**Thesis Title:** Secure Internet of Things (IoT)

The Internet Key Exchange (IKE) Protocol for the Cloud-connected IoT

**Description of the units:**

The Networked Embedded Systems (NES) group at SICS Swedish ICT is a part of the Computer Systems Laboratory. The current research focus is on wireless sensor networks systems and the Internet of Things. Among the group’s key technologies are the Contiki operating system, uIP stack, ContikiRPL, SICSLoWPAN, SICS®Sense, and lightweight implementation of IPsec and DTLS. The NES group conducts projects together with industry and academic partners from Sweden and across the world.

**Thesis description:**

Internet of things (IoT) technologies are getting ready to transform the way we work and live; if one thing can prevent the IoT from transforming the way we live and work, it will be a breakdown in security. The goal of the project is to integrate and evaluate the standardized Internet Key Exchange (IKE) protocol in modern Internet of Things architectures consisting of things (sensor nodes), clouds, smartphones, and end-users. The implemented/integrated asymmetric security solution based on IKE will be evaluated in a smart home scenario on real Yanzi Networks hardware, shown in the picture below. SICS will provide the necessary hardware.

SICS will also provide both background information and a certain amount of code libraries reflecting the current status of the research project that forms the framework for this thesis. The tasks of the Masters student for this thesis are:

- Study different IoT protocols and the asymmetric cryptography with, IKEv2 and IPsec
- Learn to program the selected embedded systems platform with the Contiki OS.
- Implement and evaluate relevant parts of the framework on the real hardware platform.
- Document the results as a thesis document.

**Competence:**

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

Applications should include a brief personal letter, CV, and recent grades. In your application, make sure to give examples of previous programming 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.

**Start time:** As soon as possible

**City:** SICS Swedish ICT Kista, Stockholm

**Contact person:**

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**SICS Swedish ICT AB**

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