



# Fibre Sensing – Data Acquisition

NREN Fibre Infrastructure for Sensing

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Géant infoshare

05 December 2024

Public (PU)

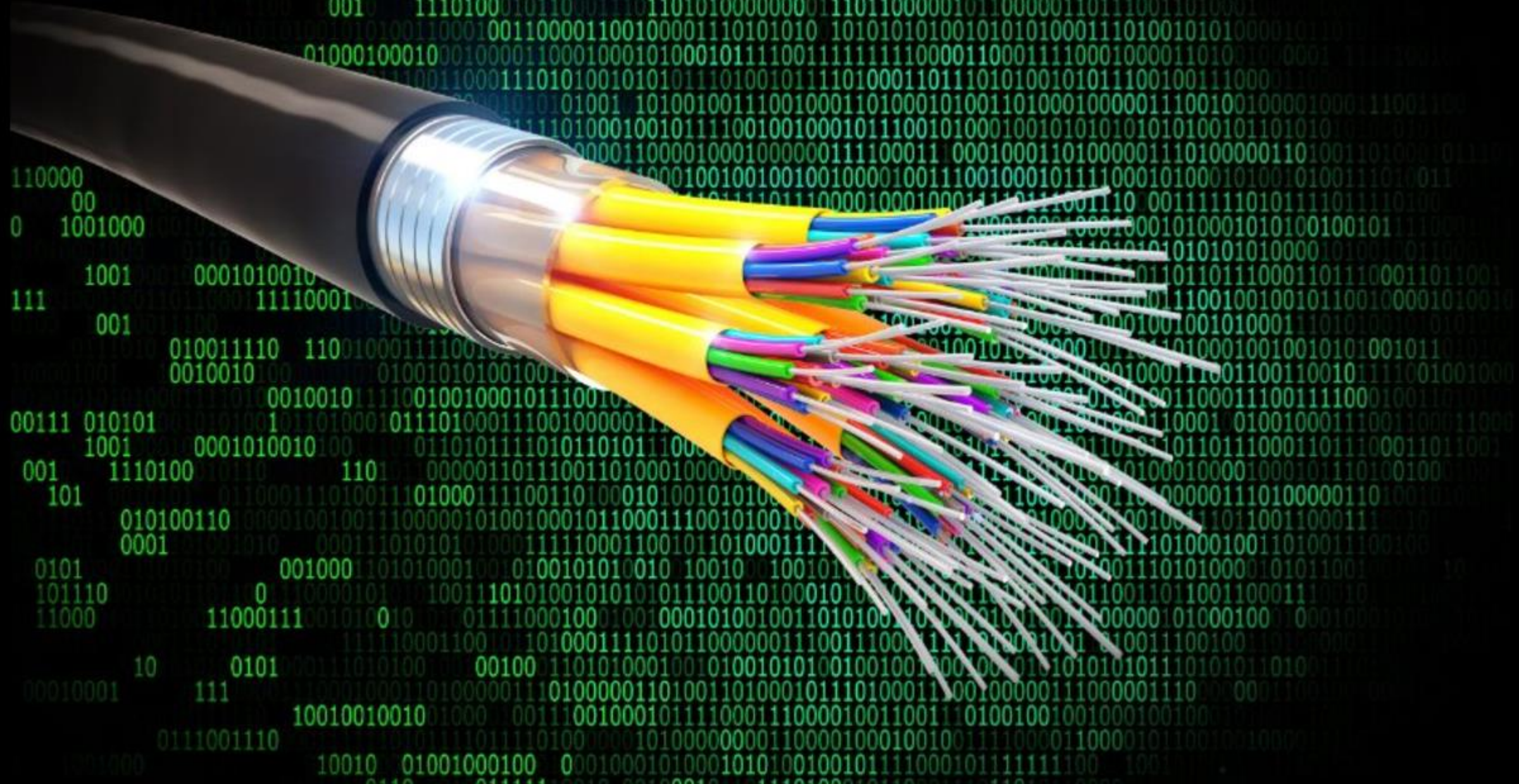
GN5-1

# Agenda

- Introduction to fibre sensing and Data Management
- Ecosystem
- Stakeholders
- Data Acquisition

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# Introduction to fibre sensing and Data Management

- Data can be collected on subsea and terrestrial cables
- **Large** amounts of data are created (1 TB per day and location)
- A lot of noise
- Involvement of different research areas and military use

We want FAIR data!

