CCA-102: Data Communications

ASSIGNMENT

1. What are the different types of networks?

A computer network can be divided into the following types, based on the geographical area that they cover, they are:

1. LAN(Local Area Network)
2. MAN(Metropolitan Area Network)
3. WAN(Wide Area Network)

Now, let us study these networks one by one:

LAN(Local Area Network)

A local area network is a network, which is designed to operate over a very small geographical or physical area such as an office, building, a group of buildings, etc.

Generally, it is used to connect two or more personal computers through a communication medium such as coaxial, twisted-pair cables, etc. A LAN can use either wired or wireless mode of communication. The LAN which entirely uses wireless media for communication can be termed as WLAN(Wireless Local Area Network).

Local Area Networks came under existence in around 1970s. IEEE developed the specifications for LAN. The speed of this network varies from 10mbps(Ethernet network) to 1gbps(FDDI or Gigabit Ethernet).

In other words, a LAN connects a relatively small number of machines in a relatively close geographical area. Bus, Ring, and Star topology are generally used in a local area network. In LAN, one computer can become a server in a star topology, serving all other computers called clients. Two different buildings can be connected very easily in LAN using a 'Bridge'.

Ethernet LAN is the most commonly used LAN. The speed of a Local Area Network also depends on the topology used. *For example,* a LAN using bus topology has a speed of 10mbps to 100mbps, while in ring topology it is around 4mbps to 16mbps. LAN's are generally privately owned networks.

Following are the functionalities of a Local Area Network:

1. File Serving: In LAN, a large storage disk acts as a central storage repository.
2. Print Serving: Printers can be shared very easily in a LAN by various computers.
3. Academic Support: A LAN can be used in the classroom, labs, etc. for educational purposes.
4. Manufacturing Support: LAN can support the manufacturing and industrial environment.
5. High Reliability: Individual workstations might survive the network in case of failures.

Following are the advantages of a LAN:

1. File transfer and file access
2. Resource or peripherals sharing
3. Personal computing
4. Document distribution
5. Easy to design and troubleshoot
6. Minimum propagation delay
7. High data rate transfer
8. Low error rate
9. Easily scalable(devices can be added or removed very easily)

Following are the disadvantages of a LAN:

1. Equipment and support may be costly
2. Some hardware devices may not inter-operate properly

MAN(Metropolitan Area Network)

A Metropolitan Area Network is a bigger version of LAN that uses similar technology as LAN. It spans over a larger geographical area such as a town or an entire city.

It can be connected using an optical fiber cable as a communication medium. Two or more LAN's can also be connected using routers to create a MAN. When this type of network is created for a specific campus, then it is termed as CAN(Campus Area Network).

The MAN spans over a geographical area of about 50km. The best example of MAN is the cable television network that spans over the whole city.

A MAN can be either a public or privately owned network. Generally, a telephone exchange line is most commonly used as a communication medium in MAN. The protocols that are used in MAN are RS-232, Frame Relay, ISDN, etc.

Uses of MAN are as follows:

1. MAN can be used for connecting the various offices of the same organization, spread over the whole city.
2. It can be used for communication in various governmental departments.

Following are the advantages of using MAN:

1. Large geographical area cover as compared to LAN
2. High-speed data connectivity
3. The Propagation delay of MAN is moderate

Following are the disadvantages of MAN:

1. It is hard to design and maintain a MAN
2. MAN is less fault-tolerant
3. It is costlier to implement
4. Congestions are more in a MAN

WAN(Wide Area Network)

A Wide Area Network is the largest spread network. It spans over very large-distances such as a country, continent or even the whole globe. Two widely separated computers can be connected very easily using WAN. For Example, the Internet.

A WAN may include various Local and Metropolitan Area Network. The mode of communication in a WAN can either be wired or wireless. Telephone lines for wired and satellite links for wireless communication can be used in a wide area network.

In other words, WAN provides long distance transmission of data, voice, image, and video, over a large geographical area. A WAN may span beyond 100km range. It may be privately or publicly owned.

The protocols used in WAN are ISDN(Integrated Service Digital Network), SMDS(Switched Multi-Megabit Data Service), SONET(Synchronous Optical Network), HDLC(High Data Link Control), SDLC(Synchronous Data Link Control), etc.

