



# LONG TERM DATA STORAGE WITH RDMS

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09-10-2024



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# OUTLINE

- Short term vs long term data storage
  - Existing solutions at the university
- What is the RDMS?
- How to access the RDMS
  - Discovering web interface
- How to transfer data to the RDMS
- Different environment in the RDMS
  - How to share data within RDMS?
  - How to work with metadata?
  - How to implement automatized policies?
- Roles and permissions
- How to perform search in the RDMS
- Future

## SHORT-TERM VS LONG-TERM DATA STORAGE

### Short-Term Data Storage

Short-term storage refers to keeping data that is actively being used during the course of a research project. It typically involves temporary or working storage solutions designed to accommodate data in its raw or semi-processed state..

**Purpose:** To support active research activities such as data analysis, simulations, or experimental runs

### Long-Term Data Storage

Long-term storage is focused on the preservation and accessibility of research data for future reference, reuse, or replication of research findings. It often involves the use of repositories and archival services to ensure the data remains usable and protected over extended periods.

**Purpose:** To ensure that research data is accessible for verification, replication of results, or future studies.

# SHORT-TERM VS LONG-TERM DATA STORAGE

## EXISTING SOLUTIONS

### Short-Term Data Storage

- UWP:  
X & Y drives
- LWP  
Home & Project drives
- Hábrók  
/scratch & /projects directories
- VRW  
Home & Group drives

**Purpose:** These are environments that allow to perform computation and fast access to data.

### Data Sharing Options for Short Term Data Storage

- Unishare
- SURF Drive

**Purpose:** These environments facilitate data sharing between non-RUG users, don't offer computation functionality but data is stored for short term.

[For further details refer to the IT Solution page of the DCC](#)



LONG-TERM DATA  
STORAGE

EXISTING SOLUTION

# Research Data Management System (RDMS)

# WHAT IS RDMS?

## **Long-term data storage where:**

- You can implement policy-based automation..
- You can manage metadata templates & extract metadata.
- You can search for your data, save your search and export it.
- You can manage group and personal environments.
- You can assign users different roles and permissions.
- You can access and share data within RUG anytime.
- You can see activity auditing (in progress).
- You can publish your metadata in DataverseNL (in progress).

# WHAT IS RDMS?

- RDMS user manual or RDMS wiki:

<https://wiki.hpc.rug.nl/rdms/rdmsproject/start>

(You can just Google as RDMS wiki)

- Contact us:

**rdms-support@rug.nl**

# BEST PRACTICE

## Step 1

- I **don't need to frequently** access, process or analyze data. I published an article/poster/thesis/book/etc.
- I don't need to access the data frequently, maybe in the future I may reuse the data or share it for research purposes.
- I need a storage where even if I leave my supervisor/group leader/ data manager can always find & access the data.
- I need a storage to archive our group/lab/personal data.

## Step 2

- Decide on **which data** should be archived.
- Estimate the **amount of data** you need to archive.
- Decide on how many Team Drive you need.
- Decide in who should have which **roles** and permissions and for how long.
- Decide on whom shall be the **main contact point?**
- Ask for help from the RDMS team.



# WHAT IS RDMS?

Data management platform that uses [iRODS](#) to manage and store data in the backend.

- iRODS (Integrated Rule-Oriented Data System) is an open-source data management software platform that enables organizations to manage, share, and preserve large amounts of distributed data across different storage systems.
- It provides a virtual file system that abstracts data from the underlying storage, allowing for better control, automation, and organization of data at scale.
- iRODS is widely used in research, industry, and government sectors to ensure compliance with data management policies, automate workflows, and manage data lifecycles efficiently.
- Dutch universities and SURF often use iRODS based solutions as their data storage and archiving solution. They develop systems such as RDMS as well based on iRODS e.g: Yoda
- University of Groningen is part of the international iRODS consortium together with other four Dutch organizations; SURF, Utrecht University and Maastricht University.

# WHAT IS RDMS?

Since RDMS uses iRODS there some new concepts:

**Zone:** Zone is a virtual environment designed to manage data storage, users, and resources. Each Zone has a unique name. Currently there are two RDMS zones: RUG\_DEFAULT and SD\_Zone. Advantage of having multiple zones are to assignee specific environments to institutes, big groups etc to optimize the performance.

**Data object:** Data objects in iRODS represent files, but with enhanced flexibility through metadata, replication, and access control. The virtualized storage allows users to work with their data regardless of the underlying physical location.

**Collection:** All Data Objects stored in an iRODS system are stored in some Collection, which is a logical name for that set of Data Objects. A Collection can have sub-collections, and hence provides a hierarchical structure. An iRODS Collection is like a directory in a Unix file system (or Folder in Windows), but is not limited to a single device or partition.

# WHAT IS RDMS?

## Data storage (as of 2024)

- Data is replicated and stored in two different physical location.
  - Kept for 10 years as the university data policy requires.
- Sensitive data must be stored in Sensitive Data Zone.
- Replication is copying live data from 1 site to another, against:
  - system-failure
  - datacenter-failure (fire, etc.)
- Data is backed-up
  - Retention period: 30 days
  - Active versions: 2
  - Deleted versions: 2



## HOW TO ACCESS THE RDMS?

- 1) Web Interface
- 2) iCommands

**Note:** You need VPN if you are outside of the RUG network

# HOW TO ACCESS THE RDMS?

## WEB INTERFACE

Log in via: <https://research.web.rug.nl/rdmswebapp>

**RUG RDMS**

Username\*

Type username here. Username is your institution email address...

Password\*

Data zone

Institution\*

University of Groningen

Data zone\*

RUG\_DEFAULT

Login

→ RUG email address

→ Password

→ Zone name

My folder  
[redacted]@rug.nl

Filter by name..

- ★ Starred
- > Projects
- > Team drives
- > Shared
- Bin
- > My folder

Browser of the selected Menu item

Menu

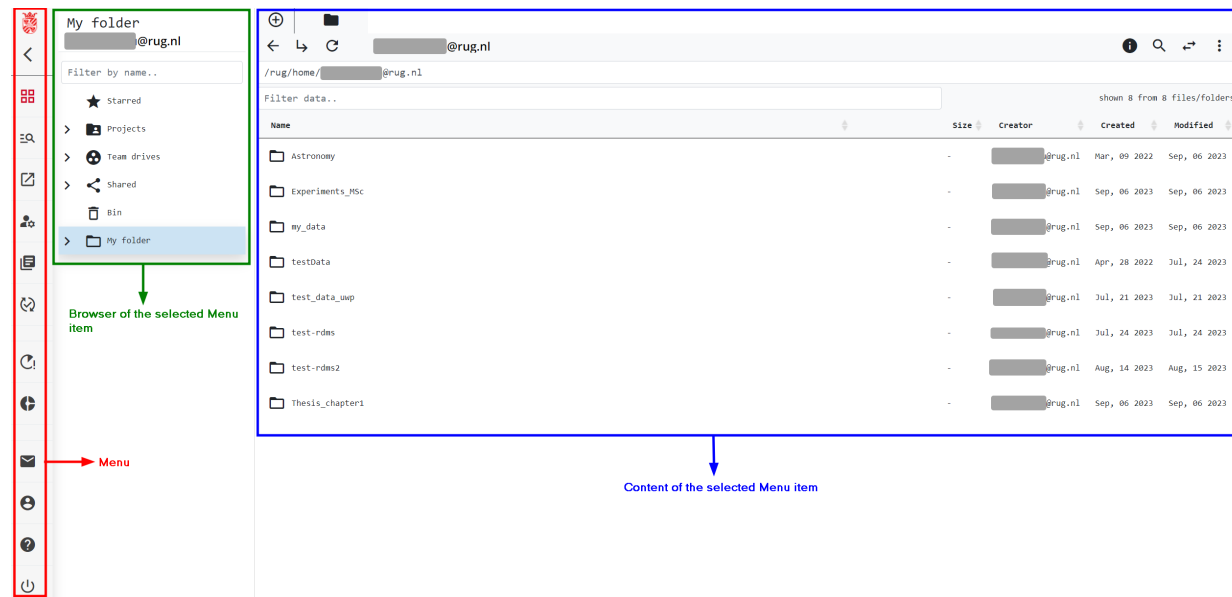
/rug/home/[redacted]@rug.nl

Filter data..

shown 8 from 8 files/folders

| Name            | Size | Creator           | Created      | Modified     |
|-----------------|------|-------------------|--------------|--------------|
| Astronomy       | -    | [redacted]@rug.nl | Mar, 09 2022 | Sep, 06 2023 |
| Experiments_MSc | -    | [redacted]@rug.nl | Sep, 06 2023 | Sep, 06 2023 |
| my_data         | -    | [redacted]@rug.nl | Sep, 06 2023 | Sep, 06 2023 |
| testData        | -    | [redacted]@rug.nl | Apr, 28 2022 | Jul, 24 2023 |
| test_data_uwp   | -    | [redacted]@rug.nl | Jul, 21 2023 | Jul, 21 2023 |
| test-rdms       | -    | [redacted]@rug.nl | Jul, 24 2023 | Jul, 24 2023 |
| test-rdms2      | -    | [redacted]@rug.nl | Aug, 14 2023 | Aug, 15 2023 |
| Thesis_chapter1 | -    | [redacted]@rug.nl | Sep, 06 2023 | Sep, 06 2023 |

Content of the selected Menu item



Via the web interface:

- Managing user roles and permissions
- Sharing data within the RUG
- Policy implementation
- Create metadata templates, append metadata to files and folders and extract metadata
- Creating Groups, Team Drives and Projects
- Managing Archiving and Publishing (not yet enabled) workflows
- Uploading data
- .....

Two functionality buttons that you will see in every level. They will display actions such as:

- Add user, group, move to bin, create folder, rename, upload/download file, add, extract metadata, etc.

The screenshot shows a file browser interface. On the left, a sidebar menu is highlighted with a red box. A green box highlights the 'My folder' item in the sidebar, with a green arrow pointing to the text 'Browser of the selected Menu item'. A blue box highlights the main content area, which displays a table of files and folders. A blue arrow points from the bottom of the blue box to the text 'Content of the selected Menu item'. In the top right corner of the main content area, there are three icons: an information icon, a search icon, and a three-dot menu icon, all enclosed in red boxes.

| Name            | Size | Creator | Created      | Modified     |
|-----------------|------|---------|--------------|--------------|
| Astronomy       | -    | @rug.nl | Mar, 09 2022 | Sep, 06 2023 |
| Experiments_MSc | -    | @rug.nl | Sep, 06 2023 | Sep, 06 2023 |
| my_data         | -    | @rug.nl | Sep, 06 2023 | Sep, 06 2023 |
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| test_data_uwp   | -    | @rug.nl | Jul, 21 2023 | Jul, 21 2023 |
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| Thesis_chapter1 | -    | @rug.nl | Sep, 06 2023 | Sep, 06 2023 |



## Useful hotkeys

**dbn**: Create a new collection (folder)

**dbu**: Upload a new data object (file)

**dbm**: Move the selected objects or collections

**dbl**: Link a collection

**ctrl + h**: Display the help window

The screenshot shows a web-based file browser interface. On the left, a vertical sidebar contains a menu of navigation options. A red box highlights the entire sidebar, with a red arrow pointing to the word "Menu". A green box highlights the "My folder" item in the sidebar, with a green arrow pointing to the text "Browser of the selected Menu item". The main content area displays a file list for the selected folder. A blue box highlights the entire main content area, with a blue arrow pointing to the text "Content of the selected Menu item".

| Name            | Size | Creator | Created      | Modified     |
|-----------------|------|---------|--------------|--------------|
| Astronomy       | -    | @rug.nl | Mar, 09 2022 | Sep, 06 2023 |
| Experiments_MSc | -    | @rug.nl | Sep, 06 2023 | Sep, 06 2023 |
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| Thesis_chapter1 | -    | @rug.nl | Sep, 06 2023 | Sep, 06 2023 |

# HOW TO ACCESS THE RDMS?

## ICOMMANDS

- You need a shell/terminal where you can install iCommands
- iCommands are Unix utilities that give users a command-line interface to operate on data in the iRODS system. iCommands provide the most comprehensive set of client-side standard iRODS manipulation functions.
- iCommands are already installed in the **LWP** and **Hábrók**. From the LWP it is also **possible** to access X & Y drive. This way data transfer or other data management tasks can be performed on the data on X & Y drive.

