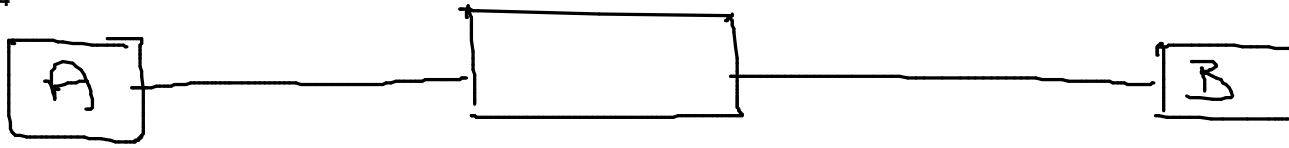
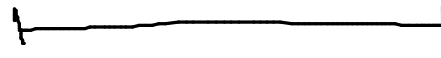


$$T = \frac{\text{Taille}}{R} \quad \frac{(L0+S)}{R}$$



①

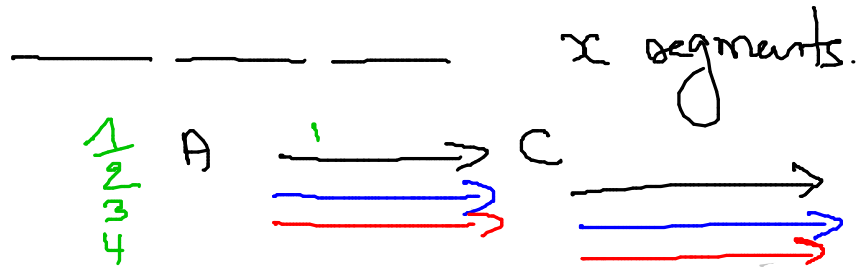
$$t = \frac{F}{R}$$



2 étapes A → C et C → B

$$T = 2 \times t_e = 2 \times \frac{F}{R}$$

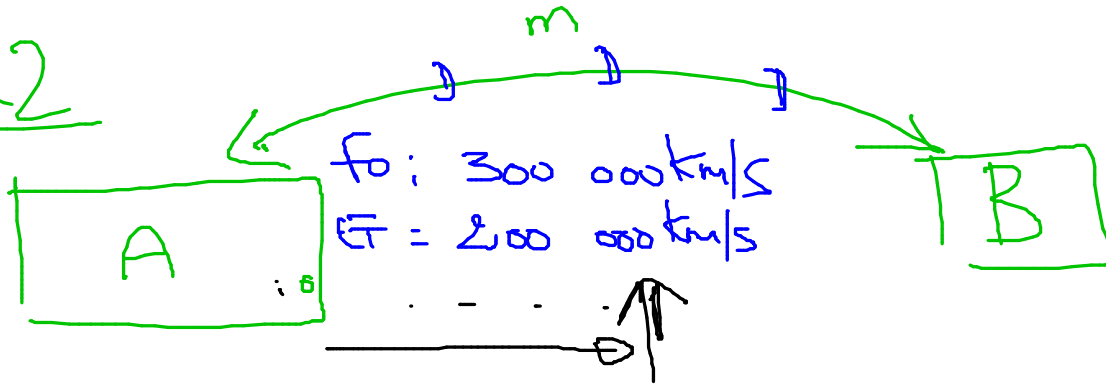
②



$$B \left\{ \begin{aligned} N &= x + 1 \\ &= \frac{F}{s} + 1 \\ T &= \frac{s + 40}{R} \end{aligned} \right.$$

