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OPEN UNIVERSITY**

BCA

BACHELOR OF COMPUTER APPLICATION



BCAR-104

Introduction to Internet Technologies and HTML

INTRODUCTION TO INTERNET TECHNOLOGIES AND HTML



**DR. BABASAHEB AMBEDKAR OPEN UNIVERSITY
AHMEDABAD**

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ROLE OF SELF-INSTRUCTIONAL MATERIAL IN DISTANCE LEARNING

The need to plan effective instruction is imperative for a successful distance teaching repertoire. This is due to the fact that the instructional designer, the tutor, the author (s) and the student are often separated by distance and may never meet in person. This is an increasingly common scenario in distance education instruction. As much as possible, teaching by distance should stimulate the student's intellectual involvement and contain all the necessary learning instructional activities that are capable of guiding the student through the course objectives. Therefore, the course / self-instructional material are completely equipped with everything that the syllabus prescribes.

To ensure effective instruction, a number of instructional design ideas are used and these help students to acquire knowledge, intellectual skills, motor skills and necessary attitudinal changes. In this respect, students' assessment and course evaluation are incorporated in the text.

The nature of instructional activities used in distance education self-instructional materials depends on the domain of learning that they reinforce in the text, that is, the cognitive, psychomotor and affective. These are further interpreted in the acquisition of knowledge, intellectual skills and motor skills. Students may be encouraged to gain, apply and communicate (orally or in writing) the knowledge acquired. Intellectual-skills objectives may be met by designing instructions that make use of students' prior knowledge and experiences in the discourse as the foundation on which newly acquired knowledge is built.

The provision of exercises in the form of assignments, projects and tutorial feedback is necessary. Instructional activities that teach motor skills need to be graphically demonstrated and the correct practices provided during tutorials. Instructional activities for inculcating change in attitude and behavior should create interest and demonstrate need and benefits gained by adopting the required change. Information on the adoption and procedures for practice of new attitudes may then be introduced.

Teaching and learning at a distance eliminates interactive communication cues, such as pauses, intonation and gestures, associated with the face-to-face method of teaching. This is

particularly so with the exclusive use of print media. Instructional activities built into the instructional repertoire provide this missing interaction between the student and the teacher. Therefore, the use of instructional activities to effect better distance teaching is not optional, but mandatory.

Our team of successful writers and authors has tried to reduce this.

Divide and to bring this Self-Instructional Material as the best teaching and communication tool. Instructional activities are varied in order to assess the different facets of the domains of learning.

Distance education teaching repertoire involves extensive use of self-instructional materials, be they print or otherwise. These materials are designed to achieve certain pre-determined learning outcomes, namely goals and objectives that are contained in an instructional plan. Since the teaching process is affected over a distance, there is need to ensure that students actively participate in their learning by performing specific tasks that help them to understand the relevant concepts. Therefore, a set of exercises is built into the teaching repertoire in order to link what students and tutors do in the framework of the course outline. These could be in the form of students' assignments, a research project or a science practical exercise. Examples of instructional activities in distance education are too numerous to list. Instructional activities, when used in this context, help to motivate students, guide and measure students' performance (continuous assessment)

PREFACE

We have put in lots of hard work to make this book as user-friendly as possible, but we have not sacrificed quality. Experts were involved in preparing the materials. However, concepts are explained in easy language for you. We have included many tables and examples for easy understanding.

We sincerely hope this book will help you in every way you expect.

All the best for your studies from our team!

INTRODUCTION TO INTERNET TECHNOLOGIES AND HTML

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BLOCK 1 : INTERNET & EXTRANET

UNIT 1 INTRNET CONCEPT

UNIT 2 TOPOLOGY

UNIT 3 EXTRANET

UNIT 4 WEB ESSENTIALS

INTERNET & EXTRANET

Block Introduction :

In this Block, we are going to learn about the internet and the extranet. In unit 1, we will cover concepts like the concept of internet, connections of the internet, the concept of network, the types of network, network topologies and an introduction to intranet and also know about the difference between internet and intranet.

In unit 2, we shall study about the concepts of extranet, an introduction to virtual private network, about the IP address, understand what a domain name is, we will learn about web space, URL, ISP etc.

In unit 3 highlights on extranet , how extranet is differ than intra net and with this some what large virtual network that use by so many ecommerce company now a days called Virtual Private Network (VPN) we will study in this block.

Where unit 4 we will understand the standard address protocol in network known as Internet Protocol (IP) along with this any website having domain name as well web space is required to upload website this concept, we will cover in this block

Before proceeding further, first we should understand the basic concept of internet. The internet is an electronic web that connects people and businesses that have access to networks and allows them to send and receive e-mail and to participate in a number of other activities, around the clock.

With the end of this block, we will be able to know about the basics of internet, connections related to internet, the network concept, the different types of network layout and also about the concept of intranet.

Block Objectives :

- To Understand internet concept with Network types and network topology.
- To understand intranet, IP address of computer with URL in website and ISP
- To focus on extranet and compare with intranet with VPN concept that use by emerging technology like 'e-commerce'
- To understand Internet Protocol (IP) and how website upload in webspace

Block Structure :

Unit 1 : Intrnet Concept

Unit 2 : Topology

Unit 3 : Extranet

Unit 4 : Web Essentials

UNIT STRUCTURE

- 1.0 Learning Objectives
- 1.1 Introduction
 - Check Your Progress – 1
- 1.2 World Wide Web
 - 1.2.1 Connections of The Internet
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- 1.3 How The Internet Works ?
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 - Check Your Progress – 4
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- 1.6 Answer For Check Your Progress
- 1.7 Glossary
- 1.8 Assignment
- 1.9 Activity
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- 1.11 Further Reading

1.0 Learning Objectives :

After reading this Unit, you will be able to :

- How Internet Works ?
- Types of Networks
- Different types of topology
- Advantages and disadvantages of topologies

1.1 Introduction :

This unit introduces the concept of Internet—a network of networks, the advantages of Internet, the method of establishing a connection, if you want to connect your system to Internet. After establishing the connection to an internet, the method of accessing/surfing the web is also explained. The buttons present on the Internet Explorer page are also explained in detail, which will help you to surf the web in an efficient manner. Similarly, the concept of network, its characteristics and types of network is also discussed in detail.

- **What is Internet ?**

Internet called simply "the Net," is a worldwide system of computer networks – a network of networks in which users at any one computer can, if

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they have authorization, get information from any other computer (and sometimes talk directly to users at other computers). The U.S. Department of Defence laid the foundation of the Internet roughly 30 years ago with a network called ARPANET. But the general public did not use the Internet much until the development of the World Wide Web in the early 1990s.

In 1957, the U.S. government formed the Advanced Research Projects Agency (ARPA), in which Department of Defence charged with ensuring U.S. leadership in science and technology with military applications. In 1969, ARPA established ARPANET, the forerunner of the Internet.

ARPANET is a network in which major computers are connected at the University of California at Los Angeles, the University of California at Santa Barbara, Stanford Research Institute, and the University of Utah. Within a couple of years, several other educational and research institutions joined the network.

In response to the threat of nuclear attack, ARPANET is designed to allow continued communication if one or more sites were destroyed. Unlike today, where millions of people have access to the Internet from home, ARPANET served only computer professionals, engineers, and scientists who knew their way around its complex workings.

❑ Check Your Progress – 1 :

1. _____ laid the foundation of the Internet roughly 30 years ago
[A] Indian Defence [B] U. K. Defence
[C] The U. S. Defence [D] None of this
2. ARPA means _____
[A] Auto Research Project Agency
[B] Advanced Research Projects Agency
[C] Advance Resource Project Agency
[D] None of this
3. WWW means _____
[A] World Wide Web [B] World Work Web
[C] Work Wide Web [D] None of this
4. www was established early of _____
[A] 1990 [B] 1970 [C] 1960 [D] 1950

1.2 World Wide Web :

What is the World Wide Web ?

The World Wide Web came into existence in 1991. It was developed by Tim Berners-Lee and others at the European Laboratory for Particle Physics, also known as Conceal European pour la Recherché Nuclear (CERN). The CERN team created the protocol based on hypertext that makes it possible to connect content on the Web with hyperlinks. Berners-Lee now directs the World Wide Web Consortium (W3C), a group of industry and university representatives that oversees the standards of Web technology.

Earlier, the Internet was limited to non-commercial uses because its backbone was provided largely by the National Science Foundation, the National Aeronautics and Space Administration, and the U. S. Department of Energy, and funding came from the government. But as independent networks began to spring up, users could access commercial Web sites without using the government-funded network. By the end of 1992, the first commercial online service provider, Delphi, which offered full Internet access to its subscribers, and several other providers followed.

In June 1993, the Web boasted just 130 sites. A year later, the number had risen to nearly 3,000. By April 1998, there were more than 2.2 million sites on the Web.

The Internet is a public, cooperative, and self-sustaining facility accessible to hundreds of millions of people worldwide. Physically, the Internet uses a portion of the total resources of the currently existing public telecommunication networks. Technically, what distinguishes the Internet is its use of a set of protocols called TCP/IP (for Transmission Control Protocol/Internet Protocol). Two recent adaptations of Internet technology, the intranet and the extranet, also make use of the TCP/IP protocol.

For many Internet users, electronic mail (e-mail) has practically replaced the Postal Service for short written transactions. Electronic mail is the most widely used application on the Net. One can also carry on live "conversations" with other computer users, using Internet Relay Chat (IRC). More recently, Internet telephony hardware and software allows real-time voice calls.

The most widely used part of the Internet is the World Wide Web (often abbreviated "WWW" or called "the Web"). Its outstanding feature is hypertext, a method of instant cross-referencing. In most Web sites, certain words or phrases appear in text of a different colour than the rest; often this text is also underlined.

When you select one of these words or phrases, you will be transferred to the site or page that is relevant to this word or phrase. Sometimes there are buttons, images, or portions of images that are "clickable." If you move the pointer over a spot on a Web site and the pointer changes into a hand, this indicates that you can click and be transferred to another site.

To view files on the Web, one needs Web browsing software. One use this software to view different locations on the Web, which are known as Web pages. A group of Web pages is a Web site. The first page of a Web site is often called the home page.

1.2.1 Connections of the Internet :

There are lots of ways to connect devices like mobile phones and computers to the internet. For some of us, our options depend on where we live, what devices we have, and if we want to use the internet when we're away from home.

❖ Dial-up Connections :

To get a dial-up connection, your computer will dial a phone number using your telephone line. Dial-up connections need a modem to connect to the internet and you pay for a call each time you dial-up. Dial-up connections are really slow compared to broadband, and are usually too slow for streaming video and making voice or video calls on the internet. If you want to do more than read web pages and send emails, you'll probably need a broadband connection.

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Fig. 1 : Dial Up Connection

Leased Connection

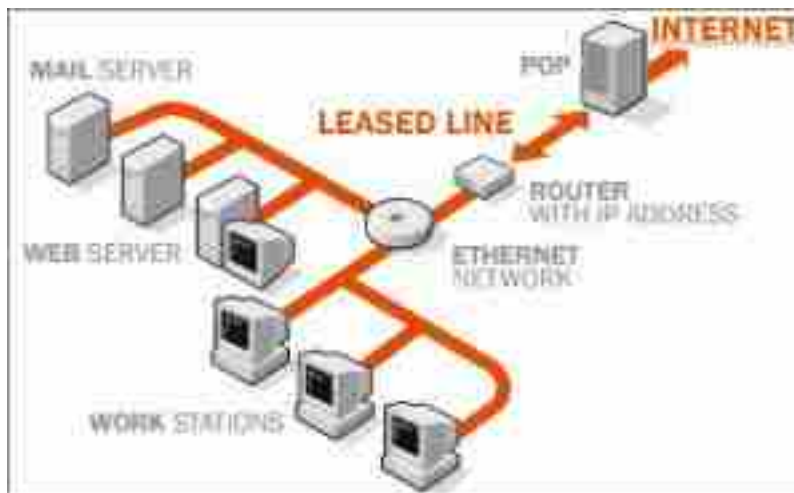


Fig. 2 : Leased Connection

Leased connection is also known as direct Internet access or Level Three connection. It is the secure, dedicated and most expensive, level of Internet connection. With leased connection, your computer is dedicatedly and directly connected to the Internet using high speed transmission lines. It is on-line twenty-four hours a day, seven days a week.

❖ **Broadband Connections :**

Broadband is a high-speed internet connection. Unlike dial-up, with broadband your phone line is not tied up. You can make a phone call and be on the internet at the same time. With broadband, you can watch live news and sport, download and share large files quickly and shop or bank online more easily. There are different ways to get broadband which means it doesn't matter where you live in India—everyone can get access to a fast internet connection.

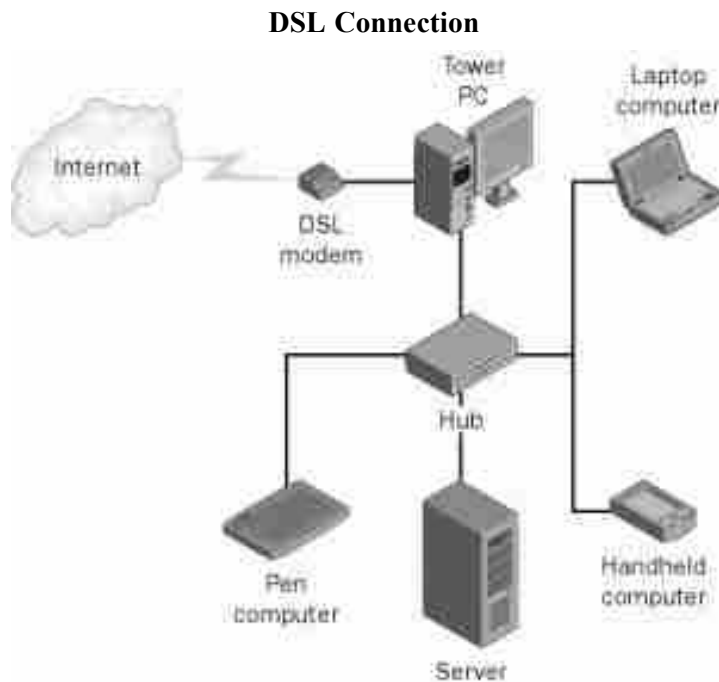


Fig. 3 : DSL Connection

Digital Subscriber Line (DSL) is a family of technologies that provides digital data transmission over the wires of a local telephone network. DSL originally stood for digital subscriber loop. In telecommunications marketing, the term DSL is widely understood to mean Asymmetric Digital Subscriber Line (ADSL), the most commonly installed DSL technology. DSL service is delivered simultaneously with wired telephone service on the same telephone line. This is possible because DSL uses higher frequency bands for data separated by filtering. On the customer premises, a DSL filter on each outlet removes the high frequency interference, to enable simultaneous use of the telephone and data.

The data bit rate of consumer DSL services typically ranges from 256 kbit/s to 40 Mbit/s in the direction to the customer (downstream), depending on DSL technology, line conditions, and service-level implementation. In ADSL, the data throughput in the upstream direction, (the direction to the service provider) is lower, hence the designation of asymmetric service. In Symmetric Digital Subscriber Line (SDSL) services, the downstream and upstream data rates are equal.

❖ **Fixed Broadband Connections :**

A 'fixed broadband connection' is a permanent connection to the internet. If you've got fixed broadband at home, you'll have a broadband modem that you can plug a cable into. If your modems also a wireless modem, you'll be able to connect wireless internet devices to your modem without using a cable.

Wireless connections can be good if you have more than one person and more than one device all wanting to use the same fixed connection. Most wireless connections let you use the internet in different rooms and even if you're outside. With a fixed broadband connection, you might also look into getting an internet phone rather than keeping your traditional phone line. This is called VoIP—which stands for 'voice over internet protocol'.

❖ **Fixed Wireless and Satellite Connections :**

If you live in a remote part of India, you can get a broadband internet connection by using either a fixed wireless connection or a satellite connection.

Once you have a broadband connection to your home, you might like to set up a wireless router so you can connect several wireless devices and use them in and around the home.

❖ **Mobile Broadband Connections :**

You could also get the internet on a mobile broadband connection where you plug a USB modem into your device and use mobile phone towers to access the Internet. This can be useful if you need the internet when you're out and about, or if you live in an area with good mobile phone coverage.

❖ **Internet on Your Mobile Phone :**

Many mobile phones let you access the internet if you've signed up for internet in your mobile phone plan. 'Smartphone's' are mobile phones that are like small computers. They have software on them to make it easier for you to surf the internet, check your email and use social networking sites.

❖ **Wireless Hotspots :**

If you're out and about with an internet device like a laptop, tablet or Smartphone, you might want to connect at a wireless hotspot. Wireless 'hotspots' are places like libraries and cafés, which offer you free access to their broadband connection. You may need to be a member of the library or a customer at a café to get the password for the wireless connection.

❖ **Cable Modem Connection :**

A cable modem is a type of Network Bridge and modem which provides bi-directional data communication via radio frequency channels on a HFC and RFoG infrastructure. Cable modems are basically used to deliver broadband Internet access in the form of cable Internet, taking advantage of the high bandwidth of a HFC and RFoG network. They are commonly deployed in Australia, Europe, Asia and America.

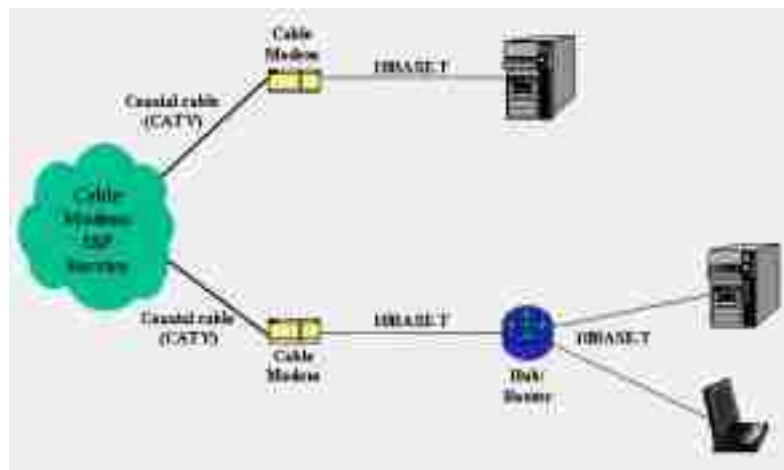


Fig. 4 : Cable Modem Connection

Above figure shows the most common network connection topologies while using cable modems. The cable TV company runs a coaxial cable into the building to deliver their Internet service. Although fed from the same coax that provides cable TV service, most of the companies place a splitter outside of the building and runs two cables in, rather than using a splitter at the set-top box. The coax terminates at the cable modem.

The cable modem itself attaches to the SOHO computing equipment via its 10BASE-T port. In most circumstances, the cable modem attaches directly

to a user's computer. If a LAN is present on the premises (something many cable companies frown upon), some sort of router can be connected to the cable modem.

❑ Check Your Progress – 2 :

1. Full form of DSL is _____
 [A] Dynamic Subscriber Line [B] Digital Subscriber Line
 [C] Data Subscriber Line [D] None of this
2. Full form of MODEM is _____
 [A] Morden Demodulation [B] Modulation Demodulation
 [C] Modulation Draft [D] None of this
3. Full form if IRC is _____
 [A] Internet Relay Chat [B] International Relay Chat
 [C] Instagram Resource Chat [D] None of this
4. Full form of SDSL is _____
 [A] Symmetric Digital Subscriber Line
 [B] Symmetric Data Subscriber Line
 [C] System Digital Subset Line
 [D] System Data Subset Line

1.3 How The Internet Works ?

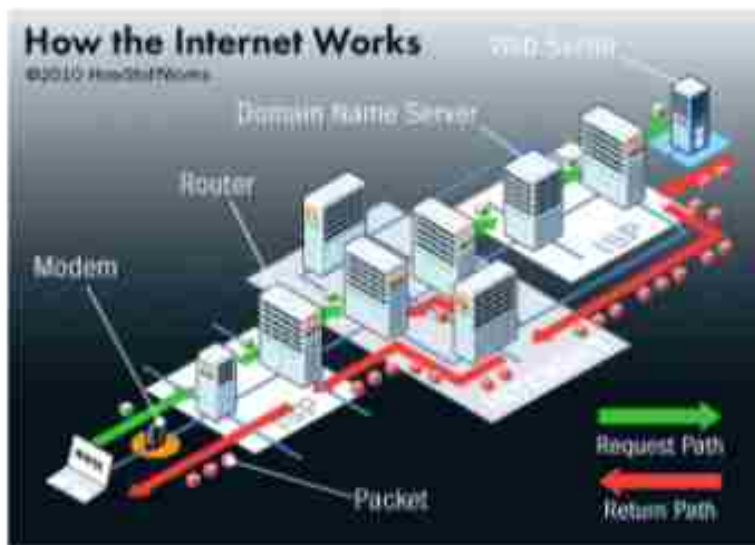


Fig. 5 : Internet working

Even though the Internet still being a young technology, it's hard to imagine life without it now. Every year, engineers create more devices to integrate with the Internet. This network of networks crisscrossed the globe and even extends into space. But what makes it work ?

To understand the Internet, it helps to look at it as a system with two main components. The first of those components is **hardware**. It includes everything from the cables that carry terabits of information every second to the computer sitting in front of you.

Other types of hardware that support the Internet includes routers, servers, cell phone towers, satellites, radios, smart phones and other devices. These devices together create a network of networks. The Internet is a malleable system

– it changes in little ways as elements join and leave networks around the world. Some of those elements may stay fairly static and make up the backbone of the Internet. Others are more peripheral.

These elements are connections. Some are end points – the computer, smart phone or other device you 're using to read this may count as one. We call those end points clients. Machines that store the information we seek on the Internet are servers. Other elements are nodes which serve as a connecting point along a route of traffic. And then there are the transmission lines which can be physical, as in the case of cables and fiber optics, or they can be wireless signals from satellites, cell phone or 4G towers, or radios.

All these hardware wouldn't create a network without the second component of the Internet : the protocols. Protocols are sets of rules that machines follow to complete tasks. Without a common set of protocols which all machines connected to the Internet must follow, communication between devices couldn't happen. The various machines would be unable to understand one another or even send information in a meaningful way. The protocols provide both the method and a common language for machines used to transmit data.

❑ **Check Your Progress – 3 :**

1. _____ is the first hardware component from client to server for Request form.
[A] Router [B] DNS [C] MODEM [D] Packet
2. _____ is the second hardware component from client to server for Request form.
[A] Router [B] DNS [C] MODEM [D] Packet
3. _____ is the third hardware component from client to server for Request form.
[A] Router [B] DNS [C] MODEM [D] Packet
4. _____ is main element that return from server to client for Response form
[A] Router [B] DNS [C] MODEM [D] Packet

1.4 Concept of Networks :

Computer networking has become an integral part of business today. Individuals, professionals and academics have also learned to rely on computer networks for capabilities such as electronic mail and access to remote databases for research and communication purposes. Networking has thus become an increasingly pervasive, worldwide reality because it is fast, efficient, reliable and effective. Just how all this information is transmitted, stored, categorized and accessed remains a mystery to the average computer user.

❖ **Technologies used in Networking :**

Types of Networks – including LANs, WANs and WLANs

The Internet and Beyond – The Internet and its contributions to intranets and extranets

Types of LAN Technology – including Ethernet, Fast Ethernet, Gigabit Ethernet, 10 Gigabit Ethernet, ATM, PoE and Token Ring

Networking and Ethernet Basics – including standard code, media, topographies, collisions and CSMA/CD

Ethernet Products – including transceivers, network interface cards, hubs and repeaters

1.4.1 Types of Networks :

In describing the basics of networking technology, it will be helpful to explain the different types of networks in use.

❖ **Local Area Networks (LANs) :**

A network is any collection of independent computers that exchange information with each other over a shared communication medium. Local Area Networks or LANs are usually confined to a limited geographic area, such as a single building or a college campus. LANs can be small, linking as few as three computers, but can often link hundreds of computers used by thousands of people. The development of standard networking protocols and media has resulted in worldwide proliferation of LANs throughout business and educational organizations.

❖ **Wide Area Networks (WANs) :**

Often elements of a network are widely separated physically. Wide area networking combines multiple LANs that are geographically separate. This is accomplished by connecting the several LANs with dedicated leased lines such as a T1 or a T3, by dial-up phone lines (both synchronous and asynchronous), by satellite links and by data packet carrier services. WANs can be as simple as a modem and a remote access server for employees to dial into, or it can be as complex as hundreds of branch offices globally linked. Special routing protocols and filters minimize the expense of sending data over vast distances.

❖ **Wireless Local Area Networks (WLANs) :**

Wireless LANs, or WLANs, use radio frequency (RF) technology to transmit and receive data over the air. This minimizes the need for wired connections. WLANs give users mobility as they allow connection to a local area network without having to be physically connected by a cable. This freedom means users can access shared resources without looking for a place to plug in cables, provided that their terminals are mobile and within the designated network coverage area. With mobility, WLANs give flexibility and increased productivity, appealing to both entrepreneurs and to home users. WLANs may also enable network administrators to connect devices that may be physically difficult to reach with a cable.

❑ **Check Your Progress – 4 :**

1. Full form of LAN is _____

[A] Large Area Network	[B] Long Area Network
[C] Local Area Network	[D] None of This
2. Full form of MAN is _____

[A] Master Area Network	[B] Metro Area Network
[C] Metro Politian Area Network	[D] Packet
3. Full form of WAN is _____

[A] World Area Network	[B] Wide Area Network
[C] Work Area Network	[D] None of This

4. Full form of RF is _____
[A] Robust Frequency [B] Radio Frequency
[C] Rest Frequency [D] Radio Forecast
5. Full form of WLAN is _____
[A] Wireless Local Area Network [B] Wide Local Area Network
[C] Wireless Logic Area Network [D] None of This
6. Which is not a Topology from below
[A] XLAN [B] LAN [C] MAN [D] WAN
7. _____ topology is the smallest as geographical wise
[A] LAN [B] MAN
[C] WAN [D] None of This
8. _____ topology does not required cable for networking
[A] WLAN [B] LAN [C] MAN [D] WAN

1.5 Lets Sum Up :

In this unit we have studied the Internet concepts and how internet works. Computer Network and Types of networks

- A computer network is a group of interconnected computers. Networks may be classified according to a wide variety of characteristics.
- A personal area network (PAN) is a computer network used for communication among computer devices close to one person.
- This is a network covering a small geographic area, like a home, office, or building.
- A Metropolitan Area Network is a network that connects two or more Local Area Networks or Campus Area Networks together but does not extend beyond the boundaries of the immediate town/city.
- A CAN may be considered a type of MAN (metropolitan area network), but is generally limited to a smaller area than a typical MAN.
- Global Area networks (GAN) specifications are in development by several groups, and there is no common definition.

1.6 Answer for Check Your Progress :

❑ Check Your Progress 1 :

1. [C] The U.S. Defence
2. [B] Advanced Research Projects Agency
3. [A] World Wide Web
4. [A] 1990

❑ Check Your Progress 2 :

1. [B] Digital Subscriber Line
2. [B] Modulation Demodulation
3. [A] Internet Relay Chat
4. [A] Symmetric Digital Subscriber Line

❑ Check Your Progress 3 :

1. [C] MODEM
2. [A] Router
3. [B] DNS
4. [D] Packet

❑ **Check Your Progress 4 :**

1. [C] Local Area Network 2. [C] Metro Politian Area Network
3. [B] Wide Area Network 4. [B] Radio Frequency
5. [A] Wireless Local Area Network
6. [A] XLAN
7. [A] LAN 8. [A] WLAN

1.7 Glossary :

- **Browser** – Contains the basic software you need in order to find, retrieve, view, and send information over the Internet.
- **Download** – To copy data from a remote computer to a local computer.
- **Upload** – To send data from a local computer to a remote computer.
- **E-mail** – E-mail (electronic mail) is the exchange of computer-stored messages by telecommunication. E-mail can be distributed to lists of people as well as to individuals. However, you can also send non-text files, such as graphic images and sound files, as attachments sent in binary streams.
- **Filter** – Software that allows targeted sites to be blocked from view. Example : X-Stop.
- **Home Page** – The starting page of any site.
- **HTML (Hypertext Markup Language)** – The coding language is used to create documents for use on the World Wide Web. There are three-letter suffixes used in coding that helps to identify the type location one is viewing
- **WWW (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).

1.8 Assignment :

1. Explain LAN in Short
2. Explain WAN in Short
3. List out Various Types of Internet Connectivity

1.9 Activity :

1. 'Draw flow chart of 'How Internet Works

1.10 Case Study :

1. What is WiFi ? How it works

1.11 Further Reading :

1. Introduction to Networking Recharad McMohan Tata McGraw hillPublication
2. Computer Network Fundamentals and application –RS Rajesh Vikas Publication
3. Unleashed Windows 2003 Server – Todd Brown & Chris MillerTechmedia SAMS Publication

**Introduction to
Internet Technologies
and HTML**

4. Microsoft Windows 2000 Professional – Paul Cassel Techmedia SAMSPublication
5. Fedora 3 Bible – Christopher Negus Wiley Dreamtech Publication
6. HTML Black Book – Steven Holzner – Dreamtech Press
7. HTML, Java Script, DHTML, PERL, CGI – Evan Bayross – BPB

UNIT STRUCTURE

- 2.0 Learning Objectives
- 2.1 Network Topology
 - 2.1.1 Why We Need Network Topology
- 2.2 Different Types of N/W Topologies
 - Check Your Progress – 1
- 2.3 Comparison of Network Topologies
- 2.4 Introduction To Intranet
 - Check Your Progress – 2
 - 2.4.1 Difference Between Internet and Intranet
 - Check Your Progress – 3
- 2.5 Lets Sum Up
- 2.6 Answer For Check Your Progress
- 2.7 Glossary
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- 2.9 Activity
- 2.10 Case Study
- 2.11 Further Reading

2.0 Learning Objectives :

After reading this Unit, you will be able to :

- What is topology
- Need to topology
- Different types of topology
- Advantages and disadvantages of topologies
- What is Internet : Comparing Internet and Intranet

2.1 Network Topology :

Computer network topology is the way in which various components of a network (like nodes, links, peripherals, etc) are arranged. Network topology is defined as the layout, virtual shape or structure of network, not only physically but also logically. The method in which different systems and nodes are connected and interact with each other is defined by topology of the network. Topology can be physical or logical. Physical Topology is define as the physical layout of nodes, workstations and cables in the network; while logical topology is define as the way information flows between different components.

2.1.1 Why We Need Network Topology :

- To expansion of Computer Network
- To check the capabilities of Clients (PC)
- To achieve better and fast data communications
- To Manage Network equipment
- To manage network with better way

2.2 Different Types of N/W Topologies :

❖ Bus Topology :

Bus Topology is the simplest among all network topologies. This type of topology, all nodes (computers as well as servers) are connected to the single cable (called bus), by the help of interface connectors. This central cable is the backbone of the network and is known as Bus (thus the name). Every workstation interacts with the other device through this bus.

A signal from the source is broadcasted and it travels to all workstations connected to bus cable. Although the message is broadcasted but only the intended recipient, whose MAC address or IP address matches, accepts it. If the MAC /IP address of machine doesn't match with the intended address, machine discards the signal.

A terminator is added at ends of the central cable, to prevent bouncing of signals. A barrel connector can be used to extend it. Below is a basic diagram of a bus topology and followed by advantages and disadvantages of Bus Network Topology.

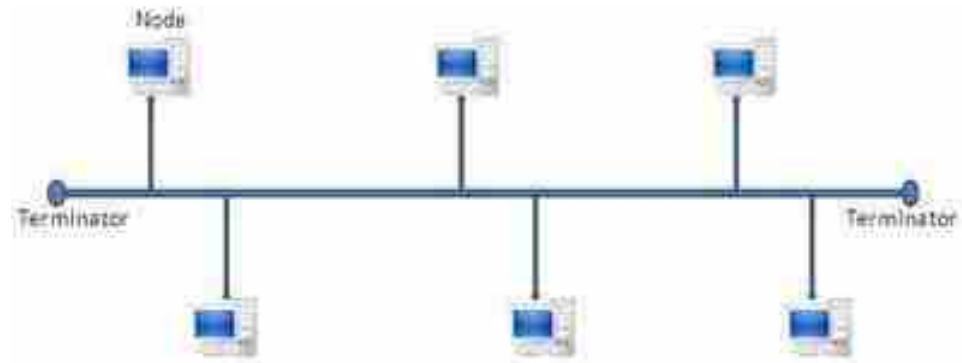


Fig. 1 : Bus Topology Diagram

Advantages (benefits) of Linear Bus Topology :

- (1) It is easy to set-up and extend bus network.
- (2) Cable length required for this topology is the least as compared to other networks.
- (3) Bus topology is very low in cost
- (4) Linear Bus network is used in small networks. Good for LAN.

Disadvantages (Drawbacks) of Linear Bus Topology :

- (1) There is a limit on central cable length and number of nodes that can be connected.
- (2) Dependency on central cable in this topology has its disadvantages. If the main cable (i.e. bus) encounters some problem, whole network breaks down.

- (3) Proper termination is required to dump signals. Use of terminators is must.
- (4) It is difficult to detect and troubleshoot fault at individual station.
- (5) Maintenance costs can get higher with time.
- (6) Efficiency of Bus network reduces, as the number of devices connected to it increases.
- (7) It is not suitable for networks with heavy traffic.
- (8) Security is very low because all the computers receive the sent signal from the source.

❖ **Star Topology :**

Star topology is a topology in which all the components of network are connected to the central device called 'hub' which may be a hub, a router or a switch. Unlike Bus topology, where nodes were connected to central cable, here all the workstations are connected to central device with a point-to-point connection. So every computer is indirectly connected to every other node by the help of 'hub'.

All the information on the star topology passes through the central device before reaching the intended destination. Hub acts as a central device to connect different nodes present in Star Network, and at the same time it manages and controls whole of the network. Depending on which central device is used, 'hub' can act as repeater or signal booster. Central device can also communicate with other hubs of different network. Unshielded Twisted Pair (UTP) Ethernet cable is used to connect workstations to central node.

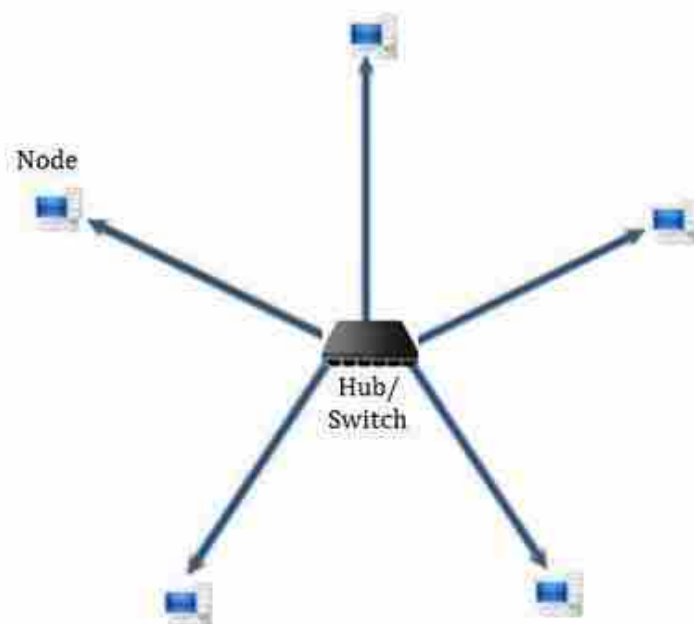


Fig. 2 : Star Topology

Advantages of Star Topology :

- (1) It gives far much better performance; signals don't necessarily get transmitted to all the workstations. A sent signal reaches the intended destination after passing through no more than 3–4 devices and 2–3 links. Performance of the network is dependent on the capacity of central hub.
- (2) Easy to connect new nodes or devices. In star topology new nodes can be added easily without affecting rest of the network. Similarly components can also be removed easily.

- (3) Centralized management. It helps in monitoring the network.
- (4) Failure of one node or link doesn't affect the rest of network. At the same time it's easy to detect the failure and troubleshoot it.

Disadvantages of Star Topology :

- (1) Too much dependency on central device has its own drawbacks. If it fails whole network goes down.
- (2) The use of hub, a router or a switch as central device increases the overall cost of the network.
- (3) Performance and as well number of nodes which can be added in such topology is depended on capacity of central device.

❖ **Mesh Topology :**

Mesh network topology in which each of the network node, computer and other devices, are interconnected with one another. Every node not only sends its own signals but also relays data from other nodes. A true mesh topology is the one where every node is connected to every other node in the network. Mesh topology is very expensive as there are many redundant connections, thus it is not mostly used in computer networks. This topology is commonly used in wireless networks. Flooding or routing technique is used in mesh topology.

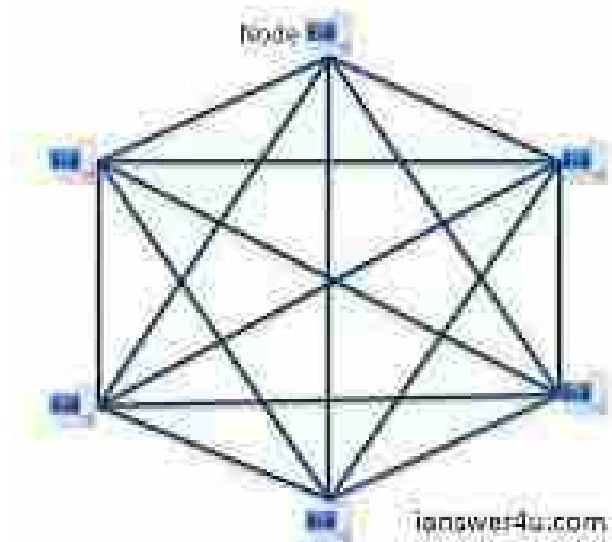


Fig. 3 : Mesh Topology

- (1) In this, as a true mesh, each component is interconnected to every other component. Even after considering the redundancy factor and cost of this network, its main advantage is that the network traffic can be redirected to other nodes if one of the nodes goes down. Full mesh topology is used only for backbone networks.
- (2) **Partial Mesh Topology :** It's far more practical as compared to full mesh topology. In this some of the systems are connected in similar fashion as in mesh topology while rests of the systems are only connected to 1 or 2 devices. It can be said that in partial mesh, the workstations are 'indirectly' connected to other devices. This one is less costly and also reduces redundancy.

Advantages of Mesh Topology :

- (1) Data can be transmitted from different devices simultaneously. This topology can withstand high traffic.
- (2) Even if one of the components fails there is always an alternative present. So data transfer doesn't get affected.
- (3) Expansion and modification in topology can be done without disrupting other nodes.

Disadvantages of Mesh Topology :

- (1) There are high chances of redundancy in many of the network connections.
- (2) Overall cost of this network is way too high as compared to other network topologies.
- (3) Set-up and maintenance of this topology is very difficult. Even administration of the network is tough.

❖ **What is Tree Topology ?**

This Topology integrates the characteristics of Star and Bus Topology. As we saw how in Physical Star network Topology, computers (nodes) are connected by each other through central hub. And we also saw in Bus Topology, work station devices are connected by the common cable called Bus. After understanding these two network configurations, we can understand tree topology better. In Tree Topology, the number of Star networks is connected using Bus. This main cable seems like a main stem of a tree, and other star networks as the branches. It is also called Expanded Star Topology. Ethernet protocol is commonly used in this type of topology.

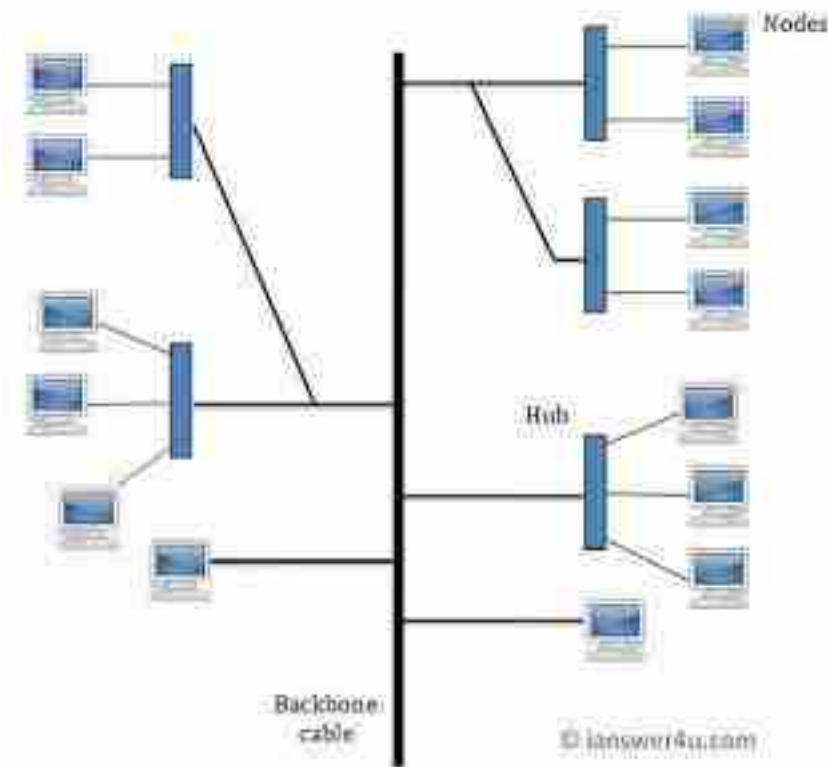


Fig. 4 : Tree Topology

Let's discuss the advantages and disadvantages of Tree Topology now.

Advantages of Tree Topology :

- (1) It is an extension of Star and bus Topologies, so in networks where these topologies can't be implemented individually for reasons related to scalability, tree topology is the best alternative.
- (2) Expansion of Network is possible and easy.
- (3) Here, we divide the whole network into segments (star networks), which can be easily managed and maintained.
- (4) Error detection and correction is easy.
- (5) Each segment is provided with dedicated point-to-point wiring to the central hub.
- (6) If one segment is damaged, other segments are not affected.

Disadvantages of Tree Topology :

- (1) Because of its basic structure, tree topology, relies heavily on the main bus cable, if it breaks whole network is crippled.
- (2) As more and more nodes and segments are added, the maintenance becomes difficult.
- (3) Scalability of the network depends on the type of cable used.

❖ **What is Ring Topology ?**

In Ring Topology, all the nodes are connected to each-other in a way that they make a closed loop. Each workstation is connected to two other components on either side, and it communicates with these two adjacent neighbours. Data travels around the network, in one direction. Sending and receiving of data takes place by the help of TOKEN.

Token Passing : It contains a piece of information which along with data is sent by the source computer. Token is then passes to next node, which checks if the signal is intended to it. If yes, it receives it and passes the empty to into the network, otherwise passes token along with the data to next node. This process continues until the signal reaches its intended destination.

The nodes with token are the ones only allowed to send data. Other nodes have to wait for an empty token to reach them. This network is usually found in offices, schools and small buildings.

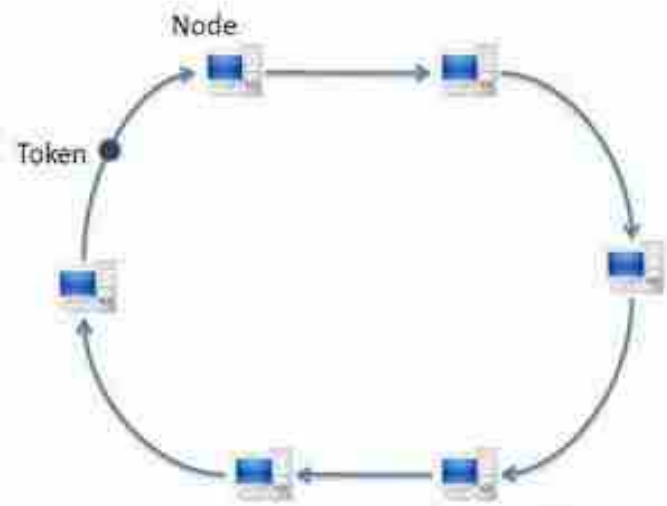


Fig. 5 : Ring Topology and Token

Advantages of Ring Topology :

- (1) This type of network topology is very organized. Each node gets to send the data when it receives an empty token. This helps to reduce chances of collision. Also in ring topology all the traffic flows in only one direction at very high speed.
- (2) Even when the load on the network increases, its performance is better than that of Bus topology.
- (3) There is no need for network server to control the connectivity between workstations.
- (4) Additional components do not affect the performance of network.
- (5) Each computer has equal access to resources.

Disadvantages of Ring Topology :

- (1) Each packet of data must pass through all the computers between source and destination. This makes it slower than Star topology.
- (2) If one workstation or port goes down, the entire network gets affected.
- (3) Network is highly dependent on the wire which connects different components.
- (4) MAU's and network cards are expensive as compared to Ethernet cards and hubs.

❑ Check Your Progress – 1 :

1. Clients connect with single cable in all horizontal or vertical, this topology called _____
[A] Bus [B] Ring [C] Star [D] Tree
2. All Clients connect with circular form, this topology is called _____
[A] Bus [B] Ring [C] Star [D] Tree
3. All Clients connect with central Hub/Switch, this topology called _____
[A] Bus [B] Ring [C] Star [D] Tree
4. Combination of Star and Ring topology is called _____ topology
[A] Star [B] Tree [C] Bus [D] Ring
5. Full form of UTP is _____
[A] United Twisted Pair [B] Universal Task Pair
[C] Universal Twisted Pair [D] Universal Task Port
6. Full form of PC
[A] Personal Computer [B] Process Compare
[C] Personal Cast [D] Protected Computer
7. Full form of MAC
[A] Model Access Control [B] Media Access Control
[C] Media Action Control [D] None of This
8. TOKEN is used in _____ topology
[A] Star [B] Tree [C] Bus [D] Ring

2.3 Comparison of Network Topologies :				
Parameter	BUS	STAR	RING	MESH
Installation	Easy	Easy	Difficult	Difficult
Cost	inexpensive	expensive	moderate	expensive
Flexible	yes	yes	no	no
Reliability	moderate	high	high	high
Extension	easy	easy	easy	difficult
Robust	no	yes	no	yes

Fig. 6 : Comparison of Various Topology

2.4 Introduction to Intranet :

An intranet can be defined as a private computer network or a cluster of interconnected PC & Laptops in an organization that is setup to share information (e.g. files, documents, emails), resources (such as printers, scanners), company programs & software applications (like company attendance, job sheets, payroll system etc.). The Intranet is private and has restricted access. Only authorized people inside the organization can access it.