[RDMS Command Line Workshop October 23<sup>rd</sup>, 13:00](#)

# HOW TO ACCESS THE RDMS?

## ICOMMANDS

### Step 1:

- Create a `~/.irods` directory in your home directory:

```
$ mkdir ~/.irods
```

- Create an `irods_environment.json` file in that directory with a text editor of your choice.

```
$ cd ~/.irods
```

```
$ nano irods_environment.json
```

# HOW TO ACCESS THE RDMS?

## ICOMMANDS

### Step 2:

- Configure the `irods_environment.json` file `$ cd ~/.irods`

```
{  
  "irods_authentication_scheme": "pam_password",  
  "irods_client_server_negotiation": "request_server_negotiation",  
  "irods_client_server_policy": "CS_NEG_REQUIRE",  
  "irods_default_resource": "rootResc",  
  "irods_encryption_algorithm": "AES-256-CBC",  
  "irods_encryption_key_size": 32,  
  "irods_encryption_num_hash_rounds": 16,  
  "irods_encryption_salt_size": 8,  
  "irods_host": "store.data.rug.nl",  
  "irods_port": 1247,  
  "irods_ssl_verify_server": "cert",  
  "irods_user_name": "<emailaddress>",  
  "irods_zone_name": "rug"  
}
```

→ Your email address

# HOW TO ACCESS THE RDMS?

## ICOMMANDS

### **Step 3:**

- Each time you want to interact with RDMS, you need to initiate iCommands:

```
$ iinit
```

Enter your current PAM password: Type in your password

- You are ready to use iCommands

```
$ ipwd
```

```
$ ils
```

```
$ itree
```

```
$ icd <new_path>
```

# HOW TO ACCESS THE RDMS?

## ICOMMANDS

### **Accssing X or Y drive within LWP via iCommands**

Even though the UWP is a Windows OS, you can still use the iCommands to benefit from its various functionalities, speed and efficiency. The Y: drive is available under **/media/ydrive**

```
$ iinit
```

```
$ cd /media/ydrive/<your folder>
```

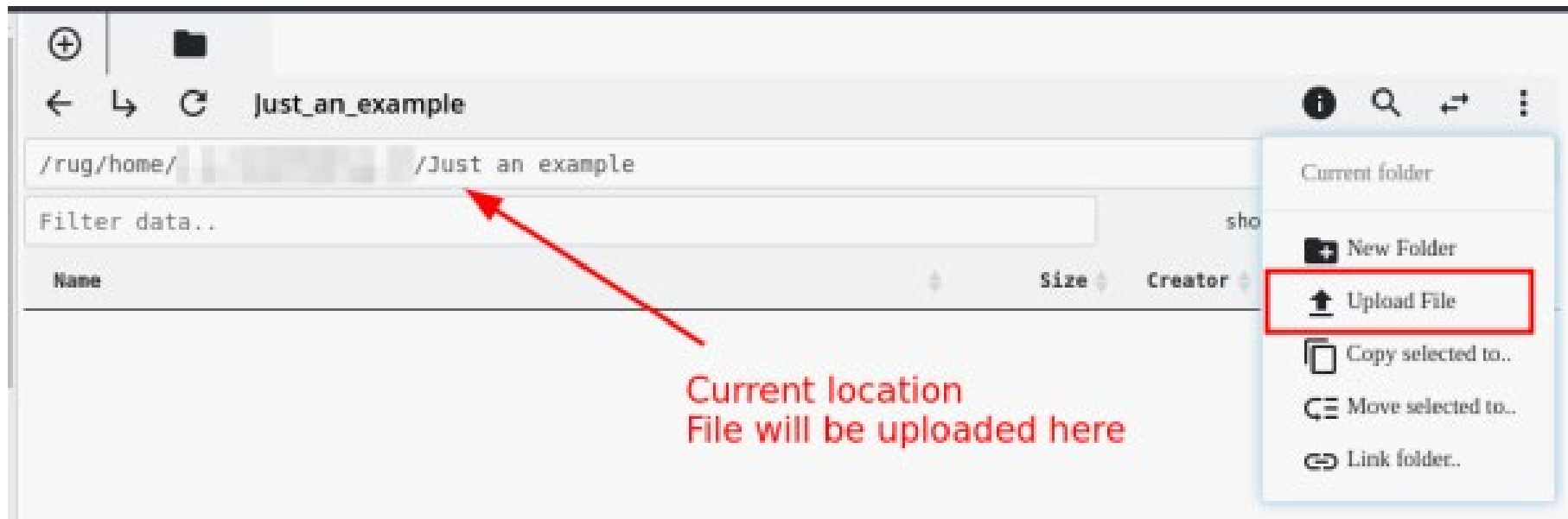
- You are ready to use iCommands

## HOW TO TRANSFER DATA TO THE RDMS?

- Web Interface
- iCommands
- File transfer applications
  - CyberDuck
  - WinSCP

# HOW TO TRANSFER DATA TO THE RDMS?

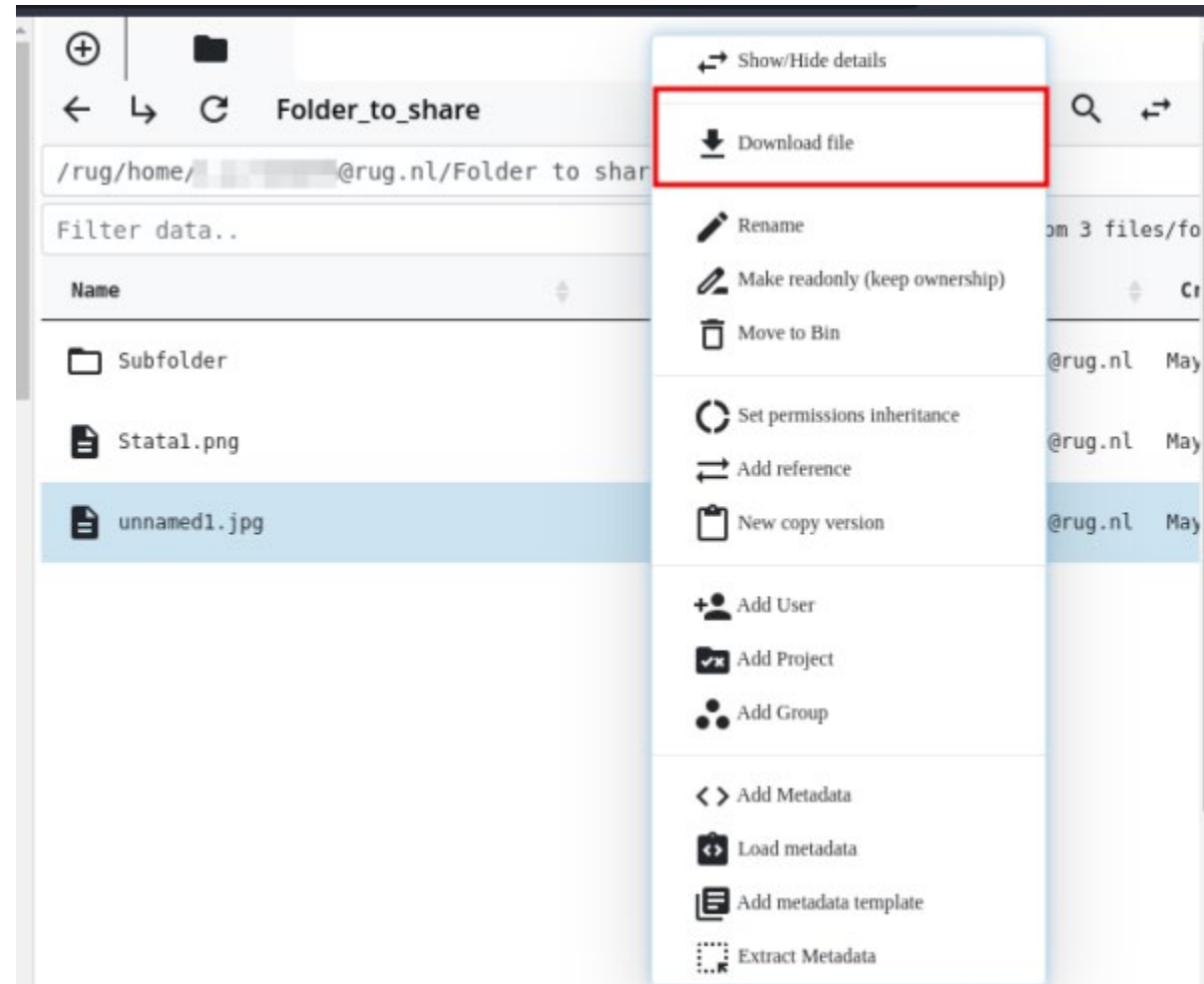
- Web Interface
  - Only individual files
  - Data size < 50 MB





# HOW TO TRANSFER DATA TO THE RDMS?

- Web Interface
  - Only individual files
  - Data size < 50 MB



## HOW TO TRANSFER DATA TO THE RDMS?

- iCommands

```
# Transfer a file to the RDMS
$ iput test.txt /rug/home/rdms-testers@rug.nl/some_example_folder
$ ils /rug/home/rdms-testers@rug.nl/some_example_folder
/rug/home/rdms-testers@rug.nl/some_example_folder:
  test.txt
```

If you want to transfer a whole folder structure, the additional `-r` flag has to be used.

```
$ iput -r Testdir_L1
Running recursive pre-scan... pre-scan complete... transferring data...
```

If you want to see the transfer rate, you can use the additional `-P` flag.

```
$ iput -P 1GB_Testfile_1
0/1 - 0.00% of files done   0.000/953.674 MB - 0.00% of file sizes done
```

## HOW TO TRANSFER DATA TO THE RDMS?

- Download data from RDMS:

```
$ iget [flags] <source> <destination>
```

- Synchronize data:

```
# Synchronize the content of local folder to a folder on the RDMS:  
$ irsync -r <source> i:<dest>
```

```
Synchronize the content of remote folder on the RDMS with a local folder:  
$ irsync -r i:<source> <dest>
```

```
Synchronize the content of two remote RDMS folders:  
$ irsync -r i:<source> i:<dest>
```

# HOW TO TRANSFER DATA TO THE RDMS?

- File transfer applications
  - CyberDuck: You can use two protocols WebDAV or iRODS native
- What is a protocol?

Data transfer protocols refer to the standardized methods used to securely move data between various data sources and applications.

## **Examples:**

- the HTTP (HyperText Transfer Protocol) is used for transferring hypermedia documents on the web,
- FTP (File Transfer Protocol) is used for transferring files from one host to another,
- WebDAV is an extension of HTTP, used for collaborative file editing and management over the web .....

# HOW TO TRANSFER DATA TO THE RDMS?

- File transfer applications
  - Cyberduck: You can use two protocols WebDAV or iRODS native

**Step 1:** Go to RDMS wiki [and Cyberduck](#) chapter

iRODS Cyberduck profile:

Click to display section ▾

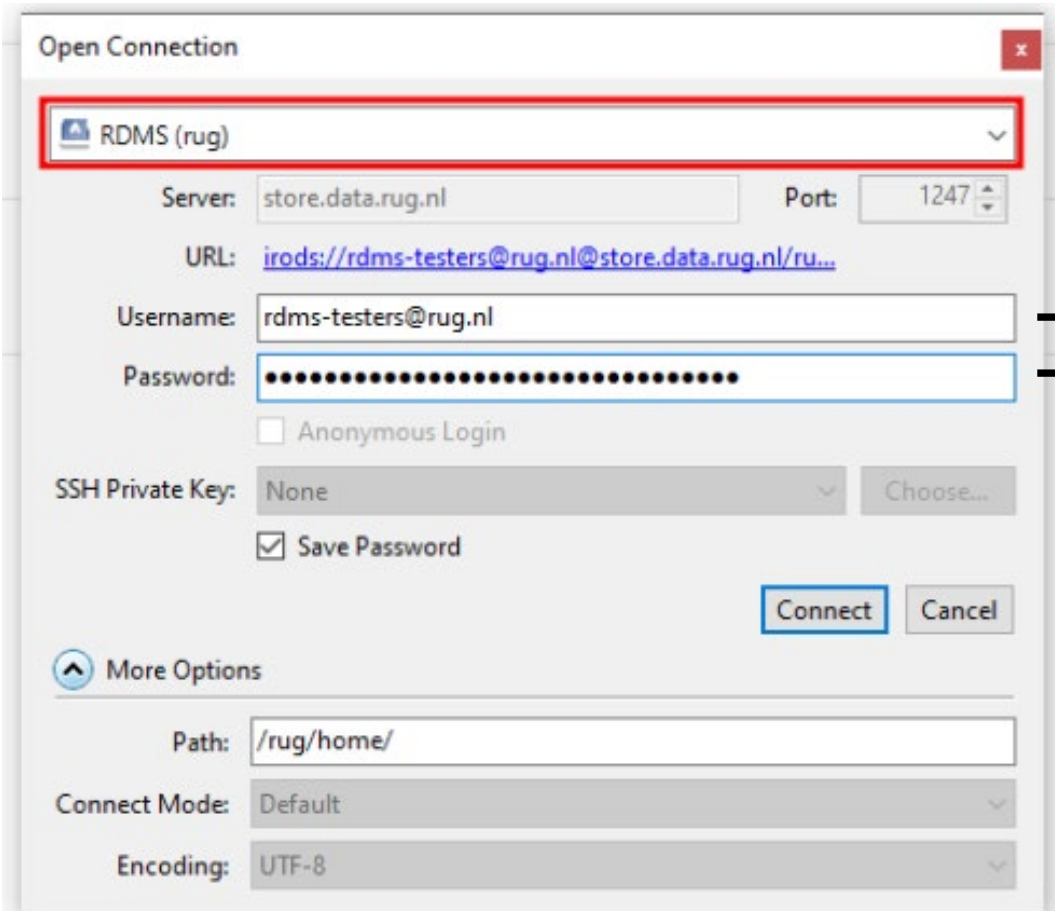
Click on and download the profile. Add the extension *.cyberduckprofile*

