

djehuty

The 4TU.ResearchData and Nikhef repository system



<https://github.com/4TUResearchData/djehuty>
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Chapter 1

Introduction

`djehuty` is the data repository system developed by 4TU.ResearchData and Nikhef. The name finds its inspiration in `Thoth`, the Egyptian entity that introduced the idea of writing.

1.1 Obtaining the source code

The source code can be downloaded at the `Releases`¹ page. Make sure to download the `djehuty-25.6.tar.gz` file.

Or, directly download the tarball using the command-line:

```
curl -LO https://github.com/4TUResearchData/djehuty/releases/\
download/v25.6/djehuty-25.6.tar.gz
```

After obtaining the tarball, it can be unpacked using the `tar` command:

```
tar zxvf djehuty-25.6.tar.gz
```

1.2 Installing the prerequisites

The `djehuty` program needs Python (version 3.9 or higher) and Git to be installed. Additionally, a couple of Python packages need to be installed. The following sections describe installing the prerequisites on various GNU/Linux distributions. To put the software in the context of its environment, figure 1.1 displays the complete run-time dependencies from `djehuty` to `glibc`.

¹<https://github.com/4TUResearchData/djehuty/releases>

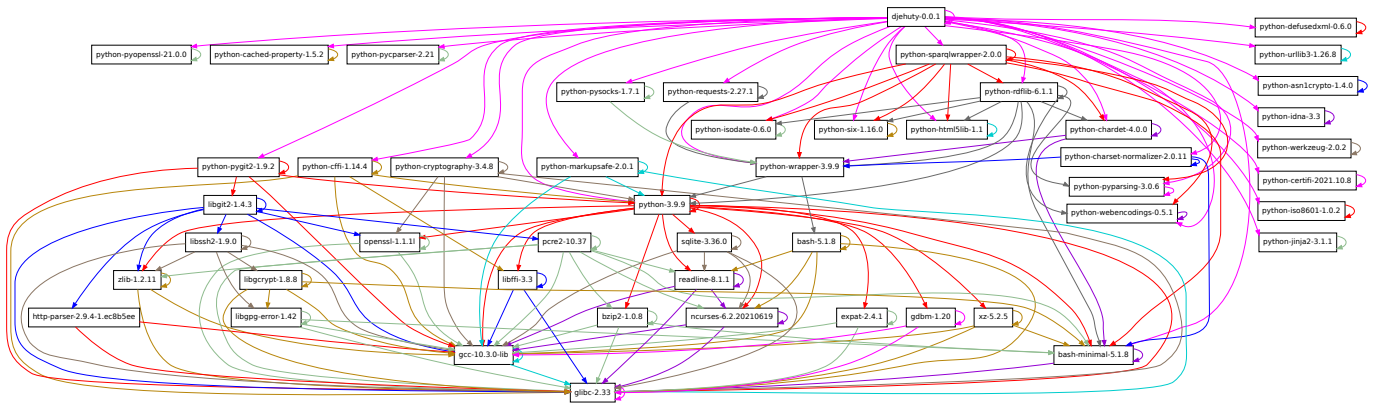


Figure 1.1: Run-time references when constructed with the packages from GNU Guix.

The web service of `djehuty` stores its information in a SPARQL 1.1 [?] endpoint. We recommend either [Blazegraph](#)² or [Virtuoso open-source edition](#)³.

1.2.1 Optional installation requirements depending on configuration

For specific features `djehuty` may require additional packages to be installed. Whether this is the case depends on the run-time configuration. When an optional package is required `djehuty` will report which one in its logs. There are three configuration scenarios that require the additional packages: SAML, S3 and IIIF.

SAML

When configuring the use of an identity provider via SAML `djehuty` requires the `python3-saml` Python package to be installed. This package provides the implementation of the SAML protocol.

S3

When configuring file access in S3 buckets `djehuty` requires the `boto3` Python package to be installed. This package is used to authenticate to the S3 endpoints and to download (or stream) data.

IIIF

When enabling the IIIF functionality `djehuty` requires the `pyvips` Python package to be installed. This package is used to perform image transformations.

1.3 Installation instructions

After obtaining the source code (see section 1.1 ‘Obtaining the source code’) and installing the required tools (see section 1.2 ‘Installing the prerequisites’), building involves running the following commands:

²<https://blazegraph.com/>

³<http://vos.openlinksw.com/owiki/wiki/VOS>


```
cd djehuty-25.6
autoreconf -vif # Only needed if the "./configure" step does not work.
./configure
make
make install
```

To run the `make install` command, super user privileges may be required. Specify a `--prefix` to the `configure` script to install the tools to a user-writeable location to avoid needing super user privileges.

After installation, the `djehuty` program will be available.

1.4 Pre-built containers

4TU.ResearchData provides Docker container images as a convenience service for each monthly `djehuty` release. The following table outlines the meaning of each image provided. The images are published to [Docker Hub](#)⁴.

Image tag	Description
devel	Image meant for development purposes. Before it executes the <code>djehuty</code> command it checks out the latest codebase. So re-running the same container image may result in running a different version of <code>djehuty</code> .
latest	This image points to the latest <code>djehuty</code> release. It does not automatically update the <code>djehuty</code> codebase.
XX.X	4TU.ResearchData releases a version each month where the number before the dot refers to the year and the number after the dot refers to the month. Use a specific version image when you want to upgrade at your own pace.

To build the container images for yourself, see the build instructions in the ‘`docker/Dockerfile`’ file.

1.5 RPM packages

4TU.ResearchData provides RPM packages built for Enterprise Linux 9. This RPM depends on packages in the [Extra Packages for Enterprise Linux \(EPEL\)](#) repository.

Filename	Description
<code>djehuty-25.6-1.el9.noarch.rpm</code>	Binary RPM, to install and run <code>djehuty</code> .
<code>djehuty-25.6-1.el9.src.rpm</code>	Source RPM, to (re)build from source code.

RPM packages for more distributions are [built via Copr](#).

⁴<https://hub.docker.com/r/4turesearchdata/djehuty>

Chapter 2

Configuring djehuty

Now that `djehuty` is installed, it's a good moment to look into its run-time configuration options. All configuration can be done through a configuration file, for which an example is available at `etc/djehuty/djehuty-example-config.xml`.

2.1 Essential options

Option	Description
<code>bind-address</code>	The address to bind a TCP socket on.
<code>port</code>	The port to bind a TCP socket on.
<code>alternative-port</code>	A fall-back port to bind on when <code>port</code> is already in use.
<code>base-url</code>	The URL on which the instance will be available to the outside world.
<code>allow-crawlers</code>	Set to 1 to allow crawlers in the <code>robots.txt</code> , otherwise set to 0.
<code>production</code>	Performs extra checks before starting. Enable this when running a production instance.
<code>live-reload</code>	When set to 1, it reloads Python code on-the-fly. We recommend to set it to 0 when running in production.
<code>debug-mode</code>	When set to 1, it will display backtraces and error messages in the web browser. When set to 0, it will only show backtraces and error messages in the web browser.
<code>use-x-forwarded-for</code>	When running <code>djehuty</code> behind a reverse-proxy server, use the HTTP header <code>X-Forwarded-For</code> to log IP address information. Set to 1 when <code>djehuty</code> should use the <code>X-Forwarded-For</code> HTTP header.
<code>static-resources-cache</code>	When running <code>djehuty</code> behind a reverse-proxy server, it can write images, fonts, stylesheets and JavaScript resources to a folder so it can be served by the reverse-proxy server. Specify a filesystem directory to store the resources at.
<code>disable-collaboration</code>	When set to 1, it disables the “collaborators” feature.
<code>allowed-depositing-domains</code>	When unset, any authenticated user may deposit data. Otherwise, this option limits the ability to deposit to users with an e-mail address of the listed domain names.
<code>cache-root</code>	<code>djehuty</code> can cache query responses to lower the load on the database server. Specify the directory where to store cache files. This element takes an attribute <code>clear-on-start</code> , and when set to 1, it will remove all cache files on start-up of <code>djehuty</code> .
<code>profile-images-root</code>	Users can upload a profile image in <code>djehuty</code> . This option should point to a filesystem directory where these profile images can be stored.
<code>disable-2fa</code>	Accounts with privileges receive a code by e-mail as a second factor when logging in. Setting this option to 1 disables the second factor authentication.
<code>sandbox-message</code>	Display a message on the top of every page.
<code>notice-message</code>	Display a message on the main page.
<code>maintenance-mode</code>	When set to 1, all HTTP requests result in the displayment of a maintenance ⁷ message. Use this option while backing up the database, or when performing major updates.

2.2 Configuring the Database

The `djehuty` program stores its state in a SPARQL 1.1 compliant RDF store. Configuring the connection details is done in the `rdf-store` node.

Option	Description
<code>state-graph</code>	The graph name to store triplets in.
<code>sparql-uri</code>	The URI at which the SPARQL 1.1 endpoint can be reached. When the <code>sparql-uri</code> begins with <code>bdb://</code> , followed by a path to a filesystem directory, it will use the BerkeleyDB back-end, for which the <code>berkeleydb</code> Python package needs to be installed.
<code>sparql-update-uri</code>	The URI at which the SPARQL 1.1 Update endpoint can be reached (in case it is different from the <code>sparql-uri</code>).

2.3 Audit trails and database reconstruction

The `djehuty` program can keep an audit log of all database modifications made by itself from which a database state can be reconstructed. Whether `djehuty` keeps such an audit log can be configured with the following option:

Option	Description
<code>enable-query-audit-log</code>	When set to 1, it writes every SPARQL query that modifies the database in the web logs. This can be replayed to reconstruct the database at a later time. Setting this option to 0 disables this feature. This element takes an attribute <code>transactions-directory</code> that should specify an empty directory to which transactions can be written that are extracted from the audit log.

2.3.1 Reconstructing the database from the query audit log

Each query that modifies the database state while the query audit logs are enabled can be extracted from the query audit log using the `--extract-transactions-from-log` command-line option. A timestamp to specify the starting point to extract from can be specified as an argument. The following example displays its use:

```
djehuty web --config-file=config.xml --extract-transactions-from-log="YYYY-MM-DD
HH:MM:SS"
```

This will create a file for each query in the folder specified in the `transactions-directory` attribute. To replay the extracted transactions, use the `apply-transactions` command-line option:

```
djehuty web --config-file=config.xml --apply-transactions
```

When a query cannot be executed, the command stops, allowing to fix or remove the query to be replayed. Invoking the `--apply-transactions` command a second time will continue replaying where the previous run stopped.

2.4 Configuring storage

Storage locations can be configured with the `storage` node. When configuring multiple locations, `djehuty` attempts to find a file by looking at the first configured location, and in case it cannot find the file there, it will look at the second configured location, and so on, until it has tried each storage location.

This allows for moving files between storage systems transparently without requiring specific interactions with `djehuty` other than having the files made available as a POSIX filesystem or in an S3 bucket.

One use-case that suits this mechanism is letting uploads write to fast online storage and later move the uploaded files to a slower but less costly storage.

Option	Description
<code>location</code>	A filesystem path to where files are stored. This is a repeatable property.
<code>s3-bucket</code>	An S3 bucket configuration. See section 2.4.1. This is a repeatable property.

2.4.1 Configuring S3 buckets

Other than configuring storage locations on a POSIX filesystem, `djehuty` can be configured to serve files from an S3 bucket. To do so, the following parameters must be configured within a `s3-bucket` node.

Option	Description
<code>endpoint</code>	Endpoint URL to connect to.
<code>name</code>	Name of the bucket.
<code>key-id</code>	Key ID for the bucket.
<code>secret-key</code>	Secret key for the bucket.

For example, configuring one filesystem location and one S3 bucket as storage locations looks as following:

```
<storage>
  <location>/data</location>
  <s3-bucket>
    <endpoint>https://some.example</endpoint>
    <name>example-bucket</name>
    <key-id>...</key-id>
    <secret-key>...</secret-key>
  </s3-bucket>
```

```
</storage>
```

There are a few scenarios in which `djehuty` downloads an S3 object to perform some operation on: creating thumbnails and IIIF image transformations. To direct where these temporary files will be stored, the `s3-cache-root` can be configured.

Option	Description
<code>s3-cache-root</code>	The directory to store the S3 objects while performing some operation on the objects. This option can only be configured globally and applies to all S3 buckets.

2.5 Configuring an identity provider

Ideally, `djehuty` makes use of an external identity provider. `djehuty` can use SAML2.0, ORCID, or an internal identity provider (for testing and development purposes only).

This section will outline the configuration options for each identity provision mechanism.

2.5.1 SAML2.0

For SAML 2.0, the configuration can be placed in the `saml` section under `authentication`. That looks as following:

```
<authentication>
  <saml version="2.0">
    <!-- Configuration goes here. -->
  </saml>
</authentication>
```

The options outlined in the remainder of this section should be placed where the example shows `<!-- Configuration goes here. -->`.

Option	Description
<code>strict</code>	When set to 1, SAML responses must be signed. Never disable ‘strict’ mode in a production environment.
<code>debug</code>	Increases logging verbosity for SAML-related messages.
<code>attributes</code>	In this section the attributes provided by the identity provider can be aligned to the attributes <code>djehuty</code> expects.
<code>service-provider</code>	The <code>djehuty</code> program fulfills the role of service provider. In this section the certificate and service provider metadata can be configured.
<code>identity-provider</code>	In this section the certificate and single-sign-on URL of the identity provider can be configured.
<code>sram</code>	In this section, SURF Research Access Management-specific attributes can be configured.

The attributes configuration

To create account and author records and to authenticate a user, **djehuty** stores information provided by the identity provider. Each identity provider may provide this information using different attributes. Therefore, the translation from attributes used by **djehuty** and attributes given by the identity provider can be configured. The following attributes must be configured.

Option	Description
first-name	A user's first name.
last-name	A user's last name.
common-name	A user's full name.
email	A user's e-mail address.
groups	The attribute denoting groups.
group-prefix	The prefix for each group short name.

As an example, the attributes configuration for SURFConext looks like this:

```
<attributes>
  <first-name>urn:mace:dir:attribute-def:givenName</first-name>
  <last-name>urn:mace:dir:attribute-def:sn</last-name>
  <common-name>urn:mace:dir:attribute-def:cn</common-name>
  <email>urn:mace:dir:attribute-def:mail</email>
</attributes>
```

And for SURF Research Access Management (SRAM), the attributes configuration looks like this:

```
<attributes>
  <first-name>urn:oid:2.5.4.42</first-name>
  <last-name>urn:oid:2.5.4.4</last-name>
  <common-name>urn:oid:2.5.4.3</common-name>
  <email>urn:oid:0.9.2342.19200300.100.1.3</email>
  <groups>urn:oid:1.3.6.1.4.1.5923.1.1.1.7</groups>
  <group-prefix>urn:mace:surf.nl:sram:group:[organisation]:[service]</group-
    prefix>
</attributes>
```

The sram configuration

When using SURF Research Access Management (SRAM), **djehuty** can persuade SRAM to send an invitation to anyone inside or outside the institution to join the SRAM collaboration that provides access to the **djehuty** instance. To do so, the following attributes must be configured.

Option	Description
organization-api-token	An organization-level API token.
collaboration-id	The UUID of the collaboration to invite users to.

The service-provider configuration

Option	Description
<code>x509-certificate</code>	Contents of the public certificate without whitespacing.
<code>private-key</code>	Contents of the private key belonging to the <code>x509-certificate</code> to sign messages with.
<code>metadata</code>	This section contains metadata that may be displayed by the identity provider to users before authorizing them.
<code>display-name</code>	The name to be displayed by the identity provider when authorizing the user to the service.
<code>url</code>	The URL to the service.
<code>description</code>	Textual description of the service.
<code>organization</code>	This section contains metadata to describe the organization behind the service.
<code>name</code>	The name of the service provider's organization.
<code>url</code>	The URL to the web page of the organization.
<code>contact</code>	A repeatable section to list contact persons and their roles within the organization. The role can be configured by setting the <code>type</code> attribute.
<code>first-name</code>	The first name of the contact person.
<code>last-name</code>	The last name of the contact person.
<code>email</code>	The e-mail address of the contact person. Note that some identity providers prefer functional e-mail addresses (e.g. <code>support@...</code> instead of <code>jdoe@...</code>).

2.5.2 ORCID

[ORCID.org](https://orcid.org) plays a key role in making researchers findable. Its identity provider service can be used by `djehuty` in two ways:

1. As primary identity provider to log in and deposit data;
2. As additional identity provider to couple an author record to its ORCID record.

When another identity provider is configured in addition to ORCID, that identity provider will be used as primary and ORCID will only be used to couple author records to the author's ORCID record.

To configure ORCID, the configuration can be placed in the `orcid` section under `authentication`. That looks as following:

```
<authentication>
  <orcid>
    <!-- Configuration goes here. -->
  </orcid>
</authentication>
```

Then the following parameters can be configured:

Option	Description
client-id	The client ID provided by ORCID.
client-secret	The client secret provided by ORCID.
endpoint	The URL to the ORCID endpoint to use.

2.6 Configuring an e-mail server

On various occasions, `djehuty` will attempt to send an e-mail to either an author, a reviewer or an administrator. To be able to do so, an e-mail server must be configured from which the instance may send e-mails.

The configuration is done under the `email` node, and the following items can be configured:

Option	Description
server	Address of the e-mail server without protocol specification.
port	The port the e-mail server operates on.
starttls	When 1, <code>djehuty</code> attempts to use StartTLS.
username	The username to authenticate with to the e-mail server.
password	The password to authenticate with to the e-mail server.
from	The e-mail address used to send e-mail from.
subject-prefix	Text to prefix in the subject of all e-mails sent from the instance of <code>djehuty</code> . This can be used to distinguish a test instance from a production instance.

