

First steps of the basic service Terminology Services 4 NFDI

Step by step through the initialization to the
integration phase

Roman Baum, Jan Fillies, Naouel Karam, Oliver Koepler, Pooya Oladazimi, Julia Sasse

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Existing terminology services in the NFDI

Basic Service: TS4NFDI

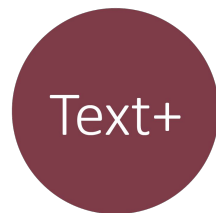
First steps: Usage of TS4NFDI

Outlook: Integration Phase

Existing Terminology Services in the NFDI

Terminology Services across NFDI domains and beyond

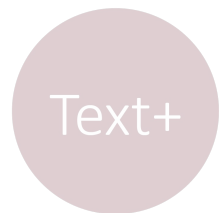
- several NFDI consortia provide terminologies in respective domain-specific terminology services or registries



Existing Terminology Services in the NFDI

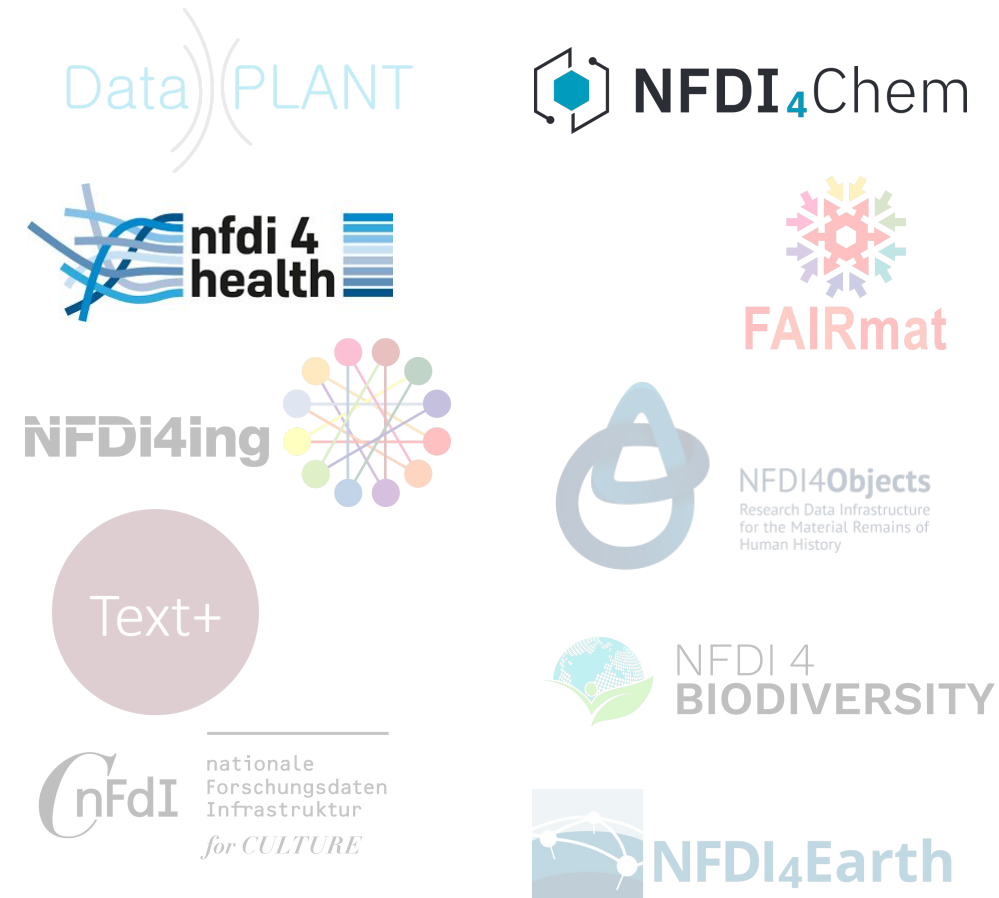
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Existing Terminology Services in the NFDI

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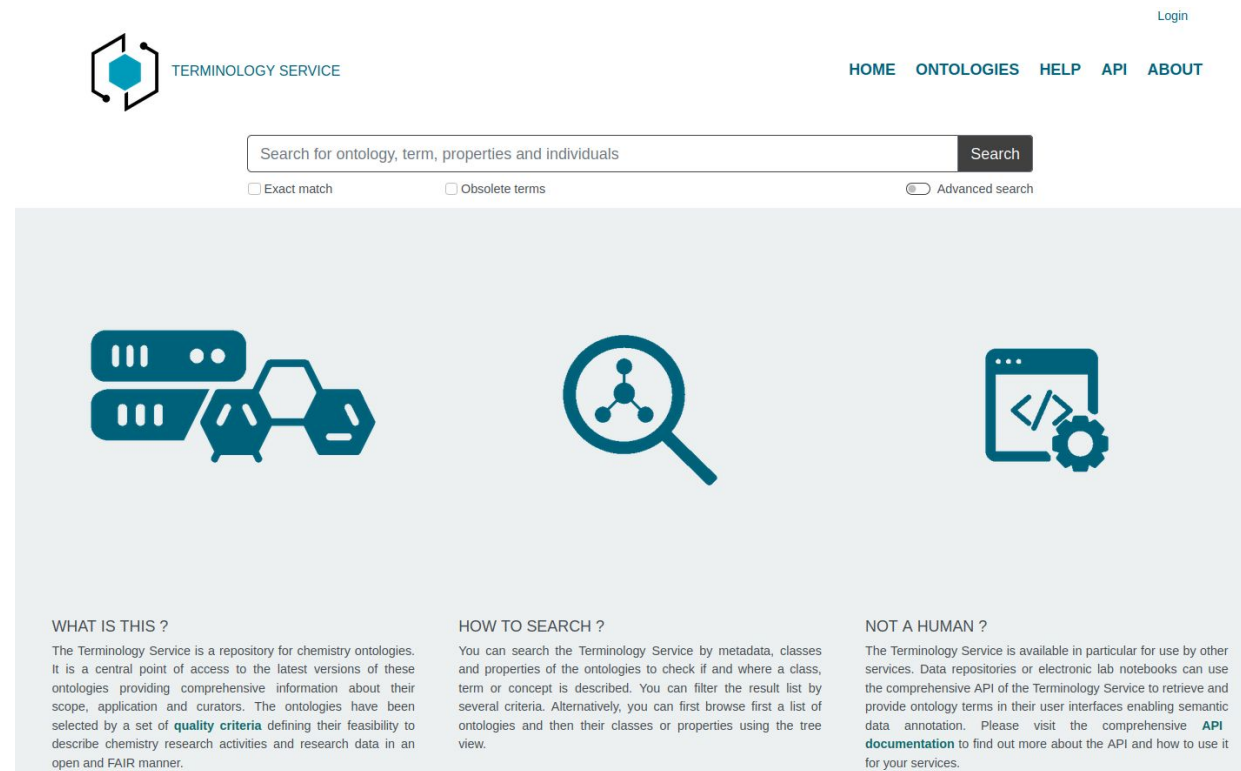


- several NFDI consortia provide terminologies in respective domain-specific terminology services or registries
- based on the Ontology Lookup Service (OLS)

Existing Terminology Services in the NFDI

NFDI4Chem - Terminology Service

- provides access to a collection of ontologies relevant to the chemistry community
- provides faceted search inside ontologies, tree and lists views of concepts, properties and individuals
- aims to support comparison and analysis across multiple ontologies for curation tasks
 - offers an unified view of issues from the original ontology repository
- can also index and display SKOS vocabularies
- a comprehensive API to retrieve all data



The screenshot shows the homepage of the Terminology Service. At the top left is the logo, a blue hexagon with a white outline, followed by the text "TERMINOLOGY SERVICE". To the right is a navigation menu with links for "HOME", "ONTOLOGIES", "HELP", "API", and "ABOUT", and a "Login" link in the top right corner. Below the navigation is a search bar with the placeholder text "Search for ontology, term, properties and individuals" and a "Search" button. Under the search bar are three checkboxes: "Exact match", "Obsolete terms", and "Advanced search". The main content area features three columns of information, each with an icon and a heading. The first column has an icon of two speech bubbles and a chemical structure, with the heading "WHAT IS THIS ?" and a paragraph of text. The second column has a magnifying glass icon over a tree diagram, with the heading "HOW TO SEARCH ?" and a paragraph of text. The third column has an icon of a code editor with a gear, with the heading "NOT A HUMAN ?" and a paragraph of text.

TERMINOLOGY SERVICE

HOME ONTOLOGIES HELP API ABOUT Login

Search for ontology, term, properties and individuals Search

Exact match Obsolete terms Advanced search

WHAT IS THIS ?
The Terminology Service is a repository for chemistry ontologies. It is a central point of access to the latest versions of these ontologies providing comprehensive information about their scope, application and curators. The ontologies have been selected by a set of **quality criteria** defining their feasibility to describe chemistry research activities and research data in an open and FAIR manner.

