OTTO VON GUERICKE UNIVERSITÄT MAGDEBURG | INF | FAKULTÄT FÜR INFORMATIK

Communication and Networked Systems

Master Thesis
Extending Battery Life by Employing Fog Computing in CoAP

Motivation

Battery life is a crucial factor for mobile IoT scenarios like fitness trackers. Often wireless communication is the biggest contributor to power consumption. Thus, reducing traffic can greatly extend battery life – even if it comes at the cost of increased CPU time. To some extend this problem is solved by the Observe [2] extension (see Fig.1) for CoAP [1] IoT nodes. However, using URI queries to specify which data a device is interested in is too limited to cover more than the most trivial scenarios. In contrast, the migration of code to a data source to allows precise filtering and even preprocessing the raw data, so that traffic can reduced significantly.

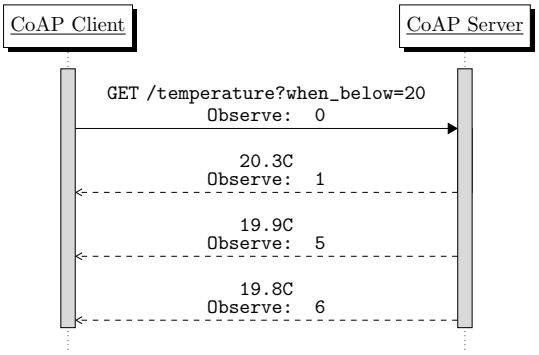

Fig. 1: A CoAP client "observing" a temperature sensor

Task

- Specify an API to discover which formats an CoAP server supports for dynamic code migration
- Implement this API for one of the following format: MicroPython, TinyScheme, Lua, ...
- CoAP servers differ in processing power, provided sensors or amount of memory. Specify an API to detect the "abilities" of a CoAP server supporting dynamic code migration
- Create a proof of concept implementations allowing to filter observed events using dynamic code migration

Required Skills

- Good C99 programming experience
- Network programming experience
- Ideally have attended one of the ComSys software projects

References

[1] **Z. Shelby, K. Hartke, C. Bormann**. The Constrained Application Protocol (CoAP). `https://tools.ietf.org/html/rfc7252`

[2] **K. Hartke**. Observing Resources in the Constrained Application Protocol (CoAP). `https://tools.ietf.org/html/rfc7641`

Project type	Master Thesis
Duration	1 Semester

Contact	Marian Buschsieweke
E-Mail	marian.buschsieweke@ovgu.de
Room	G29-314