CHAPTER – 5

COMPUTER COMMUNICATION AND INTERNET

5. Introduction

- Communication is one of the most popular use of the internet
- The internet is making it easier for people to communicate with one another using computer
- The most popular way of communication on the internet is the electronic mail.
- The internet provides a capability and powerful that it can be used for almost any purpose that depends on information.
- It is accessible by every individual who connects to one of its constituent network

5.1 Objective

The Reader will be able to understand the following :

- Basic of computer network
- Concept of internet
- Services on internet
- Preparing computer for internet access

5.2 Basics of Computer Networks

5.2.1 Local Area Network (LAN)

local area network (LAN)

A local area network (LAN) is a group of computers and associated devices that share a common communications line or wireless link and typically share the resources of a single processor or server within a small geographic area (for example, within an office building).

Major local area network technologies are:

- Ethernet
- Token Ring
- FDDI (Fiber Distributed Data Interface)

Advantages of local area network (LAN)

Sharing of resources: All the resources are attached to one network and if any computer needs any resources then it can be shared with the required computer. Types of resources are the DVD drive, printers, scanners, modems and hard drives.

Client and server relationship: All the data from attached computers can be stored in one server. If any computer (Client) needs data then that computer user can simply log in and access the data from the server. For example movies and songs can be stored on the server and can be accessed by any authorized user (Client computer).

Disadvantages of local area network (LAN)

Data security problem: If the server computer is not set up correctly and there is a leak in security then unauthorized users can access the data also. So there should be privacy policy and rules set up correctly on the server.

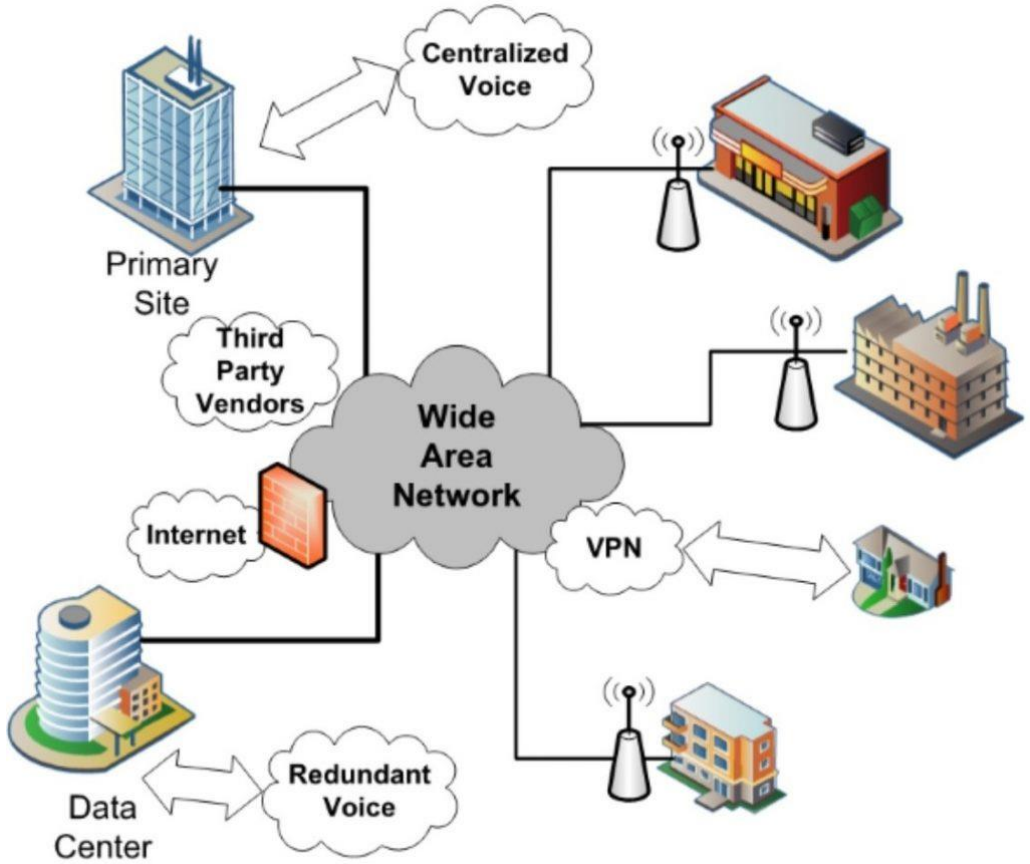
Limitation of distance: Local area networks are usually made within a building or nearby building and cannot extend to the wider area.

