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| **PLATFORM ENGINEERING ASSIGNMENT**    Akilesh Raj M  2021506010 |

**1)Ipv4 :**

* Each device connected to the Internet is given a unique identification number called an IP address.
* IPv4 has a 32-bit address space.
* Provides approximately 4.19 billion unique IP addresses.
* An IP address in IPv4 is represented by four numbers, like 190.168.112.10.
* Uses ARP (Address Resolution Protocol) to map IP addresses to MAC addresses for local network communication.
* Has no built in support for security features.
* IPv4 uses broadcast traffic to deliver data to all devices on the network, which can cause reduced performance.

**2)Ipv6 :**

* 128-bit address format.
* Provides around 3.4 x 10^38 unique IP addresses.
* Represented in hexadecimal format (e.g., 2023:0db8:85b1:0000:0000:8a2e:0370:7345).
* Uses NDP (Neighbour Discovery Protocol) instead of ARP for address resolution and neighbour discovery.
* Has built in support for security features.
* IPv6 uses multicast for one-to-many communication, eliminating the need for broadcast traffic and reducing unnecessary network load.

**3)IP Addressing scheme :**

An addressing scheme is clearly a requirement for communications in a computer network. With an addressing scheme, packets are forwarded from one location to another.

* To manage a large number of devices efficiently, IP addresses are divided into two parts: the network ID and the host ID.
* The network ID identifies the network to which a device belongs, while the host ID identifies the specific device on that network.
* Devices on the same network share the same network ID.
* IP addresses are classified into five classes - A, B, C, D, and E - based on how the bits are positioned for the network ID and host ID.
* Class A addresses have a large number of hosts but a limited number of networks.

Starts with 0, followed by 7 bits for the network ID and 24 bits for the host ID.

* Class B addresses strike a balance between the number of networks and hosts.

Starts with 10, followed by 14 bits for the network ID and 16 bits for the host ID.

* Class C addresses offer many networks but support a limited number of hosts per network.

Starts with 110, followed by 21 bits for the network ID and 8 bits for the host ID.

* Class D addresses are reserved for multicast purposes and are used for sending data to multiple devices at once.

Starts with 1110, followed by 28 bits.

* Class E addresses are reserved for experimental purposes and are not used for general networking.

Starts with 1111, followed by 28 bits.

4)Reserved Ports :

* Reserved ports – specific port number that are reserved for specific services.
* Assigned by Internet Assigned Numbers Authority(IANA)
* Used to ensure standardized communication.
* Includes well known ports and registered ports.

WELL-KNOWN PORTS:

* Ports range 0-1023
* Associated with essential network services
* Port 20 and 21: FTP(File Transfer Protocol)
* Port 22:SSH(Secure Shell)
* Port 25: SMTP(Simple Mail Transfer Protocol)
* Port 53: DNS(Domain Name System)
* Port 80: HTTP(Hypertext Transfer Protocol)
* Port 443:HTTPS(HTTP Secure)

SREGISTERED PORTS:

* Ports range 1024-49151
* Used for applications and services
* Allocated by IANA upon request by organization or individuals.
* Used for client-side application or temporary connection.
* Port 143:IMAP(Internet Message Access Protocol)
* Port 3306:MySQL Database.