**RDMS.cyberduckprofile**

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE plist PUBLIC "-//Apple//DTD PLIST 1.0//EN" "http://www.apple.com/DTDs/PropertyList-1.0.dtd">
<plist version="1.0">
  <dict>
    <key>Protocol</key>
    <string>irods</string>
    <key>Vendor</key>
```

# HOW TO TRANSFER DATA TO THE RDMS?

**Step 2:** Go to the location you downloaded the file and double-click. Cyberduck should be automatically loaded.



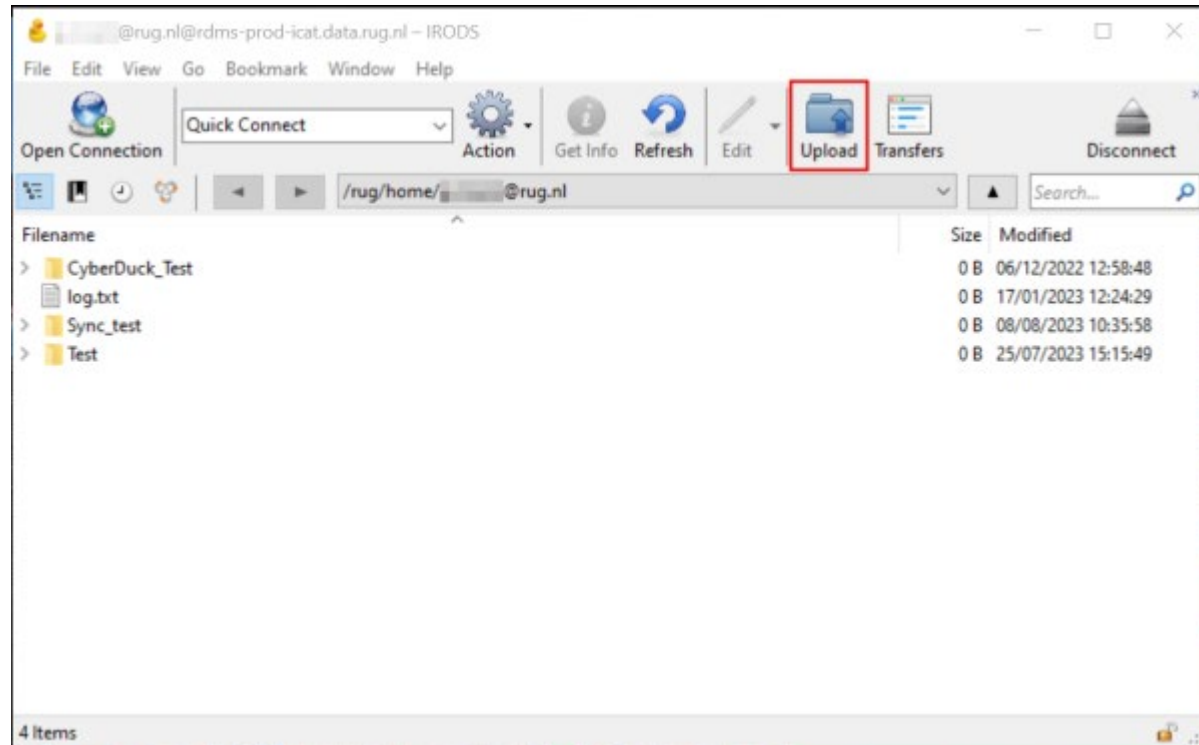
Everything should be filled exactly the same except your own email address & password.

→ Your email address

→ Your password

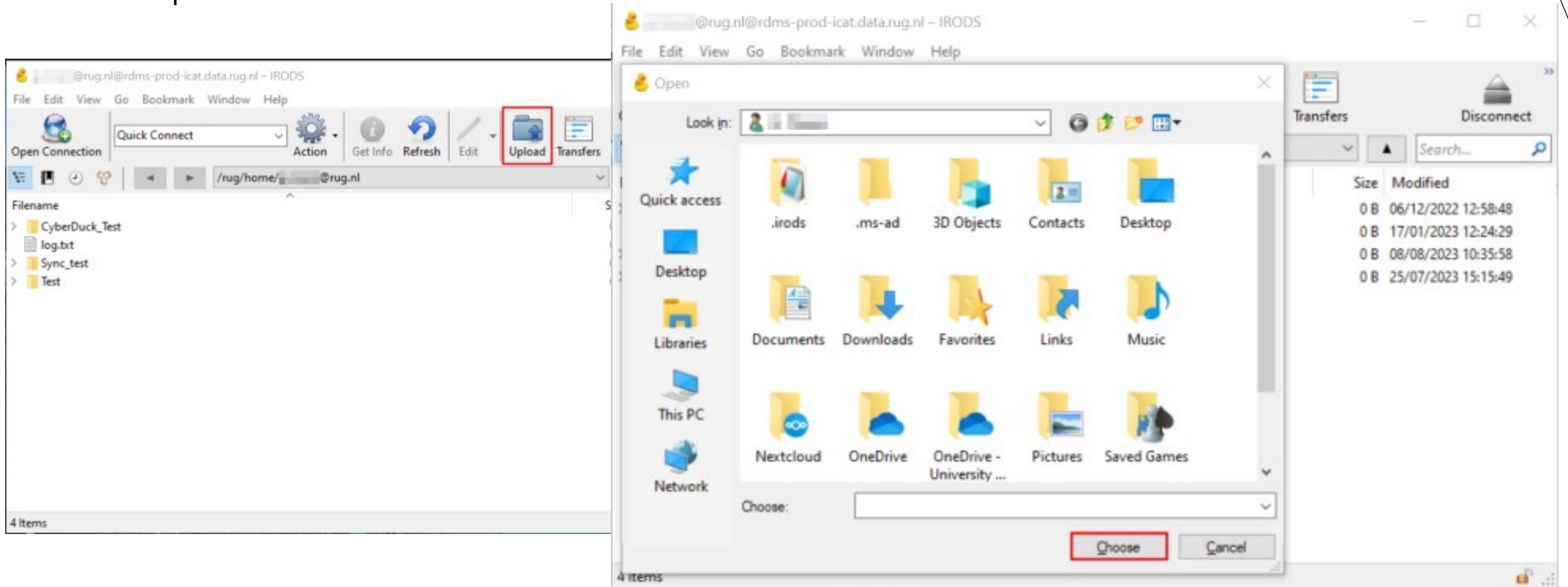
# HOW TO TRANSFER DATA TO THE RDMS?

Data upload:



# HOW TO TRANSFER DATA TO THE RDMS?

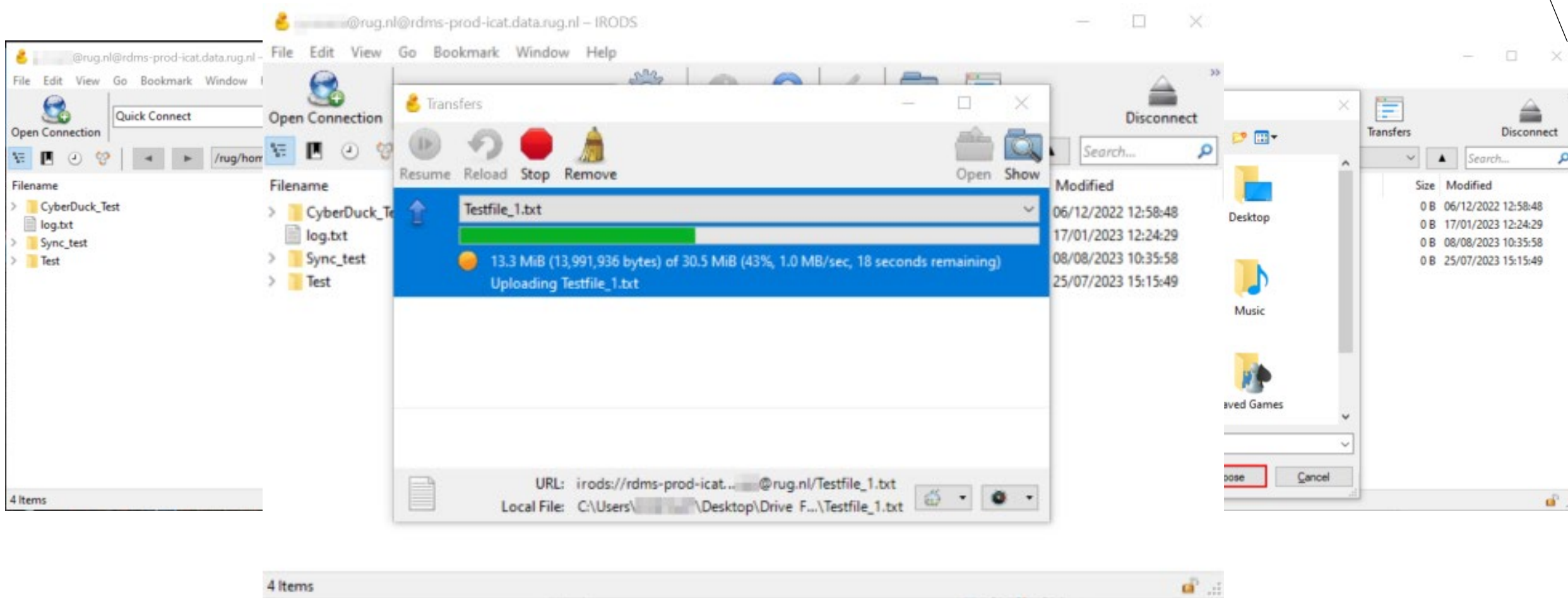
Data upload:





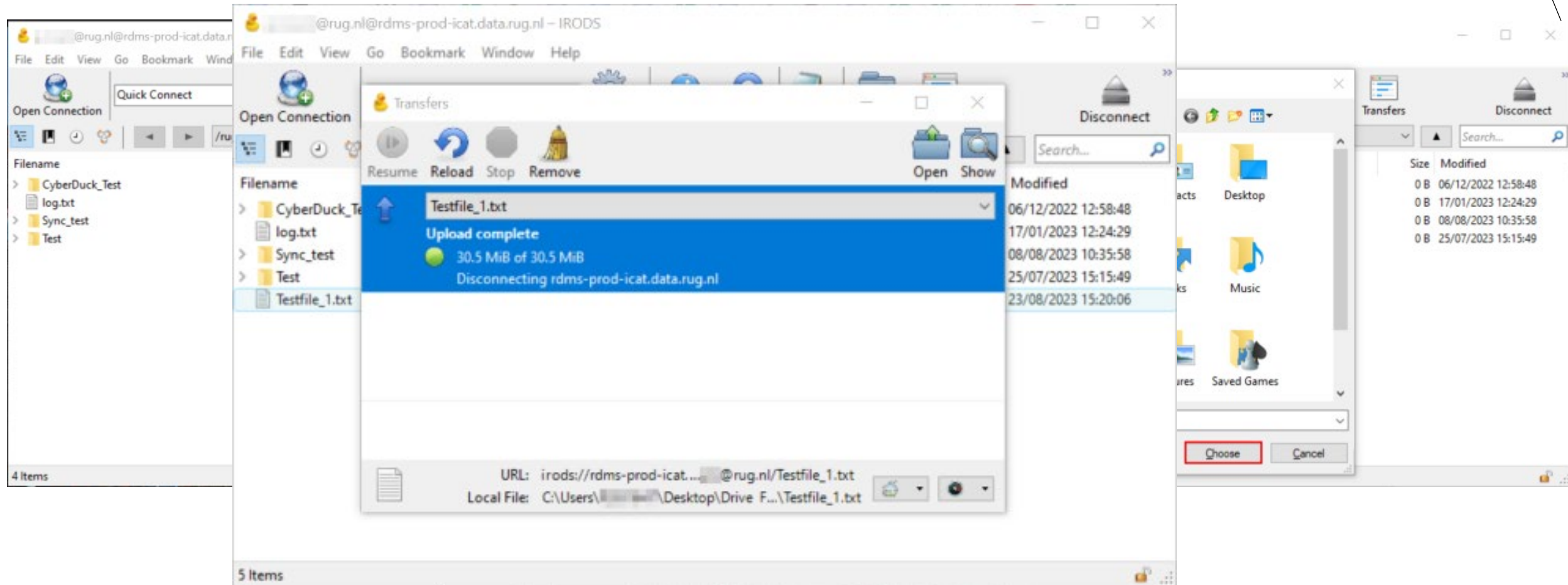
# HOW TO TRANSFER DATA TO THE RDMS?

Data upload:



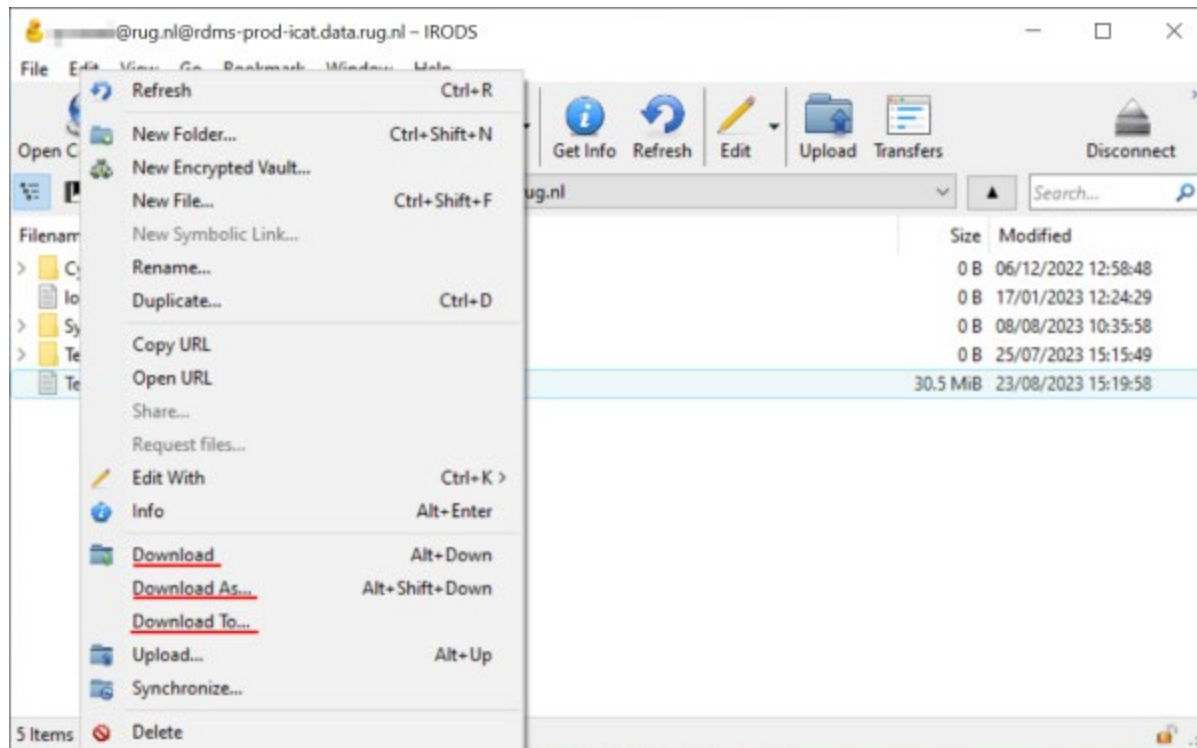
# HOW TO TRANSFER DATA TO THE RDMS?

Data upload:



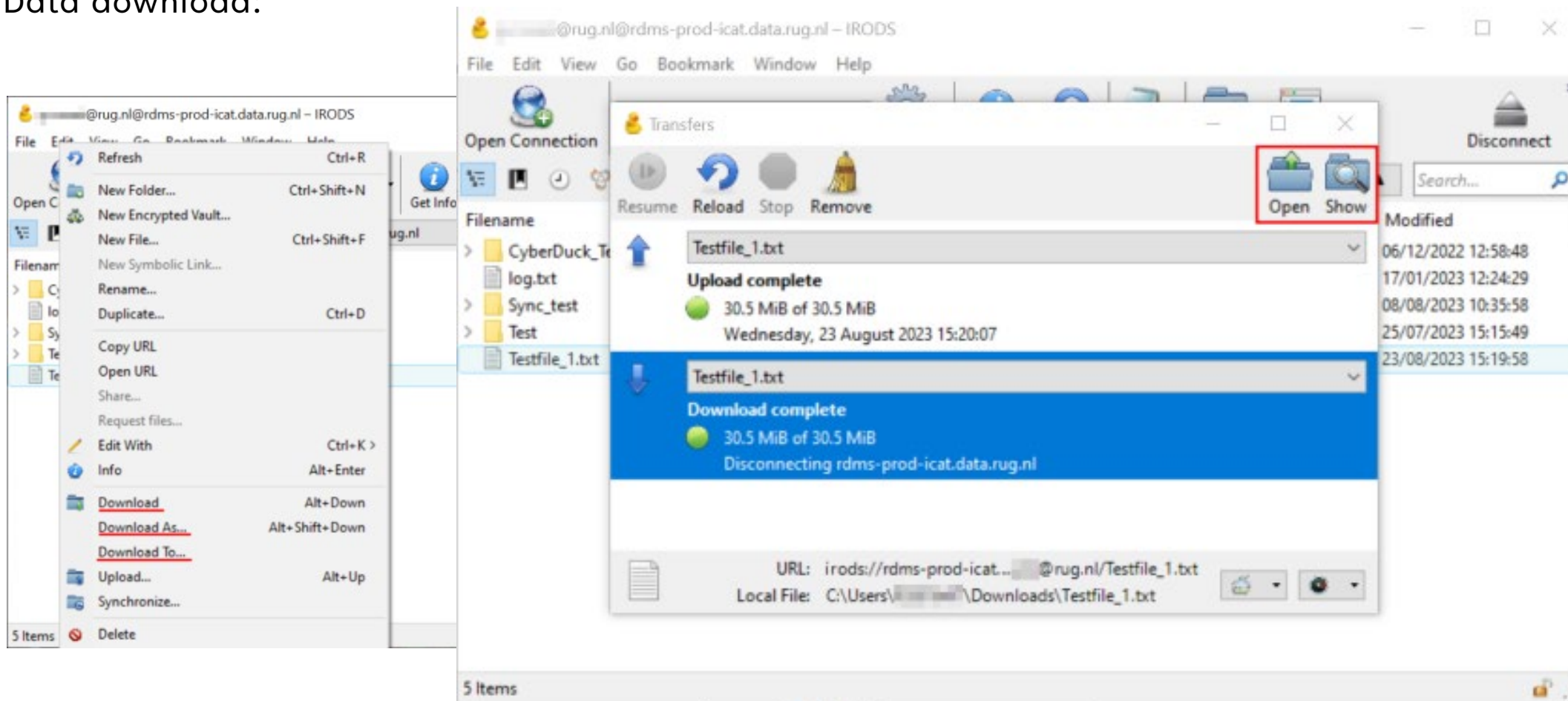
# HOW TO TRANSFER DATA TO THE RDMS?

Data download:



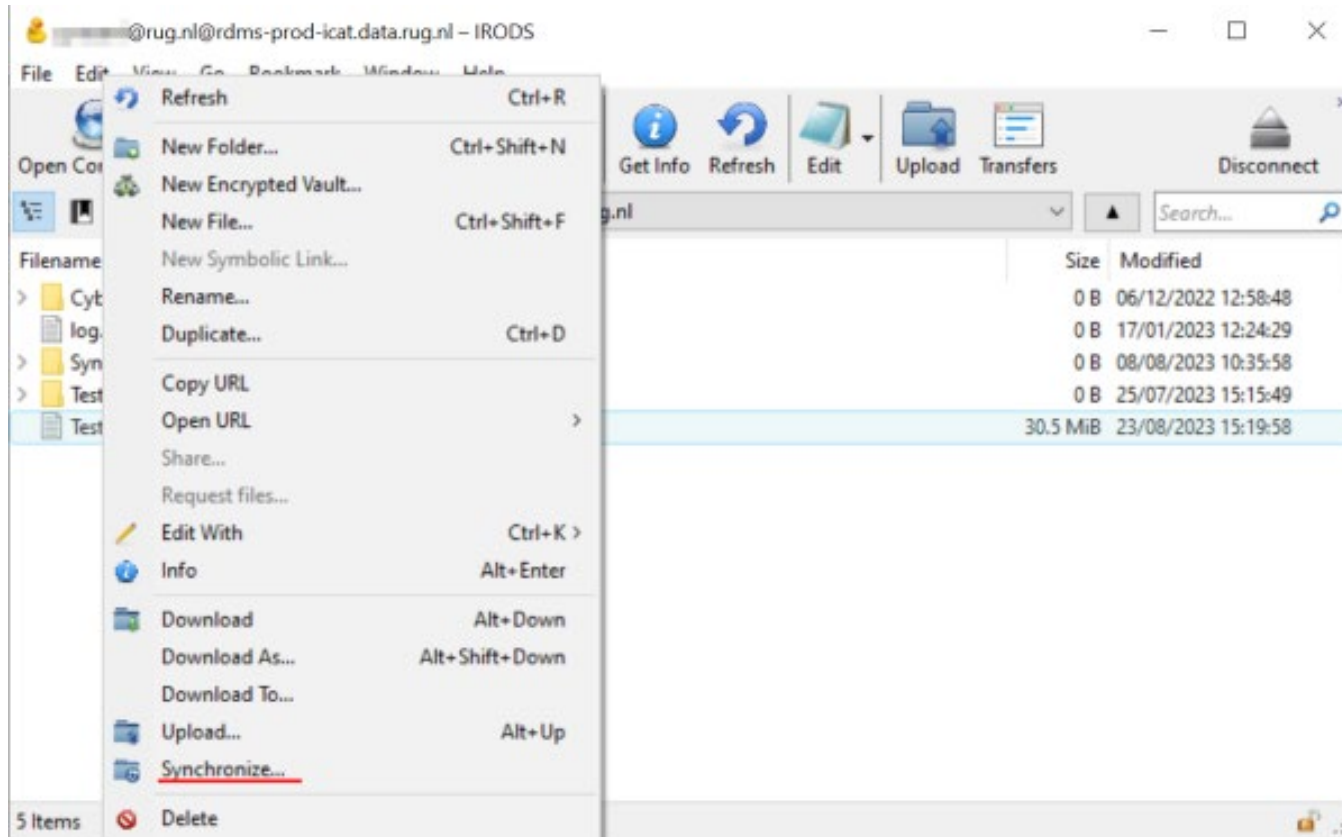
# HOW TO TRANSFER DATA TO THE RDMS?

Data download:



# HOW TO TRANSFER DATA TO THE RDMS?

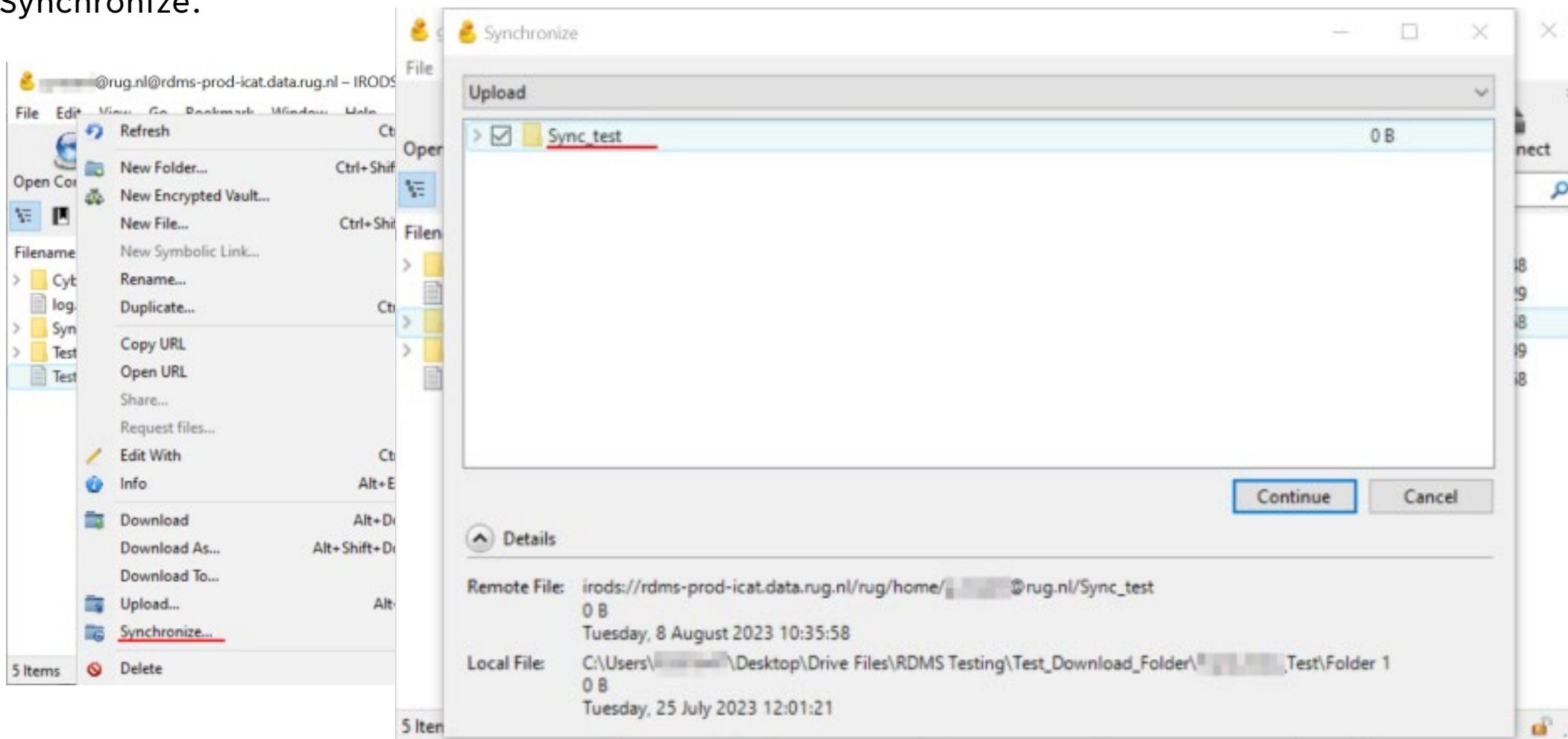
Synchronize:





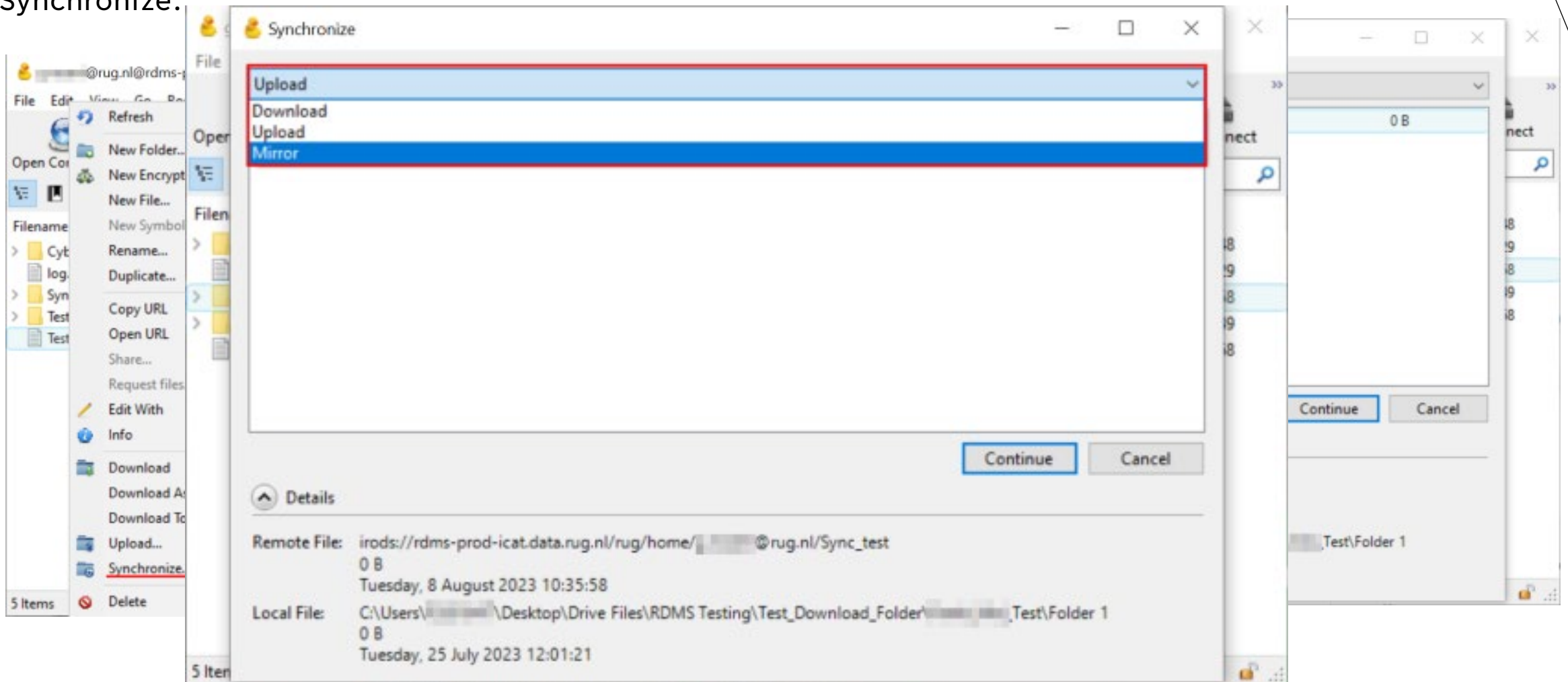
# HOW TO TRANSFER DATA TO THE RDMS?

Synchronize:



# HOW TO TRANSFER DATA TO THE RDMS?

Synchronize:



## BEST PRACTICE

- If you have large amount data, such as many folders and sub folders with each of them hundreds to thousands of files, **always zip or tar or tar.gz or tar.bz the folders** before you transfer them to the RDMS.
- Do **not use special characters** such as `~!@#%^&\*()?.,” In your file or folder names including, characters Such as Chinese, Greek etc.
- **Avoid** giving space in between words when naming folders.
- Check the Best Practices and Cyberduck/iCommands chapters for updated tips and best practices.



## DIFFERENT ENVIRONMENT IN THE RDMS

- 1) Home Drive:** Personal environment which is by default only accessible to the user who owns the account. You can perform various data management functionalities in this environment: share, rename, add metadata, move, link, add user, etc.  
Home Drive always has the path: **`/rug/home/<username>`**
- 2) Team Drive:** Group environment. In addition to all the data management functionalities you have Home Drive, you can implement policies, add groups and manage group permissions between Team Drives. In order to have a permission to create a Team Drive you need to contact [rdms-support@rug.nl](mailto:rdms-support@rug.nl)  
Team Drive always has the path: **`/rug/home/<Team_Name>`**
- 3) Projects:** To store data sets that are intended to be published. Stricter permission management and user roles exist compared to Team Drives. The reason for this is to make sure that the datasets that are converted to a project comply with quality requirements of becoming a publication.  
Projects always has the path: **`/rug/home/Projects/<Project_Name>`**

# DIFFERENT ENVIRONMENT IN THE RDMS

## Home Drive:

The screenshot displays the Google Drive interface for a user with the email address `@rug.nl`. The left sidebar shows the navigation menu with 'My folder' selected. The main content area shows a file explorer view of the home drive, displaying a list of folders:

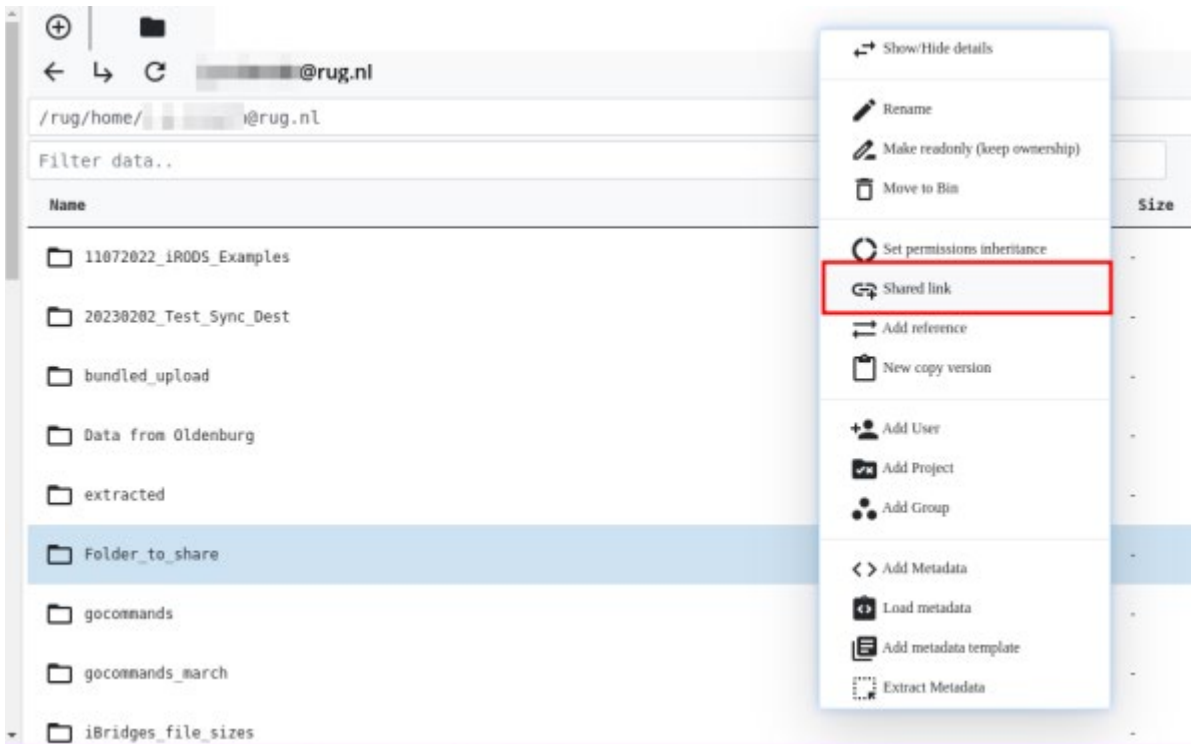
- Astronomy
- Experiments\_MSc
- my\_data
- testData
- test\_data\_uwp
- test-rdms
- test-rdms2
- Thesis\_chapter1

The browser's address bar shows the URL `/rug/home/@rug.nl`. A red circle highlights the information icon in the browser's address bar.

