

# SUCCESS STORY

## New Hierarchical Storage Management System (HSM) for DKRZ

### Customer Challenges

The German Climate Computing Centre (DKRZ) is a central service for German climate and earth system research and provides infrastructure for simulation-based climate science. DKRZ were faced with migrating over 150 Petabytes of climate model data of the last 30 years from a legacy data storage infrastructure into the new HSM with minimal downtime to users. The migration was complicated by the multitude of storage systems and access protocols that made up the legacy infrastructure. In addition the new HSM would need to provide future scalability to accommodate a minimum of 120 Petabytes of newly generated data to be archived annually. The system designed by Cristie Data utilized a powerful metadata-driven workflow engine called StrongLink from StrongBox Data Solutions in connection with servers and particularly powerful OceanStor storage systems from Huawei, which act as temporary storage for all data to be archived.



### Huawei OceanStor 100D provides efficient processing for Diverse Data and economical storage for Mass Data

The HSM new system manages the 9 existing tape libraries with a total of 79,000 cartridge slots and 90 LTO tape drives. The 2 Petabyte hard disk cache based on Huawei OceanStor 100D series NAS achieves a transfer rate of 30 Gigabytes/s. By using the open standard LTFS (Linear Tape File System) for data storage on the magnetic tapes, the climate data will be archived in a future-proof manner and the data exchange with other institutions can be simplified. In addition, climate data will be archived with supplementary metadata so that it can be retrieved more easily. The S3 interface contained in StrongLink also significantly expands the possibilities for providing data access at the application level.

## A Data Archive solution designed for Exabyte scale and beyond

The new HSM began operation in late 2021 with up to 120 petabytes of newly generated data generated for archive annually. Thanks to the scalability of the Huawei OceanStor 100D and Stronglink LTFS, the total capacity can be adapted to increasing requirements. A data volume of up to 500 petabytes is expected by 2026. In principle, the storage concept allows data volumes of more than one exabyte (1,000 petabytes) to be archived and managed. Pulling on over decades of data management project experience the Cristie Data professional services team were able to migrate the existing archive to the new HSM in under one week.

### Alternative solution limitations

Diverse high-performance compute (HPC) applications result in a diverse range of data storage protocols. Alternative storage solutions evaluated by DKRZ were limited by the number of data access protocols they could support. The Huawei OceanStor series offers multi-protocol interworking to streamline multiple storage requirements into just one device.





## Key Benefits of Huawei OceanStor 100D Intelligent Distributed Storage for HPC & HPDA



OceanStor 100D is an intelligent, distributed storage solution, offering scale-out capabilities in addition to multiple industry standard interfaces, including file, Hadoop Distributed File System (HDFS), and object storage, for upper-layer applications. This greatly simplifies operations complicated by siloed storage systems, offering highly efficient processing for diverse data, and more economical storage for mass data.



File storage is applicable to High-Performance Computing (HPC) and other performance-intensive scenarios with full compatibility for native Network File System (NFS) and System Bay (SMB) protocols, as well as Portable Operating System Interface (POSIX) and Message Passing Interface (MPI).



***"This new system will enable DKRZ to expand and modernize essential data services to our research community, while also seamlessly transitioning to a new open-standard platform that can grow as we do. This will provide a solid foundation to ensure researchers have ongoing access to the critical data needed for climate modelling and improved climate projections."***

**- Prof. Thomas Ludwig, CEO, DKRZ.**