Introduction to the Internet

ICT

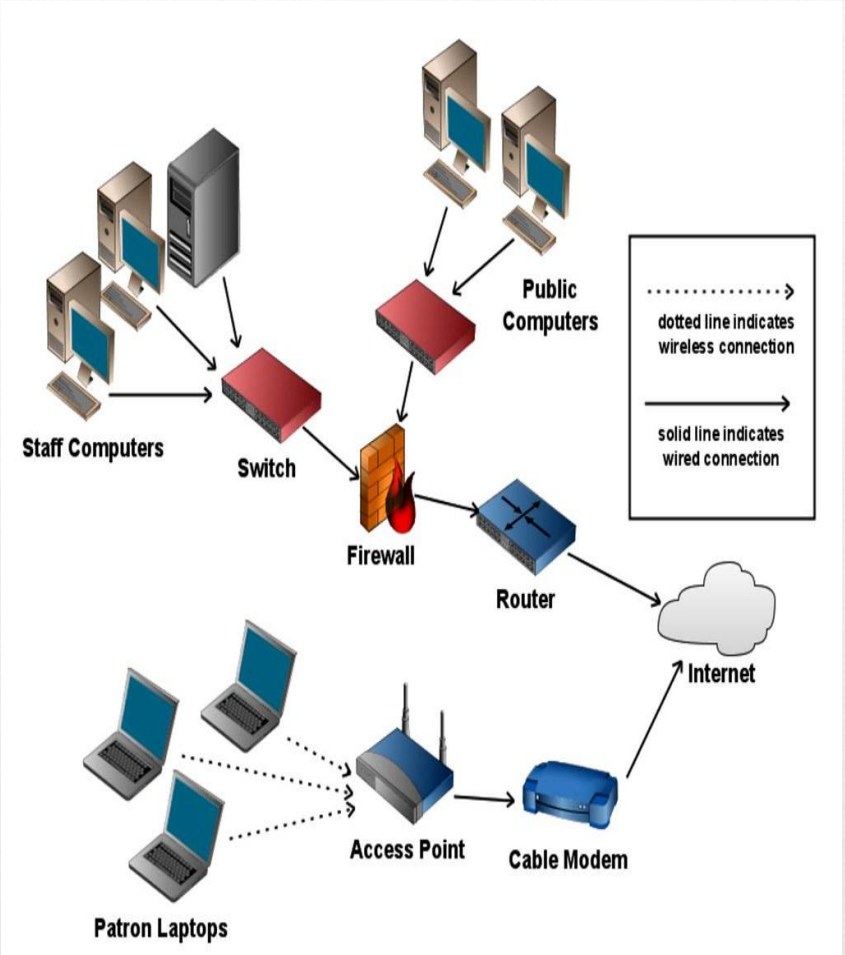
- ICT –information and communication technology
- Information- meaningful data.
- Data? = facts – ram, 15, Delhi- raw
- Ram is a man who is 15 years and he lives in Delhi
- Communication- exchange of information – meaningful – receiver through info sender – meaningful- sender acknowledgment

Internet

It is the largest network in the world that connects hundreds of thousands of individual networks all over the world.

The popular term for the Internet is the "information highway".

Rather than moving through geographical space, it moves your ideas and information through cyberspace – the space of electronic movement of ideas and information.



Internet

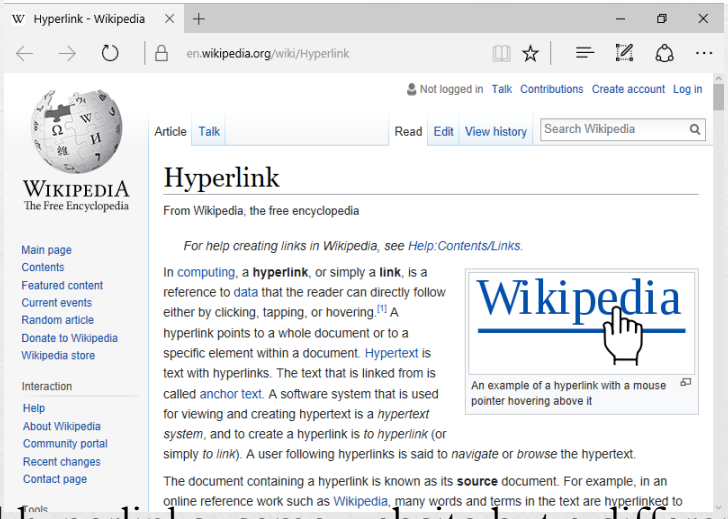
- It has no formal management organization.
- As it was originally developed by the Department of defense, American this lack of centralization made it less vulnerable to wartime or terrorist attacks. ARPANET – Advanced research projects agency network) 1960s .
- California Univeristy – computers were connected .
- University of UTAH- 1971
- To access the Internet, an existing
- network need to pay a small registration fee and agree to certain standards based on the TCP/IP (Transmission Control Protocol/Internet Protocol) .
- Hypertext transfer protocol- https – secure
- Website - http/ https

The uses of the Internet

- Send e-mail messages.
- Send (upload) or receive (download) files between computers.
- Participate in discussion groups, such as mailing lists and newsgroups.
- Surfing the web.
- Video calling
- Healthcare – database- server connection

What is the Web?