## An example from the Submerge project on storage needed

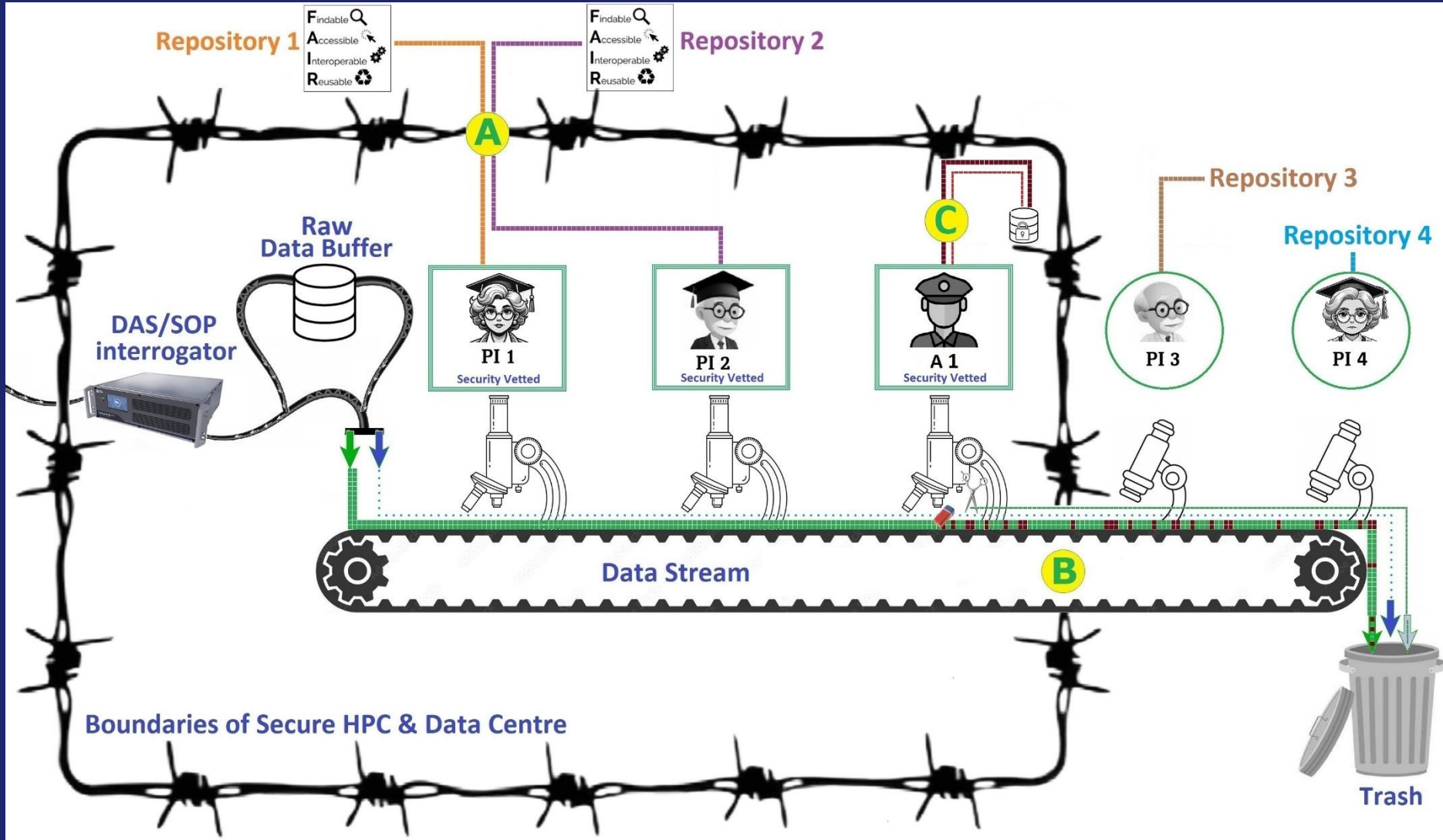
- Experience from the first campaign at Svalbard was
  - DAS: **3-7TB/day** of raw data
  - SoP: **6-12GB/day** of raw data
- data volume can be reduced by
  - Filtering (DAS has 32.000 channels available, SoP only 4)
  - Exclusion of frequencies
  - Exclusions in time
  - Spatial exclusions

...so it depends...

