



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



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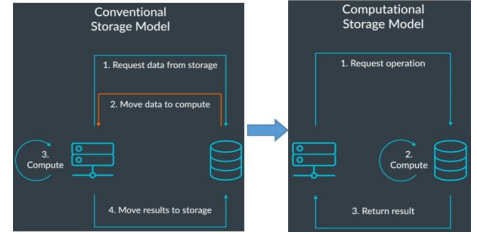
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Introduction

A large amount of data move between storage nodes and computing nodes becomes one of the bottlenecks that limit computing efficiency.

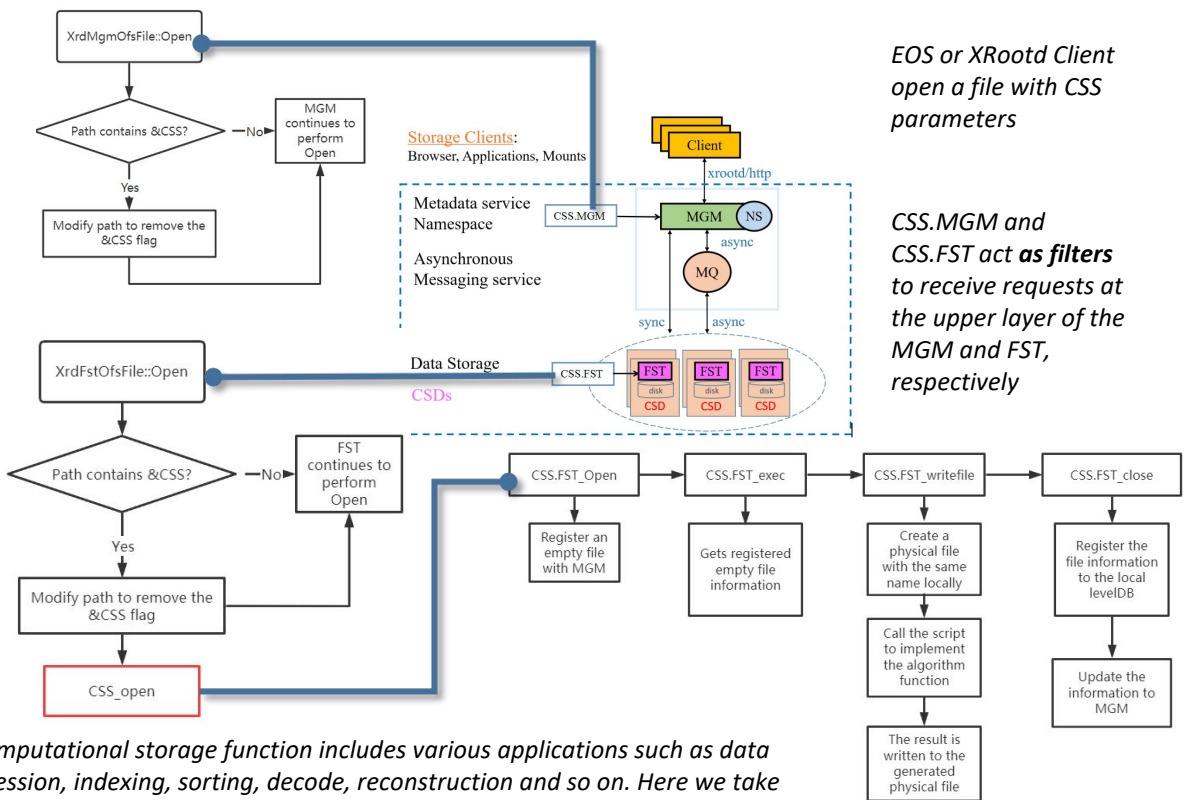


Computational storage model alleviates this problem by processing data at the storage device level



Design

Our computational storage system is implemented based on the EOS distributed file system. By adding programmatic **plug-ins** to EOS, corresponding computing tasks are assigned and run on FST storage servers.

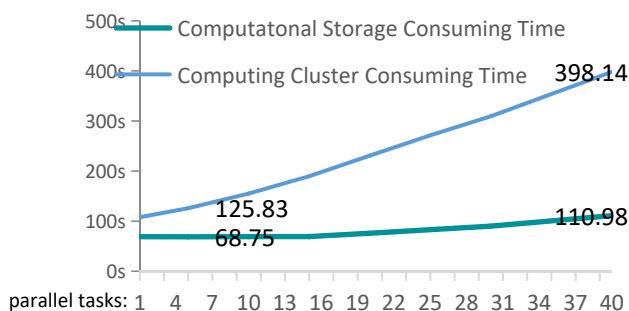


The computational storage function includes various applications such as data compression, indexing, sorting, decode, reconstruction and so on. Here we take LHAASO **decode** as an example, which reads in detector raw data and then encode them into the output ROOT files.

Results

The computational storage mode performs better than traditional computing mode in terms of time consumption

The trend is more obvious as the more parallel tasks access the same storage nodes



Outlook

- Application Scenarios
 - A large amount of data in or out
 - Real-time data processing
- On-going work
 - Use FPGA as a co-processing device
 - Decomposing large-scale data processing in complex algorithms