

Bachelor's Thesis

Non intrusive hardware tracing over ethernet

Tracing of events in hardware components is one powerful tool to monitor, debug and improve existing designs. Through this approach detailed insights can be acquired and peak performance can be achieved, while being a challenging task to be integrated with good performance. One of the major challenges of tracing is to collect as much information as possible with ideally no impact on the to-be-analyzed system. Herewith, it can be ensured that the gained insights are representative of an execution without any tracing enabled. In this work, a hardware tracing component should be designed that takes an arbitrary data input and sends it via an ethernet connection to a different PC that performs the postprocessing of the data. The tracing component has to be designed in a way that for sending the data over ethernet no CPU involvement is required to minimize the impact on the traced system. This tracing component should be integrated into the hardware platform based on a Xilinx Zynq board. This features a heterogeneous ARM multicore setup directly integrated into the ASIC, combined with programmable logic in the FPGA part of the chip. In the FPGA a hardware accelerator is already implemented that should be traced with the new component.

Prerequisites

To successfully complete this work, you should have:

- good HDL programming skills,
- experience with microcontroller programming,
- basic knowledge about Git,
- first experience with the Linux environment.

The student is expected to be highly motivated and independent.

Advisors

Lars Nolte