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NETWORKING AND
INTERNET CONCEPTS

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NETWORKING CONCEPTS

- **COMPUTER NETWORKING** : The communications media, devices and software needed to connect two or more computer system and or devices.

- **TELECOMMUNICATION** :
  Means sending of information in any from that is Voice, Data, Text, Images from one place to another using electronic or light emitting media.

- **DATACOMMUNICATION** :
  It describe the transmitting and receiving data over communication links between one or more computer system and variety of input / out put terminals.

  A specialized subset of telecommunication that refers to the electronic collection, processing and distribution of data typically between computer system & hardware devices.

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1

Computer Terminology

This is a Standalone Personal Computer
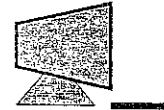PC's have intelligence built into them
PC's have local storage & processing capability

This is a Terminal
Terminals DO NOT have intelligence
Storage & processing at the Server

If a Terminal is intelligent (PC) it is called
Workstation, and if a Terminal is NOT intelligent
it is called a Dumb Terminal

Why Computer Network

Share Common Resources
  • Information, Databases
  • Printer (Dot matrix, Laser, Ink Jet)
  • Disks,

Availability of PC's on all desktops at
all locations within an enterprise

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2

BENEFITS OFFERED BY TELECOMMUNICATION TO BUSINESS

- Reduce cost compared to traditional communication
- Enables sharing and dissemination of company information
- Enables sharing of hardware resources such as database, back up, processing power, printer
- Promotes new ways of working
- Restructure relationship with partners
- The use of telecommunication helps to solve business problems and maximize opportunities.

COMMUNICATION CHANNELS

- COMMUNICATION MEDIUM : Anything that carries an electronic signals and interfaces between a sending and receiving devices.

- TYPES OF COMMUNICATION CHANNELS
  - I PHYSICAL CHANNELS
    - I TWISTED PAIR OF WIRE :
    - II. COAXIAL CABLE
      - BASE BAND CABLE
      - BROAD BAND CABLE
    - III .OPTICAL CABLE

  - II CABLE LESS CHANNELS
    - MICROWAVE
    - SATELLITE
    - INFRARED

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COMMUNICATION CHANNELS

TWISTED PAIR OF WIRES : It is insulated pair of wires twisted around each others It can packed into bundles of thousands or more pairs. Ex Telephone Lines. Speed 300bps to 10 mbps

COAXIAL CABLE : It consist of one or more central wire surrounded by an insulator and encased in either a wire mesh or metal sheathing . Cable of cable T.V wire. Speed 56 kbps to 200mbps

BASE BAND CABLE : It carries a single communication or message at very high megabit speed. It is used in case of LAN.

BROADBAND CABLE : This cable carries multiple signals simultaneously each signal can be a different speed.

OPTICAL CABLE - Use lights as a digital information carrier. Glass fibers are used as transmission medium in place of wires. Data are carried by laser beams. simultaneous telephonic conversions. Speed 500 kbps to 10 gbps

MICROWAVE – It uses high frequency radio signals to send data information through air without wire or cable. Speed 256kbps

SATELLITE – long distance cable less communication. Speed 256kbps to 100mbps

INFRARED – Data and Information are transmitted in coded form by means of an infrared light beamed from one transceiver to another. The transmitter and receiver should be in sight of one another. Speed 500kbps to 10gbps

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TRANSMISSION MODE & DIRECTION

■ TRANSMISSION MODE :

ASYNCHRONOUS TRANSMISSION – It is also called start stop transmission. It transmit one character at a time over a line. It is used for low speed transmission.

SYNCHRONOUS TRANSMISSION – It transmit group of characters at a time. It is high speed transmission.

