

FPGA Configuration and Monitoring via Ethernet in MicroTCA

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In the European XFEL (EuXFEL), the MicroTCA.4 platform hosts Advance Mezzanine Cards (AMCs) with FPGAs for data acquisition, processing and timing distribution. Communication with these devices, to configure, monitor and receive raw and process data, is done via PCI Express (PCIe) using a CPU AMC.

In some setups, FPGAs are not used for data acquisition but transmit information to devices outside of the MicroTCA crate (for example detectors). The FPGA device is configured in the beginning of an experiment and periodically monitored afterwards. In these cases, the CPU's sole function is to provide PCIe communication, increasing the cost and configuration complexity per crate. Since the MCH can also communicate via Gigabit Ethernet with the AMCs of the crate, we can bypass the need for a CPU in the crate by developing an Ethernet protocol to communicate with the FPGAs. In addition, for setups where the data volume is not significant, this communication method can also be used to send raw and process data directly from the MCH to our DAQ system.

In this presentation, we will demonstrate how such communication is being develop in the EuXFEL.

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