- It contains hThe **Web (World Wide Web)** consists of information organized into Web pages containing text and graphic images.
- ypertext links, highlighted keywords, and images leading to related information.
- A website is a collection of linked Web pages with a common theme or focus.
- The site's home page is the main page that all of the pages on a particular Web site are organized around and linked back to.
- Tim Bernes Lee



Internal hyperlinks- same website but a different part, External Hyperlink – word taking to another website

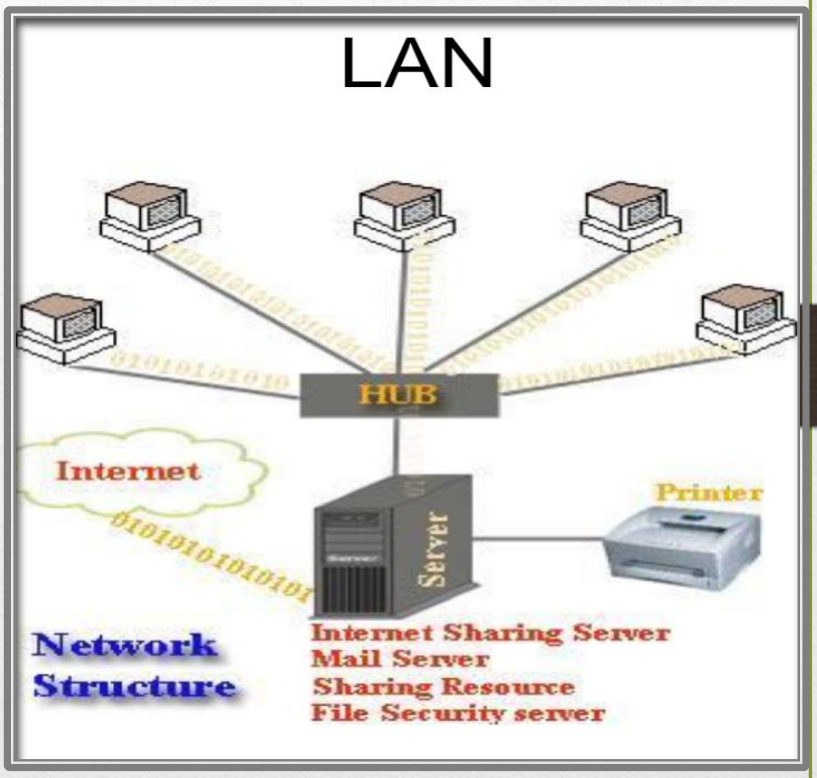
How to access the Internet?

- Students and employees can access through the organization's local area networks (LAN) or through their own personal computers.
- Dial-up, Broadband- ethernet cables- RJ45, Cable, satellite, and wireless mobile hotspots are a few methods we use to connect to the Internet.
- LAN- Method to create a connection

LAN

Local Area Network

- 1.Covers a small region of space, typically a single building.
- 2. LAN is the smallest network compared to the other two networks.
- 3. the simplest form of LAN is to connect two computers
- 4. LAN is operated within a limited physical area such as at home, school, a single building, or several buildings.
- 5. A network which consists of less than 500 interconnected devices across several buildings, is still recognized as a LAN.
- 6. LAN is a very high-speed network (from previously 10Mbps) to 100Mbps, which is faster than MAN and WAN.



CONNECTING DEVICES

HUB

- 5 devices – c1 c2 c3 c4 c5 . C2 searched for educational institutes. The server response will be sent to each computer.

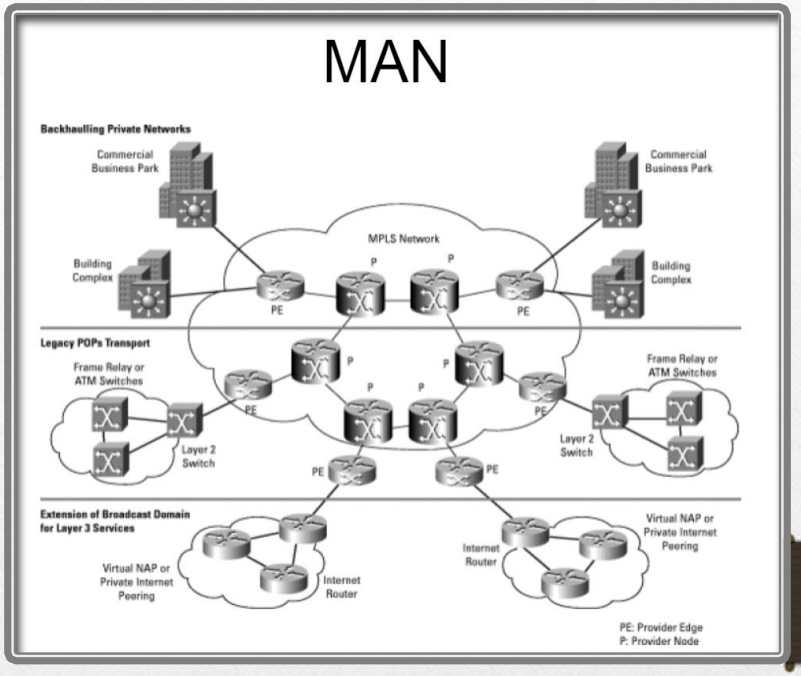
SWITCH

MAN

Metropolitan Area Network

- 1. Is the collection of LANs with the same geographical area, for instance, a city.
- 2. Is a network of computers located at different sites within a large physical area, such as a city.
- 3. MAN often acts as a high-speed network(although not as fast as LAN) to allow sharing of regional resources.
- 4. MAN can defined as a group of computers and network devices connected together within a large physical area.
- 5. Companies that have several branches within the DELHI city such banks, might find a MAN useful to th