■ TRANSMISSION DIRECTION

SIMPLEX TRANSMISSION – Data can travels only in one direction at all times Ex. Radio Signals / Microwave

HALF DUPLEX TRANSMISSION – The data can travels in two direction but can travel in only one direction at a time. Ex. Wireless (Police / Military wireless system)
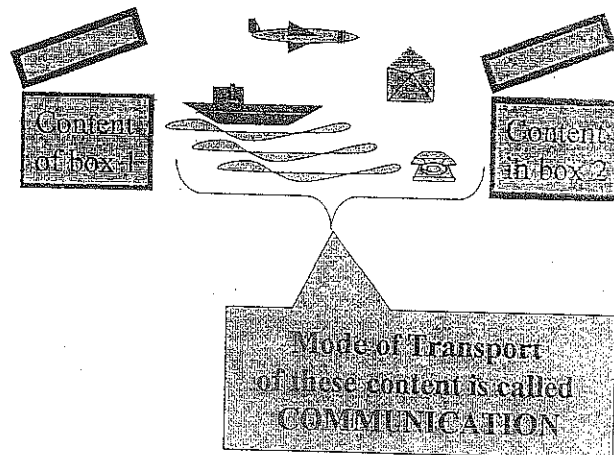
FULL DUPLEX TRANSMISSION – The data travel in both the direction at time simultaneously ex. Telephone System.

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BASIC COMPONENTS IN A TELECOMMUNICATION NETWORK

- TERMINAL
- TELECOMMUICATION PROCESSOR (Modem)
- TELECOMMUNICATION CHANNELS
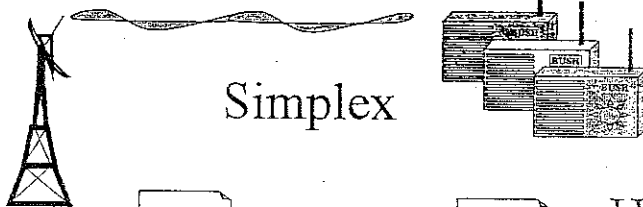- COMPUTERS
- TELECOMMUNICATION SOFTWARE

Communication

Content of box 1
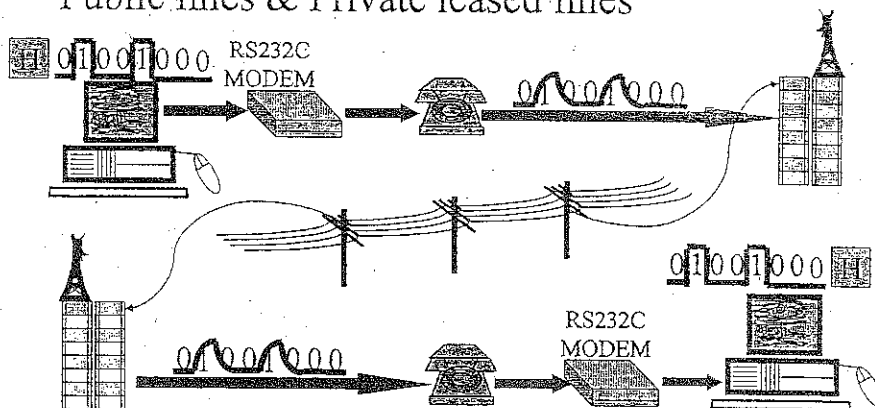
Content in box 2

Mode of Transport of these content is called COMMUNICATION

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Types of Communication

One way communication from one Point to another Point

Simplex

Half Duplex

Receive or Send one at a time
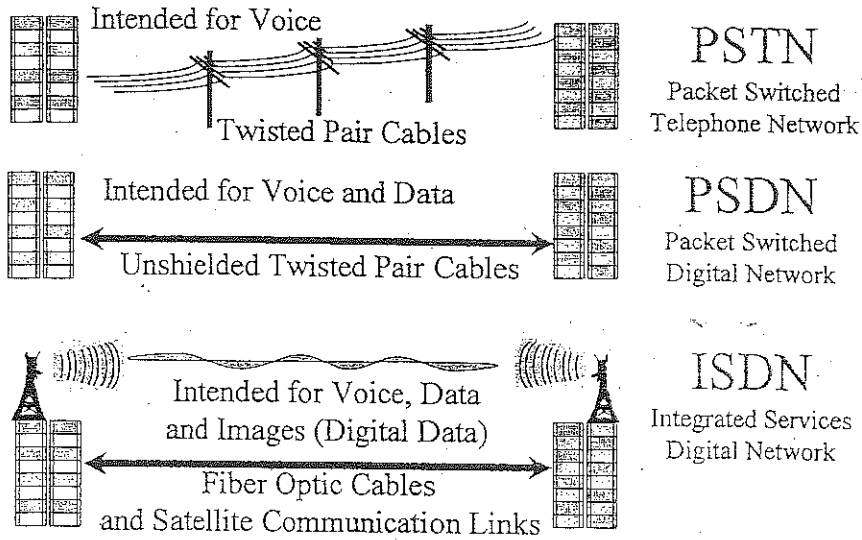
Full Duplex

