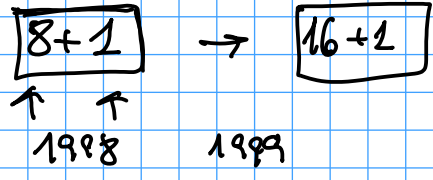
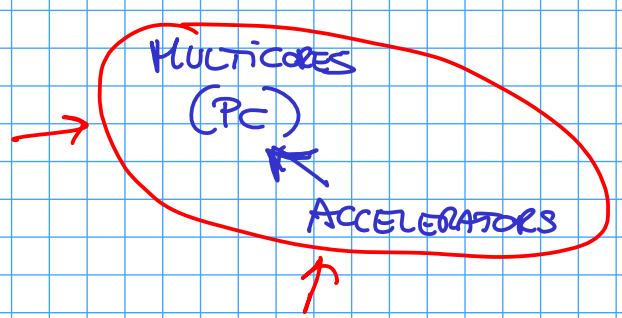
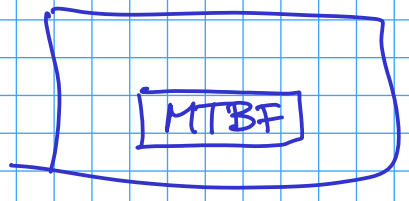
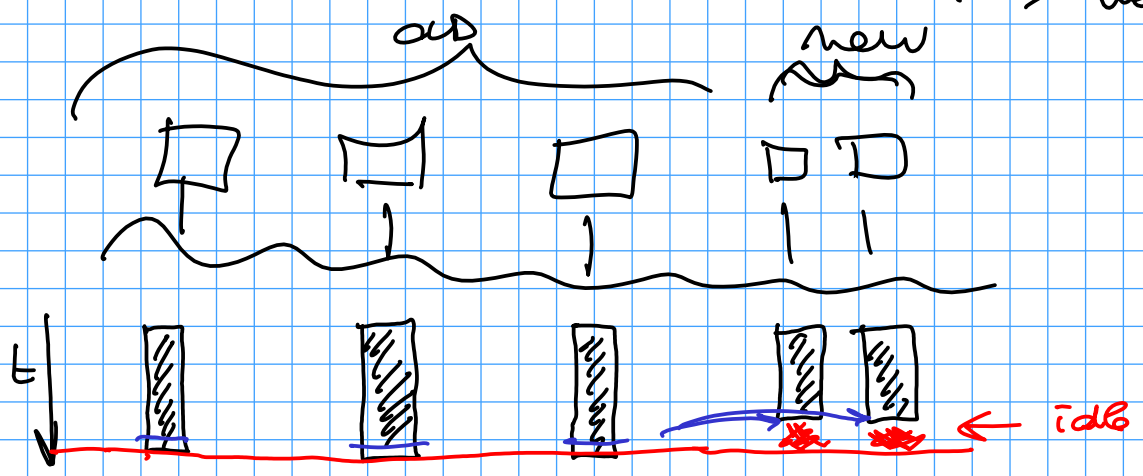


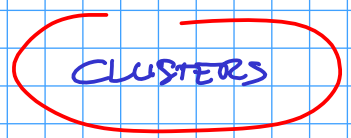
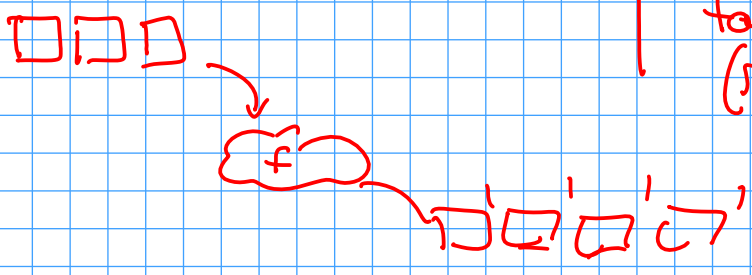
Clusters



maintenance  $\Rightarrow$  1 year homogeneous system  $\rightarrow$  heterogeneous



