''बेटी बचाओ, बेटी पढ़ाओ''

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Faculty of Education & Methodology

Faculty Name - JV'n Nisha kumari

(Asst. Prof./ Asso. Prof./ Professor)

Program - B-tech/Vth Semester / Year

Course Name - Computer Network

Session No. & Name - 1. & Computer Network

Academic Day starts with –

- Greeting with saying **'Namaste'** by joining Hands together following by 2-3 Minutes Happy session, Celebrating birthday of any student of respective class and **National Anthem**.

Lecture starts with- quotations' answer writing

Review of previous Session- **Discussion Computer Language**

- Topic to be discussed today- Today We will discuss about **…… Active database……...**
- Lesson deliverance (ICT, Diagrams & Live Example)-

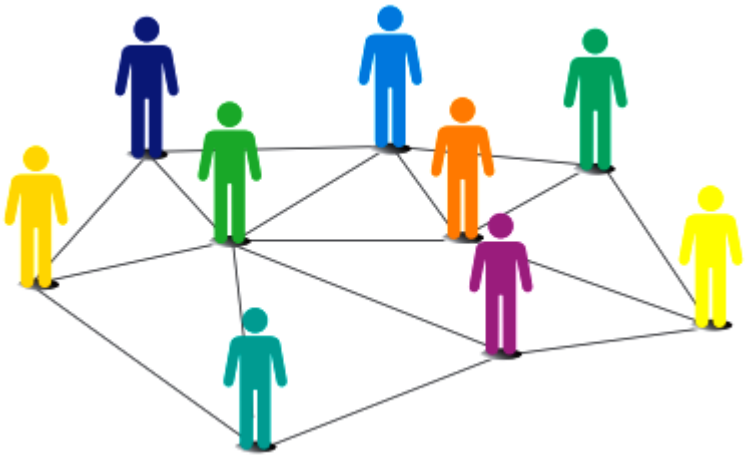
➢ PPT (10 Slides)

➢ Diagrams

Introduction & Brief Discussion about the Topic

Computer Network

We are living in a connected world. Information is being produced, exchanged, and traced across the globe in real time. It's possible as almost everyone and everything in the digital world is interconnected through one way or the other. Figure 10.1: Interconnection forming a social network



A group of two or more similar things or people interconnected with each other is called network (Figure 10.1). Some of the examples of network in our everyday life includes:

• Social network

• Mobile network

• Network of computers

• Airlines, railway, banks, hospitals networks A computer network (Figure 10.2) is an interconnection among two or more computers or computing devices. Such interconnection allows computers to share data and resources among each other. A basic network may connect a few computers placed in a room. The network size may vary from small to large depending on the number of computers it connects. A computer network can include different types of hosts (also called nodes) like server, desktop, laptop, cellular phones.

Figure 10.2: A computer network

Apart from computers, networks include networking devices like switch, router, modem, etc. Networking devices are used to connect multiple computers in different settings. For communication, data in a network is divided into smaller chunks called packets. These packets are then carried over a network. Devices in a network can be connected either through wired media like cables or wireless media like air. In a communication network, each device that is a part of a network and that can receive, create, store or send data to different network routes is called a node. In the context of data communication, a node can be a device such as a modem, hub, bridge, switch, router, digital telephone handset, a printer, a computer or a server.

Interconnectivity of computing devices in a network allows us to exchange information simultaneously with many parties through email, websites, audio/video calls, etc. Network allows sharing of resources. For example, a printer can be made available to multiple computers through a network; a networked storage can be accessed by multiple computers. People often connect their devices through hotspot, thus forming a small personal network.

In the 1960s a research project was commissioned by Advanced Research Projects Agency Network (ARPANET) in the U.S. Department of Defense to connect the academic and research institutions located at different places for scientific collaborations. The first message was communicated between the University of California, Los Angeles (UCLA) and Stanford Research Institute

(SRI). Slowly but gradually, more and more organizations joined the ARPANET, and many independent smaller networks were formed. Few of the milestones in the magnificent journey of evolution of computer networks is depicted in the timeline shown in Figure 10.3.

