CCA-102: Data Communications

ASSIGNMENT

Q1:What are the different types of network?

Ans.

11 Types of Networks in Use Today

 Personal Area Network (PAN) ...

 Local Area Network (LAN) ...

 Wireless Local Area Network (WLAN) ...

 Campus Area Network (CAN) ...

 Metropolitan Area Network (MAN) ...

 Wide Area Network (WAN) ...

 Storage-Area Network (SAN) ...

 System-Area Network (also known as SAN)

Q2:Explain the Shielded twisted pair (STP) and Unshielded twisted

pair (UTP)

Ans. Difference between Unshielded Twisted Pair

(UTP) and Shielded Twisted Pair (STP) cables

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UTP:

UTP is the type of twisted pair cable. It stands for Unshielded 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.

STP:

STP is also the type of twisted pair which stands for Shielded twisted pair. In STP grounding cable is required but in UTP grounding cable is not required. in Shielded Twisted Pair (STP) much more maintenance are needed therefore it is costlier than Unshielded Twisted Pair (UTP).

Difference between Unshielded Twisted Pair (UTP) and Shielded Twisted Pair (STP) cables:

S.NO UTP STP

1. UTP stands for Unshielded twisted pair.

STP stands for Shielded twisted

pair.

2. In UTP grounding cable is not necessary.

While in STP grounding cable is

required.

3.

Data rate in UTP is slow compared to

STP. Data rate in STP is high.

4. The cost of UTP is less. While STP is costlier than UTP.

5.

In UTP much more maintenance are not

needed.

While in STP much more

maintenance are needed.

6. In UTP noise is high compared to STP. While in STP noise is less.

7.

In UTP the generation of crosstalk is also

high compared to STP.

While in STP generation of

crosstalk is also less.

8.

In UTP, attenuation is high in comparison

to STP. While in STP attenuation is low.

Q3: What is difference between baseband and broadband transmission?

Ans. Difference between Broadband and Baseband

Transmission

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Broadband system use modulation techniques to reduce the effect of noise in the environment. Broadband transmission employs multiple channel unidirectional transmission using combination of phase and amplitude modulation.

Baseband is a digital signal is transmitted on the medium using one of the signal codes like NRZ, RZ Manchester biphase-M code etc. is called baseband transmission.

These are following differences between Broadband and Baseband transmission.

Baseband transmission –

1. Digital signalling.
2. Frequency division multiplexing is not pssible.
3. Baseband is bi-directional transmission.
4. Short distance signal travelling.
5. Entire bandwidth 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 division 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. When computers, network devices or other networks are required to be connected, hubs, switches and routers are the bridges to link them together. All the three types of devices can perform the same function, and technicians sometimes may use the terms interchangeably. However, this will make people confuse whether they are the same thing or different from each other. This post is going to explore the actual meanings of hub, switch, router and what they are used for.

Overview of Hub, Switch & Router

Hub

A hub is to sent out a message from one port to other ports. For example, if there are three computers of A, B, C, the message sent by a hub for computer A will also come to the other computers. But only computer A will respond and the response will also go out to every other port on the hub. Therefore, all the computers can receive the message and computers themselves

need to decide whether to accept the message.

Switch

A switch is able to handle the data and knows the specific addresses to send the message. It can decide which computer is the message intended for and send the message directly to the right computer. The efficiency of switch has been greatly improved, thus providing a faster network speed.

Router

Router is actually a small computer that can be programmed to handle and route the network traffic. It usually connects at least two networks together, such as two LANs, two WANs or a LAN and its ISP network. Routers can calculate the best route for sending data and communicate with each other by protocols.

MODEM:

Stands for "modulating-demodulating":

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) that a computer can recognize.

Simply send traffic from point A to piont B without further manipulation.

Q5:When you move the NIC cards from one PC , does the MAC

address gets transferred as well?

Ans.

But the MAC address is part and parcel of the network adapter, just as your internal organs are part of you. When you move to a new house, you take your liver with you. In the same way, when you move a NIC to a different computer, it takes its MAC address with it.

Q6: When troubleshooting computer network problems, what

common hardware-related problems can occur?

Ans.

A large percentage of a network is made up of hardware. Problems in these areas can range from malfunctioning hard drives, broken NICs and even hardware startups. Incorrectly hardware configuration is also one of those culprits to look into.

where Q7**: In a network that contains two servers and twenty workstations,**

is the best place to install an Anti-virus program ?

Ans.

An anti-virus program must be installed on all servers and workstations to ensure protection. That's because individual users can access any workstation and introduce a computer virus when plugging in their removable hard drives or flash drives.

