

→ Arquitectura de computadoras - Ficha 5

1-

- 4 bloques de igual latencia (60 ps)

- latencia = 20 ps

- 1 estadio



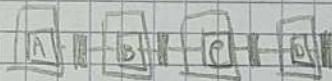
$$T_{\text{estadio}} = 60 + 60 + 60 + 60 = 240 \text{ ps}$$

$$T_{\text{cc}} = \max(240) + 20 = 260 \text{ ps}$$

$$f = \frac{1}{T_{\text{cc}}} = \frac{1}{260 \times 10^{-12}} = 3,85 \times 10^9 \text{ GHz}$$

$$T_{\text{lat}} = 1 \times T_{\text{cc}} = 260$$

- 4 estadios

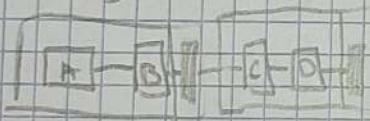


$$T_{\text{estadio}} = T_{\text{estadio}} 2 = T_{\text{estadio}} 3 = T_{\text{estadio}} 4 = 60$$

$$T_{\text{cc}} = \max(60, 60, 60, 60) + 20 = 80 \text{ ps}$$

$$f = \frac{1}{T_{\text{cc}}} = \frac{1}{80 \times 10^{-12}} = 12,5 \times 10^9 \text{ GHz}$$

- 2 estadios



$$T_{\text{estadio}} = T_{\text{estadio}} 1 = 120$$

$$T_{\text{cc}} = \max(120, 120) + 20 \\ = 140 \text{ ps}$$

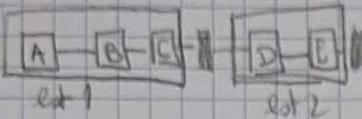
$$T_{\text{lat}} = 2 \times 120 = 240$$

$$f = \frac{1}{T_{\text{cc}}} = \frac{1}{140 \times 10^{-12}} = 7,14 \text{ GHz}$$

$$T_{\text{lat}} = 2 \times T_{\text{cc}} = 280$$

2-

a) • 2.40 logicos



$$T_{\text{ext}1} = 40 + 20 + 20 = 80 \text{ ps}$$

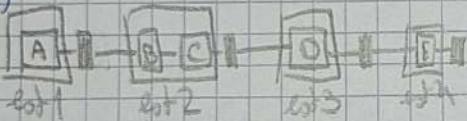
$$T_{\text{ext}2} = 50 + 20 = 70 \text{ ps}$$

$$T_{\text{cc}} = \max(80, 70) + 20 = 100 \text{ ps}$$

$$f = \frac{1}{100 \times 10^{-12}} = 10 \times 10^9 \text{ GHz}$$

$$T_{\text{inst}} = 2 \times 100 = 200 \text{ ps}$$

b)



$$T_{\text{ext}1} = 40$$

$$T_{\text{ext}2} = 40$$

$$T_{\text{ext}3} = 50$$

$$T_{\text{ext}4} = 20$$

$$T_{\text{cc}} = \max(40, 40, 50, 20) + 20$$

$$= 70 \text{ ps}$$

$$f = \frac{1}{70 \times 10^{-12}} = 14,3 \times 10^9 \text{ GHz}$$

$$T_{\text{inst}} = 4 \times 70 = 280$$