



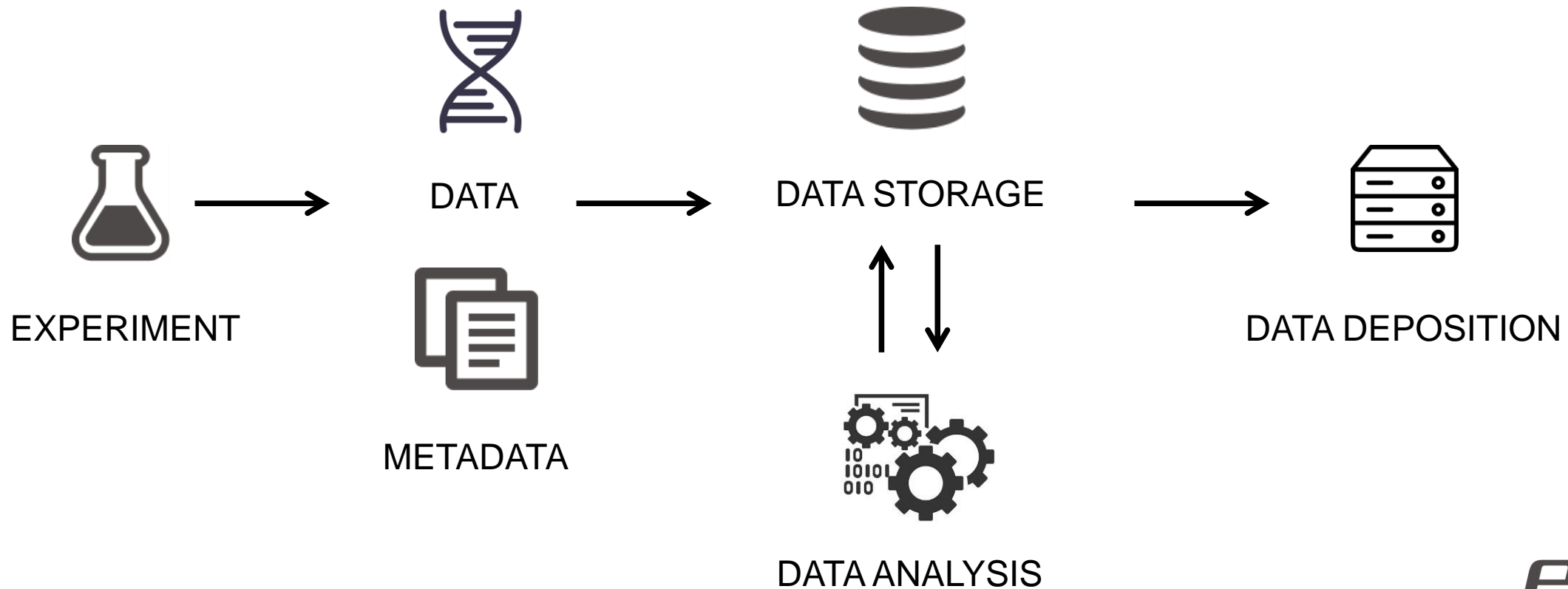
National storage infrastructures

NeLS/StoreBioInfo, NIRD, TSD

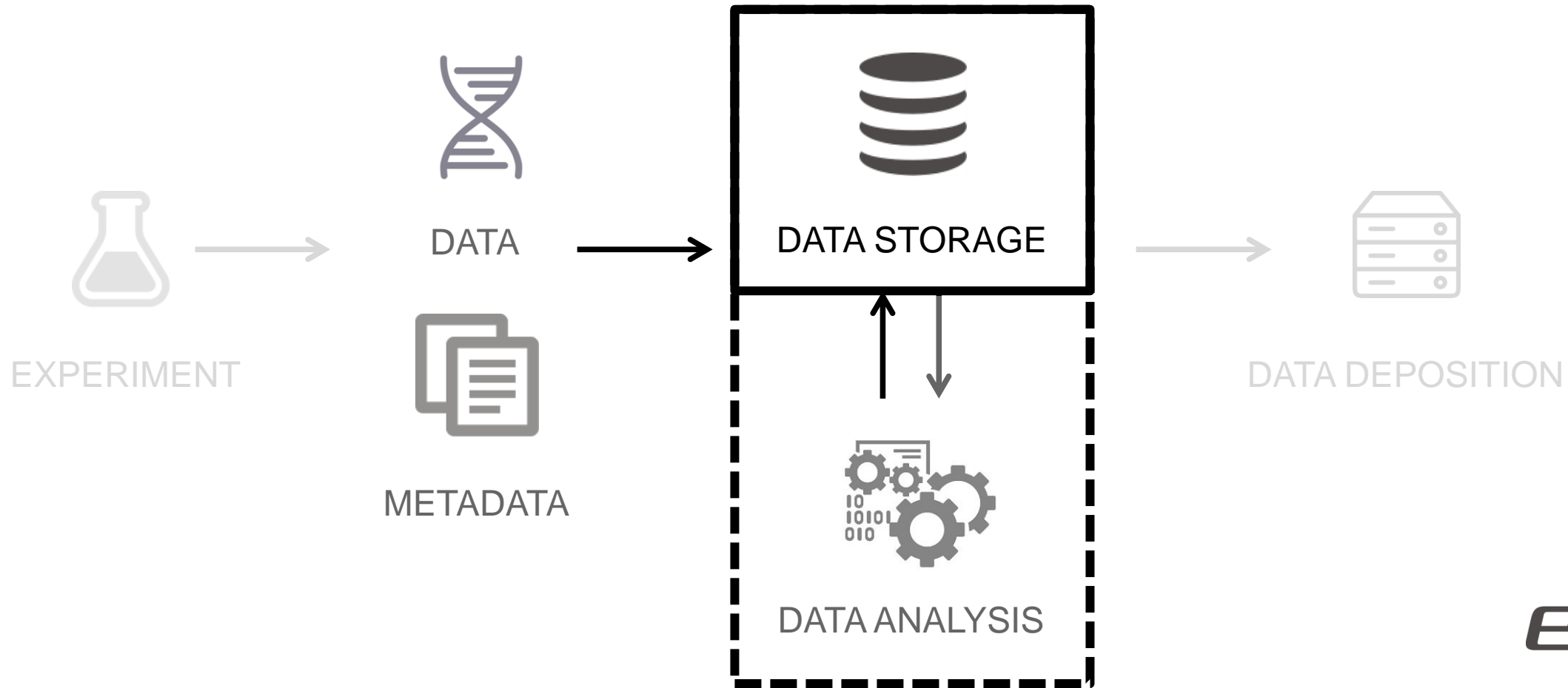


