Thesis title: *Secure service isolation in Smart Grid devices*

Thesis description

Smart Grids represent the new model for power generation and distribution, where traditional power grids benefit from the adoption of IT technologies. In particular, Data Concentrators make it possible to interact with multiple smart power meters, in order to monitor energy consumption of final users and dispatch management commands. Since Smart Grids are exposed to a number of cyber attacks, it is vital and critical to preserve the security of the involved components and of the power system as a whole. The goal of this project is to design, implement and evaluate a software model of a simple but complete secure Data Concentrator. The implementation will consider the ARMv8 HiKey board, and will include virtualization solutions for platform security based on a Hypervisor for embedded systems developed at SICS.

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

- Study the services provided by Smart Grid Data Concentrators, and the related security implications.
- Design a simple but complete software model of a secure Data Concentrator, composed of multiple sets of services.
- Implement the Data Concentrator model on the HiKey board hardware. The service separation will rely on virtualization techniques provided by the Hypervisor developed at SICS.
- Evaluate the correctness and effectiveness of the implemented Data Concentrator, also in the presence of one compromised service.
- 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 C or C++ programming skills are required, as well as basic knowledge of operating system architectures, preferably on embedded devices. In addition, we require experience with the Linux environment, as well as good spoken and written English.

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 research project on Smart Grid security.

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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