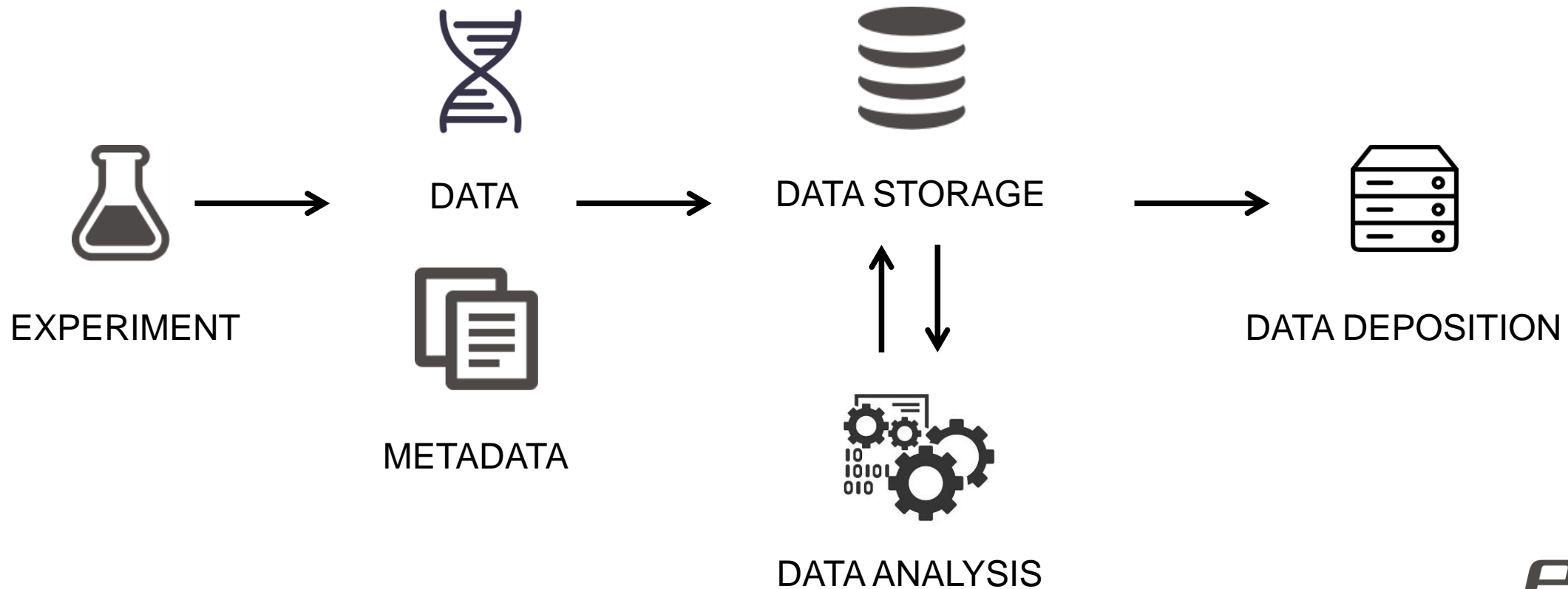# National storage infrastructures

NeLS/StoreBioInfo, NIRD, TSD
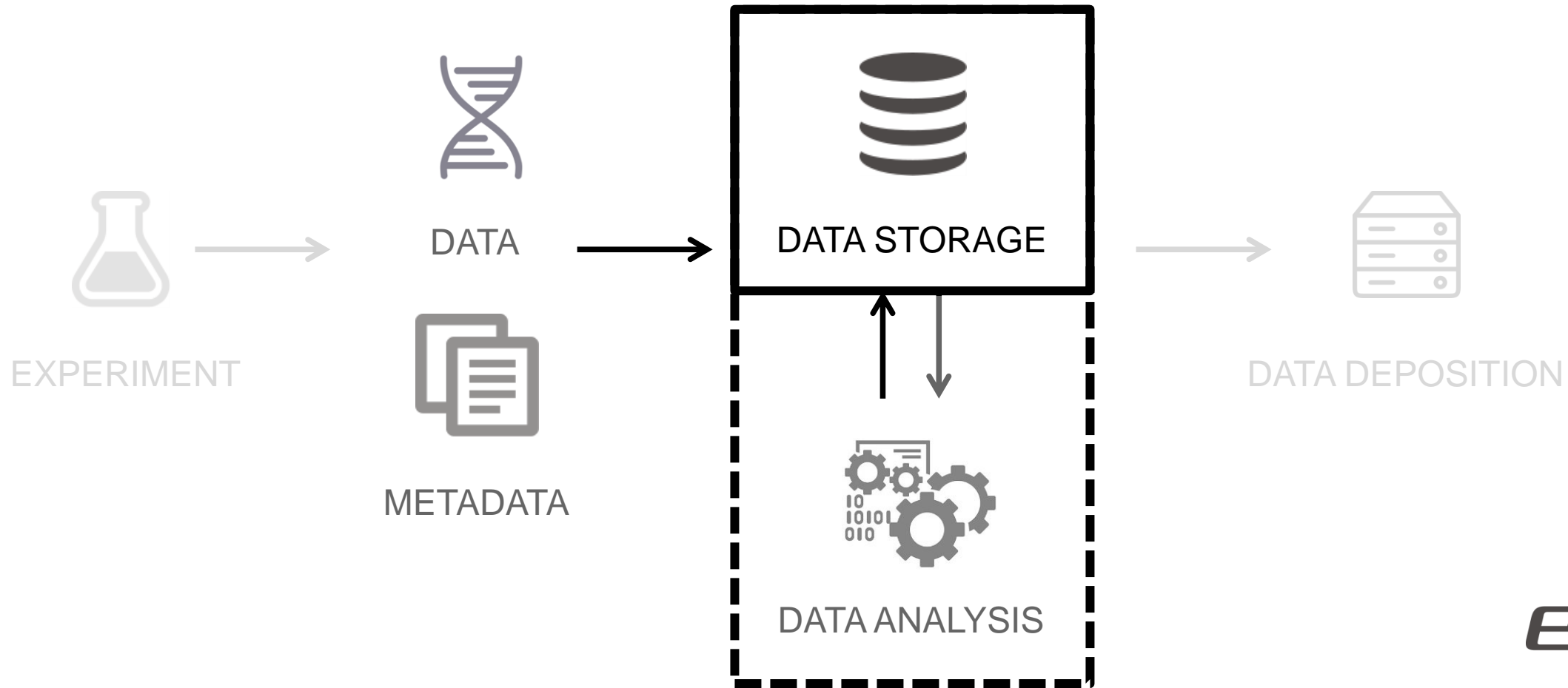
