

CCA-102: DATA COMMUNICATIONS

ASSIGNMENT

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Q.1.) What are the different type of networks?

Ans $\Rightarrow$ Type of Network:-

1. Personal Area Network (PAN):-

The smallest and most basic type of network, a PAN is made up of a wireless modem, a computer or two, phones, printers, tablets etc, and revolves around one person in building.

2. Local Area Network (LAN):- A local area network is usually privately owned and links the devices in a single office, building.

3. Wireless Local Area Network (WLAN):-

Functioning like a LAN, WLAN make use of wireless network technology, such as wi-fi, typically seen in the same type of networks don't require that device rely on physical cables connect to the network.

4. Campus Area Network (CAN):-

Largest than LANs, but smaller than metropolitan area network (MANs), typically seen in universities, large K-12 school districts or small business.

5. Metropolitan Area Network (MAN):-

These types networks are larger than LANs but smaller than WANs - and incorporate elements from both types of networks.

6. Wide Area Network (WAN):-

~~the~~ computers together across longer physical distances. Slightly more

7. Storage Area Network (SAN):-

As a dedicated high-speed network that connects shared pools of storage of networks don't rely on a LAN or WAN.

8. System Area Network (also known as SAN):-

This term is fairly new within the past two decades. It is

used to explain a relatively Local Network that is designed to provide high-speed connection in server-to-server applications.

9. Passive Optical Local Area Network (POLAN) :-

As an alternative to traditional switch based Ethernet LANs POLAN technology can be integrated into structured cabling to overcome concerns about supporting traditional.

10. Enterprise Private Network (EPN) :-

These type of network are built and owned by business that want to securely connect its various locations to share computer resources.

11. Virtual Private Network (VPN) :-

By extending a private network across the internet, a VPN lets its users send and receive data as if their devices were connected to the private network - if not, though a virtual point-to-point connection, users can access a private network remotely.

Q.2.) Explain the shielded twisted pair (STP) and unshielded twisted pair (UTP)

Ans $\Rightarrow$ Shielded twisted pair (STP):—

STP cable has an additional braided mesh coating or metal foil that wraps each set of insulated conductors. The metal casing intercepts the penetration of electromagnetic noise. It also can eradicate a phenomenon called crosstalk which is the unwanted effect of one circuit (or channel) on another circuit (or channel).

It occurs when one line (acting as a kind of receiving antenna) picks up some of the signals travelling down another line (acting as a kind of sending antenna). This effect can be experienced during telephone conversation in the background. Shielding each pair of a twisted pair cable can eliminate most crosstalk.

STP has the similar quality factor and uses the shield must be connected to the ground.

Unshielded twisted pair (UTP):-

UTP cable is the most prevalent type of telecommunication medium in use today. Its frequency range is suitable for transmitting both data and voice. Therefore, these are most commonly used in telephone systems.

A twisted pair consists of two insulated conductors (usually copper) in a twisted configuration. Color bands are used in plastic insulation for identification. In addition, color also identifies the how they relate to other pairs in a larger bundle.

The two wires are twisted in the twisted pair cable which significantly reduces the noise generated by the external source. The noise here we are talking about is generated when two wires are parallel which causes an increase in voltage level in the wire closest to the source and also uneven load and damaged signal.

Q.3.) What is difference between baseband and broadband transmission?

Ans ⇒

S.No	Baseband	Broadband
1.	In baseband transmission, the type of signalling used is analog.	In broadband transmission, the type of signalling used is digital.
2.	Baseband Transmission is unidirectional in nature.	Broadband Transmission, the bidirectional in nature.
3.	Signals can be travelled over long distance without being attenuated.	Signal can only travel over short distances.
4.	It is used with a bus as well as tree topology.	It work well with bus topology.
5.	only PSK encoding is used.	In broadband transmission, manchester and different manchester encoding are used.

Q.4.) What is the difference between a hub, modem, router and a switch?

