Introduction to the Internet

Computer is very efficient in performing many applications. However, computers may not have all the resources along with them. For example in an office, we may have more than one computer in every section of the office, but each section has only single printer to print documents. Some computers will not have regional language support to type Hindi and Gujarati fonts. Some computers will not have compact disc writing mechanism. Further, we may need some information from remote computers. Whenever we need such specific support regarding hardware or software, we need to go to the computer which provides the facility. If this happens frequently, then why should not we connect the computers with different capabilities ? Once we connect computers, their facilities are linked and any facility can be accessed from any computer! This is the basic idea behind computer network. Figure 13.1 demonstrates the idea.

Figure 13.1 : Computer Network

By connecting computers into a network, one can use resources of all connected computers from any point of the network. You might have heard about telephone network, electricity network, and railway line network. You might have observed that electricity is produced at a few locations, but transmitted through network of wires to entire state.

Basic Network Types

Different computer networks are categorized according to their scope or scale. Common examples of network types are mentioned below :

LAN - Local Area Network

A Local Area Network (LAN) connects computers and other devices over a relatively short distance. An office building, a school, a laboratory or a home usually contains a single LAN. In addition to operating in a limited space, LANs are also typically owned, controlled, and managed by a single person or organization. To connect computers and other devices LAN use wired media. However, it may use wireless connection. A LAN based on wireless technology is called a WLAN - Wireless Local Area Network.

WAN - Wide Area Network

As the term implies, a Wide Area Network (WAN) spans a large physical distance. The Internet is the largest WAN, spanning the Earth. WAN is a geographically-dispersed collection of LANs. A WAN differs from a LAN in several important ways. Most WANs (like the Internet) are not owned by any one organization but rather exist under collective or distributed ownership and management.

MAN - Metropolitan Area Network

Network spanning a physical area larger than a LAN but smaller than a WAN, such as a city is called Metropolitan Area Network (MAN). A MAN is typically owned and operated by a single entity such as a government body or large corporation (such as Municipal Corporation).

Some other network categories include :

- SAN - Storage Area Network, System Area Network, Server Area Network, or sometimes Small Area Network
- CAN - Campus Area Network, Controller Area Network, or sometimes Cluster Area Network
- PAN - Personal Area Network
- DAN - Desk Area Network

LAN and WAN were the original categories of area networks, while the others have gradually emerged over many years of technology evolution.

Internet

Internet is also a kind of network, which connects different computer networks. Internet is also called super-network or meta-network. This computer network is spread across different parts of the world. The internet combines two basic things, one is computers and another is connections. Together it is known as "**INTER**connections and **NET**work" that is **INTERNET**! Computers in the network can be connected with some wire or may be with a special type of connection facility called wireless connectivity. The popular connections use phone line cables, optical fibers and satellite links. See figure 13.2 that demonstrates a conceptual diagram of the Internet.

Computers (and other devices) connected in a network should behave in some particular manners and obey formal rules. Just like when guests come, we welcome them with 'Namaste' and offer them something! There is no fix formula or compulsion for such behavior, but we insist to follow such manners. Similarly, for smooth operations within the network, all the computers and other devices should behave in 'good manners'! These laws and rules are called protocols. Following the protocols guarantee smooth operations between the connected computers in the network. File Transfer Protocol (FTP), and Transmission Control Protocol (TCP) and Internet Protocol (IP) are the popular protocols to guide internetworking.

Once computers and other devices are connected within a network, we need to identify the computer for getting some resource. If we do not know computer's address within the network, how would we get help (in terms of resources) from it ? To identify every machine in a unique fashion there is a requirement of an address or an identification number.

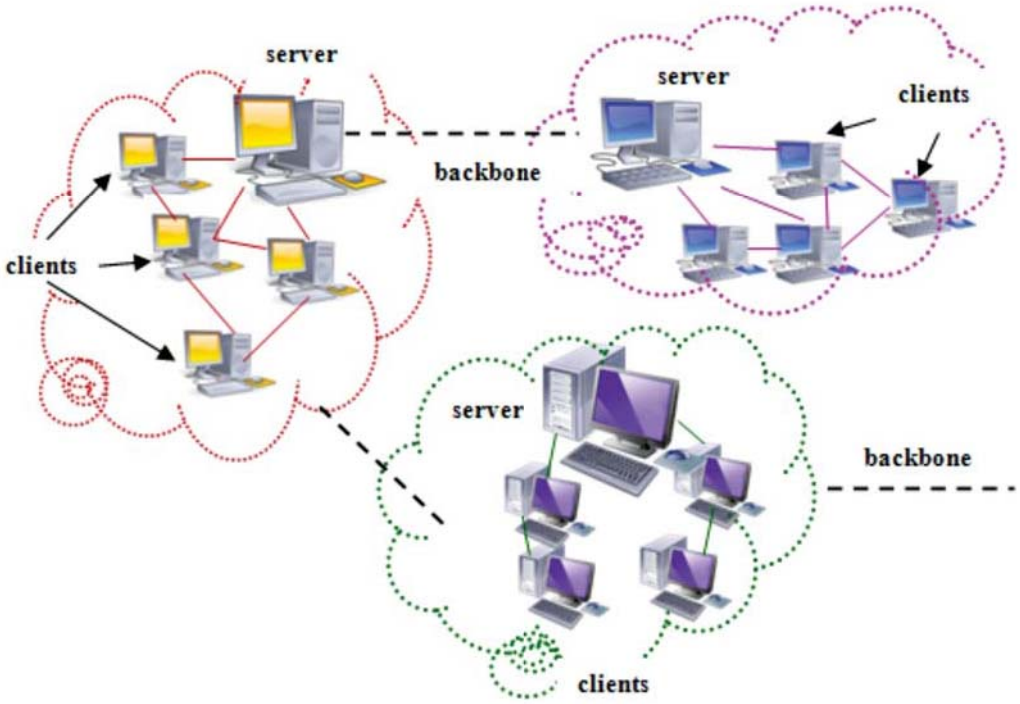

Figure 13.2 : Internet

Just as we have unique telephone numbers in a telephone network, we must have unique identification for every computer in a network. This number is called an IP address. Here IP stands for Internet Protocol, which defines guidelines of such addressing. A typical IP address can be as shown here:

An example IP address → 216.27.61.137

Computer communicates with the help of such IP addresses. This is just like students are given roll numbers in a school for attendance and examination purpose. If one computer knows an (IP) address of another one, they can talk with each other and share resources! (Just like if we know telephone number of one person we can talk) As computers use binary (machine) language to interact, the IP addresses are represented into binary language internally. Usually the IP address takes 32 or 128 bits (binary digits). There are two standards for IP addresses: IP Version 4 (IPv4) and IP Version 6 (IPv6). Majority of computers with IP addresses have an IPv4 address. Some computers have started the new extended version called IPv6 address system. IPv4 uses 32 binary bits to create a unique address on the network. An IPv4 address is expressed by four numbers separated by dots. Each number is the decimal representation for an eight-digit binary number. It is also known as dotted decimal notation. An example IP address and its decomposition are explained in the figure 13.3.

172.	16.	254.	1	Decimal
10101100	00010000	11111110	00000001	Binary
8 bits	8 bits	8 bits	8 bits	32 bits

Figure 13.3 : Decomposition of an IP Address

Components of Internet

Internet connects millions of academic, business and government networks. Hence, Internet is not a proprietary network. Within the Internet there are some large and high speed computers that are used to store information. These computers are called servers. Many computers are connected with these servers. The connected computers with server to seek support are known as clients. Servers are connected, on land as well as across the oceans, through high capacity cables. These cables are known as backbones or information super-highway. Fiber optic cables are very useful for this purpose. Internet also uses routers that help in forwarding the content within the network. A router is a device that forwards data within computer networks.

Wired media such as telephone cables can transfer only analog signals while computer sends digital symbols. Hence, before transferring the data, conversion of the digital data into equivalent analog signal must be done. Similarly, at the receiving end, conversion of the analog data into equivalent digital symbols must be done. This process is known as modulation and demodulation. A device that performs modulation is known as a modulator and a device that performs the inverse operation of modulation (demodulation) is known as a demodulator (sometimes detector or demod). A device that can do both operations is a modem (from "modulator–demodulator"). Now a days, most of the computers have in-built modem. Figure 13.4 shows these components.