The advantage of WAN is that it spans over a very large geographical area, and connects a huge mass of people.

Following are the disadvantages of WAN:

1. The propagation delay is more in a WAN
2. The data rate is low
3. The error rate is high
4. It is very complex to design a WAN

These are the types of network according to geographical area.

Following are the types of network, based on functionality:

- Client-Server Network: Client-Server network is a network in which a client runs the program and access data that are stored on the server. In this kind of network, one computer becomes the server, serving all other computers called clients.
- Peer-to-Peer Network: Peer-to-Peer network facilitates the flow of information from one peer to another without any central server. In other words, each node on a server acts as both client and server.

Following are the types of network, based on Ownership:

- Private Network: A private network is a network in which various restrictions are imposed to secure the network, to restrict unauthorized access. This type of network is privately owned by a single or group of people for their personal use. Local Area Network(LAN) can be used as a private network.
- Public Network: A public network is a network that has the least or no restrictions on it. It can be freely accessed by anyone, without any restrictions. This type of network is publicly owned by the government or NGOs. Metropolitan Area Network(MAN) and Wide Area Network(WAN) can be used as a public network.

Following are the types of network, based on Transmission Media:

- Bound/Guided Media Network: Bounded/Guided media can also be referred to as wired media. This kind of networks provides a physical link between two nodes connected in a network. The physical links are directed towards a particular direction in the network. Co-axial, twisted pair, optical fiber cable, etc. can be used in such networks for connectivity. Local Area Network(LAN) and Metropolitan Area Network(MAN) can be used as a Bound/Guided media network.

- Unbound/Unguided Media Network: Unbounded/Unguided media can also be referred to as wireless media. This kind of network does not need any physical link for electromagnetic transmission. Radio waves, Microwaves, Infrared, etc. can be used in such networks for connectivity. Metropolitan Area Network(MAN) and Wide Area Network(WAN) can be used as an Unbound/Unguided media network.

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

UTP (Unshielded Twisted Pair)

UTP is an unshielded twisted pair cable used in computer and telecommunications mediums. Its frequency range is suitable for transmitting both data and voice via a UTP cable. Therefore, it is widely used in the telephone, computers, etc. It is a pair of insulated copper wires twisted together to reduce noise generated by external interference. It is a wire with no additional shielding, like aluminium foil, to protect its data from the exterior.

Advantages of the UTP:

1. It is a less costly and less expensive unshielded wire from another network medium.
2. It is designed to reduce crosstalk, RFI, and EMI.
3. Its size is small, and hence the installation of the UTP is easier.
4. It is mostly useful for short-distance network connections like home and small organizations.
5. It is the most commonly used networking cable in the market. It is considered as faster copper-based data transmission cable.
6. It is suitable for transmitting both data and voice via UTP cable.

Disadvantage of the UTP:

1. It can only be used in length segment up to 100 meters.
2. It has limited bandwidth for transmitting the data.
3. It does not provide a secure connection for data transmitting over the network.

STP (Shielded twisted pair):

A shielded twisted pair is a type of twisted pair cable that contains an extra wrapping foil or copper braid jacket to protect the cable from defects like cuts, losing

bandwidth, noise, and signal to the interference. It is a cable that is usually used underground, and therefore it is costly than UTP. It supports the higher data transmission rates across the long distance. We can also say it is a cable with metal sheath or coating that surround each pair of the insulated conductor to protect the wire from external users and prevent electromagnetic noise from penetrating.

Features of Shielded twisted pair cable:

1. **Frequency:** It has higher frequency data transmission as compared to the UTP.
2. **Thickness:** It is a thick shielded twisted pair cable as it contains the wrapping of plastic material to the copper conductor.
3. **Grounding practices:** The uses of shielded twisted pair cable are underground for a longer distance.
4. **Installation** of the shielded wire is more difficult than the UTP (Unshielded twisted pair) cable.

Advantages of the STP cable

1. It has lower noise and attenuation than UTP.
2. It is shielded with a plastic cover that protects the STP cable from a harsh environment and increases the data transmission rate.
3. It reduces the chances of crosstalk and protects from external interference.
4. A modular connection helps to terminate the connection of the STP cable.

