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Which Memory Abstraction for NVDIMM on Object Storage ?

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The SAGE storage system developed by the SAGE consortium provides a unique paradigm to store, access and process data in the realm of extreme-scale data-intensive computing. The storage system can incorporate multiple types of storage device technologies in a multi-tier I/O hierarchy, including flash, disk, and more importantly NVDIMMs.

The core software infrastructure driving the storage system is not a parallel file system, but an object storage software platform called “Mero”, built from the ground up to cater to extreme-scale HPC. The object storage platform provides a powerful, flexible and open API called Clovis which provides an I/O interface and instrumentation interfaces to get fine grain telemetry data and operation logs from the storage system. These interfaces help to flexibly extend the storage system capabilities with new data management features and provide methods to access data in multiple ways.

In this poster, we present the Global Memory Abstraction Design work being done during the first year of the project, where the main goal is to provide memory like addressing semantics of persistent storage such as NVDIMM, i.e. how to expose the NVRAM technology to applications using Mero. The other goal is also to study the optimal use of NVDIMM in the I/O stack including those in the compute nodes themselves and understand what can bring the interesting properties of NVRAM, i.e. persistence, byte-addressability or its important density, for HPC applications.

Keywords

NVDIMM, Object Storage, Mero

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