❑ Check Your Progress – 2 :

- _____ topology is inexpensive
[A] Bus [B] Ring [C] Star [D] Tree
- _____ topology is NOT roust
[A] Bus [B] Ring [C] Star [D] Tree
- _____ topology is NOT flexible
[A] Bus [B] Star [C] Mesh [D] None of This
- The Intranet is private and has _____ access.
[A] Free [B] Only India [C] Restricted [D] None of This

2.4.1 Difference Between Internet and Intranet :

- **Users differ.** Intranet users are your own employees who know a lot about the company, its organizational structure, and special terminology and circumstances. Your Internet site is used by customers who will know much less about your company and also care less about it.
- **The tasks differ.** The intranet is used for everyday work inside the company, including some quite complex applications; the Internet site is mainly used to find out information about your products.
- **The type of information differs.** The intranet will have many draft reports, project progress reports, human resource information, and other detailed information, whereas the Internet site will have marketing information and customer support information.
- **The amount of information differs.** Typically, an intranet has between ten and a hundred times as many pages as the same company's public website. The difference is due to the extensive amount of work-in-progress that is documented on the intranet and the fact that many projects and departments never publish anything publicly even though they have many internal documents.

- **Bandwidth and cross–platform needs differ.** Intranets often run between a hundred and a thousand times faster than most Internet users' Web access which is stuck at low–band or mid–band, so it is feasible to use rich graphics and even multimedia and other advanced content on intranet pages. Also, it is sometimes possible to control what computers and software versions are supported on an intranet, meaning that designs need to be less cross–platform compatible (again allowing for more advanced page content).

❑ Check Your Progress – 3 :

1. Intranet users are your own _____
[A] Boss [B] Manager [C] Employee [D] None of this
2. The _____ is used for everyday work inside the company
[A] internet [B] www [C] intranet [D] None of this
3. Variety type of reports find in _____
[A] internet [B] Bus topology [C] intranet [D] None of This
4. Intranet is _____ than internet
[A] slower [B] back log [C] faster [D] None of This
5. Physical and Logical arrangement of network is called _____
[A] Topology [B] Hub [C] Switch [D] None of this
6. Combination of multiple topology is called _____ topology
[A] Bus [B] Mesh/Hybrid [C] Ring [D] Star
7. Internet means _____
[A] collection of Hub [B] collection of topology
[C] collection of different networks [D] None of This
8. Internet technology used within registered employee only is called _____
[A] http [B] www [C] LAN [D] Intranet

2.5 Lets Sum Up :

In this unit we have studied the Internet concepts and how internet works. Computer Network and Types of networks

- A computer network is a group of interconnected computers. Networks may be classified according to a wide variety of characteristics.
- A personal area network (PAN) is a computer network used for communication among computer devices close to one person.
- This is a network covering a small geographic area, like a home, office, or building.
- A Metropolitan Area Network is a network that connects two or more Local Area Networks or Campus Area Networks together but does not extend beyond the boundaries of the immediate town/city.
- A CAN may be considered a type of MAN (metropolitan area network), but is generally limited to a smaller area than a typical MAN.
- Global Area networks (GAN) specifications are in development by several groups, and there is no common definition.

❖ **Intranet :**

An intranet is a private computer network that uses Internet protocols and network connectivity to securely share any part of an organization's information or operational systems with its employees.

2.6 Answer for Check Your Progress :

❑ **Check Your Progress 1 :**

1. [A] Bus
2. [B] Ring
3. [C] Star
4. [B] Tree
5. [C] Universal Twisted Pair
6. [A] Personal Computer
7. [B] Media Access Control
8. [D] Ring

❑ **Check Your Progress 2 :**

1. [A] Bus
2. [A] Bus
3. [C] Mesh
4. [C] Restricted

❑ **Check Your Progress 3 :**

1. [C] Employee
2. [C] intranet
3. [C] intranet
4. [C] faster
5. [A] Topology
6. [B] Mesh/Hybrid
7. [C] collection of different networks
8. [D] Intranet

2.7 Glossary :

- **Browser** – Contains the basic software you need in order to find, retrieve, view, and send information over the Internet.
- **Download** – To copy data from a remote computer to a local computer.
- **Upload** – To send data from a local computer to a remote computer.
- **E-mail** – E-mail (electronic mail) is the exchange of computer-stored messages by telecommunication. E-mail can be distributed to lists of people as well as to individuals. However, you can also send non-text files, such as graphic images and sound files, as attachments sent in binary streams.
- **Filter** – Software that allows targeted sites to be blocked from view. Example : X-Stop.
- **Home Page** – The starting page of any site.
- **HTML (Hypertext Markup Language)** – The coding language is used to create documents for use on the World Wide Web. There are three-letter suffixes used in coding that helps to identify the type location one is viewing
- **WWW (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).

2.8 Assignment :

1. Explain Bus topology in short
2. Explain Ring topology with advantages and disadvantages
3. What is tree topology ? give brief idea

2.9 Activity :

1. How Intranet is superior than Internet give argument in your words

2.10 Case Study :

1. Which topology is best give your argument

2.11 Further Reading :

1. Introduction to Networking Recharad McMohan Tata McGraw Hill Publication
2. Computer Network Fundamentals and Application – RS Rajesh Vikas Publication
3. Unleashed Windows 2003 Server – Todd Brown & Chris MillerTechmedia SAMS Publication
4. Microsoft Windows 2000 Professional – Paul Cassel Techmedia SAMSPublication
5. Fedora 3 Bible – Christopher Negus Wiley Dreamtech Publication
6. HTML Black Book – Steven Holzner – Dreamtech Press
7. HTML, Java Script, DHTML, PERL, CGI – Evan Bayross – BPB

UNIT STRUCTURE

- 3.0 Learning Objectives
- 3.1 Introduction
 - Check Your Progress – 1
- 3.2 Concept of Extranet
 - 3.2.1 Comparison of Intranet and Extranet
 - Check Your Progress – 2
- 3.3 Introduction To VPN
 - Check Your Progress – 3
 - 3.3.1 How VPN Works
 - Check Your Progress – 4
- 3.4 Different Types of VPN
- 3.5 Advantages and Disadvantages of VPN
 - Check Your Progress – 5
- 3.6 Lets Sum Up
- 3.7 Answer For Check Your Progress
- 3.8 Glossary
- 3.9 Assignment
- 3.10 Activity
- 3.11 Case Study
- 3.12 Further Reading

3.0 Learning Objectives :

After reading this Unit, you will be able to :

- What is Extranet
- Need of Virtual Private Network
- Pros and Cons of VPN

3.1 Introduction :

An **extranet** is an extension of the information system of the company to its partners located outside of the network. Access to the extranet must be secured to the extent that the same provides access to the information system for persons located outside of the enterprise.

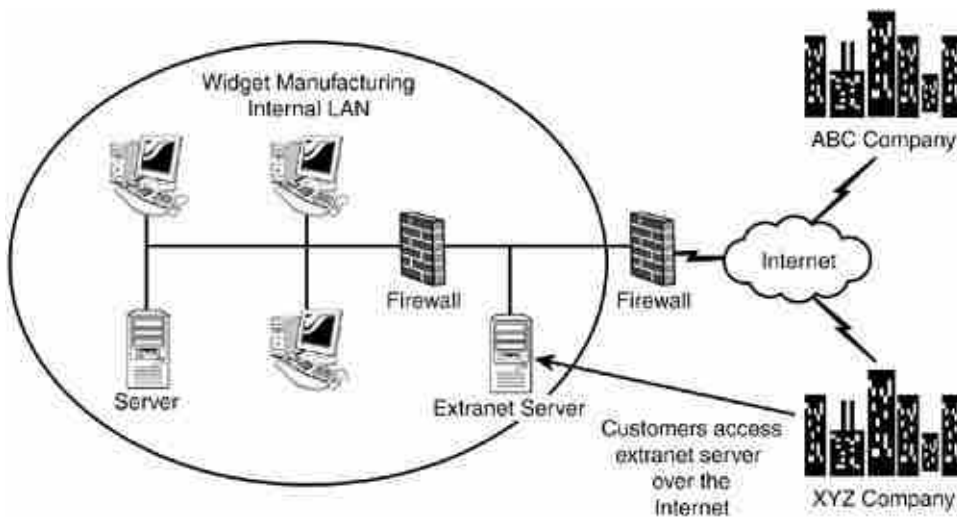


Fig. 1 : Extranet Diagram

This might involve simple authentication (authentication via user name and password) or strong authentication (authentication via a certificate). It is recommended to use HTTPS for all web pages that are consulted from the outside to secure the transport of HTTP queries and answers and to prevent, in particular, the open transfer of the password on the network.

An extranet is therefore neither an Intranet nor an Internet site. It is rather a supplementary system providing, for example, the clients of an enterprise, its partners or its subsidiaries with privileged access to certain computer resources of the enterprise via a Web interface.

❑ Check Your Progress – 1 :

1. is as extension of the information technology ?
 [A] Extranet [B] HTML [C] IP [D] TCP
2. Extranet is recommended use _____ for all web pages.
 [A] HTTPS [B] HTML [C] Extranet [D] Intranet
3. Extranet is rather a _____ system providing.
 [A] Supplementary [B] Extranet
 [C] Intranet [D] Internet
4. An extranet is therefore an _____ nor _____ on Site.
 [A] Internet, Intranet [B] Internet, Extranet
 [C] Extranet, IP [D] None of this

3.2 Concept of Extranet :

Any network or application that is accessible from outside the physical and logical boundaries of an organization can be called an extranet. This means that any network on which remote access services are provided could, technically, be considered an extranet. Commonly, though, the term extranet is used to describe a system or application, hosted within an organization, which is securely made available to selected individuals or entire organizations outside of the hosting organization.

The key consideration to this model is that the company providing the system controls access to the extranet. In other words, only selected clients and associates are provided with access, and they might even be required to access

the extranet over secure virtual private networking (VPN) links. Contrast this with the model used by, for example, online bookstores, where anyone can access the site, even though a username and password is subsequently required to place or track orders. Although the bookstore could decide to prevent a certain user from accessing the site, they are unlikely to do so. Figure 2 shows an example of an extranet.

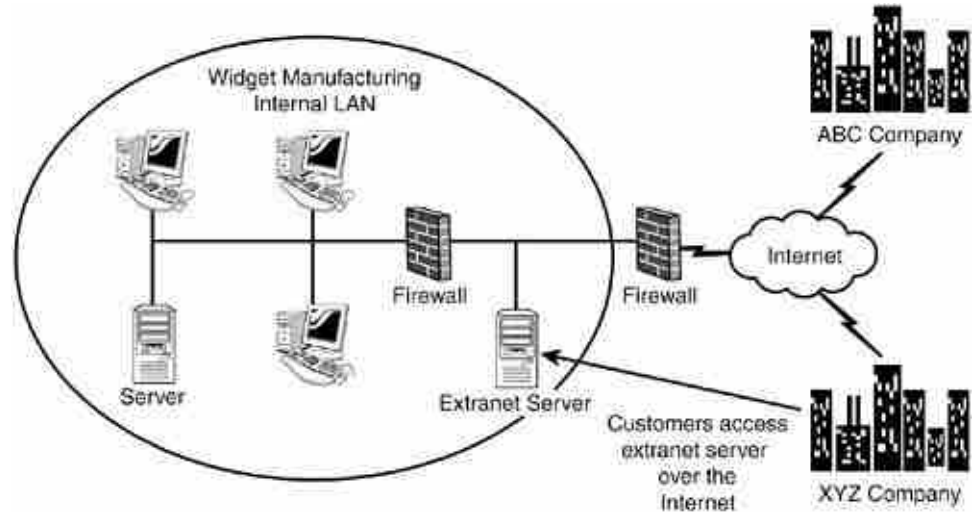


Fig. 2 : An Example of an Extranet

Extranets are commonly identified by the following characteristics :

- Users are outside of the hosting organization Access to the extranet system is made available to individuals and organizations that are not directly affiliated with the host organization.
- Only the owner of the system grants access Access to the extranet is normally granted and controlled by the operating organization.
- Secure Extranets are typically secure, and connection to the extranet might require the use of secure communication channels such as a VPN.

Typically, though not exclusively, extranet applications, like intranet applications, are hosted on a Web server and accessed through a Web browser.

3.2.1 Comparison of Intranet and Extranet :

Factor	Intranet	Extranet / and or Internet
Speed	Faster	Slower
System costs–H/W, S/W. to implement & maintain	Less expensive	Expensive
Costs to connect/transmit	Economical	More costly
Information / knowledge type	Frequently used knowledge : high relevance; in common interest of staff	May be essential information or knowledge occasionally used
Confidentiality	Very high and strictly confidential	Low or moderate

Security	Exclusive use to internal users	Some external websites requires login and passwords from its restricted users
Information/ knowledge type	Frequently used knowledge: high relevance: in common interests of staff	May be essential information or knowledge occasionally used
System failure	System availability is high as system is monitored and attended to	Unpredictable: systems may be down or not available at certain time Periods

❑ Check Your Progress – 2 :

1. VPN means
 [A] Virtual Private Network [B] Virtual Personal Network
 [C] Virtual Public Network [D] None of this
2. The term extranet is used to describe a
 [A] System [B] Server [C] Data [D] None of this
3. Only the _____ of the system grants Access.
 [A] Owner [B] Seller [C] Public [D] None of this
4. Extranet is normally _____ and _____ by the operating system.
 [A] Granted [B] Controlled [C] A & B both [D] None of this

3.3 Introduction to VPN :

VPN which stands for Virtual Private Network is basically a network connection that builds an extremely secure connection over public or private network between remote locations to the end users. It creates a 'tunnel' through which your data passes from your Operating system /Device over the internet through a secure channel.

It was first used in the early 1990's with two different protocols. i.e ;

Transparent Mode : It is used in remote technology

Tunnel Mode : It is used in local network

❑ Check Your Progress – 3 :

1. Virtual private network is basically a _____ connection.
 [A] Network [B] Internet [C] Extranet [D] None of this
2. VPN was first used in the early
 [A] 1990 [B] 1980 [C] 1970 [D] 1995
3. Transparent mode is used in _____ technology.
 [A] Remote [B] Internet [C] Extranet [D] None of this
4. Tunnel mode is used in _____ network.
 [A] Local [B] Private [C] Public [D] None of this

3.3.1 How VPN Works :

A Virtual Private Network (VPN) allows you to connect **branch offices, telecommuting workers, field representatives** and other users into one seamless network. When referring to the Internet, the term VPN usually refers to overlaying a private network connection onto the Internet. Because the Internet is the most public data network available, it is important to secure communications between remote offices and users when using the Internet as the transport medium.

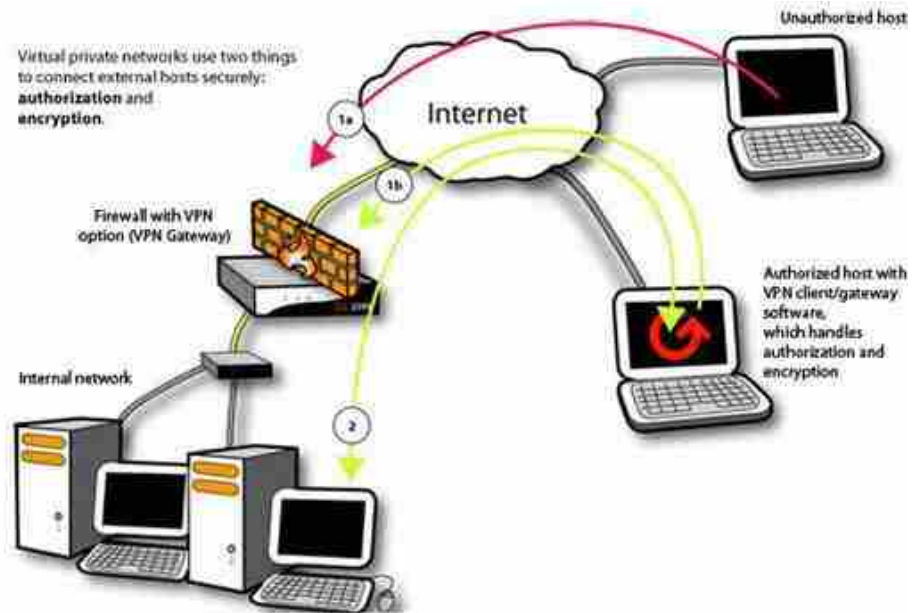


Fig. 3 : How VPN Works ?

1. **Authorization ensures that only trusted hosts can gain network access.** If a computer has not logged in with the VPN gateway, the connection is denied (1a). If a computer provides authorization credentials such as a password and pre-shared secret, the VPN gateway adds the computer to its list of computers allowed to connect (1b).
2. **Encryption defeats interception of traffic by scrambling data.** Once authorized, a computer can use encryption to prevent digital eavesdropping (packet sniffing) by any in-between points on the Internet, including unauthorized hosts.

☐ **Check Your Progress – 4 :**

1. A VPN allows you to connect

[A] Branch Offices	[B] Telecommunication Workers
[C] Field Representatives	[D] All of this
2. VPN usually refers to overlaying a _____ network connection onto the Internet.

[A] Private	[B] Extranet	[C] Intranet	[D] None of this
-------------	--------------	--------------	------------------
3. If a computer has not logged in with the VPN gateway, the connection is

[A] Denied	[B] Allowed	[C] Connect	[D] None of this
------------	-------------	-------------	------------------
4. _____ Defeats interception of traffic by scrambling data.

[A] Encryption	[B] Inter Connection
[C] Extension	[D] None of this

3.4 Different Types of VPN :

A Virtual Private Network is an encrypted connection between two or more devices over a public network. Some may argue that it doesn't necessarily has to be encrypted, but when it's not, that's called a tunnel (for me at least). Here's a list of the types :

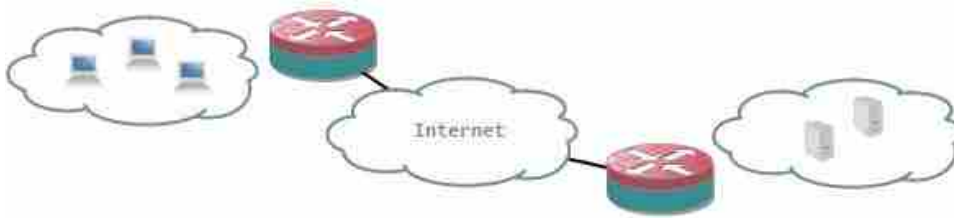


Fig. 4 : Site-to-site VPN

Often abbreviated to S2SVPN It's a connection between two sites and encrypts all traffic between two (or multiple) subnets. There are two types of S2SVPN :

- **Policy-based** : interesting traffic triggers an ACL and is encrypted and sent to the remote VPN peer.
- **Routed** : traffic is routed into an encrypted tunnel to the remote VPN peer.

For a detailed explanation and configuration, Jeremy made some excellent posts about this on Packet life : Part 1 for policy-based and Part 2 for routed.

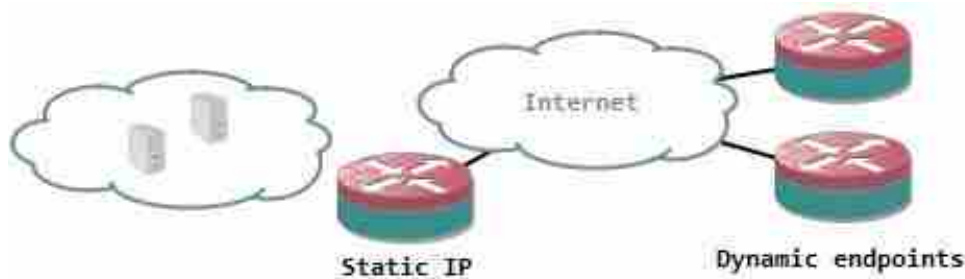


Fig. 5 : DMVPN

A dynamic multipoint VPN is not a protocol but more a technique using different protocols. One or more central hub routers are required, but the remote (spoke) routers can have dynamic IPs and more can be added without having to modify the configuration on the hub router(s), or any other spoke routers. The routers use a next-hop resolution protocol, combined with a dynamic routing protocol to discover remote peers and subnets. The VPN itself is a mGRE tunnel (GRE with multiple endpoints) which is encrypted. This way, traffic between spoke routers does not have to go through the hub router but can be sent directly from spoke to spoke.

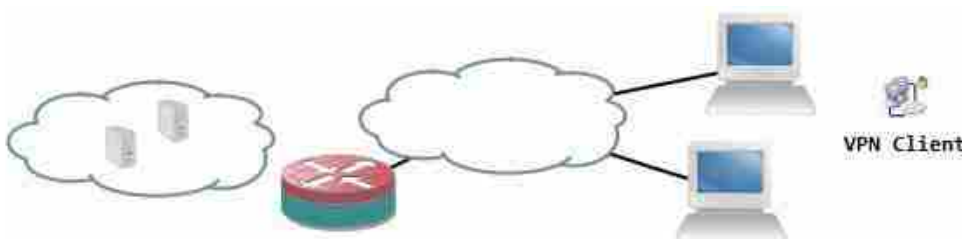


Fig. 7 : Client VPN

A client VPN is an encrypted connection from one device towards a VPN router. It makes that one remote device appear as a member of a local subnet behind the VPN router. Traffic is tunnelled from the device (usually a computer or laptop of a teleworker) towards the VPN router so that user has access to resources inside the company. It requires client software that needs to be installed and configured.

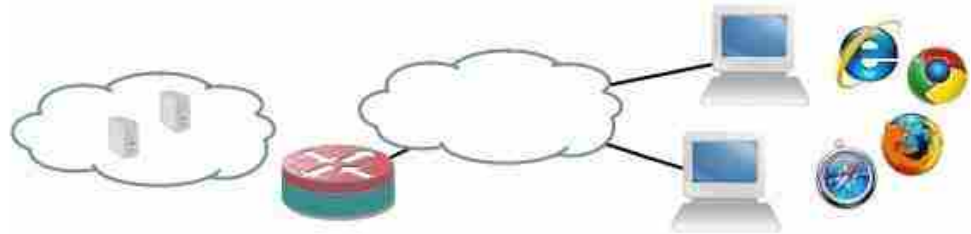


Fig. 8 : SSLVPN

This type of VPN works like a client VPN. The difference is that the remote client does not need preconfigured software, but instead the browser acts as VPN software. The browser needs to support active content, which every modern browser supports, either directly or through a plug-in. Traffic is tunneled over SSL (or TLS) to the SSLVPN router. From a networking perspective, traffic is tunnelled over layer 4 instead of layer 3. The benefit is that the remote user does not need to configure anything and can simply log in to a web page to start the tunnel. The drawback that you'll likely need a dedicated device as SSLVPN endpoint because this is not a standard feature.

3.5 Advantages and Disadvantages of VPN :

- **Advantages :**
 - o A VPN service hides your real IP address, effectively masking your online identity and allowing you to bypass geo-blocks.
 - o Since a VPN masks your IP address, it also helps you bypass firewalls.
 - o A VPN encrypts your online connections, protecting your data from hackers and ISP/government surveillance.
 - o By encrypting your online traffic, a VPN ensures your ISP can't throttle your bandwidth.
 - o A VPN offers you a better online gaming experience by keeping you safe from IP bans, DDoS attacks, and by giving you access to geo-blocked/banned video games.
 - o With a VPN, you are much safer when downloading torrents since your ISP can't see what you're doing, and other people who are downloading/uploading the same torrent can't see your real IP address.
 - o A VPN can potentially help you avoid online price discrimination (like when airline companies charge more for the same ticket if you're from a different geographical area) since it hides your IP address.
- **Disadvantages :**
 - o VPN services will usually cost money, as free VPNs aren't an option since they don't work right and endanger your data.

- o Not all devices and operating systems natively support VPN applications, so you might have to manually set up a connection sometimes.
- o Using a VPN will usually lower your online speeds to a certain extent because of various factors (distance from the server, type of encryption that's used, what VPN protocol you use, etc.).
- o Some VPN providers log user data, which can put your privacy in danger.

❑ Check Your Progress – 5 :

1. A _____ is an encrypted connection between two or more devices over a public network.
 [A] Virtual Private Network [B] Virtual Public Network
 [C] Vital Private Network [D] None of this
2. S2S VPN means
 [A] Site-to-site Virtual Private network
 [B] Simple-to-simple Virtual Private network
 [C] Slide-to-slide Virtual Private network
 [D] None of this
3. There are _____ types of S2S VPN.
 [A] Two [B] Four [C] Five [D] Six
4. DMVPN means
 [A] Dynamic Multipoint VPN [B] Domestic Multipoint VPN
 [C] Data Multipoint VPN [D] None of this

3.6 Lets Sum Up :

In this Unit we have studied what is extranet and its function. An extranet is therefore neither an Intranet nor an Internet site. It is rather a supplementary system providing, for example, the clients of an enterprise, its partners or its subsidiaries with privileged access to certain computer resources of the enterprise via a Web interface. VPN is most useful network that propose for the private network with having strong security aspects for various clients. This unit focus on various types of VPN with advantages and disadvantages.

3.7 Answer for Check Your Progress :

❑ Check Your Progress 1 :

1. [A] Extranet 2. [A] HTTPS
3. [A] Supplementary 4. [A] Internet, Intranet

❑ Check Your Progress 2 :

1. [A] Virtual Private Network 2. [A] System
3. [A] Owner 4. [C] A & B both

❑ Check Your Progress 3 :

1. [A] Network 2. [A] 1990
3. [A] Remote 4. [A] Local

❑ **Check Your Progress 4 :**

1. [D] All of this
2. [A] Private
3. [A] Denied
4. [A] Encryption

❑ **Check Your Progress 5 :**

1. [A] Virtual Private Network
2. [A] Site-to-site Virtual Private network
3. [A] Two
4. [A] Dynamic Multipoint VPN

3.8 Glossary :

- **Back** – Lets you return to pages you've viewed, beginning with the most recent. Right-click the Back button and select from a list of recently visited sites.
- **Forward** – Lets you move forward through pages you've viewed using the Back button. Right-click the Forward button and select from a list of recently visited sites.
- **Stop** – Halts the process of downloading a Web page. Click this if you want to stop downloading a page for any reason for example, if you're having trouble downloading it or if you don't want to wait for it to download. Then try downloading it again or browse elsewhere.
- **Refresh** – Updates any Web page stored in your disk cache with the latest content. When you return to a page that you've visited, your browser displays the file stored in your disk cache, rather than the current page on the World Wide Web. If a web page doesn't come up the whole way or is taking abnormally long to load, try the Refresh or Reload button – sometimes this will load the page better.
- **Home** – Returns you to your home page. You can designate any Web page as your home page.
- **Search** – Displays a choice of popular Internet search engines in the left pane. Your search results appear in the left pane, too. When you click a link, the page appears in the right pane, so you don't lose sight of your search results.
- **Favourites** – Displays a list of the sites you have marked. Click any item in the list to jump to it.
- **History** – Shows a list of Web sites you've visited.

3.9 Assignment :

1. Advantages and Disadvantages of VPN
2. Explain how VPN works
3. Explain Extranet in short

3.10 Activity :

1. Just list out main components of Extranet

3.11 Case Study :

1. As per security concern How Extranet is useful write bulleted list in your words

3.12 Further Reading :

Extranet

1. Introduction to Networking Recharad McMohan Tata McGraw Hill Publication
2. Computer Network Fundamentals and application – R S Rajesh Vikas Publication
3. Microsoft Windows 2000 Professional – Paul Cassel Techmedia SAMS Publication
4. HTML Black Book – Steven Holzner – Dreamtech Press
5. HTML, Java Script, DHTML, PERL, CGI – Evan Bayross – BPB

UNIT STRUCTURE

- 4.0 Learning Objectives
- 4.1 Introduction to IP Address
 - Check Your Progress – 1
- 4.2 What is A URL ?
 - Check Your Progress – 2
- 4.3 What Are Domains ?
 - 4.3.1 Home Page & History
 - Check Your Progress – 3
- 4.4 Web Space
 - 4.4.1 Web Space Functions
 - 4.4.2 Web Space Measurement
 - Check Your Progress – 4
- 4.5 ISP Internet Service Providers
 - Check Your Progress – 5
- 4.6 Let Us Sum Up
- 4.7 Answer For Check Your Progress
- 4.8 Glossary
- 4.9 Assignment
- 4.10 Activity
- 4.11 Case Study
- 4.12 Further Reading

4.0 Learning Objectives :

After reading this Unit, you will be able to:

- How Internet Works ?
- Types of Networks
- Different types of topology
- Advantages and disadvantages of topologies

4.1 Introduction to IP Address :

The IP address is a 32-bit address that consists of two components.

- One component is the network portion of the address, consisting of the network bits.
 - The network bits make up the left portion of the address.
 - They consist of the first bit up to some boundary, to be discussed later.

- The second component is the host portion of the address, consisting of the host bits.
- The host bits make up the right portion of the address.
- They consist of the remaining bits not included with the network bits.



Fig. 1 : 32 Bit Address

❖ **Network and host number :**

- Every network in a TCP/IP internet is assigned a unique network number
- Each host on a specific network is assigned a host number or host address that is unique within that network
- Host's IP address is the combination of the network number (prefix) and host address (suffix)

❖ **Properties of IP address :**

- Network numbers are unique
- Host addresses may be reused on different networks; combination of network number prefix and host address suffix will be unique
- Assignment of network numbers must be coordinated globally; assignment of host addresses can be managed locally

❖ **Format of IP address :**

- IP designers chose 32-bit addresses
- Allocate some bits for prefix, some for suffix
 - o Large prefix, small suffix – many networks, few hosts per network
 - o Small prefix, large suffix – few networks, many hosts per network
- Because of variety of technologies, need to allow for both large and small networks

❖ **Classes of IP address**

- Designers chose a compromise – multiple address formats that allow both large and small prefixes
- Each format is called an address class
- Class of an address is identified by first four bits

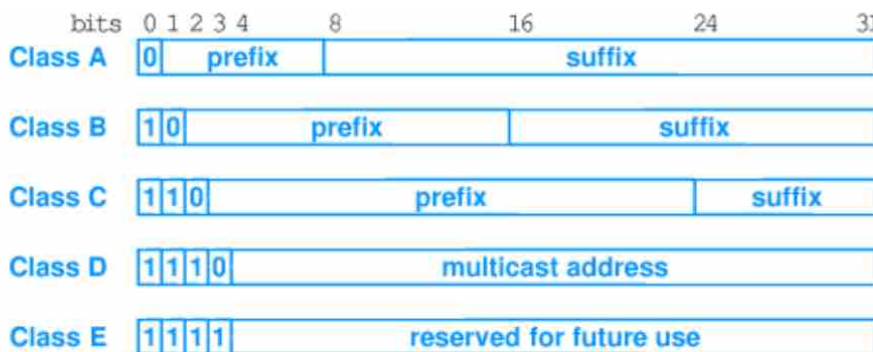


Fig. 2 : Classes of IP address

❖ **Using IP address classes :**

- A, B and C are primary classes
 - Used for ordinary host addressing
 - Class D is used for multicast, a limited form of broadcast
 - o Internet hosts join a multicast group
 - o Packets are delivered to all members of group
 - o Routers manage delivery of single packet from source to all members of multicast group
 - o Used for m-bone (multicast backbone)
 - Class E is reserved
- Because this is not a standard feature.

❑ **Check Your Progress – 1 :**

1. The IP address is _____ bit.
[A] 32 [B] 58 [C] 20 [D] 60
2. Prefix means
[A] Network Number [B] IP
[C] TCP [D] None of this
3. Suffix means
[A] Host Address [B] Address [C] IP [D] None of this
4. Network numbers are
[A] Unique [B] Same [C] Simple [D] None of this

4.2 What is a URL ?

Every server on the Internet has an IP number, a unique number consisting of 4 parts separated by dots. The IP number is the server's address.

165.113.245.2

128.143.22.55

However, it is harder for people to remember numbers than to remember word combinations. So, addresses are given "word-based" addresses called URLs. The URL and the IP number are one and the same.

The standard way to give the address of any resource on the Internet that is part of the World Wide Web (WWW). A URL looks like this :

http://www.matisse.net/seminars.html

telnet://well.sf.ca.us

gopher://gopher.ed.gov/

The URL is divided into sections :

Transfer/transport protocol server (or domain). Generic top level domain/
path/filename


The first part of a URL defines the transport protocol.

http:// (HyperText Transport Protocol) moves graphical, hypertext files
ftp:// (File Transfer Protocol) moves a file between 2 computers

gopher:// (Gopher client) moves text-based files news : (News group reader) accesses a discussion group telnet:// (Telnet client) allows remote login to another computer



Here's an example :

- http is the protocol
 - www.vrml.k12.la.us is the server
 - tltc/ is the path
 - mainmenu.htm is the filename of the page on the site
1. You do not have to enter, most browsers will add that information when you press Enter or click the  button at the end of the Address Bar.
 2. To view recently visited Web sites, click the down arrow at the end of the address field.
 3. When you start typing a frequently used Web address in the Address bar, a list of similar addresses appears that you can choose from. And if a Web-page address is wrong, Internet Explorer can search for similar addresses to try to find a match.
 4. The URL must be typed correctly. If you get a ?Server Does Not Have A DNS Entry ? message, this message tells you that your browser can't locate the server (i.e. the computer that hosts the Web page). It could mean that the network is busy or that the server has been removed or taken down for maintenance. Check your spelling and try again later.

❑ Check Your Progress – 2 :

1. Every Server on the internet has an

[A] IP Number	[B] Phone Number
[C] TCP	[D] None of this
2. "Word-based" addresses called

[A] URLs	[B] IP	[C] Data	[D] TCP
----------	--------	----------	---------
3. The first part of a URL defines the

[A] Transport Protocol	[B] TCP
[C] IP	[D] None of this
4. HTTP means

[A] Hypertext Transport Protocol	[B] Hydro Text Transfer Protocol
[C] Hybrid Text Transfer Protocol	[D] None of this

4.3 What are Domains ?

Domains divide World Wide Web sites into categories based on the nature of their owner, and they form part of a site's address, or uniform resource locator (URL). Common top-level domains are :

.com-commercial enterprises	.mil-military site
.org-organization site (non-profits, etc.)	.int-organizations established by international treaty
.net-network	.biz-commercial and personal
.edu-educational site (universities, schools, etc.)	.info-commercial and personal
.gov-government organizations	.name-personal sites

Additional three-letter, four-letter, and longer top-level domains are frequently added. Each country linked to the Web has a two-letter top-level domain, for example .fr is France, .ie is Ireland.

4.3.1 Home Page & History :



Go to Tools on the menu bar and click Internet Options. The following window opens with the General tab active.

To Set the Home page :

With the desired home page active in the web browser window, click Use Current. The URL is placed in the Address field.

- Click Apply to set the new home page.
- Click OK to close the Internet Options box.

To Make Changes to History :

- Specify the number of days pages are to be kept in history.
- Click on Clear History to remove all web pages visited since last cleared.

❑ **Check Your Progress – 3 :**

1. .com means
 [A] Commercial Enterprises [B] Comparative Enterprises
 [C] Common Enterprises [D] None of this
2. .mil means
 [A] Military Site [B] Meal Site [C] Moral Site [D] None of this
3. .net means
 [A] Network [B] Internet [C] Data [D] None of this
4. .name means
 [A] Personal Sites [B] Several Sites
 [C] Some Sites [D] None of this

4.4 Web Space :

The web space, also known as storage space or disk space, generally refers to the amount of space on a web server that is allocated to website owners by the web hosting companies. It is made up of the total quantity of all text files, images, scripts, databases, emails and other files related to your website.

Having an idea of the web space demands for your web presence will help you choose the right web hosting plan configuration. Thus, you will feel secure about the online availability of your uploaded content and hence – for your web image. This will make your uploaded content always available online and your virtual profile – invulnerable to shortage in resources.

4.4.1 Web Space Functions :

The web space can serve two basic purposes. In the first place, it allows you to upload file information (HTML files, image files, etc.) on the World Wide Web where it will be available at a global scale. Second, this resource enables you to store various files that are not visible to website visitors but play an important role for the proper functioning of your website.

Some of the popular 'invisible' files taking up web space on the server where your website is located are PHP files, database files and CGI program files. PHP files are stored on the server with a .php extension and are used for various important on-site activities such as order form processing for online stores, poll results management, etc. Databases, in turn, store data such as product codes, customer details, etc., which is retrieved by PHP scrips and CGI programs. CGI programs serve for processing data inputs from online forms, which require that the collected information be stored on the website's server.

Other web space occupying files worth mentioning include externally linked CSS files and JavaScript files. External CSS files, responsible for defining the style elements of a web page, are stored on the web hosting server and linked to each web page requiring them. JavaScript files, also linked to web pages needing them, lie in the basis of dynamic drop-down menus, visitor counters, etc., i.e. they work for increasing the interactivity of a website.

Log files are other website-related data containers that eat up your allocated web space. They contain important details about your website visitors' behaviour, generated through requests sent from your website to the web server. The email accounts and the separate email messages are also considered as disk space consumers. The storage amount they occupy is usually added to the web space quota of the regular web hosting plans.

As you can see, the web space you need to launch a website on the World Wide Web is not used only for accommodating files visible to the visitor's eye. It also refers to storing files and programs that lie in the background of a website, but are responsible for supporting its interactivity, dynamic content, statistics and e-mail communication. In this light, when estimating your web space demands, you need to first total the quantity of your website files on your computer and then add approximately estimated space for databases, emails, log files, etc. In view of your website's future smooth expansion, you should add at least half of the whole estimated space to the calculation you have made so far. Now it will be much easier for you to find the right web hosting account configuration.

4.4.2 Web Space Measurement :

The web space is generally measured in bytes, kilobytes (1,000 bytes), megabytes (1,000 kilobytes) and gigabytes (1,000 megabytes) on both personal computers and web servers. Since disk space has lately become a comparatively cheap web hosting resource, it is usually offered in gigabyte quantities with standard plans. Megabytes are represented with "MB" and gigabytes with "GB". A popular web hosting trick is to represent disk space in smaller units, in order to impress the customers.

❑ Check Your Progress – 4 :

1. The web page also known as
[A] Storage Space [B] Disk Space
[C] A & B both [D] None of this
2. 1 Kilobytes is _____ bytes
[A] 1,000 [B] 10,000 [C] 100 [D] 10
3. "MB" means
[A] Megabytes [B] Multibytes [C] Moral bytes [D] None of this
4. "GB" means
[A] Gigabytes [B] Grave bytes [C] Grid-bytes [D] None of this

4.5 ISP Internet Service Providers :

An ISP (Internet service provider) is an organization that provides access to the Internet. Internet service providers can be community-owned, private, for profit and non profit.

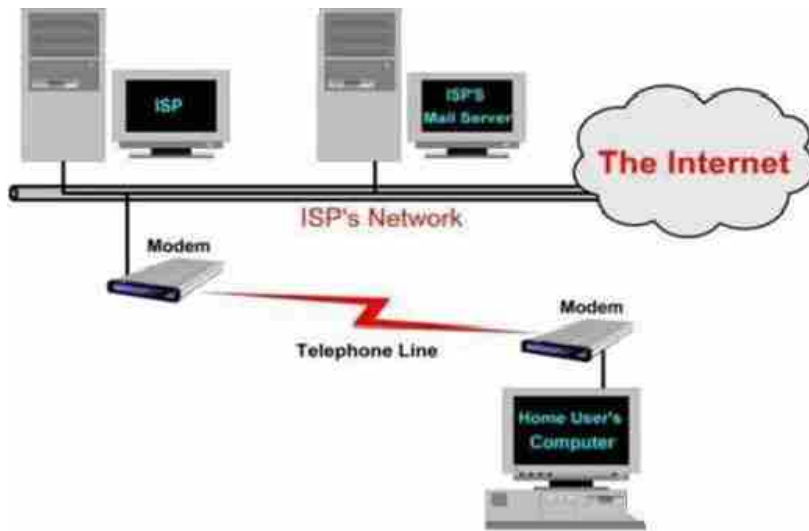


Fig. : How internet service provider works

The following areas have to be looked after carefully while choosing an internet service provider for your home or for your business :

- **Availability of the Network** – Check for the network expansion of the IPS. If the particular IPS is not providing internet services in your area or if you fall under the out-of-signal range, then there is no point in opting that particular IPS.
- **Cost and the Special Packages Available** – The cost of the Internet service is always important. Compare the cost of various Internet Service Providers and then choose the one who is cheap and reliable. You can also choose a comfortable package based on your amount of internet usage.
- **Payment Plans** – Payment plans like online payment or payment through post etc have to be looked in carefully since you cannot afford to run every time to a nearby outlet to make the payments.
- **Connection Speed** – This is the cause of major competition between the ISPs. There is no point in going for a low cost connection that has got very low speed. Choose a company that often upgrades its connection speed.
- **Modem Ratio** – Modem ratio determines the speed of the network accessibility. Check for the modem ratio of the IPS. The lesser the modem ratio is, the higher the speed is. Prefer a less modem ratio service provider.
- **Effective Customer Support** – The customer service offered is always much important. Check whether 24*7 Customer Support facilities are available. How soon do they address the problems or issues raised by the server ? Check for phone-in customer care support and also support through chat etc. Checking the charges they collect for technical assistance is also important.
- **Other Special Features** – You must also consider the special features offered by your service provider. The features could be anything like the number of emails provided by the IPS, the spam control services, virus protection services, chat room facilities available etc.

☐ Check Your Progress – 5 :

1. ISP means

[A] Internet Service Provider	[B] Internet Software Provider
[C] Internet System Provider	[D] None of this

2. _____ is an organization that provides access to the internet.
[A] ISP [B] IP [C] TCP [D] None of this
3. _____ determines the speed of the network accessibility.
[A] Modern Ration [B] Internet
[C] ISP [D] None of this
4. _____ of the internet service is always important.
[A] Cost [B] Internet [C] Data [D] None of this

4.6 Let Us Sum Up :

In this Unit we have studied what is extranet and its function. An extranet is therefore neither an Intranet nor an Internet site. It is rather a supplementary system providing, for example, the clients of an enterprise, its partners or its subsidiaries with privileged access to certain computer resources of the enterprise via a Web interface. Having an idea of the web space demands for your web presence will help you choose the right web hosting plan configuration. Thus, you will feel secure about the online availability of your uploaded content and hence – for your web image. Domains divide World Wide Web sites into categories based on the nature of their owner, and they form part of a site's address, or uniform resource locator (URL).

4.7 Answer for Check Your Progress :

- Check Your Progress 1 :**
 1. [A] 32
 2. [A] Network Number
 3. [A] Host Address
 4. [A] Unique
- Check Your Progress 2 :**
 1. [A] IP Number
 2. [A] URLs
 3. [A] Transport Protocol
 4. [A] Hypertext Transport Protocol
- Check Your Progress 3 :**
 1. [A] Commercial Enterprises
 2. [A] Military Site
 3. [A] Network
 4. [A] Personal Sites
- Check Your Progress 4 :**
 1. [C] A & B both
 2. [A] 1,000
 3. [A] Megabytes
 4. [A] Gigabytes
- Check Your Progress 5 :**
 1. [A] Internet Service Provider
 2. [A] ISP
 3. [A] Modern Ration
 4. [A] Cost

4.8 Glossary :

- **Back** – Lets you return to pages you've viewed, beginning with the most recent. Right-click the Back button and select from a list of recently visited sites.
- **Forward** – Lets you move forward through pages you've viewed using the Back button. Right-click the Forward button and select from a list of recently visited sites.

- **Stop** – Halts the process of downloading a Web page. Click this if you want to stop downloading a page for any reason for example, if you're having trouble downloading it or if you don't want to wait for it to download. Then try downloading it again or browse elsewhere.
- **Refresh** – Updates any Web page stored in your disk cache with the latest content. When you return to a page that you've visited, your browser displays the file stored in your disk cache, rather than the current page on the World Wide Web. If a web page doesn't come up the whole way or is taking abnormally long to load, try the Refresh or Reload button – sometimes this will load the page better.
- **Home** – Returns you to your home page. You can designate any Web page as your home page.
- **Search** – Displays a choice of popular Internet search engines in the left pane. Your search results appear in the left pane, too. When you click a link, the page appears in the right pane, so you don't lose sight of your search results.
- **Favourites** – Displays a list of the sites you have marked. Click any item in the list to jump to it.
- **History** – Shows a list of Web sites you've visited.

4.9 Assignment :

1. What is IP address in computer ? list important of it
2. What is web space ? discuss the need of it
3. How Internet Service Provider (ISP) works ?

4.10 Activity :

1. In various type of computer network role of IP address

4.11 Case Study :

1. Give steps how to set Home Page, How to clear history in web browser

4.12 Further Reading :

1. Introduction to Networking Recharad McMohan Tata McGraw Hill Publication
2. Computer Network Fundamentals and application – R S Rajesh Vikas Publication
3. Microsoft Windows 2000 Professional – Paul Cassel Techmedia SAMS Publication
4. HTML Black Book – Steven Holzner – Dreamtech Press
5. HTML, Java Script, DHTML, PERL, CGI – Evan Bayross – BPB

BLOCK SUMMARY :

In Block 1 we have studied :

- Internet and how internet works ?
- Connections to the Internet
- Topology and its types
- Network and its types
- Internet and Extranet differences
- Applications of Internet
- Introduction to VPN
- IP address
- Domain name
- Web space and its requirements

BLOCK ASSIGNMENT :

❖ **Short Answer Questions :**

- (1) How Internet works ?
- (2) How VPN works ?
- (3) Explain IP address and their classes ?
- (4) Web space and functions : Write short notes on :

❖ **Long Questions :**

- (1) Discuss various type of connection of Internet .
- (2) What is Topology discuss important of it in computer network
- (3) Compare Internet and Intranet
- (4) What is VPN ? How it Works
- (5) What is Domain Name ? Discuss domain name need

❖ **Enrolment No. :**

1. How many hours did you need for studying the units ?

Unit No.	1	2	3	4
No. of Hrs.				