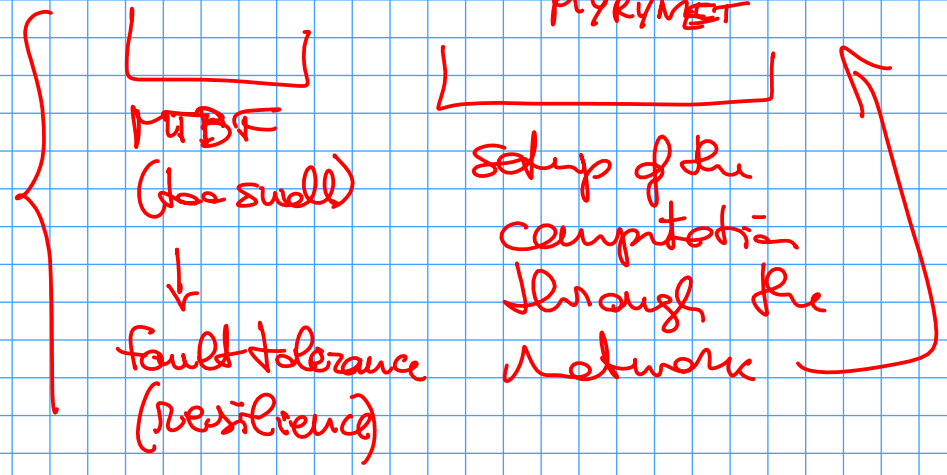
GRID COMP  
FP7



100 Gbit/sec  
 baud = 54 Gbit/sec  
