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)

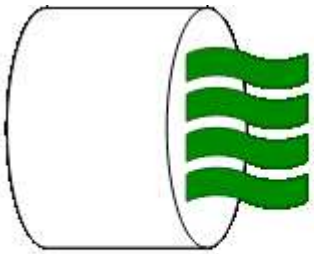
Q2:Explain the Shielded twisted pair (STP) and Unshielded twisted pair (UTP)

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

Last Updated: 21-05-2020

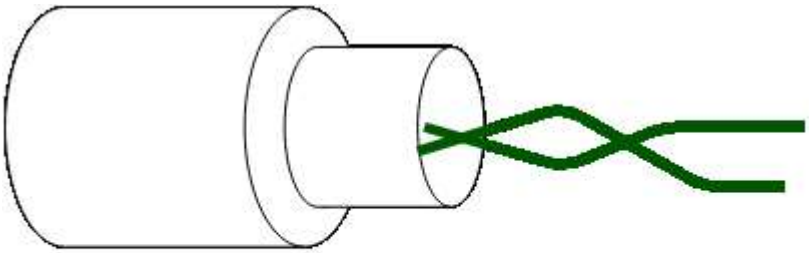
UTP:

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.



Unshielded Twisted Pair

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).



Shielded Twisted Pair

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

Last Updated: 25-11-2019

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.

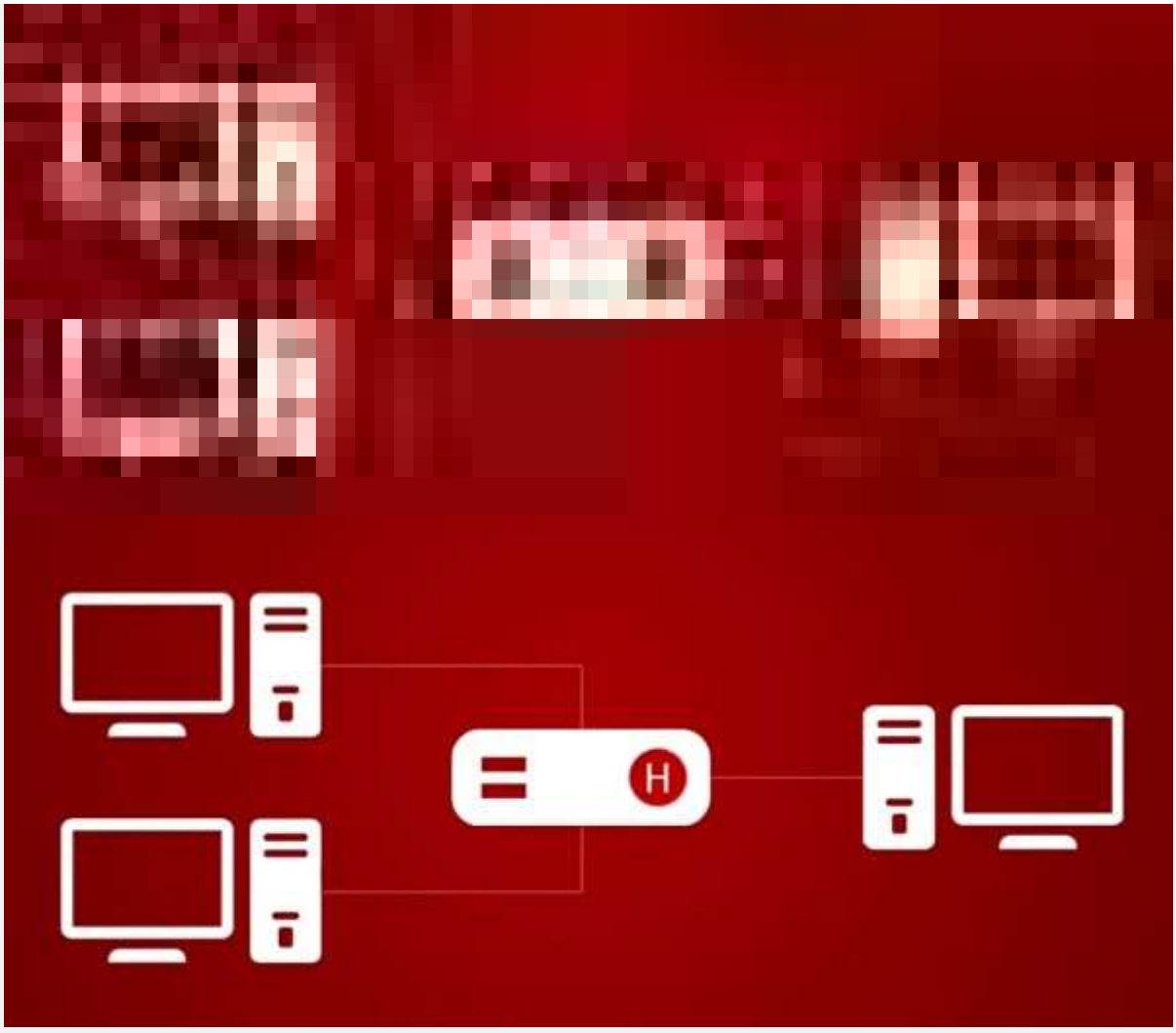
Q4:What is the difference between a hub, modem, router and a switch?