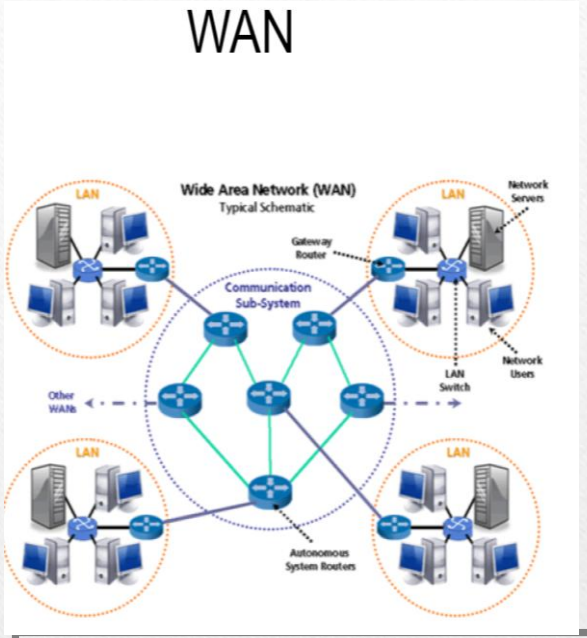
VSNL – videsh Sanchar

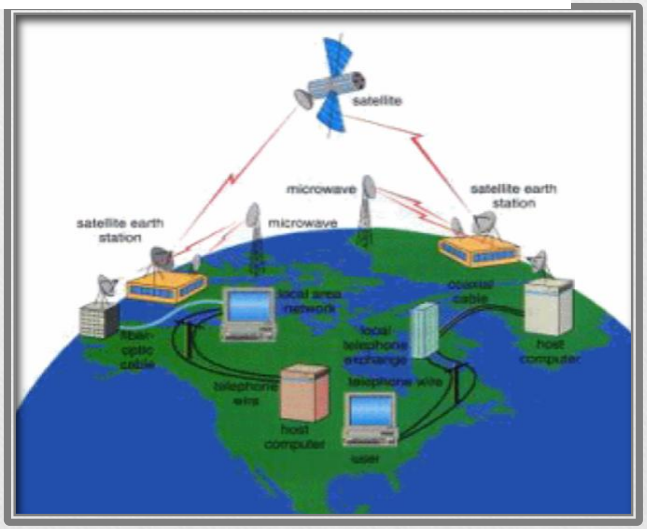


WAN

WAN-Wide Area Network

- 1. Is the largest network of all network types.
- 2. The internet is the largest WAN in the world.
- 3. WAN generally covers large distances such as states, countries or continents.
- 4. WAN is group of MANs or LANs or the mixture of both network.
- 5. An example in society using WAN is the banking organization.





Internet Service Provider (ISP)

- A commercial organization with a permanent connection to the Internet that sells temporary connections to subscribers.
- Examples: AIRTEL, JIO FIBRE.

How to access the Web?

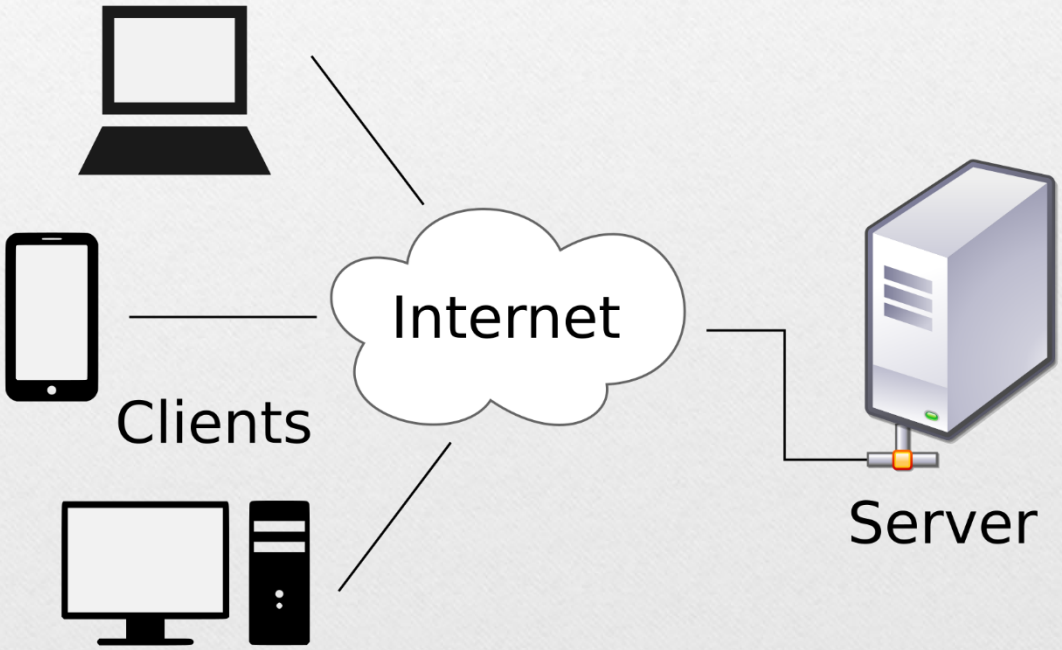
- Once you have your Internet connection, then you need special software called a browser to access the Web.
- Web browsers are used to connect you to remote computers, open and transfer files, display text and images.
- Web browsers are specialized programs.
- Examples of Web browser: Netscape Navigator (Navigator) and Internet Explorer.

