martes, 1 de marzo de 2022 07:38 a. m.

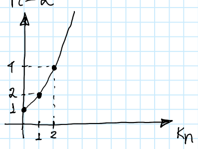
CASO: NO comunicación

DATOS: $\vec{x} = (-1,2,4,1,6,0,-1,0)$

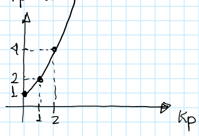
TAREA: $\sum_{i=1}^{n=8} x_i = (-1)+2+4+1+6+0+(-1)+0$

$E(n_p, n)$

$n = 2^{K_n}$



$n_p = 2^{K_p}$

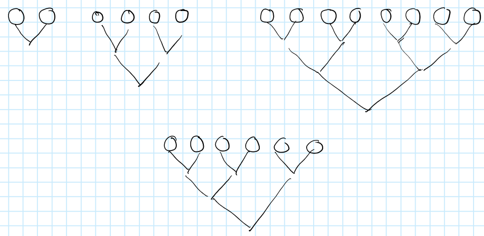


$K_n = 3$ $\vec{x} = (-1,2,4,1,6,0,-1,0)$

$K_n = 2$ $\vec{x} = (-1,2,4,1)$
$K_n = 1$ $\vec{x} = (-1,2)$
$K_n = 0$ $\vec{x} = (-1)$

$K_p = 3$ P P P P P P P P

$K_p = 2$ P P P P
$K_p = 1$ P P
$K_p = 0$ P



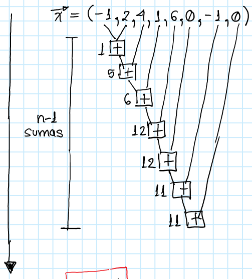
SERIE

$K_p = 0 \longrightarrow n_p = 2^{K_p} = 2^0 = 1$
$K_n = 3 \longrightarrow n = 2^{K_n} = 2^3 = 8$

PARALELO

$K_p = 1 \longrightarrow n_p = 2^{K_p} = 2^1 = 2$
$K_n = 3 \longrightarrow n = 2^{K_n} = 2^3 = 8$

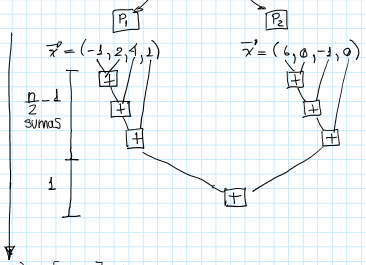
$\vec{x} = (-1,2,4,1,6,0,-1,0)$



$t(n_p, n) = \boxed{t(1,n)} = n-1$

$t(n_p=1, n=8) = (8)-1 = 7$

$\vec{x} = (-1,2,4,1,6,0,-1,0)$



$t(2,n) = \left[\frac{n}{2} - 1\right] + 1 = \frac{n}{2}$

$S(n_p, n) = \left[\frac{t(1,n)}{t(n_p,n)}\right]$ $E(n_p, n) = \left[\frac{S}{n_p}\right]$ $C(n_p, n) = n_p t(n_p, n)$

$S(2,8) = \frac{t(1,8)}{t(2,8)} = \frac{7}{\left(\frac{8}{2}\right)} = \frac{7}{4} = 1.75 < 2$

$E(2,8) = \frac{S(2,8)}{2} = \frac{1.75}{2} = 0.87$

$C(2,8) = 2\,t(2,8) = \cancel{2}\left[\frac{8}{\cancel{2}}\right] = 8$

$K_p = 2 \longrightarrow n_p = 2^{K_p} = 2^2 = 4$
$K_n = 3 \longrightarrow n = 2^{K_n} = 2^3 = 8$

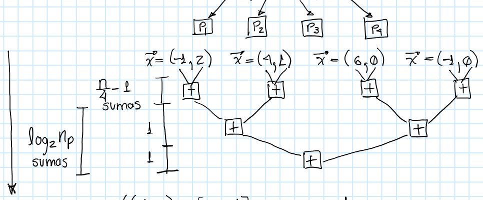
$S(n_p, n) = \left[\frac{t(1,n)}{t(n_p,n)}\right]$ $E(n_p, n) = \left[\frac{S}{n_p}\right]$ $C(n_p, n) = n_p t(n_p, n)$

