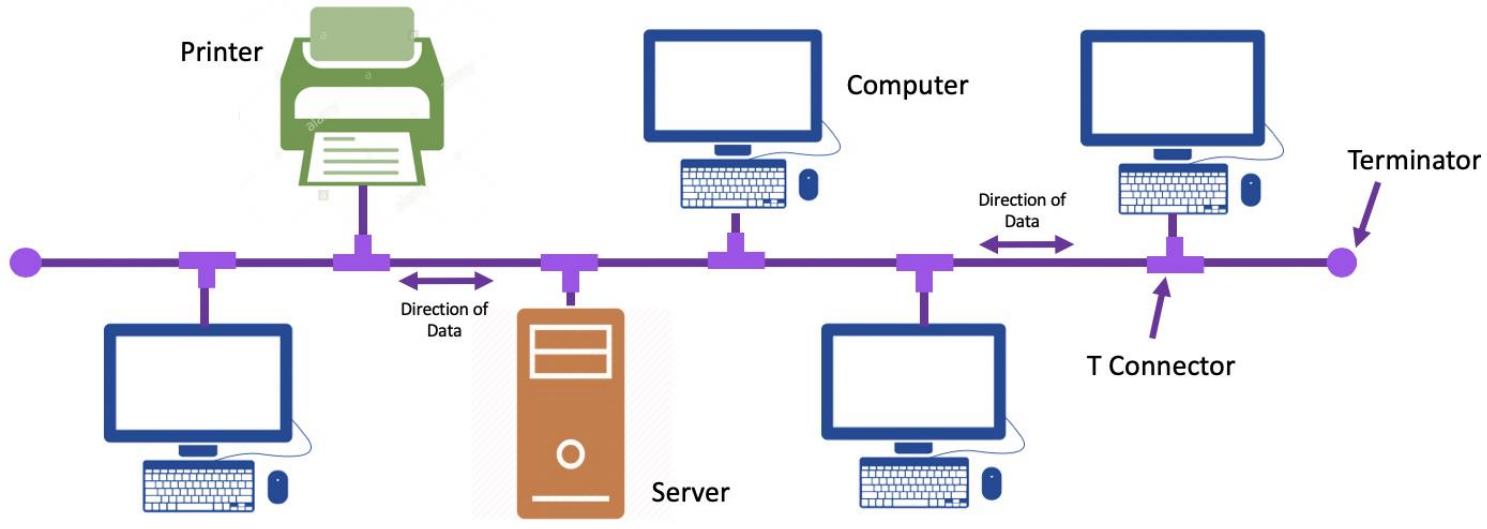
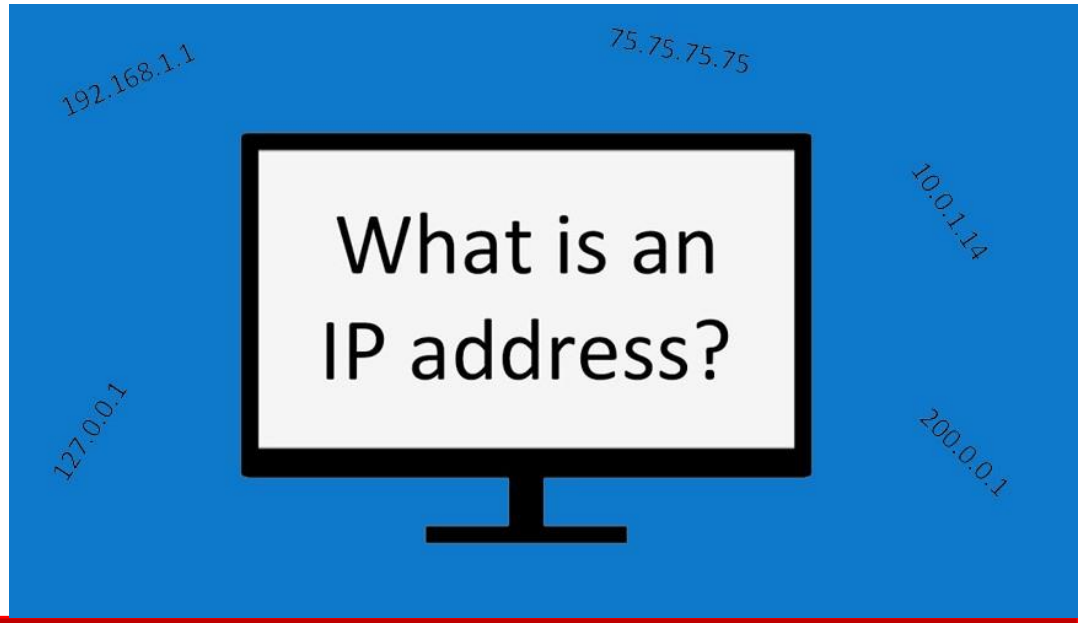
IP Address