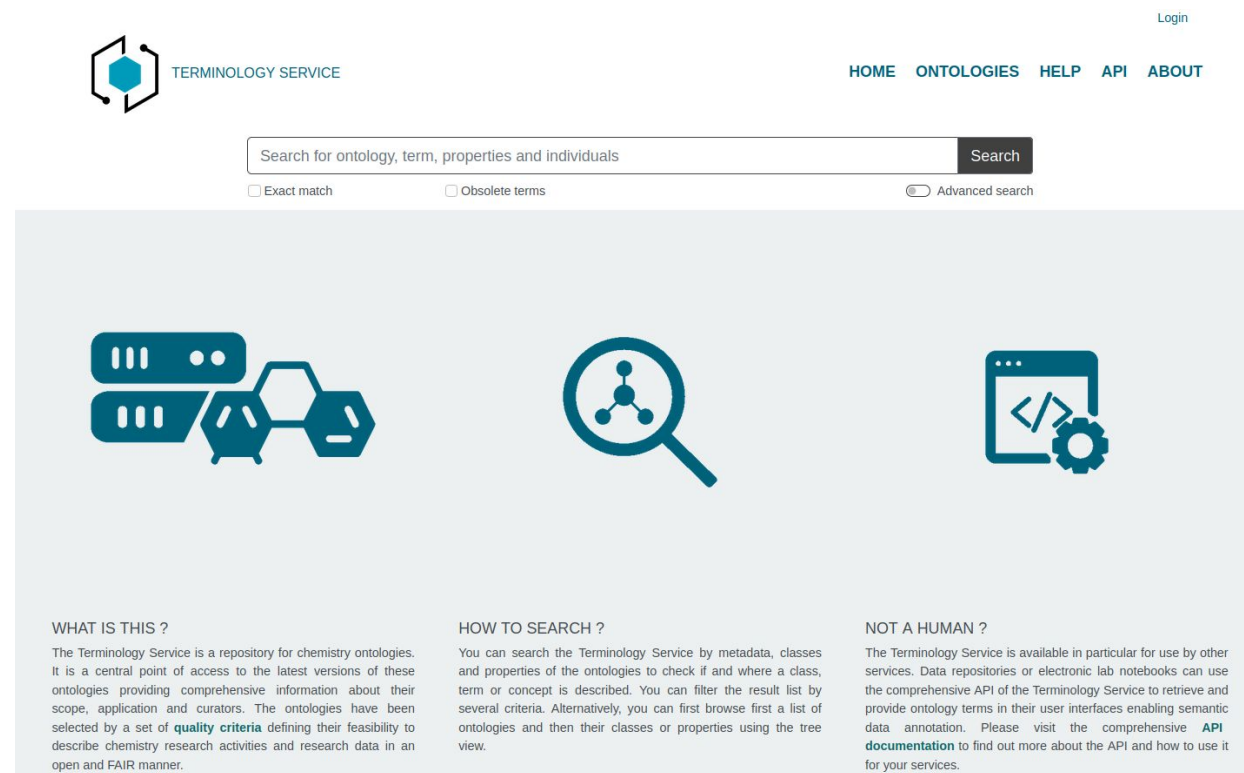
HOW TO SEARCH ?
You can search the Terminology Service by metadata, classes and properties of the ontologies to check if and where a class, term or concept is described. You can filter the result list by several criteria. Alternatively, you can first browse first a list of ontologies and then their classes or properties using the tree view.

NOT A HUMAN ?
The Terminology Service is available in particular for use by other services. Data repositories or electronic lab notebooks can use the comprehensive API of the Terminology Service to retrieve and provide ontology terms in their user interfaces enabling semantic data annotation. Please visit the comprehensive **API documentation** to find out more about the API and how to use it for your services.

Existing Terminology Services in the NFDI

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Existing Terminology Services in the NFDI

NFDI4Health - SemLookP



Search

Type to search

Examples: diabetes, GO:0098743, <http://snomed.info/id/423701002>

Or use the advanced Search

[Looking for a certain terminology?](#)

Data Content

Updated 17.11.2024, 15:55:04

- 18 ontologies and terminologies
- 3.774.096 terms
- 2.676 properties
- 402.889 individuals

[Missing Resource?](#)

Please contact us via semlookp-support@zbmed.de.

Use Case

ZB MED preprint Viewer

preVIEW: COVID-19

Semantic Search to Explore COVID-19 Research Preprints

The search engine uses the SemLookP API and Terminology Service Suite to display semantic information.

Terminology Service Suite

Small GUI components to use and display semantic information

Explore



Autocomplete



Hierarchy View



Search



Synonyms

- **Semantic Lookup Platform**
- provides terminologies from the fields of medicine, nutrition and life sciences
- access to these terminologies is realized via a graphical user interface (GUI) or via APIs
- GUI consists of several combined React based widgets
- Such a widget uses an API and combines the data received with specific HTML components
- widgets can directly integrated into other applications

Existing Terminology Services in the NFDI

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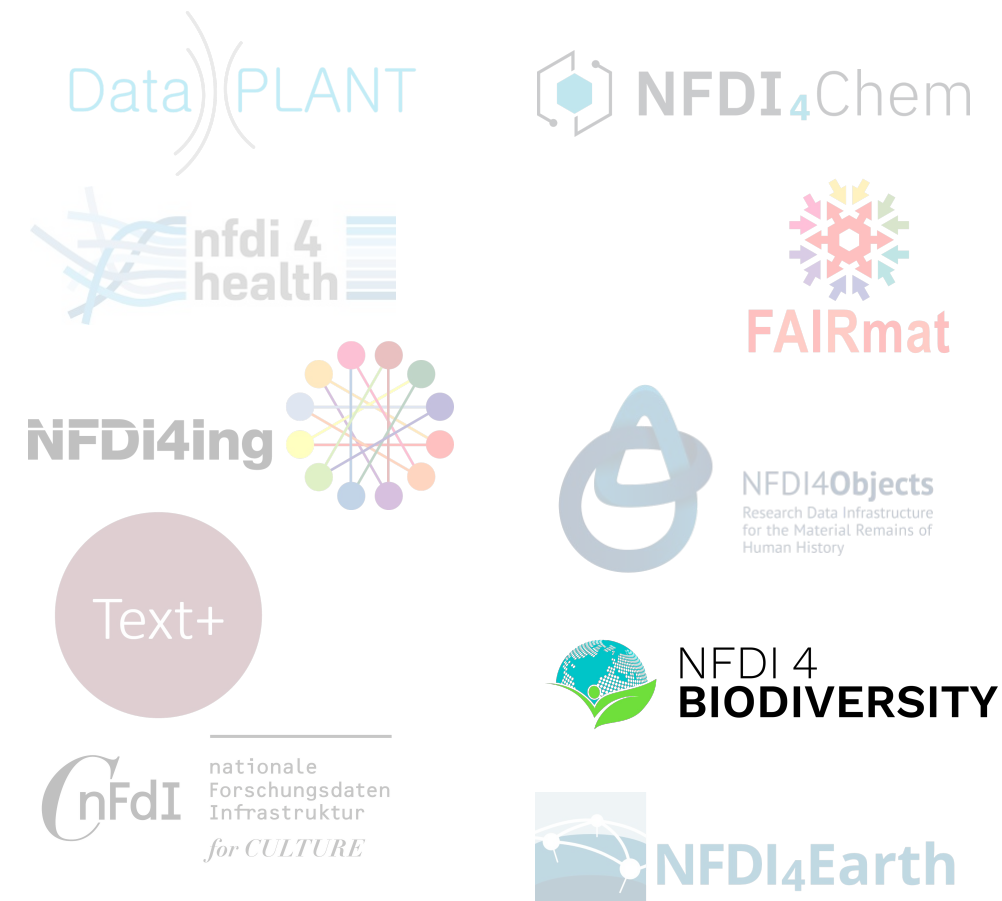


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Existing Terminology Services in the NFDI

Terminology Services across NFDI domains and beyond

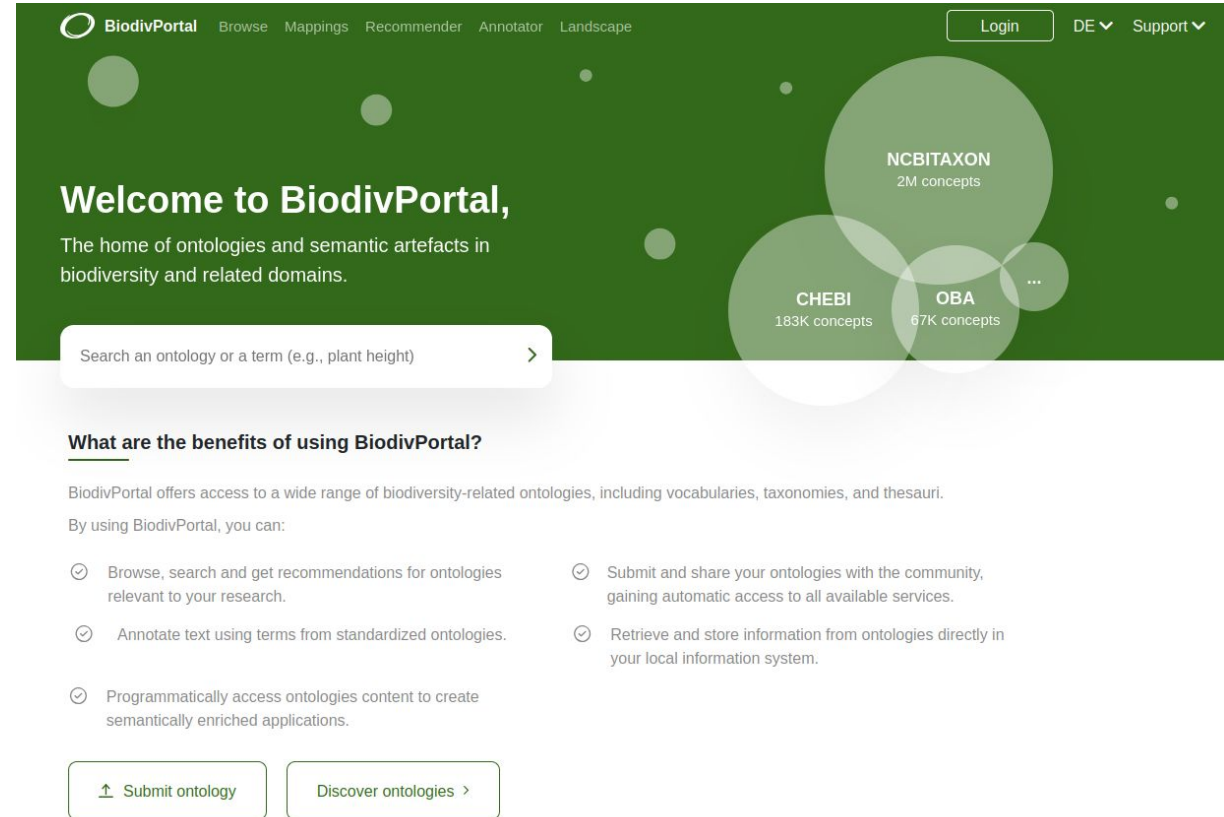


- several NFDI consortia provide terminologies in respective domain-specific terminology services or registries
- GFBio Terminology Service is self-developed
- **BiodivPortal** is based on **OntoPortal**

Existing Terminology Services in the NFDI

NFDI4Biodiversity - BiodivPortal

- provides access to a collection of ontologies relevant to the biodiversity community
- provides faceted search inside ontologies, tree and lists views of concepts, properties and individuals
- can also index and display SKOS vocabularies and specific SKOS constructs (e.g. schemas)
- provides terminology recommendation and text annotation services
- computes mappings automatically and offers the possibility to upload external mappings
- a comprehensive API to retrieve all data



What are the benefits of using BiodivPortal?

