

stream di istruzioni (D-RISC)
 ✓ istruzioni vere completamente eseguita prima di passare alla prossima

$$T_p(m) = T_{distribuzione} + T_{controllo} + T_{ricezione}$$

$\approx \frac{T_{seq}}{m}$

Overhead

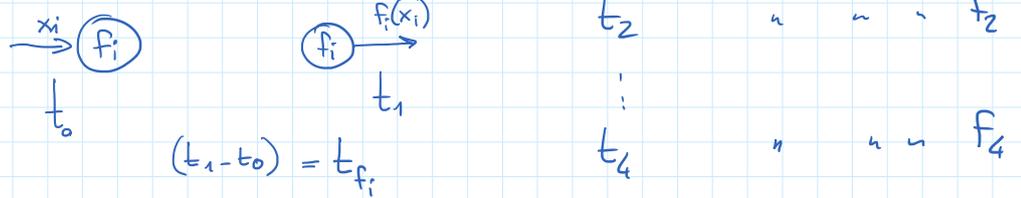
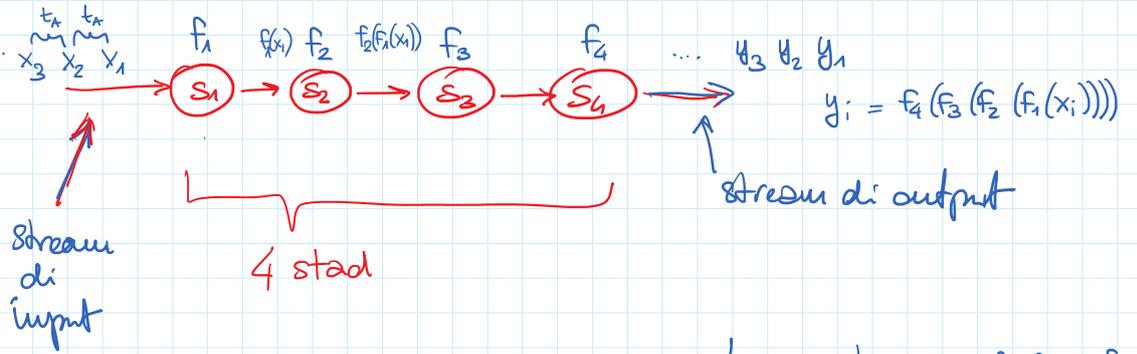
efficienza $E(m) = \frac{T_{id}(m)}{T_p(m)}$

$T_{id}(m) = \frac{T_{seq}}{m}$

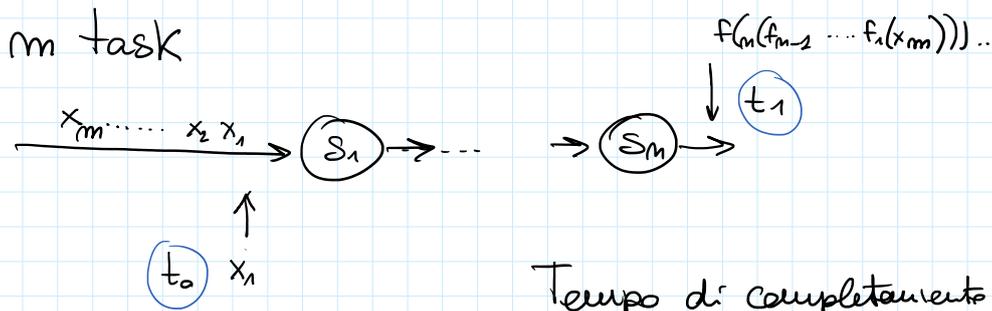
$E(m) = \frac{T_{seq}}{m} = \frac{Speedup(m)}{m}$

