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Content Provider Handbook

v1.4

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1.1	10/09/2024	Ignacio Lamata Martinez, Łukasz Opioła	Some changes in Section 3.6. Added VIGIE Study references and short description of directories. Added changes for v21.02.6. Other improvements based on user feedback
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1. Introduction

This **informal** document explains in a **practical** way the steps required to use EGI DataHub, focusing especially on the upload of 3D models by content providers. This can be considered as a manual for the upload of data that complements the official deliverables of the project.

1.1 Structure of the document

The rest of this document is organised as follows:

- **Section 2** explains how you can prepare your access to the applications available for the EUreka3D community.
- **Section 3** explains how you can upload and publish your 3D models through EUreka3D.
- **Section 4** discusses how to automate the process of uploading and publishing 3D objects, which is useful when hundreds of objects have to be uploaded and is unfeasible to do the work manually.
- Finally, **Section** 5 provides some conclusions.

1.2 Where to find additional information

If you need more context and information about the technologies used in EUreka3D, please refer to the official deliverables of the project, in particular:

- **Deliverable 3.2** "*The EUreka3D AAI architecture*" (October 2024), which describes the infrastructure and technologies implemented to perform the authentication and authorisation of users in EUreka3D.
- **Deliverable 3.3** "*Final report on the EUreka3D services and resource hub*" (October 2024), which describes the configuration of the cloud and data technologies used in the project, giving a deeper understanding of EGI DataHub, the applications and the compute side of the project.

2. Configuring your access

The access to applications and data in EUreka3D must be protected from unauthorised users. In order to implement this security mechanism, EUreka3D data hub and services are supported by **EGI Check-in**[1]. This section will explain to you the actions you need to take to configure your access to EUreka3D, which mainly consist of:

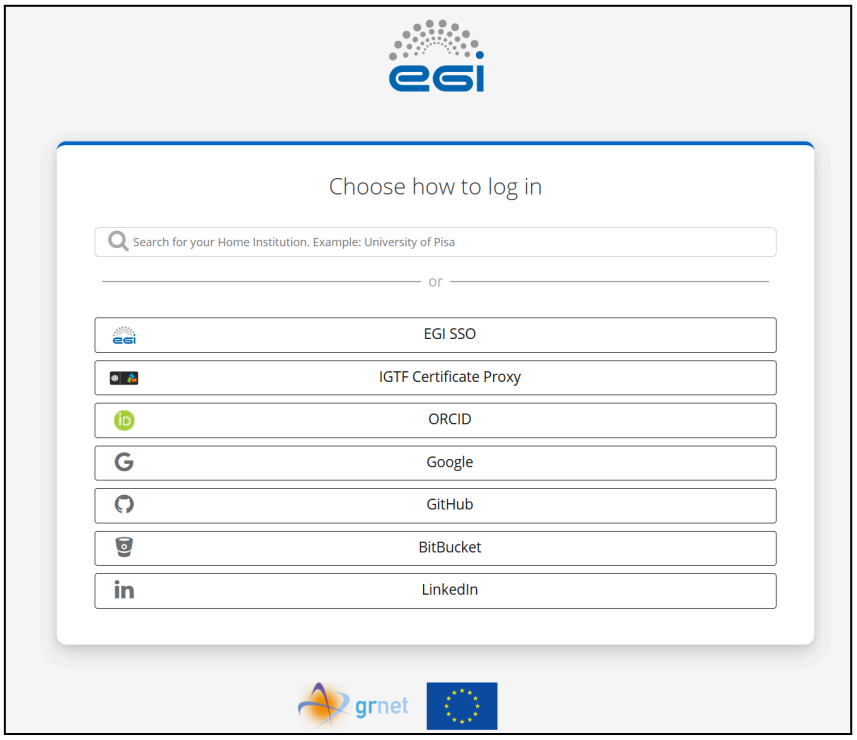
- **Register in Check-in**. You will need to register your account in Check-in. This is discussed in Section 2.1.
- **Join the EUreka3D community**. To obtain the required permissions to access EUreka3D applications and data, you will need to join the EUreka3D community. This is discussed in Section 2.2.

2.1 Registering an account in Check-in

Registering an account is a simple process. Just visit:

https://aai.egi.eu/signup

The process to register your account is as simple as just logging in with your usual account. As can be seen in the image below, Check-in offers multiple options to log in:



[1] https://www.egi.eu/service/check-in/

It is recommended that you use the account of your Home Organisation (your research institute, University, etc) by looking for it in the search box. If your institution is not listed here, you can use one of the social accounts available: Google, LinkedIn, ORCID, GitHub, etc. All of these have a specific button that will redirect you to the corresponding login page. Once you have completed the login process with your preferred account, you will be registered in Check-in.

Additional documentation:

- https://docs.egi.eu/users/aai/check-in/signup/

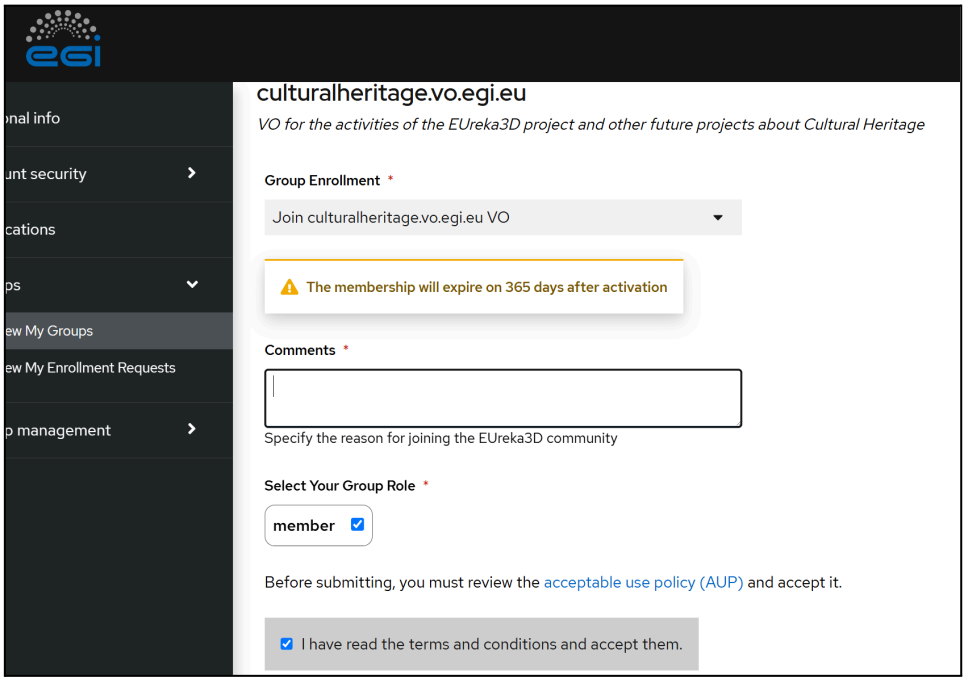
2.2 Joining the EUreka3D community

Once you are registered in Check-in you need to ask to be included in the EUreka3D community. This is done by requesting membership in a *Virtual Organisation* (VO), which is a group of users that belong to a community and have specific permissions assigned to access some resources. The VO of EUreka3D is called: **culturalheritage.vo.egi.eu**.

To ask for membership in the EUreka3D VO you need to visit the following link:

https://go.egi.eu/join_eureka3d

which will present you with the following page:



Note that **you will need to be logged in** in Check-in, otherwise you will be requested to log in first.

In this page you can provide some comments about why you need to request access to EUreka3D. Then, select the Group Role "*member*" and review the Acceptable Use Policy and accept the terms and conditions if this is the case. Click "*Submit*" to finish the request.

Your application will be received by an administrator who will evaluate it and manually accept or reject it. This process should only take a few hours, but please consider that this is a manual process and therefore subject to longer processing times. If you are also publishing in Europeana, some extra configuration is necessary: either create a specific group for your institution in the platform or assign you to an existing group. If the creation is necessary consider that the process to grant you access will take some extra time.

Membership in this VO **must be renewed every year**. This means that every year you will receive a notification email to remind you to renovate your membership. The process is exactly the same as when you join the VO for the first time: visit a link and follow the instructions.

Additional documentation:

- https://docs.egi.eu/users/aai/check-in/joining-virtual-organisation/

3. The data platform — DataHub

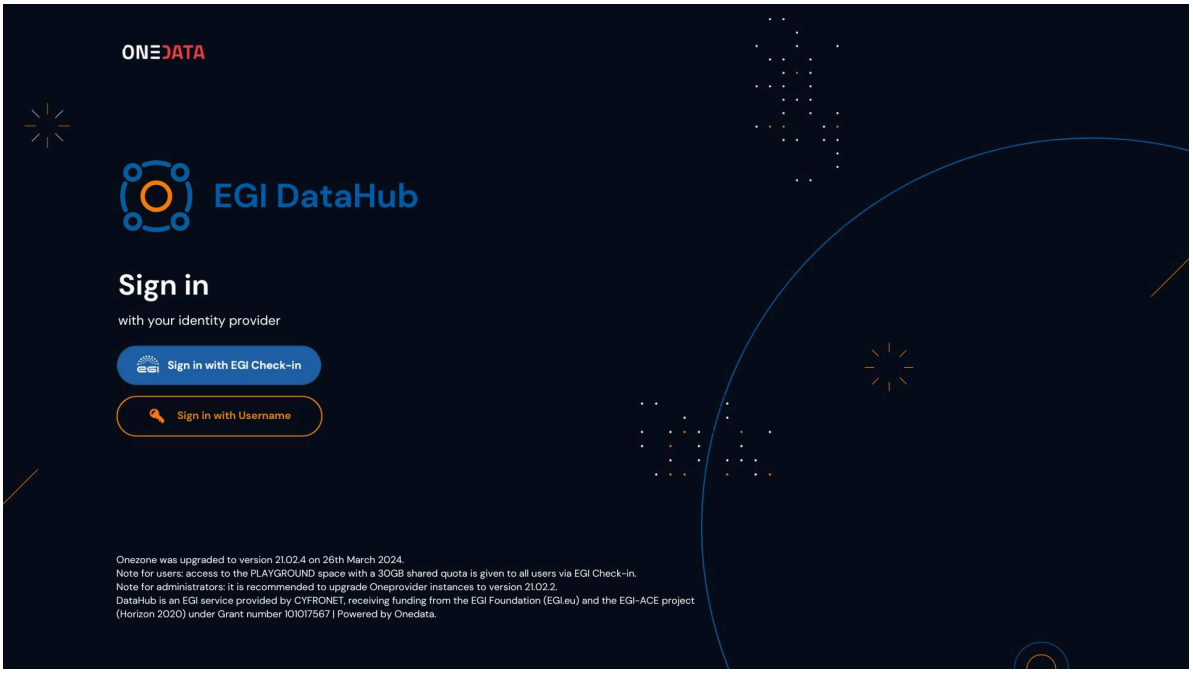
Once you have registered your account in Check-in and become a member of the EUreka3D community you will be able to access the data platform. The data management platform in EUreka3D is implemented with **EGI DataHub**[2].

3.1 Accessing the DataHub

To access the data platform you just need to visit:

https://datahub.egi.eu

which will present the following login screen:



Click on the EGI button (

) to be redirected to Check-in, and proceed with the login process as usual.

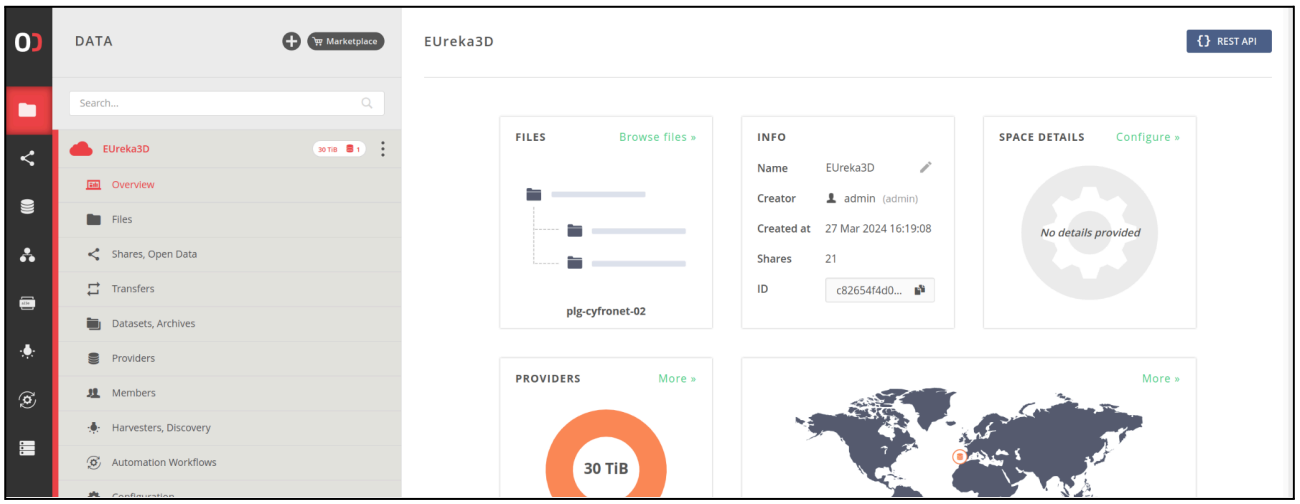
NOTES:

1. The login page will not appear if you are already logged in (then simply go to Section 3.2).
2. If this is the first login via Check-in, you will be asked to accept the terms and conditions and agree to release your basic user information to DataHub. Follow the instructions on the screen.

[2] https://www.egi.eu/service/datahub/

3.2 DataHub overview

After you have logged in, you will be presented with DataHub's home screen, where you can see a data space called "EUreka3D" in the left menu.



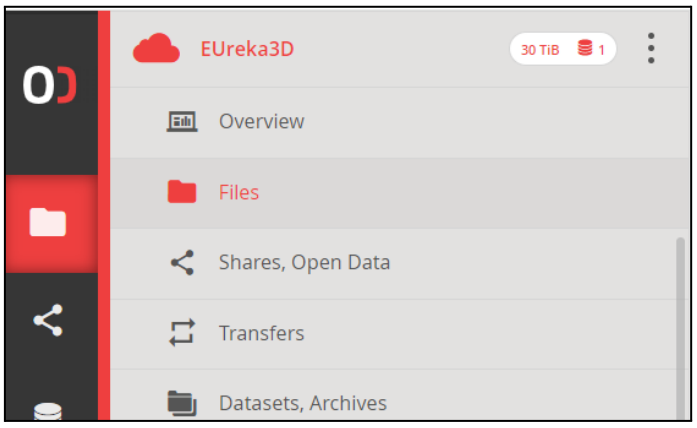
NOTE: If you do not see the EUreka3D data space depicted above, then:

1. Make sure you have completed the process described in Section 2.1.

2. If you had logged in before being accepted to the EUreka3D community, **you will have to log out and log in again**, so that your group memberships can be updated. Use the menu with the user icon in the bottom left corner to log out.

3. It is possible that you have not been accepted in the EUreka3D community or that you have not been assigned permission to access DataHub. If this is the case, contact an EUreka3D administrator via email.

