

Master Thesis

Overcoming CoAP's Resource Discovery Limitations

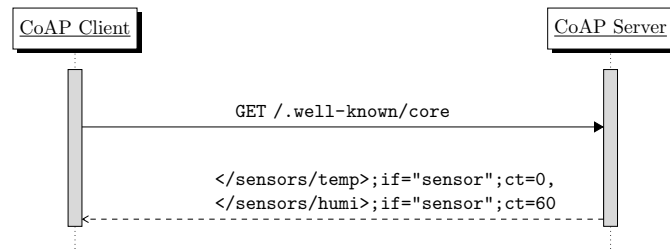
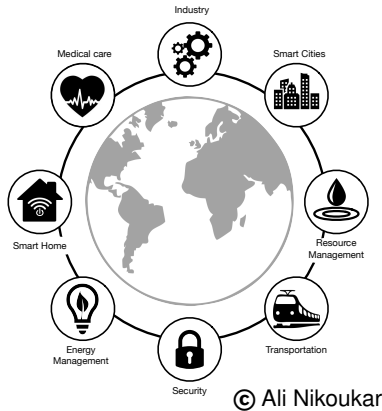


Fig. 1: A CoAP client discovering resources on a server

Motivation

The IoT has many applications in various areas including Smart Home, medical care, industrial control, and many more. These scenarios have a high degree of dynamic in common, which needs to be address by a high level of flexibility on the protocol level. The Constrained Application Protocol (CoAP) [1] provides this flexibility by providing a standard method of resource discovery (an example is given in Fig.1). Yet, the CoAP resource discovery is quite limited, rather static and inefficient. Among these limitations is the lack of standardization of common filtering use cases, e.g. by location. Also common attributes cannot be discovered, such as the location of a sensor, number of decimal places, degree of uncertainty, or the unit of its value. These limitations should be addressed in this thesis.

Task

Specify an extended resource discovery based on CBOR [2], that allows:

- Querying only specific resources by type, location, ...
- Provides additional information on resources like location, class, ...
- Description of Services consisting of more than one URI path

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] **C. Bormann, P. Hoffman.** Concise Binary Object Representation (CBOR). <https://tools.ietf.org/html/rfc7049>