Static and Dynamic IP Address:

All private and public IP addresses can be either **static** or **dynamic.**

Static IP Address:

IP addresses that you configure manually and fix them to the network of your device are called static IP address.

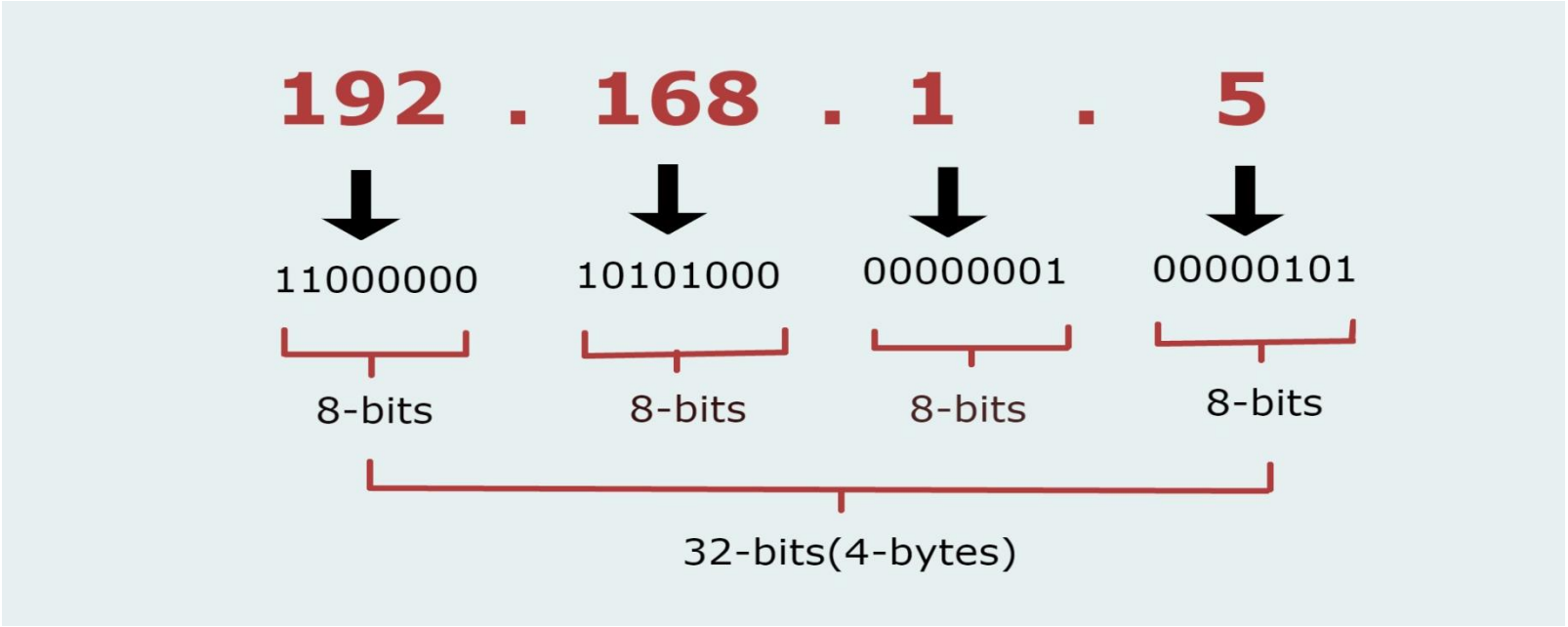
Static IP addresses cannot change automatically but it can be altered by network administration. Static IP addresses are consistent, which is assigned once, that remains the same over the years.

Dynamic IP Address:

The Dynamic IP address configures automatically and assigns an IP to your network when you set up the router with internet.

This distribution of IP addresses is managed by DHCP (Dynamic Host Configuration Protocol). DHCP can be your internet router that assigns an IP address to your network in your home or business environment. Dynamic IP address is active for a specific amount of time, after that, it will expire.

