

Adaptive Security Modules in Incrementally Deployed Sensor Networks

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Abstract

Distributed wireless sensor networks often suffer problems on detecting malicious nodes, which always bring destructive threats. Thus, sensor networks have to supply authentication services for sensor identity and data communication. As matter of fact, intrusion detection and prevention schemes are always integrated in sensor security appliances so that they can enhance network security by discovering malicious or compromised nodes. This paper provides adaptive security modules to improve secure communication in distributed sensor networks. The primary security module provides online identity authentication services to new incoming sensor nodes which being distributed after initial deployment. The advanced security module addresses compromised node detection issues to exclude internal compromised nodes. The proposed schemes can accomplish secure communications in the sensor networks when the network lifetime is divided into multiple time intervals. The network security and network performance are evaluated with the adaptive security modules, which shows efficient protection and sensible overheads to sensor nodes can be achieved.