ESERCIZIO 1 APPELLO DEL 21/01/2020

L1 : B 197.200.111.255 250 H

L2 : R2 197.200.113.13 b: 197.200.112.0

L3 : 512 H

L4 : 1000 H R4 : 197.200.117.34 R3 : 197.200.119.99

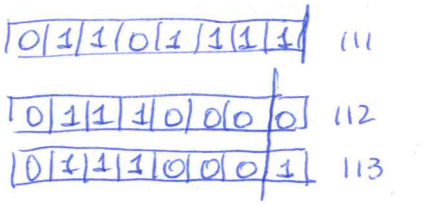
L5 : 59 H

L6 : 62 H B : 197.200.201.255

L7 : 32 H R5 197.200.201.125

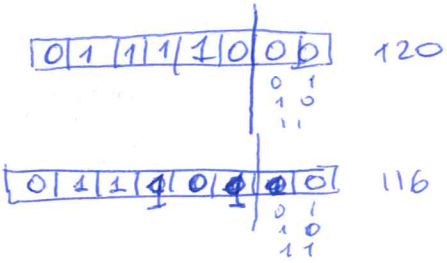
L1: 197.200.111.0/24

L2: 197.200.112.0/23



L3: 197.200.120.0/22

L4: 197.200.116.0/22



L5: 197.200.201.0/26

L6 : 197.200.201.128/25

L7 : 197.200.201.64/26

ROUTER:

R1-R2: 197.200.114.0/30

R1-R3: 197.200.114.4/30

R1-R5: 197.200.114.8/30

R2-R3 : 197.200.114.12/30

R3-R5 : 197.200.114.16/30

R4-R5 : 197.200.114.20/30

BLOCCHI LIBERI

114.24 → 114.255

115

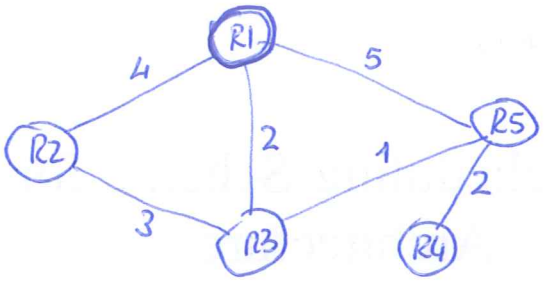
124

200

77 blocchi di classe C

+ 232 indirizzi della .114

ESERCIZIO 2



$T = 34\ s$

R1-R3 down

Hello = 50

$T_e = 0{,}5\ ms$

$\tau = 2\ ms$

$V_T = 1\ Mbps$

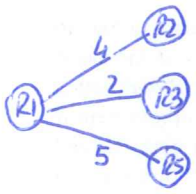
$P = 520B$

$T_x = \frac{(520+46)\cdot 8}{1\ Mbps} = 4{,}53\ ms$

$T_x + T_e + \tau = 7{,}028$

$t = 5{,}007$

R1

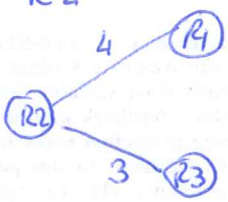


$(R_1, R_2, 4)$
$(R_1, R_3, 2)$
$(R_1, R_5, 5)$

R1	1	LSDB(R1)