$$t = N \times t_e = \left(\frac{F}{s} + 1 \right) \times \frac{s + 40}{R}$$

Ex2

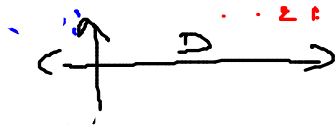


débit = R
taille = L

distance : m
vitesse = S

$$T_{\text{trans}} = \frac{L}{R}$$

$$T_{\text{prop}} = \frac{m}{S} \Rightarrow \frac{L}{R} + \frac{m}{S}$$



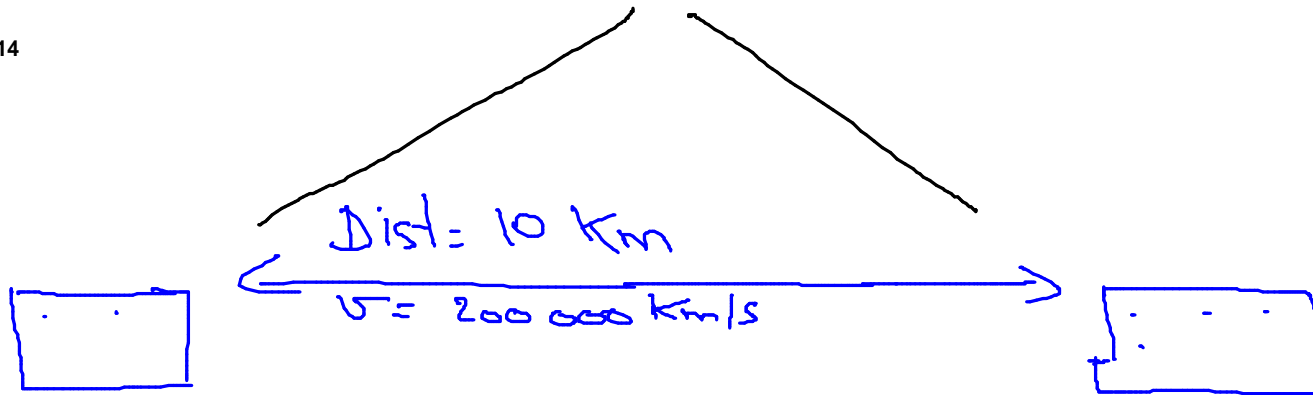
c) le bit est en entrée du réso

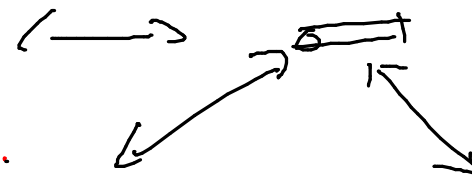
$$d) D = S \times T_{\text{trans}}$$

$$e) d = S \times T_{\text{prop}} = m.$$

$$f) T_{\text{prop}} = T_{\text{trans}} \Rightarrow \frac{L}{R} = \frac{m}{S} \Rightarrow m = \frac{L \times S}{R}$$

$$m = \frac{10^2 \times 2,5 \times 10^8}{28 \times 10^3} = 0,89 \times 10^6 \text{ m} = 892,8 \text{ km}$$



a) liaison 2 Mbps . 
 Sat Geo stat : 2 Gps .

données ont une taille moyenne de 50 Mo
 données _____ de 1 Ko.

$$T = \frac{L}{D} + \frac{D}{v}$$

$$\text{Cas 1.A} = \frac{50 \times 8 \times 10^6}{2 \times 10^6} + \frac{10}{200\,000} = 200 \text{ s}$$


$$\text{Cas 1.B} = \frac{50 \times 8 \times 10^6}{2 \times 10^9} + \frac{2 \times 36\,000}{300\,000} = 0,2 \text{ s} + 0,24$$

