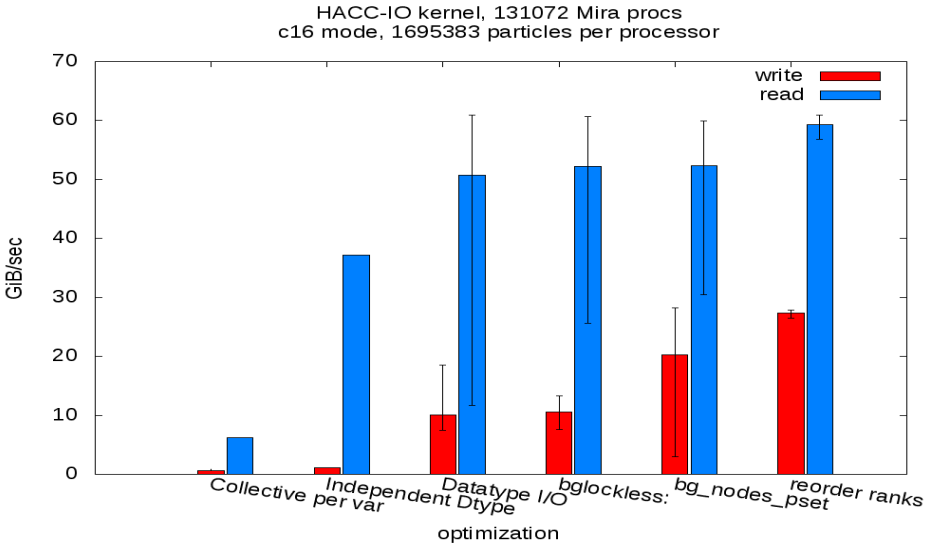
# Accelerating Science Input/Output on Leadership Platforms

## Objectives

- Standards-based Input/Output (I/O) interfaces are a cornerstone of DOE science codes
- The ROMIO MPI-IO implementation is the most widely used I/O library in HPC systems
- Tuning ROMIO for specific platforms is critical for performance of many applications

## Approach

- I/O "proxy applications" such as the HACC-IO cosmology I/O represent I/O patterns of real applications
- Approach is to use these I/O proxy apps to determine appropriate default parameters for ROMIO library
- Systems knowledge needed to select these parameters from very large parameter space, typically applicable to wide range of codes




## Impact

- Minor adjustments to interface use within application, in conjunction with selection of appropriate tuning parameters, puts performance on par with hand-tuned codes
- 15x performance improvement over default vendor configuration
- **Provides scientists with choice: either to capture more data from their simulations, or to complete simulations in less time.**