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An Open Source General Purpose DMA Engine For DAQ Systems

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We present a description of a high-performance direct memory access (DMA) engine and kernel driver for data acquisition systems. The DMA engine is designed to support multiple incoming interleaved data channels simultaneously. The kernel driver enables multiple user-space clients to access the DMA engine for receiving or transmitting data, with the ability to create a memory map in the user space to the underlying DMA buffers to minimize the number of data copies required during data recitation or transmission. The DMA engine and kernel driver combination have been deployed in multiple data acquisition systems, including on PCI-Express cards, Xilinx ZYNQ SOC devices, and the Xilinx RFSOC platform, with the platform fully utilizing the bandwidth of the host PCI-Express bus.

Early Career

No

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