

FAIR Data Spaces Final Event

Architecture Overview

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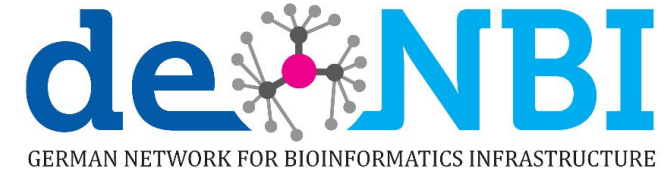


Motivation

Development of a shared **cloud-based** dataspace
for industry and science

Cloud foundations

- **Community Cloud:** de.NBI
 - One of the largest scientific Community Clouds in Germany
 - Provides free storage & compute resources for researchers in life science
 - Operational since 2016
- **Public Cloud:** Open Telekom Cloud



Technologies

- Free and Open Source
- Large communities
 - Science & Industry
 - Widespread adoption
- Vendor agnostic
 - Sovereignty

Operations



Standards



Infrastructure

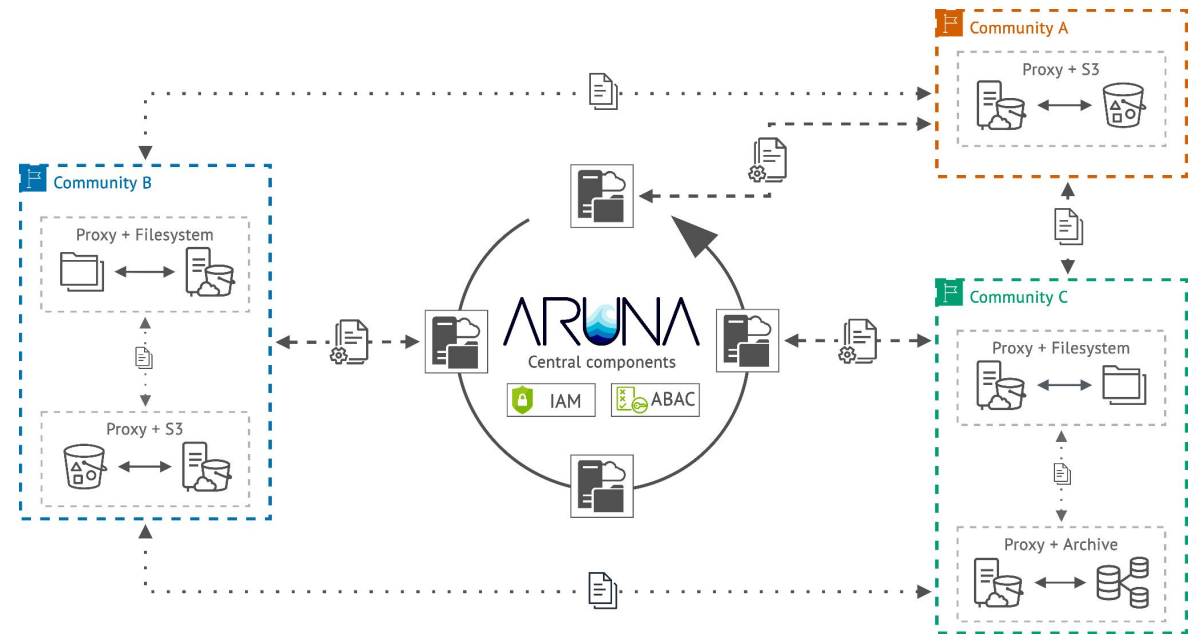


Interfaces

- **Data exchange (external): Data Space Protocol**
 - Contract negotiation via Open Digital Rights Language (ODRL)
 - Data catalog (DCAT)
- **Data exchange (internal): S3 compatible**
- **Service Catalog**
 - Discovery of services via Self Descriptions

Storage Architecture

- **Aruna:** Storage engine developed by NFDI4Biodiversity and NFDI4Microbiota
- Integrated Data Catalog (Custom + DCAT)
- Standardized Metadata with PIDs and full-text search (schema.org)
- Unified (S3) interface for existing storage
- Event driven architecture
 - automated trigger of internal & external actions workflows
 - **Compliance Monitoring**
- Custom **EDC** compatible **DSP** integration



