Providing IoT Services with Thread Sensor Nodes

This bachelor thesis attends to the topic of the Internet of Things (IoT) in the field of building automation. The main result of this work is a demonstrator for the "Nacht der Technik", which connects sensor nodes and actuator nodes via Thread / CoAP to an IoT service platform. With OpenThread as Thread stack and Thingsboard as IoT service platform, exclusively open-source components were used. The hardware design, which was developed in the previous project, was used for the sensor nodes.

Through the IoT service platform, a visitor of the "Nacht der Technik" is able to make settings on the connected nodes. In addition, the IoT service platform visualizes measured quantities of the sensor nodes as well as status indicators of the actuator nodes. The visitor can interactively influence the measured quantities and track the changes on a screen.

The work began with the evaluation of a suitable open-source IoT service platform. Thingsboard was chosen as the IoT service platform. The concept, which was developed afterwards, describes how the nodes are connected to the Thingsboard server. A functioning network with a Thingsboard server and two nodes confirmed the feasibility of the concept. The functioning network includes the successful setup of an IPv4 to IPv6 translation with NAT64 and served as the basis for the continuation of the implementation. Finally, a methodical verification of the final implementation and an outlook on how the present work can be expanded and improved in the future followed.

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