Receive and Send simultaneously
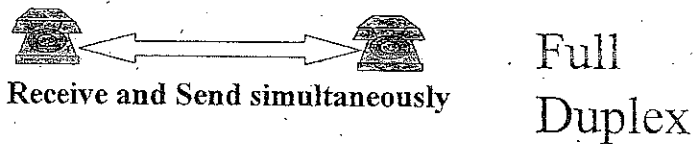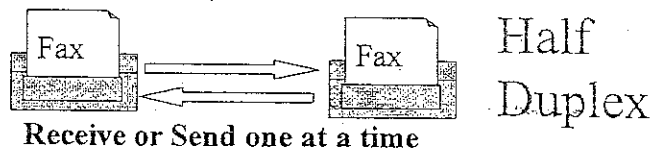
Telephone Network

* Designed primarily for Voice Communication
* Used for communication with remote computers
* Public lines & Private leased lines

RS232C MODEM

RS232C MODEM

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6

Communication Lines

Intended for Voice

Twisted Pair Cables

PSTN
Packet Switched
Telephone Network

Intended for Voice and Data

Unshielded Twisted Pair Cables

PSDN
Packet Switched
Digital Network

Intended for Voice, Data
and Images (Digital Data)

Fiber Optic Cables
and Satellite Communication Links

ISDN
Integrated Services
Digital Network

TYPES OF COMMUNICATION NETWORKS

- I. NETWORK BY TOPOLOGY
    - THE STAR NETWORK
    - THE BUS NETWORK
   - THE RING NETWORK
    - THE HYBRID NETWORK

- II. NETWORK BY GEOGRAPHIC SCOPE
    - LOCAL AREA NETWORK
    - WIDE AREA NETWORK
    - METROPOLITAN AREA NETWORK (MAN)

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NETWORK BY TOPOLOGY

- **STAR NETWORK** – The star network consists of central host computer connected to a number of smaller computers or terminals. All communication must pass through the central host computer. The central computer is the traffic controller for the other computers and terminals in the network.

- **THE BUS NETWORK** – The bus network links a number of computers by a single circuit made. A special software is being used to identify which direction peripherals or terminals is going to receive signals. There is no host computer. The message can travel in both the directions along the cable.

- **THE RING NETWORK** – The computers in this network arranged in the form of a ring. The messages are transmitted in one direction to all devices between the sending node to receiving node. This network break down if one computer system is out of order. Each computer in the network can communicate to other computer and each process its application independently.

