



ABSTRACT IDE0908

An Application Dependent Medium Access Protocol for Active RFID Using Dynamic Tuning of the Back-off Algorithm

Abstract

Active Radio Frequency Identification (A-RFID) is a technology where the tags (transponders) carry an on-board energy source for powering the radio, processor circuits, and sensors. Besides offering longer working distance between RFID-reader and tag than passive RFID, this also enables the tags to do sensor measurements, calculations and storage even when no RFID-reader is in the vicinity of the tags.

In this paper we introduce a medium access data communication protocol which dynamically adjusts its back-off algorithm to best suit the actual active RFID application at hand. Based on a simulation study of the effect on tag energy cost, readout delay, and message throughput incurred by some typical back-off algorithms in a CSMA/CA (Carrier Sense Multiple Access / Collision Avoidance) A-RFID protocol, we conclude that by dynamic tuning of the initial contention window size and back-off interval coefficient, tag energy consumption and read-out delay can be significantly lowered. We also present specific guidelines on how parameters should be selected under various application constraints (viz. maximum readout delay; and the number of tags passing).

Authors:

Björn Nilsson, Lars Bengtsson, and Bertil Svensson, Halmstad university

Presented at: 2009 IEEE International Conference on RFID, Orlando, FL, USA, April 27-28, 2009

Contact Björn Nilsson:
Mobil: +46 (0)702356545
www2.hh.se/staff/bjni/