Criteria	LAN	MAN	WAN
Cost	Low	High	Higher
Network Size	Small	Larger	Largest
Speed	Fastest	Faster	Fast
Transmission Media Type	Twisted-Pair	Twisted-Pair and Fibre-Optic	Fibre-Optic, radio wave and satellite
Number of computer	Smallest	Large	Largest

Difference between LAN MAN WAN

Client/Server Structure of the Web

- Web is a collection of files that reside on computers, called **Web servers**, that are located all over the world and are connected to each other through the Internet.
- When you use your Internet connection to become part of the Web, your computer becomes a **Web client** in a worldwide client/server network.
- A **Web browser** is the software that you run on your computer to make it work as a web client. NETSCAPE, CHROME, Opera, Mozilla Firefox.
- client – request, server – request's response


Internet
Clients
Server

Addresses on the Web: IP Addressing

- Each computer on the internet does have a unique identification number, called an IP (Internet Protocol) address.
- The IP addressing system currently in use on the Internet uses a four-part number.
- Each part of the address is a number ranging from 0 to 255, and each part is separated from the previous part by period,
- For example, 106.29.242.17 ipv4 ipv6

IP Addressing

- The combination of the four IP address parts provides 4.2 billion possible addresses (256 x 256 x 256 x 256).
- This number seemed adequate until 1998.
- Members of various Internet task forces are working to develop an alternate addressing system that will accommodate the projected growth.
- However, all of their working solutions require extensive hardware and software changes throughout the Internet.

IPv4

Initially widely used version of the Internet Protocol is called IPv4 (Internet Protocol version 4). It is the most popular version of the Internet Protocol and is in charge of distributing data packets throughout the network.

Maximum unique addresses for IPv4 are 4,294,967,296 (232), which are possible due to the use of 32-bit addresses. 8bits.8bits.8bits.8bits

The network address and the host address are the two components of each address.

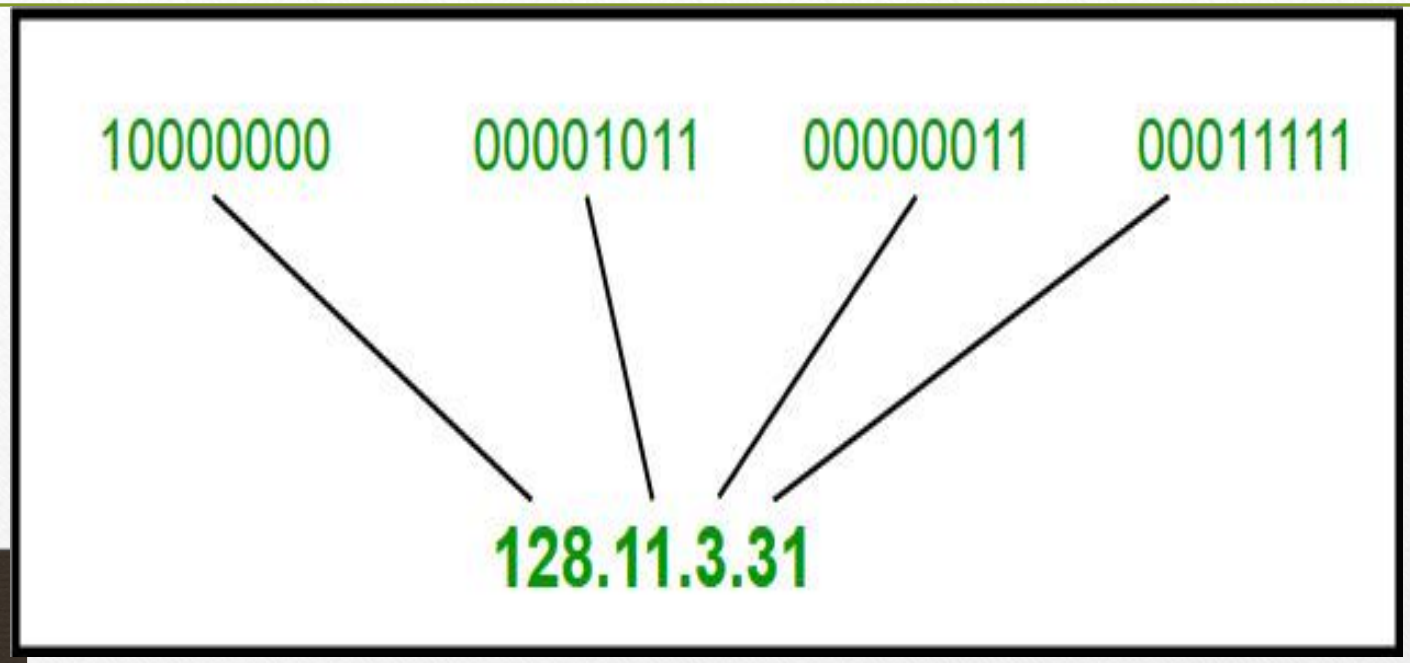
In the “dotted decimal” notation, which is the standard for IPv4 addresses, each octet (8 bits) of the address is represented by its decimal value and separated by a dot (e.g. 192.168.1.1).

