



SNS COLLEGE OF ENGINEERING

Kurumbapalayam(Po), Coimbatore – 641 107

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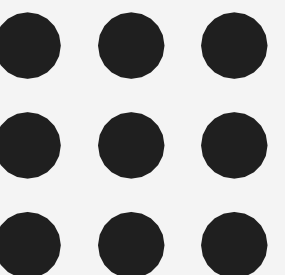
Department of Information Technology

Course Name – 23ITT204 Computer Networks

II Year / III Semester

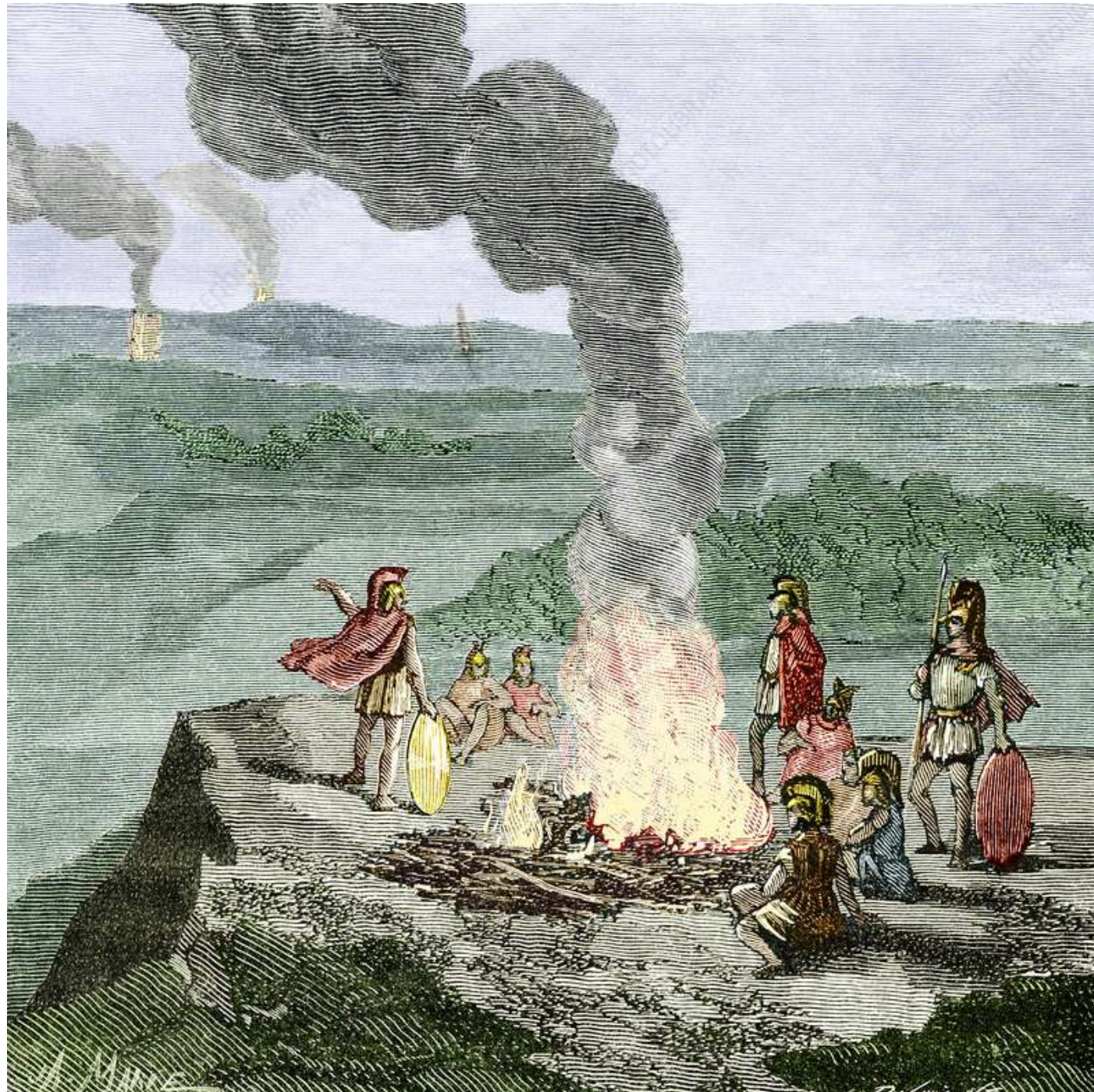
Unit 1 – Introduction and Application Layers