BiodivPortal offers access to a wide range of biodiversity-related ontologies, including vocabularies, taxonomies, and thesauri.

By using BiodivPortal, you can:

- ✔ Browse, search and get recommendations for ontologies relevant to your research.
- ✔ Annotate text using terms from standardized ontologies.
- ✔ Programmatically access ontologies content to create semantically enriched applications.
- ✔ Submit and share your ontologies with the community, gaining automatic access to all available services.
- ✔ Retrieve and store information from ontologies directly in your local information system.

[Submit ontology](#) [Discover ontologies >](#)

Existing Terminology Services in the NFDI

Terminology Services across NFDI domains and beyond

Terminology Registries

BARTOC knows about [terminology registries](#), including itself. [registries](#) also provide access to full terminologies either via an API (terminology **service**) or by other means (terminology **repository**)*.

Name	Links	Type
GODAN Action VEST / AgroPortal map (VEST Registry)	🏠	registry
coli-conc KOS Registry	🏠 jskos	registry
DANTE	🏠 jskos	service
FAIRSharing	🏠	registry
OBO Foundry	🏠	registry
Getty Vocabularies	🏠	repository
EU Vocabularies	🏠	registry
Conservation controlled vocabularies	🏠	registry
European Register of Marine Species (ERMS)	🏠	registry
Metadata registry of the German Network for Educational Research Data	🏠	repository
onomy.org	🏠	repository

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- **BARTOC**
- The **B**asic **R**egister of **T**hesauri, **O**ntologies & **C**lassifications is a database of Knowledge Organization Systems and KOS related registries

Existing terminology services in the NFDI

Basic Service: TS4NFDI

First steps: Usage of TS4NFDI

Outlook: Integration Phase

Basic Service: TS4NFDI

What does TS4NFDI want to solve?

- Diverse landscape of terminology services in NFDI consortia
 - Access via web interface or API
 - Different access formats



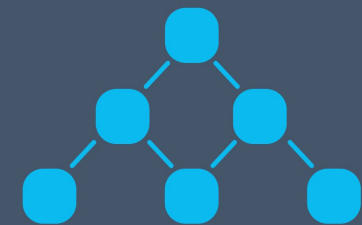
Basic Service: TS4NFDI

What does TS4NFDI want to solve?

- Diverse landscape of terminology services in NFDI consortia
 - Access via web interface or API
 - Different access formats
- Multiple web services in NFDI consortia
 - Annotation tools, ELNs, search engines, data repositories
 - Direct integration of terminology services often did not exist

TS4nfdi

**Terminology Services
for the German National Research
Data Infrastructure**



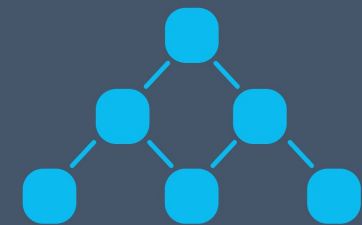
Basic Service: TS4NFDI

What does TS4NFDI want to solve?

- TS4NFDI aims to standardise and harmonise terminology management within the NFDI
- facilitating consensus-building and interoperability of services across disciplines to achieve a common knowledge representation and engineering framework

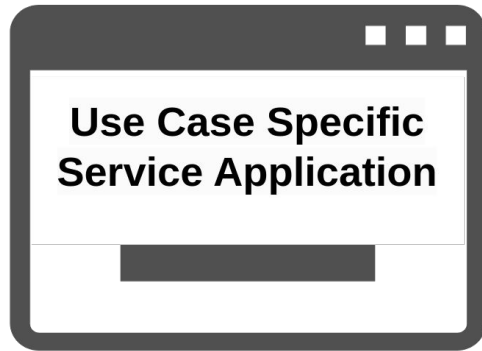
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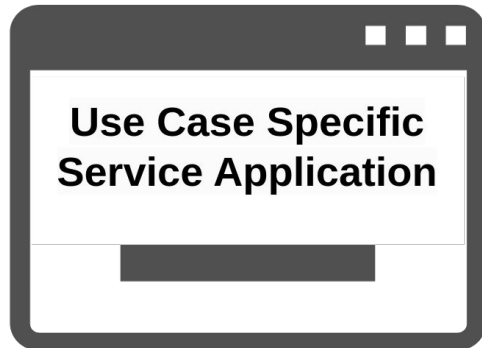
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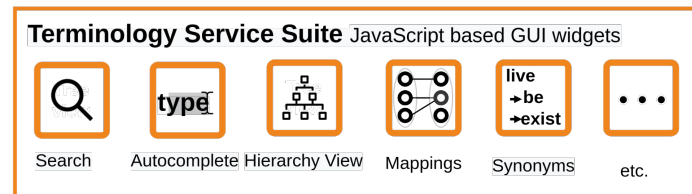
- web services with data
 - annotation service
 - search engine
 - data repository

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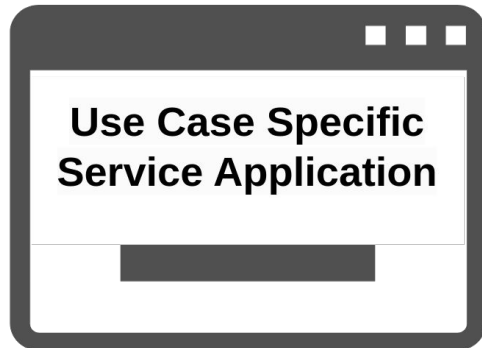
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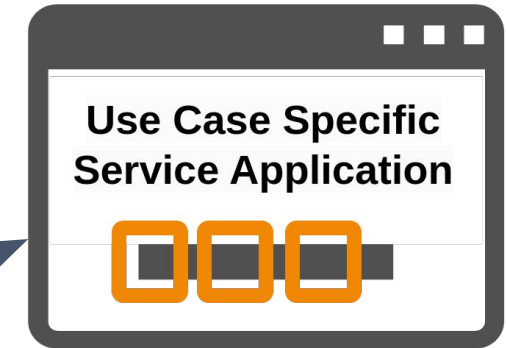
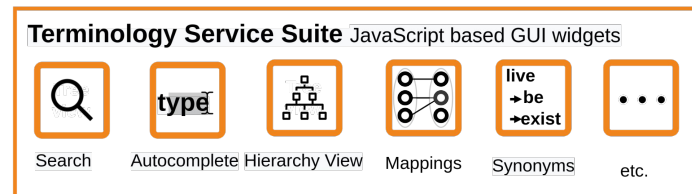
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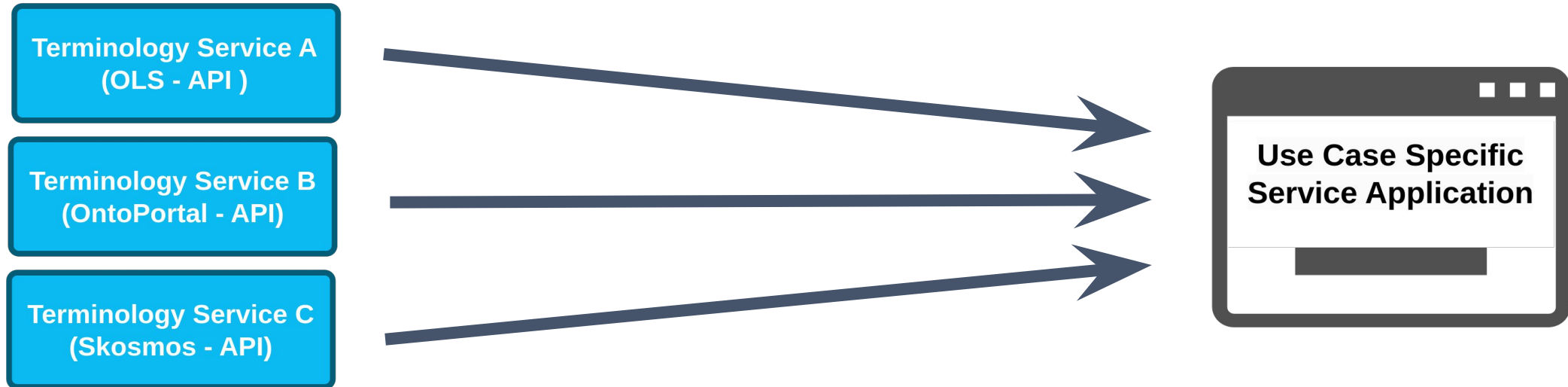


