pag 21

$d = 10 Km = 10000\ m \quad (10^4)$

$V = 2 \times 10^8\ m/s$

$L = 1000\ bits = 10^3$

$R = 10\ Mbps = 10 \times 10^6\ bps$

$a = \frac{tp}{tt} \qquad tp = \frac{10^4}{2 \times 10^8} = \frac{1}{2 \times 10^4}$

$tt = \frac{10^3}{10 \times 10^6} = \frac{1}{10^4} \qquad a = \frac{\frac{1}{2 \times 10^4}}{\frac{1}{10^4}} = \frac{10^4}{2 \times 10^4} = 1/2 = 0.5$

pag 22

$d = 1000\ Km = 10^6\ m$

$v = 2 \times 10^8\ m/s$

$L = 424\ bits \quad (53\ bytes)$

$R = 155\ Mbps = 155 \times 10^6\ bps$

$a = \frac{tp}{tt} \qquad tp = \frac{10^6}{2 \times 10^8} = \frac{1}{2 \times 10^2}$

$tt = \frac{424}{155 \times 10^6} \qquad a = \frac{155 \times 10^6}{424 \times (2 \times 10^2)} = \frac{155 \times 10^4}{424 \times 2} = 1827,83$

pag 25

stop-and-wait (~~24~~) (1)

(21) $U = \frac{1}{\underset{0.5}{2a+1}} = \frac{1}{1+1} = 0.5 \qquad (U = 50\%)$

(22) $U = \frac{1}{\underset{182783}{2a+1}} = 0.000273 = 2,7 \times 10^{-4} = 0.027\%$

metodo stop and wait muito ineficiente c/ a elevado pag. 25 .2

$a = 0.5$

$R = ??$ para $U = 0.8$

$$U = \frac{1}{1+2a} \qquad 0.8 = \frac{1}{1+2a}$$

$$0.8 + 1.6a = 1$$

$$a = \frac{0.2}{1.6} = 0.125$$

$$\frac{d/v}{L/R} = 0.125 \qquad \frac{\frac{10^4}{2\times10^8}}{\frac{10^3}{R}} = 0.125$$

$$\frac{\frac{1}{2\times10^4}}{\frac{10^3}{R}} = 0.125 \qquad \frac{R}{2\times10^7} = 0.125$$

$R = 2500000$ bps

2,5 Mbps

pag 29

$W = ??$

$U = 50\%$

$a = 1824$

$$U = \frac{W}{1+2a}$$

$$0.5 = \frac{W}{1+2\times1824}$$

$$W = 1824.5$$

$$\boxed{W = 1825}$$