Unit 1: Introduction to Internet

1.1 Concepts of internet

Internet:

The Internet is the global system of interconnected computer networks that uses the Internet protocol suite (TCP/IP) to communicate between networks and devices.

The Internet is a global network of billions of computers and other electronic devices. With the Internet, it's possible to access almost any information, communicate with anyone else in the world, and do much more.

You can do all of this by connecting a computer to the Internet, which is also called going online. When someone says a computer is online, it's just another way of saying it's connected to the Internet.

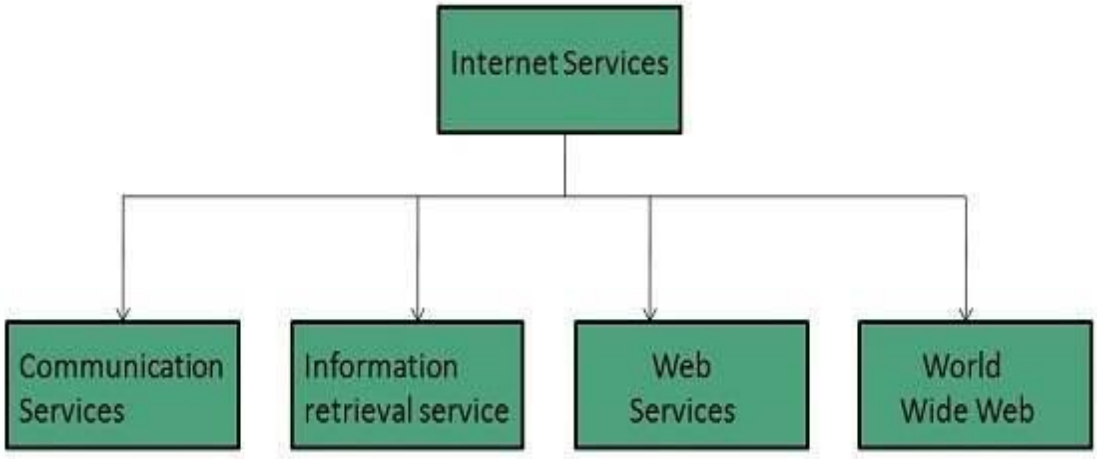
Internet is a world-wide global system of interconnected computer networks. Every computer in internet is identified by a unique IP address. IP Address is a unique set of numbers (such as 110.22.33.114) which identifies a computer location.

Evolution of Internet

The concept of Internet was originated in 1969 and has undergone several technological & Infrastructural changes as discussed below:

- The origin of Internet devised from the concept of **Advanced Research Project Agency Network (ARPANET).**
- **ARPANET** was developed by United States Department of Defense.
- Basic purpose of ARPANET was to provide communication among the various bodies of government.
- Initially, there were only four nodes, formally called **Hosts.**
- In 1972, the **ARPANET** spread over the globe with 23 nodes located at different countries and thus became known as **Internet.**
- By the time, with invention of new technologies such as TCP/IP protocols, DNS, WWW, browsers, scripting languages etc., Internet provided a medium to publish and access information over the web.

Internet Services:



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

1. Communication Services:

Communication services offers exchange of information with individuals or groups. For example: Electronic mail - Used to send electronic message over the internet. Instant Messaging - Offers real time chat between individuals and group of people. Eg. Yahoo messenger, MSN messenger.

2. Information Retrieval Services:

Information Retrieval Services offers easy access to information present on the internet. For example: File Transfer Protocol (FTP) – enables the users to transfer files.

3. Web Services:

Web services allow exchange of information between applications on the web. Using web services, applications can easily interact with each other. For example: some websites used online weather web services to display weathers (eg. AccuWeather API).

4. World Wide Web:

WWW is also known as W3. It offers a way to access documents spread over the several servers over the internet. These documents may contain texts, graphics, audio, video, hyperlinks. The hyperlinks allow the users to navigate between the documents.

Advantages and Disadvantages of Internet

Advantages:

Internet covers almost every aspect of life, one can think of. Here, we will discuss some of the advantages of Internet:

- Internet allows us to communicate with the people sitting at remote locations. There are various apps available on the wed that uses Internet as a medium for communication. One can find various social networking sites such as:
    - Facebook
    - Twitter
    - Yahoo
    - Google+
    - Flickr
    - Orkut
- One can surf for any kind of information over the internet. Information regarding various topics such as Technology, Health & Science, Social Studies, Geographical Information, Information Technology, Products etc can be surfed with help of a search engine.
- Apart from communication and source of information, internet also serves a medium for entertainment. Following are the various modes for entertainment over internet.
    - Online Television
    - Online Games
    - Songs
    - Videos
    - Social Networking Apps
- Internet allows us to use many services like:
    - Internet Banking
    - Matrimonial Services
    - Online Shopping
    - Online Ticket Booking
    - Online Bill Payment
    - Data Sharing
    - E-mail
- Internet provides concept of **electronic commerce**, that allows the business deals to be conducted on electronic systems.

Disadvantages:

- There are always chances to lose personal information such as name, address, credit card number. Therefore, one should be very careful while sharing such information. One should use credit cards only through authenticated sites.

- Another disadvantage is the **Spamming**. Spamming corresponds to the unwanted e-mails in bulk. These e-mails serve no purpose and lead to obstruction of entire system.
- **Virus** can easily be spread to the computers connected to internet. Such virus attacks may cause your system to crash or your important data may get deleted.
- There are various websites that do not provide the authenticated information. This leads to misconception among many people.