Disadvantages of the STP cable

1. It is the most expensive wire from UTP cables.
2. It requires more maintenance to reduce the loss of data signals.
3. There is no segment improvement in length despite its thick and heavier connection.
4. It is used only as a grounded wire.

Difference between UTP and STP

Following are the differences of the UTP and STP, as follows:

UTP	STP
It is an unshielded twisted pair.	It is a shielded twisted pair.
UTP cable is a twisted pair cable with wires that are twisted together.	It is enclosed within a foil or mesh shield.
The price of UTP is lower as compared to the STP.	The price of STP is much costlier than UTP.
It does not require a grounding cable.	It requires a grounding cable.
In UTP, the electromagnetic interference is more than the STP while transferring the signal to the transmission media.	It reduces electromagnetic interference while transferring the signal to the transmission media.
UTP has high crosstalk.	STP has low crosstalk.
Transferring speed of the data signal is slow as compared to the STP.	Transferring speed of the data signal is high as compared to the UTP.
Installation of UTP cables is easy as they are lighter, small in size, and flexible.	Installation of STP cable is quite difficult as compared to the UTP. Its size is heavy, bigger, and stiffer.
It does not require much maintenance.	It requires more maintenance.
UTP cables are noisier.	STP cables are less noisy.
However, the UTP cable is used to establish the connection within a short distance, like a home or small industry.	Generally, it is used to establish the connection for enterprises over a long distance.

3. What is difference between baseband and broadband transmission?

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 possible.
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.

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

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

Device	Switch	Router	Modem	Hub
Use	Joins several computers together within one local area network. They cannot join multiple networks, and are incapable of sharing an Internet connection.	Joins multiple area networks (LAN & WAN). Serving as “middle man” or intermediate destinations for network traffic. Using the IP they forward data to specific destination.	Modems, like routers connect home PCs to the Internet.	Connects a network of personal computers together so they can be joined through a central hub.
Function	A home network with a switch must designate one computer as the gateway to the internet. Connects multiple computers together within one local network. Connects to various network segments.	Creates a home network, where all home computers are connected equally to the router, where there is no hierarchy in performance. Protects from viruses. Sends to a specific destination.	Codes and decodes data so that it can pass between home network and Internet service provider (ISP). Modem brings in the information, while the router distributes it to the devices.	Broadcasts data, does not select where the data goes, but rather sends it to every destination. Connects to multiple Ethernet devices, making them act as a single segment.
Network	LAN	LAN & WAN		LAN
Sophistication level	Medium	High	High	Low

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

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.

Yes, certainly. The MAC address is set by the manufacturer of the end-station (the system that the Ethernet is plugged in to).

If the network interface is integrated within a computer, for instance, then the MAC is set there. If, let’s say, you installed a NIC within that computer and plugged the Ethernet cable into that NIC, then the MAC address would be the one on the NIC, not the one that’s associated with the integrated network interface which, in this case, isn’t used.

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

- 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.
- The network consists of hardware, problems can vary from a defective network card or hard drive malfunctioning, a bad starting materials or incorrect configuration
- Most of the time, the trouble shootings comes from cables

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

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.

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

Static IP Addresses

A static IP address is an IP address that always stays the same. If you have a web server, FTP server, or other Internet resource that must have an address that cannot change, you can get a static IP address from your ISP. A static IP address is usually more expensive than a dynamic IP address, and some ISPs do not supply static IP addresses. You must configure a static IP address manually.

Dynamic IP Addresses

A dynamic IP address is an IP address that an ISP lets you use temporarily. If a dynamic address is not in use, it can be automatically assigned to a different device. Dynamic IP addresses are assigned using either DHCP or PPPoE.

Differences between IPv4 and IPv6

IPv4 and IPv6 are internet protocol version 4 and internet protocol version 6, IP version 6 is the new version of Internet Protocol, which is way better than IP version 4 in terms of complexity and efficiency.

