

## ABSTRACT

A Multi-Criteria Ad Hoc On-Demand Multi-Path Distance Vector (M-AOMDV)  
Routing Protocol

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The current disjoint path Ad hoc On-demand Multi-path Distance Vector (AOMDV) routing protocol does not have any energy-awareness or fault tolerant guarantees, which considers lifetime, node survivability, energy distribution and packet loss as the paths selected are based only on hop count. Thus, the current protocol needs to be extended by simple additions creating a new energy-aware or fault tolerant protective layer in the existing AOMDV framework.

In achieving these objectives an additional metric is added to the existing hop count metric. The main focus of this thesis is in exploring the efficiency of multi-criteria trade-offs, when making path selection decisions in the AOMDV routing protocol. It is proposed that adding an extra energy or packet loss metric will improve the routing decisions made, which will improve WSN survivability.

This Multi-criteria Ad hoc On-demand Multipath Distance Vector (M-AOMDV) routing protocol is compared to the current AOMDV routing protocol to prove its worth in being used with future networking protocols. It is found that M-AOMDV leads to better WSN survivability, which enhances the requirements needed in these specific areas for WSNs.

Keywords: energy-awareness; fault tolerant; lifetime; energy distribution; throughput; packet loss; hop count; survivability; routing protocol; Multi-criteria Ad hoc On-demand Multi-path Distance Vector (M-AOMDV).