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Percipient StorAGe for Exascale Data Centric Computing

Path to ESDs

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Per-cip-i-ent (pr-sp-nt)
Adj.
Having the power of perceiving, especially perceiving keenly and readily.
n.
One that perceives.
SAGE aims to lay the foundation for future Extreme Scale/Data Intensive Storage Platforms

Project lead by Seagate
Validated with use cases: 2018

www.sagestorage.eu
Growing HPDA/Big Science Requirement:
Simulation & Big Data Analysis as part of the same workflow

Co-Design with Use cases:
– Visualization
– Satellite Data Processing
– Bio-Informatics
– Space Weather
– Nuclear Fusion (ITER)
– Synchrotron Experiments

Validation at Juelich Supercomputing Center [2018]

Growing HPDA/Big Science Requirement:
Simulation & Big Data Analysis as part of the same workflow

SAGE: Co-Design
Validation with Future data intensive use cases
SAGE: Architecture
In-Storage Compute and Many I/O Tiers

- Co-Design Activity
- Hardware Platform Availability
- Design of core software components
- First Prototype Implementations
- **Exascale Object Store (Mero)**
  - Integrated with Exascale apps and software through Clovis API

- **Ecosystem Components (Separately exploitable for ESDs)**
  - Data Management tools
    - HSM
    - Data Integrity Checking
    - Performance Analysis
    - Programming methods, Runtimes and Visualization utilities
    - Apache Flink suitable for Exascale HPC

- Storage servers with inbuilt compute

- **Tech. Readiness Level at end of the project: 5**

**Anticipated Tech. for Inclusion in ESDs**
- **Pre-requisites & Needs**
  - Availability of NVRAM technologies
  - Need for more user communities outside of SAGE to be aware of Mero, Clovis and its ecosystem
  - Understanding new HPC use cases (AI/Deep learning)

- **Information/Action to best prepare for ESDs**
  - Plans for incorporating existing techs into ESDs without losing critical innovations??

**Needs and Pre-qqs**