Internet

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What is internet ?

- It is a network of networks.
- It is a web of computers laid around the globe.
- The internet is a network of thousands of computer networks.
- Every network and every computer in these networks exchange information according to certain rules called protocols.
- These different computers and different networks are united with the common thread of two protocols, i.e., Internet Protocol (IP), and Transmission Control Protocol (TCP)

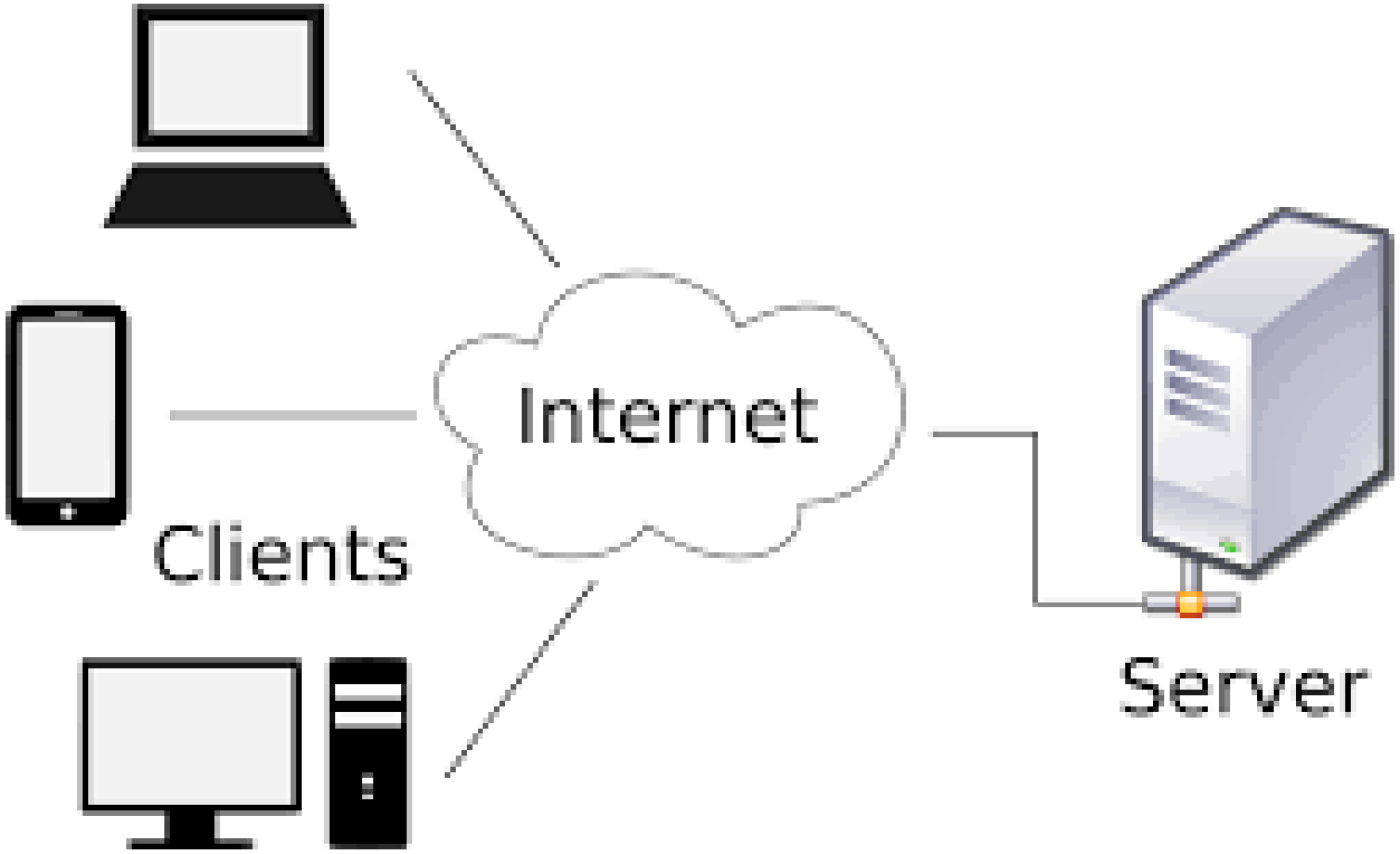
Concept of internet and WWW

- **Internet is an interconnection of multiple networks.**
- **The term ‘internet’ and ‘Internet’ are different**
  - internet – network of networks
  - Internet – World Wide Web
- **The most widely used part of the Internet is World Wide Web.**
- **Web browsing is done with web browsers.**

WWW

- **The WWW is the part of the Internet that contains websites and webpages.**
- **It was invented by Tim Berners-Lee in 1989 at CERN, Geneva, Switzerland.**
- **It is basically a system of Internet servers that supports specially formated documents.**
  - The documents are formated in a markup language called HTML.
- **The WWW is essentially a huge client-server system with millions of servers distributed worldwide.**
- **You can refer a document in WWW by a means of reference called Uniform Resource Locator (URL)**

Client - Server Model



How it works ?

