

KASNEB

DIPLOMA IN INFORMATION COMMUNICATION TECHNOLOGY

Internet Skills

LEVEL 2

PAPER NO. 6

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CHAPTER1

INTRODUCTION TO THE INTERNET

What is the Internet?

- ❖ It is a large number of connected computers (or a large set of computer networks) linked together that communicate with each other, over telephone lines.
- ❖ It is a worldwide computer network connecting thousands of computer networks, through a mixture of private & public data using the telephone lines.
- ❖ It is a worldwide (global or an international) network of computers that provide a variety of resources and data to the people that use it.

Internet refers to a global inter-connection of computers and computer networks to facilitate global information transfer. It is an interconnection of computers throughout the world, using ordinary telecommunication lines and modems.

History of the Internet

The **history of the Internet** begins with the development of electronic computers in the 1950s. Initial concepts of packet networking originated in several computer science laboratories in the United States, United Kingdom, and France. The US Department of Defense awarded contracts as early as the 1960s for packet network systems, including the development of the ARPANET. The first message was sent over the ARPANET from computer science Professor Leonard Kleinrock's laboratory at University of California, Los Angeles (UCLA) to the second network node at Stanford Research Institute (SRI).

Packet switching networks such as ARPANET, NPL network, CYCLADES, Merit Network, Tymnet, and Telenet, were developed in the late 1960s and early 1970s using a variety of communications protocols. Donald Davies first designed a packet-switched network at the National Physics Laboratory in the UK, which became a testbed for UK research for almost two decades. The ARPANET project led to the development of protocols for internetworking, in which multiple separate networks could be joined into a network of networks.

Access to the ARPANET was expanded in 1981 when the National Science Foundation (NSF) funded the Computer Science Network (CSNET). In 1982, the Internet protocol suite (TCP/IP) was introduced as the standard networking protocol on the ARPANET. In the early 1980s the NSF funded the establishment for national supercomputing centers at several universities, and provided interconnectivity in 1986 with the NSFNET project, which also created network access to the supercomputer sites in the United States from research and education organizations. Commercial Internet service providers (ISPs) began to emerge in the very late 1980s. The ARPANET was decommissioned in 1990. Limited private connections to parts of the Internet by officially commercial entities emerged in several American cities by late 1989 and 1990, and the NSFNET was decommissioned in 1995, removing the last restrictions on the use of the Internet to carry commercial traffic.

In the 1980s, research at CERN in Switzerland by British computer scientist Tim Berners-Lee resulted in the World Wide Web, linking hypertext documents into an information system, accessible from any node on the network. Since the mid-1990s, the Internet has had a revolutionary impact on culture, commerce, and technology, including the rise of near-instant communication by electronic mail, instant messaging, voice over Internet Protocol (VoIP) telephone calls, two-way interactive video calls, and the World Wide Web with its discussion forums, blogs, social networking, and online shopping sites. The research and education community continues to develop and use advanced networks such as NSF's very high speed Backbone Network Service (vBNS), Internet2, and National LambdaRail. Increasing amounts of data are transmitted at higher and higher speeds over fiber optic networks operating at 1-Gbit/s, 10-Gbit/s, or more. The Internet's takeover of the global communication landscape was almost instant in historical terms: it only communicated 1% of the information flowing through two-way telecommunications networks in the year 1993, already 51% by 2000, and more than 97% of the telecommunicated information by 2007. Today the Internet continues to grow, driven by ever greater amounts of online information, commerce, entertainment, and social networking.

Features of the Internet.

- (i). The Internet is a collection of networks; it is not owned or controlled by any single organization, and it has no formal management organization. However, there is an **Internet Society** that co-ordinates and sets standards for its use.
In addition, Networks have no political boundaries on the exchange of information.
- (ii). Networks are connected by **Gateways** that effectively remove barriers so that one type of network can “talk” to a different type of network.
- (iii). To join the Internet, an existing network will only be required to pay a small registration fee and agree to certain standards based on TCP/IP.