Topic 1- Overview and Basics



Pre Historic

Communication – Smoke and Fire (Visual)



Drums (Sound)



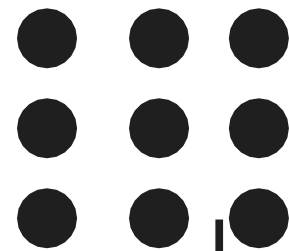
BCE - Before Common Era

Pigeon



Hydraulic semaphore – Greek 4th Century BC





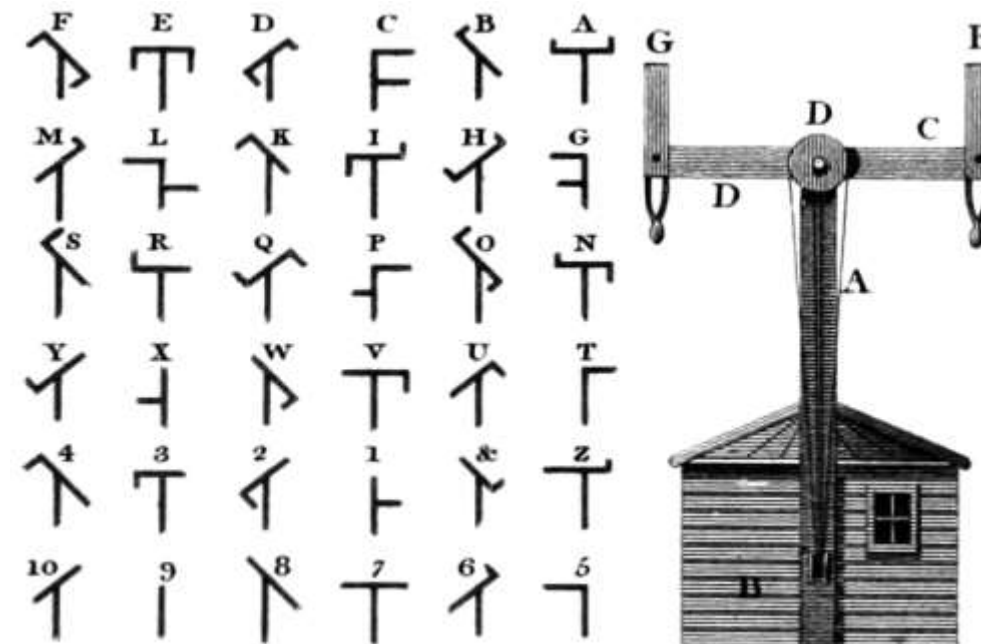
CE – Current Era

1790's – Semaphore lines

1800's – Heliograph

1830's – Electric Telegraph

1870's - Telephone



CE – Current Era

1890's – Radio

1920's – Television

1960's – Satellite



Marconi operating apparatus similar to that used by him to transmit first wireless signal across Atlantic



RCA 630-TS, the first mass produced television set, which sold in 1946–1947



July 10, 1962, Telstar, first telecommunications satellite, is put into orbit.



Computer Networks - A Beginning

1960's – Network through evolution of computers.

- Mainframe computers in research organizations were standalone devices.
- Computers from different manufacturers were unable to communicate with one another.
- The Advanced Research Projects Agency (ARPA) in the Department of Defense (DoD) was interested in finding a way to connect computers.

