



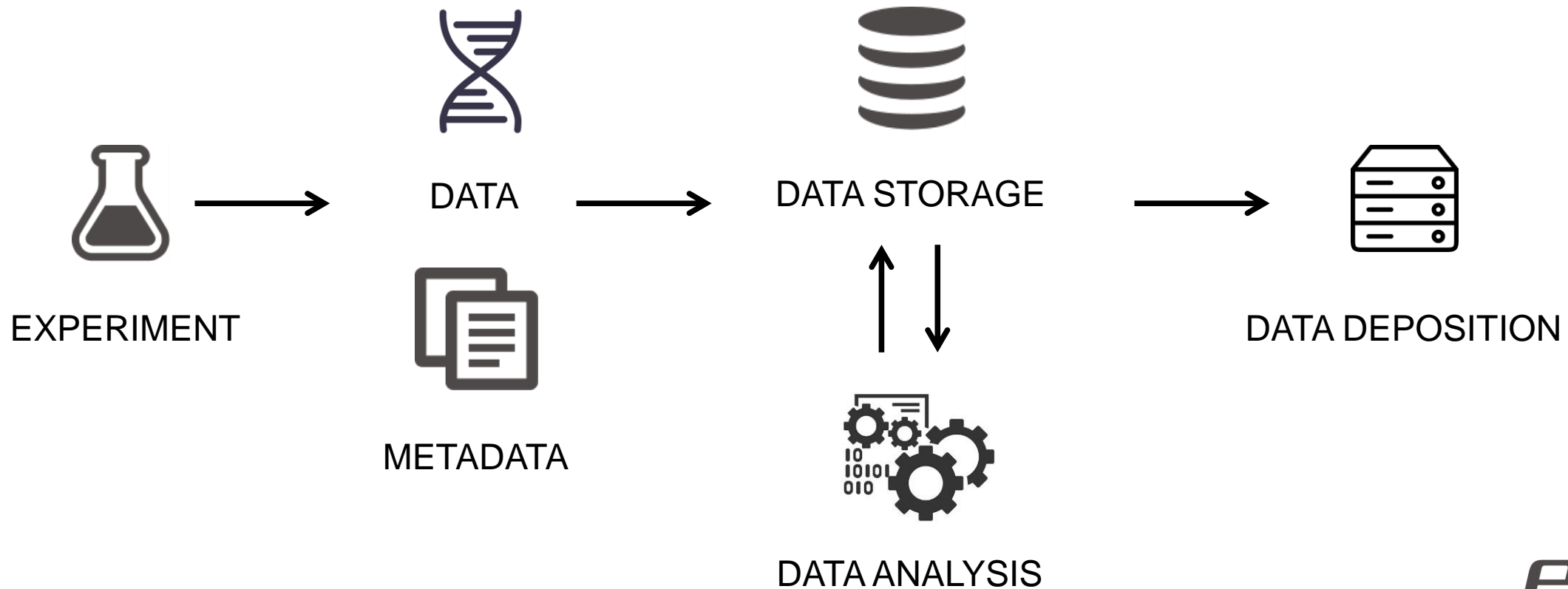
# National storage infrastructures

*NeLS/StoreBioInfo, NIRD, TSD*

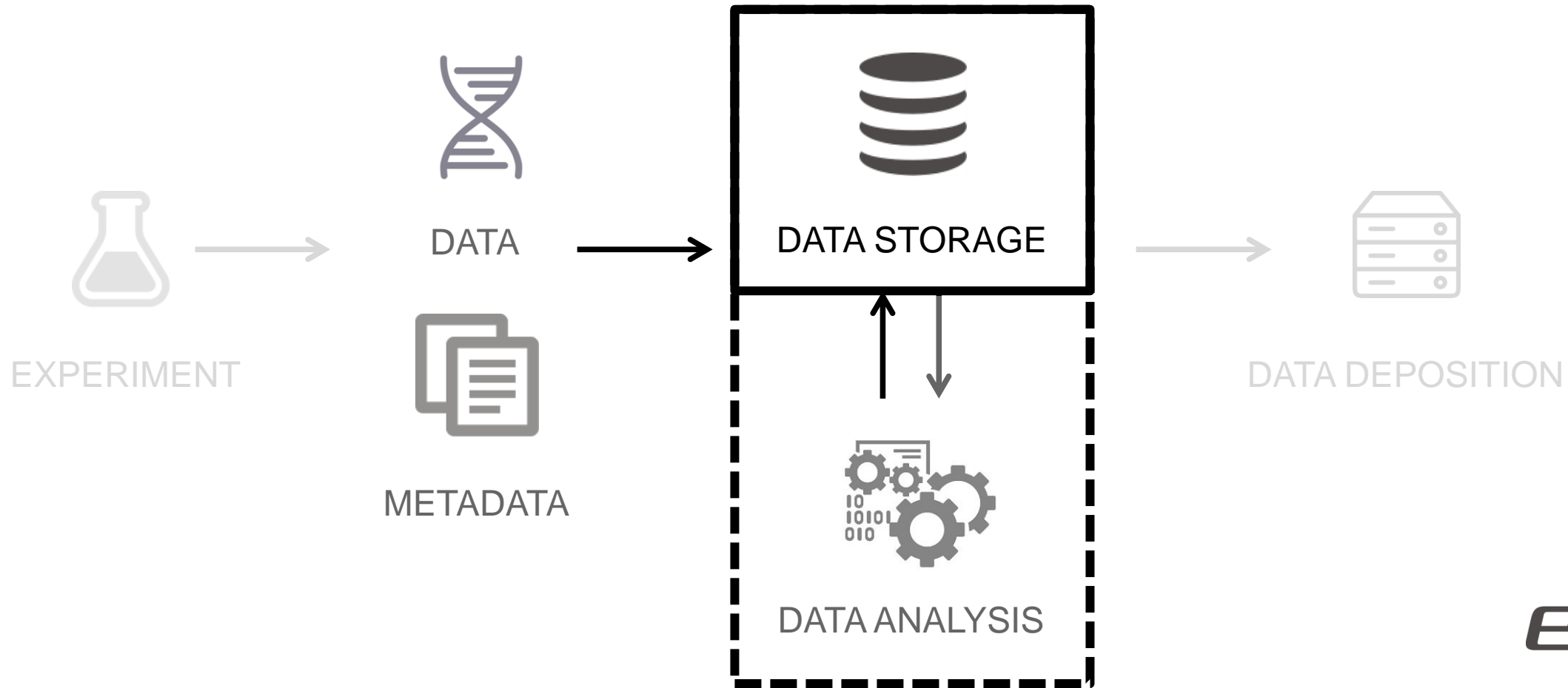


David Dolan  
Research Support Lead  
ELIXIR Norway

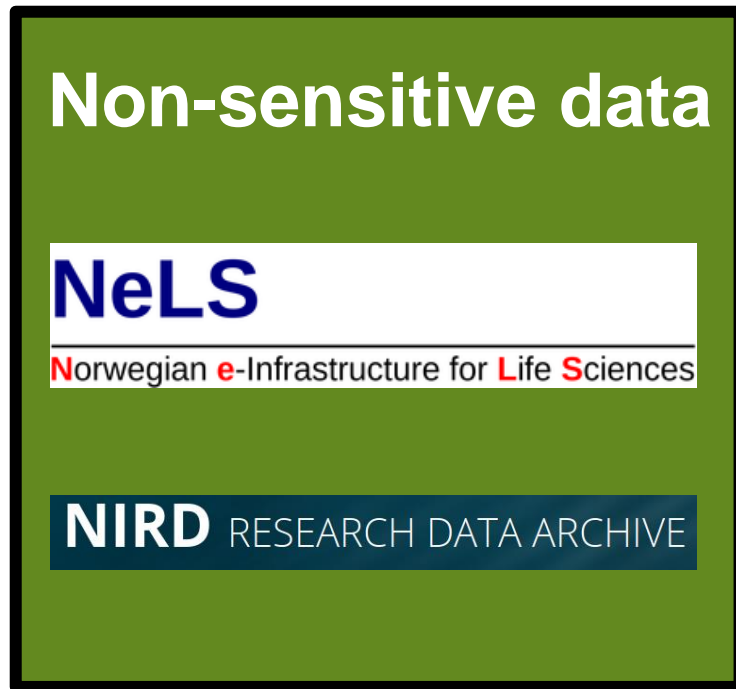
# *Data storage – from the researcher perspective*



# *Data storage – from the researcher perspective*



# National storage infrastructures



DATA ANALYSIS



# Data storage – General considerations

## The ELIXIR Research Data Management kit

Data life cycle	+
Your role	+
Your domain	+
Your problem	-