$S(4,8) = \frac{t(1,8)}{t(4,8)} = \frac{7}{\frac{8}{4}+1} = \frac{7}{\frac{8}{4}+\frac{4}{4}} = \frac{7}{\frac{12}{4}} = \frac{7}{3} = 2.33 < 4$

$E(4,8) = \frac{S(4,8)}{4} = \frac{2.33}{4} = 0.58$

$C(4,8) = 4\,t(4,8) = 4(3) = 12$

$\vec{x} = (-1,2,4,1,6,0,-1,0)$



$t(4,n) = \left[\frac{n}{4} - 1\right] + 2 = \frac{n}{4} + 1$

$\boxed{t(n_p,n)} = \left[\frac{n}{n_p} - 1\right] + K_p = \left[\frac{n}{n_p} - 1\right] + \log_2 n_p$
$= \left[\frac{n}{n_p} - 1\right] + \log_2(2^{K_p})$

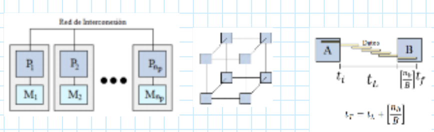
$S(n_p, n) = \frac{t(1,n)}{t(n_p,n)} = \frac{n-1}{\left[\frac{n}{n_p} - 1\right] + \log_2 n_p}$

$E(n_p, n) = \frac{S(n_p,n)}{n_p} = \frac{n-1}{n_p\left[\frac{n}{n_p} - 1 + \log_2 n_p\right]}$

$C(n_p, n) = n_p t(n_p, n) = n_p\left[\frac{n}{n_p} - 1 + \log_2 n_p\right]$

CASO: Comunicación usando red Hipercubo

Memoria Distribuida.



$t_T = 3$

$\vec{x} = (-1,2,4,1,6,0,-1,0)$

$K_p = 0 \longrightarrow n_p = 2^{K_p} = 2^0 = 1$ ☐

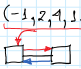
t
0

Nivel del Arbol

0 2(3) I ◯
Kp(2)(3)

$\vec{x} = (-1,2,4,1,6,0,-1,0)$

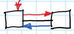
$K_p = 1 \longrightarrow n_p = 2^{K_p} = 2^1 = 2$



1 2(3)
Kp(2)(3)

$\vec{x} = (-1,2,4,1,6,0,-1,0)$

$Kp = 1 \longrightarrow n_p = 2^{Kp} = 2^1 = 2$

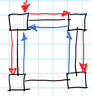


$1 \quad 2(3)$

$Kp(2)(3)$

$\vec{x} = (-1,2,4,1,6,0,-1,0)$

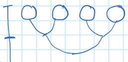
$Kp = 2 \longrightarrow n_p = 2^{Kp} = 2^2 = 4$



$2 \quad + \quad 2(3)$

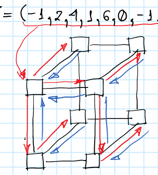
$2(3)$

$Kp(2)(3)$



$\vec{x} = (-1,2,4,1,6,0,-1,0)$

$Kp = 3 \longrightarrow n_p = 2^{Kp} = 2^3 = 8$

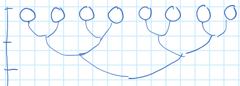


$3 \quad + \quad 2(3)$

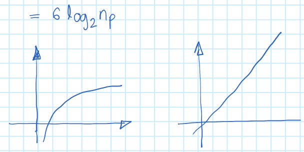
$2(3)$

$2(3)$

$Kp(2)(3)$



$$t_c(n_p,n) = 6Kp = 6\log_2 n_p$$

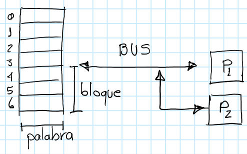


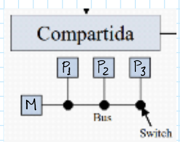
$$\boxed{t(n_p,n)} = \left[\frac{n}{n_p} - 1\right] + Kp + 6Kp = \left[\frac{n}{n_p} - 1\right] + 7Kp = \left[\frac{n}{n_p} - 1\right] + 7\log_2 n_p$$