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

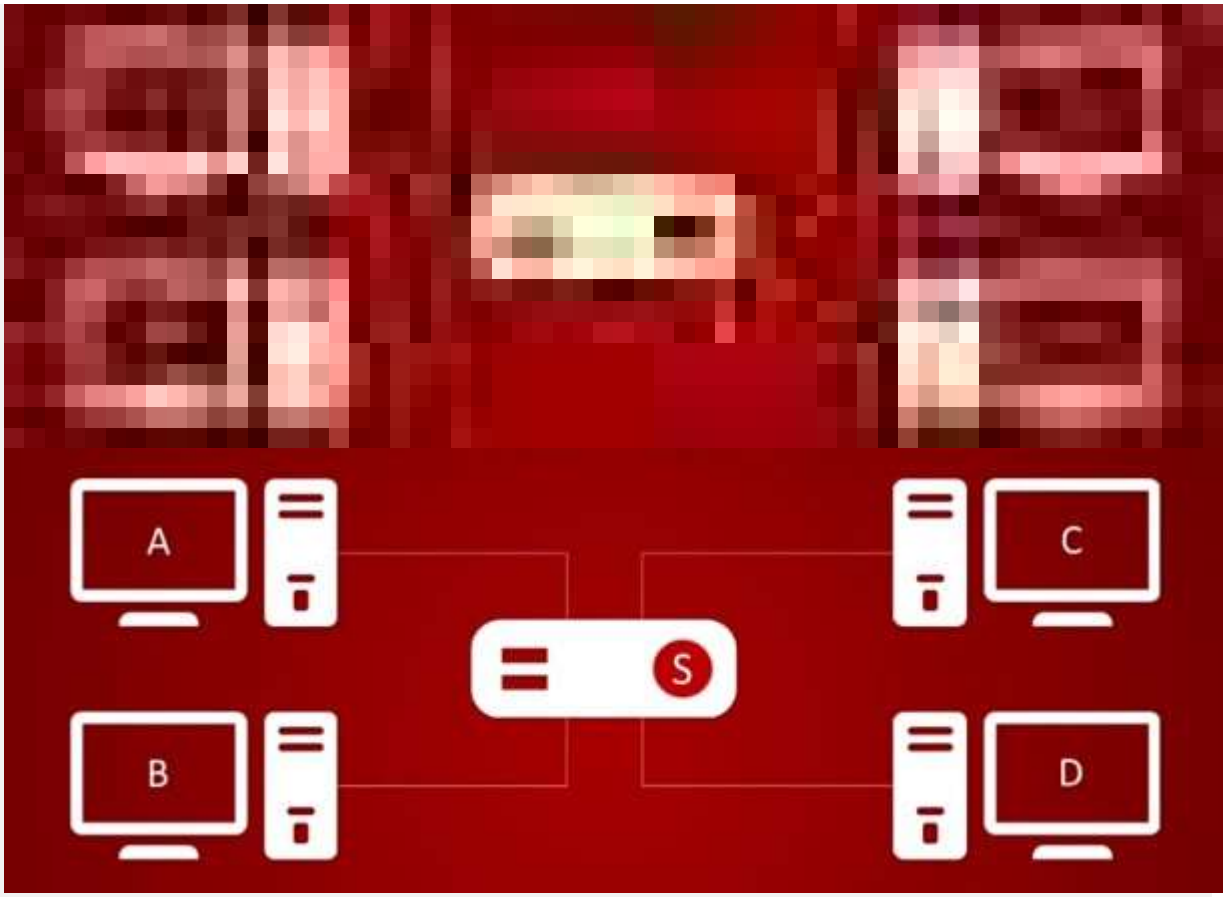
Hub

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.



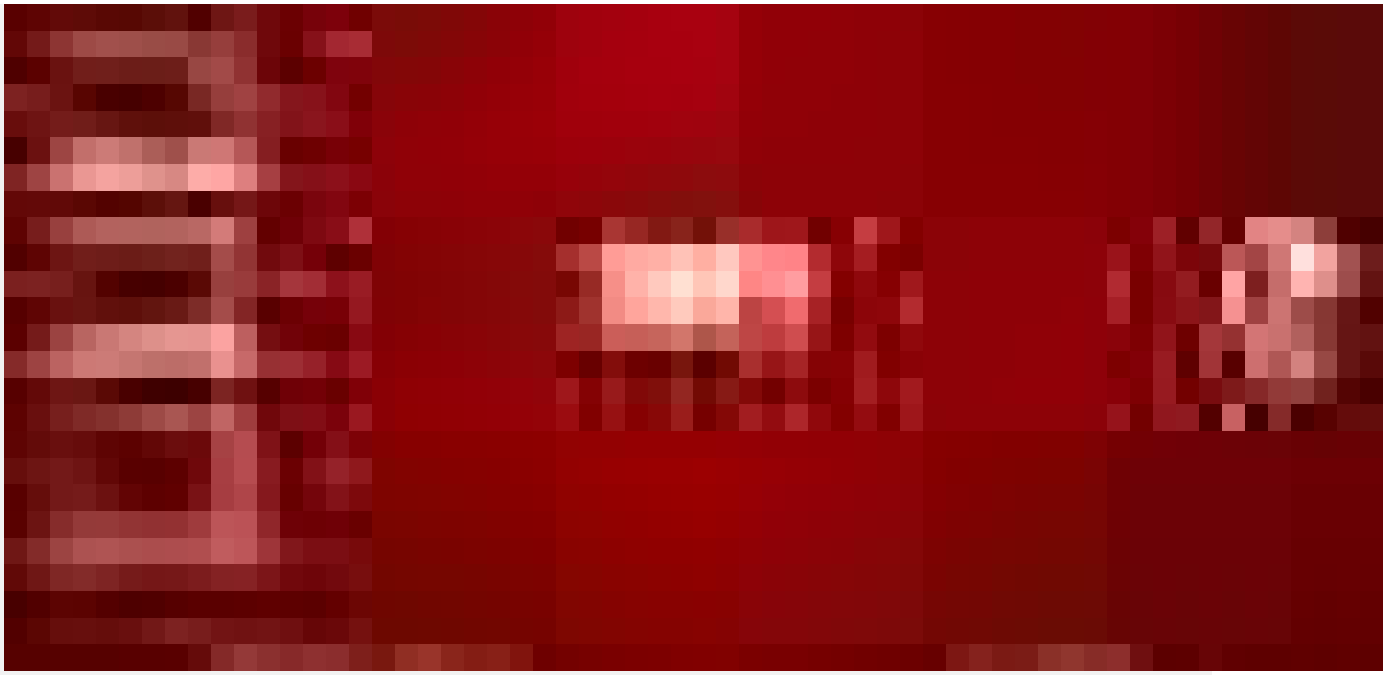
Switch

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.

Q7:IN a network that contains two servers and twenty workstation, where 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 ? Discuss the different between IPV4 and IPV6.

Ans.

What is IP?