David Dolan
ELIXIR Norway
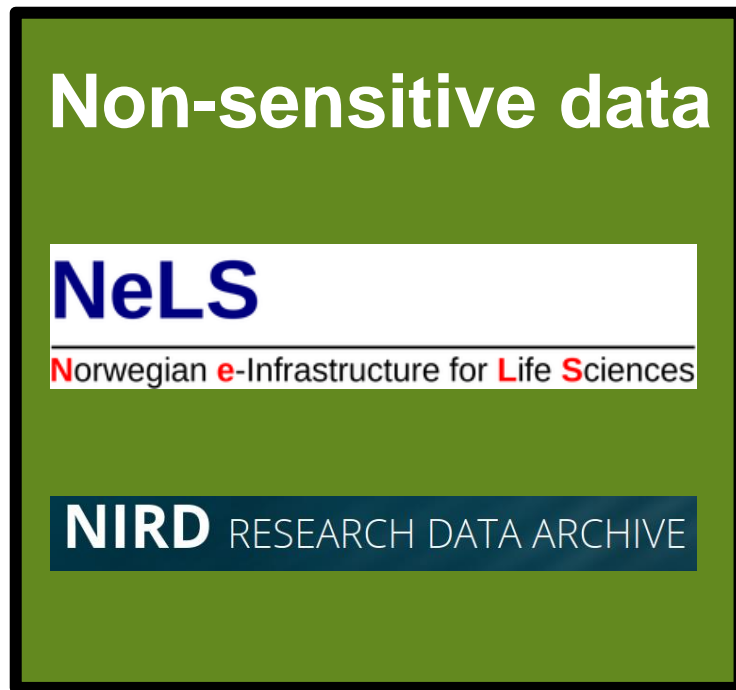
Data storage – from the researcher perspective

