## Network: - (vpc)

a group of computers linked to each other that enables the computer to communicate

with another computer and share their resources, data, and applications.

## IP address: -

IP stands for "Internet Protocol," which is the set of rules governing the format of data sent via the internet or local network

## Five IPv4 Classes: -

In the IPv4 IP address space, there are five classes: A, B, C, D and E. Each class has a specific range of IP addresses Primarily, class A, B, and C are used by the majority of devices on the Internet. Class D and class E are for special uses.

The list below shows the five available IP classes, along with the number of networks each can support and the maximum number of hosts (devices) that can be on each of those networks. The four octets that make up an IP address are conventionally represented by a.b.c.d - such as 127.10.20.30.

## Class A Public & Private IP Address Range:

Class A addresses are for networks with large number of total hosts. Class A allows for 126 networks by using the first octet for the network ID. The first bit in this octet, is always zero. The remaining seven bits in this octet complete the network ID. The 24 bits in the remaining three octets represent the hosts ID and allows for approximately 17 million hosts per network. Class A network number values begin at 1 and end at 127.

- Public IP Range: 1.0.0.0 to 127.0.0.0
    - First octet value ranges from 1 to 127
- Private IP Range: 10.0.0.0 to 10.255.255.255
- Subnet Mask: 255.0.0.0 (8 bits)
- Number of Networks: 126
- Number of Hosts per Network: 16,777,214

## Class B Public & Private IP Address Range:

Class B addresses are for medium to large sized networks. Class B allows for 16,384 networks by using the first two octets for the network ID. The first two bits in the first octet are always 1 0. The remaining six bits, together with the second octet, complete the network ID. The 16 bits in the third and fourth octet represent host ID and allows for approximately 65,000 hosts per network. Class B network number values begin at 128 and end at 191.

- Public IP Range: 128.0.0.0 to 191.255.0.0
    - First octet value ranges from 128 to 191
- Private IP Range: 172.16.0.0 to 172.31.255.255
- Subnet Mask: 255.255.0.0 (16 bits)
- Number of Networks: 16,382
- Number of Hosts per Network: 65,534

## Class C Public & Private IP Address Range:

Class C addresses are used in small local area networks (LANs). Class C allows for approximately 2 million networks by using the first three octets for the network ID. In a class C IP address, the first three bits of the first octet are always 1 1 0. And the remaining 21 bits of first three octets complete the network ID. The last octet (8 bits) represents the host ID and allows for 254 hosts per network. Class C network number values begins at 192 and end at 223.

- Public IP Range: 192.0.0.0 to 223.255.255.0
    - First octet value ranges from 192 to 223
- Private IP Range: 192.168.0.0 to 192.168.255.255
- Special IP Range: 127.0.0.1 to 127.255.255.255
- Subnet Mask: 255.255.255.0 (24 bits)
- Number of Networks: 2,097,150
- Number of Hosts per Network: 254

## Class D IP Address Range:

Class D IP addresses are not allocated to hosts and are used for multicasting. Multicasting allows a single host to send a single stream of data to thousands of hosts across the Internet at the same time. It is often used for audio and video streaming, such as IP-based cable TV networks. Another example is the delivery of real-time stock market data from one source to many brokerage companies.

- Range: 224.0.0.0 to 239.255.255.255
    - First octet value ranges from 224 to 239
- Number of Networks: N/A
- Number of Hosts per Network: Multicasting

## Class E IP Address Class:

Class E IP addresses are not allocated to hosts and are not available for general use. These are reserved for research purposes.

- Range: 240.0.0.0 to 255.255.255.255
    - First octet value ranges from 240 to 255
- Number of Networks: N/A
- Number of Hosts per Network: Research/Reserved/Experimental

## Special IP Addresses:

- IP Range: 127.0.0.1 to 127.255.255.255 are network testing addresses (also referred to as loop-back addresses). These are virtual IP address, in that they cannot be assigned to a device. Specifically, the IP 127.0.0.1 is often used to troubleshoot network connectivity issues using the Specifically, it tests a computer's TCP/IP network software driver to ensure it is working properly.

## IPV4 classes:

| | Public IP Range | Private IP Range | Subnet Mask | # of Networks | # of Hosts per Network |
|---|---|---|---|---|---|
| **Class A** | 1.0.0.0 to 127.0.0.0 | 10.0.0.0 to 10.255.255.255 | 255.0.0.0 | 126 | 16,777,214 |
| **Class B** | 128.0.0.0 to 191.255.0.0 | 172.16.0.0 to 172.31.255.255 | 255.255.0.0 | 16,382 | 65,534 |
| **Class C** | 192.0.0.0 to 223.255.255.0 | 192.168.0.0 to 192.168.255.255 | 255.255.255.0 | 2,097,150 | 254 |