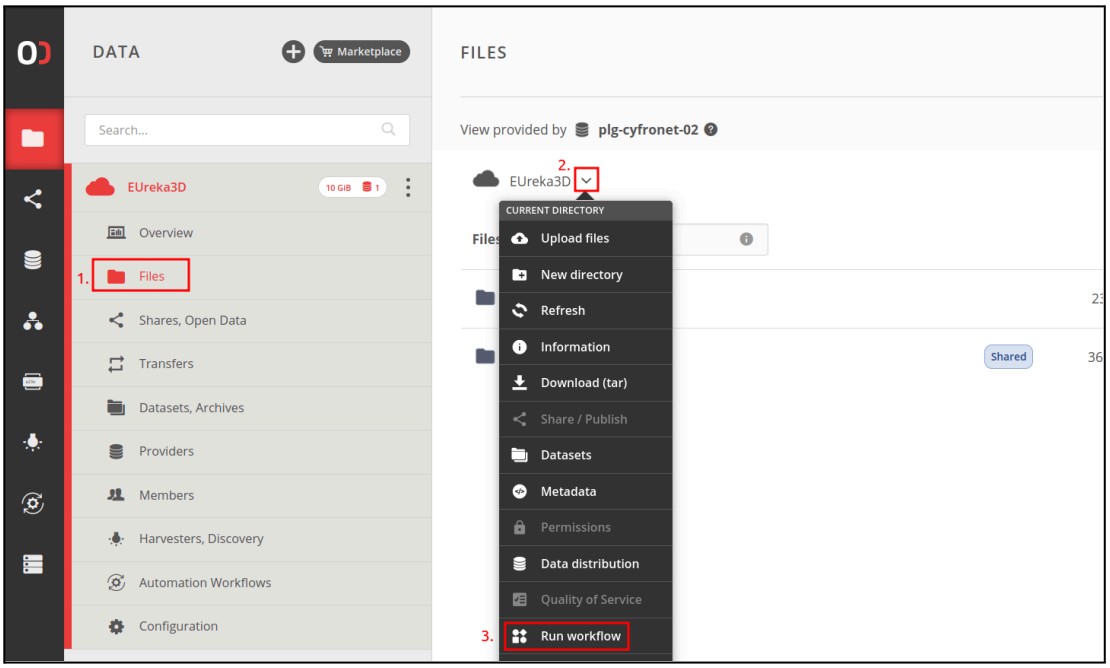
Every project in EUreka3D is organised into a single directory that lies directly in the root of the EUreka3D data space and has a predefined structure. Go to the left menu and click on the **Files** tab to open the file browser:



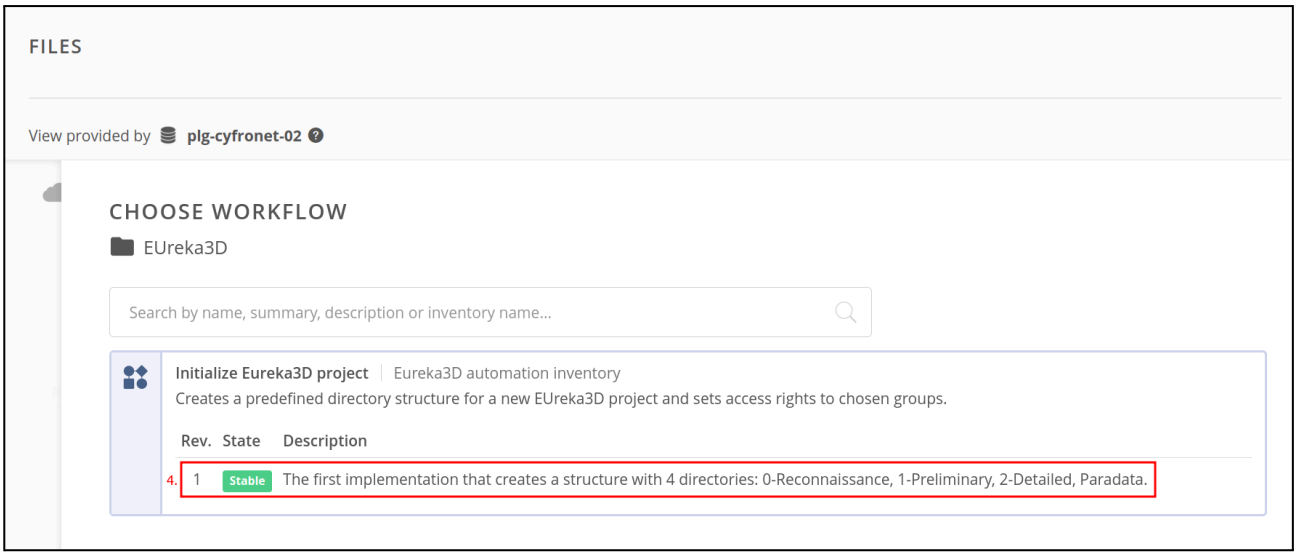
3.3 Creating a new project

To facilitate the creation of a project and its underlying directory structure, an automated procedure called "workflow" must be run. To do so, follow these steps:

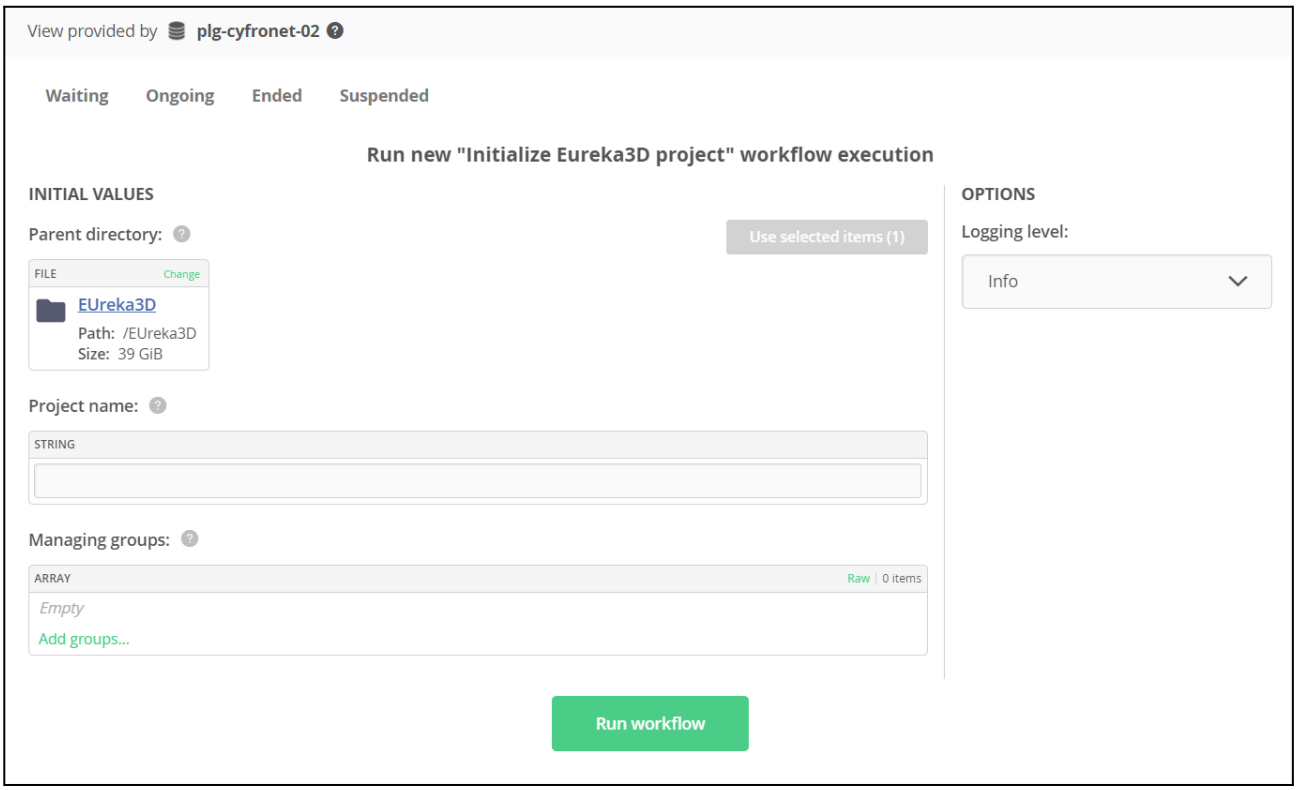
1. Click on the **Files** tab of the left menu, located in the **EUreka3D** space sidebar.
2. Open the **dropdown menu** for the main directory of the EUreka3D space by clicking on the button next to **EUreka3D**, as shown in the figure below.
3. Choose the **Run workflow** action.



4. Locate the "**Initialize EUreka3D project**" workflow and click on the newest stable revision (e.g. Rev. 1), as shown in the figure below:



This will open the following screen:

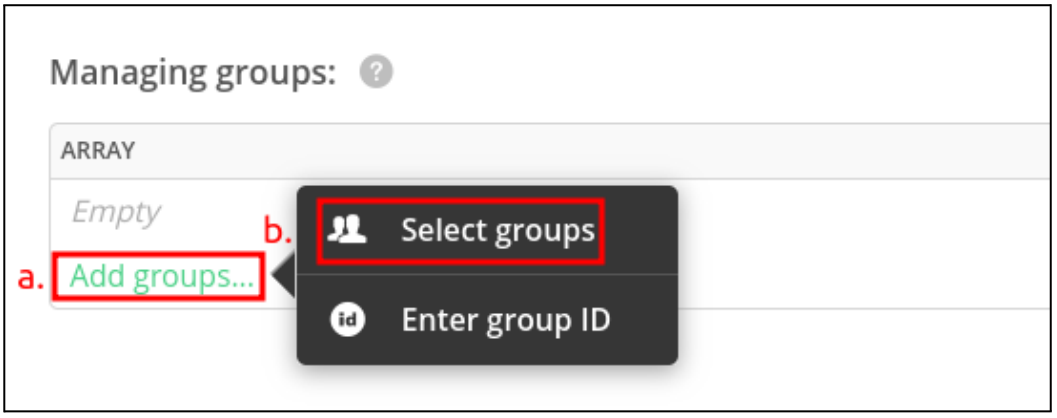


5. Enter the desired **project name**. Avoid using your institution name. Instead, use a meaningful name for the objects that will be stored.

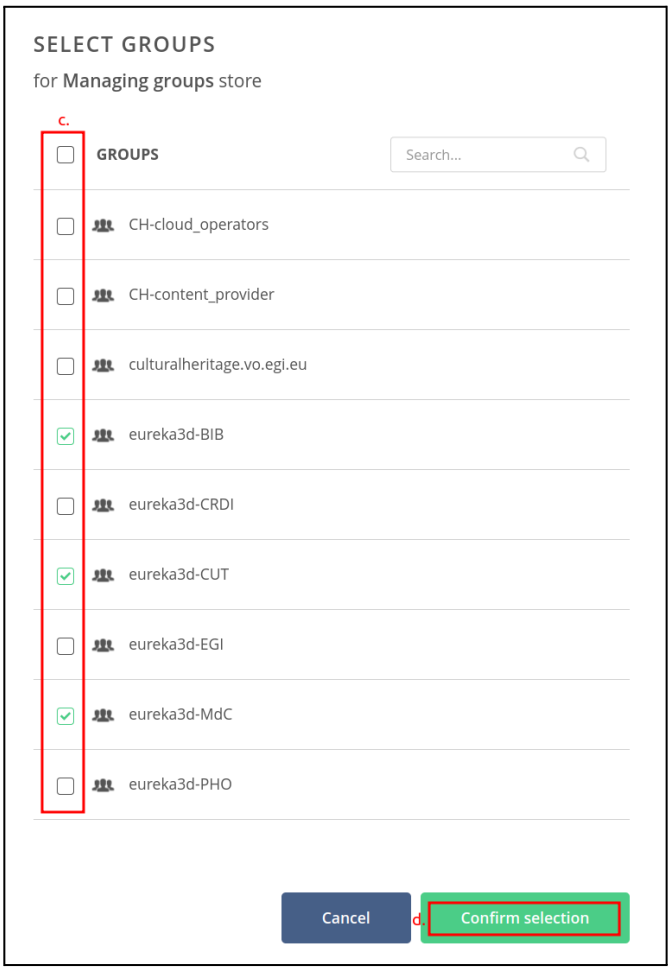


6. The section "**Managing groups**" lets you specify the groups inside EUreka3D that will have access to this project. For example, the "eureka3d-CUT" group represents the members of the Cyprus University of Technology, the "eureka3d-PHO" group represents the members of the Photocosortium, and so on. By default, no ACL will be established and **everyone in the EUreka3D community** will have access to your data so, if this is a problem, it is recommended that you limit the access to your data at this initial stage. Note that you do not need to assign access permissions to other groups at this time - you can also modify these permissions at any time after the project has been created.

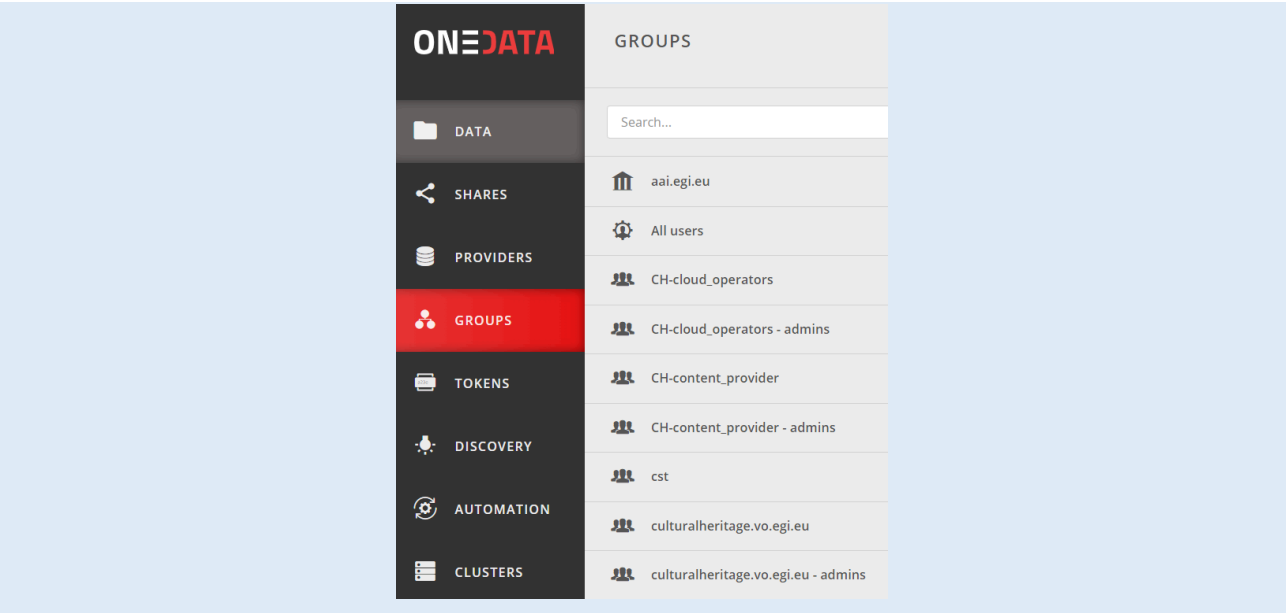
   To specify the managing group(s):



   a. click the **Add groups…** button,
   b. click the **Select groups** action,
   c. select the groups by checking the boxes,
   d. click the **Confirm selection** button.



