CMPT434 ~ ASSIGNMENT 1 2017-02-01

IAIN WORKMAN IPW969 11139430

4 a)

$$BD = \frac{(1\times10^{6}\ \text{bits/sec})(270\times10^{-3}\ \text{sec})}{1000\ \text{bits/frame}}$$

$$= 270$$

Since the ACK is included in data frames it is included :

$$\text{utilization} = \frac{w}{2(270)+2} = \frac{w}{542}$$

stop & wait: $w = 1$ $\text{utilization} = \frac{1}{542} = 0.00185$

Go Back N $w = 2^{\text{sequence\_size}} - 1 = 2^{3} - 1 = 8 - 1 = 7$

$$\text{utilization} = \frac{7}{542} = 0.0129$$

Selective Repeat $w = \frac{2^{\text{sequence\_size}}}{2} = \frac{8}{2} = 4$

$$\text{utilization} = \frac{4}{542} = 0.00738$$

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4) b) rate = 1.544×10^6 bits/sec

length = 100×10^3 m

Prop. speed = 2×10^8 m/sec

Prop. delay = $\frac{100 \times 10^3 \text{ m}}{2 \times 10^8 \text{ m/sec}} = 0.005 \text{ sec}$

capacity = $(1.544 \times 10^6 \text{ bits/sec})(0.005 \text{ sec})$

= 7720 bits