

THE INTERNET**1. Brief History**

Many years ago, the military of the United States of America desired to interconnect or link their computers in order to better understand and manage information and communication with respect to enemy attacks in times of crisis. In the year 1969 the Department of Defense (DoD) then developed an experimental network called the Advanced Research Project Agency Network (ARPANet)

In the year 1980, the National Science Foundation of the United States of America then developed the technology of ARPANet to produce the National Science Foundation Network (NSFNet) which now enabled universities and other school establishments in the USA to be interconnected. After a great deal of work, a network which enabled the transfer of large amounts of information at very high speed which is today called the Internet was developed.

The Internet can be defined as a worldwide/global system of interconnected computer networks. It is the network of networks in which users can view information on the World Wide Web, exchange electronic mail, participate in electronic discussion forums (newsgroups), send files from any computer to any other and even use each other's computers directly if they have appropriate passwords. Another name for the Internet is information superhighway.

2. ISP and Internet Access

An Internet service provider (ISP), also sometimes referred to as an Internet access provider (IAP), is a company that offers its customers access to the Internet. The ISP connects to its customers using a data transmission technology appropriate for delivering Internet Protocol Paradigm, such as dial-up, digital subscriber line (DSL), cable modem, wireless or dedicated high-speed interconnects.

ISPs may provide Internet e-mail accounts to users which allow them to communicate with one another by sending and receiving electronic messages through their ISP's servers. ISPs may provide services such as remotely storing data files on behalf of their customers, as well as other services unique to each particular ISP.

Different methods exist for connection to the Internet.

2.1. POTS/PSTN (Dial-up)

POTS (*Plain Old Telephone System*) and PSTN (*Public Switched Telephone Network*) refer to the standard telephone network designed for analog transmission of voice over copper wire. By using a dial-up modem, a computer can use the telephone line for transferring digital information. This type of connection is known as a dial-up connection. A dial-up modem connection offers relatively slow transfer rates and is established on demand. This method has long been the most widely used method to connect to the Internet but it has been replaced by high-speed broadband and wireless connections.

2.2. Digital Subscriber Line (DSL)

DSL uses the standard copper telephone wires, often already installed in homes and offices to provide a high-speed Internet connection. xDSL means that there are different types of DSL: asynchronous DSL (ADSL), synchronous DSL (SDSL), High bit-rate DSL (HDSL), Rate Adaptive DSL (RADSL) and ISDN DSL (IDSL).

- ✓ ADSL allows the telephone wires to be used for analog POTS system and digital data transfer simultaneously. The download speed (downstream) for ADSL is faster than the upload speed (upstream).
- ✓ SDSL cannot share the physical medium with standard telephone communications and has a download speed equal to the upload speed.

A DSL connection requires a transceiver (DSL modem) which allows an Ethernet UTP or a USB connection directly to a PC, or to a hub, router, or switch to provide Internet access to an entire network. The transceiver can be integrated into a router or switch.

2.3. Broadband Cable

TV channels only take up 6MHz of cable bandwidth each, which usually leaves several hundred MHz available. This additional space on cable is used for high-speed Internet connection. Information from the Internet travels through the cable as a single TV channel. Just as with DSL, cable Internet requires a special transceiver (cable modem) which allows information to be sent and received on frequencies not used by TV channels. The cable modem provides one or more LAN interfaces, usually Ethernet or USB which connect directly to a client or a device such as a hub, switch, or wireless router to allow additional clients or entire networks to use the same connection. The cable modem is also equipped with connections for TV and radio.

2.4. Wireless Internet Access

Wireless Internet access or wireless broadband is particularly useful for mobile users. With handheld devices becoming more advanced and increasingly popular, wireless access is becoming one of the major ways of connecting to the Internet. This method provides an “always-on connection” which can be accessed from anywhere as long as you are geographically within network coverage. Wireless Internet access includes deploying Wi-Fi hotspots for accessing the Internet. Technologies such as GPRS and UMTS (Universal Mobile Telecommunication System) allow Smartphones and other handhelds with Internet capabilities to access the Internet using existing cell phone networks.

