

Subnetting a Class C Network Number

Valid Ranges for Different Subnets of a Class C Network Number

Note, in the binary representations:

N represents a network bit

h represents a host bit

(B) - the information is in binary format

(D) - the information is in decimal format

Remember that a subnet portion of all zeros or all ones is invalid and cannot be used, per the RFC.

Subnet Bits: 0 NNNNNNNN.NNNNNNNN.NNNNNNNN.hhhhhhh
 Number of Subnets: 1
 Hosts per Subnet: 254
 Total Number of Hosts: 254
 Netmask: 255.255.255.0 or /24

Last Octet:	Subnet Bits (B)	Range of Values (D)	Network (D)	Broadcast (D)	Valid Host IP (D)
	hhhhhhh	0 - 255	0	255	1 - 254

Subnet Bits: 1 NNNNNNNN.NNNNNNNN.NNNNNNNN.Nhhhhhh
 Number of Subnets: 0
 Hosts per Subnet: 0
 Total Number of Hosts: 0
 Netmask: 255.255.255.128 or /25

Last Octet:	Subnet Bits (B)	Range of Values (D)	Network (D)	Broadcast (D)	Valid Host IP (D)
	0 hhhhhh	0 - 127	0	127	no valid hosts
	1 hhhhhh	128 - 255	128	255	no valid hosts

Subnet Bits: 2 NNNNNNNN.NNNNNNNN.NNNNNNNN.NNhhhhh
 Number of Subnets: 2
 Hosts per Subnet: 62
 Total Number of Hosts: 124
 Netmask: 255.255.255.192 or /26

Last Octet:	Subnet Bits (B)	Range of Values (D)	Network (D)	Broadcast (D)	Valid Host IP (D)
	00 hhhhhh	0 - 63	0	63	no valid hosts
	01 hhhhhh	64 - 127	64	127	65 - 126
	10 hhhhhh	128 - 191	128	191	129 - 190
	11 hhhhhh	192 - 255	192	255	no valid hosts

Subnet Bits: 3 NNNNNNNN.NNNNNNNN.NNNNNNNN.NNNhhhhh
 Number of Subnets: 6
 Hosts per Subnet: 30
 Total Number of Hosts: 180
 Netmask: 255.255.255.224 or /27

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Last Octet:	Subnet Bits (B)	Range of Values (D)	Network (D)	Broadcast (D)	Valid Host IP (D)
	000 hhhh	0 - 31	0	31	<i>no valid hosts</i>
	001 hhhh	32 - 63	32	63	33 - 62
	010 hhhh	64 - 95	64	95	65 - 94
	011 hhhh	96 - 127	96	127	97 - 126
	100 hhhh	128 - 159	128	159	129 - 158
	101 hhhh	160 - 191	160	191	161 - 190
	110 hhhh	192 - 223	192	223	193 - 222
	111 hhhh	224 - 255	224	255	<i>no valid hosts</i>

Subnet Bits: 4 NNNNNNNN.NNNNNNNN.NNNNNNNN.NNNNhhhh
 Number of Subnets: 14
 Hosts per Subnet: 14
 Total Number of Hosts: 196
 Netmask: 255.255.255.240 or /28

Last Octet:	Subnet Bits (B)	Range of Values (D)	Network (D)	Broadcast (D)	Valid Host IP (D)
	0000 hhhh	0 - 15	0	15	<i>no valid hosts</i>
	0001 hhhh	16 - 31	16	31	17 - 30
	0010 hhhh	32 - 47	32	47	33 - 46
	0011 hhhh	48 - 63	48	63	49 - 62
	0100 hhhh	64 - 79	64	79	65 - 78
	0101 hhhh	80 - 95	80	95	81 - 94
	0110 hhhh	96 - 111	96	111	97 - 110
	0111 hhhh	112 - 127	112	127	113 - 126
	1000 hhhh	128 - 143	128	143	129 - 142
	1001 hhhh	144 - 159	144	159	145 - 158
	1010 hhhh	160 - 175	160	175	161 - 174
	1011 hhhh	176 - 191	176	191	177 - 190
	1100 hhhh	192 - 207	192	207	193 - 206
	1101 hhhh	208 - 223	208	223	209 - 222
	1110 hhhh	224 - 239	224	239	225 - 238
	1111 hhhh	240 - 255	240	255	<i>no valid hosts</i>

Subnet Bits: 5 NNNNNNNN.NNNNNNNN.NNNNNNNN.NNNNNhhh
 Number of Subnets: 30
 Hosts per Subnet: 6
 Total Number of Hosts: 180
 Netmask: 255.255.255.248 or /29

Subnet Bits: 6 NNNNNNNN.NNNNNNNN.NNNNNNNN.NNNNNhh
 Number of Subnets: 62
 Hosts per Subnet: 2
 Total Number of Hosts: 124
 Netmask: 255.255.255.252 or /30