2. Please give your reactions to the following items based on your reading of the block :

Items	Excellent	Very Good	Good	Poor	Give specific example if any
Presentation Quality	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Language and Style	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Illustration used (Diagram, tables etc)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Conceptual Clarity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Check your progress Quest	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Feed back to CYP Question	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____

3. Any other Comments

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**Dr. Babasaheb Ambedkar
Open University Ahmedabad**

BCAR-104

Introduction to Internet Technologies and HTML

BLOCK 2 : NETWORK CONNECTION & APPLICATION OF INTERNET

- UNIT 5 NETWORK CONNECTION
- UNIT 6 APPLICATION OF INTERNET-I
- UNIT 7 APPLICATION OF INTERNET-II
- UNIT 8 COMPUTER NAME AND WORK GROUP

NETWORK CONNECTION & APPLICATION OF INTERNET

Block Introduction :

In this block, we shall study about network connection and the application of internet.

Unit 5 talks about network connection, ISP, IP and IPv6, transmission control protocol (TCP), client server and about DNS.

In Unit 6, we will learn about the application of internet–I, the World Wide Web, search engine, web servers and news group.

Unit 7 talks about the application of internet–II, web portal and vortal, blogs, and remote login.

Unit 8 focus about the windows operating system and its important aspects of computer network that known as 'Computer Name ' and 'Work Group '

By the completion of this block, we will be clear and have a thorough understanding about the ISP and network connection, the IP and IPv6, the TCP, about client server and also about the DNS.

Block Objectives :

- To understand various type of network connections.
- To focus on IP, IPv6 with TCP protocols with client server DNS
- To understand www, search engine, webservers, news groups.
- To understand portal, blogs and distance base login (remote)
- To understand windows OS, Computer name, work group for computer network.

Block Structure :

Unit 5 : Network Connection

Unit 6 : Application of Internet–I

Unit 7 : Application of Internet–II

Unit 8 : Computer Name and Work Group

UNIT STRUCTURE

- 5.0 Learning Objectives
- 5.1 Introduction
 - 5.1.1 Types of Network Connection
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 - 5.2.1 IPV4 Address Example
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- 5.7 Answers For Check Your Progress
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- 5.11 Case Study
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5.0 Learning Objectives :

After studying this unit, you will be able to understand :

- How Internet Works ?
- Internet service providers and network connections
- IP & IPV6
- Transmission control protocol/ Internet protocol
- Client server technology
- Domain name system

5.1 Introduction :

Network Connections provides connectivity between your computer and the Internet, a network, or another computer. With Network Connections, you can configure settings to reach local or remote network resources or functions.

Network Connections combines Microsoft® Windows® NT 4.0 Dial-Up Networking with features that were formerly located in the Network Control Panel, such as network protocol and service configuration. Each connection in the Network Connections folder contains a set of features that creates a link between your computer and another computer or network. By using Network Connections, performing a task, such as modifying a network protocol, is as easy as right-clicking a connection and then clicking Properties.

5.1.1 Types of Network Connection :

1. Gateway Access
2. Dial-up Connection
3. Leased Connection
4. DSL
5. Cable Modem Connection
6. VSAT

❖ Gateway Access :

Gateway Access is also known as Level-One connection. It is the access to the Internet from a network, which is not on the Internet. The gateway allows the two different types of networks – to talk to each other. But the users of the Gateway Internet have limited access to the Internet. They might not be able to use all the tools available on Internet. The local Internet Service Provider (ISP) normally defines this limitation. Good example of network with Level One connectivity within India is that of VSNL (Videsh Sanchar Nigam Limited). All access to Internet from India is through VSNL gateway.

❖ Dial-Up Connection :

‘Dial-up’ connection is also known as Level Two connection. This provides connection to Internet through a dial-up terminal connection. The computer, which provides Internet access, is known as ‘Host’ and the computer that receives the access, is ‘Client’ or ‘Terminal’. The client computer uses modem to access a – host and acts as if it is a terminal directly connected to that host. 56K modem access is now widely available and supported by most ISPs. It allows user to surf the Web at 56 Kbps with graphics. So this type of connection is also known as ‘Remote Modem Access’ connection. And the host to which the client gets connected is actually connected to the Internet by a full time connection (See Leased Connection).

In dial-up connection to Internet, Host carries all the command that are typed on a client machine and forward them to Internet. It also receives the data or information from the Internet on behalf of the ‘Client’ and passes it to them. The client computer acts as a ‘dumb’ terminal connected to remote host.

This type of connection can further be divided into three categories.

❖ Shell Connection :

In this type of Internet Connection, the user will get only textual matter of a Web Page. This connection does not support Graphics display. Shell Accounts were the only type of Internet access available for many years before the Internet entered in to the world of graphics and became more users friendly.

❖ **TCP/IP Connection :**

Today's graphical World Wide Web browsers provide easier access with multimedia sound and pictures. The major difference between Shell and TCP/IP account is that, Shell account can only display text and does not support graphics display, whereas TCP/IP can display both.

❖ **ISDN :**

ISDN (Integrated Services Digital Network) offers Internet connectivity at speeds of up to 128 Kbps through the use of digital phone lines. ISDN is a dial-up service that has been provided by telephone companies for many years.

To access any of these dial-up accounts you need the followings;

- Computer
- Modem
- Telephone Connection
- Shell or TCP/IP/ISDN account from the ISP
- Internet client software such as Internet browser

❑ **Check Your Progress – 1 :**

1. Network connections provides connectivity between _____ and _____.
[A] Person, Computer [B] Computer, Computer
[C] Computer, Intranet [D] None of this
2. Gateway access is known as _____.
[A] Level Two Connection [B] Level Three Connection
[C] Level Four Connection [D] Level One Connection
3. Which connection is known as level two connection ?
[A] Gateway Access [B] Dialup Connection
[C] DSL [D] VSAT
4. ISDN means _____.
[A] Integrated Service Digital Network
[B] Integrated Software Digital Network
[C] Integrated System Digital Network
[D] None of this

❖ **Leased Connection :**

Leased connection is also known as direct Internet access or Level Three connection. It is the secure, dedicated and most expensive, level of Internet connection. With leased connection, your computer is dedicatedly and directly connected to the Internet using high-speed transmission lines. It is on-line twenty four hours a day, seven days a week.

❖ **DSL Connection :**

Digital Subscriber Line (DSL) is a family of technologies that provides digital data transmission over the wires of a local telephone network. DSL originally stood for digital subscriber loop. In telecommunications marketing, the term DSL is widely understood to mean Asymmetric Digital Subscriber Line (ADSL), the most commonly installed DSL technology. DSL service is delivered

simultaneously with wired telephone service on the same telephone line. This is possible because DSL uses higher frequency bands for data separated by filtering. On the customer premises, a DSL filter on each outlet removes the high frequency interference, to enable simultaneous use of the telephone and data.

The data bit rate of consumer DSL services typically ranges from 256 kbit/s to 40 Mbit/s in the direction to the customer (downstream), depending on DSL technology, line conditions, and service-level implementation. In ADSL, the data throughput in the upstream direction, (the direction to the service provider) is lower, hence the designation of asymmetric service. In Symmetric Digital Subscriber Line (SDSL) services, the downstream and upstream data rates are equal.

Advantages :

- **Security :** Unlike cable modems, each subscriber can be configured so that it will not be on the same network. In some cable modem networks, other computers on the cable modem network are left visibly vulnerable and are easily susceptible to break in as well as data destruction.
- **Integration :** DSL will easily interface with ATM and WAN technology.
- High bandwidth
- Cheap line charges from the phone company.
- Good for ‘bursty’ traffic patterns

Disadvantages :

- **No current standardization :** A person moving from one area to another might find that their DSL modem is just another paperweight. Customers may have to buy new equipment to simply change ISPs.
- **Expensive :** Most customers are not willing to spend more than \$20 to \$25 per month for Internet access. Current installation costs, including the modem, can be as high as \$750. Prices should come down within 1–3 years. As with all computer technology, being first usually means an emptier wallet.
- **Distance Dependence :** The farther you live from the DSLAM (DSL Access Multiplexer), the lower the data rate. The longest run lengths are 18,000 feet, or a little over 3 miles.

❖ Cable Modem Connection :

A cable modem is a type of Network Bridge and modem that provides bi-directional data communication via radio frequency channels on a HFC and RFoG infrastructure. Cable modems are primarily used to deliver broadband Internet access in the form of cable Internet, taking advantage of the high bandwidth of a HFC and RFoG network. They are commonly deployed in Australia, Europe, Asia and Americas.

Advantages :

- **Always Connected :** A cable modem connection is always connected to the Internet. This is advantageous because you do not have to wait for your computer to ‘log on’ to the Internet; however, this also has the disadvantage of making your computer more vulnerable to hackers.
- **Broadband :** Cable modems transmit and receive data as digital packets, meaning they provide high-speed Internet access. This makes cable modem connections much faster than traditional dial-up connections.

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- **Bandwidth :** Cable modems have the potential to receive data from their cable provider at speeds greater than 30 megabits per second; unfortunately, this speed is rarely ever realized. Cable lines are shared by all of the cable modem users in a given area; thus, the connection speed varies depending upon the number of other people using the Internet and the amount of data they are receiving or transmitting.
- **File Transfer Capabilities :** Downloads may be faster, but uploads are typically slower. Since the same lines are used to transmit data to and from the modem, priority is often given to data travelling in one direction.
- **Signal Integrity :** Cable Internet can be transmitted long distances with little signal degradation. This means the quality of the Internet signal is not significantly decreased by the distance of the modem from the cable provider.
- **Routing :** Cable routers allow multiple computers to be hooked up to one cable modem, allowing several devices to be directly connected through a single modem. Wireless routers can also be attached to your cable modem.
- **Rely on Existing Connections :** Cable modems connect directly to preinstalled cable lines. This is advantageous because you do not need to have other services, such as telephone or Internet, in order to receive Internet through your cable modem. The disadvantage is that you cannot have cable internet in areas where there are no cable lines.

Disadvantages :

- Cable internet technology excels at maintaining signal strength over distance. Once it is delivered to a region, however, such as a neighborhood, it is split among that region's subscribers. While increased capacity has diminished the effect somewhat, it is still possible that users will see significantly lower speeds at peak times when more people are using the shared connection.
- Bandwidth equals money, so cable's advantage in throughput comes with a price. Even in plans of similar speeds compared with DSL, customers spend more per Mb with cable than they do with DSL.
- It's hard to imagine, but there are still pockets of the United States without adequate cable television service. There are far fewer such pockets without residential land-line service meaning cable internet is on balance less accessible in remote areas.

❖ **VSAT :**

Short for very small aperture terminal, an earthbound station used in satellite communications of data, voice and video signals, excluding broadcast television. A VSAT consists of two parts, a transceiver that is placed outdoors in direct line of sight to the satellite and a device that is placed indoors to interface the transceiver with the end user's communications device, such as a PC. The transceiver receives or sends a signal to a satellite transponder in the sky. The satellite sends and receives signals from a ground station computer that acts as a hub for the system. Each end user is interconnected with the hub station via the satellite, forming a star topology. The hub controls the entire operation of the network. For one end user to communicate with another, each transmission has to first go to the hub station that then retransmits it via the satellite to the other end user's VSAT.

Advantages :

Satellite communication systems have some advantages that can be exploited for the provision of connectivity. These are :

- Costs Insensitive to Distance
- Single Platform service delivery (one-stop-shop)
- Flexibility
- Upgradeable
- Low incremental costs per unit

Disadvantages :

However like all systems there are disadvantages also. Some of these are

- High start-up costs (hubs and basic elements must be in place before the services can be provided)
- Higher than normal risk profiles
- Severe regulatory restrictions imposed by countries that prevent VSAT networks and solutions from reaching critical mass and therefore profitability
- Some service quality limitations such the high signal delays (latency)
- Natural availability limits that cannot be mitigated against
- Lack of skills required in the developing world to design, install and maintain satellite communication systems adequately

❖ Wireless ISP :

Wireless is an internet connection offered by businesses with access to a main internet route. Data is downloaded about 50 times faster than dial-up through a direct line-of-sight (LOS) from your home to the provider's antenna. You must have a powered receiving antenna on your property to send and receive data.

Wireless ISP :

- Is always on so there is no need to wait for a lengthy dial-up connection
- Is usually 50 times faster than typical dial-up connections
- Allows you to use the telephone and the internet at same time
- Does not require a cable line
- May cost a few hundred dollars to set up; an antenna with power is required
- You must be able to see the provider's antenna from your antenna for the connection to work-hills, trees and buildings blocking the view will cancel the connection

❖ Satellite ISP :

Satellite is a connection that makes high-speed internet accessible to areas where DSL and cable connections are not yet available. Data is downloaded (received) about 10 times faster than dial-up through a satellite dish attached to your home. Some satellite systems have slower uploading times (sending data) because data must travel over phone lines through a modem. Other systems use the satellite both ways-for uploading and downloading.

Satellite ISP :

- Is always on so there is no need to wait for a lengthy dial-up connection
- Is usually 10 times faster than typical dial-up connections
- Allows you to use the telephone and the internet at same time
- Does not require a cable line
- Is very expensive to set up; an internet satellite dish and satellite modem are required.
- Some satellite providers penalize you for frequent downloads and uploads with a megabyte limit; this should appear in the fine print of your contract, so read carefully and ask questions

5.2 IP & IPV6 :

Internet Protocol Version 6 (IPv6) is a network layer protocol that enables data communications over a packet switched network. Packet switching involves the sending and receiving of data in packets between two nodes in a network. The working standard for the IPv6 protocol was published by the Internet Engineering Task Force (IETF) in 1998. The IETF specification for IPv6 is RFC 2460. IPv6 was intended to replace the widely used Internet Protocol Version 4 (IPv4) that is considered the backbone of the modern Internet. IPv6 is often referred to as the "next generation Internet" because of its expanded capabilities and it's growth through recent large scale deployments. In 2004, Japan and Korea were acknowledged as having the first public deployments of IPv6.

The explosive growth in mobile devices including mobile phones, notebook computers, and wireless handheld devices has created a need for additional blocks of IP addresses. IPv4 currently supports a maximum of approximately 4.3 billion unique IP addresses. IPv6 supports a theoretical maximum of 2¹²⁸ addresses (340, 282, 366, 920, 938, 463, 463, 374, 607, 431, 768, 211, 456 to be exact!). Recent advancements in network technology including Network Address Translation (NAT) have temporarily lessened the urgency for new IP addresses, however, recent estimates indicate that IPv4 addresses could be exhausted as soon as 2012.

IPv6 and IPv4 share a similar architecture. The majority of transport layer protocols that function with IPv4 will also function with the IPv6 protocol. Most application layer protocols are expected to be interoperable with IPv6 as well, with the notable exception of File Transfer Protocol (FTP). FTP uses embedded network layer addresses to facilitate data transmission. An IPv6 address consists of eight groups of four hexadecimal digits. If a group consists of four zeros, the notation can be shortened using a colon to replace the zeros.

A main advantage of IPv6 is increased address space. The 128-bit length of IPv6 addresses is a significant gain over the 32-bit length of IPv4 addresses, allowing for an almost limitless number of unique IP addresses. The size of the IPv6 address space makes it less vulnerable to malicious activities such as IP scanning. IPv6 packets can support a larger payload than IPv4 packets resulting in increased throughput and transport efficiency.

A key enhancement over IPv4 is native support for mobile devices. IPv6 supports the Mobile IPv6 (MIPv6) protocol which enables mobile devices to switch between networks and receive a roaming notification regardless of physical location. MIPv6 is a hallmark of the protocol and was specified as a firm

requirement during the design of IPv6. The IETF has separate specifications for MIPv6 that detail data structure, messaging, and security requirements.

Auto-configuration is another IPv6 enhancement that is considered a great benefit to network administrators. IPv6 devices can independently auto-configure themselves when connected with other IPv6 devices. Configuration tasks that can be carried out automatically include IP address assignment and device numbering. An IPv6 router has the ability to determine its own IPv6 address using data link layer addressing parameters. The IETF has issued RFC 2462 to set guidelines for IPv6 auto-configuration.

The IPv6 protocol improves upon IPv4 with increased authentication and privacy measures. IPSec security is embedded into the IPv6 specification to manage encryption and authentication between hosts. This built in security framework enables secure data traffic between hosts that is independent of any applications on either host. In this way, IPv6 provides an efficient end to end security framework for data transfer at the host or the network level.

The deployment of IPv6 networks is growing worldwide. Full replacement of IPv4 is expected to take some time, as it remains the most widely used Internet Protocol. The United States, China, and India are leading recent deployments of the IPv6 protocol and have large investments in IPv6 network infrastructure. The United States government has mandated that federal agencies must complete the transition to an IPv6 infrastructure no later than 2008. Software companies are also releasing operating systems that support the IPv6 standard. In 1997, IBM became the first commercial vendor to support IPv6 through its AIX 4.3 operating system. The latest version of Microsoft's Windows operating system, Windows Vista, has full IPv6 support enabled by default.

❑ Check Your Progress – 2 :

1. DSL means

[A] Digital Subscriber Line	[B] Digital Subscriber Link
[C] Direct Subscriber Link	[D] None of this
2. _____ is a type of network bridge and modem.

[A] Network Modem	[B] Cable Modem
[C] DSL	[D] VSAT
3. LOS means

[A] Line-of-sight	[B] Link-of-sight
[C] Line-of-source	[D] Link-of-source
4. IETF means

[A] Internet Engineering Task Force
[B] Internet Engineering Take Force
[C] Internet Engineering Task Force
[D] Internet Engineering Task Force

5.2.1 IPv4 Address Example :

An example ip-address :

69.89.31.226

The above ip-address is in the dotted decimal number format. An ip address is in the format of 4 sets of decimal numbers separated by dots. The decimal number in each and every set is in the range 0 to 255. Each and every set is called octet. So, there are 4 octets in an ip address.

However systems understand ip-address only in the binary format. So, when you configure your system with an ip-address in a dotted decimal number format, it is converted to a binary number format internally by the system as shown below.

```
01000101010110010001111111100010  
(Or)  
01000101.01011001.00011111.11100010
```

IPv4 IP address is 32 bit numbers. In the above binary format, there are total of 32 binary numbers. Each and every binary number that are separated by the dot is converted to its corresponding binary number. There are total of 4 bytes here.

Each and every octet can have a value from 0 to 255. Since there are 4 octets in an ip-address, the total possible combination of unique ipv4 ip addresses are 4,294,967,296.



5.2.2 IPv6 Address Example :

IPv4 stands for Internet Protocol Version 4. Most of the networks and systems in the internet is currently configured for IPv4. Since IPv4 ip address has only 32 bits (a total of 4,294,967,296 unique ip-addresses), the ip addresses in the internet are running out quickly. Please note that there is a big block of these ip addresses are reserved for special purposes (for example, private network and multicast addresses).

IPv6 stands for Internet Protocol Version 6. Since there is a possibility that we might run out of ip address in the internet, IPv6 was developed. IPv6 ip address has 128 bits. This is a huge improvement from the 32 bit ipv4 ip address. While lot of networks are getting configured for both IPv4 and IPv6, there is still a huge number of networks and systems in the internet that works only for IPv4. But eventually all these systems might go towards the IPv6 route.

IPv6 ip address is typically written in hexadecimal separated by colon. A colon separates 16 bit. The following is an example of IPv6 address :

```
2002:4559:1FE2::4559:1FE2
```

Leading zeros can be truncated. For example ?0000 ? can be just written as empty. In the above example : indicates that it has multiple 0 ?s in that location. Typically the IPv6 format can be written down in three ways 1) compressed, 2) uncompressed and 3) fully uncompressed as shown below. All of the following are the same :

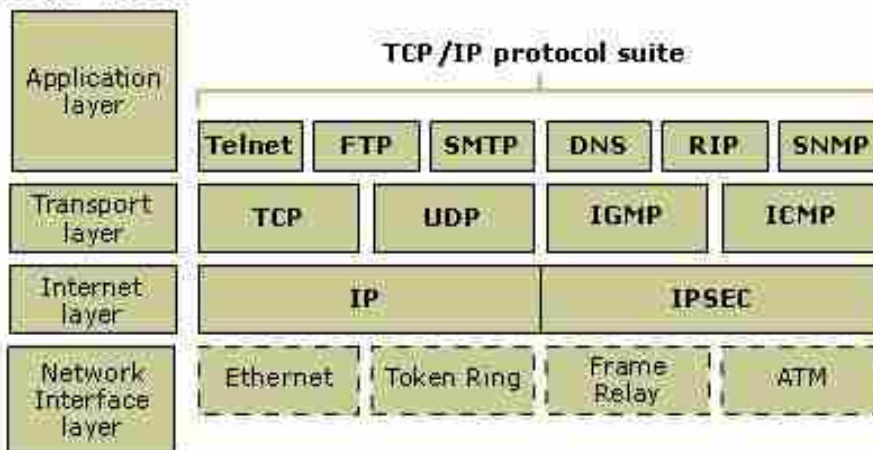
- IPv6 Compressed (0000 is not displayed) –
2002:4559:1FE2::4559:1FE2

- IPv6 Uncompressed (0000 is displayed as 0) –
2002:4559:1FE2:0:0:0:4559:1FE2
- IPv6 Fully Uncompressed (0000 is fully displayed) –
2002:4559:1FE2:0000:0000:0000:4559

5.3 TCP/IP (Transmission Control Protocol / Internet Protocol) :

TCP/IP is based on a four-layer reference model. All protocols that belong to the TCP/IP protocol suite are located in the top three layers of this model. As shown in the following illustration, each layer of the TCP/IP model corresponds to one or more layers of the seven-layer Open Systems Interconnection (OSI) reference model proposed by the International Standards Organization (ISO).

TCP/IP model



TCP/IP Protocols

Many protocols make up the suite of protocols commonly referred to as TCP/IP protocols. IP is the network layer protocol of the TCP/IP suite. We will now examine some of the more common protocols that make up TCP/IP.

5.3.1 Internet Control Message Protocol (ICMP) :

ICMP is a control protocol used mainly by routers to control the movement of packets and for reporting network problems. It is also commonly used for manual troubleshooting of IP networks. ICMP is a network layer protocol and is an integral part of IP. ICMP is a message based protocol and some of the message types are :

- Destination Unreachable
- Echo Request and Reply
- Redirect
- Time Exceeded

When an ICMP destination-unreachable message is sent by a router, it means that the router is unable to send the packet to its final destination. The router then discards the original packet. A destination may be unreachable because the source host has specified a nonexistent address or the router does not have a route to the destination.

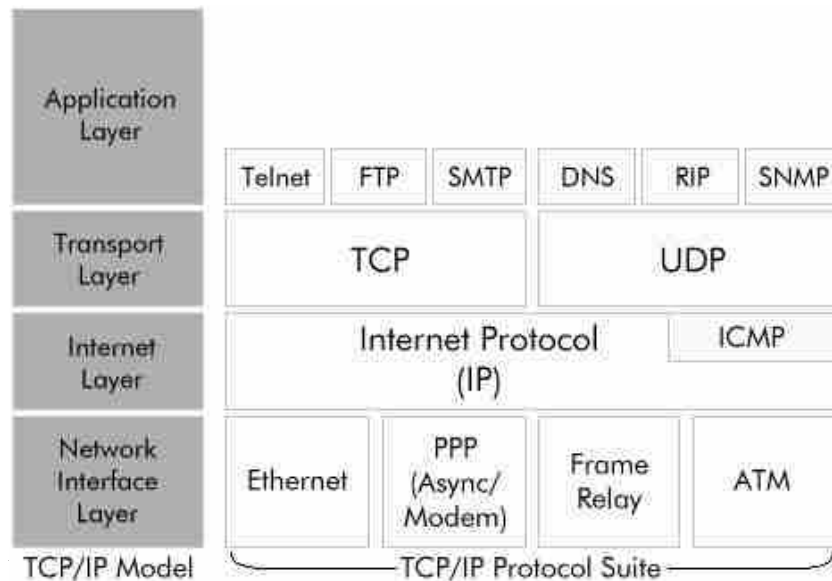
Echo requests (commonly called a "ping") are generated by the "ping" command and are used to determine if hosts are reachable across the network. Echo replies are sent in response to echo requests. The ping command is used to test network problems such as routing configurations and is the first tool to use when diagnosing communication issues on IP networks.

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An ICMP redirect message is designed to inform hosts of more efficient routes to destinations. Thus if a router receives a packet that would be better forwarded by a different router then it will still forward the packet but will also send an ICMP Redirect message to the sending host to tell it of the better route. This does not mean the host will always act upon this information.

An ICMP Time-exceeded message is sent by a router if an IP packet's Time-to-Live field (expressed in hops or seconds) reaches zero. The Time-to-Live field prevents packets from continuously circulating the network if the network contains a routing loop. The router then discards the original packet.

For more information on the ICMP protocol please refer to RFC 792.



TCP provides a reliable data delivery mechanism between two hosts on the IP network. TCP ensures that data is delivered by numbering packets for identification and retransmitting packets that are not received. TCP is a connection oriented protocol which means two hosts make a TCP connection and then uses that connection to communicate reliably. The TCP connection needs to be established prior to communication and torn down after it is finished. Data transmission cannot begin until the establishment phase is complete.

A TCP connection is identified uniquely using a combination of the IP address of the host and a TCP port number which is associated with an upper layer application level protocol. Application level protocols usually have their own well known port numbers associated with them. TCP is the transport protocol for many well known application level protocols such as TELNET, FTP (File Transfer Protocol) and SMTP (Simple Mail Transfer Protocol).

❑ Check Your Progress – 3 :

1. OSI means
 - [A] Open Systems Interconnection [B] Open Security Interconnection
 - [C] Open Software Interconnection [D] None of these
2. ISO means
 - [A] International System Organization
 - [B] International Software Organization
 - [C] International Standard Organization
 - [D] None of these

3. ICMP is a control protocol used mainly by _____.

[A] Cable	[B] Routers
[C] Wifi	[D] None of these

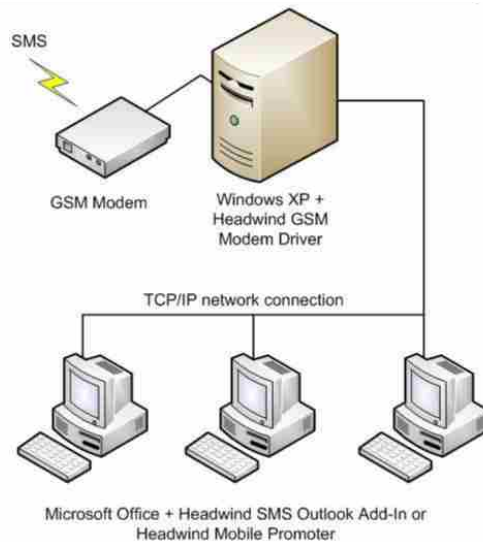
4. FTP means

[A] File Transaction Protocol	[B] Function Transfer Protocol
[C] Folder Transfer Protocol	[D] File Transfer Protocol

5.4 Client–Server Architecture :

If several people in the office need to communicate with remote personnel via SMS, it is not necessary to equip each computer with a GSM modem. Headwind SMS suite allows to share one GSM modem between several computers. The computer connected with a GSM modem (server) must be equipped with Headwind GSM Modem Driver, which uses DCOM (Distributed Component Object Model) technology to provide access to the SMS capabilities to other computers (clients) in the network.

This solution may be particularly useful if the office personnel need to send SMS to the contacts from Microsoft Outlook address book. In this case, Headwind SMS Outlook Add–In must be installed on each client computer. It is also necessary to install Headwind GSM Modem Driver on each client computer (but it won't be used so you do not need a license for client copies). When the Outlook user sends a short message through Headwind SMS Outlook Add–In, it connects to the server through DCOM and transfers the message to the GSM modem.



To use DCOM technology, both client and server must be configured manually. The manual for GSM modem sharing is available online and is also included in the distributive of Headwind SMS Outlook Add–In. The architecture has been tested for Windows XP. Currently, we do not recommend using Windows Vista in this architecture because DCOM does not work properly on this system.

❑ Check Your Progress – 4 :

1. CSA means _____.

[A] Client– Server Architecture	[B] Client–System Architecture
[C] Client–Software System	[D] Client–Standard Architecture

2. DCOM means _____.
[A] Direct Component Object Model
[B] Distributed Component Objetc Model
[C] Derived Component Object Model
[D] None of These
3. To use DCOM technology, both _____ and _____ must be configured manually.
[A] Client and Person [B] Client and Computer
[C] Client and Server [D] Client and system
4. _____ SMS suite allows to share one GSM modem between several computers.
[A] TCP [B] Headwind [C] Mindwind [D] IP

5.5 Domain Name System :

DNS is an important protocol in most networks and especially in the Internet as it allows computers and people to use names instead of IP addresses when communicating between hosts. DNS allows names to be associated with IP addresses and provides mechanisms for these pairs to be dynamically updated and the changes propagated throughout the network. Without DNS we would not be able to use names such as "http://www.ml-ip.com/" or http://www.microsoft.com/" when using a web browser or use a command such as : ping my_pc.company.com

DNS resolves these names into IP addresses so that the application can then communicate with the destination host. DNS is actually a network of DNS servers. If one DNS server doesn't know how to translate a particular domain name, it asks another one, and so on, until the correct IP address is returned.

When configuring hosts it is typical to tell the host the IP address of the nearest DNS server(s) as well as the domain name for that domain. The domain name is the portion of the full host name after the host name part. So, for the name "my_pc.company.com", the domain name is "company.com". Domain names are made up of multiple parts separated by periods ("."). The last part is a standard suffix such as "com", "org", "edu", "net" etc. Domain names are allocated by locall domain naming authorities so that the names remain unique for each region. Countries also typically have their own suffix as part of a domain name. Thus, the domain name "mycompany.com.au" would be a commercial organization in Australia.

☐ Check Your Progress – 5 :

1. DNS means _____
[A] Domain Name System [B] Direct Name System
[C] Deem Name System [D] None of these
2. _____ is an important protocol in most networks.
[A] TCP [B] IP [C] DNS [D] DCOM
3. DNS is actually a network of _____.
[A] DNS Systems [B] DNS Software
[C] DNS Sites [D] DNS Servers

4. _____ names are allocated by local domain naming authorities.
- [A] File Transaction Protocol [B]Function Transfer Protocol
 [C] Folder Transfer Protocol [D] File Transfer Protocol

5.6 Let Us Sum Up :

After studied this unit, you will be able to understand

- ISP & Network connection
- IP & IPV6
- TCP/IP
- Client server architecture and its working model
- DNS

5.7 Answers For Check Your Progress :

❑ Check Your Progress 1 :

1. [C] Computer, Intranet 2. [D] Level One Connection
 3. [B] Dialup Connection 4. [A] Integrated Service Digital Network

❑ Check Your Progress 2 :

1. [A] Digital Subscriber Line 2. [B] Cable Modem
 3. [A] Line-of-sight 4. [A] Internet Engineering Task Force

❑ Check Your Progress 3 :

1. [A] Open Systems Interconnection
 2. [C] International Standard Organization
 3. [B] Routers
 4. [D] File Transfer Protocol

❑ Check Your Progress 4 :

1. [A] Client – Server Architecture
 2. [B] Distributed Component Objetc Model
 3. [C] Client and Server
 4. [B] Headwind

❑ Check Your Progress 5 :

1. [A] Domain Name System 2. [C] DNS
 3. [D] DNS Servers 4. [B] None of these.

5.8 Glossary :

- DNS is an important protocol in most networks and especially in the Internet as it allows computers and people to use names instead of IP addresses when communicating between hosts.
- ICMP is a control protocol used mainly by routers to control the movement of packets and for reporting network problems. It is also commonly used for manual troubleshooting of IP networks. ICMP is a network layer protocol and is an integral part of IP.

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- IPv6 stands for Internet Protocol Version 6. Since there is a possibility that we might run out of ip address in the internet, IPv6 was developed. IPv6 ip address has 128 bits
- IPv4 ip address has only 32 bits (a total of 4,294,967,296 unique ip-addresses), the ip addresses in the internet are running out quickly

5.9 Assignment :

1. What is ISP ? mention the role of ISP in internet
2. Compare IP and IPv6
3. Explain Client Server Architecture

5.10 Activity :

1. Mention name of 3 websites names that having domains of .com, .edu, .org

5.11 Case Study :

1. List of Internet Service Providers (ISP) in your city with various plan of speed and rent.

5.12 Further Reading :

- Introduction to Networking Recharad McMohan Tata McGraw Hill Publication
- Computer Network Fundamentals and application – R S Rajesh Vikas Publication
- Microsoft Windows 2000 Professional – Paul Cassel Techmedia SAMS Publication
- Fedora 3 Bible – Christopher Negus Wiley Dreamtech Publication
- HTML Black Book – Steven Holzner – Dreamtech Press
- HTML, Java Script, DHTML, PERL, CGI – Evan Bayross – BPB

UNIT STRUCTURE

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6.0 Learning Objectives :

After reading this Unit, you will be able to :

- World Wide Web
- Search engine
- Web servers
- News group

6.1 Introduction :

A system of Internet servers that support specially formatted documents. The documents are formatted in a markup language called HTML (*Hypertext Markup Language*) that supports links to other documents, as well as graphics, audio, and video files. This means you can jump from one document to another simply by clicking on hot spots. Not all Internet servers are part of the World

Wide Web. There are several applications called Web browsers that make it easy to access the World Wide Web; Two of the most popular being Firefox and Microsoft's Internet Explorer. World Wide Web is not synonymous with the internet.

6.2 WWW (World Wide Web) :

The term WWW refers to the World Wide Web or simply the Web. The World Wide Web consists of all the public Web sites connected to the Internet worldwide, including the client devices (such as computers and cell phones) that access Web content. The WWW is just one of many applications of the Internet and computer networks.

The World Web is based on these technologies :

- HTML – Hypertext Markup Language
- HTTP – Hypertext Transfer Protocol
- Web servers and Web browsers
- HTTP – the Hypertext Transfer Protocol – provides a standard for Web browsers and servers to communicate. The definition of HTTP is a technical specification of a network protocol that software must implement.
- HTTP is an application layer network protocol built on top of TCP. HTTP clients (such as Web browsers) and servers communicate via HTTP request and response messages. The three main HTTP message types are GET, POST, and HEAD.
- HTTP utilizes TCP port 80 by default, though other ports such as 8080 can alternatively be used.
- The current version of HTTP in widespread use – HTTP version 1.1 – was developed to address some of the performance limitations of the original version – HTTP 1.0. HTTP 1.1 is documented in RFC 2068.

Following are some of the key differences in features of Web Server and Application Server :

- Web Server is designed to serve HTTP Content. App Server can also serve HTTP Content but is not limited to just HTTP. It can be provided other protocol support such as RMI/RPC
- Web Server is mostly designed to serve static content, though most Web Servers have plug-in to support scripting languages like Perl, PHP, ASP, JSP etc. through which these servers can generate dynamic HTTP content.
- Most of the application servers have Web Server as integral part of them that means App Server can do whatever Web Server is capable of. Additionally App Server have components and features to support Application level services such as Connection Pooling, Object Pooling, Transaction Support, Messaging services etc.
- As web servers are well suited for static content and app servers for dynamic content, most of the production environments have web server acting as reverse proxy to app server. That means while servicing a page request, static contents (such as images/Static HTML) are served by web server that interprets the request. Using some kind of filtering technique (mostly extension of requested resource) web server identifies dynamic content request and transparently forwards to app server

Example of such configuration is Apache Tomcat HTTP Server and Oracle (formerly BEA) Web Logic Server. Apache Tomcat HTTP Server is Web Server and Oracle Web Logic is Application Server.

In some cases the servers are tightly integrated such as IIS and .NET Runtime. IIS is web server. When equipped with .NET runtime environment, IIS is capable of providing application services.

❑ **Check Your Progress – 1 :**

1. WWW means
[A] World Wide Web [B] World White Web
[C] World Wide Work [D] None of these
2. HTML means _____
[A] High Text Mark Language [B] Hypertext Markup Language
[C] High Text Markup Language [D] None of These
3. HTTP means
[A] Hypertext Transfer Protocol [B] High Text Transfer Protocol
[C] Hypertext Transaciton Protocol [D] None of these
4. HTTP utilizes TCP_____ by default.
[A] Port 90 [B] Port 60 [C] Port 80 [D] Port 10

6.3 Search Engine :

On the Internet, a search engine is a coordinated set of programs that includes :

- A spider (also called a "crawler" or a "bot") that goes to every page or representative pages on every Web site that wants to be searchable and reads it, using hypertext links on each page to discover and read a site's other pages
- A program that creates a huge index (sometimes called a "catalog") from the pages that have been read
- A program that receives your search request, compares it to the entries in the index, and returns results to you

An alternative to using a search engine is to explore a structured directory of topics. Yahoo, which also lets you use its search engine, is the most widely-used directory on the Web. A number of Web portal sites offer both the search engine and directory approaches to finding information.

❖ **Different Search Engine Approaches :**

- Major search engines such as Google, Yahoo (which uses Google), AltaVista, and Lycos index the content of a large portion of the Web and provide results that can run for pages – and consequently overwhelm the user.
- Specialized content search engines are selective about what part of the Web is crawled and indexed. For example, Tech Target sites for products such as the AS/400 (<http://www.search400.com>) and CRM applications (<http://www.searchCRM.com>) selectively index only the best sites about these products and provide a shorter but more focused list of results.

- Ask Jeeves (<http://www.ask.com>) provides a general search of the Web but allows you to enter a search request in natural language, such as "What's the weather in Seattle today ?"
- Special tools and some major Web sites such as Yahoo let you use a number of search engines at the same time and compile results for you in a single list.
- Individual Web sites, especially larger corporate sites, may use a search engine to index and retrieve the content of just their own site. Some of the major search engine companies' license or sell their search engines for use on individual sites.

6.3.1 Spider/Crawler :

Each major search engine has one or more spider. These show up in server logs as unique user agents. 'Polite' spiders identify their parent search engine. For example the Google spider identifies itself as 'Googlebot'.

A spider is a program run by a search engine to build a summary of a website's content (*content index*). Spiders create a text-based summary of content and an address (URL) for each webpage.

When a person searches, the keyword(s) they enter are compared with the available website content indexes. Due to the large number of webpages indexed, direct text-only-matching is rare, rather search engines use sophisticated logics (*algorithms*) to rank potential matches. For example, the underlying information hierarchy of a webpage (semantic markup) may be factored into the ranking a webpage is assigned.

A spider will only index the **text-based content of your website**. Images (such as photos or graphical-text), video and Flash elements require supplementary HTML-text to be 'seen' by a spider.

❑ Check Your Progress – 2 :

1. Spider also called
[A] Crawler [B] Bot
[C] Both [A] and [B] [D] None of these
2. A program that creates a huge index is called _____.
[A] Catalog [B] Spider
[C] Datalog [D] Search Engine
3. Each major search has one or more _____.
[A] website [B] Spider [C] Server [D] System
4. _____ will only index the text-based content of your website.
[A] Website [B] System [C] Spider [D] webpages

6.3.2 Top 10 Search Engines :

SEARCH ENGINE	ALEXA RANK*	UNIQUE VISITORS**
	1	182 M
	4	173 M
	22	162 M
	30	69 M
	662	1 M
	1583	77 K
	3750	NA
	3861	NA
	4501	3 M
	11827	24 K

Alexa Traffic Rank* (global). *Monthly Unique Visitor* estimates from Compete.com (U.S. only). Updated for 2014.

6.4 Web Servers :

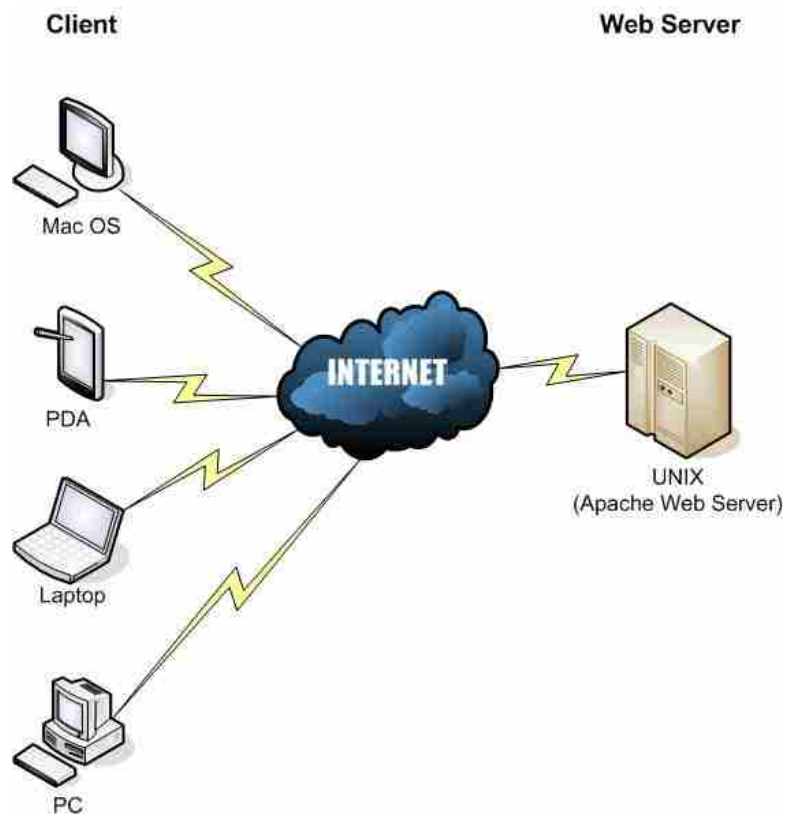
A Web server is a program that, using the client/server model and the World Wide Web's Hypertext Transfer Protocol (HTTP), serves the files that form Web pages to Web users (whose computers contain HTTP clients that forward their requests). Every computer on the Internet that contains a Web site must have a Web server program. Two leading Web servers are Apache, the most widely-installed Web server, and Microsoft's Internet Information Server (IIS). Other Web servers include Novell's Web Server for users of its NetWare operating system and IBM's family of Lotus Domino servers, primarily for IBM's OS/390 and AS/400 customers.

Web servers often come as part of a larger package of Internet- and intranet-related programs for serving e-mail, downloading requests for File Transfer Protocol (FTP) files, and building and publishing Web pages. Considerations in choosing a Web server include how well it works with the operating system and other servers, its ability to handle server-side programming, security characteristics, and publishing, search engine, and site building tools that may come with it.

6.4.1 Introduction to JSP :

Java Server Pages (JSP) is a technology based on the Java language and enables the development of dynamic web sites. JSP was developed by Sun Microsystems to allow server side development. JSP files are HTML files with special Tags containing Java source code that provide the dynamic content. The following shows the Typical Web server, different clients connecting via the Internet to a Web server. In this example, the Web server is running on UNIX and is the very popular Apache Web server

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First static web pages were displayed. Typically these were people's first experience with making web pages so consisted of My Home Page sites and company marketing information. Afterwards Perl and C were languages used on the web server to provide dynamic content. Soon most languages including Visual basic, Delphi, C and Java could be used to write applications that provided dynamic content using data from text files or database requests. These were known as CGI server side applications. ASP was developed by Microsoft to allow HTML developers to easily provide dynamic content supported as standard by Microsoft's free Web Server, Internet Information Server (IIS). JSP is the equivalent from Sun Microsystems, a comparison of ASP and JSP will be presented in the following section.

The following diagram shows a web server that supports JSP files. Notice that the web server also is connected to a database.

JSP source code runs on the web server in the JSP Servlet Engine. The JSP Servlet engine dynamically generates the HTML and sends the HTML output to the client's web browser.

❑ Check Your Progress – 3 :

1. IIS means

[A] Internet Information Server	[B] Inter Information Server
[C] Intranet Information Server	[D] None of these
2. Full form of FTP is _____.

[A] Function Transfer Protocol	[B] File Transfer Protocol
[C] Function Transaction Protocol	[D] None of these
3. Full form of JSP is _____.

[A] Java Server Pages	[B] Java System Pages
[C] Java Structure Pages	[D] Java Structure Pages

4. _____ was developed by sun microsystems.
[A] ISP [B] WWW [C] JSP [D] FTP

6.5 News Group :

A newsgroup is a discussion about a particular subject consisting of notes written to a central Internet site and redistributed through Usenet, a worldwide network of news discussion groups. A newsgroup is a discussion about a particular subject consisting of notes written to a central Internet site and redistributed through Usenet, a worldwide network of news discussion groups. Usenet uses the Network News Transfer Protocol (NNTP).

Newsgroups are organized into subject hierarchies, with the first few letters of the newsgroup name indicating the major subject category and sub-categories represented by a subtopic name. Many subjects have multiple levels of subtopics. Some major subject categories are : news, rec (recreation), soc (society), sci (science), comp (computers), and so forth (there are many more). Users can post to existing newsgroups, respond to previous posts, and create new newsgroups.

Newcomers to newsgroups are requested to learn basic Usenet netiquette and to get familiar with a newsgroup before posting to it. A frequently-asked question is provided. The rules can be found when you start to enter the Usenet through your browser or an online service. You can subscribe to the postings on a particular newsgroup.

❑ Check Your Progress – 4 :

1. JSP source code runs on the _____.
[A] Webserver [B] Webpages
[C] Websites [D] None of these
2. The JSP search engine dynamically generates _____.
[A] HTTP [B] HTML [C] CSS [D] JSP
3. Newspaper group is a discussion about a _____.
[A] Particular Subject [B] State
[C] Nation [D] None of these
4. NNTP means _____.
[A] Net News Transfer Protocol
[B] Network News Transaction protocol
[C] Network News Transfer Protocol
[D] None of this

6.5.1 Big 8 News Group :

Newsgroups are sorted into a hierarchy, which represents them much like a family tree. The most basic categories that newsgroups are sorted into are known as top-level hierarchies. There are eight top-level hierarchies that are carried by almost all newsgroup hosts, which are known as the 'Big 8'. These hierarchies are :

- comp.* – computer-related discussions
- humanities.* – literature, religion, history, etc. discussions
- misc.* – any newsgroup that doesn't belong in another hierarchy

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- news.* – discussions regarding Usenet itself (creation/removal of newsgroups, abuse issues, etc.)
- rec.* – discussions regarding recreation of all types
- sci.* – discussions of scientific topics
- soc.* – current events & societal issues, as well as simple socializing ("chatting")
- talk.* – discussions of sensitive topics; newsgroups here tend to include very lively debates, where soc.* is more casual

Under these broad umbrellas is where individual newsgroups can be found. Let's examine the rec.* hierarchy as an example. rec.sport is a newsgroup devoted to sporting in general, but it is so general that not many users choose to post there. A step deeper would contain newsgroups devoted to particular sports, rec.sport.football being an example. This newsgroup is still a bit too general; there is nothing to distinguish between American or European style football. Going even further into the hierarchy, newsgroups such as rec.sport.football.college can be found. This could go further and further into newsgroups devoted to particular teams or regions.