EXPERIMENT → DATA / METADATA → DATA STORAGE ⇄ DATA ANALYSIS → DATA DEPOSITION

Data storage – from the researcher perspective

National storage infrastructures

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?
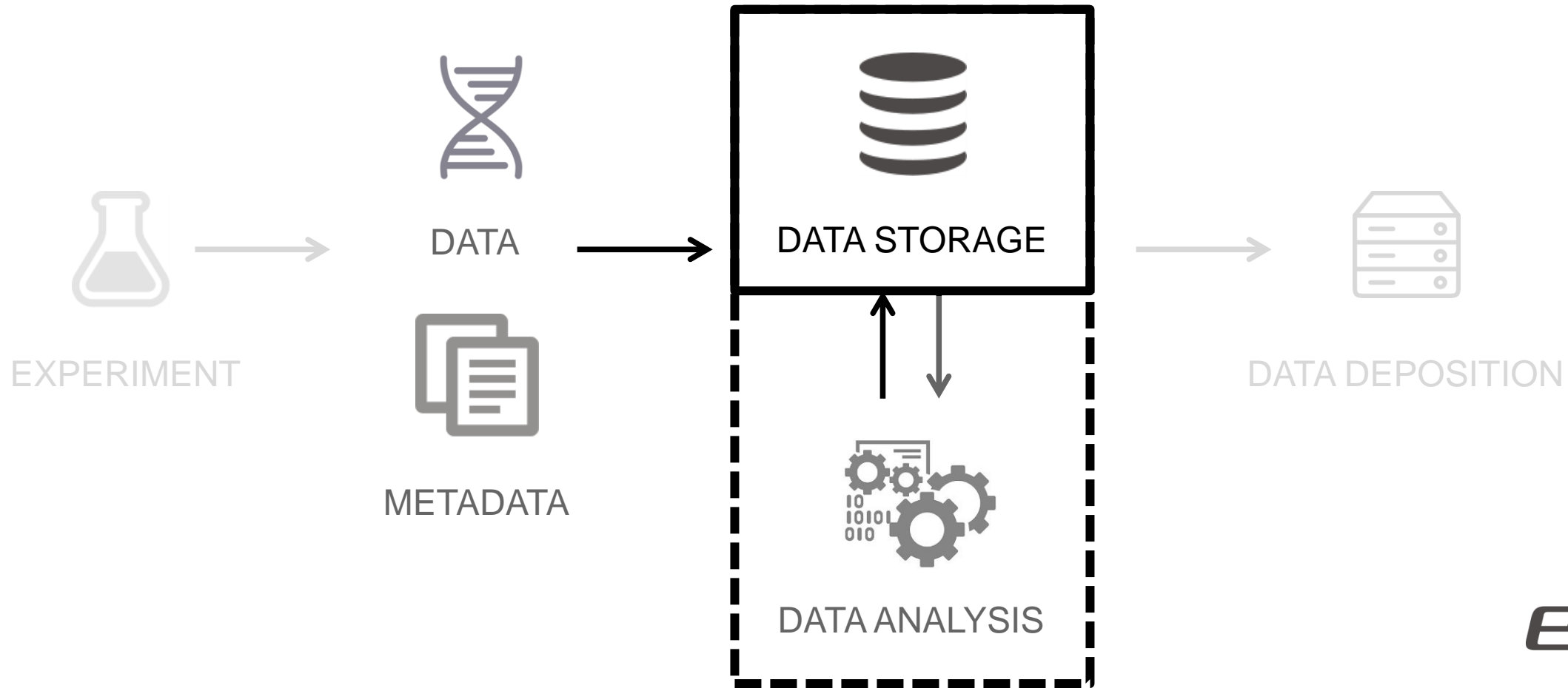- Relevant tools and resources

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 respository software.	storage researcher data manager IT support	elixir