2.5. Internet Over Satellite

Internet over satellite (IoS) allows a user to access the Internet via a satellite that orbits the earth. A satellite is placed at a static point above the earth's surface. The satellite then communicates with the ISP's dish giving the user access to the internet.

3. Internet Services

3.1. The World Wide Web

The World Wide Web(WWW) consists of a large number of web servers that host websites. A website consists of a number of web pages connected by hypertext links. A web page is a text file that contains information stored using a structured language called HTML (Hypertext Markup Language). This information can be text, images, video, animation and sound.

A website or web page can be accessed by typing its address or URL (Uniform/Universal Resource Locator) into the address bar of a web browser. An example of a URL is <http://www.crtv.cm> where http is the protocol used and www.crtv.cm, the domain name (address) of the site.

Example 1: <http://www.bgsmolyko.edu/Ls3,4/ict796/intenet.pdf>

- ✓ http is the protocol used (hypertext transfer protocol)
- ✓ www.bgsmolyko.edu is the domain name (the machine at BGS Molyko that hosts the website)
- ✓ Ls3,4/ict796/internet.pdf is the path of the document (resource) on the host computer. Ls3,4 is the folder, ict796 is the subfolder and internet.pdf is the file(resource).

Example 2: www.minsup.gov.cm

- ✓ gov is the top level domain which specifies that the URL is for a government institution.
- ✓ cm specifies the country in which the URL is hosted or the country the institution is found.

A domain name system (DNS) is a service which performs the function of turning human-understandable domain names into IP addresses.

a. Web Browser

A web browser (or simply browser) is a computer program that enables a user to read hypertext in files or on the World Wide Web. Popular browsers include Mozilla Firefox, Microsoft Internet Explorer, Opera Mini and Netscape.

b. Search Engine

A search engine is a computer program that searches for specific words on the World Wide Web and returns a list of documents in which they were found. Examples of search engines include Google and yahoo.

3.2. Electronic Mail

Electronic mail or e-mail (email) is a means of sending messages, text, and computer files between computers via the Internet. To send and receive e-mails, you need an Internet connection and an e-mail account which can be created within a webmail service such as Yahoo, Hotmail or Gmail. When you create an e-mail account, you are given a unique email address that gives you access to your mail box. An email address is made up of two parts separated by the symbol @ pronounced "at". For example

bgsmyko@yahoo.com.

In the above address,

- ✓ bgsmyko is the user ID, user name or login
- ✓ Yahoo.com is the domain name. The domain specifies the mail server (computer) on which the mail box is located.

The part of the domain name after the dot is called top-level domain, and specifies the type of organization or the country the host server is located. Some common top-level domains are:

- .com - for commercial enterprises
- .edu - for educational institutions and universities
- .gov - for United States government agencies
- .net - for organizations such as Internet Service Providers
- .org - for non-commercial organizations

3.3. Interpersonal Computing

Interpersonal computing refers to person-to-person interactions facilitated by websites that enable collaborative content creation, sharing and manipulation. Interpersonal computing involves: blogs, social networks, wikis and viral video sites.

a. Blogs

A blog (web log) is a chronological, journal-style website which its author (or "blogger") maintains like an online diary, with regular entries of commentary, descriptions of events, or other material such as graphics or video. Many blogs provide commentary or news on a particular subject; others function as more personal online diaries. They also provide the readers with the ability to leave comments in an interactive format.

b. Social Networks

Social networking sites are websites that enable people to build communities fostered around friendship, interests, teams and activities, and facilitated by online tools for sending individual messages, file sharing (particularly photo sharing), discussion forums, and online chat. The most important social networking sites is facebook and twitter.

c. Wikis

Wikis are websites that allow visitors to easily add, remove and edit content, hence enabling the collaborative authorship of comprehensive documents. The best example of a wiki is the multi-lingual, web-based encyclopaedia Wikipedia, and which currently includes over two million articles.

d. Viral Sites

A viral video is a video that is distributed by sharing. Viral videos are websites that allow anybody to post videos online. Whilst it is now not difficult to put a video on any website, the significance of viral video sites is that they provide somewhere to put videos where it is likely that at least some other people will actually find them. Examples are YouTube and Kaltura.

