Associate Professorship of Embedded Systems and Internet of Things
TUM School of Computation, Information and Technology
Technical University of Munich

Investigating a HATEOAS Approach for the Web of Things

Description of Master Thesis
Fady Salama, May 8, 2023

Title: "Investigating a HATEOAS Approach for the Web of Things"
Supervisor: Fady Salama
Period: 24 weeks
Student: TBD

Context

The Thing Description (TD) is a static document that describes the network-interface of devices and the possible interactions that can be performed with these devices over the network. The TD also describes constraints on possible interactions, such as the security measures needed to do a certain interaction, or constraint the type and value of the input payload needed for the interaction. However, the static nature of the TD makes it hard to describe the dynamic behavior of a device and the statefulness of the Application Programming Interface (API) provided by it. A Hypermedia As The Engine Of Application State (HATEOAS) approach can help solve this.

In this thesis, the student will investigate how to implement a HATEOAS approach for the Web of Things and develop a prototype. The student will then compare his approach with the traditional approach of using a static TD, as well as an approach of using a TD and a state machine description.

Requirements

- Understanding of the WoT Architecture and WoT Thing Description
- Adequate proficiency in JavaScript/Typescript
- Knowledge of Web APIs, REST principles and HATEOAS
- Knowledge of state machines is a plus

Tasks

1. Literature Research: HATEOAS, State Machines
2. Development of a HATEOAS approach for the Web of Things
3. Implementation of a prototype using the developed approach
4. Comparing approach to traditional, static TDs
5. Comparing approach to TDs linked with State Machines