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Sean Gibb, Eideticom

TITLE

Computational Storage Using NVM Express on Eideticom's NoLoad

ABSTRACT

Computational storage acceleration promises the capability to offload the host CPU for processing intensive tasks such as error protection and compression. By leveraging the NVMe specification to provide access to storage acceleration functions, existing out-of-box drivers and storage tools can be used to test, benchmark, and deploy the accelerator card. We describe the use of an FPGA-based acceleration card with a firmware-based NVMe controller to provide acceleration over NVMe. We discuss the advantages of advanced NVMe features such as Controller Memory Buffer (CMB) and Scatter-Gather Lists (SGLs) for use in acceleration offload. We also discuss the stack from the NVMe controller to user software to take advantage of acceleration resources over NVMe, highlighting the benefits and challenges of using NVMe. We will discuss possible standardization efforts to improve the ecosystem for providing computational storage in storage standards including NVMe.

BIOGRAPHY

Sean Gibb is the VP of Software and a co-founder of Eideticom, where he is the architect of the NVMe-based Offload Engine for Storage Acceleration. Sean is involved in all aspects of NVMe protocol implementation for both host and controller implementations. Prior to working at Eideticom, Sean worked for PMC-Sierra where he oversaw system software and FEC algorithm development for PMC's enterprise-grade SSD controllers. He has 10 issued patents for his work in signal processing and LDPC code design. He received his PhD in Electrical Engineering from the University of Calgary.