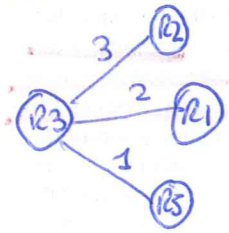
From SQ

R2



$(R_2, R_1, 4)$
$(R_2, R_3, 3)$

R3

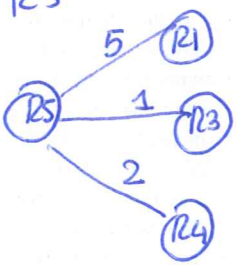


$(R_3, R_2, 3)$
$(R_3, R_1, 2)$
$(R_3, R_5, 1)$

R4

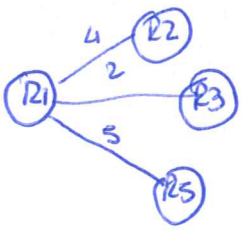
$(R_4, R_5, 2)$

R5



$(R_5, R_1, 5)$
$(R_5, R_3, 1)$
$(R_5, R_4, 2)$

$t = 5{,}014$ R1 riceverà R2, R3, R5



$(R_1, R_2, 4)$ ~~$(R_2, R_1, 4)$~~ ~~$(R_3, R_2, 3)$~~ ~~$(R_5, R_1, 5)$~~ $(R_1, R_2, 4)$

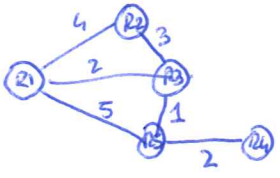
$(R_1, R_3, 2)$ $(R_2, R_3, 3)$ ~~$(R_3, R_1, 2)$~~ ~~$(R_5, R_3, 1)$~~ $(R_1, R_3, 2)$

$(R_1, R_5, 5)$ $(R_3, R_5, 1)$ $(R_5, R_4, 2)$ $(R_1, R_5, 5)$

$(R_2, R_3, 3)$

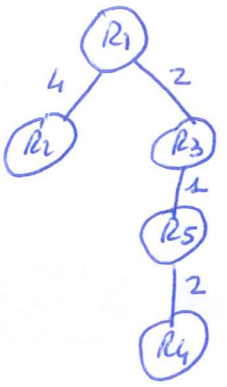
$(R_3, R_5, 1)$

$(R_5, R_4, 2)$

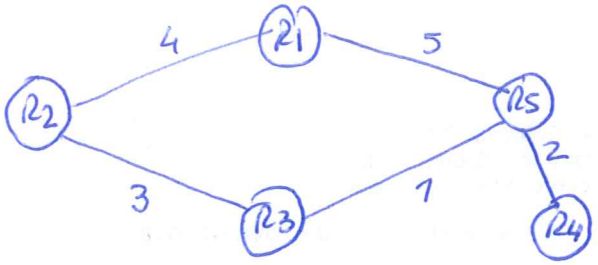


ESERCIZIO 2

	R1	R2	R3	R4	R5
R1	—	4/R1	2/R1	∞	5/R1
R1,R3	—	4/R1	—	∞	3/R3
R1,R3,R5	—	4/R1	—	~~5/R5~~	—
R1,R3,R5,R2	—	—	—	5/R5	—
R1,R3,R5,R2,R4	—	—	—	—	—



TO	NEXT	COST
R2	R2	4
R3	R3	2
R5	R3	3
R4	R3	5



T = 34 s R1 - R3 down

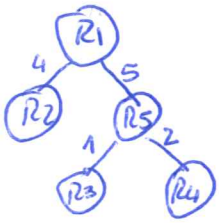
1° Hello 35 s

2° Hello 40 s

3° Hello 45 s

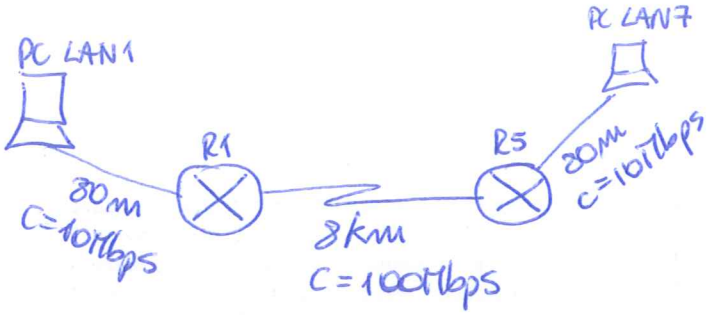
T = 45,007 R1 conosce subito la nuova topologia

