**CHAPTER TWO**

**ENABLING TECHNOLOGIES AND INFRASTRUCTURE**

**2.1 The Internet and the World Wide Web**

The **Internet** is a global system of interconnected [computer networks t](http://en.wikipedia.org/wiki/Computer_network)hat use the standard [Internet Protocol Suite (](http://en.wikipedia.org/wiki/Internet_Protocol_Suite)TCP/IP) to serve billions of users worldwide. It is a network of networks that consists of millions of private, public, academic, business, and government networks, of local to global scope, that are linked by a broad array of electronic, wireless and optical networking technologies. The Internet carries a vast range o[f information](http://en.wikipedia.org/wiki/Information) resources and services, such as the inter-linked [hypertext](http://en.wikipedia.org/wiki/Hypertext) documents of the [World Wide Web](http://en.wikipedia.org/wiki/World_Wide_Web) (WWW) and the infrastructure to support [electronic mail.](http://en.wikipedia.org/wiki/Electronic_mail)

The origins of the Internet reach back to research of the 1960s, commissioned by the United States government in collaboration with private commercial interests to build robust, fault-tolerant, and distributed computer networks.

Services Provided by the Internet

**Electronic Mail**

E-mail, also known as electronic mail, is one of the most popular Internet services. E- mail allows you to send messages to one person, or to send a message simultaneously to a group of people. One of the greatest advantages of e-mail over other forms of

communication is the convenience to the recipient. Messages wait in your mailbox until you open it. Another advantage of an Internet e-mail account is that you can check your e-mail as you travel; assuming you can access the Internet in the city you are

visiting through friends, family, professional organizations, or a public or college library.

**(i) Features of E-mail:**

One-to-one or one-to-many communications

Instant communications

Physical presence of recipient is not required

Most inexpensive mail service, 24-hours a day and seven days a week

Encourages informal communication

**(ii) Components of an E-mail Address**

As in the case of normal mail system, e-mail is also based upon the concept of a recipient address. The email address provides all of the information required to get a message to the recipient from anywhere in the world. Consider the e-mail ID

[john@hotmail.com](mailto:john@hotmail.com)

In the example above, "john" is the local part, which is the name of a mailbox on the destination computer, where finally the mail will be delivered. Hotmail is the mailserver where the mailbox "john" exists, **.**com is the type of organisation on net, which is hosting the mail server.

There are six main categories;

**com** Commercial institutions or organization

**edu** Educational institutions

**gov** Government site

**mil** Military site

**net** Gateways and administrative hosts

**org** Private organizations

**WWW**

**WWW** are initials that stand for **World Wide Web**. A "web" is a network of fibers or cables connecting different points. (Spiders make webs to catch flies.) The Web is one of the services available on the Internet. It lets you access millions of pages through a system of hyperlinks. Because it is "world-wide", it was originally called the World Wide Web or WWW. This is a special part of the internet that allows people to view information stored on participating computers. It is an easy-to-use, graphical source of

information which has opened the internet to millions of people interested in finding out information.

**FTP (File Transfer Protocol)**

This facility is a method of gaining limited access to another machine in the Internet, and obtaining files from it. You **need full Internet connectivity**, to do ftp interactively. FTP has many advantages, for example, it allows you to get new free software, or updated versions of old programs, as well as useful data for your research. The most common way of using FTP is via **anonymous FTP**. When you start an ftp connection, you will be asked for a user name and a password.

**Telnet: logging in to Remote Network Computers**

Telnet is the Internet facility that allows you to execute commands on a remote host (another computer, most likely one to which you do not have physical access) as if you were logged in locally. You need to know the name of the machine to which you want to connect, and to have a valid user name in it. There is no such thing as "anonymous" telnet.

The commands for telnet are:

o telnet hostname: it will open a connection to the host you name. For example, "telnet math.sunysb.edu" will connect you to the machine named math.sunysb.edu

o telnet "address": it opens a connection to the host at "address".

**Usenet Newsgroups**

Usenet newsgroups, also called bulletin boards, are a similar e-mail conferencing system, but are less intrusive to the subscriber than listserves since messages are posted to Usenet sites around the world instead of appearing in each subscriber's mailbox. Usenet refers to the huge collection of messages which are posted to tens of thousands of newsgroups worldwide. Millions of people around the world regularly read newsgroup messages, following their favorite topics of interest. New newsgroups are added and old ones deleted every day.

Usenet can provide a unique information resource not readily accessible from any other source. If you are looking for personal anecdotes about products, especially computer- related hardware and software products, how-to information, practical advice, or the latest news stories, newsgroup archives may be a valuable resource.

**Internet Chat**

Communication on the Internet goes even further than personal e-mail, newsgroups and mailing lists, to encompass real-time conversations (synchronous communication) among two or more people. Chat is available on the Internet through Internet Relay Chat or IRC. It consists of thousands of chat channels, each covering a different topic and with participants from all over the world.

**Web Conferencing**

Many institutions are discovering new ways to integrate Internet communications into their organizations. One of the most popular ways is through the use of web or online conferencing.

Web conferencing is currently being used by businesses for employee training, meetings and general communication. Educational institutions are using web conferencing as a way to enhance on-site classes or distance education classes. Web conferencing is a tool which provides a way for "students" to share information, ask questions, get answers, discuss problems and work collaboratively. Conferencing provides opportunities to solve issues by providing a dynamic exchange of text, graphics, HTML links to information, audio, and video in a structured conversation organized by topic.

Web conferences may take place in "real-time" where all participants are communicating at the same pre-arranged time.

**Requirements for connecting to the internet**

 **Internet service provider –** an internet service provider provides you with a connection to the internet and the software you will need to navigate.

