ASSIGNMENT

Course: Certificate in Computer Application

Course Code: CCA-102

Topic: Data Communications

Centre: Unify CSC Academy, Demthring, Shillong

Submitted By: Mrs. Susanna Kshiar

Q1 What are the different types of networks?

Ans: The different types of networks are as follows

- A local area network (LAN) is usually privately owned and links the devices in a single office, building, or campus.
- Currently, LAN size is limited to a few kilometers.
- LANs are designed to allow resources to be shared between personal computers or workstations.
- The resources to be shared can include hardware (e.g., a printer), software (e.g., an application program), or data.
- One of the computers may be given a large capacity disk drive and may become a server to clients.
- Software can be store on this central server and used as needed by the whole group.
- In addition to size, LANs are distinguished from other types of network by their transmission media and topology.
- The most common LAN topologies are bus, ring and star.
- Early LANs had data rates in 4 to 16 megabits per second (Mbps) range.
- Ethernet (IEEE 802.3) is one example of LAN
- IEE has defined the specifications for a wireless LAN, called IEE 802.11, which covers the physical and data link layers.
- A BSS without an AP is called an ad hoc network; a BSS with an AP is called an
- A Wide area network (WAN) provides long distance transmission of data, image, audio, and vedio information over large

geographic areas that may comprise a country, a continent, or even the whole world.

- A WAN can be as complex as the backbones that connect the internet or as simple as a dial-up line that connects a home computer to the internet.
- We normally refer the first as a switched WAN and to the second as a point WAN.

Q2. Explain the Shielded twisted pair (STP) and Unshielded twisted pair (UTP)

Ans- Shielded Twisted Pair (STP) :- STP are also a twisted pair cables but are required to be grounded, wants more maintenance, have high data transmission capacity and are more costly than UTP.

Unshielded Twisted Pair (UTP) :- Unshielded Twisted Pair or UTP are twisted pair cables and are used to transmit both data and voice as their frequency range is suitable for transmission. UTP are more cost effective and are not needed to be grounded.

Q3. What is difference between baseband and broadband transmission?

Ans- Baseband Transmission -

1. Digital Signalling
2. Frequency division multiplexing is not possible.
3. Baseband is bi-directional transmission.
4. Short distance signal travelling.
5. Entire bandwith is for single signal transmission.
6. Example: Ethernet is using Basebands for LAN.

Broadband Transmission –

1. Analog Signalling.
2. Transmission of data is unidirectional.
3. Signal travelling distance is long.
4. Frequency devision multiplexing possible.
5. Simultaneous transmission of multiple signals over different frequencies.
6. Example: Used to transmit cable TV to premises.

Q4. What is the difference between a hub, modem, router, and a switch?

Ans:-

Device	What is does
1. Hubs	– Unlike switches, hubs broadcast data to all ports, which is inefficient, so hubs are basically a multiport repeated.
2. Modem	– Modems are hardware devices that allow a computer or another device, such as a router or switch, to connect to the internet. They convert or "modulate" an analog signal from a telephone or cable wire to digital data (1s and 0s) to a computer can recognize.
3. Router	– Are responsible for sending data from one network to another. Work at layer 3 (network) of the OSI model, which deals with IP addresses. Typically, router today will perform the functionality of both a router and a switch – that is, the router will have to multiple ethernet ports that devices can plug into.
4. Switches	– They use the MAC address of a devices to send data only to the port the destination devices is plugged into. Work at Layer 2 (Data link) of the OSI model which deals with MAC address.

Q5 When you move the NIC cards from one PC to another PC, does the MAC address gets transferred as well?

Ans:- Every NIC has a hardware address that's known as a MAC, for Media Access Control. Where IP addresses are associated with TCP/IP (networking software), MAC address are linked to the hardware of network adapters.

A MAC address is given to a network adapter when it is manufactured. It is hardwired or hard-coded onto your computer's network interface card (NIC) and is unique to it. Something called the ARP is like a passport that takes data from an IP address through an actual piece of computer hardware. Therefore it remain static and doesn't changed.