IP Address:


192 . 168 . 1 . 5
11000000
10101000
00000001
00000101
8-bits
8-bits
8-bits
8-bits
32-bits(4-bytes)

IP Address Class:

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.

Subnet Mask:

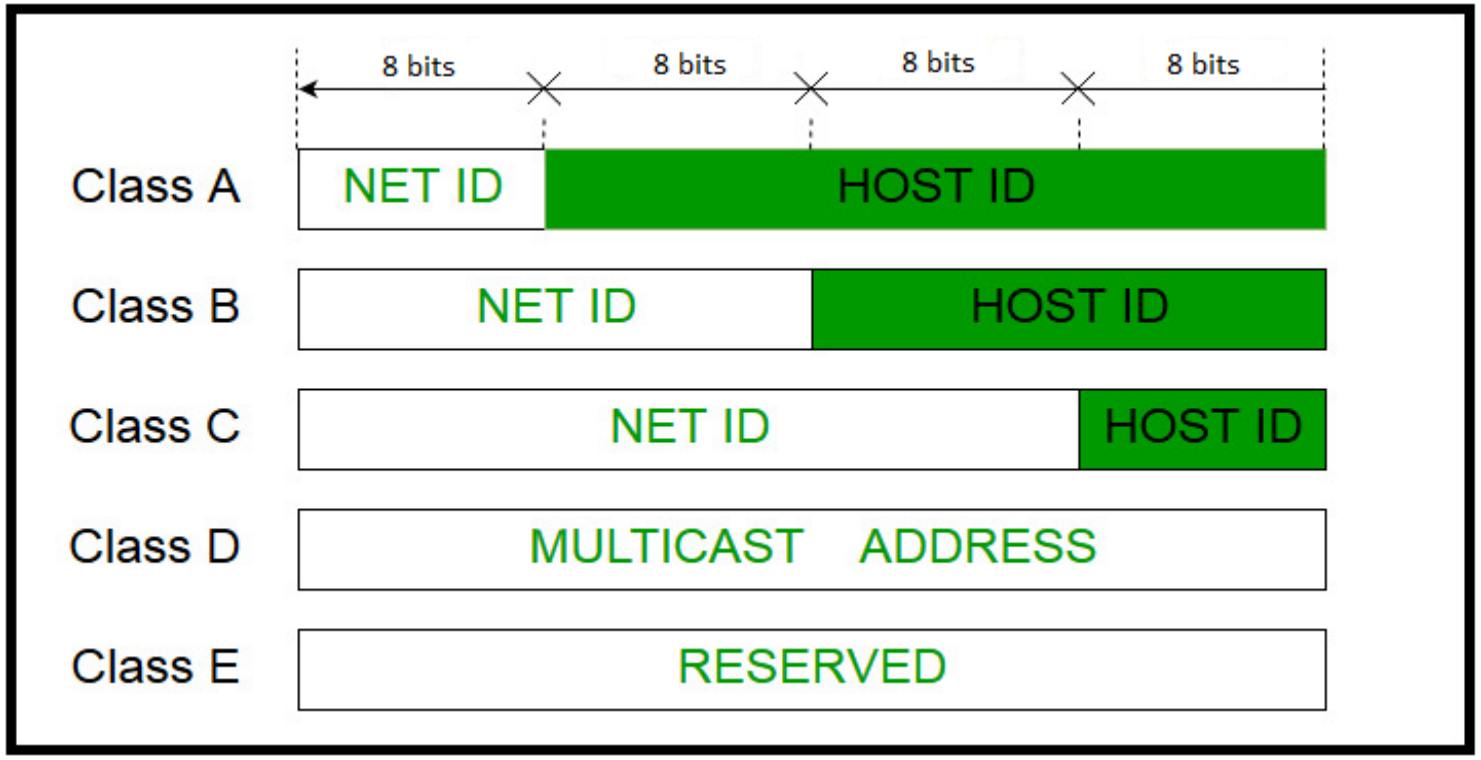
A subnet mask is a 32 bits address used to distinguish between a network address and a host address in IP address. A subnet mask identifies which part of an IP address is the network address and the host address.