$sp(m) = \frac{T_{seq}}{n}$

PIPELINE

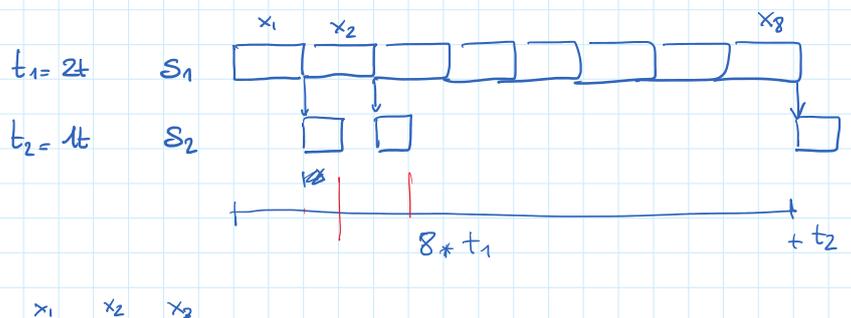
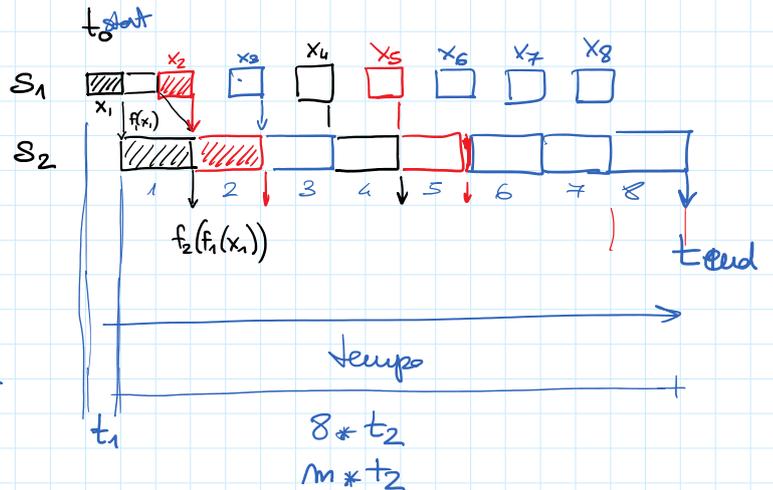
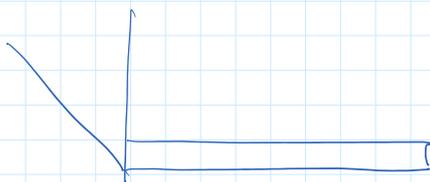


n stadi } stadio i calcolo $f_i()$ in t_i
 ↑
 latenza



Tempo di completamento di m task

$m=2$ $t_1=1t$
 $m=8$ $t_2=2t$



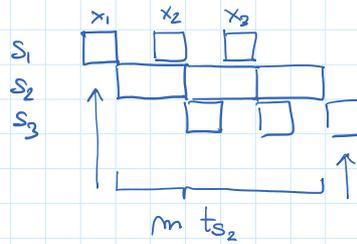
$8 * t_1$

$+ t_2$

$$t_1 = 1t$$

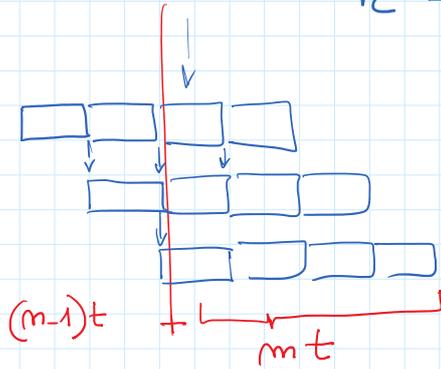
$$t_2 = 2t$$

$$t_3 = 1t$$



$$T_c = m * (\max\{t_{s_i}\}) + \sum_{j \neq \max} t_{s_j}$$

$$t_{s_i} = t_{s_j}$$

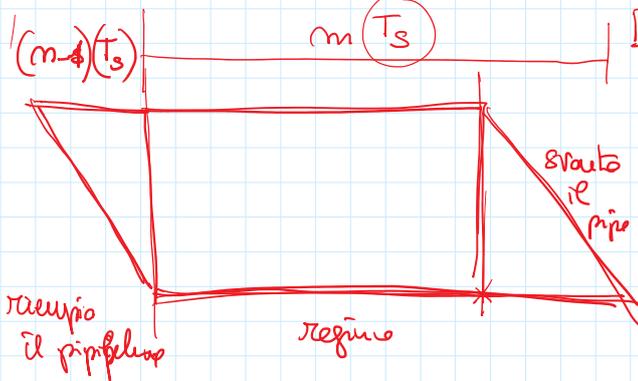
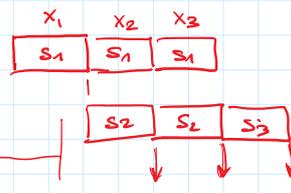
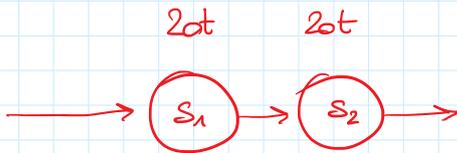
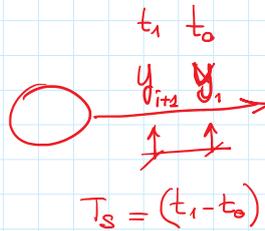


$$T_c^{(m)} = \underline{(m-1)t} + \boxed{m(t)} \quad ||$$

$$T_{seq} = m * \underbrace{(m \cdot t)}_{\text{tempo x calcolo } s_3(s_2(s_1(x_i)))} \quad ||$$

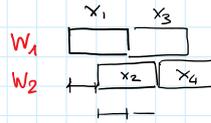
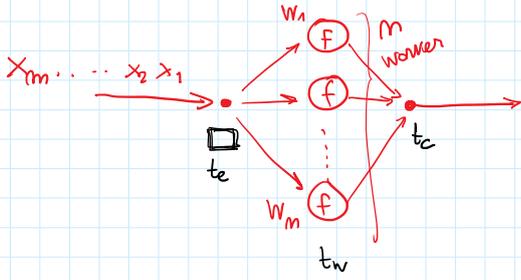
$$m = sp(m) = \frac{T_{seq}}{T_c(m)} = \frac{m(m \cdot t)}{((m-1)+m)t}$$