Compliance monitoring

Data analysis

Data management plan

Data organisation

Data protection

Data publication

Data quality

**Data storage**

Data transfer

Identifiers

Licensing


Documentation and metadata

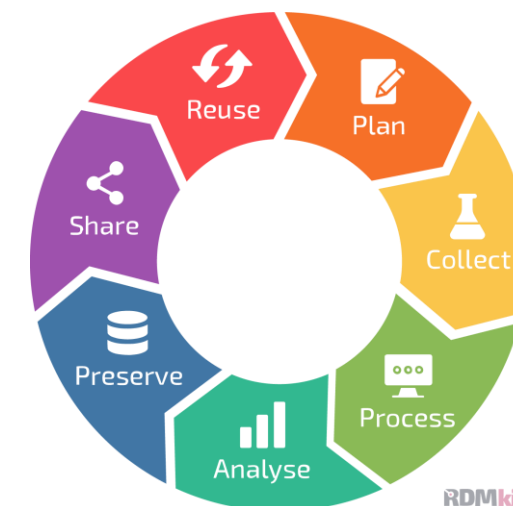
Sensitive data

All tools and resources

- What features do you need in a storage solution when collecting data?
- How do you estimate computational resources for data processing and analysis?
- Where should you store the data after the end of the project?
- Relevant tools and resources

