



Thesis title: *Improving robustness against Denial of Service attack in the Internet of Things*

Thesis description

In the upcoming Internet of Things (IoT) scenario, all connectable devices will be directly connected to the Internet. This makes them particularly exposed to Denial of Service (DoS) attacks, and thus less reactive or even unable to serve legitimate requests. The goal of the project is to design, implement and evaluate a security countermeasure aimed at reducing the impact of DoS attacks against a victim device, while preserving best-effort service availability. The designed countermeasure will rely on a specific mechanism for early-detection of DoS previously defined at SICS.

SICS will provide background information and the necessary guidance during the course of the thesis. The tasks of the Masters student for this thesis are:

- Study IoT communication and security protocols, as well as issues related to DoS attack.
- Design a reactive countermeasure against DoS attack, on top of the early-detection mechanism defined at SICS.
- Implement and experimentally evaluate the designed security countermeasure in the IoT libraries Californium/Scandium. Performance analysis will include evaluation of memory usage, communication overhead, and effectiveness in counteracting DoS attacks.
- Document the activities and results as a thesis report.

Competence

We are looking for a bright MSc student who has fulfilled the course requirements. Good Java programming skills are required, as is good spoken and written English. Experience with network and communication security is a plus.

Applications should include a brief *personal statement*, *CV*, and a *list of grades*. In the application, make sure to mention previous activities or other projects that you consider relevant for the position. Candidates are encouraged to send in their application as soon as possible. Suitable applicants will be interviewed as applications are received. A successful candidate will have the opportunity to contribute to a European project on IoT connectivity platforms.

Start time: As soon as possible

Location: SICS Swedish ICT AB, Kista, Stockholm

About SICS

SICS Swedish ICT is a leading research institute for applied information and communication technology in Sweden. SICS is a part of Swedish ICT Research AB, a non-profit research organization owned by the Swedish government and industry. SICS' mission is to contribute to the competitive strength of Swedish industry by conducting advanced and focused research in strategic areas of computer science, and actively promote the uptake of new research ideas and results in industry and society at large. SICS is an active participant in collaborative national, European, and other international R&D programs.

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