- **HYBRID NETWORK** – These network are a combination of Star , Ring, Bus Network.
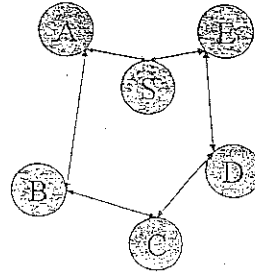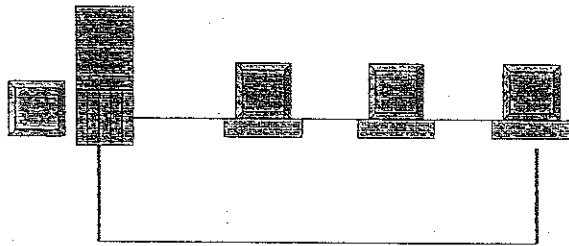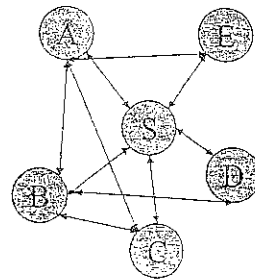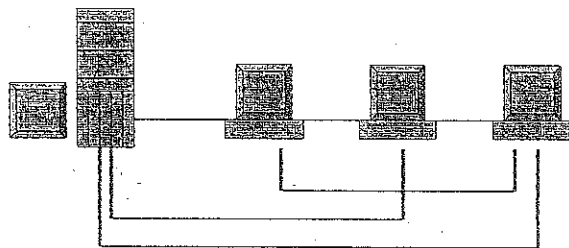
Network Topology
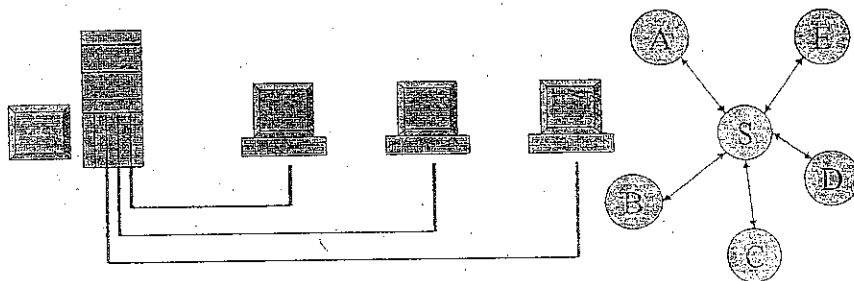
STAR Topology

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Network Topology

RING Topology

Network Topology

MESH Topology

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9
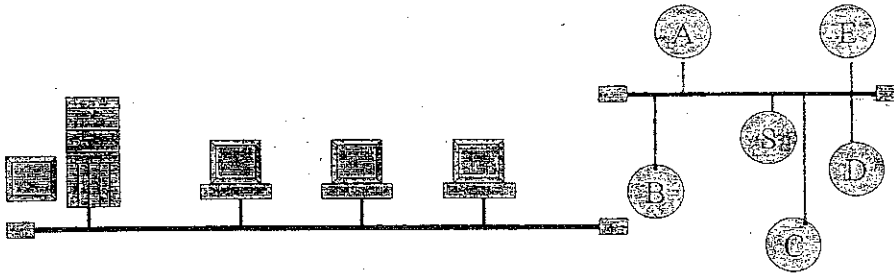
Network Topology

BUS Topology

NETWORK RESOURCE SHARING AND SERVICES

- **CLIENT SERVER TECHNOLOGY**

  Is a distributed Cooperative processing environment whereby the entire task of processing is divided in such a manner that there is a demand on the system through a client and there is server in the network to serve this demand.

  It is Defined as " A FORM OF SHARED OR DISTRIBUTED COMPUTING POWER ARE SPLIT BETWEEN SERVER AND CLIENTS SERVER STORE AND PROCESS DATA COMMON TO AREAS ACROSS THE ENTERPRISE, THESE DATA CAN THEN BE ACCESSED BY CLIENT SYSTEMS FOR INDIVIDUAL PROCESSING REQUIREMENT. "

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Client / Server Architecture
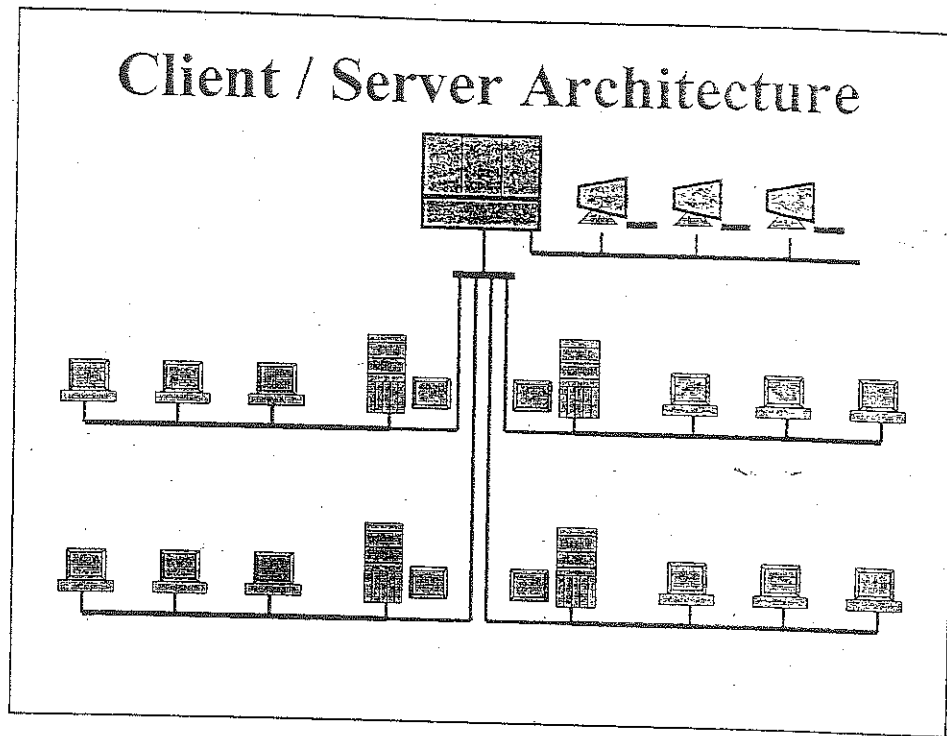
Network Computing