$$\text{Cas 2 A: } \frac{8 \times 10^3}{2 \times 10^6} + \frac{16}{200000}$$

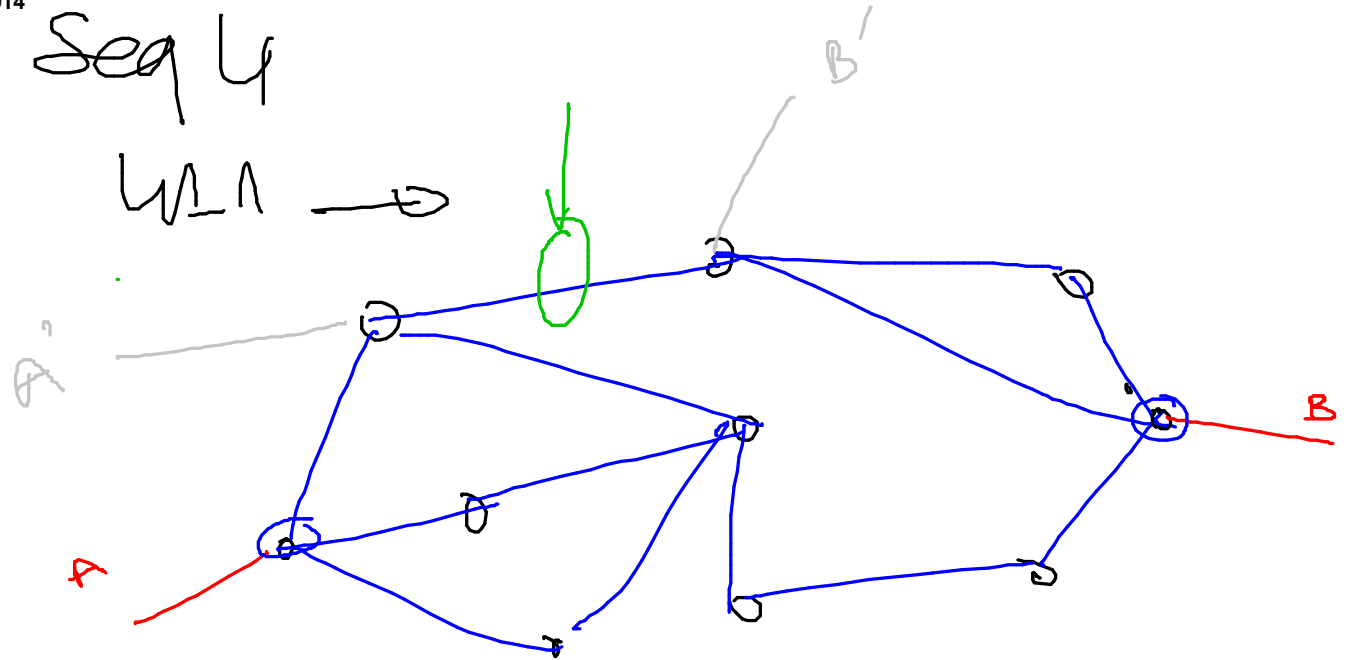
4 ms

$$\text{Cas 2 B: } \frac{8 \times 10^3}{2 \times 10^9} + \frac{2 \times 36000}{300000}$$

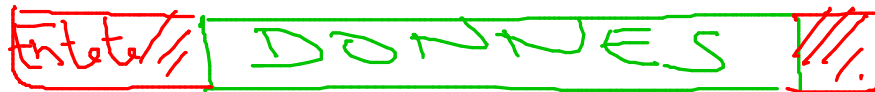
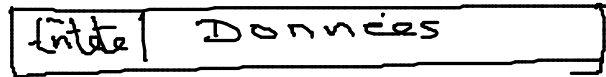
4 NS 240 ms