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

Data storage – from the researcher perspective

EXPERIMENT → DATA / METADATA → DATA STORAGE ⇄ DATA ANALYSIS → DATA DEPOSITION

ELIXIR NORWAY

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

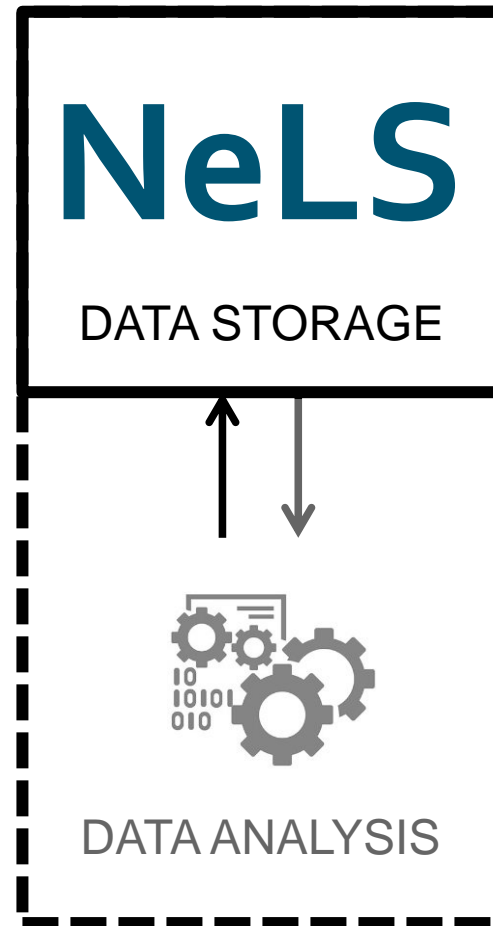Enable collaborative projects

Multiple storage layers

Integrated with compute

Multiple permission roles - shared data

Free of charge*

Support for data deposition

User support: Elixir Norway helpdesk

NeLS

DATA STORAGE

DATA ANALYSIS

Type of data

Non-sensitive data
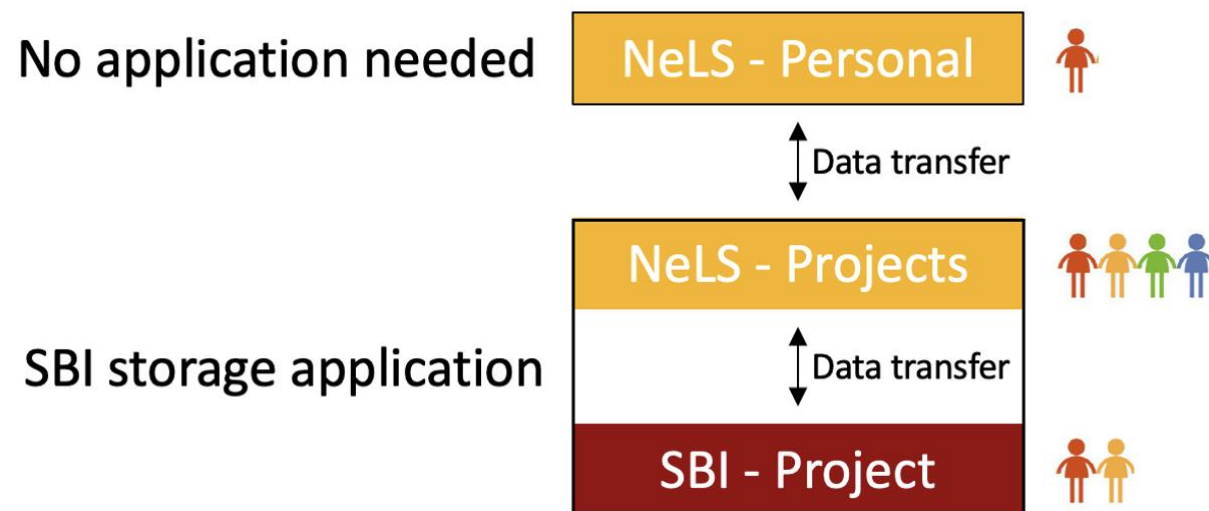
Support multiple data types