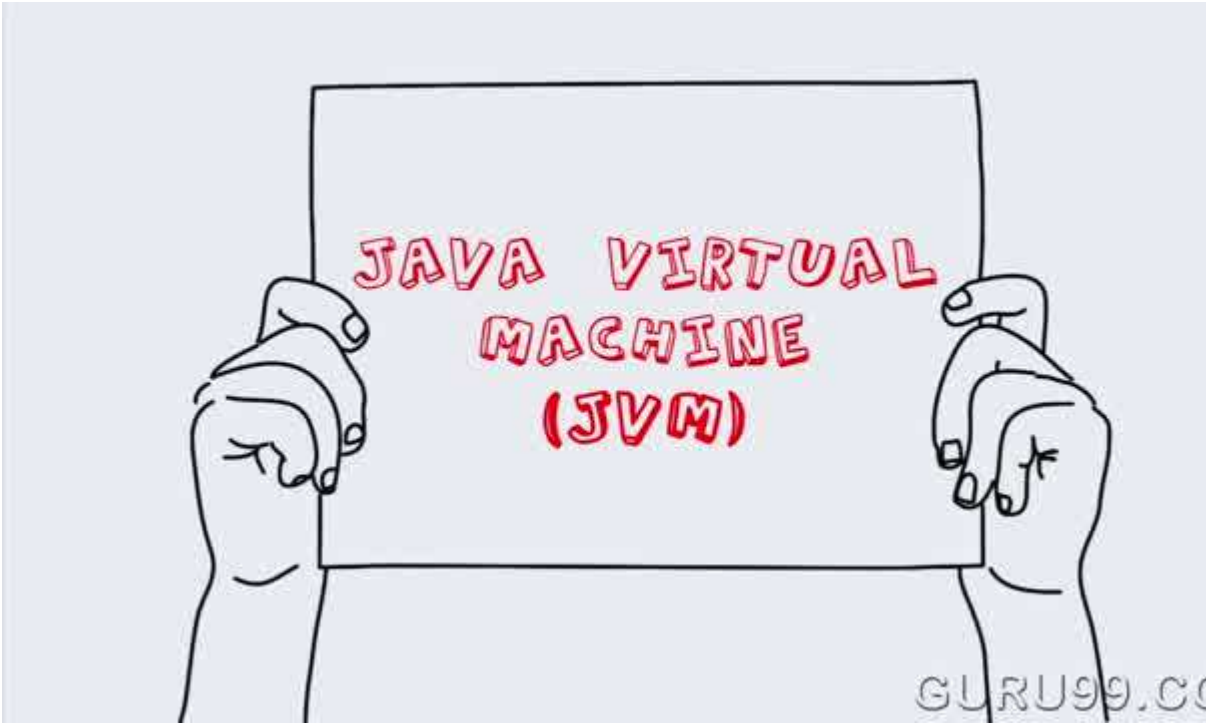
An Internet Protocol address is also known as IP address. It is a numerical label which assigned to each device connected to a computer network which uses the IP for communication.

IP address act as an identifier for a specific machine on a particular network. The IP address is also called IP number and internet address. IP address specifies the technical format of the addressing and packets scheme. Most networks combine IP with a TCP (Transmission Control Protocol). It also allows developing a virtual connection between a destination and a source.

What is IPv4?

IPv4 was the first version of IP. It was deployed for production in the ARPANET in 1983. Today it is most widely used IP version. It is used to identify devices on a network using an addressing system.

The IPv4 uses a 32-bit address scheme allowing to store 2^32 addresses which is more than 4 billion addresses. Till date, it is considered the primary Internet Protocol and carries 94% of Internet traffic.



Guru99

What is IPv6?

It is the most recent version of the Internet Protocol. Internet Engineer Taskforce initiated it in early 1994. The design and development of that suite is now called IPv6.

This new IP address version is being deployed to fulfill the need for more Internet addresses. It was aimed to resolve issues which are associated with IPv4. With 128-bit address space, it allows 340 undecillion unique address space. IPv6 also called IPng (Internet Protocol next generation).