David Dolan
ELIXIR Norway

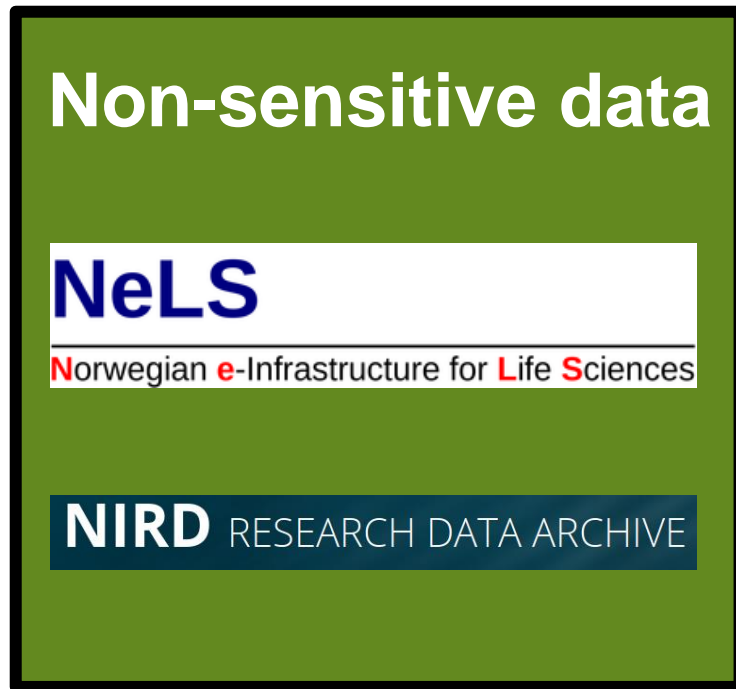
Data storage – from the researcher perspective