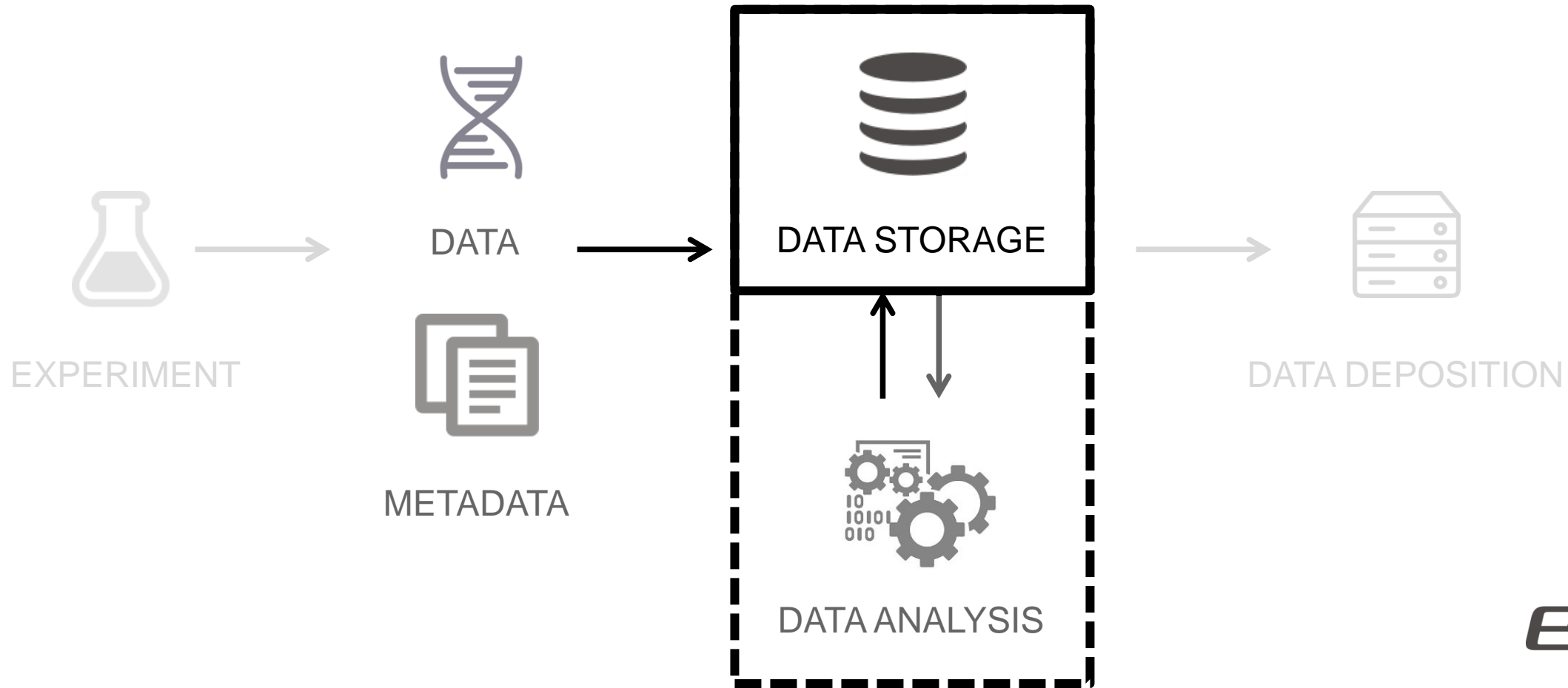
### Relevant tools and resources

Tool or resource ⓘ	Description	Tags	Registry
<a href="#">CERNBox</a>	CERNBox cloud data storage, sharing and synchronization	storage	
<a href="#">CS3</a>	Cloud Storage Services for Synchronization and Sharing (CS3)	storage	
<a href="#">DATAVERSE</a>	Open source research data repository software.	storage researcher data manager IT support	



Link to RDMkit storage: <https://rdmkit.elixir-europe.org/>

# *Data storage – from the researcher perspective*



# Data storage in NeLS and StoreBioInfo (SBI)

Norwegian e-infrastructure for Life Sciences - developed and operated by Elixir Norway

