Subnetting

Bogdan Tatu – Gr. 3.1

1.
   a. A. What is the first valid host on the subnetwork that the node 172.17.4.114/23 belongs to? 172.17.4.1

172.17.4.114	10101100.00010001.00000100.01110010
255.255.254.0	11111111.11111111.11111110.00000000
172.17.4.0/23	10101100.00010001.00000100.00000000
First Host	172.17.4.1/23

   b. What valid host range is the IP address 172.25.28.250/23 a part of? 172.25.28.1 through to 172.25.29.254

172.25.28.250	10101100.00011001.00011100.11111010
255.255.254.0	11111111.11111111.11111110.00000000
172.25.28.0/23	10101100.00011001.00011100.00000000

Network Address	172.25.28.0/23
First Host	172.25.28.1/23
Last Host	172.25.29.254/23
Broadcast Address	172.25.29.255/23

2. Starting from:

IP Address	251.100.8.6/22

251.100.8.6	11111011.01100100.00001000.00000110
255.255.252.0	11111111.11111111.11111100.00000000
251.100.8.0/22	11111011.01100100.00001000.00000000

1st network: 90 hosts => 92 addresses < 128 => 7 bits => 22 (original) + 2 + 1 (loaned)

2nd Network: 32 hosts => 34 addresses < 64 => 6 bits => 23 (network) + 2 + 1 (loaned)

3rd Network: 7 hosts => 9 addresses < 16 => 4 bits => 24 (network) + 3 + 1 (loaned)

4th Network: 7 hosts => 9 addresses < 16 => 4 bits => 25 (network) + 2 + 1 (loaned)

26 bits loaned => 6 bits left

2 hosts => 4 addresses <= 4 => 2 bits needed => 6-2 = 4 networks

1st Network			
Network Address	251.100.8.0/25	11111011.01100100.00001000.00000000	
First Host	251.100.8.1/25	11111011.01100100.00001000.00000001	
Last Host	251.100.8.126/25	11111011.01100100.00001000.01111110	
Broadcast Address	251.100.8.127/25	11111011.01100100.00001000.01111111	a
2nd Network			
Network Address	251.100.8.128/26	11111011.01100100.00001000.10000000	
First Host	251.100.8.129/26	11111011.01100100.00001000.10000001	
Third Host	251.100.8.129/26	11111011.01100100.00001000.10000001	b
Last Host	251.100.8.190/26	11111011.01100100.00001000.10111110	
Broadcast Address	251.100.8.191/26	11111011.01100100.00001000.10111111	
3rd Network			
Network Address	251.100.8.192/28	11111011.01100100.00001000.11000000	
First Host	251.100.8.193/28	11111011.01100100.00001000.11000001	c
Last Host	251.100.8.206/28	11111011.01100100.00001000.11001110	
Broadcast Address	251.100.8.207/28	11111011.01100100.00001000.11001111	
4th Network			
Network Address	251.100.8.208/28	11111011.01100100.00001000.11010000	
First Host	251.100.8.209/28	11111011.01100100.00001000.11010001	
Last Host	251.100.8.222/28	11111011.01100100.00001000.11011110	
Broadcast Address	251.100.8.223/28	11111011.01100100.00001000.11011111	
		11111011.01100100.00001000.11100000	