Computer Networks

Computer Network

Syllabus

Section-A

OSI Reference Model and Network Architecture: Introduction to Computer Networks, Example networks ARPANET, Internet, Private Networks, Network Topologies: Bus-, Star-, Ring-, Hybrid -, Tree -, Complete -, Irregular –Topology; Types of Networks : Local Area Networks, Metropolitan Area Networks, Wide Area Networks; Layering architecture of networks, OSI model, Functions of each layer, Services and Protocols of each layer

Section-B

TCP/IP: Introduction, History of TCP/IP, Layers of TCP/IP, Protocols, Internet Protocol, Transmission Control Protocol , User Datagram Protocol, IP Addressing, IP address classes, Subnet Addressing, Internet Control Protocols, ARP, RARP, ICMP, Application Layer, Domain Name System, Email – SMTP, POP,IMAP; FTP, NNTP, HTTP, Overview of IP version 6.

Section-C

Local Area Networks: Introduction to LANs, Features of LANs, Components of LANs, Usage of LANs, LAN Standards, IEEE 802 standards, Channel Access Methods, Aloha, CSMA, CSMA/CD, Token Passing, Ethernet, Layer 2 & 3 switching, Fast Ethernet and Gigabit Ethernet, Token Ring, LAN interconnecting devices: Hubs, Switches, Bridges, Routers, Gateways.

Wide Area Networks: Introduction of WANs, Routing, Congestion Control, WAN Technologies, Distributed Queue Dual Bus (DQDB),

Section-D

Synchronous Digital Hierarchy (SDH)/ Synchronous Optical Network (SONET), Asynchronous Transfer Mode (ATM), Frame Relay.,Wireless Links.

Introduction to Network Management: Remote Monitoring Techniques: Polling, Traps, Performance Management, Class of Service, Quality of Service, Security management, Firewalls, VLANs, Proxy Servers, Introduction to Network Operating Systems: Client-Server infrastructure, Windows NT/2000.

Computer Network

Books

- **Data Communication & Networking, Behrouz A Forouzan**
- **Computer Networks, Tanenbaum Andrew S.**

Computer Network

A BRIEF HISTORY OF COMPUTER NETWORK

1960s (ARPANET)

In the **1960s, the Advanced Research Projects Agency (ARPA**) started funding the design of the Advanced Research Projects Agency Network (ARPANET) for the United States Department of Defense

1969s

The **Advanced Research Projects Agency Network** (**ARPANET**), was the world's first operational packet switching network and the core network of a set that came to compose the global Internet. The network was funded by the Defense Advanced Research Projects Agency (DARPA) of the United States Department of Defense for use by its projects at universities and research laboratories in the US

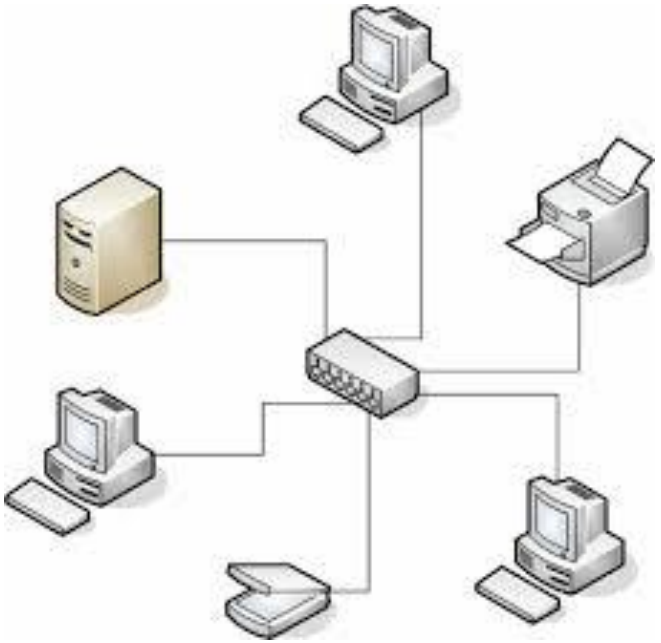
The cable modem was introduced in 1996,

Chapter 1
Introduction

- **Computer Network**
- **Data Communication**
- **Networks**
- **Protocols**
- **Data Flow**

What is Computer Network

A **computer network** is a collection of hardware components and computers interconnected by communication channels that allow sharing of resources and information



