

# Análisis de Simulaciones IoT

## Resumen Ejecutivo

Este reporte presenta un análisis detallado de las simulaciones de red IoT, comparando diferentes protocolos de enrutamiento bajo diversas condiciones de red.

## Estadísticas Resumen

Métrica	Unidad	Media	Mediana	Std	
throughput_promedio	Kbps	0.081360400000000001	0.077705500000000001	0.024984305062178535	0.000000000000000000
delay_promedio	ms	0.9606154	0.884794	0.4338523925567773	0.000000000000000000
packet_loss_promedio	ms	0.5979349	0.5713935	0.36816951859121905	0.000000000000000000
packet_loss_paquetes	%	24.0475475	19.955143	13.013846834802923	1.000000000000000000
packet_loss_pdr	%	75.9524525	80.044857000000001	13.013846834802923	4.000000000000000000
packets_totales	packets	7987.3	7391.5	4658.3794617871135	0.000000000000000000
throughput_promedio	Kbps	0.751530899999999999	0.752276	0.14706672431481568	0.000000000000000000
delay_promedio	ms	0.1653709000000000002	0.0874395	0.1599959764821916	0.000000000000000000
packet_loss_promedio	ms	0.1326559	0.0704085	0.1410441519825973	0.000000000000000000
packet_loss_paquetes	%	52.860366	52.93413200000000005	5.683278070676975	4.000000000000000000
packet_loss_pdr	%	47.139634	47.0658679999999995	5.683278070676975	3.000000000000000000
packets_totales	packets	834.8	835.0	1.5362291495737215	0.000000000000000000
throughput_promedio	Kbps	1.0392	0.9552	0.2501486278195425	0.000000000000000000
delay_promedio	ms	0.5209918	0.469240499999999995	0.3038196731144315	0.000000000000000000
packet_loss_promedio	ms	0.5389838	0.4347305	0.3938123700634098	0.000000000000000000
packet_loss_paquetes	%	42.3218389	45.57471250000000004	9.764406715900137	2.000000000000000000
packet_loss_pdr	%	57.678161099999999	54.4252874999999996	9.764406715900137	4.000000000000000000
packets_totales	packets	870.0	870.0	0.0	0.000000000000000000
throughput_promedio	Kbps	0.0	0.0	0.0	0.000000000000000000
delay_promedio	ms	0.0	0.0	0.0	0.000000000000000000
packet_loss_promedio	ms	0.0	0.0	0.0	0.000000000000000000
packet_loss_paquetes	%	0.0	0.0	0.0	0.000000000000000000
packet_loss_pdr	%	0.0	0.0	0.0	0.000000000000000000
packets_totales	packets	0.0	0.0	0.0	0.000000000000000000
throughput_promedio	Kbps	0.0785602	0.078159	0.020880450588050055	0.000000000000000000
delay_promedio	ms	0.8771708	0.8688335	0.13195299907451896	0.000000000000000000

rtt_promedio	ms	0.5546743999999999	0.5945195	0.15693566282155247	0.15693566282155247
perdida_paquetes	%	18.5030508	17.493598	4.287652293012128	4.287652293012128
pdr	%	81.4969492	82.50640200000001	4.287652293012129	4.287652293012129
paquetes_totales	packets	7815.8	7519.5	2782.6918909573874	2782.6918909573874
throughput_promedio	Kbps	0.7456847	0.765931	0.21202568183173	0.21202568183173
delay_promedio	ms	0.1765324	0.14589200000000002	0.12530509918052019	0.12530509918052019
rtt_promedio	ms	0.17736789999999997	0.1453625	0.13283652787501635	0.13283652787501635
perdida_paquetes	%	52.6167597	52.2753085	8.354287240666244	8.354287240666244
pdr	%	47.383240300000004	47.7246915	8.354287240666244	8.354287240666244
paquetes_totales	packets	863.0	836.0	34.41801853680714	34.41801853680714
throughput_promedio	Kbps	0.7686545	0.768	0.08389102648108437	0.08389102648108437
delay_promedio	ms	0.34917539999999997	0.3334375	0.13124652231750752	0.13124652231750752
rtt_promedio	ms	0.37168959999999995	0.369093	0.14280042538255971	0.14280042538255971
perdida_paquetes	%	52.103049299999995	51.419557999999995	3.673194160078176	3.673194160078176
pdr	%	47.896950700000005	48.580442000000005	3.673194160078176	3.673194160078176
paquetes_totales	packets	951.0	951.0	0.0	0.0
throughput_promedio	Kbps	4.2803200000000001	0.0	8.34161962066254	8.34161962066254
delay_promedio	ms	10.900095539287733	0.0	16.98791105347512	16.98791105347512
rtt_promedio	ms	0.20394680142323426	0.0	0.5295991633805546	0.5295991633805546
perdida_paquetes	%	0.0	0.0	0.0	0.0
pdr	%	30.0	0.0	45.8257569495584	45.8257569495584
paquetes_totales	packets	62.7	0.0	122.1916936620489	122.1916936620489
throughput_promedio	Kbps	0.26401050000000004	0.22481	0.13009779731129195	0.13009779731129195
delay_promedio	ms	1.2110687	1.257313	0.27885627467462526	0.27885627467462526
rtt_promedio	ms	0.7837720000000001	0.809169	0.19448589379643966	0.19448589379643966
perdida_paquetes	%	39.361429099999995	39.083778499999994	8.33314220538472	8.33314220538472
pdr	%	60.63857089999999	60.916221500000006	8.333142205384718	8.333142205384718
paquetes_totales	packets	22353.8	21547.5	3593.244711956034	3593.244711956034
throughput_promedio	Kbps	10.5999314	9.338625	5.971665826962929	5.971665826962929
delay_promedio	ms	0.5716809	0.541407	0.262535078786988	0.262535078786988
rtt_promedio	ms	0.3564748	0.346235	0.1761011304437311	0.1761011304437311
perdida_paquetes	%	46.6678759	53.0562235	18.45289819415006	18.45289819415006
pdr	%	53.3321241	46.9437765	18.45289819415006	18.45289819415006
paquetes_totales	packets	10812.4	10813.0	1.8000000000000003	1.8000000000000003
throughput_promedio	Kbps	11.868075000000001	13.0545	5.987192168548209	5.987192168548209