# DIFFERENT ENVIRONMENT IN THE RDMS

## HOW TO SHARE DATA WITHIN THE RDMS?

### Step 1

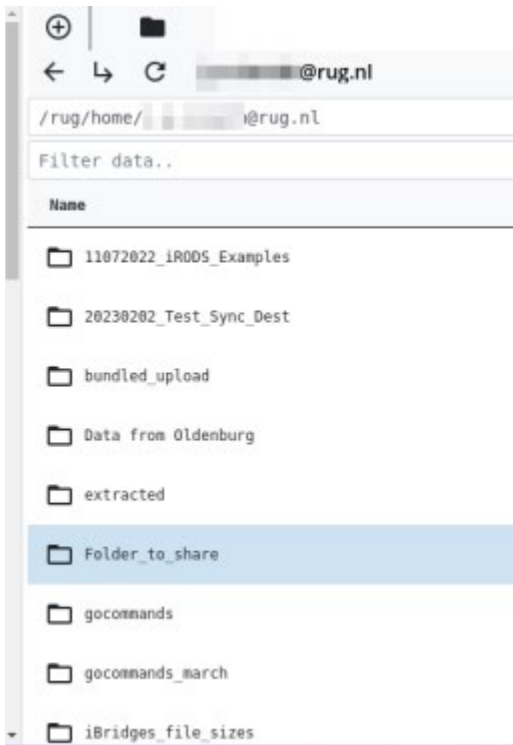


Set a shared link for the folder or file you want to share.

# DIFFERENT ENVIRONMENT IN THE RDMS

## HOW TO SHARE DATA WITHIN THE RDMS?

### Step 1



### Shared link

Current link

shared link is not set

Link location

`/rug/home/Shared/`

Link metadata id

`8869562d2b861091f5520248b9923f6431d29e9339fb917251a8e13a`

Set shared link

# DIFFERENT ENVIRONMENT IN THE RDMS

## HOW TO SHARE DATA WITHIN THE RDMS?

### Step 1

The screenshot shows a web interface for a 'Shared folder' at '@rug.nl'. On the left, a sidebar lists 'Team drives' with a 'Shared' category highlighted in red. Below it, a list of users is shown, with 'j.p.nimoth@rug...' selected in blue. A red arrow points from the 'Shared' category to the text 'Lists all users who have setup shared links'. Another red arrow points from the address bar, which shows '/rug/home/Shared/' followed by a red box around the user name, to the text 'Location of selected share'. A third red arrow points from the selected user in the list to the text 'Selected user who setup a new share in this example'. Below the address bar, there is a search bar and a table header with columns 'Name', 'Size', 'Creator', 'Created', and 'Modified'. The table content is empty, with the text 'shown 0 from 0 files/folders' displayed.

Lists all users who have setup shared links

Location of selected share

Nothing visible at this point as the shared link was created, but no permissions were set!

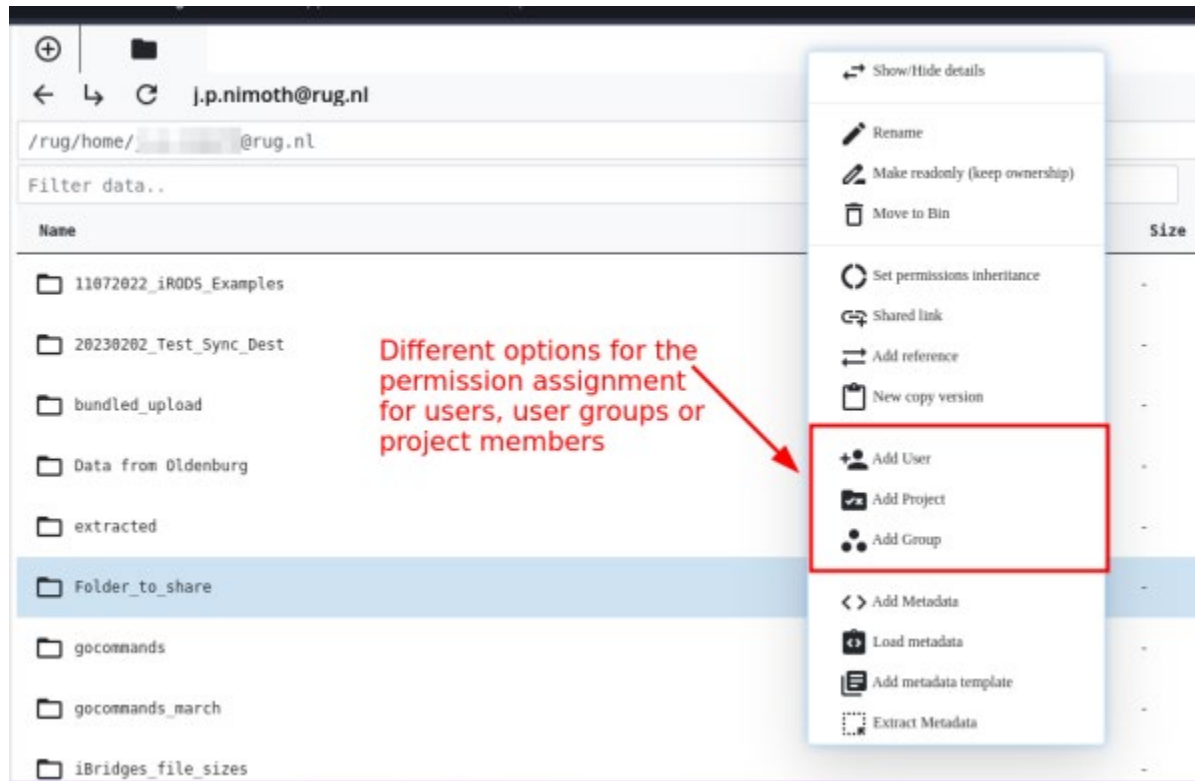
Selected user who setup a new share in this example

At this point, the name of the user that just setup the share will become visible within the **Shared** category of the web interface, but no content will be displayed as there were no permissions assigned for the shared object yet!

# DIFFERENT ENVIRONMENT IN THE RDMS

## HOW TO SHARE DATA WITHIN THE RDMS?

### Step 2



Assign permissions

# DIFFERENT ENVIRONMENT IN THE RDMS

## HOW TO SHARE DATA WITHIN THE RDMS?

### Step 2

File browser interface showing a list of folders. The folder 'Folder\_to\_share' is selected. A red text annotation 'Different permission for users, project m' is visible next to the list.

### User permission

#### Select User

#### Select permission

- Including sub files and folders
- Only this file/folder

Set permission

# DIFFERENT ENVIRONMENT IN THE RDMS

## HOW TO SHARE DATA WITHIN THE RDMS?

It is always possible to revoke and change permissions and remove the shared link!

The screenshot shows the RDMS interface with a file browser on the left and a permissions dialog on the right. The dialog is titled "Folder\_to\_share" and has a red arrow pointing to its title bar with the label "Name of object". Below the title bar is a table with columns "User/Group/Project" and "Permission".

| User/Group/Project | Permission |
|--------------------|------------|
| .....@rug.nl       | OMN        |
| .....s@rug.nl      | READ       |

Red arrows point to the "User/Group/Project" column with the label "Users who have permissions on selected object", to the "Permission" column with the label "Permission levels", and to the edit icons in the right column with the label "Button used to change the permissions of a user/group".

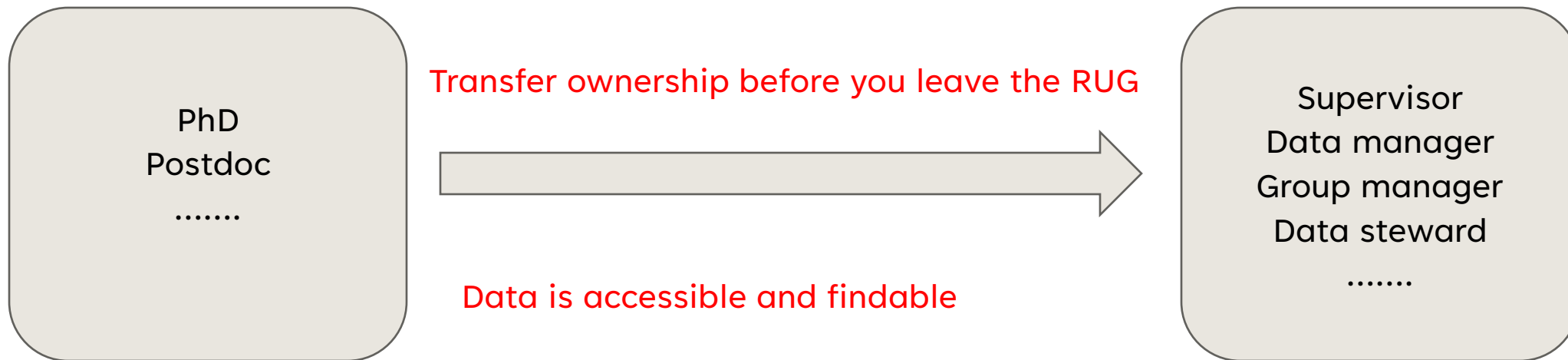
The screenshot shows the "Shared link" dialog in the RDMS interface. It contains the following fields:

- Current link:** /rug/home/Shared/.....@rug.nl/Folder\_to\_share[95483]