Subnet masks are used when sub-netting, which is when we break a large network into smaller networks.

A subnet mask is a 32-bit number created by setting **host bits to all 0s** and setting **network bits to all 1s**. In this way, the subnet mask separates the IP address into the network and host addresses.

Subnet Mask:

IP Address = Network ID + Host ID



Default Subnet mask

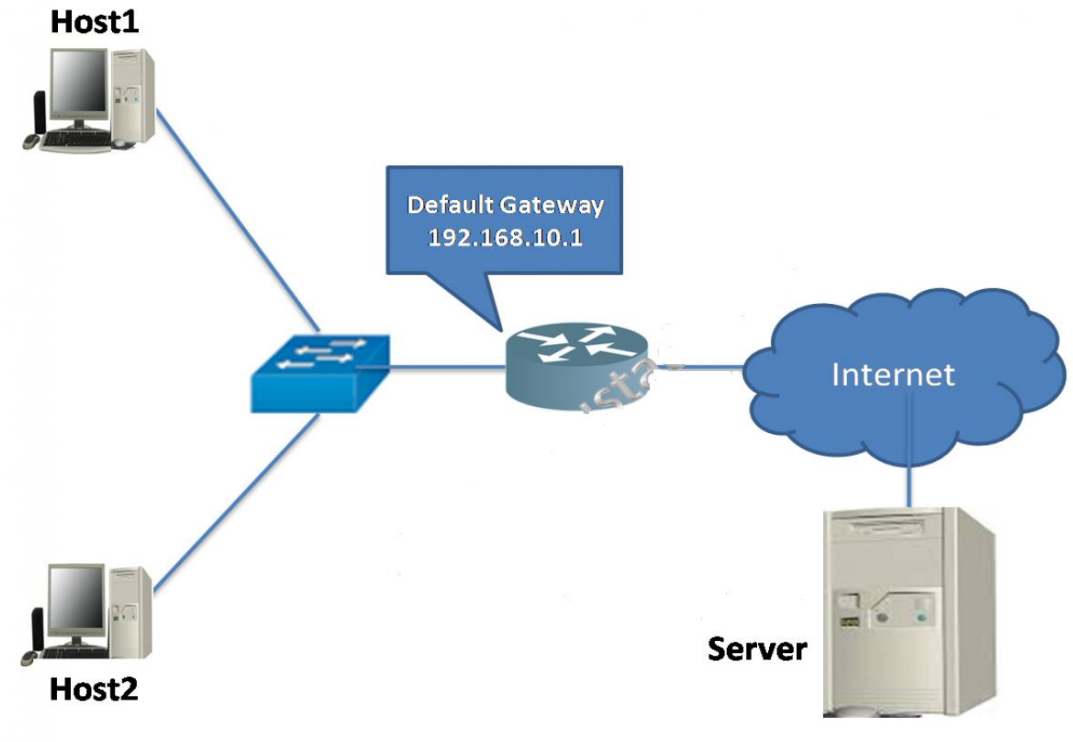
Class A	Network	Host		
Subnet mask	1 1 1 1 1 1 1 1	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
	255	0	0	0

Class B	Network		Host	
Subnet mask	1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
	255	255	0	0

