Estimation based Efficient and Resilient Hierarchical In-Network Data Aggregation Scheme for Wireless Sensor Network

Abstract

In a large sensor network, in-network data aggregation is inherently used as a communication paradigm which reduces the number of packets transmitted and hence the energy consumed. However the unattended and hostile operation of sensor network makes the system vulnerable to node compromise attack. The compromised nodes can inject false data into the network which deteriorates the accuracy of the aggregate data. So the research on resilient data aggregation with a focus on data integrity and accuracy becomes a major issue. In this paper, we propose a statistical based robust estimate to design a resilient in-network aggregation scheme which detects and isolates the outliers from computed aggregate value. Simulation results demonstrate that our approach provides a powerful mechanism for detecting outliers even in the presence of multiple compromised nodes.


Index Terms

Computer Science
Communication
Networks

Key words

Sensor Networks
Resilient aggregation
Outlier detection
data integrity