

Intern: Luke Logan, Illinois Institute of Technology, **Virtual at:** Chicago, IL
Mentor: Jay Lofstead, 1423 Department of Scalable Systems Software

Abstract Persistent memory (PMEM) 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.

Problem Domain

Resource Utilization

Technical Approach

Memory Mapping

Mission Application

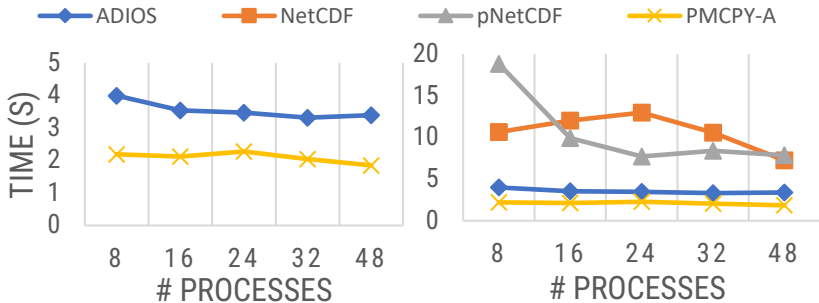
Supercomputing

[Experimental Results]

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I/O LIBRARY VS # PROCESSES (READS)



pMEMCPY is 5x faster than pNetCDF and NetCDF by avoiding network communications and data copying costs. pMEMCPY is 2x faster than ADIOS since it avoids data copying costs required by POSIX.