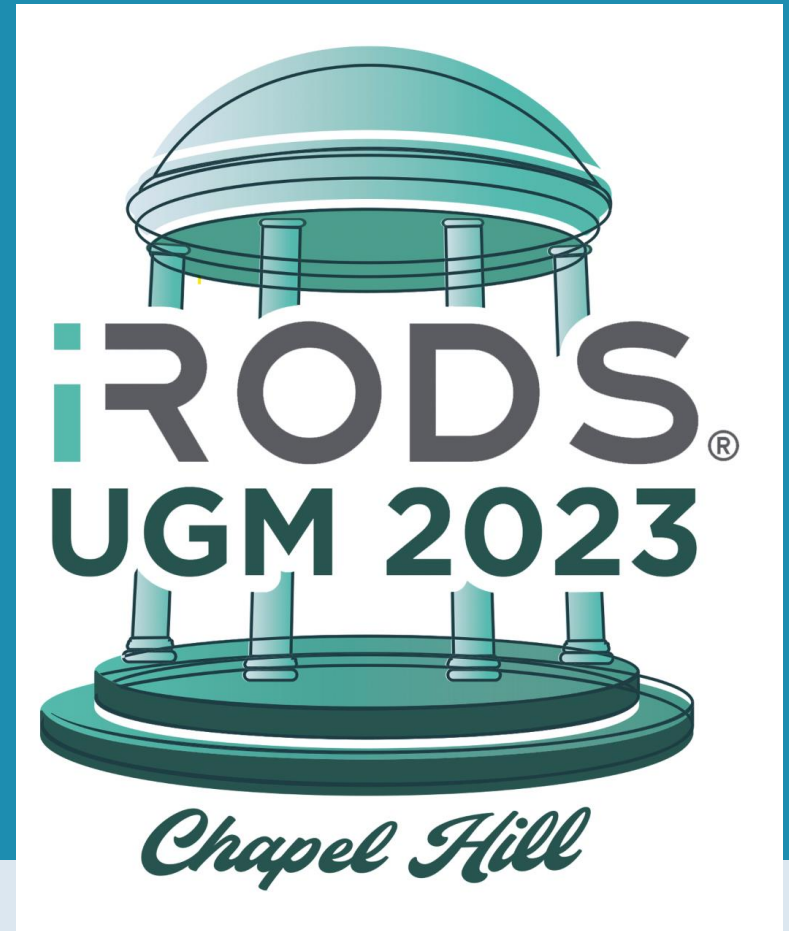
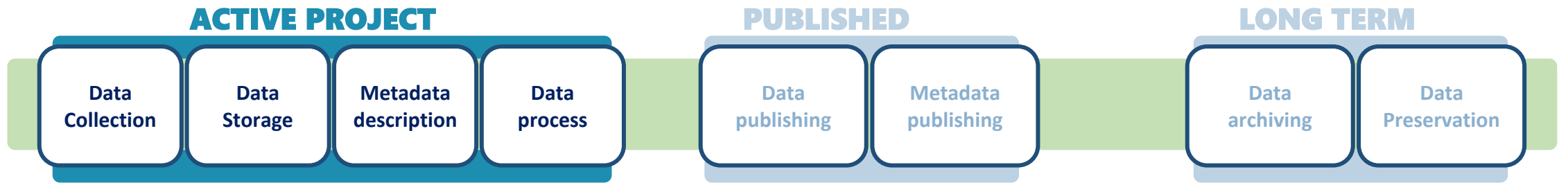


ManGO: a web portal and framework built on top of iRODS for active research data management