# Agenda

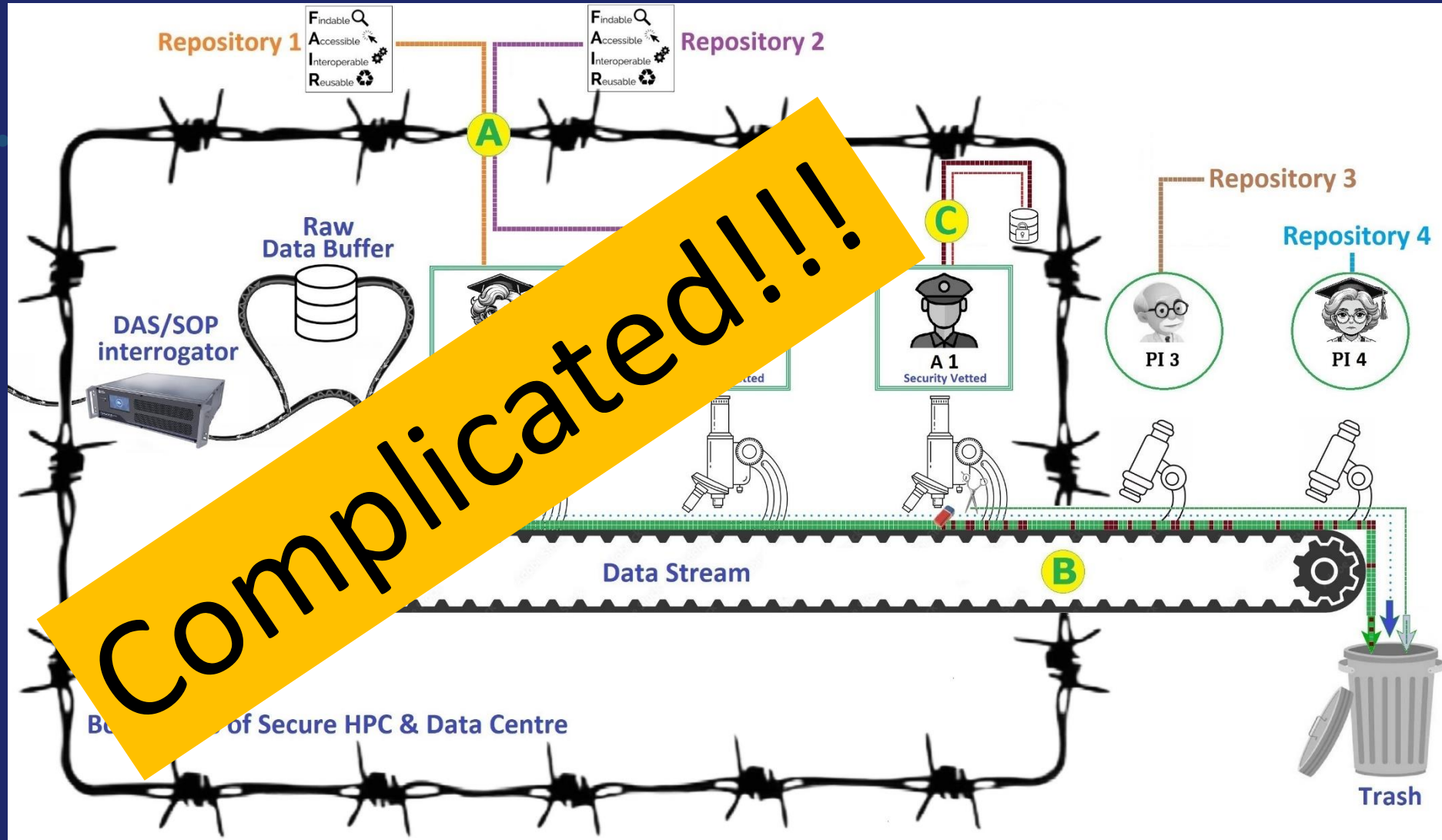
- Introduction to fibre sensing and Data Management
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# Ecosystem