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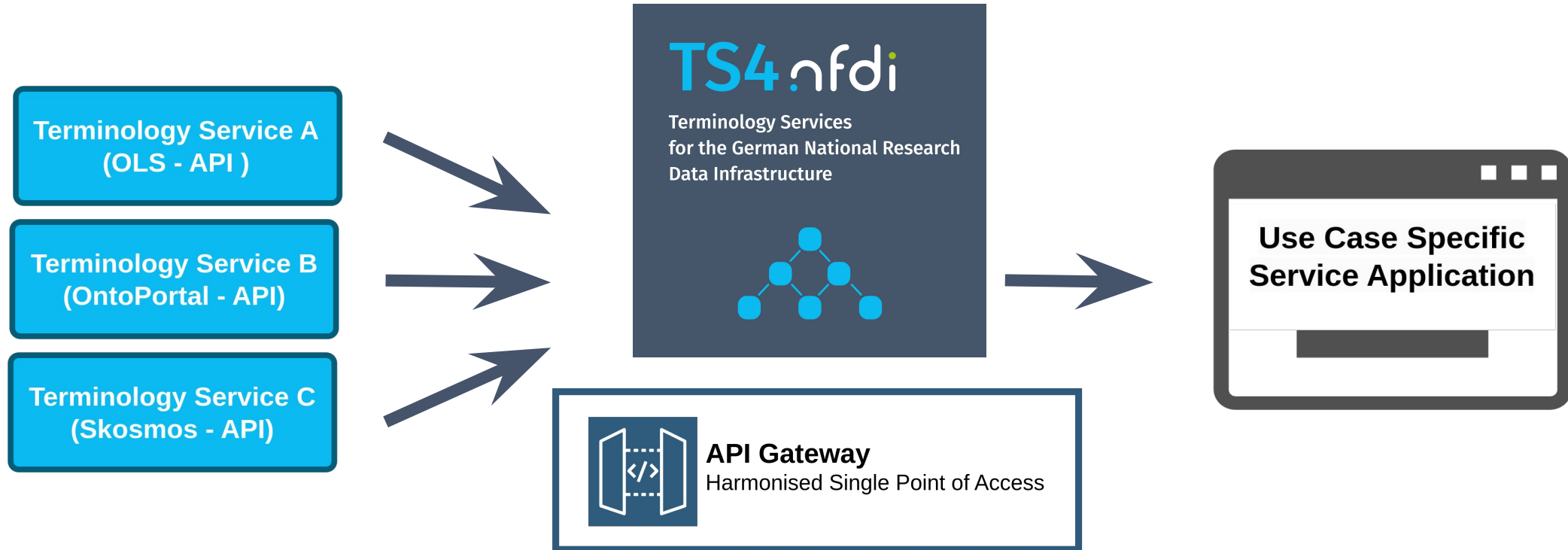
What does TS4NFDI want to solve?



- multiple different APIs for different Terminology Services

Basic Service: TS4NFDI

What does TS4NFDI want to solve?



- **one single API** for different Terminology Services

Basic Service: TS4NFDI

What are the user needs?

TS4NFDI Requirements Analysis Report

Baum, Roman¹  , Bouazzouni, Syphax²  , Fillies, Jan²  , Karam, Naouel²  , Koepler, Oliver³ 
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doi:[10.5281/zenodo.13862158](https://doi.org/10.5281/zenodo.13862158)

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The target groups of this requirement analysis are developers and managers of web services. We are also interested in users who work with terminologies or ontologies.

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- Three target group
 - manager, developer, user

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3. Results

A total of 69 participants completed the survey.

- Did a survey to collect requirements
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- Questionnaire
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- Results
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Basic Service: TS4NFDI

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a. General Answers

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d. User/Other Branch Answers

- Did a survey to collect requirements
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 - 8 subsections
- Results
 - 69 participants
 - 4 subsections

Project phases and outlook - Currently in Initialisation



- Analyzing requirements of all consortia
- consortia landscape analysis (Inventory of existing solutions and services)
- Terminology Service Suite (TSS)
- API Gateway

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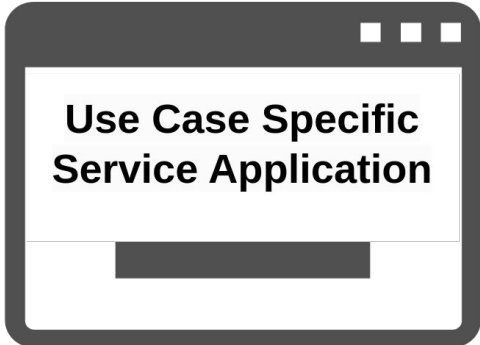
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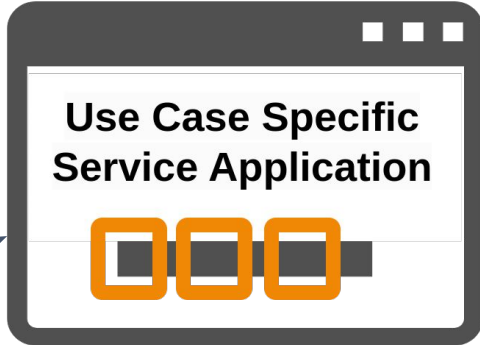
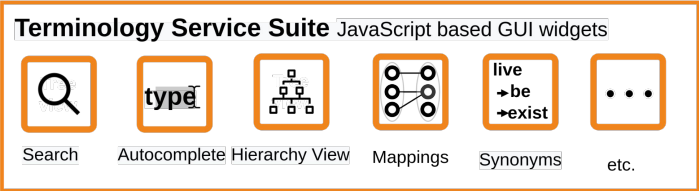
Outlook: Integration Phase

First Steps: Usage of TS4NFDI

Terminology Service Suite



- web services with data
 - annotation service
 - search engine
 - data repository

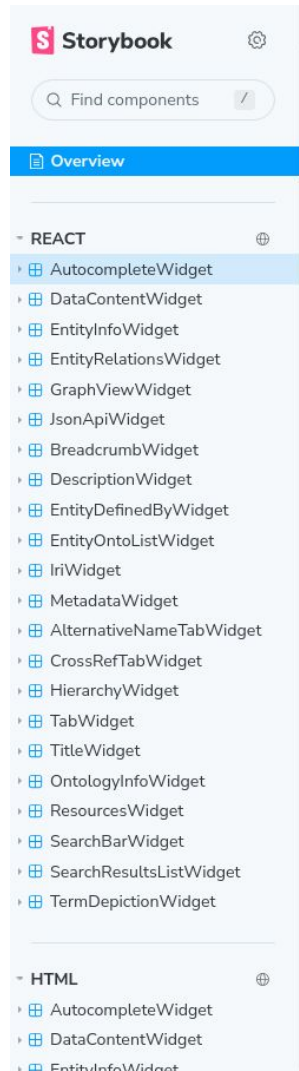


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• direct integration of terminologies to web services through widgets

First Steps: Usage of TS4NFDI

Terminology Service Suite



SemLookP Widgets

As part of the TS4NFDI Service Suite

The Terminology Service Suite project, derived from the [SemLookP](#) project and now hosted on GitHub under the [TS4NFDI](#) repository, is a collection of interactive widgets designed to ease the integration of terminology service functions into third-party applications.

In this Storybook, you will find an interactive documentation of the widget component library.

The widgets are built using React and TypeScript and can be used in both React and plain HTML applications. The functionality and arguments are the same for the React and plain HTML versions. Only the code snippet you get when you click "Show code" in the Storybook is different.

Click [here](#) for documentation on the different versions.

The widgets are currently under active development. Please forgive any errors that occur and report issues via [GitHub Issue](#).

Documentation: [All Versions](#)

React package: [Latest](#), [All Versions](#)

JavaScript modules: [Latest](#), [All Versions](#)

Content

- [How to use this Storybook](#)



First Steps: Usage of TS4NFDI

Terminology Service Suite

Storybook

Find components

Overview

REACT

- AutocompleteWidget
- DataContentWidget
- EntityInfoWidget
- EntityRelationsWidget
- GraphViewWidget
- JsonApiWidget
- BreadcrumbWidget
- DescriptionWidget
- EntityDefinedByWidget
- EntityOntoListWidget
- IriWidget
- MetadataWidget
- AlternativeNameTabWidget
- CrossRefTabWidget
- HierarchyWidget
- TabWidget
- TitleWidget
- OntologyInfoWidget
- ResourcesWidget
- SearchBarWidget
- SearchResultsListWidget
- TermDepictionWidget

HTML

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TS4.nfdi
Terminology Services

Access via:
<https://t.ly/29VKE>



Documentation: [All Versions](#)

React package: [Latest](#), [All Versions](#)

JavaScript modules: [Latest](#), [All Versions](#)

Content

- [How to use this Storybook](#)

First Steps: Usage of TS4NFDI Terminology Service Suite - preVIEW

preVIEW: COVID-19 ABOUT TUTORIAL CONTACT LOGIN

Refine your search. Currently 2.743 documents are matched

Documents per page: 20

1 2 3 4 5 ... 138

Publication Date

Availability of peer-reviewed versions

- No peer-reviewed article: 1749
- Linked through Crossref/preprint server: 821
- Found by Pre2Pub algorithm: 173

Classification

- Long COVID: 93

Semantic Classes

COMPARATIVE CHARACTERISTICS OF THE ACCUMULATION OF DIFFERENT VARIANTS OF THE SARS-COV-2 VIRUS (WUHAN, DELTA, OMICRON) IN THE ORGANS OF MODEL ANIMALS

Authors: Aleksandr Chernov, Vitaly Kazakov, Irina Gogleva, Sergei Savenko, Veronica Schukina, Svetlana Loginova, Ivan Smirnov, Sergei Borisevich, Georgii Telegin, Alexey Belogurov Jr.