2.7 Configuring DOI registration

When publishing a dataset or collection, `djehuty` can register a persistent identifier with DataCite. To enable this feature, configure it under the `datacite` node. The following parameters can be configured:

Option	Description
api-url	The URL of the API endpoint of DataCite.
repository-id	The repository identifier given by DataCite.
password	The password to authenticate with to DataCite.
prefix	The DOI prefix to use when registering a DOI.

2.8 Configuring Handle registration

Each uploaded file can be assigned a persistent identifier using the Handle system. To enable this feature, configure it under the `handle` node. The following parameters can be configured:

Option	Description
<code>url</code>	The URL of the API endpoint of the Handle system implementor.
<code>certificate</code>	Certificate to use for authenticating to the endpoint.
<code>private-key</code>	The private key paired with the certificate used to authenticate to the endpoint.
<code>prefix</code>	The Handle prefix to use when registering a handle.
<code>index</code>	The index to use when registering a handle.

2.9 Configuring IIIF support

When publishing images, `djehuty` can enable the IIIF Image API for the images. It uses `libvips` and `pyvips` under the hood to perform image manipulation. The following parameters can be configured:

Option	Description
<code>enable-iiif</code>	Enable support for the IIIF image API. This requires the <code>pyvips</code> package to be available in the run-time environment.
<code>iiif-cache-root</code>	The directory to store the output of IIIF Image API requests to avoid re-computing the image.

2.10 Customizing looks

With the following options, the instance can be branded as necessary.

Option	Description
site-name	Name for the instance used in the title of a browser window and as default value in the publisher field for new datasets.
site-description	Description used as a meta-tag in the HTML output.
site-shorttag	Used as keyword and as Git remote name.
ror-url	The ROR URL for this instance's organization.
support-email-address	E-mail address used in e-mails sent to users in automated messages.
custom-logo-path	Path to a PNG image file that will be used as logo on the website.
custom-favicon-path	Path to an ICO file that will be used as favicon.
small-footer	HTML that will be used as footer for all pages except for the main page.
large-footer	HTML that will be used as footer on the main page.
show-portal-summary	When set to 1, it shows the repository summary of number of datasets, authors, collections, files and bytes on the main page.
show-institutions	When set to 1, it shows the list of institutions on the main page.
show-science-categories	When set to 1, it shows the subjects (categories) on the main page.
show-latest-datasets	When set to 1, it shows the list of latest published datasets on the main page.
colors	Colors used in the HTML output. See section 2.10.1.

2.10.1 Customizing colors

The following options can be configured in the `colors` section.

Option	Description
primary-color	The main background color to use.
primary-foreground-color	The main foreground color to use.
primary-color-hover	Color to use when hovering a link.
primary-color-active	Color to use when a link is clicked.
privilege-button-color	The background color of buttons for privileged actions.
footer-background-color	Color to use in the footer.
background-color	Background color for the content section.

2.11 Configuring privileged users

By default an authenticated user may deposit data. But users can have additional roles; for example: a dataset reviewer, a technical administrator or a quota reviewer.

Such additional roles are configured in terms of privileges. The following privileges can be configured

in the `privileges` section:

Option	Description
<code>may-administer</code>	Allows access to perform maintenance tasks, view accounts and view reports on restricted and embargoed datasets.
<code>may-run-sparql-queries</code>	Allows to run arbitrary SPARQL queries on the database.
<code>may-impersonate</code>	Allows to log in to any account and therefore perform any action as that account.
<code>may-review</code>	Allows to see which datasets are sent for review, and allows to perform reviews.
<code>may-review-quotas</code>	Allows access to see requests for storage quota increases and approve or decline them.
<code>may-review-integrity</code>	Allows access to an API call that provides statistics on the accessibility of files on the filesystem.
<code>may-process-feedback</code>	Accounts with this privilege will receive e-mails with the information entered into the feedback form by other users.
<code>may-recalculate-statistics</code>	Views and downloads statistics are not calculated in real time. An administrator with this additional privilege can trigger a recalculation of these statistics, which can be a database-intensive action.
<code>may-receive-email-notifications</code>	This “privilege” can be used to disable sending any e-mails to an account by setting it to 0. The default is 1.

To enable a privilege for an account, set the value of the desired privilege to 1. Privileges are disabled by default, except for `may-receive-email-notifications` which defaults to 1.

```
<privileges>
  <account email="you@example.com" orcid="0000-0000-0000-0001">
    <may-administer>1</may-administer>
    <may-run-sparql-queries>1</may-run-sparql-queries>
    <may-impersonate>1</may-impersonate>
    <may-review>0</may-review>
    <may-review-quotas>0</may-review-quotas>
    <may-review-integrity>0</may-review-integrity>
    <may-process-feedback>0</may-process-feedback>
    <may-receive-email-notifications>1</may-receive-email-notifications>
  </account>
</privileges>
```

Chapter 3

Running djehuty

Before running `djehuty`, consider the chapter 2 ‘[Configuring djehuty](#)’ which provides the configuration options to enable or disable features, where data will be stored and a way to adapt `djehuty` to your organization’s style.

3.1 Running djehuty

Invoking `djehuty web` starts the web interface of `djehuty`. On what port it makes itself available can be configured in its configuration file.

```
djehuty web --config-file=your-djehuty-config.xml
```

3.2 Running djehuty behind an nginx reverse-proxy

While `djehuty` itself does not support SSL/TLS, it is designed to work together with a reverse-proxy HTTP server like `nginx`. When `djehuty` starts, it will bind on a pre-configured address and port, which in turn can be `proxy_passed` to using `nginx`.

The following snippet shows how to configure `nginx`.

```
server {
    listen          443 ssl;
    listen          [::]:443 ssl;
    server_name     example.domain;

    ssl_certificate  /etc/letsencrypt/live/example.domain/fullchain.pem;
    ssl_certificate_key /etc/letsencrypt/live/example.domain/privkey.pem;

    location / {
        # Set 'use-x-forwarded-for' in the djehuty configuration.
        proxy_set_header X-Forwarded-For $proxy_add_x_forwarded_for;
```

```
# The values for address and port depend on what is configured in the
# djehuty configuration file.
proxy_pass http://127.0.0.1:8080;
root /usr/share/nginx/html;
}
}
```

To ensure `djehuty` receives the actual client IP address so it can log this information, one can set the `use-x-forwarded-for` option described in section 2.1.

Chapter 4

Knowledge graph

Djehuty processes its information using the Resource Description Framework [?]. This chapter describes the parts that make up the data model of `djehuty`.

This chapter dives into the structure of the data model, but does not describe every property. When running an instance of `djehuty`, the “Exploratory” available in the “Admin panel” can be used to explore every property.

4.1 Use of vocabularies

Throughout this chapter, abbreviated references to ontologies are used. Table 4.1 lists these abbreviations.

Abbreviation	Ontology URI
<code>djht</code>	Internal and unpublished ontology.
<code>rdf</code>	http://www.w3.org/1999/02/22-rdf-syntax-ns#
<code>rdfs</code>	http://www.w3.org/2000/01/rdf-schema#
<code>xsd</code>	http://www.w3.org/2001/XMLSchema#

Table 4.1: Lookup table for vocabulary URIs and their abbreviations.

4.2 Notational shortcuts

In addition to abbreviating ontologies with their prefix we use another notational shortcut. To effectively communicate the structure of the RDF graph used by `djehuty` we introduce a couple of shorthand notations.

4.2.1 Notation for typed triples

When the **object** in a triple is *typed*, we introduce the shorthand to only show the type, rather than the actual value of the **object**. Figure 4.1 displays this for URIs, and figure 4.2 displays this for literals.

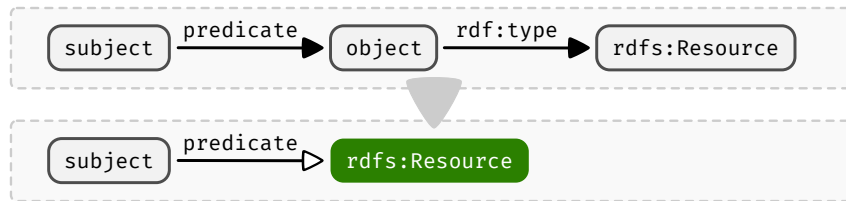


Figure 4.1: *Shorthand notation for triples with an `rdf:type` which features a hollow predicate arrow and a colored type specifier with rounded corners.*

Literals are depicted by rectangles (with sharp edges) in contrast to URIs which are depicted as rectangles with rounded edges.

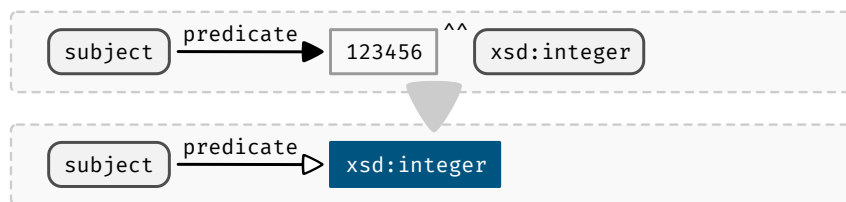


Figure 4.2: *Shorthand notation for triples with a literal, which features a hollow predicate arrow and a colored rectangular type specifier.*

When the subject of a triple is the shorthand type, assume the subject is not the type itself but the subject which has that type.

4.2.2 Notation for `rdf:List`

To preserve the order in which lists were formed, the data model makes use of `rdf:List` with numeric indexes. This pattern will be abbreviated in the remainder of the figures as displayed in figure 4.3.

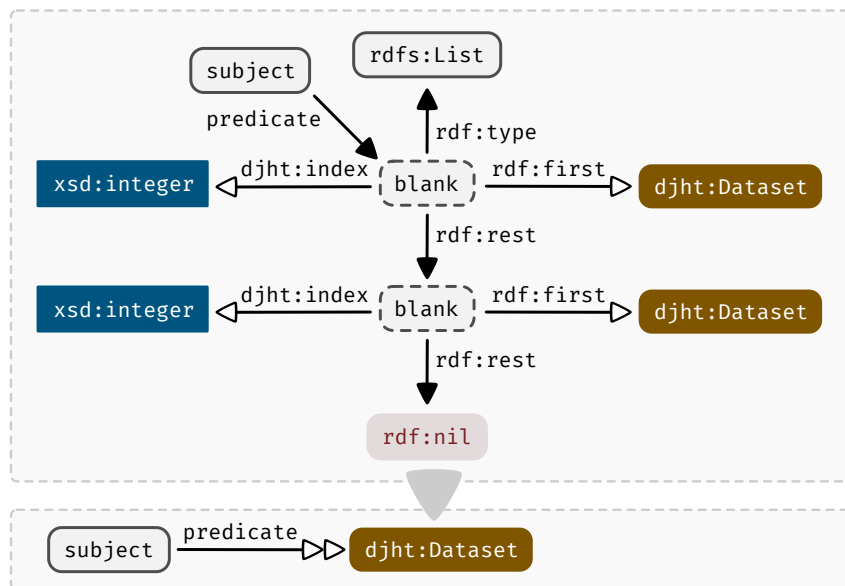


Figure 4.3: Shorthand notation for `rdf:List` with numeric indexes, which features a hollow double-arrow. Lists have arbitrary lengths, and the numeric indexes use 1-based indexing.

The hollow double-arrow depicts the use of an `rdf:List` with numeric indexes.

4.3 Datasets

Datasets play a central role in the repository system because every other type links in one way or another to it. The user submits files along with data about those bytes as a single record which we call a `djht:Dataset`. Figure 4.4 shows how the remainder of types in this chapter relate to a `djht:Dataset`.

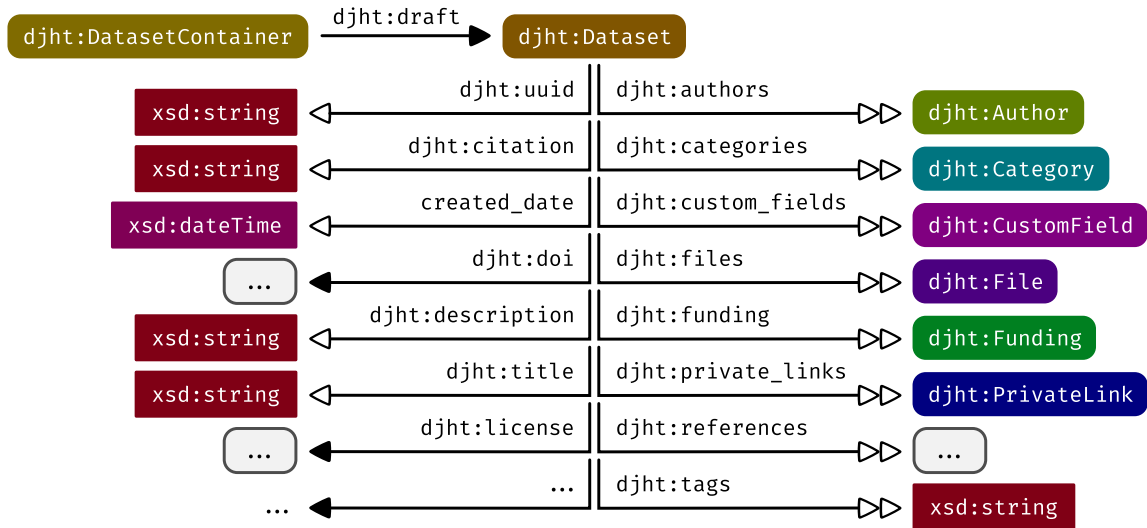


Figure 4.4: The *RDF* pattern for a `djht:Dataset`. For a full overview of `djht:Dataset` properties, use the exploratory from the administration panel.

Datasets are versioned records. The data and metadata between versions can differ, except all versions of a dataset share an identifier. We use `djht:DatasetContainer` to describe the version-unspecific properties of a set of versioned datasets.

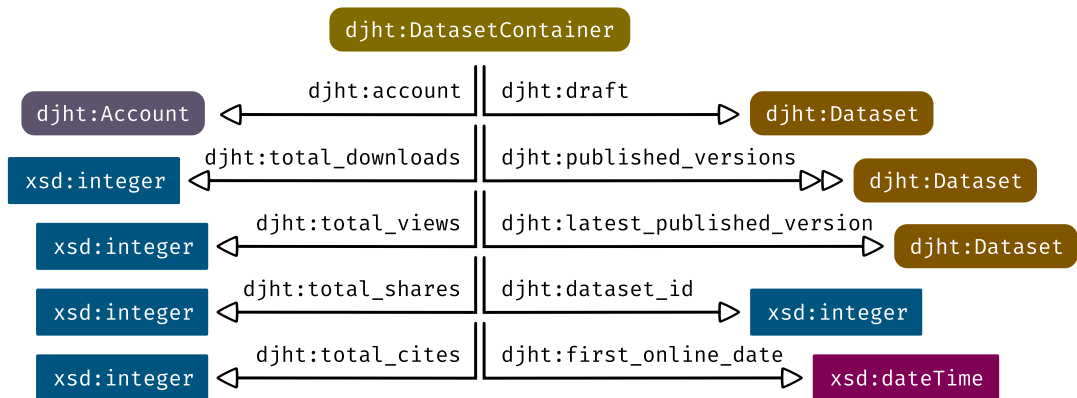


Figure 4.5: The *RDF* pattern for a `djht:DatasetContainer`. All versions of a dataset share a `djht:dataset_id` and a *UUID* in the container *URI*.

The data model follows a natural expression of published versions as a linked list. Figure 4.5 further reveals that the *view*, *download*, *share* and *citation* counts are stored in a version-unspecific way.

4.4 Collections

Collections provide a way to group `djht:Dataset` objects.

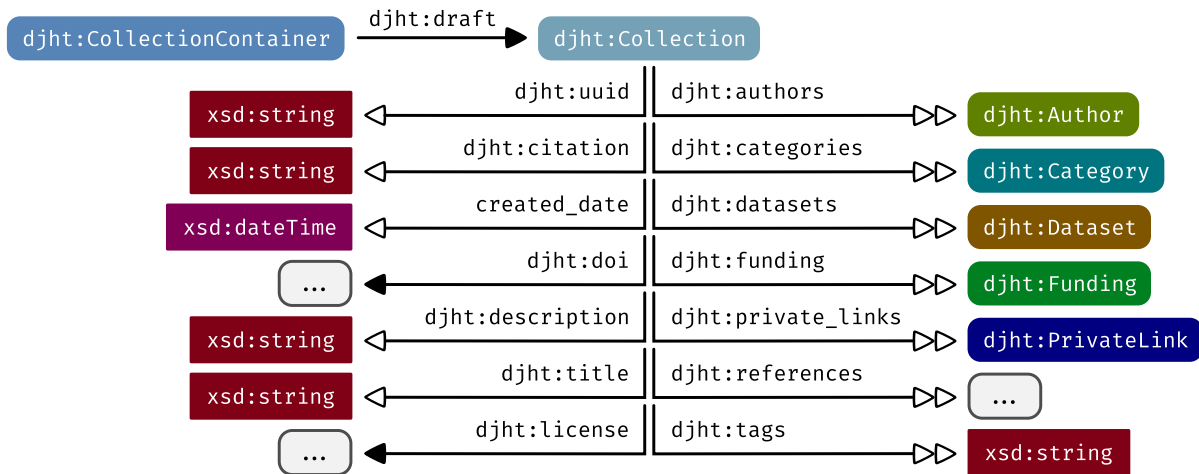


Figure 4.6: The *RDF pattern* for a `djht:Collection`. For a full overview of `djht:Collection` properties, use the exploratory from the administration panel.

