Contribution ID: **1277** Type: **Poster**

Optimization of fast parallel operations with large disk arrays

Thursday 18 July 2024 20:40 (20 minutes)

This contribution addresses the need for reliable and efficient data storage in the high-energy physics experiment called AMBER. The experiment generates sustained data rates of up to 10 GB/s, requiring optimization of data storage. The study investigates single-disk performance, including random and sequential disk operations, highlighting the impact of parallel access and disk geometry. A comparison with SSD drives reveals important differences. Various RAID configurations are assessed, considering their reliability, data rates, and capacity. Probability analysis is used to evaluate the RAID rebuilding procedure in the event of disk failure. In addition, an innovative approach of alternating disk access is proposed to ensure uninterrupted performance. Finally, the study identifies the most suitable RAID configuration for the AMBER experiment. The results of this study contribute to the design of high-performance storage solutions for data-intensive scientific experiments.

Alternate track

I read the instructions above

Yes

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Session Classification: Poster Session 1

Track Classification: 14. Computing, AI and Data Handling