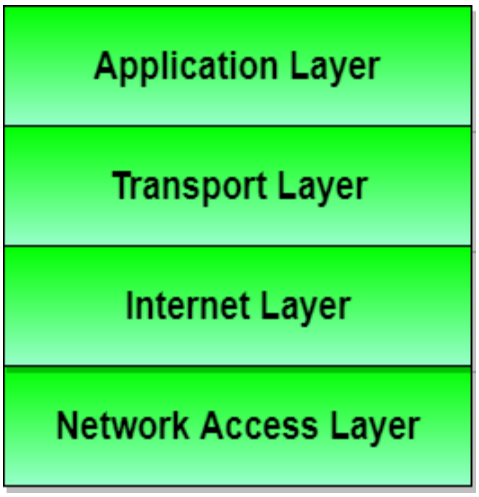
IPv4	IPv6
IPv4 has 32-bit address length	IPv6 has 128-bit address length
It Supports Manual and DHCP address configuration	It supports Auto and renumbering address configuration
In IPv4 end to end connection integrity is Unachievable	In IPv6 end to end connection integrity is Achievable
It can generate 4.29×10^{9} address space	Address space of IPv6 is quite large it can produce 3.4×10^{38} address space
Security feature is dependent on application	IPSEC is inbuilt security feature in the IPv6 protocol
Address representation of IPv4 is in	Address Representation of IPv6 is in

IPv4	IPv6
decimal	hexadecimal
Fragmentation performed by Sender and forwarding routers	In IPv6 fragmentation performed only by sender
In IPv4 Packet flow identification is not available	In IPv6 packetflow identification are Available and uses flow label field in the header
In IPv4 checksumfield is available	In IPv6 checksumfield is not available
It has broadcast Message Transmission Scheme	In IPv6 multicast and any cast message transmission scheme is available
In IPv4 Encryption and Authentication facility not provided	In IPv6 Encryption and Authentication are provided
IPv4 has header of 20-60 bytes.	IPv6 has header of 40 bytes fixed

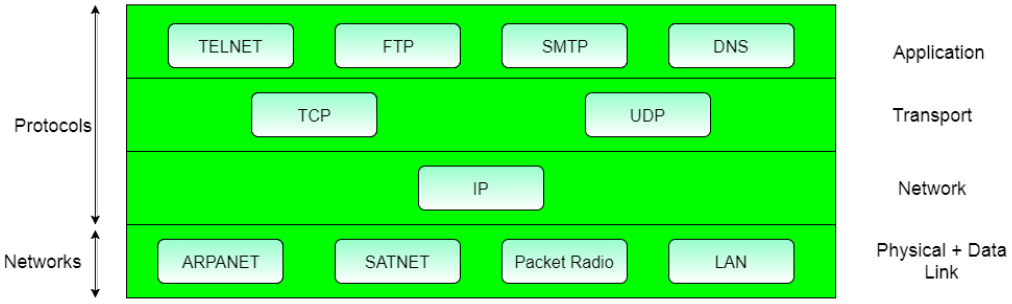
9. Discuss TCP/IP model in detail.

The TCP/IP Reference Model

TCP/IP means Transmission Control Protocol and Internet Protocol. It is the network model used in the current Internet architecture as well. **Protocols** are set of rules which govern every possible communication over a network. These protocols describe the movement of data between the source and destination or the internet. They also offer simple naming and addressing schemes.



Protocols and networks in the TCP/IP model:



Overview of TCP/IP reference model

TCP/IP that is Transmission Control Protocol and Internet Protocol was developed by Department of **Defence's Project Research Agency** (ARPA, later DARPA) as a part of a research project of network interconnection to connect remote machines.

The features that stood out during the research, which led to making the TCP/IP reference model were:

- Support for a flexible architecture. Adding more machines to a network was easy.
- The network was robust, and connections remained intact untill the source and destination machines were functioning.

The overall idea was to allow one application on one computer to talk to(send data packets) another application running on different computer.

Different Layers of TCP/IP Reference Model

Layer 1: Host-to-network Layer

1. Lowest layer of the all.
2. Protocol is used to connect to the host, so that the packets can be sent over it.
3. Varies from host to host and network to network.