Ans. Difference between a hub, modem, router, router and a Switch:-

Hub:-

Unlike switches, hubs broadcast data to all ports, which is inefficient. So hubs are basically a multipoint repeaters.

Modem:-

Stands for, modulating-demodulating. modems are hardware devices that allows a computer or another that devices, such as a router or switch. to connects 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 point B without further manipulation.

Routers:-

Are responsible for sending data from one (network) of the OSI model, which deals with it address. Typically routers today will perform the functionality of both a router

and Switch.

Switches:-

They use the MAC address of a device to send data only to the ~~part~~ destination device is plugged into. work at layer 2 (Data link) of the OSI model, which deals with MAC address.

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

Ans) The media access control address for any network adapter is hard coded into the card itself. Each manufacture of network adapters has a group of characters assigned that refer specifically to that company. I believe that is the first 1/2 of the MAC address which is 12 hexadecimal characters long. 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.

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

Ans=> The term troubleshooting refers to the process of identifying problems with a network through a rigorous and repeatable process and then solving those problems using testable methods. Troubleshooting is more effective than trying things at random until the network functions, and encourages you to document your process. Network troubleshooting is useful for almost anyone, from a computer enthusiast to an aspiring network engineer.

The common hardware-related problems can occur:-

When you are beginning the troubleshooting process, check all your hardware to make sure it's connected and has come loose or somebody has got on important router. This could be the problem behind your networking issues. There's no point in going through the process of troubleshooting network

issues if all you need to do is
play a card in. Make sure all
switches are in the correct
positions and haven't been
bumped off and back on
again. This is the mastery of
IT troubleshooting, and while
it might sound simplistic, often
it really does solve the problem.
Power cycling your modem,
router, and PC can solve simple
issues. Just be sure to leave
each device off for at least
60 seconds before you turn
it back on.

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

Ans.) A good firewall. This can stop intrusions, malware, unauthorized access, etc. before they reach the workstation.

Antivirus software on the servers and at the endpoint workstations. This software should be centrally managed to keep end users updated constantly and to minimize users meddling with the settings. Good antivirus will also protect email clients.

Educated and aware users who: do not casually install downloaded programs; don't click on unknown links; don't fall for phishing emails, etc. Establish a strong Password Policy for all users. You should consider not giving your users Administrative rights they install they need and your workstation but, I guarantee you, your entire environment will be more reliable, and secure.

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

Ans → Static IP :-

Use advanced Setting to reserve an IP address for a device on your local network. Your device keeps the same IP address until you channel from your network, even if the device is disconnected.

When you sign up for google Fiber for small business, you can choose to have no static IPs (that is dynamic IPs for all your devices), one static IP, or multiple static IPs. The number of static IPs available is shown on the screen when you sign up for services. If you sign up for static IPs, we will assign address to you when your service is installed and activated.

Dynamic IP :-

Use advanced setting for your network to configure dynamic DNS. When the entry so outside domain name box

can Choose the Dynamic DNS Provider and don't to install additional software on your computer.

Sno	IPv4	IPv6
1.	IPv4 has 32-bit address length.	IPv6 has 128-bit address length
2.	It Supports manual and DHCP address configuration	It supports Auto and zeroconfig address configuration.
3.	In IPv4 end to end connection integrity is unachievable.	In IPv6 end to end connection integrity is Achievable.
4.	It can generate 4.29×10^9 address space	Address space of IPv6 is quite large it can produce 3.4×10^{38} address space.
5.	Security feature is dependent on application.	Security feature in the IPv6 Protocol.
6.	Address representation of IPv4 is in decimal	Address representation of IPv6 is in hexadecimal

Q.9.) Discuss TCP/IP model in detail.

Ans → The TCP/IP model (Transmission Control Protocol / Internet Protocol) is a model with four layers with is for both modelling current Internet architecture, as well as providing a set of rules that govern all forms of transmission over a network. DARPA, an agency of the United States Department of Defense, created in the 1970s. It evolved area network and a predecessor of the Internet. The TCP/IP model called the Internet Model or less often the DoD Model.