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

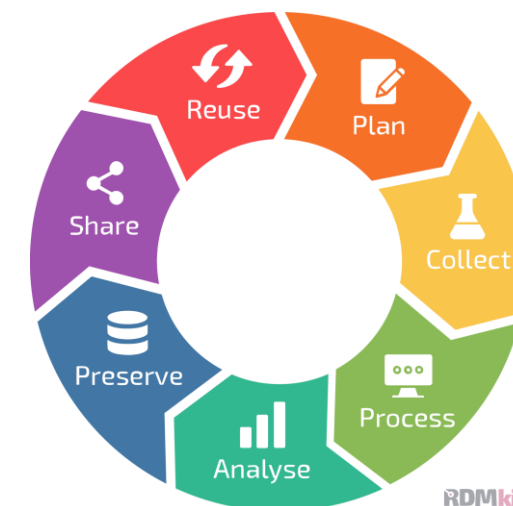
Sensitive data

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

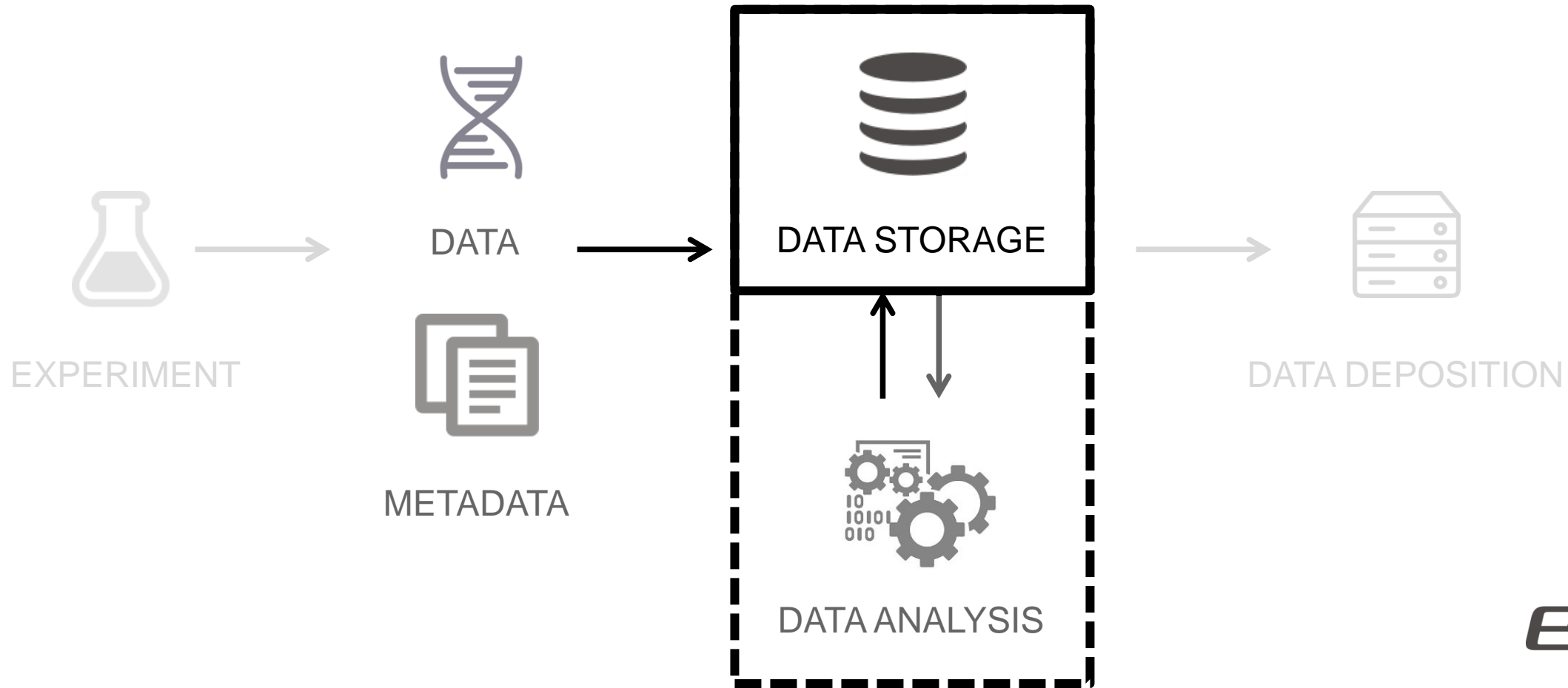
Relevant tools and resources

Tool or resource ⓘ	Description	Tags	Registry
CERNBox	CERNBox cloud data storage, sharing and synchronization	storage	
CS3	Cloud Storage Services for Synchronization and Sharing (CS3)	storage	
DATAVERSE	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