5.2.2 Wide Area Network (WAN)

Wide area network (WAN)

A wide area network (WAN) is a telecommunications or computer network that extends over a large geographical distance.

A Wide Area Network suits an individual, a Company or Organization that operates different location that is separated by large geographical distances, it will be a matter of necessity to connect these individual locations so as to share, exchange and manager data or communication. To achieve this, the organization needs a Telecommunication Service Provider (TSP) to interconnect the LANs at the different locations.



WAN Types Including:

- Leased Line
- Circuit Switching
- Packet Switch
- Cell Relay

Advantages of a wide area network (WAN)

Covers large geographical area: Wan covers a large geographical area of 1000 km or more If your office is in different cities or countries then you can connect your office branches through wan. ISP (Internet service provider) can give you leased lines by which you can connect different branch offices together.

Centralized data: Your company doesn't need to buy email, files, and backup servers, they can all reside on head office. All office branches can share the data through the head office server. You can get back up, support, and other useful data from the head office and all data are synchronized with all other office branches.

Get updated files and data: Software companies work over the live server to exchange updated files. So all the coders and office staff get updated version of files within seconds.

Disadvantages of a wide area network (WAN)

Security problems: WAN has more security problem as compare to MAN and LAN. WAN has many technologies combined with each other which can create a security gap.

Needs firewall and antivirus software: As data transferred on the internet can be accessed and changed by hackers so firewall needs to be enabled in the computer. Some people can also inject a virus into the computer so antivirus software needs to be installed. Other security software also needs to be installed on different points in WAN.

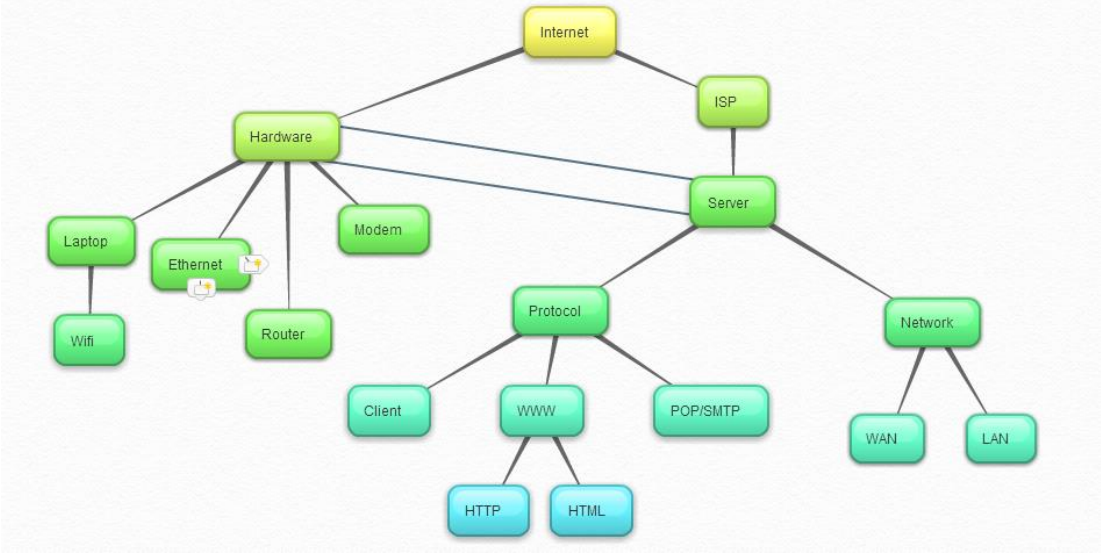
The setup cost is high: Setting up WAN for the first time in office costs higher money. It may involve purchasing routers, switches, and extra security software.

5.3 Internet

5.3.1 Concept of Internet

Internet

Internet is a global network of networks connecting millions of users worldwide via many computer networks using a simple standard common addressing system and basic communications protocol called TCP/IP (Transmission Control Protocol/Internet Protocol). This allows messages sent over the Internet to be broken into small pieces, called packets, which travel over many different routes between source and destination computers.