Q6. When troubleshooting computer network problems, what common hardware-related problem can occur?

Ans:- The common hardware-related problem can occur are:-

1. Computer Freezing. The major reason for the hardware problem in a PC is overheating.
2. System Error Blue Screen. The user often finds a blue screen when they start the computer.
3. RAM Faults & Error
4. Liquid Spilled on PC
5. Noisy computer.

Q7 In a network that contain

Ans Almost every antivirus vendor offers a software solution designed to run on a PC desktop. Desktop protection, the first

virus-protection model, is still the most popular. For strong protection, you must implement desktop solutions, then keep them up-to-date, which can be challenging for several reasons. First, keeping many desktops updated and current is difficult even with automated tools. Missing or bypassing a workstation is easy, and one weak link can harm the rest of the network. Second, when you place anti-virus product on desktops, end users can disable the protection. Third, virus scanners loaded on desktops can severely affect local performance.

Q8 Define Static IP and Dynamic IP? Discuss the difference between IPV4 and IPV6.

Ans:- A Static IP addresses is an IP address that doesn't change. Our static IP addresses usually stay the same unless our network architecture changes or our devices are out of commission. Static IP address are typically used for servers or other important networking equipment. They're popular within business settings because they ensure that the devices connected to them keep a consistent address. They also work well for remote access solutions.

A dynamic IP addresses is an IP addresses that can regularly change. An ISP (Internet Services Provider) will buy a large number of dynamic IP addresses and assign them to their customer's devices. Dynamic IP addresses are often reassigned IP addresses helps internet providers save money

and ensure a higher level of security. It also means that they don't need to take the time to reestablish any network connections if we go on a vacation or move to a new location.

The major differences between IPv4 and IPv6 are :-

IPv4 (Internet Protocol version 4)	IPv6 (Internet Protocol version 6)
- Encryption and authentication is not provided in IPv4 (Internet Protocol version 4).	- Encryption and authentication is provided in IPv6 (Internet Protocol version 6).
- Header of IPv4 is 20-60 bytes	- Header of IPv6 is fixed at 40 bytes
- Checksum field is available in IPv4	- Checksum field is not available in IPv6
- Packet flow identification is not available in IPv4 (Internet Protocol version 4)	- Packet flow identification is available in IPv6. Flow label field is available in the header.
- IPv4 address are usually represented in dot-decimal notation, consisting of four decimal numbers, each ranging from 0 to 255, separated by dots	- An IPv6 address is represented as eight groups of four hexadecimal digits, each group representing 16 bits.
- In IPv4, Security features relies on application	- In IPv6, there is an inbuilt security feature named IPSEC
- Sender and forwarding routers performs fragmentations in IPv4.	- Fragmentation is performed only by the sender in IPv6.
- End to end connection integrity cannot be achieved in IPv4.	- End to end connection integrity can be done in IPv6.
- IPv4 supports DHCP and manual address configuration.	- IPv6 supports renumbering and auto address configuration.
- IPv4 Addresses are 32-bit long	- IPv6 addresses are 128 bits long.
- The address space in IPv4 is 4.29×10^9	- The address space in IPv6 is 3.4×10^{38}.
- IPv4 has a broadcast message transmission scheme.	- Multicast and anycast message transmission scheme is available in IPv6.

Q9. Discuss TCP/IP Model in detail.

Ans:- TCP/IP Model helps us to determine how a specific computer should be connected to the internet and how data should be transmitted between them. It helps us to create a virtual network when multiple computer ~~members~~ networks are connected together. The purpose of TCP/IP model is to allow communication over large distances.

TCP/IP stands for Transmission Control Protocal/Internet Protocol. TCP/IP Stack is specifically designed as a model to offer highly reliable and end-to-end byte stream over an unreliable internetwork.

Q10. What is a Web Browser (Browser)? Give some example of Browsers.

Ans:- Web Browser is a common term which is frequently used by people while discussing the internet. However, the exact definition of a Web browser is known by few only.

