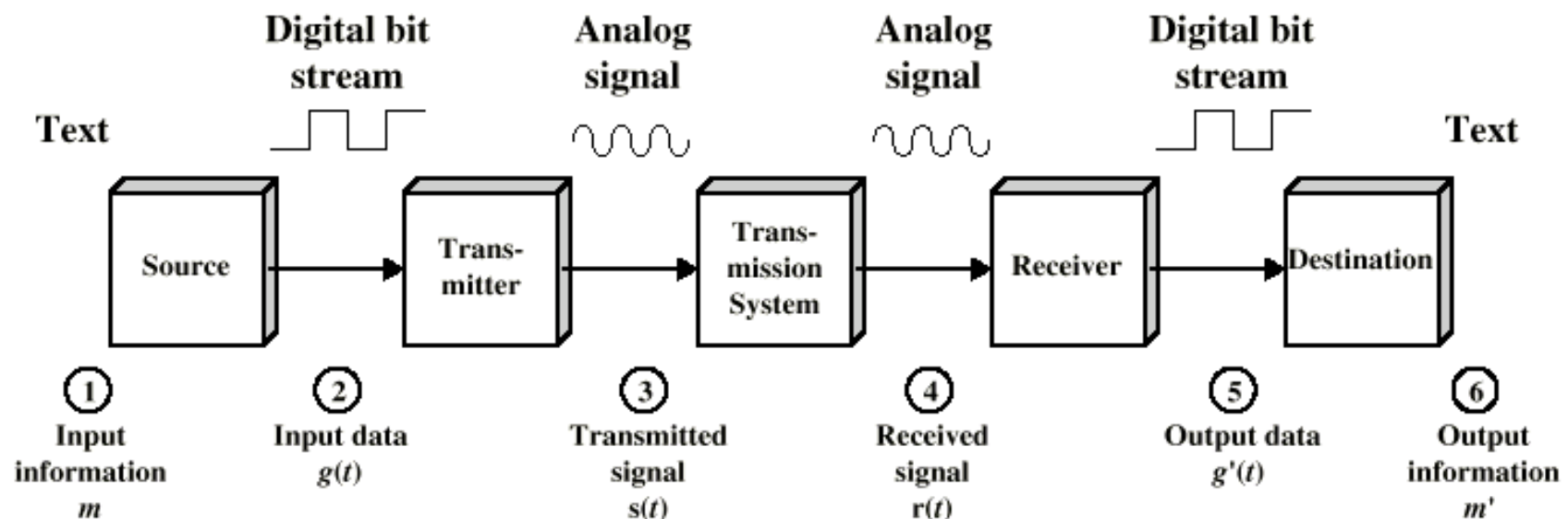 - Takes incoming data

Simplified Communications Model - Diagram

SourceSystem

Destination System

Source → Trans-mitter → Trans-mission System → Receiver → Destination

(a) General block diagram

Workstation — Modem — Public Telephone Network — Modem — Server

(b) Example

Simplified Data Communications Model

Key Communications Tasks

- Transmission System Utilization
- Interfacing
- Signal Generation
- Synchronization
- Exchange Management
- Error detection and correction
- Addressing and routing
- Recovery
- Message formatting
- Security
- Network Management

Networking

- Point to point communication not usually practical
  - Devices are too far apart
  - Large set of devices would need impractical number of connections
- Solution is a communications network
  - Wide Area Network (WAN)
  - Local Area Network (LAN)