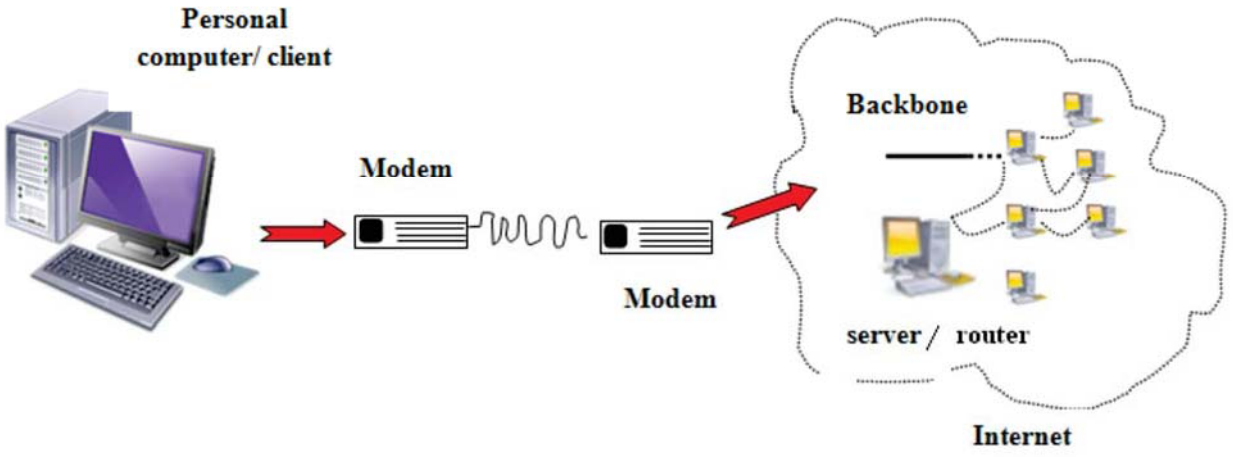

Figure 13.4 : Components of Internet

History of Internet

During late 1960s the Defense Advanced Research Projects Agency (DARPA) started a project to develop a communication protocol for computer network. This project (ARPANET) was funded by US military. The ARPANET was set of US military computers to communicate defense and security related information. This network used to send the data by splitting it into small packets through routers. E-mails were first used on this network. In the middle of 1980's US National Science Foundation (NSF) developed NSFNET which provided the basic platform for communication service used for modern networking. Gradually, different protocols were invented and many organizations came into existence that dealt with internetworking. Some examples of other networks are 'Because Its Time NETwork' (BITNET) and 'Computer Science Network' (CSNET). Facilities called gateways were developed to connect BITNET with other networks, which allowed exchange of electronic mail, particularly for e-mail discussion lists. The ARPANET was dismantled in 1990.

Internet Connectivity

The ways to connect Internet include traditional dial-up access, leased lines and wireless. These methods are described in detail in this section.

Dial-up Connection

The most basic type of Internet connection available from an Internet Service Provider (ISP) is called dial-up connection. An Internet service provider (ISP) is an organization that provides access to the Internet. In India, BSNL (Bharat Sanchar Nigam Limited) is the largest service provider. The dial-up connection is made through a modem that uses a telephone line to connect the Internet. The modem must dial the telephone number provided by the ISP every time it wants to connect to the Internet, hence it is identified as the dial-up connection. When you start accessing the dial up connection, the modem converts the digital information onto the analog signals. These analog signals use the telephone lines to pass the converted signals. At receiving end, these signals are converted into digital information. Figure 13.5 represents a typical model of an inbuilt modem.

Figure 13.5 : Modem

As dial-up connection uses ordinary telephone lines, the data rates are limited and the quality of the connection is not always good. Nowadays very few people use this type of connection. Further, it makes the telephone line busy till you use the internet. Since most of the computers have the facility of in-built modem (See figure 13.5), this solution is easy but not economical as it is slow and increases the telephone bill. Dial-up connections operate at speeds of 14.4Kbit, 28.8Kbit, or 56Kbit. Figure 13.6 demonstrates working of dial-up connection.

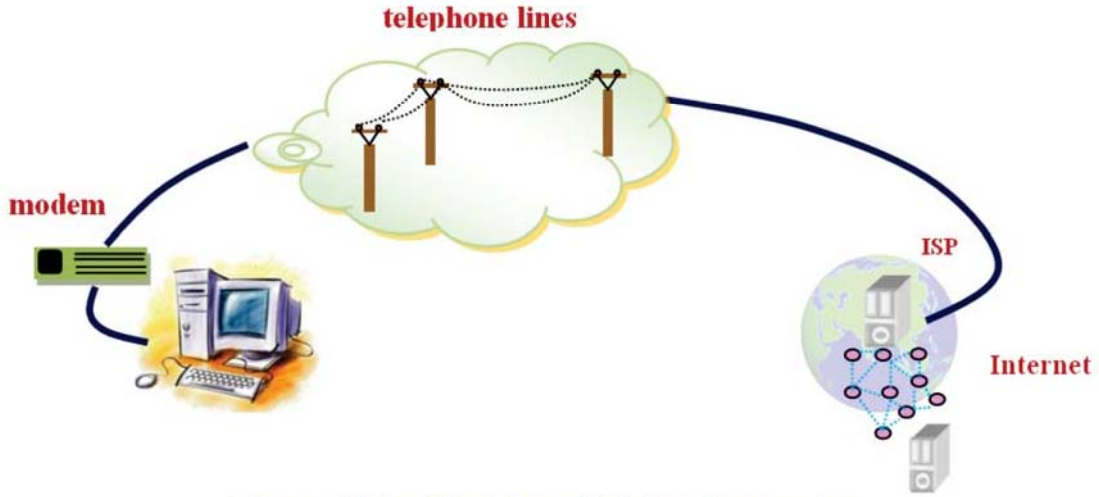

Figure 13.6 : Working of Dialup Connection

ISDN - Dial-up Connection

The second type of internet connection is through an ISDN (Integrated Services Digital Network). This connection is also called dial-up connection. However, this is a high-speed connection that requires special (digital) type of dedicated telephone line. As the digital information to analog and vice-versa conversion is not necessary, the connection speed is improved. Since this connection type uses dedicated lines, it is costly. Further, a special ISDN line as well as ISDN modem must be installed at the customer's location. The ISDN dial-up connection operates at speeds of 128Kbit and 256Kbit. This connection can only be provided by landline phone companies and therefore is being phased out.

Direct Internet Access (Leased line) Connection

Leased line is a "permanent connection" generally used by larger institutions, corporate and government agencies. It involves establishing your own Internet connection and paying to have a direct full time line with the network, which makes such connection faster as well as costly. It is personalized and dedicated line of connection which is always on.

Broadband Connection

Broadband is a type of Internet access in which a single medium or wire can carry several channels or communication paths at once. It is also a high-speed Internet connection. Both these features make surfing the Web very efficient. Such connection can transmit both television signals and Internet data at the same time. Broadband telephone connections like Digital Subscriber Line (DSL) are able to transmit multi-media information (such as voice and data) over the same line at the same time. Further, the broadband connections are always on. You need not have to dial-up specifically. Generally a broadband connection accesses the Internet either by a cable modem

provided through their local cable company or a DSL modem and DSL telephone line provided by their local telephone service provider.

There are two popular types of cables; coaxial and fiber optic. The first one is commonly used by cable TV and that is common for data communications. Fiber optic cables are strands of a special optical material as thin as a human hair that carries multi-media information over long distances. In fiber optic cables data are carried as light signals. Figure 13.7 shows a cross section of the cable.

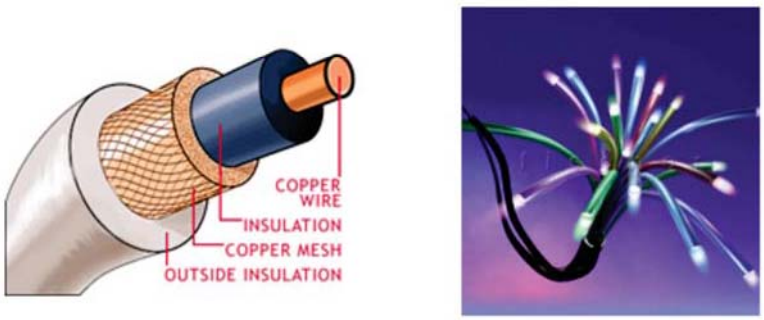

Figure 13.7 : Co-axial Cable and Optical Fiber

Wireless Internet Connection

Wireless broadband or Wireless Internet Connections operates on radio frequency instead of cable networks. Wireless Internet can be accessed from anywhere as long as you are within a network coverage area. It also provides an always-on connection type. It is typically more expensive and mainly available in metropolitan areas or big institutes.