In addition to the Big 8, there is also an alt.* hierarchy which has much more relaxed guidelines for the newsgroups it contains. Short for 'alternative,' this hierarchy was meant to contain newsgroups that would not be allowed in any of the Big 8, particularly for taboo topics. However, because of its lax nature, the alt.* hierarchy has many innocuous newsgroups that might seem better placed in a different hierarchy. Generally, alt.* topics have a narrower focus than those in other newsgroups – discussing a single player as opposed to a sports team in general, for example.

After finding a newsgroup that interests you, it is necessary to subscribe to the newsgroup. This tells your newsgroup software which groups you would always like to see, so that it isn't necessary to browse through the hierarchies every time you connect.

Once you have subscribed to a newsgroup, your software will display all of the headers in the newsgroup. An article's header is the same as the subject line in an email, a concise summary of the content in an article. Replies to an article will have "RE :" in their headers, again behaving just like email. Some newsgroups have hundreds of thousands of articles, especially through a high retention host like Giganews, and most newsgroup software allows you to limit how many headers to obtain at once to conserve resources. Reading an article is as simple as selecting its header.

Replying to an article is about as simple as writing an email, but before sending anything to a newsgroup; some things should be said about the accepted conventions of posting in newsgroups. Newsgroups are one of the oldest group communication forums on the Internet, and quite a few users today have been accessing them for a number of years. Some of the norms established by the newsgroup community over the years have even been adopted in other forms of online communication like email and message boards. For example, the term 'spam' was first used to describe unsolicited advertisements posted in newsgroups. Many of the rules of Netiquette (Internet etiquette) also developed in the newsgroups. Observing the rules of Netiquette is probably the most important thing to do when posting to a newsgroup. Netiquette rules are largely unspoken,

and explaining them is a subject all its own, but the best practice is to keep your articles well-composed and civil. Most newsgroups are peer-moderated, meaning that the users themselves enforce the rules, and a "Golden Rule" attitude is the best way to respect that : as a user, post only what you would like to see posted.

❑ Check Your Progress – 5 :

1. _____ are organised into subject hierarchies.
[A] WWW [B] JSP
[C] Newsgroup [D] Search Engine
2. Comp means
[A] Computer related discussions [B] Computer related group
[C] Computer interaction [D] None of these
3. Humanities means _____.
[A] Literature discussions [B] Religion discussions
[C] History discussions [D] All of these
4. Sci meas _____.
[A] Discussion of scientific topics [B] Discussion of current topics
[C] Discussion of social topics [D] None of these

6.6 Let Us Sum Up :

After studied this unit, you will be able to understand :

- Search engine and its uses
- Web servers and its function
- News group and its uses
- Spider and crawlers

6.7 Answer For Check Your Progress :

❑ Check Your Progress 1 :

1. [A] World Wide Web 2. [B] Hypertext Markup Language
3. [A] Hypertext Transfer Protocol
4. [C] Port 80

❑ Check Your Progress 2 :

1. [C] Both [A] and [B] 2. [A] Catalog
3. [B] Spider 4. [C] Spider

❑ Check Your Progress 3 :

1. [A] Internet Information Server
2. [B] File Transfer Protocol
3. [A] Java Server Pages 4. [C] JSP

❑ Check Your Progress 4 :

1. [A] Webserver 2. [B] HTML
3. [A] Particular Subject 4. [C] Network News Transfer Protocol

❑ **Check Your Progress 5 :**

1. [C] Newsgroup
2. [A] Computer related discussions
3. [D] All of these
4. [C] Discussion of social topics

6.8 Glossary :

- A Web server is a system that delivers content or services to end users over the Internet. A Web server consists of a physical server, server operating system (OS) and software used to facilitate HTTP communication.
- **Internet technologies :** This WhatIs.com glossary contains terms related to Internet technologies, including definitions about port numbers, standards and protocols and words and phrases about how the Internet works.
- **Internet applications :** This WhatIs.com glossary contains terms related to Internet applications, including definitions about Software as a Service (SaaS) delivery models and words and phrases about web sites, e-commerce...
- **Server :** In information technology, a server is a computer program that provides services to other computer programs (and their users) in the same or other computers.
- **Vint Cerf (Vinton Gray Cerf) :** Vint Cerf (Vinton Gray Cerf) is an American computer scientist best known as an Internet pioneer. With engineer Bob Kahn, Cerf developed the TCP/IP protocol suite and the architecture that enabled...
- **SYN flood (half open attack) :** SYN flooding is a method that the user of a hostile client program can use to conduct a denial-of-service (DOS) attack on a computer server.

6.9 Assignment :

1. What is search engine ? List out some popular search engine
2. What is search engine ? give the functions of it
3. What is News groups and its use

6.10 Activity :

1. Compare any 3 News groups with its characteristics

6.11 Case Study :

1. List out 3 – 3 website names that has Http and Https extensions

6.12 Further Reading :

- Introduction to Networking Recharad Mc Mohan Tata McGraw Hill Publication
- Computer Network Fundamentals and application – R S Rajesh Vikas Publication
- Microsoft Windows 2000 Professional – Paul Cassel Techmedia SAMS Publication
- Fedora 3 Bible – Christopher Negus Wiley Dreamtech Publication
- HTML Black Book – Steven Holzner – Dreamtech Press
- HTML, Java Script, DHTML, PERL, CGI – Evan Bayross – BPB

UNIT STRUCTURE

7.0 Learning Objectives

7.1 Introduction

7.2 Web Portal

Check Your Progress – 1

7.3 Today's Portal

7.3.1 What a Portal Does

7.3.2 What are The Major Functions of Portals ?

7.3.3 A Portal Should

7.4 Personalization

7.4.1 Types of Personalization

Check Your Progress – 2

7.5 Architecture of The Portal

Check Your Progress – 3

7.6 Types of Portals

Check Your Progress – 4

7.7 Vortal

7.8 Blogs

7.8.1 Micro Blogging

7.9 Remote Login

Check Your Progress – 5

7.10 Let Us Sum Up

7.11 Answer For Check Your Progress

7.12 Glossary

7.13 Assignment

7.14 Activity

7.15 Case Study

7.16 Further Reading

7.0 Learning Objectives :

After reading this unit you will be able to understand :

- What is Web portal
- Different Types of portal
- What is Personalization
- Vortal

- Blogs and micro blogging
- Remote login
- Architecture of portal

7.1 Introduction :

Portals are often the first page the web browser loads when users get connected to the Web or that users tend to visit as an anchor site. Personalization is vital to the delivery of appropriate information to portal users : each user gets only the information which is specifically tailored to his/her needs. Personalization should be based on user roles, as well as user preferences. Vortal is also short for voice portal.

7.2 Web Portal :

Initially, the term portal was used to refer to well-known Internet search and navigation sites that provided a starting point for web consumers to explore and access information on the World Wide Web. The original portals were search engines. The initial value proposition was to offer a full text index of document content and a chance to take advantage of the hyperlinking capabilities built into the web protocols. Internet navigation sites, such as Yahoo!, Excite, Info seek, AOL, MSN, Netscape Net center and Lycos, represented the next phase of portal development. The term "Internet portal" (or "web portal") began to be used to describe these mega-sites because many users used them as a "starting point" for their web surfing.

❑ Check Your Progress – 1 :

1. _____ is a vital to the delivery of appropriate information.
[A] Personalization [B] Standardization
[C] Socialization [D] None of these
2. _____ also short for voice portal.
[A] VORTAL [B] PORTAL [C] SORTAL [D] None of these
3. The original portals were _____.
[A] Search Engine [B] Webpage
[C] WWW [D] None of these
4. The term "Internet Portal" _____.
[A] Web Portal [B] Website [C] Webpage [D] None of these

7.3 Today's Portal :

Portals are often the first page the web browser loads when users get connected to the Web or that users tend to visit as an anchor site. They offer users a surplus value of service based on the features of classic search engines : a well-trained concierge who knows where to search and find; a well-assorted newspaper kiosk that keeps the latest market information about the surfer's personal stocks ready; free communications possibilities like email or discussion boards. Thus, the traditional virtual roadhouses –the search engines– become feel-good entrance halls, gateways to the internet, easy, one-stop embarkation points for the daily Web-surfing sessions. The hope behind the idea of a portal : surfer start their voyage into the web in a modern entrance hall, and preferably find their way back to the starting point without major difficulty.

7.3.1 What a Portal Does :

- Enables universal login
- Handles both structured and unstructured data
- Facilitates multi-channel consistency
- Facilitates messaging and notification
- Automated tuning : pervasive content can be tuned based on personalization, location, browser, etc.
- Integration to other systems

❖ Key features of portals :

- Security
- Access different data
- Transactions
- Search
- Publish Content
- Personal Content

❖ What a portal is not :

- It is not just a **Website** (which is usually characterized by static information)
- It is not just a personalized **intranet**
- It is not just a personalized **extranet**
- It is not just a personalized front end for **business applications**
- It is not just **groupware**
- It is not just a personalized **knowledge management solution**
- It is not just a sophisticated **search engine**

Instead, a portal is nothing less than just one personalizable, browser based user interface to all the components mentioned above.

7.3.2 What Are The Major Functions of Portals ?

According to the analyst and consulting firm – as described in their study "Enterprise Portals : New Strategies for Information Delivery", 2000 – the ideal portal is based on eight functionality areas :

- search and navigation
- information integration (content management)
- personalization
- notification (push technology)
- task management and workflow
- collaboration and groupware
- integration of applications and business intelligence
- infrastructure functionality

7.3.3 A Portal Should :

- automatically present its users with the information appropriate to the user's role

- suggest additional information to the user, and/or allow the user to voluntarily personalize the information presented by the portal
- allow the user to search for information that was not previously known to be relevant to the user's role, but which may be available through the portal

7.4 Personalization :

Personalization is vital to the delivery of appropriate information to portal users : each user gets only the information which is specifically tailored to his/her needs. Personalization should be based on user roles, as well as user preferences.

There are several types of personalization :

- Personalization of navigation
e.g. shortcuts to specific information, mostly known as bookmarks or favourites
- Personalization of data/content
e.g. which stocks do I want to see in my stock ticker
- Personalization of layout
e.g. what information appears where on the screen, in which format, color or size

An important high-level distinction exists between :

- Design personalization
the initial appearance of the portal, which may be 'pre-personalized' according to the user's role
- Voluntary personalization
where the user is offered a menu of personalization options to choose from
- Involuntary personalization
where the system itself unilaterally makes decisions for the user according to 'guesses' about user preferences

7.4.1 Types of Personalization :

- Personalization of navigation
e.g. shortcuts to specific information, mostly known as bookmarks or favourites
- Personalization of data/content
e.g. which stocks do I want to see in my stock ticker
- Personalization of layout
e.g. what information appears where on the screen, in which format, color or size

An important high-level distinction exists between :

- Design personalization the initial appearance of the portal, which may be 'pre-personalized' according to the user's role
- Voluntary personalization where the user is offered a menu of personalization options to choose from

- Voluntary personalization where the user is offered a menu of personalization options to choose from
- Voluntary personalization where the user is offered a menu of personalization options to choose from

❑ Check Your Progress – 2 :

1. Portal is not just a _____
[A] Website [B] Webpage [C] Webserver [D] None of these
2. Portal is not just a sophisticated _____
[A] Browser [B] Search Engine
[C] Webpage [D] None of these
3. _____ should be based on user roles.
[A] Personalization [B] Socialization
[C] Socialization [D] None of these
4. Where the user is offered a menu of personalization _____
[A] Involuntary Personalization [B] Voluntary Personalization
[C] Design Personalization [D] None of these

7.5 Architecture of The Portal :

If you bring to mind once again the eight functionalities of an ideal portal and then take a look at real portals, that is portal projects already put into action, you will probably notice some discrepancies : Some portals may attach importance to collaboration while others lay stress on notification, depending on the specific needs of the portal's clientele, but also on the technological capabilities of the portal's carrier. Most of today's portal solutions meet the requirements of only single functionalities, thus providing a partial solution for particular problem areas. This is exactly where the theoretical distinction between horizontal and vertical portals becomes crucial.

❖ Definition of Horizontal Portal :

Horizontal portals target the entire Internet community. These sites, often referred to as "mega portals", usually contain search engines and provide the ability for user to personalize the page by offering various channels (i.e. access to other information such as regional weather, stock quotes or news updates). Voluntary personalization where the user is offered a menu of personalization options to choose from Yahoo! and Lycos constitute mega portals. These portals are also gateways to contents and services of other offers.

❖ Definition of Vertical Portal :

According to Gartner Group, vertical portals differ only in their more specific objects and contents from horizontal portals; the technology employed remains the same. Most of the times, vertical portals offer information and services customized to niche audiences about a particular area of interest. Vertical industry portals, known as vortals, are sites that provide a gateway to information related to a particular industry, such as, insurance, automobiles, etc. There are innumerable possibilities for establishing special vertical portals on the market. The numerous solutions can be divided into 3 major groups that partially overlap :

- **Corporate Portals :** provide personalized access to selected information of a specific company

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- **Commerce Portals** : support business-to-business and business-to-consumer e-commerce
- **Pervasive Portals** : support access via Pervasive Devices such as PDAs. Particularly this type of vertical portal will have a great stake in the future.
- ❖ **Common Architecture of Horizontal and Vertical Portal :**

Yet, no matter what type of portal – they all should conform to a basic architecture. Vertical portals make only sense if they are not established independently, but as a particular occurrence of a common platform – that is the horizontal portal. This horizontal portal performs and fulfills all the functionalities of an ideal portal discussed above.

The basic architecture of portals is depicted in figure. The middle part encompasses all the functionalities and services of an ideal portal, the horizontal portal. These functionalities should at least in part be fulfilled by any portal, no matter how narrow its focus. The bottom part – connectivity services – should be able to integrate any data type that comes into question. Finally, the upper area corresponds to the user interface which enables the presentation of all data and applications.

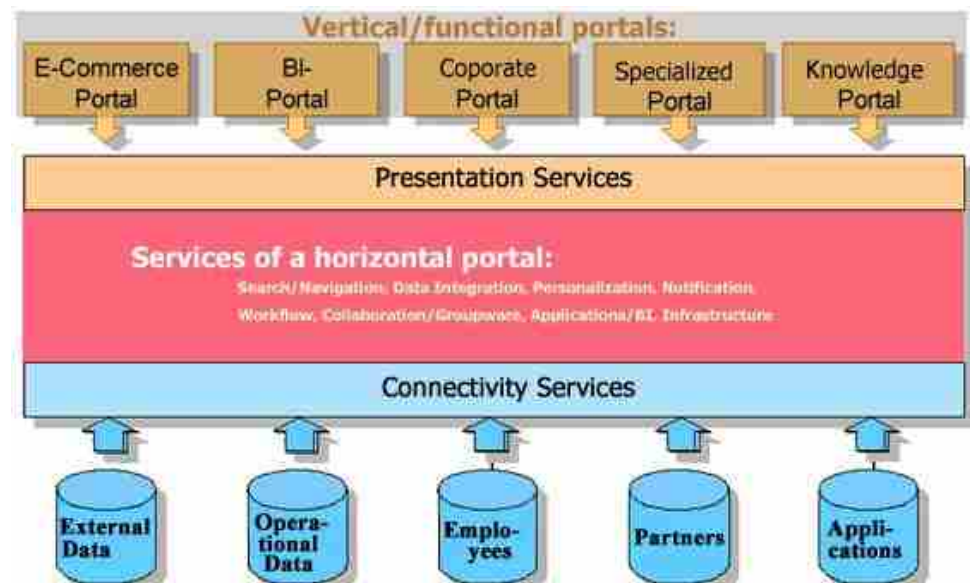


Fig. : Architecture of the portal

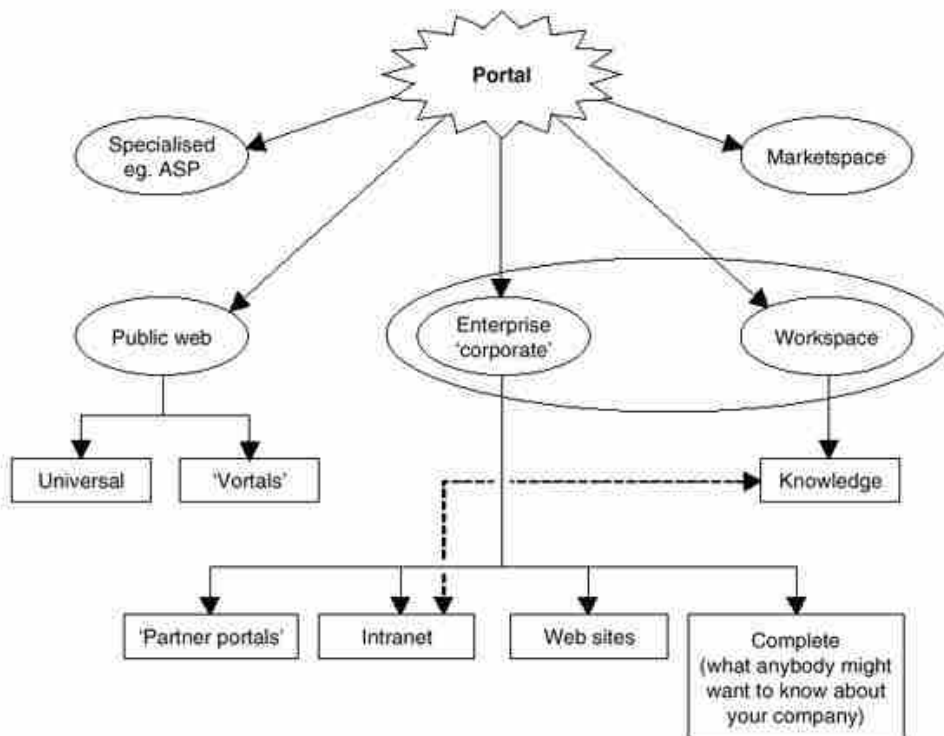
❑ **Check Your Progress – 3 :**

1. _____ portals target the entire internet community.
[A] Vertical [B] Horizontal [C] Simple [D] None of these
2. Horizontal sites, often referred as _____.
[A] "Mega Portal" [B] "Beta portal"
[C] "Giga Portal" [D] None of these
3. _____ should be based on user roles.
[A] Contents, Service [B] Person, Computer
[C] Information, Technology [D] None of these
4. Vertical industry portals known as _____.
[A] Horizontal [B] Portals [C] Vortals [D] None of these

7.6 Types of Portals :

❖ Specialized Portals :

A hierarchy of portal types



Specialized portals are designed for a specific purpose. One such specialized portal is an ASP (Application Service Provider) portal that provides its customers with access to applications via an extranet or the Internet.

❖ Market space Portals :

Market space portals exist to support business-to-business or business-to-consumer e-commerce.

❖ Major functionalities :

- software support for e-commerce transactions
- ability to find and access rich information about the products on sale
- ability to participate in discussion groups with other vendors and/or buyers

Public web portals exist to provide easy-to-use and attractive services to the public.

❖ Major functionalities :

- extensive search and/or navigation system
- great variety of service offerings
- mega-sites used as "starting point" for the web surfing

❖ Enterprise Portals :

An enterprise portal (sometimes called a corporate portal) provides personalized access to an appropriate range of information about a particular company.

Enterprise portals have become one of the hottest new technologies of the Internet. Initially called intranet portals – enterprise portals existing for the benefit of the company's own employees, this set of technologies has developed to assist and provide access to a company's business partners (suppliers, customers) as well.

As opposed to public web portals, enterprise portals aim at providing a virtual workplace for each individual using them – executives, employees, suppliers, customers, third-party service providers. Rather than offering access to consumer goods, services, and information, enterprise portals are designed to give each individual using them access to all of the information, business applications, and services needed to perform their jobs.

A company's public Website itself is not automatically a corporate portal. It can become one if the Website provides personalization and navigation functionality, as many is beginning to do.

More advanced enterprise portal solutions provide access via mobile devices, such as cell phones, PDA's, handheld PC's etc. facilitating on the road work, decision making, and business processes.

❖ **Workspace Portals :**

A workspace portal is a single, coherent, integrated portal that presents its users with all the information they need to carry out their jobs.

According to the workspace portal represents the radical vision of a portal providing the user interface people always wanted and never had : A user interface making available all the information necessary for an employee's job role. The current alternatives to a workspace portal are specialized portals and/or the contemporary Windows desktop. Thus, the advantages workspace portals have to offer over these alternatives ought to be evident and convincing.

A 'complete' enterprise portal – an enterprise portal that provides efficient personalization with the appropriate information – is a promising candidate for a workspace portal.

❖ **Knowledge Portals :**

Knowledge portals increase the effectiveness of knowledge workers by providing easy access to information that is necessary or helpful to them in one or more specific roles. Knowledge portals are not mere intranet portals since the former are supposed to provide extra functionality such as collaboration services, sophisticated information discovery services and a knowledge map.

❖ **Exemplary portal sites :**

- AltaVista
- Excite
- Info seek
- View
- Lycos
- Microsoft's Internet Start
- Netscape's Net center
- Oracle Portal Studio
- Plumtree
- Yahoo!

If you are looking for more in detail statistics and comparisons of web portals, there are many addresses on the web. The Open Directory Project holds an extensive list of portals (over 250 links) with short descriptions of their functionalities. Other in-depth statistics are provided by leading web traffic and usage measurement services such as Media Metrix, net Score, and WebSideStory, Alexa, and Nielsen Net ratings.

❑ Check Your Progress – 4 :

1. ASP means _____.
[A] Affordable System Provider [B] Application System Provider
[C] Application Service Provider [D] None of these
2. Enterprise portals also called _____.
[A] Corporate Portal [B] Horizontal Portal
[C] Vertical Portal [D] Commerce Portal
3. _____ should be based on user roles.
[A] Horizontal [B] Enterprise
[C] Workspace [D] None of these
4. _____ portals increase the effectiveness of knowledge.
[A] Horizontal [B] Enterprise
[C] Knowledge [D] Commerce

7.7 Vortal :

On the Web, a vertical portal (sometimes called a vortal) is a Web site that provides a gateway or portal to information related to a particular industry such as health care, insurance, automobiles, or food manufacturing. (A vertical industry is one that is focused on a relatively narrow range of goods and services, whereas a horizontal industry is one that aims to produce a wide range of goods and services. Because most industry tends to specialize, most industry tends to be vertical.) A term that might also be used is interest community Web site since any vertical industry brings together people sharing an interest in buying, selling, or exchanging information about that particular industry. Vertical portals are also seen as likely business-to-business communities – for example, small business people with home offices might be attracted to a comprehensive vertical portal that provided ideas and product information related to setting up and maintaining the home office.

7.8 Blogs :

A blog (a truncation of the expression web log) is a discussion or informational site published on the World Wide Web and consisting of discrete entries ("posts") typically displayed in reverse chronological order (the most recent post appears first). Until 2009 blogs were usually the work of a single individual occasionally of a small group, and often covered a single subject. More recently "multi-author blogs" (MABs) have developed, with posts written by large numbers of authors and professionally edited. MABs from newspapers, other media outlets, universities, think tanks, advocacy groups and similar institutions account for an increasing quantity of blog traffic. The rise of Twitter and other "micro blogging" systems helps integrate MABs and single-author blogs into societal new streams. Blog can also be used as a verb, meaning to maintain or add content to a blog.

7.8.1 Micro Blogging :

Micro blogging is the practice of posting small pieces of digital content—which could be text, pictures, links, short videos, or other media—on the Internet. Micro blogging offers a portable communication mode that feels organic and spontaneous to many and has captured the public imagination.

Friends use it to keep in touch, business associates use it to coordinate meetings or share useful resources, and celebrities and politicians (or their publicists) micro blog about concert dates, lectures, book releases, or tour schedules. A wide and growing range of add-on tools enables sophisticated updates and interaction with other applications and the resulting profusion of functionality is helping to define new possibilities for this type of communication. Examples of these include Twitter, Face book, Tumblr, and by far the largest WeiBo.

7.9 Remote Login :

Rlogin (remote login) is a UNIX command that allows an authorized user to login to other UNIX machines (hosts) on a network and to interact as if the user were physically at the host computer. Once logged in to the host, the user can do anything that the host has given permission for, such as read, edit, or delete files.

Rlogin is similar to the better known Telnet command. Rlogin is considered useful for simple logins that don't require a lot of control over the client/host interaction, but is thought to be less useful than Telnet where a lot of customization is desired, for multiple sessions, for connections between very distant terminals or to terminals that are not running UNIX, for that matter, since rlogin can only connect to UNIX hosts. A benefit of rlogin is the ability to use a file called .rhosts that resides on the host machine and maintains a list of terminals allowed to login without a password.

A secure version of rlogin (slogin) was combined with two other UNIX utility, ssh and scp, in the Secure Shell suite, an interface and protocol created to replace the earlier utilities.

❑ Check Your Progress – 5 :

1. Verticals portals are also seen likely _____ communities.
[A] Work to work [B] Business-to-Business
[C] Day-to-day [D] None of these
2. _____ is a discussion site publish on the WWW.
[A] Corporate Portal [B] Horizontal Portal
[C] Vertical Portal [D] Commerce Portal
3. MABS means _____.
[A] Multi-author blogs [B] Multi-application bags
[C] More application blogs [D] None of these
4. Rlogin means _____.
[A] Remote Login [B] Auto Login
[C] Dynamic [D] None of these

7.10 Let Us Sum Up :

In this Unit we have studied

- Remote login
- Micro blogging and blog
- Knowledge portal and corporate portal
- Personalization
- Features of portal
- Architecture of common portal like vertical and horizontal

7.11 Answer For Check Your Progress :

☐ Check Your Progress 1 :

1. [A] Personalization
2. [A] VORTAL
3. [A] Search Engine
4. [A] Web Portal

☐ Check Your Progress 2 :

1. [A] Website
2. [B] Search Engine
3. [C] Personalization
4. [A] Voluntary Personalization

☐ Check Your Progress 3 :

1. [B] Horizontal
2. [A] "Mega Portal"
3. [A] Contents, Service
4. [C] Vortals

☐ Check Your Progress 4 :

- 1.[C] Application Service Provider
2. [A] Corporate Portal
- 3.[C] Workspace
4. [C] Knowledge

☐ Check Your Progress 5 :

1. [B] Business-to-Business
2. [B] Business-to-Business
3. [A] Multi-author blogs
4. [A] Multi-author blogs

7.12 Glossary :

- **Rlogin** : Rlogin (remote login) is a UNIX command that allows an authorized user to login to other UNIX machines (hosts) on a network and to interact as if the user were physically at the host computer.
- Micro blogging is the practice of posting small pieces of digital content—which could be text, pictures, links, short videos, or other media—on the Internet.
- A blog (a truncation of the expression web log) is a discussion or informational site published on the World Wide Web and consisting of discrete entries ("posts") typically displayed in reverse chronological order (the most recent post appears first).
- Vortal is also short for voice portal. On the Web, a vertical portal (sometimes called a vortal) is a Web site that provides a gateway or portal to information related to a particular industry such as health care, insurance, automobiles, or food manufacturing.

**Introduction to
Internet Technologies
and HTML**

- Corporate Portals : provide personalized access to selected information of a specific company

7.13 Assignment :

1. What is knowledge portal ? give brief idea of it
2. What is corporate portal ? give brief idea of it
3. What is remote login explain in short

7.14 Activity :

1. Compare blogging and micro blogging

7.15 Case Study :

1. List out only names of 2 portals of B2B (Business to Business) and B2C (Business to Consumer)

7.16 Further Reading :

- Introduction to Networking Rechar McMohan Tata McGraw Hill Publication
- Computer Network Fundamentals and application – R S Rajesh Vikas Publication
- Microsoft Windows 2000 Professional – Paul Cassel Techmedia SAMS Publication
- HTML Black Book – Steven Holzner – Dreamtech Press
- HTML, Java Script, DHTML, PERL, CGI – Evan Bayross – BPB

UNIT STRUCTURE

- 8.0 Learning Objectives
- 8.1 Introduction Computer Name
 - Check Your Progress – 1
- 8.2 Computer Name In Various O/S
 - 8.2.1 'Computer Name' : Rules
 - Check Your Progress – 2
- 8.3 Introduction of Work Group
 - Check Your Progress – 3
- 8.4 Need of Work Group
 - Check Your Progress – 4
- 8.5 Windows Network Sharing Resource
 - 8.5.1 Sharing Printer With Work Group
 - Check Your Progress – 5
- 8.6 Let Us Sum Up
- 8.7 Answer For Check Your Progress
- 8.8 Glossary
- 8.9 Assignment
- 8.10 Activity
- 8.11 Case Study
- 8.12 Further Reading

8.0 Learning Objectives :

After reading this Unit, you will be able to know :

- Important of 'Computer Name'
- 'Computer Name ' and windows Network
- Important of 'Work Group'
- 'Work Group' and 'Computer Name' configuration in Windows OS
- Sharing computer network and sharing resource like printer

8.1 Introduction Computer Name :

Every operating system asks you to give a computer name when you install it on a PC or device. Windows is no exception to this rule. That's because this name is important to identify the computer when it is part of a network.

Your computer's name can be learned by going to "Control Panel > System and Security > System". There you will find a section named "Computer name, domain, and workgroup settings". Look for the entry named "Computer name".

❑ **Check Your Progress – 1 :**

1. Every operating system asks you to give a _____.
[A] Computer name [B] Id
[C] Password [D] None of these
2. Your computer's name can be learned by going to _____.
[A] System>Security>Function
[B] Control Panel>System and Security>System
[C] Control Panel>Notification
[D] None of these
3. Click on the _____ button to start windows.
[A] Start [B] Delete [C] Space [D] Capslock
4. To start MAC OS X click on what ?
[A] Start 1 [B] Delete [C] Apple logo [D] None of these

8.2 Computer Name In Various O/S :

❖ **WINDOWS 7 :**

- Click on the Start button.
- Right-click on Computer.
- Select Properties.
- Under Computer name, domain, and workgroup settings you will find the computer name listed.

❖ **WINDOWS 8/8.1 :**

- Click on the Start button.
- When the launch screen appears, type Computer.
- Right-click on Computer within the search results and select Properties.
- Under Computer name, domain, and workgroup settings you will find the computer name listed.

❖ **WINDOWS 10 :**

- Click on the Start button.
- In the search box, type Computer.
- Right click on This PC within the search results and select Properties.
- Under Computer name, domain, and workgroup settings you will find the computer name listed.

❖ **MAC OS X :**

- Click on the Apple logo in the top left corner.
- Click on System Preferences.
- Click on Sharing.
- The computer name will appear at the top of the window that opens in the Computer Name field.

8.2.1 'Computer Name' : Rules

- In recent versions of Windows such as Windows 10, Windows 7 and Windows 8.1, the computer name can have up to 63 characters in length.
- Best compatibility, however, you should not use more than 15 characters
- A computer name can contain letters, hyphens, and numbers.
- You cannot use blank spaces and special characters like :
` ~ @ # \$ % ^ & () = + [] { } | ; : , ' " . / ? .

❑ Check Your Progress – 2 :

1. In recent computer name can have up to _____ character in length.
[A] 42 [B] 53 [C] 72 [D] 63
2. For best compatibility you should not use more than _____ character.
[A] 15 [B] 40 [C] 25 [D] 35
3. A computer name can contain _____.
[A] Letters [B] Hyphens [C] Numbers [D] All of these
4. You cannot use _____.
[A] Blank Space [B] Special Characters
[C] [A] & [B] both [D] None of these

8.3 Introduction of Work Group :

The workgroup is a collection of computers that are part of the same network. All the computers are peers and do not have control over another computer. The workgroup facilitates the detection of the computers that are part of it and the sharing of resources like folders or printers.

Workgroups are not protected by the use of a password and they can be created only for computers that are part of the same local network. They are designed for small networks like those found in your home or small businesses.

❑ Check Your Progress – 3 :

1. The workgroup is a collection of _____.
[A] Computer [B] Network [C] Cable [D] None of these
2. Workgroup are not protected by the use of a _____.
[A] Id [B] Password [C] Login [D] None of these
3. Workgroup are designed for _____ networks.
[A] Big [B] Distributed [C] Small [D] None of these
4. Workgroup can be useful for identify the various _____.
[A] Server [B] Computer Network
[C] System [D] Website

8.4 Need of Work Group :

- Work Group can be useful for identify the various computer network (LAN / MAN / WAN)
- Work Group is play key role when we having various types of topology of computer network

- It is useful when we need to share some documents / files or data among same network or different network.
- By work group only we can share some hardware resource like printer, plotter, FAX... etc. among various computer network.
- By work group we can assign specific rule for computer or group of network.

Let's take an example of a little three-person office. John, Amy, and Mark are this small office's three employees. Every computer on this network will have its own database of usernames and passwords.

Essentially, a workgroup is "every man for themselves," and there's no central control. Every PC during a workgroup may be a server and a client at an equivalent time. A PC will act as a client when it seeks to access a resource in another PC. The PC which must provide the access to its resources will act as a server during the method of authentication and authorization.

For instance, if Amy wants to use Mark's computer, her username and password got to be created on Mark's computer. And if Mark wants to use Amy's computer, his username and password got to be created on her computer.

❑ Check Your Progress – 4 :

1. A user account is collection of _____ and _____.
[A] Setting [B] Information
[C] [A] & [B] both [D] None of these
2. The user account allows you to _____ to windows.
[A] Authenticate [B] Specification [C] Login [D] None of these
3. By going to the "Control Panel" you can manage your computer's _____.
[A] User [B] Admin [C] Student [D] All of these
4. _____ is the name you are giving to that account.
[A] Username [B] Id [C] Password [D] None of these

8.5 Windows Network Sharing Resource :

❖ User Accounts :

- A user account is a collection of settings and information that tells Windows which files and folders you can access, what you can do on your computer, what are your preferences, and what network resources you can access when connected to a network.
- The user account allows you to authenticate to Windows or any other operating system so that you are granted authorization to use them. Multi-user operating systems such as Windows don't allow a user to use them without having a user account.
- In Windows, you can manage your computer's user accounts by going to the "Control Panel" and then to "User Accounts and Family Safety > User Accounts."

A user account in Windows is characterized by the following attributes :
User name – the name you are giving to that account. Password – the password associated with the user account (in Windows 7 or older versions you can also use blank passwords). User group – a collection of user accounts that share the

same security rights and permissions. A user account must be a member of at least one user group. Type – all user accounts have a type which defines their permissions and what they can do in Windows.

❖ **Administrator :**

The "Administrator" user account has complete control over the PC. He or she can install anything and make changes that affect all users of that PC.

❖ **Standard :**

The "Standard" user account can only use the software that's already installed by the administrator and change system settings that don't affect other users.

❖ **Guest :**

The "Guest" account is a special type of user account that has the name Guest and no password. This is only for users that need temporary access to the PC. This user can only use the software that's already installed by the administrator and cannot make any changes to system settings.

8.5.1 Sharing Printer With Work Group :

- Sharing your local printer with the Homegroup is incredibly easy.
In Windows 8.x, go to PC Settings and then to "Network > HomeGroup". There you will find several switches for sharing with the Homegroup.
- Find the one named "Printers" and set it to "On".
- To remove this setting Find the one named "Printers" and set it to "Off".

Check Your Progress – 5 :

1. _____ user account has complete control over the PC.
[A] Administrator [B] Standard [C] Guest [D] None of these
2. _____ user account can only use the software.
[A] Guest [B] Standard [C] Admin [D] None of these
3. _____ account is a special types of user account.
[A] Admin [B] Standard [C] Guest [D] None of these
4. _____ is the name you are giving to that account.
[A] Student [B] Standard [C] Friend [D] Guest

8.6 Let Us Sum Up :

After studied this unit, you will be able to understand

- Computer Name and it's important
- Various O/S and Computer Name
- Work Group and It's important
- How to share Printer in Work Group

8.7 Answer For Check Your Progress :

Check Your Progress 1 :

1. [A] Computer Name
2. [B] Control Panel>System and Security>System
3. [D]] Capslock
4. [C] Apple logo

- ❑ **Check Your Progress 2 :**
 1. [D] 63
 2. [A] 15
 3. [D] All of these
 4. [C] [A] & [B] both
- ❑ **Check Your Progress 3 :**
 1. [B] Computer
 2. [B] Password
 3. [C] Small
 4. [C] Computer Network
- ❑ **Check Your Progress 4 :**
 - 1.[C] [A] & [B] both
 2. [A] Aunthenticate
 - 3.[A] User
 4. [A] Username
- ❑ **Check Your Progress 5 :**
 1. [A] Administrator
 2. [B] Standard
 3. [C] Guest
 4. [D] Guest

8.8 Glossary :

- A Web server is a system that delivers content or services to end users over the Internet. A Web server consists of a physical server, server operating system (OS) and software used to facilitate HTTP communication.
- **Internet technologies :** This WhatIs.com glossary contains terms related to Internet technologies, including definitions about port numbers, standards and protocols and words and phrases about how the Internet works.
- **Internet applications :** This WhatIs.com glossary contains terms related to Internet applications, including definitions about Software as a Service (SaaS) delivery models and words and phrases about web sites, e-commerce..
- **Server :** In information technology, a server is a computer program that provides services to other computer programs (and their users) in the same or other computers.
- **Vint Cerf (Vinton Gray Cerf) :** Vint Cerf (Vinton Gray Cerf) is an American computer scientist best known as an Internet pioneer. With engineer Bob Kahn, Cerf developed the TCP/IP protocol suite and the architecture that enabled...
- **SYN flood (half open attack) :** SYN flooding is a method that the user of a hostile client program can use to conduct a denial-of-service (DOS) attack on a computer server.

8.9 Assignment :

1. How can we set Compute Name in Desktop
2. What is Work Group, List out important of it
3. Give steps to install printer in Computer network

8.10 Activity :

1. Various Operating System and How to set Compute Name

8.11 Case Study :

1. In your computer how many user group you create and purpose of it.

8.12 Further Reading :

- Introduction to Networking Recharad Mc Mohan Tata McGraw Hill Publication
- Computer Network Fundamentals and application – R S Rajesh Vikas Publication
- Microsoft Windows 2000 Professional – Paul Cassel Techmedia SAMS Publication
- Fedora 3 Bible – Christopher Negus Wiley Dreamtech Publication
- HTML Black Book – Steven Holzner – Dreamtech Press
- HTML, Java Script, DHTML, PERL, CGI – Evan Bayross – BPB

Computer Name and Workgroup

BLOCK SUMMARY :

In Block 2 we have studied :

- ISP & Network connection
- IP & IPV6
- TCP/IP
- Client server architecture and its working model
- DNS
- Search engine and its uses
- Web servers and its function
- News group and its uses
- Spider and crawlers
- Remote login
- Micro blogging and blog
- Knowledge portal and corporate portal
- Personalization
- Features of portal
- Architecture of common portal like vertical and horizontal
- Use and important of 'Computer Name ' in Network
- Use and important of 'Work Group' in Network

BLOCK ASSIGNMENT :

❖ **Short Answer Questions :**

- (1) What are the advantages and disadvantages of TCP/IP Connection ?
- (2) Define hot spots ?
- (3) Explain top 5 search engines ?
- (4) Explain web servers ?
- (5) What is the use of news group ?
- (6) What is computer name ? How can we give computer name in windows 10
- (7) What is Work Group ? Discuss advantages of Work Group

❖ **Long Questions :**

- (1) What are the different types of personalization ?
- (2) What are the features of portal ?
- (3) Give characteristics of Micro Blog and Blog
- (4) Explain Web server with its types.
- (5) Explain ICMP with its characteristics

❖ **Enrolment No. :**

1. How many hours did you need for studying the units ?

Unit No.	5	6	7	8
No. of Hrs.				

2. Please give your reactions to the following items based on your reading of the block :

Items	Excellent	Very Good	Good	Poor	Give specific example if any
Presentation Quality	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Language and Style	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Illustration used (Diagram, tables etc)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Conceptual Clarity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Check your progress Quest	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Feed back to CYP Question	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____

3. Any other Comments

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BCAR-104

Introduction to **Internet Technologies and HTML**

BLOCK 3 : INTERNET TECHNOLOGY AND APPLICATION

UNIT 9 INTERNET TECHNOLOGY

UNIT 10 RECENT INTERNET TECHNOLOGY APPLICATION

UNIT 11 INTERNET PROTOCOLS

UNIT 12 ADVANCE PROTOCOL AND WEB PROGRAMMING

INTERNET TECHNOLOGY AND APPLICATION

Block Introduction :

In this block, we shall study about internet technology and its application.

In Unit 9, covers up topics regarding the internet technology, how the internet works, packet switching and the network to network concept.

In Unit 10, we learn about the recent internet technology application, about the concept of e-mail, about e-commerce such as B2B, B2C, e-learning, e-banking, e-governance, social networking, chatting and instant messenger, as well as about audio and video conference.

In Unit 11, focus on Internet protocols, main protocols that use for internet services and main important protocols like Mail base protocols, File base protocols, and other security base protocols.

In Unit 12, understand about possible web programming language, various types of web programming language like HTML, PHP, Java... etc and understand the history of HTML

This block will help us attain a complete understanding of concepts Such as the technique used in sending email, understand about e-commerce, understand the advance concepts of e-learning, e-banking and e-governance, gain a good knowledge on the concept of social networking, chatting, instant messenger, and about audio and video conferencing.

Block Objectives :

- To understand How Internet works with types of network.
- To focus application of internet likes e-mail, e-commerce, B2B, B2C.. etc.
- To understand Internet working rules or protocols, service base protocol like mail, file and other security level
- To understand about web programming.
- To understand HTML, PHP and other web programming language

Block Structure :

Unit 9 : Internet Technology

Unit 10 : Recent Internet Technology Application

Unit 11 : Internet Protocols

Unit 12 : Advance Protocol and Web Programming

UNIT STRUCTURE

- 9.0 Learning Objectives**
- 9.1 Introduction**
- 9.2 How Internet Works ?**
 - Check Your Progress – 1**
- 9.3 Packet Switching**
 - 9.3.1 Advantages of Packet Switching**
 - 9.3.2 Disadvantages of Packet Switching**
 - Check Your Progress – 2**
 - 9.3.3 Types of Packet Switching**
 - Check Your Progress – 3**
- 9.4 Network To Network**
 - Check Your Progress – 4**
 - Check Your Progress – 5**
 - 9.4.1 ATM Architecture**
- 9.6 Answer For Check Your Progress**
- 9.7 Glossary**
- 9.8 Assignment**
- 9.9 Activity**
- 9.10 Case Study**
- 9.11 Further Reading**

9.0 Learning Objectives :

This unit will help you to understand :

- To understand how Internet Works
- To study and understand Packet switching
- Difference between packet switching and circuit switching
- Advantages and disadvantages of packet switching

9.1 Introduction :

This unit introduces beginners with a complete overview of the working of the Internet, i.e. how the internet technology works, the way data is transferred from one system to other using packet switching method. A few years ago, the concept of an 'Information Superhighway' was introduced, which is a way to access a wealth of information and interact with people globally. The back bone of this network is Internet.

9.2 How Internet Works ?

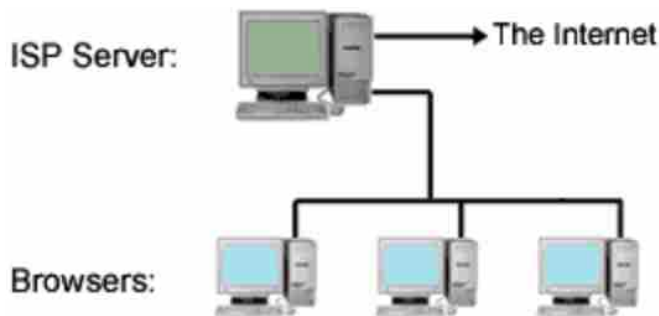
The internet is a world-wide network of computers linked together by telephone wires, satellite links and other means. For simplicity's sake we will say that all computers on the internet can be divided into two categories : servers and browsers.

Servers are where most of the information on the internet "lives". These are specialized computers which store information, share information with other servers, and make this information available to the general public.

Browsers are what people use to access the World Wide Web from any standard computer. Chances are, the browser you're using to view this page is either Netscape Navigator/Communicator or Microsoft Internet Explorer. These are by far the most popular browsers, but there are also a number of others in common use.

When you connect your computer to the internet, you are connecting to a special type of server which is provided and operated by your Internet Service Provider (ISP). The job of this "ISP Server" is to provide the link between your browser and the rest of the internet. A single ISP server handles the internet connections of many individual browsers – there may be thousands of other people connected to the same server that you are connected to right now.

The following picture shows a small "slice" of the internet with several home computers connected to a server :



ISP servers receive requests from browsers to view webpages, check email, etc. Of course each server can't hold all the information from the entire internet, so in order to provide browsers with the pages and files they ask for, ISP servers must connect to other internet servers. This brings us to the next common type of server : the "Host Server".

To view a web page from your browser, the following sequence happens :

1. You either type an address (URL) into your "Address Bar" or click on a hyperlink.
2. Your browser sends a request to your ISP server asking for the page.
3. Your ISP server looks in a huge database of internet addresses and finds the exact host server which houses the website in question, then sends that host server a request for the page.
4. The host server sends the requested page to your ISP server.
5. Your ISP sends the page to your browser and you see it displayed on your screen.

❑ **Check Your Progress – 1 :**

1. IT means _____.
[A] Internet Technology [B] Intranet Technology
[C] Interactual Technology [D] Interpersonal Technology
2. _____ are where most of the information on the internet "lives".
[A] Servers [B] Optic Cable [C] Data [D] None of these
3. _____ are what people use to access the world wide web.
[A] Browser [B] Server [C] Data [D] ISP
4. ISP means _____.
[A] Internet Service Provider [B] Internet Software Provider
[C] Internet System Provider [D] Intranet System Provider

9.3 Packet Switching :

❖ **Packet Switching**

Packet switching is a WAN switching method in which network devices share a single point-to-point link to transport packets from a source to a destination across a carrier network. Statistical multiplexing is used to enable devices to share these circuits. Asynchronous Transfer Mode (ATM), Frame Relay, Switched Multimegabit Data Service (SMDS), and X.25 are examples of packet-switched WAN technologies.