1) **You surf WWW with the help of web browser.**
    1) Example : Google Chrome
2) **Web browser is a client software that requests for URL (that you have typed in the URL bar) to the server with the help of HTTP protocol**
3) **The request is routed to the right server with the help of the Internet routers.**
4) **When the server gets a request, it sends the document back to the web browser client.**
5) **The information is then displayed on your web browser.**

Steps for connecting to a website

- Type the URL for a website (www.google.com) into your web browser.
- Your browser attempts to make a connection to a web server.
- The web server receives the request.
- The website’s home page is downloaded from the web server to your PC.
- The web page is displayed by your web browser, and the connection between the the server and your browser is closed.

URL

- **URLs are the unique addresses of the Internet resources.**
- **They are used by web browsers to connect you directly to a specific document or page on the WWW.**
- **Example : http://www.abc.com/html/app/home.html**
- **Transfer Protocol :// Server name /Directory Path / File name**

Web page

- **A web page is an electronic document written in a computer language called HTML.**
- **Each web page has a unique address, called a URL that identifies its location on the network.**

Website

- **A website is a collection of web pages associated with a particular person, business, government, school and organization.**
- **Websites are stored on a web server, a special computer that makes web pages available for people on web browsers.**
- **A website has one or more related web pages.**
- **Web pages on a website are linked together through a system of hyperlinks to jump between them by clicking on the link.**

Internet Addressing Scheme

- **Every computer connected to the internet has a unique address whose format is defined by the “IP addressing system”.**
- **An IP address is a number that represents a single unique computer on the internet.**
- **Domain Name System (DNS) converts a name (www.google.com) into a corresponding numeric IP address.**

Domain names

- **Each domain name ends with an identifier that tells you what type of website it is.**

.com	Commercial business
.edu	Educational Institues
.gov	Government entities
.net	Internet service providers
.mil	Military sites
.org	Organisations that do not fit in any other category

Static website and Dynamic Website

- **A static website contains web pages with fixed content.**
- **Each web page is coded in HTML and displays same information to every visitor.**
- **Dynamic websites contain web pages that are generated in real-time.**
- **These web pages contain scripting code , such as PHP or ASP.**

Absolute URL and Relative URL

- **A fully qualified URL that specifies the location of a resource that resides on the internet is called an absolute URL.**
- **A relative URL points to a file or directory in relation to the present file or directory.**
- **ex : http ://www.abc.com/first.html**

