DAY 6 - IPv4

Purinat33

IPv4 Addresses

- 32 bits addresses.
- Separated into 4 octets of 8 bits each.
- Written in dotted decimal notation

192	168	1	254
11000000	10101000	00000001	11111110

Each octet have values from 0-255.

Network and Host portion:

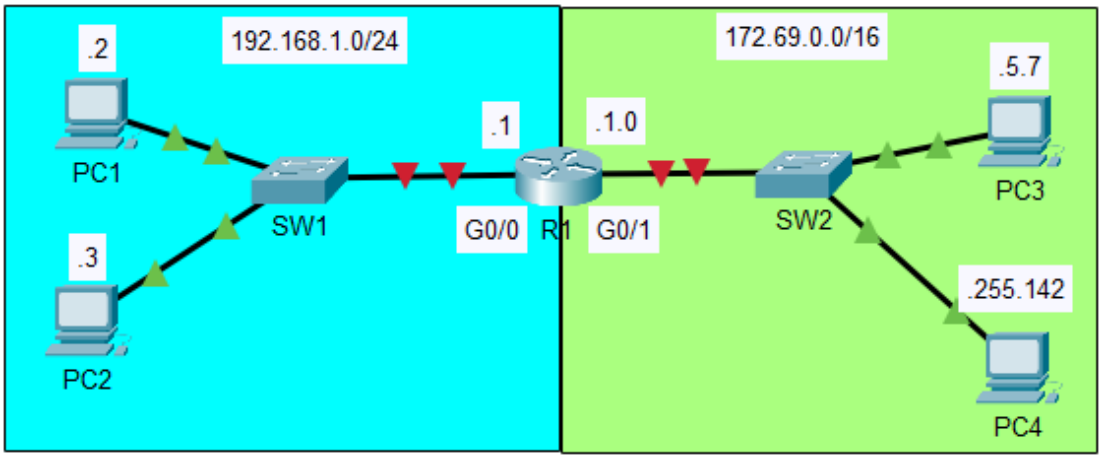
eg. `192.168.1.2` / `24`

- `/24` bits netmask signifies **How many bits are used to identified the network portion** (Which network the IP belongs to).
  - **192.168.1**.0 Network.
  - 192.168.1.**2** Host
  - `24` bits are used to identify the Network.
  - 32- `24` = `8` bits are used to identify the Host.

Netmask

- How many bits are used to identified the network portion.
  eg.
- `/8`
  - 8 bits network portion.
  - `11111111` .00000000.00000000.00000000
  - `255` .0.0.0
- `/16`
  - 16 bits network portion.
  - `11111111` . `11111111` .00000000.00000000

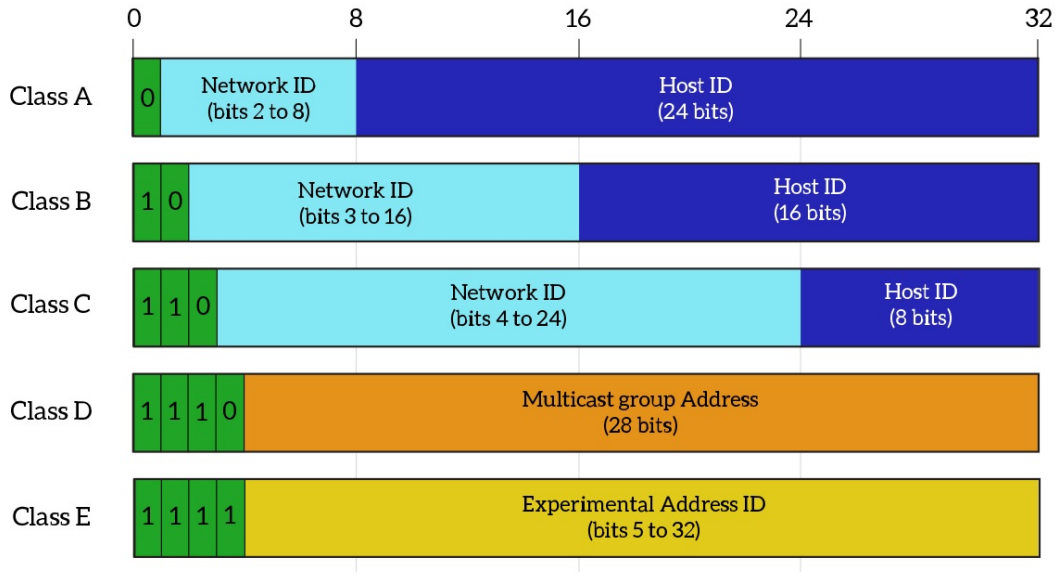
  - `255` . `255` .0.0
- `/24`
  - 24 bits network portion.
  - `11111111` . `11111111` . `11111111` .00000000
  - `255` . `255` . `255` .0
- `/21`
  - 21 bits network portion.
  - `11111111` . `11111111` . `11111000` .00000000
  - `255` . `255` . `248` .0



- `192.168.1.0/24` Network
  - PC1: `192.168.1.2`
  - PC2: `192.168.1.3`
  - R1's G0/0 Interface: `192.168.1.1`
- `172.69.0.0/16` Network
  - PC3: `172.69.5.7`
  - PC4: `172.69.255.142`
  - R1's G0/1 Interface: `172.69.1.0`

IPv4 Address Classes:

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.		



What is Loopback Address:

- Address used to test the network model on the local device.

```
C:\Users\User>ping 127.0.0.1

Pinging 127.0.0.1 with 32 bytes of data:
Reply from 127.0.0.1: bytes=32 time<1ms TTL=128
Reply from 127.0.0.1: bytes=32 time<1ms TTL=128
Reply from 127.0.0.1: bytes=32 time<1ms TTL=128
Reply from 127.0.0.1: bytes=32 time<1ms TTL=128

Ping statistics for 127.0.0.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Important IP Addresses in each network:

1. **Network Address**
2. **Broadcast Address**