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**Computer skill
BS DT**



Course: applications/Skills/ITC/CAB **Program:** BS Computer
Semester: 4th **Major**
Assignment
Total Marks: 50 **Instructor:** Zakir
Rahim
Due Date: 25th Sep,2020

Instructions:

- Students are required to solve the provided assignment and upload it on SIC in due time.
- The solutions can be type-written or hand-written.
- In case of handwritten solutions, you are required to copy pictures of the solved assignment in Ms-Word and upload it.
- The solutions must be uploaded either in Ms-Word format or pdf format.
- Students are required to save the file with their name and student id. For example ahmad_12345.

- Q1. (a) Differentiate between open source software and applications software? (6)
(b) Write different features of system software? (6)
- Q2. (a) Discuss different functions of operating system? (6)
(b) Explain the use of File Transfer Protocol and TelNet services? (8)
- Q3. (a) Explain Metropolitan Area Network (MAN) with a suitable example? (7)
(b) Define topology? Which topology would you chose to setup a local area network and why? (7)
- Q4. In your opinion, what are the different types of common media used for storage, access and transmission of information? Explain each type in detail? (10)



QUESTION NO 1

OPEN SOURCE SOFTWARE

- Open source software is software with source code that anyone can inspect, modify, and enhance.
- "Source code" is the part of software that most computer users don't ever see it's the code computer programmers can manipulate to change how a piece of software—

a program or application works. Programmers who have access to a computer program's source code can improve that program by adding features to it or fixing parts that don't always work correctly

APPLICATION SOFTWARE

- application software is that it is exceedingly broad.
- Application software is commonly defined as any program or number of programs designed for end-users. That's it, in a nutshell.

- In that sense, any end user program can be called an application. Hence the age-old saying: “there's an app for that.”
- People often use the term “application software” to talk about bundles or groups of individual software applications, using a different term, “application program,” to refer to individual applications.

- That's because the word program correlates to a discrete, countable single unit, while the word "software" is often used to refer to more than one individual program

- **Examples**
- of application software include items like Microsoft Word, Microsoft Excel, or any of the web browsers used to navigate the Internet or the actual software suites themselves, if they are intended for end users

THE DIFFERENCE BETWEEN OPEN SOURCE AND APPLICATION SOFTWARE

- Open-source refers to the software whose source code is available for anybody to access and modify, while Application software refers to the software which is solely owned by the individual or publisher who developed it

- Unlike open source software, application software is managed by the individual or the organization that holds exclusively the intellectual property rights of the source code and nobody outside the circle is allowed to view the code let alone inspect it. The main difference between the two is that open source projects have the ability to evolve as they can be iterated upon by millions of developers located across the globe

- **Open source**
- often referred as free of cost software. It can, however, have costs for extras like assistance, additional services or added functionality. Thus, you may still pay for a service with OSS.

- **Application software**
- is usually a paid software. The costs can vary depending on the complexity of the software. While the price can be higher, what you get is a better product, full support, functionality and innovation. However, most companies provide free trials to convince the purchaser that their software is the right fit.

QUESTION 1 (B)

- Write different features of system software

SYSTEM SOFTWARE

- can be designed as the software in such a way so that it can control and work with computer hardware. It acts as an interface between the device and the end user.
- It also provides the platform for the running of other software.
- Example: operating systems, antivirus software etc.

FEATURES OF SYSTEM SOFTWARE

- It is difficult to design.
- • It is written in the low-level language, or you can say that it is written in machine language which is only understood by the machine.
- It is difficult to manipulate.
- System software is very close to the system.
- The speed of the system software is fast

QUESTION NO 2

- **Discuss different function of operating systems**

OPERATINGSYSTEM

- An Operating System acts as a communication bridge (interface) between the user and computer hardware. The purpose of an operating system is to provide a platform on which a user can execute programs in a convenient and efficient manner

Function of operating system

- **Security**
- The operating system use passwords
- To protect data
- **Control over system performance** –
Recording delays between request for a service and response from the system

- **Job accounting** – Keeping track of time and resources used by various jobs and users.
- **Error detecting aids** – Production of dumps, traces, error messages, and other debugging and error detecting aids.