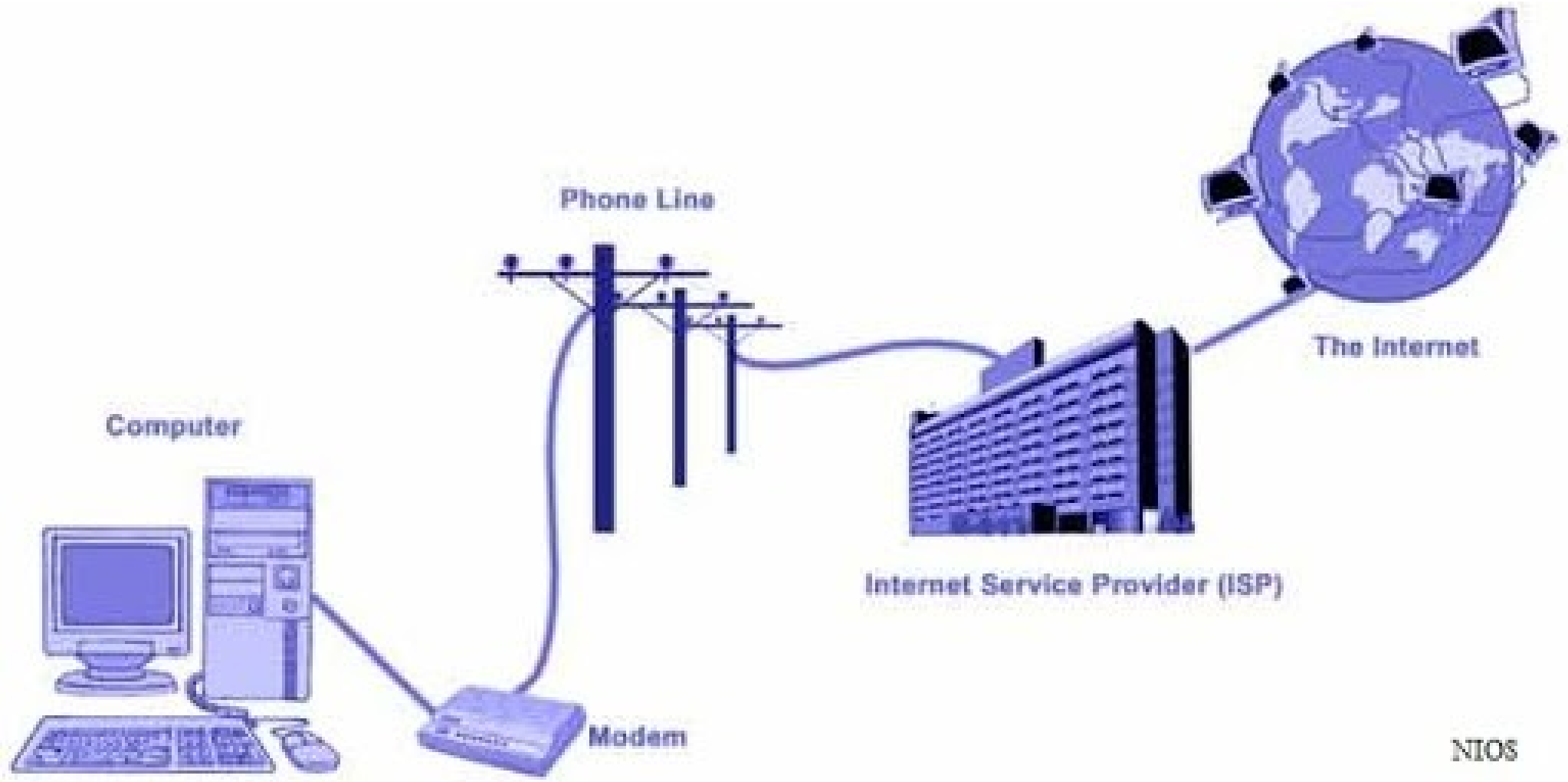
Applications of Internet

- Exchange messages using e-mail (Electronic mail).
- Transfer files as well as softwares
- Browse through information on any topic on web.
- Communicate in real time (chat) with others connected to the Internet.
- Search databases of government, individuals and organisations.
- Read news available from leading news groups.
- Send and receive animation and picture files from distant places.
- Set up a site with information about your company’s products and services.

ISP and Role of ISP

- **The Internet Service Provider is a company which allows you to connect to the Internet.**
- **Your modem connects to a single modem among a bank of modems at your ISP. *This is called a dial-up connection.***
- ***Users within corporations and large organisations mostly connect to an ISP via a high-speed link (typically over fiber optic cabling but not phone lines), and such a connection is called a direct connection.***

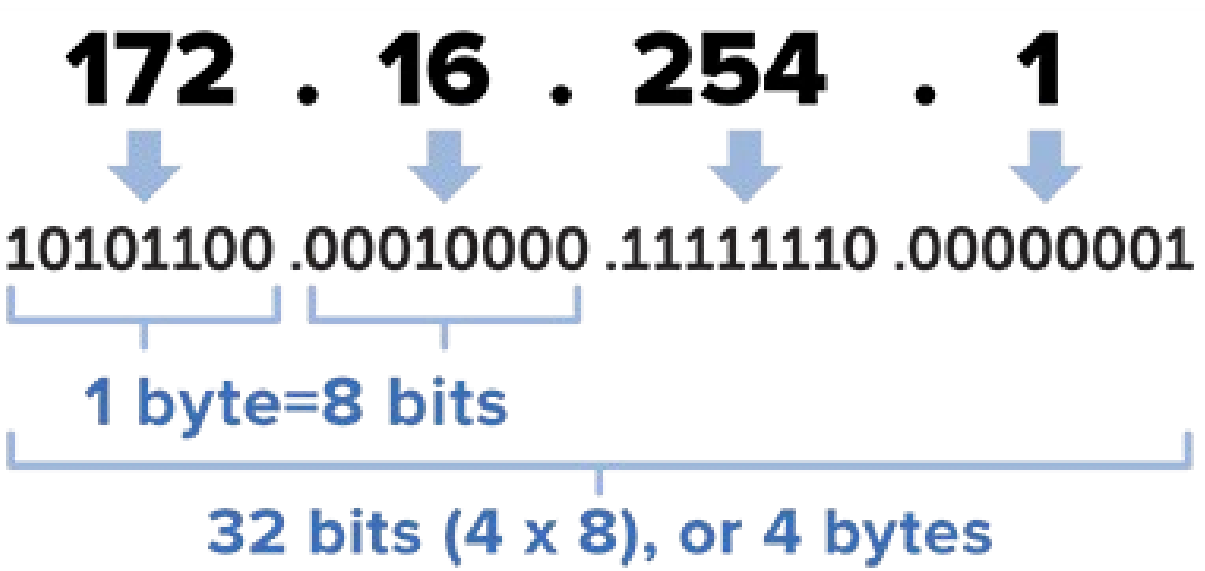
Dial-up connection using an ISP as a gateway to the Internet



