



SAGE

sage ¹ (sāj)

n.

One venerated for experience, judgment, and wisdom.

adj. **sag·er**, **sag·est**

1. Having or exhibiting wisdom and calm judgment.

2. Proceeding from or marked by wisdom and calm judgment: *sage advice*.

Percipient StorAGe for Exascale Data Centric Computing *Path to ESDs*

Sai Narasimhamurthy (Seagate)

Per-cip-i-ent (pr-sp-nt)

Adj.

Having the power of perceiving, especially perceiving keenly and readily.

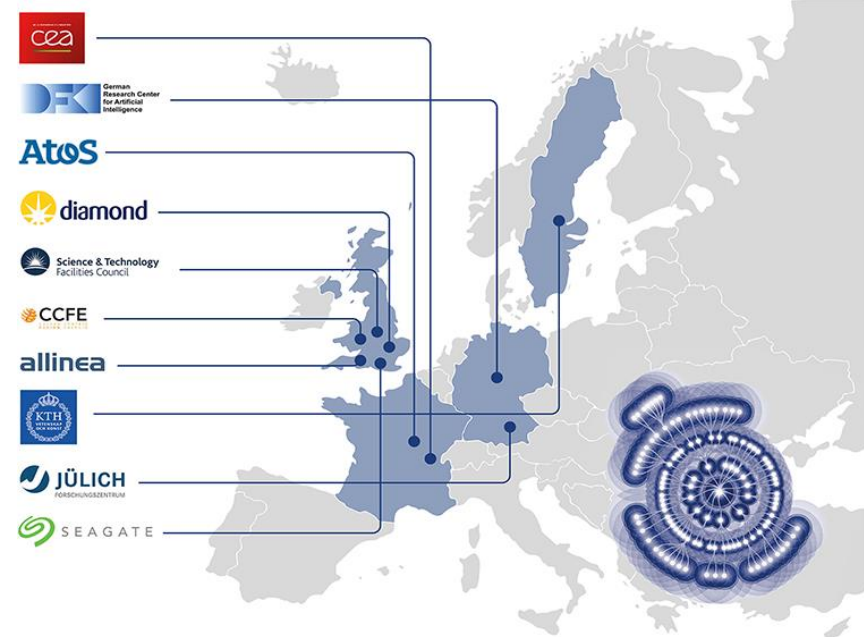
n.

One that perceives.

*The material presented reflects the
presenters view point and may not
present the views of the European
Commission*

This project has received funding from the European
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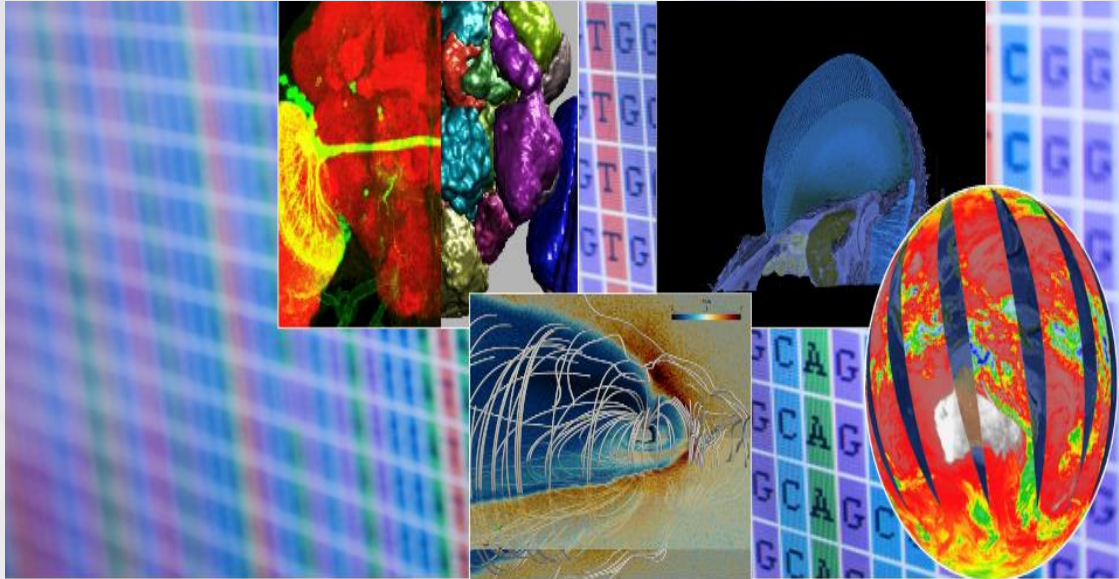
Project lead by Seagate
 Validated with use cases: 2018

**SAGE aims to lay the foundation for future
 Extreme Scale/Data Intensive Storage Platforms**



www.sagestorage.eu

Co-Design with Use cases:



- Visualization
- Satellite Data Processing
- Bio-Informatics
- Space Weather
- Nuclear Fusion (ITER)
- Synchrotron Experiments