Collections are (just like Datasets) versioned records. The metadata between versions can differ, except all versions of a collection share an identifier. We use `djht:CollectionContainer` to describe the version-unspecific properties of a set of versioned collections.

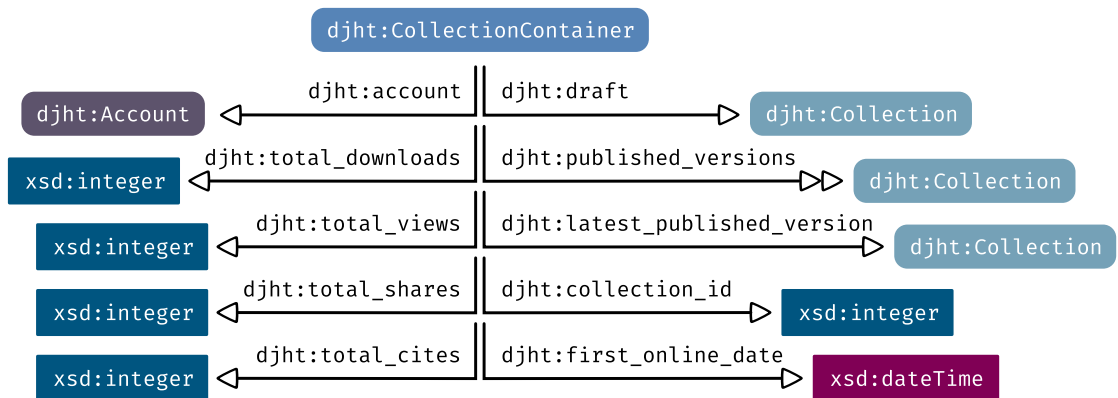
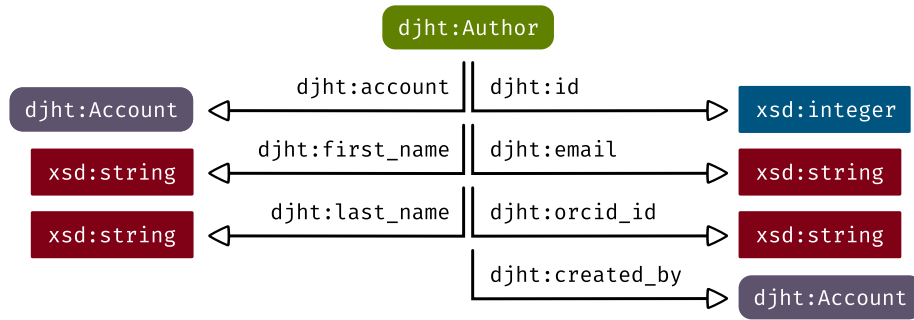


Figure 4.7: The *RDF pattern* for a `djht:CollectionContainer`. All versions of a collection share a `djht:collection_id` and a *UUID* in the container *URI*.

The data model follows a natural expression of published versions as a linked list. Figure 4.7 further reveals that the *view*, *download*, *share* and *citation* counts are stored in a version-unspecific way.

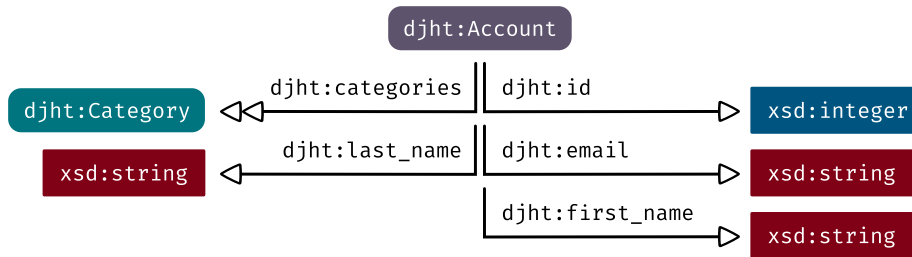
4.5 Authors

djehuty keeps records of authors including their full name, ORCID, and e-mail address. Furthermore, each `djht:Account` has a linked `djht:Author` record.

Figure 4.8: The RDF pattern for an `djht:Author`.

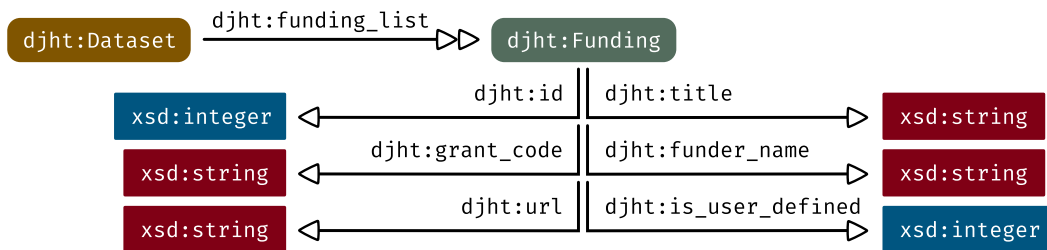
4.6 Accounts

`djehuty` uses an external identity provider, but stores an e-mail address, full name, and preferences for categories.

Figure 4.9: The RDF pattern for an `djht:Account`.

4.7 Funding

When the `djht:Dataset` originated out of a funded project, the funders can be listed using `djht:Funding`. Figure 4.10 displays the details for this structure.

Figure 4.10: The RDF pattern for a `djht:Funding`.

4.8 Categories

Categories in `djehuty` are a controlled vocabulary based on the [Australian and New Zealand Standard Research Classification \(ANZSRC\)](#). The hierarchical structure is captured by using `id` and `parent_id`

properties.

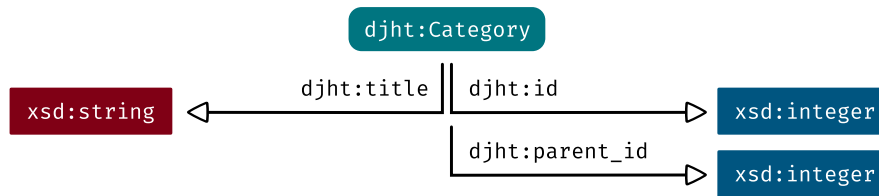


Figure 4.11: The RDF pattern for an `djht:Category`.

4.9 Institutions/groups

An `djht:Account` has an affiliation with an institute or research group. The `djht:InstitutionGroup` is stored per `djht:Dataset` and `djht:Collection`. The groups can be structured hierarchically by using the `id` and `parent_id` properties.

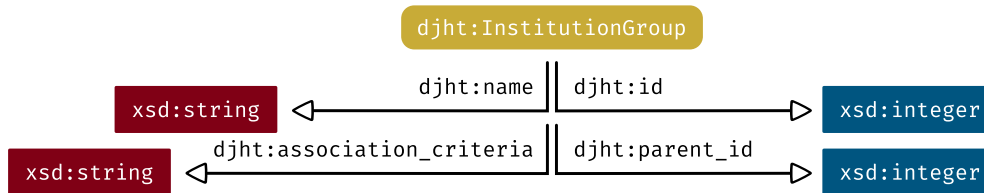


Figure 4.12: The RDF pattern for an `djht:InstitutionGroup`.

4.10 Files

A `djht:Dataset` keeps a list of `djht:File` records. The file metadata is stored in the knowledge graph while the file contents are stored on a filesystem. The location of the file data is tracked via the `djht:filesystem_location` property.

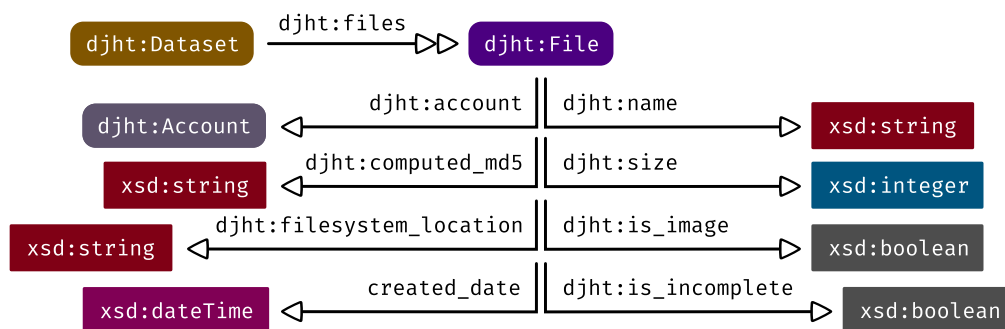


Figure 4.13: The RDF pattern for a `djht:File`.

4.11 Private links

Before a `djht:Dataset` or a `djht:Collection` is made publically available, it can be shared using a private link.

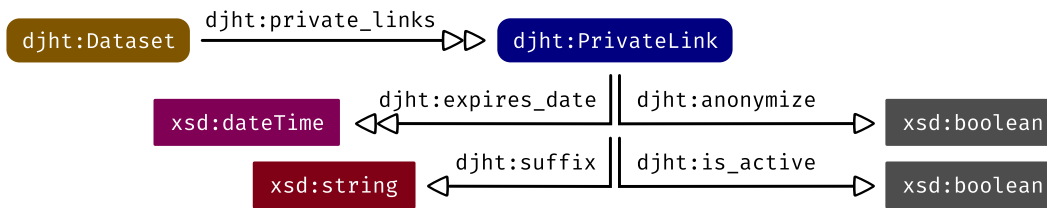


Figure 4.14: The RDF pattern for a `djht:PrivateLink`.

The figure 4.14 displays how private links are stored for a `djht:Dataset`, and it works the same for a `djht:Collection`.

4.12 Collaborators

To enable multiple accounts collaborating on a dataset before it's published, each `djht:Dataset` can have a list of `djht:Collaborator` objects.

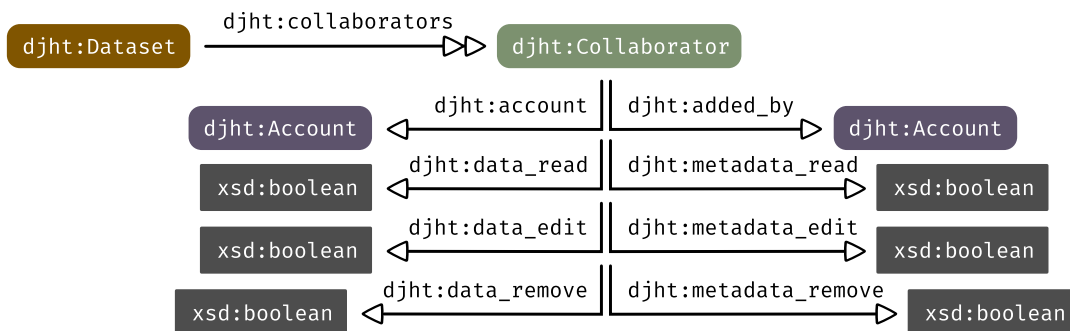


Figure 4.15: The RDF pattern for a `djht:Collaborator`.

As shown in figure 4.15, a `djht:Collaborator` can be given read, edit, and/or remove rights independently for both metadata (the form fields) and data (the files).

Chapter 5

Contributing

This chapter outlines how to set up an instance of `djehuty` with the goal of modifying its source code. Or in other words: this is the developer setup.

5.1 Setting up a development environment

First, we need to obtain the latest version of the source code:

```
$ git clone https://github.com/4TUTResearchData/djehuty.git
```

Next, we need to create a somewhat isolated Python environment:

```
$ python -m venv djehuty-env
$ . djehuty-env/bin/activate
[env]$ cd djehuty
[env]$ pip install -r requirements.txt
```

And finally, we can install `djehuty` in the virtual environment to make the `djehuty` command available:

```
[env]$ sed -e 's/@VERSION@/0.0.1/g' pyproject.toml.in > pyproject.toml
[env]$ pip install --editable .
```

If all went well, we will now be able to run `djehuty`:

```
[env]$ djehuty --help
```

5.2 Configuring `djehuty`

Invoking `djehuty web` starts the web interface of `djehuty`. On what port it makes itself available can be configured in its configuration file. An example of a configuration file can be found in

'etc/djehuty/djehuty-example-config.xml'. We will use the example configuration as the basis to configure it for the development environment.

```
[env]$ cp etc/djehuty/djehuty-example-config.xml config.xml
```

In the remainder of the chapter we will assume a value of 127.0.0.1 for `bind-address` and a value of 8080 for `port`.

5.2.1 Modifications to the example configuration for developers

The chapter 2 'Configuring djehuty' describes each configuration option for djehuty. The remainder of sections here contain a fast-path through configuring djehuty for use in a development setup.

Live reload

The djehuty program can be configured to automatically reload itself when a change is detected by setting `live-reload` to 1.

Configuring authentication with ORCID

The djehuty program does not have Identity Provider (IdP) capabilities, so in order to log into the system we must configure an external IdP. With an **ORCID** account comes the ability to set up an OAuth endpoint. Go to **developer-tools** at **orcid.org**. When setting up the OAuth at ORCID, choose `http://127.0.0.1:8080/login` as redirect URI.

Modify the following bits to reflect the settings obtained from ORCID.

```
<authentication>
  <orcid>
    <client-id>APP-XXXXXXXXXXXXXXXXXX</client-id>
    <client-secret>XXXXXXXX-XXXX-XXXX-XXXX-XXXXXXXXXXXX</client-secret>
    <endpoint>https://orcid.org/oauth</endpoint>
  </orcid>
</authentication>
```

To limit who can log into a development system, accounts are not automatically created for ORCID as IdP. So we need to configure who can log in by creating a record in the `privileges` section of the configuration file.

This is also a good moment to configure additional privileges for your account. In the following snippet, configure the ORCID with which you will log into the system in the `orcid` argument.

```
<privileges>
  <account email="you@example.com" orcid="0000-0000-0000-0001">
    <may-administer>1</may-administer>
    <may-impersonate>1</may-impersonate>
    <may-review>1</may-review>
  </account>
```

```
</privileges>
```

5.2.2 Invoking djehuty

Once we've configured djehuty for development use, we can start the web interface by running:

```
[env]$ djehuty web --initialize --config-file=config.xml
```

The `--initialize` option creates the internal account record and associates the specified ORCID with it. We only need to run djehuty with the `--initialize` option once.

By now, we should be able to visit djehuty through a web browser at `localhost:8080`, unless configured differently. We should be able to log in through ORCID, and access all features of djehuty.

5.3 Navigating the source code

In this section, we trace the path from invoking djehuty to responding to a HTTP request.

5.3.1 Starting point

Because djehuty is installable as a Python package, we can find the starting point for running djehuty in `pyproject.toml`. It reads:

```
[project.scripts]
djehuty = djehuty.ui:main
```

So, we start our tour at `'src/djehuty/ui.py'` in the procedure called `main`.

5.3.2 How djehuty initializes

The main procedure calls `main_inner`, which handles the command-line arguments. When invoking djehuty, we usually invoke `djehuty web`, which is handled by the following snippet:

```
import djehuty.web.ui as web_ui
...
if args.command == "web":
    web_ui.main (args.config_file, True, args.initialize,
                 args.extract_transactions_from_log,
                 args.apply_transactions)
```

So, the entry-point for the `web` subcommand is found in `src/djehuty/web/ui.py` at the `main` procedure.

This procedure essentially sets up an instance of `WebServer` (found in `src/djehuty/web/wsgi.py` and uses `werkzeug`'s `run_simple` to start the web server.

5.3.3 Translating URI paths to internal procedures

An instance of the `WebServer` is passed along in `werkzeug`'s `run_simple` procedure. `Werkzeug` calls the instance directly, which is handled by the `__call__` procedure of the `WebServer` class. The `__call__` procedure invokes its `wsgi` instance, which is configured as following:

```
self.wsgi = SharedDataMiddleware(self.__respond, self.static_roots)
```

The `__respond` procedure calls `__dispatch_request`

In `__dispatch_request`, the requested URI is translated into the procedure name using the `url_map`. So, except for static resources in the `src/djehuty/web/resources` folder and pre-configured static pages, URIs are handled by a procedure in the `WebServer` instance.

A mapping between a URI and the procedure that is executed to handle the request to that URI can be found in the `url_map` defined in the `WebServer` class in `'wsgi.py'`.

5.3.4 Diving into the code that displays the homepage

As an example, in the `url_map`, we can find the following line:

```
R("/", self.ui_home),
```

In this case, `self` is a reference to an instance of the `WebServer` class, so we look for a procedure called `ui_home` inside the `WebServer` class. Some code editors have a feature to “go to definition” which helps navigating.

The `ui_home` gathers the summary numbers from the SPARQL endpoint with the following line:

```
summary_data = self.db.repository_statistics()
```

And a list of the latest datasets with the following line:

```
records = self.db.latest_datasets_portal(30)
```

It then passes that information to the `__render_template` procedure which renders the `'portal.html'` in the `'src/djehuty/web/resources/html_templates'` folder. The Jinja¹ package is used to interpret the template.

```
return self.__render_template (request, "portal.html",  
                                summary_data = summary_data,  
                                latest = records, ...)
```

¹<https://jinja.palletsprojects.com/en/3.1.x/>

5.3.5 Database communication

In the `ui_home` procedure, we found a call to the `self.db.repository_statistics` procedure. To find out by hand where that procedure can be found, we can look for the place where `self.db` is assigned a value:

```
self.db = database.SparqlInterface()
```

And from there look up where `database` comes from:

```
from djehuty.web import database
```

From which we can conclude that it can be found in `'src/djehuty/web/database.py'`.

