Method for Adaptive Robustness to Denial-of-Service Attacks in Internet of Things Devices

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IoT devices can easily be the target of Denial-of-Service attacks. This is especially true for resource constrained devices; that is devices with limited processing power, energy resources, and memory. A high volume of request messages sent to a victim server can make it waste resources, and even make it unable to serve legitimate clients. To complement approaches for detecting and mitigating DoS attacks from a whole-network perspective, this work focuses on a host-based, context-aware and reactive countermeasure enforced at server devices. By leveraging the detection of invalid incoming messages, the countermeasure gradually and adaptively adjusts the operative behavior of the victim server, by trading-off performance and service availability, based on the perceived attack intensity and persistency. Furthermore, by utilizing low-power modes of operation available in the specific hardware platform targeted, the proposed approach makes it possible to reduce the energy consumption on the victim server while under DoS attack.