**Name: Adithya K**

**Register no: 2021506007 PLATFORM ENGINEERING ASSIGNMENT**

**1) Total number of bits available and why it is limited:**

There are about 65,535 ports per IP address: this is the highest number that can be represented by a 16-bit, or 2-byte it wasn't conceivable that computers would ever be able to spare more than that for something as trivial as ports, or something like that.

**2) Ipv4 and Ipv6**

Ipv4 and ipv6 are the versions to provide the proper information and identification for each ip addresses as there are large number of ip addresses in current period.

**Ipv4 addresses:**

* The first version of an ip address that was in format of 2^ 32 bits of tots kip address in ipv4 form .it was sufficient at initial phase .but in current advancement the addresses in ip ranges from 0 to 225 with 4 octets each is separated by a period. In a ip address first 3 parts are network id and last part Is host id . using ipv4 addresses as reference we can identify ipv4 addresses from ipv6 addresses
* Ip classes are designed to provide easier management of large number of ip address .there are 5 classes depending on class size named a,b,c,d,e.
* First part a accommodates network with large number of networks first part ranging from 0 to 127
* Next part can fulfil the requirement for a moderated number of network host ranges from 128 to 191
* Part c can allocate ip address for low number of network id .the first 3 bits of network id is 1 1 0. Ranging from 192 to 223. So for above 3 part we can easily assign and identify network host.
* Part d is used for multicasting to send multiple signals at same time from a single host.for example in a video streaming the lead bit is 1 1 1 0 with network id ranges from 224 to 239
* Class e has ip bits reserved for research purpose only where ip address ranges from 240 to 255
* For Ipv4 the memory required for storing ipv4 version addresses in a system is very low they apply connection less protocol for sharing data and providing best effort in delivery

**Ipv6 addresses:**

* It was designed to overcome the address demand which to apply 128- bit binary type format.
* Approximately 320 civilian ip address were satisfied under ipv6
* This type of ip addresses were designed of 4 hexadecimal digit and 8 sets with each block contains 16 bits
* Ipv 6 addresses provides integrated security for network that is internet sequirity protocol(ipsec).
* It allows its application to extend in various services according to the need of the network
* It also allows address config that uses dhcp network for setting and stateless that applies auto config settings.
* It also allows some methods to convert ipv4 address to ipv6 addresses.

**3) Ip addressing schemes :**

* IP address stands for internet protocol address; it is an identifying number that is associated with a specific computer or computer network. When connected to the internet, the IP address allows the computers to send and receive information.
* Ip addressing is a requirement for communication in a computer network with an addressing scheme ,packets are forwarded from one location to another.
* The scheme consist of two special cases of ip address addresses and loopback addresses and three layer address are used for routing , switching, creating of path.

**Class A:**

* In this class out of 32 bits only first 8 bits are assigned to the network part, hence it has default subnet mask of 255.0.0.0. In this class the first bit is reserved and is always kept off.
* Lower range can be found out by keeping all the bits off (means the corresponding numerical value is not added)
* the IP range of this class should be 0-127 but 0.0.0.0 doesn’t represent a valid network and 127.0.0.0 to 127.255.255.255 is reserved for local host loop back to verify [TCP/IP](https://networkinterview.com/introduction-to-tcp-ip/) services. Eg: Some examples are 10.x.x.x, 125.x.x.x, 79.x.x.x, 98.x.x.x etc.

**class B:**

* in this class first 16 bits are assigned to network part & so it has default subnet mask of 255.255.0.0. For range assignment first two bits are reserved, first bit always on and second bit always off.
* Its lower range is 128 as last six bits and Its higher range is 191 as last six bits So the range of class B is 128-191. Some examples are 130.x.x.x, 156.x.x.x, 178.x.x.x, 190.x.x.x.

**Class C:**

* This class has 24 bits for network part and so its default subnet mask is 255.255.255.0. To assign the range first 3 bits are reserved, 1 & 2 bits are always on and 3 bit is always off.
* Its lower range is 192 as last five bits are off.
* So the class C range is **192-223**. Some examples are 200.x.x.x, 215.x.x.x, 221.x.x.x, 195.x.x.x.

**Class D:**

* The range of this class is from 224-239 and can’t be allocated to hosts. This class is used for multicasting by various routing protocols. Some common examples are
* 224.0.0.5-Used by all OSPF routers
* 224.0.0.6-Used by OSPF DRs (Designated Routers)
* 224.0.0.9-Used by RIP-2
* 224.0.0.10-Used by EIGRP
* 224.0.0.12-Used by DHCP Server/Relay Agent
* 224.0.0.14-Used by RSVP encapsulation
* 224.0.0.18-Used by VRRP
* 224.0.0.22-Used by IGMP

**Class E:**

* The range of this class is from 240-255 and is not meant for general use. These are typically used for experiments.

**4) Reserved ports:**

* Port numbers range from 0 to 65535, but only port numbers 0 to 1023 are reserved for privileged services and designated as well-known ports. The following list of well-known port numbers specifies the port used by the server process as its contact port.

1. 1- tcp port service multiplexer
2. 5- remote job entry
3. 7- echo
4. 18- message send protocol
5. 20- ftp data
6. 21- ftp control
7. 22- ssh remote login protocol
8. 23- telnet
9. 25- Simple mail transfer protocol
10. 29- Msg icp
11. 37- time
12. 42- host name server
13. 43- whols
14. 49- login host protocol
15. 53- domain name system
16. 69- tvft
17. 70- gopher server
18. 79- finger
19. 80- http
20. 103- x.400 standard
21. 108- sna gateway
22. 109- pop2
23. 110- pop3
24. 115- simple file transfer protocol
25. 118- sql service
26. 119- news group
27. 137- netbios name service
28. 139- netbios datagram service
29. 143- interim mail access protocol
30. 150- netbios session service
31. 156- sql server
32. 161- snmp
33. 179- border gatewap protocol
34. 190- gateway access control protocol
35. 194- internet rely chat
36. 197- dls
37. 389- lightweight direct access protocol
38. 396- novel netware ip
39. 443- https
40. 444- snpp
41. 445- Microsoft ds
42. 458- apple quick time
43. 546- dhcp client
44. 547- dhcp server
45. 563- snews
46. 1080- socks