In the `repository_statistics` procedure, we find a call to `self.__query_from_template` followed by a call to `__run_query` which takes the output of the former procedure as its input.

As the name implies, `__run_query` sends the query to the SPARQL endpoint and retrieves the results by putting them in a list of Python dictionaries.

The `self.__query_from_template` procedure takes one parameter, which is the name of the template file (minus the extension) that contains a SPARQL query. These templates can be found in the `'src/djehuty/web/resources/sparql_templates'` folder.

Chapter 6

Application Programming Interface

The application programming interface (API) provided by `djehuty` allows for automating tasks otherwise done through the user interface. In addition to automation, the API can also be used to gather additional information, like statistics on Git repositories.

Throughout this chapter we provide examples for using the API using `curl` and `jq`. Another way of seeing the API in action is to use the developer tools in a web browser while performing the desired action using the web user interface.

6.1 Published datasets

The v2 API was designed by Figshare¹. `djehuty` implements a backward-compatible version of it, with the following differences:

1. The `id` property is superseded by the `uuid` property.
2. Error handling is done through precise HTTP error codes, rather than always returning 400 on a usage error.

Unless specified otherwise, the HTTP **Content-Type** to interact with the API is `application/json`. In the case an API call returns information, don't forget to set the HTTP **Accept** header appropriately.

6.1.1 `/v2/articles` (GET)

This API endpoint can be used to retrieve a list of published datasets. Passing (one of) the following parameters will filter or sort the list of datasets:

¹<https://figshare.com>

Parameter	Required	Description
order	Optional	Field to use for sorting.
order_direction	Optional	Can be either <code>asc</code> or <code>desc</code> .
institution	Optional	The institution identifier to filter on.
published_since	Optional	When set, datasets published before this timestamp are dropped from the results.
modified_since	Optional	When set, only datasets modified after this timestamp are shown from the results.
group	Optional	The group identifier to filter on.
resource_doi	Optional	The URL of the DOI of an associated peer-reviewed journal publication. When set, only returns datasets associated with this DOI.
item_type	Optional	Either <code>3</code> for datasets or <code>9</code> for software.
doi	Optional	The DOI of the dataset to search for.
handle	Optional	Unused.
page	Optional	The page number used in combination with <code>page_size</code> .
page_size	Optional	The number of datasets per page. Used in combination with <code>page</code> .
limit	Optional	The maximum number of datasets to output. Used together with <code>offset</code> .
offset	Optional	The number of datasets to skip in the output. Used together with <code>limit</code> .

Example usage:

```
curl "https://data.4tu.nl/v2/articles?limit=100&published_since=2024-07-25" | jq
```

Output of the example:

```
[ /* Example output has been shortened. */
{
  "id": null,
  "uuid": "4f8a9423-83fc-4263-9bb7-2aa83d73865d",
  "title": "Measurement data of a Low Speed Field Test of Tractor Se...",
  "doi": "10.4121/4f8a9423-83fc-4263-9bb7-2aa83d73865d.v1",
  "handle": null,
  "url": "https://data.4tu.nl/v2/articles/4f8a...865d",
  "published_date": "2024-07-26T10:39:57",
  "thumb": null,
  "defined_type": 3,
  "defined_type_name": "dataset",
  "group_id": 28589,
  "url_private_api": "https://data.4tu.nl/v2/account/articles/4f8a...865d",
  "url_public_api": "https://data.4tu.nl/v2/articles/4f8a...865d",
```



```
"url_private_html": "https://data.4tu.nl/my/datasets/4f8a...865d/edit",
"url_public_html": "https://data.4tu.nl/datasets/4f8a...865d/1",
...
}
]
```

6.1.2 /v2/articles/search (POST)

In addition to the parameters of section 6.1.1 `/v2/articles (GET)`, the following parameters can be used.

Parameter	Data type	Required	Description
search_for	string	Optional	The terms to search for.

Example usage:

```
curl --request POST \
  --header "Content-Type: application/json" \
  --data '{"search_for": "djehuty"}' \
  https://data.4tu.nl/v2/articles/search | jq
```

Output of the example:

```
[ /* Example output has been shortened. */
{
  "id": null,
  "uuid": "342efadc-66f8-4e9b-9d27-da7b28b849d2",
  "title": "Source code of the 4TU.ResearchData repository",
  "doi": "10.4121/342efadc-66f8-4e9b-9d27-da7b28b849d2.v1",
  "handle": null,
  "url": "https://data.4tu.nl/v2/articles/342e...49d2",
  "published_date": "2023-03-20T11:29:10",
  "thumb": null,
  "defined_type": 9,
  "defined_type_name": "software",
  "group_id": 28586,
  "url_private_api": "https://data.4tu.nl/v2/account/articles/342e...49d2",
  "url_public_api": "https://data.4tu.nl/v2/articles/342e...49d2",
  "url_private_html": "https://data.4tu.nl/my/datasets/342e...49d2/edit",
  "url_public_html": "https://data.4tu.nl/datasets/342e...49d2/1",
  ...
}
]
```

6.1.3 /v2/articles/<dataset-id> (GET)

This API endpoint can be used to retrieve detailed metadata for the dataset identified by `dataset-id`.

Example usage:

```
curl https://data.4tu.nl/v2/articles/342efadc-66f8-4e9b-9d27-da7b28b849d2 | jq
```

Output of the example:

```
{ /* Example output has been shortened. */
  "files": ...,
  "custom_fields": ...,
  "authors": ...,
  "description": "<p>This dataset contains the source code of the 4TU...",
  "license": ...,
  "tags": ...,
  "categories": ...,
  "references": ...,
  "id": null,
  "uuid": "342efadc-66f8-4e9b-9d27-da7b28b849d2",
  "title": "Source code of the 4TU.ResearchData repository",
  "doi": "10.4121/342efadc-66f8-4e9b-9d27-da7b28b849d2.v1",
  "url": "https://data.4tu.nl/v2/articles/342e...49d2",
  "published_date": "2023-03-20T11:29:10",
  "timeline": ...,
  ...
}
```

6.1.4 /v2/articles/<dataset-id>/versions (GET)

This API endpoint can be used to retrieve a list of versions for the dataset identified by `dataset-id`.

Example usage:

```
curl https://data.4tu.nl/v2/articles/342efadc-66f8-4e9b-9d27-da7b28b849d2/
  versions | jq
```

Output of the example:

```
[
  {
    "version": 1,
    "url": "https://data.4tu.nl/v2/articles/342e...49d2/versions/1"
  }
]
```

6.1.5 /v2/articles/<dataset-id>/versions/<version> (GET)

This API endpoint can be used to retrieve detailed metadata of the version `version` for the dataset identified by `dataset-id`.

Example usage:

```
curl https://data.4tu.nl/v2/articles/342e...49d2/versions/1 | jq
```

The output of the example is identical to the example output of section 6.1.3 `/v2/articles/<dataset-id> (GET)`.

6.1.6 /v2/articles/<dataset-id>/versions/<version>/embargo (GET)

This API endpoint can be used to retrieve embargo information of the version `version` for the dataset identified by `dataset-id`.

Example usage:

```
curl https://data.4tu.nl/v2/articles/c127...8fd7/versions/2/embargo | jq
```

Output of the example:

```
{
  "is_embargoed": true,
  "embargo_date": "2039-06-30",
  "embargo_type": "article",
  "embargo_title": "Under embargo",
  "embargo_reason": "<p>Need consent to publish the data</p>",
  "embargo_options": []
}
```

6.1.7 /v2/articles/<dataset-id>/files (GET)

This API endpoint can be used to retrieve the list of files associated with the dataset identified by `dataset-id`.

Example usage:

```
curl https://data.4tu.nl/v2/articles/342efadc-66f8-4e9b-9d27-da7b28b849d2/files
```

Output of the example:

```
[ /* Example output has been shortened. */
  {
    "id": null,
    "uuid": "d3e1c325-7fa9-4cb9-884e-0b9cd2059292",
    "name": "djehuty-0.0.1.tar.gz",
```

```
"size": 3713709,  
"is_link_only": false,  
"is_incomplete": false,  
"download_url": "https://data.4tu.nl/file/342e...49d2/d3e1...9292",  
"supplied_md5": null,  
"computed_md5": "910e9b0f79a0af548f59b3d8a56c3bf4"  
}  
]
```

6.1.8 /v2/articles/<dataset-id>/files/<file-id> (GET)

This API endpoint can be used to retrieve all metadata of the file identified by `file-id` associated with the dataset identified by `dataset-id`.

Example usage:

```
curl https://data.4tu.nl/v2/articles/342e...49d2/files/d3e1...9292 | jq
```

Output of the example:

```
{ /* Example output has been shortened. */  
  "id": null,  
  "uuid": "d3e1c325-7fa9-4cb9-884e-0b9cd2059292",  
  "name": "djehuty-0.0.1.tar.gz",  
  "size": 3713709,  
  "is_link_only": false,  
  "is_incomplete": false,  
  "download_url": "https://data.4tu.nl/file/342e...49d2/d3e1...9292",  
  "supplied_md5": null,  
  "computed_md5": "910e9b0f79a0af548f59b3d8a56c3bf4"  
}
```

6.2 Published collections

6.2.1 /v2/collections (GET)

This API endpoint can be used to retrieve a list of collections published in the data repository.

The following parameters can be used:

Parameter	Required	Description
order	Optional	Field to use for sorting.
order_direction	Optional	Can be either <code>asc</code> or <code>desc</code> .
institution	Optional	The institution identifier to filter on.
published_since	Optional	When set, collections published before this timestamp are dropped from the results.
modified_since	Optional	When set, only collections modified after this timestamp are shown from the results.
group	Optional	The group identifier to filter on.
resource_doi	Optional	The URL of the DOI of an associated peer-reviewed journal publication. When set, only returns collections associated with this DOI.
doi	Optional	The DOI of the collection to search for.
handle	Optional	Unused.
page	Optional	The page number used in combination with <code>page_size</code> .
page_size	Optional	The number of collections per page. Used in combination with <code>page</code> .
limit	Optional	The maximum number of collections to output. Used together with <code>offset</code> .
offset	Optional	The number of collections to skip in the output. Used together with <code>limit</code> .

Example usage:

```
curl "https://data.4tu.nl/v2/collections?limit=100&published_since=2024-07-25" | jq
```

Output of the example:

```
[ /* Example output has been shortened. */
{
  "id": null,
  "uuid": "0fe9ab80-6e6a-4087-a509-ce09dddfa3d9",
  "title": "PhD research 'Untangling the complexity of local water ...'",
  "doi": "10.4121/0fe9ab80-6e6a-4087-a509-ce09dddfa3d9.v1",
  "handle": "",
  "url": "https://data.4tu.nl/v2/collections/0fe9...fa3d9",
  "timeline": {
    "posted": "2024-08-13T14:09:52",
    "firstOnline": "2024-08-13T14:09:51",
    ...
  },
  "published_date": "2024-08-13T14:09:52"
```

```
},
...
]
```

6.2.2 /v2/collections/search (POST)

This API endpoint can be used to search for collections published in the data repository.

In addition to the parameters of section 6.2.1 ‘/v2/collections (GET)’, the following parameters can be used.

Parameter	Required	Description
search_for	Optional	The terms to search for.

Example usage:

```
curl --request POST \
  --header "Content-Type: application/json" \
  --data '{ "search_for": "wingtips" }' \
  https://data.4tu.nl/v2/collections/search | jq
```

Output of the example:

```
[ /* Example output has been shortened. */
  {
    "id": 6070238,
    "uuid": "3dfc4ef2-7f79-4d33-81a7-9c6ae09a2782",
    "title": "Flared Folding Wingtips - TU Delft",
    "doi": "10.4121/c.6070238.v1",
    "handle": "",
    "url": "https://data.4tu.nl/v2/collections/3dfc...2782",
    "timeline": {
      "posted": "2023-04-05T15:05:04",
      "firstOnline": "2023-04-05T15:05:03",
      ...
    },
    "published_date": "2023-04-05T15:05:04"
  },
  ...
]
```

6.2.3 /v2/collections/<collection-id> (GET)

This API endpoint can be used to retrieve detailed metadata for the collection identified by [collection-id](#).

Example usage:

```
curl https://data.4tu.nl/v2/collections/3dfc4ef2-7f79-4d33-81a7-9c6ae09a2782 | jq
```

Output of the example:

```
{ /* Example output has been shortened. */
  "version": 3,
  ...
  "description": "<p>This collection contains the results of the work ...",
  "categories": [ ... ],
  "references": [],
  "tags": [ ... ],
  "created_date": "2024-08-08T15:48:55",
  "modified_date": "2024-08-12T11:24:39",
  "id": 6070238,
  "uuid": "3dfc4ef2-7f79-4d33-81a7-9c6ae09a2782",
  "title": "Flared Folding Wingtips - TU Delft",
  "doi": "10.4121/c.6070238.v3",
  "published_date": "2024-08-12T11:24:40",
  "timeline": ...
  ...
}
```

6.2.4 /v2/collections/<collection-id>/versions (GET)

This API endpoint can be used to retrieve a list of versions for the collection identified by `collection-id`.

Example usage:

```
curl https://data.4tu.nl/v2/collections/3dfc4ef2-7f79-4d33-81a7-9c6ae09a2782/
  versions | jq
```

Output of the example:

```
[ /* Example output has been shortened. */
  {
    "version": 3,
    "url": "https://data.4tu.nl/v2/collections/3dfc...2782/versions/3"
  },
  {
    "version": 2,
    "url": "https://data.4tu.nl/v2/collections/3dfc...2782/versions/2"
  },
  {
    "version": 1,
    "url": "https://data.4tu.nl/v2/collections/3dfc...2782/versions/1"
  }
]
```

```
}
]
```

6.2.5 /v2/collections/<collection-id>/versions/<version> (GET)

This API endpoint can be used to retrieve detailed metadata of the version `version` for the collection identified by `collection-id`.

Example usage:

```
curl https://data.4tu.nl/v2/collections/3dfc...2782/versions/2 | jq
```

Output of the example:

```
{ /* Example output has been shortened. */
  "version": 2,
  ...
  "description": "<p>This collection contains the results of the work ...",
  "categories": [ ... ],
  "references": [],
  "tags": [ ... ],
  "references": [],
  "tags": [ ... ],
  "authors": [ ... ],
  "created_date": "2023-04-05T15:07:35",
  "modified_date": "2023-05-26T15:19:11",
  "id": 6070238,
  "uuid": "3dfc4ef2-7f79-4d33-81a7-9c6ae09a2782",
  "title": "Flared Folding Wingtips - TU Delft",
  "doi": "10.4121/c.6070238.v2",
  ...
}
```

6.2.6 /v2/collections/<collection-id>/articles (GET)

This API endpoint can be used to retrieve the list of datasets in the collection identified by `collection-id`.

Example usage:

```
curl https://data.4tu.nl/v2/collections/3dfc...2782/articles | jq
```

Output of the example:

```
[ /* Example output has been shortened. */
  {
```



```
"id": 20222334,  
"uuid": "c5fde4a2-798a-456e-b793-cf64e486c0e8",  
"title": "E001 - Stiffness and Hinge Release Study (October 2021) ...",  
"doi": "10.4121/20222334.v2",  
"published_date": "2023-05-31T08:57:54",  
"defined_type": 3,  
"defined_type_name": "dataset",  
"group_id": 28586,  
"timeline": {  
  "posted": "2023-05-31T08:57:54",  
  "firstOnline": "2023-05-26T15:08:09",  
  "revision": null  
},  
"resource_title": "Effect of Wing Stiffness and Folding Wingtip ...",  
"resource_doi": "https://doi.org/10.2514/1.C037108"  
},  
{  
  "id": null,  
  "uuid": "984090ea-26fd-4809-8dac-f41367bf8916",  
  "title": "M001 - GVT Data and Nastran models (August 2024) ...",  
  "doi": "10.4121/984090ea-26fd-4809-8dac-f41367bf8916.v1",  
  "published_date": "2024-08-12T11:21:47",  
  "defined_type": 3,  
  "defined_type_name": "dataset",  
  "group_id": 28586,  
  "timeline": {  
    "posted": "2024-08-12T11:21:47",  
    "firstOnline": "2024-08-12T11:21:46",  
    "revision": null  
  },  
  "resource_title": "Effect of Wing Stiffness and Folding Wingtip ...",  
  "resource_doi": "https://doi.org/10.2514/1.C037108"  
}  
]  
]
```

6.3 Categories

6.3.1 /v2/categories (GET)

Each dataset and collection is categorized using a controlled vocabulary of categories. This API endpoint provides those categories.

Example usage:

```
curl https://data.4tu.nl/v2/categories | jq
```

Output of the example:

```
[ /* Example output has been shortened. */
{
  "id": 13622,
  "uuid": "01fddd41-68d2-4e28-9d9c-18347847e7d1",
  "title": "Mining and Extraction of Energy Resources",
  "parent_id": 13620,
  "parent_uuid": "6e5bdc69-96db-41e4-ac0b-18812b46c49c",
  "path": "",
  "source_id": null,
  "taxonomy_id": null
},
{
  "id": 13443,
  "uuid": "026f555c-2826-4a83-97ff-0f230fb54ddb",
  "title": "Livestock Raising",
  "parent_id": 13440,
  "parent_uuid": "45a8c849-ab59-4302-af79-09b8c0677df8",
  "path": "",
  "source_id": null,
  "taxonomy_id": null
},
...
]
```

6.4 Licences

6.4.1 /v2/licenses (GET)

Publishing a dataset involves communicating under which conditions it can be re-used. The licenses under which you can publish a dataset can be found with this API endpoint.