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11

NETWORK BY GEOGRAPHIC SCOPE

LOCAL AREA NETWORK

- A LAN is system of hardware, software and communication channels that connect in close proximity of around 2000 foot radius or building and have been used to link microcomputer with physical cables. Within a limited physical area such as office classroom, Building Manufacturing Plants.
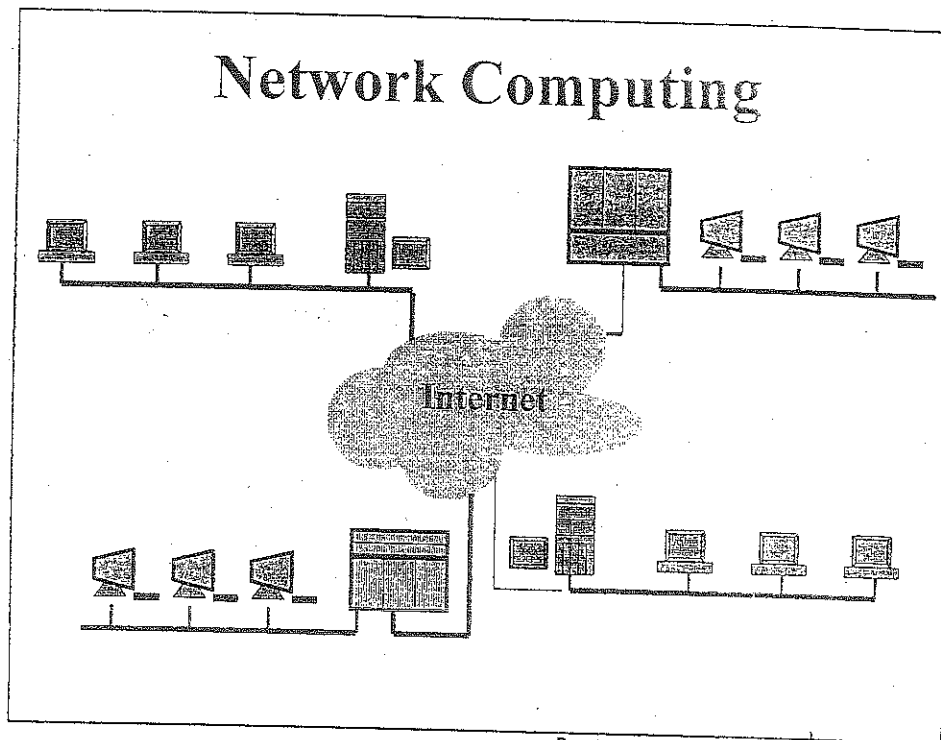
- It permit the flow of data (Text, voices and graphics images) between different types of hardware such as mainframe, personal computers, terminals and input out put devices.