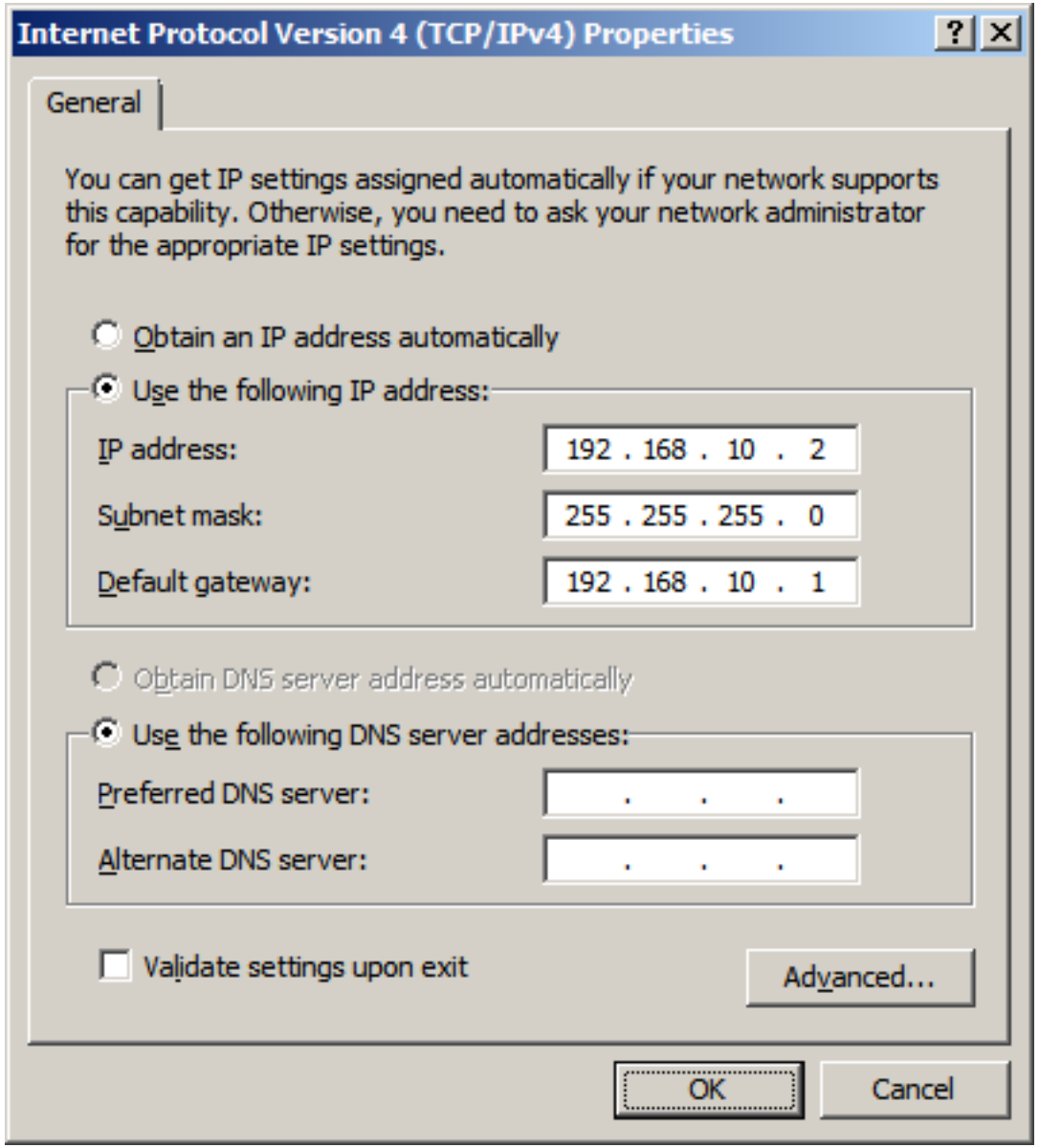
Class C	Network			Host
Subnet mask	1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	0 0 0 0 0 0 0 0
	255	255	255	0

Default Gateway:

A default gateway forwards data from one network to another. A default gateway as an intermediate device between the local network and the internet. The default gateway transfers internal data to the internet and back again. In most homes and offices, the default gateway is a router.