11. IPv6

The most recent version of the Internet Protocol, IPv6, was created to address the IPv4 protocol's drawbacks.

A maximum of 4.3 billion unique addresses are possible with IPv4's 32-bit addresses.

Contrarily, IPv6 uses 128-bit addresses, which enable a significantly greater number of unique addresses.



IPv6 address

2001 : 0DC8 : E004 : 0001 : 0000 : 0000 : 0000 : F00A

16 bits : 16 bits : 16 bits : 16 bits : 16 bits : 16 bits : 16 bits : 16 bits

128 Bits

ClouDNS

128.31.11.1-
234.45.6.7facebook- server –

Hexa decimal =16

0-9…10 =A 11=B 12=c 13=d 14=E 15=F

IPV6

256*.256*.256*.256.

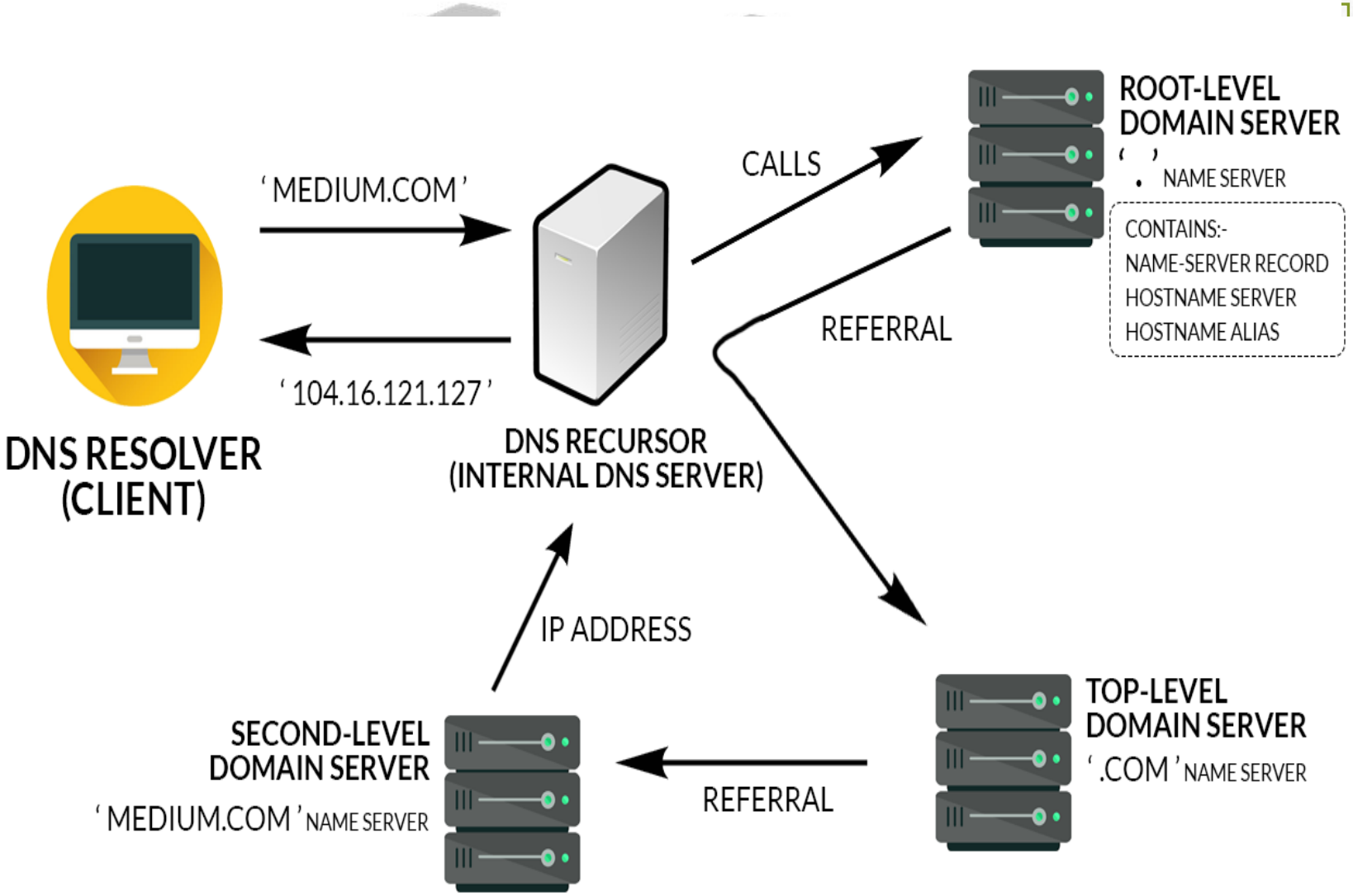
Domain Name Addressing

- Most web browsers do not use the IP address to locate Web sites and individual pages.
- They use domain name addressing.
- A **domain name** is a unique name associated with a specific IP address by a program that runs on an Internet host computer.
- This program, which coordinates the IP addresses and domain names for all computers attached to it, is called **DNS (Domain Name System) software**.
- The host computer that runs this software is called a **domain name server.**

Domain Name

A domain name is a unique name that identifies a website.