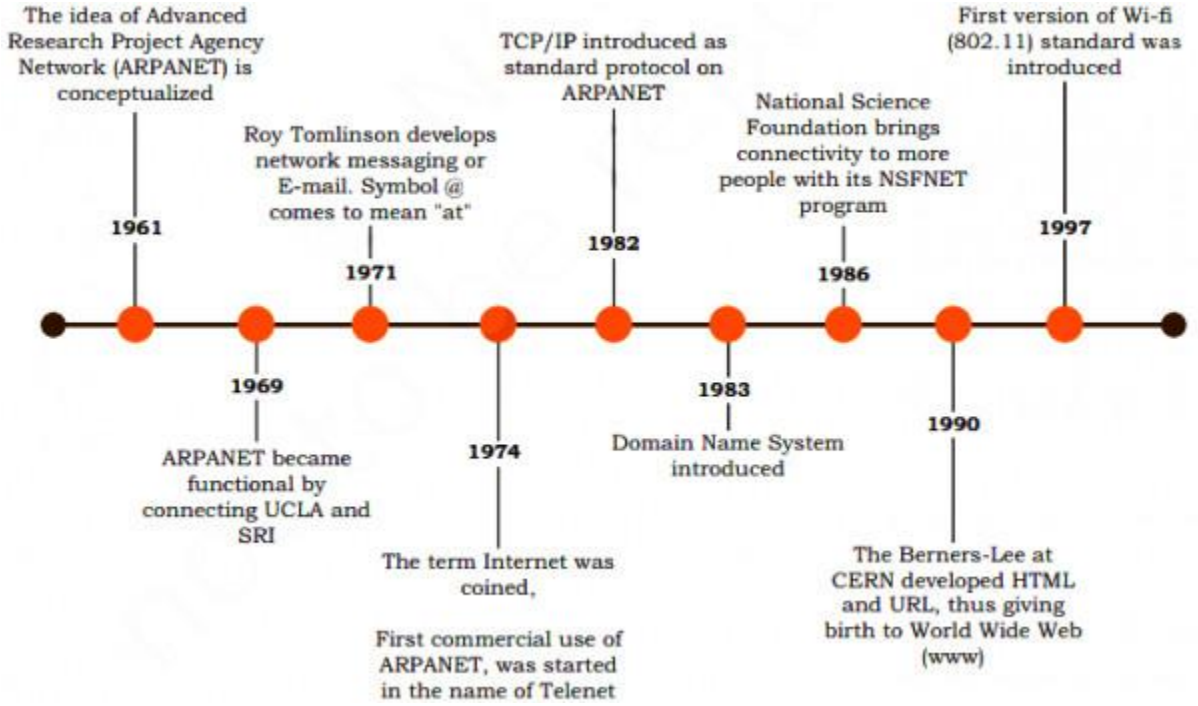


Figure 10.3: Timeline showing evolution of networking

There are various types of computer networks ranging from network of handheld devices (like mobile phones or tablets) connected through Wi-Fi or Bluetooth within a single room to the millions of computers spread across the globe. Some are connected wireless while others are connected through wires. Based on the geographical area covered and data transfer rate, computer networks are broadly categorized as:

- **PAN** (Personal Area Network)
- **LAN** (Local Area Network)
- **MAN** (Metropolitan Area Network)
- **WAN** (Wide Area Network)

Personal Area Network (PAN): It is a network formed by connecting a few personal devices like computers, laptops, mobile phones, smart phones, printers etc., as shown in Figure below. All these devices lie within an approximate range of 10 meters. A personal area network may be wired or wireless. For example, a mobile phone connected to the laptop through USB forms a wired PAN while two smart phones communicating with each other through Bluetooth technology form a wireless PAN or WPAN.

Figure 10.4: A Personal Area Network

Local Area Network (LAN)

Local Area Network (LAN) It is a network that connects computers, mobile phones, tablet, mouse, printer, etc., placed at a limited distance. The geographical area covered by a LAN can range from a single room, a floor, an office having one or more buildings in the same premise, laboratory, a school, college, or university campus. The connectivity is done by means of wires, Ethernet cables, fibre optics, or Wi-Fi. A Local Area Network (LAN) is shown in Figure 10.5.

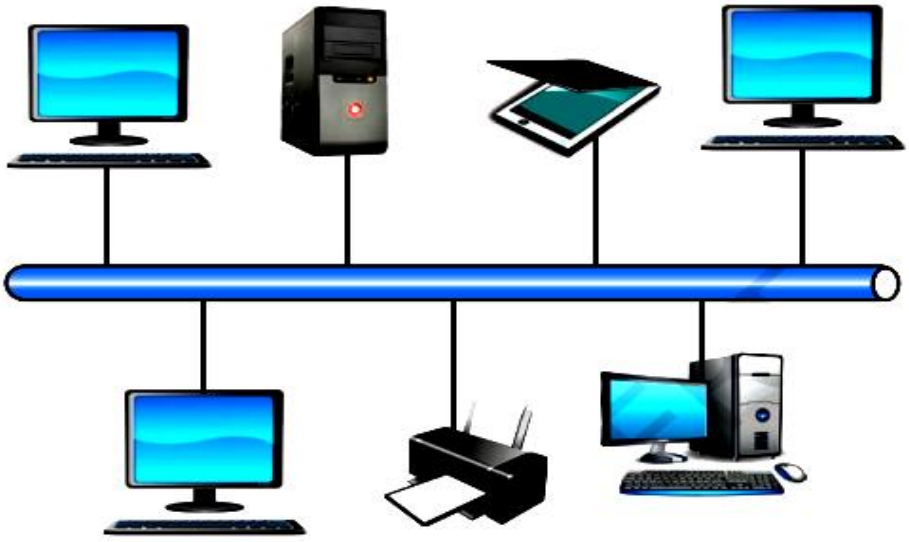


Figure 10.5: A Local Area Network

LAN is comparatively secure as only authentic users in the network can access other computers or shared resources. Users can print documents using a connected printer, upload/download documents and software to and from the local server. Such LANs provide the short range communication with the high speed data transfer rates. These types of networks can be extended up to 1 km. Data transfer in LAN is quite high, and usually varies from 10 Mbps (called Ethernet) to 1000 Mbps (called Gigabit Ethernet), where Mbps stands for Megabits per second. Ethernet is a set of rules that decides how computers and other devices connect with each other through cables in a local area network or LAN.

Metropolitan Area Network (MAN) :Metropolitan Area Network (MAN) is an extended form of LAN which covers a larger geographical area like a city or a town. Data transfer rate in MAN also ranges in Mbps, but it is considerably less as compared to LAN. Cable TV network or cable based broadband internet services are examples of MAN. This kind of network can be extended up to 30-40 km. Sometimes, many LANs are connected together to form MAN, as shown in Figure 10.6.

Wide Area Network (WAN) Wide Area Network connects computers and other LANs and MANs, which are spread across different geographical locations of a country or in different countries or continents. A WAN could be formed by connecting a LAN to other LANs (Figure 10.7) via wired/wireless media. Large business, educational and government organizations connect their different branches in different locations across the world through WAN. The Internet is the largest WAN that connects billions of computers, smart phones and millions of LANs from different continents.