1967 – In Association for Computing Machinery (ACM) meeting, ARPA presented its ideas for ARPANET, a small network of connected computers.

- Each host computer (not necessarily from the same manufacturer) would be attached to a specialized computer, called an interface message processor (IMP).
- The IMPs, in turn, would be connected to one another.
- Each IMP had to be able to communicate with other IMPs as well as with its own attached host.

Computer Networks – A reality

1969 – ARPANET – A Reality

Four nodes, at the

- University of California at Los Angeles (UCLA),
- University of California at Santa Barbara (UCSB),
- Stanford Research Institute (SRI), and
- University of Utah

connected via the IMPs to form a network (50 kbps).

Software called the Network Control Protocol (NCP) provided communication between the hosts.



Leonard Kleinrock and the
first Interface **M**essage **P**rocessor
(router)

Computer Networks – A reality

1972 – ARPANET connected 15 nodes, Email was introduced.

In 1972, Vint Cerf and Bob Kahn, both of whom were part of the core ARPANET group, collaborated on what they called the Internetting Project.

1973 - Vint Cerf and Bob Kahn introduced TCP/IP Protocol

Emergence of different networks

- ALOHAnet (Microwave) - University of Hawaii
 - First Public demonstration of wireless data network.
- DARPA Satellite - Defense Advanced Research Projects Agency
- BBN Commercial
 - SATNET, PRNET, MILNET, SIMNET and invented first link-state routing protocol.



Figure 1 ALOHAnet 1971



Computer Networks – A reality

1976 – Ethernet by Robert Metcalfe at Xerox PARC

1981 – 213 hosts on ARPANET

1982 – SMTP

1983 – DNS

1986 – IETF

1988 – OSI Reference model released

1989 – BGP, RIP



Internet and more

1990 – Commercialisation of Internet (ISP)

1991 – WWW by Tim Berners Lee

1995 – Applications on Instant messaging, P2P, E-Commerce (Ebay and Amazon)

1998 – Google Search

1999 - WiFi

- 2003: Skype
- 2004: Facebook
- 2005: Youtube
- 2006: Twitter
- 2008: Cloud based services (E.g. Dropbox)
- 2010: Instagram (Photosharing)
- 2011: Google+

Computer Network

Computer network is a **connection** of autonomous computers for the purpose of resource sharing and communication between them.

