

IP Addressing Guide

First Octet Ranges		Leading Bit Patterns				Formulas					
Class A: 1-127		0 (127 is reserved for loopback and internal testing)				N = Bits Borrowed			N = Host Bits		
Class B: 128-191		10				2 ⁿ = Total # of Subnets			2 ⁿ = Total # of Hosts		
Class C: 192-223		110				2 ⁿ - 2 = Usable Subnets			2 ⁿ - 2 = Usable Hosts		
Class D: 224-239		1110 (Reserved for multicast)				Note: You must borrow at least 2 bits and you must leave at least 2 bits					
Class E: 240-255		11110 (Reserved for experimental, used for resaerch)									
Max # of unique address in each class		Class A 2 ⁷ - 2 = 126				Class B 2 ¹⁴ - 2 = 16,382			Class C 2 ²¹ - 2 = 2,097,150		
Class A N.H.H.H						Class B N.N.H.H					
# of Bits Borrowed	Subnet Mask	Total Subnets	Usable Subnets	Total Hosts	Usable Hosts	# of Bits Borrowed	Subnet Mask	Total Subnets	Usable Subnets	Total Hosts	Usable Hosts
2	255.192.0.0	4	2	4,194,304	4,194,302	2	255.255.192.0	4	2	16,384	16,382
3	255.224.0.0	8	6	2,097,152	2,097,150	3	255.255.224.0	8	6	8,192	8,190
4	255.240.0.0	16	14	1,048,576	1,048,574	4	255.255.240.0	16	14	4,096	4,094
5	255.248.0.0	32	30	524,288	524,286	5	255.255.248.0	32	30	2,048	2,046
6	255.252.0.0	64	62	262,144	262,142	6	255.255.252.0	64	62	1,024	1,022
7	255.254.0.0	128	126	131,072	131,070	7	255.255.254.0	128	126	512	510
8	255.255.0.0	256	254	65,536	65,534	8	255.255.255.0	256	254	256	254
9	255.255.128.0	512	510	32,768	32,766	9	255.255.255.128	512	510	128	126
10	255.255.192.0	1,024	1,022	16,384	16,382	10	255.255.255.192	1,024	1,022	64	62
11	255.255.224.0	2,048	2,046	8,192	8,190	11	255.255.255.224	2,048	2,046	32	30
12	255.255.240.0	4,096	4,094	4,096	4,094	12	255.255.255.240	4,096	4,094	16	14
13	255.255.248.0	8,192	8,190	2,048	2,046	13	255.255.255.248	8,192	8,190	8	6
14	255.255.252.0	16,384	16,382	1,024	1,022	14	255.255.255.252	16,384	16,382	4	2
15	255.255.254.0	32,768	32,766	512	510	Class C N.N.N.H					
16	255.255.255.0	65,536	65,534	256	254	# of Bits Borrowed	Subnet Mask	Total Subnets	Usable Subnets	Total Hosts	Usable Hosts
17	255.255.255.128	131,072	131,070	128	126	2	255.255.255.192	4	2	64	62
18	255.255.255.192	262,144	262,142	64	62	3	255.255.255.224	8	6	32	30
19	255.255.255.224	524,288	524,286	32	30	4	255.255.255.240	16	14	16	14
20	255.255.255.240	1,048,576	1,048,574	16	14	5	255.255.255.248	32	30	8	6
21	255.255.255.248	2,097,152	2,097,150	8	6	6	255.255.255.252	64	62	4	2
22	255.255.255.252	4,194,304	4,194,302	4	2						