Example usage:

```
curl https://data.4tu.nl/v2/licenses | jq
```

Output of the example:

```
[ /* Example output has been shortened. */
{
  "value": 1,
  "name": "CC BY 4.0",
  "url": "https://creativecommons.org/licenses/by/4.0/",
  "type": "data"
},
```

```
{
  "value": 10,
  "name": "CC BY-NC 4.0",
  "url": "https://creativecommons.org/licenses/by-nc/4.0/",
  "type": "data"
},
...
]
```

6.5 Account properties

The interaction with the v2 private interface API requires an API token. Such a token can be obtained from the dashboard page after logging in. This token can then be passed along in the **Authorization** HTTP header as:

```
Authorization: token YOUR_TOKEN_HERE
```

6.5.1 /v2/account (GET)

This API endpoint can be used to retrieve information about the account identified with the API token.

Example usage:

```
curl --header "Authorization: token YOUR_TOKEN_HERE" \
  https://data.4tu.nl/v2/account | jq
```

Output of the example:

```
{ /* Example output has been shortened. */
  "id": null,
  "uuid": "df7c0e54-b988-42b1-a815-308513d2f269",
  "is_active": true,
  "is_public": false,
  ...
}
```

6.6 Authors

6.6.1 /v2/account/authors/search (POST)

This API endpoint can be used to search for authors known to the data repository.

The following parameter can be used:

Parameter	Data type	Required	Description
search	string	Yes	The string to search for.

Example usage:

```
curl --request POST \
  --header "Authorization: token YOUR_TOKEN_HERE" \
  --data '{ "search": "John Doe" }' \
  https://data.4tu.nl/v2/account/authors/search | jq
```

Output of the example:

```
[ /* This example output has been shortened. */
  {
    "full_name": "John Doe Jr",
    "uuid": "08f4d496-67b5-4b7c-b2d2-923458d1f450",
    "orcid_id": "",
    ...
  },
  {
    "full_name": "John Doe",
    "uuid": "6815031c-21dc-4873-93c9-f6539da482ce",
    "orcid_id": "",
    ...
  }
]
```

6.6.2 /v2/account/authors/<author-id> (GET)

This API endpoint returns a detailed author record for the author identified by `author-id`.

Example usage:

```
curl --header "Authorization: token YOUR_TOKEN_HERE" \
  https://data.4tu.nl/v2/account/authors/5c75...94aa | jq
```

Output of the example:

```
{ /* This example output has been shortened. */
  "first_name": "Roel",
  "full_name": "Roel Janssen",
  "uuid": "5c752155-60ff-41d7-9b88-b7112afc94aa",
  "last_name": "Janssen",
  "orcid_id": "0000-0003-4324-5350",
  ...
}
```

6.7 Institutions

6.7.1 /v2/account/institution (GET)

This API endpoint returns the accounts within your institution.

Example usage:

```
curl --header "Accept: application/json" \  
  --header "Authorization: token ${API_TOKEN}" \  
  https://data.4tu.nl/v2/account/institution/accounts | jq
```

Output of the example:

```
[  
  { /* This example output has been shortened. */  
    "uuid": "485a04c8-7fb0-4361-856f-470930c5fec0",  
    "first_name": "Roel",  
    "last_name": "Janssen",  
    "full_name": "Roel Janssen",  
    "is_active": true,  
    "is_public": false,  
    ...  
  },  
  ...  
]
```

6.7.2 /v2/account/institution/users/<account-id> (GET)

This API endpoint returns account information for the specified [account-id](#).

Example usage:

```
curl --header "Accept: application/json" \  
  --header "Authorization: token ${API_TOKEN}" \  
  https://data.4tu.nl/v2/account/institution/users/485a...fec0 | jq
```

Output of the example:

```
{ /* This example output has been shortened. */  
  "uuid": "485a04c8-7fb0-4361-856f-470930c5fec0",  
  "first_name": "Roel",  
  "last_name": "Janssen",  
  "full_name": "Roel Janssen",  
  "is_active": true,  
  "is_public": false,  
  ...  
}
```

```
}
```

6.8 Git repositories

A published dataset may include a Git repository in its publication. The Git repository has a unique UUID that isn't re-used between versions of the same publication.

6.8.1 /v3/datasets/<git-uuid>.git (GET)

This endpoint can be used to pass as a URL to `git clone`.

Example usage:

```
git clone https://data.4tu.nl/v3/datasets/de82...20b7.git
```

Output of the example:

```
Cloning into 'djuhuty'...
remote: Enumerating objects: 24850, done.
remote: Counting objects: 100% (4171/4171), done.
remote: Compressing objects: 100% (599/599), done.
remote: Total 24850 (delta 3963), reused 3647 (delta 3571), pack-reused 20679 (
  from 2)
Receiving objects: 100% (24850/24850), 11.41 MiB | 569.00 KiB/s, done.
Resolving deltas: 100% (17094/17094), done.
```

6.8.2 /v3/datasets/<git-uuid>.git/zip (GET)

This endpoint offers a ZIP file to download the files in the Git repository without using Git. The ZIP file is generated on the spot, and therefore, the timestamps of files within the ZIP file are set to *January 1, 1980* to ensure that downloading a ZIP file multiple times results in an identical ZIP file.

6.8.3 /v3/datasets/<git-uuid>.git/languages (GET)

This API endpoint can be used to gather which programming languages are used in which ratio to each other for the Git repository identified by the `git-uuid`.

The number returned per programming language is the sum of the number of bytes of files identified to belong to that programming language.

Example usage:

```
curl --header "Accept: application/json" \
  https://data.4tu.nl/v3/datasets/de82...20b7.git/languages
```

Output of the example:

```
{ /* Example output has been shortened. */  
  "Python": 963065,  
  "JavaScript": 188239,  
  "HTML": 186766,  
  ...  
}
```

6.8.4 /v3/datasets/<git-uuid>.git/contributors (GET)

This API endpoint provides contributions in the form of additions, deletions and commits per week per author.

Example usage:

```
curl --header "Accept: application/json" \  
  https://data.4tu.nl/v3/datasets/de82...20b7.git/contributors
```

Output of the example:

```
[ /* Example output has been annotated and shortened. */  
  {  
    "total": 2769,  
    "additions": 94508,  
    "deletions": 62028,  
    "weeks": [  
      {  
        "w": 1624831200, /* Timestamp for the week */  
        "a": 100,       /* Additions */  
        "d": 0,         /* Deletions */  
        "c": 2          /* Commits */  
      },  
      ...  
    ],  
    "author": {  
      "name": "Roel Janssen",  
      "email": "...", /* Omitted from the example. */  
    }  
  },  
  ...  
]
```

6.9 Creating and editing datasets

6.9.1 /v2/account/articles (GET)

This API endpoint lists the draft datasets of the account to which the authorization token belongs.

The following parameters can be used:

Parameter	Required	Description
page	Optional	The page number used in combination with <code>page_size</code> .
page_size	Optional	The number of datasets per page. Used in combination with <code>page</code> .
limit	Optional	The maximum number of datasets to output. Used together with <code>offset</code> .
offset	Optional	The number of datasets to skip in the output. Used together with <code>limit</code> .

Example usage:

```
curl --header "Authorization: token YOUR_TOKEN_HERE" \
https://data.4tu.nl/v2/account/articles | jq
```

Output of the example:

```
{ /* Example output has been shortened. */
  "id": null,
  "uuid": "6ddd7a31-8ad8-4c20-95a3-e68fe716fa42",
  "title": "Example draft dataset",
  "doi": null,
  "handle": null,
  "url": "https://data.4tu.nl/v2/articles/6ddd7a31-8ad8-4c20-95a3-e68fe716fa42",
  "published_date": null,
  ...
}
```

6.9.2 /v2/account/articles (POST)

This API endpoint can be used to create a new dataset.

The following parameters can be used:

Parameter	Data type	Description
title	string	The title of the dataset.
description	string	A description of the dataset.
tags	list of strings	Keywords to enhance the findability of the dataset. Instead of using the key <code>tags</code> , you may also use the key <code>keywords</code> .
keywords	list of strings	See <code>tags</code> .
references	list of strings	URLs to resources referring to this dataset, or resources that this dataset refers to.
categories	list of strings	Categories are a controlled vocabulary and can be used to make the collection findable in the categorical overviews. The <code>string</code> values expected here can be found under the <code>uuid</code> property with a call to <code>/v2/categories</code> . For more details, see section 6.3.1 <code>'/v2/categories (GET)'</code> .
authors	list of author records	
defined_type	string	One of: <code>figure</code> , <code>online resource</code> , <code>preprint</code> , <code>book</code> , <code>conference contribution</code> , <code>media</code> , <code>dataset</code> , <code>poster</code> , <code>journal contribution</code> , <code>presentation</code> , <code>thesis</code> or <code>software</code> .
funding	string	One-liner to cite funding.
funding_list	list of funding records	
license	integer	Licences communicate under which conditions the dataset can be re-used. The <code>integer</code> value to submit here can be found as the <code>value</code> property in a call to <code>/v2/licences</code> . For more details, see section 6.4.1 <code>'/v2/licenses (GET)'</code> .
language	string	An ISO 639-1 language code.
doi	string	Do not use this field as a DOI will be automatically assigned upon publication.
handle	string	Do not use this field as it is deprecated.
resource_doi	string	The URL of the DOI of an associated peer-reviewed journal publication.
resource_title	string	The title of the associated peer-reviewed journal publication.
publisher	string	The name of the data repository publishing the dataset.
custom_fields	list of key-value pairs	An <code>Object</code> where each key is a field name and each value is the corresponding value. Allowed values are: <code>contributors</code> , <code>data_link</code> , <code>derived_from</code> , <code>format</code> , <code>geolocation</code> , <code>language</code> , <code>latitude</code> , <code>longitude</code> , <code>organizations</code> , <code>publisher</code> , <code>same_as</code> , <code>time_coverage</code> .
custom_fields_list	list of <code>Objects</code>	Each <code>Object</code> should have two keys: <code>name</code> and <code>value</code> . For allowed keys, see <code>custom_fields</code> .
timeline		Do not use this field because it will be automatically populated during the publication process.

Example usage:

```
curl --header "Authorization: token YOUR_TOKEN_HERE" \  
  --header "Content-Type: application/json" \  
  --data '{ "title": "Example dataset" }' \  
  https://data.4tu.nl/v2/account/articles | jq
```

Output of the example:

```
{ /* The UUID in this example has been shortened. */  
  "location": "https://data.4tu.nl/v2/account/articles/d7b3...995b1",  
  "warnings": []  
}
```

6.9.3 /v2/account/articles/<dataset-id> (GET)

This API endpoint lists details of the dataset identified by `dataset-id`.

Example usage:

```
curl --header "Authorization: token YOUR_TOKEN_HERE" \  
  https://data.4tu.nl/v2/account/articles/d7b3daa5-45e2-47b0-9910-0f7fa6a995b1  
  | jq
```

Output of the example:

```
{ /* Example output has been shortened. */  
  "files": [],  
  "authors": [],  
  "id": null,  
  "uuid": "637e9a3b-3e6d-4810-bc8d-f15ab1d6a4d7",  
  "title": "Example dataset",  
  ...  
}
```

6.9.4 /v2/account/articles/<dataset-id> (PUT)

This API endpoint can be used to update the metadata of the dataset identified by `dataset-id`.

The following parameters can be used:

Parameter	Required	Description
title	string	The title of the dataset.
description	string	A description of the dataset.
resource_doi	string	The URL of the DOI of an associated peer-reviewed journal publication.
resource_title	string	The title of the associated peer-reviewed journal publication.
license	integer	Licences communicate under which conditions the dataset can be re-used. The integer value to submit here can be found as the value property in a call to /v2/licences . For more details, see section 6.4.1 ‘ /v2/licenses (GET) ’.
group_id	integer	
time_coverage	string	Free-text field to describe the time coverage of the dataset.
publisher	string	The name of the data repository publishing the dataset.
language	string	An ISO 639-1 language code.
contributors	string	Free-text field to indicate contributors to the dataset other than direct authors.
license_remarks	string	Free-text field to clarify licensing details.
geolocation	string	Free-text field to specify a location.
longitude	string	The longitude coordinate of the location.
latitude	string	The latitude coordinate of the location.
format	string	Free-text field to indicate the data format(s) used in the dataset.
data_link	string	URL to where the data can be found. This is only applicable when data is not directly uploaded.
derived_from	string	DOI or URL of a dataset from which this dataset is derived from.
same_as	string	DOI or URL of the dataset that is the same as this one.
organizations	string	Free-text field to specify organizations that contributed or are associated with the dataset.
is_embargoed	boolean	Set to true when the dataset is under embargo.
embargo_options	Object	An Object with an id property that can have either the integer value 1000 to indicate the dataset has no end-date for the embargo or the integer value 1001 to indicate that the dataset is permanently closed-access.
embargo_until_date	string	A date indicator for when the dataset will be available publically.
embargo_type	string	Either file for files-only embargo or article to also hide the metadata, except for the title and authors of the dataset.
embargo_title	string	Title of the embargo.

Example usage:

```
curl --verbose --request PUT \
  --header "Authorization: token YOUR_TOKEN_HERE" \
  --data '{ "title": "Updated title" }'
https://data.4tu.nl/v2/account/articles/d7b3daa5-45e2-47b0-9910-0f7fa6a995b1
| jq
```

HTTP response of the example:

```
HTTP/1.1 205 RESET CONTENT
```

6.9.5 /v2/account/articles/<dataset-id> (DELETE)

This API endpoint can be used to delete a draft dataset.

Example usage:

```
curl --verbose --request DELETE \
  --header "Authorization: token YOUR_TOKEN_HERE" \
  https://data.4tu.nl/v2/account/articles/d7b3daa5-45e2-47b0-9910-0f7fa6a995b1
```

HTTP response of the example:

```
HTTP/1.1 204 NO CONTENT
```

6.9.6 /v2/account/articles/<dataset-id>/authors (GET)

This API endpoint lists the authors of the dataset identified by `dataset-id`. The following URL parameters can be used:

Parameter	Required	Description
order	Optional	Field to use for sorting.
order_direction	Optional	Can be either <code>asc</code> or <code>desc</code> .
limit	Optional	The maximum number of datasets to output. Used together with <code>offset</code> .

Example usage:

```
curl --header "Authorization: token YOUR_TOKEN_HERE" \
  https://data.4tu.nl/v2/account/articles/d7b3daa5-45e2-47b0-9910-0f7fa6a995b1
| jq
```

Output of the example:

```
[
  {
    "id": null,
    "uuid": "08f4d496-67b5-4b7c-b2d2-923458d1f450",
    "full_name": "John Doe Jr",
    "is_active": false,
    "url_name": null,
    "orcid_id": ""
  },
  {
    "id": null,
    "uuid": "6815031c-21dc-4873-93c9-f6539da482ce",
    "full_name": "John Doe",
    "is_active": false,
    "url_name": null,
    "orcid_id": ""
  }
]
```

6.9.7 /v2/account/articles/<dataset-id>/authors (POST)

This API endpoint can be used to append authors to the dataset identified by `dataset-id`.

The following parameters can be used:

Parameter	Data type	Required	Description
full_name	string	No	The full name of the author.
first_name	string	Yes	The first name of the author.
last_name	string	Yes	The last name of the author.
email	string	No	The e-mail address of the author.
orcid_id	string	No	The ORCID identifier for the author.
job_title	string	No	The job title of the author.

Example usage:

```
curl --request POST \
  --header "Authorization: token YOUR_TOKEN_HERE" \
  --header "Content-Type: application/json" \
  --data '{ "authors": [{ "name": "John Doe" } ] }' \
  https://data.4tu.nl/v2/account/articles/d7b3daa5-45e2-47b0-9910-0f7fa6a995b1
/authors
curl --request POST \
  --header "Authorization: token YOUR_TOKEN_HERE" \
  --header "Content-Type: application/json" \
```

```
--data '{ "authors": [{ "name": "John Doe Jr" }]} ' \
https://data.4tu.nl/v2/account/articles/d7b3daa5-45e2-47b0-9910-0f7fa6a995b1
/authors
```

The following is an example of the output of the HTTP POST calls:

```
HTTP/1.1 205 RESET CONTENT
```

An example of the output of the HTTP GET call can be found in 6.9.6 `'/v2/account/articles/<dataset-id>/authors (GET)'`.

6.9.8 /v2/account/articles/<dataset-id>/authors (PUT)

In contrast to 6.9.7 `'/v2/account/articles/<dataset-id>/authors (POST)'`, this API endpoint can be used to **overwrite** the list of authors of the dataset identified by `dataset-id`.

Example usage:

```
curl --request PUT \
  --header "Authorization: token YOUR_TOKEN_HERE" \
  --header "Content-Type: application/json" \
  --data '{ "authors": [{ "name": "John Doe" }]} ' \
  https://data.4tu.nl/v2/account/articles/d7b3daa5-45e2-47b0-9910-0f7fa6a995b1
/authors

curl --request PUT \
  --header "Authorization: token YOUR_TOKEN_HERE" \
  --header "Content-Type: application/json" \
  --data '{ "authors": [{ "name": "John Doe Jr" }]} ' \
  https://data.4tu.nl/v2/account/articles/d7b3daa5-45e2-47b0-9910-0f7fa6a995b1
/authors

curl --header "Authorization: token YOUR_TOKEN_HERE" \
  https://data.4tu.nl/v2/account/articles/d7b3daa5-45e2-47b0-9910-0f7fa6a995b1
| jq
```

Output of the example:

```
[
  {
    "id": null,
    "uuid": "61751fe3-53a1-477f-a46f-e534cbd0b618",
    "full_name": "John Doe Jr",
    "is_active": false,
    "url_name": null,
    "orcid_id": ""
  },
]
```

```
]
```

6.9.9 /v2/account/articles/<dataset-id>/authors/<author-id> (DELETE)

This API endpoint can be used to delete an author's association with a dataset.