Layer 2: Internet layer

1. Selection of a packet switching network which is based on a connectionless internetwork layer is called a internet layer.
2. It is the layer which holds the whole architecture together.
3. It helps the packet to travel independently to the destination.
4. Order in which packets are received is different from the way they are sent.
5. IP (Internet Protocol) is used in this layer.
6. The various functions performed by the Internet Layer are:
    - Delivering IP packets
    - Performing routing
    - Avoiding congestion

Layer 3: Transport Layer

1. It decides if data transmission should be on parallel path or single path.

2. Functions such as multiplexing, segmenting or splitting on the data is done by transport layer.
3. The applications can read and write to the transport layer.
4. Transport layer adds header information to the data.
5. Transport layer breaks the message (data) into small units so that they are handled more efficiently by the network layer.
6. Transport layer also arrange the packets to be sent, in sequence.

Layer 4: Application Layer

The TCP/IP specifications described a lot of applications that were at the top of the protocol stack. Some of them were TELNET, FTP, SMTP, DNS etc.

1. **TELNET** is a two-way communication protocol which allows connecting to a remote machine and run applications on it.
2. **FTP**(File Transfer Protocol) is a protocol, that allows File transfer amongst computer users connected over a network. It is reliable, simple and efficient.
3. **SMTP**(Simple Mail Transport Protocol) is a protocol, which is used to transport electronic mail between a source and destination, directed via a route.
4. **DNS**(Domain Name Server) resolves an IP address into a textual address for Hosts connected over a network.
5. It allows peer entities to carry conversation.
6. It defines two end-to-end protocols: TCP and UDP
    - **TCP(Transmission Control Protocol):** It is a reliable connection-oriented protocol which handles byte-stream from source to destination without error and flow control.
    - **UDP(User-Datagram Protocol):** It is an unreliable connection-less protocol that do not want TCPs, sequencing and flow control. Eg: One-shot request-reply kind of service.

Merits of TCP/IP model

1. It operated independently.

2. It is scalable.
3. Client/server architecture.
4. Supports a number of routing protocols.
5. Can be used to establish a connection between two computers.

Demerits of TCP/IP

1. In this, the transport layer does not guarantee delivery of packets.
2. The model cannot be used in any other application.
3. Replacing protocol is not easy.
4. It has not clearly separated its services, interfaces and protocols.

10. What is a Web Browser (Browser)? Give some example of browsers.

A web browser is a software program that allows a user to locate, access, and display web pages. In common usage, a web browser is usually shortened to "browser."

Web browsers are used primarily for displaying and accessing websites on the internet, as well as other content created using languages such as Hypertext Markup Language (HTML) and Extensible Markup Language (XML).

Browsers translate web pages and websites delivered using Hypertext Transfer Protocol (HTTP) into human-readable content. They also have the ability to display other protocols and prefixes, such as secure HTTP (HTTPS), File Transfer Protocol (FTP), email handling (mailto:), and files (file:).

Examples :

1. Internet explorer 2. Firefox 3. Google Chrome 4. Netscape Navigator

11. What is a search engine? Give example.

A search engine is a service that allows Internet users to search for content via the World Wide Web (WWW). A user enters keywords or key phrases into a search engine and receives a list of Web content results in the form of websites, images, videos or other online data that semantically match with the search query.

List of Top 12 Best Search Engines in The World

1. **Google**

Google Search Engine is the best search engine in the world and it is also one of most popular products from Google. Almost 70 percent of the Search Engine market has been acquired by Google. The tech giant is always evolving and looking to improve the search engine algorithm to provide best results to the end-user. Although Google appears to be the biggest search engine, as of 2015 YouTube is now more popular than Google (on desktop computers).

2. Bing

Bing is Microsoft's answer to Google and it was launched in 2009. Bing is the default search engine in Microsoft's web browser. At Bing, they are always striving to make it a better search engine but it's got a long way to go to give Google competition. Microsoft's search engine provides different services including image, web and video search along with maps. Bing introduced Places (Google's equivalent is Google My Business), this is a great platform for business to submit their details to optimise their search results.

3. Yahoo

Yahoo & Bing compete more with each other than with Google. A recent report on netmarketshare.com tells us that Yahoo have a market share of 7.68 percent. Although a leader as a free email provider, this is declining significantly though with

their recent acknowledgement that User Details & Passwords where hacked last year.

