

On Alleviating Reader Collision Towards High Efficient RFID Systems

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Abstract

With the emergence of wireless technologies, RFID is increasingly used in many applications such as inventory management, object tracking, retail checkout etc. In an RFID system, readers are centered in a finite area within which they can communicate with tags. Because the same radio frequency is used for communication, readers may also interfere with the operations of other readers even if their interrogation zones do not overlap. Thus the problem of scheduling multiple readers to tags transmissions in dynamic systems has been arousing attention. This paper presents a priority based transaction method to coordinate simultaneous communications among multiple readers in order to increase the overall read rate in dynamic RFID systems. Through a contention-free scheduling, the reader-tag transmissions can be performed without collisions even the environment has hidden terminal. To evaluate the effectiveness of the proposed techniques, both network density and mobility of readers' join and leave are conducted in the tests. Experimental results show that the proposed techniques provide superior system throughput in both static and dynamic circumstances.

Keyword : RFID