Example usage:

```
curl --request DELETE \  
  --header "Authorization: token YOUR_TOKEN_HERE" \  
  https://data.4tu.nl/v2/account/articles/d7b3...995b1/authors/6175...0b618
```

HTTP response of the example:

```
HTTP/1.1 204 NO CONTENT
```

6.9.10 /v2/account/articles/<dataset-id>/funding (GET)

This API endpoint lists the funding of the dataset identified by `dataset-id`.

Example usage:

```
curl --header "Authorization: token YOUR_TOKEN_HERE" \  
  https://data.4tu.nl/v2/account/articles/d7b3...95b1/funding | jq
```

Output of the example:

```
[  
  {  
    "id": null,  
    "uuid": "6f605fe1-e87a-43f5-8b67-70ebe3f9b868",  
    "title": "Example cases fund",  
    "grant_code": "EXA-001",  
    "funder_name": "Example",  
    "is_user_defined": null,  
    "url": "https://example.exa"  
  }  
]
```

6.9.11 /v2/account/articles/<dataset-id>/funding (POST)

This API endpoint can be used to append funders to the dataset identified by `dataset-id`.

The following parameters can be used:

Parameter	Data type	Required	Description
uuid	string	No	The uuid of an existing funding record. When this parameter is set, other parameters will be ignored.
title	string	Yes	The title of the funding project.
grant_code	string	No	An optional grant code of the funding.
funder_name	string	No	The name of the funder.
url	string	No	A URL to the funding project or funding organization.

Example usage:

```
curl --verbose --request POST \
  --header "Authorization: token YOUR_TOKEN_HERE" \
  --header "Content-Type: application/json" \
  --data '{ "funders": [{ "title": "Example cases fund", \
                        "grant_code": "EXA-001", \
                        "funder_name": "Example", \
                        "url": "https://example.exa" }]} ' \
  https://data.4tu.nl/v2/account/articles/d7b3daa5-45e2-47b0-9910-0f7fa6a995b1/funding
```

HTTP response of the example:

```
HTTP/1.1 205 RESET CONTENT
```

6.9.12 /v2/account/articles/<dataset-id>/funding (PUT)

In contrast to 6.9.11 ‘/v2/account/articles/<dataset-id>/funding (POST)’, this API endpoint can be used to **overwrite** the list of funders of the dataset identified by [dataset-id](#).

```
curl --verbose --request PUT \
  --header "Authorization: token YOUR_TOKEN_HERE" \
  --header "Content-Type: application/json" \
  --data '{ "funders": [{ "title": "Example cases fund", \
                        "grant_code": "EXA-001", \
                        "funder_name": "Example", \
                        "url": "https://example.exa" }]} ' \
  https://data.4tu.nl/v2/account/articles/d7b3daa5-45e2-47b0-9910-0f7fa6a995b1/funding
```

HTTP response of the example:

```
HTTP/1.1 205 RESET CONTENT
```


6.9.13 /v2/account/articles/<dataset-id>/funding/<funding-id> (DELETE)

This API endpoint can be used to delete an funder's association with a dataset.

Example usage:

```
curl --request DELETE \  
  --header "Authorization: token YOUR_TOKEN_HERE" \  
  https://data.4tu.nl/v2/account/articles/d7b3...995b1/funding/d50e...7500
```

HTTP response of the example:

```
HTTP/1.1 204 NO CONTENT
```

6.9.14 /v2/account/articles/<dataset-id>/categories (GET)

This API endpoint lists the categories of the dataset identified by `dataset-id`. The identifiers for the categories can be found by using the API endpoint described at 6.3.1 `'/v2/categories (GET)'`.

Example usage:

```
curl --header "Authorization: token YOUR_TOKEN_HERE" \  
  https://data.4tu.nl/v2/account/articles/d7b3...95b1/categories | jq
```

Output of the example:

```
[  
  {  
    "id": 13558,  
    "uuid": "8f27eb44-0a63-4496-ba6d-e3cbf4efa6c7",  
    "title": "Other Earth Sciences",  
    "parent_id": 13551,  
    "parent_uuid": "dd4dbaaf-0610-4d8d-8b07-e1eeb32dd11c",  
    "path": "",  
    "source_id": null,  
    "taxonomy_id": null  
  },  
  {  
    "id": 13551,  
    "uuid": "dd4dbaaf-0610-4d8d-8b07-e1eeb32dd11c",  
    "title": "Earth Sciences",  
    "parent_id": null,  
    "parent_uuid": null,  
    "path": "",  
    "source_id": null,  
    "taxonomy_id": null  
  }  
]
```

```
]
```

6.9.15 /v2/account/articles/<dataset-id>/categories (POST)

This API endpoint can be used to append categories to the dataset identified by `dataset-id`. The parameters sent to the server should be a JSON object with a single key named `categories`, with as value a list of either the numeric or the UUID identifiers for a category. The API endpoint described in 6.9.14 ‘/v2/account/articles/<dataset-id>/categories (GET)’ shows how to obtain the category identifiers.

Example usage:

```
curl --verbose --request POST \  
  --header "Authorization: token YOUR_TOKEN_HERE" \  
  --header "Content-Type: application/json" \  
  --data '{ "categories": [13551, 13558]}' \  
  https://data.4tu.nl/v2/account/articles/d7b3...995b1/categories
```

HTTP response of the example:

```
HTTP/1.1 205 RESET CONTENT
```

6.9.16 /v2/account/articles/<dataset-id>/categories (PUT)

In contrast to 6.9.15 ‘/v2/account/articles/<dataset-id>/categories (POST)’, this API endpoint can be used to **overwrite** the list of categories of the dataset identified by `dataset-id`.

Example usage:

```
curl --verbose --request POST \  
  --header "Authorization: token YOUR_TOKEN_HERE" \  
  --header "Content-Type: application/json" \  
  --data '{ "categories": ["dd4dbaaf-0610-4d8d-8b07-e1eeb32dd11c"]}' \  
  https://data.4tu.nl/v2/account/articles/d7b3...995b1/categories
```

HTTP response of the example:

```
HTTP/1.1 205 RESET CONTENT
```

6.9.17 /v2/account/articles/<dataset-id>/categories/<category-id> (DELETE)

This API endpoint can be used to delete a category’s association with a dataset. The `category-id` can be either the `uuid` or the `id` property.

Example usage:

```
curl --request DELETE \  
  --header "Authorization: token YOUR_TOKEN_HERE" \  
  https://data.4tu.nl/v2/account/articles/d7b3...995b1/categories/5c61...b668
```

HTTP response of the example:

```
HTTP/1.1 204 NO CONTENT
```

6.9.18 /v2/account/articles/<dataset-id>/embargo (GET)

This API endpoint lists the embargo status of the dataset identified by `dataset-id`.

Example usage:

```
curl --header "Authorization: token YOUR_TOKEN_HERE" \  
  https://data.4tu.nl/v2/account/articles/d7b3...995b1/embargo | jq
```

Output of the example:

```
{  
  "is_embargoed": false,  
  "embargo_date": null,  
  "embargo_type": "file",  
  "embargo_title": "",  
  "embargo_reason": "",  
  "embargo_options": []  
}
```

6.9.19 /v2/account/articles/<dataset-id>/embargo (DELETE)

This API endpoint can be used to remove an embargo on the dataset identified by `dataset-id`.

Example usage:

```
curl --verbose --request DELETE \  
  --header "Authorization: token YOUR_TOKEN_HERE" \  
  https://data.4tu.nl/v2/account/articles/d7b3d...995b1/embargo
```

HTTP response of the example:

```
HTTP/1.1 204 NO CONTENT
```

6.9.20 /v2/account/articles/<dataset-id>/files (GET)

This API endpoint lists files associated with the dataset identified by `dataset-id`.

Example usage:

```
curl --header "Authorization: token YOUR_TOKEN_HERE" \
      https://data.4tu.nl/v2/account/articles/d7b3...995b1/files | jq
```

Output of the example:

```
[ /* Example output has been shortened. */
  {
    "id": null,
    "uuid": "d112d0cd-bc15-4f8e-9013-930750fc017a",
    "name": "README.md",
    "size": 3696,
    "is_link_only": false,
    "is_incomplete": false,
    "download_url": "https://next.data.4tu.nl/file/d7b3...995b1/d112...c017a",
    "supplied_md5": null,
    "computed_md5": "c5b36584a0d62d28e9bf9e6892d9ebac"
  }
]
```

6.9.21 /v2/account/articles/<dataset-id>/files (DELETE)

Note: This API endpoint is a djehuty extension to the original specification.

This API endpoint can be used to delete all files associated with the dataset identified by `dataset-id`.

Example usage:

```
curl --request DELETE \
      --header "Authorization: token YOUR_TOKEN_HERE" \
      --header "Content-Type: application/json" \
      --data '{ "remove_all": true }' \
      https://data.4tu.nl/v2/account/articles/d7b3...995b1/files
```

HTTP response of the example:

```
HTTP/1.1 204 NO CONTENT
```

6.9.22 /v2/account/articles/<dataset-id>/files/<file-id> (GET)

This API endpoint lists files associated with the dataset identified by `dataset-id`.

Example usage:

```
curl --header "Authorization: token YOUR_TOKEN_HERE" \  
https://data.4tu.nl/v2/account/articles/d7b3...995b1/files | jq
```

Output of the example:

```
[ /* Example output has been shortened. */  
  {  
    "id": null,  
    "uuid": "d112d0cd-bc15-4f8e-9013-930750fc017a",  
    "name": "README.md",  
    "size": 3696,  
    "is_link_only": false,  
    "is_incomplete": false,  
    "download_url": "https://next.data.4tu.nl/file/d7b3...995b1/d112...c017a",  
    "supplied_md5": null,  
    "computed_md5": "c5b36584a0d62d28e9bf9e6892d9ebac"  
  }  
]
```

6.9.23 /v2/account/articles/<dataset-id>/private_links (GET)

This API endpoint lists the private links associated with the dataset identified by `dataset-id`.

Example usage:

```
curl --header "Authorization: token YOUR_TOKEN_HERE" \  
https://data.4tu.nl/v2/account/articles/d7b3...995b1/private_links | jq
```

Output of the example:

```
[  
  {  
    "id": "8G2f...IJPO",  
    "is_active": true,  
    "expires_date": "2032-01-01T00:00:00"  
  },  
  {  
    "id": "Hb0a...diitg",  
    "is_active": true,  
    "expires_date": "2026-01-01T00:00:00"  
  }  
]
```

6.9.24 /v2/account/articles/<dataset-id>/private_links (POST)

This API endpoint can be used to append a private link to the dataset identified by `dataset-id`.

The following parameter can be used:

Parameter	Data type	Required	Description
<code>expires_date</code>	string	No	The format of the date string should be YYYY-MM-DD.

Example usage:

```
curl --request POST \
  --header "Authorization: token YOUR_TOKEN_HERE" \
  --data '{ "expires_date": "2032-01-01", "read_only": false }' \
  https://data.4tu.nl/v2/account/articles/d7b3...995b1/private_links | jq
```

output of the example:

```
{ /* Example output has been shortened. */
  "location": "https://data.4tu.nl/private_datasets/8G2fk..."
}
```

6.9.25 /v2/account/articles/<dataset-id>/private_links/<link-id> (GET)

This API endpoint can be used to view the details of a private link for the dataset identified by `dataset-id`.

Example usage:

```
curl --header "Authorization: token YOUR_TOKEN_HERE" \
  https://data.4tu.nl/v2/account/articles/d7b3...995b1/private_links/8G2fk...
| jq
```

Output of the example:

```
[
  {
    "id": "8G2f...IJP0",
    "is_active": true,
    "expires_date": "2032-01-01T00:00:00"
  }
]
```

6.9.26 /v2/account/articles/<dataset-id>/private_links/<link-id> (PUT)

This API endpoint can be used to update the expiry date of a private link and whether the private link is active or not for the dataset identified by `dataset-id`.

The following parameter can be used:

Parameter	Data type	Required	Description
<code>expires_date</code>	string	No	The format of the date string should be YYYY-MM-DD.
<code>is_active</code>	boolean	No	Defaults to false.

Example usage:

```
curl --request PUT \  
  --header "Authorization: token YOUR_TOKEN_HERE" \  
  --data '{ "expires_date": "2034-01-01", "is_active": true }' \  
  https://data.4tu.nl/v2/account/articles/d7b3...995b1/private_links/8G2fk... \  
  | jq
```

Output of the example:

```
{ /* Example output has been shortened. */  
  "location": "https://data.4tu.nl/private_datasets/8G2fk..."  
}
```

6.9.27 /v2/account/articles/<dataset-id>/private_links/<link-id> (DELETE)

This API endpoint can be used to remove a private link for the dataset identified by `dataset-id`.

Example usage:

```
curl --request DELETE \  
  --header "Authorization: token YOUR_TOKEN_HERE" \  
  https://data.4tu.nl/v2/account/articles/d7b3...995b1/private_links/8G2fk...
```

HTTP response of the example:

```
HTTP/1.1 204 NO CONTENT
```

6.9.28 /v2/account/articles/<dataset-id>/reserve_doi (POST)

This API endpoint can be used to obtain the DOI before the dataset is published and the DOI is activated.

Example usage:

```
curl --request POST \  
  --header "Authorization: token YOUR_TOKEN_HERE" \  
  https://data.4tu.nl/v2/account/articles/d7b3...995b1/reserve_doi | jq
```

Output of the example:

```
{  
  "doi": "10.5074/d7b3daa5-45e2-47b0-9910-0f7fa6a995b1"  
}
```

6.9.29 /v2/account/articles/<dataset-id>/publish (POST)

This API endpoint can be used to publish the dataset identified by `dataset-id`.

Note: Only users with the “review” privilege can successfully use this API call.

Example usage:

```
curl --request POST \  
  --header "Authorization: token YOUR_TOKEN_HERE" \  
  https://data.4tu.nl/v2/account/articles/d7b3...995b1/publish | jq
```

HTTP response of the example:

```
HTTP/1.1 201 CREATED
```

Output of the example:

```
{ /* Example output has been shortened. */  
  "location": "https://data.4tu.nl/review/published/9ce6...3976"  
}
```

6.10 Creating and editing collections

6.10.1 /v2/account/collections (GET)

This API endpoint lists the draft collections of the account to which the authorization token belongs.

The following parameters can be used:

Parameter	Required	Description
page	Optional	The page number used in combination with <code>page_size</code> .
page_size	Optional	The number of datasets per page. Used in combination with <code>page</code> .
limit	Optional	The maximum number of datasets to output. Used together with <code>offset</code> .
offset	Optional	The number of datasets to skip in the output. Used together with <code>limit</code> .
order	Optional	Field to use for sorting.
order_direction	Optional	Can be either <code>asc</code> or <code>desc</code> .

Example usage:

```
curl --header "Authorization: token YOUR_TOKEN_HERE" \  
https://data.4tu.nl/v2/account/collections | jq
```

Output of the example:

```
[ /* This example output has been shortened. */  
  {  
    "id": null,  
    "uuid": "fc03a4c3-cba4-4a88-a8a6-eb38924eeb6d",  
    "title": "Test collection",  
    "doi": null,  
    "handle": "",  
    "url": "https://data.4tu.nl/v2/collections/fc03...eb6d",  
    "published_date": null,  
    ...  
  }  
]
```

6.10.2 /v2/account/collections (POST)

This API endpoint can be used to create a new collection.

The following parameters can be used:

Parameter	Data type	Description
title	string	The title of the collection.
description	string	A description of the collection.
tags	list of strings	Keywords to enhance the findability of the collection. Instead of using the key <code>tags</code> , you may also use the key <code>keywords</code> .
keywords	list of strings	See <code>tags</code> .
references	list of strings	URLs to resources referring to this collection, or resources that this collection refers to.
categories	list of strings	Categories are a controlled vocabulary and can be used to make the collection findable in the categorical overviews. The <code>string</code> values expected here can be found under the <code>uuid</code> property with a call to <code>/v2/categories</code> . For more details, see section 6.3.1 <code>'/v2/categories (GET)'</code> .
authors	list of author records	
funding	string	One-liner to cite funding.
funding_list	list of funding records	
license	integer	Licences communicate under which conditions the collection can be re-used. The <code>integer</code> value to submit here can be found as the <code>value</code> property in a call to <code>/v2/licences</code> . For more details, see section 6.4.1 <code>'/v2/licenses (GET)'</code> .
doi	string	Do not use this field as a DOI will be automatically assigned upon publication.
handle	string	Do not use this field as it is deprecated.
resource_doi	string	The URL of the DOI of an associated peer-reviewed journal publication.
resource_title	string	The title of the associated peer-reviewed journal publication.
custom_fields	Object	An <code>Object</code> where each key is a field name and each value is the corresponding value. Allowed values are: <code>contributors</code> , <code>data_link</code> , <code>derived_from</code> , <code>format</code> , <code>geolocation</code> , <code>language</code> , <code>latitude</code> , <code>longitude</code> , <code>organizations</code> , <code>publisher</code> , <code>same_as</code> , <code>time_coverage</code> .
custom_fields_list	list of Objects	Each <code>Object</code> should have two keys: <code>name</code> and <code>value</code> . For allowed keys, see <code>custom_fields</code> .
timeline		Do not use this field because it will be automatically populated during the publication process.
articles	list of strings or integers	The articles to include in the collection.