CHAPTER 3

CLOUD COMPUTING

Introduction to Cloud computing

Cloud computing means that instead of all the computer hardware and software you're using sitting on your desktop, or somewhere inside your company's network, it's provided for you as a service by another company and accessed over the Internet, usually in a completely seamless way. Exactly where the hardware and software is located and how it all works doesn't matter to you, the user—it's just somewhere up in the nebulous "cloud" that the Internet represents.

Cloud computing is a general term for the delivery of hosted services over the internet.

Types of cloud computing

IT people talk about three different kinds of cloud computing, where different services are being provided for you. Note that there's a certain amount of vagueness about how these things are defined and some overlap between them.

- *Infrastructure as a Service (IaaS)* means you're buying access to raw computing hardware over the Net, such as servers or storage. Since you buy what you need and pay-as-you-go,

this is often referred to as utility computing. Ordinary web hosting is a simple example of IaaS: you pay a monthly subscription or a per-megabyte/gigabyte fee to have a hosting company serve up files for your website from their servers.

- Software as a Service (SaaS) means you use a complete application running on someone else's system. Web-based email and Google Documents are perhaps the best-known examples. Zoho is another well-known SaaS provider offering a variety of office applications online.
- Platform as a Service (PaaS) means you develop applications using Web-based tools so they run on systems software and hardware provided by another company. So, for example, you might develop your own ecommerce website but have the whole thing, including the shopping cart, checkout, and payment mechanism running on a merchant's server. App Cloud (from salesforce.com) and the Google App Engine are examples of PaaS.

Cloud computing boasts several attractive benefits for businesses and end users. Three of the main benefits of cloud computing are:

- Self-service provisioning: End users can spin up compute resources for almost any type of workload on demand. This eliminates the traditional need for IT administrators to provision and manage compute resources.
- Elasticity: Companies can scale up as computing needs increase and scale down again as demands decrease. This eliminates the need for massive investments in local infrastructure which may or may not remain active.
- Pay per use: Compute resources are measured at a granular level, allowing users to pay only for the resources and workloads they use.

Advantages and Disadvantages of Cloud Computing

There is no doubt that businesses can reap huge benefits from cloud computing. However, with the many advantages, come some drawbacks as well. Take time to understand the advantages and disadvantages of cloud computing, so that you can get the most out of your business technology, whichever cloud provider you choose.

Advantages:

1. Easy implementation. Cloud hosting allows business to retain the same applications and business processes without having to deal with the backend technicalities. Readily manageable by the Internet, a cloud infrastructure can be accessed by enterprises easily and quickly.
2. Accessibility. Access your data anywhere, anytime. An Internet cloud infrastructure maximizes enterprise productivity and efficiency by ensuring your application is always accessible. This allows for easy collaboration and sharing among users in multiple locations.
3. No hardware required. Since everything will be hosted in the cloud, a physical storage center is no longer needed. However, a backup could be worth looking into in the event of a disaster that could leave your company's productivity stagnant.
4. Cost per head. Overhead technology costs are kept at a minimum with cloud hosting services, enabling businesses to use the extra time and resources for improving the company infrastructure.
5. Flexibility for growth. The cloud is easily scalable so companies can add or subtract resources based on their needs. As companies grow, their system will grow with them.

6. Efficient recovery. Cloud computing delivers faster and more accurate retrievals of applications and data. With less downtime, it is the most efficient recovery plan.

Disadvantages:

1. No-longer in control. When moving services to the cloud, you are handing over your data and information. For companies who have an in-house IT staff, they will be unable to handle issues on their own. However, Stratosphere Networks has a 24/7 live help desk that can rectify any problems immediately.
2. May not get all the features. Not all cloud services are the same. Some cloud providers tend to offer limited versions and enable the most popular features only, so you may not receive every feature or customization you want. Before signing up, make sure you know what your cloud service provider offers.
3. Doesn't mean you should do away with servers. You may have fewer servers to handle which means less for your IT staff to handle, but that doesn't mean you can let go of all your servers and staff. While it may seem costly to have data centers and a cloud infrastructure, redundancy is key for backup and recovery.
4. No Redundancy. A cloud server is not redundant nor is it backed up. As technology may fail here and there, avoid getting burned by purchasing a redundancy plan. Although it is an extra cost, in most cases it will be well worth it.