- A LAN allows a large number of user to share corporate resources through Network server or CPU that contain a network operating system program which control telecommunication and use and sharing network resources (such as storage devices , printers, Fax, Application systems & Database, common bank of information)

LAN HARDWARE & SOFTWARE

- Network Interface card (NIC)
- The cable that connect the nodes in the network
- Server (The File server, The Print Server, The communication Server)
- Network Operating Software (Ex. Novell Netware , Microsoft LAN Manager, IBM PC LAN)

LOCAL AREA NETWORK

- **TYPES OF LAN**
- **CLIENT SERVER LAN** : It consist of requesting micro computers called clients and a device called as server. The server is usually powerful one and manages shared devices such as printers, scanners etc. Ex. A network that run under novel NetWare is an example of client server network.

- **PEER – To – PEER LAN** : It is a network in which all computers in a network communicate directly with each other without depending on server . Ex. Windows for work group by Microsoft are common software used for peer – to – peer Networking

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12

WIDE AREA NETWORK

- WAN are long haul, broadband (analog) networks covering wide geographic area. Ranging from kilometers to entire Earth area.
- They generally are provided by common carriers. WAN include regional network such as Telephone Companies or International Network such as Global Communication Service Providers.
- WAN usually have very large circuits with many communication processors that makes it possible to use these circuits efficiently. (like Multiplexer – Is a Single communication channels to carry data from multiple sources simultaneously , Router – Pathway)
- WAN may combines Switched (Telephone lines and dedicated lines microwaves and satellite communication)
- Computer connected to a wide area network are often connected through public networks such as the telephone system and satellite
- The largest WAN existence is the INTERNET

METROPOLITAN AREA NETWORK (MAN)

- MAN can be referred to as a group of LAN with high speed, seamless interconnection within a Metropolitan area. The later is not necessary a city.
- It is a set of network that work together to provide access and services in a metro region. MAN is a single separate identifiable " Metro Area Network" that is owned and run by a single network operator usually a service provider a carrier.
- The MAN is the network or set of network, that picks up traffic from the LAN and passes it to the WAN or to another LAN in the same metro area.
- The purpose of a Metropolitan area network is to provide secure distributed broadband access to end user. It covers an area between 5 to 50 Kim's.
- A MAN often acts as a high speed network to allow sharing of regional resources (similar to large LAN). It is also frequently used to provide a shared connection to other network using a link to WAN.

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VIRTUAL PRIVATE NETWORK

- VPN is a private network that uses a public network (usually the Internet) to connect remote sites or users together

- Instead of using a dedicated, real-world connection such as leased line, a VPN uses "virtual" connections routed through the Internet from the company's private network to the remote site I.e branch offices and business partners world wide or employees .

- VPNs provide a gateway between a corporate LAN and the Internet, and they allow access to a corporate networks e-mail,shared files or internet via an Internet connection .

TYPICAL VPN OF A COMPANY
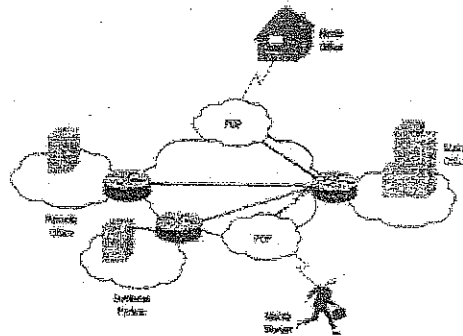
.A typical VPN might have a main LAN at the corporate headquarters of a company, other LANs at remote offices or facilities and individual users connecting from out in the field.

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14

NETWORK COMMUNICATION SOFTWARE

- **NETWORK OPERATING SYSTEMS**

  Is system software that controls the hardware devices, software and communications media and channels across a network .

  The NOS enables various devices to communicate with each other.

  Examples : NetWare by Novell and Windows NT from Microsoft are popular NOS for LAN.

- **NETWORK MANAGEMENT SOFTWARE**

  Has many functions in operating a network Like installation new of Software on many devices across a network, Remote Diagnosing of problems in devices connected to the network. In short it perform functions that decrease the human resources needed to manage the network

NETWORK COMMUNICATION SOFTWARE

- **PROTOCOLS**
- A standard set of rules and procedures for the control of communication in a network is known as a protocol
- The Common communication protocol which will facilitate different computers using different operating system to communicate with each other.
- The important standards that are being used today are Open System Interconnect (OSI),Transmission Control Protocol / Internet Protocol (TCP/IP)

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15

INTERNET CONCEPTS

What is Internet ?