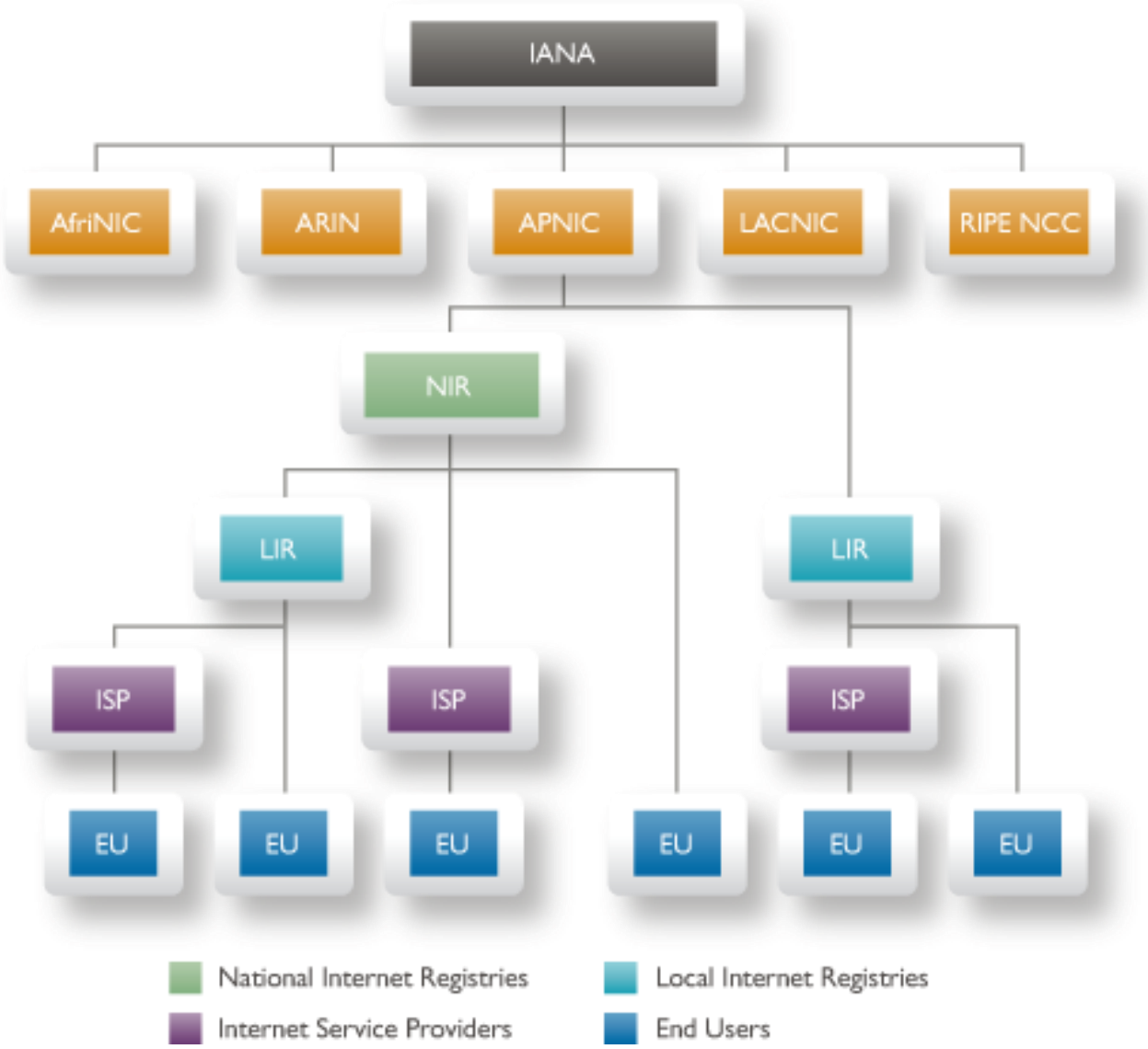
What is IP Address ?

