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RWND = 12

SSTHRESH = 8

1)

$RTT = T_1 + \tau_1 + T_2 + \tau_2 + T_3 + \tau_3 + T_4 + \tau_4 + \tau_4 + \tau_3 + \tau_2 + \tau_1$

MSS = 600 B = 4800 bit

$T_{open} = 2(\tau_{1,2,3,4}) = 3\ ms$

$T_1 = \frac{MSS}{C_1} = 0,00024\ s = 0,24\ ms$

$T_3 = T_2 = \frac{MSS}{C_{2,3}} = 0,12\ ms$

$T_4 = \frac{MSS}{C_4} = 0,04\ ms$

$T_1 \times 11 = 2,64$

$3,52 - 2,64 = 0,88$

$RTT = 0,52 + 3 = 3,52\ ms$

$W_{CONT} \geq \frac{RTT}{T} = \frac{3,52}{0,24} = 14,6 \quad W_{CONT} = 15$

2) No $RWND < W_c$

3) F = 66 KB

N° MSS = 110

S.S. C.A.

(1) (2,3) (4,5,6,7) (8,9,10,11,12,13,14,15) (16-24) (25-34) (35-45)

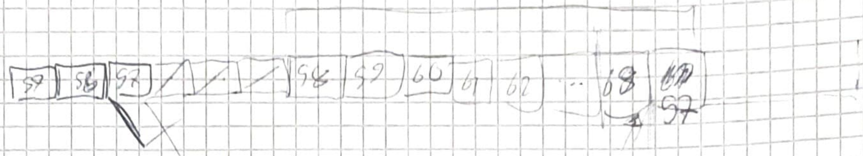
(46-57) | RWND (58-69) (70-81) (82-93) (94-105) (106-110)

Non ho problemi se $RTT > 12T_1$ OK

$T_{TOT} = T_{open} + 12RTT + 4T_1 = 3 + 12 \cdot 3,52 + 4 \cdot 0,24 = 49,32$

3,52

3)



$8RTT + T_6 + RTT + RTT + RTT$

69–80 81–92 93–

(49,28) (2,64)

$T_{ERR} = 3 + 14 \cdot 3{,}52 + 11 \cdot 0{,}24 + 10\,ms$

$\cong 64{,}92$

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1 QUESITI

$C = 1\ Mb/s$

$\tau = 2\,ms$

$L_{ACK} = 1200\,bit$

$\eta \geq 60\%$ L_{min}?

$T = \frac{L_{min}}{C}$

$RTT = T_1 + \tau_1 + T_1' + \tau_1$

$= \frac{L_{min}}{C} + \tau + \frac{L_{ACK}}{C} + \tau$

$\eta = \frac{T}{RTT} = \frac{L_{min}}{C \cdot RTT}$

$L_{min} = \eta \cdot C \cdot RTT$

$L_{min} = \eta \cdot C \cdot \left(\frac{L_{min}}{C} + \tau + \frac{L_{ACK}}{C} + \tau\right)$

$L_{min} = \eta \cdot L_{min} + \eta \cdot C \cdot \tau + \eta L_{ACK} + \eta C \tau$

$L_{min}(1-\eta) = \eta C \tau + \eta L_{ACK} + \eta C \tau$

$L_{min} = \frac{\eta \cdot (C\tau + L_{ACK} + C\tau)}{1-\eta} = \frac{\eta\,(2M + 1200 + 2M)}{1-\eta} \cong 6\,Mbit$

3) $RTT_{av}(i+1) = \left(1 - \frac{1}{8}\right) \cdot 24\,ms + \frac{1}{8} \cdot 20\,ms$

$= \frac{7}{8} \cdot 24 + \frac{1}{8} \cdot 20 = \frac{168}{8} + \frac{20}{8} = \frac{188}{8}$

4) $T_o = RTT_{av} + 4\,RTT_{dev} = 24 + 4 \cdot 5 = 44$