This model was being made at the same time as the OSI model was created. The TCP/IP model is not the same which is why may names of the different layers are the same.

The TCP/IP model describes a set of general design guidelines and network protocols and computers to communicate over a network. TCP/IP provides end-to-end connectivity, routed and received

at the destination. Protocols exist for a variety of different type of communication services between computers.

TCP/IP has

four abstraction layers as defined in RFC 1122: link layer, internet reference model was intended to be prescriptive hence being a reference model.

**Q.10.) What is a web Browser (Browser)?
Give some example of browsers.**

Ans⇒ A web browser, or browsers for short, is a computer software application that enables a person to locate, retrieve, and display content such as webpages, images, video as well as other files on the world wide web.

Browsers work because every web page, image, and video on the web has its own unique Uniform Resource Locator (URL), allowing the browser to identify the resource and retrieve it from web server.

Some of example of Browsers:-

1. Google Chrome :- Chrome, created by internet giant Google, is the most popular browser in the USA, perceived by its computer and smartphone users as fast, secure, and reliable. There are also many options for customization in the shape of useful extensions and apps that can be downloaded for free from the Chrome Store.

2. Apple Safari:- Safari is the default on apple computers and phones, as well as other Apple devices. It's generally considered to be a very efficient browser. Its slick design being in keeping with the ethos of Apple.

3. Microsoft Internet Explorer and Edge:-

Although it has been discontinued, Internet Explorer is worthy of mention as it was the go-to browser in the early days of the internet revolution, with usage share rising to 95% in 2003.

4. Mozilla Firefox:- Unlike Chrome, Safari, Internet Explorer, and Microsoft Edge, Firefox is an open source browser, created by community members of the Mozilla Foundation. It is perhaps the most customizable of the main browsers, with many add-ons and extensions to choose from. In late 2003, it had a usage share of 32.21%, before gradually losing out to competition from Google Chrome.

Q.11.) What is a search engine? Give example?

Ans ⇒ Search engine :-

A search engine is a website through which users can search internet content. To do this, users enter the desired search term into the search field. The search engine then looks through its index for relevant websites and displays them in form of a list. The search engine's internal evaluation algorithm determines which position a website will get in the search results.
Ex:- Google, Bing and Yahoo are examples of popular search engines.

Google:- Google takes first place in search engines. According to the research of Statista and Statcounter, around 92.16% of searches are happening on Google, dominating in the market. If you want any of the information, just Google it!

Bing:- Bing is a Microsoft product now which is known as Microsoft Bing. Bing has now renamed to Microsoft Bing in October 2020. Microsoft Bing is another popular search engine.

that takes place after Google. Although the searching ratio on Bing is less than Google, but it takes second place after Google. Around 2.18% of searches are happening on Bing.

Yahoo:- Before Google entered the market, Yahoo was the most popular search engine. When Google came into use, Yahoo's popularity began to wane and it went off the market. Nowadays, very few people use the Yahoo search engine. In the United States, Yahoo is the default search engine for Mozilla Firefox since 2014 till now. Yahoo is the most search engine in the United States.

Q.12) what is the Internet & www.? what are the use of internet in our daily life?

Ans) Internet:-

The internet is a global network of network connecting millions of users worldwide via many computer networks using a simple standard common addressing system and basic communications protocol called TCP/IP.

This allows message sent over the internet to be broken into small pieces, called packets, which travel over many different routes between source and destination computers.

Fortunately, nobody owns the internet, there is no centralized control, and nobody can turn it off.

It's evolution depends on rough consensus about technical proposal, and on running code.

Engineering feed-back from real implementations is more important than any architectural principle.

WWW:- www stands for world wide

web. Technically the world wide web can be defined as "All the resources and users on the internet that are using the Hypertext Transfer Protocol (HTTP)".

