EE 450

HW #4

Name : Shih-Ju Hsu

Ch4

P8.

a.

Prefix Match	link Interface
11100000 00	0
11100000 01000000	1
1110 0000	2
11100001 0	2
otherwise	3

b. ① 11001000 10010001 01010001 01010101

⇒ no match from the prefix

⇒ interface 3 *

② 11100001 01000000 11000011 00111100

⇒ match ⇒ interface 2 *

③ 11100001 10000000 00010001 01110111

⇒ no match from the prefix ⇒ interface 3 *

Ch4
P9

Destination Address Range	Interface	# of address
0000 0000 through 0011 1111	0	$2^6 = 64$
0100 0000 through 0101 1111	1	$2^5 = 32$
0110 0000 through 1011 1111	2	$2^5 + 2^6 = 96$
1100 0000 through 1111 1111	3	$2^6 = 64$

Ch4

P10

Destination Address Range	Interface	# of address
1100 0000 through 1101 1111	0	$2^5 = 32$
1000 0000 through 1011 1111	1	$2^6 = 64$
1110 0000 through 1111 1111	2	$2^5 = 32$
0000 0000 through 0111 1111	3	$2^7 = 128$

Ch4

P11

Subnet 1 supports 60 interfaces ($2^6 = 64$)

⇒ requires 6 bits ⇒ /26

the last 8 bits are 10_ _ _ _ _ _

⇒ 223.1.17.128/26 #

Subnet 2 supports 90 interfaces ($2^7 = 128$)

⇒ requires 7 bits ⇒ /25

the last 8 bits are 0_ _ _ _ _ _ _

⇒ 223.1.17.0/25 #

Subnet 3 supports 12 interfaces ($2^4 = 16$)

⇒ requires 4 bits ⇒ /28

the last 8 bits are 1100_ _ _ _

⇒ 223.1.17.192/28 #

Ch4
P12

Prefix Match	Interface
200.23.16/21	0
200.23.24/24	1
200.23.24/21	2
otherwise	3

Ch4
P13

Prefix Match	link Interface
224.0 /10	0
224.64 /16	1
224 /8	2
225.0 /9	2
otherwise	3

Ch4

P14.

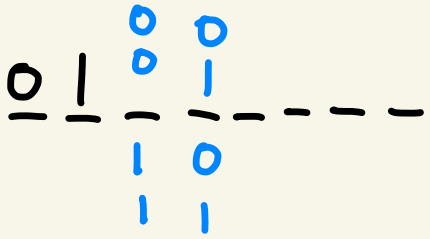
(1)

128.119.40.129 is an IP address that can be assigned to 128.119.40.128/x

(2)

we need 2 bits to create 4 blocks

hence, the last 8 bits should be



128.119.40.64/28

⇒ the prefix will be 128.119.40.80/28

128.119.40.96/28

128.119.40.112/28

Ch4

P15. 214.97.254/23

a. A needs 8 bits ⇒ 214.97.255/24

B needs 7 bits ⇒ 214.97.254.0/25 – 214.97.254.0/29

C needs 7 bits ⇒ 214.97.254.128/25

D needs 1 bit ⇒ 214.97.254.0/31

E needs 1 bit ⇒ 214.97.254.2/31

F needs 1 bit ⇒ 214.97.254.4/30

b.

R1

Longest Prefix Match	Interface
11010110 01100001 1111111 214.97.255/24	Subnet A
11010110 01100001 1111110 0000000 214.97.254.0/31	Subnet D
11010110 01100001 1111110 000001 214.97.254.4/30	Subnet F

Ch4
P15
(cont.)

R2

Longest Prefix Match	Interface
11010110 01100001 11111101 214.97.254.128/25	Subnet C
11010110 01100001 11111110 0000001 214.97.254.2/31	Subnet E
11010110 01100001 11111110 000001 214.97.254.4/30	Subnet F

R3

Longest Prefix Match	Interface
11010110 01100001 11111100 214.97.254.0/25	Subnet B
11010110 01100001 11111110 0000000 214.97.254.0/31	Subnet D
11010110 01100001 11111110 0000001 214.97.254.2/31	Subnet E

Ch5

P3

(distance, previous node)

step	seen nodes	t	u	v	w	y	z
0	x	∞	∞	3, x	6, x	6, x	8, x
1	xv	7, v	6, v		6, x	6, x	8, x
2	xvu	7, v			6, x	6, x	8, x
3	xvuw	7, v				6, x	8, x
4	xvuwy	7, v					8, x
5	xvuwyt						8, x
6	xvuwytz						

shortest distance from x to $\begin{cases} t = 7 \\ u = 6 \\ v = 3 \\ w = 6 \\ y = 6 \\ z = 8 \end{cases}$ ✅

Ch5

P5

from \ to	u	v	x	y	z
u					
v					
x					
y					
z	∞	6	2	∞	0

⇓

from \ to	u	v	x	y	z
u	0	1	∞	2	∞
v	1	0	3	∞	6
x	∞	3	0	3	2
y	2	∞	3	0	∞
z	7	5	2	5	0

⇓

from \ to	u	v	x	y	z
u	0	1	4	2	6
v	1	0	3	3	5
x	4	3	0	3	2
y	2	3	3	0	5
z	6	5	2	5	0

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