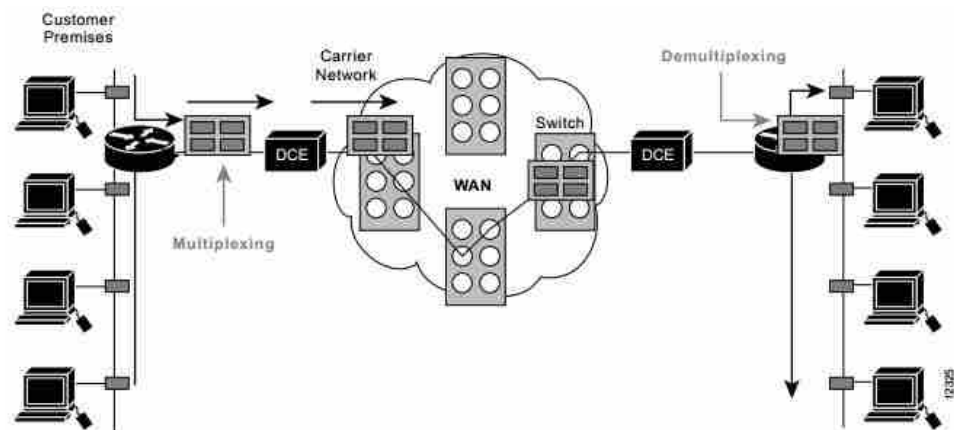


Fig. : Packet switching transfers packets across a carrier network

Packet switching can be used as an alternate to circuit switching. In the packet switched networks, data is sent in discrete units that have variable length. They are called as packets. There is a strict upper bound limit on the size of packets in a packet switch network. The packet contains data and various control information. The packet switched networks allow any host to send data to any other host without reserving the circuit. Multiple paths between a pair of sender and receiver may exist in a packet switched network.

One path is selected between source and destination. Whenever the sender has data to send, it converts them into packets and forwards them to next computer or router. The router stores this packet till the output line is free. Then, this packet is transferred to next computer or router (called as hop). This way, it moves to the destination hop by hop. All the packets belonging to a transmission may or may not take the same route. The route of a packet is decided by network layer protocols.

9.3.1 Advantages of Packet Switching :

1. The main advantage of packet switching is the efficiency of the network. In circuit switching network, a reserved circuit cannot be used by others, till the sender and receiver leave it. Even if no data is being sent on a reserved circuit, no one else can access the circuit. This results in network bandwidth wastage. The packet switching reduces network bandwidth wastage.
2. The other advantage is that the packet switching is more faults tolerant. In case of circuit switching, all the packets are lost if a router in the circuit is down as all the packets follow the same route. But, in case of packet switching network, the packets can be routed over the malfunctioning component of the network. This is because all the packets may follow a different route to the destination.
3. The circuit switching bills the user depending on the distance and duration of connection whereas packet switching network bill users only on the basis of duration of connectivity.
4. The advantage of circuit switching network over packet switching network is that the circuit switching network provides ordered delivery of packets. As all the packets follow the same route. They arrive in correct order at destination.
5. It uses a digital network. This method enables digital data to be directly transmitted to a destination, and is therefore appropriate for data communication systems.
6. High data transmission quality – The quality of data transmission in a packet switched network is kept high (error free) because the data distribution is checked and error detection is employed during data transmission.

9.3.2 Disadvantages of Packet Switching :

The various disadvantage of Packet switching

1. Packets may be lost on their route, so sequence numbers are required to identify missing packets.
2. Switching nodes requires more processing power as the packet switching protocols are more complex.
3. Switching nodes for packet switching require large amount of RAM to handle large quantities of packets.
4. A significant data transmission delay occurs – Use of store and forward method causes a significant data transmission.

☐ Check Your Progress – 2 :

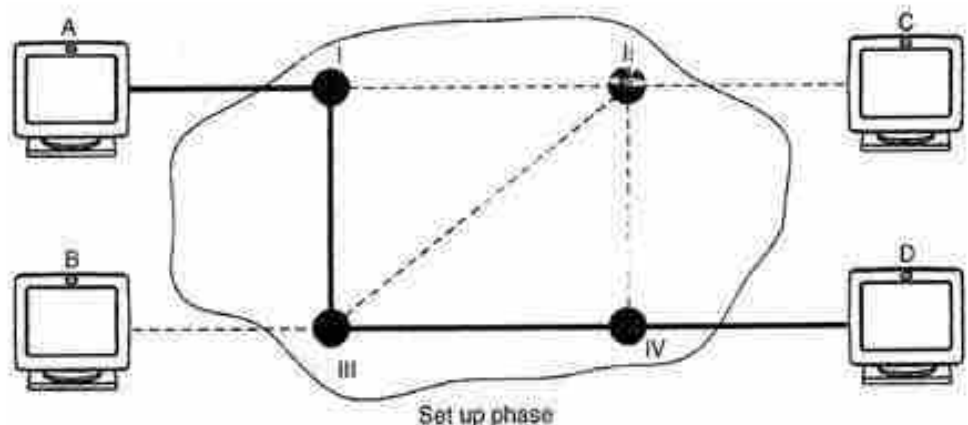
1. _____ server receive request from browsers to view webpage.
 [A] Data [B] ISP [C] Cable [D] Server
2. _____ is a WAN switching method 8.
 [A] Pocket Switching [B] Virtual switching
 [C] Datagram [D] None of these

3. SMDS means _____.
- [A] Switched Multimegabit Data Service
 - [B] Supported Multimegabit Data Server
 - [C] Supported Multiple Data Service
 - [D] Switched Multiple Data System
4. The packet switching has _____ approaches.
- [A] Two
 - [B] Three
 - [C] Four
 - [D] Five

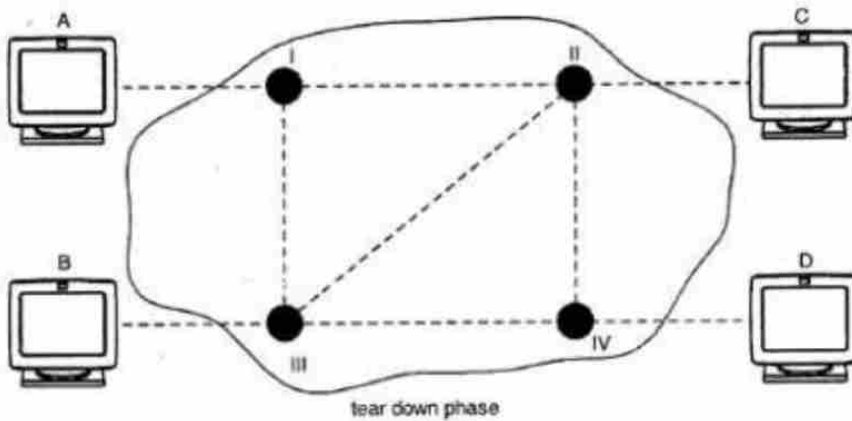
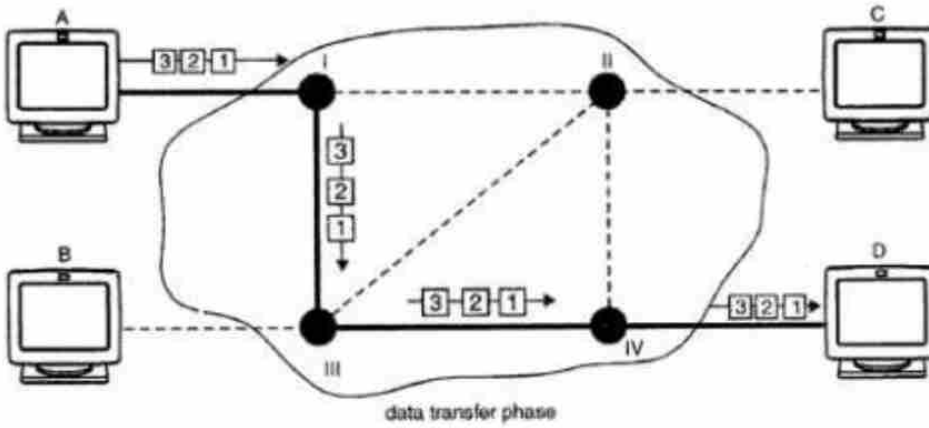
9.3.3 Types of Packet Switching :

The packet switching has two approaches : Virtual Circuit approach and Datagram approach. WAN, ATM, frame relay and telephone networks use connection oriented virtual circuit approach; whereas internet relies on connectionless datagram based packet switching.

- (i) **Virtual Circuit Packet Switching :** In virtual circuit packet switching, a single route is chosen between the sender and receiver and all the packets are sent through this route. Every packet contains the virtual circuit number. As in circuit switching, virtual circuit needs call setup before actual transmission can be started. He routing is based on the virtual circuit number.



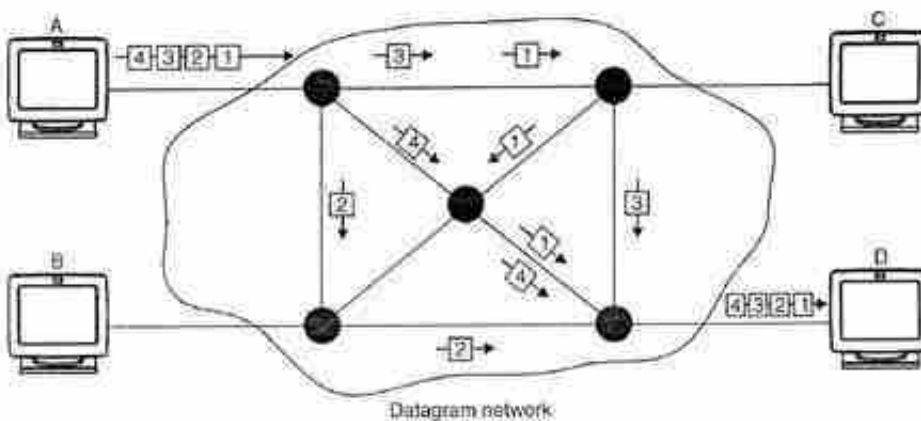
This approach preserves the relationship between all the packets belonging to a message. Just like circuit switching, virtual circuit approach has a set up, data transfer and tear down phases. Resources can be allocated during the set up phase, as in circuit switched networks or on demand, as in a datagram network. All the packets of a message follow the same path established during the connection. A virtual circuit network is normally implemented in the data link layer, while a circuit switched network is implemented in the physical layer and a datagram network in the network layer.



Phases in virtual circuit packet-switching

(ii) **Datagram Packet Switching** : In datagram packet switching each packet is transmitted without any regard to other packets. Every packet contain full packet of source and destination. Every packet is treated as individual, independent transmission.

Even if a packet is a part of multi-packet transmission the network treats it as though it existed alone. Packets in this approach are called datagram's. Datagram switching is done at the network layer. Figure show how a datagram approach is used to deliver four packets from station A to station D. All the four packets belong to same message but they may travel via different paths to reach the destination i.e. station D.



Datagram packet switching

Datagram approach can cause the datagrams to arrive at their destination out of order with different delays between the packets. Packets may also be lost or dropped because of lack of resources. The datagram networks are also referred as connectionless networks. Here connectionless means that the switch does not keep information about connection state. There are no connection establishment or tear down phases.

The datagram can arrive at the destination with a different order from the order in which they were sent. The source and destination address are used by the routers to decide the route for packets. Internet use datagram approach at the network layer.

❑ **Check Your Progress – 3 :**

1. _____ packet switching, a single route is chosen between the sender and receiver.
[A] Virtual Circuit [B] Datagram
[C] Server [D] None of these
2. A virtual circuit network is normally implemented in _____ layer.
[A] Datagram [B] Data link [C] Server [D] None of these
3. _____ packet switching each packet is transmitted without any regard to other packets.
[A] Datagram [B] Server [C] Cable [D] None of these
4. Datagram switching is done at _____ layer.
[A] Datagram [B] Network [C] Server [D] None of these

9.4 Network to Network :

In telecommunications, a **network-to-network interface (NNI)** is an interface which specifies signalling and management functions between two networks. An NNI circuit can be used for interconnection of signalling (e.g. SS7), Internet Protocol (IP) (e.g. MPLS) or ATM networks.

ATM is a major traffic carrier used by telecommunication companies. ATM is also the core networking technology used to aggregate and connect ADSL tail circuits to ISPs. ATM provides for virtual circuits and can guarantee Quality of Service (QoS).

Some of the key concepts involved in ATM include :

- The basic unit of transmission is the **cell**. A cell is 53 bytes in length – 5 bytes of **header** and 48 bytes of **payload**. These small, fixed-format cells can be **switched** very quickly.
- ATM networks are based on connection-oriented **cell relay** – cells are multiplexed onto higher bit rate channels, but there is no timing relationship between individual cells within a particular connection. Cells may be dropped but are never delivered out of order.
- The telecommunications industry uses ATM as a basis for providing converged services, allowing for the seamless integration of voice (telephony), audio, video-on-demand, video conferencing, video broadcast and data, on the one network.
- ATM is **complex**. Even the telcos admit it has many unsolved problems.

❖ ATM Background :

- Designed in early 1990s, when both bandwidth and networking equipment was relatively expensive, and voice and data convergence was a hot topic in the industry.
- A technology evolved more from the telecommunications industry than the computer/data industry.
- Designed for high-performance mixed network traffic (voice, data, video and future media applications).
- Designed for bursty traffic.
- Designed to replace all existing analog and digital communication backbone systems.
- A relatively expensive networking technology, mainly used among tier 1 and tier 2 telcos.
- Gigabit Ethernet (a much cheaper technology) has replaced ATM on many networks. ATM is Less popular now.
- Gigabit Ethernet is a natural upgrade path for Fast Ethernet.
- ATM offers QoS, but QoS issues can simply be overcome by providing a bigger pipe ?

"Arguably, ATM is unnecessary if bandwidth is cheap and plentiful, and there is no congestion in the network."

"Experience has also shown that over-provisioning bandwidth does not resolve all QoS issues. Hence Gigabit Ethernet is not expected to replace ATM at this time."

❖ ATM Features :

- Cell based switching technique
- Fixed-size cells (53-Bytes) – small cells
- Asynchronous time-division multiplexing (Asyn TDM)
- Connection oriented
- Virtual Circuit (VPI VCI)
- QoS as part of the technology

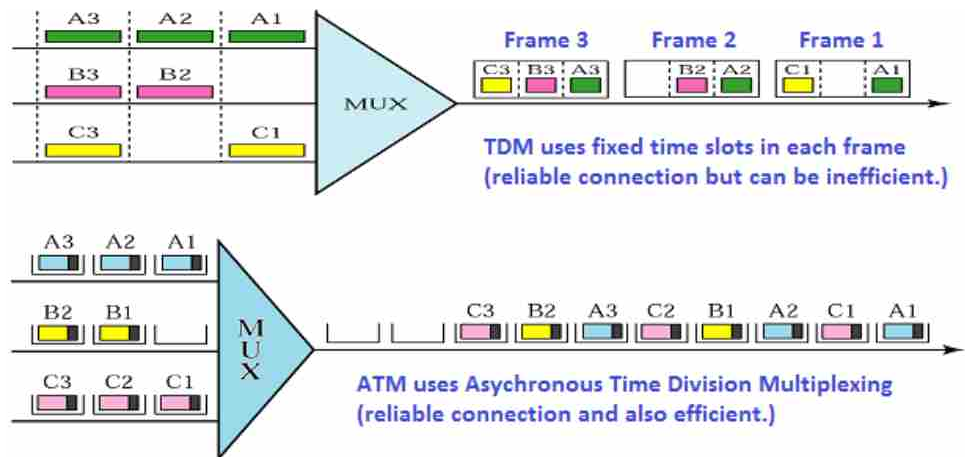
❖ ATM Speed :

- Originally designed to work over Synchronous Optical Networking (SONET)
- Expresses in OC (Optical Carrier) levels.
- OC-3 : 155 Mbps (3 x 51.84 Mbps)
- OC-12 : 622 Mbps
- OC-192 : upto 10Gbps bit rate
- In early 1990s, 155 Mbps was considered very fast.

❖ ATM – Circuit Switching or Packet Switching :

- ATM is a packet switching technology where fixed size small packets are switched efficiently.
- ATM uses virtual circuits – provides a reliable dedicated path during the whole session of transmission, offering the advantage of circuit switching, i.e. reliable connection, and can guarantee a specific QoS.

- ATDM – how ATM does multiplexing.



Advantages :

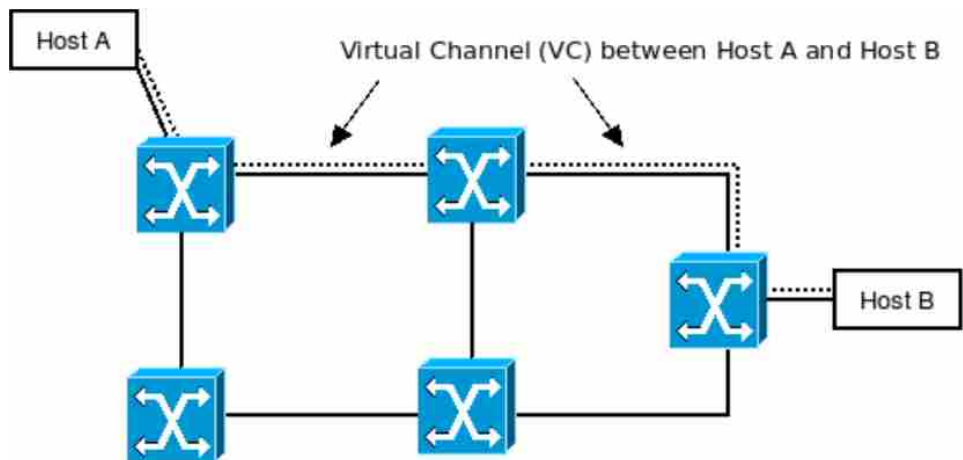
- Fast switching of small cells
- Better utilization than circuit switching
- No fragmentation problem
- Reduce jitter (variance in delays)
- Easier to allocate bandwidths and delays to VCs
- Easier to implement priorities to traffic
- Enables traffic management and congestion control
- Suitable for time-critical information such as voice or video

Disadvantages :

- Extra overhead as IP data grams are segmented into small cells
- Expensive technology

❖ **ATM Virtual Channels :**

ATM is connection-oriented and switching is based on the idea of a virtual channel or VC. A **virtual channel** is set up between a pair of hosts connected to a network of switches :



The existence of a VC is based on entries in **routing tables** in each of the switches (which are really **routers**), set up at VC **establishment** time. Each switch compares its table entries to a field in the cell header to decide where the cell is to be sent.

❖ **Permanent and Switched Virtual Circuits :**

- Permanent Virtual Circuit (PVC) : dedicated virtual circuit established for continuous use, and no need for repeated call setup and clearing. Usually preconfigured by a service provider. PVC is similar to a leased line.
- Switched Virtual Circuit (SVC) : setup on a per-call basis and disconnected when the call is terminated. SVC is dynamically established on demand and is torn down when transmission is finished. SVC is similar to a normal PSTN phone line.

❑ **Check Your Progress – 4 :**

1. NNI means _____.
 [A] Network-to-network intraface
 [B] Network-to-network interface
 [C] Network-to-network interchange
 [D] None of these
2. _____ is a major traffic carrier used by telecommunication company.
 [A] ATM [B] BTM [C] Server [D] None of these
3. PVC means _____.
 [A] Temporary Virtual Network [B] Permanent Virtual Circuit
 [C] Primary Virtual Circuit [D] None of these
4. SVC means _____.
 [A] Switched Virtual Network [B] Support Virtual Circuit
 [C] System Virtual Circuit [D] None of these

❖ **ATM – connection-oriented protocol :**

- Connection-oriented establishes a session, and then delivers a stream of data in the same order as it was sent.
- Can be a circuit switched connection, or a virtual circuit switched connection in a packet switched network like ATM.
- Connection-oriented protocols are not necessarily reliable protocols. ATM is an example of a connection-oriented, unreliable protocol.

❖ **ATM Virtual Channel Setup :**

All cells relating to a connection (call, circuit) follow the same path through the network. During call setup, a separate **Protocol Connection Identifier** is assigned to the connection on each link through the network.

The numeric value of the PCI identifier has only local significance at each link, and changes from one link to another as cells relating to a particular call (or connection) pass through the network.

Associated with each incoming link/port at a switch is a routing table that contains, for each incoming PCI, the corresponding outgoing link/port and the new PCI to be used.

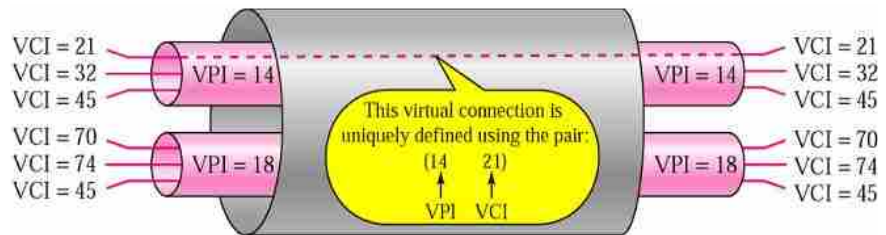
The PCI is made up of two components : the **Virtual Path Identifier** (VPI) and the **Virtual Channel Identifier** (VCI). Routing can be on the basis of the value of either, or both, of these subfields.

**Introduction to
Internet Technologies
and HTML**

The VPI can be used where multiple connections are set up between the same pair of hosts. The VCI field is used where connections are not between the same pair of hosts.

❖ **ATM VPI/VCI :**

- **Transmission Path (TP) :** Physical connection, usually fibres.
- **Virtual Path (VP) :** Connection between two ATM switches. VPI identifies the cell's next VP to pass through.
- **VC : Virtual Channel/Circuit (VC) :** VC must first establish before any data transfer. VCI identifies the cell's next VC inside the VP.



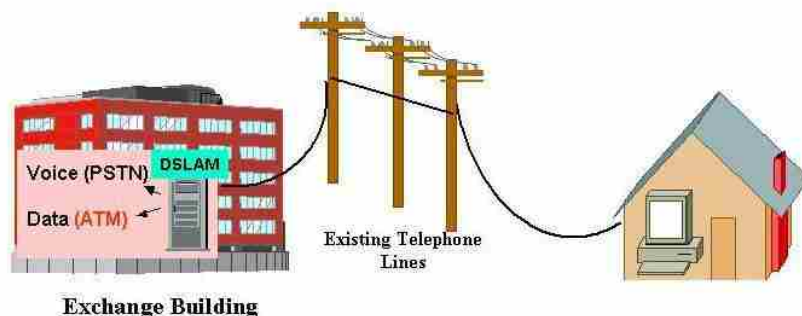
❑ **Check Your Progress – 5 :**

1. VPI means _____.
 [A] Video Path Identifier [B] Vertical Path Identifier
 [C] Virtual Path Identifier [D] None of these
2. VCI means _____.
 [A] Vertical Channel Identifier [B] Virtual Channel Identifier
 [C] Virtual Common Identifier [D] None of these
3. GFC means _____.
 [A] Generic Flow Control [B] General Flow Control
 [C] General Function Control [D] None of these
4. CLP means _____.
 [A] Cell Loss Priority [B] Control Less priority
 [C] Common Loss Priority [D] None of these

❖ **ATM and ADSL :**

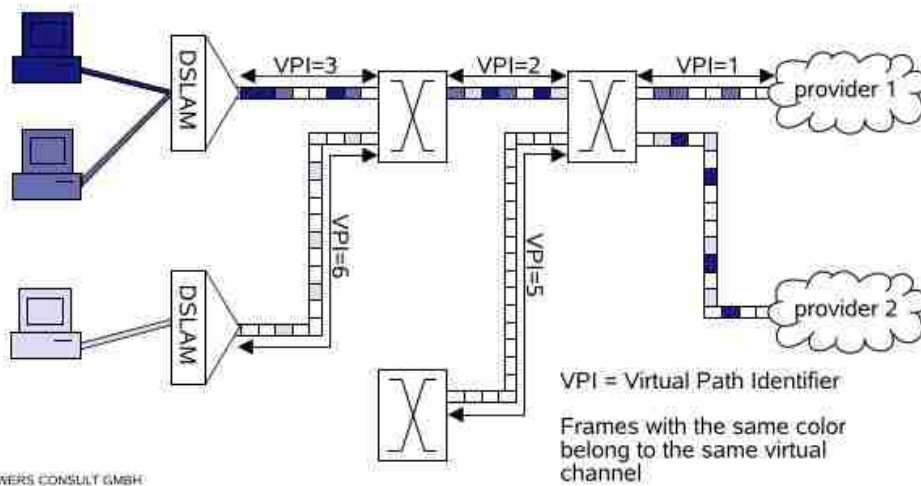
- DSL is an access method for an ATM network, allowing a DSL tail to connect to many ISPs through a wholesale ATM network (e.g. Telstra wholesale).
- ADSL uses ATM as an intermediate layer between the physical layer and a layer 2 protocol like PPP.

ADSL (Asymmetric Digital Subscriber Line) G.Lite ITU-T 992.2



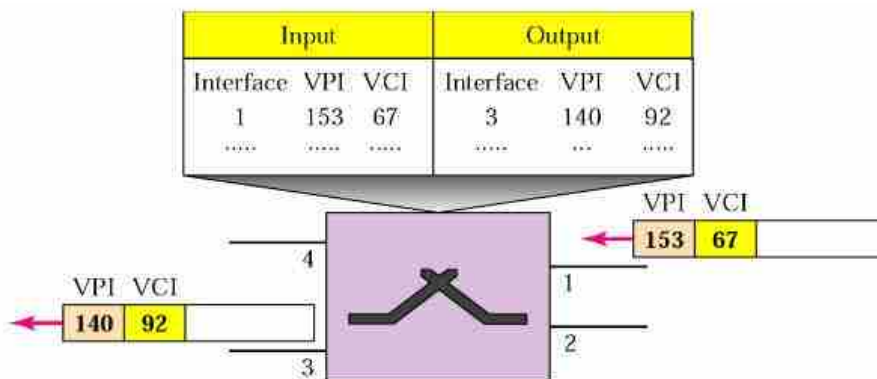
❖ **High Level View of an ADSL / ATM Network :**

- ADSL access tails connecting to DSLAMs (Digital Subscriber Line Access Multiplexer).
- DSLAMs connecting to a Tier 1 telco's ATM backbone network.
- Tier 1 telco aggregates all the ADSL tails and distributes the traffic to the smaller providers.



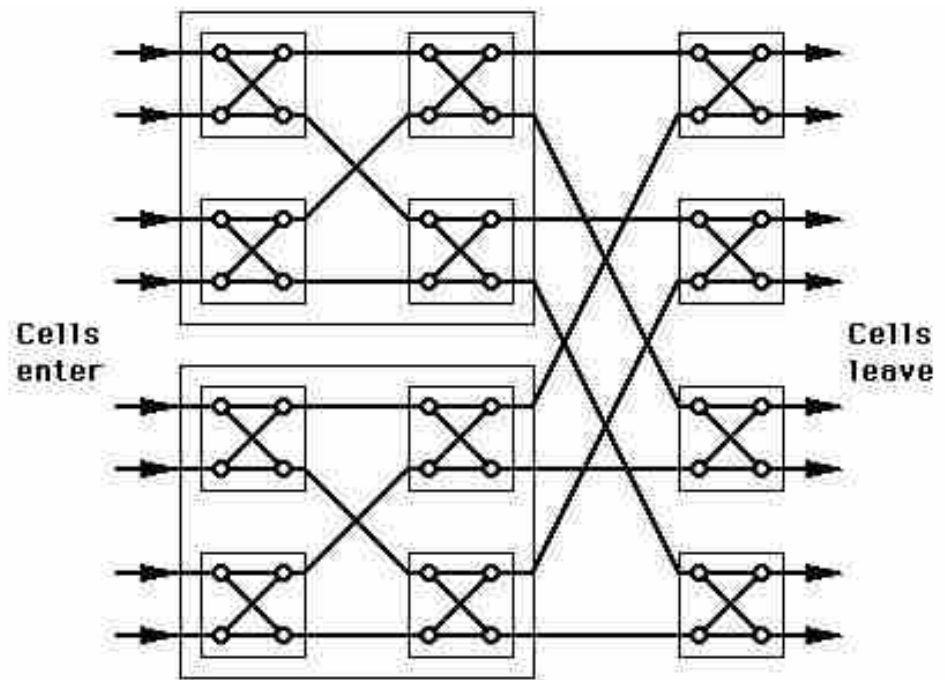
❖ **ATM Switching :**

ATM routes a cell using both the VPI and the VCI.



❖ **ATM Switches :**

ATM switches are typically built of a network of **Banyan** switches. Each element of the switch can either pass a cell straight through or cross the path over. This decision is made directly by the corresponding bit in the cell's destination address (VPI/VCI bits). The first bit controls the first switch; the second bit controls the second switch etc.



❖ **All ATM switches have two common goals :**

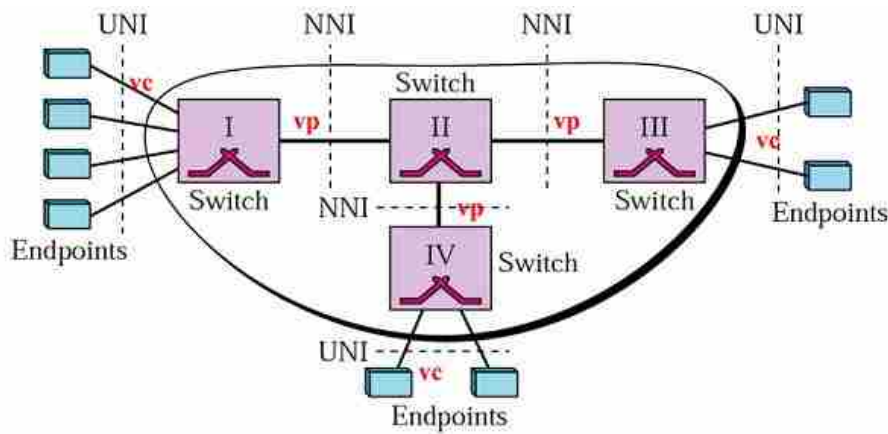
- Switch all cells with as low a discard rate as possible, preferably nil.
- Never (ever) re-order the cells on a virtual connection.

A problem occurs when two cells arrive at a given time, both destined for the same output. The general solution is :

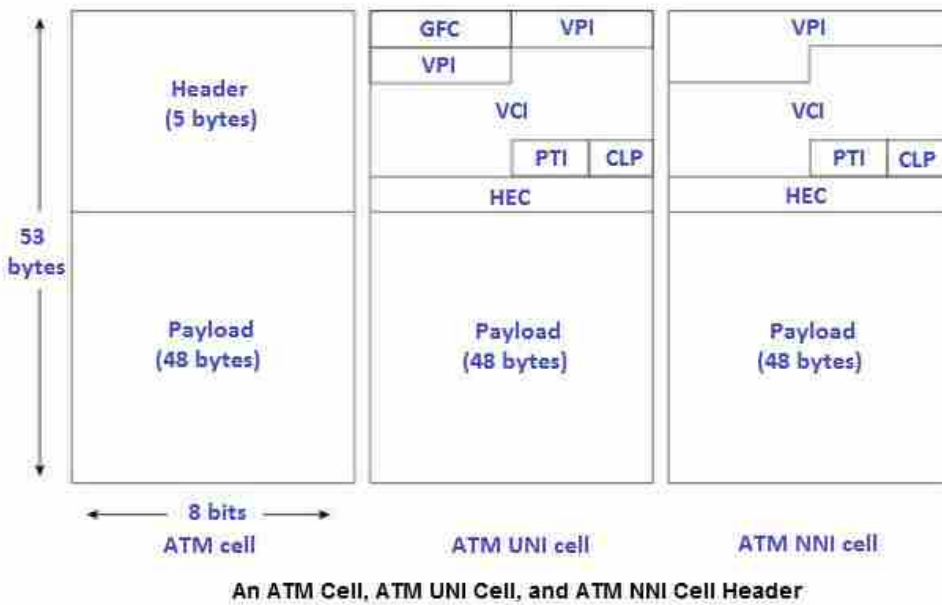
1. Pre-sort the cells before feeding them into the Banyan switch (this avoids switching contention) and
2. Provide a queue on each outgoing line (this avoids "output" contention).

9.4.1 ATM Architecture :

- **ATM Switches :** reads and updates the cell header information and switches the information cell towards its destination.
- **ATM Endpoints :** contains the ATM network interface adaptor to enable data entering or leaving the ATM network to interface to the external world. Examples of these end points include workstations, LAN switches, video codecs and many more items.
- **NNI :** Network-to-network interface (between two switches, inside an ATM network).
- **UNI :** User-to-network interface (between a user access device and a switch, on the edge of an ATM network).



❖ **ATM Cell Format :**



❖ **GFC :**

Generic Flow Control, only present in cells passing over the User–Network Interface (UNI). On Network–Network Interfaces (NNI), this is part of the VPI field. GFC provides local function, such as identifying multiple stations that share a single ATM interface. Typically not used and is set to default (binary 0000).

❖ **VPI, VCI :**

See previous slide.

❖ **PTI :**

Payload Type Identifier. MSB (1st bit) indicates data type – (0 = user data, 1 = control data). 2nd bit indicates congestion (0 = no congestion, 1 = congestion). 3rd bit indicates if the cell is the last of the frame (0 = No, 1 = Yes).

❖ **CLP :**

Cell loss priority. 1 = discard the cell under extreme congestions.

❖ **HEC :**

Header Error Correction or checksum.

9.5 Let Us Sum Up :

After reading this unit, you will be able to

- How internet works
- Packet switching and its advantages
- ATM Architecture
- ATM components
- ATM Designs

9.6 Answer for Check Your Progress :

☐ Check Your Progress 1 :

1. [A] Internet Technology
2. [A] Servers
3. [A] Browser
4. [A] Internet Service Provider

☐ Check Your Progress 2 :

1. [B] ISP
2. [A] Packet Switching
3. [A] Switched Multimegabit Data Service
4. [A] Two

☐ Check Your Progress 3 :

1. [A] Virtual Circuit
2. [B] Data link
3. [A] Datagram
4. [B] Network

☐ Check Your Progress 4 :

1. [B] Network-to-network interface
2. [A] ATM
3. [B] Permanent Virtual Circuit
4. [A] Switched Virtual Network

☐ Check Your Progress 5 :

1. [C] Virtual Path Identifier
2. [B] Virtual Channel Identifier
3. [A] Generic Flow Control
4. [A] Cell Loss Priority

9.7 Glossary :

- **Servers** are where most of the information on the internet "lives". These are specialized computers which store information, share information with other servers, and make this information available to the general public.
- **Browsers** are what people use to access the World Wide Web from any standard computer. Chances are, the browser you're using to view this page is either Netscape Navigator/Communicator or Microsoft Internet Explorer.
- **HEC** header error correction
- **CLP** cell loss priority
- **PTI** pay load type identifier
- **GFC** generic flow control
- **VPI** virtual path identifier
- **VCI** virtual channel identifier

9.8 Assignment :

1. Explain How Internet works
2. Discuss Pros and Cons of Packet switching network
3. ATM components list and its works in short

9.9 Activity :

1. List out type of packet switching and discuss any one in your words.

9.10 Case Study :

1. How ATM works draw flow lines in your own words

9.11 Further Reading :

- Introduction to Networking Recharad McMohan Tata McGraw Hill Publication
- Computer Network Fundamentals and application R. S. Rajesh Vikas Publication
- Unleashed Windows 2003 Server – Todd Brown & Chris Miller Techmedia
- Microsoft Windows 2000 Professional – Paul Cassel Techmedia SAMS Publication
- HTML Black Book – Steven Holzner – Dreamtech Press

UNIT STRUCTURE

- 10.0 Learning Objectives**
- 10.1 Introduction**
- 10.2 Chatting and Instant Messages**
 - Check Your Progress – 1**
 - 10.2.1 What's The Difference Between E-Mail, Online Chat, and Instant Messaging ?**
- 10.3 Video And Audio Conferences**
 - Check Your Progress – 2**
- 10.4 E-Mail**
 - 10.4.1 Writing an E-Mail**
 - 10.4.2 How E-mail Works**
 - Check Your Progress – 3**
- 10.5 E-Commerce**
 - 10.5.1 Business-to-Business (B2B)**
 - 10.5.2 Business-to-Customer (B2C)**
 - Check Your Progress – 4**
- 10.6 What is E-Learning ?**
- 10.7 E-Banking**
- 10.8 Social Networking**
 - Check Your Progress –5**
- 10.9 Let Us Sum Up**
- 10.10 Answer For Check Your Progress**
- 10.11 Glossary**
- 10.12 Assignment**
- 10.13 Activity**
- 10.14 Case Study**
- 10.15 Further Reading**

10.0 Learning Objectives :

After reading this Unit, you will be able to :

- Chatting and messengers
- E commerce and its types
- Social networking advantages
- Audio and video conferences
- E banking

10.1 Introduction :

How difficult our life would have been if there was no Internet. Think about it. To find some information, we all have acquired the habit of 'Googling' it on the web; within a few seconds the screen displays the desired information. You want to book tickets for a movie night with friends, and you can book them at the click of a button. Many of us cannot imagine life without the social networking sites. The Internet has indeed made the world a small place and living life easier. And the rapid progress of technology has made it possible to access the Internet from anywhere through plenty of means. It has such a plethora of uses that we use it for one purpose or the other daily.

❖ For Information :

For a layman, it is nothing but a collection of websites. And there are innumerable websites that serve a variety of purposes. There are news websites, social networking websites, websites that provide information and websites of various businesses and organizations. These websites are updated frequently to provide information to the user. You can find everything of anything on the web just by browsing through a few websites. You can also use emails, blogs, IM chat, social networking websites and communication software for sharing your information with the world. It has made access to information cheaper and easier and this is its most common use.

❖ Business & Advertising :

Almost all the businesses these days have websites, through which they promote and advertise themselves. This medium these days has been used extensively for promotional campaigns. Not only promoting your business but you can also effectively advertise your event or any cause on this medium. There are many businesses that depend on the Internet for their survival like stocks and call centres, to name a few. It has promoted faster access to necessary information which strengthens the business processes.

❖ Education :

It also is a popular medium used by students. Many students use it for educational purposes, like for finding study material or for applying to some college or university. It is now a virtual world and all the applications are done online through the website of the concerned educational body. Students use websites for these and many other purposes like checking exam results, exam schedule, application procedure to any course, etc. Students also take the help of the Internet for project help and for obtaining the required images. Everything is a click away from us.

❖ Communication & Networking :

The use of the Internet for networking is very popular among all age groups. There are many good social networking websites that are used by people for communication. These websites provide an effective and easy platform that facilitates interaction. It is widely used as a means of communication through means like networking websites, chat websites, blogs, etc. Through these websites you can also share your photographs with your near and dear ones. It is widely used by job seekers for job applications and job searching. Facilities like video conferencing have made it possible to conduct interviews online.

❖ **Entertainment :**

Another popular use of the Internet is for entertainment. Facilities like listening to online music, downloading music and a movie provides a platform for entertainment. There are plenty of other ways through which you can entertain yourselves. You can play online games, view sports matches, or watch videos of your choice. It is a trusted means of entertainment for these kinds of purposes and is extensively used for the same.

❖ **Other Popular Uses :**

It is popularly used for banking. Almost all the banking transactions are possible through this medium. Apart from these common uses, it can also be used for shopping. Online shopping is very popular among masses and on the Internet you can buy anything and get it delivered at home. There are also many people who use it to work from home.

These were some of the chief common uses. It is a boon for us and has made our life easy by facilitating so many uses. But it is also prone to attacks of many kinds that threaten safety. To protect the Internet from these attacks we should all use it carefully and also protect ourselves from various privacy intrusions. Its use as a tool for communication will always remain its most powerful use. The array of uses of the Internet is vast and with the progress of technology new uses will get added to the list of uses continuously.

10.2 Chatting and Instant Messages :

Online communication has revolutionized the way we connect with each other but it can be a very confusing technological world to explore. A whole new, industry-specific jargon has been created to reference various aspects of the internet media. So what IS the difference between chat, instant messaging and forums ?

❖ **Forums :**

Forums are built into many average community websites. Sometimes referred to as billboards or message boards, they are often a collection of topics and titles. Forums are divided into categories, topics, threads, and posts. Most forums require membership and each new reply by a member is called a post. When a member posts the initial entry for a conversation they create a thread to which other members can reply.

When the internet was in its infancy connection speeds were slow and files sizes were clunky and cumbersome. Forums were created as a way to communicate that required a simple design and functionality. It was a time insensitive medium with messages available from postdate well into the future and hours or even days between responses.

Forums maintain information server-side'. This means that all the information inside the forum is held in a large database owned by the website owners and stored on the same servers that hold the individual web pages for that site. Forums have developed into simple systems that most average web hosts can maintain and provide an effective means of long term communication across a broad audience. They provide a wealth of archived information for all users to access at any time and all members have the opportunity to contribute to the conversations and topics.

❖ **Instant Messaging :**

People wanted a means to communicate more immediately on the net with their friends and family so larger internet savvy companies developed instant messaging. Instant messaging is often done from a console, like Yahoo Messenger or MSN Messenger. These are small programs downloaded onto your computer. When connected to the internet these programs monitor the activity and availability of members via usernames.

You can communicate in real time with people all around the world by typing text into a small window and clicking send. Messengers are designed to pop up conversation windows with users where two people can communicate by sending text back and forth. These days, instant messenger services are more advanced incorporating photo/file sharing and conferencing that allows multiple users (usually by invitation only) to join a conversation, and share images with ease.

❖ **Chat :**

Similar to Instant Messaging and Forums is Chat. Chat is a mixture of both with users able to access a chat room. Sometimes chat rooms are available with Java from a website or connected to with a Client. Chat rooms are available to multiple users and work similarly to a conference via messenger.

❖ **VOIP :**

With the development of technology and the speed and accuracy of the internet these mediums have also developed beyond typed text to allow Voice Messages or Voice Chat. VOIP stands for Voice–Over–Internet Protocol which is programming that is designed to allow users to use microphones and speakers to speak and listen to others with their own voices. Just like using a phone people around the world can chat in real time. This developing medium continues to gain popularity as a means of communication and has been picked up by many instant messengers and chat rooms to further extend the ease of online communication.

With these four systems online conversation has flourished and the internet is alive with communities developing their interests in a wealth of ways. More means of keeping in touch are adding to the already socially rich environment. Blogging (web log aka online journal), video conferencing (web cam & vblogs video blogs), and social profiles, offer more immediacy and functionality than ever before.

The web is a wonderfully diverse world to explore and hopefully with a little more information about some of the fantastic ways we can keep in touch with our friends online you'll find it less daunting to roam in the coming days and months.

❑ **Check Your Progress – 1 :**

1. How difficult our life would have been if there was no _____.
[A] Internet [B] Data [C] Cable [D] None of these
2. _____ is a popular medium used by student.
[A] Teachers [B] Education [C] Books [D] None of these
3. _____ are built into many average community websites.
[A] Books [B] Education [C] Students [D] Forums
4. Forums are divided into _____.
[A] Categories [B] Topics [C] Threads [D] All of these

10.2.1 What's the difference between e-mail, online chat, and instant messaging ?

These are three different ways of communicating with other people over the Internet. To answer your question, I'll explain each method individually.

1. **E-mail** is a way of sending individual messages to people using an e-mail server to relay the message. Because the server holds the messages for a person until he or she retrieves them, e-mail can be sent whether or not a person is online. One way to send or receive e-mail is to use a mail program such as Outlook Explorer or Mac OS X Mail that will communicate with your mail server. Another method is called Webmail (such as Hotmail or Gmail) that allows you to send messages using a Web-based interface. To send someone an e-mail message using either of these methods, you simply need to know their e-mail address.
2. **Online Chat** is a way of talking online in real time with many people at once. Some chat rooms are available via the Web, such as Yahoo! Chat, while others require a separate software program for chatting with other users. Online chat rooms allow multiple users to join in a conversation and see what all the other people are typing. Typically chat rooms are based around certain themes, such as Teen Chat, Macintosh Chat, or Religious Chat. Using online chat, you can meet new people in an anonymous environment. You will need to choose a "screen name" to join a chat room, but the screen name can be whatever you would like it to be. I usually choose something that describes me well, like "Hot Guy."
3. **Instant Messaging**, or "IMing," is a way of communicating online with a select group of people, usually individually. To instant message someone, you need to know his or her screen name. You can save your friends' screen names in a list called a "Buddy List." In the instant messaging world, your screen name is likely to be more permanent than with online chat. Also, unlike online chat, you need to use an instant messaging program, such as AOL Instant Messenger or MSN Messenger. While online, you can open IM windows with many of your friends at once and type messages back and forth until you realize it's time for bed and you haven't done your homework yet.

10.3 Video and Audio Conferences :

This is a very broad category of online tools, incorporating a range of options from free one-to-one audio conferencing all the way to more sophisticated and expensive tools such as Polycom which allow multiple sites with entire classes participating using video and audio.

1. Video and audio, or just audio connection between two computers communicating via the Internet.
 - o Examples of free audio conferencing software : Gizmo, Skype (both cross platform) both enable users to speak to other Gizmo/Skype users free of charge (although users can also pay a fee and make calls to landlines using the computer). For further examples view Wikipedia list.
 - o Examples of free video conferencing software : ivisit (cross platform), ichat (Mac only), NetMeeting (Windows only).

- o Breeze can also be used for video conferencing (but Breeze is more than just a video/audio conferencing tool).
- 2. Transmitted to & received from any computer in any location that has Internet connection (broadband desirable for effective use). Teacher must have microphone, can have camera. Ideally end users have microphone (camera not essential) for synchronous communication.
- 3. Technology requirements for video/audio conferencing :
 - o Computer with access (ideally broadband) to the Internet.
 - o Browser.
 - o Speakers to hear audio.
 - o Microphone (to contribute audio).
 - o Web camera to contribute video.

❑ **Check Your Progress – 2 :**

1. _____ is a mixture of both with users able to access a chat room.
[A] Chat [B] Call [C] Message [D] None of these
2. VOIP means _____.
[A] Valid Other Internet Protocol [B] Voice Over Internet Protocol
[C] Vertical Over Internet Protocol [D] None of these
3. _____ is a way of sending individual messages to people.
[A] Chat [B] E–mail
[C] Instant Messaging [D] None of these
4. _____ is a way of talking online in real time with many people at once.
[A] Online Chat [B] E–mail [C] Chat [D] None of these

10.4 E–Mail :

Short for **electronic mail**, **e–mail** or **email** is text messages that may contain files, images, or other attachments sent through a network to a specified individual or group of individuals. The first e–mail was sent by Ray Tomlinson in 1971. By 1996, more electronic mail was being sent than postal mail. Below is an example and breakdown of an Internet e–mail address.