Basic Terminologies

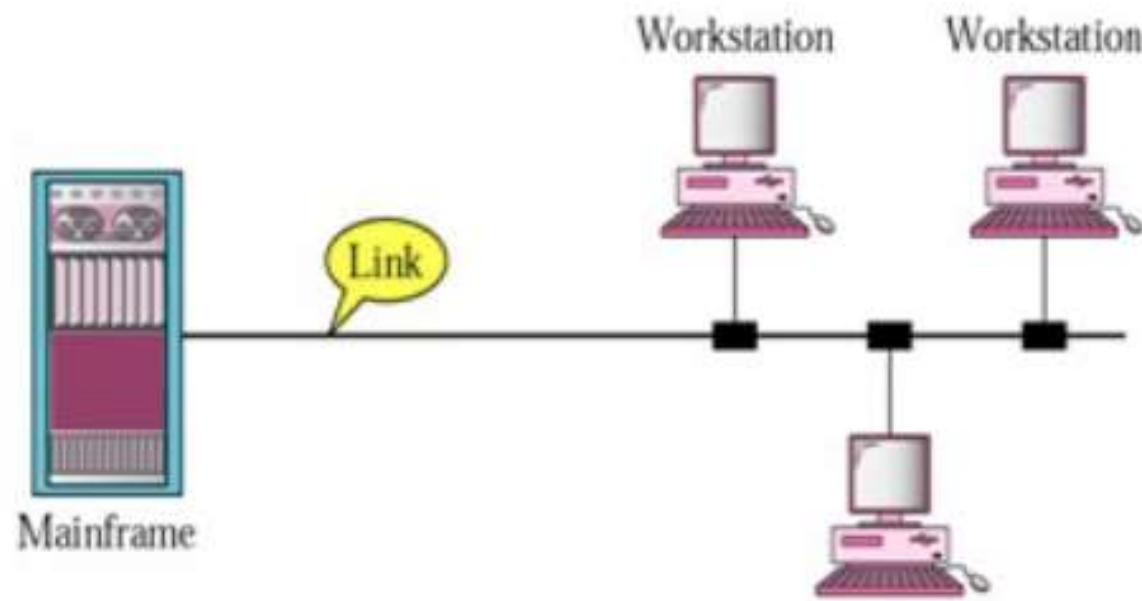
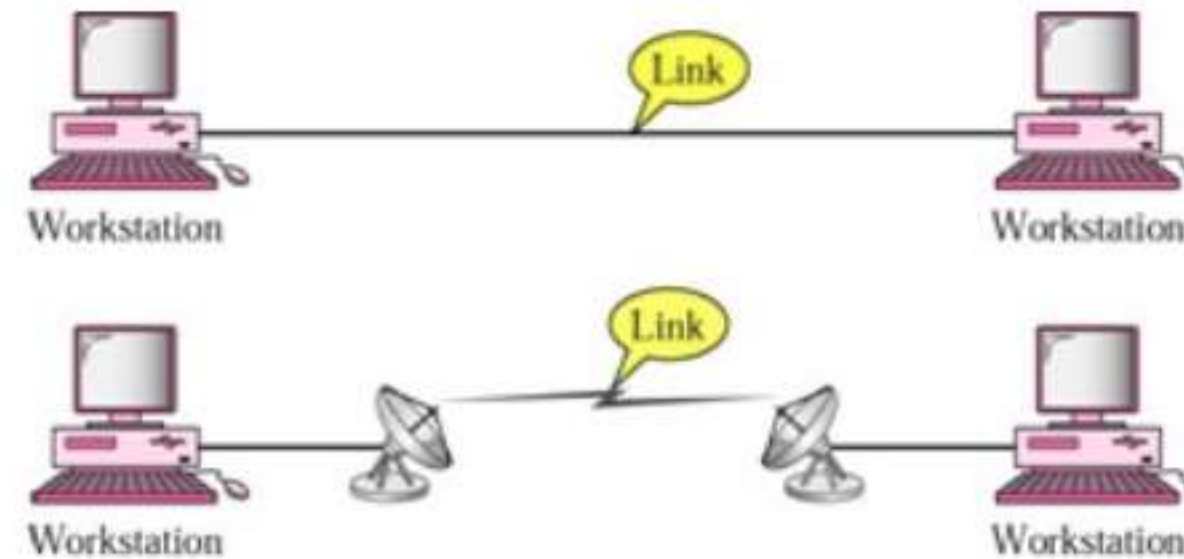
Links and Nodes

Links are physical medium such as coaxial cable or an optical fiber

Nodes are computers.