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

Ans. Difference between Static and Dynamic IP

address

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IP stands for Internet Protocol. IP address may be a distinctive numerical symbol allotted to every device on a network to spot each affiliation unambiguously.

The distinction between Static and Dynamic IP address lies inside the length of allotted scientific discipline address. The static scientific discipline address is fastened scientific discipline address that is manually allotted to a tool for a protracted amount of your time. On the opposite hand, the Dynamic scientific discipline address oft changes whenever user boots his/her machine, and it's mechanically allotted.

Difference between Static and Dynamic IP address:

S.NO STATIC IP ADDRESS DYNAMIC IP ADDRESS

1. It is provided by ISP(Internet Service While it is provided by DHCP

Provider). (Dynamic Host Configuration

Protocol).

2.

Static ip address does not change any time,

it means if a static ip address is provided

then it can't be changed or modified.

While dynamic ip address

change any time.

3. Static ip address is less secure.

While in dynamic ip address,

there is low amount of risk than

static ip address's risk.

4. Static ip address is difficult to designate.

While dynamic ip address is

easy to designate.

5.

The device designed by static ip address

can be trace.

But the device designed by

dynamic ip address can't be

trace.

6.

Static ip address is more stable than

dynamic ip address.

While dynamic ip address is less
stable than static ip address.

7.
The cost to maintain the static ip address is
higher than dynamic ip address.

While the maintaining cost of
dynamic ip address is less than
static ip address.

8. It is used where computational data is less
confidential.

While it is used where data is
more confidential and needs
more security.

Q9: Discuss TCP/IP model in detail.

Ans: TCP/IP Reference Model is a four-layered suite of communication protocols. It was developed by the DoD (Department of Defence) in the 1960s. It is named after the two main protocols that are used in the model, namely, TCP and IP. TCP stands for Transmission Control Protocol and IP stands for Internet Protocol.

The four layers in the TCP/IP protocol suite are −

 Host-to- Network Layer −It is the lowest layer that is concerned with the physical transmission of data. TCP/IP does not specifically define any protocol here but supports all the standard protocols.

 Internet Layer −It defines the protocols for logical transmission of data over the network. The main protocol in this layer is Internet Protocol (IP) and it is supported by the protocols ICMP, IGMP, RARP, and ARP.

 Transport Layer − It is responsible for error-free end-to-end delivery of data. The protocols defined here are Transmission Control Protocol (TCP) and User Datagram Protocol (UDP).

 Application Layer − This is the topmost layer and defines the interface of host programs with the transport layer services. This layer includes all high-level protocols like Telnet, DNS, HTTP, FTP, SMTP, etc.

The following diagram shows the layers and the protocols in each of the layers −

Q10: What is a web browser (browser) ? Give some explain

of browser.

Ans. A web browser, or simply "browser," is an application used to access and view websites. Common web browsers include Microsoft Internet Explorer, Google Chrome, Mozilla Firefox, and Apple Safari.

The primary function of a web browser is to render HTML, the code used to design or "mark up" webpages. Each time a browser loads a web page, it processes the HTML, which may include text, links, and references to images and other items, such as cascading style sheets and JavaScript functions.

The browser processes these items, then renders them in the browser window.

Early web browsers, such as Mosaic and Netscape Navigator, were simple applications that rendered HTML, processed form input, and

supported bookmarks. As websites have evolved, so have web browser requirements. Today's browsers are far more advanced, supporting multiple types of HTML (such as XHTML and HTML 5), dynamic JavaScript, and encryption used by secure websites.

The capabilities of modern web browsers allow web developers to create highly interactive websites. For example, Ajax enables a browser to dynamically update information on a webpage without the need to reload the page. Advances in CSS allow browsers to display a responsive website layouts and a wide array of visual effects. Cookies allow browsers to remember your settings for specific websites.

While web browser technology has come a long way since Netscape, browser compatibility issues remain a problem. Since browsers use different rendering engines, websites may not appear the same across multiple browsers. In some cases, a website may work fine in one browser, but not function properly in another. Therefore, it is smart to install multiple browsers on your computer so you can use an alternate browser if necessary.

Q11: What is search engine ? Give explain

Ans. A search engine is a web-based tool that enables users to locate information on the World Wide Web. Popular examples of search engines are Google, Yahoo!, and MSN Search. Search engines utilize automated software applications (referred to as robots, bots, or spiders) that travel along the Web, following links from page to page, site to site. The information gathered by the spiders is used to create a searchable index of the Web.

search engines work

There may be some differences in how the search engines work but the fundamentals remain the same. Each of them has to do the following tasks:

1. Crawling

2. Indexing

3. Creating results

1. Crawling

Search engines have their own crawlers, small bots that scan websites on the world wide web. These little bots scan all sections, folders, subpages, content, everything they can find on the website.

