Delay Aware, Reconfigurable Security for Embedded Systems

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ABSTRACT

Wireless embedded systems, especially life-critical body-area networks, need security in order to prevent unauthorized and malicious users from injecting traffic and accessing confidential data. Coupled with the security costs in system performance and power consumption, embedded systems are also restricted by the type of security that can fit in their limited memory. The *Dynamic Security System* (DYNASEC) architecture is a reconfigurable security system that allows a central node to program other nodes with different levels of security. A delay-aware heuristic based on throughput and encryption decides when the level of security should be changed under various timing constraints. The goal is to maximize the strength of the security while meeting the deadline. This experimental analysis of a reconfigurable electrocardiogram (ECG) application validates the efficacy of the DYNASEC architecture in a body area network. Our experiments demonstrate that DYNASEC enables lightweight medical embedded systems to dynamically optimize security levels to meet timing constraints in a body sensor network.