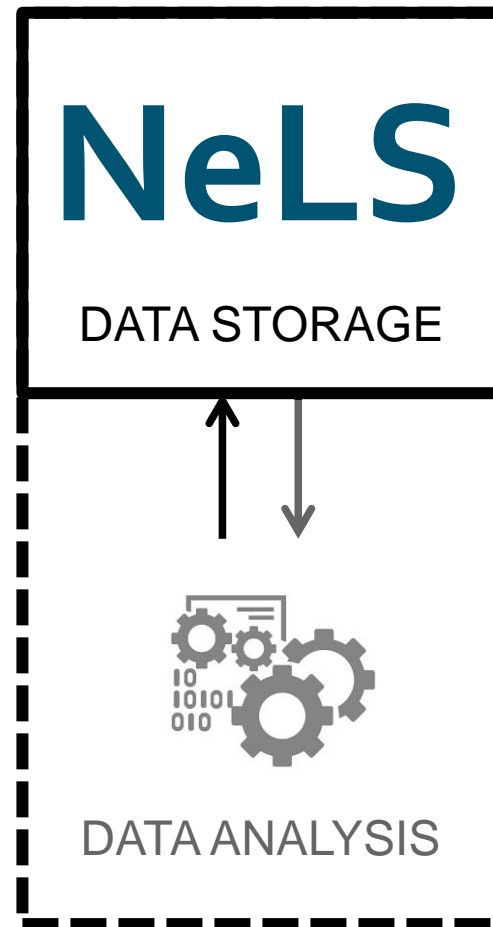
Integrated with compute

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

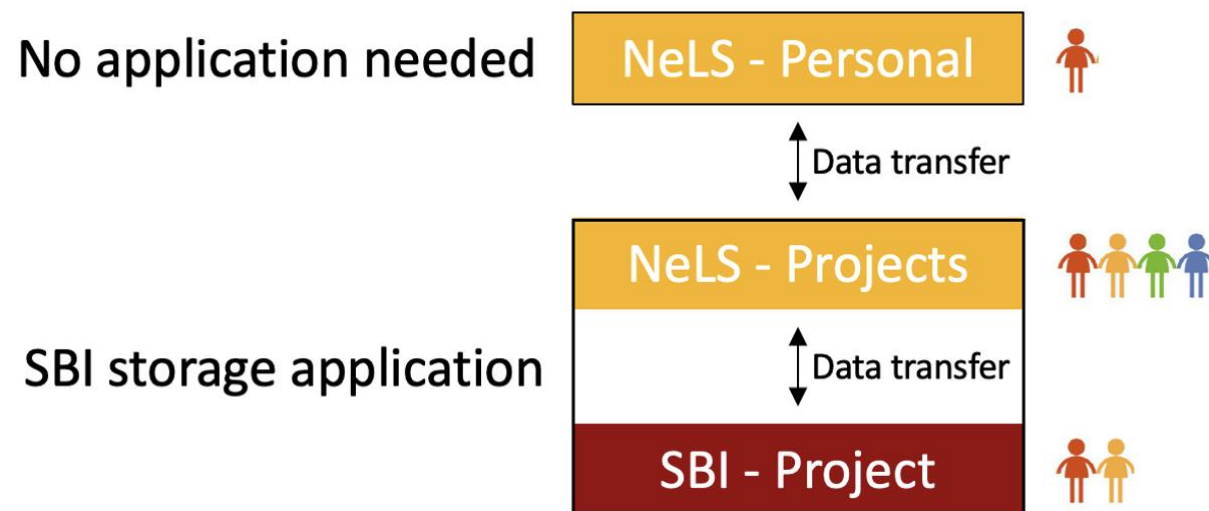
SEEK integration for metadata

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

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

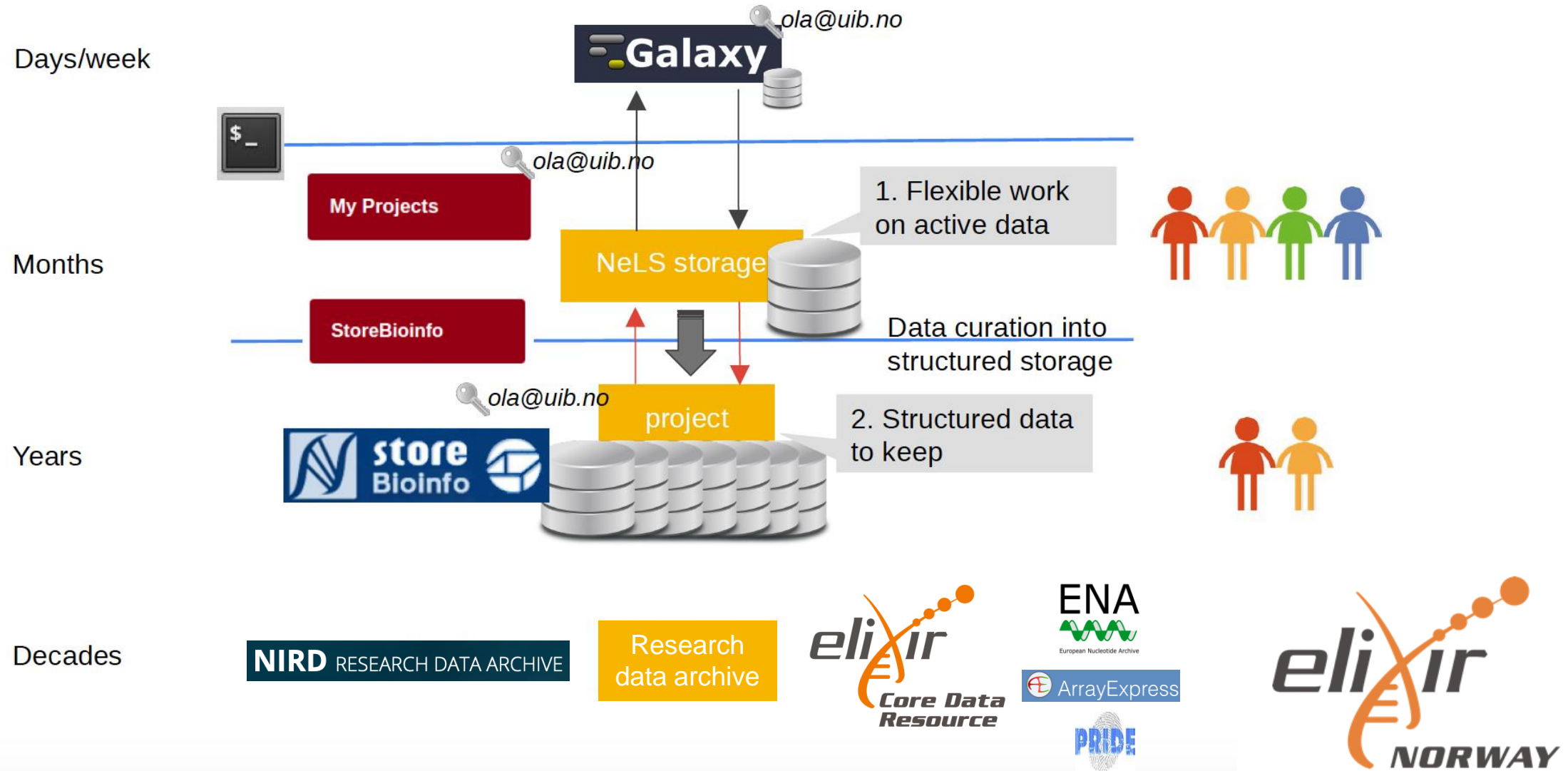
Access data storage in NeLS

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 sections: Notifications, Disk Usage, and Data Operations. The Notifications section shows a list of updates. The Disk Usage section shows a file browser with a tree view of folders and files. The Data Operations section shows a table of projects with columns for Project Name, Rule, and Creation Date.

Project Name	Rule	Creation Date
UR, Greifschel_RCP_Seq_Human_Senescence_Aging_2023	Helpdesk	Jul 7, 2023