$$R_{c \to c} = \left[\frac{t_{\text{cálculo}}}{t_{\text{comunicación}}}\right] = \frac{t(n_p,n)}{t_c(n_p,n)} = \frac{\left[\frac{n}{n_p} - 1\right] + Kp}{6Kp} = \frac{\left[\frac{n}{n_p} - 1\right] + \log_2 n_p}{6\log_2 n_p}$$

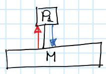
CASO: Comunicación usando red bus

Memoria : RAM



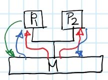


$Kp = 0 \longrightarrow 2^{Kp} = 2^0 = 1$ $\qquad \vec{x} = (-1,2,4,1,6,0,-1,0)$ $\qquad t$



$3 + 1(3) \quad 0(2)(3)$

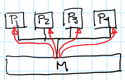
$Kp = 1 \longrightarrow 2^{Kp} = 2^1 = 2$



$3 + 2(3) \quad 1(2)(3)$

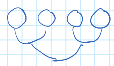
$$3 + 3n_p + (2)(3)\underbrace{[1]}_{2^0}$$

$Kp = 2 \longrightarrow 2^{Kp} = 2^2 = 4$



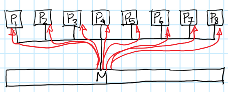
$3 + 4(3) \quad (2)(2)(3)$

$(1)(2)(3)$



$$3 + 3n_p + (2)(3)\underbrace{[1+2]}_{2^0 + 2^1}$$

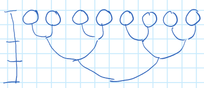
$Kp = 3 \longrightarrow 2^{Kp} = 2^3 = 8$



$3 + 8(3) \quad 4(2)(3)$

$2(2)(3)$

$1(2)(3)$



$$3 + 3n_p + (2)(3)\underbrace{[1+2+4]}_{2^0 + 2^1 + 2^{2}}$$

$(Kp-1)$

$$t_c(n_p,n) = 3 + 3n_p + (2)(3)\sum_{i=0}^{(Kp-1)} 2^i$$

$$\sum_{n=0}^{N} a x^n = a\left[\frac{1 - x^{N+1}}{1 - x}\right], \quad x \neq 1$$

$x = 2$

$n = i$

$a = 1$

$N = Kp - 1$

$$\sum_{i=0}^{(Kp-1)} 2^i = (1)\left[\frac{1 - 2^{(Kp-1)+1}}{1 - 2}\right], \quad 2 \neq 1$$

$$= \left[\frac{1 - 2^{Kp}}{-1}\right]$$

$$\sum_{i=0}^{(K_p-1)} 2^i = (1)\left[\frac{1-2^{(K_p-1)+1}}{1-2}\right],\ 2 \neq 1$$

$$= \left[\frac{1-2^{K_p}}{-1}\right]$$

$$= 2^{K_p}-1$$

$$3+3n_p+(2)(3)\left[2^{K_p}-1\right]$$

$$3+3n_p+6\left[2^{K_p}-1\right]$$

$$3+3n_p+6(2^{K_p})-6$$

$$3n_p+6(2^{K_p})-3$$

$$3n_p+6(2^{\log_2 n_p})-3$$

$$3n_p+6n_p-3$$

$$9n_p-3$$

$$t(n_p,n) = \left[\frac{n}{n_p}-1\right]+K_p+9n_p-3$$

$$= \left[\frac{n}{n_p}-1\right]+\log_2 n_p+9n_p-3$$

$$R_{c\to c} = \frac{\left[\frac{n}{n_p}-1\right]+\log_2 n_p}{9n_p-3}$$