10.1101/2024.11.12.623177 Date: 2024-11-13 Source: biorxiv

Abstract

Background: The genotypic variability of the SARS-CoV-2 virus has proven to be extremely high, and the emergence of new strains raises concerns about their possible high virulence, transmissibility, and ability to bypass responses of the body's immune system induced by previous infection or vaccination. Therefore, one of the main tasks is to study the pathogenesis of various variants of the virus using experimental animal biomodels of SARS-CoV-2 to quickly find methods and approaches to fighting new viruses. Methods: 60 humanized mice of the C57BL/6-Tgtn (CAG-human AEC2-IRES-Luciferase-WPRE-polyA) line (hACE2) were used. Mice were infected intranasally at different doses with three variants of the SARS-CoV-2 virus: Wuhan, Delta and Omicron. Results: We showed that humanized hACE2 mice, when infected with all three variants of the SARS-CoV-2 virus, showed typical pathological changes in lung consistency comparable to those found in COVID-19 in humans. All mice developed interstitial pneumonia, characterized by inflammatory cell infiltration and thickening of the alveolar septa, characteristic of vascular damage. Conclusions: At a dose of 4 lg plaque-forming unit (PFU), all variants showed 100% mortality. A dose-dependent effect was established only for the Wuhan and Delta variants. In a comparative assessment of different variants of the SARS-CoV-2 virus in a humanized mouse model of hACE2, it was found that the Delta variant leads to more severe damage compared to Wuhan or Omicron.

DEVELOPING NEW DUAL-ACTION ANTIVIRAL/ANTI-INFLAMMATORY SMALL MOLECULES FOR COVID-19 TREATMENT USING IN SILICO AND IN-VITRO APPROACHES

Authors: Vladimir V. Ivanov, Anton B. Zakharov, Dmytro O. Anokhin, Olha O. Mvkhailenko, Serai M. Kovalenko, Larvsa V. Yevsieieva.

Source

enable feedback mode

collapse all abstracts

Highlight semantic concepts

- HUGO Gene Nomenclature Committee
- Medical Subject Headings - Diseases
- SARS-CoV-2 Proteins
- SARS-CoV-2 virus variants

deselect all

Sort by: publication date, descending

First Steps: Usage of TS4NFDI Terminology Service Suite - preVIEW

preVIEW: COVID-19 ABOUT TUTORIAL CONTACT LOGIN

Refine your search. Currently 2.743 documents are matched

< 1 2 3 4 5 ... 138 > Documents per page: 20

Publication Date

Availability of peer-reviewed versions

- No peer-reviewed article: 1749
- Linked through Crossref/preprint server: 821
- Found by Pre2Pub algorithm: 173

Classification

- Long COVID: 93

Semantic Classes

COMPARATIVE CHARACTERISTICS OF THE ACCUMULATION OF DIFFERENT VARIANTS OF THE SARS-COV-2 VIRUS (WUHAN, DELTA, OMICRON) IN THE ORGANS OF MODEL ANIMALS

Authors: Aleksandr Chernov, Vitaly Kazakov, Irina Gogleva, Sergei Savenko, Veronica Schukina, Svetlana Loginova, Ivan Smirnov, Sergei Borisevich, Georgii Telegin, Alexey Belogurov Jr.

10.1101/2024.11.12.623177 Date: 2024-11-13 Source: biorxiv

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Background: The genotypic variability of the SARS-CoV-2 virus has proven to be extremely high, and the emergence of new strains raises concerns about their possible high virulence, transmissibility, and ability to bypass responses of the body's immune system induced by previous infection or vaccination. Therefore, one of the main tasks is to study the pathogenesis of various variants of the virus using experimental animal biomodels of SARS-CoV-2 to quickly find methods and approaches to fighting new viruses. Methods: 60 humanized mice of the C57BL/6-Tgtn (CAG-human AEC2-IRES-Luciferase-WPRE-polyA) line (hACE2) were used. Mice were infected intranasally at different doses with three variants of the SARS-CoV-2 virus: Wuhan, Delta and Omicron. Results: We showed that humanized hACE2 mice, when infected with all three variants of the SARS-CoV-2 virus, showed similar pathological changes in lung consistency comparable to those found in COVID-19 in humans. All mice developed interstitial pneumonia, characterized by inflammatory cell infiltration and thickening of the alveolar septa, characteristic of vascular damage. Conclusions: At a dose of 4 lg plaque-forming unit (PFU), all variants showed 100% mortality. A dose-dependent effect was established only for the wuhan and Delta variants. In a comparative assessment of different variants of the SARS-CoV-2 virus in a humanized mouse model of hACE2, it was found that the Delta variant leads to more severe damage compared to Wuhan or Omicron.

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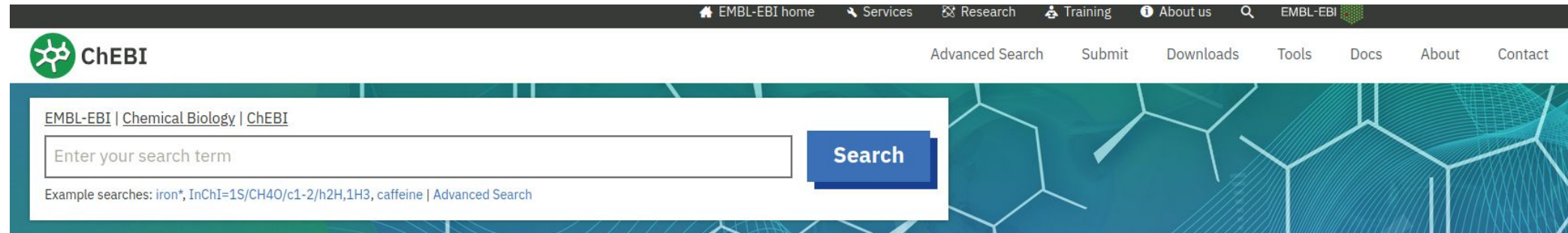
deselect all

Sort by: publication date, descending

Source

Source	Count
biorxiv	1.522
researchsquare	474
medrxiv	304
preprints.org	174
arxiv	48

First Steps: Usage of TS4NFDI Terminology Service Suite - ChEBI



CHEBI:24431 - chemical entity

ChEBI ID	CHEBI:24431
ChEBI Name	chemical entity
Stars	★★★
Definition	A chemical entity is a physical entity of interest in chemistry including molecular entities, parts thereof, and chemical substances.
Last Modified	31 March 2015

On this page

- [Intro](#)
- [Ontology](#)
- [Names](#)

ChEBI Ontology

[TEXT](#) [TREE VIEW](#)

- Incoming Relation(s)
- molecular entity (CHEBI:23367) **is a** chemical entity (CHEBI:24431)
 - group (CHEBI:24433) **is a** chemical entity (CHEBI:24431)
 - atom (CHEBI:33250) **is a** chemical entity (CHEBI:24431)
 - chemical substance (CHEBI:59999) **is a** chemical entity (CHEBI:24431)

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First Steps: Usage of TS4NFDI Terminology Service Suite - ChEBI

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Enter your search term **Search**

Example searches: iron*, InChI=1S/CH4O/c1-2/h2H,1H3, caffeine | Advanced Search

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- Names

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ChEBI Ontology

TEXT TREE VIEW

↳ chemical entity (199.266)

UniProt Name ⓘ	Source
chemical entity	UniProt

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TEXT TREE VIEW

↳ chemical entity (199.266)

UniProt Name ⓘ

chemical entity

Source
UniProt

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On this page

- [Intro](#)
- [Ontology](#)
- [Names](#)

ChEBI Ontology

TEXT TREE VIEW

- chemical entity (199.266)
 - atom (278)
 - chemical substance (1.336)
 - group (3.102)
 - molecular entity (195.011)

[↑ Back to top](#)

First Steps: Usage of TS4NFDI

Terminology Service Suite - SemLookP

The screenshot shows the nfdi 4 health Terminology Service interface. At the top center is the logo for nfdi 4 health, consisting of a stylized blue and grey graphic to the left of the text 'nfdi 4 health'. Below the logo is the title 'Terminology Service'. The main content area is divided into several sections:

- Search:** A search input field with the placeholder text 'Type to search'. Below the field are examples: 'diabetes, GO:0098743, http://snomed.info/id/423701002'. There are links for 'Or use the advanced Search' and 'Looking for a certain terminology?'.
- Data Content:** A box indicating the data was updated on 17.11.2024 at 15:55:04. It lists statistics: 18 ontologies and terminologies, 3.774.096 terms, 2.676 properties, and 402.889 individuals.
- Missing Resource?:** A light blue banner with an icon of a document and a question mark, containing the text 'Please contact us via semlookp-support@zbmed.de.'
- Use Case:** A white box titled 'Use Case' for 'ZB MED preprint Viewer preVIEW: COVID-19'. It describes 'Semantic Search to Explore COVID-19 Research Preprints' and states 'The search engine uses the SemLookP API and Terminology Service Suite to display semantic information.'
- Terminology Service Suite:** A blue box titled 'Terminology Service Suite' with the subtitle 'Small GUI components to use and display semantic information'. It features an 'Explore' button and four icons: 'type' (Autocomplete), a hierarchy diagram (Hierarchy View), a magnifying glass (Search), and 'live +be +exist' (Synonyms).

First Steps: Usage of TS4NFDI

Terminology Service Suite - SemLookP

nfdi 4 health
Terminology Service

Search

Type to search

Examples: diabetes, GO:0098743, <http://snomed.info/id/423701002>

Or use the advanced Search [Looking for a certain terminology?](#)

Data Content
Updated 17.11.2024, 15:55:04

- 18 ontologies and terminologies
- 3.774.096 terms
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- 402.889 individuals

Missing Resource?
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Use Case
ZB MED preprint Viewer
preVIEW: COVID-19
Semantic Search to Explore COVID-19 Research Preprints
The search engine uses the SemLookP API and Terminology Service Suite to display semantic information.