- Every machine on a network has a unique identifier.
- An IP Address is made up of numbers or characters.
- IP (Internet Protocol) Address is an address of your network hardware.
- It helps in connecting your computer to other devices on your network and all over the world.





Who Provides us IP Address ?



IANA - Internet Assigned Number Authority

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RIR - Regional Internet Registries

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NIT - National Internet Registries

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LIR Local Internet Registries

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ISP - Internet Service Providers

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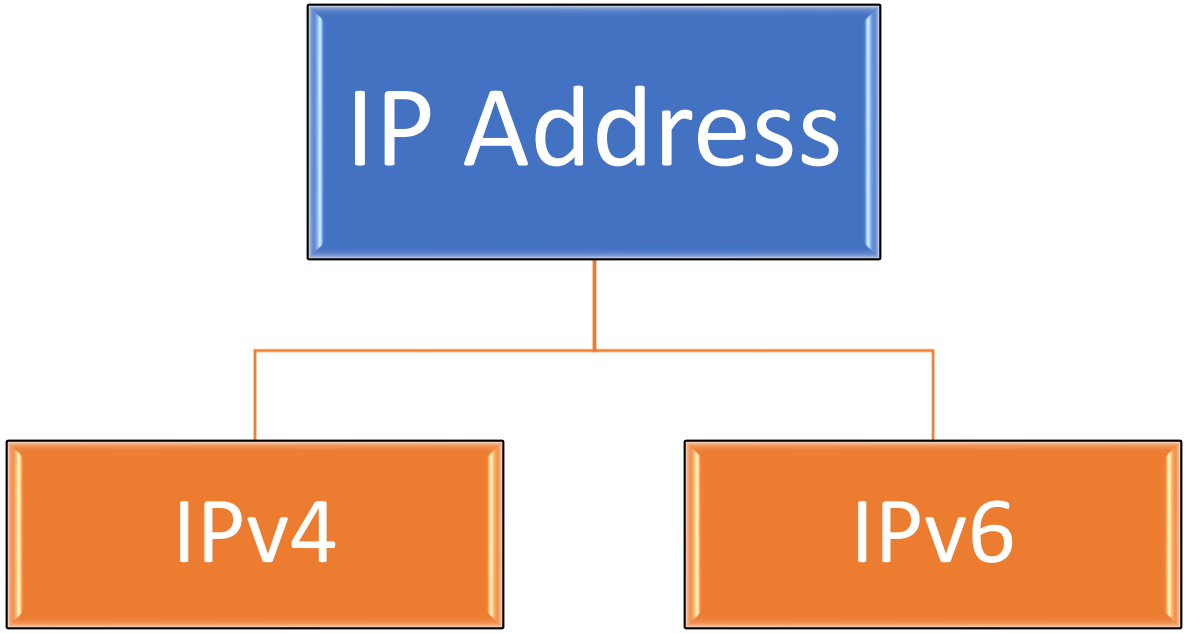
EU - End Users