The first portion all e–mail addresses is the alias, user, group, or department of a company. In our above example **support** is the Technical Support department at Computer Hope. Next, the **@** (at sign) is used as a divider in the e–mail address and is always required for all SMTP e–mail addresses and was first used by Ray Tomlinson.

10.4.1 Writing an e–mail :

When writing a new e–mail message a window similar to the example below will appear. As can be seen, several fields are required when sending an e–mail, the From or Reply–To is a field that is automatically filled out and is where the e–mail returns if a reply is made. Next, the CC or Carbon Copy field allows you to send a copy of the message to another e–mail address, but is not a required field. The To field is where you type the e–mail address of who you are sending the e–mail address. Next, the subject line although not required should be a few words describing what the e–mail is about. Finally, the message

body will be the location you type your message and are what will contain your signature.



10.4.2 How Email Works :

Email, or electronic mail, is the most common method of exchanging digital messages and remains one of the most popular services currently available via the Internet, with over 90% of US Internet user's actively using email. Here you'll find an overview of the modern email system and infrastructure, as well as its origin and use.

For a shorter, less technical overview, please see What Runbox Email Is All About. If you have any questions about email, feel free to ask in the Runbox Forum or use the Support Centre.

❖ The Email System :

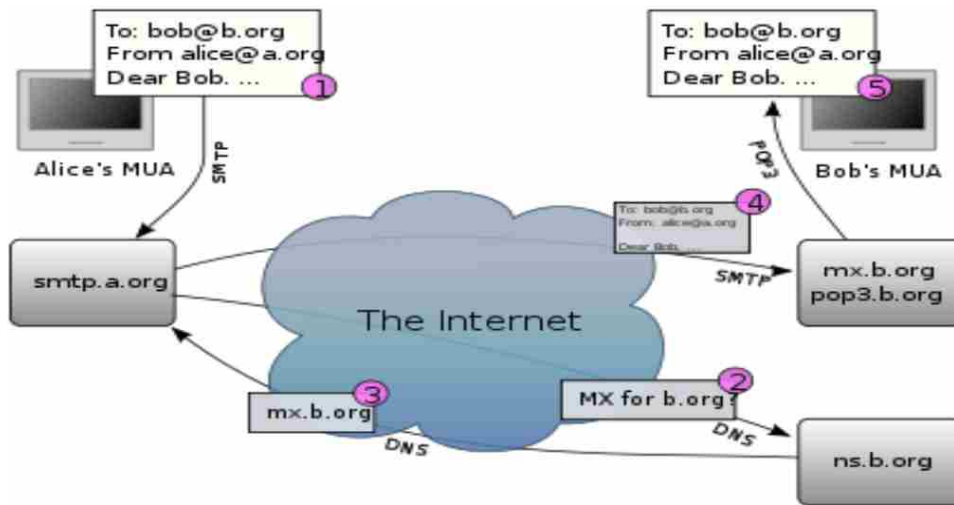
Email systems consist of computer servers that process and store messages on behalf of users who connect to the email infrastructure via an email client or web interface.

When someone sends an email, the message is transferred from his or her computer to the server associated with the recipient's address, usually via a number of other servers.

In more detail (please refer to the illustration on the right) :

1. A user (Alice) sends an email message and connects to an SMTP (Simple Mail Transfer Protocol) server as configured in her email client or Mail User Agent (MUA).
2. On the SMTP server, a Mail Transfer Agent (MTA) looks at the recipient address and looks up the domain part of the address to determine its destination.
3. After querying a Domain Name System (DNS) server for the name of the Mail exchanger (MX) for the recipient's domain name...

4. ...the SMTP server will send the message to that server via the SMTP protocol.
5. The receiving server will store the message and make it available to the recipient (Bob), who can access it via web, POP, or IMAP.



□ Check Your Progress – 3 :

1. E-mail means _____.
 [A] Electronic Mail [B] Electricity Mail
 [C] Emergency Mail [D] None of these
2. The first e-mail was sent by Ray Tomlinson in _____.
 [A] 1971 [B] 1981 [C] 1961 [D] 1951
3. Cc means _____.
 [A] Control Copy [B] Carbon Copy [C] Central Copy [D] None of these
4. MTA means _____.
 [A] Mail Transfer Agent [B] Most Transfer Agent
 [C] Main Transfer Agent [D] None of these

10.5 E-Commerce :



The diagram above outlines the path the information travels to create an ecommerce transaction. Here is an explanation of each piece.

- **Customer** : Hopefully, this one is obvious and needs no explanation!
- **Website** : Your visitors are constantly sending and receiving information over the internet from their computer to your web server. An ecommerce transaction would send credit card data to perform a transaction.
- **SSL Certificate** : While most data can flow freely, we want to be sure the credit card data is transmitted safely. So it is encrypted as it is sent to keep

prying eyes from seeing it. An SSL Certificate is what accomplishes this task.

- **Online Gateway :** The gateway is the "middle-man" that allows a website to send data to a merchant (credit card) account. The website sends the credit card data to Authorize.net, who performs a live check on the card and received a charge authorization (or decline). This information is passed back through to the website. We use the major player out there : Authorize.net.
- **Merchant Account :** A merchant account allows your business to accept credit cards. We have partnered with First Data, America's leading processor, to offer preferred rates to our customers.
- **Bank Account :** The money paid is deposited to your bank account within a few days !

10.5.1 Business-to-business (B2B) :

Describes commerce transactions between businesses, such as between a manufacturer and a wholesaler or between a wholesaler and a retailer. Contrasting terms are business-to-consumer (B2C) and business-to-government (B2G). **B2B branding** is a term used in marketing.

The overall volume of B2B (Business-to-Business) transactions is much higher than the volume of B2C transactions. The primary reason for this is that in a typical supply chain there will be many B2B transactions involving sub components or raw materials, and only one B2C transaction, specifically sale of the finished product to the end customer. For example, an automobile manufacturer makes several B2B transactions such as buying tires, glass for windcreens, and rubber hoses for its vehicles. The final transaction, a finished vehicle sold to the consumer, is a single (B2C) transaction.

B2B is also used in the context of communication and collaboration. Many businesses are now using social media to connect with their consumers (B2C); however, they are now using similar tools within the business so employees can connect with one another. When communication is taking place amongst employees, this can be referred to as "B2B" communication.

10.5.2 Business-to-Customer (B2C) :

It all comes down to size, speed, and need.

As opposed to businesses—which typically make large purchases to meet previously identified business needs—an end consumer typically makes much smaller purchases, sometimes to meet a ?need ? only thought of after seeing the product for sale.

Consumer purchases take much less time—seconds, for an impulse buy; perhaps a couple of weeks if shopping for a specific item at the best price. The decision is made by only one person (or two, in the case of a couple making a joint purchase). Consumers expect to receive some benefit from their purchase, but typically don't weigh the financial risks as heavily as businesses do.

Effective business-to-consumer (B2C) marketers know this, and develop campaigns that connect with the consumer mindset. Through advertising, direct and Internet marketing, storefronts, and discount offers, the B2C marketer works to convert shoppers to buyers as efficiently as possible.

❑ **Check Your Progress – 4 :**

1. _____ is the "middle-man".
[A] Gateway [B] SSL
[C] Emergency Mail [D] None of these
2. _____ account allows your businesss to accept credit cards.
[A] Saving [B] Merchant [C] Current [D] None of These
3. B2B means _____.
[A] Back to Back [B] Business to Business
[C] Buy to Buy [D] None of these
4. B2C means _____.
[A] Business to Consumer [B] Back to Copy
[C] Business to Contract [D] None of these

10.6 What is E-Learning ?

E-learning is to classroom learning as cell phones are to a pay phone at the bus station.

At least it is in some ways. For instance, e-learning allows you to learn anywhere and usually at any time, as long as you have a properly configured computer. Cell phones allow you to communicate any time and usually anywhere, as long as you have a properly configured phone.

E-learning can be CD-ROM-based, Network-based, Intranet-based or Internet-based. It can include text, video, audio, animation and virtual environments. It can be a very rich learning experience that can even surpass the level of training you might experience in a crowded classroom. It's self-paced, hands-on learning.

The quality of the electronic-based training, as in every form of training, is in its content and its delivery. E-learning can suffer from many of the same pitfalls as classroom training, such as boring slides, monotonous speech, and little opportunity for interaction. The beauty of e-learning, however, is that new software allows the creation of very effective learning environments that can engulf you in the material. We'll use software from Trainer soft as an example to show you how the process works.

❖ **Levels of E-Learning :**

E-learning falls into four categories, from the very basic to the very advanced. The categories are :

- **Knowledge databases** – While not necessarily seen as actual training, these databases are the most basic form of e-learning. You've probably seen knowledge databases on software sites offering indexed explanations and guidance for software questions, along with step-by-step instructions for performing specific tasks. These are usually moderately interactive, meaning that you can either type in a key word or phrase to search the database, or make a selection from an alphabetical list.
- **Online support** – Online support is also a form of e-learning and functions in a similar manner to knowledge databases. Online support comes in the form of forums, chat rooms, online bulletin boards, e-mail, or live instant-messaging support. Slightly more interactive than knowledge databases, online support offers the opportunity for more specific questions and answers, as well as more immediate answers.

10.7 E–Banking :

Online banking is an electronic payment system that enables customers of a financial institution to conduct financial transactions on a website operated by the institution, such as a retail bank, virtual bank, credit union or building society. Online banking is also referred as Internet banking, e–banking, virtual banking and by other terms.

To access a financial institution's online banking facility, a customer with Internet access would need to register with the institution for the service, and set up some password (under various names) for customer verification. The password for online banking is normally not the same as for telephone banking. Financial institutions now routinely allocate customers numbers (also under various names), whether or not customers have indicated an intention to access their online banking facility. Customers' numbers are normally not the same as account numbers, because a number of customer accounts can be linked to the one customer number. The customer can link to the customer number any account which the customer controls, which may be cheque, savings, loan, credit card and other accounts. Customer numbers will also not be the same as any debit or credit card issued by the financial institution to the customer.

To access online banking, a customer would go to the financial institution's secured website, and enter the online banking facility using the customer number and password previously setup. Some financial institutions have set up additional security steps for access to online banking, but there is no consistency to the approach adopted.

10.8 Social Networking :

Social networking platforms may allow organizations to improve communication and productivity by disseminating information among different groups of employees in a more efficient manner. While it is not meant to be all–inclusive, the list below outlines some of the possible advantages and disadvantages of Social media use by workplaces.

❖ Possible Advantages :

- Facilitates open communication, leading to enhanced information discovery and delivery.
- Allows employees to discuss ideas, post news, ask questions and share links.
- Provides an opportunity to widen business contacts.
- Targets a wide audience, making it a useful and effective recruitment tool.
- Improves business reputation and client base with minimal use of advertising.
- Expands market research, implements marketing campaigns, delivers communications and directs interested people to specific web sites.

❖ Possible Disadvantages :

- Opens up the possibility for hackers to commit fraud and launch spam and virus attacks.
- Increases the risk of people falling prey to online scams that seem genuine, resulting in data or identity theft.

- Potentially results in negative comments from employees about the company or potential legal consequences if employees use these sites to view objectionable, illicit or offensive material.
- Potentially results in lost productivity, especially if employees are busy updating profiles, etc.

Employers do have the right to simply ban all computer activity that is not work-related, but this approach may not yield optimal results. If employees are to be allowed access to social networking platforms, then a comprehensive and well-defined policy should be established to prevent abuse.

❖ **A social networking use policy generally :**

- Defines what social networking is particular to your organization, so employees know exactly what is meant by the term.
- Establishes a clear and defined purpose for the policy.
- Communicates benefits of social networking and of having a policy.
- Provides a clear platform for educating employees.
- Takes into consideration any legal ramifications of not following laws.
- Refers to confidentiality of employer trade secrets and private or confidential information. Talks about productivity in terms of social networking.
- Provides guidance regarding social networking outside of company time/ property that could be associated with the company, employees or customers. Some employers may prohibit posting of company information on social networking sites without explicit consent.
- Provides examples of policy violations.
- Outlines disciplinary measures to be taken for policy violations.

What may be the most concerning aspect of social networking platforms is that they encourage people to share personal information. Even the most cautious and well-meaning individuals can give away information they should not; the same applies to what is posted on company-approved social networking platforms.

❑ **Check Your Progress – 5 :**

1. _____ is a classroom learning.
[A] E-mail [B] Call [C] E-learning [D] None of these
2. _____ allow you to communicate anytime and usually anywhere.
[A] E-mail [B] Cell Phones [C] Laptop [D] Computer
3. _____ is an electronic payment system.
[A] E-learning [B] One Time Banking
[C] Online Banking [D] None of these
4. _____ platform may allow organization to improve communication and productivity.
[A] Social Networking [B] Public Networking
[C] General Networking [D] None of these

10.9 Let Us Sum Up :

After completing this unit, you can understand

- Uses of email
- How email works
- Usage of Internet
- Application internet in day to day life
- E– banking and its function
- E Commerce and its application

Internet Banking provides access to your BNZ accounts via the Internet. You can do your banking from the convenience of your own home or office without visiting a store or ATM. You can :

- View account balances and transaction history
- View account details from your everyday accounts, e.g., Ready Money, savings accounts, credit cards, term deposits, term loans, etc.
- Transfer funds between accounts
- Make payments
- Update your personal details held with BNZ
- Register for, and receive Online Statements for transaction and savings accounts
- Setup and manage email and text Alerts for your savings and transaction accounts
- Send secure email messages to request services from us
- Export transactional information to financial management software, e.g., Microsoft Money, Quicken, QuickBooks etc.

10.10 Answer For Check Your Progress :

❑ Check Your Progress 1 :

1. [A] Internet
2. [B] Education
3. [D] Forums
4. [D] All of these

❑ Check Your Progress 2 :

1. [A] Chat
2. [B] Voice Over Internet Protocol
3. [B] E–mail
4. [A] Online Chat

❑ Check Your Progress 3 :

1. [A] Electronic Mail
2. [A] 1971
3. [B] Carbon Copy
4. [A] Mail Transfer Agent

❑ Check Your Progress 4 :

- 1.[A] Gateway
2. [B] Merchant
- 3.[B] Business to Business
4. [A] Business to Consumer

❑ Check Your Progress 5 :

1. [C] E–learning
2. [B] Cell Phones
3. [C] Online Banking
4. [A] Social Networking

10.11 Glossary :

- **Chat** : Similar to Instant Messaging and Forums is Chat. Chat is a mixture of both with users able to access a chat room. Sometimes chat rooms are available with Java from a website or connected to with a Client. Chat rooms are available to multiple users and work similarly to a conference via messenger.
- **VOIP** : With the development of technology and the speed and accuracy of the internet these mediums have also developed beyond typed text to allow Voice Messages or Voice Chat.
- **E-learning** : E-learning is to classroom learning as cell phones are to a pay phone at the bus station.
- **Social Networking** : Social networking platforms may allow organizations to improve communication and productivity by disseminating information among different groups of employees in a more efficient manner.

10.12 Assignment :

1. What is the use of E-mail, Explain in short
2. What is E-banking give brief idea of it
3. What is social networking discuss advantages and disadvantages

10.13 Activity :

1. Draw and Explain E-commerce Model in your words

10.14 Case Study :

1. Configure your E-mail / Gmail with Outlook

10.15 Further Reading :

- Introduction to Networking Recharad McMohan Tata McGraw Hill Publication
- Computer Network Fundamentals and application– R.S.Rajesh Vikas Publication
- Unleashed Windows 2003 Server–Todd Brown & Chris Miller Techmedia
- Microsoft Windows 2000 Professional– Paul Cassel Techmedia SAMS Publication
- HTML Black Book–Steven Holzner–Dreamtech Press

UNIT STRUCTURE

- 11.0 Learning Objectives
- 11.1 Introduction
- 11.2 TCP and it's Services
 - Check Your Progress – 1
 - Check Your Progress – 2
- 11.3 IP and it's Services
 - Check Your Progress – 3
- 11.4 Internet Service Protocols
 - Check Your Progress – 4
- 11.5 Hyper Text System Protocol
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- 11.6 Let Us Sum Up
- 11.7 Answer For Check Your Progress
- 11.8 Glossary
- 11.9 Assignment
- 11.10 Activity
- 11.11 Case Study
- 11.12 Further Reading

11.0 Learning Objectives :

After reading this Unit, you will be able to :

- What is Internet base Protocols
- Internet main protocols like : TCP – IP
- Internet services protocols : UDP, POP, SMTP, FTP
- HTTP, HTTPS Hyper Text base protocols

11.1 Introduction :

In the world of technology, there are vast numbers of users' communicating with different devices in several languages. That also includes some ways during which they transmit data alongside the various software they implement. So, communicating worldwide won't be possible if there have been no fixed 'standards' which will govern the way user communicates for data also because the way our devices treat those data. Here we'll be discussing these standard set of rules.

Yes, we're talking about "protocols" which are set of rules that help in governing the way a specific technology will function for communication. In other words, it are often said that the protocols are digital languages implemented within the sort of networking algorithms. There are different networks and network protocols, user's use while surfing.

❖ Transmission Control Protocol (TCP) :

TCP may be a connection oriented protocol and offers end-to-end packet delivery. It acts as back bone for connection. It exhibits the subsequent key features :

Transmission Control Protocol (TCP) corresponds to the Transport Layer of OSI Model.

TCP may be a reliable and connection-oriented protocol.

❑ Check Your Progress – 1 :

1. _____ which are set of rules.
[A] Protocols [B] Vortals [C] TCP [D] None of these
2. _____ may be a connection oriented protocol.
[A] TCP [B] IP [C] UDP [D] POP
3. _____ is an electronic payment system.
[A] OSI [B] MSI [C] GSI [D] FTP
4. _____ TSP may be _____ and _____ oriented protocol.
[A] Reliable and Connection [B] Reliable and Object
[C] Object and Product [D] None of These

❖ TCP offers :

- (1) Stream Data Transfer.
- (2) Reliability.
- (3) Efficient Flow Control
- (4) Full-duplex operation.
- (5) Multiplexing.

TCP offers connection oriented end-to-end packet delivery.

TCP ensures reliability by sequencing bytes with a forwarding acknowledgement number that indicates to the destination subsequent byte the source expect to receive.

It retransmits the bytes not acknowledged with in specified period of time.

❖ TCP Services :

TCP offers following services to the processes at the appliance layer :

- (1) Stream Delivery Service
- (2) Sending and Receiving Buffers
- (3) Bytes and Segments
- (4) Full Duplex Service
- (5) Connection Oriented Service
- (6) Reliable Service
- (7) Stream Deliver Service

❖ Sending and Receiving Buffers :

It may not be possible for sending and receiving process to supply and acquire data at same speed, therefore, TCP needs buffers for storage at sending and receiving ends.

❖ **Full Duplex Service :**

Transmitting the info in duplex mode means flow of knowledge in both the directions at an equivalent time.

❖ **Connection Oriented Service :**

TCP offers connection oriented service within the following manner :

TCP of process-1 informs TCP of process - 2 and gets its approval.

TCP of process - 1 and TCP of process - 2 and exchange data in both the 2 directions.

After completing the info exchange, when buffers on each side are empty, the 2 TCP's destroy their buffers.

❑ **Check Your Progress – 2 :**

1. TCP offers connection oriented _____ packet delivery.
 [A] End-to-end [B] Business-to-Business
 [C] Customer-to-Customer [D] None of these
2. TCP ensures reliability by sequencing _____.
 [A] Data [B] Bytes [C] Connection [D] Protocol
3. _____ is an electronic payment system.
 [A] Sending [B] Receiving
 [C] [A] & [B] both [D] Start
4. Transmitting the info in duplex mode means _____.
 [A] Flow of education [B] Flow of knowledge
 [C] Flow of data [D] Flow of information

11.3 IP and it's Services :

Internet Protocol is **connectionless** and **unreliable** protocol. It ensures no guarantee of successfully transmission of data.

In order to make it reliable, it must be paired with reliable protocol such as TCP at the transport layer.

Internet protocol transmits the data in form of a datagram as shown in the following diagram :

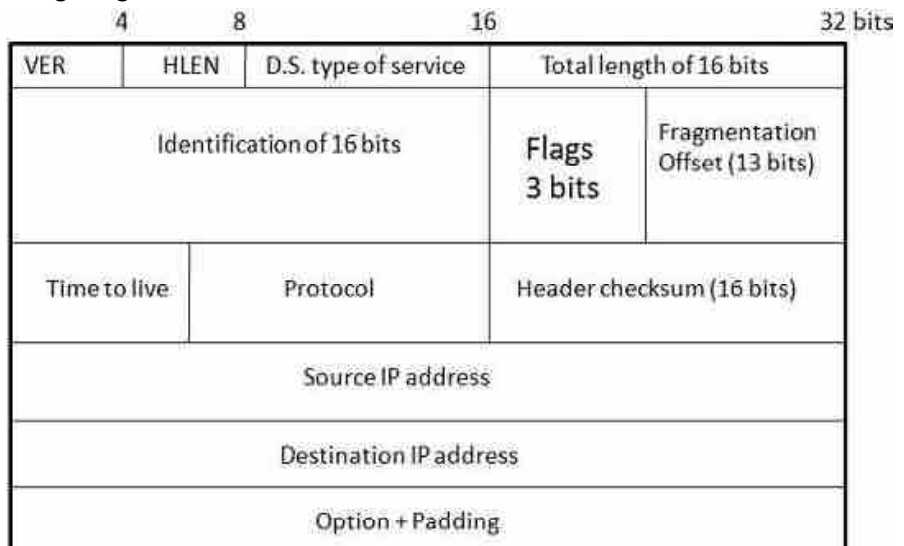


Fig. 1 : IP structure (32 bit)

❖ **Points to remember :**

- The length of datagram is variable.
- The Datagram is divided into two parts : **header** and **data**.
- The length of header is 20 to 60 bytes.
- The header contains information for routing and delivery of the packet.

❑ **Check Your Progress – 3 :**

1. _____ is connectionless and unreliable protocol.
 [A] IT [B] Internet Protocol
 [C] Standard [D] None of these
2. The length of datagram is _____.
 [A] Variable [B] Number [C] Data [D] Character
3. Datagram divided into _____ parts.
 [A] Two [B] Six [C] Seven [D] Four
4. The length of header is _____ bytes.
 [A] 20 to 60 [B] 60 to 120 [C] 120 to 180 [D] 40 to 80

11.4 Internet Service Protocols :

- **User Datagram Protocol (UDP) :** UDP may be a substitute communication protocol to Transmission Control Protocol implemented primarily for creating loss-tolerating and low-latency linking between different applications.
- **Post office Protocol (POP) :** POP3 is meant for receiving incoming E-mails.
- **Simple mail transport Protocol (SMTP) :** SMTP is meant to send and distribute outgoing E-Mail.
- **File Transfer Protocol (FTP) :** FTP allows users to transfer files from one machine to a different . sorts of files may include program files, multimedia files, text files, and documents, etc.

❑ **Check Your Progress – 4 :**

1. UDP means _____.
 [A] Undefined Datagram Protocol [B] Understand Datagram Protocol
 [C] User Datagram Protocol [D] None of these
2. POP means _____.
 [A] Post Office Protocol [B] Parcel of Protocol
 [C] Personal Offer Protocol [D] Private Offer Protocol
3. SMTP means _____.
 [A] Soft Mail Transport Protocol [B] Simple Mail Transfer Protocol
 [C] Safe Mail Transport Protocol [D] None of these
4. _____ is a mean to send and distribute outgoing E-mail.
 [A] SMTP [B] FTP [C] IP [D] UDP

11.5 Hyper Text System Protocol :

- **Hyper Text Transfer Protocol (HTTP) :** HTTP is meant for transferring a hypertext among two or more systems. HTML tags are used for creating links. These links could also be in any form like text or images. HTTP is meant on Client–server principles which permit a client system for establishing a reference to the server machine for creating an invitation . The server acknowledges the request initiated by the client and responds accordingly.
- **Hyper Text Transfer Protocol Secure (HTTPS) :** HTTPS may be a bbreviated as Hyper Text Transfer Protocol Secure is a standard protocol to secure the communication among two computers one using the browser and other fetching data from web server. HTTP is employed for transferring data between the client browser (request) and therefore the web server (response) within the hypertext format, same just in case of HTTPS except that the transferring of knowledge is completed in an encrypted format. So it are often said that https thwart hackers from interpretation or modification of knowledge throughout the transfer of packets.

☐ Check Your Progress – 5 :

1. _____ is meant for transferring a hypertext among two or more systems.
[A] TP [B] HTTP [C] IP [D] TCP
2. _____ tags are used to creating links
[A] HTTP [B] HTML [C] CSS [D] None of these
3. HTTPS means _____.
[A] Hybrid Text Transfer Protocol Secure
[B] Hyper Text Transfer Protocols Secure
[C] Hyper Tempar Transfer Protocol Secure
[D] None of these
4. HTTP is employed for transferring data between.
[A] Client and Seller [B] Client browser and Web browser
[C] Server and Station [D] None of these

11.6 Let Us Sum Up :

After completing this unit, you can understand

- To work with internet Protocol is very important role
- For interne main protocol like 'TCP' & IP
- Service level protocol like : UDP, POP, FTP, SMTP
- Web page communication protocol like : HTTP, HTTPS

Internet protocol is an important element for Hyper text, web communication service like E–Mail, File transferring ... etc are very important.

11.7 Answer For Check Your Progress :

- ❑ **Check Your Progress 1 :**
 1. [A] Protocols
 2. [A] TCP
 3. [A] OSI
 4. [A] Reliable and Connection
- ❑ **Check Your Progress – 2 :**
 1. [A] End-to-end
 2. [B] Bytes
 3. [B] [A] & [B] both
 4. [B] Flow of knowledge
- ❑ **Check Your Progress – 3 :**
 1. [B] Internet Protocol
 2. [A] Variable
 3. [A] Two
 4. [A] 20 to 60
- ❑ **Check Your Progress – 4 :**
 1. [C] User Datagram Protocol
 2. [A] Post Office Protocol
 3. [B] Simple Mail Transfer Protocol
 4. [A] SMTP
- ❑ **Check Your Progress – 5 :**
 1. [B] HTTP
 2. [B] HTML
 3. [B] Hyper Text Transfer Protocols Secure
 4. [B] Client browser and Web browser

11.8 Glossary :

- **Protocols :** A bunch of rule that can manage for various types of data communications on Internet is called protocols. This protocols are very much useful for network as well as Internet.
- **Base Protocol :** Basic protocols like TCP and IP are important protocol that manage 'Data Packets' as well as strength of Internet signals,
- **Service Protocols :** Internet is not depend on only base protocols but it provide various service on E-mail base protocols like SMTP, FTP and some network support protocols like UDP, POP.
- **Hypertext base protocols :** For web communication Hypertext base language are most essential so in recent trends also when we open any browser and any website this http or https we found that is essential part of web security and web domain base rules.

11.9 Assignment :

1. What is Internet base Protocols ? List any 3 Internet base Protocols
2. Explain any 2 Internet service base protocol
3. Discuss any one E-mail service base protocol

11.10 Activity :

1. Detail comparison between TCP and IP

11.11 Case Study :

1. How HTTPS is more useful than HTTP, list any 3 website that has HTTPS

11.12 Further Redading :

- Introduction to Netorking Recharad McMohan Tata McGraw Hill Publication
- Computer Network Fundamentals and application– R.S.Rajesh Vikas Publication
- Unleashed Windows 2003 Server–Todd Brown & Chris Miller Techmedia
- Microsoft Windows 2000 Professional– Paul Cassel Techmedia SAMS Publication
- HTML Black Book–Steven Holzner–Dreamtech Press

UNIT STRUCTURE

12.0 Learning Objective

12.1 Introduction

12.2 Advance IP

Check Your Progress – 1

12.2.1 About IPV4

12.2.2 About IPV6

12.2.3 Compare IPV4 – IPV6

Check Your Progress – 2

12.2.4 Mobile IP

Check Your Progress – 3

12.3 Internet – TCP and OSI Model

Check Your Progress – 4

12.4 Internet and Web Programming

12.4.1 Web Application Architecture

12.4.2 Web Application Architecture and Web Programming.

12.4.3 Web Programming

12.4.4 HTML – HTTP

Check Your Progress – 5

12.5 Let Us Sum Up

12.6 Answer For Check Your Progress

12.7 Glossary

12.8 Assignment

12.9 Activity

12.10 Case Study

12.11 Further Reading

12.0 Learning Objectives :

After reading this Unit, you will be able to :

- Emerging IP versions of 6 (IPV6)
- Sub types of IPV6 like (IPV6, IPV6–Header, Mobile IP)
- Some layer of TCP model and OSI model
- Various types of web programming

12.1 Introduction :

This new IP address version is being deployed to satisfy the necessity for more Internet addresses. It had been aimed to resolve issues which are related

to IPv4. With 128-bit address space, it allows 340 undecillion unique address space. IPv6 also called IPng (Internet Protocol next generation). OSI (Open System Interconnection) describe seven layers for computer network. This OSI model study in your next semester with subject of 'Computer Network. Here we talked about computer network and now we are studying Internet concept so here in this unit. When we want to start web programming language it is necessary to study about all older to latest programming language.

12.2 Advance IP :

It is the foremost recent version of the web Protocol. Internet Engineer Taskforce initiated it in early 1994. the planning and development of that suite is now called IPv6. IP address act as an identifier for a specific machine on a particular network. The IP address is also called IP number and internet address. IP address specifies the technical format of the addressing and packets scheme. Most networks combine IP with a TCP (Transmission Control Protocol). It also allows developing a virtual connection between a destination and a source.

❑ Check Your Progress – 1 :

1. OSI means _____.
[A] Open Software Interconnection [B] Open System Interconnection
[C] Open Software Interface [D] None of these
2. IPNG means _____.
[A] Internet Protocol Next Generation
[B] Interprsonal Protocol Next Generation
[C] Interact Protocol Next Generation
[D] None of these
3. _____ is the foremost recent version of the web protocol.
[A] Advance IP [B] Internet [C] Protocol [D] IPV
4. The IP address is also called _____.
[A] IP number [B] Internet Address
[C] [A] & [B] both [D] None of these

12.2.1 About IPV4 :

IPV4 was the primary version of IP. It had been deployed for production within the ARPANET in 1983. Today it's most generally used IP version. It's wont to identify devices on a network using an addressing system.

The Ipv4 uses a 32-bit address scheme allowing to store 2^{32} addresses which is quite 4 billion addresses. Till date, it's considered the first Internet Protocol and carries 94% of Internet traffic.

❖ Features of Ipv4 :

- Connectionless Protocol
- Allow creating an easy virtual communication layer over diversified devices
- It requires less memory, and simple remembering addresses
- Already supported protocol by many devices
- Offers video libraries and conferences

12.2.2 About IPV6 :

This new IP address version is being specially deployed to take more output and the necessity for more Internet addresses. It had resolve issues which are related to Ipv4. With higher rage of bit address space, it allows more undecillion unique address space. Ipv6 also called Ipng (Internet Protocol next generation).

❖ Features of Ipv6 :

- Hierarchical addressing and routing infrastructure.
- Stateful and Stateless configuration.
- Support for quality of service (QoS).
- An ideal protocol for neighbouring node interaction.

12.2.3 Compare IPV4 – IPV6 :

After understanding IPV4 and IPV6 major aspects it is necessary to compare both IP address so let's we take comparison of both

- IPv4 is 32–Bit IP address whereas IPv6 **may be a** 128–Bit IP address.
- IPv4 **may be a** numeric addressing method whereas IPv6 is an alphanumeric addressing method.
- IPv4 binary bits are separated by a dot(.) whereas IPv6 binary bits are separated by a colon(:).
- IPv4 offers 12 header fields whereas IPv6 offers 8 header fields.
- IPv4 supports broadcast whereas IPv6 doesn't support broadcast.
- IPv4 has checksum fields while IPv6 doesn't have checksum fields
- IPv4 supports VLSM (Virtual Length Subnet Mask) whereas IPv6 doesn't support VLSM.
- IPv4 uses ARP (Address Resolution Protocol) to map to MAC address whereas IPv6 uses NDP (Neighbour Discover Protocol) to map to MAC (Media Access Control) Address.

❑ Check Your Progress – 2 :

1. _____ was the primary version of IP.
[A] IPV4 [B] IPV3 [C] IPV6 [D] IPV2
2. IPV4 uses a _____ bit address.
[A] 64 [B] 32 [C] 128 [D] 324
3. IPV6 is called _____.
[A] IPNG [B] IP [C] Advance IP [D] None of these
4. IPV6 uses a _____ bit address.
[A] 32 [B] 128 [C] 256 [D] 16

12.2.4 Mobile IP :

Mobile IP may be a communication protocol (created by extending Internet Protocol, IP) that permits the users to manoeuvre from one network to a different with an equivalent IP address. It ensures that the communication will continue without user's sessions or connections being dropped.

❖ **Terminologies :**

Mobile Node (MN) : It is the hand-held communication device that the user carries e.g. telephone.

Home Network : It is a network to which the mobile node originally belongs to as per its assigned IP address (home address).

Home Agent (HA) : It is a router in home network to which the mobile node was originally connected.

Home Address : It is the permanent IP address assigned to the mobile node (within its home network).

Foreign Network : It is the present network to which the mobile node is visiting (away from its home network).

Foreign Agent (FA) : It is a router in foreign network to which mobile node is currently connected. The packets from the home agent are sent to the foreign agent which delivers it to the mobile node.

Correspondent Node (CN) : It is a tool on the web communicating to the mobile node.

Care of Address (COA) : It is the temporary address employed by a mobile node while it's moving faraway from its home network.

❑ **Check Your Progress – 3 :**

1. _____ may be a communication protocol.
[A] Mobile IP [B] IPV4 [C] IPV6 [D] None of these
2. MN means _____.
[A] Mobile Node [B] Main Node
[C] Merge Node [D] Mobile Number
3. _____ is the permanent IP address.
[A] Home Address [B] Guest Address
[C] Primary Address [D] None of these
4. COA means _____.
[A] Care of Automacity [B] Care of Address
[C] Care of Architech [D] None of these

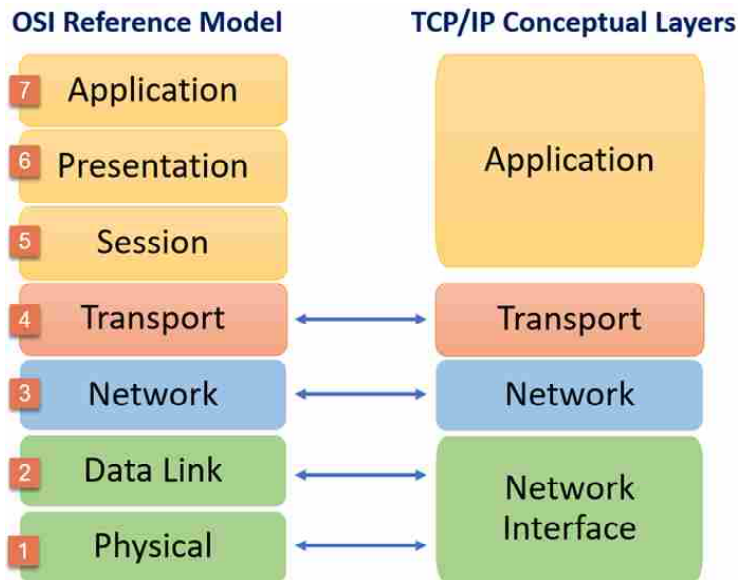
12.3 Internet-TCP and OSI Model :

TCP/IP helps you to work out how a selected computer should be connected to the web and the way you'll transmit data between them. It helps you to make a virtual network when multiple computer networks are connected together. TCP/IP stands for Transmission Control Protocol/ Internet Protocol. It's specifically designed as a model to supply highly reliable and end-to-end byte stream over an unreliable internetwork.

❖ **History of TCP/IP Model :**

- In 1974, Vint Cerf and Bob Kahn published a paper "A Protocol for Packet Network Interconnection" which describes the TCP/IP Model.
- By 1978, testing and further development of this language led to a replacement suite of protocols called TCP/IP.

- In 1982, it had been decided that TCP/IP should get replaced NCP (Network Control Programme) because the standard language of the ARPAnet.
- On January 1, 1983, ARPAnet converted to TCP/IP.
- ARPAnet finished its existence in 1990. the web has since grown from ARPAnet's roots, and TCP/IP evolved to satisfy the changing requirements of the web.



Comparison of TCP Model and OSI Model

❖ **KEY DIFFERENCE :**

- OSI has 7 layers whereas TCP/IP has 4 layers.
- The OSI Model may be a logical and conceptual model that defines network communication employed by systems hospitable interconnection and communication with other systems. On the opposite hand, TCP/IP helps you to work out how a selected computer should be connected to the web and the way you'll be transmitted between them.
- OSI header is 5 bytes whereas TCP/IP header size is 20 bytes.
- OSI refers to Open Systems Interconnection whereas TCP/IP refers to Transmission Control Protocol.
- OSI follows a vertical approach whereas TCP/IP follows a horizontal approach.
- OSI model, the transport layer, is merely connection-oriented whereas the TCP/IP model is both connection-oriented and connectionless.
- OSI model is developed by ISO (International Standard Organization), whereas TCP Model is developed by ARPANET (Advanced scientific research Agency Network).
- OSI model helps you to standardize router, switch, motherboard, and other hardware whereas TCP/IP helps you to determine a connection between differing types of computers.

❑ **Check Your Progress – 4 :**

1. Arpanet finished its existence in _____.

- [A] 1982 [B] 1985 [C] 1990 [D] 1987

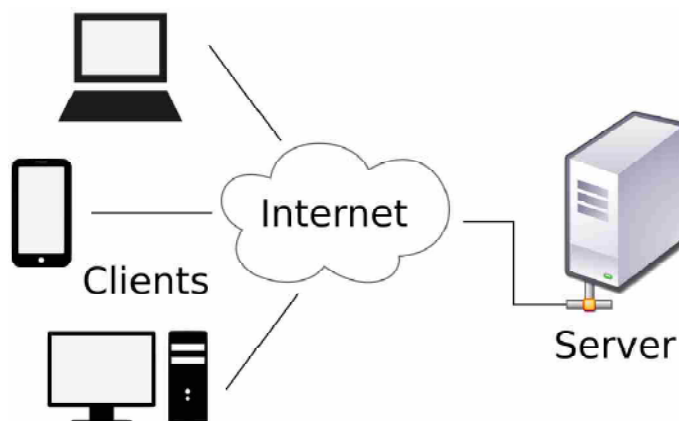
2. TCP/IP has _____ layers.
[A] 1 [B] 3 [C] 4 [D] 6
3. TCP/IP header size is _____ bytes.
[A] 20 [B] 40 [C] 60 [D] 80
4. ARPANET means _____.
[A] Automatic Scientific Research Agency Network
[B] Advanced Scientific Research Agency Network
[C] Advanced Scientific Company Network
[D] None of these

12.4 Internet and Web Programming :

To understand any website process we need to understand the web application architecture and then web programming describes the interactions between applications, databases, and middleware systems on the online.

12.4.1 Web Application Architecture :

It ensures that multiple applications work simultaneously. allow us to know it with an easy example of opening a webpage. As soon because the user hits the go button after typing a URL within the address bar of an internet browser, it requests for that specific web address. The server sends files to the browser as a response to the request made. The browser then executes those files to point out the requested page.



Web Application Architecture

Finally, the user is in a position to interact with the web site . the foremost important thing to notice here is that the code parsed by the online browser. an internet app works during a similar way.

This code might or won't have specific instructions that tell the browser the way to respond with reference to the various sorts of user inputs.

Hence, an internet application architecture has got to include all the sub-components also because the external applications interchanges for the whole software application, within the aforementioned case, which may be a website.

The web application architecture is indispensable within the times because a serious portion of the worldwide network traffic, also as most of the apps and devices, make use of web-based communication.

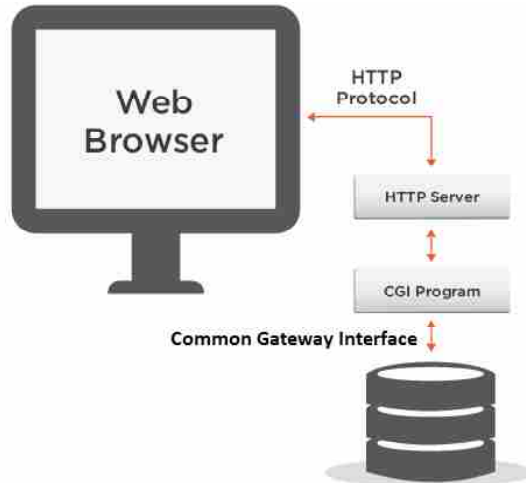
A web application architecture has got to not only affect efficiency, but also with reliability, scalability, security, and robustness.

12.4.2 Web Application Architecture and Web Programming :

With any typical web application, there are two different codes (sub-programs) running side-by-side. These are :

Client-side Code : The code that's within the browser and responds to some user input

Server-side Code : The code that's on the server and responds to the HTTP requests



CGI & Web Architecture

As understand as beside image first Web Application Architecture play a role of Client and server process than Common Gateway Interface (CGI) comes as interface that can manage request and response from your web browser and handles 'Client' and 'Server' level process as common gateway refer as "Web Programming".

A web developer (team) developing the online application decides on what the code on the server will do with reference to the code within the browser. For writing server-side code, C#, Java, JavaScript, Python, PHP, Ruby, etc. are used.

Any code that's ready to answer HTTP requests has the power to run on a server. The server-side code is liable for creating the page that the user requested also as storing differing types of knowledge, including user profiles and user input. it's never seen by the end-user.

12.4.3 Web Programming :

Building an internet Program there are several technologies that you simply will need to master to create an efficient internet site. Here are some for starters :

HTML (Hyper Text Mark up Language) It is used to design web pages using markup language. HTML is the combination of Hypertext and Markup language. Hypertext defines the link between the web pages. Markup language is used to define the text document within tag which defines the structure of web pages. This language is used to annotate (make notes for the computer) text so that a machine can understand it and manipulate text accordingly. Most markup languages (e.g. HTML) are human readable. Language uses tags to define what manipulation has to be done on the text.

CSS (Cascading Style Sheets) specifies how the content is to be displayed. The trend in web design has been to separate the content from the redering instructions. The specifications for the design sheets also are determined by the W3C. Some amazing designs are often created using style sheets.

XML (eXtensible Mark up Language) It allows users to make their own control tags. XHTML features a small set of predefined tags. With XML you'll have any number of tags. These tags are often wont to describe the content of the document not just for the human user but also for a machine that's capable of reading that document. This document specifies the way to create and use control tags in XML.

JavaScript may be a scripting language that's used for writing scripts that run on the client side. These scripts normally do client side verification of knowledge that you simply enter during a form. These scripts also can be used with cascading style sheets to supply dynamic effects. Such scripts are called Dynamic HTML or DHTML.

Java is an object oriented language that's used for writing applets which will run on the client machine. Java also can be used on the server side. The client program can request an application be run on the server side. A Java class called Servlets are often used for these applications.

Perl may be a systems programing language . this suggests that Perl can access OS functions directly. Perl is employed to process data that a user sends back during a form. It also can be used for accessing databases on the server side and returning that information to the client.

PHP (Hypertext Preprocessor / Personal Home Page) was developed to be an internet programing language . it's a scripting language like JavaScript but runs on the server side. The script is embedded within the XHTML document. With PHP you'll process forms and access databases but the training curve is a smaller amount steep compared to Perl.

But this not enough. To be an efficient web programmer you'll even have to master some graphics package like PhotoShop to make your own graphics. you'll even have to supply a database rear for your website . There are several free database packages available like MySQL or PostgreSQL.

12.4.4 HTML – HTTP :

- HTML is mark up language where HTTP is protocol.
- HTML is related to tags where HTTP related for rules of network.
- HTML is enhancing CGI (Common Gateway Interface) where HTTP enhancing Web architecture of Client – Server.
- HTML is most basic and essential web programming where HTTP is most essential with TCP/IP Model.
- HTML is developer side web element where HTTP is Computer Network side element.

☐ Check Your Progress – 5 :

1. CSS stands for _____.
[A] Cascading Style Sheet [B] Carbon Style Sheet
[C] Cascading Special Sheet [D] None of these
2. XML stands for _____.
[A] Expensive Markup Language [B] Extensive Markup Language
[C] Extra Mark Language [D] None of these

3. HTML is _____ language.
[A] Programming [B] Markup [C] Designing [D] Coding
4. CGI stands for
[A] Common Gateway Interface [B] Carbon Gateway Interchange
[C] Cascading Gateway Interface [D] None of these

12.5 Let Us Sum Up :

After completing this unit, you can understand

- Emerging IP address technique that useful for local network as well as internet communication. In this part you understand IP address standard like IPV4 and IPV6 with its comparison.
- In internet TCP/IP and OSI reference model
- Finally Internet web architecture and Web programming with Client – Server model.

12.6 Answer For Check Your Progress :

☐ Check Your Progress 1 :

1. [B] Open System Interconnection
2. [A] Internet Protocol Next Generation
3. [A] Advance IP
4. [A] & [B] both

☐ Check Your Progress 2 :

1. [A] IPV4
2. [B] 32
3. [B] IPNG
4. [B] 128

☐ Check Your Progress 3 :

1. [A] Mobile IP
2. [A] Mobile Node
3. [A] Home Address
4. [B] Care of Address

☐ Check Your Progress 4 :

1. [C] 1990
2. [A] 4
3. [B] 20
4. [A] Advanced Scientific Research Agency Network

☐ Check Your Progress 5 :

1. [A] Cascading Style Sheet
2. [B] Extensive Markup Language
3. [B] Markup
4. [A] Common Gateway Interface

12.7 Glossary :

- **Emerging IP :** Internet protocol is play key role to identify the local machine (node) as well as main machine (Server) so identification method is having version of IPV4 and IPV6 that study in this unit.
- **Internet and TCP :** Basic communication between 2 or more machine is depend of TCP so it is very necessary to understand TCP/IP reference model and OSI model so we can understand the communication method when Internet works with data.