Link Types

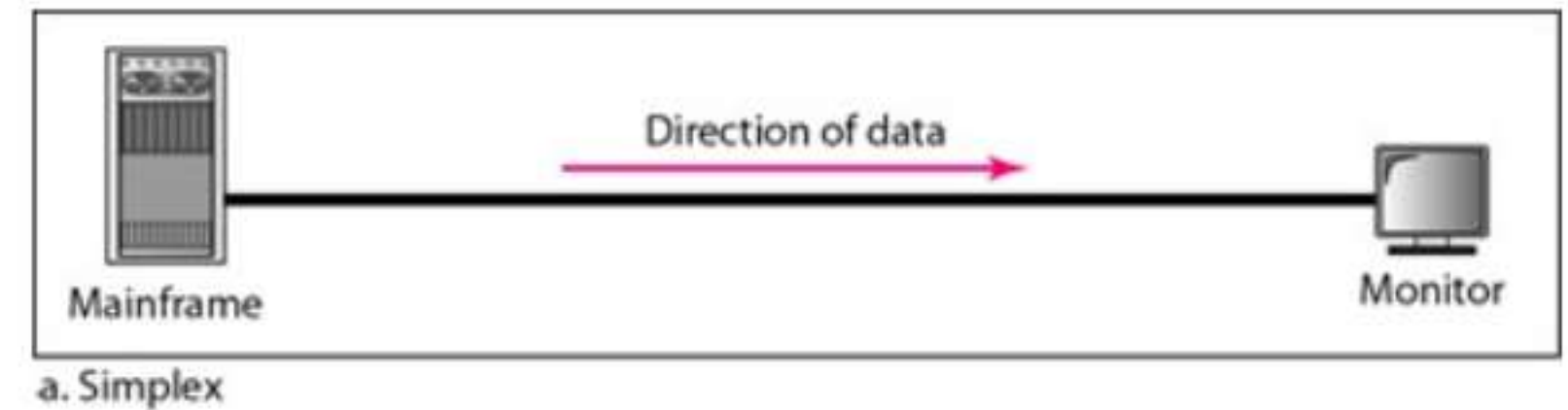
- Point to Point
- Multiple Access or Multipoint



