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## Design and implementation of computational storage system based on EOS for HEP data processing

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Computing in high energy physics is one kind of typical data-intensive applications, especially some data analysis, which require access to a large amount of data. The traditional computing system adopts the “computing-storage” separation mode, which leads to large data volume move during the computing process, and also increase transmission delay and network load. Therefore, it can effectively alleviate this situation by pushing down some data-intensive tasks from computing node to storage node. The philosophy is that bringing computing as close to the source of data as possible in order to reduce latency and bandwidth use. Generally, storage nodes have computing resources like CPUs, necessary for deploying distributed file system. However, the computing power in storage node is often ignored. This paper designed and implemented a computational storage system based on CERN Open Storage (EOS). The system presents transparently the computational storage functions through standard POSIX file system interface, such as open, read and write. A plugin implemented in EOS storage node (FST) will execute the specified algorithm or program when it finds the special arguments in filename, for example “&CSS=decode”. The plugin can read and write file locally in FST, then register new-generated file into EOS name node (MGM). The paper finally give some test results showing that the computational storage mode performs faster and supports more parallel computing tasks than the traditional mode in some applications like raw data decode for LHAASO experiment. Computational storage mode reduces computation time by 37% in single task execution and 72% in the case of 40 tasks in parallel compared with traditional mode.

### Experiment context, if any

### References

### Significance

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