Figure 13.8 : Data Card

For mobile Internet connection to personal computers or laptops, 3G USB data cards are used. 3G USB Data cards are meant for accessing Internet at anytime and from anywhere. It provides simple and instant internet access at mega fast speeds up to 7 Mbps. 3G data cards make us free from messy wires and fixed line requirement. Among different types of the 3G data card (also referred as Dongle or connect cards), an USB data and is very popular. Companies such as BSNL, MTNL, Airtel, Vodaphone, Tata etc. offers this facility. Figure 13.8 illustrates a typical data card.

Such data cards are easy to set up and automatically detected by a personal computer or a laptop in which it is connected. Due to the support like roaming, easy set up, flexibility and attractive tariff plans, the data cards have become very popular.

Satellite Connection

Internet over Satellite (IoS) allows a user to access the Internet via a geostationary satellite that moves around the earth. Because of the large distances between home and satellite, signals must travel from the earth up to the satellite and back again, IoS is slightly slower than high-speed terrestrial connections over copper or fiber optic cables. Typical Internet over Satellite connection speeds (standard IP services) average around 492 to 512 Kbps.

Applications of Internet

Internet has changed the way people do their business and also the way in which they use computers and communicate. Internet allows high degree of flexibility in working hours and location. The Internet can be accessed from any location across the world using basic computer facilities. It can reach many people simultaneously and act as a basic platform for business operations and communications. People can operate their business, get some information, communicate with one or more persons and entertain themselves. The popular applications of Internet are e-mail (communication of digital multi-media messages), information sharing on the World Wide Web (WWW or Web), and searching for information. Following sections provide brief introduction to some of these applications.

Domain Name System

A domain name is an identification string that defines a territory of administrative autonomy, authority, or control on the Internet. Domain names are formed by the rules and procedures of the Domain Name System (DNS). Domain names are based on either type of organization or geographical area. The popular domains are listed in table 13.1.

Domain	Description
com	Commercial organizations, however can be used for any website
gov	Government organizations
org	Non commercial organizations
edu	Educational organizations
info	For information
mil	Military organizations
net	Large networks
coop	Co-operatives organizations
int	International organizations
aero	Air transport organizations
Domain based on geographical region	
in	India
au	Australia
us	United status
jp	Japan
pk	Pakistan
ca	Canada
hk	Hongkong
np	Nepal
cn	China
uk	United kingdom

Table 13.1 : Popular Domain Names

World Wide Web

World Wide Web is an advanced information retrieval system on Internet platform. It is also known as WWW, W3 or Web in short. The Web was invented in 1991 by Tim Berners-Lee, while consulting at CERN (European Organization for Nuclear Research) in Switzerland. The Web contains multimedia as well as streaming (radio/television using internet) information on variety of topics. Web is therefore called a virtual store of information. A web page is a document on the Web. Web consists of such plenty of pages. A page on the Web can be read using a computer program called web browser. A web browser is a software application for retrieving, presenting, and traversing information resources on the Web. Mozilla Firefox, Internet explorer, Google chrome, Netscape navigator are some of the most popular browsers. There is a Uniform Resource Locator (URL) that references a web resource (page) uniquely. You can go directly to a web page if you know its URL. URL is occasionally referred as URI – Uniform Resource Identifier.

The web pages are stored on a special computer called, web servers. Any organization can set up a web server and have collection of related web pages. The collection of web pages is known as website. The starting point (generally the first page) is called a home page of the web site.

There are some websites that offer services to perform business transactions, money transactions, news services, etc. Such websites are known as portals. Portals are entry points to some resources or services. Generally portals are specific to a particular industry or institution. However, the portals can also be general like yahoo.

To jump from one page to another page, Web links called hyperlinks are given behind the text. That is, information on the web page is connected by hyperlinks. A reader sees on the screen a document with sensitive parts of text representing the links. These links are followed by clicking (or selecting) on them. The text behind which the link is hidden is called an anchor text. The Hyper Text Mark-up Language (HTML) is a language to create or edit the web pages and to manage links within the documents.

There are some predefined methods for computers to follow links and transfer documents. These methods are known as Hyper Text Transfer Protocol (HTTP) and File Transfer Protocol (FTP). Management of the Web becomes easy using these protocols. Figure 13.9 represents a conceptual view of the Web.

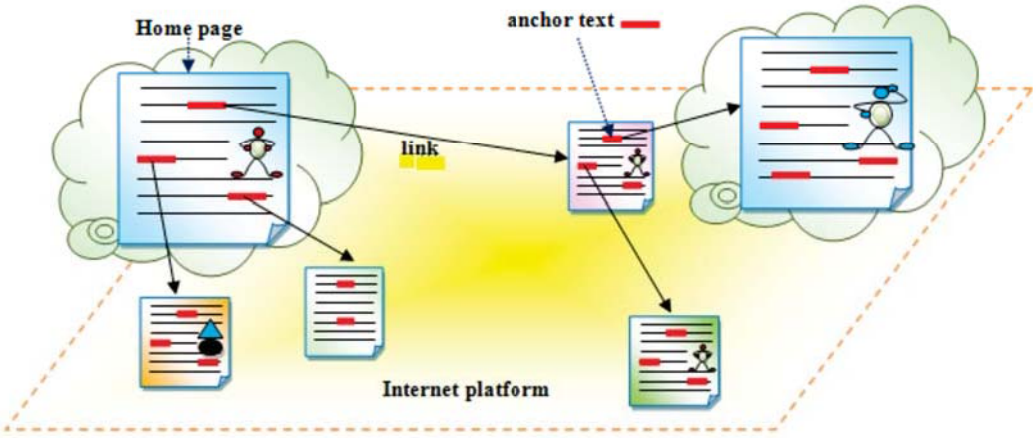

Figure 13.9 : World Wide Web

Web Browser

To see content of the Web on the computer screen, we require an application that retrieves and presents the content on demand. As discussed earlier, we identify this application as a Web browser or simply a browser. Browsers generally work with Web; however, with private network one can use such applications. The first web browser was invented in 1990 by Sir Tim Berners-Lee. It was called 'WorldWideWeb' (without any spaces) and was later renamed Nexus.

The main objective of a browser is to retrieve and to present content of the Web to user. Browser identifies resources from URI (uniform resource identifier). The most commonly used kind of URI starts with *http:* and identifies a resource to be retrieved over the Hypertext Transfer Protocol (HTTP). Many times you may see *https:*. URL's beginning with HTTPS indicates that the connection between client and browser is encrypted for security purpose.

Some Preliminary Characteristics of Browsers

- A browser must be able to deal with multimedia information, as the Web content may include text, numbers, characters, symbols, audio, video and animation.
- A browser must be user friendly by providing good options on the screen. These options include space to provide URI/URL, file operations like save file, navigation operation such as back and forward, other buttons such as refresh, book mark, help etc. Later we will explore such operations.

About FireFox

Figure 13.10 : Getting Firefox Browser

Firefox is an open source browser available for free from the Mozilla Foundation, http://www.mozilla.org/. The code of the FireFox is freely available to view and modify. While sharing such software, the major expectations are to wide spread the application as well as to invite comments/ modifications on the applications. Figure 13.10 shows the main (home) page of the Mozilla community where Firefox browser is available for free download.

As shown in the figure 13.10, you may download the appropriate Firefox Browser by clicking the link given on the page. This website also provides tutorials on the web browsing using Firefox, emailing using a tool called Thunderbird and Mozilla mail, and other Mozilla products.

Once you install the browser, you can use it. Your browser may be available under Application menu or placed as a shortcut icon at the top margin of the desktop screen. You may be lead to the start page if you are using the browser first time. See figure 13.11.

