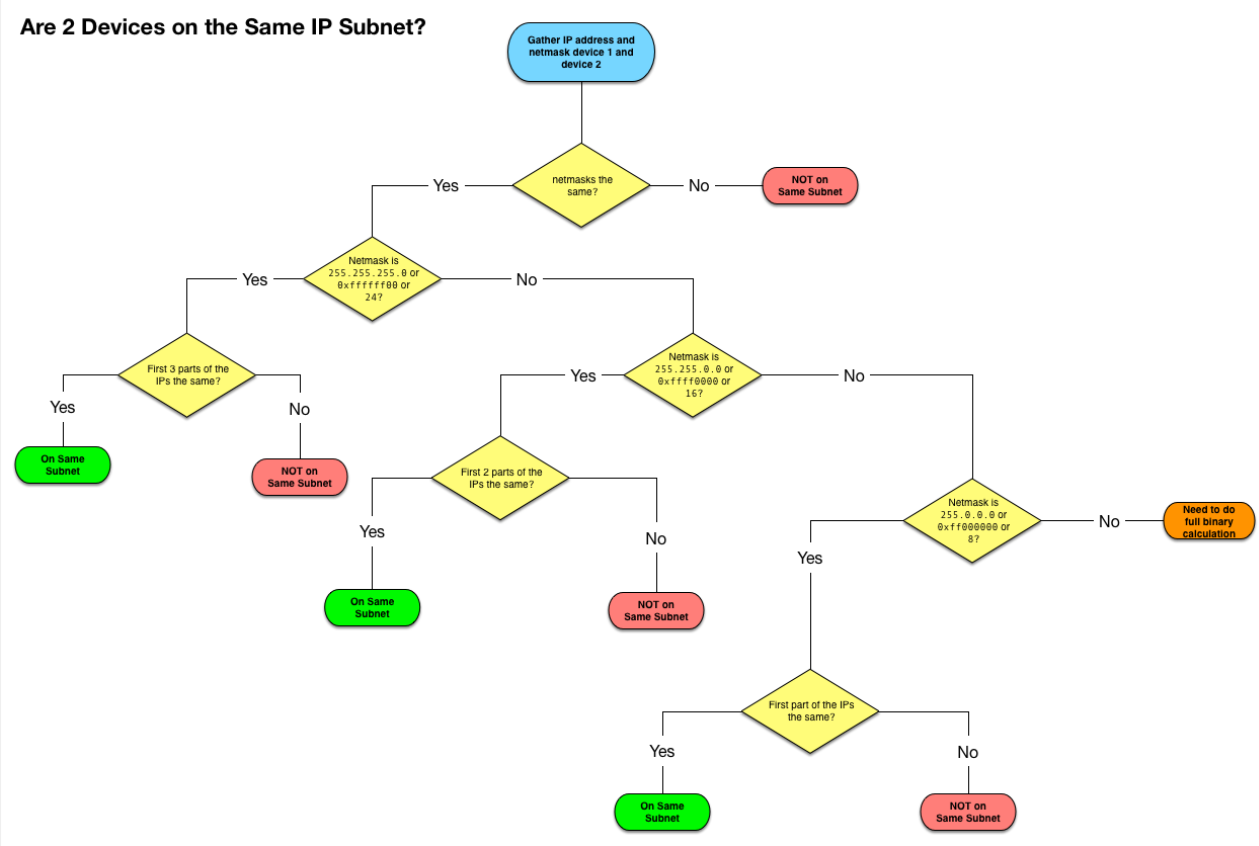
ARE ALL THE DEVICES ON YOUR HOME ON THE SAME NETWORK?

When the IP stack is trying to decide how to route a packet it only knowns its own IP address and netmask, and the destination IP, but when you are trying to figure out if two devices on your home network share a subnet, you have access to more information because you and discover each computer's IP AND netmask (by reading them from the UI to terminal).

If your intention was to create a single home network, and you want to verify that any two devices really are on the same subnet, you can use the following simple algorithm:

1. Are the netmasks on the two computers the same? Yes – continue to step 2, NO – the two computers are NOT on the same subnet
2. Figure out the network addresses for both IPs, if they are the same, the computers are on the same subnet.

The following flow chart will walk you through the process:



Since most of our home networks use Class C netmasks, you'll probably only ever need a small section of the diagram.

Conclusions

For a computer to work correctly on an IP network, it must have the following three things properly configured:

1. An IP Address
2. A Netmask
3. A Default Router

When troubleshooting home network sharing problems, one of the first things to do is verify that all devices are on the same subnet. Usually when they're not, that was unintentional, and the cause of the problems. Learning to read and understand IP addresses and netmasks is a vital skill for just about any network troubleshooting. In this instalment we concentrated on understanding the network settings we see in our computers, in the next instalment we'll take a look at the protocol that is almost certainly passing those settings to your computers, DHCP.

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