Introduction to Internet Technologies and HTML

- **Web Programming** : It is CGI (Common Gateway Interface) is an interface when client and server communicate with each other. It is necessary to understand request and response process by web programming. There are sever web programming available we discuss some important
- **HTML – HTTP** : it is necessary to compare so we can understand the concept of protocol and mark up language. Before starring of HTML web programming this should clear as concept of web browser communications.

12.8 Assignment :

1. What is IPv6 ? Give its advantages
2. What is TCP model give the list of layers in this model
3. Difference between IPv4 and IPv6

12.9 Activity :

1. List out sub types of IPv6 explain any 1 in details

12.10 Case Study :

1. List any 3 web programming now a days use and which is most demandable give your argument

12.11 Further Redading :

- Introduction to Netorking Recharh McMohan Tata McGraw Hill Publication
- Computer Network Fundamentals and application– R.S.Rajesh Vikas Publication
- Unleashed Windows 2003 Server–Todd Brown & Chris Miller Techmedia
- Microsoft Windows 2000 Professional– Paul Cassel Techmedia SAMS Publication
- HTML Black Book–Steven Holzner–Dreamtech Press

BLOCK SUMMARY :

Education these days has been the top priority for any family or individual person, and no doubt amongst the latest technologies to promote and maintain the education standards the internet comes first.

Internet is not only an access to websites, these days there is knowledge and information on every aspect of the educational world over the internet. The resources provided on various web pages are indeed very informative and useful for professionals and students related to every field of work. The only pre-requisite is the research over the internet for a specific educational topic, and then this information just needs to be filtered to gain the basic knowledge of what you are looking for. Therefore, these are true internet resources which deal with every individual's educational needs.

Internet has also provided the opportunity to study online. There are virtual universities set up, in which the students can take classes sitting on the computer seat opening the university's website video section according the topic, and then study at home.

The most amazing thing about internet education is that the international education is no more a chance for only the wealthy and high profile family students because now via internet no matter if one can afford to study in top most universities, people can easily benefit from the international quality education and gain a respectable university degree sitting at home through the online educational courses provided by the world universities.

BLOCK ASSIGNMENT :

❖ **Short Answer Questions :**

- (1) How is an automatic payment different from a bill payment ?
- (2) What is Internet Banking ?
- (3) Explain E-commerce model in short
- (4) What is the use of social media networks and instant messages ?
- (5) How social media is helpful in your education ?
- (6) Give advantages of IPV6

❖ **Long Questions :**

- (1) Detail comparison between HTTP and HTTPS
- (2) Detail comparison between IPV4 and IPV6
- (3) Explain ATM Architecture in detail
- (4) Explain E-Banking in Details
- (5) Explain E-Commerce in Details with its types

**Introduction to
Internet Technologies
and HTML**

❖ **Enrolment No. :**

1. How many hours did you need for studying the units ?

Unit No.	9	10	11	12
No. of Hrs.				

2. Please give your reactions to the following items based on your reading of the block :

Items	Excellent	Very Good	Good	Poor	Give specific example if any
Presentation Quality	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Language and Style	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Illustration used (Diagram, tables etc)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Conceptual Clarity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Check your progress Quest	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Feed back to CYP Question	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____

3. Any other Comments

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Dr. Babasaheb Ambedkar
Open University Ahmedabad

BCAR-104

Introduction to **Internet Technologies and HTML**

BLOCK 4 : HTML AND STRUCTURING WEB PAGE

UNIT 1 INTRODUCTION TO HTML

UNIT 2 PRACTICAL USE IN HTML

UNIT 3 STRUCTURING WEB PAGE

UNIT 4 CONCEPT OF WEBSITE

HTML AND STRUCTURING WEB PAGE

Block Introduction :

In this block, we shall study about HTML and webpage structuring. In unit 13, we will study about HTML document structure, HTML Comments, XML, DHTML etc.

In unit 14, we will learn about the practical use in HTML which comprises of text formatting, special characters, anchor tag, images, metatag and about Sound and video.

In unit 15, we will study about how a webpage, tables, frames, forms are structured. After studying these three units, we will be clear with the concept of HTML document structure, the HTML comments, the concept of XML and its function and also be clear about the concept of DHTML.

In unit 16, concept of website that lead to type of website, that focus on static and dynamic website that is more demandable in modern web development. Than website deploy on machine called webserver and type of website i.e. platform of website related web Engine concept you will learn in this block

Block Objectives :

- To understand HTML Practical paradigm.
- To focus on type of HTML tags with its types.
- To understand practical of structure and unstructured tags of HTML.
- How to develop webpage – website ?
- To understand static and dynamic website
- To classify and focus about webserver and web Engine

Block Structure :

Unit 13 : Introduction to HTML

Unit 14 : Practical Use in HTML

Unit 15 : Structuring Web Page

Unit 16 : Concept of Website

UNIT STRUCTURE**13.0 Learning Objectives****13.1 Introduction****13.2 HTML Document Structure****13.2.1 Starting with a Template****13.2.2 HTML Basic Examples****13.2.3 HTML Elements****Check Your Progress – 1****Check Your Progress – 2****13.3 XML Introduction****13.3.1 Structure of XML Data****13.3.2 XML Example****13.3.3 Example of Nested Elements****13.3.4 Attributes****Check Your Progress – 3****13.4 DHTML Introduction****13.4.1 What is DHTML ?****13.4.2 Advantages of Dhtml****13.4.3 DHTML Components****13.4.4 What is DOM ?****Check Your Progress – 4****13.4.5 Components of DOM****Check Your Progress – 5****13.5 Let Us Sum Up****13.6 Answer For Check Your Progress****13.7 Glossary****13.8 Assignments****13.9 Activity****13.10 Case Study****13.11 Further Reading****13.0 Learning Objectives :**

After reading this Unit, you will be able to :

- HTML structure
- HTML comments
- XML DHTML
- DOM

13.1 Introduction :

You should be aware that there are historically many versions of the HTML specification. You will read most about the HTML 3.0, 3.2, and 4.0 specifications. I have tried to display HTML tags and attributes that are supported by the 3.2 and 4.0 specification, but cannot guarantee that all tags and attributes contained herein will work in all versions of HTML. There are several HTML common document types when referring to HTML 4.0 which are :

- Strict – HTML 4.0 without frame or HTML 3.2 deprecated feature support.
- Frame – HTML 4.0/3.2 with frame support.
- Transitional or loose – Supports features of HTML 3.2 that are being deprecated in HTML 4.0. This DTD does not support framesets. Some deprecated tags/elements not supported by strict HTML 4.0 are CENTER, FRAME, FRAMESET, NOFRAMES, IFRAME, ISINDEX, DIR, MENU, APPLET, BASEFONT, FONT, S, STRIKE, and U.

13.2 HTML Document Structure :

HTML uses tags that are encased in brackets like the following :

<>

HTML documents consist of elements which are constructed with tags. For instance, a paragraph is considered to be an html element constructed with the tags <P> and </P>. The <P> tag begins the paragraph element and the </P> tag ends the element. The following is a paragraph element.

<p>

this is a sample paragraph element. Any text in a paragraph goes here.

</p>

Not all tags have a tag for ending the element such as the line break,
 tag. The HTML document is begun with the <html> tag and ended with the </html> tag. Elements of an HTML document include the HEAD, BODY, paragraphs, lists, tables, and more. Elements may be embedded within each other. Also some elements have attributes embedded in the tag that define characteristics of the element such as the placing of text, size of text, source of an image, and other characteristics depending on the element. These attributes are listed in this document when the element is discussed in detail.

An HTML document is structured with two main elements :

1. HEAD
2. BODY

13.2.1 Starting with a Template :

To begin your first web page, you will want to create a template from which you can start all your pages which has the basic structure of an HTML document as shown in the "HTML document Structure" section of this document. You can copy the example file shown there into your editor's file or make your own. You will want to follow the standard HTML structure of HTML, HEAD, and BODY elements. If you want to set your HTML page with multiple frames, for example with an HTML index on the left side for easier document viewing, you will need to become familiar with the section on FRAMES before you begin. If working with frames is initially too complicated, stick with the standard HEAD, BODY structure until you gain familiarity.

13.2.2 HTML BASIC Examples :

HTML Headings

HTML headings are defined with the <h1> to <h6> tags.

Example :

```
<h1>This is a heading</h1>
```

```
<h2>This is a heading</h2>
```

```
<h3>This is a heading</h3>
```

HTML paragraphs are defined with the <p> tag.

Example

```
<p>This is a paragraph.</p>
```

```
<p>This is another paragraph.</p>
```

HTML links are defined with the <a> tag.

Example :

This is a link HTML images are defined with the tag.

Example

```

```

13.2.3 HTML Elements :

An HTML element is everything from the start tag to the end tag :

Start tag *	Element content	End tag *
<p>	This is a paragraph	</p>
	This is a link	

A complete list of standard tags from HTML 4.01 / XHTML 1.0 is given here. All the tags are ordered alphabetically.

We have used the Netscape and Internet Explorer indications to the far right of each item to indicate tags that are extensions to the HTML 4.01 and XHTML 1.0 standards. If no indication is shown, then the tag is part of the HTML 4.01 and XHTML 1.0 standards.

- **NS** : indicates Netscape Extension
- **IE** : indicates Internet Explorer Extension

Tag	Description	Browser
<!--...-->	Specifies a comment	
<!DOCTYPE>	Specifies the document type	
<a>	Specifies an anchor	
<abbr>	Specifies an abbreviation	
<acronym>	Specifies an acronym	
<address>	Specifies an address element	
<applet>	Deprecated. Specifies an applet	
<area>	Specifies an area inside an image map	

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	Specifies bold text	
<base>	Specifies a base URL for all the links in a page	
<basefont>	Deprecated. Specifies a base font	
<bdo>	Specifies the direction of text display	
<bgsound>	Specifies the background music	IE
<big>	Specifies big text	
<blink>	Specifies a text which blinks	NS
<blockquote>	Specifies a long quotation	
<body>	Specifies the body element	
 	Inserts a single line break	
<button>	Specifies a push button	
<caption>	Specifies a table caption	
<center>	Deprecated. Specifies centered text	
<cite>	Specifies a citation	
<code>	Specifies computer code text	
<col>	Specifies attributes for table columns	
<colgroup>	Specifies groups of table columns	
<comment>	Puts a comment in the document	IE
<dd>	Specifies a definition description	
	Specifies deleted text	
<dfn>	Specifies a definition term	
<dir>	Deprecated. Specifies a directory list	
<div>	Specifies a section in a document	
<dl>	Specifies a definition list	
<dt>	Specifies a definition term	
	Specifies emphasized text	
<embed>	Deprecated. Embeds an application in a document	IE & NS
<fieldset>	Specifies a fieldset	
	Deprecated. Specifies text font, size, and color	
<form>	Specifies a form	
<frame>	Specifies a sub window (a frame)	
<frameset>	Specifies a set of frames	
<h1> to <h6>	Specifies header 1 to header 6	
<head>	Specifies information about the document	
<hr>	Specifies a horizontal rule	
<html>	Specifies an html document	
<i>	Specifies italic text	

❑ **Check Your Progress – 1 :**

1. <P> means _____.
 [A] PRESENT [B] PARAGRAPH
 [C] PROCEDURE [D] POINT
2. To insert any image in HTML web page _____ tag is important
 [A] [B] <image> [C] <pic> [D] <picture>
3. To set 'https://baou.edu.in ' we use _____ part of HTML
 [A] <form> [B] <body> [C] <a href > [D] <head>
4. Use of <form> is _____.
 [A] Specifies a form [B] Fill up to paragraph
 [C] Print the form [D] None of this

Tag	Description	Browser
<iframe>	Specifies an inline sub window (frame)	
<ilayer>	Specifies an inline layer	NS
	Specifies an image	
<input>	Specifies an input field	
<ins>	Specifies inserted text	
<isindex>	Deprecated. Specifies a single–line input field	
<kbd>	Specifies keyboard text	
<keygen>	Generate key information in a form	
<label>	Specifies a label for a form control	
<layer>	Specifies a layer	NS
<legend>	Specifies a title in a fieldset	
	Specifies a list item	
<link>	Specifies a resource reference	
<map>	Specifies an image map	
<marquee>	Create a scrolling–text marquee	IE
<menu>	Deprecated. Specifies a menu list	
<meta>	Specifies meta information	
<multicol>	Specifies a multicolumn text flow	NS
<nobr>	No breaks allowed in the enclosed text	
<noembed>	Specifies content to be presented by browsers that do not support the <embed> tag	NS
<noframes>	Specifies a noframe section	
<noscript>	Specifies a noscript section	
<object>	Specifies an embedded object	

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	Specifies an ordered list	
<optgroup>	Specifies an option group	
<option>	Specifies an option in a drop-down list	
<p>	Specifies a paragraph	
<param>	Specifies a parameter for an object	
<plaintext>	Deprecated. Render the remainder of the document as preformatted plain text	
<pre>	Specifies preformatted text	
<q>	Specifies a short quotation	
<s>	Deprecated. Specifies strikethrough text	
<samp>	Specifies sample computer code	
<script>	Specifies a script	
<select>	Specifies a selectable list	
<spacer>	Specifies a white space	NS
<small>	Specifies small text	
	Specifies a section in a document	
<strike>	Deprecated. Specifies strikethrough text	
	Specifies strong text	
<style>	Specifies a style definition	
<sub>	Specifies subscripted text	
<sup>	Specifies superscripted text	
<table>	Specifies a table	
<tbody>	Specifies a table body	
<td>	Specifies a table cell	
<textarea>	Specifies a text area	
<tfoot>	Specifies a table footer	
<th>	Specifies a table header	
<thead>	Specifies a table header	

❑ Check Your Progress – 2 :

- means _____.
 [A] Specifies a list item [B] Specifies a lost item
 [C] Specifies a large item [D] Specifies a list index
- <th> means _____.
 [A] Specifies a Task Header [B] Specifies a Table Hand
 [C] Specifies a Table Home [D] Specifies a Table Header

3. <select> means _____.
- [A] Specifies a selectable last Index
 [B] Specifies a selectable list
 [C] Specifies a strong list
 [D] None of This
4. Use of <sub> is _____.
- [A] Specifies subtotal text [B] Specifies subsection text
 [C] Specifies subscripted text [D] None of this

Tag	Description	Browser
<title>	Specifies the document title	
<tr>	Specifies a table row	
<tt>	Specifies teletype text	
<u>	Deprecated. Specifies underlined text	
	Specifies an unordered list	
<var>	Specifies a variable	
<wbr>	Indicate a potential word break point within a <nobr> section	IE&NS
<xmp>	Deprecated. Specifies preformatted text	

The start tag is often called as the opening tag and the end tag is often called as the closing tag. Define HTML.

13.3 XML Introduction :

XML stands for eXtensible Markup Language. Documents have tags giving extra information about sections of the document.

E.g. <title> XML </title><slide> Introduction ...</slide>

Extensible, unlike HTML. Users can add new tags, and separately specify how the tag should be handled for display.

Earlier generation formats were based on plain text with line headers indicating the meaning of fields, Similar in concept to email headers, does not allow for nested structures, no standard ?type ? language and tied too closely to low level document structure (lines, spaces, etc).

Each XML based standard defines what valid elements, using are XML type specification languages to specify the syntax

DTD (Document Type Descriptors), XML Schema Plus textual descriptions of the semantics, XML allows new tags to be defined as required. However, this may be constrained by DTDs. A wide variety of tools is available for parsing, browsing and querying XML documents/data.

13.3.1 Structure of XML data :

Tag : label for a section of data

Element : section of data beginning with <tagname> and ending with matching </tagname>

Elements must be properly nested

Proper nesting

```
<account> ... <balance> .... </balance></account>
```

Improper nesting

```
<account> ... <balance> .... </account></balance>
```

Formally : every start tag must have a unique matching end tag, that is in the context of the same parent element.

Every document must have a single top-level element

13.3.2 XML example :

```
<?xml version="1.0" encoding="UTF-8"?>
<note>
  <to> Tove</to>
      <from>Jani</from>
      <heading>Reminder</heading>
      <body>Don't forget me this weekend!</body>
</note>
```

13.3.3 Example of nested elements :

```
<bank-1>
<customer>
<customer_name> Hayes </customer_name>
<customer_street> Main </customer_street>
<customer_city> Harrison </customer_city>
<account>
<account_number> A-102 </account_number>
<branch_name> Perryridge </branch_name>
<balance> 400 </balance>
</account>
<account>
...
</account>
</customer>
</bank-1>
```

13.3.4 Attributes :

Elements can have attributes

```
<account acct-type = -checking>
```

```
<account_number> A-102 </account_number> <branch_name>
```

```
Perryridge </branch_name> <balance> 400 </balance> </account>
```

Attributes are specified by name=value pairs inside the starting tag of an element

An element may have several attributes, but each attribute name can only occur once

```
<account acct-type = -checking - monthly-fee= -5?>
```

❑ Check Your Progress – 3 :

1. DTD means _____.

[A] Document Type Disk	[B] Data Type Descriptors
[C] Document Task Descriptor	[D] Document Type Descriptors
2. Use of is _____.

[A] Specifies an ordered list	[B] Specifies an ordered Last
[C] Specifies an orange list	[D] Specifies an ordinary list
3. Use of is _____.

[A] Specifies an unmount list	[B] Specifies an unmerge list
[C] Specifies an unorder list	[D] Specifies an unmanage list
4. Use of <tr> is _____.

[A] Specify Task Raw	[B] Specify Table Raw
[C] Specify Table Read	[D] None of this

13.4 DHTML Introduction :

The group of technologies known as Dynamic Hypertext Mark-up Language (DHTML) can make your Web pages come alive. DHTML lets the Web page author add functions to the page that can change everything on the page. Instead of having to download new information from the server computer every time something on the page changes, changes can be made by the HTML document. Web pages built with Dynamic HTML are richer and more interactive, react faster, and don't use much bandwidth. The major elements of DHTML include HTML code, scripting languages such as JavaScript, the Document Object Model, Cascading Style Sheets, multimedia filters, and the browser itself.

13.4.1 What is DHTML ?

First, let's look at what Dynamic HTML is not. It is not a scripting language like JavaScript. It is a browser feature that allows your browser (Netscape Navigator 4.x or higher, or Microsoft Internet Explorer 4.x or higher) to be dynamic. The group of technologies known as Dynamic Hypertext Mark-up Language (DHTML) can make your Web pages come alive. DHTML lets the Web page author add functions to the page that can change everything on the page. Instead of having to download new information from the server computer every time something on the page changes, changes can be made by the HTML document. Web pages built with Dynamic HTML are richer and more interactive, react faster, and don't use much bandwidth. The major elements of DHTML include HTML code, scripting languages such as JavaScript, the Document Object Model, Cascading Style Sheets, multimedia filters, and the browser itself. Browser can alter a Web page's look after the document has loaded.

13.4.2 Advantages of DHTML :

- DHTML makes documents dynamic. Dynamic documents :
- Allow the designer to control how the HTML displays Web pages' content.

- React and change with the actions of the visitor.
- Can exactly position any element in the window, and change that position after the document has loaded.
- Can hide and show content as needed.
- DHTML allows any HTML element (any object on the screen that can be controlled independently using JavaScript) in Internet Explorer to be manipulated at any time, turning plain HTML into dynamic HTML.
- With DHTML, changes occur entirely on the client side.
- Using DHTML gives the author more control over how the page is formatted and how content is positioned on the page.

13.4.3 DHTML Components :

Dynamic HTML includes the following components :

- Conventional HTML
- Scripts – Small programs designed to manipulate Web pages.
- (DOM) – The road map through which you can locate any element in an HTML document and use a scripting language, such as JavaScript, to change the element's properties
- Absolute positioning : The elements on the page are placed in a fixed location, as opposed to relative positioning, in which an element's location is relative to particular elements on the page.
- Multimedia : Multimedia features that create visual effects for text, images, and other objects, without imposing long download times on the user.

13.4.4 What is DOM ?

The DOM is like a roadmap of your Web page. You describe a path that leads from the HTML document down to the various elements on the page. The DOM for an image called button1 would be : document. Images. Button. The Document Object Model was created with these four goals in mind :

- To delineate a hierarchical structure representing all parts of a Web document.
- To allow the modification of that structure through adding and removing content.
- To provide a way to monitor and manipulate the characteristics of content on the page.
- To provide information about how the items on a page interrelate with the user and each other.

☐ Check Your Progress – 4 :

1. DHTML means _____.

[A] Dynamic Hypertext Mark-up Language

[B] Data Hypertext Mark-up Language

[C] Dynamic Hypertext Mark-up Logic

[D] Dynamic Hybrid Mark-up Language

2. DHTML makes documents _____.

[A] Data

[B] Dynamic

[C] Double

[D] None of this

3. DOM means _____.
- [A] Distribute Object Model [B] Document Overdraft Model
 [C] Document Object Model [D] Document Object Method
4. Small programs designed to manipulate Web pages is called _____.
- [A] Menu [B] Coding [C] Web Server [D] Script

13.4.5 Components of DOM :

The DOM is comprised of these components :

- **Objects :** The object is the basic unit of the DOM. Every element on the page is part of the DOM. Text and images are examples of objects. A table would be a parent object; its cells would be children of the table. A form named – MyForm could be referred to as :

<FORM NAME=–MyForm>.

After the author names an object, it can be referred to easily in a JavaScript.

- **Properties :** Properties are adjectives that describe parts of the Web page. Examples could include height, width, colour, and size. If a cell border is two pixels wide, its width property would be referenced as : WIDTH=5.
- **Events :** An event is an action or occurrence of a Web page. When an event occurs on a page, the item that received the event notifies the DOM that the event has occurred. This is called firing the event. An event is trapped, or handled, if a script is present that responds to the firing of that event. The script is called an event handler. Some examples of events :
- **OnMouseDown :** Fired when the user presses the mouse button.
- **OnMouseOver :** Fired when the user positions the mouse pointer over an object.
- **On MouseOut :** Fired when the user moves the mouse pointer outside the
- **OnKeyPress :** Fired when the user presses a key.
- **OnFocus :** Fired when the object receives the focus.
- **OnClick :** Fired when the mouse button is clicked over an area
- **Event bubbling :** (supported only in Internet Explorer) – When an object fires an event, it also notifies its parent object that the event has occurred. The event continues to travel, or ?bubble, ? up the hierarchy until it reaches the top or the bubbling action is cancelled.
- **Methods :** They describe the actions an object can take. For example, the open method directs the window to open a new browser window. Other examples are focus, Run, and reload.
- **Collections :** Collections are lists of items that are associated with a particular object. For example, the collection name images is a list of all image objects.

☐ Check Your Progress – 5 :

1. A table would be a _____ object in DOM
- [A] Brother [B] Sister [C] Child [D] Parent
2. An _____ is an action or occurrence of a Web page
- [A] Data [B] Class [C] Event [D] None of this

3. _____ event fired when the mouse button is clicked over an area
[A] OnMouseDown [B] OnClick
[C] OnFocus [D] None of This
4. _____ are lists of items that are associated with a particular object.
[A] Collections [B] Class [C] Object [D] None of this

13.5 Let Us Sum Up :

After completing this Unit, you can understand

- DHTML elements
- XML examples
- HTML elements
- Structure and template of HTML
- DOM and its components

13.6 Answer For Check Your Progress :

Check Your Progress 1 :

1. [B] PARAGRAPH 2. [A]
3. [D] <head> 4. [A] Specifies a form

Check Your Progress 2 :

1. [A] Specifies a list item
2. [D] Specifies a Table Header
3. [B] Specifies a selectable list
4. [C] Specifies subscripted text

Check Your Progress 3 :

1. [D] Document Type Descriptors
2. [A] Specifies an ordered list
3. [C] Specifies an unorder list
4. [B] Specify Table Row

Check Your Progress 4 :

1. [A] Dynamic Hypertext Mark-up Language
2. [B] Dynamic
3. [C] Document Object Model
4. [D] Script

Check Your Progress 5 :

1. [D] Parent 2. [C] Event
3. [B] OnClick 4. [A] Collection

13.7 Glossary :

- **DHTML** : The group of technologies known as Dynamic Hypertext Markup Language (DHTML) can make your Web pages come alive. DHTML lets the Web page author add functions to the page that can change

everything on the page. Instead of having to download new information from the server computer every time something on the page changes, changes can be made by the HTML document.

- **DOM** : DOM is like a roadmap of your Web page. You describe a path that leads from the HTML document down to the various elements on the page

13.8 Assignments :

1. Comparison between DHTML and HTML
2. Explain DOM in Short
3. Explain DHTML Component

13.9 Activity :

1. Prepare Web Page that use `<table>`, `` and `` as you like

13.10 Case Study :

1. With the use of `<head>` `<body>` main element of HTML prepare your bio data in web page.

13.11 Further Reading :

- Cearley, K. (1998). HTML interactive course. Corte Madera, CA :Waite Group
- Press (a division of Macmillan Computer Publishing).
- Gardner, D. (1998). Beginner's guide to dhtml. [Online]. Available : <http://www.geocities.com/ResearchTriangle/Facility/4490/>[2000, March 10].
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UNIT STRUCTURE

- 14.0 Learning Objectives
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- 14.2 Text Formatting
 - Check Your Progress – 1
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14.0 Learning Objectives :

After reading this Unit, you will be able to :

- Text formatting
- Special characters
- Embedding Anchor tag
- How to add Images
- How to add sound and Video

14.1 Introduction :

H-T-M-L are initials that stand for **Hyper Text Mark-up Language** (computer people love initials and acronyms — you'll be talking acronyms ASAP). Let me break it down for you :

- **Hyper** is the opposite of linear. It used to be that computer programs had to move in a linear fashion. This before this, this before this, and so on. HTML does not hold to that pattern and allows the person viewing the World Wide Web page to go anywhere, anytime they want.
- **Text** is what you will use. Real, honest to goodness English letters.

- **Mark up** is what you will do. You will write in plain English and then mark up what you wrote. More to come on that in the next Primer.
- **Language** because they needed something that started with "L" to finish HTML and Hypertext Mark-up Louie didn't flow correctly. Because it's a language, really — but the language is plain English.

❖ **Basic Structure :**

```
<html>
<head>
<title> George's Home Page </title>
</head>
<body>
</body>
</html>
```

14.2 Text Formatting :

Formatting Text Open/Close Flags :

Bold face

Italics <i></i>

Typewriter Font <tt></tt>

Center Text <center></center>

Flashing Text <blink></blink>

Formatting Text Single Flags :

Line Across Page <hr> or <hr width= "XX%">

<hr size= "X">

Carriage Return

Blank Line <p>

Heading Commands :

Sizes : LARGEST 1 to smallest 6.

<h1></h1>

(No need to add a <p> as it is added automatically with a Heading)

Font Size Commands :

Sizes : LARGEST +6 to smallest -6

14.2.1 Special Characters :

❖ **Special Characters :**

Certain characters need to be referred to in a special way.

These include :

- Character strings that represent special symbols, e.g.
 - & for &
 - < for <

- > for >
- " for double quote (?)

❑ Check Your Progress – 1 :

1. In HTML, 'Text' means _____.
[A] English letters [B] Typing
[C] Task [D] None of this
2. Use of is _____ as text formatting tag
[A] Bracket [B] Bold [C] Bring [D] Best
3. Use of <i> is _____ as text formatting tag
[A] Image [B] immerging [C] Italic [D] Important
4. Full form of <hr> is _____ as text formatting
[A] Home Ruler [B] Horizontal Rest
[C] Harsh Ruler [D] Horizontal Ruler

14.3 Links and Anchors :

Linking to Other Documents – The Bread and Butter of the Web Regions of text can be linked to other documents via the anchor,

<a>, tag which has the following format :

 link text

- The opening <a> tag has a href attribute that is used to specify the link to URL or local file. It means 'Hyper Reference'
- Text between the <a> and (closing tag) is highlighted by the browser to indicate the hyperlink.
- Depending on browser and web page configuration highlight style can differ.

❖ Relative and Absolute Links :

There is a subtle and very important between the links in the previous

Example :

Relative links – refer to a page in relation to the current document

- o Sub-directories and included files can be specified in the relative link.
- o Makes for very portable web pages.

Whole directory systems can be moved easily.

Example :

Football

Absolute links – reference files based on the absolute location on the local file system or WWW.

Example :

Football

❖ Anchors are special places within documents that can be linked to

- Anchors may placed anywhere in a document with

Anchor Position

- Anchors within the same document are referred to by
Go to anchor
- Anchors in the external document are referred to by

where link may a relative, absolute or remote URL link.

❖ **Anchor Example – Same code for external or internal :**

```
<ul>
<li><a href="#apples">apples</a></li>
<li><a href="#oranges">oranges</a></li>
<li><a href="#bananas">bananas</a></li>
</ul>
<h2>Information</h2>
<p><a name="apples">
Apples are green
</p>
<p><a name="oranges">
Oranges are orange
</p>
<p><a name="bananas">
Bananas are yellow
</p>
```

❑ **Check Your Progress – 2 :**

1. Full form of <a> is _____.
[A] Anchor [B] Alernate
[C] Announcement [D] None of this
2. In <a> main attribute is _____.
[A] href [B] src [C] bgcolor [D] begimg
3. Full form of <href> is _____.
[A] Hybird Reference [B] Hrper Reference
[C] Holding Reference [D] None of this
4. <a> has _____ and _____ type of link
[A] Home and Refrence [B] Relative and Absolute
[C] Strong and Weak [D] None of this

14.4 Meta Tag :

The <meta> element represents various kinds of metadata that cannot be expressed using the title, base, link, style, and script elements.

- Exactly one of the name, http-equiv, and charset attributes must be specified.
- If either name or http-equiv is specified, then the content attribute must also be specified. Otherwise, it must be omitted.

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- Name = string Sets document metadata.
- Application–name
Giving the name of the Web application that the page represents.
- Author
Giving the name of one of the page's authors.
- Description Describes the page.
- Generator
Identifies one of the software packages used to generate the document.
- Keywords
Giving the keyword relevant to the page.
Other metadata names may be registered in the WHATWG Wiki MetaExtensions page.
- http–equiv = string When the http–equiv attribute is specified on a meta element, the element is a pragma directive. You can use this element to simulate an HTTP response header, but only if the server doesn't send the corresponding real header; you can't override an HTTP header with a meta http–equiv element.
Values are those in Section 14 of the HTTP standard. Some of the most common ones include :
 - content–language
Sets the pragma–set default language.
 - content–type
Alternative form of setting the charset attribute
 - default–style OR content–style–type Sets the name of the default alternative style sheet set.
 - refresh
Acts as timed redirect.
 - Allow
Defines methods allowed by server (GET, POST etc.)
 - Content–Encoding
Define the the encoding type of the returned data
 - Content–Length
 - Date
Document creation date
 - Expires Expiration date
Last–Modified
Date when document was last modified
Location
Absolute URL pointing to the document
Set–Cookie

Example :

```
<head>
<title>World Wide Web Consortium (W3C)</title>
<meta http-equiv="Content-Type" content="text/html; charset=utf-8" />
<meta http-equiv="Content-Style-Type" content="text/css" /> <meta
name="copyright" content="© W3C" />
<meta name="author" lang="en" content="" />
<meta name="robots" content="Index,Follow" />
<meta name="description"
content="The World Wide Web Consortium (W3C) is an international
community
where Member organizations, a full-time staff,
and the public work together to develop Web standards." />
<meta name="keyword" content="W3C, HTML, CSS, SVG, Web standards"
/> </head>
```

❑ Check Your Progress – 3 :

1. The <meta> element represents various kinds of _____.
 [A] Reference [B] Metadata [C] Title [D] None of this
2. _____ and _____ are main attribute of <meta> in HTML
 [A] httpv and ched [B] http-equiv and charset
 [C] bgcolor and bgimg [D] ref and src [B]
3. _____ that cannot be expressed using the title, base, link, style, and script elements
 [A] Reference [B] Robust [C] Metadata [D] None of this
4. <meta name="author" lang="en" content="" /> in 'name' is _____.
 [A] Reference [B] Homepage [C] attribute [D] Music

14.5 Sound and Video :

❖ **External Images, Sounds, Video :**

External Images will be loaded into their own page as a simple URL. The href field within the anchor tag is used.

These are easily included by using

```
<a href= ?image url ?>link anchor</a>
<a href= ?video url ?>link anchor</a>
<a href= ?audio url ?>link anchor</a>
<a href="http://www.bbc.co.uk/sound_file.wav">MADE UP LINK!</a>
```

❖ **Embedded (in-line) Audio, Midi and Video :**

To include Audio, MIDI and Video Elements in a web page use the embed tag, syntax :

```
<EMBED SRC="media_url"
HEIGHT=
```


WIDTH=
AUTOPLAY= TRUE/FLASE
LOOP= TRUE/FALSE>

- height, width as before
- autoplay = TRUE forces media to play on page load
- loop = TRUE forced media to loop continuously

❖ **Example Embedded Audio, Midi and Video :**

```
<p align = center>  
Embedded Audio : <br>  
<EMBED SRC="Shaggy.wav"  
HEIGHT=50 WIDTH=200 AUTOPLAY=FLASE LOOP=FALSE>  
</p>
```

```
<p align = center>  
Embedded Midi : <br>  
<EMBED SRC="mars.mid"  
HEIGHT=50 WIDTH=200  
AUTOPLAY=FALSE LOOP=FALSE>  
</p>
```

```
<p align = center>  
Embedded Video : <br>  
<EMBED SRC="JawsII.mov"  
HEIGHT=250 WIDTH=200  
AUTOPLAY=TRUE LOOP=FALSE>  
</p>
```

Which looks like this when viewed through a browser :

❑ **Check Your Progress – 4 :**

1. External images, sound, video will link in webpage by _____ tag
[A] <meta> [B] [C] <ad> [D] <a>
2. Internal images, sound, video will link in webpage by _____ tag
[A] <meta> [B] [C] <banner> [D] <EMBED>
3. In <EMBED> attribute _____ use for automatic play video
[A] START [B] PLAY [C] AUTOPLY [D] None of this
4. In <EMBED> video player length and width decide by _____ and _____
[A] TALL AND SHORT [B] HORIZONTAL AND VERTICAL
[C] HEIGHT AND WIDTH [D] None of This

14.6 Images :

❖ **Pictures :**

```
<img src = "image.gif">
```

Activate an image

``

Align Images :

Default is to left use `img src = "image.gif"`

To put into middle use `<center></center>`

To align to the right side use ``

Align Text with images :

` Add text here Add text here Add text here`
 Change Image Size :

``

XX as the pixel size of the image. You will have to play with the numbers to find the original size. Hint use `i_view32.exe` in Shared and the Statistics option to get the original size.

❖ **Body Background Image :**

`<body background = "image.gif">`

❖ **Using Image Backgrounds :**

Some precautions should be taken when using images :

- Keep the size of the images small
- Browsers tile images :
 - Small images are repeated in rows and columns to fill the webpage.
 - This saves on downloading overheads of large images
 - Images should have patterns that flow between tiles
 - GIF and JPEG image formats allowed
- Browsers cache images and web pages so reuse a background on several pages.
- Reusing a background creates a consistency to pages providing a – web site – overall image.

❖ **Scrolled Image Backgrounds :**

Image backgrounds can be Scroll controlled via the `bgproperties` attribute of the BODY tag

- If `bgproperties="fixed"` is set when (Web Page) text is scrolled background image remains fixed

For example, my back fixed.html :

`<body background="my_back.jpg" bgproperties="fixed">`

- Otherwise the background image also scrolls

❖ **In-Line Image Example Pixel Size :**

HTML :

`<p align = center>`

An image mixed in with text `
`

`
</p>
```

In-Line Image Example Percentage Size

**HTML :**

- **Note :** Only have set width here to preserve image aspect.

```
<p align = center>
An image mixed in with text

</p>
```

Which looks like this when viewed through a browser :

**Check Your Progress – 5 :**

1. To make image at center \_\_\_\_\_ tag use  
[A] <center> [B] <big> [C] <mid> [D] <midele>
2. To make image at top \_\_\_\_\_ attribute is use  
[A] <align> [B] <set> [C] <put> [D] None of this
3. Main attribute if <img> is \_\_\_\_\_.  
[A] meta [B] bgcolor [C] src [D] MIDI
4. In <img> 'src' attribute full form is \_\_\_\_\_.  
[A] send [B] second [C] source [D] None of This

**14.7 Let Us Sum Up :**

After reading this unit, you will be able to,

- Align images
- Embedding the pictures and videos
- Meta tag
- Formatting and anchor tags

**14.8 Answer For Check Your Progress :**

**Check Your Progress 1 :**

1. [A] <center>
2. [A] <align>
3. [C] src
4. [C] source

**Check Your Progress 2 :**

1. [A] <center>
2. [A] <align>
3. [C] src
4. [C] source

**Check Your Progress 3 :**

1. [A] <center>
2. [A] <align>
3. [C] src
4. [C] source

❑ **Check Your Progress 4 :**

- |            |                |
|------------|----------------|
| 1. [D] <a> | 2. [A] <align> |
| 3. [C] src | 4. [C] source  |

❑ **Check Your Progress 5 :**

- |                 |                |
|-----------------|----------------|
| 1. [A] <center> | 2. [A] <align> |
| 3. [C] src      | 4. [C] source  |

**14.9 Glossary :**

- **Single-line text input controls** – This control is used for items that require only one line of user input, such as search boxes or names. They are created using HTML <input> tag.
- **Password input controls** – This is also a single-line text input but it masks the character as soon as a user enters it. They are also created using HTML <input> tag.
- **Multi-line text input controls** – This is used when the user is required to give details that may be longer than a single sentence. Multi-line input controls are created using HTML <textarea> tag

**14.10 Assignments :**

1. How can we add video in webpage
2. How can we add audio in webpage
3. What is the use of <embed> give suitable example

**14.11 Activity :**

1. Prepare Web Page that use to display image in webpage using HTML tag

**14.12 Case Study :**

1. With the use of hyperlink prepare webpage on click of button any video should play in HTML web page.

**14.13 Further Reading :**

- Cearley, K. (1998). HTML interactive course. Corte Madera, CA :Waite Group Press (a division of Macmillan Computer Publishing).
- Gardner, D. (1998). Beginner's guide to dhtml. [Online]. Available : <http://www.geocities.com/ResearchTriangle/Facility/4490/>[2000, March 10].
- Heinle, N. Dynamic html and cascading style sheets. [Online]. Available : <http://www.dhtmlzone.com/articles/>[2000, March 10].
- Hyman, M. (1999). Dynamic html for dummies. Foster City, CA : IDG Books Worldwide, Inc.
- Richmond, A. (1969). Dynamic html. [Online]. Available : <http://www.stars.com/Authoring/DHTML/> [2000, March 10].
- Schurman, E., & Pardi, W. (1999). Dynamic html in action. Redmond, WA : Microsoft Press.

**UNIT STRUCTURE**

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**15.0 Learning Objectives :**

After reading this Unit, you will be able to :

- Tables
- Forms and buttons
- Forms and controls
- Frames

**15.1 Introduction :**

HTML stands for **H**yper **T**ext **M**arkup **L**anguage, which is the most widely used language on Web to develop web pages. HTML was created by Berners-Lee in late 1991 but "HTML 2.0" was the first standard HTML specification which

was published in 1995. HTML 4.01 was a major version of HTML and it was published in late 1999. Though HTML 4.01 version is widely used but currently we are having HTML-5 version which is an extension to HTML 4.01, and this version was published in 2012.

## 15.2 Tables :

The HTML tables allow web authors to arrange data like text, images, links, other tables, etc. into rows and columns of cells.

The HTML tables are created using the `<table>` tag in which the `<tr>` tag is used to create table rows and `<td>` tag is used to create data cells.

### Example :

```
<!DOCTYPE html>
<html>
<head>
<title>HTML Tables</title>
</head>
<body>
<tableborder="1">
<tr>
<td>Row 1, Column 1</td>
<td>Row 1, Column 2</td>
</tr>
<tr>
<td>Row 2, Column 1</td>
<td>Row 2, Column 2</td>
</tr>
</table>
</body>
</html>
```

This will produce following result :

Row 1, Column 1	Row 1, Column 2
Row 2, Column 1	Row 2, Column 2

Here **border** is an attribute of `<table>` tag and it is used to put a border across all the cells. If you do not need a border then you can use `border="0"`.

### 15.2.1 Table Heading :

Table heading can be defined using `<th>` tag. This tag will be put to replace `<td>` tag, which is used to represent actual data cell. Normally you will put your top row as table heading as shown below, otherwise you can use `<th>` element in any row.

**Example :**

```
<!DOCTYPE html>
<html>
<head>
<title>HTML Table Header</title>
</head>
<body>
<tableborder="1">
<tr>
<th>Name</th>
<th>Salary</th>
</tr>
<tr>
<td>Ramesh Raman</td>
<td>5000</td>
</tr>
<tr>
<td>Shabbir Hussein</td>
<td>7000</td>
</tr>
</table>
</body>
</html>
```

This will produce following result :

<b>Name</b>	<b>Salary</b>
Ramesh Raman	5000
Shabbir Hussein	7000

**15.2.2 Cell Padding and Cell Spacing Attributes :**

**There are two attributes called cell padding** and cell spacing which you will use to adjust the white space in your table cells. The cells pacing attribute defines the width of the border, while cell padding represents the distance between cell borders and the content within a cell.

**Example :**

```
<!DOCTYPE html>
<html>
<head>
<title>HTML Table Cellpadding</title>
</head>
<body>
<table border="1"cellpadding="5"cellspacing="5">
```

```

<tr>
<th>Name</th>
<th>Salary</th>
</tr>
<tr>
<td>Ramesh Raman</td>
<td>5000</td>
</tr>
<tr>
<td>Shabbir Hussein</td>
<td>7000</td>
</tr>
</table>
</body>
</html>

```

This will produce following result :

Name	Salary
Ramesh Raman	5000
Shabbir Hussein	7000

### 15.2.3 Colspan and Rowspan Attributes :

You will use **colspan** attribute if you want to merge two or more columns into a single column. Similar way you will use **rowspan** if you want to merge two or more rows.

#### Example :

```

<!DOCTYPE html>
<html>
<head>
<title>HTML Table Colspan/Rowspan</title>
</head>
<body>
<tableborder="1">
<tr>
<th>Column 1</th>
<th>Column 2</th>
<th>Column 3</th>
</tr>
<tr><tdrowspan="2">Row 1 Cell 1</td><td>Row 1 Cell 2</td><td>Row
1 Cell 3</td></tr>
<tr><td>Row 2 Cell 2</td><td>Row 2 Cell 3</td></tr>
<tr><tdcolspan="3">Row 3 Cell 1</td></tr>

```



```
</table>
</body>
</html>
```

❑ **Check Your Progress – 1 :**

1. Cell padding and cell spacing is use for \_\_\_\_\_ space in your table  
[A] white [B] black [C] brown [D] red
2. Cell padding and cell spacing generally use with \_\_\_\_\_ tag only  
[A] <table> [B] <ol> [C] <ul> [D] None of this
3. For merging two or more column \_\_\_\_\_ is useful  
[A] colspan [B] rowsapn [C] href [D] none of this
4. For merging two or more rows \_\_\_\_\_ is useful  
[A] rowspan [B] colspan [C] src [D] None of This

This will produce following result :

Column 1	Column 2	Column 3
Row 1 Cell 1	Row 1 Cell 2	Row 1 Cell 3
Row 2 Cell 1	Row 2 Cell 2	Row 2 Cell 3
Row 3 Cell 1		

**15.2.4 Tables Backgrounds :**

You can set table background using one of the following two ways :

- **bgcolor attribute** – You can set background color for whole table or just for one cell.
- **background attribute** – You can set background image for whole table or just for one cell.

You can also set border color also using bordercolor attribute.

**Example :**

```
<!DOCTYPE html>
<html>
<head>
<title>HTML Table Background</title>
</head>
<body>
<tableborder="1"bordercolor="green"bgcolor="yellow">
<tr>
<th>Column 1</th>
<th>Column 2</th>
<th>Column 3</th>
</tr>
<tr><td rowspan="2">Row 1 Cell 1</td><td>Row 1 Cell 2</td><td>Row
1 Cell 3</td></tr>
```

```

<tr><td>Row 2 Cell 2</td><td>Row 2 Cell 3</td></tr>
<tr><td colspan="3">Row 3 Cell 1</td></tr>
</table>
</body>
</html>

```

This will produce following result :

Column 1	Column 2	Column 3
Row 1 Cell 1	Row 1 Cell 2	Row 1 Cell 3
Row 2 Cell 1	Row 2 Cell 2	Row 2 Cell 3
Row 3 Cell 1		

Here is an example of using **background** attribute. Here we will use an image available in /images directory.