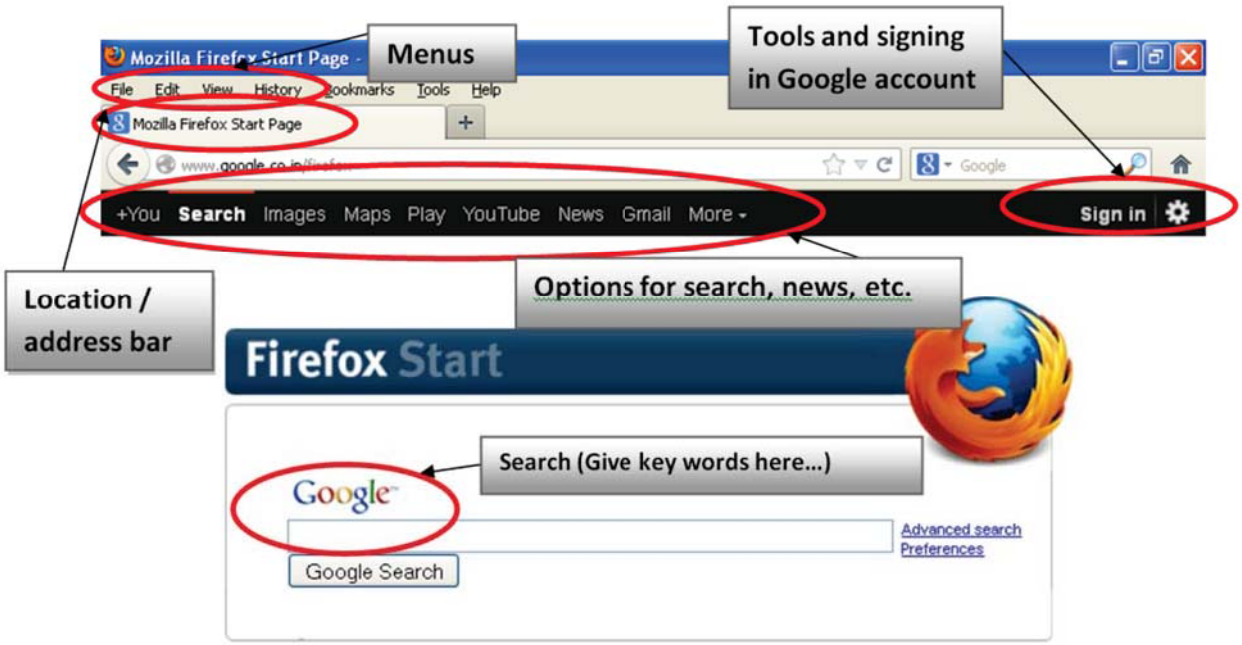

Figure 13.11 : Firefox Browser Start Page on Windows OS

Every time you open the browser, you need to enter the address such as 'Google.com' or 'www.google.com'. You may set this page as a default page by doing the following :

(1) Select *Tools*, *Option* and *General*.

(2) Give home page address, which will become your default page. When you start browser, this page will come.

From the screen shown in figure 13.11, within the Google search option you may write keywords to search. For example, if you want to find out about *Schools in Gujarat,* type these words in the Google search bar, and you will see results as shown in figure 13.12. It is possible that when

you try this the output may be different from what is exactly visible in figure 13.12. The screen in figure 13.11 was taken on Windows OS while the screen in figure 13.12 is taken on Ubuntu 10.04. Observe that the look and feel of the browser on both the operating systems is exactly same.

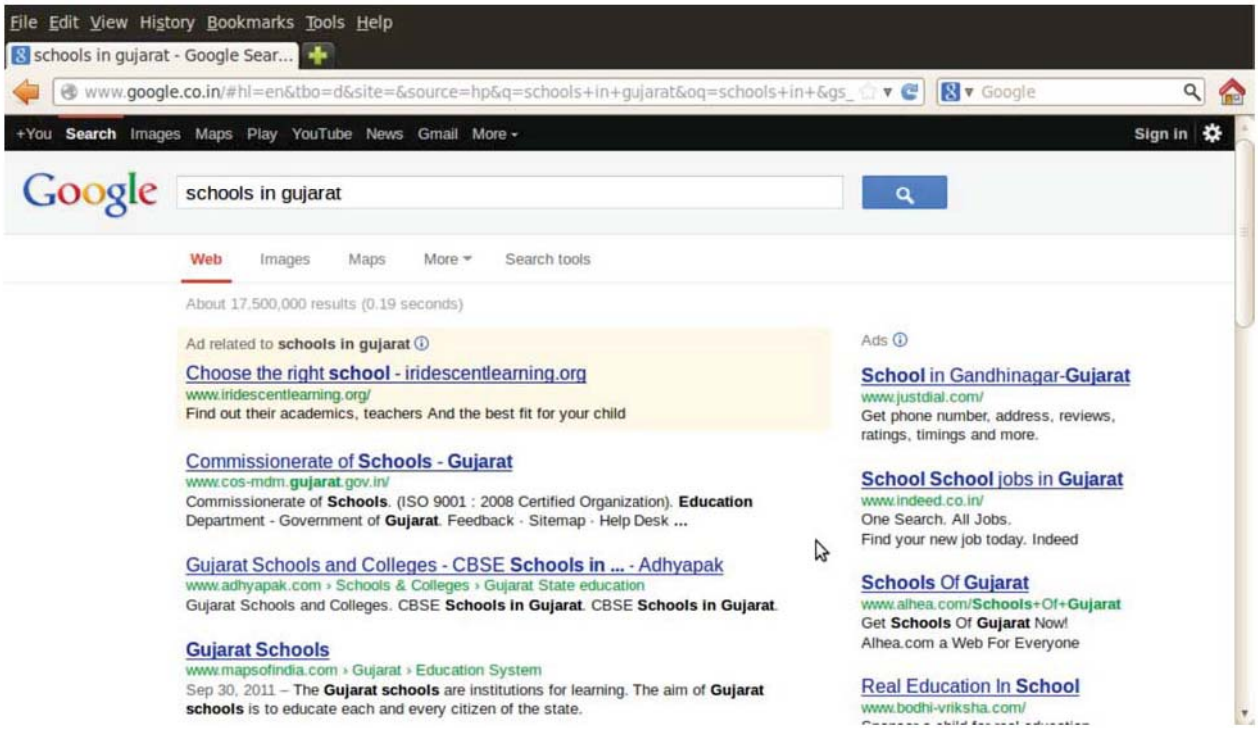

Figure 13.12 : Searching Using Firefox

About Search Engine

The web provides mechanism to store and link different web pages connected with hyperlinks. Only providing connections between the documents through the hyperlinks and mechanism to follow the links cannot make the Web really useful. The actual power of the Web comes from ability to search the content automatically by following the links. It is really difficult to search particular information from the ocean of the Web. Just like you have content list (or index list) in your book to search for a topic from the book, the Web also prepares index lists which allow searching based on key words provided. The computer program that does this job is called a search engine. Google [www.google.co.in], Yahoo [www.yahoo.com], Ask [www.ask.com], Scirus [www.scirus.com] and AltaVista [www.altavista.com] are some such popular search engines.

Many search engines accept keywords from users and extend the keywords to many more search engines at back end. This type of search engine is called a meta-search engine. Some examples of meta-search engines are as follows :

- iBoogie [www.iboogie.tv/]
- InfoGrid [www.infogrid.com]
- Dogpile [www.dogpile.com
- Ithaki [www.ithaki.net/indexu.htm]

About Google

Google is an America (Mountain View, California) based multi-national corporation founded by Larry Page and Sergey Brin from the Stanford University. The objective of the corporation is to provide services and products related to the Internet.

The name '***Google***' originated from the word "Googol". The word '*Googol'* is used for the mathematician's term for the number one followed by one hundred zeros. To significantly represent the large pool of information on the Internet/Web platform this word was decided to be used. Gradually the word is evolved as 'Google'.

Google can also be used to search in Hindi and other regional language such as Gujarati. See the screens shown in figure 13.13, figure 13.14, and figure 13.15.

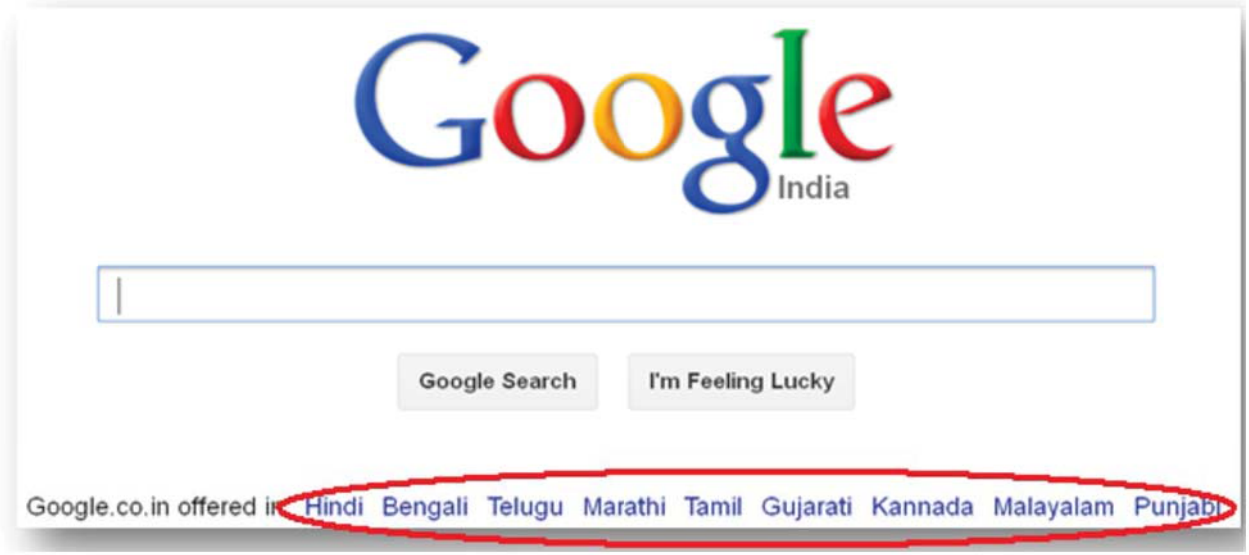

Figure 13.13 : Multilingual Support From Google

If you select Hindi, you can see screen as shown in figure 13.14.