157.240.22.35- FB


'MEDIUM.COM'
'104.16.121.127'
DNS RESOLVER
(CLIENT)
DNS RECURSOR
(INTERNAL DNS SERVER)
CALLS
REFERRAL
ROOT-LEVEL
DOMAIN SERVER
' '
. NAME SERVER
CONTAINS:-
NAME-SERVER RECORD
HOSTNAME SERVER
HOSTNAME ALIAS
IP ADDRESS
REFERRAL
TOP-LEVEL
DOMAIN SERVER
'.COM' NAME SERVER
SECOND-LEVEL
DOMAIN SERVER
'MEDIUM.COM' NAME SERVER

Domain Name Addressing

- Domain names can include any number of parts separated by periods, however most domain names currently in use have only three or four parts.
- Domain names follow hierarchical model that you can follow from top to bottom if you read the name from the right to the left.
- For example, the domain name minervainstitute.in is the computer connected to the Internet at the Graduate School , No other computer on the Internet has the same domain name.

Uniform Resource Locators

- The IP address and the domain name each identify a particular computer on the Internet.
- However, they do not indicate where a Web page's HTML document resides on that computer.
- To identify a Web page's exact location, Web browsers rely on the Uniform Resource Locator (URL).
- URL is a four-part addressing scheme that tells the Web browser:

➓ What transfer protocol to use for transporting the file

➓ The domain name of the computer on which the file resides

➓ The pathname of the folder or directory on the computer on which the file resides

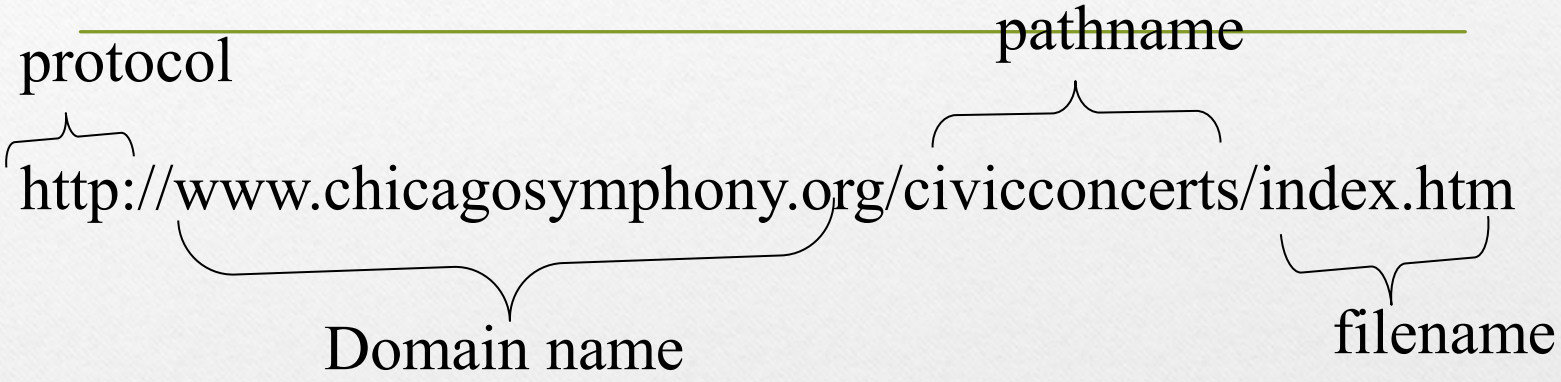
➓ The name of the file

A domain name is the name of a website, while a URL (Uniform Resource Locator) is the address of a specific page on that website

https://cloudflare.com/learning/", "cloudflare.com" is the domain name, "https" is the protocol, and "/learning/" is the path.

www.facebook.com= dns www.facebook.com/photos

Structure of a Uniform Resource Locators



http => Hypertext Transfer Protocol

HTTP

- The transfer protocol is the set of rules that the computers use to move files from one computer to another on the Internet.
- The most common transfer protocol used on the Internet is the Hypertext Transfer Protocol (HTTP). Html- hypertext markup language
- Two other protocols that you can use on the Internet are the File Transfer Protocol (FTP) and the Telnet Protocol (Teletype Network)

How to find information on the Web?

- A number of search tools have been developed and available to you on certain Web sites that provide search services to help you find information.
- Examples:
- GOOGLE

➓ Yahoo → www.yahoo.com

➓ Excite → www.excite.com

➓ Lycos → www.lycos.com

➓ AltaVista → www/alta-vista.com

➓ MSN WebSearch → www.search.msn.com

How to find information on the Web?

- You can find information by two basic means.
- **Search by Topic** and **Search by keywords**.
- Some search services offer both methods, others only one.
- Yahoo offers both.

➓ Search by Topic

You can navigate through topic lists

➓ Search by keywords

You can navigate by entering a keyword or phase into a search text box.

Internet Basics

Terminology

add-on

a software program that works with another program, enhancing its features. Add-ons are software extensions that add new features to existing programs or applications. Here are some examples of add-ons:

•Web browser add-ons: These include ad-blockers, password managers, productivity tools, language support, online conference features, social media tools, video downloaders, and website screenshot tools.

•Video game add-ons: These include new levels, characters, and customization options.

•Image editing software add-ons: These include plugins.