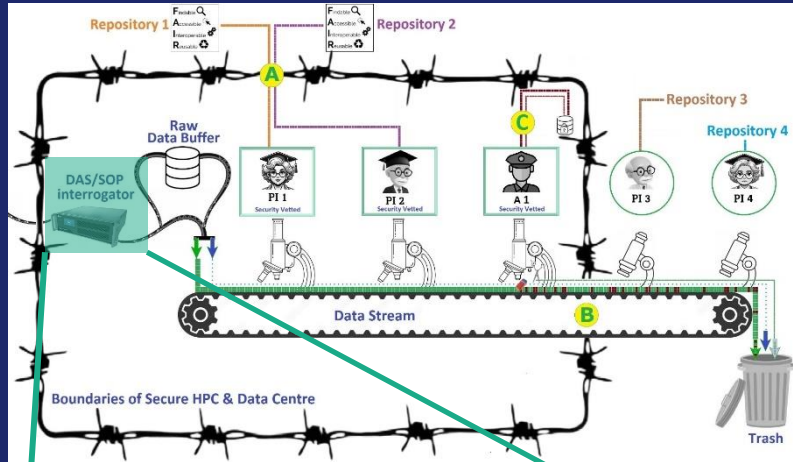
# Ecosystem



# Agenda

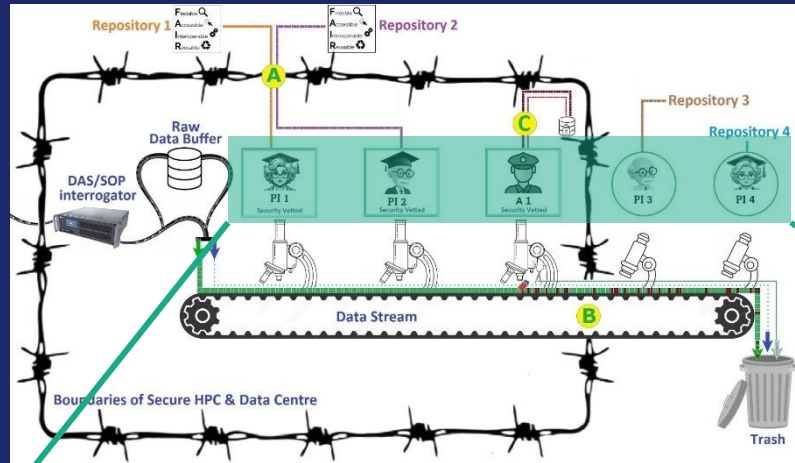
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# Stakeholders – Fibre Infrastructure Owners



- Fibre infrastructure owners own the telecoms cable
- Who owns the data?
  - Fibre infrastructure owners
  - NREN's
  - Researchers
  - Other stakeholders

# Stakeholders – Data Users



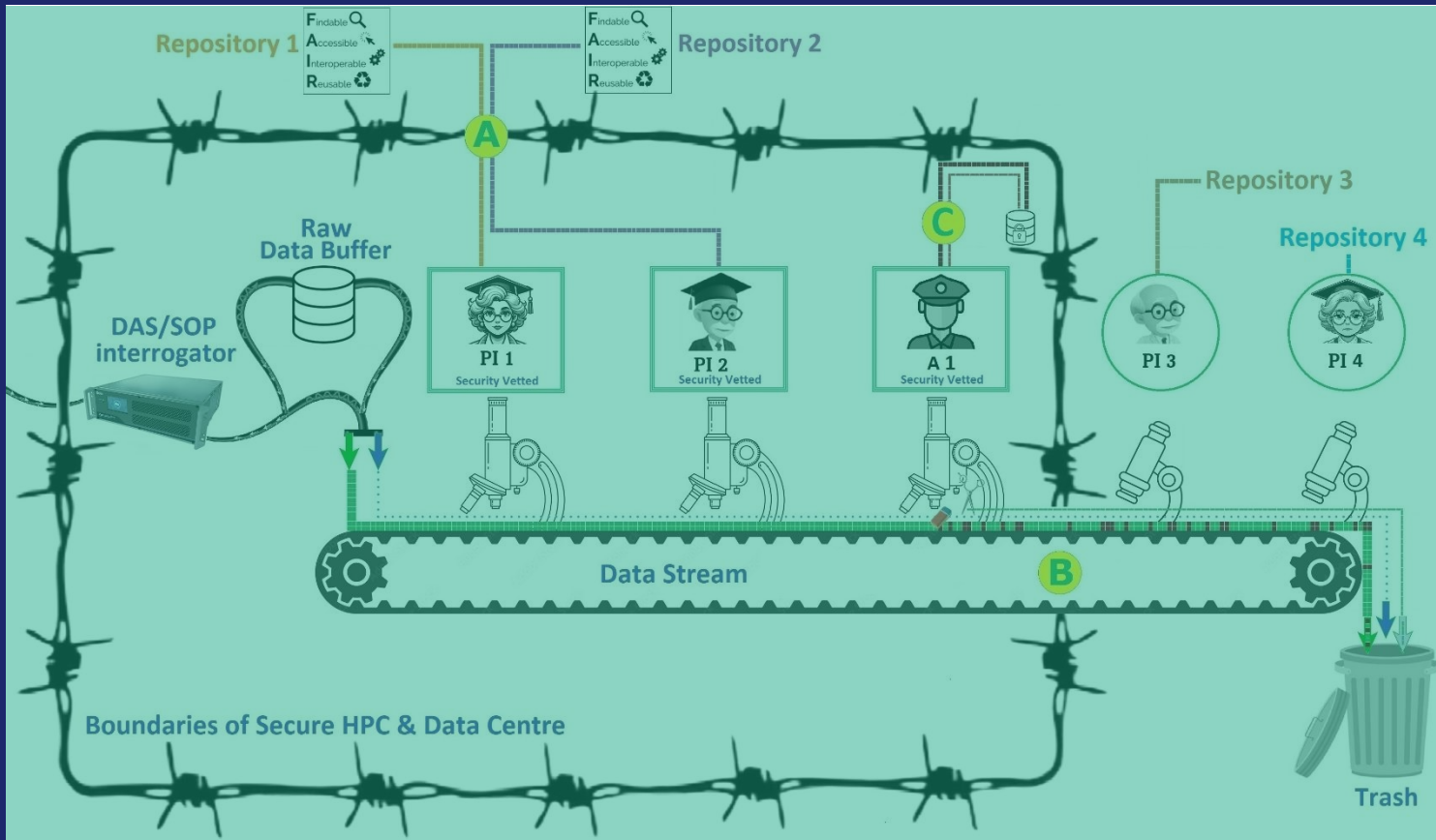
- Researchers
- Civil protection
  - early warning agencies
- Dual use
  - Military
  - Intelligence
  - law enforcement
- Commercial
  - Fibre infrastructure owners
  - Infrastructure operators (power, transport)

