Abstract

Hybrid medium access control (MAC) design in Wireless Sensor Network (WSN) brings a new research challenge nowadays. Hybrid MAC gives significant improvement in network performance especially in terms of energy efficiency and reliability of the network. Some of the data are sensitive to loss in the medium such as video data and data for emergency application.

In MAC protocol, a contention access method which is Carrier Sense Multiple Access (CSMA) encounters collision problem when the number of nodes in the network increases. Meanwhile, the issue of slotted access which is Time Division Multiple Access (TDMA) is a strict synchronization problem. To avoid the weakness of both access methods, a hybrid MAC layer is proposed with unsynchronized TDMA, which is a token approach that calls the HMAC-TA. Token approach will be used in this protocol to avoid synchronization problems that can
Medium Access Control with Token Approach in Wireless Sensor Network
degrade network performance in TDMA protocol. The performance analysis of HMAC-TA
shows 48% significant improvement in terms of energy efficiency compared to MAC IEEE 802.
15. 4 standard. The packet delivery ratio of proposed protocol also shows the good
performance.

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**Index Terms**

Computer Science  
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**Keywords**

WSN  Hybrid MAC  Token  MAC IEEE 802.15.4