REAL-WORLD SIMPLIFICATIONS AND IP NETWORK CONFIGURATION

While it is entirely permissible to have a subnet of any size between 0 and 32 bits, not all sizes are equally common. There are three very common sizes, and, not coincidentally, they have the advantage that you can visually interpret them when written as dotted quads, so no need to revert to binary! These three common sizes are:

Netmask dotted quad	bits	Hex	#IP addresses	Common Name
255.0.0.0	**8**	**0xff000000**	16,777,214	Class A network
255.255.0.0	**16**	**0xffff0000**	65,534	Class B network
255.255.255.0	**24**	**0xffffff00**	254	Class C network

If our computer has a **class C** netmask, then our network address is the first three quads of our IP with the last quad set to 0. Also, all IPs that start with the same three quads as our IP are local.

Similarly, if our computer has a **class B** netmask, then our network address is the first two quads of our IP with the last two quads set to 0. Also, all IPs that start with the same two quads as our IP are local.

Finally, if our computer has a **class A** netmask, then our network address is the first quad of our IP with the last three quads set to 0. Also, all IPs that start with the same first quad as our IP are local.

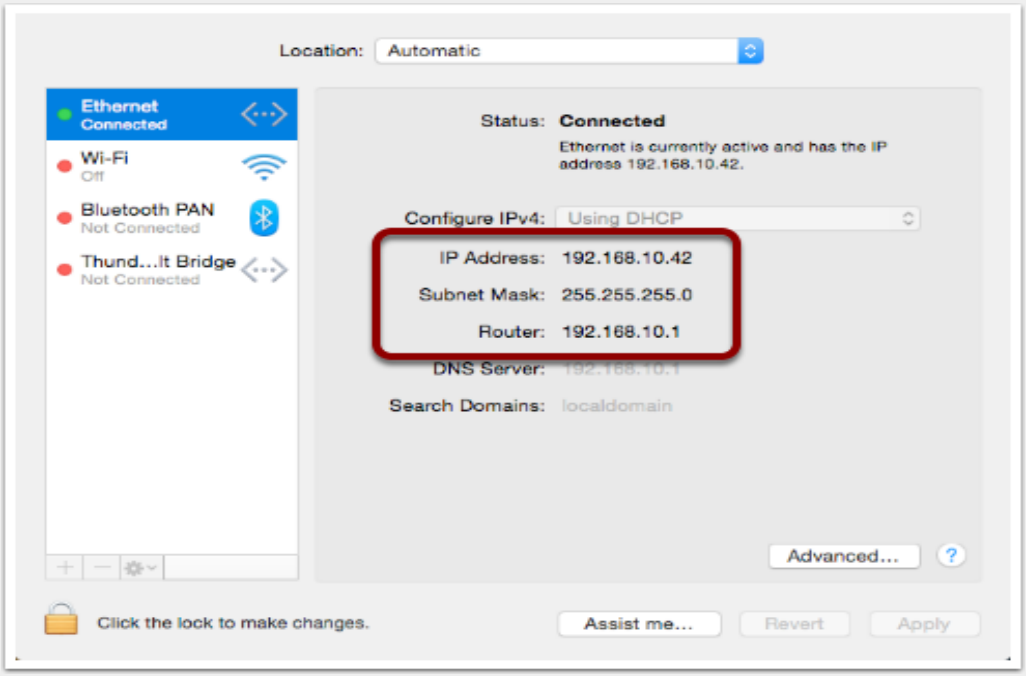
Most home routers create class C networks by default, so understanding class C networks is enough to allow most home users get by.

IP Network Configuration

In order for a device to properly use an IP network it needs to have three settings correctly configured:

1. IP Address
2. Netmask
3. Default gateway AKA default route (the IP address of the router) – the router's IP MUST fall within the subnet defined by the IP address combined with the netmask

You can see these three settings in the Networks system preference pane in OS X:



Or, you can access them via the command line with the following two commands:

```
ifconfig -a

netstat -rn
```

Both of these commands are VERY talkative, and while all the needed info is in there somewhere, we can use the power of **egrep** to filter those outputs down to just what we want:

```
ifconfig -a | egrep '\binet\b' | egrep -v '127[.]'

netstat -rn | egrep '^default'
```

With these filtered versions of the commands, we can clearly see the three pieces of information we are looking for. Below is my output, with the desired information highlighted in bold:

```
bart-iMac2013:~ bart$ ifconfig -a | egrep '\binet\b' | egrep -v '127[.]'
        inet 192.168.10.42 netmask 0xffffff00 broadcast 192.168.10.255
bart-iMac2013:~ bart$ netstat -rn | egrep '^default'
default            192.168.10.1       UGSc           55        0     en0
bart-iMac2013:~ bart$
```

If you copy and paste the IP and netmask values from the above commands.

Source: https://www.bartbusschots.ie/s/2014/12/07/taming-the-terminal-part-25-of-n-ip-subnets/