SEEK integration for metadata

elixir
NORWAY

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
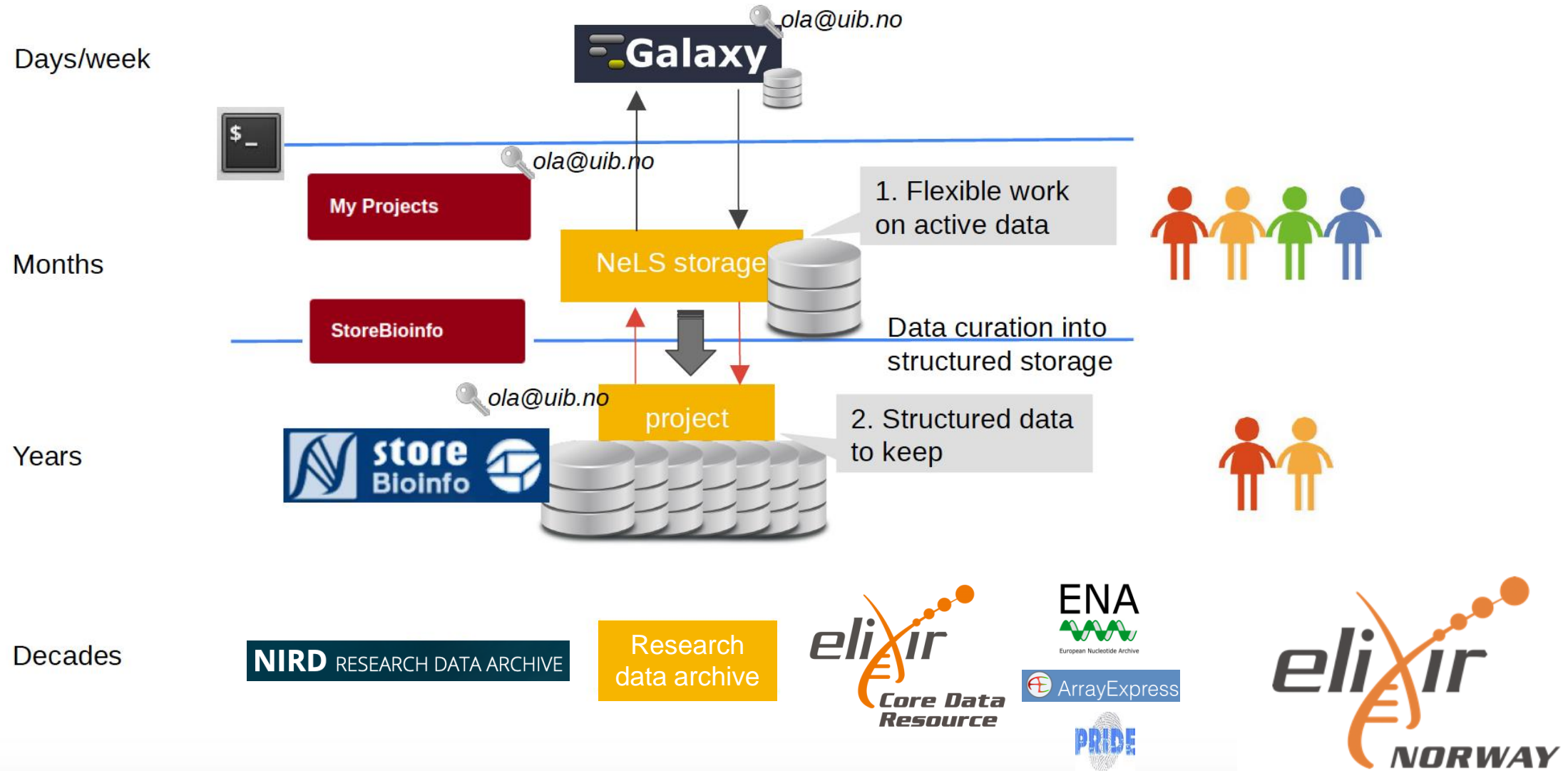
Apply for storage: support@elixir.no

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
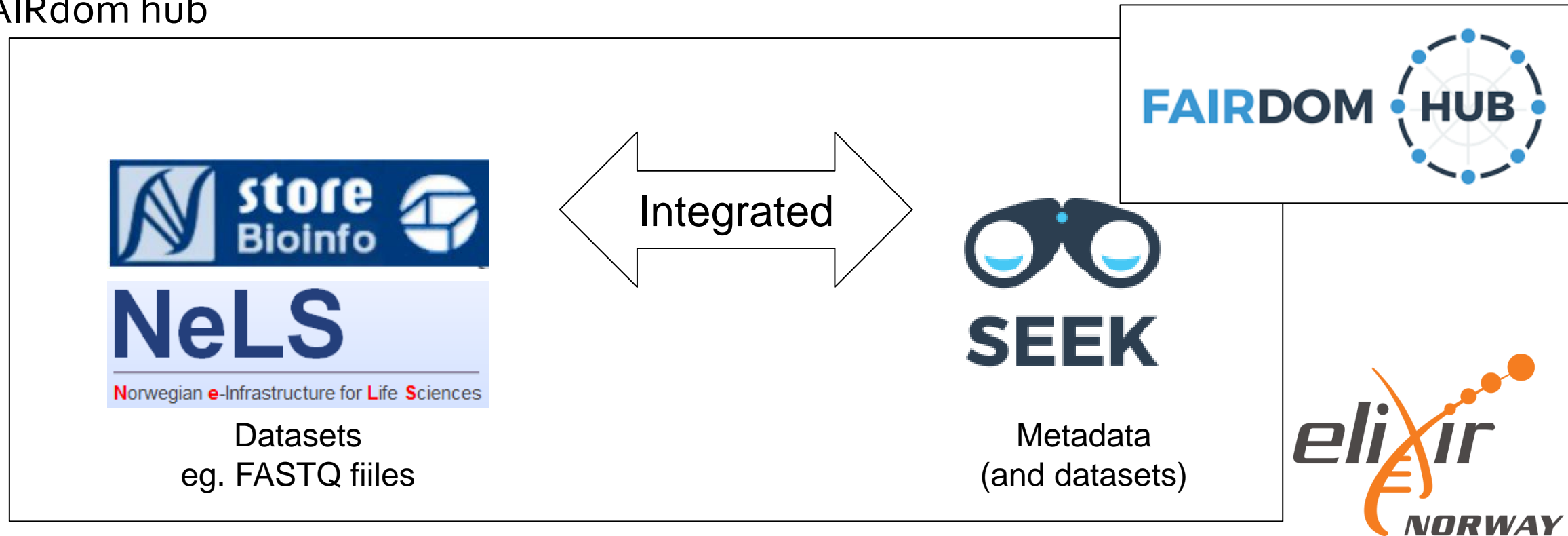
NeLS architecture