## NeLS in general

Available to all Norwegian researchers

Enable collaborative projects

Multiple storage layers

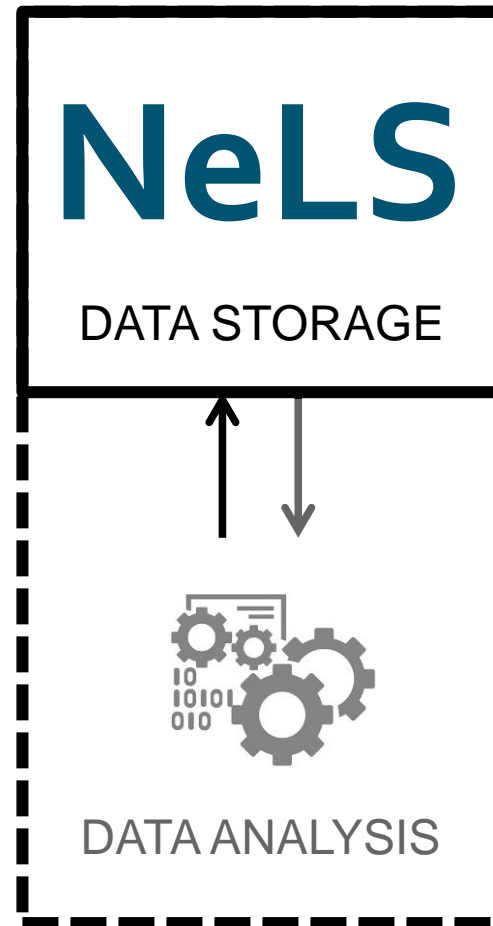
Integrated with compute

Multiple permission roles - shared data

Free of charge\*

Support for data deposition

User support: Elixir Norway helpdesk



## Type of data

Non-sensitive data

Support multiple data types

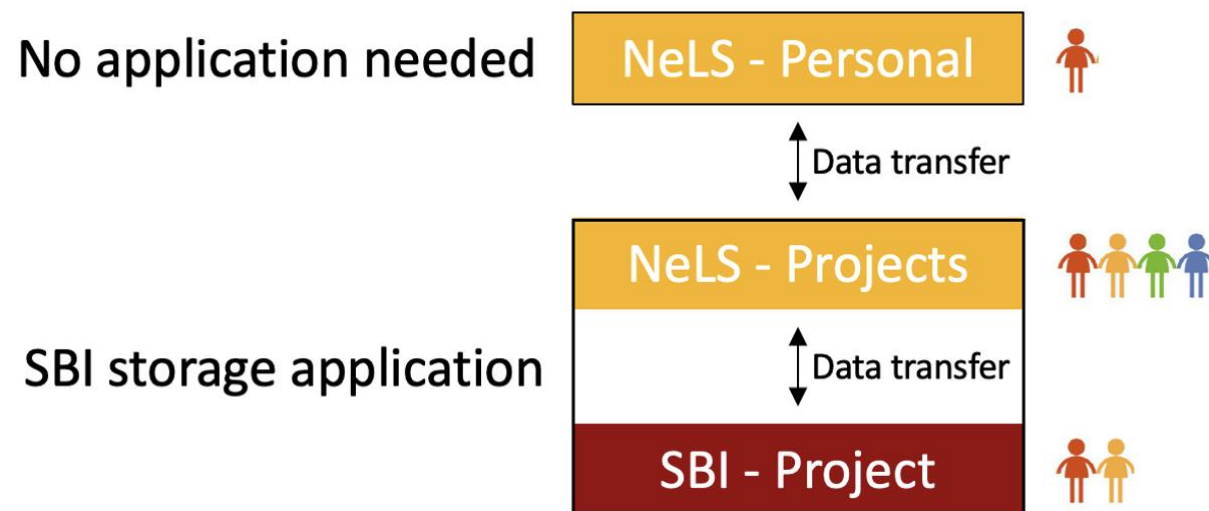
SEEK integration for metadata

# *Data storage in NeLS/SBI – How to get access*

Storage application needed for projects where data is shared by many users

Access via FEIDE user or NeLS idp can be made for non-FEIDE users

Free storage < 10 TB



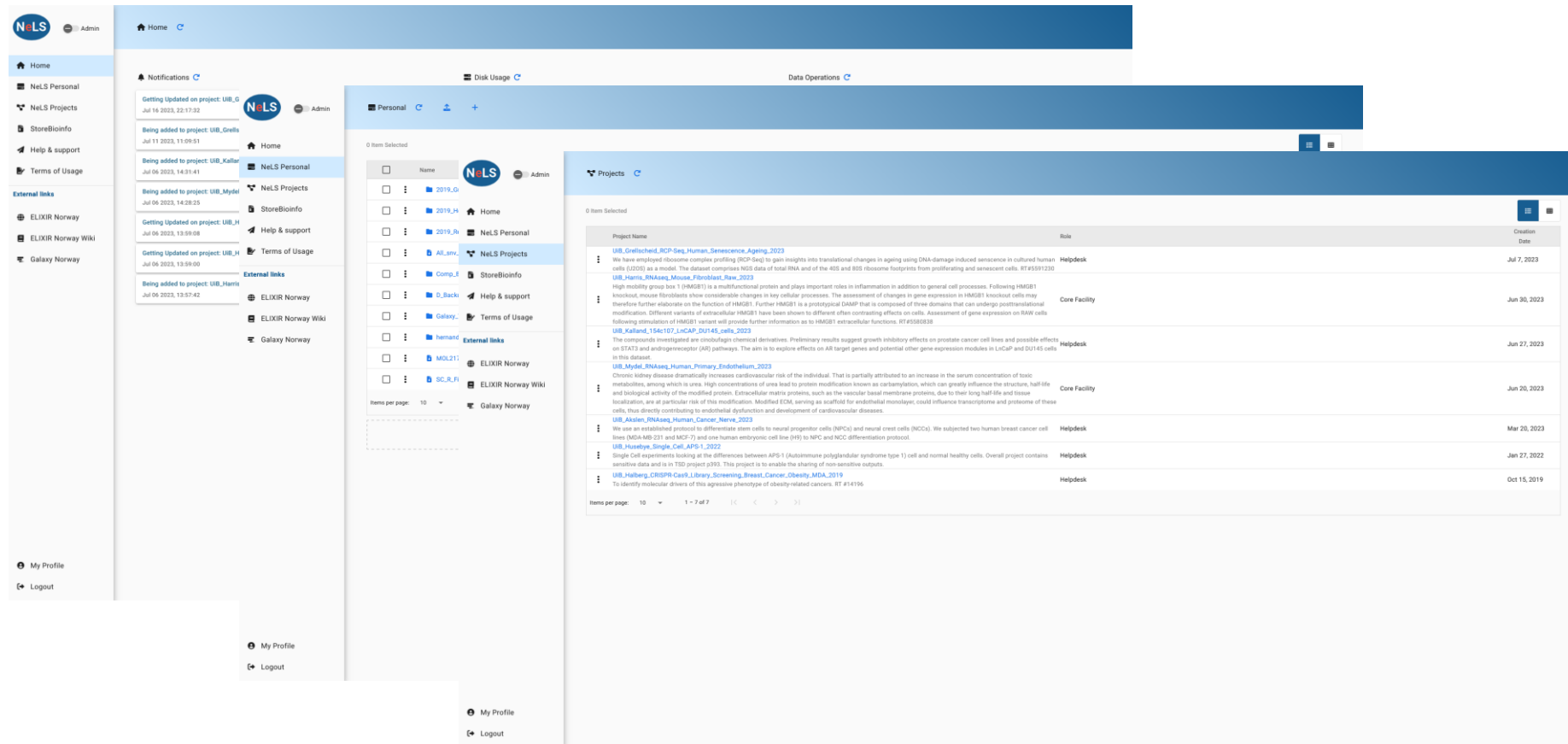
Apply for storage: [support@elixir.no](mailto:support@elixir.no)