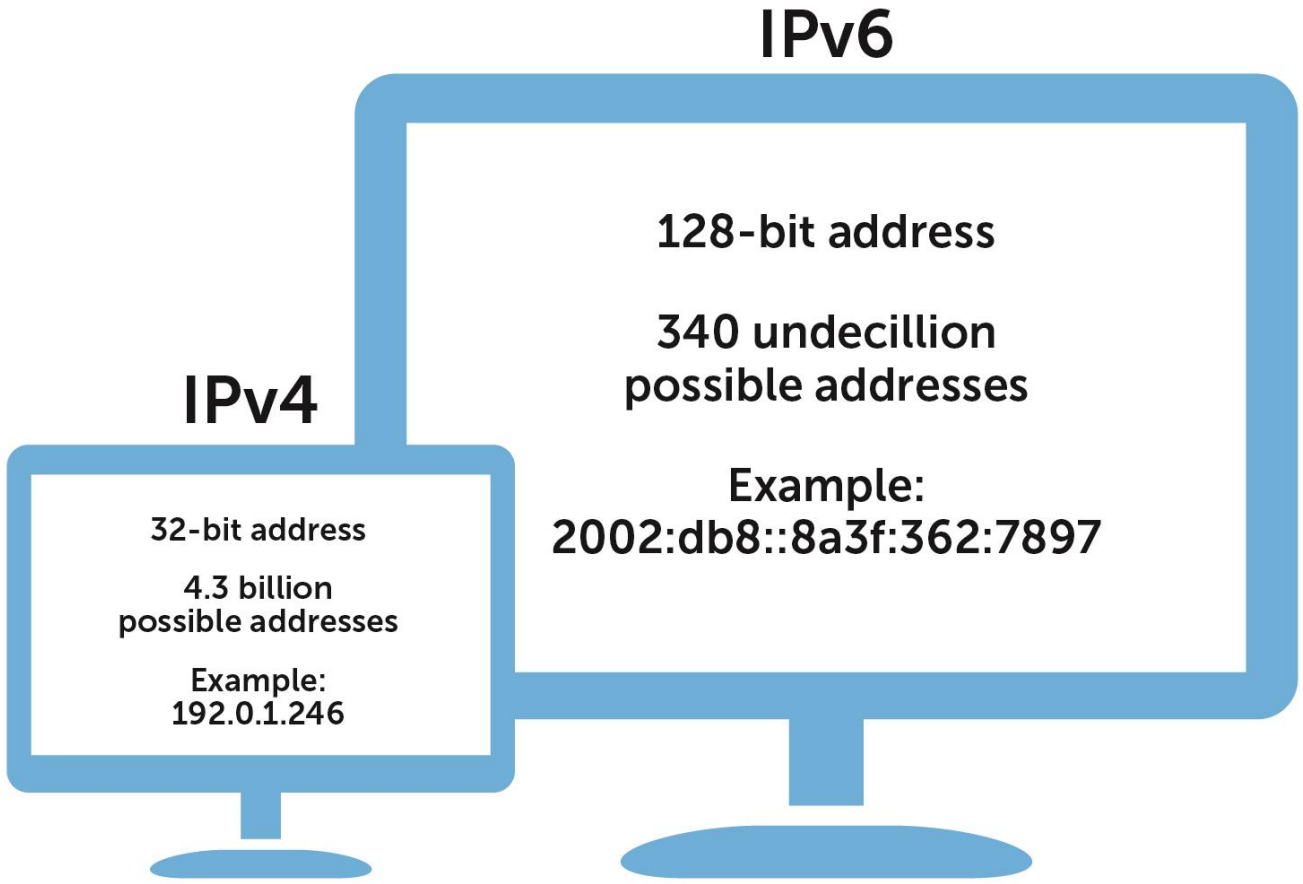
IP Address - Versions



IPv4: IPv4 written in Decimal Number System.

IPv6 : IPv6 written in Hexa-Decimal Number System.