Data Communication System Components

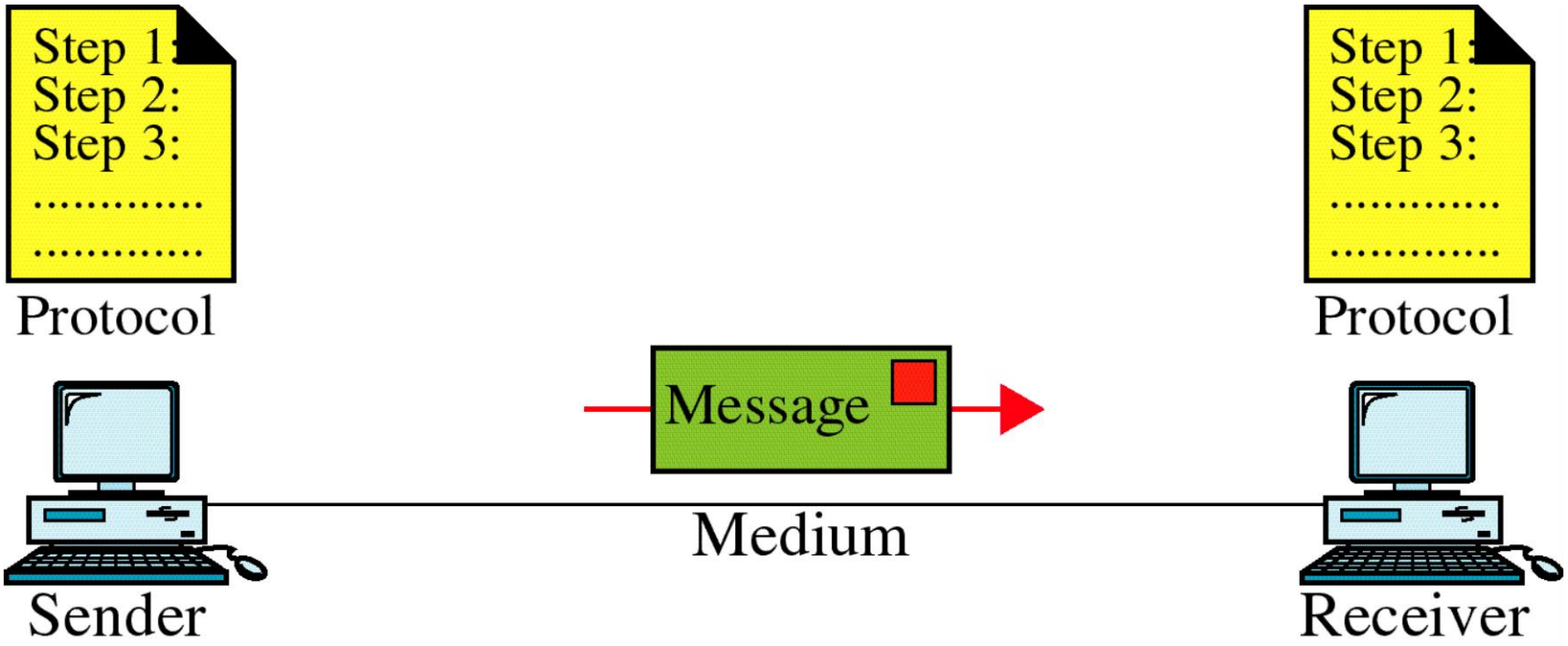
Data communication system depend on four fundamental characteristics

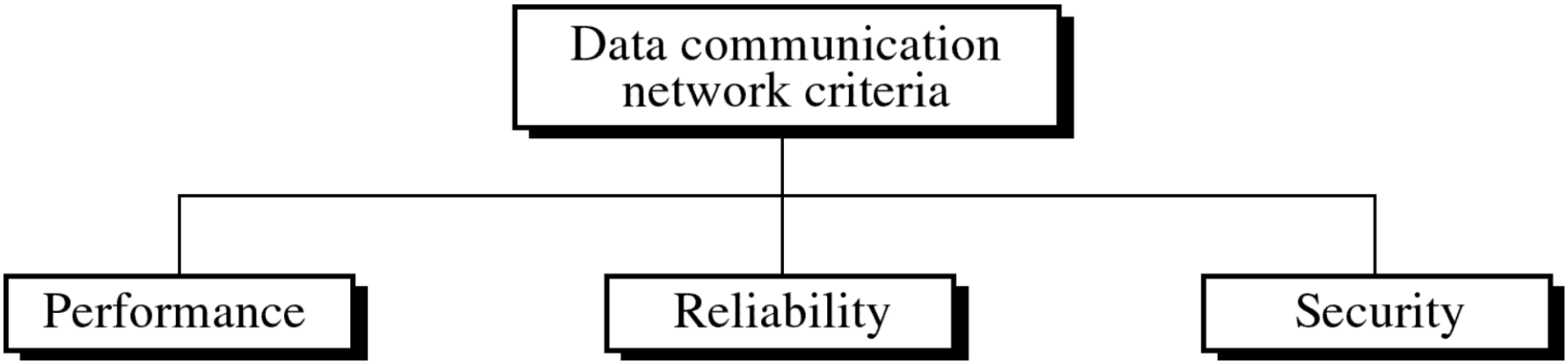
1. Delivery
2. Accuracy
3. Timeliness
4. Jitter