Terminology Service Suite
Small GUI components to use and display semantic information [Explore](#)

- type** Autocomplete
- Hierarchy View**
- Search**
- live → be → exist** Synonyms

First Steps: Usage of TS4NFDI

Terminology Service Suite - SemLookP

nfdi 4 health
Terminology Service

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Type to search

Examples: diabetes, GO:0098743, http://snomed.info/id/423701002

Or use the advanced Search [Looking for a certain terminology?](#)

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Terminology Service Suite
Small GUI components to use and display semantic information [Explore](#)

- type** Autocomplete
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- Search**
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Existing Terminology Services in the NFDI

Terminology Service Suite - NFDI4Health - SemLookP

nfdi 4 health
Terminology Service

Search

Type to search

Examples: diabetes, GO:0098743, <http://snomed.info/id/423701002>

Or use the advanced Search [Looking for a certain terminology?](#)

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Terminology Service Suite
Small GUI components to use and display semantic information

Explore

type Autocomplete Hierarchy View Search live → be → exist Synonyms

- **Semantic Lookup Platform**
- provides terminologies from the fields of medicine, nutrition and life sciences
- access to these terminologies is realized via a graphical user interface (GUI) or via APIs
- GUI consists of several combined React based widgets
- Such a widget uses an API and combines the data received with specific HTML components
- **widgets can directly integrated into other applications**

Existing Terminology Services in the NFDI

Terminology Service Suite - BERD@NFDI - Terminology Service



Search

Examples: person, SCHEMA:ORGANIZATION, location

Or use the advanced Search [Looking for a certain terminology?](#)

Data Content

Updated 18.11.2024, 15:50:52

- 11 ontologies and terminologies
- 86.033 terms
- 2.663 properties
- 114.527 individuals

BERD@NFDI




BERD@NFDI is a Central Resource for Unstructured Data Related to Business, Economics, and similar Social Sciences.



[Learn more about BERD@NFDI](#)

Terminology Service Suite

Small user interface components to use and display semantic information

-  Autocomplete
-  Hierarchy View
-  Search
-  Synonyms

[Explore the TSS](#)

- widgets can directly integrated into other applications

Existing Terminology Services in the NFDI

Terminology Service Suite - BERD@NFDI - Terminology Service



Search

Type to search

Examples: person, SCHEMA:ORGANIZATION, location

Or use the advanced Search

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



[Learn more about BERD@NFDI](#)


Terminology Service Suite

Small user interface components to use and display semantic information

 Autocomplete

 Hierarchy View

 Search

 Synonyms

[Explore the TSS](#)

- widgets can directly integrated into other applications
- **easy way to set up new terminology services**
- **Access via:**

<https://ts.berd-nfdi.de/>

Existing Terminology Services in the NFDI

Terminology Service Suite - NFDI4Health - SemLookP



- widgets can directly integrated into other applications
- **easy way to set up new terminology services**

Terminology service for research data management and knowledge discovery in low-temperature plasma physics

Markus Becker, Ihda Chaerony Siffa, Roman Baum

User Conference 4 Base4NFDI
21.11.2024, Berlin



FROM IDEA TO PROTOTYPE

First Steps: Usage of TS4NFDI

Terminology Service Suite


SemLookP Widgets

As part of the TS4NFDI Service Suite

The Terminology Service Suite project, derived from the [SemLookP](#) project and now hosted on GitHub under the [TS4NFDI](#) repository, is a collection of interactive widgets designed to ease the integration of terminology service functions into third-party applications.

In this Storybook, you will find an interactive documentation of the

Access via:
<https://t.ly/29VKE>



TS4.nfdi
Terminology Services

Documentation: [All Versions](#)

React package: [Latest](#), [All Versions](#)

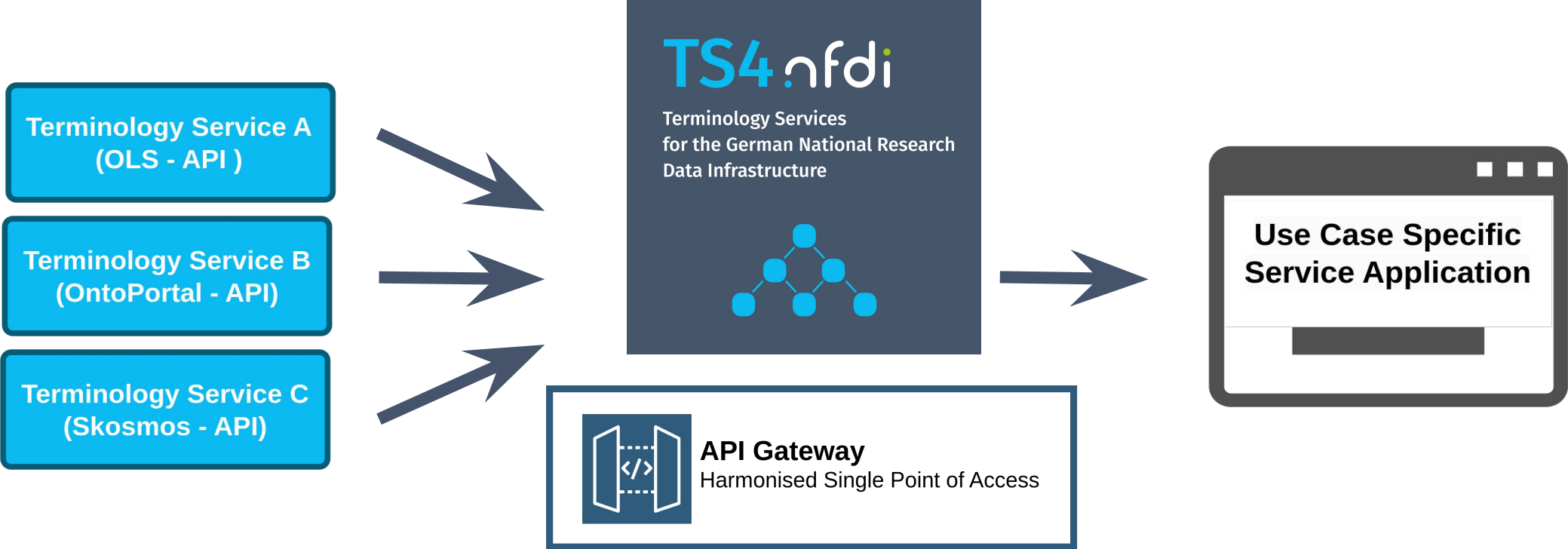
JavaScript modules: [Latest](#), [All Versions](#)

Content

- [How to use this Storybook](#)

First Steps: Usage of TS4NFDI

API Gateway



- **one single API** for different Terminology Services

First Steps: Usage of TS4NFDI

API Gateway - Prototype



API Gateway

A user interface demonstrating the NFDI API Gateway page

TS4NFDI Federated Service

<https://ts4nfdi-api-gateway.prod.km.k8s.zbmed.de/api-gateway>

The TS4NFDI Federated Service is an advanced, dynamic solution designed to perform federated calls across multiple Terminology Services (TS) within NFDI. It is particularly tailored for environments where integration and aggregation of diverse data sources are essential. The service offers search capabilities, enabling users to refine search results based on specific criteria, and supports responses in both JSON and JSON-LD formats.

A standout feature of this service is its dynamic nature, governed by a JSON configuration file. This design choice allows for easy extension and customization of the service to include new TS or modify existing configurations.

Find a concept

Gateway search endpoint

First Steps: Usage of TS4NFDI

API Gateway - Prototype

API Gateway

A user interface demonstrating the NFDI API Gateway page

Browse resources [↗](#)

Gateway artefacts endpoint

Number of Results: 829 ()

- agroportal: 210 results (1s)
- biodivportal: 45 results (135ms)
- earthportal: 42 results (214ms)
- tib: 225 results (175ms)
- ols-ebi: 266 results (558ms)
- zbmed: 40 results (135ms)
- agrovoc: 1 result (261ms)

First Steps: Usage of TS4NFDI

API Gateway - Prototype

The screenshot shows a web interface for the API Gateway. At the top, there is a header with the text "API Gateway" and a sub-header "A user interface demonstrating the NFDI API Gateway page". Below this, a section titled "Browse resources" contains a search bar with the URL "https://ts4nfdi-api-gateway.prod.km.k8s.zbmed.de/api-gateway/artefacts?showResponseConfiguration=true". Below the search bar, there are two filter input fields: "Filter by acronym and name" and "Select one or more source names". To the right of these filters, a box displays "Number of Results: 829 ()" and a list of source statistics:

- biodivportal: 45 results (135ms)
- earthportal: 42 results (214ms)
- tib: 225 results (175ms)
- ols-ebi: 266 results (558ms)
- zbmed: 40 results (135ms)
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First Steps: Usage of TS4NFDI

API Gateway - Prototype

API Gateway

A user interface demonstrating the NFDI API Gateway page

Browse resources

Gatev

Access via:
<https://ts4nfdi.github.io/api-gateway>

Select one or more source names

- bioivportal: 48 results (135ms)
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- zbmed: 40 results (135ms)
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First Steps: Usage of TS4NFDI

API Gateway - integrated to the Terminology Service Suite

The screenshot shows the Storybook interface for the 'UseAPIGatewayWithSkosmos' component. The left sidebar lists various components under the 'REACT' category, with 'UseAPIGatewayWithSkosmos' highlighted. The main area displays search results for the term 'milk'. The results are as follows:

- milk** (AGROVOC) > C_4826 ⓘ
- milkability** (AGROVOC) > C_26800 ⓘ
- milkfish** (AGROVOC) > C_4834 ⓘ
Isscaap group b-24...
- milking** (AGROVOC) > C_4835 ⓘ

Below the search results, the 'Controls' tab is active, showing a list of API endpoints for the 'api*' control. The selected endpoint is:

- <https://ts4nfdi-api-gateway.prod.km.k8s.zbmed.de/api-gateway/>

Existing terminology services in the NFDI

Basic Service: TS4NFDI

First steps: Usage of TS4NFDI

Outlook: Integration Phase

Outlook: Integration Phase



- Analyzing requirements of all consortia
- consortia landscape analysis (Inventory of existing solutions and services)
- Terminology Service Suite (TSS)
- API Gateway
- Mapping Service
- Terminology Curation Workflows
- API Gateway extension
- TSS extension
- IAM4NFDI integration
- Community Engagement and Training Material

Outlook: Integration Phase



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Outlook: Integration Phase

What are the user needs?



