CHAPTER 4

IP Addresses: Classful Addressing

Exercises

1.

a. $2^8 = 256$

b. $2^{16} = 65536$

c. $2^{64} = 1.846744737 \times 10^{19}$

3. $3^{10} = 59{,}049$

5.

a. 0x72220208

b. 0x810E0608

c. 0xD022360C

d. 0xEE220201

e. 0xF1220208

7.

a. 8/4 = 2

b. 16/4 = 4

c. 24/4 = 6

9.

a. Class C

b. Class D

c. Class A

d. Class B

e. Class E

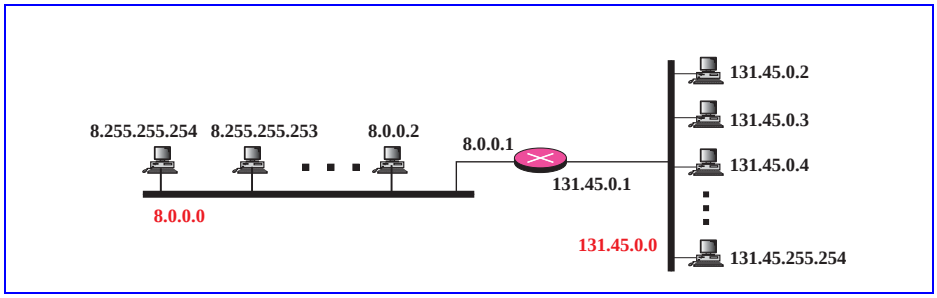
11.

a. netid: 114 **hostid: 34.2.8**
b. netid: 132.56 **hostid: 8.6**
c. netid: 208.34.54 **hostid: 12**

13. This message must travel through a router because the netids of the two addresses are different (128.23 versus 128.45).

15. Network 8.0.0.0: Class A Network 131.45.0.0: Class B **See Figure 4.1.**

Figure 4.1 *Exercise 15*



17. Source address: 108.67.18.70 **Destination address: 255.255.255.255**

19. Source address: 123.27.19.24 **Destination address: 0.67.89.56**

21. An address such as ***x.y.z.t/32*** means that the network is just one node.

23. Subtract the 2 addresses; the result is 146 + 96 × 256 = 24722. Subtracting 1, we get 24,721 addresses.

25. The first, second, and the fourth bytes can be easily found. We need to apply the AND operator to the third byte.

IP Address:	125	.	134	.	112	.	66
Mask:	**255**	**.**	**255**	**.**	**224**	**.**	**0**
	------		------		------		------
Subnet Address:	**125**	.	**134**	.	**96**	.	0

To find the value of the third byte, we directly apply the AND operator definition to 112 and 224.

First Number: 112	0	1	1	1	0	0	0	0
Second Number: 224	**1**	**1**	**1**	**0**	**0**	**0**	**0**	**0**
ANDed result: 96	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**0**

27.

a. $2^x = 1024$ $x = \log_2 1024 = 10$ mask is **255.255.192.0**

b. $2^x = 256$ $x = \log_2 256 = 8$ mask is **255.255.255.0**

c. $2^x = 32$ $x = \log_2 32 = 5$ mask is **255.255.255.248**

d. $2^x = 4$ $x = \log_2 4 = 2$ mask is **255.255.255.192**