Data communication system has five component

1. Message
2. Sender
3. Receiver
4. Transmission Medium
5. Protocol

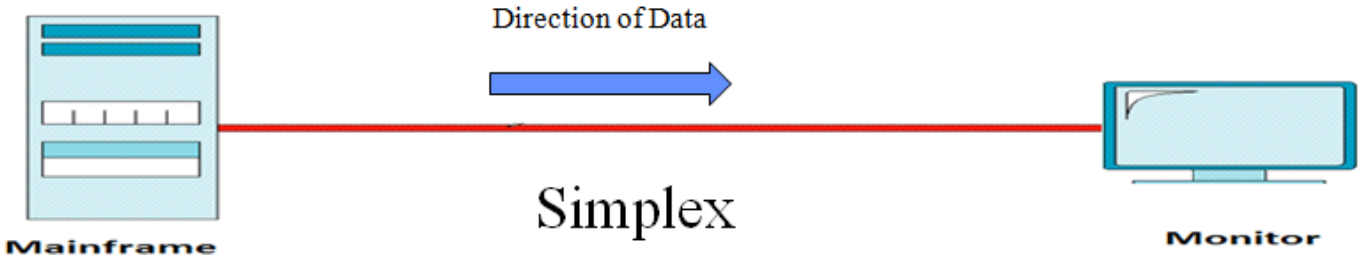
Data Communication System Components



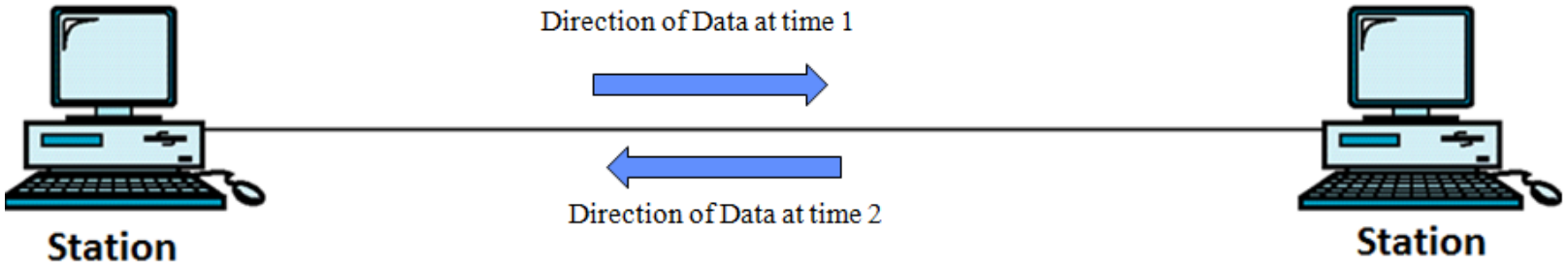

Data communication network criteria
Performance
Reliability
Security

Data Flow

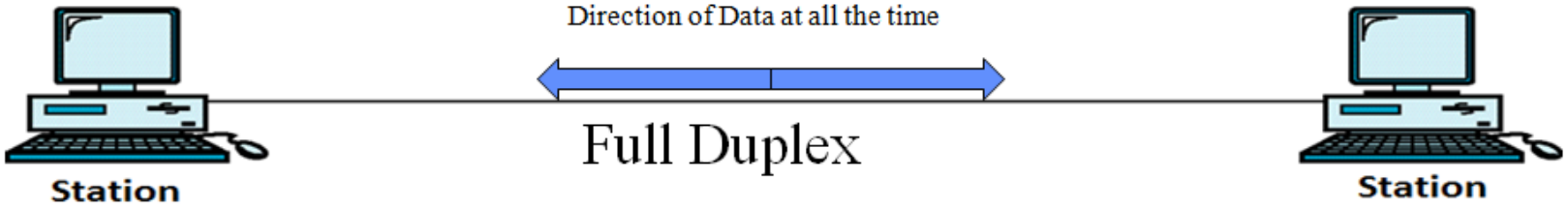
Data communication b/w two device can be Simplex, Half Duplex, Full Duplex



Simplex



Half Duplex



Full Duplex