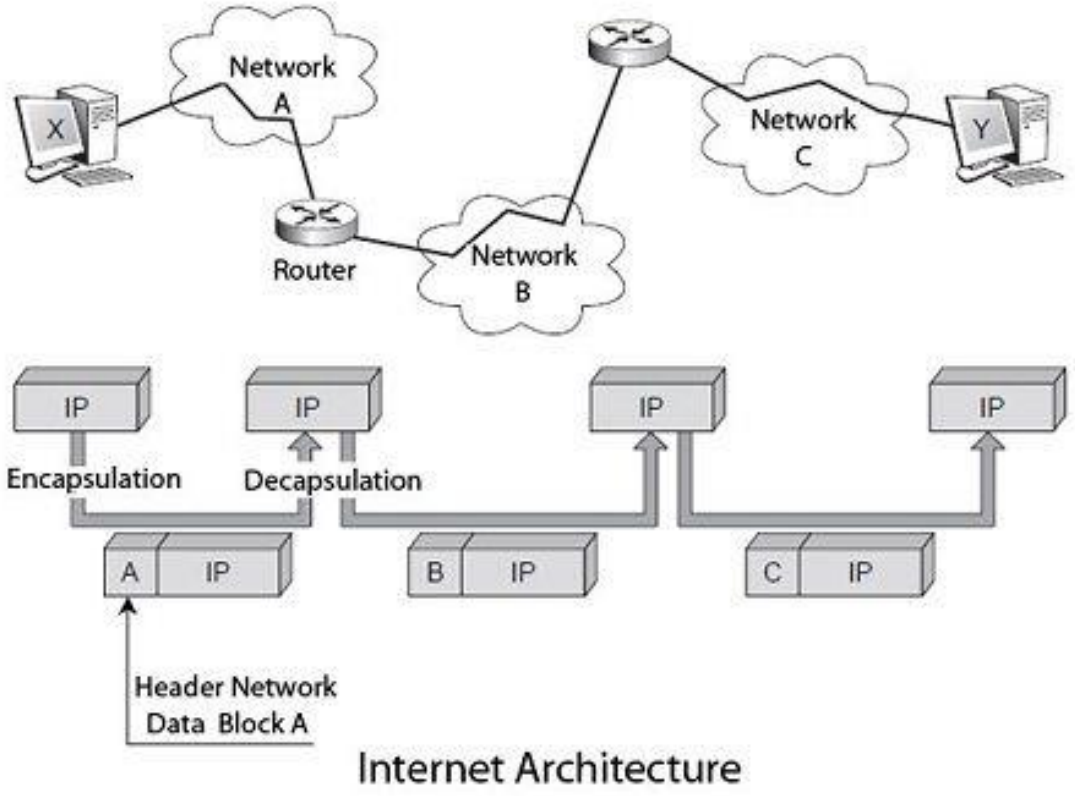


5.3.2 Architecture of internet

Internet architecture

The Internet architecture is based on a simple idea:

ask all networks want to be part of carrying a single packet type, a specific format the IP protocol. In addition, this IP packet must carry an address defined with sufficient generality in order to identify each computer and terminals scattered throughout the world. This architecture is illustrated in Figure.