- Link location:** /rug/home/Shared/.....@rug.nl
- Link metadata id:** 8869562d2b861091f5520248b9923f6431d29e9339fb917251a8e13a

At the bottom, there are two buttons: "Remove shared link" (highlighted with a red box) and "Set shared link".



# BEST PRACTICE



# DIFFERENT ENVIRONMENT IN THE RDMS

## HOW TO WORK WITH METADATA

- Metadata makes your data searchable and findable

### **Scenarios:**

- You have hundreds or thousands of data file you frequently generate,
- As a supervisor or data manager, you oversee students and projects each of them regularly generate many data files/output
- In the lab lots of data is generated daily with different machines/different set-ups/parameters
- .....

**How do you find the one you need two years later? You search using key words which comes from metadata**



# DIFFERENT ENVIRONMENT IN THE RDMS HOW TO WORK WITH METADATA

In the RDMS there are two types of metadata:

- 1) System metadata
- 2) User-defined metadata

# DIFFERENT ENVIRONMENT IN THE RDMS

## HOW TO WORK WITH METADATA

### 1) System metadata

This is the minimum level of metadata that is attached to data (file/folder) is the one generated by the system itself: The date it was uploaded to RDMS, the owner etc.

The screenshot shows a file manager interface with a sidebar on the left and a main content area on the right. The sidebar shows a navigation tree with 'My folder' selected. The main content area displays a list of files and folders with columns for Name, Size, Creator, Created, and Modified. The 'Testfile\_1.txt' entry is highlighted with a red box, and a red arrow points to it with the text 'System metadata'.

| Name           | Size    | Creator | Created      | Modified     |
|----------------|---------|---------|--------------|--------------|
| CyberDuck_Test | -       | @rug.nl | Nov, 08 2022 | Dec, 06 2022 |
| Sync_test      | -       | @rug.nl | Aug, 08 2023 | Aug, 08 2023 |
| Test           | -       | @rug.nl | Jul, 27 2022 | Jul, 25 2023 |
| log.txt        | 0 B     | @rug.nl | Jan, 17 2023 | Jan, 17 2023 |
| Testfile_1.txt | 30.5 MB | @rug.nl | Aug, 23 2023 | Aug, 23 2023 |



# DIFFERENT ENVIRONMENT IN THE RDMS HOW TO WORK WITH METADATA

## **2) User-defined metadata**

This type of metadata is added by a user. Based on your data, how you organize the, how you want to search for them, you have many options to create metadata.

You can:

- Add, edit and delete
- Upload
- Extract
- Use templates

Metadata management is possible both via the Web interface and the iCommands

# DIFFERENT ENVIRONMENT IN THE RDMS HOW TO WORK WITH METADATA

## Add, update and delete metadata

The screenshot displays a file management interface with a sidebar on the left, a main content area, and a context menu. The sidebar shows a navigation tree with 'My folder' selected. The main content area shows a list of files and folders. A context menu is open over the file 'Testfile\_1.txt', showing various actions. A table of files is visible in the background, with columns for Name, Size, Creator, Created, and Modified. Red arrows and text annotations highlight specific features: 'Display information on current collection' points to the information icon in the top right; 'Display information on selected object or collection' points to the information icon in the context menu; and 'Add metadata to the selected object/collection' points to the 'Add Metadata' option in the context menu.

Display information on current collection

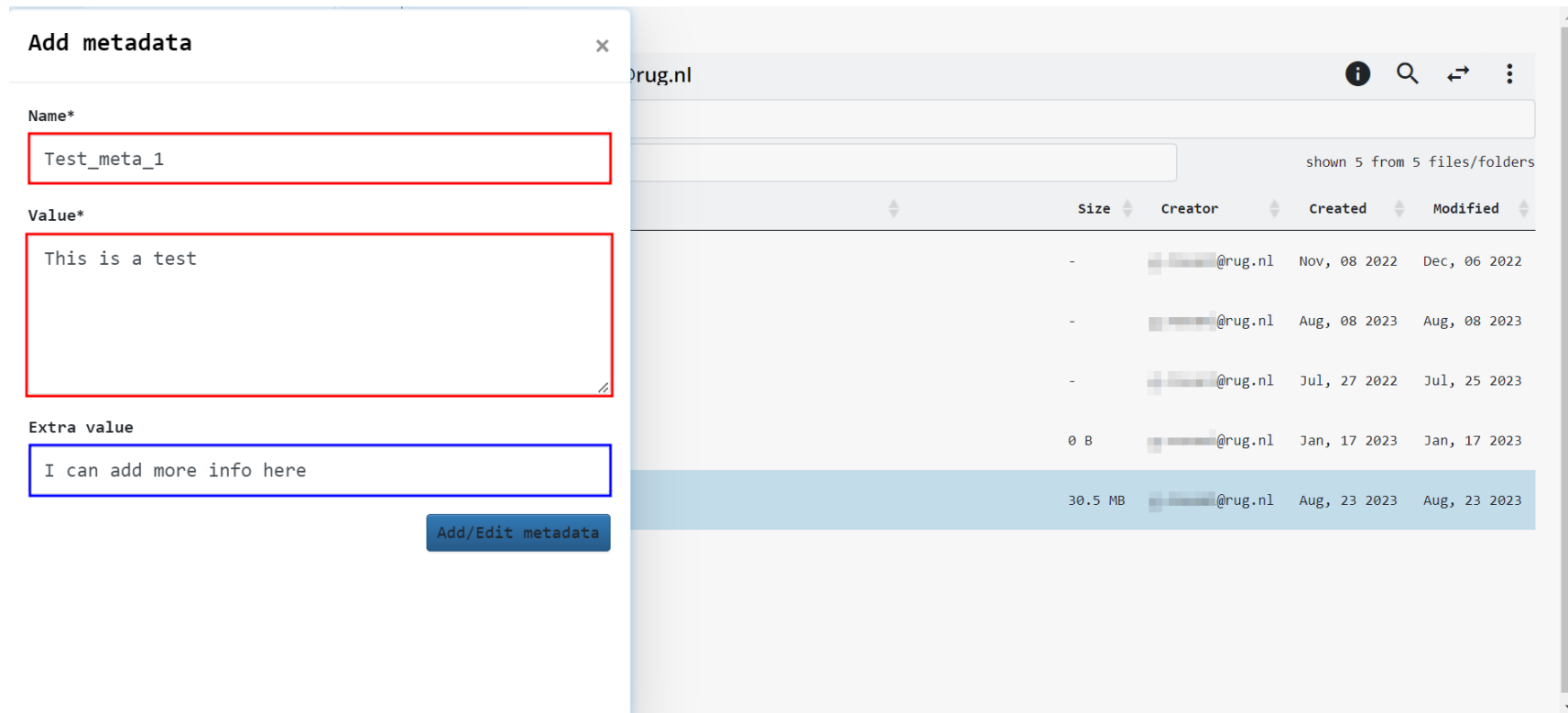
Display information on selected object or collection

Add metadata to the selected object/collection