UR, Greifschel_RCP_Seq_Human_Senescence_Aging_2023		
UR, Harris_RNAseq_Mouse_Fibroblast_Raw_2023	Core Facility	Jun 30, 2023
UR, Harris_RNAseq_Mouse_Fibroblast_Raw_2023		
UR, Kalland_154c107_LiCAP_DU145_cells_2023	Helpdesk	Jun 27, 2023
UR, Kalland_154c107_LiCAP_DU145_cells_2023		
UR, Mykle_RNAseq_Human_Primary_Endothelium_2023	Core Facility	Jun 20, 2023
UR, Mykle_RNAseq_Human_Primary_Endothelium_2023		
UR, Aksen_RNAseq_Human_Cancer_Nerve_2023	Helpdesk	Mar 20, 2023
UR, Aksen_RNAseq_Human_Cancer_Nerve_2023		
UR, Handlye_Single_Cell_APS-1_2022	Helpdesk	Jan 27, 2022
UR, Handlye_Single_Cell_APS-1_2022		
UR, Halberg_CRISPR_Cas9_Library_Screening_Breast_Cancer_Obesity_MDA_2019	Helpdesk	Oct 15, 2019
UR, Halberg_CRISPR_Cas9_Library_Screening_Breast_Cancer_Obesity_MDA_2019		