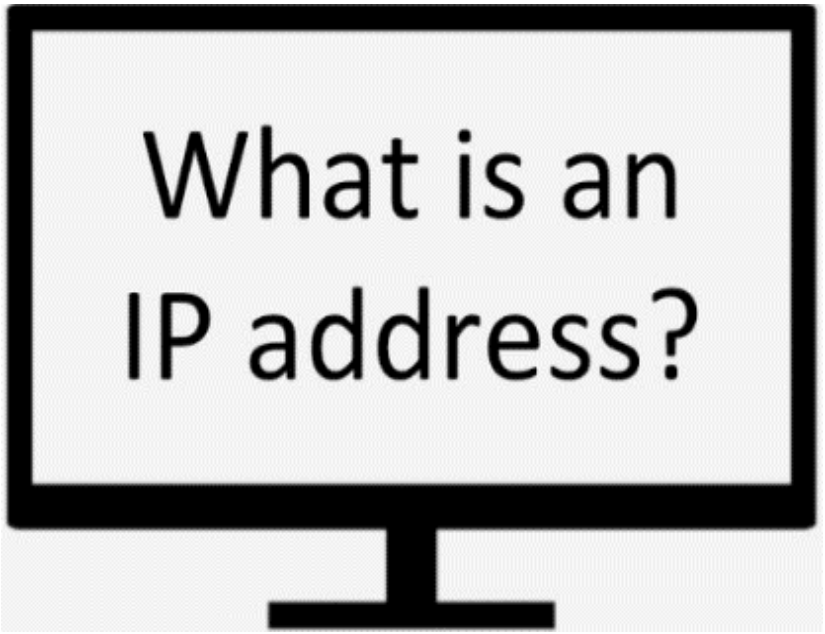
IP Address = Network ID + Host ID



IP Address – IPv4

Total Number of IP Addresses available in IPv4: 2^{32} = 4,29,49,67,296 (Approx. 4.3 Billion)

- IPv4 is a 32-Bit long numeric logical address.
- It divided into 4 parts each part is known as Octet.
- Each octet divided by dot (.) representation.
- Every octet contains 8-Bits.
- IPv4 represented in decimal number system
- IPv4 also written in Dotted Decimal Notation



IPv4 Network & Host-

- **Network ID -** The network ID is used to identify the host devices that are located in a same physical network.
- **Host ID -** Host sharing the same network ID can communicate with each other.

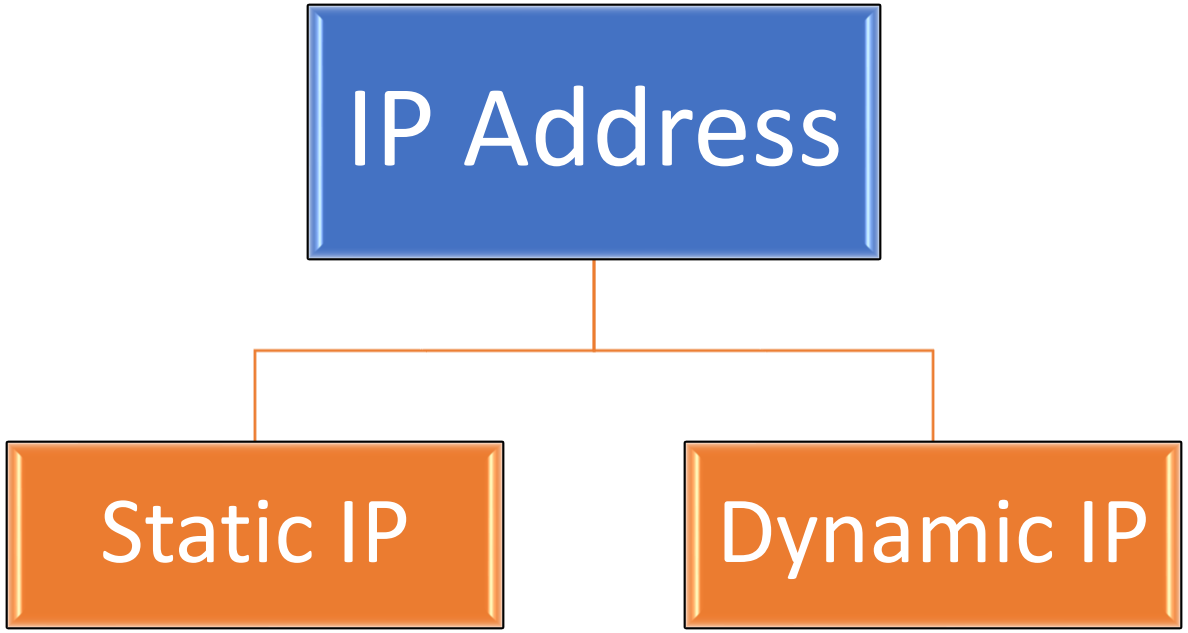
IP Address – IPv4 Classes

Internet Protocol hierarchy contains several classes of IP Addresses to be used efficiently in various situations as per the requirement of hosts per network.