```

<!DOCTYPE html>
<html>
<head>
<title>HTML Table Background</title>
</head>
<body>
<table border="1" bordercolor="green" background="/images/test.png">
<tr>
<th>Column 1</th>
<th>Column 2</th>
<th>Column 3</th>
</tr>
<tr><td rowspan="2">Row 1 Cell 1</td><td>Row 1 Cell 2</td><td>Row
1 Cell 3</td></tr>
<tr><td>Row 2 Cell 2</td><td>Row 2 Cell 3</td></tr>
<tr><td colspan="3">Row 3 Cell 1</td></tr>
</table>
</body>
</html>

```

This will produce following result. Here background image did not apply to table's header.

Column 1	Column 2	Column 3
Row 1 Cell 1	Row 1 Cell 2	Row 1 Cell 3
Row 2 Cell 1	Row 2 Cell 2	Row 2 Cell 3
Row 3 Cell 1		

### **15.2.5 Table Height and Width :**

You can set a table width and height using **width** and **height** attributes. You can specify table width or height in terms of pixels or in terms of percentage of available screen area.

**Example :**

```
<!DOCTYPE html>
<html>
<head>
<title>HTML Table Width/Height</title>
</head>
<body>
<tableborder="1"width="400"height="150">
<tr>
<td>Row 1, Column 1</td>
<td>Row 1, Column 2</td>
</tr>
<tr>
<td>Row 2, Column 1</td>
<td>Row 2, Column 2</td>
</tr>
</table>
</body>
</html>
```

This will produce following result :

Row 1, Column 1	Row 1, Column 2
Row 2, Column 1	Row 2, Column 2

### **15.2.6 Table Caption :**

The caption tag will serve as a title or explanation for the table and it shows up at the top of the table. This tag is deprecated in newer version of HTML/XHTML.

**Example :**

```
<!DOCTYPE html>
<html>
<head>
<title>HTML Table Caption</title>
```

**❑ Check Your Progress – 2 :**

1. You can set \_\_\_\_\_ image for whole table  
[A] bgcolor [B] background [C] border [D] None of this
2. You can set back ground color by \_\_\_\_\_ attribute of table  
[A] bgcolor [B] background [C] border [D] None of this

3. You can set border of table by \_\_\_\_\_ attribute  
 [A] bgcolor [B] background [C] border [D] None of this
4. You can set length and breadth of table by \_\_\_\_\_ and \_\_\_\_\_ attribute  
 [A] <ul>, <tr> [B] length, <ol> [C] <tr>, <th> [D] width, height

```
</head>
<body>
<tableborder="1"width="100%">
<caption>This is the caption</caption>
<tr>
<td>row 1, column 1</td><td>row 1, columnn 2</td>
</tr>
<tr>
<td>row 2, column 1</td><td>row 2, columnn 2</td>
</tr>
</table>
</body>
</html>
```

This will produce following result :

This is the caption  
 row 1, column 1            row 1, columnn 2  
 row 2, column 1            row 2, columnn 2  
 Table Header, Body, and Footer

Tables can be divided into three portions : a header, a body, and a foot. The head and foot are rather similar to headers and footers in a word-processed document that remain the same for every page, while the body is the main content holder of the table.

The three elements for separating the head, body, and foot of a table are :

- **<thead>** – to create a separate table header.
- **<tbody>** – to indicate the main body of the table.
- **<tfoot>** – to create a separate table footer.

A table may contain several <tbody> elements to indicate different pages or groups of data. But it is notable that <thead> and <tfoot> tags should appear before <tbody>

**Example :**

```
<!DOCTYPE html>
<html>
<head>
<title>HTML Table</title>
</head>
<body>
```

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```
<tableborder="1"width="100%">
<thead>
<tr>
<tdcolspan="4">This is the head of the table</td>
</tr>
</thead>
<tfoot>
<tr>
<tdcolspan="4">This is the foot of the table</td>
</tr>
</tfoot>
<tbody>
<tr>
<td>Cell 1</td>
<td>Cell 2</td>
<td>Cell 3</td>
<td>Cell 4</td>
</tr>
</tbody>
</table>
</body>
</html>
```

This will produce following result :

This is the head of the table

This is the foot of the table

Cell 1	Cell 2	Cell 3	Cell 4
--------	--------	--------	--------

### 15.2.7 Nested Tables :

You can use one table inside another table. Not only tables you can use almost all the tags inside table data tag <td>.

#### Example :

Following is the example of using another table and other tags inside a table cell.

```
<!DOCTYPE html>
<html>
<head>
<title>HTML Table</title>
</head>
<body>
<tableborder="1"width="100%">
<tr>
```

```

<td>
<tableborder="1"width="100%">
<tr>
<th>Name</th>
<th>Salary</th>
</tr>
<tr>
<td>Ramesh Raman</td>
<td>5000</td>
</tr>
<tr>
<td>Shabbir Hussein</td>
<td>7000</td>
</tr>
</table>
</td>
</tr>
</table>
</body>
</html>

```

This will produce following result :

Name	Salary
Ramesh Raman	5000
Shabbir Hussein	7000

```

<table>
or
<table border= ?0 ?>
<caption> Title of table </caption>
<td> Data or to add color use <td bgcolor="#XXXXXX">Data
<td> Data
<td> Data<tr>
<td> Data
<td> Data
<td> Data<tr>
</tr>
</td>
</table>

```

### 15.3 Forms :

HTML Forms are required when you want to collect some data from the site visitor. For example during user registration you would like to collect information such as name, email address, credit card, etc.

A form will take input from the site visitor and then will post it to a back-end application such as CGI, ASP Script or PHP script etc. The back-end application will perform required processing on the passed data based on defined business logic inside the application.

There are various form elements available like text fields, textarea fields, drop-down menus, radio buttons, checkboxes, etc.

The HTML **<form>** tag is used to create an HTML form and it has following syntax :

```
<form action="Script URL"method="GET|POST">
```

form elements like input, textarea etc.

```
</form>
```

#### ❖ **Form Attributes :**

Apart from common attributes, following is a list of the most frequently used form attributes :

Attribute	Description
action	Backend script ready to process your passed data.
method	Method to be used to upload data. The most frequently used are GET and POST methods.
target	Specify the target window or frame where the result of the script will be displayed. It takes values like _blank, _self, _parent etc.
enctype	You can use the enctype attribute to specify how the browser encodes the data before it sends it to the server. Possible values are :
	<ul style="list-style-type: none"> <li>application/x-www-form-urlencoded – This is the standard method most forms use in simple scenarios.</li> </ul>
	<ul style="list-style-type: none"> <li>mutlipart/form-data – This is used when you want to upload binary data in the form of files like image, word file etc.</li> </ul>

**Note :** You can refer to Perl & CGI for a detail on how form data upload works.

#### ❖ **HTML Form Controls :**

There are different types of form controls that you can use to collect data using HTML form :

- Text Input Controls
- Checkboxes Controls
- Radio Box Controls
- Select Box Controls
- File Select boxes
- Hidden Controls

- Clickable Buttons
- Submit and Reset Button

❖ **Text Input Controls :**

There are three types of text input used on forms :

- **Single-line text input controls** – This control is used for items that require only one line of user input, such as search boxes or names. They are created using HTML `<input>` tag.
- **Password input controls** – This is also a single-line text input but it masks the character as soon as a user enters it. They are also created using HTML `<input>` tag.
- **Multi-line text input controls** – This is used when the user is required to give details that may be longer than a single sentence. Multi-line input controls are created using HTML `<textarea>` tag.

❖ **Single-line text input controls :**

This control is used for items that require only one line of user input, such as search boxes or names. They are created using HTML `<input>` tag.

**Example :**

Here is a basic example of a single-line text input used to take first name and last name :

```
<!DOCTYPE html>
<html>
<head>
<title>Text Input Control</title>
</head>
<body>
<form>
First name : <input type="text" name="first_name"/>

Last name : <input type="text" name="last_name"/>
</form>
</body>
</html>
```

This will produce following result :

First name : \_\_\_\_\_

Last name : \_\_\_\_\_

**Attributes :**

Following is the list of attributes for `<input>` tag for creating text field.

❑ **Check Your Progress – 3 :**

1. \_\_\_\_\_ are required when you want to collect some data from the site  
[A] `<table>` [B] `<th>` [C] `<Form>` [D] None of this
2. In `<form>` attribute 'method' has \_\_\_\_\_ or \_\_\_\_\_ option  
[A] `tr`, `td` [B] `<ol>`, `<ul>` [C] `get`, `post` [D] None of this



3. Single-line text input controls in <form> we use \_\_\_\_\_.  
[A] <textare> [B] <ol> [C] <input> [D] None of this
4. Multi-line text input controls in <form> we use \_\_\_\_\_.  
[A] <input> [B] src [C] <textarea> [D] href

Attribute	Description
type	Indicates the type of input control and for text input control it will be set to <b>text</b> .
name	Used to give a name to the control which is sent to the server to be recognized and get the value.
value	This can be used to provide an initial value inside the control.
size	Allows to specify the width of the text-input control in terms of characters.
maxlength	Allows to specify the maximum number of characters a user can enter into the text box.

❖ **Password input controls :**

This is also a single-line text input but it masks the character as soon as a user enters it. They are also created using HTML <input> tag but type attribute is set to **password**.

**Example :**

Here is a basic example of a single-line password input used to take user password :

```
<!DOCTYPE html>
<html>
<head>
<title>Password Input Control</title>
</head>
<body>
<form>
User ID : <input type="text" name="user_id"/>

Password : <input type="password" name="password"/>
</form>
</body>
</html>
```

This will produce following result :

User ID :

Password :

**Attributes :**

Following is the list of attributes for <input> tag for creating password field.

Attribute	Description
type	Indicates the type of input control and for password input control it will be set to <b>password</b> .
name	Used to give a name to the control which is sent to the server to be recognized and get the value.
Value	This can be used to provide an initial value inside the control.
size	Allows to specify the width of the text–input control in terms of characters.
maxlength	Allows to specify the maximum number of characters a user can enter into the text box.

#### ❖ Multiple–Line Text Input Controls

This is used when the user is required to give details that may be longer than a single sentence. Multi–line input controls are created using HTML `<textarea>` tag.

#### Example :

Here is a basic example of a multi–line text input used to take item description :

```

<!DOCTYPE html>
<html>
<head>
<title>Multiple–Line Input Control</title>
</head>
<body>
<form>
Description :

<textarearows="5"cols="50"name="description">
Enter description here...
</textarea>
</form>
</body>
</html>

```

This will produce following result :

Description :



#### Attributes :

Following is the list of attributes for `<textarea>` tag.

Attribute	Description
name	Used to give a name to the control which is sent to the server to be recognized and get the value.
rows	Indicates the number of rows of text area box.
cols	Indicates the number of columns of text area box

❑ **Check Your Progress – 4 :**

- \_\_\_\_\_ can be used to provide an initial value inside the control.  
[A] Name      [B] Value      [C] size      [D] None of this
- \_\_\_\_\_ can be used to bound number character in <input>  
[A] Name      [B] Value      [C] maxlength      [D] None of this
- In <textarea> we can set width as columns as \_\_\_\_\_ attribute  
[A] cols      [B] rows      [C] <input>      [D] None of this
- In <textarea> we can set number of rows as \_\_\_\_\_ attribute  
[A] cols      [B] src      [C] <textarea>      [D] rows

❖ **Checkbox Control :**

Checkboxes are used when more than one option is required to be selected. They are also created using HTML <input> tag but type attribute is set to checkbox.

**Example :**

Here is an example HTML code for a form with two checkboxes :

```
<!DOCTYPE html>
<html>
<head>
<title>Checkbox Control</title>
</head>
<body>
<form>
<input type="checkbox" name="maths" value="on"> Maths
<input type="checkbox" name="physics" value="on"> Physics
</form>
</body>
</html>
```

This will produce following result :

Maths     Physics

**Attributes :**

Following is the list of attributes for <checkbox> tag.

Attribute	Description
type	Indicates the type of input control and for checkbox input control it will be set to <b>checkbox</b> .
name	Used to give a name to the control which is sent to the server to be recognized and get the value.
value	The value that will be used if the checkbox is selected.
checked	Set to checked if you want to select it by default.

#### ❖ Radio Button Control :

Radio buttons are used when out of many options, just one option is required to be selected. They are also created using HTML `<input>` tag but type attribute is set to **radio**.

#### Example :

Here is example HTML code for a form with two radio buttons :

```
<!DOCTYPE html>
<html>
<head>
<title>Radio Box Control</title>
</head>
<body>
<form>
<input type="radio" name="subject" value="maths"> Maths
<input type="radio" name="subject" value="physics"> Physics
</form>
</body>
</html>
```

This will produce following result :

Maths    Physics

#### Attributes :

Following is the list of attributes for radio button.

Attribute	Description
type	Indicates the type of input control and for checkbox input control it will be set to <b>radio</b> .
name	Used to give a name to the control which is sent to the server to be recognized and get the value.
value	The value that will be used if the radio box is selected.
checked	Set to checked if you want to select it by default.

#### ❖ Select Box Control :

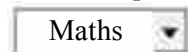
A select box, also called drop down box which provides option to list down various options in the form of drop down list, from where a user can select one or more options.

**Example :**

Here is example HTML code for a form with one drop down box

```
<!DOCTYPE html>
<html>
<head>
<title>Select Box Control</title>
</head>
<body>
<form>
<selectname="dropdown">
<optionvalue="Maths"selected>Maths</option>
<optionvalue="Physics">Physics</option>
</select>
</form>
</body>
</html>
```

This will produce following result :



**Attributes :**

Following is the list of important attributes of <select> tag :

Attribute	Description
name	Used to give a name to the control which is sent to the server to be recognized and get the value.
size	This can be used to present a scrolling list box.
multiple	If set to "multiple" then allows a user to select multiple items from the menu.

Following is the list of important attributes of <option> tag :

Attribute	Description
value	The value that will be used if an option in the select box box is selected.
selected	Specifies that this option should be the initially selected value when the page loads.
label	An alternative way of labelling options

❖ **File Upload Box :**

If you want to allow a user to upload a file to your web site, you will need to use a file upload box, also known as a file select box. This is also created using the <input> element but type attribute is set to file.

**Example :**

Here is example HTML code for a form with one file upload box :

```

<!DOCTYPE html>
<html>
<head>
<title>File Upload Box</title>
</head>
<body>
<form>
<input type="file" name="fileupload" accept="image/*"/>
</form>
</body>
</html>

```

This will produce following result :

#### Attributes :

Following is the list of important attributes of file upload box :

Attribute	Description
name	Used to give a name to the control which is sent to the server to be recognized and get the value.
accept	Specifies the types of files that the server accepts.

#### ❖ Button Controls :

There are various ways in HTML to create clickable buttons. You can also create a clickable button using `<input>` tag by setting its type attribute to **button**.

The type attribute can take the following values :

Attribute	Description
submit	This creates a button that automatically submits a form.
reset	This creates a button that automatically resets form controls to their initial values.
button	This creates a button that is used to trigger a client-side script when the user clicks that button.
image	This creates a clickable button but we can use an image as background of the button.

#### Example :

Here is example HTML code for a form with three types of buttons :

```

<!DOCTYPE html>
<html>
<head>
<title>File Upload Box</title>
</head>
<body>
<form>
<input type="submit" name="submit" value="Submit"/>

```

```
<input type="reset" name="reset" value="Reset"/>
<input type="button" name="ok" value="OK"/>
<input type="image" name="imagebutton" src="/html/images/logo.png"/>
</form>
</body>
</html>
```

This will produce following result :



## 15.4 Frames :

HTML frames are used to divide your browser window into multiple sections where each section can load a separate HTML document. A collection of frames in the browser window is known as a frameset. The window is divided into frames in a similar way the tables are organized : into rows and columns.

### ❖ Disadvantages of Frames :

There are few drawbacks with using frames, so it's never recommended to use frames in your web pages :

- Some smaller devices cannot cope with frames often because their screen is not big enough to be divided up.
- Sometimes your page will be displayed differently on different computers due to different screen resolution.
- The browser's *back button* might not work as the user hopes.
- There are still few browsers that do not support frame technology.

### ❖ Creating Frames :

To use frames on a page we use `<frameset>` tag instead of `<body>` tag. The `<frameset>` tag defines how to divide the window into frames. The **rows** attribute of `<frameset>` tag defines horizontal frames and **cols** attribute defines vertical frames. Each frame is indicated by `<frame>` tag and it defines which HTML document shall open into the frame.

#### Example :

Following is the example to create three horizontal frames :

```
<!DOCTYPE html>
<html>
<head>
<title>HTML Frames</title>
</head>
<frameset rows="10%,80%,10%">
<frame name="top" src="/html/top_frame.htm"/>
<frame name="main" src="/html/main_frame.htm"/>
<frame name="bottom" src="/html/bottom_frame.htm"/>
</frameset>
<body>
```

Your browser does not support frames.

```

</body>
</noframes>
</frameset>
</html>

```

This will produce following result :



#### Example :

Let's put above example as follows, here we replaced rows attribute by cols and changed their width. This will create all the three frames vertically :

```

<!DOCTYPE html>
<html>
<head>
<title>HTML Frames</title>
</head>
<frameset cols="25%,50%,25%">
<frame name="left" src="/html/top_frame.htm"/>
<frame name="center" src="/html/main_frame.htm"/>
<frame name="right" src="/html/bottom_frame.htm"/>
</noframes>
<body>
 Your browser does not support frames.
</body>
</noframes>
</frameset>
</html>

```

This will produce following result :



The <frameset> Tag Attributes

Following are important attributes of the <frameset> tag :



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<b>Attribute</b>	<b>Description</b>
cols	specifies how many columns are contained in the frameset and the size of each column. You can specify the width of each column in one of four ways :
	<ul style="list-style-type: none"> <li>Absolute values in pixels. For example to create three vertical frames, use cols="100, 500,100".</li> </ul>
	<ul style="list-style-type: none"> <li>A percentage of the browser window. For example to create three vertical frames, use cols="10%, 80%,10%".</li> </ul>
	<ul style="list-style-type: none"> <li>Using a wildcard symbol. For example to create three vertical frames, use cols="10%, *,10%". In this case wildcard takes remainder of the window.</li> </ul>
	<ul style="list-style-type: none"> <li>As relative widths of the browser window. For example to create three vertical frames, use cols="3*,2*,1*". This is an alternative to percentages. You can use relative widths of the browser window. Here the window is divided into sixths : the first column takes up half of the window, the second takes one third, and the third takes one sixth.</li> </ul>
rows	This attribute works just like the cols attribute and takes the same values, but it is used to specify the rows in the frameset. For example to create two horizontal frames, use rows="10%, 90%". You can specify the height of each row in the same way as explained above for columns.
border	This attribute specifies the width of the border of each frame in pixels. For example border="5". A value of zero means no border.
frameborder	This attribute specifies whether a three-dimensional border should be displayed between frames. This attribute takes value either 1 (yes) or 0 (no). For example frameborder="0" specifies no border.
framespacing	This attribute specifies the amount of space between frames in a frameset. This can take any integer value. For example framespacing="10" means there should be 10 pixels spacing between each frames.

The <frame> Tag Attributes

Following are important attributes of <frame> tag :

<b>Attribute</b>	<b>Description</b>
src	This attribute is used to give the file name that should be loaded in the frame. Its value can be any URL. For example, src="/html/top_frame.htm" will load an HTML file available in html directory.
name	This attribute allows you to give a name to a frame. It is used to indicate which frame a document should be loaded into. This is especially important when you want to create links in one frame that load pages into an another frame, in which case the second frame needs a name to identify itself as the target of the link.

frameborder	This attribute specifies whether or not the borders of that frame are shown; it overrides the value given in the frameborder attribute on the <frameset> tag if one is given, and this can take values either 1 (yes) or 0 (no).
marginwidth	This attribute allows you to specify the width of the space between the left and right of the frame's borders and the frame's content. The value is given in pixels. For example marginwidth="10".
marginheight	This attribute allows you to specify the height of the space between the top and bottom of the frame's borders and its contents. The value is given in pixels. For example marginheight="10".
noresize	By default you can resize any frame by clicking and dragging on the borders of a frame. The no resize attribute prevents a user from being able to resize the frame. For example no resize="no resize".
scrolling	This attribute controls the appearance of the scrollbars that appear on the frame. This takes values either "yes", "no" or "auto". For example scrolling="no" means it should not have scroll bars.
longdesc	This attribute allows you to provide a link to another page containing a long description of the contents of the frame. For example longdesc="framedescription.htm"

#### ❖ Browser Support for Frames :

If a user is using any old browser or any browser which does not support frames then <no frames> element should be displayed to the user.

So you must place a <body> element inside the <no frames> element because the <frameset> element is supposed to replace the <body> element, but if a browser does not understand <frameset> element then it should understand what is inside the <body> element which is contained in a <no frames> element.

#### ❑ Check Your Progress – 5 :

- To apply frame in web page \_\_\_\_\_ tag is main  
[A] <frameset> [B] <form> [C] <img> [D] None of this
- If fame divide in to width wise \_\_\_\_\_ attribute is main  
[A] Name [B] rows [C] cols [D] None of this
- If fame divide in to height wise \_\_\_\_\_ attribute is main  
[A] cols [B] rows [C] <input> [D] None of this
- \_\_\_\_\_ attribute specifies the amount of space between frames  
[A] framespacing [B] cols [C] <textarea> [D] rows

You can put some nice message for your user having old browsers. For example Sorry!! your browser does not support frames. as shown in the above example.

Frame's name and target attributes

One of the most popular uses of frames is to place navigation bars in one frame and then load main pages into a separate frame.

Let's see following example where a test.htm file has following code :

```
<!DOCTYPE html>
<html>
<head>
<title>HTML Target Frames</title>
</head>
<framesetcols="200, *">
<framesrc="/html/menu.htm"name="menu_page"/>
<framesrc="/html/main.htm"name="main_page"/>
<noframes>
<body>
 Your browser does not support frames.
</body>
</noframes>
</frameset>
</html>
```

Here we have created two columns to fill with two frames. The first frame is 200 pixels wide and will contain the navigation menu bar implemented by menu.htmfile. The second column fills in remaining space and will contain the main part of the page and it is implemented by **main.htm** file. For all the three links available in menu bar, we have mentioned target frame as **main page**, so whenever you click any of the links in menu bar, available link will open in main page.

Following is the content of menu.htm file

```
<!DOCTYPE html>
<html>
<bodybgcolor="#4a7d49">
<ahref="http://www.google.com"target="main_page">Google

<ahref="http://www.microsoft.com"target="main_page">Microsoft

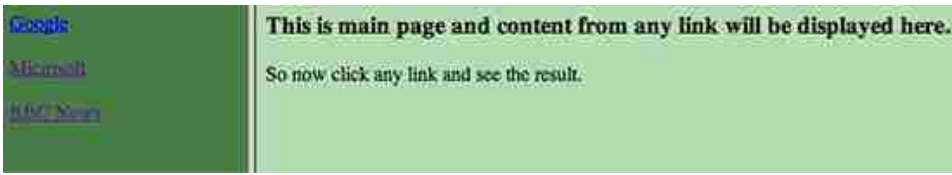
<ahref="http://news.bbc.co.uk"target="main_page">BBC News
</body>
</html>
```

Following is the content of main.htm file :

```
<!DOCTYPE html>
<html>
<bodybgcolor="#b5dcb3">
```

```
<h3>This is main page and content from any link will be displayed here.</h3>
<p>So now click any link and see the result.</p> </body>
</html>
```

When we load **test.htm** file, it produces following result :



Now you can try to click links available in the left panel and see the result. The target attribute can also take one of the following values :

Option	Description
_self	Loads the page into the current frame.
_blank	Loads a page into a new browser window.opening a new window.
_parent	Loads the page into the parent window, which in the case of a single frameset is the main browser window.
_top	Loads the page into the browser window, replacing any current frames.
Target frame	Loads the page into a named target frame.

**15.5 Let Us Sum Up :**

After Reading this unit, you will be able to understand

- Frames
- Frame set
- Button controls
- Box controls
- Check box controls
- Password input control
- Text input control

**15.6 Answers For Check Your Progress :**

- ❑ **Check Your Progress 1 :**
  1. [A] white
  2. [A] <table>
  3. [A] colspan
  4. [A] rowspan
- ❑ **Check Your Progress 2 :**
  1. [B] background
  2. [A] bgcolor
  3. [C] border
  4. [D] width, height
- ❑ **Check Your Progress 3 :**
  1. [C] <Form>
  2. [C] get, post
  3. [C] <input>
  4. [C] <textarea>

❑ **Check Your Progress 4 :**

1. [B] Value
2. [C] maxlength
3. [A] cols
4. [D] rows

❑ **Check Your Progress 5 :**

1. [A] <frameset>
2. [C] cols
3. [B] rows
4. [A] framespacing

**15.7 Glossary :**

- **Single-line text input controls** – This control is used for items that require only one line of user input, such as search boxes or names. They are created using HTML <input> tag.
- **Password input controls** – This is also a single-line text input but it masks the character as soon as a user enters it. They are also created using HTML <input> tag.
- **Multi-line text input controls** – This is used when the user is required to give details that may be longer than a single sentence. Multi-line input controls are created using HTML <textarea> tag

**15.8 Assignment :**

1. What is the use of <table> explain with any 3 attributes
2. What is use of <form> explain textbox, text area, radio button, select option of form
3. Explain <framset> with suitable example

**15.9 Activity :**

1. Prepare student Sign Up form using <form> having entry of student name, address, gender, hobbies and select city from combobox.

**15.10 Case Study :**

1. Mention only name of website that currently working on <framset> tag and give URL link as your case study with frame structure of that website

**15.11 Further Reading :**

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**UNIT STRUCTURE**

- 16.0 Learning Objectives
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- 16.2 Webpage and Website
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**16.0 Learning Objectives :**

After reading this Unit, you will be able to :

- Web page and website
- Types of website
- Webserver – Web engine
- How to develop static website in HTML

**16.1 Introduction :**

A website may be a collection of publicly accessible, interlinked sites that share one name. Websites are often created and maintained by a private, group, business or organization to serve a spread of purposes.

Together, all publicly accessible websites constitute the planet Wide Web.

Although it's sometimes called "web page," this definition is wrong, since an internet site consists of several webpages. an internet site is additionally referred to as a "web presence" or just "site".

## **16.2 Webpage and Website :**

Websites are available an almost endless variety, including educational sites, news sites, porn sites, forums, social media sites, e-commerce sites, and so on. The pages within an internet site are usually a mixture of text and other media. That said, there are not any rules dictating the shape of an internet site.

A person could create an internet site of nothing but black and white photos of roses, or the word "cat" linked to a different website with the word "mouse." However, many sites follow a typical pattern of a homepage that links off to other categories and content within the web site.

The homepage (or simply "home") represents the most page of the location itself. Frequently, the homepage may be a kind of "hub" from which all other pages are often accessed. an indoor website to which several other pages are linked during a coherent structure (such as a selected category of topics) is instead called a "parent page."

### **16.2.1 Web Access Location :**

Every page may be a single HTML document, and every one of them are connected through hyperlinks (or simply "link") which may be combined during a navigation bar for simple use.

The navigation bar is displayed on every page instead of just the homepage, and allows the user to quickly move across the most website's structure.

Another important section of most websites is that the footer, which is another recurring section that's found at rock bottom of each page. Usually the footer contains external links pointing to similar websites and other external resources, along side other vital info like disclaimers, links to the terms of service, privacy policy and get in touch with pages, also because the physical address of the corporate that owns the location.

Websites are hosted on servers, and need an internet browser like Chrome, Firefox, or Internet Explorer to be visited (either on a computer or mobile device).

A website are often accessed directly by entering its URL address or by searching it on an enquiry engine like Google or Bing.

Originally, websites were categorized by their top-level domains. Some examples include :

- \* **Government agency websites = .gov**
- \* **Educational institutions' websites = .edu**
- \* **Nonprofit organizations' websites = .org**
- \* **Commercial websites = .com**
- \* **Information sites = .info**

Although these top-level domains extensions still exist, they assert little a few website's actual content. In modern days' internet, the ".com" extension is far and away the foremost popular domain, along side many other country-specific extensions (.it, .de, .co.uk, .fr, etc.).

❑ **Check Your Progress – 1 :**

1. Government level website has \_\_\_\_\_ domain  
 [A] .edu            [B] .com            [C] .gov            [D] None of this
2. An education level website has \_\_\_\_\_ domain  
 [A] .edu            [B] .com            [C] .gov            [D] None of this
3. Group of company level website has \_\_\_\_\_ domain  
 [A] .gov            [B] .org            [C] .edu            [D] None of this
4. First page of any website is generally called \_\_\_\_\_  
 [A] About Us    [B] Contact Us    [C] Blank Page    [D] Home

**16.2.2 Website History :**

The first website was created in 1990 by Tim Berners-Lee, a British physicist at CERN. 3 years later, in 1993, CERN announced that everybody could access and use the planet Wide Web for free of charge

**16.2.3 Comparison of Web page and Website :**

1. A webpage is an independent part of a website that contains the links to other web pages on the website. On the other hand, a website is a collection of relevant web pages that is addressed to a Uniform Resource Locator.
2. Each website must have a unique URL whereas multiple web pages can have the same name until they reside in different documents.
3. Website is a location used to display the content. In contrast, a webpage is a content that is to be displayed on the website.
4. A web page URL has an extension like html, htm, php, etc. As against, website URL doesn't has any extension.
5. Web page address has an integral part of the domain name in it, and it depends upon a website. On the contrary, a website does not have any relation to web page address.
6. Designing and Development of the webpage takes less time as compared to a website as a website contain a lot of web pages.

<b>Webpage</b>	<b>Website</b>
Single document on the Internet	A collection of many related web pages linked together under one domain
Has content about a single entity	Has content about multiple entity
Execution faster and loading time is less	Execution and loading time is depend on type of website and designing
URL of the website is depending on webpage	URL of the website does not depend on webpage
Development requires minimum amount of time	Development requires maximum amount of time
In ' <b>https://baou.edu.in/result-related-link</b> ' ' <b>result-related-link</b> ' is an example of webpage	In ' <b>https://baou.edu.in</b> ' is an example of website



❑ **Check Your Progress – 2 :**

1. Collection of inner link webpages is known as \_\_\_\_\_  
[A] website [B] webserver [C] URL [D] None of this
2. Country base location for 'India' is \_\_\_\_\_  
[A] .in [B] .uk [C] .fr [D] .us
3. URL of the website is \_\_\_\_\_ on webpage  
[A] depending [B] image [C] list [D] None of this
4. In \_\_\_\_\_ Development requires maximum amount of time  
[A] URL [B] Domain [C] WebPage [D] Website

**16.3 Types of Website :**

Before part of web developer this is very important to understand the types of website. As per characteristics web architecture has classified website in two main category that is :

- (1) Static Website
- (2) Dynamic Website

**16.3.1 Static Website :**

A static internet site may be a internet site consisting of static sites . Means it's fixed and can't modification unless changes made in ASCII text file . A static internet site will only show info that's written into the HTML. Once an internet browser requests the actual static website, a server returns the page to the browser and also the user only gets whatever info is contained within the HTML code.

**Advantages :**

- (1) It's quick to develop.
- (2) It's cheaper to develop.
- (3) It's easier to host.
- (4) It's ideal for little websites.
- (5) It's easier for search engines to index.
- (6) It's faster to transfer on slow connections.

**Disadvantages :**

- (1) It's going to cost more for end of the day .
- (2) For any changes you'll got to wait until your web designer has time to form the changes.
- (3) Limited functionality
- (4) Website editors need significant training and skills to develop the online site to modern-day standards and practices. this is often often time consuming, expensive and ongoing.

❑ **Check Your Progress – 3 :**

1. In \_\_\_\_\_ type of website webpage content / text never change  
[A] website [B] webserver [C] static [D] None of this
2. Static website load \_\_\_\_\_ than dynamic website  
[A] slower [B] block [C] faster [D] None of this

3. Static website is \_\_\_\_\_ as part of price / cost  
[A] large [B] expensive [C] block [D] cheaper
4. Static web site is use for \_\_\_\_\_ type of company  
[A] small [B] large [C] multinational [D] Website

### 16.3.2. Dynamic Website :

A dynamic internet site is opposite static internet site, here sites not fixed as static internet site, changes are going to be done consistent with clients by own ends. Dynamic websites will make the foremost of your website and either use it as a tool or create knowledgeable, attention-grabbing experience for your visitors.

#### Advantages

- (1) Restructuring of dynamic websites is easier, so ensuring its longevity
- (2) Access to be ready to content manage the online site from any laptop, anyplace within the world (that has web connection)
- (3) Website content contributors/editors only need basic content editing skills
- (4) Multiple user access for updating/content managing – Users or employees who are 'experts' in their subject will add information to their relevant section of the online site.
- (5) A Dynamic internet site permits you to archive past material on a particular date or permits an item to be revealed or removed at a particular date automatically.
- (6) because the content is held within a database it permits the user to look the knowledge for content, also an internet site map is automatically generated as content is added.

Additional options out there by implementing a dynamic website :

By constructing the online site with dynamic capabilities it exposes example such as :

- (1) Online booking
- (2) E–Newsletter (subscription and distribution)
- (3) On–line photo galleries
- (4) E–commerce
- (5) Voting/Polls
- (6) Forums/Message Boards

#### Disadvantages :

- (1) For smaller firms a Dynamic internet site could be too expensive or seen as unnecessary that the investment might not be even
- (2) Slightly longer initial development time
- (3) Cost of implementing training of Content management system to Client.

### 16.3.3 Comparison Static and Dynamic Website :

Developers generally create static pages with HTML, but use languages like PHP, Javascript, or Actionscript to make dynamic pages. they will also use frameworks like Ruby on Rails, PHP or Flex for dynamic pages. Dynamic languages and frameworks even have the technical capacity to make static website

content. However, doing so creates ASCII text file that's unnecessarily complex for its purpose while being harder to take care of.

- In static sites the theme and content of sites remained fixed and in dynamic sites they changed consistent with run time.
- Browsing and loading of static sites are quicker than dynamic sites because unlike dynamic sites they are doing not required the request of server.
- Changing the content in static sites may be a difficult task because you've got to develop and upload a replacement page while in dynamic sites server application do that automatically.
- If file extension of a URL is in .htm or .html then it's a static sites. While if it's in .php, .asp and .jsp then it's the instance of dynamic sites .
- Static sites are created through HTML language while dynamic sites are created by the usage of PHP, JavaScript and ActionScript languages.
- Static web page plan is a simple and cheap method if you wants to make a static and non–updating sites . While dynamic sites method is advisable if you've got decide to update the content and material frequently.

**❑ Check Your Progress – 4 :**

1. In \_\_\_\_\_ type of website webpage content / text always change  
[A] website [B] Dynamic [C] static [D] None of this
2. Load time of Dynamic website is \_\_\_\_\_ than static web site  
[A] slower [B] block [C] faster [D] None of this
3. If any website has SignUp and Login facility it is \_\_\_\_\_ type of website  
[A] Dynamic [B] Static [C] block [D] None of this
4. file extension of a URL is .php it is \_\_\_\_\_ type of website  
[A] Dynamic [B] Static [C] multinational [D] Website

**16.4 Web Server – Search Engine :**

After understanding the Static and Dynamic website, it is necessary to know the main element for 'Dynamic' website. A place where Dynamic website deploy is known as web server. Than now a days most popular dynamic website is known as 'Search Engine' so in this part let we study both of this :

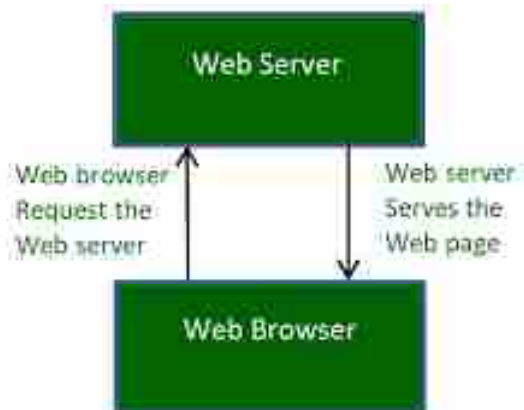
**16.4.1. Web Server :**

A web server is software and hardware that uses HTTP (Hypertext Transfer Protocol) and other protocols to reply to client requests remodeled the planet Wide Web. the most job of an internet server is to display website content through storing, processing and delivering webpages to users. Besides HTTP, web servers also support SMTP (Simple Mail Transfer Protocol) and FTP (File Transfer Protocol), used for email, file transfer and storage.

**❖ How Web Serve Works ?**

Web server software is accessed through the domain names of internet sites and ensures the delivery of the site's content to the requesting user. The software side is additionally comprised of several components, with a minimum of an HTTP server. The HTTP server is in a position to know HTTP and URLs. As hardware, an internet server may be a computer that stores web server software and other files associated with an internet site, like HTML documents, images and JavaScript files.

When an internet browser, like Google Chrome or Firefox, needs a file that's hosted on an internet server, the browser will request the file by HTTP. When the request is received by the online server, the HTTP server will accept the request, find the content and send it back to the browser through HTTP.



**How Web Server Works ?**

More specifically, when a browser requests a page from an internet server, the method will follow a series of steps. First, an individual will specify a URL during a web browser's address bar. the online browser will then obtain the IP address of the name – either translating the URL through DNS (Domain Name System) or by searching in its cache. this may bring the browser to an internet server. The browser will then request the precise file from the online server by an HTTP request. the online server will respond, sending the browser the requested page, again, through HTTP. If the requested page doesn't exist or if something goes wrong, the online server will respond with a mistake message. The browser will then be ready to display the webpage.

❖ **Popular Web Server :**

There are variety of common web servers available, some including :

**Apache HTTP Server.** Developed by Apache Software Foundation, it's a free and open source web server for Windows, Mac OS X, Unix, Linux, Solaris and other operating systems; it needs the Apache license.

**Microsoft Internet Information Services (IIS).** Developed by Microsoft for Microsoft platforms; it's not open sourced, but widely used.

**Nginx.** a well-liked open source web server for administrators due to its light resource utilization and scalability. It can handle many concurrent sessions thanks to its event-driven architecture. Nginx can also be used as a proxy server and cargo balancer.

**Lighttpd.** A free web server that comes with the FreeBSD OS . it's seen as fast and secure, while consuming less CPU power.

**Sun Java System Web Server.** A free web server from Sun Microsystems which will run on Windows, Linux and Unix. it's well-equipped to handle medium to large websites.

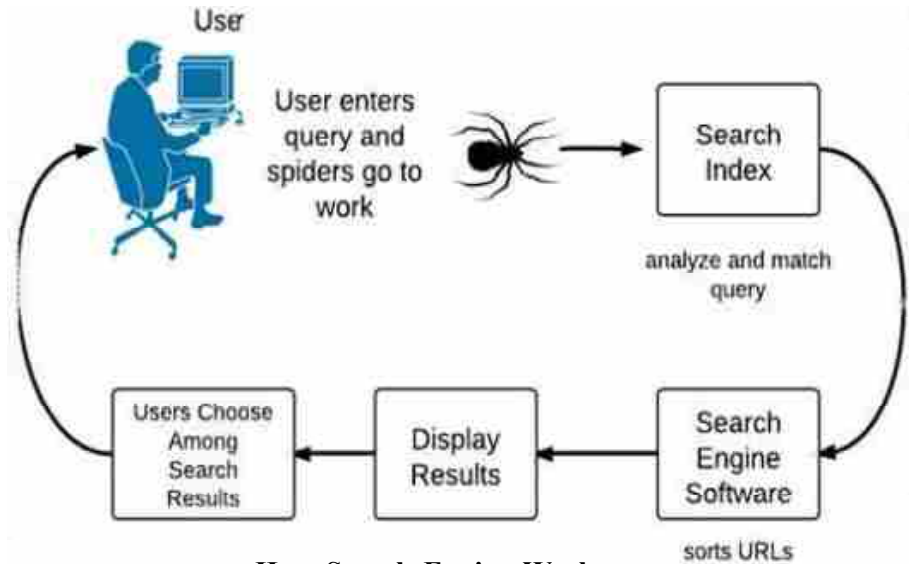
**16.4.2 Search Engine :**

A search engine may be a web-based tool that permits users to locate information on the planet Wide Web. Popular samples of search engines are Google, Yahoo!, and MSN Search. Search engines utilize automated software applications (referred to as robots, bots, or spiders) that follow the online,

following links from page to page, site to site. the knowledge gathered by the spiders is employed to make a searchable index of the online.

❖ **How Search Engine Works ?**

Every program uses different complex mathematical formulas to get search results. The results for a selected query are then displayed on the SERP (Search Engine Result Pages). Program algorithms take the key elements of an internet page, including the page title, content and keyword density, and are available up with a ranking for where to put the results on the pages.



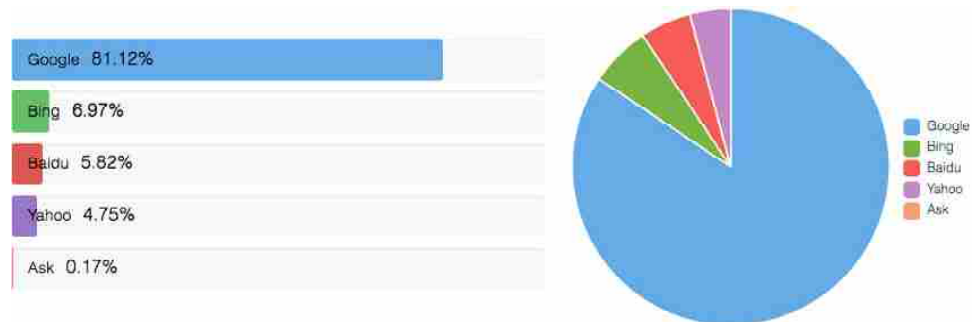
**How Search Engine Works**

Each search engine's algorithm is exclusive, so a top ranking on Yahoo! doesn't guarantee a prominent ranking on Google, and the other way around . to form things more complicated, the algorithms employed by search engines aren't only closely guarded secrets, they're also constantly undergoing modification and revision. this suggests that the standards to best optimize a site with must be surmised through observation, also as trial and error – and not just one occasion.

❖ **Popular Search Engine :**

Now a days there are so many search Engine available in the world. So many people use search engine day to day base . They search various types of search day to day life.

Some popular search engines are :



**World Level 'Search Engine Popularity**

**Google :** Google LLC is an American multinational technology company that specializes in Internet-related services and products, which include online advertising technologies, a search engine, cloud computing, software, and hardware.

**Microsoft Bing** is a web search engine owned and operated by Microsoft. The service has its origins in Microsoft's previous search engines : MSN Search, Windows Live Search and later Live Search. Bing provides a variety of search services, including web, video, image and map search products.

**Baidu** is the dominant Chinese internet search engine company, and it is the equivalent to Google in the United States. ... Baidu censors search results and other content in accordance with Chinese regulations. Baidu is registered in the Cayman Islands and is listed on the Nasdaq under ticker symbol BIDU.

**Yahoo!** Search is a rebadged version of the Bing search engine owned by Yahoo!, headquartered in Sunnyvale, California. Originally, "Yahoo Search" referred to a Yahoo-provided interface that sent queries to a searchable index of pages supplemented with its directory of websites.

**❑ Check Your Progress – 5 :**

1. \_\_\_\_\_ is the most popular search engine  
[A] Baidu            [B] Yahoo            [C] Google            [D] None of this
2. SERP means \_\_\_\_\_  
[A] Search Engine Resource Page  
[B] Search Engine Result Page  
[C] Search Engine Resource Process  
[D] None of this
3. An open source that develop by Apache software foundation is \_\_\_\_\_  
[A] Apache HTTP                            [B] MS IIS  
[C] Lighttpd                                 [D] None of this
4. Full form of IIS is \_\_\_\_\_  
[A] Internet Information Services    [B] Indian Information Services  
[C] Indian Information Server        [D] Indian Institute Software

**16.5 Let Us Sum Up :**

After completing this unit, you can understand

1. what is webpage and what is website
2. Types of website
3. Comparison of static and dynamic website
4. Webserver – types of web server and how its works
5. Search engine – how search engine works and world wide popular search engine

**16.6 Answer For Check Your Progress :**

**❑ Check Your Progress 1 :**

1. [C] .gov                                    2. [A] .edu
3. [B] .org                                    4. [D] Home

**❑ Check Your Progress – 2 :**

1. [A] website                                2. [A] .in
3. [A] depending                            4. [D] Website

❑ **Check Your Progress – 3 :**

1. [C] static
2. [C] faster
3. [D] cheaper
4. [A] small

❑ **Check Your Progress – 4 :**

1. [B] Dynamic
2. [A] slower
3. [A] Dynamic
4. [A] Dynamic

❑ **Check Your Progress – 5 :**

1. [C] Google
2. [B] Search Engine Result Page
3. [A] Apache HTTP
4. [A] Internet Information Services

**16.7 Glossary :**

1. **Webpage – Website** – After understanding HTML basic tags – structure tags it is time to understand, How to develop webpage ? Collection of Webpage is known as Website so here you compare Webpage and Website
2. **Type of Website** – As per characteristics there are only two types of websites 1) Static and 2) Dynamic website. Now a days major website are dynamic website. E-commerce website – Some Blog website and that has load all dynamic content, Signup process, Login process, search data, create graph – chart from datastore in database.
3. **Web server and Search Engine** – which type of website response to web server so web language is response by specific web server only. Webserver is main computer that response various web programming like – HTML, XML, PHP, Java, CSS ..... etc.

**16.8 Assignment :**

1. Difference between webpage and website
2. Difference between static and dynamic website
3. What do you mean by domain : list of types of domain as purpose and country wise
4. What is search engine ? how it work explain in short
5. What is web server ? explain any 2 webserver in short

**16.9 Activity :**

1. List of 5 website that has '.in' country wise extension.
2. List of webserver and compare any 2 of that as per your choice

**16.10 Case Study :**

1. In BAOU website list out Static Web page and Dynamic Webpages

**16.11 Further Redading :**

- Introduction to Netorking Recharad McMohan Tata McGraw Hill Publication
- Computer Network Fundamentals and application– R.S.Rajesh Vikas Publication
- Unleashed Windows 2003 Server–Todd Brown & Chris Miller Techmedia
- Microsoft Windows 2000 Professional– Paul Cassel Techmedia SAMS Publication
- HTML Black Book–Steven Holzner–Dreamtech Press

**BLOCK SUMMARY :**

**After reading this block, you can understand**

- HTML structure
- XML
- DHTML
- Uses of special character in HTML
- Tables
- Forms and its types
- Frames and its types
- Webpage and Website
- Types of Website
- Web server and Search Engine

**BLOCK ASSIGNMENT :**

❖ **Short Answer Questions :**

- (1) Explain DOM ?
- (2) Usage of anchor tag ?
- (3) What is search engine ?
- (4) Which tag is used to display preformatted text ?
- (5) Which HTML tag will use to scroll a text in web page ?
- (6) How to set a picture as a background web page ?
- (7) Write the basic structure of HTML ?
- (8) Give characteristics of Static Website
- (9) Compare Static and Dynamic Website
- (10) What is Webserver and Search engine

❖ **Long Questions :**

- (1). Write a HTML program to use text formatting types ? Give suitable example.
- (2) To begin a new line without starting a new paragraph, which code would you use ?
- (3) To create a drop down list for a form, which syntax would you use ?
- (4) Discuss advantages and disadvantages of 'Dynamic Website'
- (5) Explain any 3 popular web server
- (6) Compare Google and Baidu search engine in your words



**Introduction to  
Internet Technologies  
and HTML**

❖ **Enrolment No. :**

1. How many hours did you need for studying the units ?

Unit No.	1	2	3	4
No. of Hrs.				

2. Please give your reactions to the following items based on your reading of the block :

Items	Excellent	Very Good	Good	Poor	Give specific example if any
Presentation Quality	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Language and Style	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Illustration used (Diagram, tables etc)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Conceptual Clarity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Check your progress Quest	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Feed back to CYP Question	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____

3. Any other Comments

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