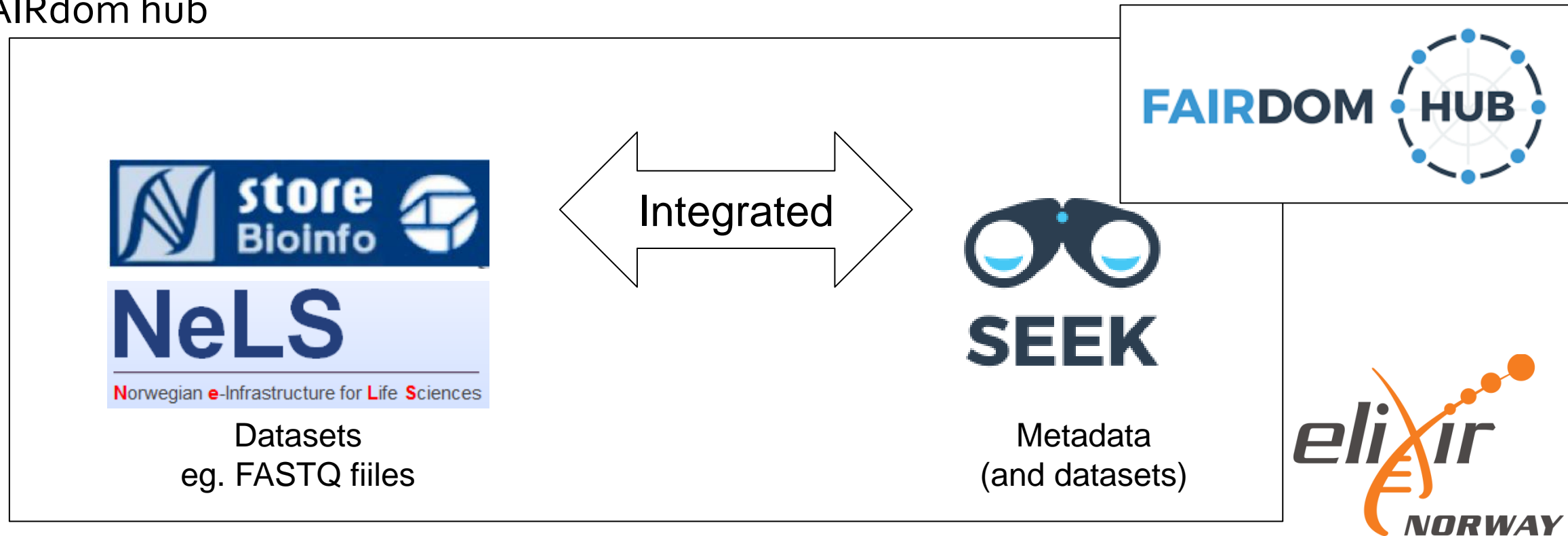
NeLS architecture



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

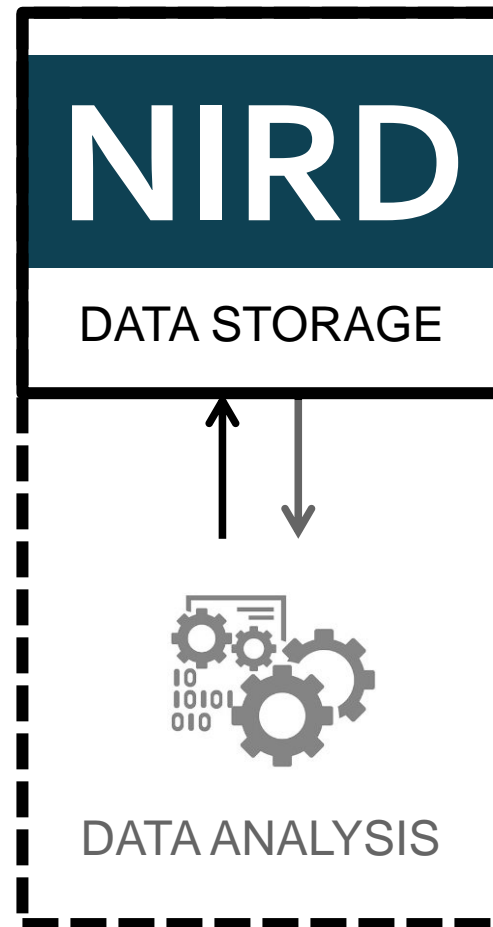
Enable collaborative projects