1.2 Internet Connections

Types of Internet connections

There exist several ways to connect to the internet. Following are these connection types available:

1. Dial-up Connection
2. ISDN
3. DSL
4. Cable TV Internet connections
5. Satellite Internet connections
6. Wireless Internet Connections
7. Mobile Hotspot

Dial-up Connection

Dial-up connection uses telephone line to connect PC to the internet. It requires a modem to setup dial-up connection. This modem works as an interface between PC and the telephone line.

There is also a communication program that instructs the modem to make a call to specific number provided by an ISP.

Dial-up connection uses either of the following protocols:

1. Serial Line Internet Protocol (SLIP)
2. Point to Point Protocol (PPP)

ISDN

ISDN is acronym of **Integrated Services Digital Network.** It establishes the connection using the phone lines which carry digital signals instead of analog signals.

There are two techniques to deliver ISDN services:

1. Basic Rate Interface (BRI)
2. Primary Rate Interface (PRI)

- The BRI ISDN consists of three distinct channels on a single ISDN line: t1o 64kbps B (Bearer) channel and one 16kbps D (Delta or Data) channels.
- The PRI ISDN consists of 23 B channels and one D channels with both have operating capacity of 64kbps individually making a total transmission rate of 1.54Mbps.

DSL

DSL is acronym of **Digital Subscriber Line.** It is a form of broadband connection as it provides connection over ordinary telephone lines.

Following are the several versions of DSL technique available today:

1. Asymmetric DSL (ADSL)
2. Symmetric DSL (SDSL)
3. High bit-rate DSL (HDSL)
4. Rate adaptive DSL (RDSL)
5. Very high bit-rate DSL (VDSL)
6. ISDN DSL (IDSL)

All of the above mentioned technologies differ in their upload and download speed, bit transfer rate and level of service.

Cable TV Internet Connection

Cable TV Internet connection is provided through Cable TV lines. It uses coaxial cable which is capable of transferring data at much higher speed than common telephone line.

- A cable modem is used to access this service, provided by the cable operator.
- The Cable modem comprises of two connections: one for internet service and other for Cable TV signals.
- Since Cable TV internet connections share a set amount of bandwidth with a group of customers, therefore, data transfer rate also depends on number of customers using the internet at the same time.

Satellite Internet Connection:

Satellite Internet connection offers high speed connection to the internet. There are two types of satellite internet connection: one way connection or two way connection.

In one way connection, we can only download data but if we want to upload, we need a dialup access through ISP over telephone line.

In two way connection, we can download and upload the data by the satellite. It does not require any dialup connection.

Wireless Internet Connection:

Wireless Internet Connection makes use of radio frequency bands to connect to the internet and offers a very high speed. The wireless internet connection can be obtained by either WiFi or Bluetooth.

- Wi Fi wireless technology is based on IEEE 802.11 standards which allow the electronic device to connect to the internet.
- Bluetooth wireless technology makes use of short-wavelength radio waves and helps to create personal area network (PAN).

Mobile Hotspot:

Hotspot is a physical location where people may obtain Internet access, typically using Wi-Fi technology. A hotspot can be in a private location or a public one, such as in a coffee shop, a hotel, an airport, or even an airplane.

Public hotspots may be created by a business for use by customers, such as coffee shops or hotels. Public hotspots are typically created from wireless access points configured to provide Internet access, controlled to some degree by the venue.

Working of Internet:

The internet works by using a Packet Routing Network to allow computers to send and receive messages using Internet Protocol addresses and a Transfer Control Protocol.

The system that handles this communication is called a Packet Routing Network. This is why access to the internet usually requires a router. A router is a piece of hardware that allows multiple computers to connect to one another in order to create this network. The router is an essential piece of equipment that guides the packets to their destinations.

The Internet Protocol and Transfer Control Protocol work together as TCP/IP to allow computers to "talk" to each other by sending and receiving messages.

1. Computer A sends message to Computer B's IP Address
2. Message is broken into smaller pieces called Packets

3. Packets are sent along Packet Routing Network to correct IP address
4. Packets are subject to Transfer Control Protocol to maintain quality
5. Packets are received and reassembled at Computer B's IP Address

This is how the internet works, step by step.

Difference between Internet, Intranet, Extranet:

Point of difference	Internet	Intranet	Extranet
Accessibility of network	Public	Private	Private
Availability	Global system.	Specific to an organization.	To share information with suppliers and vendors it male the use of public network.
Coverage	All over the world.	Restricted area upto an organization.	Restricted area upto an organization and some of its stakeholders or so.
Accessibility of content	It is accessible to everyone connected.	It is accessible only to the members of organization.	Accessible only to the members of organization and external members with logins.
No. of computers connected	It is largest in number of connected devices.	The minimal number of devices are connected.	The connected devices are comparable with Intranet.
Owner	No one.	Single organization.	Single/ Multiple organization.

Point of difference	Internet	Intranet	Extranet
Purpose of the network	It's purpose is to share information throughout the world.	It's purpose is to share information throughout the organization.	It's purpose is to share information between members and external, members.
Security	It is dependent on the user of the device connected to network.	It is enforced via firewall.	It is enforced via firewall that separates internet and extranet.
Users	General public.	Employees of the organization.	Employees of the organization which are connected.
Policies behind setup	There is no hard and fast rule for policies.	Policies of the organization are imposed.	Policies of the organization are imposed.
Maintenance	It is maintained by ISP.	It is maintained by CIO. HR or communication department of an organization.	It is maintained by CIO. HR or communication department of an organization.
Economical	It is more economical to use.	It is less economical.	It is also less economical.
Relation	It is the network of networks.	It is derived from Internet.	It is derived from Intranet.
Example	What we are normally using is internet.	WIPRO using internal network for its business operations.	DELL and Intel using network for its business operations.