# Stakeholders – Policy Makers



- MEDUSA
- Connecting several countries and continents
- Who has opinions on the data acquisition practices?

# Stakeholders – Policy Makers

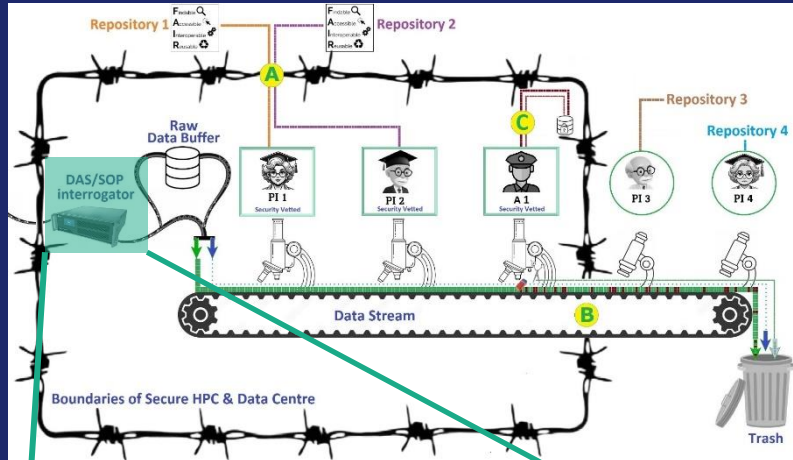


- UNCLOS (United Nations Convention on the Law of the Sea)
- National laws
- National security agencies
- Research performing organisations
- NRENs

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- **Data Acquisition**

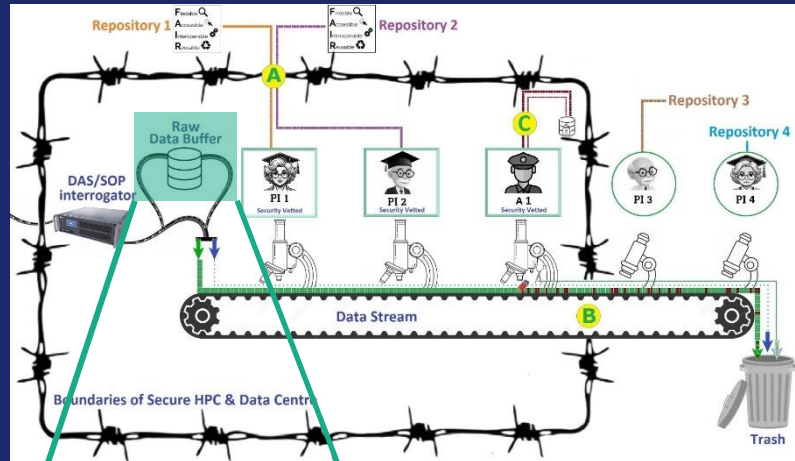
# Data Acquisition – On The Fibre



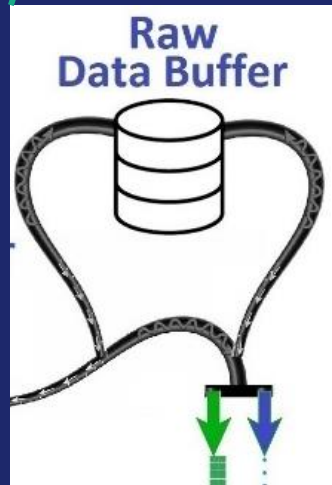
- Telecoms cable is installed
- DAS/SOP interrogator is installed
- Data is streamed to a secure computer center



