

SeGCom: The Secure Group Communication Mechanism in Cluster-Tree Wireless Sensor Networks

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Security is a challenging issue in Wireless Sensor Networks (WSNs) due to the dual impact of their inherent constraints and their operation in open and harsh environments. The problem of securing a WSN becomes even more complex when considering group communications. In this paper, we address this problem and propose a new security mechanism for group communications in cluster-tree WSNs. We define a group as a set of sensor nodes in the cluster-tree network sharing the same sensory information (e.g. temperature, pressure, etc.). Our objective is to limit the access to the group data exclusively to the members that have securely joined the group. The main contributions of the paper are (1) the proposal of an efficient and secure group management mechanism for cluster-tree networks, and (2) a secure key distribution between group members. Finally, our security analysis shows that the proposed scheme is efficient and secure.