3.4. Instant Messaging

Instant messaging is a live (or real time) communication which occurs when brief text messages are exchanged instantly over the Internet. Instant Messaging requires that both users be on-line at the same time. Common IM applications are AOL Instant Messenger, Yahoo Messenger and Microsoft MSN messaging.

3.5. Internet Telephony

Internet telephony or voice over IP (VoIP) is the transmission of voice telephone conversations through the Internet or IP networks. It allows users to have voice-talk with others. The telephone calls are digitized and transmitted through the Internet. Internet telephone services can be mainly categorized into net-to-net and net-to-phone telephony.

In net-to-net telephony, both caller and receiver must be online. When both are online, one dials the other person's phone number. If they accept the call, then voice communication is established.

In net-to-phone, only one person has to be online. This person dials the other person's phone number and the latter receives a ring on their phone. Yahoo messenger and Skype provide services for both types.

3.6. Electronic (e-) Services

a. E-commerce

E-commerce refers to the buying and selling on the Internet. Different models of e-commerce exist: business-to-business (B2B), business-to-consumer (B2C), business-to-government (B2G) and m-commerce

- ✓ B2C: model sells goods or services to the consumer, generally using online catalog and shopping cart transaction systems. For example, an online pharmacy giving free medical consultation and selling medicines to patients is following B2C model. Amazon is an example of one of the first and still one of the most successful B2C e-commerce companies.
- ✓ B2B: describes commerce transactions between businesses, such as between a manufacturer and a wholesaler, or between a wholesaler and a retailer. In this form, the buyers and sellers are both business entities and do not involve an individual consumer.
- ✓ B2G: is a derivative of B2B marketing. B2G sites provide a platform for businesses to bid on government opportunities which are presented as solicitations requests for proposal (RFPs) to tender.
- ✓ m-commerce: refers to the use of mobile devices for conducting the transactions. The mobile device holders can contact each other and can conduct the business. Even the web design and development companies optimize the websites to be viewed correctly on mobile devices.

Some e-commerce websites are: www.brunair.com for airline ticket bookings, www.amazon.com for sales of books and magazines, www.brubedia.com/shop for sales of computers, shirts, and cameras

Some advantages of setting up an e-commerce website are:

- ✓ Products can be sold to local customers and those from abroad.
- ✓ It is accessible 24 hours each day.
- ✓ It needs a small number of staff to run.
- ✓ It does not need huge office space.
- ✓ Products can be sold at cheap prices

Some disadvantages of e-commerce are:

- ✓ Credit card fraud - hackers are able to steal credit card numbers on computers.
- ✓ Certain websites spy or track the buying habits of their customers.
- ✓ Some goods do not arrive after they are paid.
- ✓ It lacks human interaction as one only sees pictures and some text descriptions.

b. E-banking

E-banking (Internet banking) is simply the use of the Internet to perform banking operations like opening an account, accessing account information, transferring funds, getting a bank statement etc. In an Internet banking system, the bank has a centralized database that is web-enabled. All the services that the bank has permitted on the Internet are displayed in a menu. Any service can be selected and further interaction is dictated by the nature of service.

c. E-learning

a. Teleconferencing

4. Intranet and Extranet

An intranet is a computer network that uses the same technology and protocols as the Internet but is restricted to a company or organization. It provides similar services within an organization to those provided by the Internet without necessarily being connected to the Internet. An intranet can be seen as a private version of the Internet. To access an intranet, some form of user authentication is usually required. External access to an intranet is not always provided.

An extranet is an interconnection of two or more intranets. It allows an organization to share information with other organizations using Internet standards but with security features preventing access to others.