

Design and Implementation of Medium Access Control Based Routing on Real Wireless Sensor Networks Testbed

Authors : Smriti Agarwal, Ashish Payal, B. V. R. Reddy

Abstract : IEEE 802.15.4 is a Low Rate Wireless Personal Area Networks (LR-WPAN) standard combined with ZigBee, which is going to enable new applications in Wireless Sensor Networks (WSNs) and Internet of Things (IoT) domain. In recent years, it has become a popular standard for WSNs. Wireless communication among sensor nodes, enabled by IEEE 802.15.4 standard, is extensively replacing the existing wired technology in a wide range of monitoring and control applications. Researchers have proposed a routing framework and mechanism that interacts with the IEEE 802.15.4 standard using software platform. In this paper, we have designed and implemented MAC based routing (MBR) based on IEEE 802.15.4 standard using a hardware platform "SENSEnuts". The experimental results include data through light and temperature sensors obtained from communication between PAN coordinator and source node through coordinator, MAC address of some modules used in the experimental setup, topology of the network created for simulation and the remaining battery power of the source node. Our experimental effort on a WSN Testbed has helped us in bridging the gap between theoretical and practical aspect of implementing IEEE 802.15.4 for WSNs applications.

Keywords : IEEE 802.15.4, routing, WSN, ZigBee

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