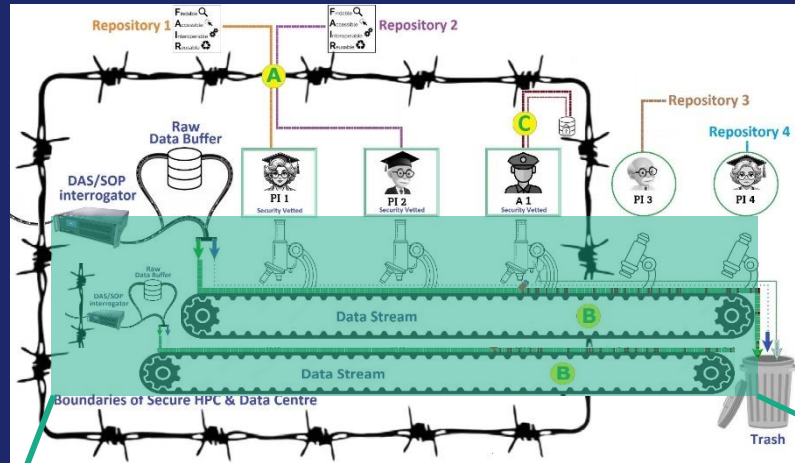
# Data Acquisition – Raw Data Buffer



- Secure data storage center in the country of data acquisition
- All raw data will be kept in a secure buffer for 3 e.g. months

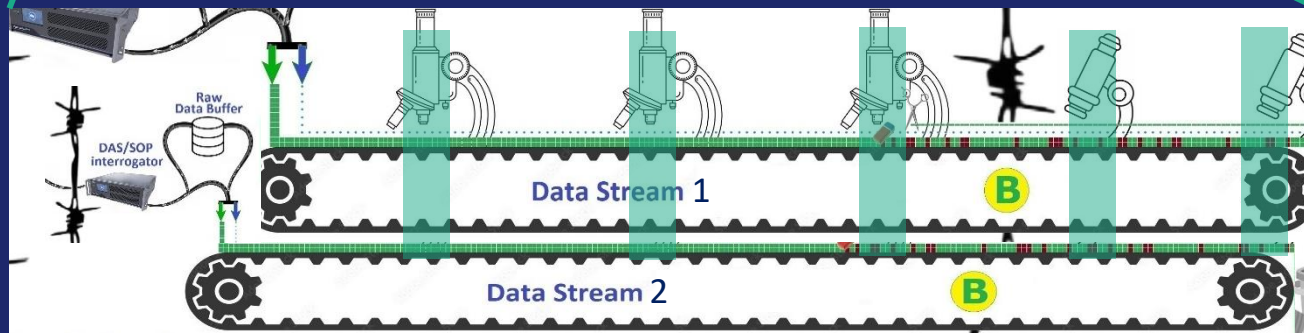


# Data Acquisition – Data pooling

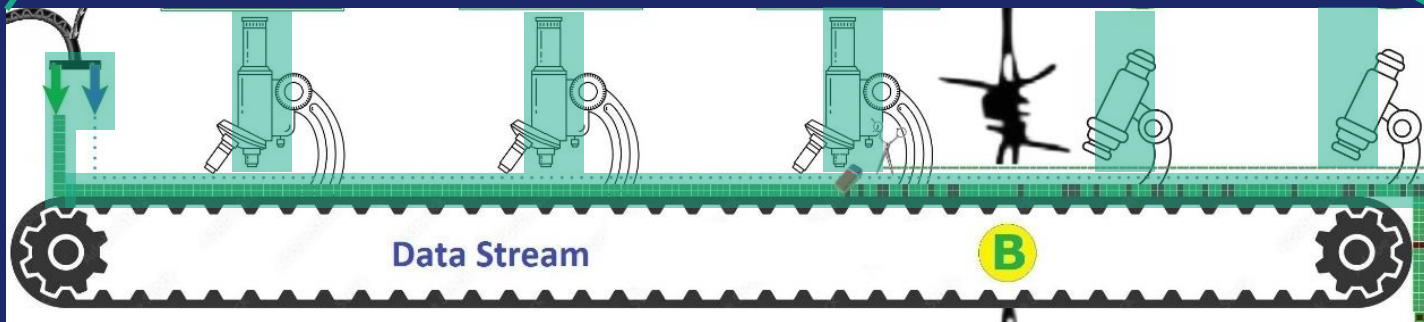
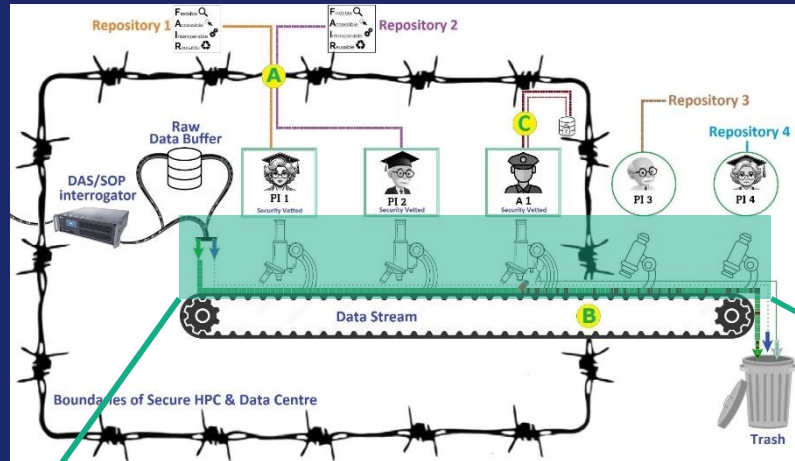