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

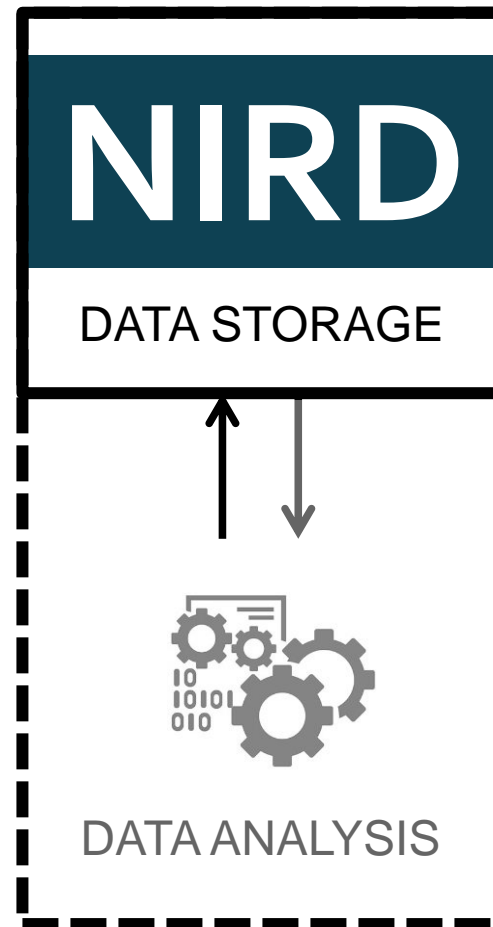## NIRD in general

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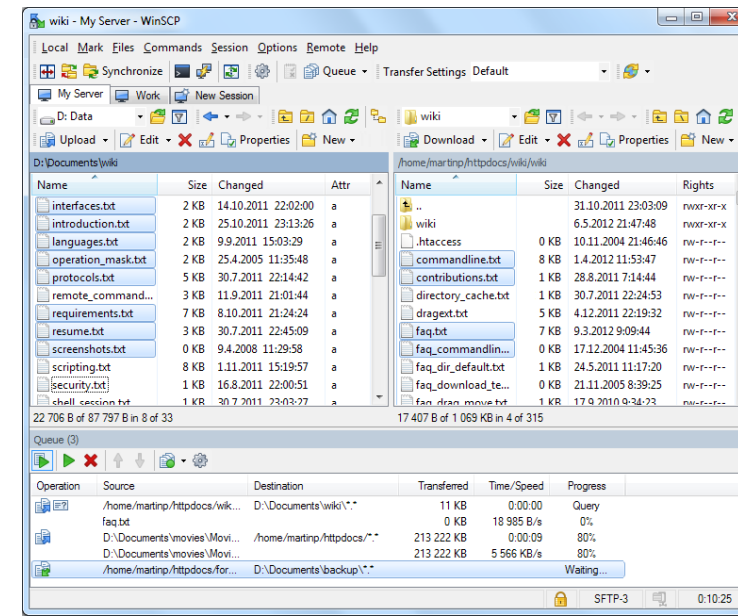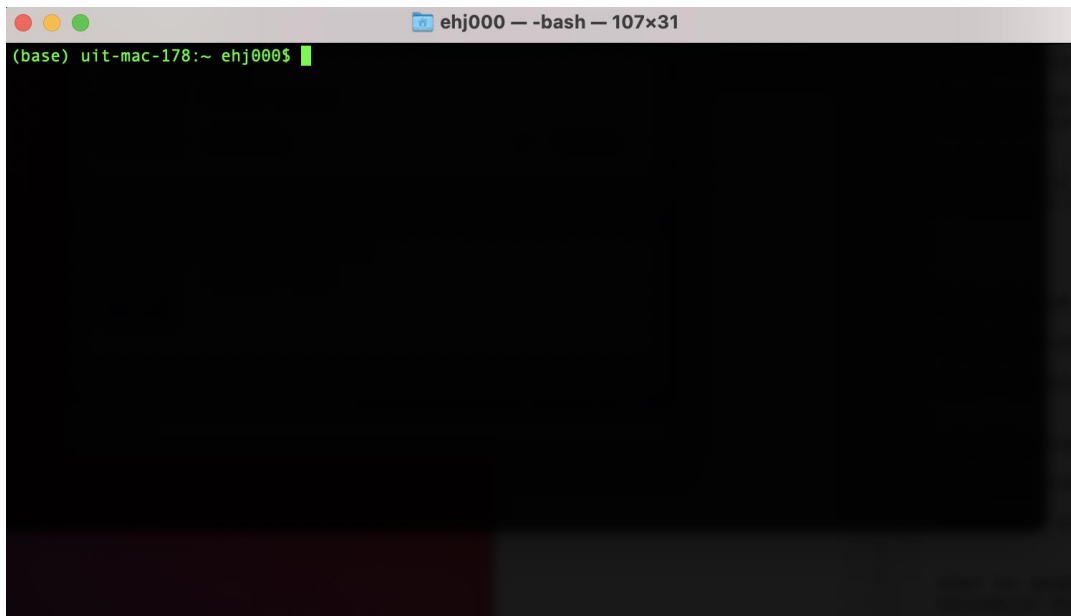
