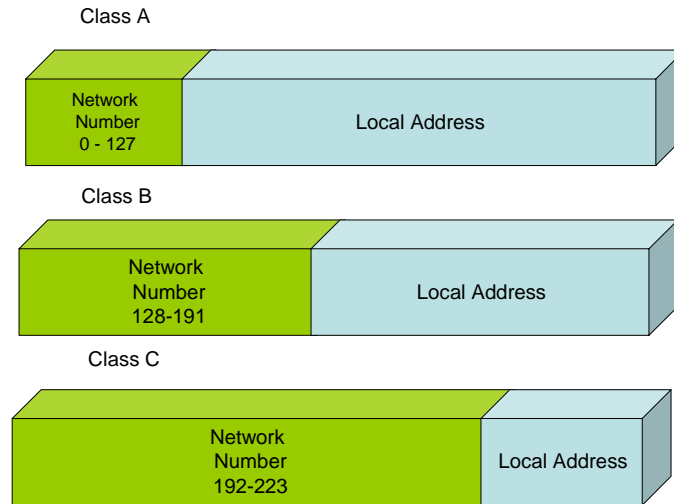

Subnet Masks

Data is routed to your home system or web site through inspection, and action upon the network and subnet part of their IP address. Class A, B, and C network addresses have a fixed size, but subnet field sizes can be chosen by the organization that owns it. Subnet masks are used to recognize the size of the subnet part of the address.



The subnet mask is a sequence of 32 bits where the bits corresponding to the network and subnet fields are set to 1, and those for the system field are set to 0. For an address starting with 128.121, the mask would be:

11111111 11111111 11111111 00000000

Subnet masks are written in dotted decimal notation (like the IP address itself), so the above mask would actually be written as:

255.255.255.0

If you have a home router (wired or wireless), you have probably already configured the mask for your home subnet provided by the router manufacturer and/or your broadband provider based on their network's/equipment's IP address. But, to give you an idea of how subnet masks are used on a Class B network with a number of subnets, we've included the following table.

Subnet Bits	Number of Subnets	Host Bits	Number of Hosts	Mask
0	0	16	65,534	255.255.0.0
1	-	15	-	Not Allowed
2	2	14	16,382	255.255.192.0
3	6	13	8,190	255.255.244.0
4	14	12	4,094	255.255.240.0
5	30	11	2,046	255.255.248.0
6	62	10	1,022	255.255.252.0
7	126	9	510	255.255.254.0
8	254	8	254	255.255.255.0
9	510	7	126	255.255.255.128
10	1,022	6	62	255.255.255.192
11	2,046	5	30	255.255.255.224
12	4,096	4	14	255.255.255.240
13	8,190	3	6	255.255.255.248
14	16,382	2	2	255.255.255.252
15	-	1	-	Not Allowed

Basically, the result is, the smaller the subnet mask (in bits), the larger the number of hosts (devices/applications) on the subnet. For example:

Subnet Bits	Subnets	Host Bits	Hosts
7	128	9	510
6	64	10	1,022

For folks who operate large, complex networks, using subnet masks and varying the number subnet bits allows them to “customize” their network to support large numbers of users/ devices/applications or networks and network connectivity. For home users, the important thing to remember is that the subnet mask you place in the configuration file of your home router is a key component in getting Internet traffic to and from your computing systems and web site.