Optimized Secure Data Delivery Based on Randomized Routing in Wireless Sensor Networks

Abstract

Security and Energy restriction are of most concern in pushing the success of Wireless Sensor Networks (WSNs) for their wide deployment. Despite years of much intensive research, deploying secure communication between wireless nodes remains the cumbersome setup process. Due to the deprived physical layout of sensor nodes, it is generally assumed that an adversary can capture and compromise a small number of sensors in the network. The key attack identified in such a network is Compromised Node (CN) attack which has the ability to create black hole, thereby intercepting the active information delivery. In this paper, we develop an effective routing mechanism that can with high probability, circumvent the black hole formed by this attack. The Purely Random Propagation (PRP) algorithm developed generates randomized dispersive routes so that the routes taken by the shares of different packets changes over time. Besides randomness, the generated routes are also highly dispersive and
energy efficient, making them quite capable of bypassing black hole. Also, the energy constraint is highly optimized in the entire routing mechanism leading to minimal energy consumption. Extensive simulations are conducted to investigate the security and energy performance of our mechanism.

References

- Yun Wang, Student Member, IEEE, Xiaodong Wang, Student Member, IEEE, Bin Xie, Senior Member, IEEE, Demin Wang, Student Member, IEEE, and Dharma P. Agrawal, Fellow, IEEE, "Intrusion Detection In Homogeneous And Heterogeneous Wireless Sensor Networks", IEEE Transactions On Mobile Computing, Vol. 7, No. 6, June 2008
- Xinyu Zhang, Baocun Li, "Optimized Multipath Coding In Lossy Wireless Networks", IEEE Journal On Selected Areas In Communications, Vol. 27, No. 5, June 2009
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