ASSIGNMENT

ON

CCA-102: DATA COMMUNICATIONS

By,

SHEMSPAHLIN L. MARBANIANG

DATA COMMUNICATIONS

ASSIGNMENT

1. what are the different types of networks?

Ans. The different types of networks are:-

(i) LAN (Local Area Networks)
(ii) WAN (wide Area Networks)
(iii) WLAN (wireless Local Area Networks)

(i) LAN (Local Area Networks):- Local Area Networks is usually privately owned and links the device in a single office, building or campus.

(ii) WAN (wide Area Network):- A wide Area Network is connect to computers together across longer physical distance. WAN is more complex than a LAN, and allows computers and low-voltage devices to be remotely connected to each other over one large Network to communicate even when they're miles apart. The Internet is the most basic example of WAN that connecting all computers together around the world.

(iii) WLAN (wireless Local Area Network):- WLAN's make use of wireless network technology, such as Wi-Fi. Typically seen in the same type of applications as

LANs, these types of networks don't require that devices rely on physical cables to connect to the networks.

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

Ans

Sheilded twisted pair (STP): Sheilded twisted pair (STP) is also the type of twisted pair which stands for sheilded twisted pair. In STP grounding cable is required but in Unsheilded twisted pair grounding cable is not required. In STP much more maintenance are needed therefore it is costlier than UTP. STP Generally used for connecting organizations over a long distance.

Unsheilded twisted pair (UTP): Unsheilded twisted pair is the type of twisted pair cable. It stands for Unsheilded twisted pair. Both Data and voice both are transmitted through UTP because its frequency range is suitable. In UTP grounding cable is not necessary also in UTP much more maintenance are not needed therefore it is cost effective. UTP it is used for data transmission within short distance such as for home and office networks.

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3. what is the difference between baseband and broadband transmission?

Ans The difference between baseband and broadband transmission are:-

Baseband transmission	Broadband transmission.
i) Digital signalling.	i) Analog signalling.
ii) Frequency division multiplexing is not possible.	ii) Transmission of data is unidirectional.
iii) Baseband is bi-directional transmission.	iii) Signal travelling distance is long.
iv) Short distance signal travelling.	iv) Frequency division multiplexing possible.
v) Entire bandwith is for single signal transmission.	v) Simultaneous transmission of multiple signals over different frequencies.
vi) Example: Ethernet is using Baseband for LAN.	vi) Example: used to transmit cable Tv to premises.

4. what is the difference between a hub, modem, router and a switch?

Ans The difference between a hub, modem, Router and a Switch are:-

Hub: A hub is a device that allows several Network device to connect together to exchange data on a single network however, they have no management component. Network hubs are also

known as repeaters. They are less 'intelligent' than switches. Unlike switches, which forward data to the intended devices, hubs merely send the data packets to all its ports. So as the name repeaters suggests, it only repeats the data from an incoming port to all the other devices, this leads to frequent collisions between packets.

Modem: A modem is short for a modulator-demodulator. Its function in to facilate the transmission of data, by converting an analogue signal to code and decoding digital information. This meant that it converts the telephone connection information into digital information for the computer to understand and convert computer digits into analog waves so that it can be transmitted over telephone lines. It could be seen as the center for information collection from WAN, as it directly connects to the outside world.

Router: A network router directs the data packets along networks. A router has a minimum of two networks, usually LANs or WANs or a LAN and its ISP. However unlike a modem, it cannot work single standing, however is able to connect to multiple nodes.

Switch: A network switch's primary function is to connect network segments on a single network. Therefore is quite different from a router and modem, it is used to expand the capability of the router, by providing additional ports. It connects many devices together on

the same network, sending data to a device that needs or requests it. A switch is able to improve the performance of a network by increasing network capacity. A switch connects two or more nodes in the same or different network.

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

Ans Yes, that's because MAC addresses are hard-wired into the NIC circuitry, not the PC. This also means that a PC can have a different MAC address when another one replaced the NIC card. The layer 2 header contains both a source and destination MAC address. These addresses change at each device, and are specific only to the local network media.