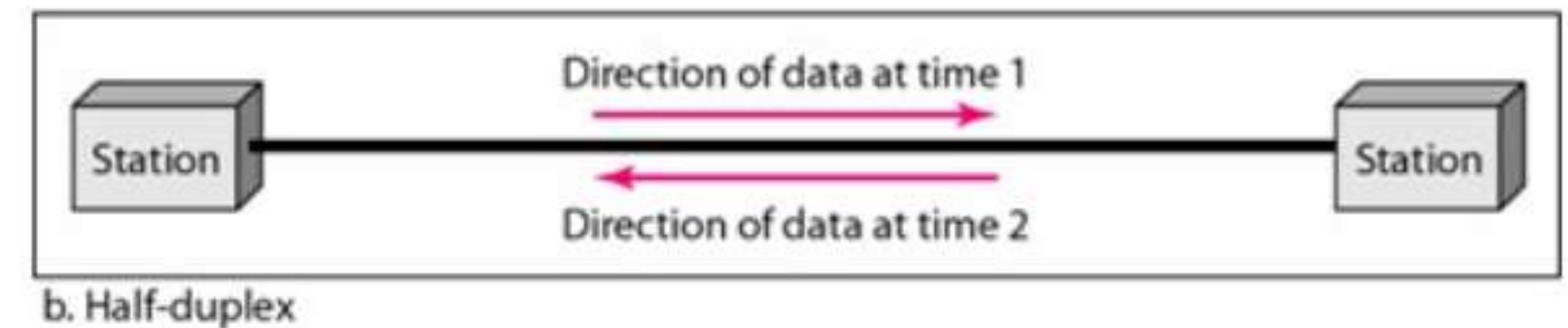
Computer Network

Flow of Information Transmission Mode

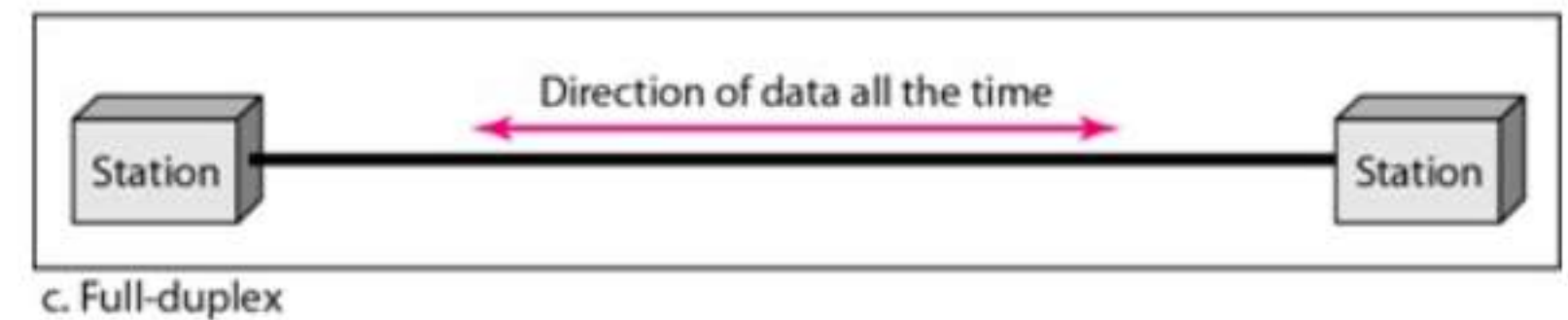
Simplex - unidirectional (Eg: keyboard, monitor)



Half-duplex - each station can both transmit and receive, but not at the same time (Eg. walkie-talkie).



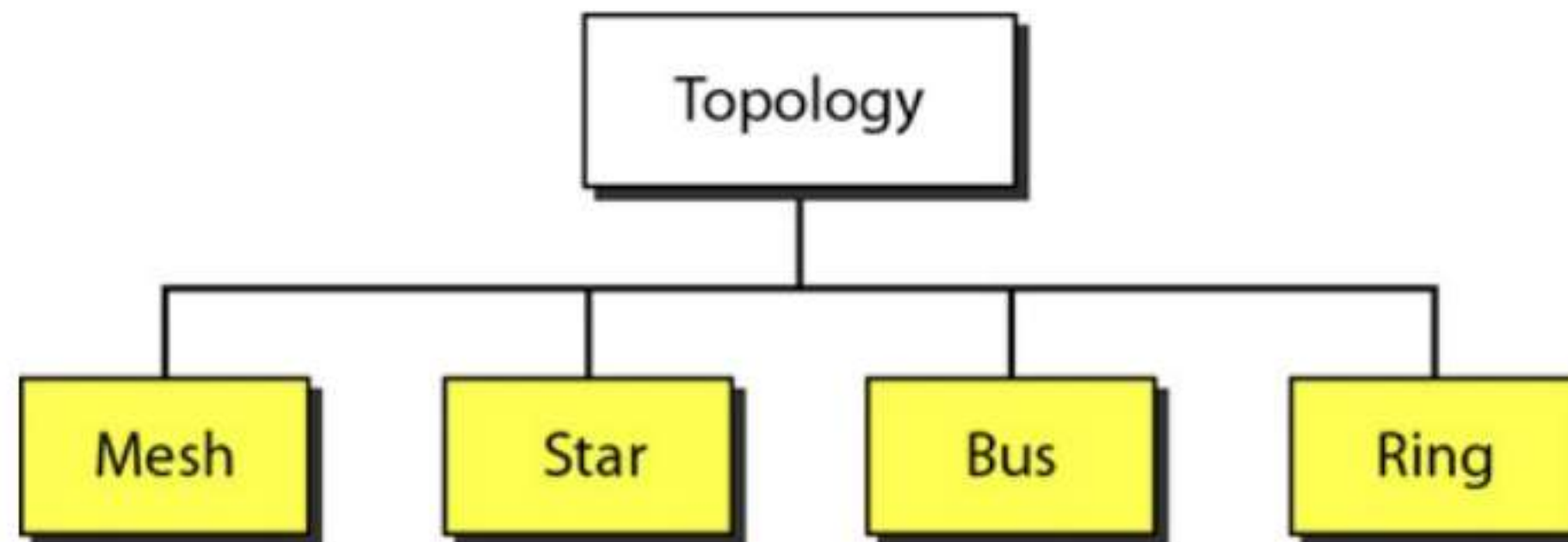
Full-duplex (also called duplex), both stations can transmit and receive simultaneously (Eg. telephone network).