Default Gateway:



MAC Address:

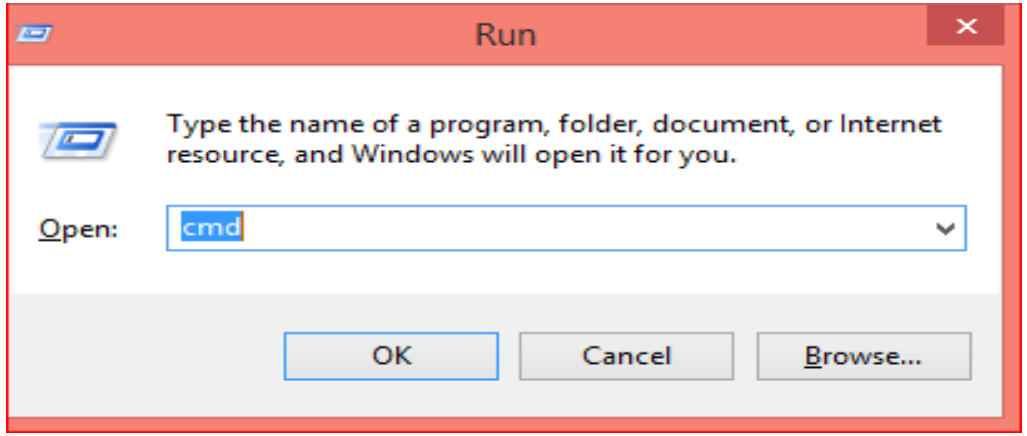
MAC address is the physical address, which uniquely identifies each device on a given network. To make communication between two networked devices, we need two addresses: IP address and MAC address. It is assigned to the NIC (Network Interface card) of each device that can be connected to the internet.

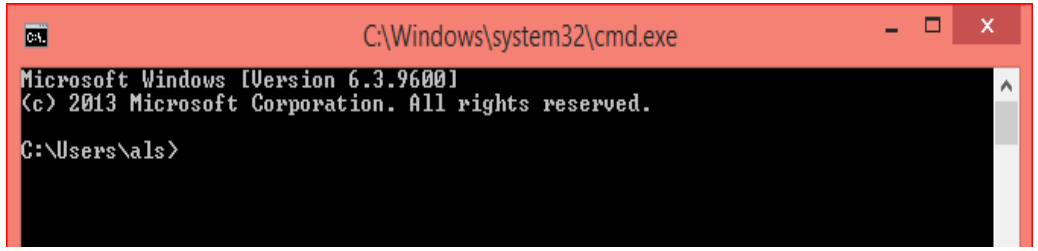
It stands for Media Access Control, and also known as Physical address, hardware address, or BIA (Burned In Address).

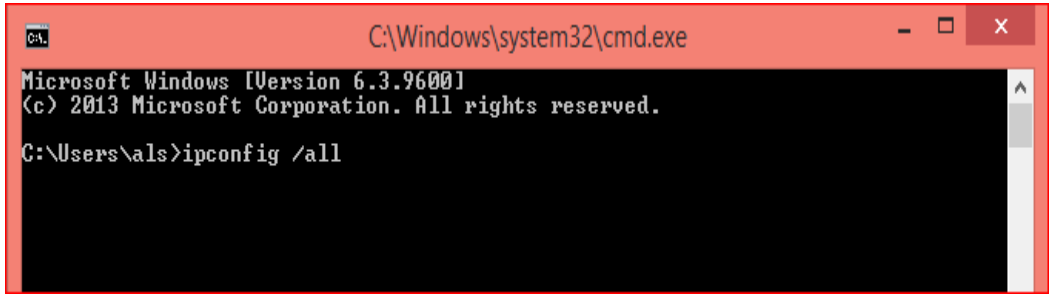
It is globally unique; it means two devices cannot have the same MAC address. It is represented in a hexadecimal format on each device, such as

