

Computer Network Assignment

On

Getting Familiar With Your Network

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1 My IP Address

```
ifconfig
en0: flags=8863<UP,BROADCAST,SMART,RUNNING,SIMPLEX,MULTICAST> mtu
    1500
    options=6460<TS04,TS06,CHANNEL_IO,PARTIAL_CSUM,
        ZEROINVERT_CSUM>
    ether 6c:b1:33:9d:0f:ce
    inet6 fe80::186d:4661:98f0:c6d9%en0 prefixlen 64 secured
        scopeid 0xf
    inet 192.168.1.3 netmask 0xffffffff broadcast 192.168.1.255
    inet6 2407:1400:aa4a:6468:14f3:5bdd:3c2c:16a8 prefixlen 64
        autoconf secured
    inet6 2407:1400:aa4a:6468:9575:c01:db9e:4a7e prefixlen 64
        autoconf temporary
    nd6 options=201<PERFORMNUD,DAD>
    media: autoselect
    status: active
```

From the above output, it is clear that my active network interface is en0. It has IP Address 192.168.1.3.

| Parameter | Value |
|------------|-------------|
| IP Address | 192.168.1.3 |

2 Subnet Mask

From the terminal output, we can see the subnet mask for my network is 0xffffffff00. Now converting this subnet mask from hexadecimal format to the dot-decimal format.

```
0xff = 255 in decimal  
0xffffffff00 = 255.255.255.0
```

Thus, my subnet mask is 255.255.255.0.

| Parameter | Value |
|-------------|---------------|
| Subnet Mask | 255.255.255.0 |

3 Network Address

To calculate the network address, we need to perform a bitwise AND operation between our IP address and your subnet mask.

The network address and subnet mask for my network are:

- **Network Address:** 192.168.1.3
- **Subnet Mask:** 255.255.255.0

Converting these dot values to binary and performing the AND operation we get:

```
11000000.10101000.00000001.00000011
AND
11111111.11111111.11111111.00000000
-----
11000000.10101000.00000001.00000000
```

Converting it back to dot notation, we get 192.168.1.0.

4 How Many Nodes Can Your Network Support?

To calculate the number of nodes that a network can support given a network address and a subnet mask, we need to determine the number of host bits available.

The number of host bits is calculated as the total number of bits in an IP address (32 for IPv4) minus the number of bits used for the network.

Given the subnet mask 255.255.255.0, we can determine the number of available host addresses as follows:

- The subnet mask 255.255.255.0 in binary is 11111111.11111111.11111111.00000000.
- This means there are 24 network bits and $32 - 24 = 8$ host bits.
- The number of possible host addresses is $2^8 - 2 = 256 - 2 = 254$.

Therefore, the network can support **254 nodes**.