

Solutions to selected exercises in chapter. 18

P. 18.1

a) 2^{12} addresses $(2^{12} - 1)_{256} = 15.255$

first: 16.12.64.0/20 last: 16.12.79.255/20

b) Prefix length for each organization = $32 - \log_2 256 = 24$

Block	First	last	Prefix
1	16.12.64.0/24	16.12.64.255/24	24
2	16.12.65.0/24	16.12.65.255/24	24
3	16.12.66.0/24	16.12.66.255/24	24
4	16.12.67.0/24	16.12.67.255/24	24
5	16.12.68.0/24	16.12.68.255/24	24
6	16.12.69.0/24	16.12.69.255/24	24
7	16.12.70.0/24	16.12.70.255/24	24
8	16.12.71.0/24	16.12.71.255/24	24
Unassigned	16.12.72.0/21	16.12.79.255/21	21

Forwarding table

c)

Prefix	interface
0001000 00001100 01000000	m1
0001000 00001100 01000001	m2
0001000 00001100 01000010	m3
0001000 00001100 01000011	m4
0001000 00001100 01000100	m5
0001000 00001100 01000101	m6
0001000 00001100 01000110	m7
0001000 00001100 01000111	m8
0001000 00001100 01001	Discard
Default	m0

P. 18.2 : Total number of addresses: $2^8 = 256$

Block	Range	Prefix
0	00000000 to 00111111	00
1	01000000 to 01111111	01
2	10000000 to 10111111	10
3	11000000 to 11111111	11

Forwarding table

Prefix	Interface
00	m0
01	m1
10	m2
11	m3

- P. 18.3
- a) 0.0.0.0
 - b) 255.252.0.0
 - c) 255.255.255.252

P. 18.5 $N = 2^{32-n}$

a) $N = 2^{32}$

b) $N = 2^{18}$

c) $N = 1$

P. 18.6 $n = 32 - \log_2 N$

a) $n = 32$

b) $n = 22$

c) $n = 0$

- P. 18.8
- a) B
 - b) C
 - c) E

P. 18.9

a) $N = 64$

b) $n = 32 - 6 = 26$

c) First: 130.56.0.0/26 last: 130.56.0.63/26

d) $(1023 \times 64)_{256} = (0.0.255.192)$ add to the ones from (c):

first: 130.56.255.192/26 last: 130.56.255.255/26

P. 18.10

0.0.0.0/0

P. 18.11

a) A

b) D

c) C

P. 18.12

yes only from interfaces m0, m1 or m2, it will be forwarded to default router R2.

P. 18.14

a) $N = 2^{(32-21)} = 2048$

$(2047)_{256} = 7.255$

first: 80.70.56.0/21

Last 80.70.63.255/21

b)

Block	Size	First	Last
1	512	80.70.56.0/23	80.70.57.255/23
2	512	80.70.58.0/23	80.70.59.255/23
3	256	80.70.60.0/24	80.70.60.255/24
4	256	80.70.61.0/24	80.70.61.255/24
5	64	80.70.62.0/26	80.70.62.63/26
6	64	80.70.62.64/26	80.70.62.127/26
7	64	80.70.62.128/26	80.70.62.191/26
unused	320	80.70.62.192/21	80.70.63.255/21

Prefix	Interface
01010000 01000110 00111100	m1
01010000 01000110 00111101	m2
01010000 01000110 00111100	m3
01010000 01000110 00111101	m4
01010000 01000110 00111100	m5
01010000 01000110 00111101	m6
01010000 01000110 00111101	m7
01010000 01000110 00111101	Discard
01010000 01000110 00111101	Discard
Default	m0

P.18.16

a) $N = 2^9 = 512$

Block	Range	Prefix
0	00000000 to 00011111	000
1-1	00100000 to 00111111	001
1-2	01000000 to 01111111	01
2	10000000 to 11111111	1

forwarding table

prefix	interface
000	m0
001	m1
01	m1
1	m2

P.18.18.

- a) 11
- b) 12
- c) 25

p. 18. 20 :

- a) 14.12.72.0/24 to 14.12.72.255/24
b) 200.107.0.0/18 to 200.107.63.255/18
c) ~~200.107.0.0/18~~
70.110.0.0/16 to 70.110.255.255/16