- Access to available data from several data collection locations

- Pooling is possible inside and outside of the secure HPC and Data Center

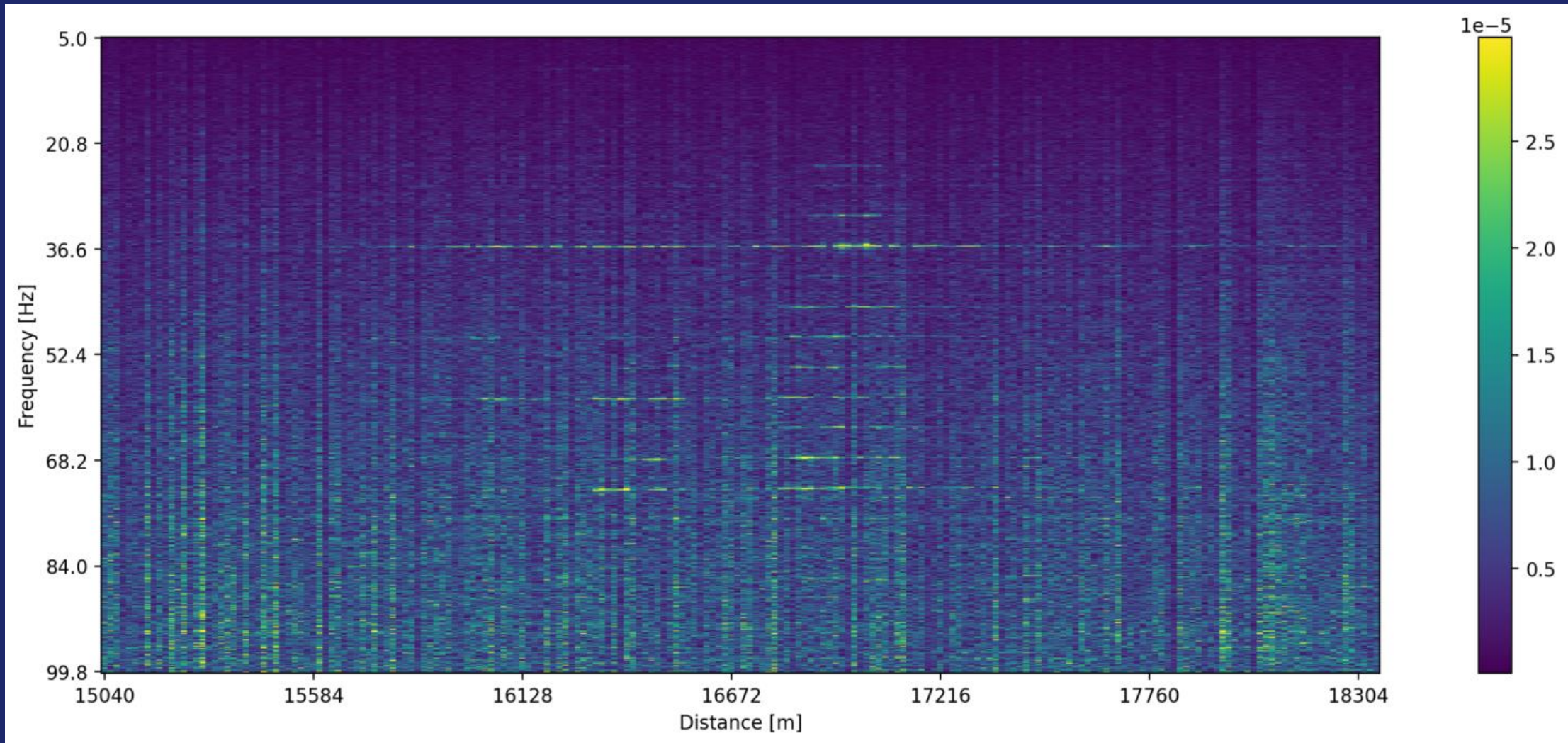


# Data Acquisition – Data Pre-processing

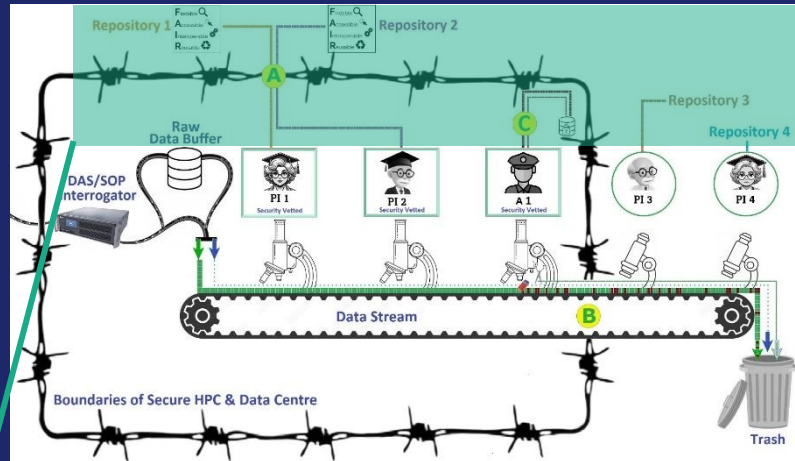


- Algorithms and Machine learning will be used to automatically pre-filter the data
  - Files containing sensitive information will be deleted
  - Files containing events will be labeled and send directly to a repository

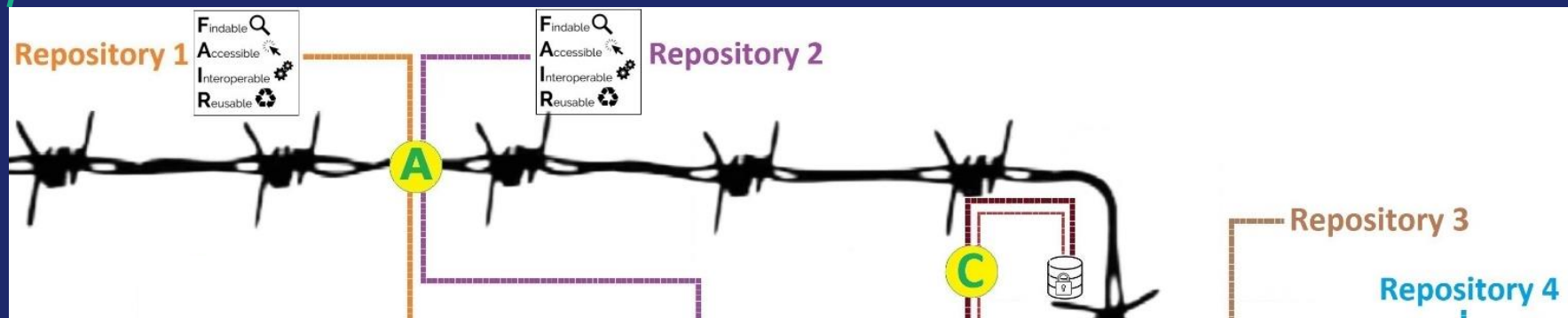
