

# Subnetting

## Problem 1

Number of needed subnets **14**

Number of needed usable hosts **14**

Network Address **192.10.10.0**

Address class     C    

Default subnet mask     255 . 255 . 255 . 0    

Custom subnet mask     255 . 255 . 255 . 240    

Total number of subnets           16          

Total number of host addresses           16          

Number of usable addresses           14          

Number of bits borrowed           4          

What is the 4th subnet range?     192.10.10.48 to 192.10.10.63    

What is the subnet number for the 8th subnet?     192 . 10 . 10 . 112    

What is the subnet broadcast address for the 13th subnet?     192 . 10 . 10 . 207    

What are the assignable addresses for the 9th subnet?     192.10.10.129 to 192.10.10.142

Show your work for Problem 1 in the space below.

	256	128	64	32	16	8	4	2	-	Number of Hosts
Number of Subnets	-	2	4	8	16	32	64	128	256	
	128	64	32	16	8	4	2	1	-	Binary values
<b>192.10.10.0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	

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(1)	0	0	0	0	0	192.10.10.0	to	192.10.10.15
(2)	0	0	0	1		192.10.10.16	to	192.10.10.31
(3)	0	0	1	0		192.10.10.32	to	192.10.10.47
(4)	0	0	1	1		192.10.10.48	to	192.10.10.63
(5)	0	1	0	0		192.10.10.64	to	192.10.10.79
(6)	0	1	0	1		192.10.10.80	to	192.10.10.95
(7)	0	1	1	0		192.10.10.96	to	192.10.10.111
(8)	0	1	1	1		192.10.10.112	to	192.10.10.127
(9)	1	0	0	0		192.10.10.128	to	192.10.10.143
(10)	1	0	0	1		192.10.10.144	to	192.10.10.159
(11)	1	0	1	0		192.10.10.160	to	192.10.10.175
(12)	1	0	1	1		192.10.10.176	to	192.10.10.191
(13)	1	1	0	0		192.10.10.192	to	192.10.10.207
(14)	1	1	0	1		192.10.10.208	to	192.10.10.223
(15)	1	1	1	0		192.10.10.224	to	192.10.10.239
(16)	1	1	1	1		192.10.10.240	to	192.10.10.255

$$\begin{array}{r}
 128 \\
 64 \\
 32 \\
 +16 \\
 \hline
 \text{Custom subnet mask } 240
 \end{array}$$

$$\begin{array}{r}
 16 \\
 -2 \\
 \hline
 \text{Usable subnets } 14
 \end{array}$$

$$\begin{array}{r}
 16 \\
 -2 \\
 \hline
 \text{Usable hosts } 14
 \end{array}$$

The binary value of the last bit borrowed is the range. In this problem the range is 16.

The first address in each subnet range is the subnet number.

The last address in each subnet range is the subnet broadcast address.

# Subnetting

## Problem 2

Number of needed subnets **1000**

Number of needed usable hosts **60**

Network Address **165.100.0.0**

Address class     *B*    

Default subnet mask     *255 . 255 . 0 . 0*    

Custom subnet mask     *255 . 255 . 255 . 192*    

Total number of subnets     *1,024*    

Total number of host addresses     *64*    

Number of usable addresses     *62*    

Number of bits borrowed     *10*    

What is the 15th  
subnet range?     *165.100.3.128 to 165.100.3.191*    

What is the subnet number  
for the 6th subnet?     *165 . 100 . 1 . 64*    

What is the subnet  
broadcast address for  
the 6th subnet?     *165 . 100 . 1 . 127*    

What are the assignable  
addresses for the 9th  
subnet?     *165.100.2.1 to 165.100.0.62*

