

# IPFS Pinning Service for Open Climate Research Data

Mid Term Progress Reports NFDI4Earth Pilots  
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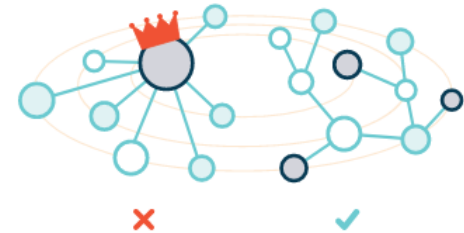
# Problems Addressed

- Scientists receive support for data management at very end of project
- Insufficient data management can result in unrecognized subsequent data changes or even data loss



# InterPlanetary File System (IPFS)

- Open-source peer-to-peer storage network for sharing data in a distributed file system
- Content Addressable Storage ensures that data is immutable by assigning a cryptographic hash to each block of data



[<https://ipfs.tech/>]



[<https://ipfs.tech/>]

# InterPlanetary File System (IPFS)

- Due to distributed nature, IPFS is fault-tolerant and ensures workflows if individual infrastructure components fail
- Public file sharing architecture strengthens Open Science efforts



[<https://ipfs.tech/>]



# Workflow Description

1. Researchers download the IPFS App and install it on their device

1. 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]

# First Outcomes

- Implementation of in-memory IPFS Pinning Service API for testing purposes “DKRZ\_Pinning\_API”

localhost:3000/docs/ 133%

Server  
/

## pins

GET	/pins	List pin objects	🔒
POST	/pins	Add pin object	🔒
GET	/pins/{requestid}	Get pin object	🔒
POST	/pins/{requestid}	Replace pin object	🔒
DELETE	/pins/{requestid}	Remove pin object	🔒

# First Outcomes

- Integrate “DKRZ\_Pinning\_API” in IPFS Desktop App

**PINNING SERVICES**

Use local pinning when you want to ensure an item on your node is never garbage-collected, even if you remove it from Files. You can also link your accounts with other remote pinning services to automatically or selectively persist files with those providers, enabling you to keep backup copies of your files and/or make them available to others when your local node is offline. [Learn more.](#)

Service	Pins	Auto Upload
Local Pinning	3	-
DKRZ_Pinning_API	0	Off

[+ Add Service](#)

[Picture taken from IPFS Desktop App]

- Secure files via pinning API

Select where you would like to pin these items.

Local node  DKRZ\_Pinning\_API

[Check pinning services' compliance](#)

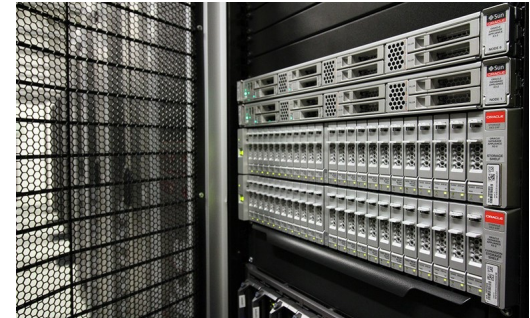
Total size: 4 KiB

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[Picture taken from IPFS Desktop App]

# Next Steps

- Implementation of IPFS Pinning Service API on virtual machine within DKRZ infrastructure and make it accessible from outside
- Throughput test with various file types and sizes



[<https://www.dkrz.de>]

