

## High-performance IO and storage

Storage has become a key component in HPC systems, and the challenges for the Exascale era are huge. In this research line we address such problems both for data and metadata.

### Summary

The research line is currently focused on adhoc filesystems, being GekkoFS one of their main achievements

### Objectives

- **Parallel File System Optimization.** Using techniques developed to optimize local storage, we are investigating under the [JLESC](#) umbrella, the utilization of such techniques to optimize the I/O Scheduler selected in a PFS.
- **Research using new devices.** Devices like NVRAM and Kinetic drives are included in our research. We are using them to create new dynamic and multi-paradigm filesystems. We use them into data schedulers research to improve the I/O Stack. We also built hardware and software to know the energy used on storage devices with different workloads.
- **AdhocFS research.** Using a virtual distributed filesystem that fuses and uses all the local node space can accelerate data-centric workloads. Metadata and data operations become faster as they are not bound to the issues of PFS. GekkoFS is our main achievement together with Mainz University. GekkoFS is being leveraged in the ADMIRE EU project.
- **I/O Scheduling.** Controlling the way that I/O is processed on a server, mainly large transfers, can overcome several drawbacks as system congestion. This produces a better handling of interferences in the system. This is explored on several EU projects, as ADMIRE or NEXTGenIO.

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