KEY DIFFERENCE

- IPv4 is 32-Bit IP address whereas IPv6 is a 128-Bit IP address.
- IPv4 is a numeric addressing method whereas IPv6 is an alphanumeric addressing method.
- IPv4 binary bits are separated by a dot(.) whereas IPv6 binary bits are separated by a colon(:).
- IPv4 offers 12 header fields whereas IPv6 offers 8 header fields.
- IPv4 supports broadcast whereas IPv6 doesn’t support broadcast.
- IPv4 has checksum fields while IPv6 doesn’t have checksum fields
- IPv4 supports VLSM (Virtual Length Subnet Mask) whereas IPv6 doesn’t support VLSM.
- IPv4 uses ARP (Address Resolution Protocol) to map to MAC address whereas IPv6 uses NDP (Neighbour Discovery Protocol) to map to MAC address.

Features of IPv4

- Connectionless Protocol
- Allow creating a simple virtual communication layer over diversified devices
- It requires less memory, and ease of remembering addresses
- Already supported protocol by millions of devices
- Offers video libraries and conferences

Features of IPv6

- Hierarchical addressing and routing infrastructure
- Stateful and Stateless configuration
- Support for quality of service (QoS)
- An ideal protocol for neighboring node interaction

Difference Between IPv4 and IPv6 Addresses

IPv4 & IPv6 are both IP addresses that are binary numbers. IPv4 is 32 bit binary number while IPv6 is 128 bit binary number address. IPv4 address are separated by periods while IPv6 address are separated by colons.

Both are used to identify machines connected to a network. In principle, they are the same, but they are different in how they work.

Basis for differences	**IPv4**	**IPv6**
Size of IP addre ss	IPv4 is a 32-Bit IP Address.	IPv6 is 128
Addressing meth od	IPv4 is a numeric address, and its binary bits are separated by a dot (.)	IPv6 is an a ress whose eparated by o contains h
Number of head er fields	12	8
Length of header filed	20	40
Checksum	Has checksum fields	Does not ha ds
Example	12.244.233.165	2001:0db8:(f00:0042:78
Type of Address	Unicast, broadcast, and multicast.	Unicast, mu

es		ast.
Number of class es	IPv4 offers five different classes of IP Addres s. Class A to E.	IPv6 allows storing an u ed number of IP Addres
Configuration	You have to configure a newly installed syste m before it can communicate with other syste ms.	In IPv6, the configuratio ptional, depending upon unctions needed.
VLSM support	IPv4 support VLSM (Virtual Length Subnet M ask).	IPv6 does not offer supp or VLSM.
Fragmentation	Fragmentation is done by sending and forwar ding routes.	Fragmentation is done b e sender.
Routing Informati on Protocol (RIP)	RIP is a routing protocol supported by the rou ted daemon.	RIP does not support IP uses static routes.
Network Configu ration	Networks need to be configured either manua lly or with DHCP. IPv4 had several overlays t o handle Internet growth, which require more maintenance efforts.	IPv6 support autoconfig on capabilities.
Best feature	Widespread use of NAT (Network address tra nslation) devices which allows single NAT ad dress can mask thousands of non-routable ad dresses, making end-to-end integrity achieva ble.	It allows direct addressi cause of vast address S .
Address Mask	Use for the designated network from host port ion.	Not used.
SNMP	SNMP is a protocol used for system manage ment.	SNMP does not support .
Mobility & Intero perability	Relatively constrained network topologies to which move restrict mobility and interoperabili ty capabilities.	IPv6 provides interopera and mobility capabilities h are embedded in netw devices.

Security	Security is dependent on applications - IPv4 was not designed with security in mind.	IPSec(Internet Protocol rity) is built into the IPv6 ocol, usable with a prop y infrastructure.
Packet size	Packet size 576 bytes required, fragmentatio n optional	1208 bytes required wit ragmentation
Packet fragment ation	Allows from routers and sending host	Sending hosts only
Packet header	Does not identify packet flow for QoS handlin g which includes checksum options.	Packet head contains F abel field that specifies et flow for QoS handling
DNS records	Address (A) records, maps hostnames	Address (AAAA) record ps hostnames
Address configur ation	Manual or via DHCP	Stateless address autoc uration using Internet C Message Protocol versi (ICMPv6) or DHCPv6
IP to MAC resolu tion	Broadcast ARP	Multicast Neighbour Sol on
Local subnet Gr oup managemen t	Internet Group Management Protocol GMP)	Multicast Listener Disco (MLD)
Optional Fields	Has Optional Fields	Does not have optional . But Extension header available.
IPSec	Internet Protocol Security (IPSec) concerning network security is optional	Internet Protocol Securi Sec) Concerning netwo curity is mandatory
Dynamic host co nfiguration Serve r	Clients have approach DHCS (Dynamic Host Configuration server) whenever they want to connect to a network.	A Client does not have t proach any such server ey are given permanent