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>

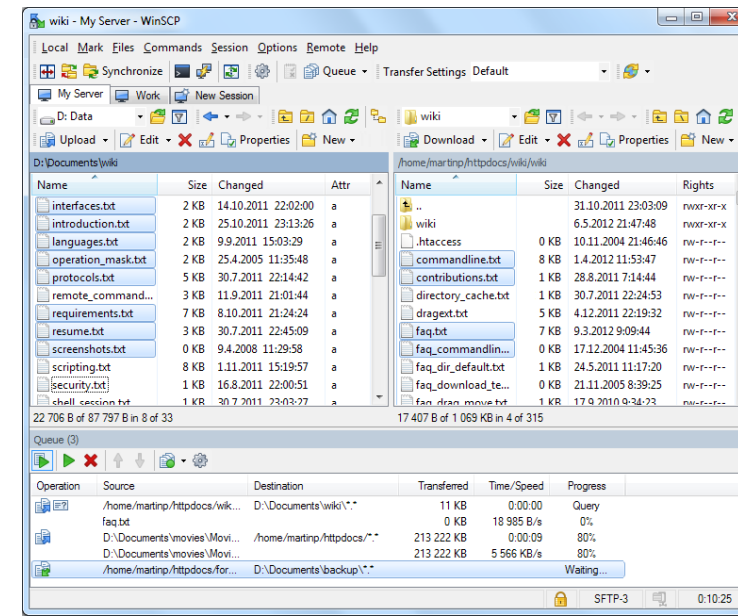
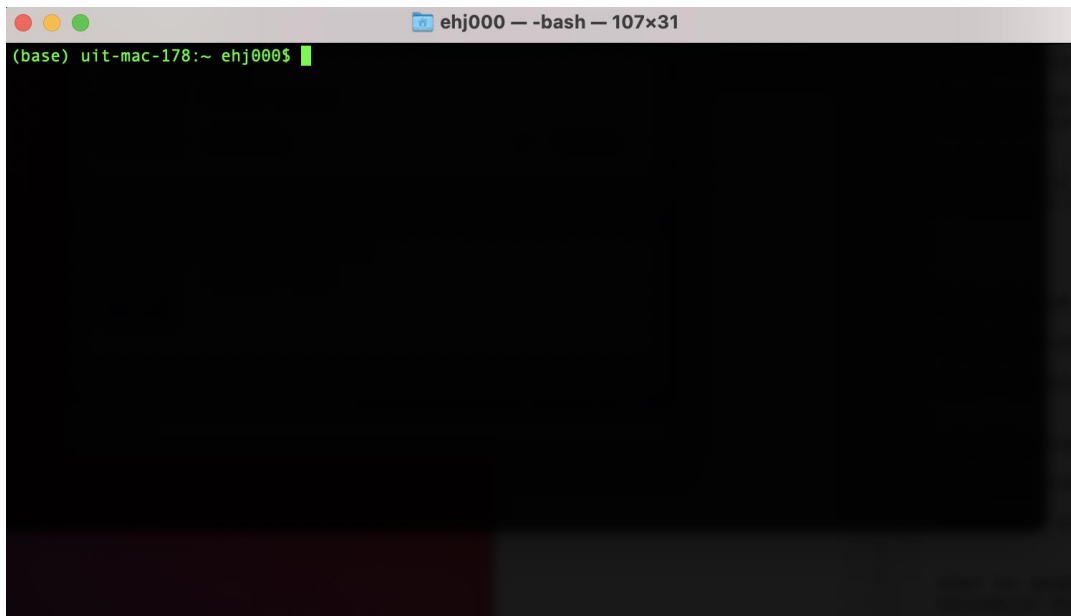
Contribution model: <https://www.sigma2.no/user-contribution-model>



