

# A Practical RFID Grouping Authentication Protocol in Multiple-Tag Arrangement with Adequate Security Assurance

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**Abstract**—Radio Frequency Identification (RFID) is considered to be an authentication technology of great potential. Due to the bright future of low-cost RFID tags in practical situations, the authentication towards multiple tags and tag groups has become the research hotspot. However, there are many concerns about the security risks and privacy issues in lightweight RFID authentication scenarios. Many researches achievements have been made focusing on the existence of single tag in one object, while the arrangement that multiple tags attached to one object is out of consideration. In this paper, we propose a practical RFID grouping authentication protocol in multiple-tag arrangement with adequate security assurance. In our assumption, one object to be authenticated is attached with a group of RFID tags. The feedback towards various cases of the RFID tags is timely provided, which is necessary in practical situations. Additionally, the probable position and status of the object can be ascertained with a number of tags combined with the object. Moreover, the protocol is proved to offer enough security assurances and have resistance to various attacks under the security analysis. The regular operation of RFID system will not be severely damaged by the incidents occurred during the authentication process.

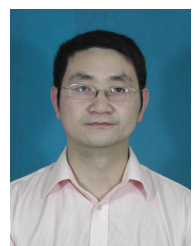
**Keywords**—RFID, lightweight, grouping authentication, multiple tag, security.



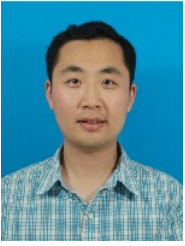
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