		esses.
Mapping	Uses ARP(Address Resolution Protocol) to map to MAC address	Uses NDP(Neighbour Discovery Protocol) to map to address
Combability with mobile devices	IPv4 address uses the dot-decimal notation. That's why it is not suitable for mobile networks.	IPv6 address is represented in hexadecimal, colon-separated notation. IPv6 is better suited to mobile networks

IPv4 and IPv6 cannot communicate with other but can exist together on the same network. This is known as **Dual Stack.**

Q9: Discuss TCP/IP model in detail.

Ans. **TCP/IP** Reference **Model** is a four-layered suite of communication protocols. ... **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.

Q10: What is a web Browser (BROWSER) ? Give some explain of browser.

ANS. # Web Browser

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 a search engine ? Give explain .

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 the form of a list. The search engine's internal evaluation algorithm determines which position a website will get in the search results. Google, Bing and Yahoo are examples of popular search engines.

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

Ans. The Internet has left a huge impact on our life. Since the internet was founded, it has brought information and knowledge on our fingertips. Internet has brought positivity in our life and has made it simple and easy. The Internet has left a huge impact in our daily life. Earlier we used to go to libraries in search of information on something but now we get that information in just a few clicks. The internet provides us with useful data, information and knowledge that is useful for social, personal and economic development. It is up to us to utilize our time on the internet in a useful and productive way.

Importance of google in daily life? There are many uses of the internet. The most important use is that you can get information and education from the internet. It provides us with various sites and various blogs that give us informative content which helps us in studies. It helps people learn various things and people get knowledge which they implement in their daily life.

It helps people connect with each other socially. It helps us to talk to people that are from far off places like in different state or foreign country. There are various apps that help us to share messages, photos and videos with different people that are living near or far off places. The apps like Whatsapp, Facebook, Twitter, Instagram, etc helps people share photos, videos and messages. There is another feature of internet called video calling. This is a very useful feature of internet. Everyone should know that **use of internet technology in our daily life**. You can see and talk to people that are living in far off places for free. It helps people download or stream movies and TV shows.

There are infinite uses of internet which help us in our day to day life. Some of them are listed below:

Uses of internet in student's daily life

Uses of Internet in Our Daily Life? Internet has been a resourceful thing for students. They grab a huge amount of information about many things which help them increase their knowledge. It is the best platform where students can increase their knowledge and skills and implement those in their daily life. Role of internet in our daily life essay to school and college students. In the same way that an **importance of education**, teachers also increase their knowledge and skills and share them with students also.

For promotion of business and innovation

Importance of internet in our life? Internet is also a very good platform to promote our business. Our products can be sold by using various e-Commerce solutions on the Internet. **Use of internet technology** is growing fast in the world. We can now see new services and various business starting online every day due to the booming of E-commerce, **internet technology and web design** which is creating new job opportunities.

Online shopping

Why internet is important? Internet is a huge Platform for buying and selling products. We can buy various types of goods and services from the internet. We can buy clothes, electronic gadgets, Hair products, health products etc. from the internet in just a few clicks. One of the major benefits of buying goods online is that we get a huge amount of discounts. Another benefit is that the good bought is delivered to our doorstep in just a few clicks.

Make Friends

Uses of Internet in Our Daily Life? Internet also helps us to socialize. We make lots of new friends through internet. There are many social networking sites that help us to connect with new people and those who are known to us but are not near us. Social networking is one of the major achievements of the internet because it is very useful. But often people get addicted to these networking sites which makes it a source of distraction and people spend lots of time on these sites.