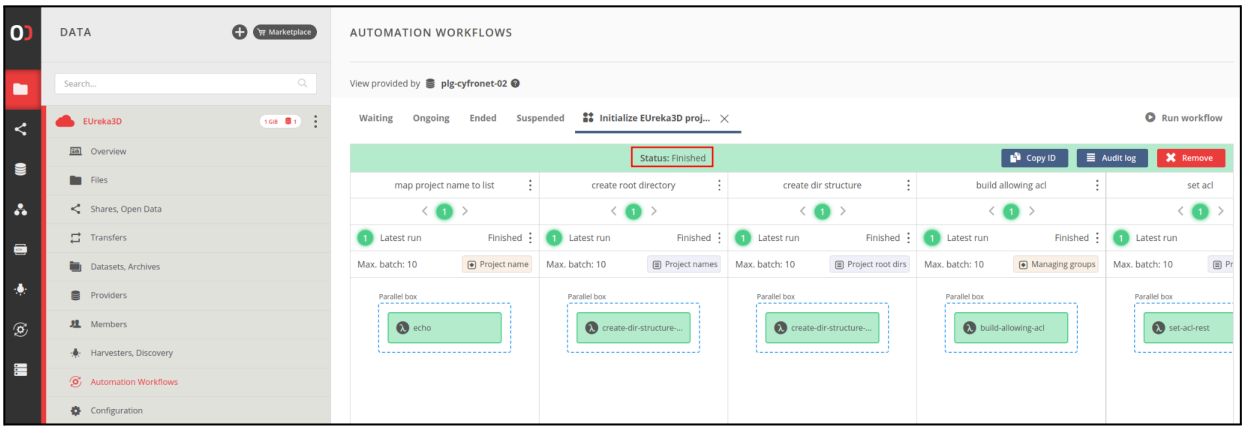
WARNING: If you configure an ACL, make sure you choose at least one group to which you belong or you will not be allowed to access the newly created project. If necessary, consult the **GROUPS** section in the left menu to check to which groups you belong — the list of your groups will be shown in the sidebar:



7. Click the **Run workflow** button.



8. Wait a moment for the workflow to finish.



9. Proceed to the **Files** tab in the **EUreka3D** space sidebar to see that the project directory was successfully created.

The new project will contain an initial structure where your data can be uploaded:

- 0-Reconnaissance
- 1-Preliminary

- 2-Detailed
- Paradata
- Viewer

Directories *0-Reconnaissance*, *1-Preliminary* and *2-Detailed* are intended for data in different quality levels:

- **0-Reconnaissance** is for data produced from a quick and easy digitisation, no complex and no expensive: (a) Very quick 2D/3D digitisation, (b) Not so accurate data set, when objects materials and their condition are not considered much, (c) Not expensive data acquisition and preprocessing of the data sets (when the most primitive equipment has been used), (d) The interest is only in the data formats used for your applications (and not about standards), (e) Data preservation and geometrical accuracy are not interesting.
- **2-Detailed** should contain the highest possible and most accurate digitisation, in order to achieve an outstanding record of data sets in the top possible quality. For example when you have high requirements in place, such as: (a) Enough time, (b) Enough budget, (c) The best infrastructure and professionals in place (for surveying and pre-processing), (d) No IPR issues, (e) You want to acquire all the information and data from the scanned objects (including accurate 2D textures/images, object's temperature and humidity/pixel, and 3D geometry, materials and their conditions, etc.), (f) Data long-term preservation is a must, (g) Data sets in standard formats is a precondition, (h) The availability of the unique results to be in Europeana.
- **1-Preliminary** is the intersection between Levels (0) and (2).

For more information about quality levels, refer to the EC's VIGIE Study[3].

Paradata is a directory intended to store all relevant paradata information (information about the digitisation process).

Viewer is a convenient directory for the storage of the 3D models that will be rendered by a viewer, such as those objects published in Europeana. This directory is intended to contain mainly public data that will be consumed by a 3D viewer.

3.4 Uploading files

The process of uploading files is very easy, thanks to the user-friendly graphical interface.

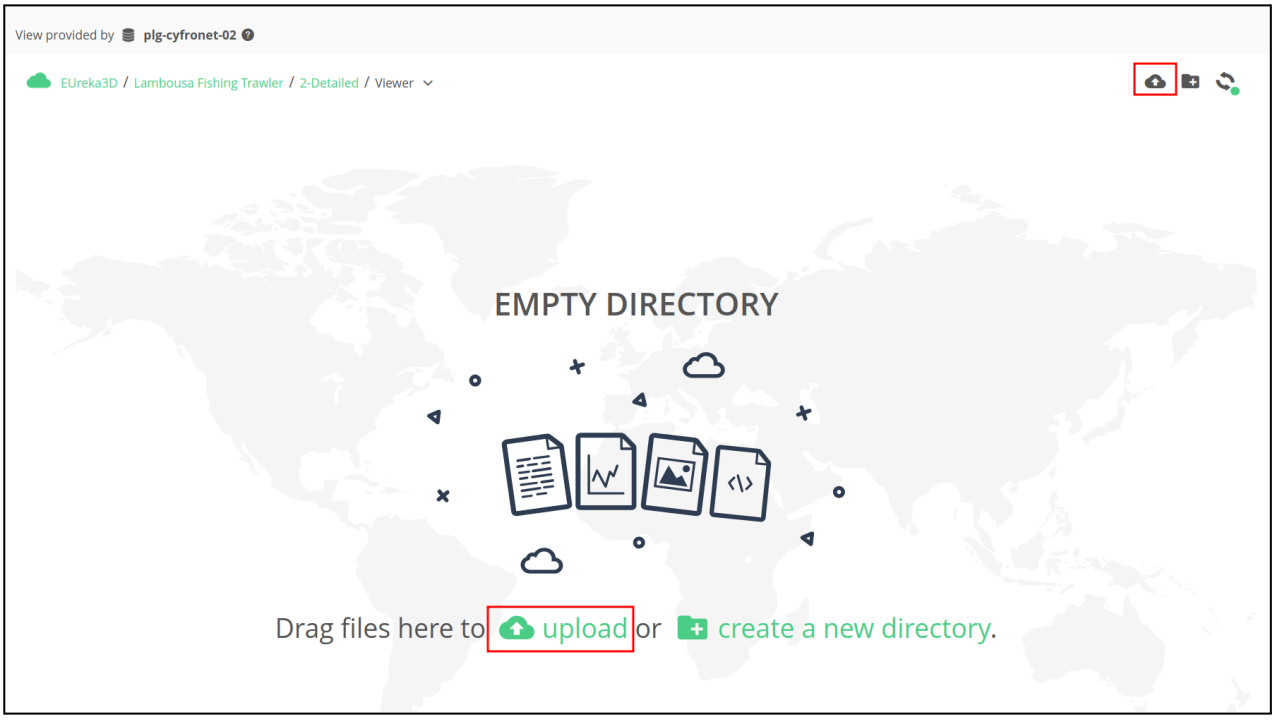
To upload files, navigate to the target directory. Use **double-click** to enter a directory or the **breadcrumb navigator**, located on the top, to move back:



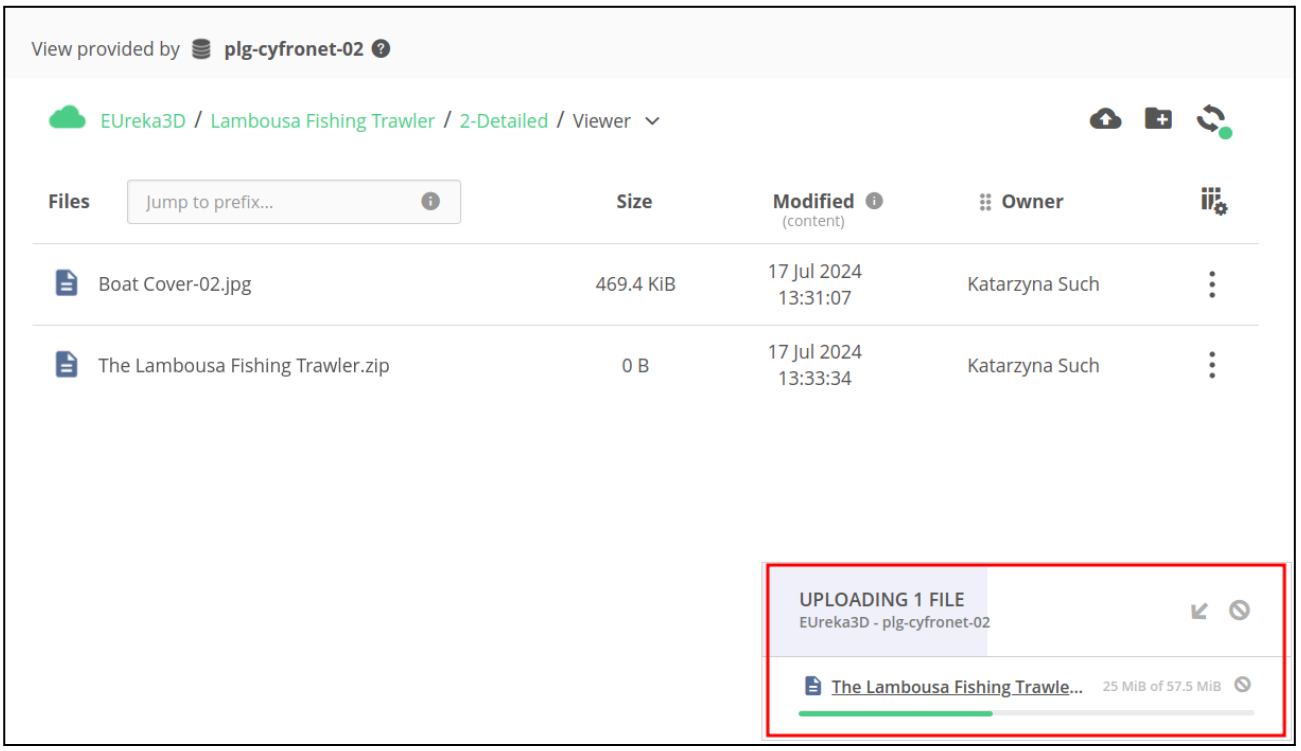
There are two main ways to upload files:

[3] *Study on quality in 3D digitisation of tangible cultural heritage*. Available at https://go.egi.eu/vigie

1. Files can be **dragged and dropped** over the directory and they will be uploaded
2. Alternatively, you can use the **upload action**, either in the centre of the page (if the directory is empty), in the top right corner, or invoking the context menu with a **right-click**.



Finally, choose the desired file from the computer. The upload progress bar is shown in the bottom right corner of the page.



3.5 Uploading 3D models for visualisation

3D models that are intended to be visualised by the EUreka3D viewer must be stored in a compressed ZIP file. You must pack your 3D model files in **a single ZIP file**. If the model has several files, such as an MTL, JPG and OBJ files, the three will be packed in a single ZIP file. If the model has only one file, such as a PLY, only this file should be packed in the ZIP file.

After the model has been packed, you should upload the ZIP file inside the "Viewer" directory.

IMPORTANT: Make sure that the initial view of the 3D model is in **its most natural position**, so the camera does not initially show the model in a strange position. If you are unsure, you can follow the steps of Section 3.7.2 to pre visualise the 3D model.

3.6 Sharing data

Once your data are uploaded, there are three main ways to share your data:

- Share data with other members of **the EUreka3D community**. All members of the community have access to DataHub, and you can grant them permissions to access your directories and data. These permissions are normally assigned to whole groups within the community. For example, the

"eureka3d-CUT" group represents all members of the Cyprus University of Technology. To understand how to share data with other community members, refer to **Section 3.6.1**.

- Share data **publicly**. Data can be shared with any person that is not part of the EUreka3D community. This is a convenient way to provide specific files and even whole directories for users that have noy been allowed to use DataHub. This is explained in **Section 3.6.2**.
- Publish 3D models in **Europeana**. Another way to share data is to use Europeana, the European initiative that aims at facilitating cultural heritage for education, research, creation and recreation. This publishing process is discussed in **Section 3.7**.

3.6.1 Configuring permissions: Collaboration with other members of EUreka3D

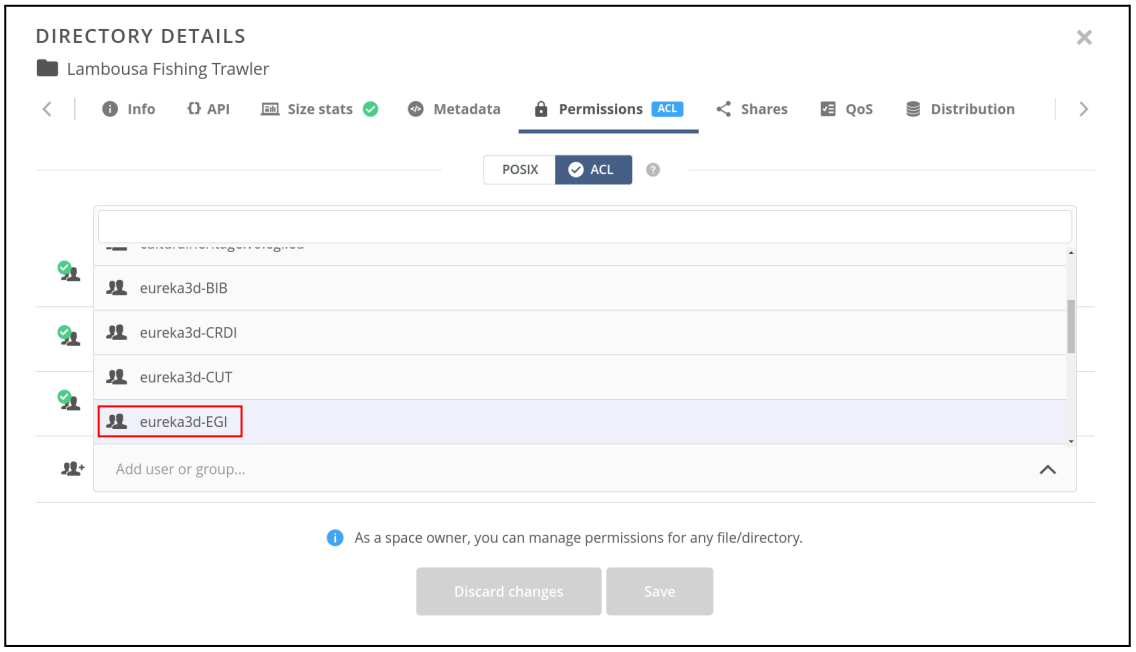
In order to configure the access of other users to your data, Access Control Lists (ACL) are used. These lists specify the permissions that each group of users have over the data (directories and files). Normally, permissions are assigned to preconfigured groups of users, rather than to individual users. If a new group is required, please contact an administrator (a "VO Manager") of the EUreka3D community.

