

Infrastructure et équipements

TD 1

Exercice 1

- a) Propagation delay or d_{prop} = distance travelled / propagation speed

d_{prop} = 75km/100 kph (where 75 km is distance between 2 tollbooths or half of total distance
i.e. 150km and 100kph is car speed immediately after each tollbooth

d_{prop} = 0.75 hours (45 minutes) between each toll booth or 1.5 hours (90 minutes) from first
booth to last booth

d_{trans} at toll = 12 seconds or 12/60 or 0.2 minutes at each toll booth for each car or (0.2 x 10)
or 2 minutes for the caravan

Therefore, total end to end delay = d_{prop} + d_{trans}

= 90 minutes + time at each toll booth (2 min + 2 min + 2 min)

SOLUTION: = 96 minutes

- b) Assuming 8 cars in caravan instead of 10 cars:

d_{trans} = 0.2 minutes x 8 = 1.6 minutes for the caravan at each toll booth

end to end delay = d_{prop} + d_{trans}

= 90 minutes + (3 booths x 1.6 minutes)

= 90 + 4.8 minutes

SOLUTION: = 94.8 minutes

Exercice 2

a) $d_{prop} = m/s$ seconds.

b) $d_{trans} = L/R$ seconds.

c) $d_{end-to-end} = (m/s + L/R)$ seconds.

Exercice 3

Negotiation = échange de paquets, taille de fenêtre, tout l'important avant communication pour que
comm fluide

Exercice 4

Nombre de couches, un modèle standard, l'autre trop complexe, les deux sont en couches

Exercice 5

- a) datalink
b) reseau

Exercice 6**Exercice 7**

People on the same layer talk directly to each other, instead of going through the lower layers.

Exercice 8

With pure ALOHA, transmission can start instantly. At low load, no collisions are expected so the transmission is likely to be successful. With slotted ALOHA, it has to wait for the next slot. This introduces half a slot time of delay.

Exercice 9

Pure aloha : 18,4 % performance

With pure ALOHA the usable bandwidth is $0.184 \times 56 \text{ kbps} = 10.3 \text{ kbps}$.

Each station requires 10 bps ($1000/100 = 10 \text{ bps}$), so $N = 10300/10 = 1030$ stations.