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

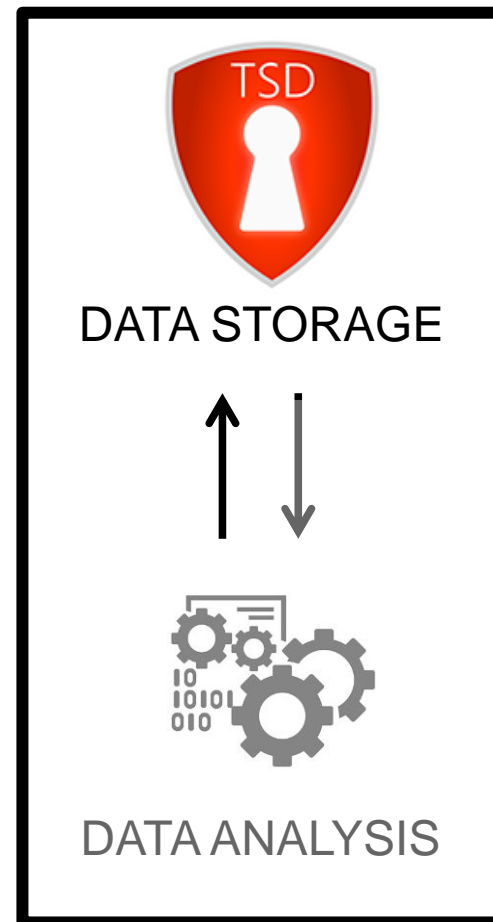
Available to all users with account

Enable collaborative projects

Integrated with compute

Multiple permission roles - shared data

User support: Tech and admin support



Type of data

Sensitive data

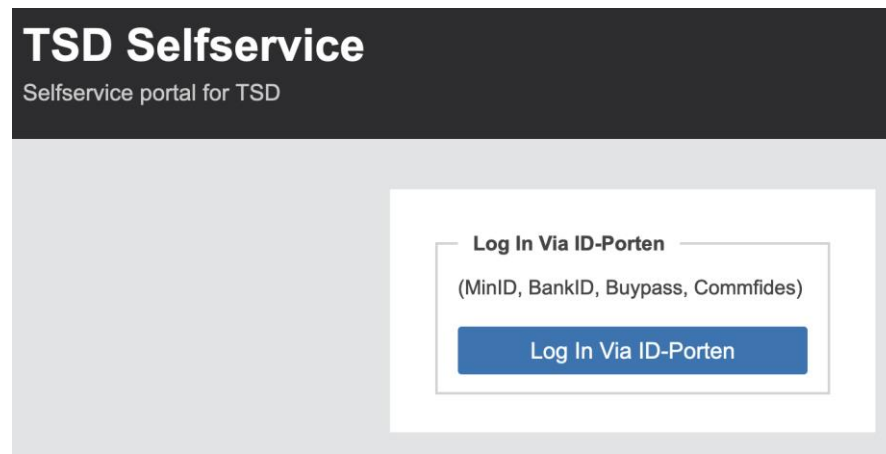
Support multiple data types

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/>

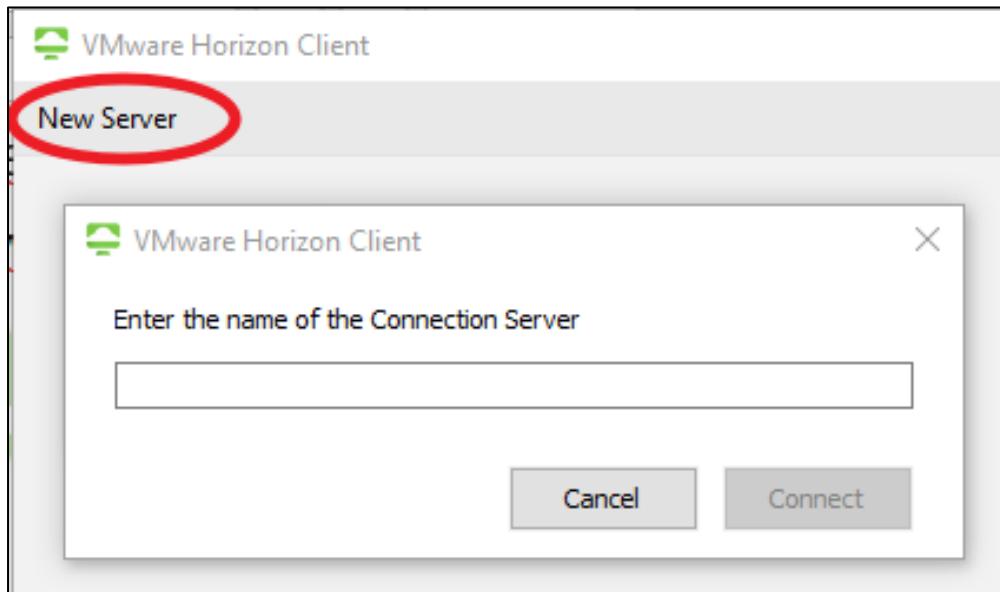
Apply for project: <https://www.uio.no/tjenester/it/forskning/sensitiv/hjelp/start/registrer.html>

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