Crawling is based on finding hypertext links that refer to other websites. By parsing these links, the bots are able to recursively find new sources to crawl.

2. Indexing

Once the bots crawl the data, it's time for indexing. The index is basically an online library of websites.

Your website has to be indexed in order to be displayed in the search engine results page. Keep in mind that indexing is a constant process. Crawlers come back to each website to detect new data.

Quick tip:

Quickly check all indexed pages of your website by using this search operator: "site:domain.com"

3. Creating results

Search engines create the results once the user submits a search query. It's a process of checking the query against all website records in the index. Based on the algorithm, the search engine picks the best results and creates an ordered list.

Q12: What is the internet & WWW?What are the uses of internet in our daily life?

ANS.

INTERNET AND ITS USES:

- Internet helps us to share information from any place in the world
- Internet is a source of lot of information for education purposes
- Internet enables fast transfer of news or incidents to people
- Internet can be used for communication from end of the world to the other
- Without internet, the world would move slow nowadays

INTERNET AND ITS USES : (SHORT ESSAY)

Internet is a global system that can be used for sharing information, providing worldwide services and communication. Daily updates are easily and instantly available in the internet. Also, you can search for any information you are looking for; in the internet. In today's world, all companies are able to operate only with the use of internet. A lot of products and services are sold and provided through internet today. Once upon a time, telephone was considered a fast mode of communication. Now, internet has enormously emerged and replaced telephone as swift mode of communication.

INTERNET AND ITS USES : (BRIEF ESSAY)

The internet has intruded globally into everything than we could imagine. There are hardly people who do not rely on the internet for their daily life. Internet has emerged in such a way that we happen to use it to run our daily life in some way. The uses of Internet are endless; a few of them are as follows:

Education : Internet is a valuable source for a lot of information. Data and information related all fields are updated in the internet. Students can spend a few minutes over the internet to read their relevant study materials. Many students use internet for intense research on their projects.

Q13: What is an internet service provider ? Give some explain of ISP in india.

Ans

Definition

An **Internet Service Provider** (**ISP**) is a company such as AT&T, Verizon, Comcast, or BrightHouse that provides Internet access to companies, families, and even mobile users. ISPs use fiber-optics, satellite, copper wire, and other forms to provide Internet access to its customers.

The type of Internet access varies depending on what the customer requires. For home use, cable or DSL (digital subscriber line) is the perfect, affordable choice. The price of home use can range anywhere from free to roughly $120 a month. The amount of bandwidth is usually what drives the price. **Bandwidth** is the amount of data that can be sent through an internet

connection in a given amount of time. The speed for home use usually varies from 14 kilobits per second to 100 megabits per second. For large companies and organizations, their bandwidth requirements may be 1 to 10 gigabits per second, which is both insanely fast and expensive!

The Internet Highway

ISPs connect to one another by forming backbones, which is another way of saying a main highway of communications. Backbones usually consist of satellite, copper wire, or even fiber-optic media. **Media** is a term that means cables or lines, and it's the physical means of connecting your home to the internet.

Now, imagine these 'main highways' are like the major arteries that we have in our bodies. These major arteries push an extreme amount of blood (or data) to our smaller blood arteries (cities). Those smaller arteries then feed into blood vessels (neighborhoods) and then into tiny capillaries (our individual homes).

ISPs provide the same service, except that they use different types of media to do so. ISPs bridge distant locations between cities, states, and countries. Because of these high speed backbone systems, we are able receive an email within seconds, stream our favorite movie without interruption, and play online games with no lag whatsoever.

Satellites

Let's go over the different types of media that are used in order to give you a broader understanding of how ISPs work.

Customers who live in remote locations, such as farms, deserts, and mountainous areas, may require a **satellite Internet service**. This involves transmitting and receiving data from a satellite orbiting about 22,000 miles above the earth. Although satellite communication is not as fast as other mediums, it does provide flexibility with limited environmental impact, and there is not as much need for support from the local telecommunications company.

These satellite terminals can also be used when setting up natural disaster recovery centers. For example, FEMA used a satellite terminal during Hurricane Katrina, since the public telecommunication infrastructure was severely damaged.

Fiber Optics

Fiber optics, or fiber, is a transmission medium used to transmit light instead of electrical voltage, like copper. The great thing about fiber is that it transmits Internet traffic at the speed of light!

