

Improving Data Exchange Security in Ad hoc Networks

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In this thesis, after the brief explanation of wireless ad hoc networks and expressions of works conducted, especially in two dimensions of security and integrity, we provide methods to compute and compare the security and integrity of ad hoc networks. In the method of virtual forwarding of secure nodes, the network will test integrity and security of new nodes which have a low performance history; then, it will rate the tested nodes as positive or negative. With these operations, the security and integrity of nodes will be evaluated. Furthermore, we will introduce a method called backbone. The backbone is a subset of network's nodes with special characteristics. Usually, nodes with high security and integrity will be selected. Backbone's nodes are the last ones which leave the network and consequently, lead to the network survivability. For backbone nodes and other secure nodes in the network, we consider more access permission such as different types of relaying and high general broadcast. In contrast, for insecure and or new nodes, we reduce the access permission. In this way, most routings are done through more secure nodes, and insecure or selfish ones will be secluded gradually. Finally, we will introduce an algorithm through which two lists are arranged, one based on the highest amount of integrity and the other based on the highest amount of security. Using the relations in the algorithm, it is possible to compare different networks and routes. However we can compute and compare the security and integrity of networks by deleting and or adding different edges and nodes as well as combining and separating networks at any time and locations.

Keywords : Wireless Ad hoc Networks, Security.

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