| Name           | Size    | Creator | Created      | Modified     |
|----------------|---------|---------|--------------|--------------|
| CyberDuck_Test | -       | @rug.nl | Nov, 08 2022 | Dec, 06 2022 |
| Sync_test      | -       | @rug.nl | Aug, 08 2023 | Aug, 08 2023 |
| Test           | -       | @rug.nl | Jul, 27 2022 | Jul, 25 2023 |
| log.txt        | 0 B     | @rug.nl | Jan, 17 2023 | Jan, 17 2023 |
| Testfile_1.txt | 30.5 MB | @rug.nl | Aug, 23 2023 | Aug, 23 2023 |

# DIFFERENT ENVIRONMENT IN THE RDMS HOW TO WORK WITH METADATA

## Add, update and delete metadata



The screenshot shows a file manager interface with a modal dialog box for adding metadata. The dialog box has three input fields: 'Name\*' with the value 'Test\_meta\_1', 'Value\*' with the value 'This is a test', and 'Extra value' with the value 'I can add more info here'. A blue button labeled 'Add/Edit metadata' is at the bottom right of the dialog. The background shows a file list with columns for Size, Creator, Created, and Modified. The selected file is 30.5 MB, created on Aug, 23 2023, and modified on Aug, 23 2023.

| Size    | Creator | Created      | Modified     |
|---------|---------|--------------|--------------|
| -       | @rug.nl | Nov, 08 2022 | Dec, 06 2022 |
| -       | @rug.nl | Aug, 08 2023 | Aug, 08 2023 |
| -       | @rug.nl | Jul, 27 2022 | Jul, 25 2023 |
| 0 B     | @rug.nl | Jan, 17 2023 | Jan, 17 2023 |
| 30.5 MB | @rug.nl | Aug, 23 2023 | Aug, 23 2023 |

# DIFFERENT ENVIRONMENT IN THE RDMS HOW TO WORK WITH METADATA

## Add, update and delete metadata

The screenshot shows a file manager interface with a sidebar on the left, a main file list in the center, and a metadata editor on the right. The sidebar shows a tree view of folders including 'My folder', 'CyberDuck\_Test', 'Sync\_test', and 'Test'. The main pane shows a list of files and folders, with 'Testfile\_1.txt' selected. The metadata editor on the right has a table with two columns: 'Name' and 'Value'. A red box highlights a row with the name 'Test\_meta\_1' and the value 'This is a test' followed by 'Extra value: I can add more info here'. A red arrow points to this row with the text 'Metadata entry you just saved'. The metadata editor also has a code editor icon (<>) highlighted with a blue box.

| Name        | Value  |
|-------------|--|
| Test_meta_1 | This is a test<br>Extra value:<br>I can add more info here |



# DIFFERENT ENVIRONMENT IN THE RDMS HOW TO WORK WITH METADATA

## Add, update and delete metadata

The screenshot shows a file manager interface with a sidebar on the left, a main view area, and a metadata table for a selected file named 'Testfile\_1.txt'.

The sidebar shows a folder structure under 'My folder' with subfolders: CyberDuck\_Test, Sync\_test, and Test.

The main view area shows the contents of the selected folder, listing files and folders: CyberDuck\_Test, Sync\_test, Test, log.txt, and Testfile\_1.txt (selected).

The metadata table for 'Testfile\_1.txt' is as follows:

| Name        | Value  |
|-------------|--|
| Test_meta_1 | This is a test<br>Extra value:<br>I can add more info here |
| Test_meta_0 | This is a previous test,<br>recorded after test_1          |

Red arrows point to the edit icons (pencil icons) for each row in the table, with the word 'Edit' written in red below them.

# DIFFERENT ENVIRONMENT IN THE RDMS

## HOW TO WORK WITH METADATA

### Upload metadata

Instead of adding each key-value pair one-by-one, you can create one metadata file and upload it. You can use it as you template and each time a similar data needs metadata you can reuse it.

