

USING OBJECT STORAGE FOR COMPUTATIONAL DATA

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Data Storage in the Infrastructure I

- infrastructure
 - distributed throughout the Czech Republic
 - hierarchical storage (tape libraries&disks)
 - disk arrays
 - object storage (aka “the way forward”)
 - currently about 120 PB physical space in total
- organisational view
 - operated within the community
 - stored under local jurisdiction
 - data always belongs to its originators

Data Storage in the Infrastructure II

- still in operation until the end of 2024
 - hierarchical storage with tape library
 - disk array
 - currently being migrated to object storage systems
- now and forever
 - object storage clusters CL1...CL5
 - 120 PB of raw capacity
 - will be continuously renewed in the future (incl. slight growth of capacity)

Object Storage

- based on Ceph technology
- elementary services S3, RBD, CephFS
- computation use case—transition from NFS mounts
- clusters are distributed across the Czech Republic—geographical optimization for data location (close to computational nodes)
- elementary use case S3
 - S3 staging
 - S3 ingesting—data repository

S3 staging

- S3 is simple to include in the jobs script
- recommended tools rclone or s5cmd (for large data)—available in computational nodes (Metacentrum, IT4I)
- stage in from S3 to user directory (DATADIR) prior computation
- stage out from user directory back to S3 after computation

S3 staging DEMO

- S3 staging DEMO (Metacentrum)
- similar usage in IT4I environment

S3 Staging DEMO

Data Repositories

- repository: data with metadata
- detail plans/ideas were presented by David Antos yesterday—“Handling Scientific Data in the National Data Infrastructure”
- currently
 - prototype of a data repository
 - <https://data.narodni-repozitar.cz>
 - proof-of-concept for the national repository platform
 - curated by the National Library of Technology
 - mostly to gain experience
 - can be used for long-term data storage
 - data stays
 - interfaces/procedures may change

Data Maturity for Repository

- data should be finalized - minor changes in the future
 - reasonable cost-effective estimation of what to keep for the future generation
 - repositories support versioning while keeping persistent DOI
- raw data has metadata - crucial for data repository
- prior to ingesting - reasonable granularity for future usage - large datasets

Stage in from data repository - shiny future

- repository platform - design of automated workflows
- translation of the DOI to S3 pre-signed URL directory/file
- then common stage-in workflow similar as demoed earlier
- effectivity highly depends on the data granularity
- stage-out need of metadata - further processing of results

GUI Ingest into Data Repository

New dataset

Dataset

Dataset title *


Toto pole je vyžadováno

 ADD SUBTITLE

Language *

  CHOOSE TERMS

Abstract *



Detailed description of the methodology and technical information should be specified in the 'Dataset Description' section

License

  CHOOSE TERM

If a Creative Commons license is associated with the dataset, select the appropriate license option from the menu. We recommend choosing the latest versions, namely 3.0 Czech and 4.0 International.

Warning: Make sure the dataset can be published under the selected license!

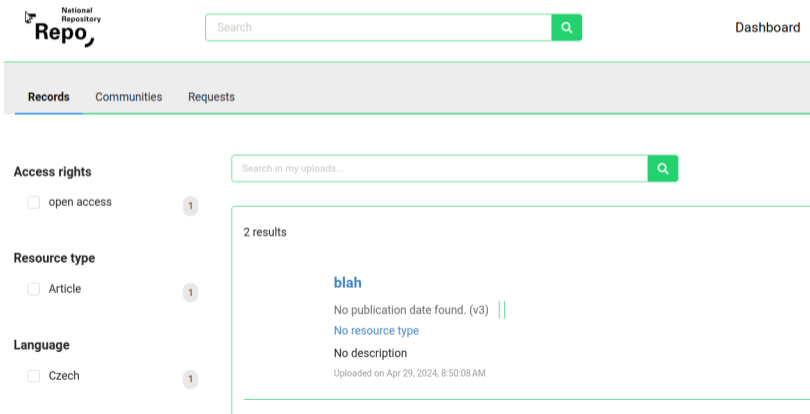
Publishers *

  CHOOSE TERMS

CONTINUE

API Ingest into Data Repository

```
curl -XPOST -H "Content-type: application/json" -H "Authorization: Bearer my-top-secret" -d '{"metadata": {"title": "blah"}}' https://docs.narodni-repozitar.cz/api/docs/
```



The screenshot shows the National Repository (Repo) interface. At the top left is the logo "National Repository Repo". To its right is a search bar with the text "Search" and a green search icon. Further right is a "Dashboard" link. Below the search bar is a navigation bar with three tabs: "Records" (selected), "Communities", and "Requests".

On the left side, there are three filter sections, each with a "1" in a grey circle to its right:

- Access rights**: open access
- Resource type**: Article
- Language**: Czech

On the right side, there is a search bar with the text "Search in my uploads..." and a green search icon. Below it, it says "2 results". The first result is:

- blah**
- No publication date found. (v3) ||
- No resource type
- No description
- Uploaded on Apr 29, 2024, 8:50:08 AM

Summary

- storage services for computational data S3 stage IN/OUT
 - manual preparation via s5cmd, rclone...
 - automated - staging as part of the job script
- data repository preferably stage in - stage-out needs metadata
- data repository - ingest via GUI/API

Contacts

- `http://du.cesnet.cz`
- user support: `support@cesnet.cz`