Seq 4

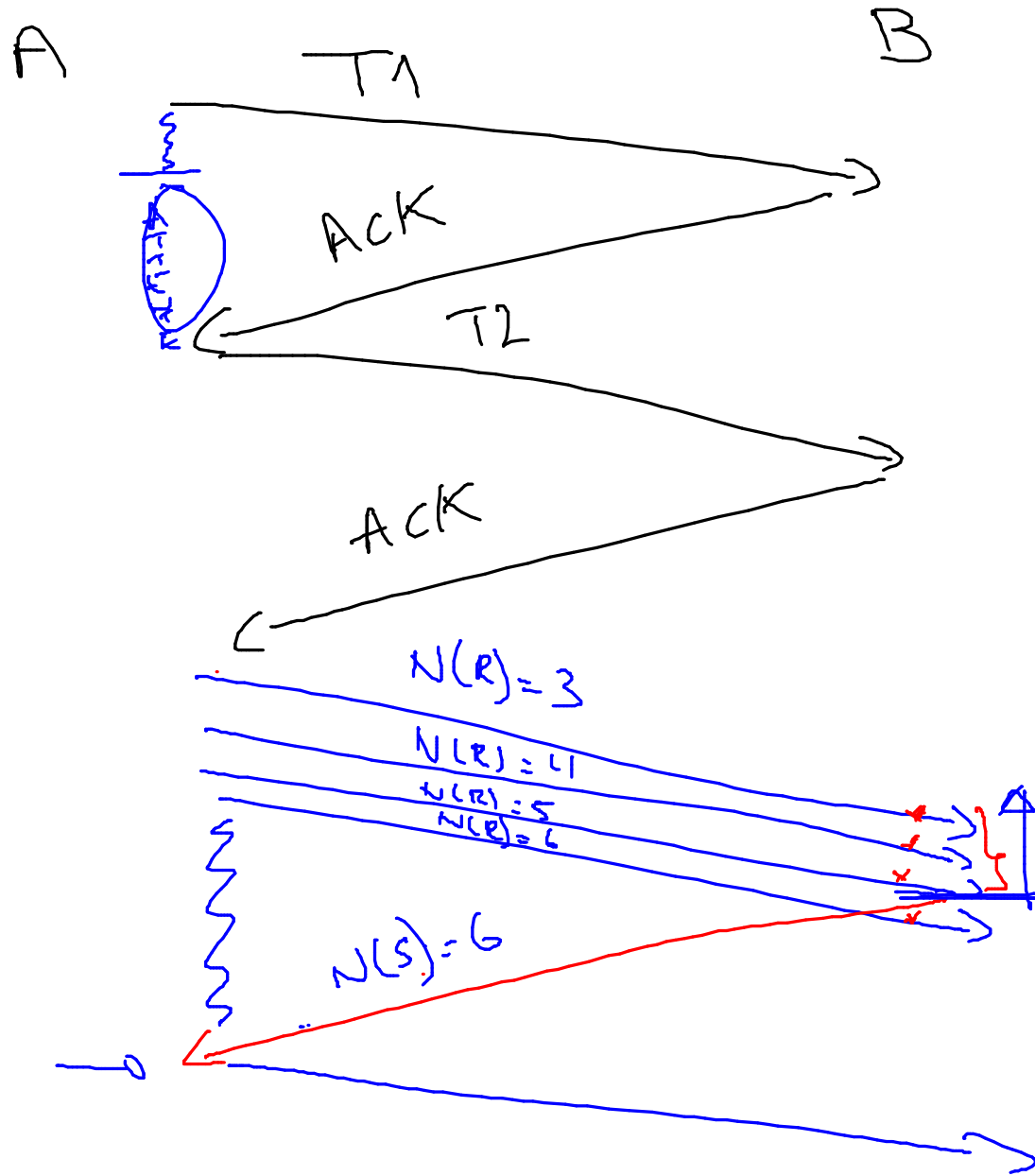


4.1.2.

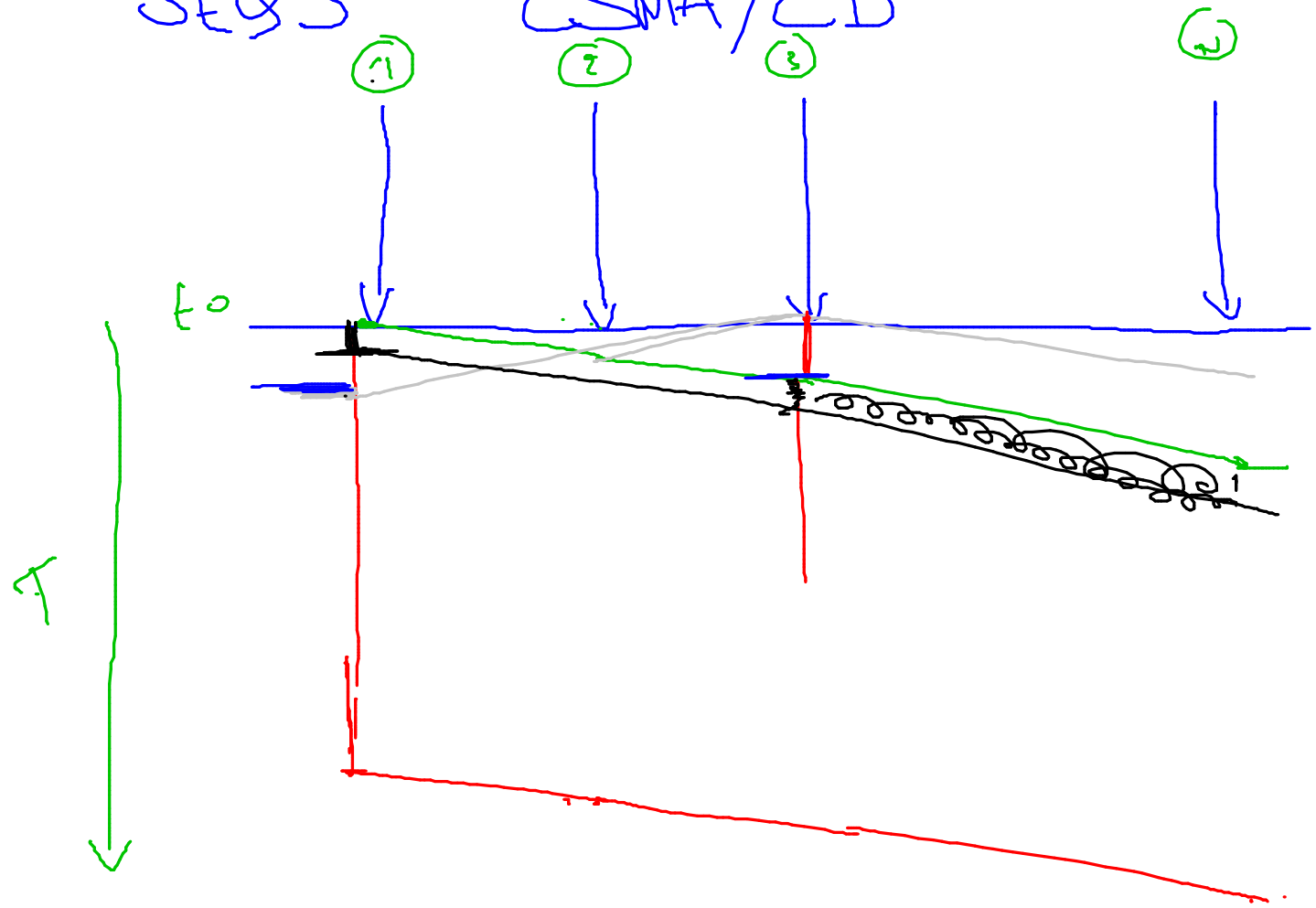


- Encapsulation

4.1.3



SEQ 5 CSMA/CD



$T_e > 2$ fois le $t_{A/R}$.