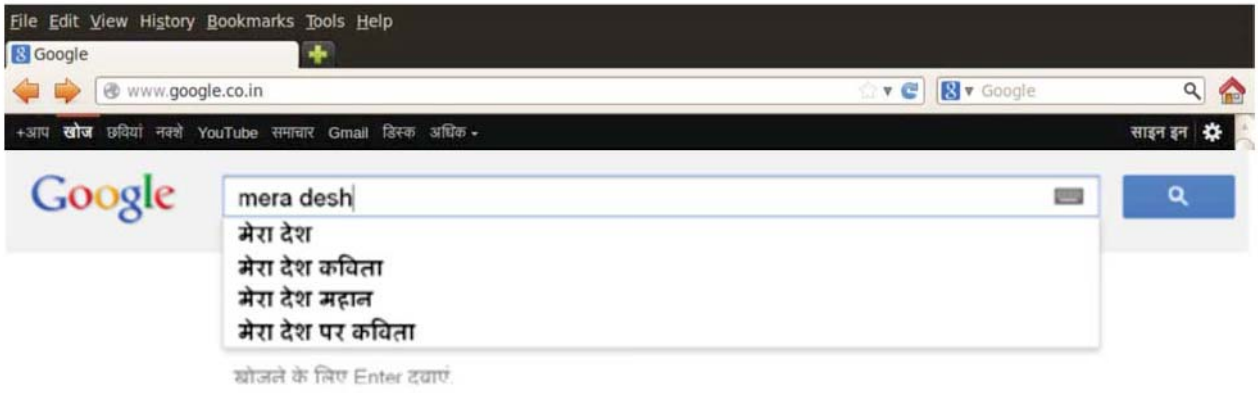

Figure 13.14 : Searching in Hindi

Google can also translate from one language to another language[http://translate.google.com/] Figure 13.15 shows features like virtual keyboard as well as phonetic typing are provided for ease of using.

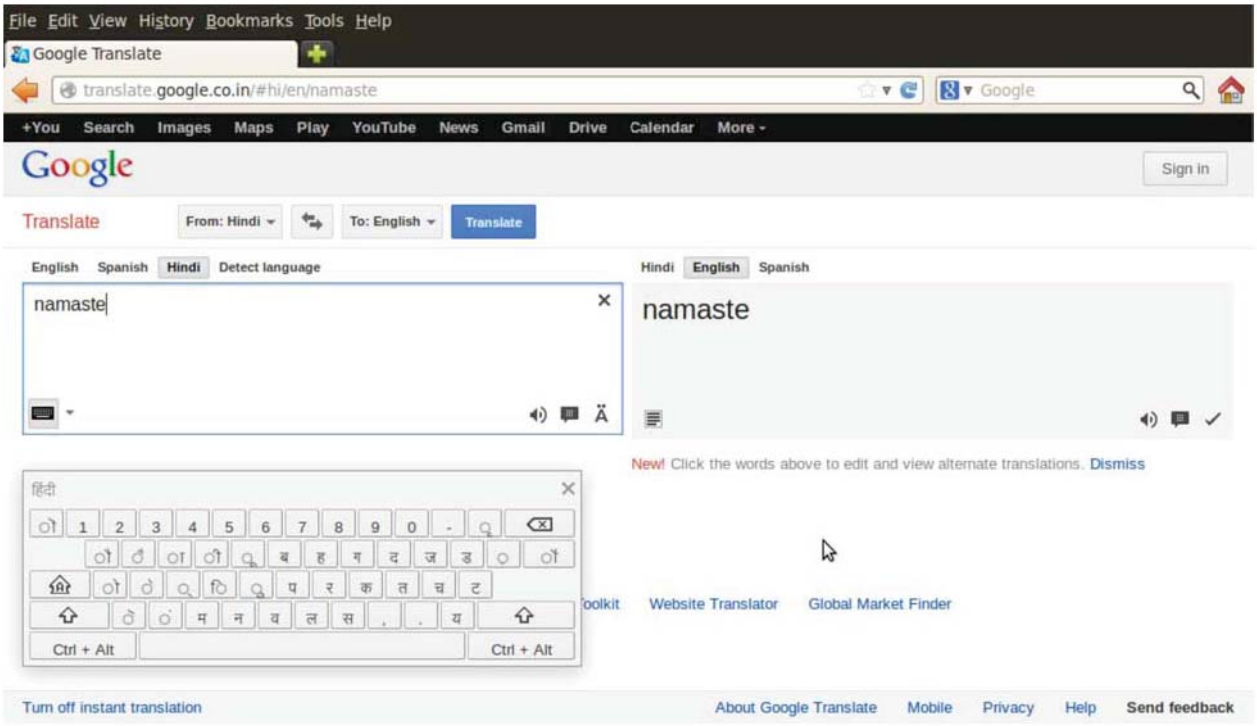

Figure 13.15 : Google Translation

Google also provides advance search facility to provide specific query and narrow or filter the search results. The following screen shows how to use advance search facility step by step.

The screen presented in figure 13.16 shows a basic (initial) screen for searching using Google. The screen illustrates the initial process of searching of *seven wonders of the world.*

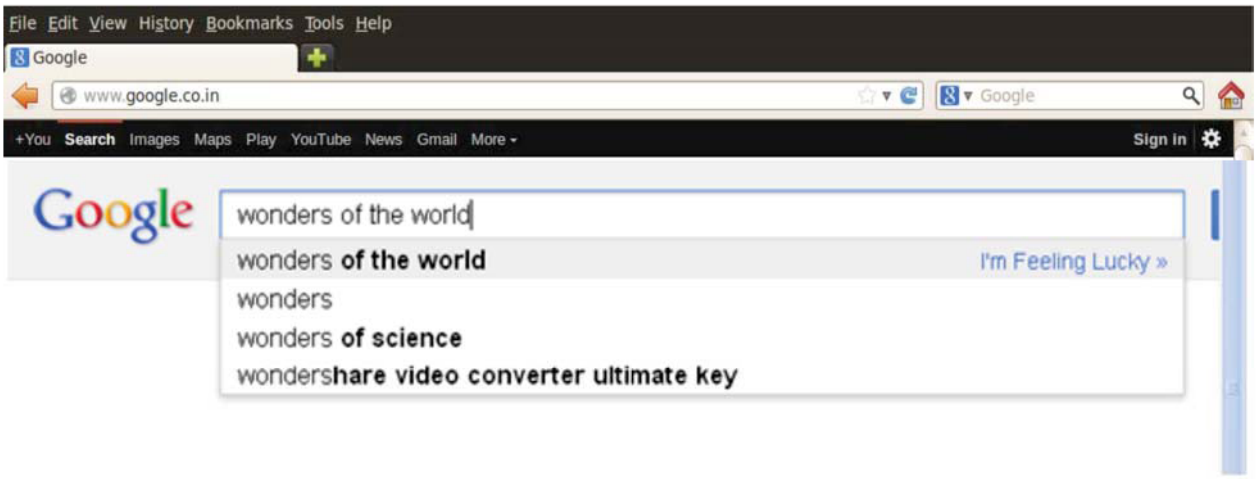

Figure 13.16 : Initial screen of advanced search

When you click on Google search button after providing query, you will see the result as shown in figure 13.17. You may see world wide information on the seven wonders.