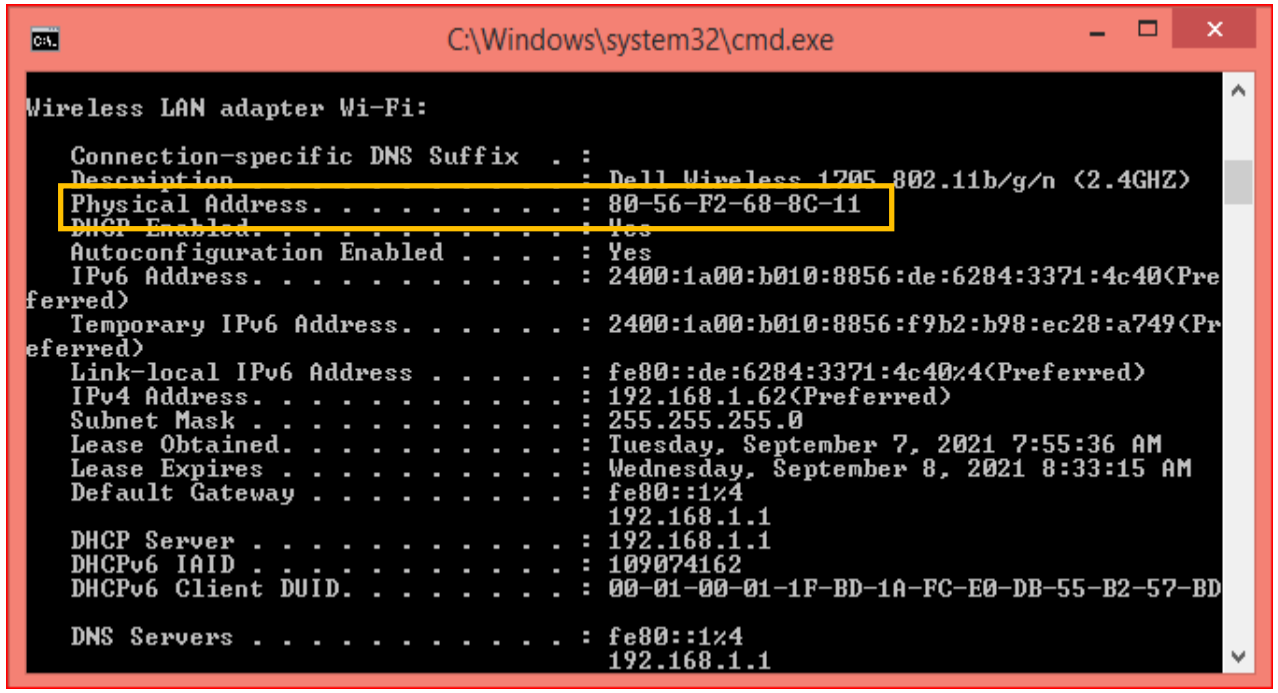
00 - 0a - 95 - 9d - 67 - 16

How to find-out the MAC address:









Internet:

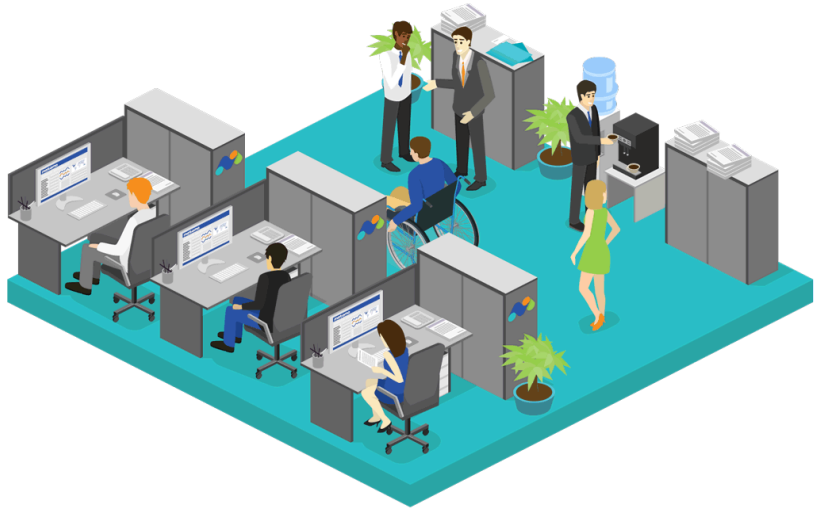
Internet is a worldwide, publicly accessible computer network of interconnected computer networks (internetwork) that transmit data using the standard Internet Protocol (IP). The largest Internetwork in the world is Internet.