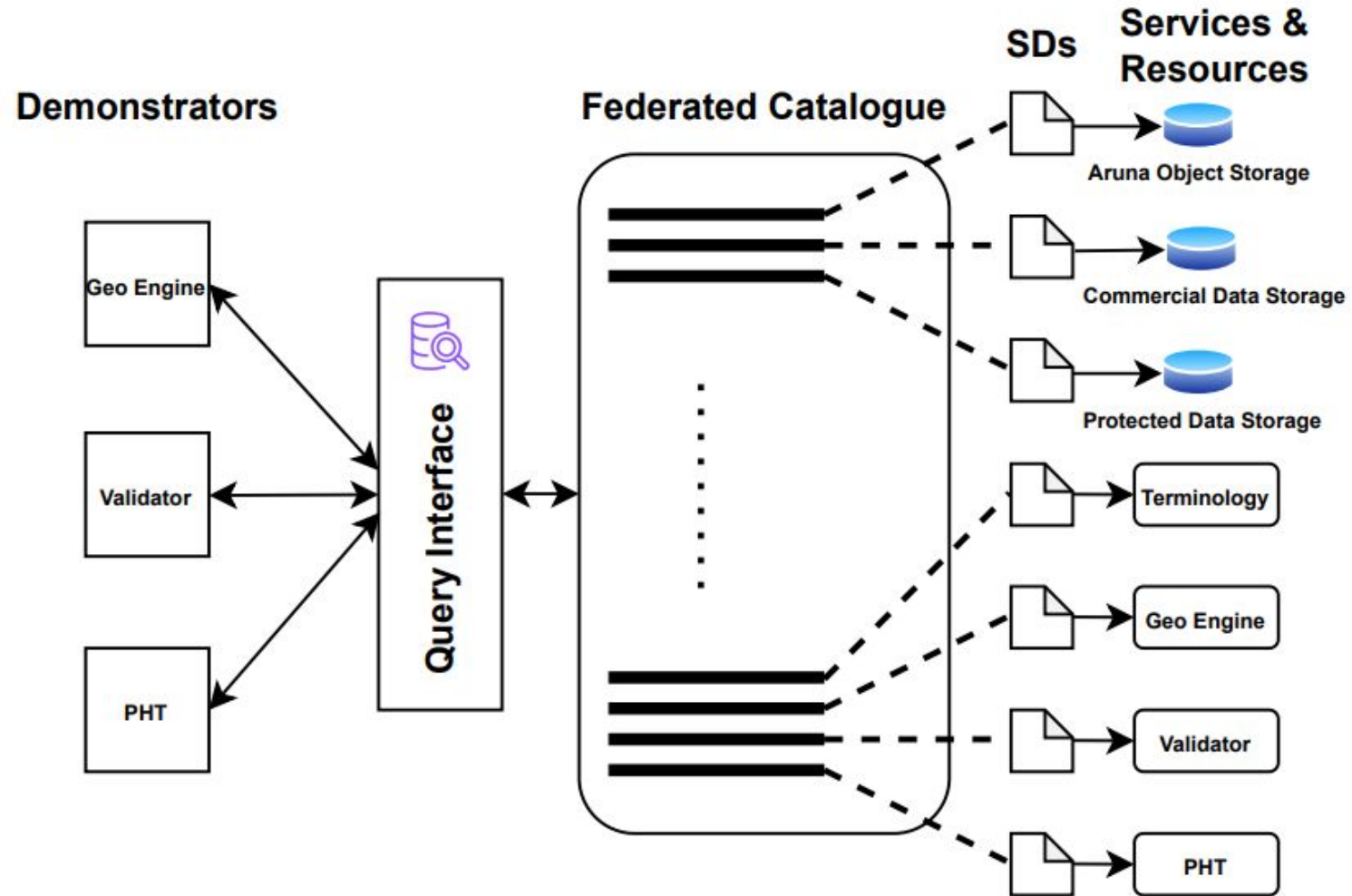
<https://aruna-engine.org/>

Terminology Service

- Service to query terminologies from various domains
- Integration into validator demonstrator and storage engine (aruna)
- Continuous developments in TS4NFDI

The screenshot displays the TIB Terminology Service interface. At the top, there are two 'Add Ontology Definition' dialog boxes. The left dialog shows the 'Currently selected ontology: ABCD Base Ontology' with fields for Id (abcd:), IRI (http://rs.tdwg.org/abcd/terms/), and Description (The base ontology of the ABCD Standard.). The right dialog shows 'Currently selected ontology: None' with a search input field containing 'a'. Below these, a search results dropdown is visible, listing various ontologies such as 'ABCD Base Ontology', 'Academic Event Ontology', 'Agronomy Ontology', 'Atomistic', 'Allotrope Foundation Ontology Merged Without QUDT And Inferred (REC/2024/03)', 'Air Traffic Management (ATM) Ontology: includes airspace infrastructure instances', and 'Audubon Core main vocabulary'. At the bottom, a search bar with 'abcd' is shown, with a dropdown menu listing 'ABCD syndrome', 'ABCDS', 'ABCD-2', 'ABCD-3', and 'ABCD-1'. Below the search bar, a 'Jump To' section displays a grid of ontology terms with their respective IRI buttons, including 'ABCD1 Gene' (ncit, NCIT_C142193), 'ABCD1 Gene Mutation' (ncit, NCIT_C147902), 'ABCD1 wt Allele' (ncit, NCIT_C142194), 'ABCD syndrome' (efo, MONDO_0010895), and 'ABCD Base Ontology' (abcd).

Demonstrator integration



Thank you for your interest!