The first configuration of access permissions is done during the creation of a new project, as explained in Section 3.3. The managing groups that are specified during the workflow execution grant rights to view and modify the project directory according to the specified ACL. Users who do not belong to any of the configured groups will not be allowed to view or modify the files inside the project.

At any other time, the ACL can be modified to add or remove groups, or to configure specific aspects of the access to some data. Use the **ACL** badge or the **Permissions** action to view the ACL set for any directory:

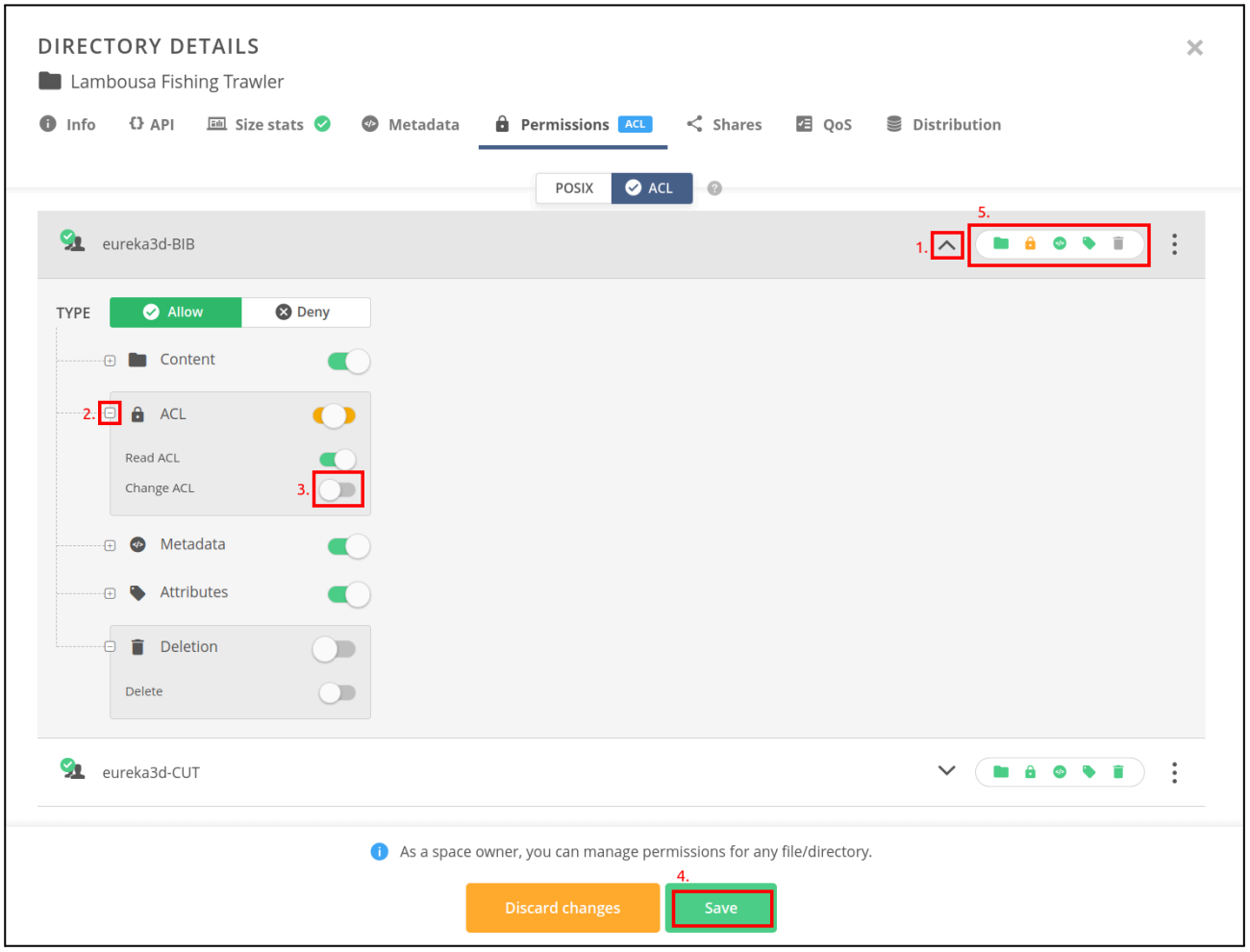


The default ACL can be adjusted as needed. Use the editor to remove entries or add new ones, adding rules for a space member (user or a group of users).



To grant or deny granular operations for a specific user or group:

1. Open the drop-down menu on an Access Control Entry (ACE) for the user or group. The **TYPE** of the entry indicates if the permissions listed below will be allowed (green) or denied (red).
2. The permissions are grouped by category (Content, ACL, etc.). Use the **+/-** button to expand or collapse the list of permissions.
3. Toggle right to select a permission that will be impacted by this ACE. Inactive permissions (marked as grey) are neither allowed nor denied by this ACE.
4. Click the **Save** button to save the changes.
5. At the right end of the principal row, you can see icons indicating the status of the groups: green (fully granted), yellow (partially granted), or grey (not granted).



ACL provides control of access to such resources as:

Permissions	Description	Applies to
Read	Allows opening the file for reading	File
Write	Allows opening the file for writing	File
List files	Allows listing directory content (see files inside a directory)	Directory
Add files	Allows adding a file inside the directory	Directory
Add subdirectory	Allows creating a subdirectory inside this directory	Directory
Traverse directory	Allows navigating through a directory structure	Directory
Delete child	Allows deleting files or subdirectories inside a directory	Directory

Read ACL	Allows reading file/directory permissions	File/Directory
Change ACL	Allows writing file/directory ACL	File/Directory
Read metadata	Allows reading file/directory metadata	File/Directory
Write metadata	Allows writing file/directory metadata	File/Directory
Read attributes	Allows reading metadata associated with file/directory attributes	File/Directory
Write attributes	Allows writing metadata associated with file/directory attributes	File/Directory
Delete	Allows deleting the file/directory	File/Directory

Additional documentation:

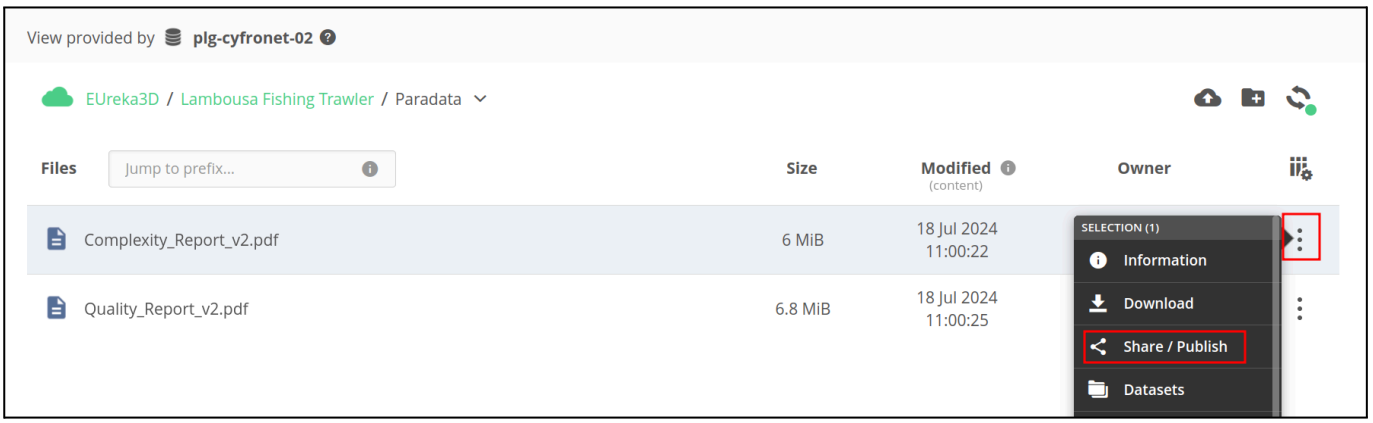
- https://onedata.org/#/home/documentation/21.02/user-guide/data[access-control-lists].html

3.6.2 Sharing data publicly

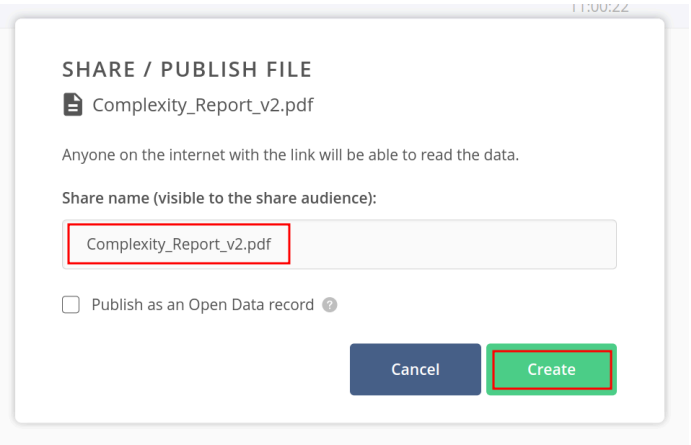
Sometimes it is useful to share data with other people, such as a paradata PDF, a raw 3D model or different interesting objects that have been produced during the digitisation process. For these cases, a **Share** can be created. Shares can be created on a single file, if only the file is to be shared, or on directories, if the whole content inside the directory is to be shared. Sharing directories is useful when many files have to be shared.

NOTE: Shares are semi-public, which means that anyone knowing the link to a share can access it. However, in practice, guessing the link is unfeasible in a timely manner.

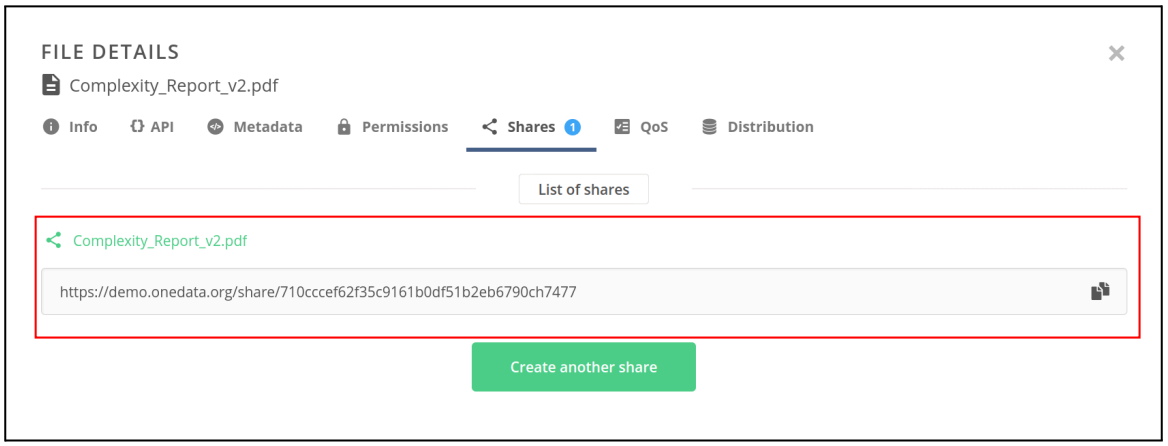
To create a Share click on the three dots button at the far right of the file or directory, and choose the **Share/Publish** option.



Enter a Share name that will be visible to other users and click the **Create** button.



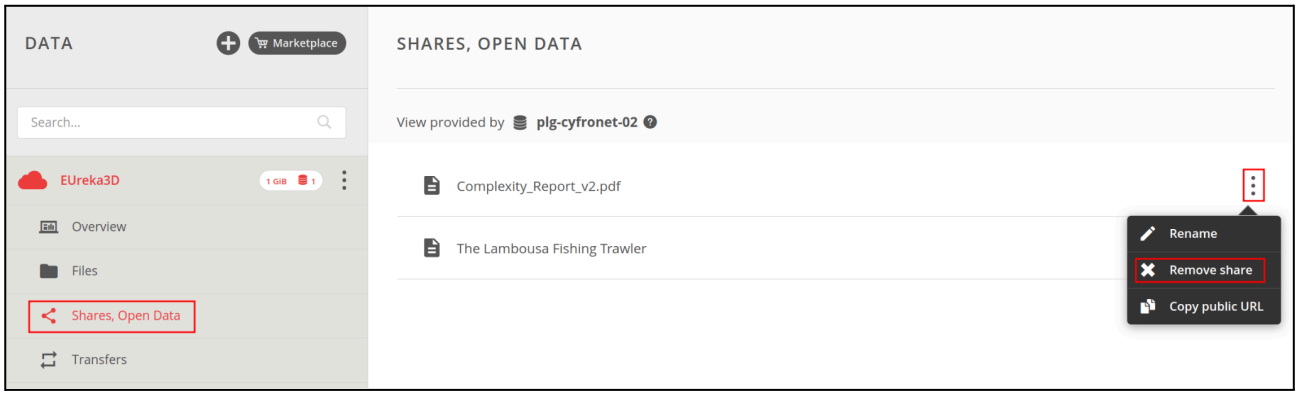
After the successful Share creation, a right-side details panel with the **Shares** tab will appear containing a list of Shares created for a selected file or directory.

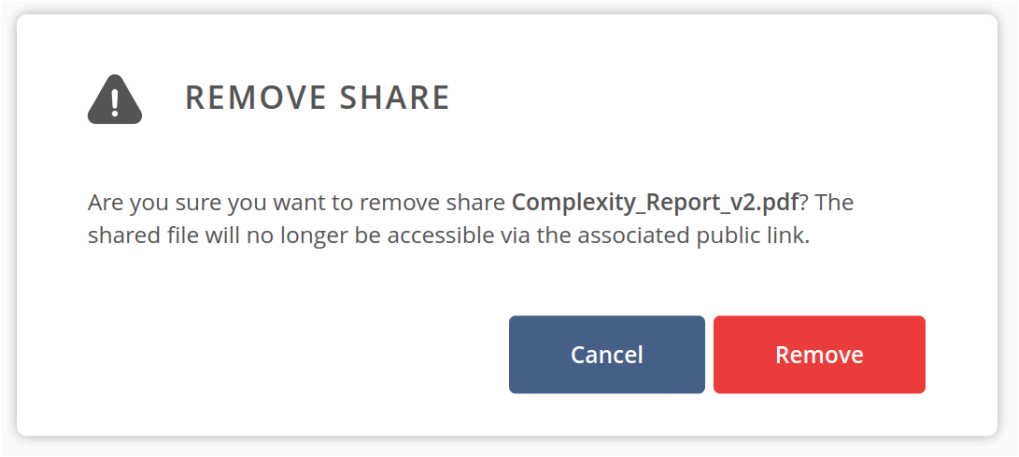


You can click on the green link (with the share icon and name) to navigate to the share details page (private view for share managers). Below you will find the public link for accessing the share (public view for anyone with the link). You can share this public URL with people interested in accessing this data.

To list all shares created in the space, navigate to the **Shares, Open Data** view. To open the action menu click the three dots button at the far right of the share row. The actions menu for Share provides the following operations: **Rename**, **Remove share**, and **Copy public URL**.

To remove a share, choose the **Remove share** option from the action menu and click the **Remove** button in the **Remove Share** modal.





