

IPFS Pinning Service for Open Climate Research Data

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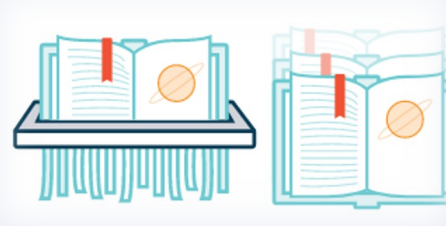

Abstract

Making data FAIR requires not only trusted repositories but also trusted workflows between data users and infrastructure providers. Limited data access, unintentional and unnoticed data changes or even (overlooked) data loss pose great challenges to those involved. This NFDI incubator project aims to mitigate these challenges by exploring an easy-to-use data management service for researchers based on the InterPlanetary File System (IPFS), an emerging distributed web technology, which ensures data authenticity and fault-tolerant remote access. Based on a transferable prototypical implementation to be built within the DKRZ infrastructure, the suitability of the IPFS for a distributed and secure "web" for research data is being examined.

Problems Addressed

- Infrastructure provider only takes over responsibility for data at very end of project 
- Insufficient data management can result in unrecognized subsequent data changes or even data loss 

How InterPlanetary File System (IPFS) Can Help

- Open-source P2P storage network for sharing data in a distributed file system ensures accessibility 
- Content addressable storage ensures that data is immutable by cryptographic hash assignment 

Proposed Workflow

1. Researchers download the IPFS App and install it on their device
2. Researchers add the *DKRZ pinning service API endpoint*
3. Researchers simply add a pin to the data to be secured

IPFS Advantages:

- Data is available anytime
- IPFS native benefit of immutable data



Visualization of the proposed workflow for researchers.
[Picture taken from IPFS Desktop App]

DKRZ and NFDI4Earth

This DKRZ project is part of the NFDI4Earth Incubator Lab. NFDI4Earth supports novel data science developments in dedicated incubator projects. The objective is the exploration of new, potentially relevant tools for the earth system science community. The presented project promotes simple, efficient, open and unrestricted access to earth system data. In addition, it has an innovative character through the use of IPFS cutting-edge technology.