So internet has influenced our life drastically. It is a very useful resource if we use it positively. You can also get more information about the Top 10 strategic uses of internet technologies.

Q13:What is an internet Service Provider ? Give some examples of ISP in india.

Ans. List of internet service providers in India

From Wikipedia, the free encyclopedia

Jump to navigationJump to search

This is a list of **internet service providers in India**. There were 358 internet service providers (ISPs) offering broadband and narrow band internet services in India as of 31 December 2019.[1]

Contents

By subscribers[edit]

The following table shows the top 10 ISPs in India by total subscriber base as of 31 March 2020. Broadband is defined as "an always-on Internet connection with download speed of 512 kbit/s or above." The number of internet users is 743.19 million, out of which 55.75 million are narrow band subscribers and 687.44 million are broadband subscribers.[2]

Rank	ISP	Narrowband	Broadband	Total
1	Reliance Jio	0	388,390,116	388,390,116
2	Airtel	27,111,012	148,569,937	175,680,949
3	Vodafone Idea	22,019,406	117,451,416	139,470,822
4	BSNL	6,400,380	24,507,496	30,907,876
5	ACT Fibernet	0	1,607,015	1,607,015
6	MTNL	170,697	855,744	1,026,441
7	Hathway	0	969,157	969,157

Rank	ISP	Narrowband	Broadband	Total
8	Your Broadband	14,660	778,584	793,244
9	GTPL Broadband	0	359,347	359,347
10	Excitel	0	350,783	350,783

Note:

1. On 28 February 2018 Aircel filed for bankruptcy at NCLT and a substantial number of customers have migrated to other services due to closing down of most of the consumer services.[3][4]
2. The services of Telenor India has been merged with Airtel on 14 May 2018.[5]
3. On 31 August 2018, Vodafone India has been merged with Idea Cellular and renamed as Vodafone Idea Limited

Q14: 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.

Sr. No.	Key	MAC Address	IP Address
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.

Q15: How do we view my internet browser's history?

Ans. Today, all major browsers have functionality that allows you to quickly and easily view your Internet browser's history. However, as multiple devices contain browser history, there are multiple ways to view as well. To proceed, choose your devices from the section below and follow the instructions.

- Desktop or laptop computer.
- Android phone or tablet running Google Chrome.
- iPhone or iPad running Safari.