Additional documentation:

- https://onedata.org/#/home/documentation/21.02/user-guide/shares.html

3.7 Publishing in Europeana

Updated 3D models can be published in Europeana through the EUreka3D platform. This process consists of three steps:

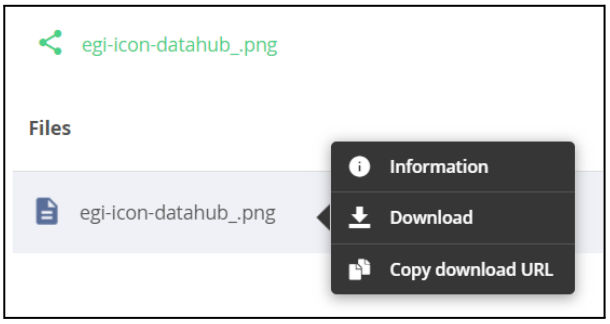
- **The request of a Persistent Identifier** (PID), which is a long-lasting reference to a digital object, a well-rooted standard in Open Data publishing. A PID is also a valid URL that can be visited to view the Open Data record in the public DataHub Web interface (publicly accessible without authentication). EUreka3D obtains PIDs from the external B2HANDLE service[4].
- **Creation of metadata**. A vital part of publishing is to include rich metadata that will make the record discoverable and meaningful for its consumers. All CH objects in EUreka3D use the EDM (Europeana Data Model) metadata format.
- **Data sharing with Europeana**. After a record is published, the Europeana service will automatically harvest its information (via the OAI-PMH protocol) and expose it in the Europeana Portal. The EDM metadata is ingested by Europeana and used to compile information about the CH object, so it must be well-curated.

The request of the PID and the data sharing are automatically done by DataHub, but content providers must provide the metadata for each object to be published. The following sections will guide you through the process of preparation of the data and their publishing in the Europeana Portal.

3.7.1 Preparing the model thumbnail

3D models can have a representative image that is used to give a first visual impression of the 3D object they will be seen in the 3D viewer. Herein, it is convenient to upload and share this static image of the 3D model before publishing it, by following these steps:

1. Create a representative image of the 3D model in JPG or PNG format.
2. Upload it in DataHub in the same directory as the ZIP file of the 3D model (directory **/Viewer** inside the project folder). Use the same file name suffixed by “thumbnail” for clarity.
3. Share the file publicly as explained in Section 3.6.2.
4. Go to the Share details.
5. Right-click on the file and click on “Copy download URL”. This will copy the necessary URL to your clipboard.



[4] https://www.eudat.eu/service-catalogue/b2handle

6. Note that you will need to use this URL for the “Representative image” attribute of the metadata.

NOTE: If the image is not shown in the metadata page once you publish the model, verify that **you are using the right URL** of the image. A simple test is to open the URL and see that you can visualise the image. One common error is to skip Step (4), so the right menu is not shown in Step (5).

It is **strongly suggested** to upload this thumbnail as, not only DataHub, but other systems will use it to provide a first overview of the object. This is, for example, the listing of two EUreka3D objects where their corresponding images are shown:



3.7.2 Test the correct visualisation of your 3D model before publishing it

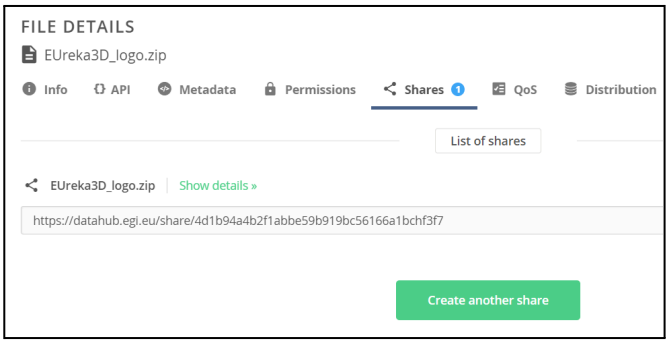
It is quite useful to test if a 3D model is visualised correctly before publishing it. If you need to do so, you can take a few steps:

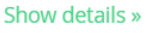
1. Upload the model normally, as explained in Section 3.5.
2. Then, provisionally share it as explained in Section 3.6.2. The file will present a “Shared” tag:



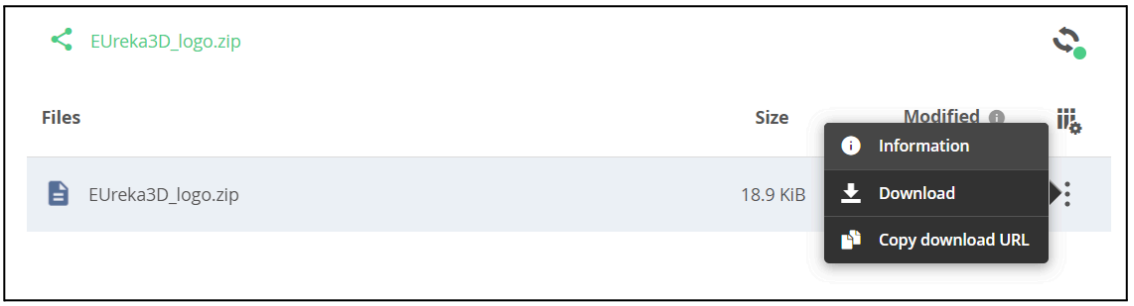
3. Click on the "**Shared**" tag: 

This will open a screen like this one:

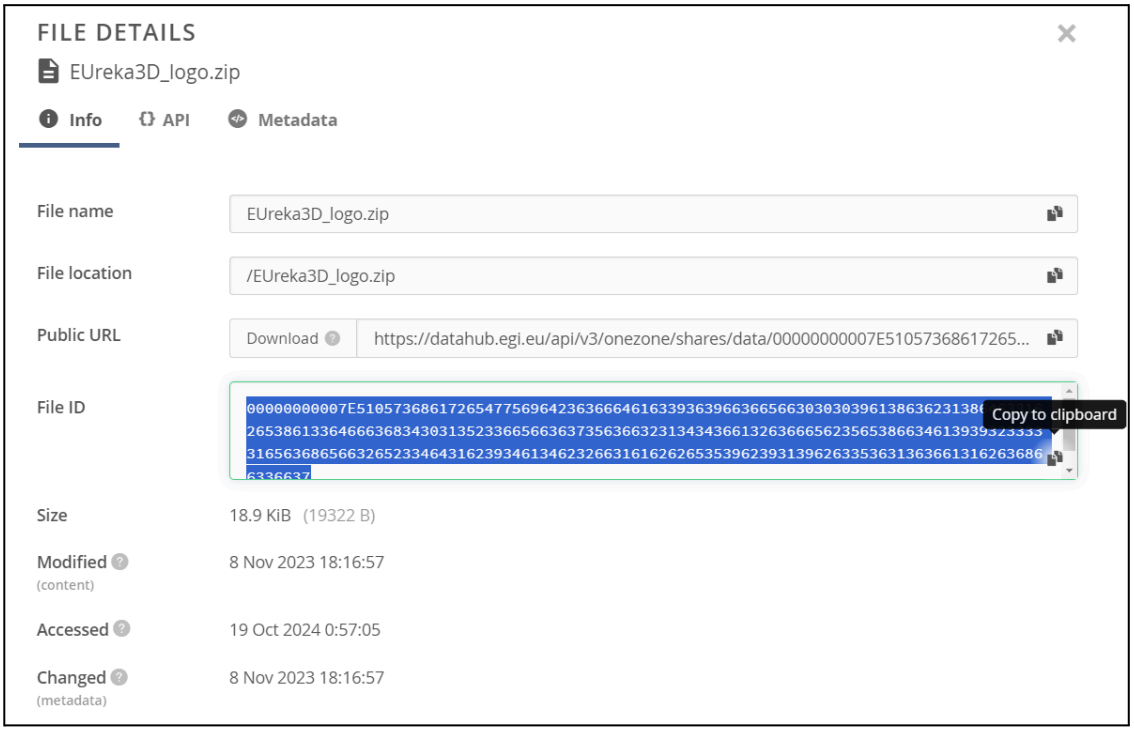


4. Click on "**Show details**": 

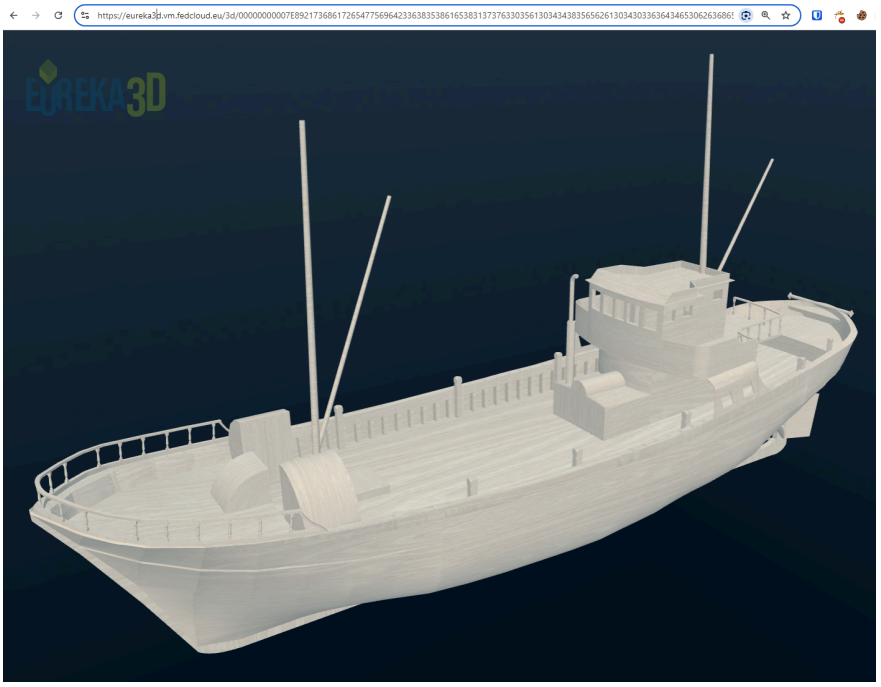
5. In the next screen click on the **three dots** (⋮) on the right side of the share to open the context menu, and then click on "**Information**"



6. In the next screen, copy the long number for the **File ID**:

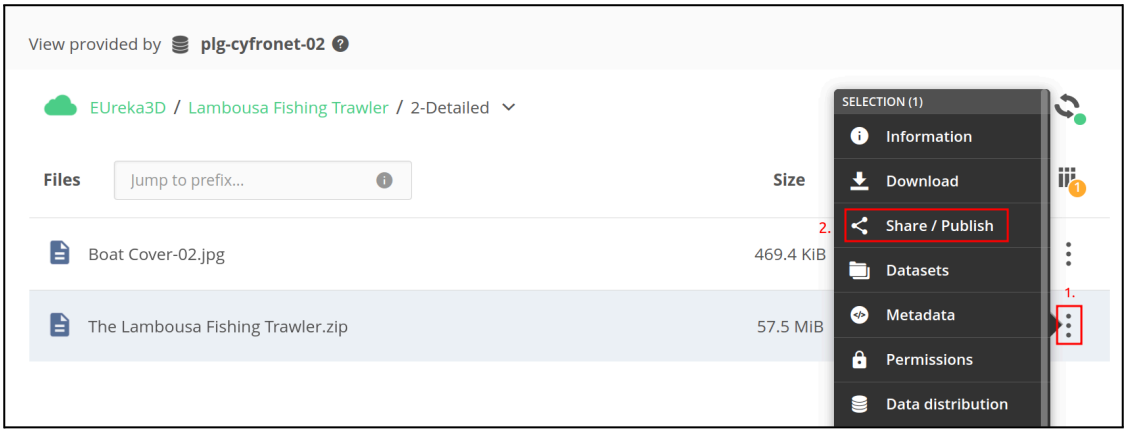


7. Finally, visit this URL:
   https://eureka3d.vm.fedcloud.eu/3d/<File ID>
   Where <File ID> is the long number you just copied.
   Example: *https://eureka3d.vm.fedcloud.eu/3d/000000000052762867756964236366646163393…*
8. If the 3D file is correct, this page will render the 3D model, so you can check how it looks. Once you finish your review, you can remove the Share you created in Step 2, as explained at the end of Section 3.6.2.

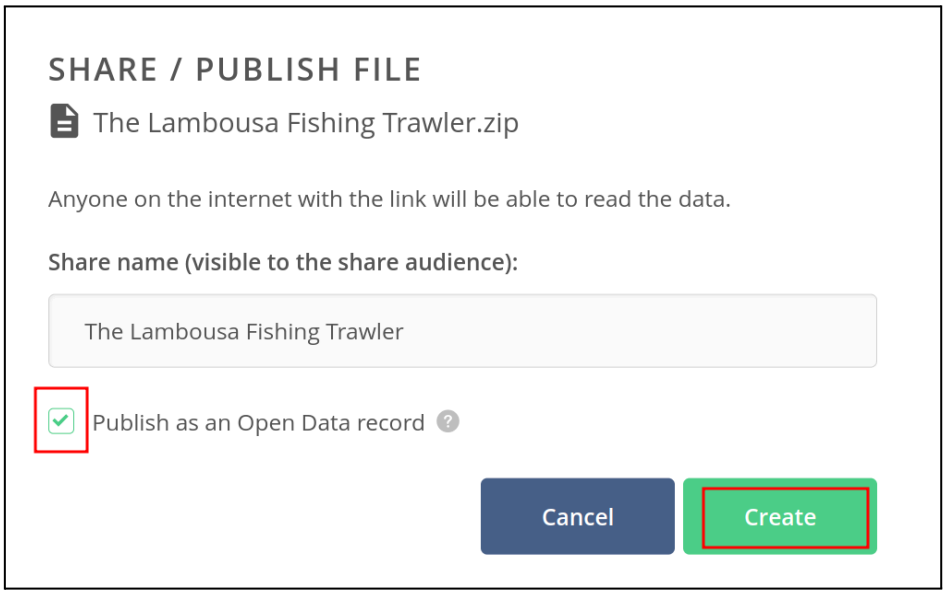


3.7.3 Create an Open Data record

To publish a 3D model click on the three dots button at the far right of the file and click on **Share/Publish** from the dropdown menu, as shown below:

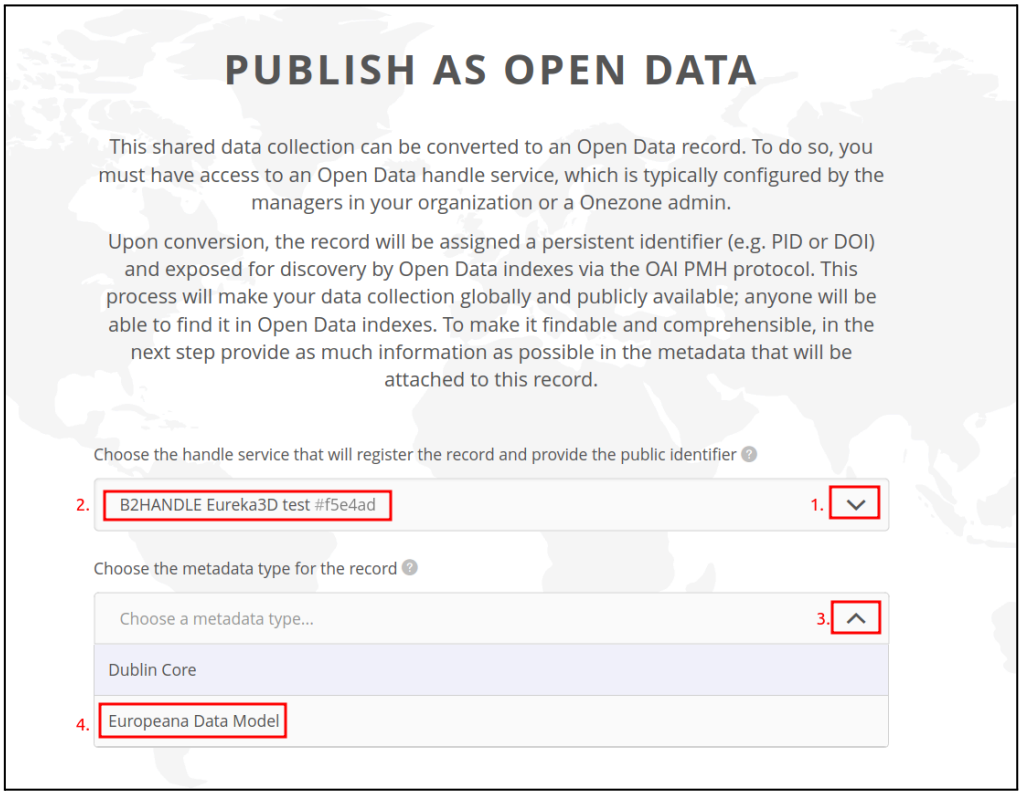


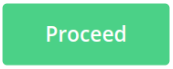
The process is similar to creating a share, but this time use the **Publish as Open Data record** option to create a share and convert it to an Open Data record in one go. Click the **Create** button to proceed:



NOTE: You can also take an existing Share and publish it as an Open Data record. Follow the instructions in Section 3.6.2 to open the share details. There, you will find the **Publish as Open Data** tab that will take you through the process, as described below. This way you can resume the Share+Publish procedure if you have not finished it, but the Share has already been created.