Bandwidth issues. For ideal performance, clients have to plan accordingly and not pack large amounts of servers and storage devices into a small set of data centers.

CHAPTER 5

WORLD WIDE WEB

Definition

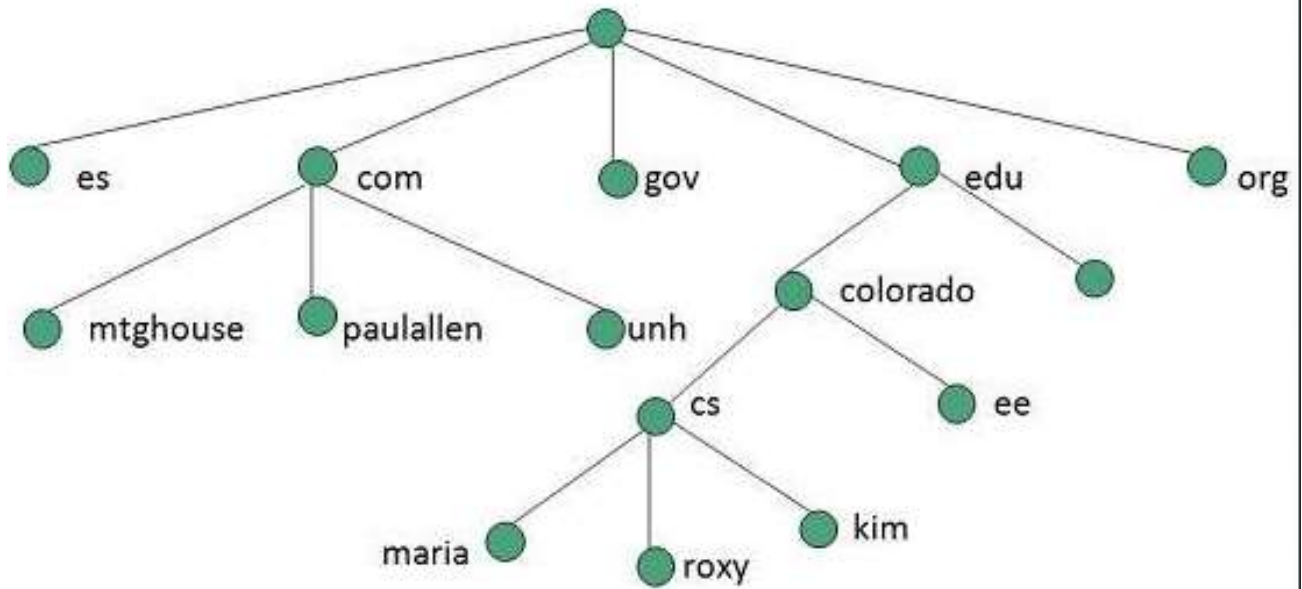
WWW stands for **World Wide Web**. A technical definition of the World Wide Web is : all the resources and users on the Internet that are using the Hypertext Transfer Protocol (HTTP).

A broader definition comes from the organization that Web inventor **Tim Berners-Lee** helped found, the **World Wide Web Consortium (W3C)**.

The World Wide Web is the universe of network-accessible information, an embodiment of human knowledge.

In simple terms, The World Wide Web is a way of exchanging information between computers on the Internet, tying them together into a vast collection of interactive multimedia resources.