 $\text{lat} \approx 1 \mu\text{sec}$

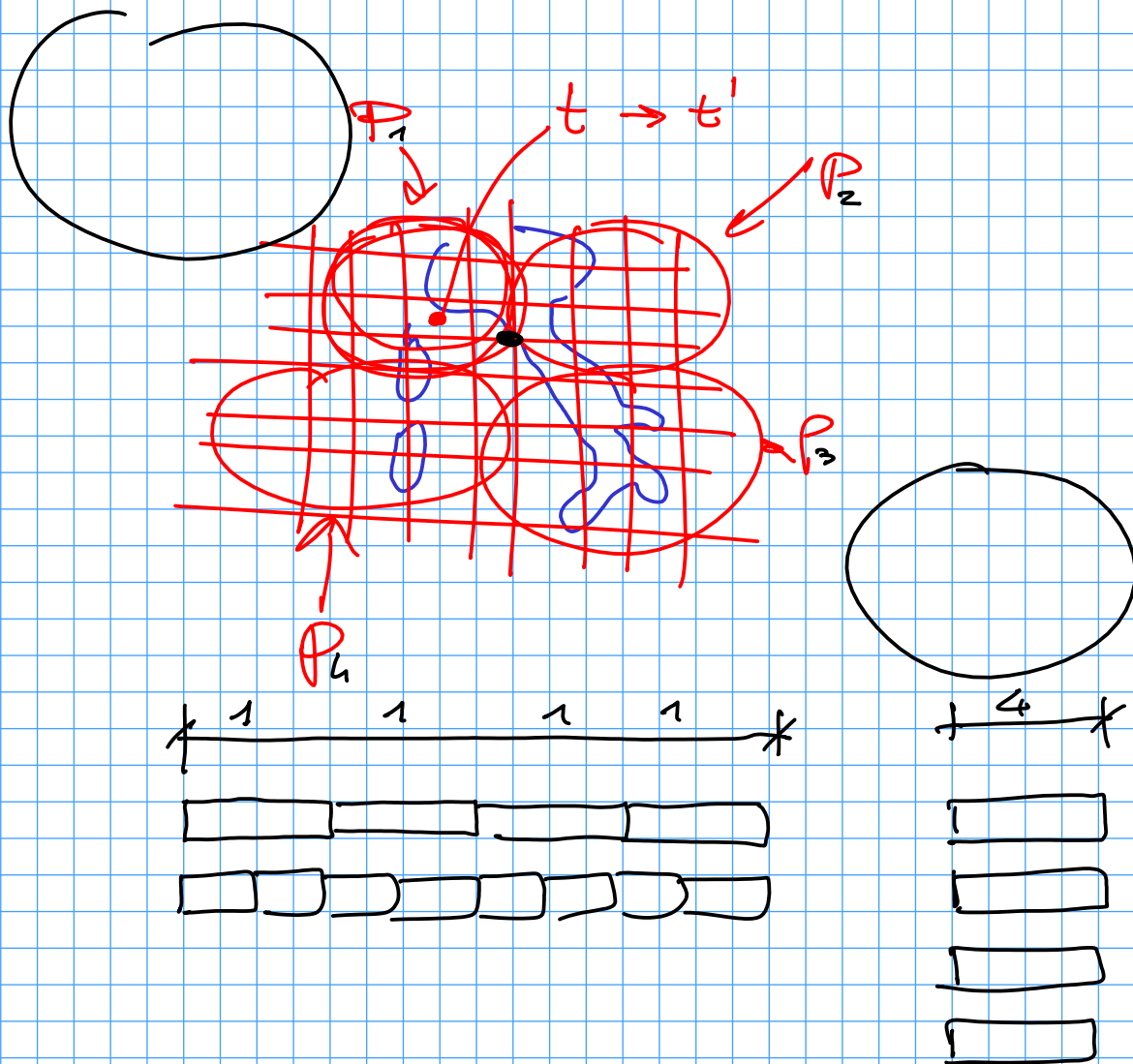
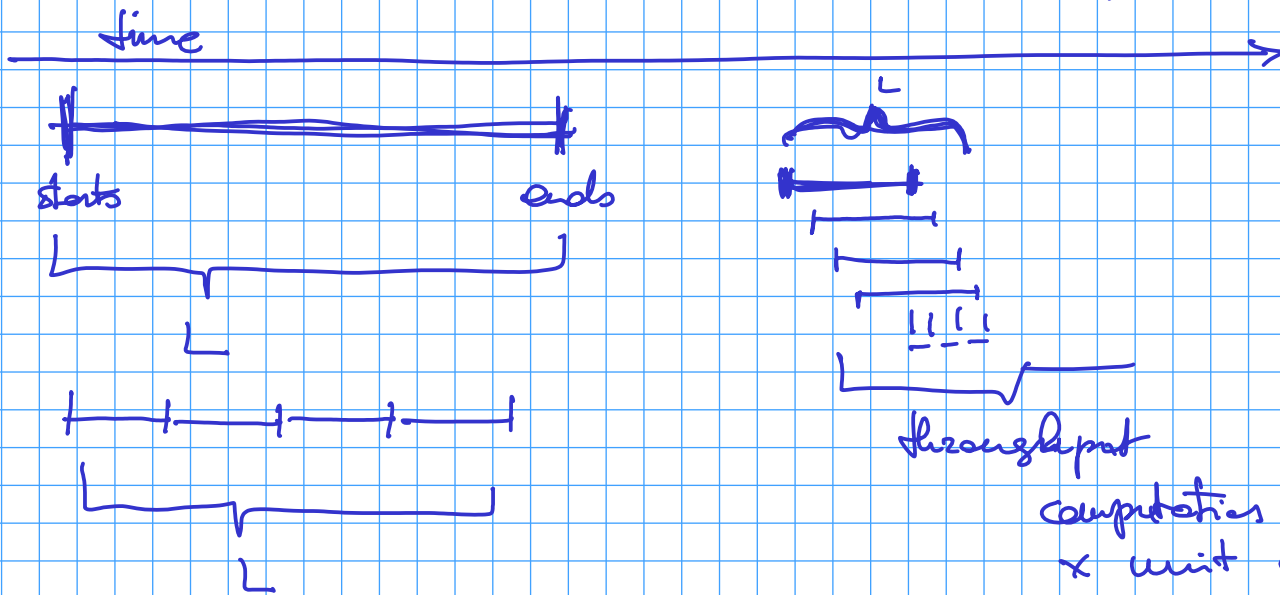
top 500