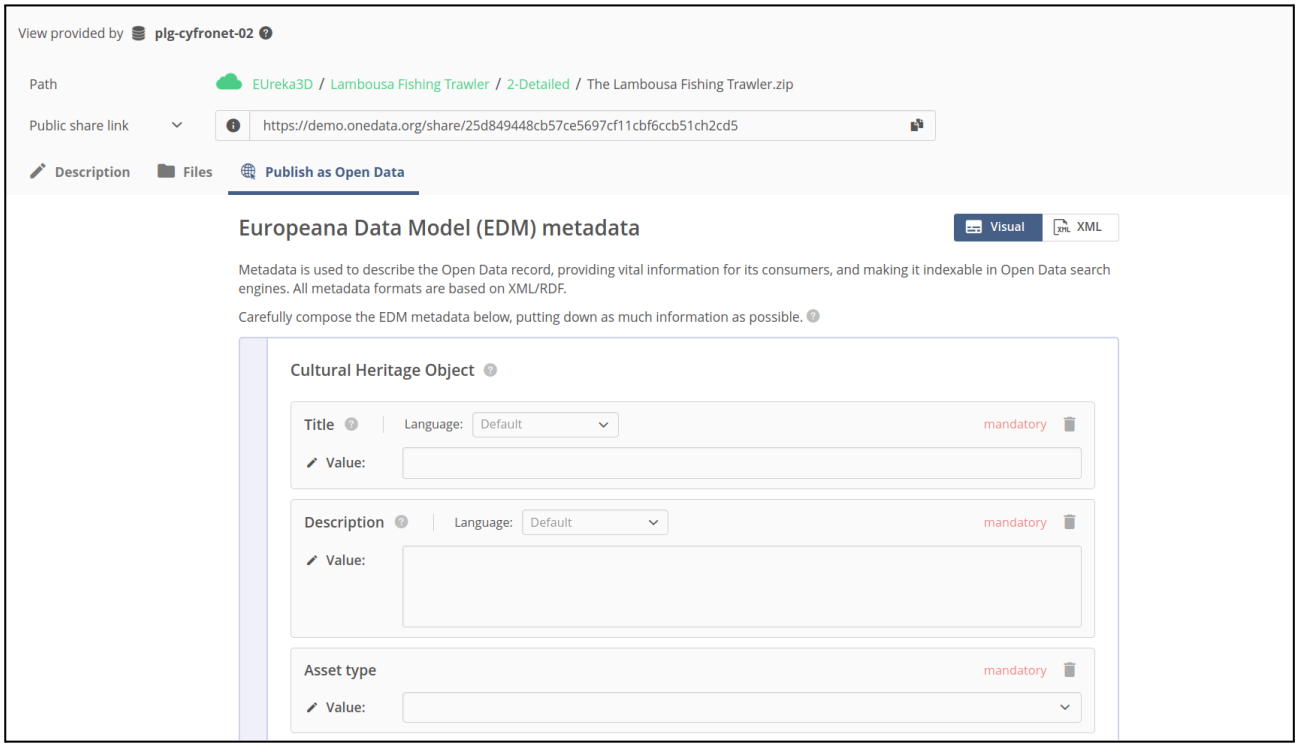
On the next page choose the **B2HANDLE** service. Next, select the **Europeana Data Model** as the metadata type:



Click on the Proceed button  .

IMPORTANT: This process will request a real PID (Persistent Identifier) from B2HANDLE. These identifiers are meant to be long-lasting references. If you want to do a test or you are not sure that the 3D model is correct, **do not publish it** in Europeana yet. For tests, ask a EUreka3D administrator to use the Testing environment. To verify the 3D model, you can proceed as explained in Section 3.7.2 to check its visualisation.

Pressing the Proceed button will lead you to a form to input metadata in EDM format.



There are two options to add the EDM metadata:

- By using a user-friendly **form**, which contains different fields for the different EDM attributes.
- By using **XML** directly to encode RDF data, which is a more advanced way to introduce EDM data.

To swap between these two modes, use the button at the top right of the form:



See Section 3.7.4 for a brief guide about the visual form and 3.7.5 for a brief guide about the XML editor.

NOTE: This document does not describe or explain EDM (Europeana Data Model). If you need to obtain more knowledge about this model, refer to the official documentation at: https://pro.europeana.eu/page/metadata

3.7.4 Adding metadata with the form

The form is a user-friendly way to introduce metadata, without needing any technical knowledge of EDM. Carefully complete the fields in the form, providing as much information as possible. Some fields are marked as mandatory and must be filled, but it is a good practice to consider and fill optional fields too.

The form is divided into three main sections to add metadata information, according to EDM:

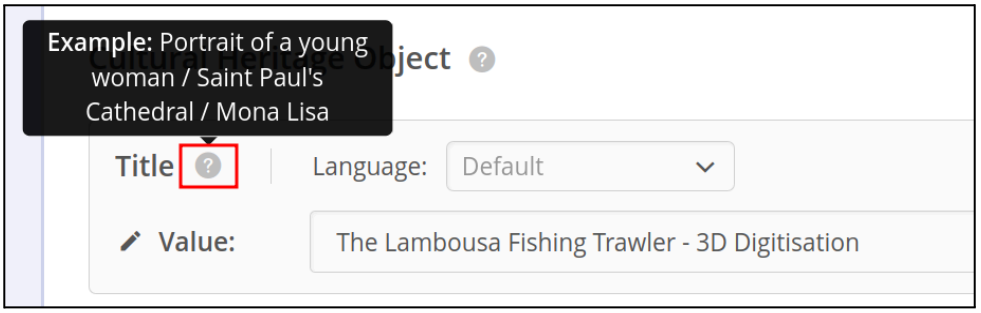
- **Cultural Heritage Object** (corresponding to *edm:ProvidedCHO* in EDM), which refers to information about the physical object in the real world.
- **Digital Object** (corresponding to *edm:WebResource* in EDM), which refers to information about the digitised 3D model of the object.
- **Aggregation** (corresponding to *ore:Aggregation* in EDM), which refers to information about the publication in Europeana and other external systems.

These three sections are mandatory to create a valid EDM record in EUreka3D.

A table with the current metadata fields can be found in Annex A.

The form presents the following features:

- If you do not know what a field means, you can access the field help, which may provide some examples. Just click on the question mark icon near the field name.



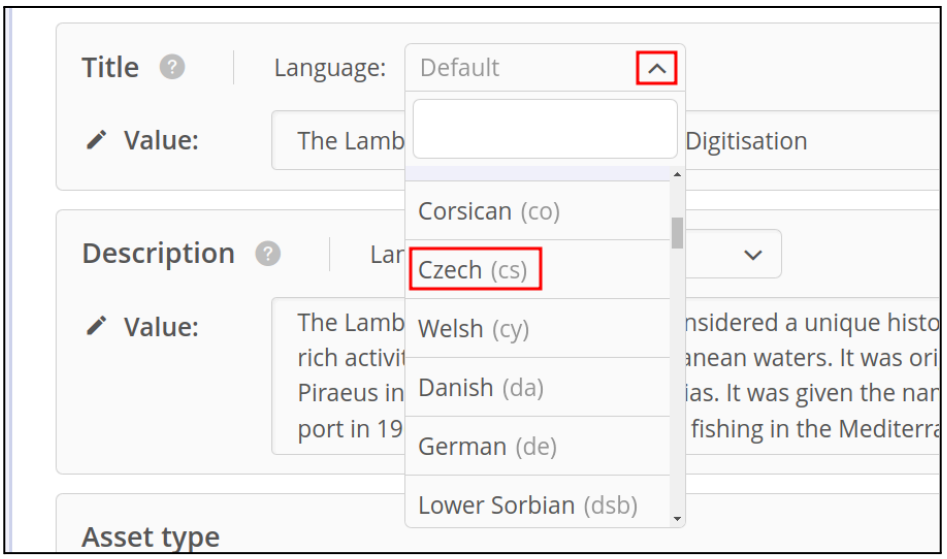
- Additionally, some fields will present an example to guide you about the sort of information that is expected for that attribute.



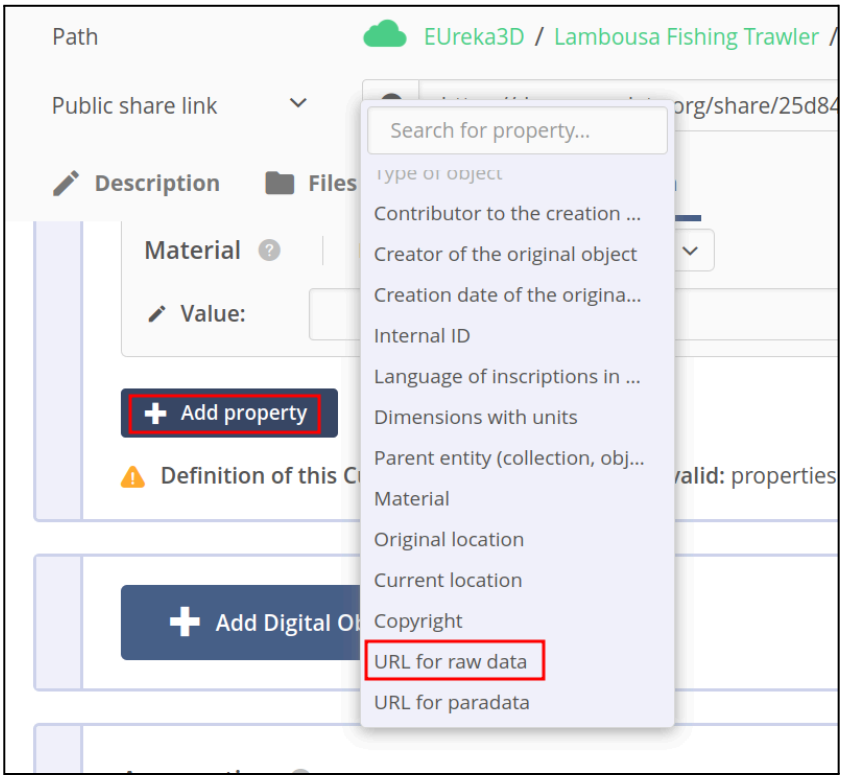
- To choose between **Literal value** and **Reference**, click the button near the field name. Literals represent text, such as “St. Paul's Cathedral”, whereas references refer to URIs. References can be used when a vocabulary is used (e.g. Getty) and is a convenient way to express interoperable data. It is suggested you use well-established references whenever possible.



- Some attributes allow information about the language in which they are written. For example, the name of an object (its "Title") can be expressed in English or its original language (e.g. Greek). To change the field's language, open the drop-down menu and select the desired language. By default, the language will be **English**.

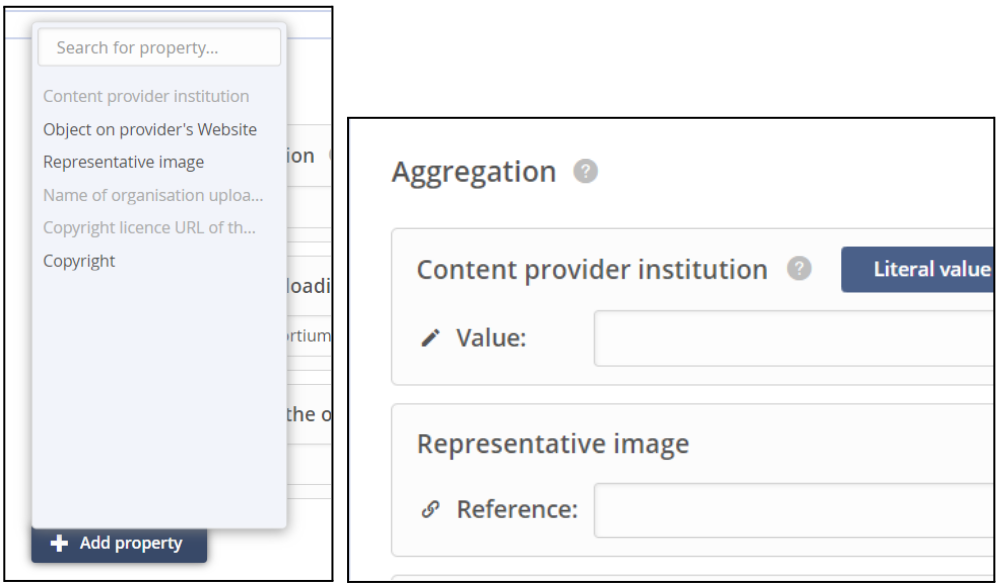


- Initially, not all fields are shown, only mandatory fields. This is done to simplify the form. To add optional fields, click the **Add property** button and choose the desired attribute.