Web Browser Definition: A software application used to access information on the World Wide Web is called a Web Browser. When a user requests some information, the web browser fetches the data from a web server and then displays the web page on the users screen.

common web browsers include Microsoft Internet Explorer, Google Chrome, Mozilla Firefox, and Apple Safari. .... For eg, Ajax enables a browsers to dynamically update information on a webpage without the need to reload the page.

Q11 What is Search engine? Give example.

Ans:- A search engine is software accessed on the internet that searches as database of information according to the users query.

The engine provides a list of result that best match what the user is trying to find. Today, there are many different search engines available on the internet, each with its own abilities and features. The first search engine ever developed is considered Archie, which was used to search for FTP files, and the first text-based search engine is considered Veronica. Currently, the most popular and well known search engine is Google. Other popular search engines include AOL, Ask.com, Baidu, Bing, DuckDuckGo and Yahoo.

Q12. What is the internet & WWW? What are the use of internet in our daily life?

Ans- The internet is a global network of billions of computers and other electronic devices. With the internet, it's possible to access almost any information, communicate with anyone else in the world, and do ~~no~~ much more.

We can do all of this by connecting a computer to the internet, which is also called going online. When someone says a computer is online, its just another way of saying its connected to the internet.

The World Wide Web (WWW) - usually called the Web for short - is a collection of different Websites we can access through the internet. A website is made up of related text, images, and other resources. Websites can resemble other forms of media - like newspaper articles or television programs - or they can be interactive in a way that's unique to computers.

The use of the internet in our daily life is depending on desires and goals.

1. Activities in our daily life are decided after the use of the internet. Internet innovated our daily life. We spend lots of time on the Web.
2. The internet provides us useful data, information, and knowledge for personal, social, and economic development and it is up to us to utilize our time on the World Wide Web in a productive manner. The internet is a revolution information technology.
3. We can ~~also~~ do online courses and improve our writing, communication, business, and online marketing skills. Online shopping, social media, emails, chatting are common things that we do daily.

Q13 What is an Internet Services Provider? Give some example of ISP in India.

Ans:- ~~IS~~ ISP is an acronym that stands for Internet service provider. An Internet Services Provider is a company that provides Internet access to organizations and home users.

An ISP Provides us with internet access, usually for a fee. Without an ISP, we wouldn't be able to shop online, access Facebook or read this page. Connecting to the Internet requires specific telecommunications, networking, and routing equipment. ISPs allow users access to networks that contain the required equipment, enabling users to establish Internet connectivity. ISPs are responsible for making sure us can access the internet

Routing Internet traffic, resolving domain names, and maintaining the network infrastructure that makes Internet access possible. Some example of ISP in India are (i) BSNL (ii) MTNL (iii) Bharti Airtel (iv) Hathway Cable.

Q14 Discuss the difference between MAC address, IP address and Port address

Ans The difference between MAC address, IP address and Port address are as follows.

	IP address	Port address	MAC address
1.	Internet Protocol address (IP address) used to identify a host in network.	– Port number is used to identify an Processes/ Services on our system.	– MAC address stands for Media Access Control address.
2.	IPv4 is of 32 bits (4 bytes) size and for IPv6 is 128 bits (16 bytes)	– The Port number is 16 bits numbers.	– MAC address is a 6 byte hexadecimal address.
3.	IP address is the address of the layer-3 IP protocol.	– Port number is the address of the layer-4 protocols	– A device attached with MAC address can retrieve by ARP Protocol.
4.	IP address is Provided by admin of system or network administrator	– Port number for application is provided by kernel of operating System.	– NIC Card's Manufacturer Provides the MAC address
5.	IP config command can be used to find IP address.	– Netstat command can be used to find network statistics excluding available TCP Ports.	– MAC address is used to enquire the physical address of a computer.
6.	Internet Protocol address (IP address) used to identify a host in network.	– Port number is used to identify an Processes / Services on ~~your~~ our system.	– MAC address stand for Media Access control address.

Q15 How do we view my Internet browser's history?

Ans- In any Chrome window, use the keyboard shortcut Ctrl+H or navigate to the URL chrome://history. Or, click the Menu button, which is located near the top-right side of the browser window, and choose History, the History again.