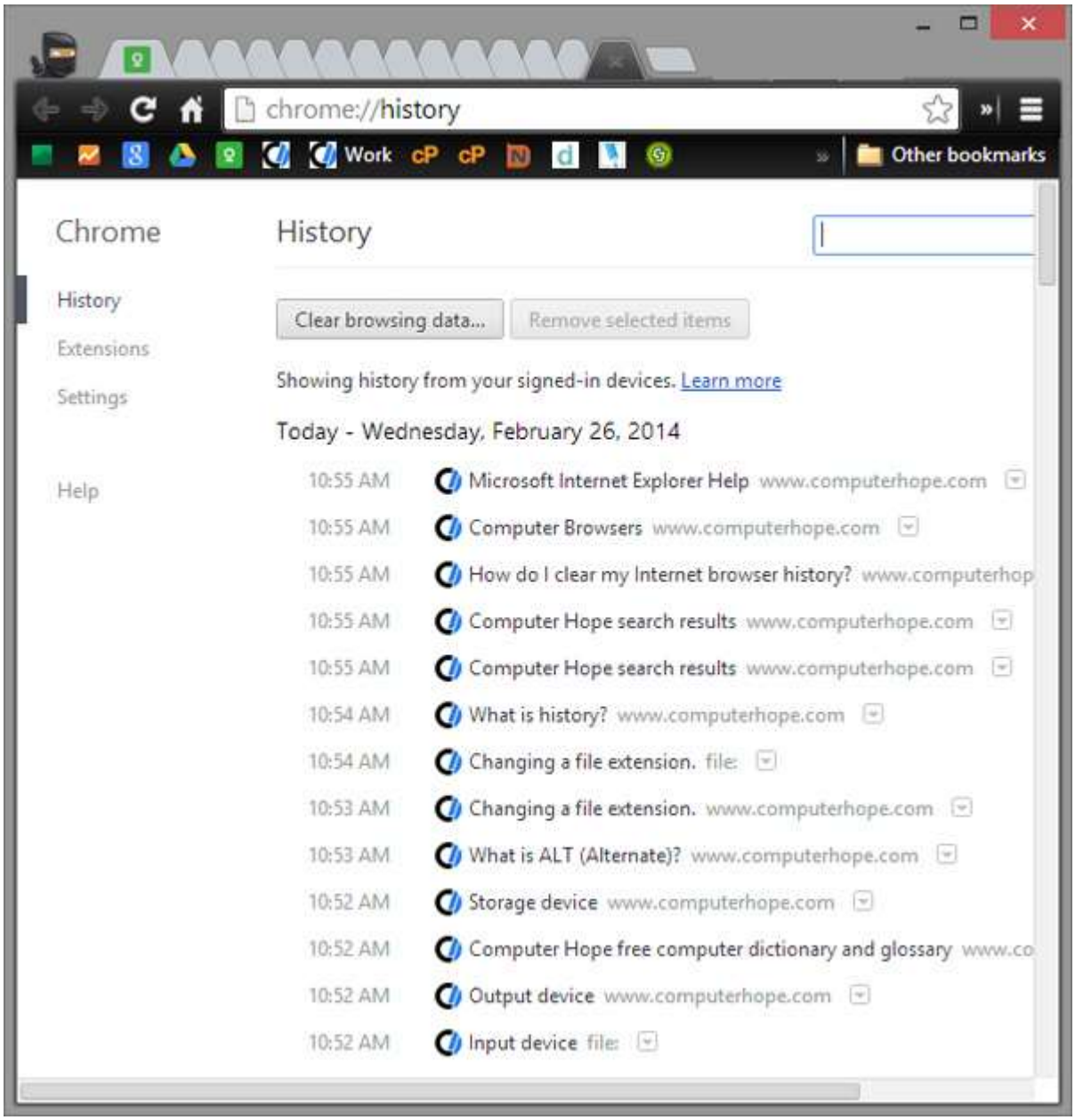
Desktop or laptop computer

If you are using Windows, Linux, or macOS, there are quick shortcut key combinations that allow you to view your history.

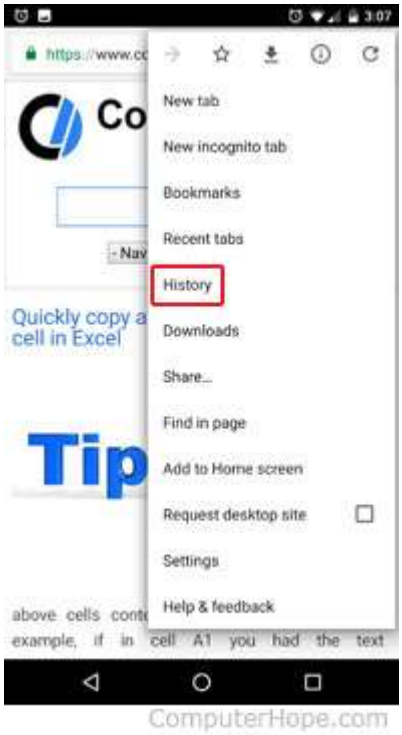
Windows and Linux users: Ctrl+H

Apple users: Command + Shift + H

Once one of the above shortcut keys is pressed, a history section similar to the example below should appear. In the following screenshot, browsing history is being viewed in Google Chrome.



Android phone or tablet running Google Chrome



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.

iPhone or iPad running Safari

Users who are running Safari for iOS on their iPhone or iPad can view their history with the following steps.

1. On your device, open the Safari Internet browser.

2. In the lower-left corner of the browser window, press and hold the back arrow.

3. The next screen contains your browser's history.

Additional information

- How do I clear my Internet browser history?
- How to reset default settings in an Internet browser.
- How do I view, edit, and disable Google search history?
- Why does a browser need to save my history?
- See our cache and history definitions for further information and related links.
- Internet browser help and support.