The Internet is a collection of interconnected computer networks, linked by copper wires, fiber-optic cables, wireless connections, etc. The World Wide Web is one of the services accessible via the Internet, along with various others including email, file sharing, remote administration, video streaming, online gaming etc.

Intranet:

An intranet is a private network that is connect within an enterprise. Typical intranet for a business organization consists of many interlinked local area networks (LAN) and use any Wide Area Network (WAN) technology for network connectivity.

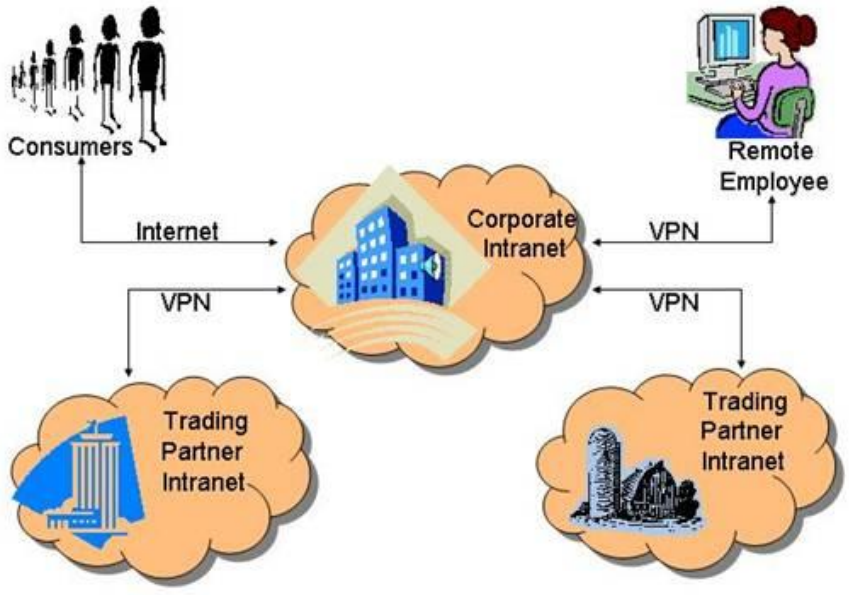
The main purpose of an intranet is to share company information and computing resources among employees. Intranet is a private Internetwork, which is usually created and maintained by a private organization. The content available inside Intranet are intended only for the members of that organization (usually employees of a company).

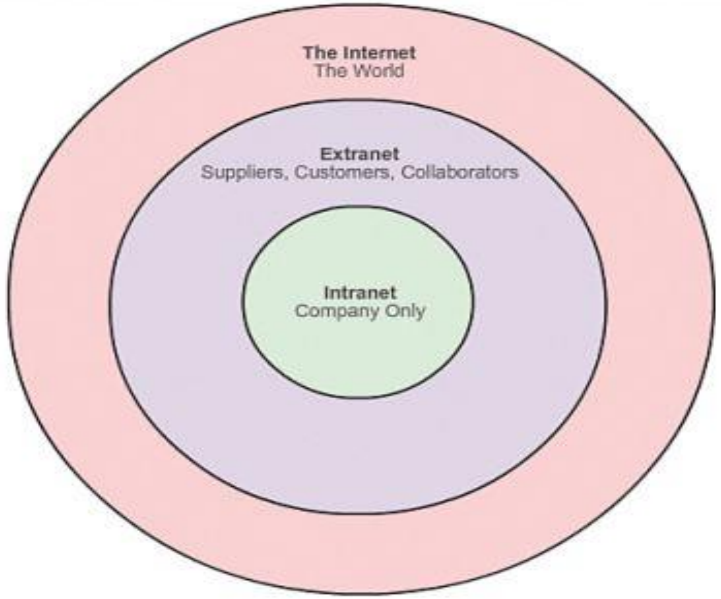


Extranet:

An extranet can be viewed as part of a company's intranet that is extended to users outside the company like suppliers, vendors, partners, customers or other business associates.