Fiber has great qualities, such as being very reliable and immune to electromagnetic interference, unlike copper. Fiber has the bandwidth capability from 10 gigabits per second all the way up to 31 terabits per second. Without boosting stations (which boost or amplify the signal as it travels, and commonly used with copper), fiber can transmit signals up to 150 miles without regeneration. Right now, there are fiber cables that run along the ocean floor, connecting countries across the globe through high speed Internet access. Pretty cool!

14. discuss the difference between mac address,ip address and port address.

Ans.

Both MAC Address and IP Address are used to uniquely identify a machine on the internet. MAC address is provided by the chip maker while IP Address is provided by the Internet Service Provider.

Following are the important differences between MAC Address and IP Address.

Sr. No.	Key	MAC Address	IP Address
1	Definition	MAC Address stands for Media Access Control Address.	IP Address stands for Internet Protocol Address.
2	Usage	MAC Address ensure that physical address of the computer is unique.	IP Address is a logical address of the computer and is used to uniquely locate computer connected via a network.
3	Format	MAC Address is of six byte hexadecimal address.	IP Address is of 4 bytes or of 16 bytes.
4	Access Protocol	MAC Address can be retrieved using ARP protocol.	IP Address can be retrieved using RARP protocol.
5	Provider	Chip maker manufacturer provides the MAC Address.	Internet Service Provider, ISP provides the IP Address.

15. how do we view my inter browser's history?

Ans.

The **history of the Internet** has its origin in the efforts to build and interconnect computer networks that arose from research and development in the United States and involved international collaboration, particularly with researchers in the United Kingdom and France.[1][2][3][4]

Computer science was an emerging discipline in the late 1950s that began to consider time-sharing between computer users and, later, the possibility of achieving this over wide area networks. Independently, Paul Baran proposed a distributed network based on data in message blocks in the early 1960s and Donald Davies conceived of packet switching in 1965 at the National Physical Laboratory (NPL) in the UK, which became a testbed for research for two decades.[5][6] The U.S. Department of Defense awarded contracts in 1969 for the development of the ARPANET project, directed by Robert Taylor and managed by Lawrence Roberts. ARPANET adopted the packet switching technology proposed by Davies and Baran,[7] underpinned by mathematical work in the early 1970s by Leonard Kleinrock at UCLA. The network was built by Bolt, Beranek, and Newman.[8]

Early packet switching networks such as the NPL network, ARPANET, Merit Network, and CYCLADES in the early 1970s researched and provided data networking. The ARPA projects and international working groups led to the development of protocols for internetworking, in which multiple separate networks could be joined into a

network of networks, which produced various standards. Bob Kahn, at ARPA, and Vint Cerf, at Stanford University, published research in 1974 that evolved into the Transmission Control Protocol (TCP) and Internet Protocol (IP), the two protocols of the Internet protocol suite. The design included concepts from the French CYCLADES project directed by Louis Pouzin.[9]

In the early 1980s the National Science Foundation (NSF) funded national supercomputing centers at several universities in the United States and provided interconnectivity in 1986 with the NSFNET project, which created network access to these supercomputer sites for research and academic organizations in the United States. International connections to NSFNET, the emergence of architecture such as the Domain Name System, and the adoption of TCP/IP internationally on existing networks marked the beginnings of the Internet.[10][11][12] Commercial Internet service providers (ISPs) began to emerge in the very late 1980s. The ARPANET was decommissioned in 1990. Limited private connections to parts of the Internet by officially commercial entities emerged in several American cities by late 1989 and 1990.[13] The NSFNET was decommissioned in 1995, removing the last restrictions on the use of the Internet to carry commercial traffic.

Research at CERN in Switzerland by British computer scientist Tim Berners-Lee in 1989-90 resulted in the World Wide Web, linking hypertext documents into an information system, accessible from any node on the network.[14] Since the mid-1990s, the Internet has had a revolutionary impact on culture, commerce, and technology, including the rise of near-instant communication by electronic mail, instant messaging, voice over Internet Protocol (VoIP) telephone calls, two-way interactive video calls, and the World Wide Web with its discussion forums, blogs, social networking, and online shopping sites. Increasing amounts of data are transmitted at higher and higher speeds over fiber optic networks operating at 1 Gbit/s, 10 Gbit/s, or more. The Internet's takeover of the global communication landscape was rapid in historical terms: it only communicated 1% of the information flowing through two-way telecommunications networks in the year 1993, 51% by 2000, and more than 97% of the telecommunicated information by 2007.[15] Today, the Internet continues to grow, driven by ever greater amounts of online information, commerce, entertainment, and social networking. However, the future of the global network may be shaped by regional differences.[