

2a) Maximum and minimum time to know lost frame

$$\text{Minimum} = 5\text{ms} + 5\text{ms} = 10\text{ms}$$

$$\text{Maximum} = 20\text{ms} + 20\text{ms} = 40\text{ms}$$

2b) Average throughput considering no dropped frames

$$79 \text{ frames} \times 20 \text{ ms} = 1580 \text{ ms}$$

$$5000 \text{ bytes} \times 8 = 40,000 \text{ bits}$$

$$\text{throughput} = \frac{40000 [\text{bits}]}{1.58 [\text{s}]} = 25316.46 [\text{bits/s}]$$

2c) every 10th frame is lost

$$\text{Retransmissions} = \frac{10000}{100} = 100$$

2d) average time for transmitting frames
 $(10000 + 100) 20 \cdot 10^{-3} = 202 [\text{s}]$