Abstract

Wireless Sensor Networks (WSNs), besides its huge application areas, is prone to various types of attacks and security threats. Due to its dynamic topology, highly decentralized infrastructure and resource constraint sensors, proper energy utilization becomes a challenging issue. These entities are responsible to make WSNs susceptible to various types of denials of service attacks which results in disastrous consequences like energy-hole creation in the network. Various cluster head selection based energy efficient protocols have been proposed to
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Improve the lifetime of WSNs. In most of the energy efficient techniques, different approaches for energy utilization by sensors are proposed to extend lifetime of WSNs. The proposed scheme is defend against cooperative Gray-Hole and Black-Hole attacks that lead to performance degradation in WSNs containing mobile sensors. In order to overcome this, energy efficient technique is presented in this paper to mitigate the impact of both attacks simultaneously, on improving cluster head selection mechanism. Proposed protocol implements a energy efficient technique, on detecting and preventing compromised node to be a part on network communication in WSNs. It also determines honest nodes to become cluster head during packets transmission phase in WSNs. NS2 simulation result compare proposed protocol with LEACH proves that implemented scheme effectively minimize the chance of compromised node to become cluster head and significantly achieves better network performance related to packet delivery ratio (PDR), throughput, end-to-end delay and energy utilization in WSNs.

References

- Wazir Zada Khan, Yang Xiang, Mohammed Y. Aalsalem, Quratulain Arshad &quot;The Selective Forwarding Attack in Sensor Networks: Detections and Countermeasures&quot;, I. J. Wireless and Microwave Technologies, 2, 33-44. Published Online April 2014.
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3rd International Conference on Advanced Computing and Communication Technologies, 10. 1109 ACCT. 2013. 59.
- Qingwei Liu, Jin Li, Mandan Liu, &quot;A Clustering Algorithm Based on Local Competition and Double Weigh Communication Energy-Consumption for Wireless Sensor Networks&quot; 10th IEEE International Conference on Control and Automation (ICCA) Hangzhou, China, June 12-14, 2013.
- M. Natranjan, R. Arthi, K. Murugan, &quot;Energy Aware Optimal CH Selection in WSNs&quot; in IEEE 4th ICCCN'T, Tiruchengode, India, July 4-6, ICICNT 2013.
- Van-Trinh HOANG, Nathalie JULIEN, Pascal BERRUET, &quot;Cluster Head Selection


**Index Terms**

Computer Science

Applied Sciences

**Keywords**

Black-hole Attack; Cluster Head Selection; Delay; Energy Efficiency; Gray-hole Attack; Leach; Network Lifetime; Packet Delivery Ratio; Throughput; wireless Sensor Networks.