Computer Network

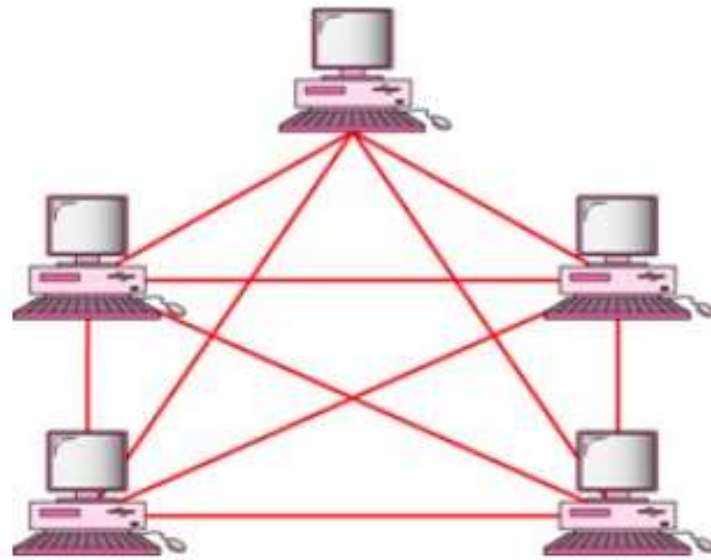
Physical Topology

- The term physical topology refers to the way in which a network is laid out physically.
- Two or more devices connect to a link; two or more links form a topology.
- The topology of a network is the geometric representation of the relationship of all the links and linking devices (usually called nodes) to one another.



