IPv4 Addressing and Subnetting

Workbook

Version 2.1

11111110

10010101

00011011

10000110

11010011

Student Name:

IPv4 Address Classes

Class A	1 – 127	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)		

Speciality Address Ranges

Loopback -	Only the single 127.0.0.1 address is used, addresses 127.0.0.0 to 127.255.255.255 are reserved. Any address within this block will loop back to the local host.
Link-Local Addresses -	IPv4 addresses in the address block 169.254.0.0 to 169.254.255.255 (169.254.0.0/16) are designated as link-local addresses.
TEST-NET Addresses -	The address block 192.0.2.0 to 192.0.2.255 (192.0.2.0/24) is set aside for teaching and learning purposes.
Experimental Addresses -	The addresses in the block 240.0.0.0 to 255.255.255.254 are listed as reserved for future use (RFC 3330).

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

Produced by: Robb Jones
Robert.Jones@fcps.org
Frederick County Career & Technology Center
Cisco Networking Academy
Frederick County Public Schools
Frederick, Maryland, USA

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Binary To Decimal Conversion

128	64	32	16	8	4	2	1	Answers
1	0	0	1	0	0	1	0	146
0	1	1	1	0	1	1	1	119
1	1	1	1	1	1	1	1	255
1	1	0	0	0	1	0	1	197
1	1	1	1	0	1	1	0	246
0	0	0	1	0	0	1	1	19
1	0	0	0	0	0	0	1	129
0	0	1	1	0	0	0	1	49
0	1	1	1	1	0	0	0	88
1	1	1	1	0	0	0	0	240
0	0	1	1	1	0	1	1	59
0	0	0	0	0	1	1	1	7
						00011011		27
						10101010		170
						01101111		111
						11111000		248
						00100000		32
						01010101		85
						00111110		62
						00000011		3
						11101101		237
						11000000		192

Scratch Area

128 64
16 32
2 16
146 4
2
1
119

Decimal To Binary Conversion

Use all 8 bits for each problem

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

Scratch Area

```
238
-128
 110
 -64
  46
 -32
  14
  -8
   6
  -4
   2
  -2
   0
```

```
34
-32
 2
-2
 0
```

Address Class Identification

Address	Class
10.250.1.1	A
150.10.15.0	B
192.14.2.0	C
148.17.9.1	B
193.42.1.1	C
126.8.156.0	A
220.200.23.1	C
230.230.45.58	D
177.100.18.4	B
119.18.45.0	A
249.240.80.78	E
199.155.77.56	C
117.89.56.45	A
215.45.45.0	C
199.200.15.0	C
95.0.21.90	A
33.0.0.0	A
158.98.80.0	C
219.21.56.0	C

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

Network Addresses

Using the IP address and subnet mask shown write out the network address:

188.10.18.2
255.255.0.0 — 188 . 10 . 0 . 0

10.10.48.80
255.255.255.0 — 10 . 10 . 48 . 0

192.149.24.191
255.255.255.0 — 192 . 149 . 24 . 0

150.203.23.19
255.255.0.0 — 150 . 203 . 0 . 0

10.10.10.10
255.0.0.0 — 10 . 0 . 0 . 0

186.13.23.110
255.255.255.0 — 186 . 13 . 23 . 0

223.69.230.250
255.255.0.0 — 223 . 69 . 0 . 0

200.120.135.15
255.255.255.0 — 200 . 120 . 135 . 0

27.125.200.151
255.0.0.0 — 27 . 0 . 0 . 0

199.20.150.35
255.255.255.0 — 199 . 20 . 150 . 0

191.55.165.135
255.255.255.0 — 191 . 55 . 165 . 0

28.212.250.254
255.255.0.0 — 28 . 212 . 0 . 0

Host Addresses

Using the IP address and subnet mask shown write out the host address:

188.10.18.2
255.255.0.0 — 0.0.18.2

10.10.48.80
255.255.255.0 — 0.0.0.80

222.49.49.11
255.255.255.0 — 0.0.0.11

128.23.230.19
255.255.0.0 — 0.0.230.19

10.10.10.10
255.0.0.0 — 0.10.10.10

200.113.123.11
255.255.255.0 — 0.0.0.11

223.169.23.20
255.255.0.0 — 0.0.23.20

203.20.35.215
255.255.255.0 — 0.0.0.215

117.15.2.51
255.0.0.0 — 0.15.2.51

199.120.15.135
255.255.255.0 — 0.0.0.135

191.55.165.135
255.255.255.0 — 0.0.0.135

48.21.25.54
255.255.0.0 — 0.0.25.54

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	255.0.0.0
191.249.234.191	255.255.0.0
223.23.223.109	255.255.255.0
10.10.250.1	255.0.0.0
126.123.23.1	255.0.0.0
223.69.230.250	255.255.255.0
192.12.35.105	255.255.255.0
77.251.200.51	255.0.0.0
189.210.50.1	255.256.0.0
88.45.65.35	255.0.0.1
128.212.250.254	255.255.0.0
193.100.77.83	255.255.255.0
125.125.250.1	255.0.0.0
1.1.10.50	255.0.0.0
220.90.130.45	255.255.255.0
134.125.34.9	255.255.0.0
95.250.91.99	255.0.0.0