```
[
  {"Attribute" : "Author",
   "Value": "Tester_1",
   "Unit": ""
  },
  {"Attribute" : "Distance",
   "Value": "100",
   "Unit": "km"
  },
  {"Attribute" : "Location",
   "Value": "Groningen",
   "Unit": ""
  }
]
```

Create a file with extension **.txt** or **.json** exactly with this format and upload it to the RDMS.

# DIFFERENT ENVIRONMENT IN THE RDMS HOW TO WORK WITH METADATA

## Upload metadata

The screenshot shows a file explorer interface with a context menu open over the file 'Test.txt'. The menu includes various actions such as 'Show/Hide details', 'Permissions map', 'Download file', 'Rename', 'Make readonly (keep ownership)', 'Move to Bin', 'Set permissions inheritance', 'Add reference', 'New copy version', 'Add User', 'Add Project', 'Add Group', 'Add Metadata', 'Load metadata', and 'Add metadata template'. The 'Load metadata' option is highlighted with a red box.

The background shows a file list with the following columns: Name, Size, Creator, Created, and Modified. The file 'Test.txt' is selected and highlighted in blue.

| Name     | Size | Creator | Created      | Modified     |
|----------|------|---------|--------------|--------------|
| test_1   | -    |         | Sep, 11 2023 | Sep, 11 2023 |
| Test.txt | 9 B  |         | Sep, 11 2023 | Sep, 11 2023 |

# DIFFERENT ENVIRONMENT IN THE RDMS HOW TO WORK WITH METADATA

## Upload metadata

The screenshot displays a file manager interface with an 'Upload Metadata' dialog box open. The dialog box has a title bar with a back arrow, the text 'Upload Metadata', and a close button. Below the title bar, there is a text input field containing 'avu\_file.txt' and a 'Browse' button. A 'Load metadata' button is highlighted with a red rectangular box. Below the button is a table with three columns: 'name', 'value', and 'unit'. The table contains three rows of metadata. At the bottom of the dialog, it says 'Metadata to Load: 3'. The background shows a file list with columns for 'Name', 'Created', and 'Modified', and two rows of files with dates 'Sep, 11 2023'.

| name     | value     | unit |
|----------|-----------|------|
| Author   | Tester_1  |      |
| Distance | 100       | km   |
| Location | Groningen |      |

# DIFFERENT ENVIRONMENT IN THE RDMS HOW TO WORK WITH METADATA

## Create metadata template

The screenshot shows the 'Metadata Template Builder' interface. A table lists existing metadata templates. A red box highlights the 'Add Metadata Template' button in the top right corner. A green arrow points to the 'Add Simple Type' button, and a blue arrow points to the 'Add Metadata Template' button. Text annotations provide instructions on how to create a new type and a new template.

Click here to create a new type

If you have all the types you need, click here to create a new template

| # | Template                             | Description   |                       |
|---|--------------------------------------|---|-----------------------|
|   | JPN_Metadata_Scheme_Example1 (v:1.0) |   | 5 months, 3 weeks ago |
|   | Lerch_XRay_Scattering                |   | 6 months ago          |
|   | GBB Proteomics Data (v:0.7)          | LC-MS data generated from GBB Proteomics  | 1 year, 7 months ago  |
|   | GELIFES Data - publication (v:1.0)   | Metadata for zip archives of journal publications in the local GELIFES repository | 2 years, 1 month ago  |
|   | GELIFES Data - MSc thesis (v:1.0)    | Metadata for zip archives of MSc theses in the local GELIFES repository           | 2 years, 1 month ago  |
|   | GELIFES Data - PhD thesis (v:1.0)    | Metadata for zip archives of PhD theses in the local GELIFES repository           | 2 years, 1 month ago  |
|   | GELIFES RDMP (v:1.0)                 | Metadata scheme for RDMPs in the GELIFES repository                               | 2 years, 1 month ago  |
|   | Feringalab (v:1)                     | Metadata template for final storage of group data Feringa Lab                     | 6 months, 1 week ago  |

# DIFFERENT ENVIRONMENT IN THE RDMS HOW TO WORK WITH METADATA

## Create metadata template


### Update Template

Name\*

Description

Visibility\*

Template Version

 Elements

| Name                   | Description            | Base type        | Minimum number of Occurences | Maximum number of Occurences | Delete                   |
|------------------------|------------------------|------------------|------------------------------|------------------------------|--------------------------|
| First and Last Name    | Enter description here | string           | <input type="text"/>         | <input type="text"/>         | <input type="checkbox"/> |
| Affiliation & Address  | Enter description here | multiline string | <input type="text"/>         | <input type="text"/>         | <input type="checkbox"/> |
| Number of publications | Enter description here | int              | <input type="text"/>         | <input type="text"/>         | <input type="checkbox"/> |
| Publication score      | Enter description here | float            | <input type="text"/>         | <input type="text"/>         | <input type="checkbox"/> |
| Start of collaboration | Enter description here | date             | <input type="text"/>         | <input type="text"/>         | <input type="checkbox"/> |

## BEST PRACTICE

- Invest in creating metadata templates or metadata files. You will create them only once or twice but will use them frequently.
- Invest in useful metadata key/value pairs and types.

# DIFFERENT ENVIRONMENT IN THE RDMS

## Team Drive:

From a normal (not a group admin or owner) user point of view

The screenshot shows the Google Drive interface from a user's perspective. On the left sidebar, the 'Team drives' section is expanded, listing 'SSNMR', 'NMR\_Data', and 'Example\_Team1'. A red box highlights this section, with an arrow pointing to a red text annotation: 'All Team Drives that are available for the user are listed here. Click on a drive name to open it.' Above the sidebar, a red box highlights the 'Data browser' icon (a grid of four squares), with an arrow pointing to another red text annotation: 'Data browser (use button above to reveal/hide the browser)'. The main content area shows a table of files and folders with columns for Name, Size, Creator, Created, and Modified. The table contains four entries, all of which are folders.

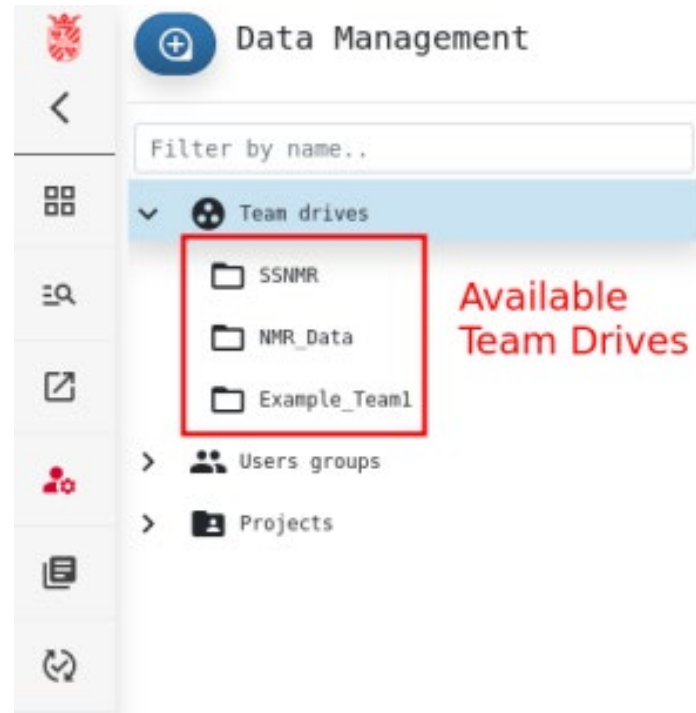
| Name         | Size | Creator           | Created      | Modified     |