Example usage:

```
curl --header "Authorization: token YOUR_TOKEN_HERE" \  
  --header "Content-Type: application/json" \  
  --data '{ "title": "Example collection" }' \  
  https://data.4tu.nl/v2/account/collections | jq
```

Output of the example:

```
{  
  "location": "https://data.4tu.nl/v2/account/collections/08b7...cfa8",  
  "warnings": []  
}
```

6.10.3 /v2/account/collections/<collection-id> (GET)

This API endpoint lists details of the collection identified by `collection-id` .

Example usage:

```
curl --header "Authorization: token YOUR_TOKEN_HERE" \  
  https://data.4tu.nl/v2/account/collections/08b7...cfa8 | jq
```

Output of the example:

```
{ /* Example output has been shortened. */  
  "articles_count": 0,  
  "authors": [],  
  "id": null,  
  "uuid": "08b702d6-98a0-4081-9445-5aeae720cfa8",  
  "title": "Example collection",  
  ...  
}
```

6.10.4 /v2/account/collections/<collection-id> (PUT)

This API endpoint can be used to update the metadata of the collection identified by `collection-id` .

The following parameters can be used:

Parameter	Data type	Required	Description
title	string	Yes	The title of the collection.
description	string	No	A description of the collection.
resource_doi	string	No	The URL of the DOI of an associated peer-reviewed journal publication.
resource_title	string	No	The title of the associated peer-reviewed journal publication.
group_id	integer	No	
time_coverage	string	No	Free-text field to describe the time coverage of the collection.
publisher	string	No	The name of the data repository publishing the collection.
language	string	No	An ISO 639-1 language code.
contributors	string	No	Free-text field to indicate contributors to the collection other than direct authors.
geolocation	string	No	Free-text field to specify a location.
longitude	string	No	The longitude coordinate of the location.
latitude	string	No	The latitude coordinate of the location.
organizations	string	No	Free-text field to specify organizations that contributed or are associated with the collection.
categories	list of strings	No	Categories are a controlled vocabulary and can be used to make the collection findable in the categorical overviews. The string values expected here can be found under the uuid property with a call to /v2/categories . For more details, see section 6.3.1 ‘/v2/categories (GET)’ .

Example usage:

```
curl --verbose --request PUT \
  --header "Authorization: token YOUR_TOKEN_HERE" \
  --header "Content-Type: application/json" \
  --data '{ "title": "Updated title" }' \
  https://data.4tu.nl/v2/account/collections/08b702d6-98a0-4081-9445-5
  aeae720cfa8 | jq
```

HTTP response of the example:

```
HTTP/1.1 205 RESET CONTENT
```

6.10.5 /v2/account/collections/<collection-id> (DELETE)

This API endpoint can be used to delete a draft collection.

Example usage:

```
curl --verbose --request DELETE \  
  --header "Authorization: token YOUR_TOKEN_HERE" \  
  https://data.4tu.nl/v2/account/collections/08b702d6-98a0-4081-9445-5  
  aeae720cfa8
```

HTTP response of the example:

```
HTTP/1.1 204 NO CONTENT
```

6.10.6 /v2/account/collections/search (POST)

This API call searches for collections, including drafts created by the account performing the search.

Parameter	Data type	Required	Description
search_for	string	Optional	The terms to search for.

Example usage:

```
curl --request POST \  
  --header "Authorization: token YOUR_TOKEN_HERE" \  
  --header "Content-Type: application/json" \  
  --data '{ "search_for": "Example" }' \  
  https://data.4tu.nl/v2/account/collections/search | jq
```

Output of the example:

```
[ /* Example output has been shortened. */  
  {  
    "id": null,  
    "uuid": "08b702d6-98a0-4081-9445-5aeae720cfa8",  
    "title": "Example collection",  
    "url": https://data.4tu.nl/v2/collections/08b7...cfa8  
    ...  
  }  
]
```

6.10.7 /v2/account/collections/<collection-id>/authors (GET)

Similar to 6.9.6 `/v2/account/articles/<dataset-id>/authors (GET)`, this API endpoint lists the authors of the collection identified by `collection-id`. The following URL parameters can be used:

Parameter	Required	Description
order	Optional	Field to use for sorting.
order_direction	Optional	Can be either <code>asc</code> or <code>desc</code> .
limit	Optional	The maximum number of datasets to output. Used together with <code>offset</code> .

Example usage:

```
curl --header "Authorization: token YOUR_TOKEN_HERE" \
  https://data.4tu.nl/v2/account/collections/3760c457-d4f3-4d58-8b94-af089a97a9b4 | jq
```

Output of the example:

```
[
  {
    "id": null,
    "uuid": "08f4d496-67b5-4b7c-b2d2-923458d1f450",
    "full_name": "John Doe Jr",
    "is_active": false,
    "url_name": null,
    "orcid_id": ""
  },
  {
    "id": null,
    "uuid": "6815031c-21dc-4873-93c9-f6539da482ce",
    "full_name": "John Doe",
    "is_active": false,
    "url_name": null,
    "orcid_id": ""
  }
]
```

6.10.8 /v2/account/collections/<collection-id>/authors (POST)

Similar to 6.9.7 ‘/v2/account/articles/<dataset-id>/authors (POST)’, this API endpoint can be used to append authors to the collection identified by `collection-id` .

The following parameters can be used:

Parameter	Data type	Required	Description
full_name	string	No	The full name of the author.
first_name	string	Yes	The first name of the author.
last_name	string	Yes	The last name of the author.
email	string	No	The e-mail address of the author.
orcid_id	string	No	The ORCID identifier for the author.
job_title	string	No	The job title of the author.

Example usage:

```
curl --request POST \  
  --header "Authorization: token YOUR_TOKEN_HERE" \  
  --header "Content-Type: application/json" \  
  --data '{ "authors": [{ "name": "John Doe" } ] }' \  
  https://data.4tu.nl/v2/account/collections/3760c457-d4f3-4d58-8b94-af089a97a9b4/authors  
curl --request POST \  
  --header "Authorization: token YOUR_TOKEN_HERE" \  
  --header "Content-Type: application/json" \  
  --data '{ "authors": [{ "name": "John Doe Jr" } ] }' \  
  https://data.4tu.nl/v2/account/collections/3760c457-d4f3-4d58-8b94-af089a97a9b4/authors
```

The following is an example of the output of the HTTP POST calls:

```
HTTP/1.1 205 RESET CONTENT
```

An example of the output of the HTTP GET call can be found in 6.10.7 `/v2/account/collections/<collection-id>/authors (GET)`.

6.10.9 `/v2/account/collections/<collection-id>/authors (PUT)`

In contrast to 6.10.8 `/v2/account/collections/<collection-id>/authors (POST)`, this API endpoint can be used to **overwrite** the list of authors of the collection identified by `collection-id`.

Example usage:

```
curl --request PUT \  
  --header "Authorization: token YOUR_TOKEN_HERE" \  
  --header "Content-Type: application/json" \  
  --data '{ "authors": [{ "name": "John Doe" } ] }' \  
  https://data.4tu.nl/v2/account/collections/3760c457-d4f3-4d58-8b94-af089a97a9b4/authors  
  
curl --request PUT \  
  --header "Authorization: token YOUR_TOKEN_HERE" \  
  --header "Content-Type: application/json" \  
  --data '{ "authors": [{ "name": "John Doe" } ] }' \  
  https://data.4tu.nl/v2/account/collections/3760c457-d4f3-4d58-8b94-af089a97a9b4/authors
```

```
--header "Authorization: token YOUR_TOKEN_HERE" \  
--header "Content-Type: application/json" \  
--data '{ "authors": [{ "name": "John Doe Jr" }]} ' \  
https://data.4tu.nl/v2/account/collections/3760c457-d4f3-4d58-8b94-  
af089a97a9b4/authors
```

```
curl --header "Authorization: token YOUR_TOKEN_HERE" \  
https://data.4tu.nl/v2/account/collections/3760c457-d4f3-4d58-8b94-  
af089a97a9b4/authors | jq
```

Output of the example:

```
[  
  {  
    "id": null,  
    "uuid": "61751fe3-53a1-477f-a46f-e534cbd0b618",  
    "full_name": "John Doe Jr",  
    "is_active": false,  
    "url_name": null,  
    "orcid_id": ""  
  },  
]
```

6.10.10 /v2/account/collections/<collection-id>/authors/<author-id> (DELETE)

This API endpoint can be used to delete an author's association with a collection.

Example usage:

```
curl --request DELETE \  
--header "Authorization: token YOUR_TOKEN_HERE" \  
https://data.4tu.nl/v2/account/collections/fc03...eb6d/authors/5c75...94aa
```

HTTP response of the example:

```
HTTP/1.1 204 NO CONTENT
```

6.10.11 /v2/account/collections/<collection-id>/categories (GET)

This API endpoint can be used to retrieve the categories associated with the collection identified by `collection-id`.

Example usage:

```
curl --header "Authorization: token YOUR_TOKEN_HERE" \  
https://data.4tu.nl/v2/account/collections/fc03...eb6d/categories | jq
```


Output of the example:

```
[
  {
    "id": 13376,
    "uuid": "2bdba8f2-5914-4d82-bfe8-c938cccab71f",
    "title": "Agricultural and Veterinary Sciences",
    "parent_id": null,
    "parent_uuid": null,
    "path": "",
    "source_id": null,
    "taxonomy_id": null
  }
]
```

6.10.12 /v2/account/collections/<collection-id>/categories (POST)

Similar to 6.9.15 `/v2/account/articles/<dataset-id>/categories (POST)` this API endpoint can be used to append categories to the collection identified by `collection-id`. The parameters sent to the server should be a JSON object with a single key named `categories`, with as value a list of either the numeric or the UUID identifiers for a category. The API endpoint described in 6.9.14 `/v2/account/articles/<dataset-id>/categories (GET)` shows how to obtain the category identifiers.

Example usage:

```
curl --verbose --request POST \
  --header "Authorization: token YOUR_TOKEN_HERE" \
  --header "Content-Type: application/json" \
  --data '{"categories": [13551, 13558]}' \
  https://data.4tu.nl/v2/account/collections/fc03...eb6d/categories
```

HTTP response of the example:

```
HTTP/1.1 205 RESET CONTENT
```

6.10.13 /v2/account/collections/<collection-id>/categories (PUT)

In contrast to 6.10.12 `/v2/account/collections/<collection-id>/categories (POST)`, this API endpoint can be used to **overwrite** the list of categories of the collection identified by `collection-id`.

Example usage:

```
curl --verbose --request POST \
  --header "Authorization: token YOUR_TOKEN_HERE" \
```

```
--header "Content-Type: application/json" \
--data '{ "categories": ["dd4dbaaf-0610-4d8d-8b07-e1eeb32dd11c"]}' \
https://data.4tu.nl/v2/account/collections/fc03...eb6d/categories
```

HTTP response of the example:

```
HTTP/1.1 205 RESET CONTENT
```

6.10.14 /v2/account/collections/<collection-id>/categories/<category-id> (DELETE)

This API endpoint can be used to delete a category's association with a collection. The `category-id` can be either the `uuid` or the `id` property.

Example usage:

```
curl --request DELETE \
--header "Authorization: token YOUR_TOKEN_HERE" \
https://data.4tu.nl/v2/account/collections/fc03...eb6d/categories/13558
```

HTTP response of the example:

```
HTTP/1.1 204 NO CONTENT
```

6.10.15 /v2/account/collections/<collection-id>/articles (GET)

This API endpoint can be used to retrieve the datasets associated with the collection identified by `collection-id`.

Example usage:

```
curl --header "Authorization: token YOUR_TOKEN_HERE" \
https://data.4tu.nl/v2/account/collections/fc03...eb6d/articles | jq
```

Output of the example:

```
[ /* This example has been shortened. */
{
  "id": null,
  "uuid": "8050f9cb-d0b0-4149-bd24-02f13c2410db",
  "doi": "10.4121/8050f9cb-d0b0-4149-bd24-02f13c2410db.v1",
  ...
},
{
```

```
"id": 14309234,  
"uuid": "06431360-776c-45c6-bcca-ec898f2870ff",  
"doi": "10.4121/14309234.v1",  
...  
}  
]
```

6.10.16 /v2/account/collections/<collection-id>/articles (POST)

This API endpoint can be used to append datasets to the collection identified by `collection-id`.

The API endpoint accepts both the `id` property and the `uuid` property of a dataset as identifier.

The parameters sent to the server should be a JSON object with a single key named `articles`, with as value a list of either the `id` or the `uuid` identifiers for datasets. The API endpoint described in 6.1.2 `/v2/articles/search (POST)` shows how to obtain the dataset identifiers.

Example usage:

```
curl --verbose --request POST \  
  --header "Authorization: token YOUR_TOKEN_HERE" \  
  --header "Content-Type: application/json" \  
  --header "Accept: application/json" \  
  --data '{ "articles": ["8050...10db", 14309234 ]}' \  
  https://data.4tu.nl/v2/account/collections/fc03...eb6d/articles
```

HTTP response of the example:

```
HTTP/1.1 205 RESET CONTENT
```

6.10.17 /v2/account/collections/<collection-id>/articles (PUT)

In contrast to 6.10.16 `/v2/account/collections/<collection-id>/articles (POST)`, this API endpoint can be used to **overwrite** the list of datasets associated with a collection.

```
curl --verbose --request PUT \  
  --header "Authorization: token YOUR_TOKEN_HERE" \  
  --header "Content-Type: application/json" \  
  --header "Accept: application/json" \  
  --data '{ "articles": [ 14309234 ]}' \  
  https://data.4tu.nl/v2/account/collections/fc03...eb6d/articles
```

HTTP response of the example:

```
HTTP/1.1 205 RESET CONTENT
```

6.10.18 /v2/account/collections/<collection-id>/articles/<dataset-id> (DELETE)

This API endpoint can be used to delete a dataset's association with a collection. The `dataset-id` can be either the `uuid` or the `id` property.

Example usage:

```
curl --request DELETE \  
  --header "Authorization: token YOUR_TOKEN_HERE" \  
  https://data.4tu.nl/v2/account/collections/fc03...eb6d/articles/8050...10db
```

HTTP response of the example:

```
HTTP/1.1 204 NO CONTENT
```

6.10.19 /v2/account/collections/<collection-id>/reserve_doi (POST)

This API endpoint can be used to obtain the DOI before the collection is published and the DOI is activated.

Example usage:

```
curl --request POST \  
  --header "Authorization: token YOUR_TOKEN_HERE" \  
  https://data.4tu.nl/v2/account/collections/fc03...eb6d/reserve_doi | jq
```

Output of the example:

```
{  
  "doi": "10.5074/fc03a4c3-cba4-4a88-a8a6-eb38924eeb6d"  
}
```

6.10.20 /v2/account/collections/<collection-id>/funding (GET)

This API endpoint lists the funding of the collection identified by `collection-id`.

Example usage:

```
curl --header "Authorization: token YOUR_TOKEN_HERE" \  
  https://data.4tu.nl/v2/account/collections/fc03...eb6d/funding | jq
```

Output of the example:

```
[  
  {  
    "id": null,  
    ...  
  }  
]
```

```
"uuid": "6f605fe1-e87a-43f5-8b67-70ebe3f9b868",
"title": "Example cases fund",
"grant_code": "EXA-001",
"funder_name": "Example",
"is_user_defined": null,
"url": "https://example.exa"
}
]
```

6.10.21 /v2/account/collections/<collection-id>/funding (POST)

This API endpoint can be used to append funders to the collection identified by `collection-id`.

The following parameters can be used:

Parameter	Data type	Required	Description
uuid	string	No	The uuid of an existing funding record. When this parameter is set, other parameters will be ignored.
title	string	Yes	The title of the funding project.
grant_code	string	No	An optional grant code of the funding.
funder_name	string	No	The name of the funder.
url	string	No	A URL to the funding project or funding organization.

Example usage:

```
curl --verbose --request POST \
  --header "Authorization: token YOUR_TOKEN_HERE" \
  --header "Content-Type: application/json" \
  --data '{ "funders": [{ "title": "Example cases fund", \
    "grant_code": "EXA-001", \
    "funder_name": "Example", \
    "url": "https://example.exa" } ] }' \
  https://data.4tu.nl/v2/account/collections/fc03a4c3-cba4-4a88-a8a6-eb38924eeb6d/funding
```

HTTP response of the example:

```
HTTP/1.1 205 RESET CONTENT
```

6.10.22 /v2/account/collections/<collection-id>/funding (PUT)

In contrast to 6.10.21 '/v2/account/collections/<collection-id>/funding (POST)', this API endpoint can be used to **overwrite** the list of funders of the collection identified by `collection-id`.

```
curl --verbose --request PUT \  
  --header "Authorization: token YOUR_TOKEN_HERE" \  
  --header "Content-Type: application/json" \  
  --data '{ "funders": [{ "title": "Example cases fund",  
                           "grant_code": "EXA-001",  
                           "funder_name": "Example",  
                           "url": "https://example.exa" }]} ' \  
https://data.4tu.nl/v2/account/collections/fc03a4c3-cba4-4a88-a8a6-  
eb38924eeb6d/funding
```

HTTP response of the example:

```
HTTP/1.1 205 RESET CONTENT
```

6.10.23 /v2/account/collections/<collection-id>/funding/<funding-id> (DELETE)

This API endpoint can be used to delete an funder's association with a collection.

