



## Selecting Back-Off Algorithm in Active RFID CSMA/CA Based Medium-Access Protocols

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### 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 RFIDreader 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 study the effect on tag energy cost and packet delay incurred by some typical back-off algorithms (constant, linear, and exponential) used in a contention based CSMA/CA (Carrier Sense Multiple Access/Collision Avoidance) protocol for A-RFID communication. The study shows that by selecting the proper back-off algorithm coefficients (based on the number of tags), i.e. the initial contention window size and back-off interval coefficient, the tag energy consumption and read-out delays can be significantly lowered.