Wiki for usage: <https://nels-docs.readthedocs.io/en/latest/>



# Access data storage in NeLS

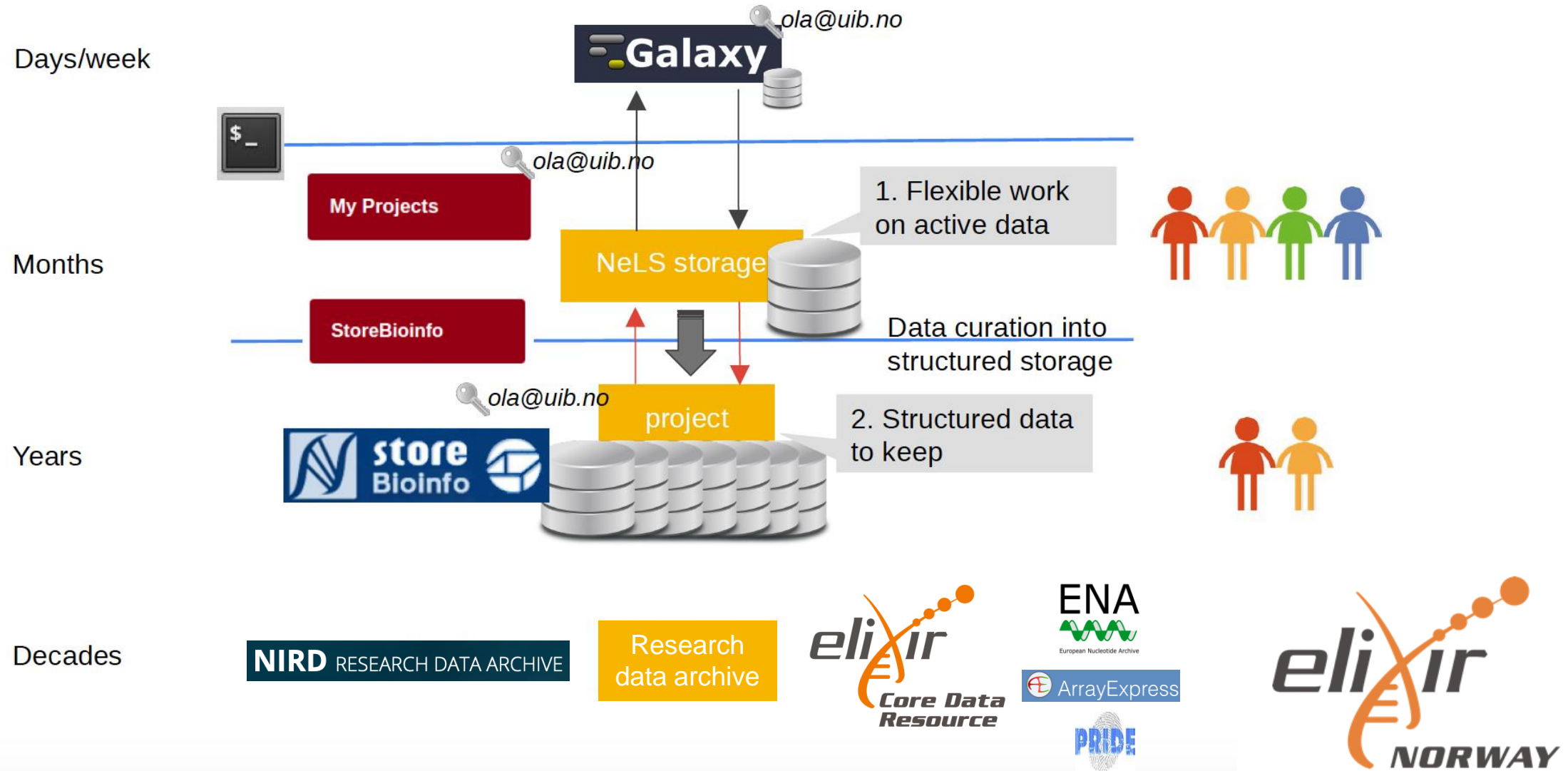
The NeLS portal can be accessed via a web browser at <https://nels.bioinfo.no/> or via a file transfer tool (e.g. Filezilla) or the command line SCP



The screenshot displays the NeLS portal interface. On the left is a sidebar with navigation links: Home, NeLS Personal, NeLS Projects, StoreBioinfo, Help & support, Terms of Usage, External links (ELIXIR Norway, ELIXIR Norway Wiki, Galaxy Norway), My Profile, and Logout. The main content area is divided into three panels. The top panel shows a 'Notifications' section with a list of updates. The middle panel shows a 'Personal' section with a list of files and folders. The bottom panel shows a 'Projects' section with a table of project entries.