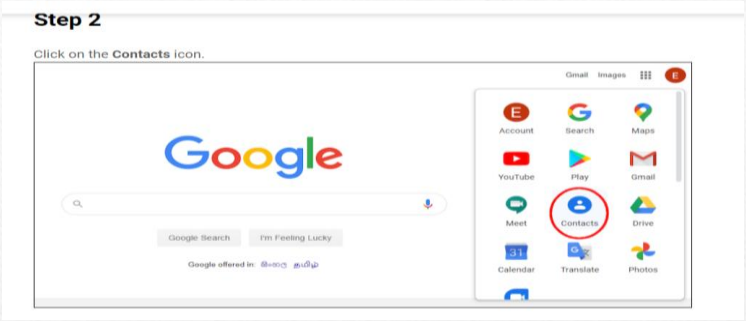
•Music production software add-ons: These include virtual instruments.

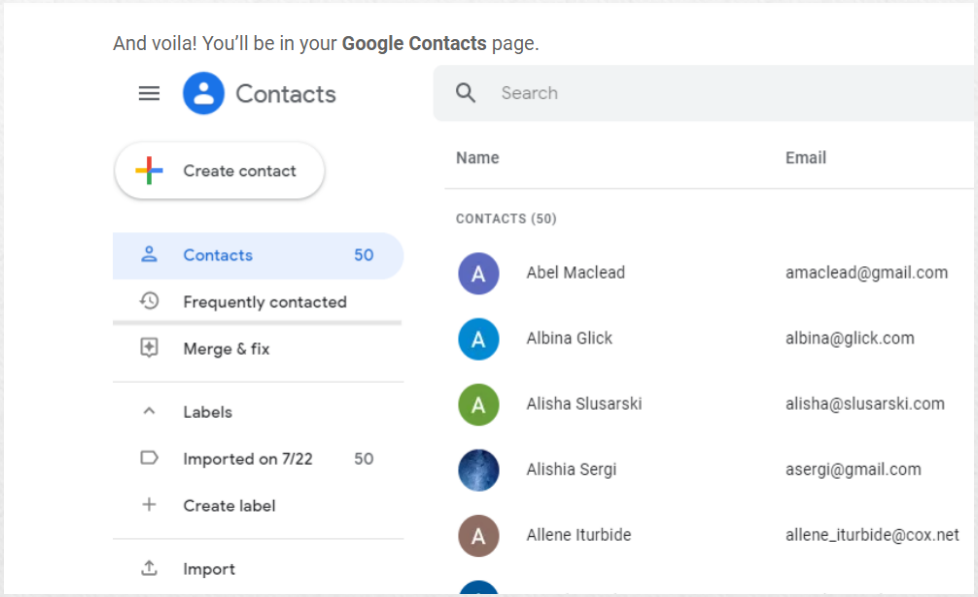
•Presentation software add-ons: These include additional templates.

•Grammarly: This add-on can be installed for Microsoft Office or used as a Chrome browser extension to proofread documents.

address book

component of e-mail programs to store names, electronic addresses, and other details about specific identities.





animated GIF

web page graphic that combines several GIF graphics in one file and in a sequence.

Animated GIF's are widely used on the Internet because they do not require a special player.

antivirus program

a utility that searches electronic files for computer viruses and removes any found.

attachment

an electronic file attached to an e-mail.

What is an Intranet?

An intranet is owned by a single organization and is a tool for sharing information throughout the organization. It is the type of Internet that is used privately. Since the intranet is a private network no one can use the intranet whose have not valid username and password. In intranet, there are a limited number of connected devices as compared to the internet. The intranet is highly secure and has a small number of visitors. It is used in order to get employee information, telephone directory, etc.

.

Advantages of Intranet

•**Enhanced Communication:** Promotes easy flow of communication between departments.

•**Centralized Information:** Enables easy retrieval of documents and other key resources that are used in a given process.

•**Increased Productivity:** Decrease the physical time that is required in locating information and conducting work within the organization.

•**Secure Environment:** Ensures the safety of the user's information only allows internal personnel to access the application.

Disadvantages of Intranet

•**Maintenance Costs:** Need a frequent fixing and updating process which may fancy the cost.

•**Limited Accessibility:** Only accessible within the organisation which means there may be a problem if need to involve personnel who are not physically present at the organisation

What is an Extranet?

Extranet is owned by either a single or a many organization. It is managed on a contractual basis between organizations and is a tool for sharing information between internal members and external members. Like intranet, it is also a private network so only those who have a valid username and password can use the extranet. Extranet is used to check status, access data, send mail, place order etc.

Advantages of Extranet

- **Improved Collaboration:** Facilitates interaction with other bodies outside the organization.
- **Secure Data Sharing:** Gives a restricted access to communicate with outside vendors or other third parties, thus protecting the TCP.
- **Cost-Effective:** Saves on costs by doing away with physical consultations which are often very expensive.

Disadvantages of Extranet

- **Complex Setup:** If implemented and designed properly it will be very strong but the planning is key to security and functionality.
- **Security Risks:** poses an increased risk if it is not protected which can lead to external threats penetrating the business.

bandwidth

the amount of data that can be transmitted in a given amount of time, typically expressed as bits per second (bps).

Maximum bit rate(rate at which information is transfererd)

BCC

blind carbon copy, a copy of an e-mail message sent to a second recipient without the address appearing in the original mailing.

bookmarks

Netscape Navigator's method of marking and organizing web page addresses as links for later use.

bounce

an e-mail message that is returned, or "bounced" back, due to an unknown or obsolete e-mail address.

browser

a software application used to access the World Wide Web and view web pages

bulletin board

an electronic message center where users post messages for other users to later read and comment on.

byte

a unit of information containg eight bits, capable of representing an alphabetic character.

modem

a modem designed to utilize cable television lines and therefore capable of transmitting more information with more bandwidth and faster connection speeds.

