

Quiz ch 3&6

班級

學號

姓名

1. What is the differences between fast fading and slow fading (draw a figure 40%)?

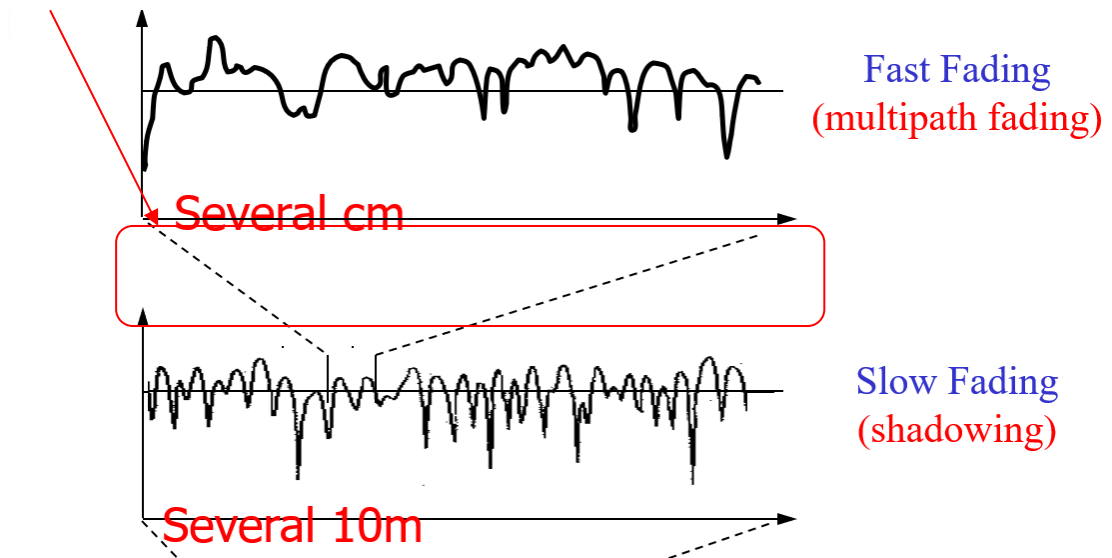
<sol_1>

Fast fading: multipath, several cm range(30%)

Slow fading: shadowing, several 10m ranges (30%)

畫圖說明(40%)

(-10%)沒畫出範圍



2. What is the intersymbol interference (ISI) (draw a figure 40%)?

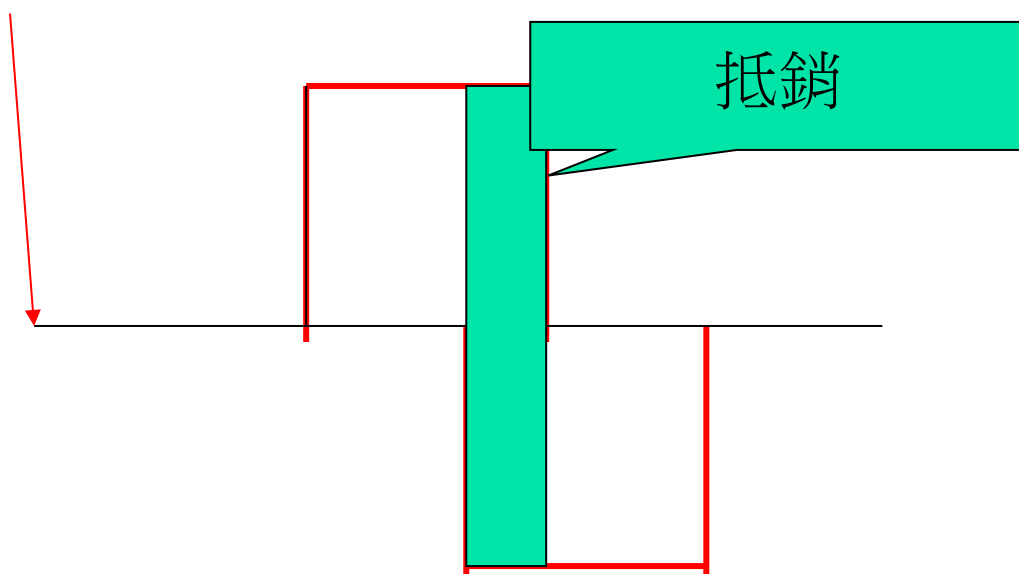
<sol>

多重路徑於下個符碼期間到達(60%)

提到多重路徑概念(30%),符碼干擾概念(30%)

畫圖說明(40%)

