Subnetting

IP Address Classes

Class	Decimal Range of First Octet	First Bit(s) of First Octet	# of Networks	# of Hosts	Classful Mask Dotted Decimal	Classful Mask Prefix
	0 (Reserved)					
A	1 – 126	0	126	16,777,214	255.0.0.0	/8
	127 (Reserved)					
B	128 – 191	10	16,384	65,534	255.255.0	/16
C	192 – 223	110	2,097,152	254	255.255.255.0	/24
D (multicast)	224 – 239	1110				
E (experimental)	240 – 254	11110				
	255 (Reserved)					

Subnetting

192.168.63.0/24

Or a mask of 255.255.255.0

	Network
Id host bits = 0	0000 0000 0
1st usable address	0000 0001 1
Last usable address	1111 1110 254
b/c address host bits = 1	1111 1111 255

Network

	Last octet (binary)	Last octet (decimal)	IP Address
Id host bits = 0	0000 0000	0	192.168.63.0
1st usable address	0000 0001	1	192.168.63.1
Last usable address	1111 1110	254	192.168.63.254
b/c address host bits = 1	1111 1111	255	192.168.63.255

Subnetting

192.168.63.0/25

Or a mask of 255.255.255.128

	2 subnets	
Subnet	0	1
Id host bits = 0	0000 0000 0	1000 0000 128
1st usable address	0000 0001 1	1000 0001 129
Last usable address	0111 1110 126	1111 1110 254
b/c address host bits = 1	0111 1111 127	1111 1111 255

Subnet 1 – 2nd subnet

	Last octet (binary)	Last octet (decimal)	IP Address
Id host bits = 0	1000 0000	128	192.168.63.128
1st usable address	1000 0001	129	192.168.63.129
Last usable address	1111 1110	254	192.168.63.254
b/c address host bits = 1	1111 1111	255	192.168.63.255

Subnetting

192.168.63.0/26

Or a mask of 255.255.255.192

	4 subnets			
Subnet	00	01	10	11
Id host bits = 0	0000 0000 0	0100 0000 64	1000 0000 128	1100 0000 192
1st usable address	0000 0001 1	0100 0001 65	1000 0001 129	1100 0001 193
Last usable address	0011 1110 62	0111 1110 126	1011 1110 190	1111 1110 254
b/c address host bits = 1	0011 1111 63	0111 1111 127	1011 1111 191	1111 1111 255

Subnet 2 – 3rd subnet

	Last octet (binary)	Last octet (decimal)	IP Address
Id host bits = 0	1000 0000	128	192.168.63.128
1st usable address	1000 0001	129	192.168.63.129
Last usable address	1011 1110	190	192.168.63.190
b/c address host bits = 1	1011 1111	191	192.168.63.191

Subnetting

192.168.63.0/27

Or a mask of 255.255.255.224

	8 subnets							
Subnet	000	001	010	011	100	101	110	111
Id host bits = 0	0000 0000 0	0010 0000 32	0100 0000 64	0110 0000 96	1000 0000 128	1010 0000 160	1100 0000 192	1110 0000 224
1st usable address	0000 0001 1	0010 0001 33	0100 0001 65	0110 0001 97	1000 0001 129	1010 0001 161	1100 0001 193	1110 0001 225
Last usable address	0001 1110 30	0011 1110 62	0101 1110 94	0111 1110 126	1001 1110 158	1011 1110 190	1101 1110 222	1111 1110
b/c address host bits = 1	0001 1111 31	0011 1111 63	0101 1111 95	0111 1111 127	1001 1111 159	1011 1111 191	1101 1111 223	1111 1111 255

Subnet 5 – 6th subnet

	Last octet (binary)	Last octet (decimal)	IP Address
Id host bits = 0	1010 0000	128	192.168.63.128
1st usable address	1010 0001	129	192.168.63.129
Last usable address	1011 1110	158	192.168.63.158
b/c address host bits = 1	1011 1111	159	192.168.63.159