- **Coordination between other softwares and users –**
Coordination and assignment of compilers, interpreters, assemblers and other software to the various users of the computer systems.

QUESTION NO 2 (B)

FILE TRANSFER PROTOCOL

- The File Transfer Protocol is a standard network protocol used for the transfer of computer files between a client and server on a computer network. FTP is built on a client-server model architecture using separate control and data connections between the client and the server

Uses OF FILE TRANSFER PROTOCOL

- FTP finds application in many day-to-day business operations that span business-to-business and peer-to-peer data transfer use cases, including:
- Organizations use FTP to allow employees to share files across different locations and branch offices.
- Employees use FTP to securely share files with coworkers and external business partners.
- IT teams use FTP to transfer data back to DR (disaster recovery) sites.
- Webmaster teams use FTP to transfer Web pages, Web application files, and images to their Web server

Telnet protocol

- Telnet is a network protocol used to virtually access a computer and to provide a two-way, collaborative and text-based communication channel between two machines. It follows a user command Transmission Control Protocol/Internet Protocol (TCP/IP) networking protocol for creating remote sessions.

- Telnet, developed in 1969, is a protocol that provides a command line interface for communication with a remote device or server, sometimes employed for remote management but also for initial device setup like network hardware. Telnet stands for Teletype Network, but it can also be used as a verb; 'to telnet' is to establish a connection using the Telnet protocol.

SERVICE OF TELNET

- Telnet provides users with a bidirectional interactive text-oriented communication system utilizing a virtual terminal connection over 8 byte. User data is interspersed in-band with telnet control information over the transmission control protocol (TCP). Often, Telnet was used on a terminal to execute functions remotely.

- The user connects to the server by using the Telnet protocol, which means entering Telnet into a command prompt by following this syntax: telnet hostname port. The user then executes commands on the server by using specific Telnet commands into the Telnet prompt. To end a session and log off, the user ends a Telnet command with Telnet

- Telnet can be used to test or troubleshoot remote web or mail servers, as well as for remote access to MUDs (multi-user dungeon games) and trusted internal networks

QUESTION NO 3

- EXPLAIN METROPOLITAN AREA NETWORK WITH SUITABLE EXAMPLE

Metropolitan Area Network (MAN)

- A metropolitan area network (MAN) is a computer network that interconnects users with computer resources in a geographic region of the size of a metropolitan area. The term MAN is applied to the interconnection of local area networks LANs in a city into a single larger network which may then also offer efficient connection to a wide area network.

- connection to a wide area network. The term is also used to describe the interconnection of several local area networks in a metropolitan area through the use of point-to-point connections between them

History

- By 1999, local area networks (LANs) were well established to provide data communication in buildings and offices. [citation needed] For the interconnection of LANs within a city, businesses relied primarily on the public switched telephone network

- But while the telephone network was able to support the packet-based exchange of data that the various LAN protocols implemented, the bandwidth of the telephone network was already under heavy demand from circuit

EXAMPLE OF MAN

- Stands for "Metropolitan Area Network." A MAN is a network that spans a large area, such as a town or city. It is larger than a campus area network (CAN), but smaller than a wide area network (WAN). An example of a MAN is a series of wireless routers distributed across a city

QUESTION NO 3 (B)

DEFINITION OF TOPOLOGY

- A Network Topology is the arrangement with which computer systems or network devices are connected to each other. Topologies may define both physical and logical aspect of the network. Both logical and physical topologies could be same or different in a same network.

- **Point-to-Point**

- Point-to-point networks contains exactly two hosts such as computer, switches or routers, servers connected back to back using a single piece of cable. Often, the receiving end of one host is connected to sending end of the other and vice-versa.
- If the hosts are connected point-to-point logically, then may have multiple intermediate devices. But the end hosts are unaware of underlying network and see each other as if they are connected directly.

