

# **Analysis of the identification process in active RFID systems with Capture Effect**

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## **Abstract**

Anti-collision protocols for active RFID systems are based on Frame Slotted Aloha, which states that the theoretical identification throughput is achieved when the number of competing tags equals the number of slots in the content frame. However, this is not exact in real RFID systems due to the so-called Capture Effect (CE) phenomenon is present. The CE occurs when a tag identification signal is successfully decoded from a multiple collision in a slot. This paper analyzes the identification performance of active RFID systems considering either CE and the requirements imposed by the de facto standard ISO 18000-7. The analytical results are confirmed by means of simulations. Results demonstrate a notable impact of the configuration on the performance.