CSMA/CD

taille minimale de la trame

$$\textcircled{1} : T = \frac{\text{Dist}}{\text{vitesse}} = \frac{200 \text{ km}}{200\,000 \text{ km/s}}$$

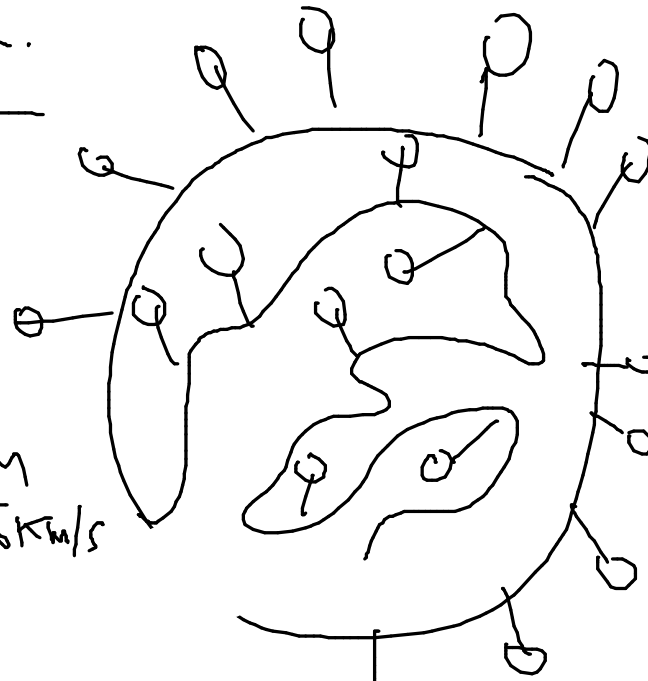
$$= 1 \text{ ms}$$

$$T_{\min} = 2 \text{ ms}$$

$\textcircled{2}$ Quelle est la taille minimale:

$$T = \frac{\text{Taille}}{\text{débit}} \Rightarrow \text{Taille} = T \times \text{débit}$$

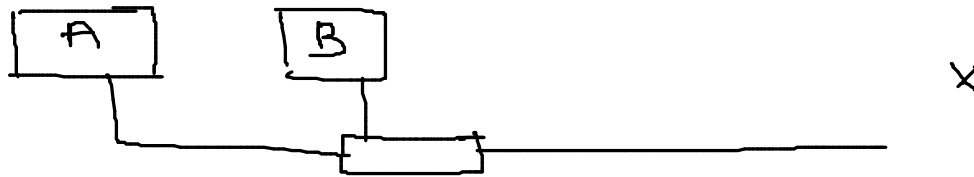
$$= 2 \times 10^{-3} \times 2 \times 10^6 = 4000 \text{ bit}$$