TS4NFDI Initialisation Phase

First Results of the Requirements Analysis

Roman Baum, Jan Fillies, Naouel Karam, Oliver Koepler, Pooya Oladazimi, Julia Sasse

Section (Meta)data, Terminologies, Provenance - Section Meeting - 16.07.2024



Outlook: Integration Phase

What are the user needs?

TS4NFDI Requirements Analysis Report

Baum, Roman¹ , Bouazzouni, Syphax² , Fillies, Jan² , Karam, Naouel² , Koepler, Oliver³ 
, Oladazimi, Pooya³ , Sasse, Julia¹ 

1. ZB MED - Information Centre for Life Sciences
2. Institute for Applied Informatics association (InfAI)
3. TIB - Leibniz Information Centre for Science and Technology - University Library

doi:[10.5281/zenodo.13862158](https://doi.org/10.5281/zenodo.13862158)

Section (Meta)data, Terminologies, Provenance - Section Meeting - 16.07.2024



Outlook: Integration Phase

What will we focus on?

- 6 work packages
 - WP1 TS4NFDI Config Panel
 - WP2 Mapping Service
 - WP3 Workflows for terminology curation
 - WP4 Extension of the Service Backend
 - WP5 Extension of the Terminology Service Suite
 - WP6 Community engagement, communication and training
- 4 new consortia will join

Outlook: Integration Phase

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Outlook: Integration Phase

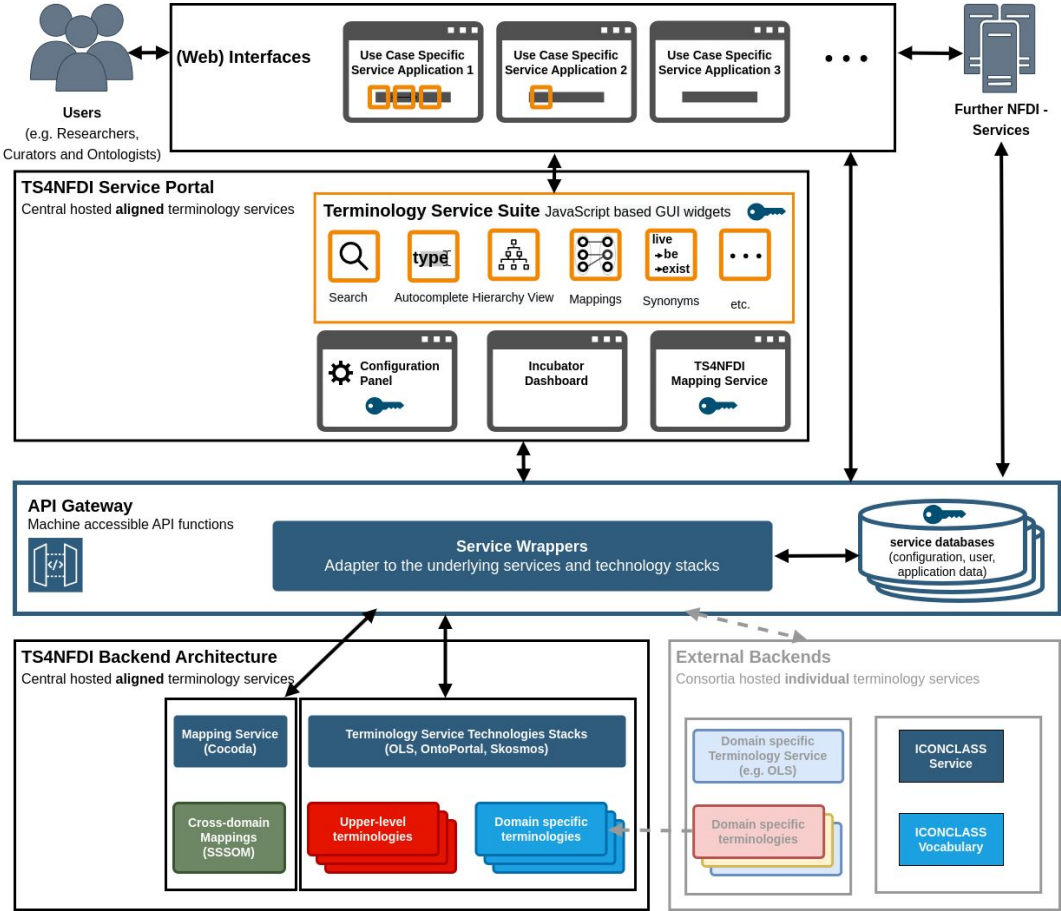
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Outlook: Integration Phase

What is the technical concept?

- **Terminology Service Suite (TSS)**
 - Javascript based widgets

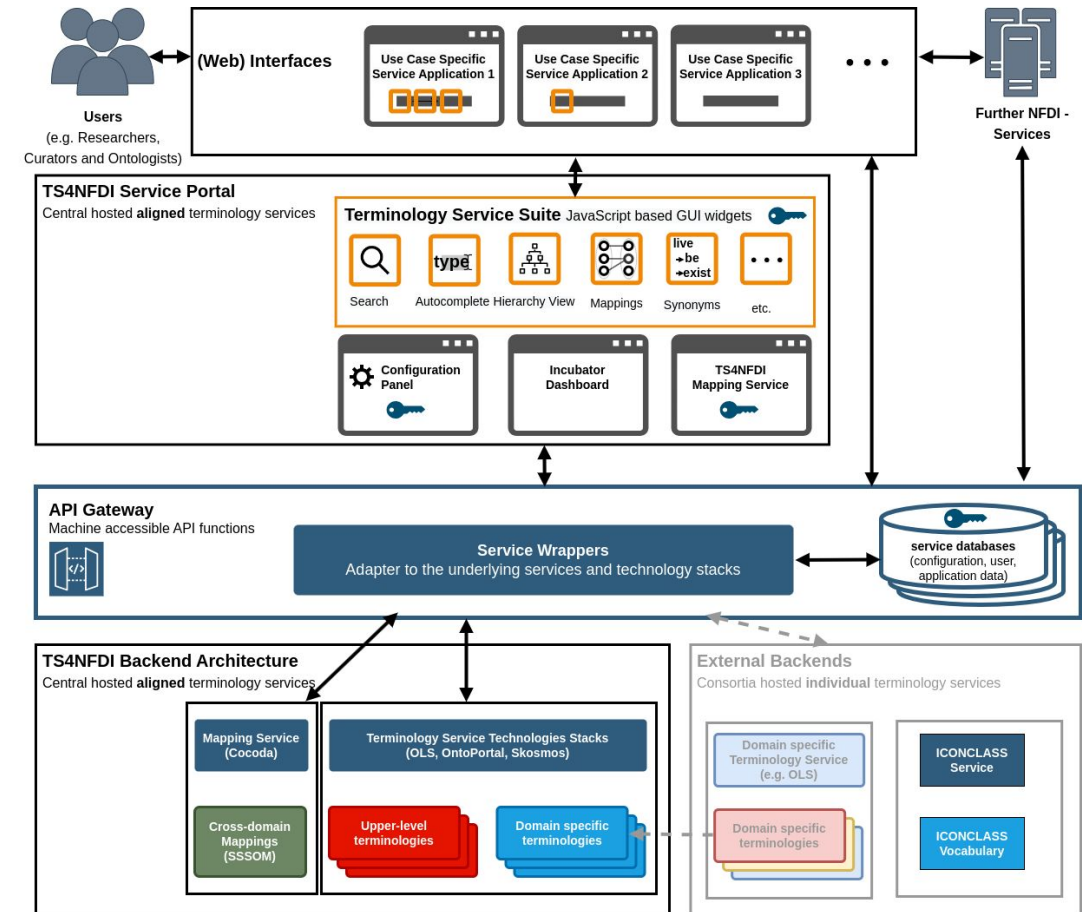


TS4NFDI architecture

Outlook: Integration Phase

What is the technical concept?

- **Terminology Service Suite (TSS)**
 - Javascript based widgets
- **Central API Gateway**
 - Harmonised single point of access to other (NFDI) terminology services

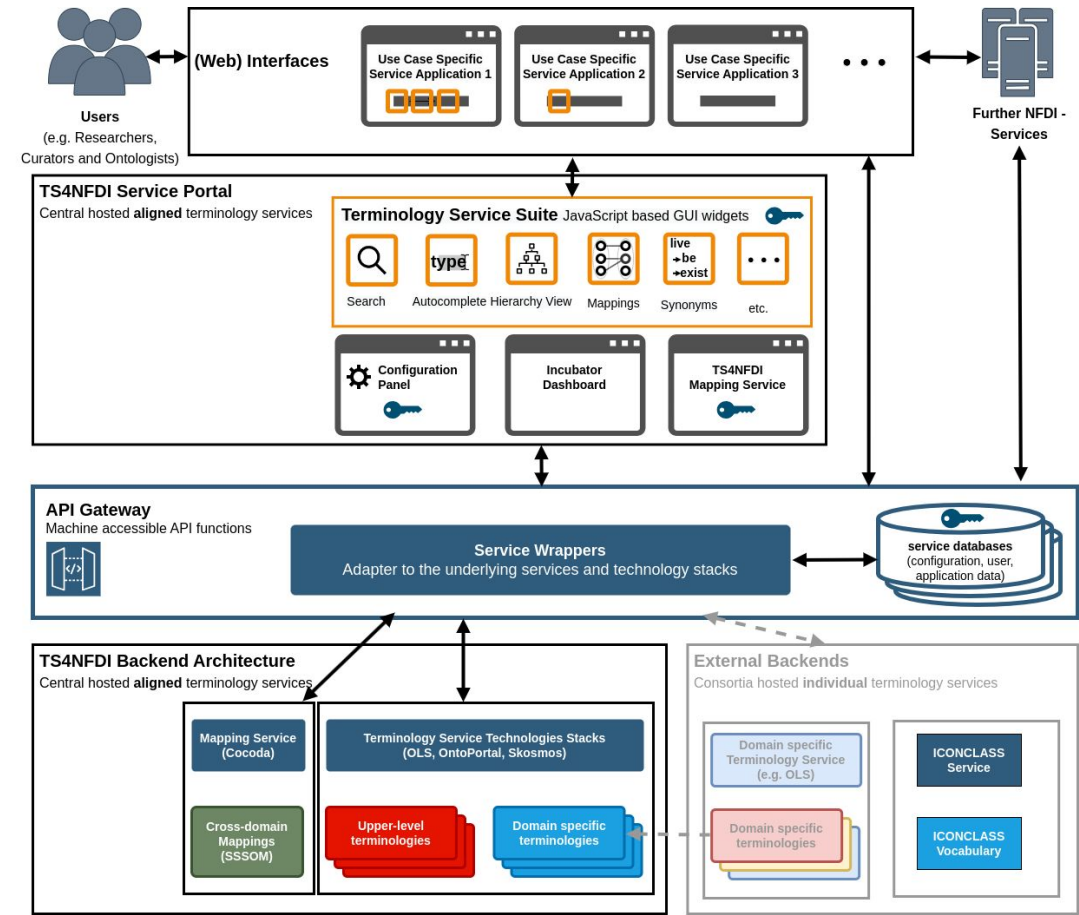


TS4NFDI architecture

Outlook: Integration Phase

What is the technical concept?