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

Ans Most of the time troubleshooting come from cables, there are problems with the material of the network card if it is defective or it is not installed, only the network cable are not good, the connection between the connector and the cable is not good, if there are two or more pcs to take the same IP address.

A large percentage of a network is made up of hardware. Problem in these areas can range from malfunctioning hard drives, broken NICs and even hardware startups. To Trouble-Shoot a Network:

i) Check the hardware.
ii) use ipconfig.
iii) use Ping and tracert.
iv) Perform a DNS check.
v) Contact the ISP.
vi) Check on virus and malware protection.
vii) Review database logs.

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7. In a network that contains two servers and twenty workstations, where is the best place to install an Anti-virus program?

Ans The best place to install an Anti-virus program is in Desktop because in sometime virus or malware are going to infect our computer. So in other word, Putting antivirus software on an Internet border device, whether the device is an email server or firewall, is the next best option. In today's world of email worms, Trojan horses, and infected web pages, placing virus-scanning protection at the border offers excellent benefits for the cost.

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8. Define static IP and Dynamic IP? Discuss the difference between IPV4 and IPV6.

Ans

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

A static IP address is assigned to a device by an ISP. Typically, static IP addresses add to the cost of your internet service.

Dynamic IP addresses: A dynamic IP address is an IP address that can regularly change. An ISP (Internet service provider) will buy a large number of dynamic IP addresses and assign them to their customer's devices. Dynamic IP addresses are often reassigned. Reassigning 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.

Dynamic IP addresses are more common for consumer equipment and personal use. A dynamic IP address

is assigned to a device by our ISP's (Internet Service Provider) Dynamic Host Configuration Protocol (DHCP) servers. The DHCP servers typically uses network routers to assign addresses to devices.

The major differences between IPV4 and IPV6 are:-

IPV4 (Internet Protocol version 4)	IPV6 (Internet Protocol version 6)
i) Encryption and authentication is not provided in IPV4 (Internet Protocol version 4).	i) Encryption and authentication is provided in IPV6 (Internet Protocol version 6).
ii) Header of IPV4 is 20-60 bytes.	ii) Header of IPV6 is fixed at 40 bytes.
iii) Checksum field is available in IPV4.	iii) Checksum field is not available in IPV6.
iv) Packet flow identification is not available in IPV4 (Internet Protocol version 4)	iv) Packet flow identification is available in IPV6. Flow lable field is available in the header.
v) IPV4 addresses are usually represented in dot decimal notation, consisting of four decimal number, each ranging from 0 to 255, seperated by dots.	v) An IPV6 address is represented as eight groups of four hexadecimal digits, each group representing 16 bits.
vi) Senders and forwarding routers performs fragmentation in IPV4	vi) Fragmentation is performed only by the senders in IPV6.
vii) In IPV4, security features relies on application.	vii) In IPV6, there is an inbuilt security feature named IPSEC.
viii) End to End connection integrity cannot be achieved in IPV4.	viii) End to end connection integrity can be done in IPV6.
ix) IPV4 supports DHCP and manual address configuration.	ix) IPV6 support renumbering and auto address configuration.

x) IPv4 addresses are 32-bit long.	x) IPv6 addresses are 128 bits long.
xi) The address space in IPv4 is 4.29 x 10^9	xi) The address space in IPv6 is 3.4 x 10^38
xii) IPv4 has a broadcast message transmission scheme	xii) Multicast and Anycast message transmission scheme is available in IPv6.

9. Discuss TCP/IP model in detail.

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

TCP/IP stands for Transmission Control Protocol/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.