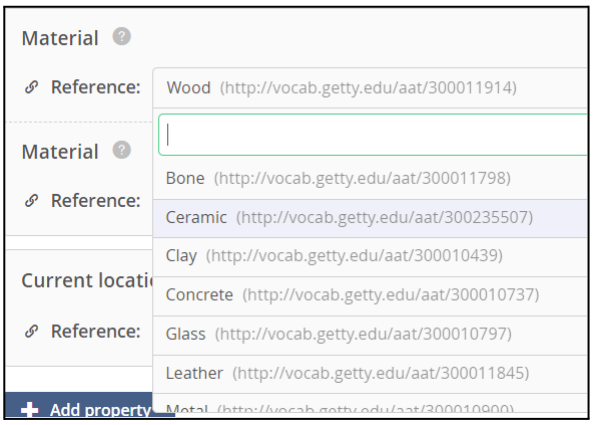


This option can be used to add existing attributes, in order to duplicate them. This allows, for example, the creation of multiple object titles that can have different languages (one in English and one in the original language).

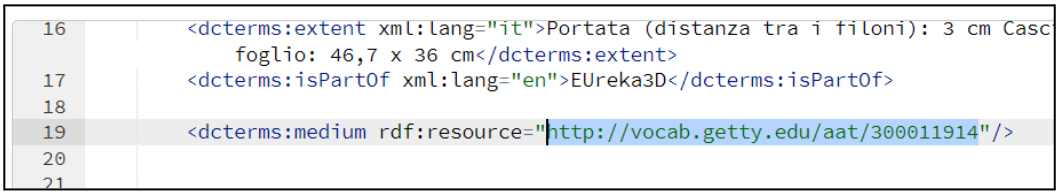
- To add a representative image of the model, go to the **Aggregation** section and add a property **Representative image**. This field is optional, but it is **strongly recommended** you use it. To fill in the attribute, follow the steps listed in Section 3.7.1 and use the image public URL.



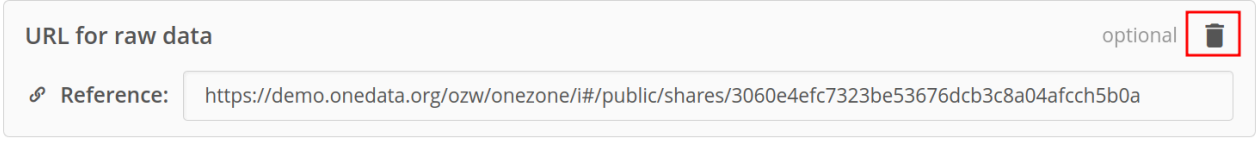
- The definition of Materials uses a predefined list of general groups (Bone, Ceramic, Clay, Concrete, Glass, Leather, Metal, etc):



Note that if you need to be more specific and use a material that is not in the predefined list, you can add it manually by using the RDF/XML editor (described in Section 3.7.5):



- To remove a field, click on the trash icon in the right corner.



When you finish adding information, click on the **Save** button at the bottom of the page.

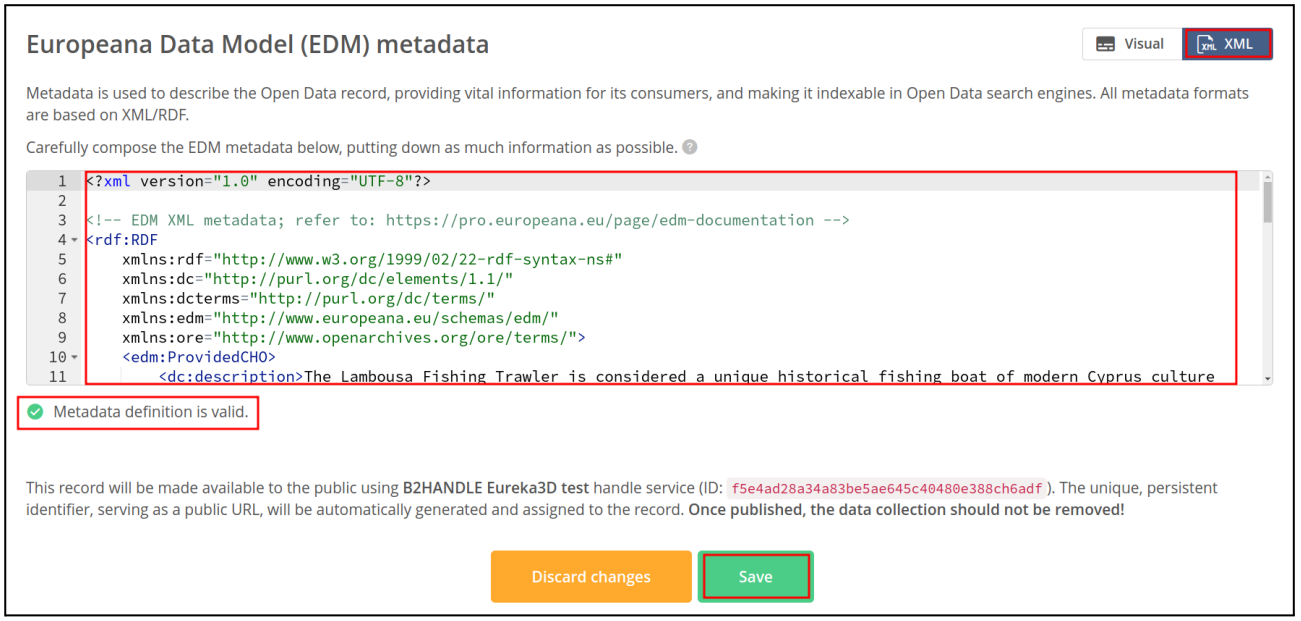


3.7.5 Adding metadata in RDF/XML

The XML editor mode displays the metadata expressed in the RDF/XML syntax. The carried information is equivalent to the information entered via the visual form, and is synchronised when the modes are switched.

You may edit and extend the metadata by inserting valid XML into the text field. It is also possible to paste in a whole XML document, as long as it is valid EDM metadata expressed in XML. The confirmation that the XML is valid will be shown on the page. See the Europeana documentation for detailed information about the EDM format and metadata mapping guidelines[5] [6] [7].

The XML mode lets you add extra fields that are not recognised in the visual form. They will be retained upon switching the modes — the visual form will display a note that the XML contains some extra information.



Once you finish editing the XML, click on the **Save** button at the bottom of the page.

[5] https://europeana.atlassian.net/wiki/spaces/EF/pages/987791389/EDM+-+Mapping+guidelines
[6] https://europeana.atlassian.net/wiki/spaces/EF/pages/1969258498/Metadata+Tier+A
[7] https://europeana.atlassian.net/wiki/spaces/EF/pages/2238447617/Examples+of+high+quality+data

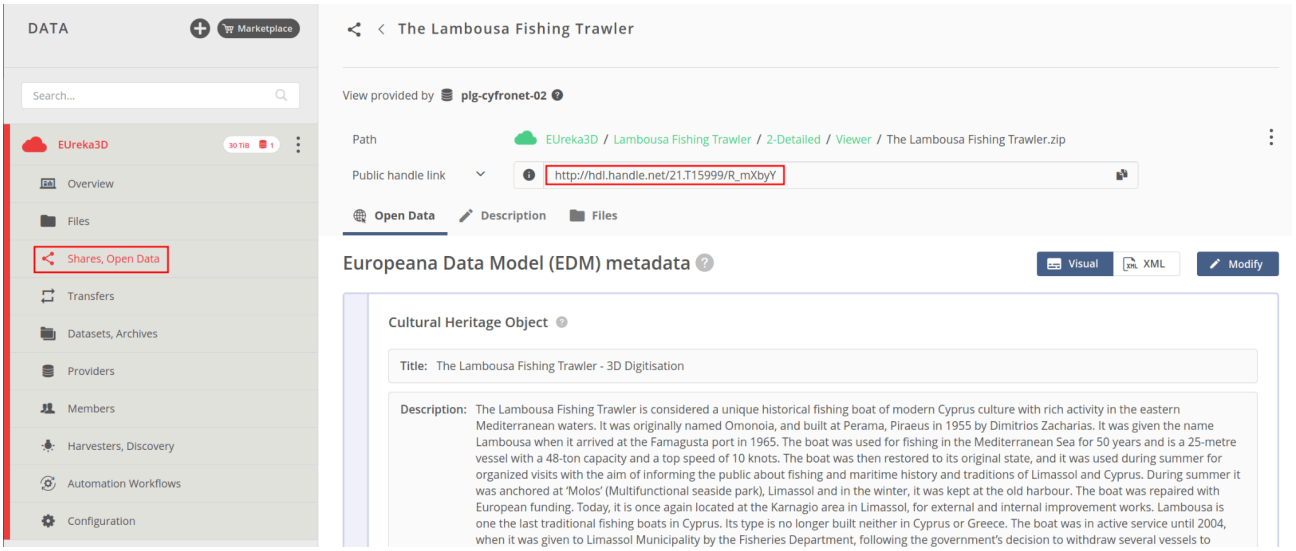
NOTE: Data introduced in the form will be shown in the XML, and vice versa. If the form does not accept some specific EDM attribute that you want to specify, use the XML mode to add it. The attribute will not be shown in the form but it will be sent to Europeana.

3.7.6 Publishing in the Europeana Portal

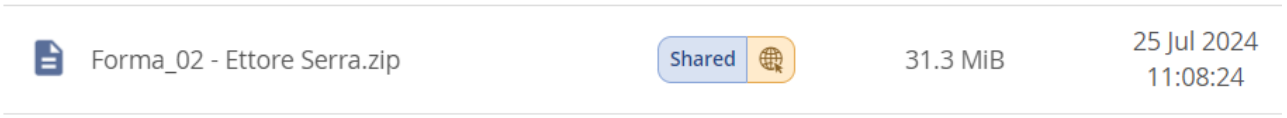
After you create the metadata, your model is published as Open Data with a PID, and it can be discovered by Europeana. Now, the Europeana systems will access your metadata at some point and ingest it in its database to be shown in its Web Portal.

NOTE: Europeana has not yet automated the process of detecting changes in the source systems, so they do some manual work to update their database Herein, **you may need to contact an EUreka3D administrator** to inform them that you have uploaded new models for publication in Europeana, so that they can contact Europeana administrators to trigger the updating process.

The metadata of the 3D model and its 3D visualisation will be public (no authorisation will be needed), and are accessible using the public handle link:



Published files will show a special icon next to the "Shared" tag to mark this situation:



You can use the **Shares, Open Data** menu in the sidebar to see the list of all shared data collections and Open Data records (an Open Data record is essentially a public Share that has been assigned a PID, metadata, and exposed to Europeana).

4. AUTOMATED PUBLISHING

The previous section has explained the process of managing your data with the GUI (Graphical User Interface) of DataHub, including uploading and sharing of models. However, when you have to upload many models (*e.g.* 500 models), working with the GUI to manually upload them one by one is a very tedious process. To solve this issue, you can use **DataHub's REST API** (Application Programming Interface). In simple terms, an API provides a way for a program to interact with a system, such as DataHub.

Using the API requires you to have some IT knowledge, at least to do some programming and understand basic Web concepts.

The process to use the API requires first to obtain a token, for security reasons. This is simply a string that gives your program permissions to do operations in DataHub in your name. This is discussed in Section 4.1.

Then, there are five steps that your program can conduct to upload and publish a model:

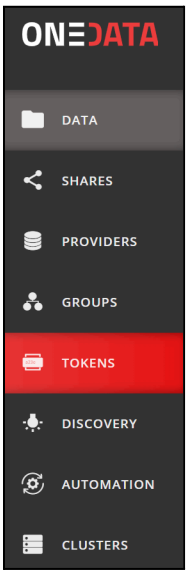
1. Create a project.
2. Check for the project creation before continuing with the rest of the steps.
3. Upload a 3D model.
4. Create a Share for the 3D model file.
5. Obtain a PID and upload the metadata.

Each of these steps will be discussed in Sections 4.2 to 4.6. Note that, strictly speaking, you do not need to perform all the steps with the API. You could for example create the project with the GUI, as explained in Section 3.3, and then automate the upload and publication of the models with the API.

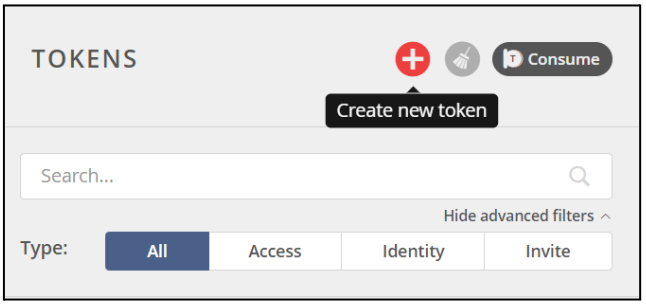
NOTE: For convenience, the examples given in this section use *curl*, but you are not expected to execute this manually. In real life, you will need to create a program or script in Python, Go, Java, Bash or any other programming language.

4.1 OBTAINING ACCESS WITH THE CREATION OF A TOKEN

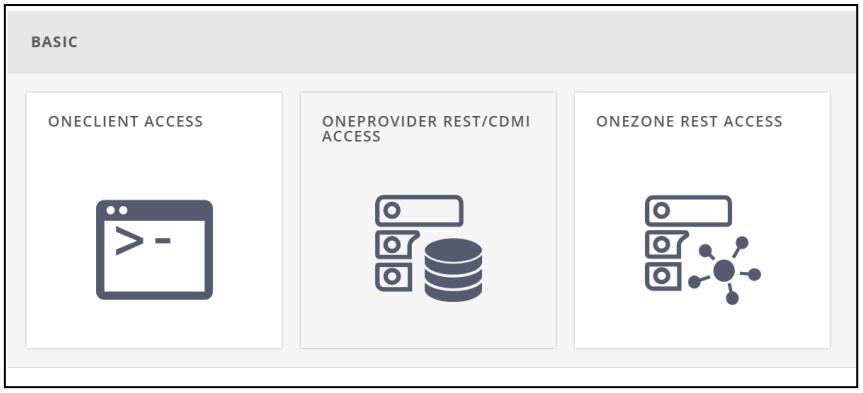
Log in to https://datahub.egi.eu and go to the menu option "Tokens":



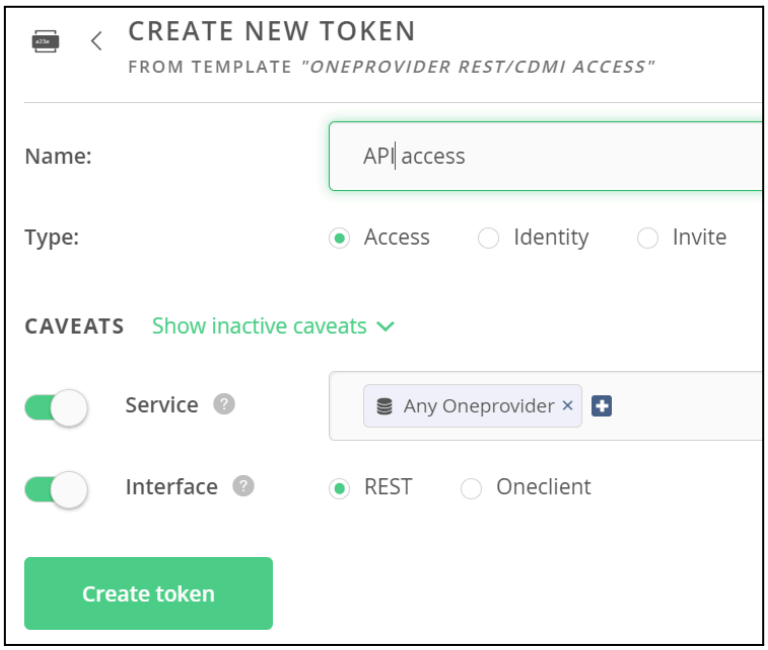
Click on the “+” sign to create a new token:



Choose the option “Oneprovider REST/CDMI access”:



Give it a name, such as “API access” and click on “Create token”:



The token is created:



You will need this token to call the different methods of the API.