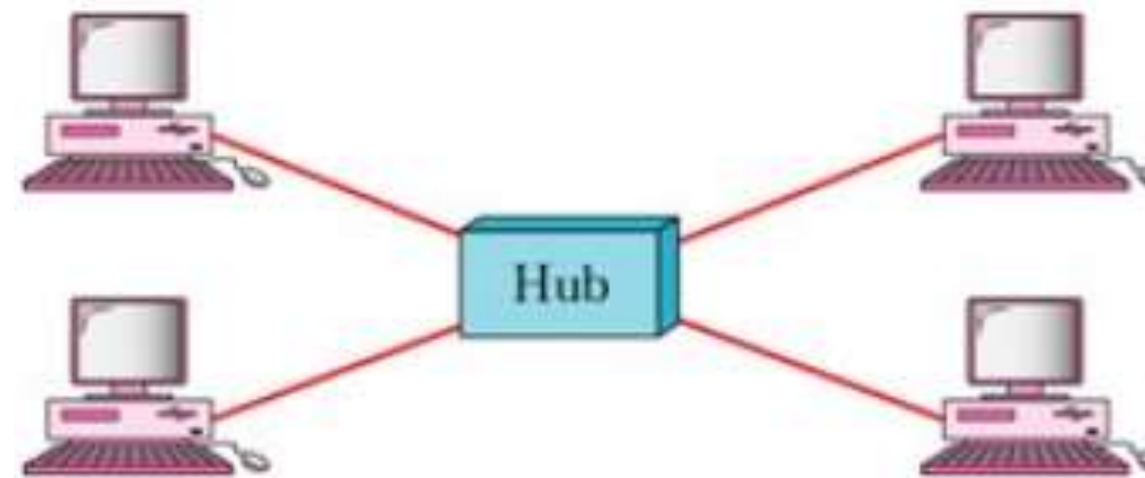
Computer Network

Mesh

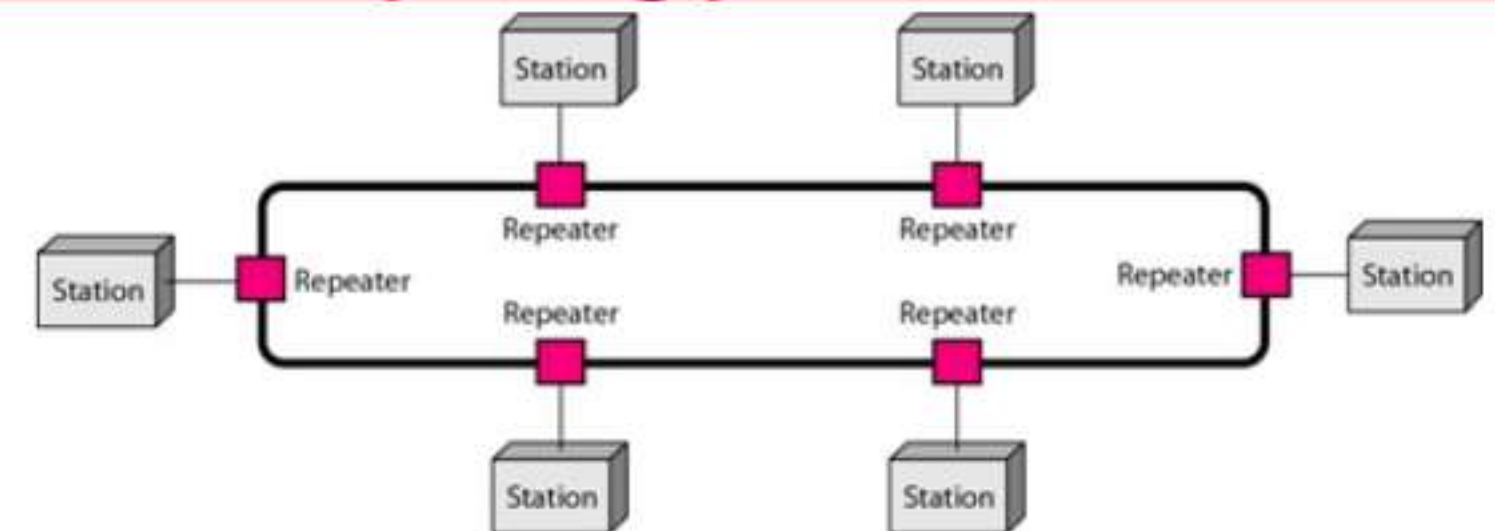


$n(n-1)/2$ physical duplex links

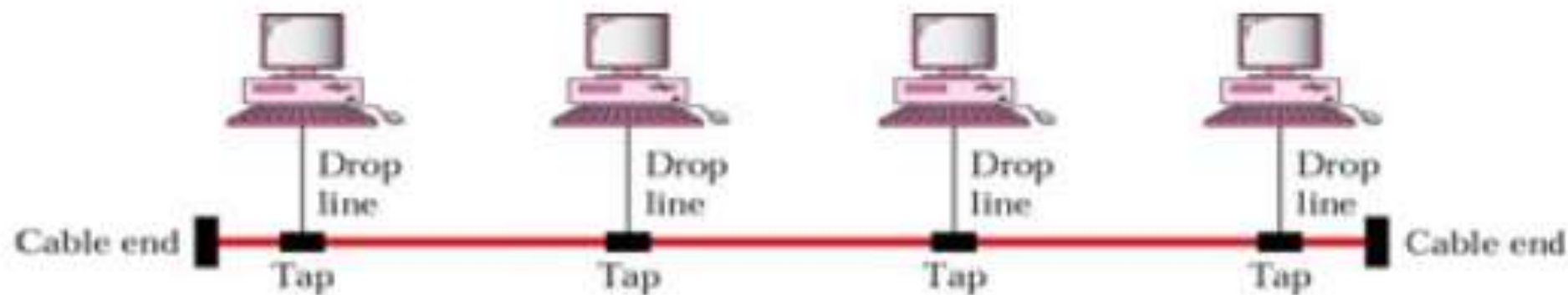
Star



Ring



Bus





THANK YOU