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## Distributed management and processing of ALICE monitoring data with Onedata

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Onedata [1] platform is a high-performance data management system with a distributed, global infrastructure that enables users to access heterogeneous storage resources worldwide. It supports various use cases ranging from personal data management to data-intensive scientific computations. Onedata has a fully distributed architecture that facilitates the creation of a hybrid cloud infrastructure with private and commercial cloud resources. Users can collaborate, share, and publish data, as well as perform high-performance computations on distributed data using different interfaces.

Within the ALICE project, we are designing an architecture that live-streams monitoring data from MonAL-ISA dataand stores it in Onedata, utilising S3 storage. This data is accessible through the POSIX filesystem HPC, cloud infrastructures, and external MLOps systems (via S3 or REST API). When a computational task requires the data, it is seamlessly transferred and cached at the task's location. Onedata's distributed and multiprotocol nature facilitates the creation of a hybrid data processing infrastructure, where Onedata functions as the data plane. The platform also includes robust security features to safeguard data and metadata from unauthorised changes, ensuring the integrity of the datasets during the final preparation stages. Additionally, Onedata enables long-term archiving of datasets, preserving crucial information for future reference. Data can be structured hierarchically within Onedata, and datasets are annotated with metadata, simplifying the organisation and retrieval of specific information.

Currently, Onedata is used in European projects: EUreka3D [3], EuroScienceGateway [4], DOME [5], Inter-Twin [6] where it provides a data transparency layer for managing large, distributed datasets on dynamic hybrid cloud containerised environments.

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References:

- [1] Onedata project website. https://onedata.org.
- [2] ALICE A Large Ion Collider Experiment. https://alice-collaboration.web.cern.ch.
- [3] EUreka3D: European Union's REKonstructed in 3D. https://eureka3d.eu.
- [4] EuroScienceGateway project: open infrastructure for data-driven research. https://galaxyproject.org/projects/esg/.
- [5] DOME: A Distributed Open Marketplace for Europe Cloud and Edge Services. https://dome-marketplace.eu.
- [6] InterTwin: Interdisciplinary Digital Twin Engine for Science. https://intertwin.eu.

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