Project Name	Rule	Creation Date
URR_Greifschied_RCP-Seg_Human_Senescence_Aging_2023	Helpdesk	Jul 7, 2023
URR_Harris_RNAseq_Mouse_Fibroblast_Raw_2023	Core Facility	Jun 30, 2023
URR_Kalland_154c107_LuCAP_DU145_cells_2023	Helpdesk	Jun 27, 2023
URR_Mykle_RNAseq_Human_Primary_Endothelium_2023	Core Facility	Jun 20, 2023
URR_Akslen_RNAseq_Human_Cancer_Nerve_2023	Helpdesk	Mar 20, 2023
URR_Hundoye_Single_Cell_APS-1_2022	Helpdesk	Jan 27, 2022
URR_Halberg_CRISPR_Cas9_Library_Screening_Breast_Cancer_Obesity_MDA_2019	Helpdesk	Oct 15, 2019

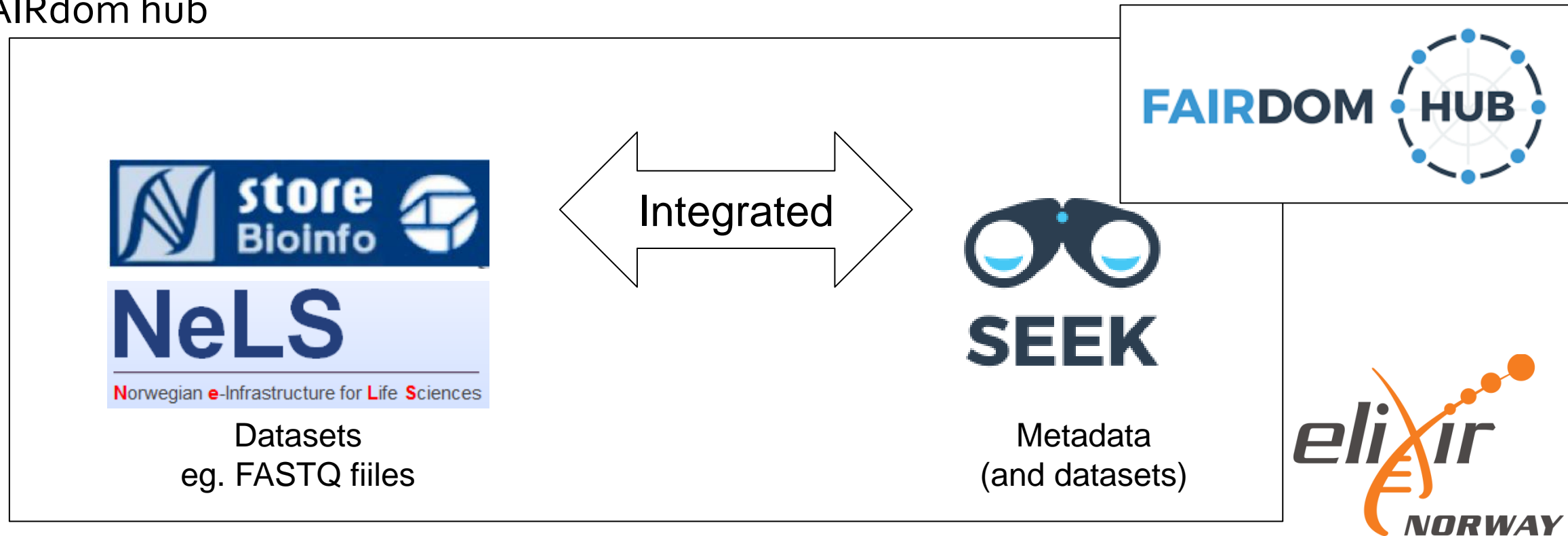
# NeLS architecture



# *SEEK - sharing heterogeneous scientific research datasets, models or simulations, processes and research outcomes*

The SEEK platform is a web-based tool for organising and storing data, and for exploring and annotating data

Norwegian users can link datasets stored in NeLS to a SEEK project using FAIRdom hub



# Data storage in NIRD

National e-Infrastructure for Research Data - owned and operated by UNINETT Sigma2

## NIRD in general

Available to all users with account

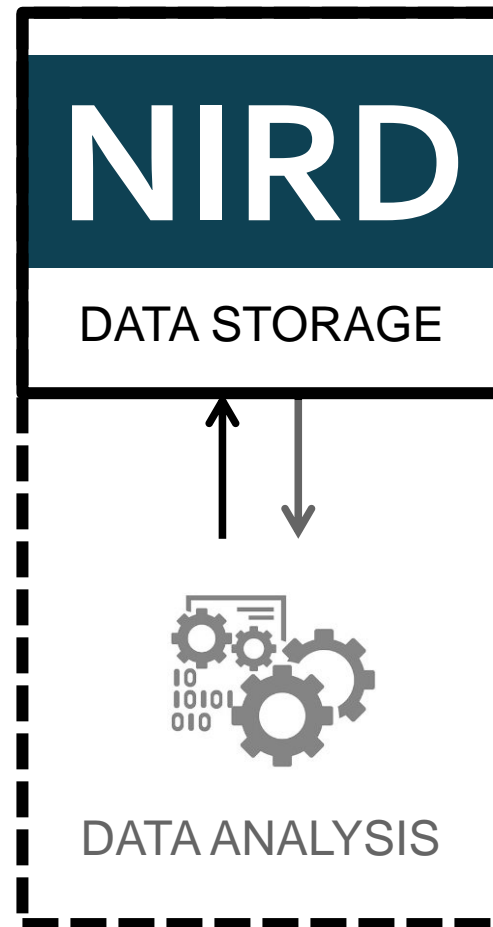
Enable collaborative projects

Integrated with compute

Multiple permission roles - shared data

Free of charge\*

User support: Metacenter support



## Type of data

Non-sensitive data

Support multiple data types

All type of scientific data\*

# Data storage in NIRD – How to get access

Apply for a UNINETT SIGMA2 user.

