

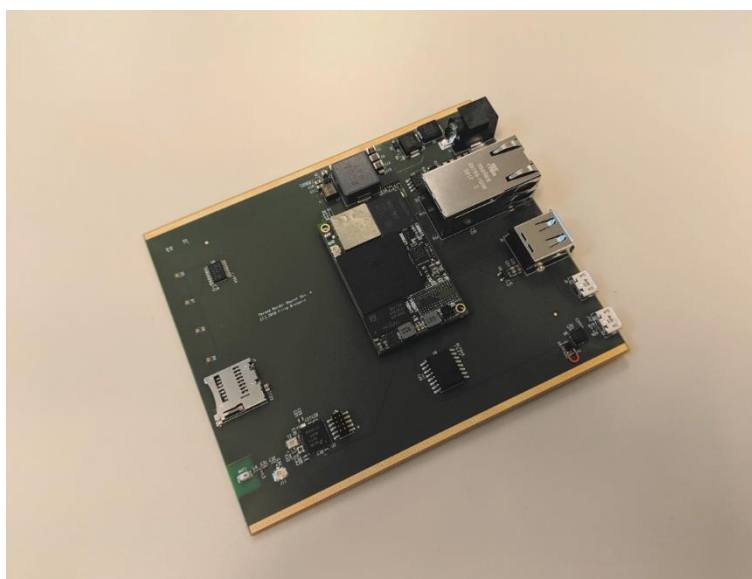
Border Router for Thread-Networks

The Internet of Things has become increasingly important over the past few years. Electronic devices are connected together, forming a network over which they can exchange relevant data and make everyday life easier. In order to facilitate this goal, having a standardized communication protocol is important. The Thread networking protocol, which is based on 802.15.4 and IPv6, is widely used for connecting sensors to a network. These Thread networks can be connected to standard IP based networks such as the internet using a border router. In the course of this thesis, a Linux based embedded board running the OpenThread border router software was developed. To this end, a hardware design utilizing an Arm Cortex-A9 based CPU module and an OpenThread compatible Arm microcontroller was created, to which the U-Boot bootloader as well as the Linux kernel were ported. Finally, a root filesystem containing all necessary tools for a border router was created using Buildroot.



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In the course of this thesis, this Thread border router was developed, based on a SolidRun System-on-Module, Linux and OpenThread. This device is able to transparently route packets between Thread and IP networks (either over an Ethernet or WiFi connection) and can additionally be powered via Power over Ethernet.