4. Baidu

Baidu is the most used search engine in China and was founded in Jan, 2000 by Chinese Entrepreneur, Eric Xu. This web search is made to deliver results for website, audio files and images. It provides some other services including maps, news, cloud storage and much more.

5. AOL

Aol.com is also among the top search engines. These are the guys that used to send out CD's which you'd load onto your PC to install their browser and modem software. Once the pre-eminent player they now have a market share of 0.59 percent. Verizon Communication bought AOL for $4.4 billion. It was started back in 1983 as Control Video Corporation. It was named America Online in 1991 and in 2009 as AOL Inc. AOL is a global mass media company which is based in New York. The company also provides advertising services as AOL Advertising, AOL mail and AOL Platform.

6. Ask.com

Founded in 1995, Ask.com, previously known as Ask Jeeves. Their key concept was to have search results based on a simple question + answer web format. It is a question & answer community where you can get the answers for your question and it integrates a large amount of archive data to answer your question. Because of this dependency on archived and active user contributions the results will not be as current as those you get in Google, Bing and Yahoo. They've tried to counter where their resources don't have the answer they take help from a third-party search engine. Interestingly they don't name who this is.

7. Excite

Excite is not widely known but is one that still gets into the top 10. Excite is an online service portal that provides internet services like email, search engine, news, instant messaging and weather updates. This also provides us with the latest trends, topics and search for phrases such as:

8. DuckDuckGo

DuckDuckGo is a popular search engine known for protecting the privacy of the users. Unlike Ask.com they are quite open about who they use to generate search results; they've partnered with Yahoo, Bing and Yummly. It was founded back in 2008 by Gabriel Weinberg in California and its revenue come from Yahoo-Bing search alliance network and Affiliates.

9. Wolfram Alpha

Wolfram Alpha is a computational knowledge search engine which does not give list of documents or web pages as search results. Results are based on facts & data about that query. Their mission statement is to make all systematic knowledge computable and broadly accessible. Launched in 2009, they now have a Pro solution designed with pricing for Students and Educators. Much as it's targeted, it's an awesome tool for the right market.

10. Yandex

Launched in 1997, Yandex is most used search engine in Russia. Yandex also has a great presence in Ukraine, Kazakhstan, Belarus and Turkey. It provides services like Yandex Maps, Yandex Music, online translator, Yandex Money and many other services.

11. Lycos

Lycos has a good reputation in search engine industry. Its key areas served are email, web hosting, social networking, and entertainment websites.

12. Chacha.com -

Chacha.com is a human-guided search engine and was founded in 2006. You can ask anything in its search box and you will be answered in real-time. It also provides mobile search and marketing services. You can also install its mobile apps on iPhone, iPad and Android.

12. What is the Internet & WWW? What are the uses of internet in our daily life?

Internet is a global network of networks. **WWW stands for World wide Web**. 2. Internet is a means of connecting a computer to any other computer anywhere in the world. World Wide Web which is a collection of information which is accessed via the Internet.

Top 10 most uses of the internet in our daily life :

1. Communication:

One of the most useful points of **use of the internet** is communication purposes. Everybody uses the internet for communication to contact family, friends, co-workers. We use e-mail, instant message, video call, chat to communicate with each other instead of any mobile call. **Social media networking activities** are one of the most uses things on the internet. The number of Social media users worldwide in 2019 is 2.82 billion which approximately 64% of total internet users are worldwide.

2. Education:

We can increase our knowledge by using the internet. Any question asks Google Mama (Mama is a Bengali world means Uncle), He / She (I don't know Google is male or Female!! HaaHaaHaa) can solve your problems in a minute. Students using the internet to gather information for education purposes. Now Online-based distance education courses allow much more flexibility than traditional classroom courses. Everybody can increase their knowledge by using the internet.

