

Performance Analysis of Wormhole Attack on Dynamic Source Routing (DSR) in Manet

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ABSTRACT

The mobile ad hoc network (MANET) is a type of wireless network that is decentralized. The network is ad hoc since it is not dependent on pre-existing infrastructure, such as routers or access points in wired networks. Rather than that, each node contributes to routing by forwarding data to other nodes; hence, which nodes forward data is determined dynamically based on network connectivity and the routing algorithm in use. Each device in a MANET is free to move in any direction, and so regularly changes its connections to other devices. Each must forward traffic that is unrelated to its own usage, requiring it to function as a router. MANET routing protocols such as DSR contain numerous security bugs, making certain types of network attacks on mobile ad hoc networks possible. wormhole attack which believed to be the dangerous network attack. This is because of the unusual form of tunnel attack between two malicious nodes, where a malicious node attracts all traffic to the tunnel, forwards it to another malicious node at the tunnel's other end and replays it throughout the network. Once the Wormhole tunnel is established, it can be used to launch various attacks such as routing attacks, packet dropping, and spoofing. In this paper, we examine and evaluate the performance of routing protocol, DSR with and without wormhole attack. At the same time, performance of DSR and DSDV are being compared based on its performance metrics. The simulation is carried out with size of area is 500m*500m, for 120 seconds, for three scenarios by using Network Simulator 2 (NS2) with vary number of nodes starting with 10, 20, 30, 40 and 50 nodes. Results showed that DSR under wormhole attack did not perform better as it had less throughput and more end-to-end delay. Meanwhile, the performance for DSR and DSDV show that, DSR performed better in term of Packet Delivery Ratio (PDR), while DSDV performed better in term of Throughput.

Keywords: MANET, Wormhole attack, DSR, DSDV, NS2