(-10%)沒標出 X 軸

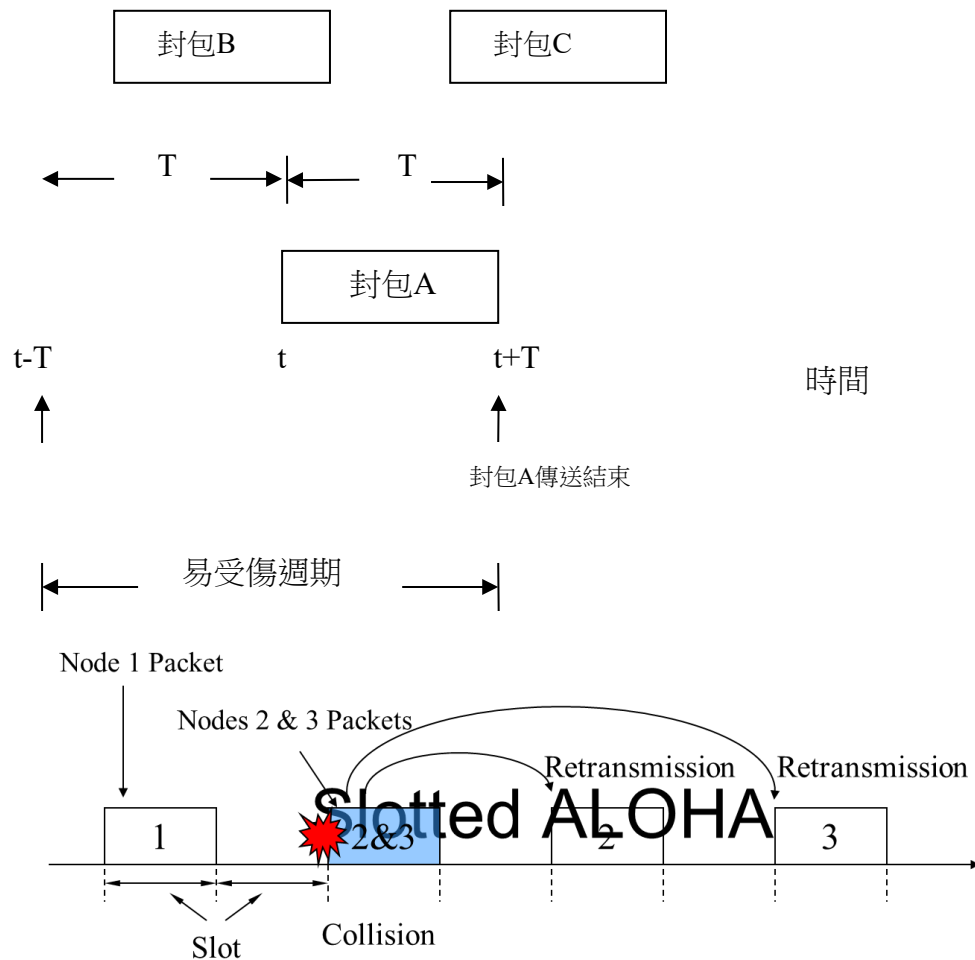


3. How does slotted ALOHA improve the throughput as compared to pure ALOHA?
Explain (50%). Plot figures for the contention period of pure ALOHA and slotted ALOHA(50%)

<sol>

In slotted ALOHA packets must be transmitted within a slot. If a terminal has a packet to send, it waits until the beginning of the next slot. Hence, slotted ALOHA has no partial collision (20%). Therefore, it can improve the throughput by reducing the contenting period ($2T \Rightarrow T$) (30%). Figure below (10%)

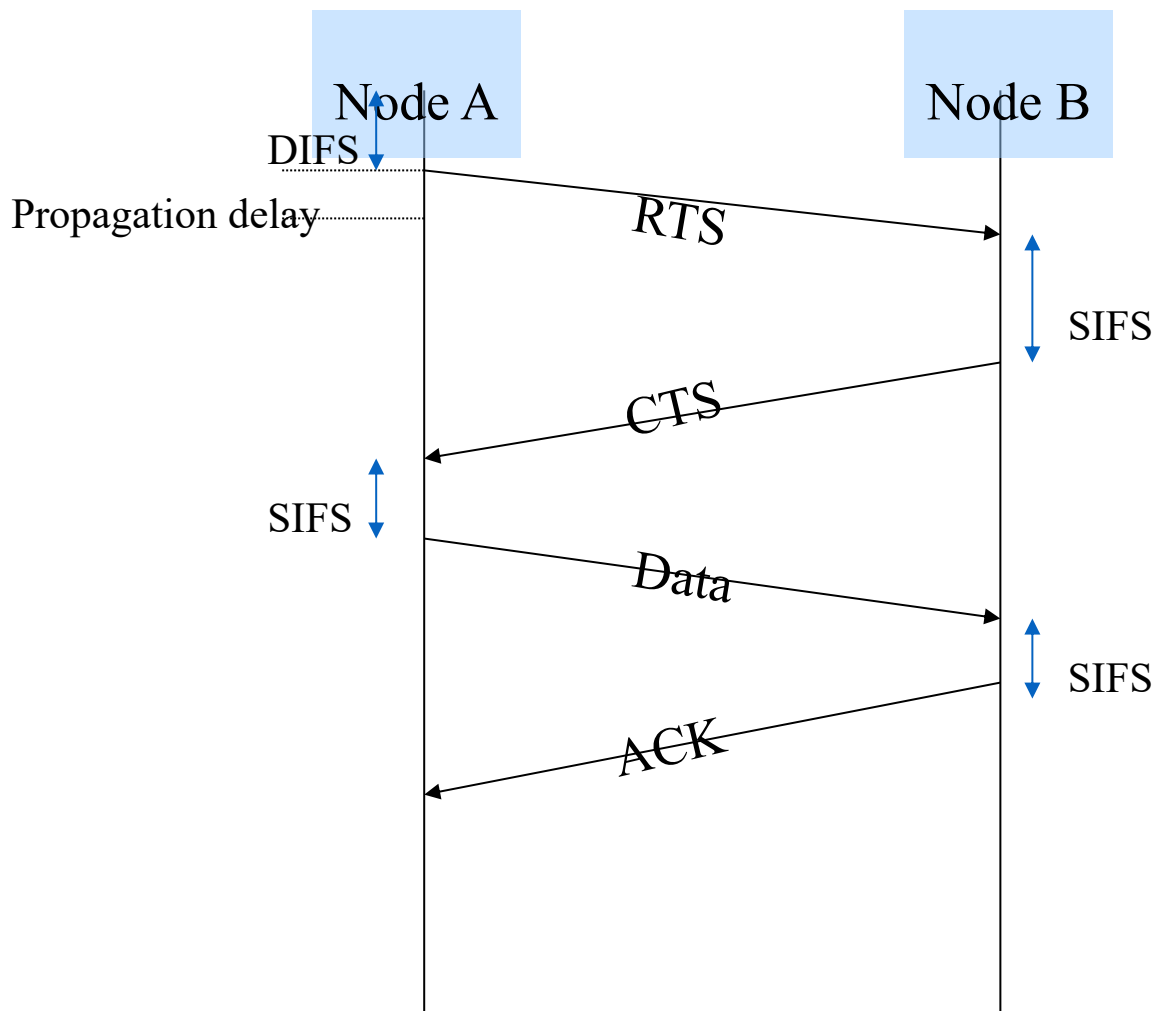
一個圖 25%(有畫錯部份給分)