Internet Architecture

5.4 Services on Internet

5.4.1 World Wide Web and Websites

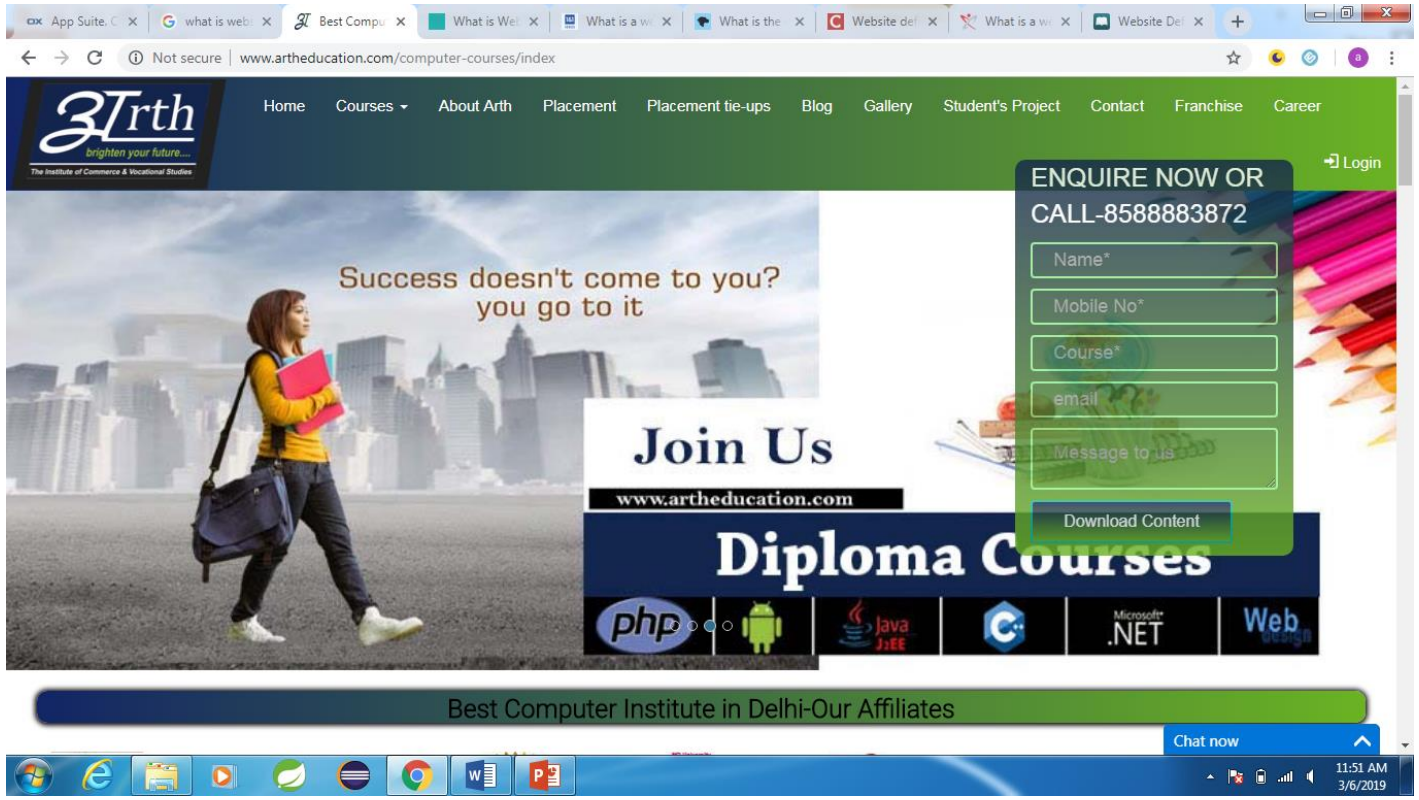
World Wide Web

WWW stands for World Wide Web. A technical definition of the World Wide Web is : all the resources and users on the Internet that are using the Hypertext Transfer Protocol (HTTP).

Website

A site or website is a central location of various web pages that are all related and can be accessed by visiting the home page of the website using a browser.

For example, the Arth Institute website address URL (Uniform Resource Locator) is http://www.artheducation.com/computer-courses/index.



5.4.2 Communication on Internet

Communication Medium on Internet

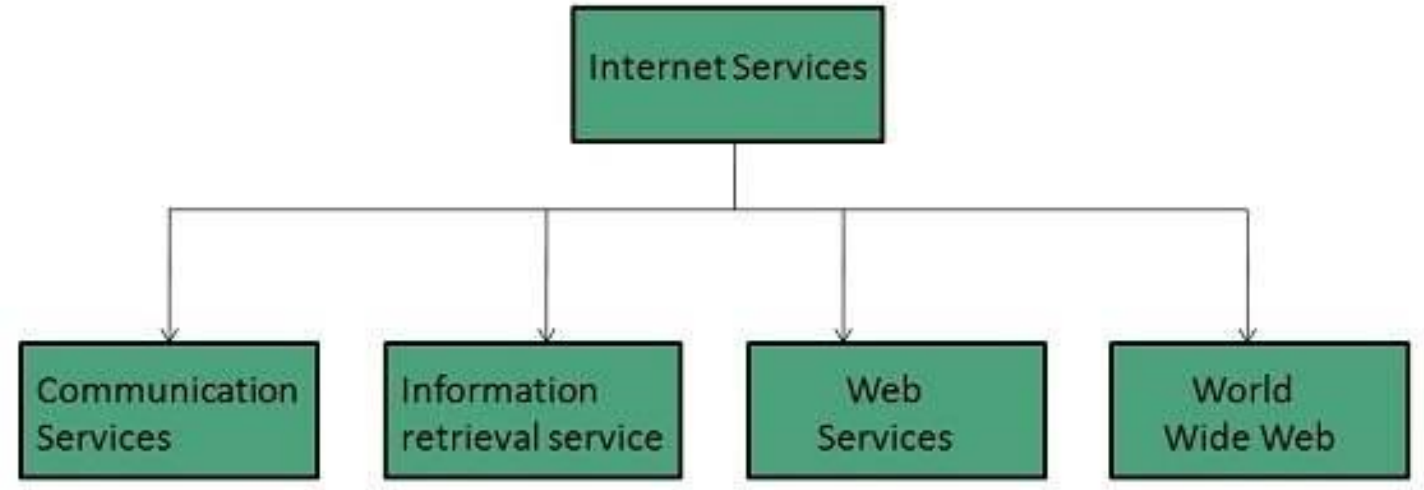
Email : Email is one of the most fundamental internet communication tools. Email addresses are required to sign up for many services online, and it's generally assumed that everyone on the internet has at least one email address.

