STUDY OF BEACON MODE COLLISION PROBLEM IN THE IEEE 802.15.4/ZIGBEE

POONAM CHHIMWAL[1], DEEPESH RAWAT[2] & DHAJVIR SINGH RAI[3]

[1]Assistant Professor, Department of Computer Science, BTKIT Dwarahat, Uttarakhand, India

[2]M.Tech, Digital Communication, BTKIT Dwarahat, Uttarakhand, India

[3]M.Tech, Computer Science & Engineering, BTKIT Dwarahat, Uttarakhand, India

ABSTRACT

ZigBee is a specification for a suite of high level communication protocols using small, low-power digital radios based on an IEEE 802 standard for personal area networks. The IEEE 802.15.4 standard provide two modes of connections: beacon enabled mode and non-beacon enabled mode. In beacon-enabled networks, the special network nodes called ZigBee Routers transmit periodic beacons to confirm their presence to other network nodes i.e. it can offer transmission determinism. The non-beacon enabled mode does not offer any guarantee on traffic determinism In this networks an unslotted CSMA/CA channel access mechanism is used. Contrary to the non-beacon enabled mode, the beacon enabled mode does not allow us to form mesh topology in order to interconnect several beacon networks. In this paper, we compare the beacon-enabled mode with the non-beacon enabled mode. A beacon aware device acts as an interface between a mesh network and in range beacon network. Unlike a non-beacon device, a beacon aware device gives priority to the in range beacon traffic, in order to avoid any perturbations. This priority is obtained with a modification of the slotted CSMA/CA algorithm, implemented on the beacon aware device. When enabling its beacon mode, the protocol makes possible real-time guarantees by using its Guaranteed Time Slot (GTS) mechanism and it provides reliability of the network.

KEYWORDS: ZigBee, IEEE 802.15.4, Beacon, Non-Beacon, Signal Perception, MAC