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A Lifetime-Enhancing Monitoring Node Distribution Using Minimum Spanning Tree in Mobile Ad Hoc Networks

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Abstract : In mobile ad hoc networks, all nodes in a network only have limited resources and calculation ability. Therefore communication topology which have long lifetime is good for all nodes in mobile ad hoc networks. There are a variety of researches on security problems in wireless ad hoc networks. The existing many researches try to make efficient security schemes to reduce network power consumption and enhance network lifetime. Because a new node can join the network at any time, the wireless ad hoc networks are exposed to various threats and can be destroyed by attacks. Resource consumption is absolutely necessary to secure networks, but more resource consumption can be a critical problem to network lifetime. This paper focuses on efficient monitoring node distribution to enhance network lifetime in wireless ad hoc networks. Since the wireless ad hoc networks cannot use centralized infrastructure and security systems of wired networks, a new special IDS scheme is necessary. The scheme should not only cover all nodes in a network but also enhance the network lifetime. In this paper, we propose an efficient IDS node distribution scheme using minimum spanning tree (MST) method. The simulation results show that the proposed algorithm has superior performance in comparison with existing algorithms.

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