A Modified AODV Routing Protocol to Avoid Black Hole Attack in MANETs

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Abstract

Mobile ad hoc networks (MANETs) are composed of a set of stations (nodes) communicating through wireless channels, without any fixed backbone support in which nodes are allowed to join and leave the network at any point of time. MANETs are generally more vulnerable to information and physical security threats than wired networks, so security is an essential requirement in MANETs to provide secured communication between mobile nodes. One of the most common attacks against routing in MANETs is the Black Hole attack. A black hole is a malicious node uses the routing protocol to advertise itself as having the shortest path to the node whose packets it wants to intercept. In this paper, we attempt to focus on improving the security of one of the popular routing protocol for MANETS, namely the Ad hoc On Demand Distance Vector (AODV) routing protocol to avoid black hole attacks. The proposed Intrusion Avoidance System (IASAODV) can be considered as modification of the AODV protocol and can be used to detect and avoid the black hole attack. The conducted experimental results using Network Simulator NS-2. 35 show an improvement in Packet Delivery Ratio (PDR), Normalized Routing Load (NRL) and throughput using the proposed protocol compared with AODV routing Protocol in the case of existing black hole attack.
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Keywords