Paul Borgermans & Mariana Montes & Ingrid Barcena Roig

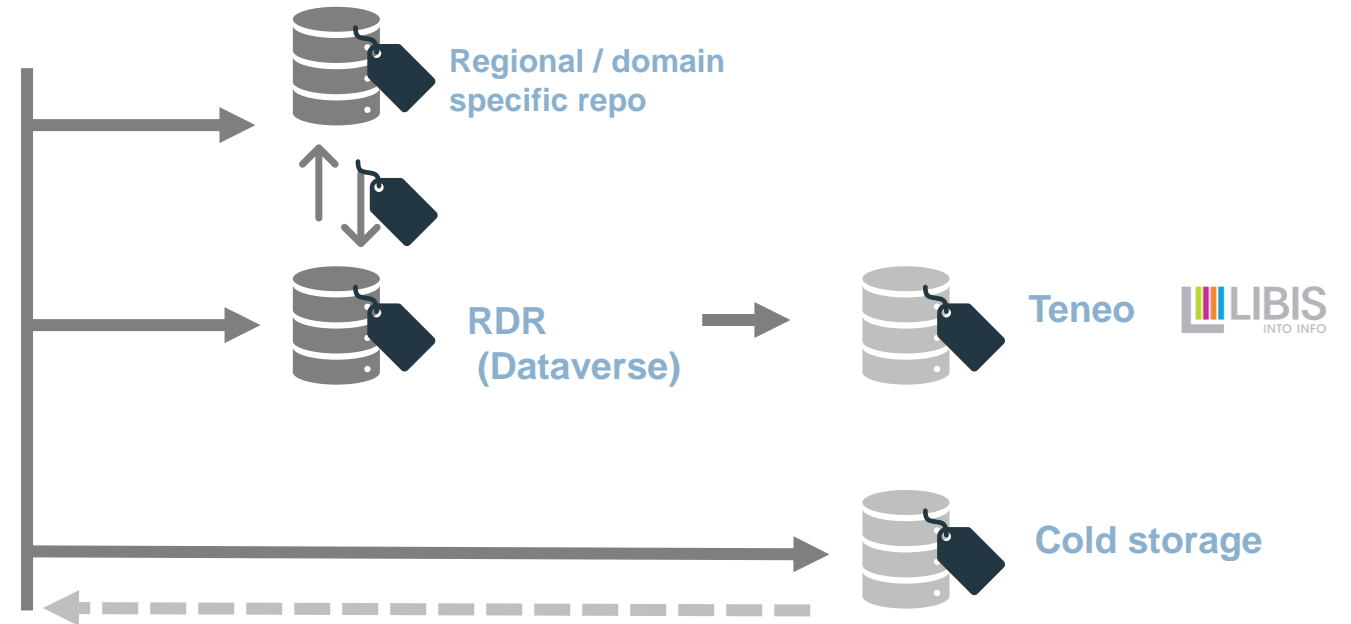
ManGO in the research data life cycle



ManGO



iRODS



ManGO Active data management as a service



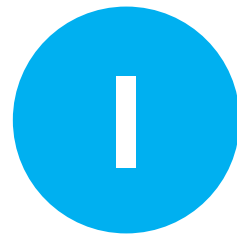
Data centralization

- Dispersion of data
- Duplication data
- + Accessibility to data
- + Data security