4.2 Creation of a project

Similarly to what is explained in Section 3.3, you can create a project with the API.

Documentation:
https://onedata.org/#/home/api/stable/oneprovider?anchor=operation/schedule_workflow_execution

Example:

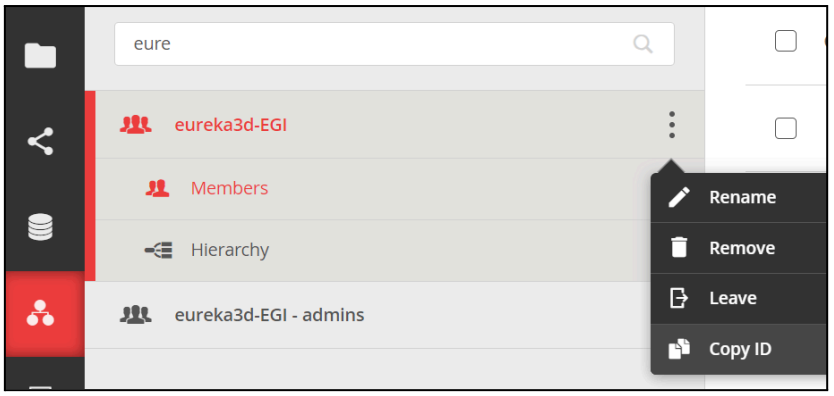
```
curl -H "X-Auth-Token: $TOKEN" -X POST
"https://plg-cyfronet-02.datahub.egi.eu/api/v3/oneprovider/automation/execution/wo
rkflows" -H "Content-Type: application/json" -d '{ "spaceId":
"6ef675cf21446a2cfeb5e8f4a992331echef2e", "atmWorkflowSchemaId":
"99ddd10bc160b73f65cb93af8444d465chb2ff", "atmWorkflowSchemaRevisionNumber": 1,
"storeInitialContentOverlay": { "cac81938bc14eb80041fe4ac51f13677abd874": "Example
project", "0fb9d0c480c2e5dbce39bc861b73ce6f53e4ca": { "fileId":
"00000000005855E5677569642373706163655F3665663637356366323134343661326366656235653
8663461393932333331656368656632652336656636373563663231343436613263666562356538663
4613939323333316563686566326" }, "bb5c588454d4d79792964d18f019d478e596b3": [
{"groupId": "7ae89b417cf97219abe41c76a9a00f25chf972"}, {"groupId":
"13a7cc86a43e84328f74276a9a06b10031809"} ]}}'
```

Answer (you need this value for the next call):

```
{"atmWorkflowExecutionId":"fb15f9813710b2a62d1d621a85150860ch0cda"}
```

Notes:

- Marked in green are the values that you need to provide, in this case the name of the project and the "group ID" of the group(s) that you want to use for the ACL (see the part about "Managing Groups" in Section 3.3). To collect the group ID of one of your groups, you can access the GUI left menu: `Groups > click the three dots of the group > Copy ID`



- Currently, "atmWorkflowSchemaId" is always "99ddd10bc160b73f65cb93af8444d465chb2ff". This should stay like this, but you can always check the ID of a new workflow in the GUI left menu: `Automation > EUreka3D inventory > click the three dots of the workflow > Copy ID`
- Similarly, "atmWorkflowSchemaRevisionNumber" is currently "1". If a new version is released you can find the revision number on the inventory page, through the GUI left menu: `Automation > EUreka3D inventory`

4.3 Checking the project has been created

Before moving to the upload of the 3D model you need to make sure that the step of Section 4.2 has finished successfully. This is necessary because running these steps in a program may run too fast, while the project creation workflow is run asynchronously in the background. This API call needs the "atmWorkflowExecutionId" value returned in the previous API call. You should periodically check for the *status*, and once it is "finished", your program can proceed to the next call.

Documentation:

https://onedata.org/#/home/api/stable/oneprovider?anchor=operation/get_workflow_execution_details

Example:

```
curl -H "X-Auth-Token: $TOKEN " -X GET
"https://plg-cyfronet-02.datahub.egi.eu/api/v3/oneprovider/automation/execution/wo
rkflows/$WORKFLOW_ID" | jq .status
```

Answer:

```
"Finished"
```

Notes:

- WORKFLOW_ID is the value "atmWorkflowExecutionId" that was obtained in the previous step.

4.4 Uploading a 3D model

The next step is to upload the 3D model to the "Viewer" directory.

Documentation:

https://onedata.org/#/home/api/stable/oneprovider?anchor=operation/create_file_at_path

Example:

```
curl -H "X-Auth-Token: $TOKEN" -X PUT
"https://plg-cyfronet-02.datahub.egi.eu/api/v3/oneprovider/data/
6ef675cf21446a2cfeb5e8f4a992331echef2e/project_name/Viewer/file_name" -H
"Content-Type: application/octet-stream" -d "@model.zip"
```

Answer:

```
{"fileId":"00000000005855E56775696423737061636555F366566..."}
```

The file ID that is necessary for the next call.

Notes:

- The space ID for EUreka3D is always "6ef675cf21446a2cfeb5e8f4a992331echef2e"

4.5 Create a share for the 3D model

Once the file is uploaded, a share must be created.

Documentation:

https://onedata.org/#/home/api/stable/oneprovider?anchor=operation/create_share

Example:

```
curl -H "X-Auth-Token: $TOKEN" -X POST "https://
plg-cyfronet-02.datahub.egi.eu/api/v3/oneprovider/shares" \

-H "Content-Type: application/json" -d '{"name": "Example of share name",
"rootFileId": "'$FILE_ID'"}'
```

Answer:

```
{"shareId":"8f4a99221446a2cfe336ef675cfb5e1echef2e"}
```

The share ID that is necessary for the next call.

Notes:

- The share must have a meaningful name, which can be similar to the model name.
- "rootFileId" should have the *fileID* that was obtained in the previous step, for example: "rootFileId": "00000000005855E56775696423737061636555F366566..."} (Note that the simple quotes are not necessary when a Bash variable is not used).

4.6 Publish the 3D model

Similarly to what is explained in Section 3.3, you can create a project with the API.

Documentation:

https://onedata.org/#/home/api/stable/onezone?anchor=operation/handle_service_register_handle

Example:

```
curl -H "x-auth-token: $TOKEN" -H "content-type: application/json" -X POST
https://datahub.egi.eu/api/v3/onezone/handles -d '{ "handleServiceId":
"'$HANDLE_SERV_ID'",  "resourceType": "Share",  "resourceId": "'$SHARE_ID'",
"metadataPrefix": "edm",  "metadata": "<?xml version=\"1.0\" encoding=\"utf-8\"
?>..."  }'
```

Notes:

- HANDLE_SERV_ID for the “handleServiceId” should contain the specific value of your EUreka3D group, for example: f5f5e13338851b6866b085fee019276ech038f.
  You can find your ID by calling: https://datahub.egi.eu/oai_pmh?verb=ListSets and looking for your group name (*e.g.* eureka-EGI for the EGI group).
- SHARE_ID for the “resourceId” is the *shareId* that was obtained in the previous API call.
- “metadata” should contain the EDM data in RDF/XML format. A draft for this template can be found in Annex B. Please check Annex A to see the list of metadata attributes that currently exist.

4.7 Final suggestions

The API is a very powerful feature that has to be used with care:

- When you work with the API, it is convenient to test your program with a single object first.
- Up to the last step (after you create the share as explained in Section 4.5), it is easy to revert what was created in case of any error, but the last step retrieves a PID from B2HANDLE, so it should not be executed for testing purposes.
- It may be appropriate to test the 3D visualisation after the share has been created, in a similar way as explained in Section 3.7.2.
- It is useful to use the XML Editor of the GUI (see Section 3.7.5) to validate your metadata RDF/XML. However, remember **NOT to save it**, as this step will request a real PID.
- Additionally, it is useful to publish one object with the GUI, so that you can see what metadata RDF/XML is generated, and what sort of data can be added.
- Once everything has been verified to work well, you can run your program to upload and publish multiple objects.

5. CONCLUSIONS

This handbook has explained the basics for Content Providers to upload, manage and share data in the EUreka3D platform. It first described the required steps to join the EUreka3D community through EGI Check-in, in order to gain access to the different services provided by the project. This consists mainly of two tasks:

- Registering an account in Check-in.
- Joining the EUreka3D Community.

Then, the handbook explained the DataHub service and the different tasks involved, including:

- Creation of new projects for 3D models.
- Upload of data.
- Assignment of permissions for data access.
- Sharing of data publicly.
- Introduction of metadata, through a user-friendly form and a more advanced RDF/XML editor.
- Final publishing in Europeana.

Thanks to the graphical user interface of DataHub, uploading data to the cloud is a simple process. In case multiple objects have to be uploaded at once, the API provides an efficient mechanism to tackle the task. The main basic steps have been explained in this handbook, with references to documentation for extended functionality.

Although the services supporting EUreka3D, such as EGI Check-in and DataHub, have been successfully used by many scientific communities in production for a long time, they are under continuous Improvements. Only the provisioning of a good user experience that remains useful for the Cultural Heritage community will determine the success of the EUreka3D platform.

Annex A. Metadata Fields

Note that this table may be outdated. Always refer to the metadata form found in DataHub and to the latest EDM version.

Name	Section	Literal/Reference	Cardinality	RDF mapping	Lang att	Notes
Title	Cultural Heritage Object	Literal	1..n	dc:title	yes	Lang attribute is mandatory in Europeana
Description / Caption	Cultural Heritage Object	Literal	1..n	dc:description	yes	Lang attribute is mandatory in Europeana
Category	Cultural Heritage Object	Literal	1	edm:type		
Subject	Cultural Heritage Object	Literal	1..n	dc:subject	yes	Lang attribute is mandatory in Europeana
Type of object	Cultural Heritage Object	Either	1	dc:type	yes	
Contributor to the creation of the original object	Cultural Heritage Object	Either	0..n	dc:contributor	yes	
Creator of the original object	Cultural Heritage Object	Either	0..n	dc:creator	yes	
Creation date of the original object	Cultural Heritage Object	Either	0..n	dcterms:created	yes	
Language of inscriptions in the object	Cultural Heritage Object	Literal	0..n	dc:language		
Dimensions with units	Cultural Heritage Object	Literal	0..n	dcterms:extent		

Parent entity (collection, object, site...)	Cultural Heritage Object	Either	0..n	dcterms:isPartOf	yes	
Material	Cultural Heritage Object	Reference	1..n	dcterms:medium		
Original location	Cultural Heritage Object	Either	0..n	dcterms:spatial		Entries of geonames vocabulary must end in a "/" for Europeana to accept it. Example: <dcterms:spatial rdf:resource="https://sws.geonames.org/2794576/"/>
Current location	Cultural Heritage Object	Either	0..1	edm:currentLocation		
Description of digital object	Digital Object	Literal	1..n	dc:description	yes	Lang attribute is mandatory in Europeana
Type of digital object	Digital Object	Literal	1	dc:type	yes	
Creator of the model	Digital Object	Either	0..n	dc:creator	yes	
Digitisation date	Digital Object	Either	0..1	dcterms:created	yes	
3D format	Digital Object	Literal	0..n	dc:format		
Internal ID	Digital Object	Literal	0..1	dc:identifier		
File size	Digital Object	Literal	0..1	dcterms:extent		
URL for raw data	Digital Object	Reference	0..1	dcterms:isFormatOf		
URL for paradata	Digital Object	Reference	0..1	dcterms:isReferencedBy		
Content provider institution	Aggregation	Either	1	edm:dataProvider	yes	

Object on provider's Website	Aggregation	Reference	0..1	edm:isShownAt		
Representative image	Aggregation	Reference	1	edm:object		
Copyright licence URL of the digital object	Aggregation	Reference	1	edm:rights		
Additional copyright information	Aggregation	Literal	0..n	dc:rights	yes	

ANNEX B. EXAMPLE OF EDM TEMPLATE

```
<?xml version="1.0" encoding="utf-8"?>
<rdf:RDF xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:dc="http://purl.org/dc/elements/1.1/" xmlns:dcterms="http://purl.org/dc/terms/"
xmlns:edm="http://www.europeana.eu/schemas/edm/"
xmlns:ore="http://www.openarchives.org/ore/terms/">
   <edm:ProvidedCHO rdf:about="">
       <dc:contributor>....</dc:contributor>
       <dc:creator>...</dc:creator>
       <dc:description>...</dc:description>
       <dc:language>...</dc:language>
       <dc:relation
rdf:resource="https://datahub.egi.eu/share/60261548ca50a1658ee35b1416f236c8ch9454"/>
       <dc:subject>...</dc:subject>
       <dc:title>...</dc:title>
       <dc:title xml:lang="it">....</dc:title>
       <dc:type>...</dc:type>
       <dcterms:created>...</dcterms:created>
       <dcterms:extent>...</dcterms:extent>
       <dcterms:isFormatOf rdf:resource="..."/>
       <dcterms:isPartOf>EUreka3D</dcterms:isPartOf>
       <dcterms:medium rdf:resource="http://vocab.getty.edu/aat/300235507"/>
       <dcterms:spatial rdf:resource="https://sws.geonames.org/2794576/"/>
       <edm:currentLocation rdf:resource="http://...."/>
       <edm:type>3D</edm:type>
   </edm:ProvidedCHO>
   <edm:WebResource rdf:about="">
       <dc:creator>...</dc:creator>
       <dc:description>...</dc:description>
       <dc:format>OBJ</dc:format>
       <dc:identifier>...</dc:identifier>
       <dc:type>3D</dc:type>
       <dcterms:created>...</dcterms:created>
       <dcterms:extent>1.5 MB</dcterms:extent>
       <dcterms:isFormatOf rdf:resource="http://...."/>
       <dcterms:isReferencedBy rdf:resource="http://...."/>
       <edm:rights rdf:resource="http://creativecommons.org/licenses/by-sa/4.0/"/>
   </edm:WebResource>
   <ore:Aggregation rdf:about="">
       <dc:rights>...</dc:rights>
       <edm:aggregatedCHO rdf:resource=""/>
       <edm:isShownAt rdf:resource="https://...."/>
       <edm:dataProvider>...</edm:dataProvider>
       <edm:object rdf:resource="https://datahub.egi.eu….">
       <edm:provider>Photoconsortium</edm:provider>
       <edm:rights rdf:resource="http://creativecommons.org/licenses/by-sa/4.0/"/>
   </ore:Aggregation>
</rdf:RDF>
```