

Title: pMEMCPY: A simple, lightweight, and portable I/O library for storing data in persistent memory

Luke Logan (Illinois Institute of Technology), Jay Lofstead (Sandia National Labs), Scott Levy (Sandia National Labs), Patrick Widener (Sandia National Labs), Xian-He Sun (Illinois Institute of Technology), Anthony Kougkas (Illinois Institute of Technology)

Abstract: Persistent memory (PMEM) devices can achieve comparable performance to DRAM while providing significantly more capacity. This has made the technology compelling as an expansion to main memory. Rethinking PMEM as storage devices can offer a high performance buffering layer for HPC applications to temporarily, but safely store data. However, modern parallel I/O libraries, such as HDF5 and pNetCDF, are complicated and introduce significant software and metadata overheads when persisting data to these storage devices, wasting much of their potential. In this work, we explore the potential of PMEM as storage through pMEMCPY: a simple, lightweight, and portable I/O library for storing data in persistent memory. We demonstrate that our approach is up to 2x faster than other popular parallel I/O libraries under real workloads.