Example usage:

```
curl --request DELETE \  
  --header "Authorization: token YOUR_TOKEN_HERE" \  
https://data.4tu.nl/v2/account/collections/fc03...eb6d/funding/9b43...e6cd
```

HTTP response of the example:

```
HTTP/1.1 204 NO CONTENT
```

Contact

Stay up-to-date

Subscribe to our [news mailing list](#) to receive release updates and other announcements regarding djehuty.

General inquiries

For questions about the project or requesting an (test) instance, e-mail us at info@djehuty.4tu.nl.

Reporting security vulnerabilities

For security-related matters, please e-mail us at security@djehuty.4tu.nl. This will reach only the security teams at 4TU.ResearchData and Nikhef.

Meet the team

We would love to have you over at either TU Delft or Nikhef for a cup of coffee, to talk about the endless possibilities of djehuty and what it could mean for you!

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News

Release notes for v25.6.

The June release of 2025 consists of 15 commits made by 3 authors.

New features

- Add initial support to display a CodeWorks badge ([4b3d5212b5bd0d26cd6e928b9bf9c9e23a4e4439](#)).
- Add auto-completion support for keywords ([032445341f6a066ba15cd37579dfd866ed4948a4](#)).

Bugfixes

- Return empty list upon error in `/v3/datasets/<uuid>.git/contributors` ([5a7c70c0662f4cd2c7b3](#)).
- Avoid duplicating entries in the funding autocompletion ([a53887390a9bee48a2ba3bf9d76f050e4e285c49](#)).

Incremental improvements

- Improve documentation ([3458987dbb65b284334d6303615a4ef5c1c546db](#), [9edb43e9c09024c1195ae5cdf15e95f9dad16a3369db42e90f04c65edb946771](#)).
- Improve the caching system ([4b1c054f7dd7dd564f4de12d1bd114852b1e288b](#), [4cee56a6fd01226f4982c](#)).
- Introduce permission to recalculate statistics ([5c6beab7792da231c53c180c8b0be33eebdc5620](#)).
- Improve contrast of the “connect with ORCID” button ([c1b4d1bfcc3d1074d2137119b53c7766f2fe3d2f](#)).

Release notes for v25.5.

The May release of 2025 consists of 14 commits made by 3 authors.

This release contains a security fix for a SPARQL injection found by Thomas Thelen and a security fix for a HTML injection found by Anass Ksiber. Many thanks to both for reporting and assisting in resolving these vulnerabilities.

UI revisions

- Introduce an “Interoperability” section with links to the RO-Crate metadata API and the IIIF manifest ([2a49687d0fab911f52b461f806dd7eadcc15df30](#)).

Security

- Properly escape session cookie value ([da1cbf2b15155ce4541ab7ca81f3102067fb749f](#)).
- Avoid possibility of HTML injection in the search page ([4f479f6869a2b7eeaf7cd78832419014eddf06f8](#)).

Bugfixes

- Avoid re-creating the Handle configuration ([80f1f2e3e06b2b85ced6b17e75793bb0ab2d670](#)).
- Ensure the v2 API respects the depositing-domains property ([45941d2d9217ff2c389a0072002249dac64c](#)).
- Don't show file metadata for restricted datasets in RO-Crate output ([b81c730ec7d36e88f3cb4461c2920c](#)).
- Improve render quality of PDF files in the IIIF Image API ([6556bf2ff6d7dd57ea8630199e7738dfbd4968ffb35961a7bc24477913ca428c44001543342e8a](#)).
- Document acceptable parameters for various API endpoints ([b5dea019bcaaa1e3beae643ab8ed4c8776e0](#)).
- Distribute missing files in the release tarball ([76b29514e469a28ad3bfc080a2711672aa0f3765](#)).

Technical debt

- Simplify the `dist-docker` target ([7b08aae0f3c44447869d7dab53bbb65678ce3747](#)).

Release notes for v25.4.

The April release of 2025 consists of 51 commits made by 4 authors.

New features

- Implement IIIF Presentation API ([1eb35f4f424e379462a34a9f032a14d74892d052](#), [b052e5dc7a0a469a9dca2ffa5dfec843bfde15a3c61eacdfd3d38ecb](#), [68f2bbacd960aae7a7bbb185562033c78dc191d2](#), [ed0a39e19ea25709cb577ecfb7f41e4d4e004433](#), [8f975910f69b9e4f484eefaf59e02e7a9b5ca527](#), [ce43c4590a3668e10bc0826cd5925169d235cc7f](#), [a4b43cdd778402ad890b48ad42b77f2965d377cc](#)).
- Implement tiles property for IIIF Image API ([e9453e1ec43514a2fc1a7a6256ee17203f38a82a](#)).
- Implement `static-resources-cache` option ([1529d961aa833fb388809ebb02c6e2d0455411d4](#)).

Security

- Harden the Content-Security-Policy as an extra layer of defence against cross-site scripting ([3c2c5329089a41d2f4637fed9c0c1de19c5669ef](#), [ce428d824c0f7e30a85054970f62fa0734011d26](#), [4a1abf60e94e07ff6db748c447dc1ed1508a33a5](#), [da39ace8eec25d3a4646b288c2d9156022fd7063](#), [1bcc4f92dbda97bd38328c2f00c843996d3c9418](#), [13c06ef7bd5465adeda52e8fff9fe8d0620547c1](#), [b5434f969275314f4180f28fcf88de1bf1b79c3b](#), [7a157070a9ffcf62e5d0426dbc21ee405248a274](#), [9d84583c80ec001f461bf113bfc52c5045bb3c39](#)).

Bugfixes

- Ensure ZIP files of Git repositories are bit-reproducible ([586c3045883c2b13ebec1c6a7aa88f740b39f40e](#)).

- Fix alignment of search results when viewed as a list (2463ebbcff89e8ddb18c06925b2dcfa6520af938).
- Document the institution API endpoints (fc27ddf7ab963c964d7ebcbb2e2803f780de19e7).
- Show reviews for institutional reviewers based on the group rather than accounts (6ef0eca6c4c498c651e2).

Technical debt

- Code clean-ups (02ce6b383d2f83cbdb04daaa212f27f4dd0633ba, a1e7c2fe62c0011a214fc7e7edb999f1a3adcfccc8f309d17815f00a51559bf75a9412a, c61f2724723965f4783a1af7ae86e3218e7bcce0, 9d6307afa163954ad496007306f65c921ea6773e, a4e5b38a75a019d09b6175a3fc485c16496a4c31, e60e6f3734bc8ec8d32b8d92d0fd375a57aa44e9, 51817a2b540adb44bd1b1db8d17b90b3f20f529b, 96d338254309ae683935fe9d423a59c0cc39cecd, 2de1e417fbc658b79e1f3ba6fb1406fc7cc7c044, 35afe28e959f3275489223f028d8d33f2e91e2da)

Release notes for v25.3.

The March release of 2025 consists of 57 commits made by 2 authors.

This release contains various bugfixes, minor UI revisions, minor feature updates, and contains the foundation for an extra security layer to prevent cross-site scripting vulnerabilities.

The release date slipped a couple of days because yours truly wanted to give last-minute changes a little bit of time to make sure no regressions occurred before formalizing the release.

New features

- Implement API endpoints for reviewers (1de7f680840ec882752de1fe53004a4bed16f568, 038e931b96ee2f5963553910929ef479eadeb1c770780fd8df93).
- Report number of search results in the `/v2/articles/search` endpoint. (a8917a837e9d5d70a618ff5).
- Add `SoftwareSourceCode` to RO-Crate output (79cf0b32ada27780ef0efadc0d20556c8717eb84).

UI revisions

- Revise the “Cite” and “Collect” buttons on landing pages (b0b9dbd1f21e1aec464985daff7c5af100bc534).
- Remove the need for a “save URL” button in the dataset metadata form (a853085c98417bcfe8b50d0e41e).
- Revise the versions drop-down menu on landing pages (e5b89ce23eec6e1284a22db4802d05e459f29454).
- Fix tile scaling on the main page for different zoom levels (7a30bfa47ef1c3977180dcc4b0ec31f7ff06e89).

Security

- Addressed a Cross-Site-Scripting vulnerability in the search functionality (40b12a5597407a3d67eec5a5cb).
- Only display e-mail address of authors to the creators of such records. (05a56fa18367da28e2366a90e92a4).

Bugfixes

- Fix author ordering for collections. (244017a014a4b4d36c8b4d21709996fdf24af635).

- Fix bug in cached responses in the IIIF Image API implementation (88d68c78783a654864e4264c6b60a01).
- Fix bug with proportional scaling in the IIIF Image API implementation (05d5c7a8550e63c395a75c73b8).
- Fix various bugs with rendering HTML entities and tags. (d3667ed8bcee0028ceee945351af1182d67d3e93b19d7de8c647be71708252c6de123a93fecc327, 08e4fc77a90b780b491ca9aa701fa758b43f4a5a, 3a1f3dde5e0e72518c2860afeda8c45eca112e6f).
- Avoid a divide-by-zero situation with quota usage calculation (cefde15ddb393507004e7f69d8c2658650a8).
- Fix creating datasets with repeated fields using the v2 API (74fe025dbc8b6369920ee7a5fe2f3cea35b2e87127c1f818110d68644e668388f1c61535f5525).
- Fix setting default fields when creating a dataset using the API (7f183389d608121c46cd168cbe40681b72).
- Fix returning Git statistics for empty Git repositories (be3630a63cfc3f933be9b130b0825602d5898e98, 2cffe955a2f4a95afb56cb41016559fbce8bbc53, c3227a768dd1cd476105f8a86e1de3a752af336f).

Technical debt

- Work towards a stricter Content-Security-Policy by avoiding inline use of `style` attributes, `script` elements, and event handlers (b862fdf3d558e9ef030f36ce34d2564999fd94c6, 18b3bbe3e72f08542ecb8f554950bd8387b01b16640cfc70935, 1c248a1e238b0fc4bce3766fb7a196d631beec95, 99cf348f833b2180425778f900d280d83706dee1, 7524bbbd26f4ecee67165d44437b2ad41f1d5919, 4d6696335e3fb8a2e01d4b3b5d9176b70c8190be).
- Avoid hard-coded versions in the documentation for the RPM download links (21be87dc0efdf5615eefe33).
- Avoid repetitive text in the documentation by using macros (088f8a13cf79b47adb731b3d24c672695198cf3dc9c8cd6a84af0c830fcc905d73eaeef03828bc).
- Build Docker images with C development libraries to work around “xmlsec” build issues. (2c03cb3cb02bfc85279986f7508291349bf5c609).

Release notes for v25.2.

The February release of 2025 consists of 75 commits made by 2 authors.

The major new features in this release are initial support for RO-Crate and direct support for S3 buckets. The release was delayed to include an important security fix for a Cross-Site-Scripting vulnerability found by Aaron Liebig. Many thanks for reporting and assisting in resolving this vulnerability.

New features

- Implement initial support for RO-Crates (5ffee87a7b9cfefacea984deb4c78f5007581e8e, 96ee261fff3).
- Implement support for S3 buckets via `boto3` (1077e2503c1e9e338849c5dee250a1e6483137b4, 67fe48dbc538d2f00bf687504451e60611021287, 2e5394b417518efbff5accbbe06f65cf7ba896cb, 09e20e40551404e0957f1fd2f742ffa156442294, 30209a7544a35d2da700e8f02d86f30bcb651082, 7e6d147fce19329126c91f2a056070d54e1b093f).
- Implement ability to extract/replay log entries (a5a2c090389776346944b47554c129f4e686f97e).

Security

- Addressed a Cross-Site-Scripting vulnerability ([38e89a0c8ef351bdb524ff8bcb30b44b3ba8d04f](#)).

Bugfixes

- Improve rendering for accessibility ([a3e456cf172c52b41b071133d9d71883e606c786](#), [7cb7654fcb751cd311bba959809595d1fc233be6ddd3cba4575a97fc](#), [c74ef45f1523a4e0a4905021a31996a40e4ced97](#)).
- Apply user interface updates ([b2c213ac9db2d306c8c874c0c8d60367414ba33b](#), [3f13e0c7592125911e9d98606dfcc2e8ddf5d8574f7476b13dd688c314cf](#), [858f7b7aa5dca16bf3a1043e581f16b42951a569](#), [d4db446034d81d9961ea2e4d888a1d685dbde2ab](#), [c327f196f6f2eed3cbbad4d1f3c2136a3cb5898c](#), [22107051ea5a31a8c3e5488f59936baee782b7a1](#), [c87550cc5a176c0d9b706f6da6ee8de2c907a83d](#), [6642dcf94bd118659cd0541485dbc032b3497561](#)).
- Enhance the documentation ([57192bbb83aec6512dbcbdf4c26203ebe18fe099](#), [3a864f07a09e9d1699720be65be335b4807bedbc89f6b1ed5683969001a3a](#), [ea4e623dbe2dd66091595cdb551cb6a32e175c75](#), [1c6267ec4e4c21c66344b3ad1481049743542259](#), [8d4d81266a2efc210d74bbe5e923821fb9cd278d](#)).
- Show precise error messages when input validation fails in the edit-dataset and edit-collection forms ([bfd2110f7a5de061cc9921ef4c184be433fbbab3](#)).

Technical debt

- Remove `urllib3` as explicit dependency ([672eaff0c058b3e71dabed0161faf505a5beb141](#)).
- Prevent comments in query templates from being sent to the SPARQL endpoint ([9ac703556e8f20a36c1fd](#)).

Release notes for v25.1.

The January release of 2025 consists of 85 commits made by 3 authors.

In this release we included an RPM package for Enterprise Linux 9. This RPM depends on packages in the [Extra Packages for Enterprise Linux \(EPEL\)](#) repository.

New features

- CodeMeta API output is more complete ([91ed59d8650f70022131ede59d388bb1a5b76cd0](#), [860edfec55ffa24be3609bc24c87a78e70587236](#), [3f150a246a4978d51df0ab658cba42c78a3b26a2](#), [5daa47e5f97a39cf2dc27eceb8314de0d0284b62](#)).
- A second port to bind the web service on can now be configured ([dff68a6d6bbf3f7548803857deeb1adb6c](#)).
- Enable searching by author ([18a242fcde0f0bfa6036021c20d4eca91602d5a8](#), [fe09578657d71894cec45](#)).
- Enable institution reviewing ([cbd1092cccfacaf8d3191d1130fc1b34154b555b](#), [cb67f83bfa4749c3c468f](#)).
- Improve indexability by search engines ([cc58483902f0760673c2a91567991b18829b112a](#), [20fe6fd9a5c6](#)).

Bugfixes

- Related versions of a dataset are communicated to DataCite ([1539117be2a7679bafa5a94366f79a832bd7f](#)).
- HTML output of the documentation is responsive to browser widths ([934ed9310f1153960b95aff4944a0a](#)).

- Restore ability to create new collection versions ([545de472c734161d223d94aa61b0d025eea07fec](#)).
- Display embargoed datasets in the search results ([c86dcf85bee8af42988346cc12511341f1d3c6fc](#)).
- Fixed building RPM packages ([1f629fa0d0ea5acbb45b1ea5652f9cfe8bc431f3](#), [e4c10571a8da9c6b5c6](#)).
- Fixed HTTP PUT behavior for `/v2/account/collections/<id>/articles` ([107ea693e170689b83213e6](#)).

Technical debt

- Unified the development environment instructions between GNU/Linux, Windows and macOS ([8921d35c1a0909e331b4737b6c0bb6713fb77743](#), [ca9b5831c19948f098106917c34bc4ff383543d2](#)).
- Run-time configurable properties are stored in a separate module ([a8e353db6e29342adb038950eacf350e](#)).
- Improve error handling ([bdf77edd810bb9d22c111b11e34e265c3e286f31](#), [23c3b53d297b11bacab08d243609c9864e357101f39e0dfb8cf0b045889d9d17](#)).
- Embed simplified 'zipfly' ([0fe0904a2aa25fc19094ee2c57a1b1d6fda4b4ad](#)).

Release notes for v24.12.

New features

- Add specific logging for when the server would respond an HTTP 500 error ([1dcd141f7c75e82a5f970d0ac](#)).

Bugfixes

- Fix a problem with downloading Git repositories as ZIP ([a8c2da4c544b10a493d67c515a5fca191222ba29](#)).
- Avoid returning an internal server error when using paging in the API ([2629ef56ff43946067edf7e147f48](#)).
- Fix lay-out bug on the landing pages ([a3ff6a54ee80359ad3d2299e968ab28766b86505](#)).
- Fix bug when filtering on groups in the API ([187f4344f5d0e50bcf7063f28dda9bfccc8229ae](#)).

Technical debt

- Refactor parts of the codebase ([0370836d5bdf62f04f5815893658284aff3ca48](#), [dd7602a66691840ffe6aa8eda2fc0b5cf65cd38d4002d358e65312a845d](#), [3fb51635c82ad612681db5a3244d93e62cd8f616](#), [dd6ccca45a7505b96e002a2bb79fc75b5384570c](#), [58c1fcedcec678d27c1d0daf9559dfab45fdb8f6](#)).
- Reduce build-system files ([e73966fede6e1e2fc8ea2256f107b650a23400a0](#)).
- Bump the minimal required Python version to 3.9 ([208c7e08f6162fd78a456079e079d5f609f67e68](#)).