데이터 통신 공학 과제 2

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CHAP9

P9-6. Assume Alice is travelling from 2020 Main Street in Los Angeles to 1432 American Boulevard in Chicago. If she is travelling by air from Los Angeles Airport to Chicago Airport,

a. find the end-to-end addresses in this scenario.

Source address : 1432 American Boulevard

Destination address : 2020 Main street

b. find the link-layer addresses in this scenario.

Source address : 1432 American Boulevard

Destination address : 2020 Main street

P9-7. In the previous problem, assume Alice cannot find a direct flight from the Los Angeles to the Chicago. If she needs to change flights in Denver,

a. find the end-to-end addresses in this scenario.

Source address : 1432 American Boulevard

Destination address : 2020 Main street

b. find the link-layer addresses in this scenario.

2020 Main Street => Los Angeles Airport => Denver => Chicago Airport => 1432 American Boulevard

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P9-14. In Figures 9.11 to 9.13, both the forwarding table and ARP are doing a kind of mapping. Show the difference between them by listing the input and output of mapping for a forwarding table and ARP.

Dest Phy | Sour Phy | Sour IP | Dest IP | Data

Alice Site

Input : Na | Nb | Data

Output : L1 | La | Na | Nb | Data

R1

Input : L1 | La | Na | Nb | Data

Output : L3 | L2 | Na | Nb | Data

R2

Input : L3 | L2 | Na | Nb | Data

Output : Lb | L4 | Na | Nb | Data

P9-15. Figure 9.7 shows a system as either a host or a router. What would be the actual entity (host or router) of system A and B in each of the following cases:

a. If the link is the first one in the path?

link가 처음이라면 두 시스템 모두 host일수밖에 없다.

b. If the link is the middle one in the path?

link가 시스템의 중간에 있다면 A,B는 router일수 밖에 없다

c. If the link is the last one in the path?

link가 시스템의 종단에 있다면 host일수도 router일수도있가.

d. If there is only one link in the path (local communication)?

host이어야만한다.

CHAP11

P11-2. Unstuff the following frame payload in which E is the escape byte, F is the flag byte, and D is a data byte other than an escape or a flag character.

E	E	D	E	F	D	D	E	F	E	E	D	D	D	

EDFDDFEDDD

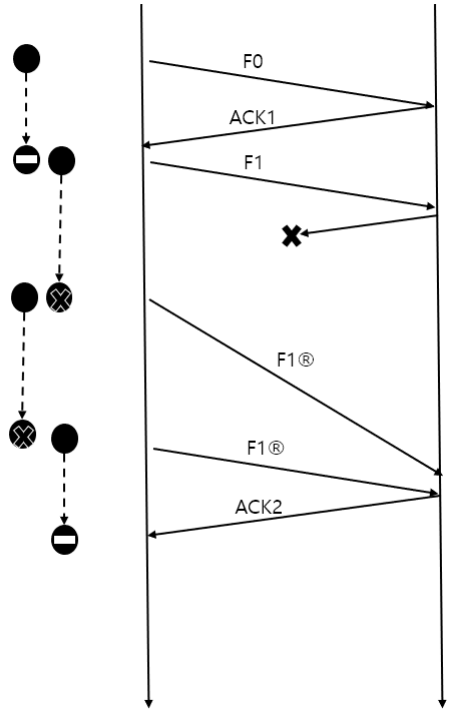
P11-3. Bit-stuff the following frame payload:

000111111100111110100011111111110000111

000111110110011111001000111110111110100000111

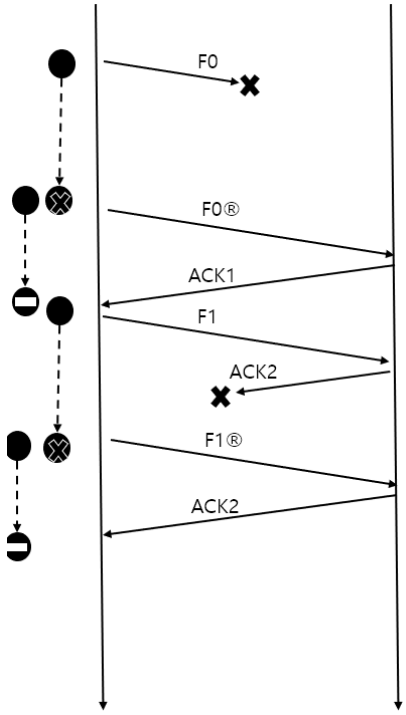
P11-7. Redraw Figure 11.12 using the following scenario:

> a. The first frame is sent and acknowledged.
> b. The second frame is sent and acknowledged, but the acknowledgment is lost.
> c. The second frame is resent, but it is timed-out.
> d. The second frame is resent and acknowledged.



P11-8. Redraw Figure 11.12 using the following scenario:

> a. Frame 0 is sent, but lost.
> b. Frame 0 is resent and acknowledged.
> c. Frame 1 is sent and acknowledged, but the acknowledgment is lost.
> d. Frame 1 is resent and acknowledged.