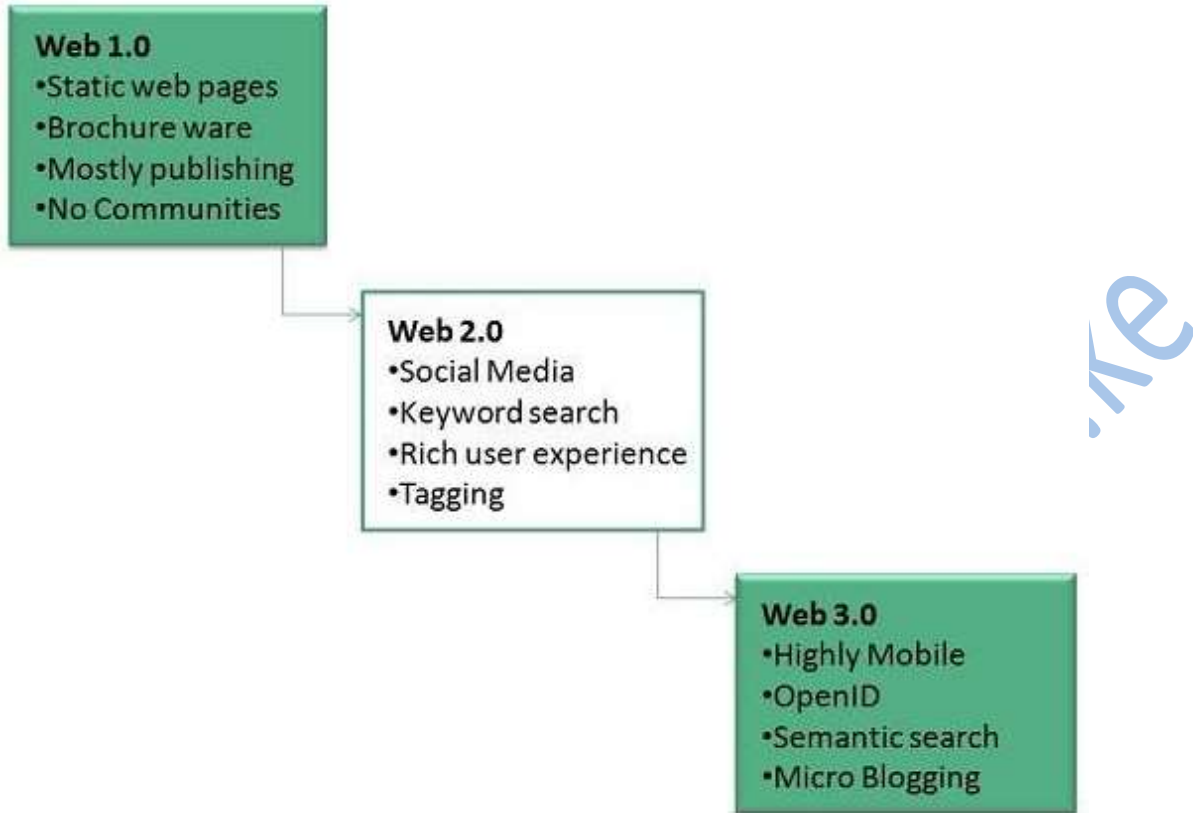
Internet and **Web** is not the same thing: Web uses internet to pass over the information.