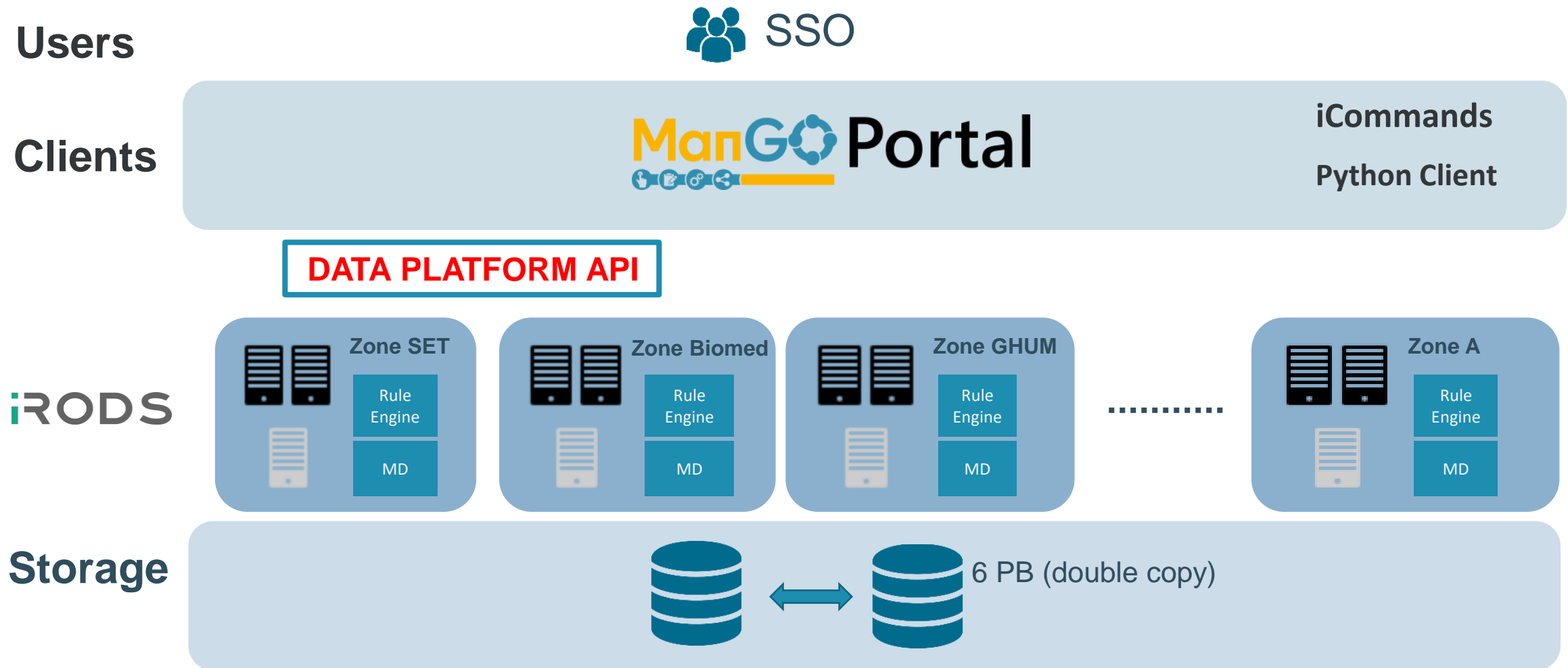
Data management

- + Standardization
- + Automation
- + Data discovery
- + Collaboration



FAIRification from the start!

ManGO Architecture



Serving many research projects

DATA PLATFORM API

iRODS zone icts_icts

Enter portal

How to connect



- Zone → projects (~60 since March 2023 launch)
- Users/Groups

📁 [variable_stars](#)

active

manager

Edit members

Retrieve API token

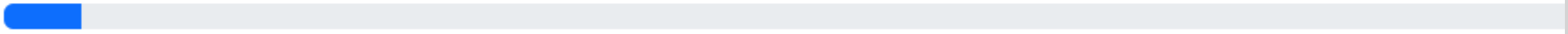
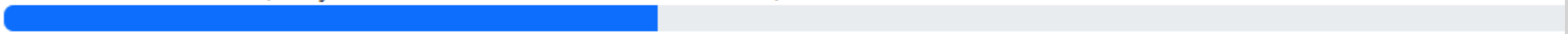
Add iRODS project

Add globus share

Usage report

Project life cycle

DATA PLATFORM API

Platform	irods (zone icts_icts)
Home folder	/icts_icts/home/variable_stars
Size	8.9 MB of 200.0 MB used 
Inodes	38 of 100 inodes used (6 objects, 4 collections, 28 metadata records) 
Features	<ul style="list-style-type: none"><input type="checkbox"/> Enforce quota, block writes if quota are exceeded<input type="checkbox"/> Enable SFTP open files for read-write<input checked="" type="checkbox"/> Enable iCommand/PRC access<input type="checkbox"/> Strict permissions, only project managers have write access to top level collection<input type="checkbox"/> Inherit permissions of the top level collection to subcollections (this implies a flat permission model, nobody is owner of any file)<input type="checkbox"/> Stored data is subject to the General Data Protection Regulation