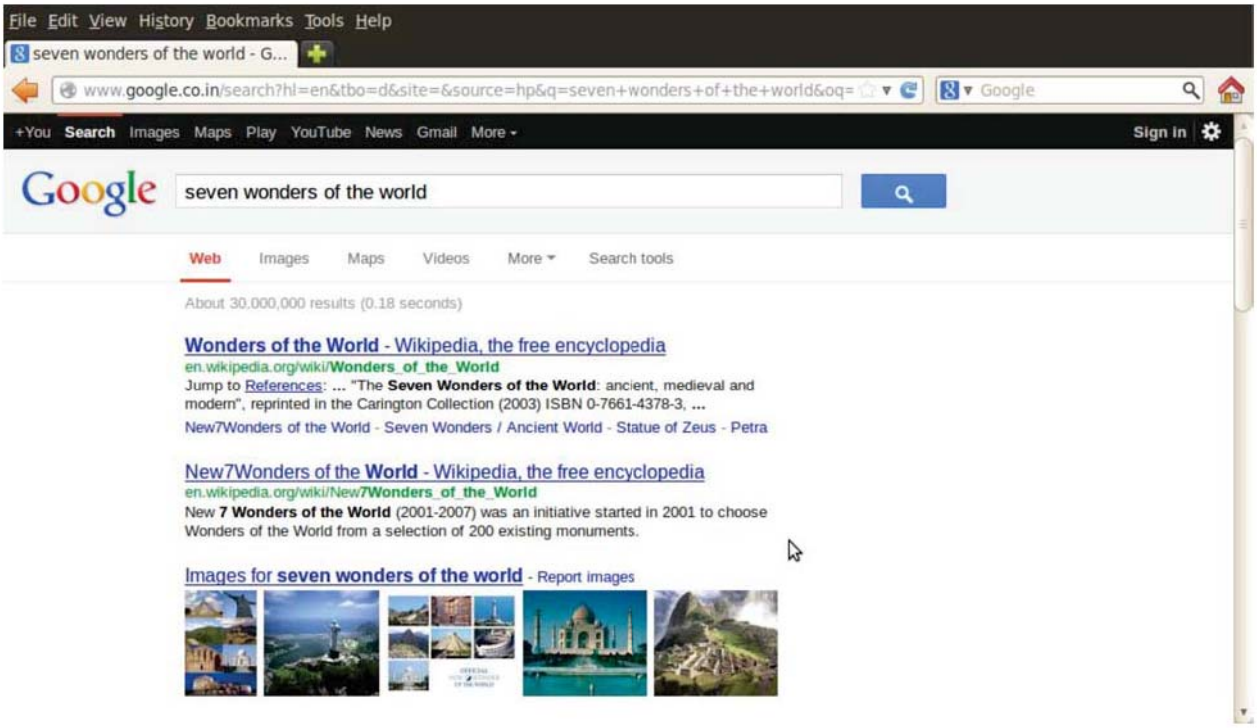

Figure 13.17 : Basic Search Results Prior to Advanced Search

If we would like to revise the search in such a way that it presents wonders of the world only from India. We may refine our search using advanced search facility. The link for advanced search is provided at the end of searched result page as shown in figure 13.18.

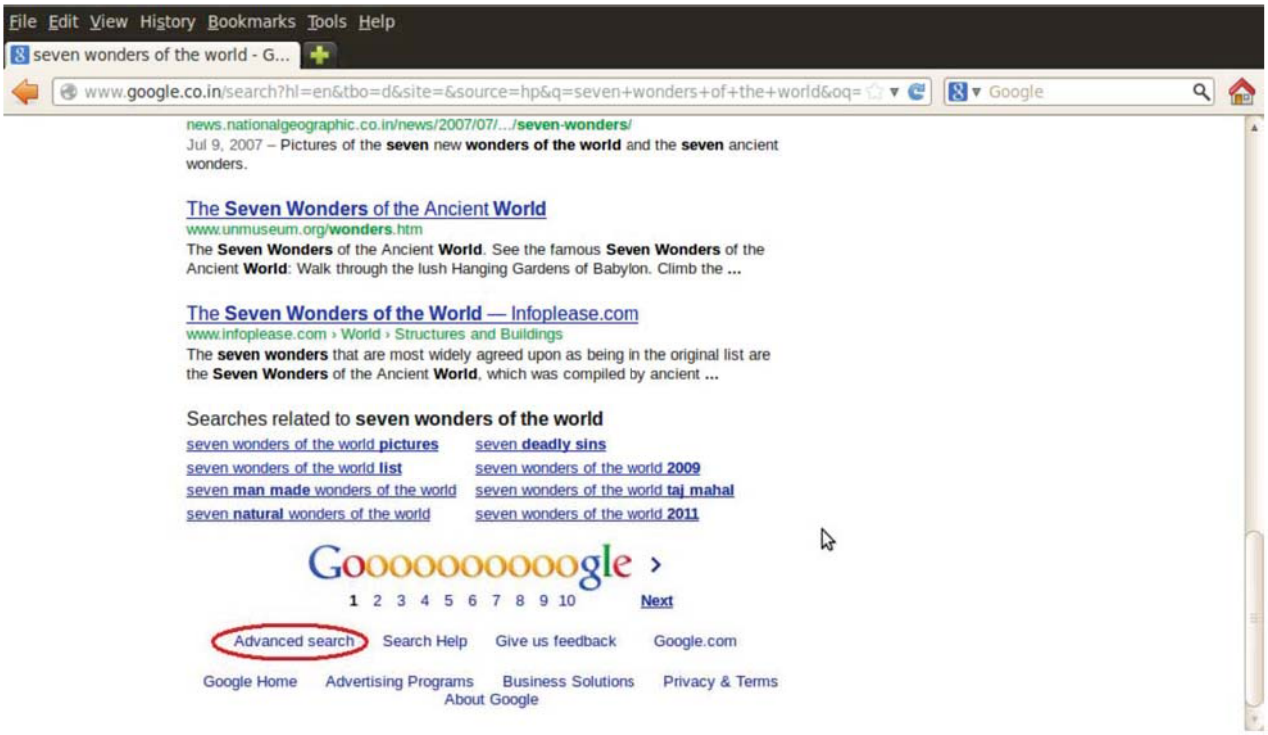

Figure 13.18 : Link to Advanced Search

When you click on the advanced search facility (see the arrow in the figure 13.18 above), you will further see screens presented in figure 13.19 and figure 13.20. The first figure 13.19 shows options about which words you want exactly. Here we have restricted our search to provide results that contain the exact word 'India' only.

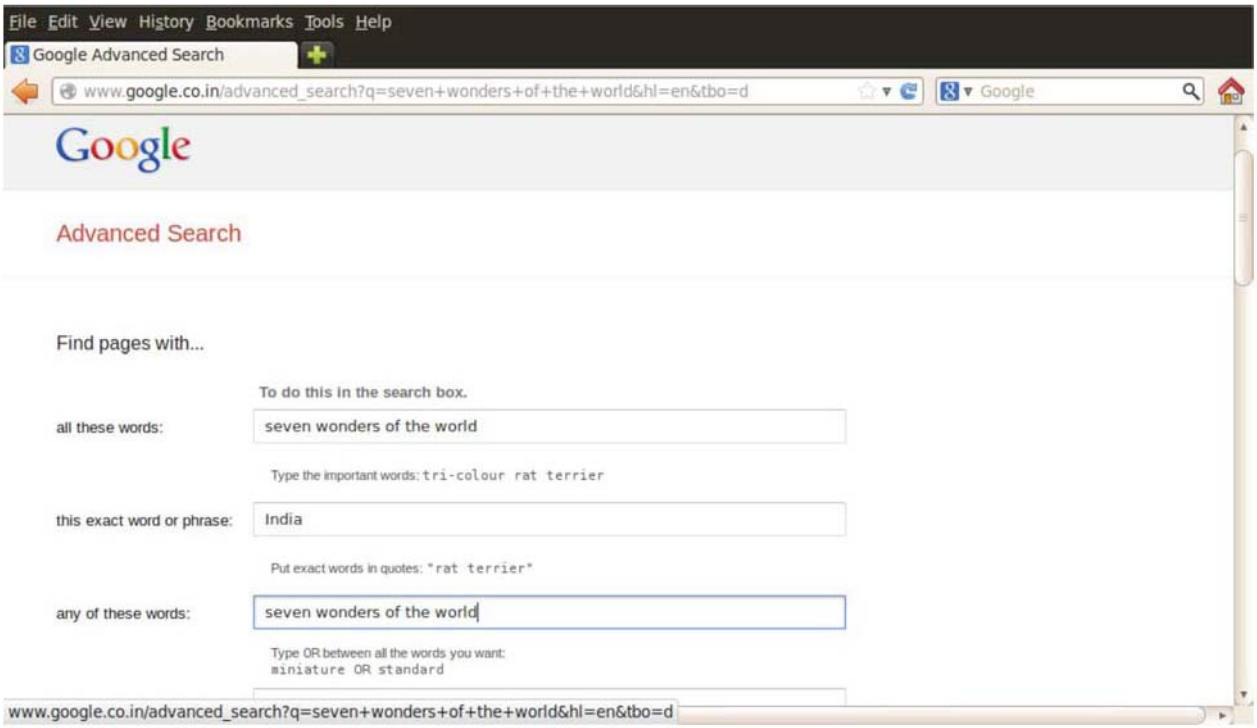

Figure 13.19 : Advanced Search Options

The second part of the advanced search is shown in figure 13.20. Here you can narrow the search results by providing options of language (such as Hindi, English etc.) region, data of update, free to use material etc.