} fibre: 200 km
 } débit: 2 Mbit/s.
 } $v_p = 200\,000 \text{ km/s}$

Seq IP : fragmentation

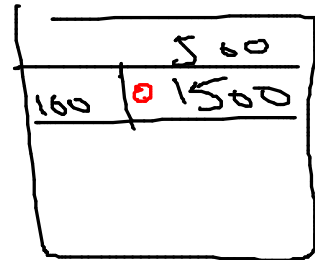
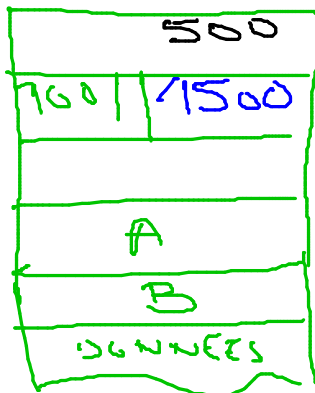
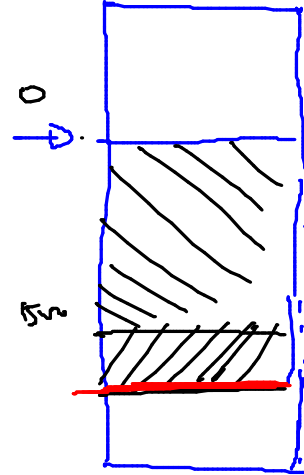
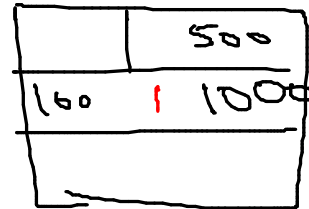
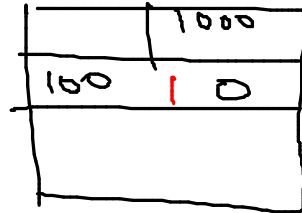
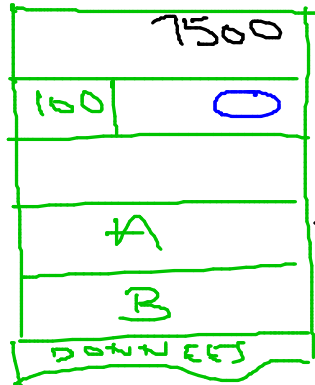
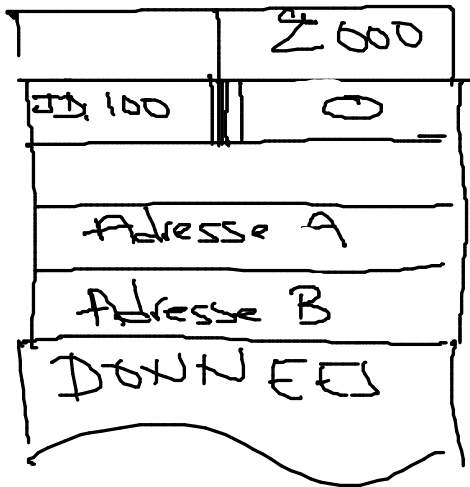
- MTU : taille maximale d'une trame



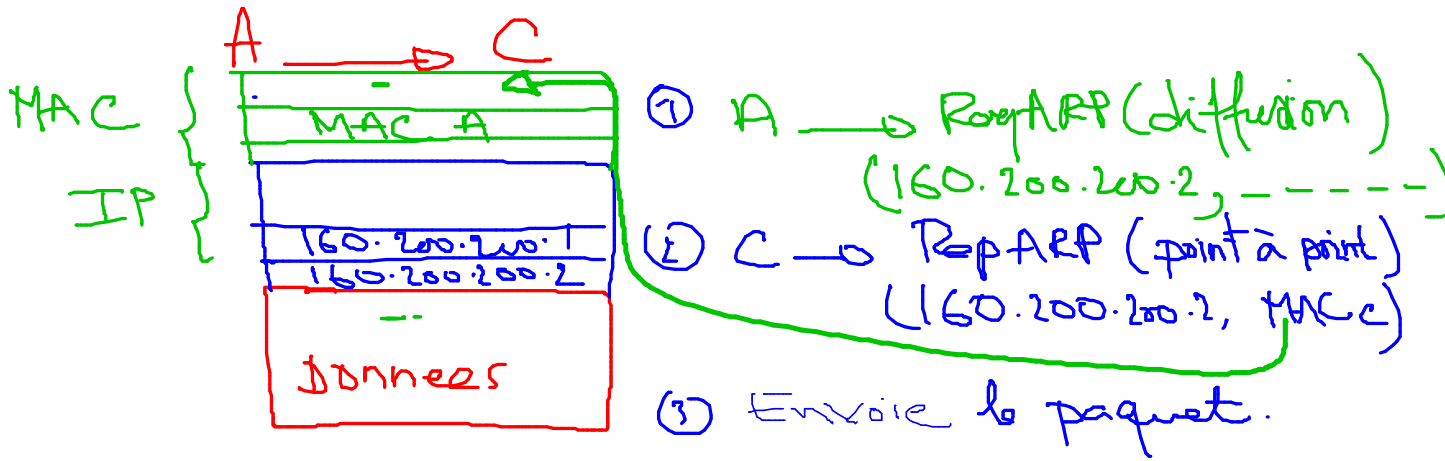
ping -l 2000 -j a
le paquet ne sera pas fragmenté.