T_s tempo di servizio

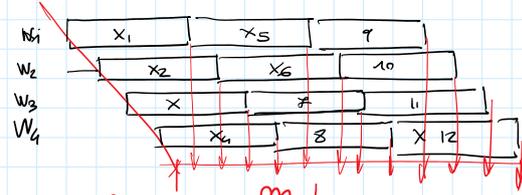


$$t_s = 2ot = \max\{T_{s_i}\}$$

FARM (REPLICAZIONE FUNZIONALE)



$$t_e = \frac{t_w}{m}$$



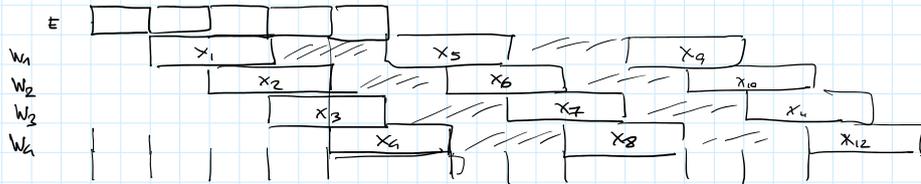
$$(m-1)t_e + \frac{m}{m}t_w$$

$$T_{seq} = mt_w$$

$$\left. \begin{matrix} t_e = t_w/m \end{matrix} \right\}$$

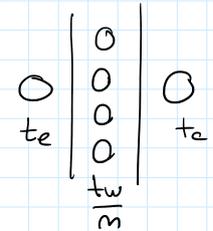
$$T_S(m) = t_e$$

$$\begin{matrix} t_e = 2t \\ t_w = 4t \end{matrix}$$

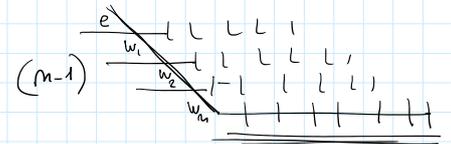


$$\begin{aligned} & 8t_e + 3t_w \\ & mt + \frac{(m)}{m}t_w \end{aligned}$$

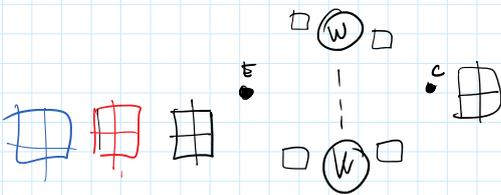
$$T_S = \max \left\{ t_e, t_c, \frac{t_w}{m} \right\}$$

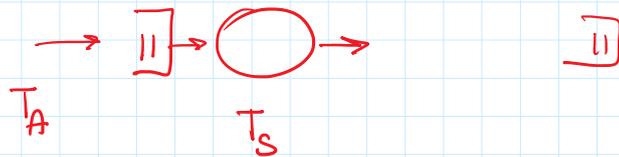


$$T_C = \underbrace{(m-1)}_{\text{}} t_s + \frac{m}{m} t_s$$



MAP





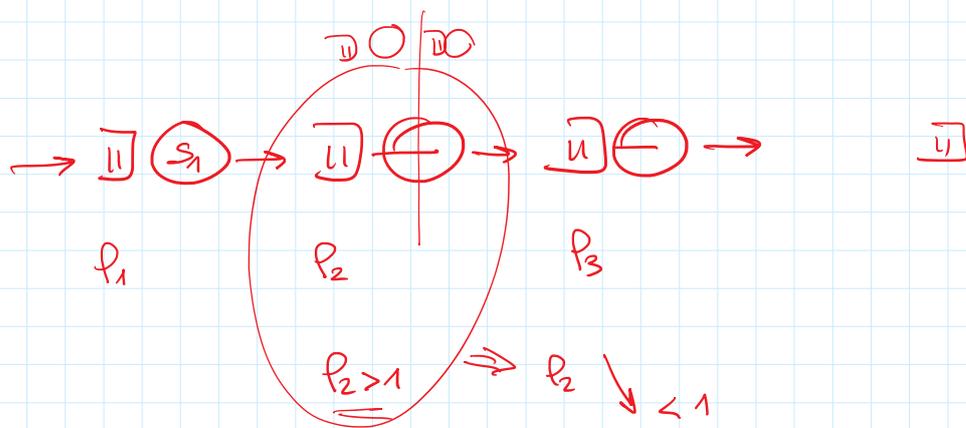
$$P \approx 1$$

$$P = \frac{T_S}{T_A}$$

$T_S \approx T_A \Rightarrow$ code vuoto

fattore di utilizzo della code

$T_S > T_A \Rightarrow$ code e' piena



while (true) {
 fetch
 decode
 exec
 int
}

do, chi
op → R
xxx₀ xxx₁ ...