Evolution

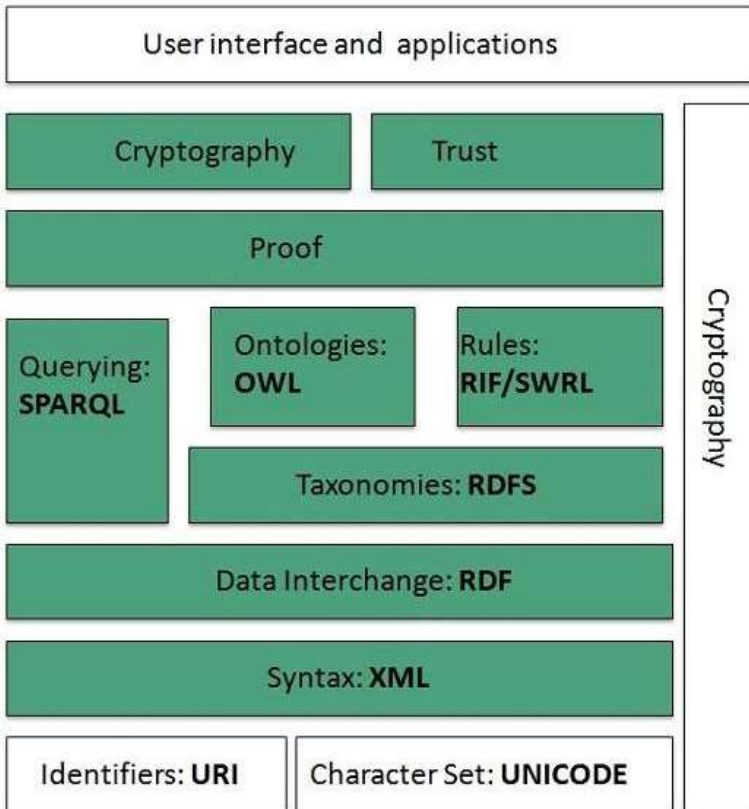
World Wide Web was created by **Timothy Berners Lee** in 1989 at **CERN** in **Geneva**. World Wide Web came into existence as a proposal by him, to allow researchers to work together effectively and efficiently at **CERN**. Eventually it became **World Wide Web**.

The following diagram briefly defines evolution of World Wide Web:



WWW Architecture

WWW architecture is divided into several layers as shown in the following diagram:



Identifiers and Character Set

Uniform Resource Identifier (URI) is used to uniquely identify resources on the web and **UNICODE** makes it possible to build web pages that can be read and write in human languages.

Syntax

XML (Extensible Markup Language) helps to define common syntax in semantic web.

Data Interchange

Resource Description Framework (RDF) framework helps in defining core representation of data for web. RDF represents data about resource in graph form.

Taxonomies

RDF Schema (RDFS) allows more standardized description of **taxonomies** and other **ontological** constructs.

Ontologies

Web Ontology Language (OWL) offers more constructs over RDFS. It comes in following three versions:

- OWL Lite for taxonomies and simple constraints.
- OWL DL for full description logic support.
- OWL for more syntactic freedom of RDF

CHAPTER 8:

INFORMATION SEARCHING

Browsing the Web.

This is also known as **Navigating** or '**Surfing**' the Web.

- ❖ To **Browse** is to navigate the Internet or the contents of your computer.
- ❖ **Browsing** can also be defined as moving around and between Web pages.

Using a Web browsing software you can read documents, listen to music, watch videos, make purchases, participate in surveys, advertise products, do research, share interests and download files on the Web.

EXPLORING / BROWSING THE INTERNET.

Use the **Internet Explorer** on your Windows desktop to browse the Web.

There are several ways in which you can browse the Web pages or "surf the net".

- (a). When viewing a Web page, you can navigate the Internet by clicking *Links, Underlined text* or special features that cause you to jump to another Web page.

Hyperlinks.

A **Hyperlink** is a coloured or underlined text or a graphic that you click to 'jump' from one location to another. The hyperlinks enable the user to 'jump' to another file, or to another location in the same file.

All Web pages have hyperlinks. These links:

- (i). Connect one part of a Web page to another part of the same Web page. This is useful if the Web page is large.
- (ii). Connect one Web page to another Website somewhere on the Web.
- (iii). Connect a page to a file, such as a sound clip, video, a Spreadsheet or a Word document.

The links can connect to objects stored anywhere on the Internet.

Hypertext links are indicated by underlined text highlighted usually in blue. Hyperlinks can also be represented by buttons, graphics or pictures.

To find hyperlinks on a page, move your mouse pointer over the page and where there is a hyperlink, the mouse pointer will change into a hand with a pointing finger. When you click a link, another Web page appears.

As you browse the Web, **Internet Explorer** stores the sites and pages that you visit. Usually, the hyperlinks you previously selected are colored differently. Internet Explorer does this to remind you that you have already visited the page identified by this link.