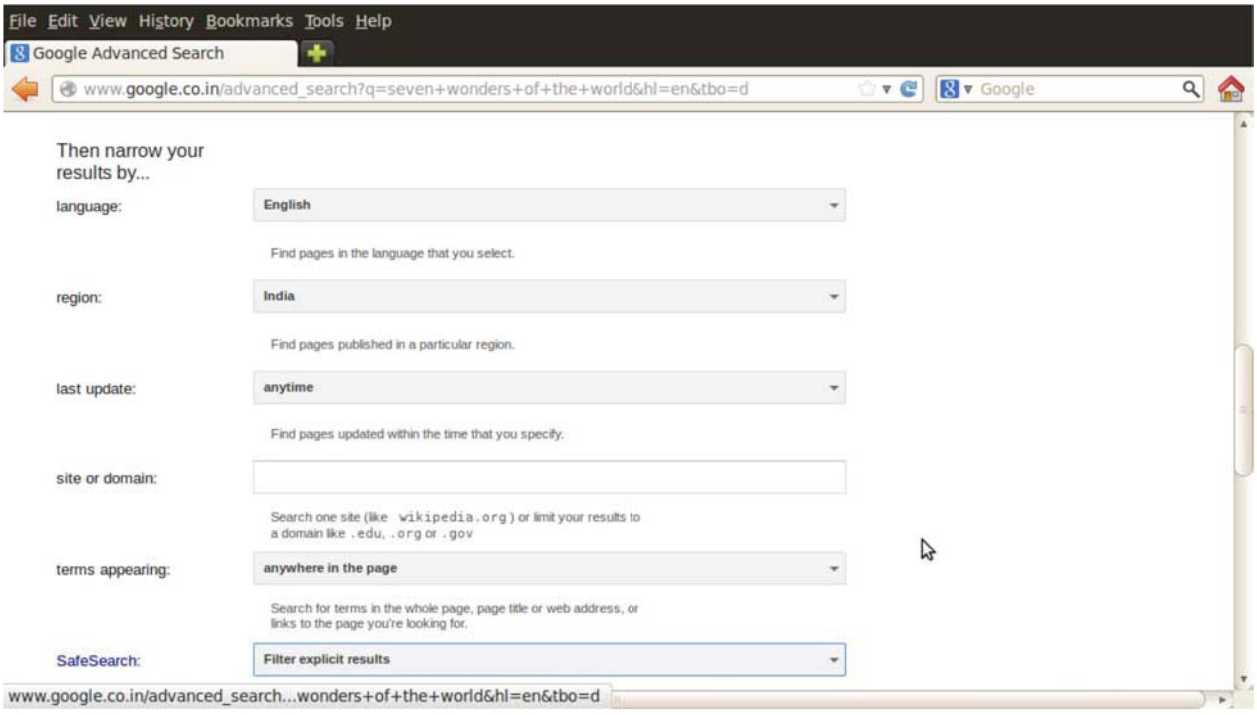

Figure 13.20 : More Advanced Search Options

After providing required choices, when the advanced search button is clicked, the Google provides following results. See screen illustrated in figure 13.21. You may notice the appearance of the world India in the presented result.

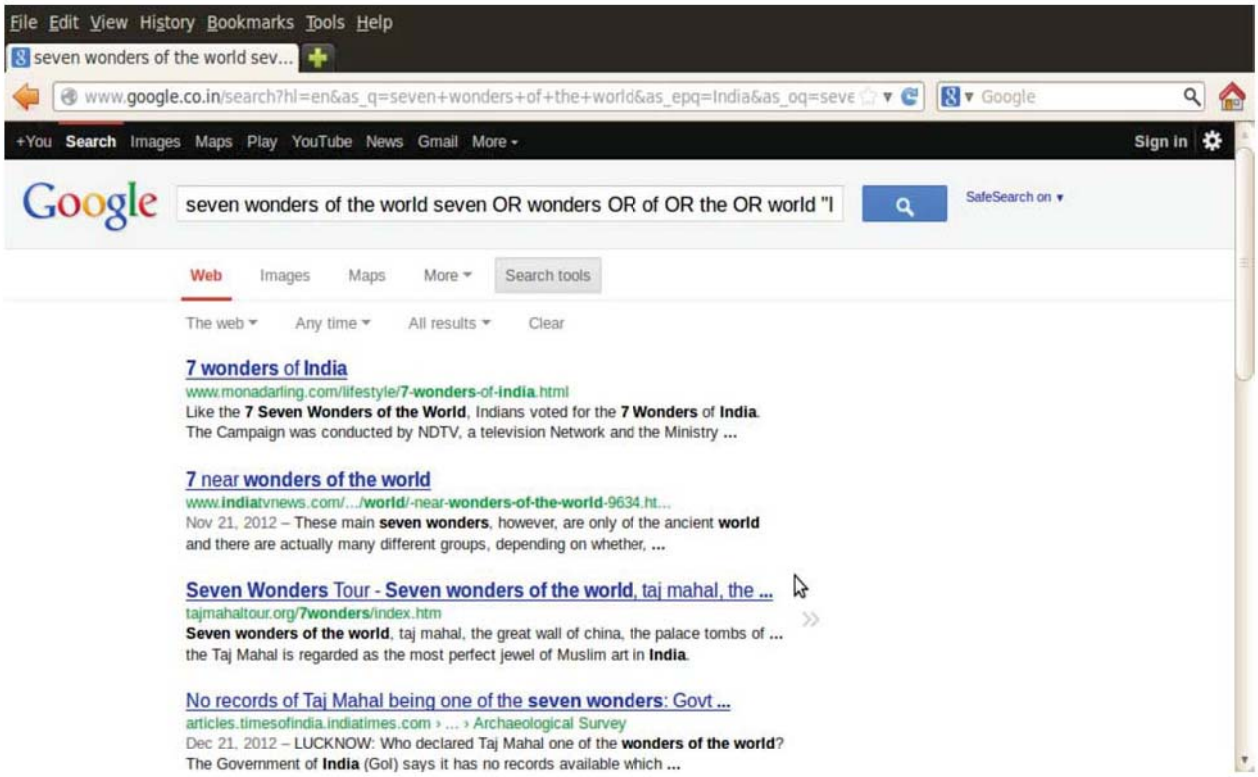

Figure 13.21 : Advanced Search Result

The major facilities offered by the Google are search, e-mail, cloud computing, and advertising. The company's mission statement from the outset is "to organize the world's information and make it universally accessible and useful".

Google also offers virtual locations to store and access documents. Google docs and Google drives are the example of such utilities. Google drive is a place where one can create, share, collaborate, search and keep all the documents. These documents are accessed from any location through any valid devices. Google docs refer to the facility that enable editing for Google documents, spreadsheets, presentations, drawings, and forms. These are online documents that live in the cloud and provide real-time collaboration features. Google drive is a step ahead and offer accessing all the files, including both Google docs and local files from a web browser or any device where Google drive is installed. One can store and use

all type of files free with initial space of 5GB storage. You need to have connection with Google cloud. For this, you may download appropriate Google cloud connect software from Google's official site. Google has also extended its services for the services mentioned herewith :

- Android mobile operating system;
- Picasa photo organization;
- Google 'Earth' the 3D view of the earth technology;
- Google chrome OS browser-only operating system for specialized notebooks called Chromebooks
- Google Driverless car that uses Google Street View with artificial intelligence technology.

Try to explore Web for more interesting information on Google's driverless car! Besides searching and sharing information on the Web, people would like to carry out many jobs using the Web platform. Some of the examples are sharing personal ideas and information; making groups and interact. For this purpose, variety of other applications have been designed; such as blogs, collaborative media (such as wikis) and social network platform. The following section introduces these concepts.

Blogs

The name blog is derived from 'Web Log'. From 'Web Log' it became 'We Blog' and from that gradually it became 'Blog'. A blog is a type of website written usually by a single person on any topic. The structure and purpose of a blog is just like a personal diary, where a person can share his idea about current affairs and their experiences along with multimedia supportive information. A blog is frequent, chronological publications of personal thoughts. Blog content is normally written in the way that content about the latest activity remains on the top. The older entries may be available on the same page or may be stored in separate folders called archives. To interact with its reader, a blog may accept comments from the readers. You may read blog on the Web and pass comments to the author of the blog. There are free blog services that help to set up blogs in friendly manner.

To keep track of your favourite blog (or website) you may use a technique called RSS, which is an abbreviated form of Really Simple Syndication. This technique provides news to the user when the interested blog or website is updated. Many people call this facility as news feed. This is just like subscribing a magazine, whenever new issue comes, automatically the subscriber will be given information about it.

