

A Markov Analytical Model between MANET Single-path and Multi-path Load Balancing Routing Protocol

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Abstract—Mobile Ad Hoc Network (MANET) is a network consisting of a set of wireless nodes that communicate through a wireless medium. It is widely used due to its characteristics such as centerlessness and self-organization for easy deployment, but these applications are based on having efficient routing algorithms. In this paper, we propose a Markov process-based algorithm analysis model to analyze the superiority of multipath algorithms and single-path algorithms in MANETs in terms of energy consumption, stability, throughput and delay. Simulation results further confirm this analysis, showing that the multipath algorithm is 37% more stable than the single-path algorithm. Under the condition of sending the same number of packets, the multipath algorithm will be more energy-efficient and time-saving than the single-path. In addition, the multipath algorithm has a higher throughput than the single-path for the same energy value.

Keyword—Analytical model, Energy consumption, Stability, Throughput, Delay.



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