 **telecommunication line** – a telephone line is required to connect you to the internet service provider.

 **Modem** – a modem converts a digital signal received from a computer into an analogue signal that can be sent along ordinary telephone lines, and back to digital at the other end.

 **Web browser –** a web browser is software used to view and download Web pages and various types of files such as text, graphics and video. Examples are Microsoft Internet Explorer or Netscape Navigator.

**2.2 Client –server technologies**

The **client–server model** of computing is [a distributed application s](http://en.wikipedia.org/wiki/Distributed_application)tructure that partitions tasks or workloads between the providers of a resource or service, called [servers,](http://en.wikipedia.org/wiki/Server_(computing)) and service requesters, called [clients.](http://en.wikipedia.org/wiki/Client_(computing))[[1](http://en.wikipedia.org/wiki/Client–server_model" \l "cite_note-0%23cite_note-0)] Often clients and servers communicate over a [computer network on](http://en.wikipedia.org/wiki/Computer_network) separate hardware, but both client and server may reside in the same system. A server machine is a host that is running one or more server programs which share their resources with clients. A client does not share any of its resources, but requests a server's content or service function. Clients therefore initiate communication sessions with servers which await incoming requests.

**Description**

The client–server characteristic describes the relationship of cooperating programs in an application. The server component provides a function or service to one or many

clients, which initiate requests for such services.

Functions such as email exchange, web access and database access, are built on the client–server model. Users accessing banking services from their computer use a web browser client to send a request to a web server at a bank. That program may in turn forward the request to its own database client program that sends a request to a database server at another bank computer to retrieve the account information. The balance is returned to the bank database client, which in turn serves it back to the web browser client displaying the results to the user. The client–server model has become one of the central ideas of [network computing.](http://en.wikipedia.org/wiki/Network_computing) Many business applications being written today use the client–server model.

**2.3 Intranet and extranets**

**What is an intranet?**

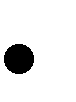
In essence, an intranet is a business' own private website. It is a confidential business network that uses the same underlying structure and network protocols as the internet and is protected from unauthorised users by a firewall.

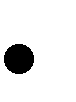
Intranets enhance existing communication between employees and provide a common knowledge base and storage area for everyone in your business. They also provide users with easy access to company data, systems and email from their desktops.

Because intranets are secure and easily accessible via the internet, they enable staff to do work from any location simply by using a web browser. This can help small businesses to be flexible and control office overheads by allowing employees to work from almost any location, including their home and customer sites.

Other types of intranet are available that merge the regular features of intranets with those often found in software such as Microsoft Office. These are known as online offices or web offices. Creating a web office will allow you to organise and manage information and share documents and calendars using a familiar web browser function, which is accessible from anywhere in the world.

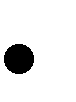
Types of content found on intranets:

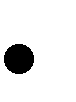
 **administrative** - calendars, emergency procedures, meeting room bookings, procedure manuals and membership of internal committees and groups

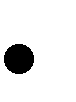
 **corporate** - business plans, client/customer lists, document templates, branding guidelines, mission statements, press coverage and staff newsletters

**financial** - annual reports and organisational performance

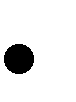
**IT** - virus alerts, tips on dealing with problems with hardware, software and networks, policies on corporate use of email and internet access and a list of online training courses and support

 **marketing** - competitive intelligence with links to competitor websites, corporate brochures, latest marketing initiatives, press releases, presentations

 **human resources** - appraisal procedures and schedules, employee policies, expenses forms and annual leave requests, staff discount schemes, new vacancies

 **individual projects** - current project details, team contact information, project

management information, project documents, time and expense reporting

 **external information resources** - route planning and mapping sites, industry organisations, research sites and search engines

**What is an extranet?**

An extranet is similar to an intranet but it is made accessible to selected external partners such as business partners, suppliers, key customers, etc, for exchanging data and applications and sharing information.

As with an intranet, an extranet can also provide remote access to corporate systems

for staff who spend lots of time out of the office, for instance those in sales or customer support, or home workers.

Extranet users should be a well-defined group and access must be protected by rigorous identification routines and security features.

**Why would you use an extranet?**

Businesses of all sizes are under increasing pressure to use online ordering, electronic order tracking and inventory management.

At the same time small businesses are keen to meet the demands of larger companies in terms of working flexibly, adopting new technologies and enabling the exchange of business information and transactions.

Extranets offer a cheap and efficient way for businesses to connect with their trading partners. It also means that your business partners and suppliers can access the information they need 24 hours a day.

The ability of the extranet to automate the trading tasks between you and your trading partners can lead to enhanced business relationships and help to integrate your business firmly within their supply chain.

**2.4 Connecting technologies for networks such as broadband**

Signals are usually transmitted over some transmission media that are broadly classified in to two categories.

**Guided Media:**

These are those that provide a conduit from one device to another that include twisted- pair, coaxial cable and fiber-optic cable. A signal traveling along any of these media is directed and is contained by the physical limits of the medium. Twisted-pair and coaxial cable use metallic that accept and transport signals in the form of electrical current.

Optical fiber is a glass or plastic cable that accepts and transports signals in the form of light.

**Unguided Media:**

This is the wireless media that transport electromagnetic waves without using a physical conductor. Signals are broadcast either through air. This is done through radio communication, satellite communication and cellular telephony.

**Broadband**

The term **broadband** refers to a telecommunications signal of greater [bandwidth,](http://en.wikipedia.org/wiki/Bandwidth_(signal_processing)) in some sense, than another standard or usual signal (and the broader the band, the greater the capacity for traffic).