

$$= 0,8$$

$$= 78$$

$$J_i = 1,5$$

$$S_i = \lambda_i \cdot S_i$$

CARLOS GARCIA CENURA

5.7

$$a) D_i = 0,6 \Rightarrow D_i = \frac{B_i}{C_0} \rightarrow D_i = \frac{B_i}{C_0} = \frac{\frac{B_i}{T}}{\frac{C_0}{T}} = \frac{U_i}{X_0} = \frac{U_i}{\lambda_0} \rightarrow U_i = D_i \cdot \lambda_0$$

$$U_i = \frac{B_i}{T}$$

$$\lambda_0 = \frac{A_i}{T}$$

$$V_i = 0,6 \cdot \frac{90}{60} = 0,9$$

b)

$$D_i = \frac{0,6}{2,5} = 0,24$$

$$V_i = 0,24 \cdot \frac{90}{60} = 0,36$$

c)

$$D_i = 0,6 \cdot 2 = 1,2$$

$$V_i = 1,2 \cdot \frac{90}{60} = 1,8$$

En este caso el servidor estaría sobrecargado ya que la utilización va a ser mayor a 1 (100%)

$$U_d = 0,8$$

$$\lambda_0 = 38$$

$$V_i = 1,5$$

$$U_i = X_i \cdot S_i = \lambda_i \cdot S_i$$

$$S_i = \frac{U_i}{\lambda_i} = \frac{0,8}{38} = 0,021$$

CARLOS GARCIA SEGURA

5.8

a)

$$CPU \rightarrow D_i = V_i \cdot S_i = 8 \cdot 0,01 = 0,08$$

$$D_1 \rightarrow D_i = V_i \cdot S_i = 4 \cdot 0,04 = 0,16$$

$$D_2 \rightarrow D_i = V_i \cdot S_i = 3 \cdot 0,03 = 0,09$$

b)

$$R_0 = \sum V_i \cdot R_i = 8 \cdot 0,0147 + 4 \cdot 0,1117 + 3 \cdot 0,0469 = 0,7027$$

c)

$$N_0 = \lambda_0 \cdot R_0 = 4 \cdot 0,7027 = 2,8108$$

d)

$$X_i = V_i \cdot X_0 \rightarrow X_i = V_i \cdot \lambda_0 \rightarrow X_i = V_i \cdot \lambda_0$$

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~~Handwritten scribbles~~

$$X_{CPU} = 8 \cdot 4 = 32$$

$$X_{D1} = 4 \cdot 4 = 16$$

$$X_{D2} = 3 \cdot 4 = 12$$

e)

$$U_i = X_i \cdot S_i$$

$$U_{CPU} = 32 \cdot 0,01 = 0,32$$

$$U_{D1} = 16 \cdot 0,04 = 0,64$$

$$U_{D2} = 12 \cdot 0,03 = 0,36$$

5.10

a)

$$NT = 3000$$

$$Z = 20$$

$$R_0 = 100$$

$$NT = N_z + N_0 = X_0 \cdot (Z + R_0) \rightarrow X_0 = \frac{NT}{Z + R_0} = \frac{3000}{30} = 100 \text{ peticiones/s}$$

$$N_z = X_0 \cdot Z = 100 \cdot 20 = 2000 \text{ peticiones}$$

b)  $X_0 = 125$ 

$$R_0 = \frac{NT}{X_0} - Z = \frac{3000}{125} - 20 = 4$$

c)

$$X_0 = 200$$

$$R_0 = \frac{3000}{200} - 20 = -5 \quad \text{No se puede conseguir}$$

c)

$$X_0 = 200$$

$$R_0 = \frac{3000}{200} - 20 = -5 \quad \text{No se puede conseguir}$$

5.13.

a)

$$\text{Max } D_i$$

$$D_i = V_i \cdot S_i$$

$$D_B = 2,25 \quad \text{El cuello de botella está en la cinta}$$

$$g) R_0^{\min} = \sum D_i = 2 + 2,25 = 4,25$$

$$c) NT = \frac{R_0^{\min} + Z}{D_B} = \frac{4,25 + 6}{2,25} = 4,5 \rightarrow 4,5 < 25 \rightarrow \text{Regimen alta carga}$$

d)

$$R_0 \geq \max \left\{ R_0^{\min}, D_B \cdot NT - Z \right\} = \max \{ 4,25, 100,25 \} = 100,25$$

$$X_0 \leq \min \left\{ \frac{NT}{R_0^{\min} + Z}, \frac{1}{D_B} \right\} = \min \left\{ \frac{25}{10,25}, \frac{1}{2,25} \right\}$$



27.

$$U_d = 0,8$$

$$\lambda_0 = 38$$

$$V_i = 1,5$$

$$U_i = X_i \cdot S_i = \lambda_i \cdot S_i$$

$$S_i = \frac{U_i}{\lambda_i} = \frac{0,8}{38} = 0,021$$

$$X_{0\max} = \frac{1}{D_g} = \frac{1}{1,5 \cdot 0,021} = 31,74$$

El administrador no tiene razón, el sitio ~~se~~ reporta como máxima 31,74 peticiones por segunda

29.

29.

$$a) D_i = V_i \cdot S_i$$

$$D_{CPU} = 8 \cdot 0,025 = 0,2$$

$$D_{HDD} = 0,050 \cdot 9 = 0,45$$

$$D_B = \max D_i = 0,45 \quad \text{El cuello de botella es el HDD}$$

$$X_{0\max} = \frac{1}{D_g} = \frac{1}{0,45} = 2,22$$

b)

$$U_i = \lambda_0 \cdot D_i$$

$$U_{CPU} = 1,5 \cdot 8 \cdot 0,025 = 0,3$$

$$\lambda_0 = 1,5$$

c)

$$\lambda_0 = 3 \quad U_{CPU} = 3 \cdot 8 \cdot 0,025 = 0,6$$

$$U_{\max} = X_{0\max} \cdot D_i = 2,22 \cdot 8 \cdot 0,025 = 0,44$$

Por lo que el servidor estaría saturado ya que la CPU no puede ir mayor al 44%

$$d) D_{HDD} = \frac{0,45}{3} = 0,15 \rightarrow D_B = 0,2$$

$$X_{0\max} = \frac{1}{0,2} = 5$$