Internet is an international network connecting large number of computer network around the world.

Internet offers access to data, graphics , sound, software text people through a variety of services and tools for communications and data exchange.

INTERNET CONCEPTS

BUSINESS USE OF THE INTERNET

- Gathering information from different web pages.
- It provides better ways for collaboration with business partners
- Customers service and support
- Communication within and between the business houses
- Disseminate published information
- Publishing and selling of products and services
- It provide vender support and communications
- Helps to do research about competitors

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16

INTERNET CONCEPTS

What is intranet ?

It refers to a private network which uses internet technology and is designed to meet the internal information needs of the employees. It is accessible only by the authorized employees, contractors and customers.

Examples

- Recent corporate news
- General product information
- Details of health insurance
- Product pricing
- In-house Training Programmes

INTERNET CONCEPTS

What is Extranet ?

It refers to provide network which operates similarly to an intranet but is directed at customers or suppliers rather than at employees. Extranet provides information customers need

Examples

Detailed product description

Frequently asked questions about different products.

How to contact customer service and sales office.

Helps to navigate information increasingly available at a single interactive site.

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FACILITIES OF THE INTERNET

- E-MAIL
- WWW - Searching the World Wide Web With Browser, such as Netscape Navigator
- File Transfer (FTP for file transfer protocol)
- On-line Chat
- Remote Log-in (Telnet)
- Browsing with Veronica (Locating all textual information through series of easy-to use hierarchical menus)
- Participating in Usenet News Group or On-Line Discussion

INTERNET SOFTWARE

- Web Server - Used to store web pages Ex Apache Microsoft's Internet Information Server (IIS) 4.0, Netscape –Enterprise

- Brower- It is Interface between user and Internet Ex Internet Explorer, Netscape Navigator, Opera

- International Portals - It works as a user's friend ,Philosopher, Guide and Aid Ex Yahoo, Excite, Net Center, America on line ,

- Indian Portals - Rediff .com, India times.com

- Search Engines - Used of on line searches for information Ex Goggle, Altanita

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18

INTERNET SOFTWARE

- **Web Based Chat** - Chat City, MSN Chat , Rediff Chat

- **FTP-File Transfer Protocol** - Among FTP clients the most popular is Cute FTP , WS-FTP Pro6.5, 3D-FTP

- **Broad Cast Player** – Real Player, Macro Media Shockware, Windows Media Player

- **Web Based Anti Virus Renewal**
  House Call by Trend Micro (www.housecal.antivirus.com)   MCAfee.com clinic (www.mcafee.com)

- **Electronic Greeting** - Egreeting.com , India times.com. Loveing you.com , Hallmark.com , Blue Mountain .com

INTERNET SOFTWARE

- **E-Mail Client** – Used for E-Mail Services Ex Outlook Express 5.5, Net scape Messenger

- **Web Based E-Mail Services** - Yahoo Mail, Hotmail Rediffmail

- **Dial up ISP** – This software is being used by the user to connect with its internet service provider. In India most popular Dialup software is provided by VSNL followed by Mantra Online , Satyam and MTNL

- **Application Service Procedures** – The most popular application software procedures on internet is star office from sum Microsystems.