Bus Topology

- In case of Bus topology, all devices share single communication line or cable. Bus topology may have problem while multiple hosts sending data at the same time. Therefore, Bus topology either uses CSMA/CD technology or recognizes one host as Bus Master to solve the issue. It is one of the simple forms of networking where a failure of a device does not affect the other devices. But failure of the shared communication line can make all other devices stop functioning.

- Both ends of the shared channel have line terminator. The data is sent in only one direction and as soon as it reaches the extreme end, the terminator removes the data from the line.

Star Topology

- All hosts in Star topology are connected to a central device, known as hub device, using a point-to-point connection. That is, there exists a point to point connection between hosts and hub. The hub device can be any of the following:
 - Layer-1 device such as hub or repeater
 - Layer-2 device such as switch or bridge
 - Layer-3 device such as router or gateway

- As in Bus topology, hub acts as single point of failure. If hub fails, connectivity of all hosts to all other hosts fails. Every communication between hosts, takes place through only the hub. Star topology is not expensive as to connect one more host, only one cable is required and configuration is simple.

Ring Topology

- In ring topology, each host machine connects to exactly two other machines, creating a circular network structure. When one host tries to communicate or send message to a host which is not adjacent to it, the data travels through all intermediate hosts. To connect one more host in the existing structure, the administrator may need only one more extra cable.

- Failure of any host results in failure of the whole ring. Thus, every connection in the ring is a point of failure. There are methods which employ one more backup ring.

Mesh Topology

- In this type of topology, a host is connected to one or multiple hosts. This topology has hosts in point-to-point connection with every other host or may also have hosts which are in point-to-point connection to few hosts only

- Hosts in Mesh topology also work as relay for other hosts which do not have direct point-to-point links. Mesh technology comes into two types:
- Full Mesh: All hosts have a point-to-point connection to every other host in the network. Thus for every new host $n(n-1)/2$ connections are required. It provides the most reliable network structure among all network topologies.

- Partially Mesh: Not all hosts have point-to-point connection to every other host. Hosts connect to each other in some arbitrarily fashion. This topology exists where we need to provide reliability to some hosts out of all.

Tree Topology

- Also known as Hierarchical Topology, this is the most common form of network topology in use presently. This topology imitates as extended Star topology and inherits properties of bus topology.
- This topology divides the network in to multiple levels/layers of network. Mainly in LANs, a network is bifurcated into three types of network devices. The lowermost is access-layer where computers are attached.

- The middle layer is known as distribution layer, which works as mediator between upper layer and lower layer. The highest layer is known as core layer, and is central point of the network, i.e. root of the tree from which all nodes fork.

Daisy Chain

- Daisy Chain
- This topology connects all the hosts in a linear fashion. Similar to Ring topology, all hosts are connected to two hosts only, except the end hosts. Means, if the end hosts in daisy chain are connected then it represents Ring topology.

- Each link in daisy chain topology represents single point of failure. Every link failure splits the network into two segments. Every intermediate host works as relay for its immediate hosts

Hybrid Topology

- A network structure whose design contains more than one topology is said to be hybrid topology. Hybrid topology inherits merits and demerits of all the incorporating topologies.
- Hybrid Topology
- arbitrarily hybrid topology. The combining topologies may contain attributes of Star, Ring, Bus, and Daisy-chain topologies. Most WANs are connected by means of Dual-Ring topology and networks connected to them are mostly Star topology networks. Internet is the best example of largest Hybrid topology