|--------------|------|-------------------|--------------|--------------|
| first_trials | -    | [redacted]@rug.nl | Dec, 16 2022 | Feb, 17 2023 |
| [redacted]   | -    | [redacted]@rug.nl | Feb, 13 2023 | Feb, 13 2023 |
| [redacted]   | -    | [redacted]@rug.nl | May, 10 2022 | May, 12 2022 |
| [redacted]   | -    | [redacted]@rug.nl | Dec, 13 2022 | Mar, 06 2023 |



# DIFFERENT ENVIRONMENT IN THE RDMS

## Team Drive:

From a group admin or owner point of view



# DIFFERENT ENVIRONMENT IN THE RDMS

## Team Drive:

From a group admin or owner point of view

The screenshot shows the Google Drive interface for a Team Drive named 'Example\_Team1'. On the left is a navigation sidebar with a search bar and a list of items including 'Team drives', 'SSNPR', 'NPR\_Data', 'Example\_Team1', 'Users groups', and 'Projects'. The main area displays the 'Example\_Team1' header with three tabs: a group icon, a permissions icon, and a data icon. Below the tabs is a 'Group members search:' input field and a list of members, with one member '@rug.nl' visible. A gear icon in the top right corner serves as a context menu. Red arrows point from text labels to these elements: 'Team Drive group tab' points to the group icon, 'Team Drive permissions tab' points to the permissions icon, 'Team Drive data tab' points to the data icon, and 'Context button for tasks (e.g. permissions)' points to the gear icon.

Team Drive group tab

Team Drive permissions tab

Team Drive data tab

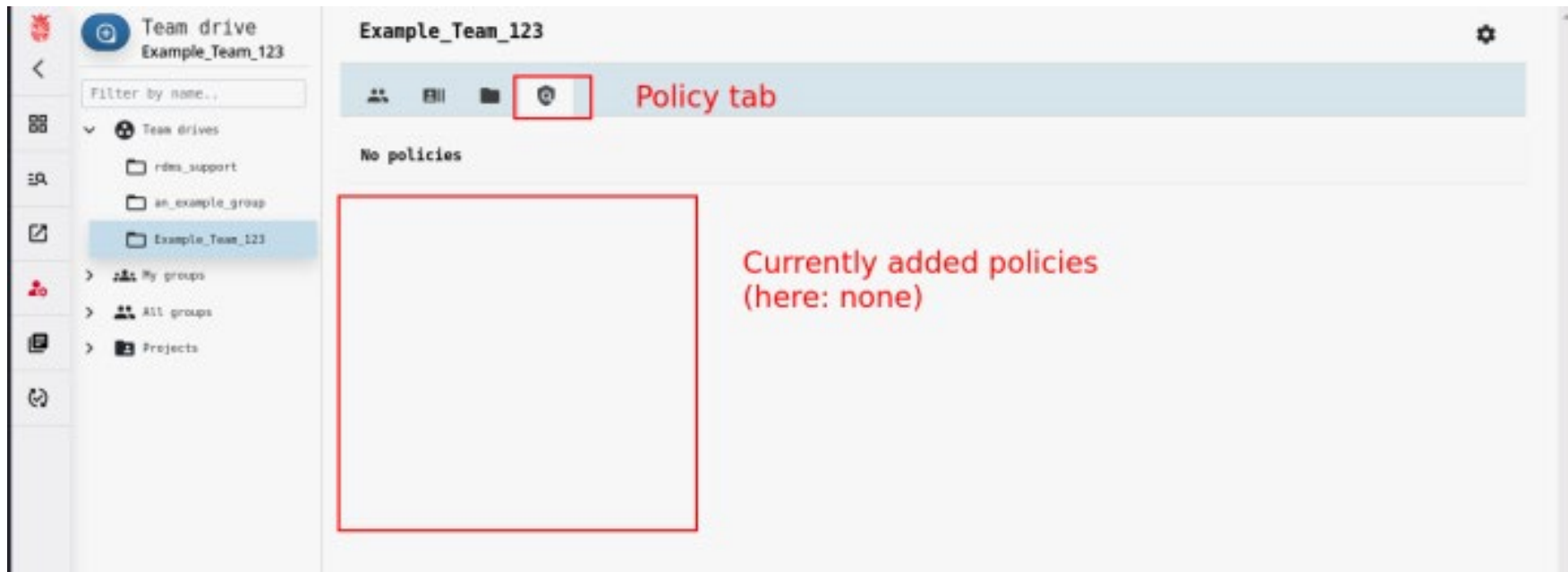
Context button for tasks (e.g. permissions)

# DIFFERENT ENVIRONMENT IN THE RDMS

## HOW TO IMPLEMENT AUTOMATIZED POLICIES?

### Step 1

Select the Team Drive or folder with a Team Drive for which you want to implement policy. And go to the Policy tab.

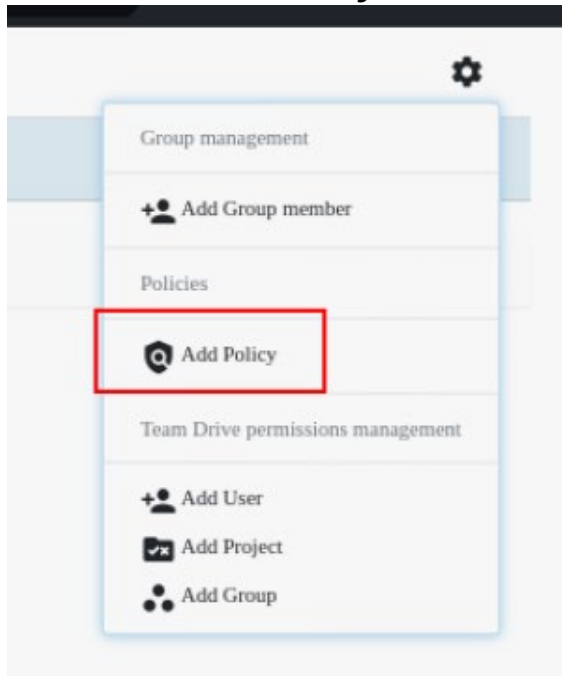


# DIFFERENT ENVIRONMENT IN THE RDMS

## HOW TO IMPLEMENT AUTOMATIZED POLICIES?

### Step 2

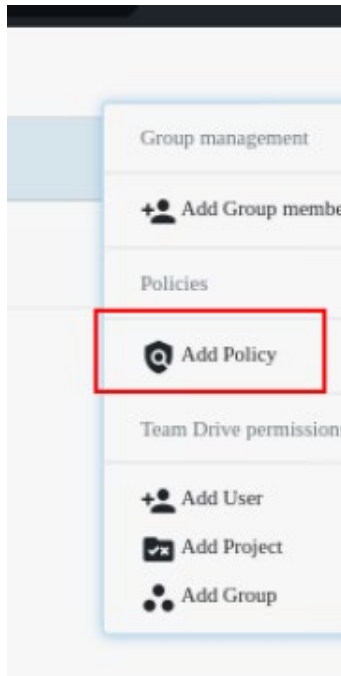
Add and create Policy for users by assigning them permissions.



# DIFFERENT ENVIRONMENT IN THE RDMS

## HOW TO IMPLEMENT AUTOMATIZED POLICIES?

Step 2



The main screenshot shows the 'Add Policy to Team Drive' dialog box for 'Example\_Team\_123'. The dialog contains the following fields and options:

- Permission start and end date (highlighted with a red box)
- Policy start date\*: 2024/03/27 12:51
- Policy end date\*: 2024/03/30 12:51
- Select User: [User Name]
- Including sub files and folders
- Only this file/folder
- Save policy button

The text 'Selected policy' is written in red next to the 'Policy start date\*' field.

# DIFFERENT ENVIRONMENT IN THE RDMS HOW TO IMPLEMENT AUTOMATIZED POLICIES?

Step 2

The screenshot shows a web interface for a team named 'Example\_Team\_123'. At the top, there are navigation icons for users, a list, a folder, and a shield. A search bar labeled 'Filter policy' is on the right. Below is a table with columns: '#', 'Name', 'Creator', 'Policy', and 'Status'. The table contains one row with a pencil icon in the first column, 'Permission start and end date' in the second, a blurred creator name in the third, and 'To be applied' in the fifth. The 'Policy' column contains three rows of data: 'username' with a blurred value, 'from date' with '27/03/2024 12:51', and 'to date' with '30/03/2024 12:51'. A red bracket on the left side of the table highlights the 'Permission start and end date' column. At the bottom left, there is an 'Add Group' button with a plus icon.





















| # | Name                          | Creator   | Policy                     | Status        |
|---|-------------------------------|-----------|----------------------------|---------------|
|   | Permission start and end date | [blurred] | username [blurred]         | To be applied |
|   |                               |           | from date 27/03/2024 12:51 |               |
|   |                               |           | to date 30/03/2024 12:51   |               |

## BEST PRACTICE

- Depending on the size of a research group and amount of research output:
  - Create multiple groups for different folders in a Team Drive  
And/Or
  - Create couple of Team Drives
- Example groups: PhD students  
Special projects  
Sub-groups in a research group  
Machines/detectors in labs  
.....
- Example folder structures: PhD Thesis  
MSc Thesis  
Machines/detectors in labs  
.....
- Assign permissions to different users for them to transfer their data to the designated folder(s) in a Team Drive.
- Make a research group policy to force members to transfer their data
- Work with metadata

# ROLES AND PERMISSIONS

## Permissions in RDMS

| Permission Level | Read  | Modify  | Create New  | Delete  | Share   |
|------------------|---|---|---|---|---|
| Null             |  |  |  |  |  |
| Read             |  |  |  |  |  |
| Write            |  |  |  |  |  |
| Own              |  |  |  |  |  |

**Own:** The user owns the data object (file) or the collection (folder) and has the full permission on reading, modifying (including deletion), and sharing.

**Write:** The user has read and write access to the object.

**Read:** The user can only read the object or its content. This also allows to make a (editable) copy of the file/folder.

**Null:** The user does not have any permission on the object. One can use 'none' when removing the previously assigned permissions to a user.



# ROLES AND PERMISSIONS

## Roles in RDMS

- **Group admin:** A group admin can create new team drives, groups, and projects and to manage them.
- **Data manager:** Data Manager is responsible for verifying that the data sent to the archive is complete and uncorrupted, and giving the final approval of the archive. This role is relevant during the Archiving workflow.
- **Metadata manager:** Metadata Manager is responsible for verifying and completing the metadata information related to the archive. This role is relevant during the Archiving workflow.
- **Project admin:** Project admin has the owner role for a project. This role is relevant during the Archiving workflow.
- **Project manager:** Project Manager is responsible for assigning the data manager and metadata manager roles, starting the archiving process. This role is relevant during the Archiving workflow.

# FUTURE

- **Enable audit**
- **Enable publishing**
- **Enable non-RUG access**

## **Plan:**

- **Integration with VRW, UWP and eLab journals**



THANK YOU

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