Collaborative Platforms

Whenever we read something on the Web on some topic, we would like to add something from our side. There are collaborative platforms / websites available that facilitate users to read,

add, modify, or delete its content via a web browser using a simplified mark-up language or a rich-text editor. You might have used wikis. Wikis are such collaborative media. Since such website content is created in collaborative fashion, it is known as the simplest online database for everybody. So far you have just read the content from wikis (or Wikipedia), now you can try to edit it by providing related content. Since it is not created by an authentic publishing agency or an author, but by plenty of people, wikis are not considered as trustworthy resources.

Besides blogs and collaborative platform, Internet can also be used as platform for social networking. These applications are not only used for fun and social interactions, but also for applications such as e-learning, marketing and product promotion.

Other Services

Internet can be used as platform for variety of services that may facilitate our industry and social applications. Some services like Internet Protocol Telephony may be used for business applications as well as personal communications. IP Telephony or Voice over IP (VoIP) is the technology that enables voice (telephone) calls to be carried over IP network (over LAN or Internet) instead of public switched telephone network (PSTN). Other examples of such generic common services that are supported by the Internet platform include remote access of computers, file transfers, chatting, video conferencing, and sending messages to mobile.

You might be interested in some frequently used terminology in this area. Table 13.2 gives a quick review of the terminology (sorted alphabetically).

Term	Description
Bandwidth	The amount of data that can be transmitted across a network or Cable. The bandwidth is usually measured in bits per second (bps) for Internet access.
Broad band	Broadband is a high-speed Internet access that offers an always-on connection, which is called in contrast to a dial-up connection using analog modem.
Browser	A browser or web browser is a software application for retrieving, presenting, and traversing information resources on the World Wide Web.
Client	The connected computers with large computers (in terms of memory and processing power) called server to seek support are known as **clients**.

Data card	Data card is a card which contains data or which is used as plug and play instrument for data operations (transfer, transformation, input, and output). The popular use of data card is to get connectivity using 3G network.
Domain name	A domain name is an identification string that defines a realm of administrative autonomy, authority, or control on the Internet. Domain names are formed by the rules and procedures of the Domain Name System (DNS).
DSL	Digital subscriber line, which used to transmit digital data over wires of local telephone network.
E-mail	Electronic mail, commonly known as e-mail, is a method of exchanging digital messages from an author to one or more recipients using Internet.
FTP	File Transfer Protocol (FTP) is a standard network protocol used to transfer files from one point to another over Internet.
Home page	The starting point (generally the first page) of a website is called a **home page** of the web site.
HTML	The Hyper Text Mark-up Language (HTML) is a language to create and edit the web pages and to manage links within the documents.
HTTP	**Hyper Text Transfer Protocol** (HTTP) provides methods for computers to follow links on a web page.
IP address	An Internet Protocol address (IP address) is an identification number assigned to each computer participating in a computer network.
ISDN	Integrated Services Digital Network is a high speed Internet connection through special dedicated lines that transmit multi-media information simultaneously.
ISP	Internet Service Provider (ISP) is an organization that provides access to the Internet.
Modem	A device that can do modulation as well as demodulation is known as a modem ("modulator–demodulator").
Portal	Portals are some websites that offer services to perform business transactions, money transactions, news services, etc.

Protocol	Protocol defines formal rules and guidelines for smooth behaviors of commuters and other devices in a network.
Router	A router is a device that forwards data within computer networks.
Search engine	Search engine is a computer search program that allows searching information from the Web based on key words provided by users.
Server	Servers are large and high speed computers that are used to store information in a network.
URL/URI	A uniform resource locator (URL) is the key entity that references a resource (web page). It is also known as Uniform Resource Identifier (URI).
Web	World Wide Web is an advanced information retrieval system on Internet platform. It is also known as WWW, W3 or Web in short.
Web page	A web page is a document on the Web.
Website	Collection of web pages is known as website.

Table 13.2 : Quick Teview of Some Internet Terminology

Technology like Internet has great impact on human lives. There are many advantages of the Internet. Use of the Internet increases degree of accessibility of resources. The resources can be accessed anytime, anywhere and by anybody. Use of the Internet makes the system transparent and efficient. Many areas such as business, research, learning, and entertainment are benefited by the Internet applications. However, the increasing use the Internet changes the social behavior, habits and abilities of people and making them more and more dependable on the machine.

Summary

In this chapter we learnt that to share resources such as hardware and software, computers need to interact with one another. We learnt introductory concepts of computer network along with their types such as Local Area Network (LAN) and Wide Area Network (WAN). We also learnt about the Internet, which is considered as the great pool of information. We discussed some components of Internet like server, client, router, modem, protocols and IP addresses. Further we learnt how to get connectivity through different mechanism such as dial up connections, ISDN connections, Satellite connections as well as wireless connections. Finally we learnt about searching mechanism that facilitates search based on users' information such as keywords provided by them.

EXERCISE

1. What are the benefits of network ?
2. What is Internet ?
3. Define an IP address. What are the two different versions of an IP address ?
4. Define the terms :
   (a) Client (b) Server
   (c) Information superhighway (d) Modem
   (e) IP address (f) Web site
   (g) Hyperlink (h) Search engine
5. Define the World Wide Web (Web). Also explain how Internet and Web are different.
6. What is browser ? Give an example.
7. What is search engine ? Give two examples of a typical search engines.
8. Why wikis are known as collaborative platform ?
9. What is blog ?
10. Give an example of each :
    (a) Collaborative platform (b) Social networking site
11. Write a short note on search engine. Also list some popular search engines.
12. **Choose the most appropriate option from those given below :**

    (1) Which is the most suitable description of the Internet ?
    (a) Network of hardware (b) Network of networks
    (c) Network of servers (d) Network of software

    (2) Which item among the followings can be shared by a network ?
    (a) Information (b) Hardware
    (c) Software (d) All of these

    (3) The computers connected with each other should behave in some particular manners and rules. What these rules / manners are called ?
    (a) Programs (b) Protocols
    (c) Server (d) Routers

    (4) Which of the following protocol guarantees smooth operations between the connected computers in the network ?
    (a) FTP (b) TCP
    (c) IP (d) All of these

    (5) Which of the following is required to identify a machine uniquely in a network ?
    (a) A connection (b) An IP addresses
    (c) A Server (d) All of these

(6) What are IPv4 and IPv6 ?

(a) Protocol standards (b) Network address

(c) IP address (d) Servers

(7) Which of the following entities help in forwarding documents by suggesting right path to be followed within a computer network ?

(a) Router (b) Amplifiers

(c) Path finder (d) Any of these

(8) Which of the following devices can perform modulation ?

(a) Calculator (b) Demodulator

(c) Modulator (d) Decalculator

(9) Which of the following devices can perform de-modulation ?

(a) Calculator (b) Demodulator

(c) Modulator (d) Decalculator

(10) Which of the following devices can perform modulation as well as de-modulation ?

(a) Calculator (b) Demodulator

(c) Modem (d) Decalculator

(11) Which facility is used to read a web page ?

(a) Web browser (b) Web site

(c) Web page (d) Any of the above

(12) Which of the following is an example of a search engine ?

(a) Mozilla Firefox (b) Google

(c) Internet explorer (d) All of the above

(13) Which utility identifies a web page uniquely ?

(a) Unified Resource Licence (b) Uniform Resource Locator (URL)

(c) Unified Random Location (d) Any of these

(14) What is the collective name of a set of web pages ?

(a) Website (b) Web pages

(c) Home page (d) Server page

(15) Among the following which tool can be used to edit the web pages and manage links within the documents ?

(a) Highly Transferable and Manageable Links

(b) Hyper Text Mark-up Language

(c) Highly Temporary and Manageable Links

(d) Hyper Text Mark-up Link

(16) Which of the following is a type of website written usually by a single person on any topic like personal diary ?

(a) Website (b) Homepage

(c) Blog (d) Index page

(17) Which of the followings is name of the websites/platforms that allow users to contribute (to edit the content) ?

(a) Collaborative (b) Co-operative

(c) Contributed (d) Distributed

PRACTICAL EXERCISE

1. Use search engine of your choice and explore information about the tourist places in India. Collect information such as history of the place, how to reach, pictures and weather information about the places.
2. Refine your search using suitable advanced search options.
3. Prepare a presentation about the places worth seeing in India from the information collected as directed in the previous question.
4. Use a meta search engine of your choice to search information about a topic of your choice.
5. Search in Gujarati language about Shri Mahatma Gandhi.
6. Search and read a blog that discusses everyday science topics for students.
7. Go to a collaborative platform (such as Wikipedia) and verify different facilities it provides.