Simplified Network Model
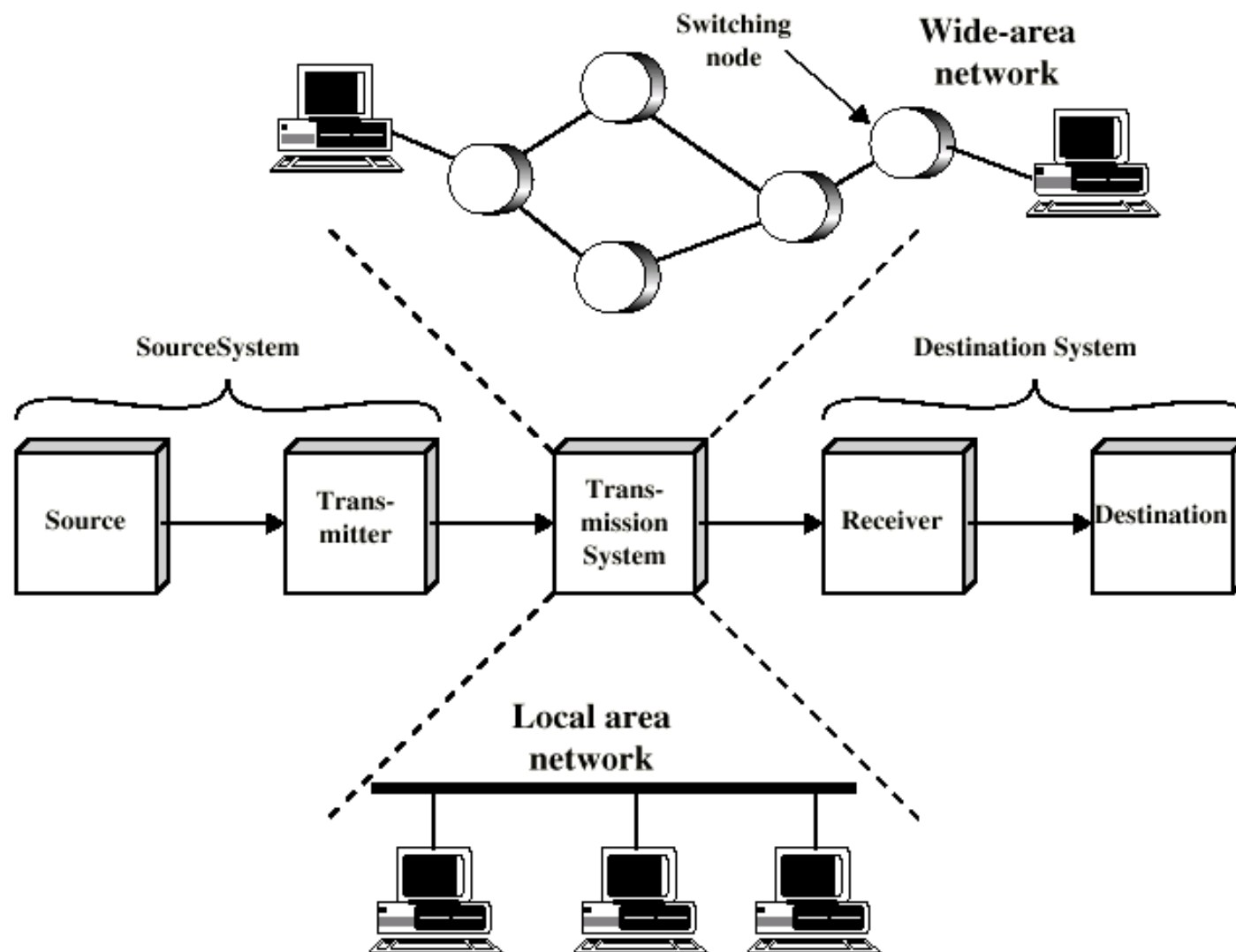
Wide Area Networks

- Large geographical area

- Crossing public rights of way

- Rely in part on common carrier circuits

- Alternative technologies
  - Circuit switching
  - Packet switching
  - Frame relay
  - Asynchronous Transfer Mode (ATM)

Local Area Networks

- Smaller scope
  - Building or small campus
- Usually owned by same organization as attached devices
- Data rates much higher
- Usually broadcast systems
- Now some switched systems and ATM are being introduced

Metropolitan Area Networks

- MAN
- Middle ground between LAN and WAN
- Private or public network
- High speed
- Large area

Networking Configuration