- (b). You can also use the Standard toolbar buttons in the Internet Explorer to move between Web pages, or to search the Internet.

Finding Web pages (information) on the Web.

There are 3 ways you can use to find interesting and useful Web pages on the Web;

- 1). You could get the **Web address** from an advertisement.
Many businesses include their Web addresses in their Television and Print advertisements.
- 2). You click a **link** that will enable you jump from one page to another.
Many industries or organizations, magazines and topic experts maintain pages that provide links from page to page.

- 3). Use of **Search Engines**.

Search Engines / Search Services.

- ❖ A **Search engine** is software that helps in locating information in the Web.
- ❖ **Search engine** is a tool that searches the Web for information that you want to find.

Purpose.

- ✓ If you want to get some information concerning an area or subject of interest over the Web but you do not know where to find it, you can use a Search engine to locate sites that contain the information.

CHAPTER 10

INTERNET GROUPS AND CORPORATIONS

GroupWare.

GroupWare is software that helps groups of people to work together more productively. They are often organized using a two-by-two grid.

	Same time	Different time
Same place	Group support systems	Group support systems
Different place	Video teleconferencing, Desktop video teleconferencing	E-mail, Discussion groups, Document-based GroupWare

GroupWare allows people in different places to communicate either at the same time (as on a telephone) or at different times.

GroupWare can also be used to improve communication and decision-making among those who work together in the same room, either at the same time or at different times.

GroupWare allows people to exchange ideas, debate issues, make decisions, and write reports, without actually having to meet face to face. Even when groups meet in the same room at the same time, GroupWare can improve meetings.

The major advantage of GroupWare is its ability to help groups make faster decisions, particularly in situations where it is difficult for group members to meet in the same room at the same time.

The 3 most popular types of GroupWare are;

- Discussion groups.
- Group support systems.
- Video Conferencing.

Discussion Groups.

A **Discussion group** is a collection of users who have joined together to discuss some topic.

There are many discussions on different topics including Cooking, Skydiving, Politics, Education, recreational, scientific research, etc.

Two of the commonly used discussion groups for business are;

- ◆ Usenet newsgroups.
- ◆ List Servers.

(a). Usenet newsgroups.

These are the most formally organized of the discussion groups.

Using a facility on the Internet called **USENET**, individuals can gain access to a very wide variety of information topics.

Usenet Newsgroups are usually worldwide discussion groups in which people share information and ideas on a defined topic through large electronic Bulletin Boards where anyone can read any articles or write articles and post messages on the topic for others to see and respond to.

The individuals can add messages to different topics and read those contributed by others. For instance, users such as students can ask questions about problems they face, or they could contribute or give an advice on how to improve the teaching of the subject.

Messages can be easily linked so that it is easy to know messages that are related.

Establishing a new newsgroup requires a vote of all interested people on the Internet. If enough people express interest, the new topic is established.

Note. To join a Newsgroup and be able to read messages on various topics, your computer must have Newsreader software such as **Outlook Express**, or **Internet News**.

Any Internet user can access some of these newsgroups, while other newsgroups will require to subscribe to a specific topic or set of topics.

Once you have subscribed, each time you access the newsgroups you are informed of any new messages added to the topics. You can then read these messages and respond to them by adding your own message.

The Usenet software receives “postings” of information and transmits new postings to users who have registered their interest in receiving the information. Each individual posting takes the form like that used for e-mail.

There are over 10,000 such newsgroups; however, each Usenet site is financed independently & controlled by a **Site Administrator**, who carries only those groups that he/she chooses.

(b). List Server

A **List Server** (or list serve) group is similar to the Usenet newsgroups, but is generally less formal.

Anyone with the right e-mail server software can establish a list server, which is simply a mail list.

The processor of the List Server processes commands such as request to subscribe, unsubscribe, or to provide information about the list serve. The List serve mailer directs messages to everyone on the mailing list.

THIS IS A SAMPLE

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