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19

History of Internet

Fear of Nuclear arm gave birth to idea of Internet

1969 : US DOD created ARPANET

1970 : Connectivity to Universities, Research

1976 : ARPANET was available to Public and MILNET got evolved for DOD

1980 : NSFNET from National Science Foundation

1990 : Internet represents most global business opportunity

1993 : Commercial use of Internet began

Who Owns Internet

Internet is not a single network
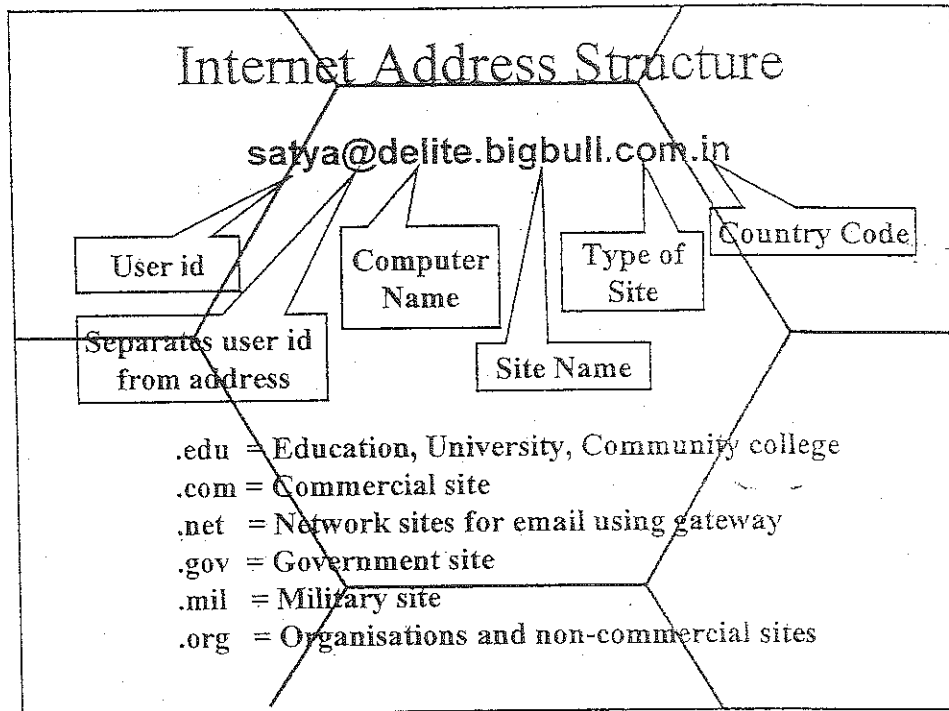
Internet = Interconnection of Network of Networks

No one owns Internet

The Internet Society (ISOC) oversees the Internet's growth and establishes standards

IAB (Internet Architecture Board) directs internet standards.

IETF (Internet Engineering Task Force) shares ideas and influences the way the network is run

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Internet Address Structure

satya@delite.bigbull.com.in

User id	Computer Name	Type of Site	Country Code

Separates user id from address

Site Name

.edu = Education, University, Community college
.com = Commercial site
.net = Network sites for email using gateway
.gov = Government site
.mil = Military site
.org = Organisations and non-commercial sites

Other NETWORK Medium

- Virtual Private Networks (EDI)
- Cable Net
- Pager Service Providers
- Mobile Service Providers

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21

ELECTRONIC DATA INTERCHANGE (EDI)

Electronic Data Interchange is the inter company
Computer - to - computer communication of
standard business transaction in a standard format
that permits the receiver to perform the intended
transaction. Inter company refers to the electronic
transmission of data between companies.

ELECTRONIC DATA INTERCHANGE (EDI)

- Typically an EDI is an information system that
  links an organization to its customers or
  suppliers

- **Examples :** A buyer and a seller might create
  link between the database of each organization
  to exchange purchase and sale information
  electrically, there by , eliminating many paper
  forms and procedures, such as purchase order
  and sales receipts.

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COMPONENTS OF EDI

- Electronic store and retrieve facilities : An electronic mailbox receives and holds messages sent by all parties to its owner.
- Communications : A network both transmits and receives the message provides security and control information and handles its efficient routing.
- Translation software : This converts a firms purchase order for example, into a structured, formatted message that its suppliers order processing software can interpret automatically via its own input formats.
- Application programming interface software: This links the firms transaction processing software to the EDI transition software

BENEFITS OF EDI

- It helps to reduce costs
- It improves trading partner relationships
- EDI active companies observe a marked growth in human interface, information sharing and cooperation between themselves and their trading partners.
- It improve intra company flow of information
- It increases the speed information exchange and processing. It basically eliminates use of mail services and decrease in transaction processing, which definitely improves the speed of information exchange .
- It also helps to achieve shrinking of the order-receipt pay business cycle.
- It improves trading partner relationships

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THANK YOU

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