3. Online Job Search:

When I discuss the 10 most uses of the internet in our daily life, We can't omit the Online job search. The Internet can expand your job search by putting thousands of recruitment advertisements at your fingertips. You can earn money by doing client's

orders online called Freelancing, you can make money to create a website and selling products online

4. Entertainment:

Entertainment without using the internet is impossible. The Internet has definitely taken entertainment to the next level. Youth Nation considered the only internet is their entertainment. You can access lots of entertaining things online by using the internet. Popular, free, online entertainment includes YouTube, Games, Social Media, Music, News and much more.

5. Shopping:

We are in the middle position of the article list of 10 most uses of internet in our daily life. As per statistics and some research on the internet regarding online shopping sites worldwide, it has been observed that consumers will spend up to $4.8 trillion online in 2021 worldwide. We can choose lots of product as per our choice from the online store, similarly, get some idea about their price easily. By using the internet we buy online eBooks, clothing, electronics, hobbies and more from all over the world from our computers, mobile, tablets, smartphones. We see the feedback from other customers all over the world before purchasing the same product.

6. Online Banking:

The Internet has many uses, all the famous and largest bank provides its total services online. Online banking is one of the best that helps us to save our important time mainly. Online banking is the way of making financial transactions through the internet without going to the Bank. We can check our bank account balance, make payments and transfer funds to others by using the internet all over the world.

7. Utility Bill Payment:

By using the internet we can pay our essential bills like the electric bill, tuition fee, credit card bill etc. Not only this you can recharge your mobile bill by visiting a trusted mobile recharge site online using the internet on your mobile and computer. Many advantages to pay online bill i.e. Never miss any payment for

required of time, you can schedule automatically for your payment, pay your bill any time and any place of the world by using of internet etc.

8. Book tickets:

Book Tickets are the 8th point of my article regarding the uses of internet. Online booking is a convenient way of finding and booking your flights over the internet. It is one of the best uses of the internet in modern times. You can book cars, book trains, air tickets & bus tickets etc. from your computer or mobile very easily. Bookings can happen round the clock and receive system notifications/updates timely.

9. Ordering food:

Now, you can order foods online while sitting at homes/offices via the Internet. Many restaurants, hotels accept the order and serve the best foods to the customer at door delivery. You can order your favorite dish by internet online using their provided App very easily.

10. Research:

At the end and last point of my article (it is not the last point because tons of things available which are users of the internet) on 10 most uses of internet in our daily life, we wish to add a point Research. The internet is a fantastic place to research information for a project or homework. It doesn't matter what topic you want to search on the internet, obviously, you will find something on your inputted terms on internet browsers guaranteed.

Not only the above, but the internet also has many many services that help you explore the world. Today the internet is used for different purposes depending upon the requirement. There are always new things turning up on the internet as entrepreneurs think of the next great service that everyone wants.

13. What is an Internet Service Provider? Give some example of ISP in India.

An Internet Service Provider (ISP) is a company such as **AT&T, Verizon, Comcast, or Spectrum** 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 examples of some internet service providers are **Hathway, BSNL, Tata teleservices, Verizon, Reliance Jio, ACT Fibernet** and many more working in India as well as worldwide. Internet service providers or ISPs are responsible for providing services for using the Internet

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

Sr. No.	Key	MAC Address	IP Address	Port Address
1	Definition	MAC Address stands for Media Access Control Address.	IP Address stands for Internet Protocol Address.	A port number is **the logical address of each application or process that uses a network or the Internet to communicate**..
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.	A port number uniquely identifies a network-based application on a computer
3	Format	MAC Address is of six byte hexadecimal address.	IP Address is of 4 bytes or of 16 bytes.	Ports are represented by 16-bit numbers. 0 to 1023 are restricted port numbers are as they are used by well-known protocol services
4	Access Protocol	MAC Address can be retrieved using ARP protocol.	IP Address can be retrieved using RARP protocol.	Ports are identified for each protocol and It is considered as a communication endpoint.
5	Provider	Chip maker manufacturer provides the MAC Address.	Internet Service Provider, ISP provides the IP Address.	Port number for application is provided by kernel of Operating System.

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

Users who are running Google Chrome on their Android phone or tablet can view their history with the following steps.

1. Open the Google Chrome Internet browser.
2. In the upper-right corner of the screen **tap the**  **icon**.
3. In the drop-down menu that appears, select **history** and shown in the image.
4. The following page contains your device's history.

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