# Example frequency domain plot



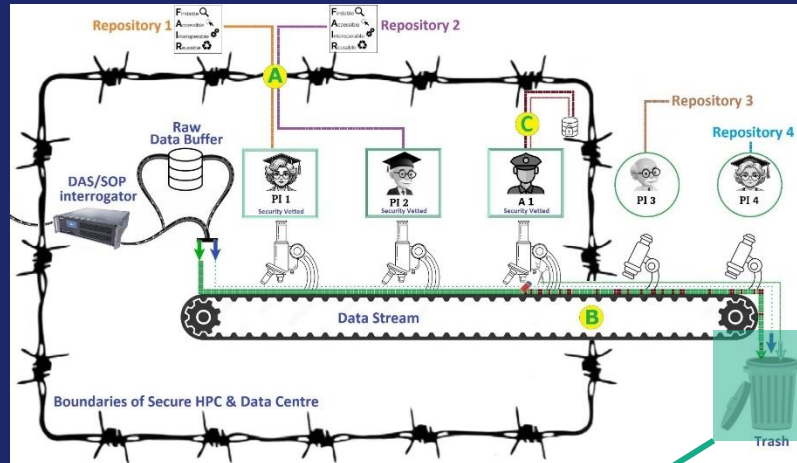
# Data Acquisition – Streaming to Archives



- Discipline specific formats and standards
- everything FAIR and as open as possible, as protected as necessary



# Data Acquisition – Data Deletion



- Everything that has not been claimed by a discipline specific archive or other data users will be deleted after 3 months





**Thank You, any questions?**

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Co-funded by  
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