Apply for a storage quota:

- **Category A:** Non-commercial projects with resources allocated through the Resource Allocation Committee (RFK) must contribute to the operational expenses of the service. This category should be used in applications to the Norwegian Research Council and other funders, except the EU.
- **Category B:** Non-commercial projects in need of Dedicated Resources, paying for capital and operational expenses.
- **Category C:** Commercial research and industry which will pay market price.
- **Category D:** For applications to the EU, as in-kind value.
- **Category o:** Smaller projects using less than 200 000 CPU core hours pr. year or using less than 7 TB storage pr. year. If any organisation outside BOTT has an aggregated use for smaller projects with a value of more than 50 000 NOK, the organisation needs to contribute given 6 months' notice, for further future use of the infrastructure.

Apply for user account: <https://www.metacenter.no/user/application/>

Apply for storage: <https://www.sigma2.no/apply-e-infrastructure-resources>

Wiki for usage: <https://documentation.sigma2.no/index.html>

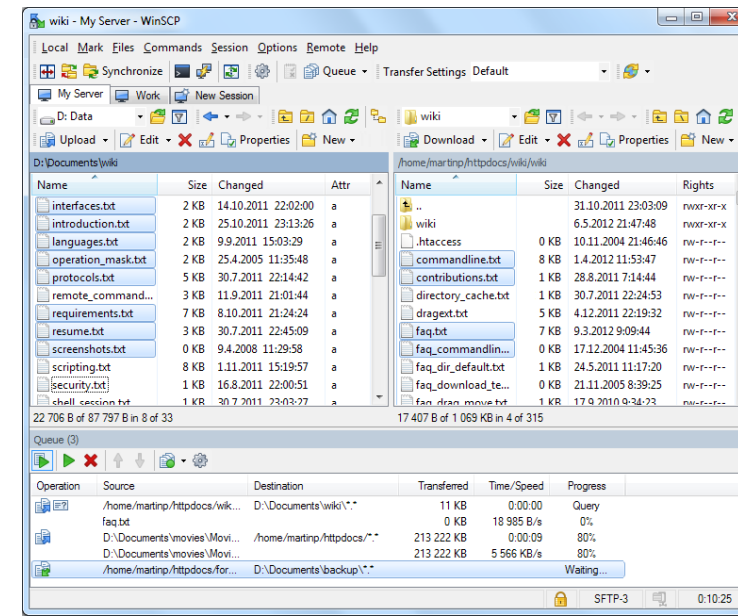
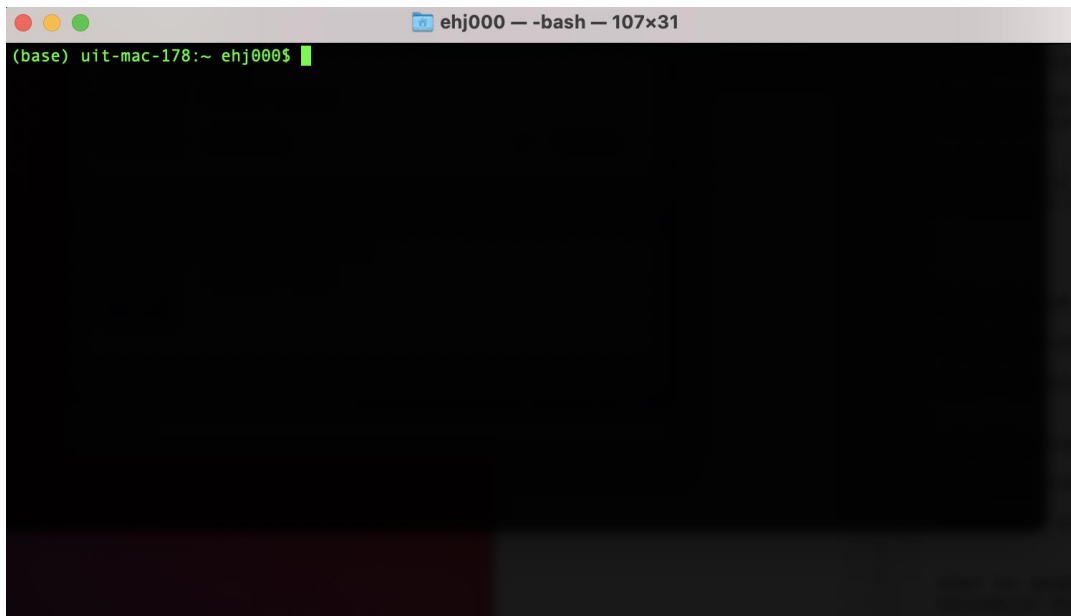
Contribution model: <https://www.sigma2.no/user-contribution-model>



# Access data storage in NIRD

The NIRD storage can be accessed via the command line using SSH

Data import/export via command line tools such as SCP or SFTP or other file transfer tools (e.g. WinSCP)