Extranet is required for normal day-to-day business activities. For example: placing purchase order to registered vendors, billing & invoices, payments related activities, joint venture related activities, product brochures, discounted price lists for the partners etc.





Point of difference	Internet	Intranet	Extranet
Accessibility of network	Public	Private	Private
Availability	Global system	Specific to an organization	To share information with suppliers and vendors it makes the use of public network.
Coverage	All over the world.	Restricted area upto an organization.	Restricted area upto an organization and some of its stakeholders or so.
No. of Computer Connected	Large number of computers	Limited number of computer within organization	Large number of computers than Intranet and Less numbers than Internet.
Owner	No one	Single organization	Single/ Multiple organizations.
Users	General public.	Employees of the organization.	Employees of the organization which are connected.

Network Tool:

❑ Packet Tracer:

Packet Tracer is a network simulator software. It simulates networking devices that are used to build CCNA (Cisco Certified Network Associate) practice labs. The cost to establish CCNA lab is very high. Packet Tracer cuts this cost by simulating all essential CCNA lab devices.

A simulation-based learning environment helps students and instructors. Students can learn how to configure routers and switches from the command line. Packet Tracer provides visual drag-and-drop problems using virtual networking devices.

Cisco Packet Tracer 7.x online

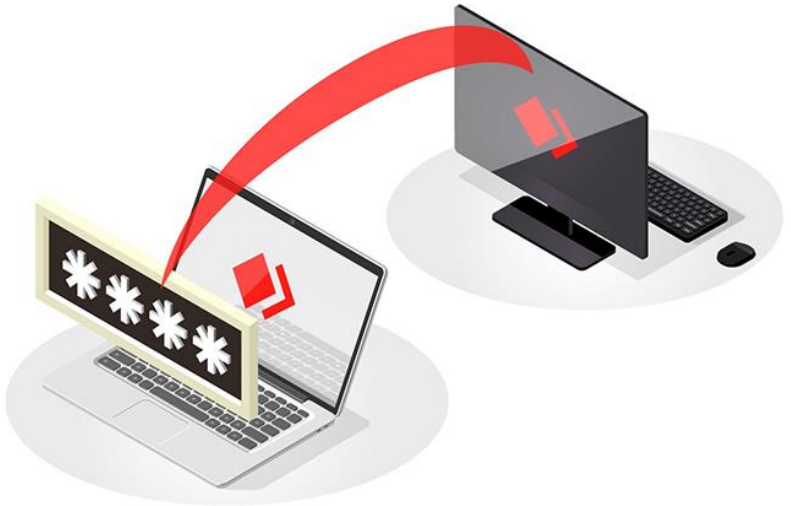
https://www.packettracernetwork.com/ptanywhere/packettracer-anywhere.html

❑ Remote Access:

Remote access is the ability for an authorized person to access a computer or a network from a geographical distance through a network connection. Remote access enables users to connect to the systems they need when they are physically far away.

Using remote access the users get access to the files and other system resources at any time. It increases employees productivity to collaborate with co-worker around the world.

Technical support professional also use remote access to connect to the users computer from remote locations to help them to resolve issues with their systems or software. The two remote login protocols are **TELNET (Terminal Network)** and **SSH (Secure Shell).**



Top 10 Remote Desktop Software:

1. TeamViewer
2. AnyDesk
3. Windows Remote Desktop Connection
4. GoToAssist
5. Splashtop Business Access
6. ConnectWise Control
7. Zoho Assist
8. VNC Connect
9. BeyondTrust Remote Support
10. LogMeIn Pro