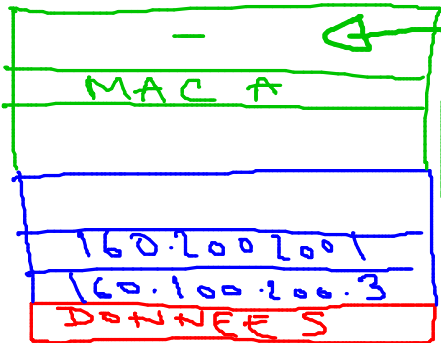
2000 octet



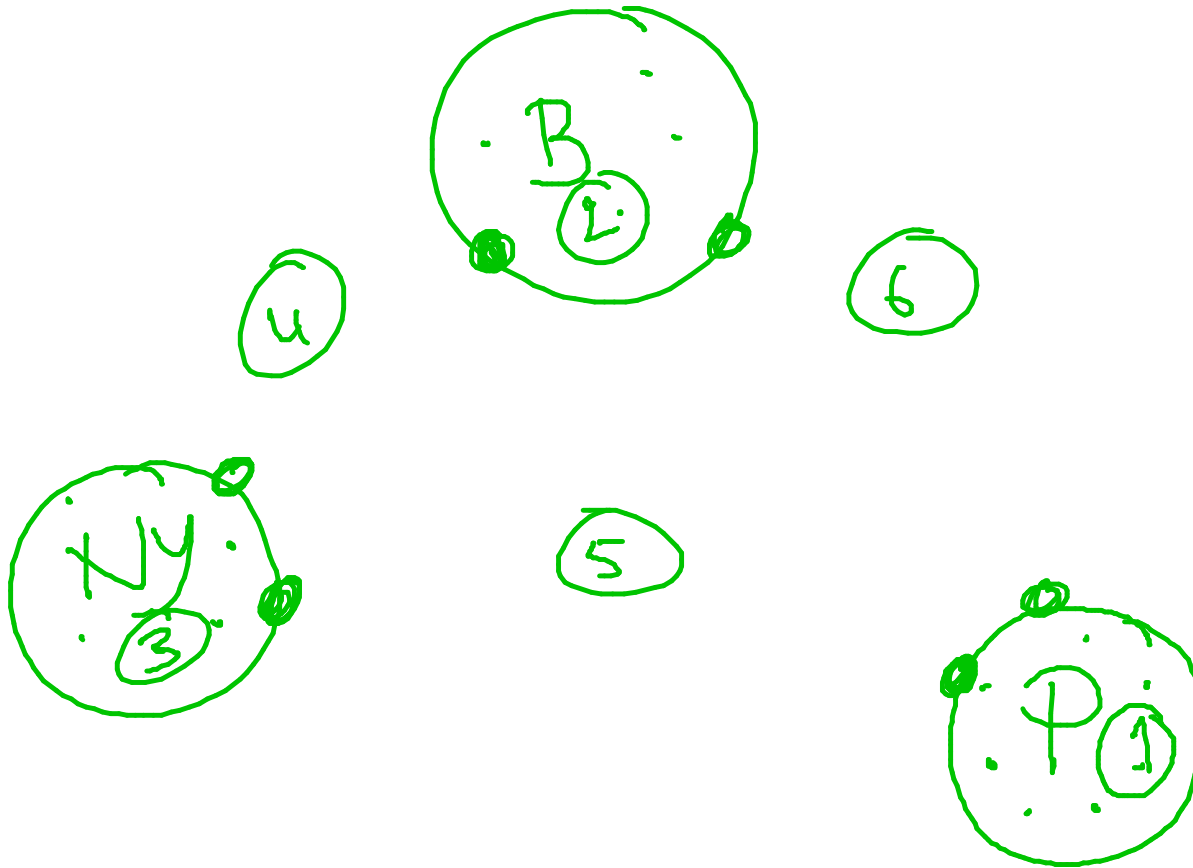
Seq8 Adressage



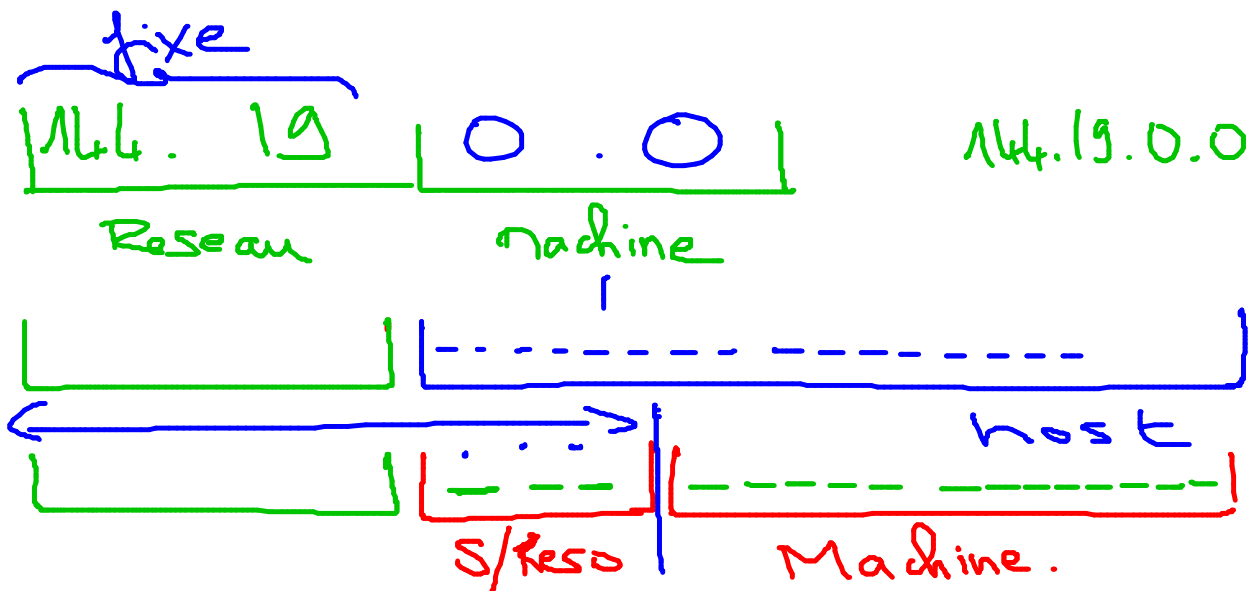
A → B



- ① Quelle est la passerelle.
si non : echec
oui
A → ReqARP (diffusion)
(IP de la passerelle, -----)
P → RepARP (@ Passerelle, MAC Pass)



144.19.0.0



6 sous réseaux $\Rightarrow n/2^n \geq 6 \Rightarrow n=3$
 vérifica \emptyset : nb d'ad / sous réseau.
 3 bit $\Rightarrow 2^3 - 2 = 8190 \emptyset$