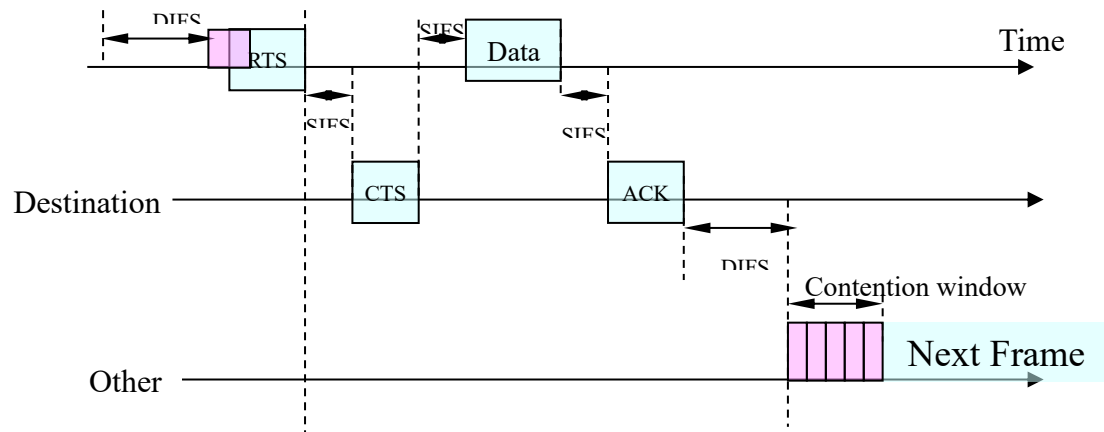


A common clock for slot sunchronization

4. Suppose the propagation delay is α , SIFS is α , DIFS is 3α , and RTS and CTS are 5α , respectively for CSMA/CA with RTS/CTS. Draw the figure in the class notes (no figure=> minus 30%).
- (a) What is the earliest time for the receiver to send the CTS message?(30%)
- (b) If data packet is 100α long, what is the shortest time for the receiver to send the ACK signal?(40%)
- (c) Explain why SIFS is kept smaller than DIFS period.(50%)
- (d) Can you make SIFS=0? **Explain(50%)**

<sol> (-5%)(a),(b)答案少加一項
 (-5%)圖每少畫少寫一個
 圖 2 選 1





- (a) $DIFS + RTS + \text{propagation delay} + SIFS = 10\alpha$
- (b) $(a) + CTS + \text{propagation delay} + SIFS + \text{data} + \text{propagation delay} + SIFS = 119\alpha$
- (c) priority to some packets
- (d) No. turn around time from transmit (receive) mode to receive (transmit) mode, >0

5. 有線乙太網路 CSMA/CD 多重存取為何不能用在無線的環境，而要另外 CSMA/CA?

<sol> collision detection (CD)- detect double voltage can't work in wireless where path loss shadowing multipath fading exist. For example 1 user $5V \Rightarrow 2.5V$ in wireless, another user $5V \Rightarrow 2.5V$ in wireless, the receiver sense $2.5V + 2.5V = 5V$, not double voltage!