



Subnetting made easy

If working things out in binary is too time consuming or that understanding the process in laying things out in 1's and 0's is too tough... try a shortcut! Figure out the magic number from the subnet mask, and find the range of that the IP address resides on. With an IP address of 172.16.1.37, and a subnet mask of 255.255.255.240, the objective is to find out:

- I) What Network does the above IP address belong to?
- II) What is the first and last assignable host of the Network (valid IP range)?
- III) What is the Broadcast address of the Network?
- IV) What is the next Network address (next subnet)?

First off, to find which network the IP address falls into we must figure out the magic number. We find out about this number by using the subnet mask, take the number that is furthest to the left that is not "255". In this case with a subnet mask of a 255.255.255.**240** the number that we take is "**240**", to get the magic number we must always subtract the subnet mask by "**256**". ***256** – **240** = **16**, now that we have our magic number of 16 we can now find the solution to our objective!

- I) What Network does the above IP address belong to?
 - a. We are working on the last octet of the address because the subnet mask 255.255.255.**240** (the octet we subtract from 256 to find our magic number is how we know which octet we are working on). With the IP address of a 172.16.1.**37**, we use our magic number to go up increments of **16** until we get into the range of 172.16.1.**37**.

0
16
32 ← 37 falls between this range...
48 ←
 - b. The Network address that 172.16.1.37 belongs to is the first number in the range from above. Giving the Network address of a **172.16.1.32** 255.255.255.240
- II) What is the first and last assignable host of the Network (Valid IP range)?
 - a. The first assignable IP address on the Network is +1 to the Network address giving the IP **172.16.1.33**.
 - b. The last assignable IP address on the Network is -2 to the ending IP address within the range of 32 and 48 giving the IP address of **172.16.1.46**
- III) What is the Broadcast address of the Network?
 - a. The Broadcast address is -1 to the ending IP address within the range of 32 and 48 giving the IP address of **172.16.1.47**
- IV) What is the next Network address (next subnet)?
 - a. The next Network address is the IP address ending in the range of 32 and 48 giving the IP address of **172.16.1.48**