delay_promedio	ms	1.1069098	1.2029385000000001	0.5764643027329271	0
rtt_promedio	ms	0.5915535999999999	0.5087235	0.3815743235838072	0
perdida_paquetes	%	40.471054699999996	41.316372	18.275432967227143	1
pdr	%	59.5289453	58.683628	18.275432967227147	2
paquetes_totales	packets	10848.0	10848.0	0.0	
throughput_promedio	Kbps	11.680426666666667	11.468800000000002	3.8475338007265556	
delay_promedio	ms	33.21448144971672	33.422883492543505	1.4914100254596645	30.963
rtt_promedio	ms	0.362567840682425	0.3319876198673122	0.1342714115632515	0.2193
perdida_paquetes	%	0.0	0.0	0.0	
pdr	%	100.0	100.0	0.0	
paquetes_totales	packets	171.1	168.0	56.360358409080405	
throughput_promedio	Kbps	0.3522278	0.2975275	0.24107940185333132	0
delay_promedio	ms	1.1645272	1.200673	0.20187229884944588	0
rtt_promedio	ms	0.7852874000000001	0.7458075	0.14092230473718487	0
perdida_paquetes	%	34.6273359	35.5845105	10.886071093021176	1
pdr	%	65.3726641	64.4154895	10.886071093021176	4
paquetes_totales	packets	22335.0	22144.5	2569.9049009642363	
throughput_promedio	Kbps	8.026451100000001	7.811999999999999	3.3106185690151153	2
delay_promedio	ms	0.8659765	0.6697075	0.9046286723279613	0
rtt_promedio	ms	0.6953745	0.47602049999999996	0.6928360022001239	0
perdida_paquetes	%	52.059679200000005	50.8781575	11.66732147150386	3
pdr	%	47.940320799999995	49.1218425	11.66732147150386	2
paquetes_totales	packets	10867.0	10878.5	21.693316943243143	
throughput_promedio	Kbps	8.404045700000001	7.3985140000000005	4.253995968772515	3
delay_promedio	ms	1.0639302	0.9213614999999999	0.5429366431230811	0
rtt_promedio	ms	0.5099402	0.507323	0.24986781273337308	0
perdida_paquetes	%	49.8892854	59.456492	19.978542513504784	1
pdr	%	50.110714600000001	40.543508	19.978542513504784	2
paquetes_totales	packets	10929.0	10929.0	0.0	
throughput_promedio	Kbps	22.152533333333334	15.633066666666666	15.542964801121082	7.9189
delay_promedio	ms	34.65509980687606	34.46383752135088	2.6096743700507075	3
rtt_promedio	ms	0.24362227234903583	0.22770672774254164	0.12924286091504472	0.0671
perdida_paquetes	%	0.0	0.0	0.0	
pdr	%	100.0	100.0	0.0	
paquetes_totales	packets	324.5	229.0	227.6801484539221	

# Conclusiones

Basado en el análisis de los datos, se pueden extraer las siguientes conclusiones:

- Para throughput\_promedio: El protocolo DSR en la configuración mal\_int mostró el mejor rendimiento con un valor promedio de 22.15 Kbps.
- Para delay\_promedio: El protocolo DSR en la configuración no\_mal\_no\_int mostró el mejor rendimiento con un valor promedio de 0.00 ms.
- Para jitter\_promedio: El protocolo DSR en la configuración no\_mal\_no\_int mostró el mejor rendimiento con un valor promedio de 0.00 ms.
- Para perdida\_paquetes: El protocolo DSR en la configuración no\_mal\_no\_int mostró el mejor rendimiento con un valor promedio de 0.00 %.
- Para pdr: El protocolo DSR en la configuración no\_mal\_no\_int mostró el mejor rendimiento con un valor promedio de 0.00 %.
- Para paquetes\_totales: El protocolo AODV en la configuración mal\_no\_int mostró el mejor rendimiento con un valor promedio de 22353.80 packets.