

0.5 → 10,000
0.001 →

Input/output systems:

- كفاءة نظام الـ In/out نقل كفاءة الـ system

- Amdahl's law :

نسبة الـ time التي كان
يخضع الجزء الباقي للـ

$$S = \frac{1}{(1-f) + (f/K)}$$

overall Speedup

fraction of work of faster component
Speedup of faster component

* بين ان القيمة المتوقعة للنظام يعتمد على الـ component

ex: Suppose we can upgrade a CPU to make it 50% faster or upgrade its disk driver to 150%.

- Processor spend 70% of their time running in the CPU and 30% of their time waiting for disk

Solve

$$f=0.70, K=1.5, S = \frac{1}{(1-0.7) + (\frac{0.7}{1.5})} = 1.3$$

$$f=0.30, K=2.5, S = \frac{1}{(1-0.3) + (\frac{0.3}{2.5})} = 1.22$$

(1)

$$f = 0,65 \quad \{ \quad K = 1,5$$

$$S = \frac{1}{(1-0,65) + \left(\frac{0,65}{1,5}\right)} = 1,2766$$

(2)

$$\text{CPU} \quad S = 1,25 \quad \{ \quad f = ,6 \quad \{ \quad K = \frac{1,25}{((1/1,25) - (1-0,6))} = 1,5$$

Disk :

$$S = 1,25 \quad \{ \quad f = 0,4 \quad \quad K = 2$$

(8)

$$S_{\text{CPU}} = \frac{1}{(1-,6) + \left(\frac{,6}{2,4}\right)} = 1,20 \Rightarrow 20\%$$

$$S_{\text{Disk}} = \frac{1}{(1-0,4) + \left(\frac{0,4}{2,5}\right)} = 1,3158 \text{ or } 31,5\%$$

$$\text{CPU} \Rightarrow \frac{5000}{20\%} = 241,66 \text{ Per } 1\% \text{ increase } \checkmark$$

$$\text{Disk} \Rightarrow \frac{8000}{31,58} = 253,3 \text{ Per } 1\%$$