CHAP12

P12-15. Assume that there are only two stations, A and B, in a bus CSMA/CD network. The distance between the two stations is 2000 m and the propagation speed is 2 × 10^8 m/s. If station A starts transmitting at time t1:

a. Does the protocol allow station B to start transmitting at time t1 + 8 μs? If

the answer is yes, what will happen?

(A에서 B까지 도착하는 시간)= propagation Time = 2000 / 2* 10^8 = 1/10^5 = 10us

B에서 전송을 허락한다. 그럴 경우 2us후에는 Colision detection이 충돌을 감지하고 전송을 실패한채 jamming signal을 보내고 Backoff time을 대기하게된다.

b. Does the protocol allow station B to start transmitting at time t1 + 11 μs? If

the answer is yes, what will happen?

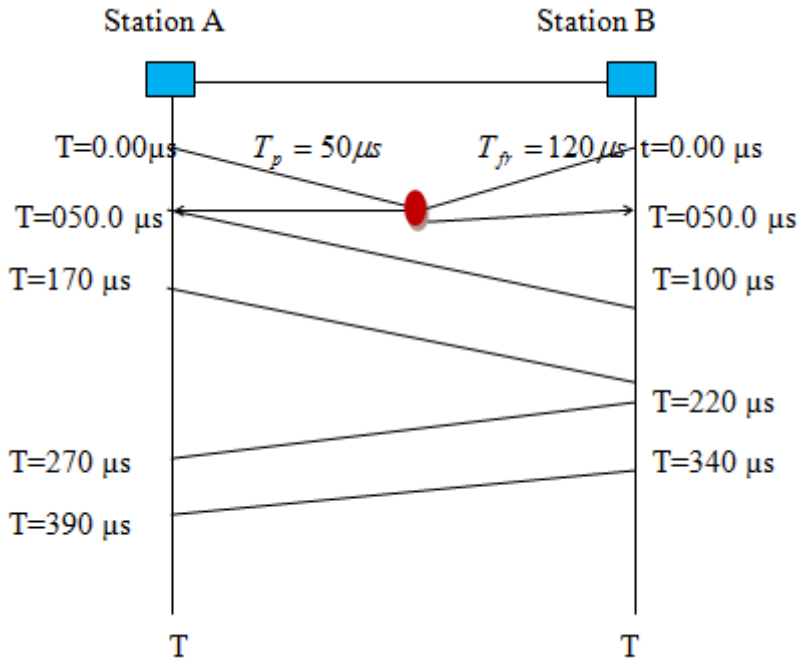
B는 전송을 허락하지 않는다. A에서 출발한 신호가 B을 지나가고 있어서 collision Detection 상태를 유지한채 회선이 비길 기다린다.

P12-18. In a bus 1-persistence CSMA/CD with Tp = 50 μs and Tfr = 120 μs, there are two stations, A and B. Both stations start sending frames to each other at the same time. Since the frames collide, each station tries to retransmit. Station A comes out with R = 0 and station B with R = 1. Ignore any other delay including the delay for sending jamming signals.

Do the frames collide again?

If Random number is not 0, The transmission can be success in second transmission

Draw a time-line diagram to prove your claim.



Does the generation of a random number help avoid collision in this case?

도움이 되었다, R의 차이로 한쪽의 Back off Time동안 다른 한쪽에서 전송을 마무리할 시간을 벌었다.

P12-24. Check to see if the following set of chips can belong to an orthogonal system.

> [+1, +1, +1, +1] , [+1, −1, −1, +1] , [−1, +1, +1, −1] , [+1, −1, −1, +1]

> CDMA에서 orthogonal system임을 확인하는 3가지 조건
>
> 1. 2의 제곱수인 쌍을 가지고 있어야한다.
> 2. 내적의 조합에서 2개는 내적의 결과가 0이어야한다.
> 3. 자기 자신과 내적했을때 내적값은 반드시 N과 같아야한다.

1. 4개임으로 2의 제곱수 조건을 만족한다.
2. A.B = [+1, +1, +1, +1] . [+1, −1, −1, +1]

=[+1,-1,-1,+1]

=0

B.C = [+1, −1, −1, +1] . [−1, +1, +1, −1]

=[-1,-1,-1,-1]

=-4

C.D = [−1, +1, +1, −1] . [+1, −1, −1, +1]

=[-1,-1,-1,-1]

=-4

3가지중 1개만 0이므로 조건에 만족하지 않는다.

3. A.A = [+1, +1, +1, +1].[+1, +1, +1, +1]

   = [+1,+1,+1,+1]

   = +4

   B.B = [+1, −1, −1, +1].[+1, −1, −1, +1]

   = [+1,+1,+1,+1]

   = +4

   C.C = [−1, +1, +1, −1].[−1, +1, +1, −1]

   = [+1,+1,+1,+1]

   = +4

   D.D = [+1, −1, −1, +1].[+1, −1, −1, +1]

   = [+1,+1,+1,+1]

   = +4

   모두 총 개수 4개와 같음으로 조건에 부합한다

4. 결론적으로 조건 2가 부합하지 않음으로 CSMA에서 사용하기에 부적절한 시스템이다.