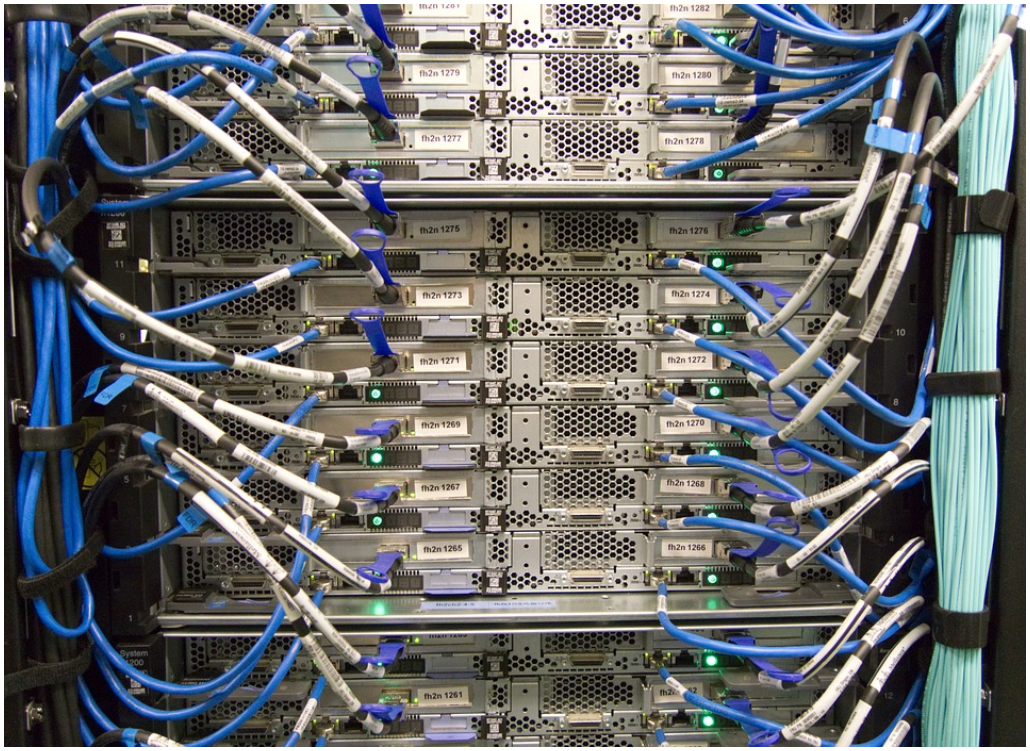
In-Network Processing



While CPUs and GPUs are well known components to execute tasks, in modern systems, resources not yet used for the processing of data became of interest. For example, programmable SSDs that can accelerate data compression task are available to accelerate cloud applications and save energy due to a reduction of unnecessary data transfers from the FLASH components to the CPU and vice versa. In this project, we want to evaluate the possibilities of network components to further push down task to the network interface of a system or even the network infrastructure itself (switches). For this, FPGAs are used as so-called smart-NICs. Next to the logic required for the network interface, specialized hardware components are developed to accelerate a wide range of task. Some possible use-cases to explore are **query acceleration**, **data compression**, **cryptography**, **message/stream processing (IOT,IT4.0)**, **large neural networks** and much more.

Prerequisites: Basic knowledge in C++ and VHDL or Verilog

Type of Work: Theory (20%), Conception (30%), Implementation (50%) (PA,BA,MA)

Supervisor: Andreas Becher (andreas.becher@tu-ilmenau.de)