Address Class	RANGE	Default Subnet Mask
A	1.0.0.0 to 126.255.255.255	255.0.0.0
B	128.0.0.0 to 191.255.255.255	255.255.0.0
C	192.0.0.0 to 223.255.255.255	255.255.255.0
D	224.0.0.0 to 239.255.255.255	Reserved for Multicasting
E	240.0.0.0 to 254.255.255.255	Experimental
Note: Class A addresses 127.0.0.0 to 127.255.255.255 cannot be used and is reserved for loopback testing.		

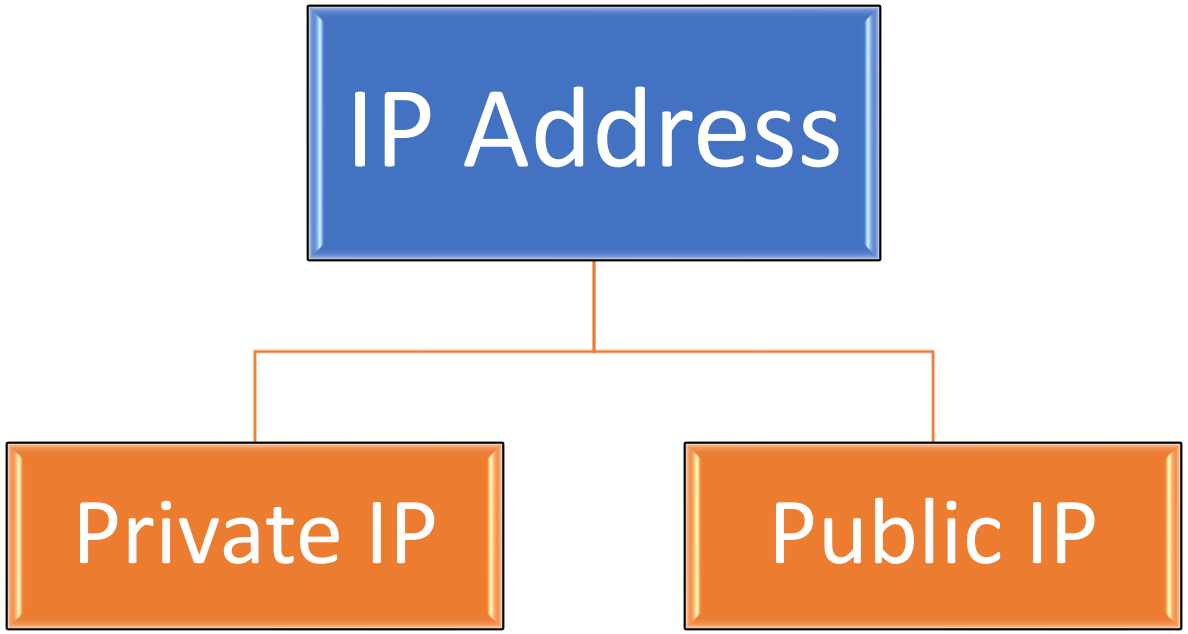
- The IPv4 Addressing system is divided into five classes.
- All the five classes are identified by the first octet of IP Address.