Internet Relay Chat : Dating back to the 1980s, internet relay chat was one of the earliest chat tools on the internet. It's still in use today for recreational purposes, coordinating work teams and handling tech support for some open-source software products.

5.4.3 Internet Services

Internet Services

Internet Services allows us to access huge amount of information such as text, graphics, sound and software over the internet.



5.5 Preparing Computer for Internet Access

Short for Internet Service Provider, it refers to a company that provides Internet services, including personal and business access to the Internet.

For a monthly fee, the service provider usually provides a software package, username, password and access phone number.

Equipped with a modem, you can then log on to the Internet and browse the World Wide Web and USENET, and send and receive e-mail.

In addition to serving individuals, ISPs also serve large companies, providing a direct connection from the company's networks to the Internet. ISPs themselves are connected to one another through

5.5.1 ISPs and examples (Broadband/Dialup/WiFi)

Broadband

Broadband is a type of high-speed internet connection that has surpassed dial-up as the standard way to connect to the internet.

Broadband packages come in all shapes and sizes, from ADSL broadband to cable broadband and 3G and 4G mobile broadband.

A broadband connection, like a telephone line, is never switched off and can be accessed at any time.

The term broadband is used to describe a type of data transmission in which a single medium (wire) can carry several channels at once. Cable TV, for example, uses broadband transmission. In contrast, baseband transmission allows only one signal at a time.

'Dial-up'

'Dial-up' is a way accessing the internet on a computer via the public telephone network, using a device known as a modem.

In addition, because dial-up uses normal phones lines, its speed and efficiency can be compromised.

Wi-Fi

Wi-Fi is a wireless network that utilizes one of the IEEE 802.11 wireless standards to achieve a wireless connection to a network.

A home wireless network uses a wireless access point or router to broadcast a signal using WAP or WEP encryption to send and receive signals from wireless devices on the network.

Linksys Wireless Router

5.5.2 Internet Access Techniques

Dial-Up (Analog 56K) : Dial-up access is cheap but slow. A modem (internal or external) connects to the Internet after the computer dials a phone number. This analog signal is converted to digital via the modem and sent over a land-line serviced by a public telephone network.

DSL : DSL stands for Digital Subscriber Line. It is an internet connection that is always "on". This uses 2 lines so your phone is not tied up when your computer is connected. There is also no need to dial a phone number to connect.

Cable : Cable provides an internet connection through a cable modem and operates over cable TV lines.

Wireless : it uses radio frequency. Wireless is also an always on connection and it can be accessed from just about anywhere.

Satellite. Satellite accesses the internet via a satellite in Earth's orbit. The enormous distance that a signal travels from earth to satellite and back again,

Cellular. Cellular technology provides wireless Internet access through cell phones. The speeds vary depending on the provider, but the most common are 3G and 4G speeds. A 3G is a term that describes a 3rd generation cellular network obtaining mobile speeds of around 2.0 Mbps. 4G is the fourth generation of cellular wireless standards.

SUMMARY

In this Chapter you learned

- internet
- WWW
- Communication medium
- LAN
- MAN
- WAN

Q 1.What is internet?

Q 2. What is LAN and WAN?

Q 3.What is TCP?

Q 4.What is Wi-Fi?

Q 5.What is Dial-Up?