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Redes de computadores 1

Exercícios CAP. 2

$$\begin{aligned} 1) \quad B &= 4 \text{ kHz} & C &= 2 \cdot 4 \cdot \log_2(2^{16}) \\ V &= 16 & C &= 8 \cdot 16 \\ & & C &= 128 \text{ Kbps} \end{aligned}$$

$$\begin{aligned} 30 \text{ db} &\rightarrow 30 = 10 \log_{10}(S/N) \\ 3 &= \log_{10}(S/N) \\ 1000 &= S/N \end{aligned}$$

* Shannon

$$\begin{aligned} C &= B \cdot \log_2(1 + S/N) \\ C &= 4 \cdot \log_2(1 + 1000) \\ C &= 4 \cdot 9,96722 \\ C &\approx 39,86888 \text{ Kbps} \end{aligned}$$

$$\begin{aligned} 2) \quad B &= 6 \text{ MHz} & C &= 2 \cdot B \cdot \log_2 V \\ V &= 4 & C &= 2 \cdot 6 \cdot \log_2 4 \\ & & C &= 12 \cdot 2 \\ & & C &= 24 \text{ Mbps} \end{aligned}$$

$$\begin{aligned} 3) \quad \text{Tempo de trânsito (GEO)} &= 2 \times (\text{Alt} / \text{vel da Luz}) \\ &= 2 \times (35800 / 300000) = 0,2386 \text{ segundos} \approx 239 \text{ ms} \\ \text{Tempo de trânsito (MEO)} &= 2 \times (18000 / 300000) \\ &= 0,12 \text{ segundos} = 120 \text{ ms} \\ \text{Tempo de trânsito (LEO)} &= 2 \times (750 / 300000) \\ &= 0,005 \text{ segundos} = 5 \text{ ms} \end{aligned}$$