masque de sous réseau:

class B: 16 } $\Rightarrow 16+3=19.$
 sous réseau sur 3 bit

||||| |||| |||| ||| 0000 00000000
 255 . 255 . 224 . 0

P	<u>0</u> <u>0</u> <u>0</u> 00000.
B	0 <u>0</u> 1 00000. 1111 1110
Ny	0 <u>L</u> 0 00000
P-B	0 <u>1</u> 100000
P-Ny	1 <u>0</u> 0 00000
B-Ny	1 <u>0</u> 1 00000.

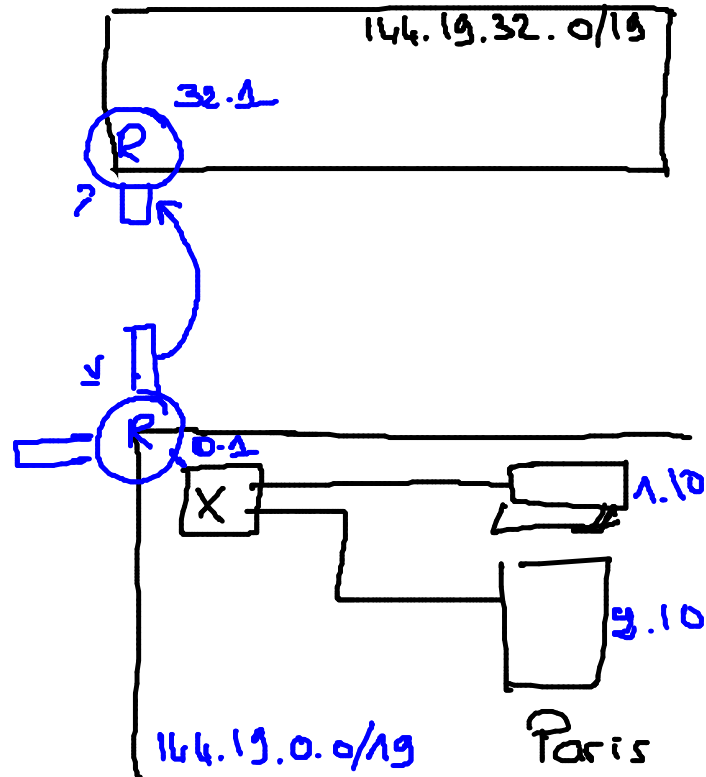
} octet 3

plage de Paris.

144.19.0.1

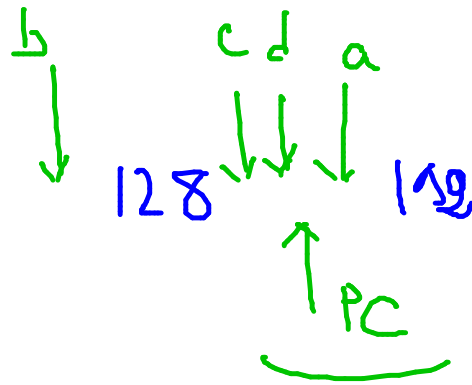
144.19.31.254

B
32.1
63.254



a) 0

64



b)

130. 2. 127. 231