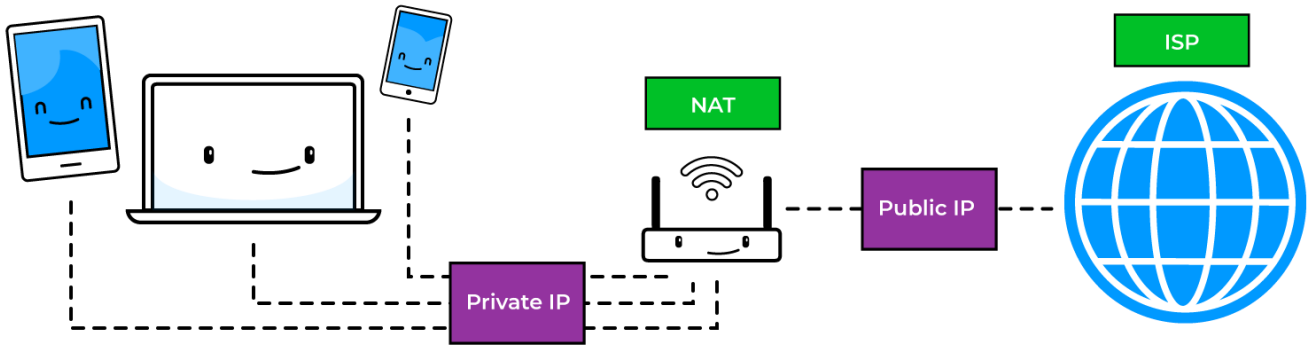
IP Address Assignment Method



- **Static IP :** Static means staying the same. Static. Stand. Stable. Yes, static IP addresses don't change.
- **Dynamic IP :** Dynamic means "constantly changing." The prefix dyna means power; however, dynamic IP addresses aren't more powerful, but they can change (or be changed).

Types of IP Address ?





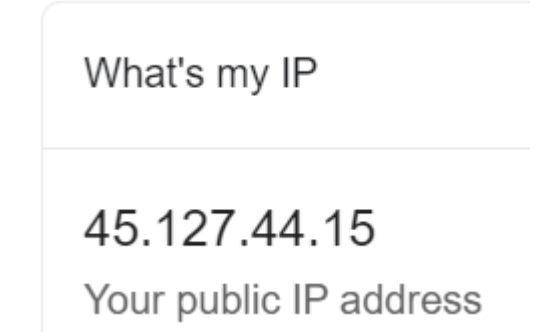
- **Private IP :** Private IP address is used with a local network
- **Public IP :** Public IP address is used outside the network. Public IP address is provided by ISP, Internet Service Provider.

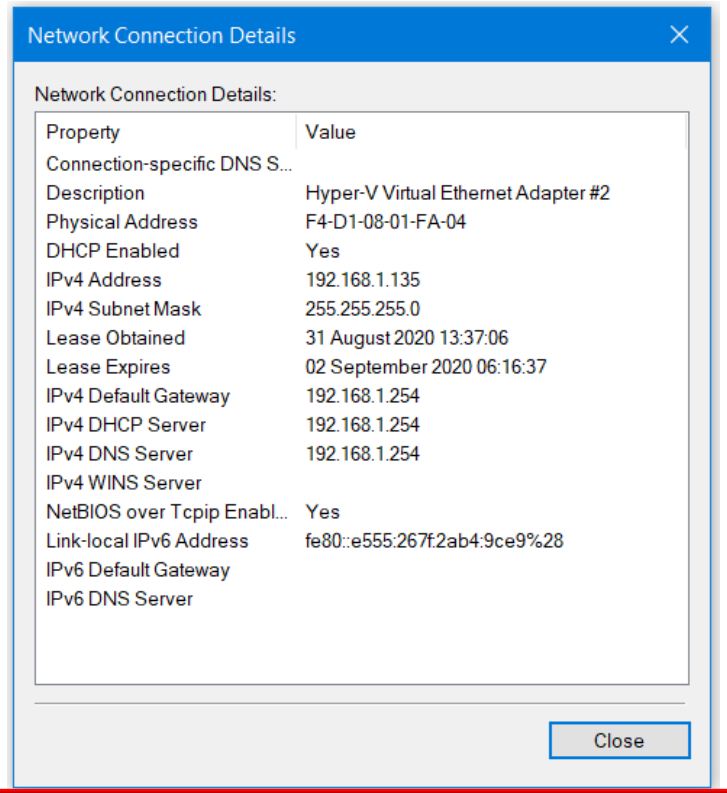
Types of IP Address ?