I will choose hybrid TOPOLOGY

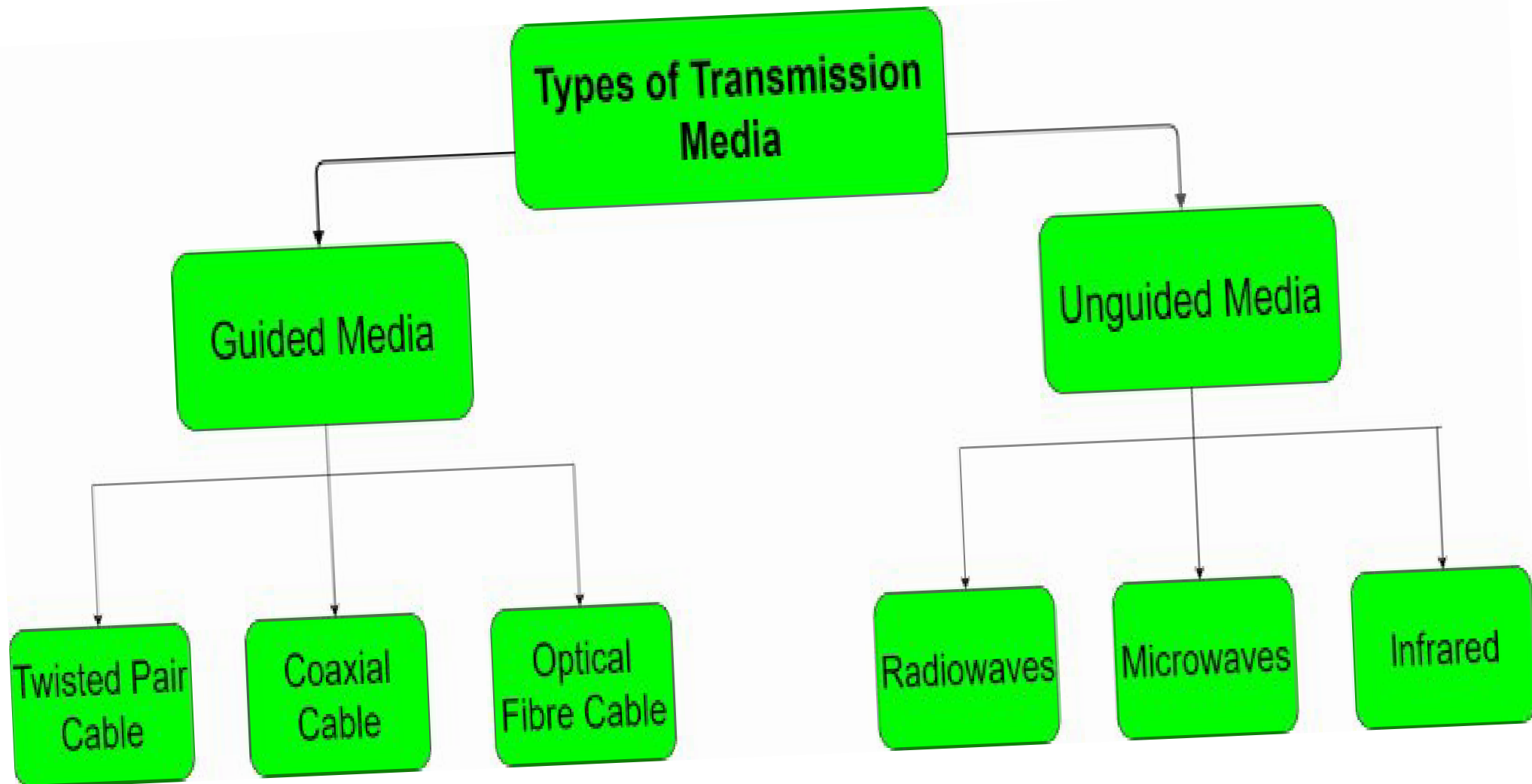
- its is the combining topologies
- It contains attributes of star, ring, bus, daisy chain topologies
- Most WAN are connected to by dual ring topology
- Hybrid has a very powerful are network mean that it has the combination of all topologies so it will cover the highest are spread in the highest area

QUESTION NO 4

Types of Transmission Media

- is a pathway that carries the information from sender to receiver. We use different types of cables or waves to transmit data. Data is transmitted normally through electrical or electromagnetic signals.