	R1	R2	R3	R4	R5
R1	—	4/R1	∞	∞	5/R1
R1,R2	—	—	7/R2	∞	5/R1
R1,R2,R5	—	—	6/R5	7/R5	—
R1,R2,R5,R3	—	—	—	7/R5	—
R1,R2,R5,R3,R4					



TO	NEXT	COST
R2	R2	4
R5	R5	5
R3	R5	6
R4	R5	7

ESERCIZIO 3



$F = 40kbit$

$CNWD = 8$

$MSS = 100B$

$ACK = 66B$

$$\begin{cases} RTT(t) = RTT(t-1) * 1,1 \\ RTT_i = RTT3 \quad i > 3 \end{cases}$$

RTT4 vengono persi tutti i segmenti

$N_{MSS} = \frac{40000}{100 \cdot 8} = 50$

$N_{RTT} = lg_2(8) = 3\,RTT$

$N_{MSS} = 2^{3+1} - 1 = 15\,MSS$

N_{MSS} rimanenti $= 50 - 15 = 35$

$\lceil \frac{35}{8} \rceil = 5$

$D = 3RTT + 5RTT = 8RTT$

$T_1 = \frac{(100+66)\cdot 8}{10Mbps} = 132,8\,\mu s = T_3$

$T_2 = \frac{1328}{100Mbps} = 13,28\,\mu s$

$\tau_1 = \frac{30}{2 \cdot 10^8} = 0,4\,\mu s = \tau_3$

$\tau_2 = \frac{8000}{2 \cdot 10^8} = 40\,\mu s$

$T_{A1} = \frac{66 \cdot 8}{10Mbps} = 52,8\,\mu s = T_{A3}$

$T_{A2} = \frac{(66 \cdot 8)^{528}}{100Mbps} = 5,28\,\mu s$

$\tau_{A1} = \tau_1 = \tau_{A3} = \tau_3 \qquad \tau_{A2} = \tau_2$

$RTT = T_1 + T_2 + T_3 + T_{A1} + T_{A2} + T_{A3} + 2(\tau_1 + \tau_2 + \tau_3) =$

$= 471,36$

$RTT2 = RTT1 \cdot 1,1 = 518,5$

$RTT3 = RTT2 \cdot 1,1 = 570,35$

$RTO = 2SRTT3$

$SRTT(k+1) = \alpha\, SRTT(k) + (1-\alpha)\, RTT(k+1)$

$\alpha = 0,8$

$SRTT1 = RTT1 = 471,36$

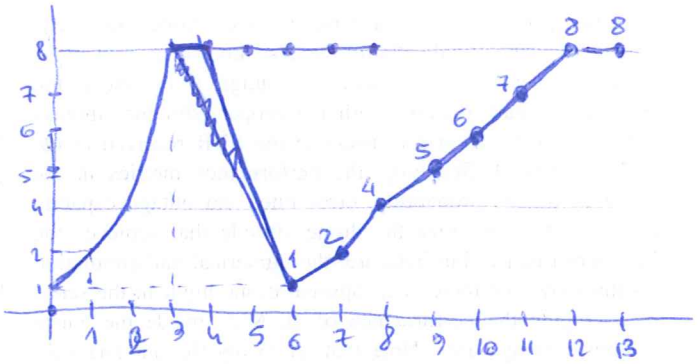
$SRTT2 = \alpha\, SRTT1 + (1-\alpha)\, RTT2 =$

$= 0,8 \cdot 471,36 + 0,2 \cdot 518,5 = 480,79$

$SRTT3 = \alpha\, SRTT2 + (1-\alpha)\, RTT3 =$

$= 0,8 \cdot 480,79 + 0,2 \cdot 570,35 = 498,70$

$RTO = 2 \cdot SRTT3 = 2 \cdot 498,70 = 997,40\,\mu s$



$N_{RTT} = lg_2 4 = 2$ $\quad MAXWIN = \frac{CWND}{2} = \frac{8}{2} = 4$

$SS_2 = 2^{2+1} - 1 = 7$ $\quad SS_{TH} = 4$

$CA =$ $\quad CWND = 1$

$SS_1 = 3RTT\ (15\,MSS)$, perdita $1RTT\ (0\,MSS)$, $RTO = 2RTT\ (0\,MSS)$, $SS_2 = 2\,RTT\ (7\,MSS)$, $CA = 5RTT\ (28\,MSS)$