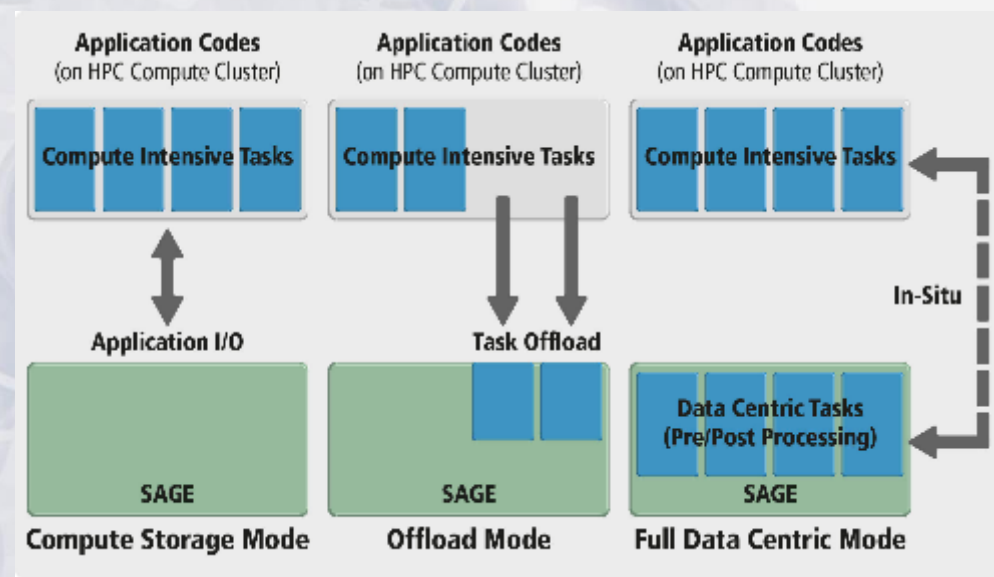
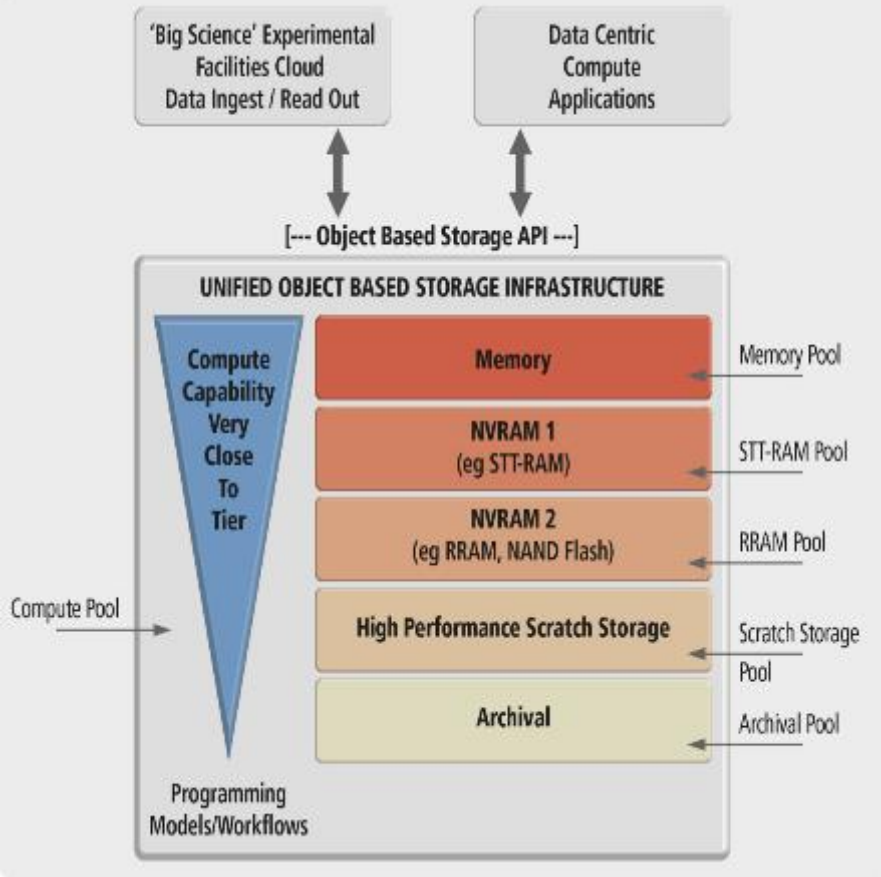
Validation at Juelich
Supercomputing Center [2018]

*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



Status

- ✓ Co -Design Activity
- ✓ Hardware Platform Availability
- ✓ Design of core software components
- ✓ First Prototype Implementations



SAGE: Architecture

In-Storage Compute and Many I/O Tiers

- **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**



SAGE

Anticipated Tech. for Inclusion in

ESD

- ***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??***