The web world wide or simply web, is a way of accessing information over the medium of the internet.

The world wide web is the universe of network-accessible information.

Important use of Internet in our Daily life :-

1. USE of the internet in Education :-

The internet is a great platform for students to learn throughout their lifetime. They can use the internet to learn new things and even acquire degrees through online education programs. Teachers can also use the internet to teach students around the world.

2. Internet use to speed up Daily tasks

The internet is very much useful in our daily routine tasks. For example

it helps us to see our notifications and emails, Apart from this, people can use the internet for money transfers, shopping order, online food etc.

3. Use of the Internet for Shopping:-

With the help of the internet anybody can order products online. The increase in online shopping has also resulted in companies offering a huge discount for their customers.

4. Internet for Research & Development:

The Internet plays a pivotal role in research and development as it is propelled through internet research. The benefit of the internet is enjoyed by small businessmen to by universities.

5. Business Promotion and Innovation:-

The Internet is also used to sell products by using various e-commerce solutions. The result is new services and business starting every day these by creating job opportunities

Opportunities and reducing unemployment

6. Communication:-

without a doubt, the internet is the most powerful medium of communication at present. It connects people across different parts of the world free and fast.

7. Digital Transaction:-

The internet facilitates internet banking, mobile banking, and e-wallets. Since all digital transactions are stored in a database, it helps the government to track income tax details or income reports in the ITR.

8. Money Management:-

The internet can also be used to manage money. Now, there are many websites, applications, and other tools that help us in daily transactions, transfers, management, budget, etc.

9. Tour & Travel:-

During tour and travel, the uses of the internet is highly

effective as it serves as a guide
people browse the internet before
they start visiting the place. Tour
booking can also be done using
the internet.

Q.13) What is an internet service provider?
Give some example of ISP in India.

Ans → An internet service provider (ISP) is an organization that provides services for accessing, using or participating in the internet. Internet service typically provided by ISPs include internet access, internet transit, domain name registration, web hosting and user services.

Types of ISPs :-

1. Dial UP Services
2. Broadband high-speed internet
3. Digital line subscribers (DSL)

Some example of ISP in India :-

Jio, Airtel, Vodafone, Idea Cellular, BSNL, Reliance, communications, Aircel, Tata Teleservices, Telenor, India, MTNL.

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

Ans ⇒ MAC address :-

The MAC address is used to identify your computer on the network and to talk to other computer on the local network, including your router.

IP address :-

The IP address is used to identify your computer on the larger internet. This includes servers like <http://www.google.com> and other once off the local network, only the IP address is significant.

Port address :-

The Port address is used to select a particular service to connect to, such as HTTP, FTP, mail etc. Port numbers are also used on your computer to identify specific processes, so you can have multiple windows open connected to different or the same server.

Q.15) How do we view my internet browser's history?

Ans ⇒ We view my internet browser's history:
First method :-

1. Open Google Chrome. It's a red, yellow, green, and blue circular icon.
2. Click: This option is in the top-right corner of this window.
3. Select History, you'll see this option near the top of the drop-down menu. Selecting it will prompt a pop-out menu.
4. Click History, it's at the top of the pop-out menu. Doing so will take you to your search history.
5. Review your browsing history. You can scroll down through your browsing history to see items from earlier in your history, or you can click a link to re-open its page.

Second Method:-

1. Open Google Chrome. it's a white app with the Chrome icon on it.
2. Tap: This icon is in the top-right corner of the screen.
3. Tap history. it's near the middle of the menu.
4. Review your browsing history. Tapping a history. Tapping a history item will take you to its page.

Third Method:-

1. Open Firefox: it's a blue globe with an orange fox wrapped around it.
2. Click ≡ This option is in the top-right corner of the Firefox window, clicking it prompts a drop-down menu to appear.
3. Clicking Library. This option is in the drop-down menu.
4. Click History. it's near the top of the menu.