- An electrical signal is in the form of current. An electromagnetic signal is series of electromagnetic energy pulses at various frequencies. These signals can be transmitted through copper wires, optical fibers, atmosphere, water and vacuum Different Medias have different properties like bandwidth, delay, cost and ease of installation and maintenance. Transmission media is also called Communication channel.



GUIDED MEDIA

- Guided Media:
- It is also referred to as Wired or Bounded transmission media. Signals being transmitted are directed and confined in a narrow pathway by using physical links
- Features:
-
- High Speed
- Secure
- Used for comparatively shorter distances
- Three major types of guided media

TWISTED PAIR CABLE

– It consists of 2 separately insulated conductor wires wound about each other. Generally, several such pairs are bundled together in a protective sheath. They are the most widely used Transmission Media. Twisted Pair is of two types

Unshielded Twisted pair

- Twisted Pair (UTP):
 - This type of cable has the ability to block interference and does not depend on a physical shield for this purpose. It is used for telephonic applications.
 - Advantages:
 - Least expensive
 - Easy to install
 - High speed capacity
 - Susceptible to external interference
 - Lower capacity and performance in comparison to STP
 - Short distance transmission due to attenuation

SHIELDED TWISTED PAIR

This type of cable consists of a special jacket to block external interference. It is used in fast-data-rate Ethernet and in voice and data channels of telephone lines.

Advantages: Better performance at a higher data rate in comparison to UTP
Eliminates crosstalk Comparitively faster
Comparitively difficult to install and manufacture More expensive Bulky

Coaxial Cable

– It has an outer plastic covering containing 2 parallel conductors each having a separate insulated protection cover. Coaxial cable transmits information in two modes: Baseband mode(dedicated cable bandwidth) and Broadband mode(cable bandwidth is split into separate ranges). Cable TVs and analog television networks widely use Coaxial cables.

- **ADVANTAGE**
- High bend width
- Better noise Immunity
- Easy to install expend
- In expensive
- Dis advantage
- Single wire failure all will be erupted

Optical fibre cable

- It uses the concept of reflection of light through a core made up of glass or plastic. The core is surrounded by a less dense glass or plastic covering called the cladding. It is used for transmission of large volumes of data.
- The cable can be unidirectional or bidirectional. The WDM (Wavelength Division Multiplexer) supports two modes, namely unidirectional and bidirectional mode.

- Advantages:
-
- Increased capacity and bandwidth
- Light weight
- Less signal attenuation
- Immunity to electromagnetic interference
- Resistance to corrosive materials

- Disadvantages:
-
- Difficult to install and maintain
- High cost
- Fragile

UNGUIDED MEDIA

- It is also referred to as Wireless or Unbounded transmission media. No physical medium is required for the transmission of electromagnetic signals.
- Features:
 -
 - Signal is broadcasted through air
 - Less Secure
 - Used for larger distances
 - There are 3 major types of Unguided

RADIO WAVES

- These are easy to generate and can penetrate through buildings. The sending and receiving antennas need not be aligned. Frequency Range: 3KHz – 1GHz. AM and FM radios and cordless phones use Radiowaves for transmission.
- Further Categorized as (i) Terrestrial and (ii) Satellite.

Microwaves

–

- It is a line of sight transmission i.e. the sending and receiving antennas need to be properly aligned with each other. The distance covered by the signal is directly proportional to the height of the antenna. Frequency Range: 1 GHz – 300 GHz. These are majorly used for mobile phone communication and television distribution.

Infrared

- Infrared waves are used for very short distance communication. They cannot penetrate through obstacles. This prevents interference between systems. Frequency Range: 300GHz – 400THz. It is used in TV remotes, wireless mouse, keyboard, printer, etc.
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