Analog signals – digital 1,0- modulator de-modulator

chat

real-time, text-based communication on the Internet.

client

software program that requests files or makes other requests of a server

Collabra

the newsreader software that comes with the Netscape Communicator suite.

Common Gateway Interface (CGI)

script that transfers data between a client and a server, often used in interactive web pages such as forms.

component bar

offers buttons to access the various components of the Communicator suite.

compression

compacts data into a smaller file size by scanning a file and eliminating duplicate areas by replacing them with reference codes.

cookie

electronic file transmitted from a server to a Web browser and sent back to the server when a new file is requested. Cookies are stored on the browser.

cybercast

broadcast over the Internet.

cyberspace

the non-physical space created by computers, such as the Internet.

dail-up account

internet access account that enables a computer to connect to the Internet via an ISP computer using a modem.

database

a collection of related information that can be searched.

document window

displays the active Web page.

domain name

names used in URL's and corresponding to one or more IP addresses. Domain names always carry a suffix, the top-level domain name such as com or edu. Domain names in a URL are case sensitive.

Domain Name Service (DNS)

Internet service that translates domain names into their numeric IP numbers

download

to copy electronic data from another computer to your computer over a network.

electronic commerce (e-commerce)

business conducted online.

e-mail

electronic messages transmitted over any computer network.

executable

a file that a computer can execute, such as a software program.

external viewer

a program that a browser launches automatically to open files not supported by the browser.

firewall

programming designed to prevent Internet users from accessing parts of an Internet server.

forum

a discussion group where users share information on a particular topic of common interest.

frame

a section of a document window, divided areas of a browser display showing distinct web pages.

freeware

copyrighted software that is provided free for anyone's use.

File Transfer Protocol (FTP)

a common protocol that facilitates transferring any type of electronic files over the Web.

gif or GIF

compressed graphics file format supported by all graphics Web browsers, the most common graphics file format used on the Web.

gigabyte (GB)

unit of electronic information storage capable of holding 1,073,741,824 bytes.

home page

the Web page that appears when you start Netscape Navigator, the index or default page of a particular Web server, folder, or person's Web site.

history window

a web browser feature with a list of sites visited, providing searchable data on each site, including title, URL, when first visited, when most recently visited, and how often visited.

home page

the entrance page to a Web site with multiple pages; a Web page about a person or company; the start page for a browser.

host

a computer connected to a TCP/IP network, such as the Internet, with a unique IP address; a computer that stores resources or provides a service for other computers on a network.

Hypertext Transfer Protocol (HTTP)

the protocol computers use to transmit Web documents between computers, identified by the prefix "http://" of the URL.

hypertext documents

electronic files containing links that can be selected to move to another part of the document or to another document altogether.

Hypertext Markup Language (HTML)

programming language used to create documents displayed by Web browsers, a logical language to format documents that can be universally understood on different computer platforms and by different Web browsers.

imagemap

a single graphic that serves as more than one hyperlink.

inbox

folder in an e-mail program where incoming messages are stored until moved to another folder or deleted.

Internet

a global network of computer networks that use standard protocols to exchange information, the largest network of computer networks.

Internet Service Provider (ISP)

companies that sell access to the Internet to other users.

IP address

the numerical identifier for a computer connected to a TCP/IP network, such as the Internet. IP addresses consist of a set of four numbers from 0 - 255 and separated by periods. For example 199.104.230.26.

jpg or JPEG

pronounced "jay-peg," a compressed graphics format supported by all graphical web browsers, second of the most common image formats used on the Web. The acronym stands for Joint Photographic Experts Group.

link

that portion of a hypertext document that allows for moving to another part of the document or to another document altogether.

local area network

computer network that covers a relatively small area, such as a single building or company, and allows for sharing devices such as printers or services such as Internet connection.

mailto link

a link in a Web page that opens the default e-mail program and addresses a message to a specific address. The specified URL begins with "mailto:" followed by the e-mail address.

menu bar

groups commands by menu name, clicking a menu name opens a menu of commands or submenus.

modem

device that enables a computer to connect to other computers via a telephone or other transmission line

navigation buttons

tool bar buttons used to move among Web pages, includes, Back, Forward and Home.

network

two or more computers linked together to exchange data.

protocol

procedure or format a computer uses to transmit or exchange files, enabling computers of different platform types to communicate in a standardized fashion.

query

a request in question form that directs a search engine to find documents that contain the specified word, phrase or other component.

search engine

database software that retrieves information based upon query parameters.

server

computer that receives and fulfills requests to provide specific services on a network.

start page

the Web page that appears when a Web browser is launched.

Uniform Resource Locator (URL)

the address of a Web page.

upload

to transfer a file from your computer to another computer.

user ID

is a name that identifies you on a network. The portion of an e-mail address preceding the @ symbol is a common example.

Web page

a hypertext document on the World Wide Web.

Web server

a computer connected to the Internet that provides electronic files to other computers.

World Wide Web (WWW)

the network of HTML files stored on Web servers and interlinked with hyperlinks, thereby creating a "web" of interlinked files.

zip files

a common compression format created by MacZip for Macintosh, WinZip for Windows and PKZIP for DOS.