Sr. No.	Key	Private IP Address	Public IP Address
1	Scope	Private IP address scope is local to present network.	Public IP address scope is global.
2	Communication	Private IP Address is used to communicate within the network.	Public IP Address is used to communicate outside the network.
3	Format	Private IP Addresses differ in a uniform manner.	Public IP Addresses differ in varying range.
4	Provider	Local Network Operator creates private IP addresses using network operating system.	ISP, Internet Service Provider controls the public IP address.
5	Cost	Private IP Addresses are free of cost.	Public IP Address comes with a cost.
6	Locate	Private IP Address can be located using ipconfig command.	Public IP Address needs to be searched on search engine like google.

7	Range	Private IP Address range:
		`10.0.0.0 – 10.255.255.255,`
		`172.16.0.0 – 172.31.255.255,`
		`192.168.0.0 – 192.168.255.255`
			Except private IP Addresses, rest IP addresses are public.

8	Example	Private IP Address is like 192.168.11.50.	Public IP Address is like 17.5.7.8.

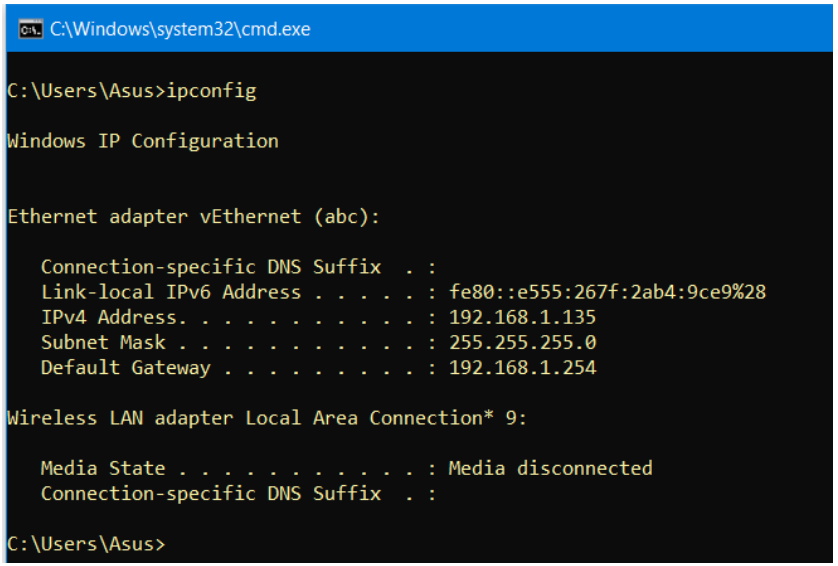




How to Check IP Address ?

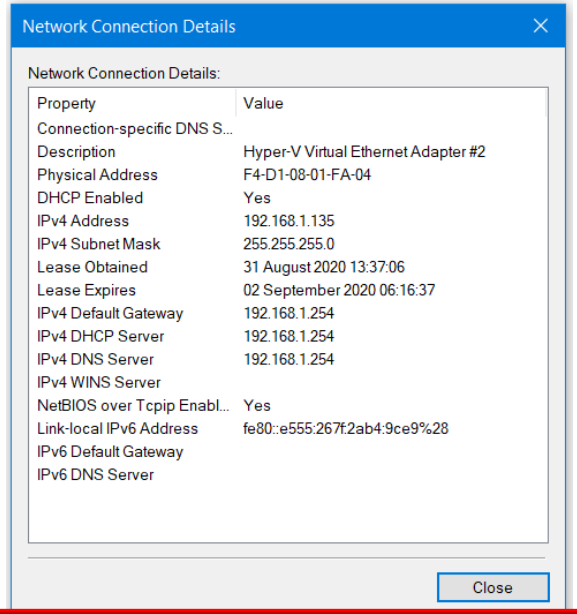
Checking IP Address using Command Line

- Open Run Dialog Box (Press Windows Key + R)
- Type command cmd then hit enter
- Type command ipconfig then hit enter



Checking IP Address using Network Adapter

- Open Run Dialog Box (Press Windows Key + R)
- Type command ncpa.cpl then hit enter
- Select adapter and go to status then click on details.



Thanks for your valuable time