Automatic Threshold Reset Scheme using a Double Fuzzy System for Improvement of Detection Rate in a Probabilistic Voting-based Filtering Scheme of WSNs

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Abstract

Wireless sensor networks (WSNs) consist of several sensor nodes and base stations that collect information through sensors located in a large area. However, WSNs have disadvantages in that they are easily damaged by an attacker because of their random and unattended deployment in an open environment, where individual management is difficult. An attacker can execute a false report injection attack or a false vote injection attack through compromised nodes. The probabilistic voting-based filtering scheme (PVFS) is a scheme to prevent these two kinds of attacks. Before sending the report, the proposed method selects the validation node, judges the validity of the report, and filters the set threshold values. Threshold settings determine the security and lifetime of the network, so setting the appropriate security values is important. In this paper, we propose a fuzzy-based PVFS method that detects the aggressiveness of the attacker and sets the appropriate threshold values. This paper confirms that the proposed method improves the energy efficiency and detection ability of the network.

References


Index Terms

Computer Science Wireless
Keywords

Wireless sensor networks, False report injection attack, False vote injection attack, Secure routing, Fuzzy system, Interactive authentication.