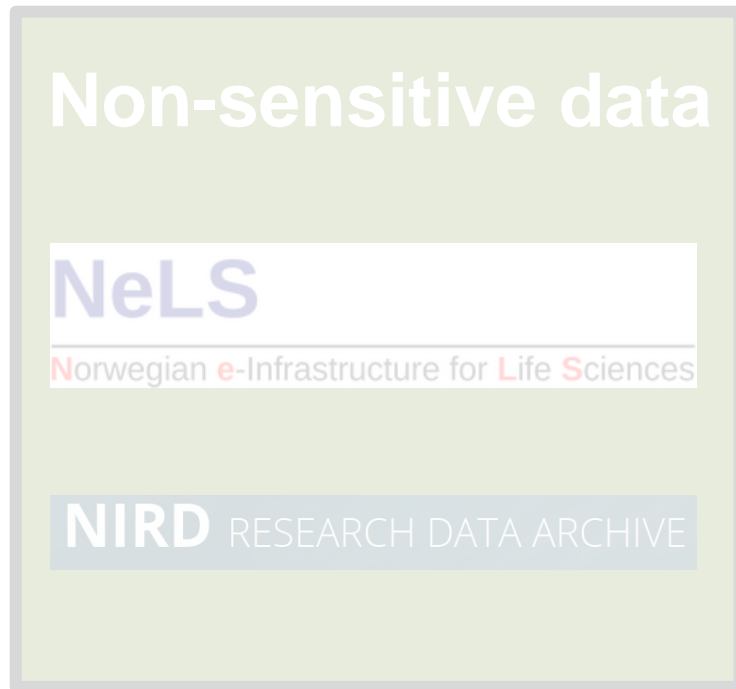Contribution model: https://www.sigma2.no/user-contribution-model

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
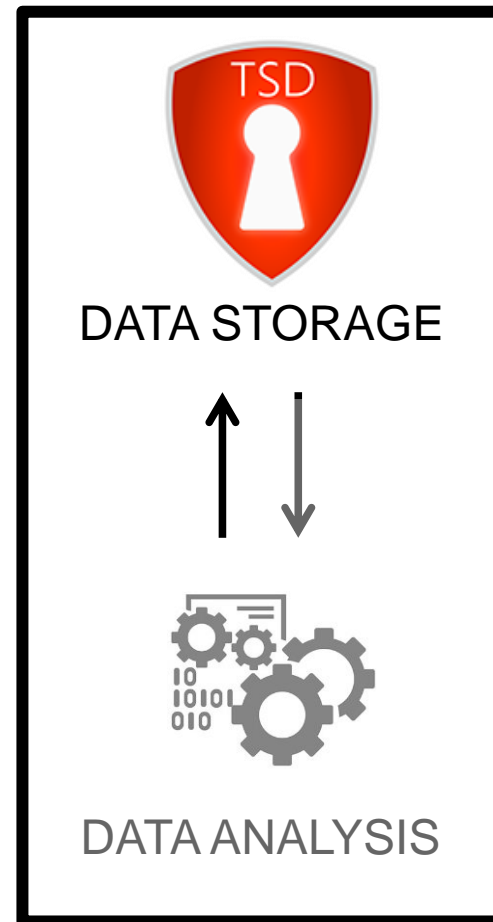
TSD in general