IP address

- IP stands for Internet Protocols.
- IP is a number or value that is used to uniquely indentify a computer on the Internet.
- It is a 32-bit value, and this number can be divided into four different sections.
- All of these sections are seperated by a period.
- As each section is of 8 bits, it can represent a value in the range of 0 to 255
- Each bit in the octet has a binary weight (128, 64, 32, 16, 8, 4, 2, 1).
- The representation is in decimal format (known as dotted decimal notation).

IP address


172 . 16 . 254 . 1
10101100 .00010000 .11111110 .00000001
1 byte=8 bits
32 bits (4 x 8), or 4 bytes

IPv4

- **The maximum number of IP addresses is 2^{32} i.e. 4,294,967,296.**
- **The bytes of IPv4 are further classified into two parts:-**
  - Network Part
    - This part specifies the unique number assigned to your network.
    - It also identifies the class of network assigned.
  - Host Part
    - This is the part of IP address that you assign to each host.
    - It uniquely identifies the machine on your network.

IPv4

Class	Range	Network and Host ID
A	1 - 126	N.H.H.H
B	128 - 191	N.N.H.H
C	192 - 223	N.N.N.H
D	224 - 239	Reserved for Multicasting
E	240 - 255	Experimental Purpose

IPv6

- **IPv6 address size is 128 bits.**
- **IPv6 are represented in hexadecimals.**
- **The 128 bit address is divided into 16 bits, each 16 bit block is converted into a 4 digit hexadecimal (0 – F, i.e. 4 bits) number seperated by colons.**
- **Format :**

  XXXX : XXXX : XXXX : XXXX

MAC address

- **MAC stands for Media Access Control.**
- **It is a unique identifier assigned to a network interface card (NIC) by the manufacturer.**
- **It is also used to connect to the Ethernet network, and it has its own unique MAC address.**
- **The physical address is sent to your local network i.e. your router or ISP, where it is used to route your information**
- **It is 48 bit address**
  - MM:MM:MM:SS:SS:SS
- **It works on the data link layer of OSI / TCP/IP model.**

IMEI

- **International Mobile Equipment Indentity.**
- **It is a 15 digit number assigned to all cellular devices, which identifies your device within the mobile network.**
- **It can be displayed on the mobile screen by entering *#06#**

Modes of connecting Internet

- **Hotspot**
- **Connecting Internet LAN Cable**
- **Wireless Fidelity (Wi-Fi) connections**
- **Broadband connections**
- **Connect to USB Tethering**

Popular Web browsers

- Microsoft Internet Explorer
- Microsoft Edge
- Mozilla Firefox
- Opera
- Google Chrome

Exploring the Internet (How to become a web surfer ?)

- Surfing the web
- Open a web page in a Tab
- Navigating web pages

Popular Search Engines

- **A search engine is a software that searches through a database of web pages for a specific information.**
- **Effectiveness of search engine can be measured by two main parameters :**
  - Indexing Exhaustivity
  - Term Specificity
- **Yahoo !**
- **Bing**
- **Opera**
- **MSN**
- **Ask.com**
- **Google**

Basics of Google Search

- **Use multiple search terms**
- **Google searches are NOT case-sensitive**
- **No need to include “and”**
- **Order of typing words makes a difference !**
- **Google ignores common words like “where” and “how”**
- **Want results for the terms that include an exact phrase. Put it in double quotes**
  - “Mother Teresa”
- **Put “-” sign in front of the words related to the meaning you want to avoid.**

Downloading and Printing web pages

Thank You !!

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