

AN APPROACH TO IMPROVE THE AODV ROUTING PROTOCOL IN MOBILE AD HOC NETWORKS BY CONSIDERING TIME AND HOP-COUNT FACTORS

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Abstract

Mobile Ad-Hoc Networks (MANET) is an emerged area in the computing field. A mobile ad hoc network is a wireless network of mobile devices that forms a temporary network to communicate among the nodes without any fixed network infrastructure or centralized administration. MANET has many characteristics such as dynamic topologies, mobility, multi-hop routing, self-configurable, etc. Because of the highly dynamic topology of mobile nodes, limited battery power, and memory size in ad-hoc networks, making routing among mobile nodes to identify the optimum path from the source node to the destination node a complicated and challenging process. There are three types of routing protocols table-driven routing Protocols (proactive), on-demand routing protocols (reactive), and hybrid routing protocol (combine proactive and reactive). This paper proposes a new routing protocol algorithm (TH-AODV) for optimal path selection in MANETs by combining the Ad-hoc On-Demand Distance Vector (AODV) protocol with the factors of time and hop-count. In TH-AODV algorithm, if a communication link is broken, the best route for data delivery is determined by comparing the path from the source node to the destination node or the path from the node at the damaged link to the destination node. We have compared the suggested algorithm TH-AODV with other three types of routing algorithm DSDV, ZRP, and AODV using the network simulator NS-3. For low and high mobile nodes between 10 and 60 nodes, we examined performance differentials on simulated regions such as 600 x 600 m², 800 x 800 m², and 1000 x 1000 m². For our evaluation, we used end-to-end delay, throughput, and packet delivery ratio as performance metrics. When the number of nodes and configuration area is increased, our testing results demonstrate that TH-AODV performs better than DSDV, ZRP, and AODV.

Keywords: Mobile ad hoc networks, MANET, Routing protocols, DSDV, AODV