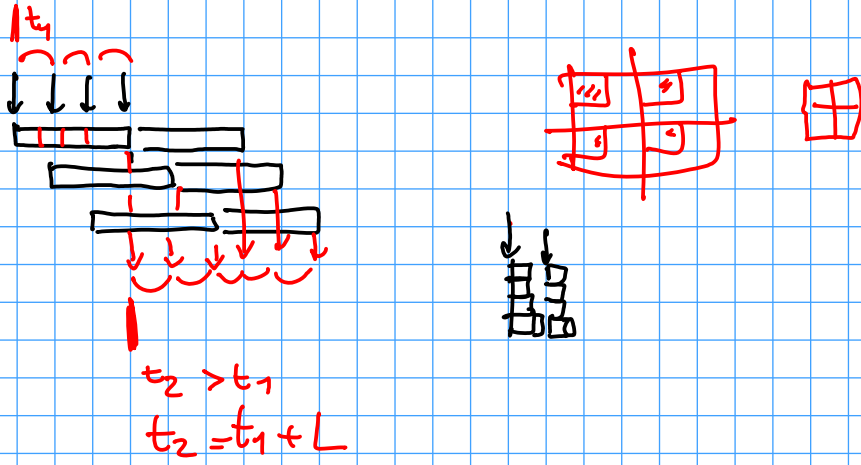
INFINIBAND  
MYRYNET



# Latency (L)

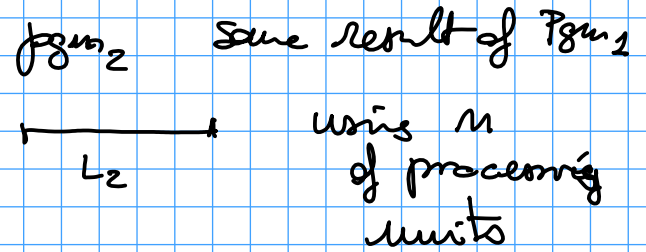
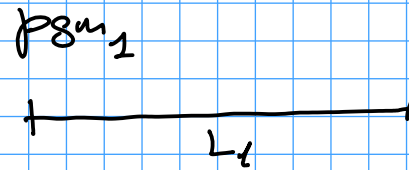
# Service time (throughput)



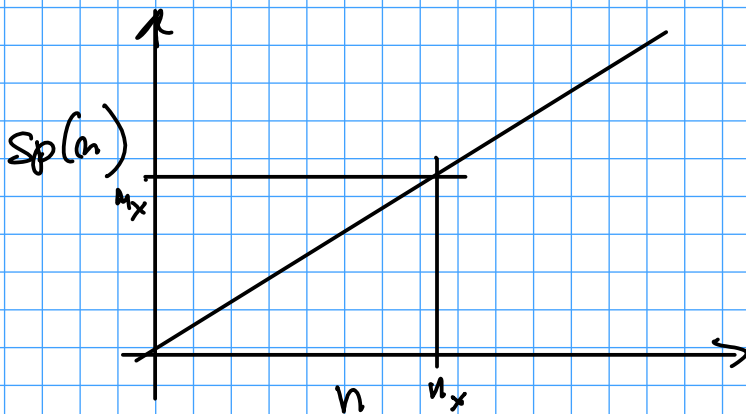


latency  $L$        $T_s$  service time

$T_c$   
 completion time  
 (complete  $m$  tasks  
 $L$   $T_s$  & task are known)



$$\text{speedup}(m) \approx \frac{L_1}{L_2} = \frac{T_{\text{seq}}}{T(m)} \leftarrow \text{relative to the "best" seq implementation}$$



$$T_{\text{seq}} = 10s$$

$$m = 10$$

$$T(m) = \underline{0.5s}$$

$$\text{Sp}(10) = \frac{10}{\frac{1}{2}} = 20$$

$$\text{scalability}(m) = \frac{T(1)}{T(m)}$$