# *Sensitive data storage*



# Data storage in TSD

National service for sensitive data - developed and operated by UiO

## TSD in general

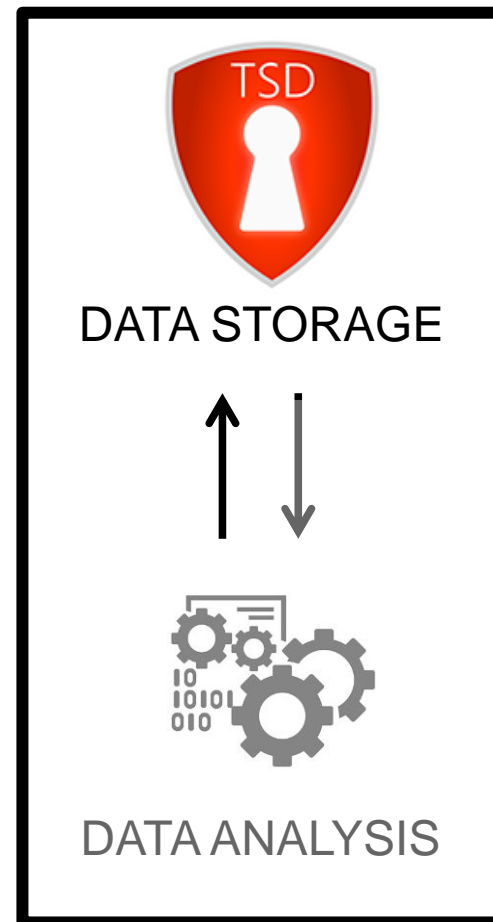
Available to all users with account

Enable collaborative projects

Integrated with compute

Multiple permission roles - shared data

User support: Tech and admin support



## Type of data

Sensitive data

Support multiple data types

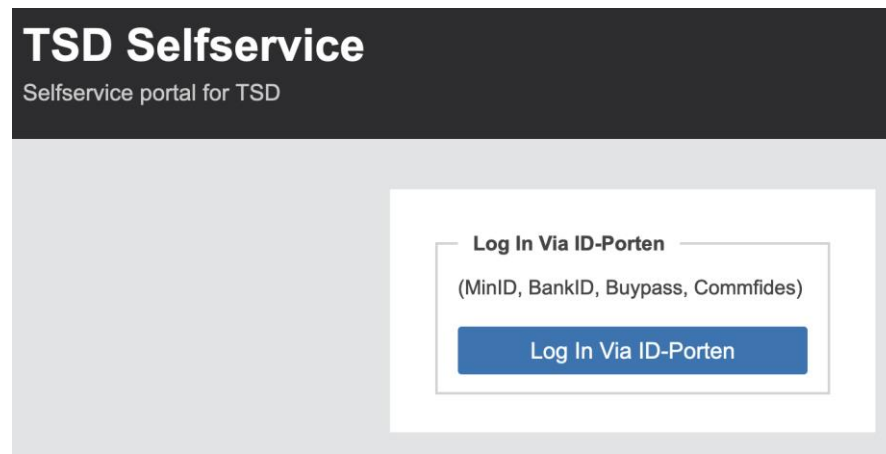


# Data storage in TSD – How to get access

Apply for a project – need to document ethical approval (e.g. from REC)

Generate a TSD user – require 2-factor authentication

Payment models for storage



Apply for a TSD project through ELIXIR.NO:  
ELIXIR Norway has a quota in TSD that, and  
users can get subsidised quota through  
ELIXIR in TSD

Generate user account: <https://selfservice.tsd.usit.no/>

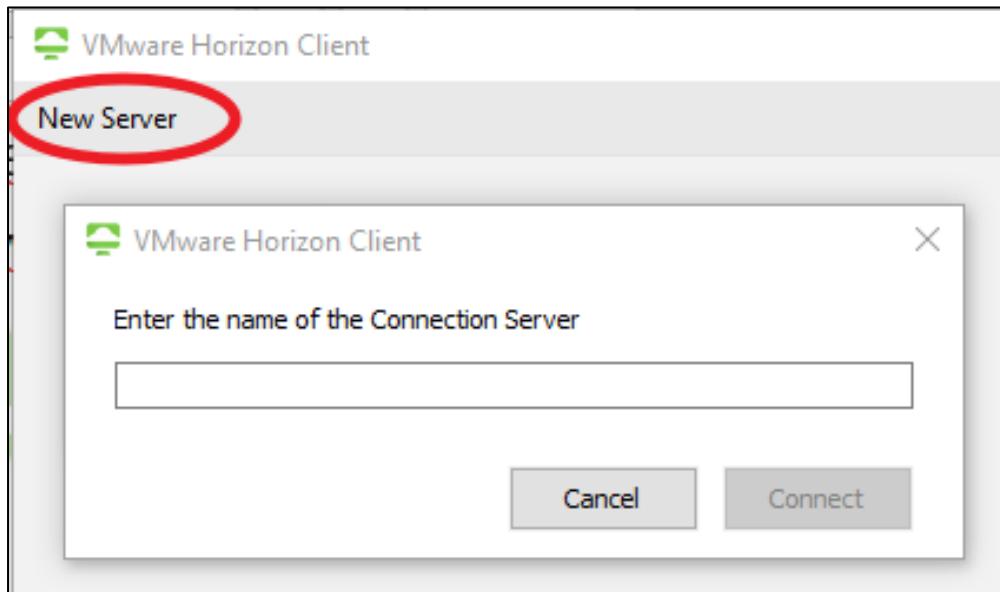
Apply for project: <https://www.uio.no/tjenester/it/forskning/sensitiv/hjelp/start/registrer.html>

Wiki for usage: <https://www.uio.no/tjenester/it/forskning/sensitiv/hjelp/start/index.html>

# Access to data storage in TSD

The TSD storage can be accessed via VMware Horizon + 2-factor authentication

Import/export data via the web file upload service



## TSD Data Portal

### Welcome to the TSD Data Portal

To use this service you should already hold a valid TSD user account.



Import Files



Export Files

# Where should I store and share my life science data?

	Sensitive data	Direct transfer from data producer	Web portal access*	Command line access	Shared projects	Integration for metadata	Support for data deposition	Free of charge
NeLS/SBI	✗	✓	✓	✓	✓	✓	✓	✓
NIRD	✗	✓	✗	✓	✓	✗	✗	✓
TSD	✓	✓	✗	✓	✓	✗	✗	✗

\*Direct access to the data and project management through the web browser

# Example - Data flow/handle using ELIXIR Norway