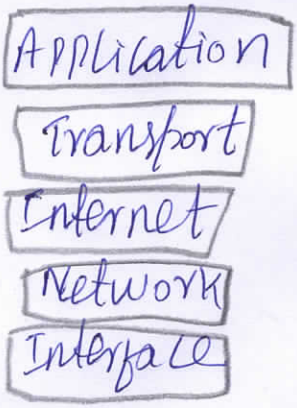
TCP characteristics:

Here, are the essential characteristics of TCP IP-Protocol.

i) Support for a flexible TCP/IP architecture.
ii) Adding more system to a network is easy.
iii) In TCP IP protocols suite, the network remains intact until the source, and destination machines were functioning properly.

iv) TCP is a connection-oriented Protocol.
v) TCP offers reliability and ensures that data which arrives out of sequence should put back into order.
vi) TCP allows you to implement flow control, so sender never overpowers a receiver with data.
vii) Four Layers of TCP/IP model.

In this TCP/IP tutorial, we will explain layers and their functionalities in TCP/IP model:



TCP/IP conceptual Layers

The functionality of the TCP/IP model in divided into four layers, and each includes specific Protocols.

TCP/IP is a layered sever architecture system in which each layer is defined according to a specific function to perform. All these four TCP IP layers work collaboratively to transmit the data from one layer to another.

- Application Layer
- Transport Layer
- Internet Layer
- Network interface.

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10. what is a web Browser (Browers)? Give some examples of browsers.

Ans

Web Browser is a common term which is frequently used by people while discussing the internet. However, the ~~exit~~ 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 webpage on the user's screen.

Common web browsers include Microsoft internet Explorer, Google Chrome, Mizilla, Firefox, and Apple Safari. for example, Ajax enables a browser to dynamically update information on a webpage without the need to reload the page.

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11. what is a search engine? Give example.

Ans

A search engine is software accessed on the Internet that searches a database of information according to the user's query. The engine provides a list of results 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, Duck Duck Go, and Yahoo.

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12. What is the internet?

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 much more.

You 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. It's just another way of saying it's connected to the internet.

The uses of the internet in our daily life is depending on desires and goals:

i) 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.

ii) The internet provides us useful data, information, and knowledge for personal, social and economic development and it's in up to utilize our time on the world wide web in a productive manner. The internet is a revolution in information technology.

iii) You can do online course and improve your writing, communication, business and online marketing skills online shopping, social media, emails, chatting are common things that we do daily.

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13. What is an internet Service Provider? Give examples of ISP in India.

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ISP is an acronym that stands for Internet Service Provider, An Internet service provider is a company that provides Internet access to organizations and home users. An ISP provides you with internet access, usually for a fee. Without an ISP, you 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. (~~IPS~~) ISPs are responsible for making sure you can access the internet, routing internet traffic, resolving domain names, and maintaining the network infrastructure that makes internet access possible.

While the core function of an ISP is provide internet access, many ISPs do much more. ISPs also offer services like web hosting, domain name registration and email services.

Internet service providers in India are as follows:

- BSNL
- MTNL
- Bharti Airtel
- Hathway Cable.

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14. Discuss the difference between MAC address, IP address and Port address.

Ans The difference between MAC address, IP address and Port address are:-

IP address	Port address	MAC address
i) Internet Protocol address (IP address) used to identify a host in network.	i) Port number is used to identify an processes/ servers on your system.	i) MAC address stands for Media Access Control Address.
ii) IPv4 is of 32 bits (4 bytes) size and for IPv6 is 128 bits (16 bytes).	ii) The port numbers is 16 bits numbers.	ii) MAC address is a six byte hexadecimal address.

iii) IP address is the address of the Layer-3 IP Protocol.	iii) Port number is the address of the layer4 Protocols.	iii) A device attached with MAL Address can retrive by ARP protocol.
iv) IP address is provided by admin of system or network administrator.	iv) Port number for application is provided by kernel of operating system.	iv) NIL card in manufacturer provides protocol.
v) Ipconfig command can be used to find IP address.	v) netstat command can be used to find Network statistics including Available TCP Ports.	v) MAC Address is used to ensure the physical address of a computer.
vi) Internet protocal address (IP address) used to identify a host in network.	vi) Port number is used to identify an processes/ services on your System.	vi) MAC address stands for media Acess control Address.

15. How do we view my Internet browser's history?

Ans

To view your browsing history in chrome:

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, then History again.