

IP Address Classes

Class A	1	127	(Network 127 is reserved for loopback and internal testing)		
			Leading bit pattern	0	00000000.00000000.00000000.00000000
					Network Host Host Host
Class B	128	191	Leading bit pattern	10	10000000.00000000.00000000.00000000
					Network Network Host Host
Class C	192	223	Leading bit pattern	110	11000000.00000000.00000000.00000000
					Network Network Network Host
Class D	224	239	(Reserved for multicast)		
Class E	240	255	(Reserved for experimental, used for research)		

Private Address Space

Class A	10.0.0.0 to 10.255.255.255
Class B	172.16.0.0 to 172.31.255.255
Class C	192.168.0.0 to 192.168.255.255

Default Subnet Masks

Class A	255.0.0.0
Class B	255.255.0.0
Class C	255.255.255.0

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Inside Cover

Binary To Decimal Conversion

128	64	32	16	8	4	2	1	Answers	Scratch Area
1	0	0	1	0	0	1	0	<u>146</u>	$\begin{array}{r} 128 \\ 16 \\ 2 \\ \hline 146 \end{array}$
0	1	1	1	0	1	1	1	<u>119</u>	$\begin{array}{r} 64 \\ 32 \\ 16 \\ 4 \\ 2 \\ 1 \\ \hline 119 \end{array}$
1	1	1	1	1	1	1	1	_____	
1	1	0	0	0	1	0	1	_____	
1	1	1	1	0	1	1	0	_____	
0	0	0	1	0	0	1	1	_____	
1	0	0	0	0	0	0	1	_____	
0	0	1	1	0	0	0	1	_____	
0	1	1	1	1	0	0	0	_____	
1	1	1	1	0	0	0	0	_____	
0	0	1	1	1	0	1	1	_____	
0	0	0	0	0	1	1	1	_____	
								00011011	_____
								10101010	_____
								01101111	_____
								11111000	_____
								00100000	_____
								01010101	_____
								00111110	_____
								00000011	_____
								11101101	_____
								11000000	_____

Decimal To Binary Conversion

Use all 8 bits for each problem

128	64	32	16	8	4	2	1 =	255	Scratch Area	
1	1	1	0	1	1	1	0	238	238	34
									-128	-32
0	0	1	0	0	0	1	0	34	110	2
									-64	-2
								123	46	0
									-32	
								50	14	
									-8	
								255	6	
									-4	
								200	2	
									-2	
								10	0	
								138		
								1		
								13		
								250		
								107		
								224		
								114		
								192		
								172		
								100		
								119		
								57		
								98		
								179		
								2		

Address Class Identification

Address	Class
10.250.1.1	_____
150.10.15.0	_____
192.14.2.0	_____
148.17.9.1	_____
193.42.1.1	_____
126.8.156.0	_____
220.200.23.1	_____
230.230.45.58	_____
177.100.18.4	_____
119.18.45.0	_____
249.240.80.78	_____
199.155.77.56	_____
117.89.56.45	_____
215.45.45.0	_____
199.200.15.0	_____
95.0.21.90	_____
33.0.0.0	_____
158.98.80.0	_____
219.21.56.0	_____

Network & Host Identification

Circle the network portion of these addresses:

177.100.18.4

119.18.45.0

209.240.80.78

199.155.77.56

117.89.56.45

215.45.45.0

192.200.15.0

95.0.21.90

33.0.0.0

158.98.80.0

217.21.56.0

10.250.1.1

150.10.15.0

192.14.2.0

148.17.9.1

193.42.1.1

126.8.156.0

220.200.23.1

Circle the host portion of these addresses:

10.15.123.50

171.2.199.31

198.125.87.177

223.250.200.222

17.45.222.45

126.201.54.231

191.41.35.112

155.25.169.227

192.15.155.2

123.102.45.254

148.17.9.155

100.25.1.1

195.0.21.98

25.250.135.46

171.102.77.77

55.250.5.5

218.155.230.14

10.250.1.1

Default Subnet Masks

Write the correct default subnet mask for each of the following addresses:

177.100.18.4 255 . 255 . 0 . 0

119.18.45.0 _____

191.249.234.191 _____

223.23.223.109 _____

10.10.250.1 _____

126.123.23.1 _____

223.69.230.250 _____

192.12.35.105 _____

77.251.200.51 _____

189.210.50.1 _____

88.45.65.35 _____

128.212.250.254 _____

193.100.77.83 _____

125.125.250.1 _____

1.1.10.50 _____

220.90.130.45 _____

134.125.34.9 _____

95.250.91.99 _____

ANDING With Default subnet masks

Every IP address must be accompanied by a subnet mask. By now you should be able to look at an IP address and tell what class it is. Unfortunately your computer doesn't think that way. For your computer to determine the network and subnet portion of an IP address it must AND the IP address with the subnet mask.

Default Subnet Masks:

Class A 255.0.0.0
 Class B 255.255.0.0
 Class C 255.255.255.0

ANDING Equations:

1 AND 1 = 1
 1 AND 0 = 0
 0 AND 1 = 0
 0 AND 0 = 0

Sample:

What you see...

IP Address: 192 . 100 . 10 . 33

What you can figure out in your head...

Address Class: C
 Network Portion: **192 . 100 . 10 . 33**
 Host Portion: 192 . 100 . 10 . **33**

In order for your computer to get the same information it must AND the IP address with the subnet mask in binary.

	Network	Host
IP Address:	1 1 0 0 0 0 0 0 . 1 1 0 0 1 0 0 . 0 0 0 0 1 0 1 0	0 0 1 0 0 0 0 1
Default Subnet Mask:	1 1 1 1 1 1 1 1 . 1 1 1 1 1 1 1 1 . 1 1 1 1 1 1 1 1	0 0 0 0 0 0 0 0
AND:	1 1 0 0 0 0 0 0 . 1 1 0 0 1 0 0 . 0 0 0 0 1 0 1 0	0 0 0 0 0 0 0 0
		(192 . 100 . 10 . 33)
		(255 . 255 . 255 . 0)
		(192 . 100 . 10 . 0)

ANDING with the default subnet mask allows your computer to figure out the network portion of the address.