Available to all users with account

Enable collaborative projects

Integrated with compute

Multiple permission roles - shared data

User support: Tech and admin support

TSD

DATA STORAGE

↑ ↓

DATA ANALYSIS

Type of data

Sensitive data

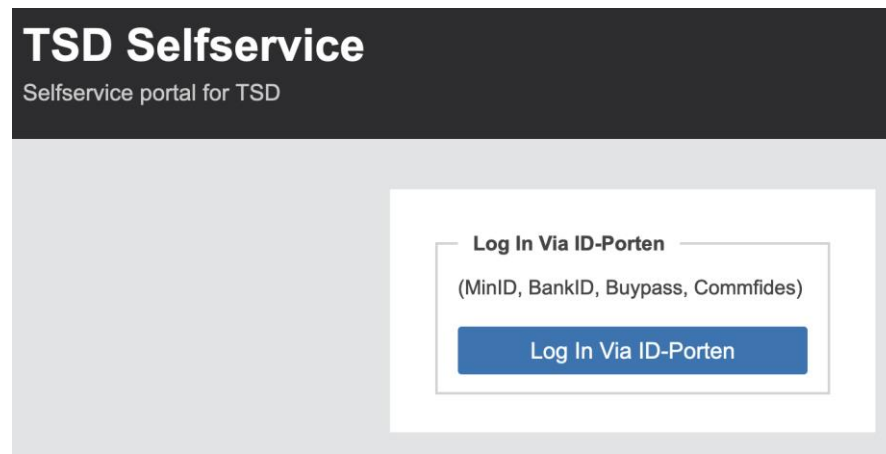Support multiple data types

elixir
NORWAY

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
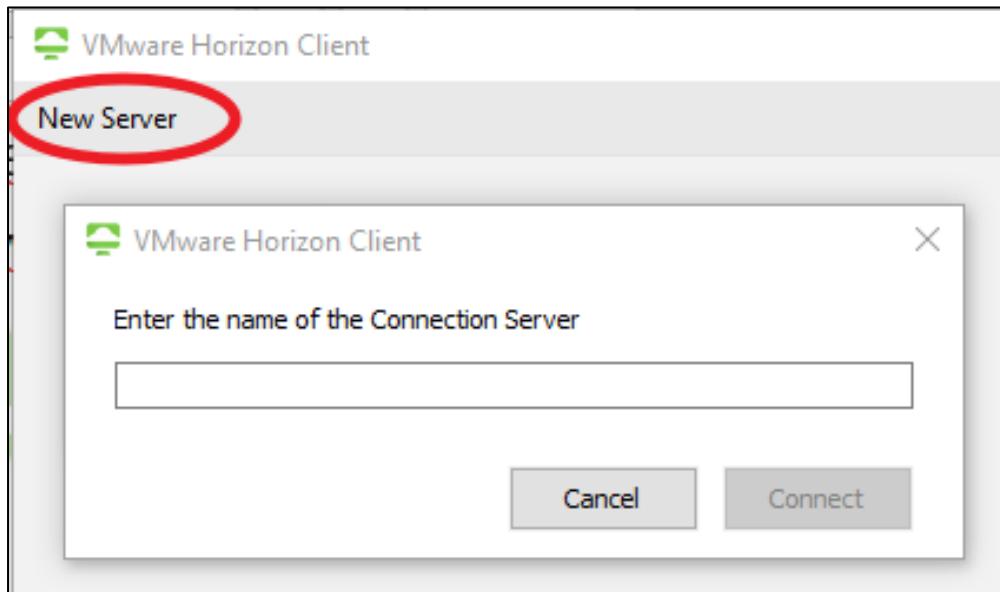
Where should I store and share my life science data?

	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

eliXir NORWAY

Example - Data flow/handle using ELIXIR Norway