- **Terminology Service Suite (TSS)**
 - Javascript based widgets
- **Central API Gateway**
 - Harmonised single point of access to other (NFDI) terminology services
- **TS4NFDI Backend Architecture**
 - Supports Terminology Services which are based on OLS, OntoPortal, or Skosmos

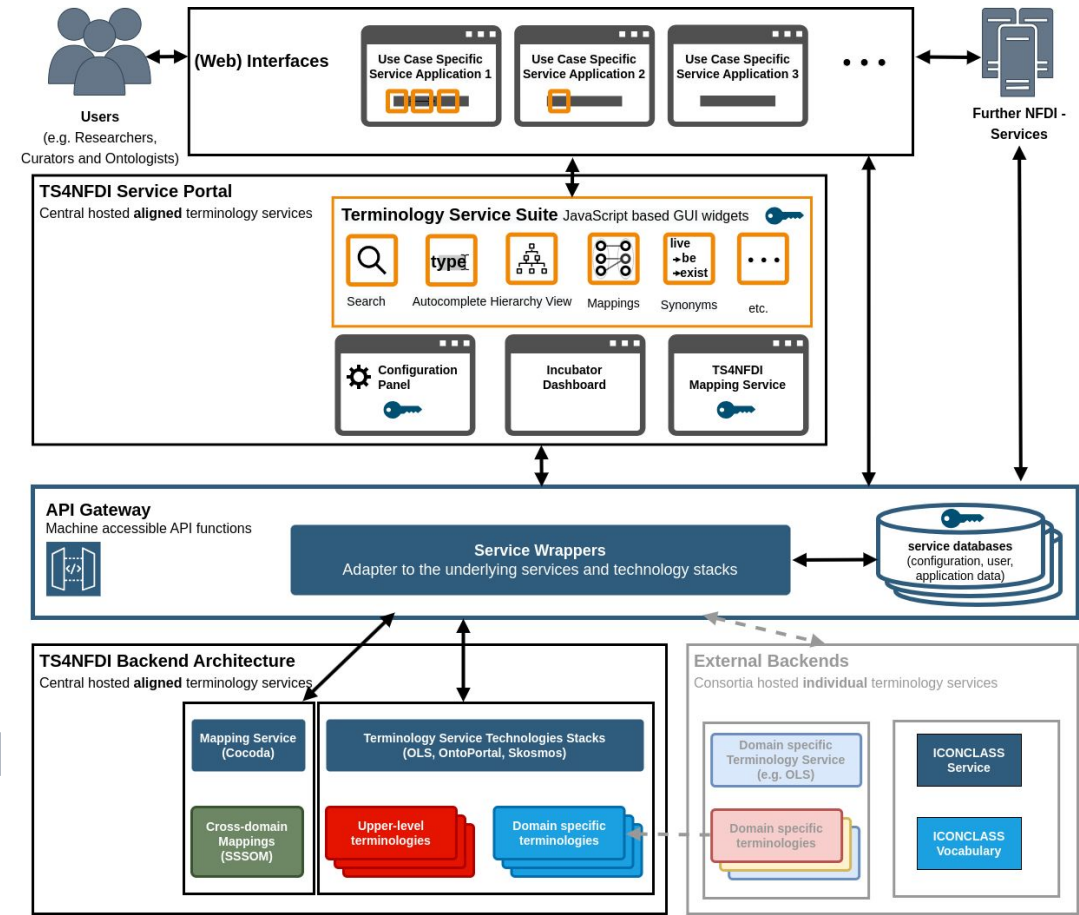


TS4NFDI architecture

Outlook: Integration Phase

What is the technical concept?

- **Terminology Service Suite (TSS)**
 - Javascript based widgets
- **Central API Gateway**
 - Harmonised single point of access to other (NFDI) terminology services
- **TS4NFDI Backend Architecture**
 - Supports Terminology Services which are based on OLS, OntoPortal, or Skosmos **and beyond**

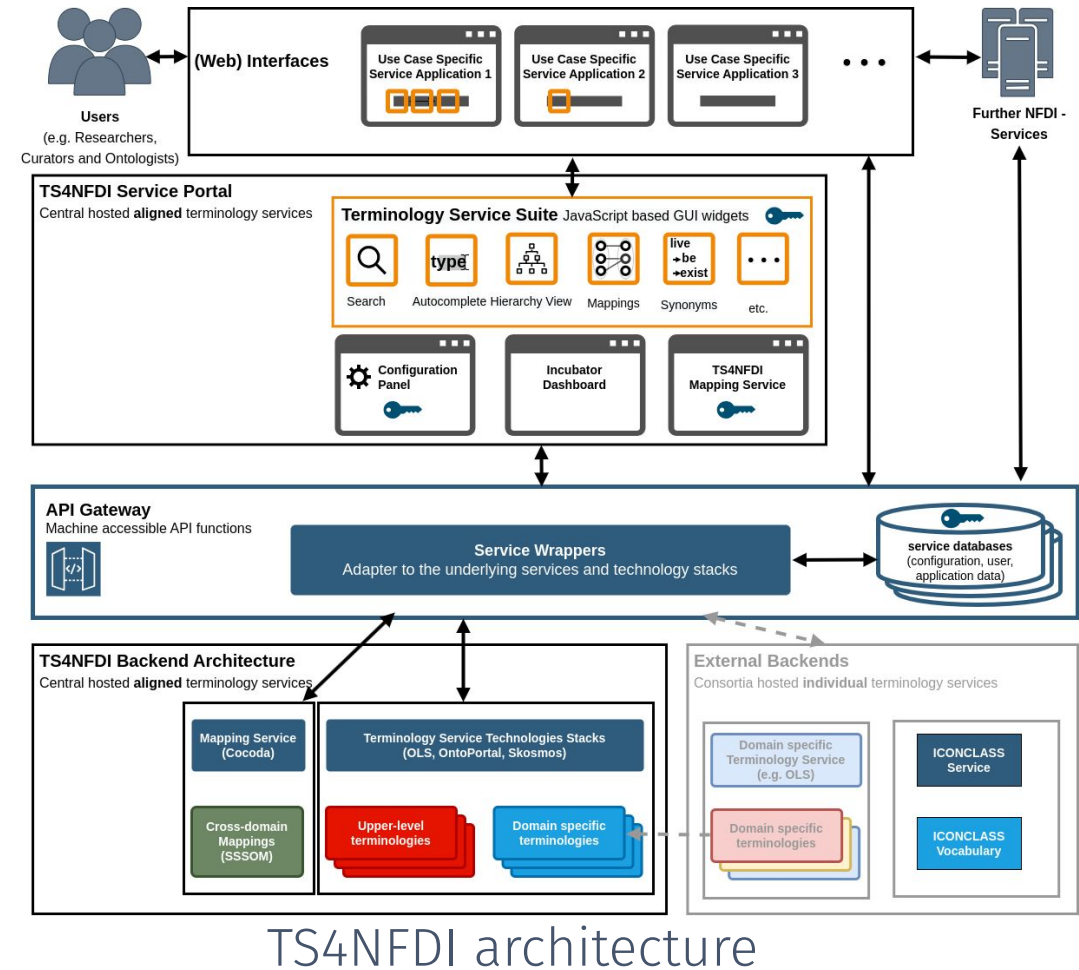


TS4NFDI architecture

Outlook: Integration Phase

What is the technical concept?

- **Terminology Service Suite (TSS)**
 - Javascript based widgets
- **Central API Gateway**
 - Harmonised single point of access to other (NFDI) terminology services
- **TS4NFDI Backend Architecture**
 - Supports Terminology Services which are based on OLS, OntoPortal, or Skosmos and beyond
 - **will provide a NFDI-wide Mapping Service with SSSOM support**



Good to know

More information:

<https://base4nfdi.de/projects/ts4nfdi>

Contact the team:

ts4nfdi@lists.nfdi.de

Upcoming

- PUNCH4NFDI Annual Meeting 2024 on Nov 27-29 (Bonn)
- **Services Roadshow by Base4NFDI** on Dec 4 (online)
- NFDI4Microbiota Annual Conference on Dec 4-5 (Leipzig)

More information

- TS4NFDI website: <https://terminology.services.base4nfdi.de/>
- NFDI talk (Video): <https://www.youtube.com/watch?v=av3eU8tO6Y>
- NFDI talk slides: <https://doi.org/10.5281/zenodo.10550341>
- Consortia - NFDI4Chem (TIB), NFDI4Health + FAIRagro (ZB MED), NFDI4Biodiversity (InfAI)
- Principal investigators - Dr. Oliver Koepler (TIB), Roman Baum (ZB MED), Naouel Karam (InfAI)

Thank You ! Questions ?

