

Contribution to the Development of Autonomous Satellite Communications Networks

—

The Internet of Satellites

by

Joan Adrià Ruiz-de-Azua Ortega

Submitted to the Department of Network Engineering
in partial fulfilment of the requirements for the degree of

Doctor of Philosophy

at the Technical University of Catalonia – UPC BarcelonaTech



**UNIVERSITAT POLITÈCNICA
DE CATALUNYA
BARCELONATECH**

Thesis Advisors:

Dr. Anna Calveras Augé

Dr. Adriano Camps

September, 2020

Contribution to the Development of Autonomous Satellite Communications Networks: The Internet of Satellites

Complementary document - Errata sheet

Page 200: acronym name

RTO acronym refers to Retransmission Timeout.

Page 201: subscript

Equation (7.2) presents the formulation of the maximum value of the RTT. However, the equation wrongly uses the term RTT_{min} , which must be replaced by RTT_{max} .

Page 201: Clarification of RTT formulation

To add after Equation (7.3):

This fomulation has been determined by empiric cases in which c packets are correctly delivered and r packets are retransmitted with respect to the entire transmitted packets ($n = c + r$). Acknowledgement transmission and processing times are considered negligible.

Page 201: Errata in Table 7.2

Table 7.2 must be replaced by the following one.

Table 1: Theoretical throughputs (S)—maximum, minimum, and average—of downlink and federation transmissions with respect to the PDR

PDR	Max. RTT [ms]	Min. RTT [ms]	Max. S [bps]	Average S [bps]	Min. S [bps]
<i>Downlink</i>					
100.00 %	1025.00	425.00	3614.12	1498.54	2556.33
66.67 %	4237.50	3637.50	422.27	362.48	392.37
50.00 %	7450.00	6850.00	224.23	206.17	215.20
40.00 %	10662.50	10062.50	152.65	144.06	148.35
33.33 %	13875.00	13275.00	115.71	110.70	113.20
28.57 %	17087.50	16487.50	93.16	89.89	91.53
25.00 %	20300.00	19700.00	77.97	75.67	76.82
<i>Federation</i>					
100.00 %	2050.00	850.00	1807.06	749.27	1278.16
80.00 %	3656.25	2456.25	625.34	420.10	522.72
66.67 %	5262.50	4062.50	378.09	291.88	334.98
57.14 %	6868.75	5668.75	270.96	223.62	247.29
50.00 %	8475.00	7275.00	211.13	181.24	196.19
44.44 %	10081.25	8881.25	172.95	152.36	162.66
40.00 %	11687.50	10487.50	146.46	131.42	138.94
36.36 %	13293.75	12093.75	127.01	115.54	121.28
33.33 %	14900.00	13700.00	112.12	103.09	107.60
30.77 %	16506.25	15306.25	100.35	93.06	96.70
28.57 %	18112.50	16912.50	90.82	84.80	87.81
26.67 %	19718.75	18518.75	82.94	77.90	80.42
25.00 %	21325.00	20125.00	76.32	72.03	74.18