Add member

Apply changes in irods

Archive

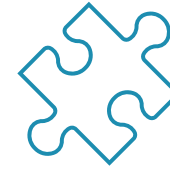
ManG Portal features

(Generic) Kernel

- CRUD Data / Metadata
- ICAT based search engine
- Permissions/ACL's
- Metadata schemas
- View templates overrides
- Extension hooks
 - Signals
 - Registration (UI)

- iRODS Python Client (PRC)
- Flask (web) framework
- Jinja2 view templates
- Bootstrap 5 (GUI components)
- Vanilla JavaScript





(Generic) Kernel

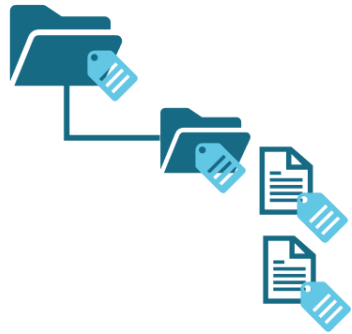
- CRUD Data / Metadata
- ICAT based search engine
- Permissions/ACL's
- Metadata schemas
- View templates overrides
- Extension hooks
 - Signals
 - Registration (UI)

(Optional) Plugins / Extensions

- User / group management *
- Data platform UI *
- OpenSearch *
- Reporting / statistics
- Analysis
 - Metadata extraction (Tika)
- ...

* Requires rodsadmin proxy

ManGO: metadata everywhere



Collections
Data objects



Users



Storage
Resources



System

- Automatic metadata extraction
- Data processing pipelines



User

- Documentation and standardization
- Workflow management



Analysis of embedded metadata

Inspect with Tika metadata extractor

Analysis executed on 2023-06-13T22:04:42+00:00

Metadata fields

AIRMASS	1.2297	<input checked="" type="checkbox"/>
BAYERPAT	RGGB	<input checked="" type="checkbox"/>
CCD-TEMP	-5	<input checked="" type="checkbox"/>
CENTALT	54.35	<input type="checkbox"/>
CENTAZ	136.19	<input type="checkbox"/>
Content-Length	18104768	<input type="checkbox"/>
YBINNING	1	<input type="checkbox"/>
YPIXSZ	3.76	<input type="checkbox"/>

Add selected metadata items as regular metadata



System properties	Metadata	Permissions
other	analysis	
AIRMASS	1.2297	
BAYERPAT	RGGB	
CCD-TEMP	-5	
EXPTIME	120	
FOCALLEN	2086	
INSTRUME	ZWO CCD ASI533MC Pro	
OBSERVER	Paul	
ORIGIN	Garden	
PIERSIDE	WEST	

ManGO portal: metadata schemas

Create metadata schemas

- Minimize user mistakes
- Allow for data validation
- Compulsory/optional metadata
- Domain specific metadata



Metadata schema manager for u0123318

New schema

Dublin Core

version 1.0.0 published version 2.0.0 draft

View Copy to new schema Download JSON Archive

Title*
Input type: text

Creator

ManGO portal: findable data

KU LEUVEN ManGO **set**

1 Search file names, collection names, owner names and selected metadata fields...

2

Collections

Search

Metadata schemas

Group administration

Trash

Admin

Type: Data object

Collection (subtree): /set/home/u0123318

Comparison: Contains

Name: M31

Created: Comparison: Before, Date: dd/mm/yyyy

Modified: Comparison: Before, Date: dd/mm/yyyy


Metadata


Attribute name	Attribute value	Attribute unit
mg.datacite.author	paul%	

Search


Data Objects: preview

[icts icts](#) » [home](#) » [variable stars](#) » [supernova and galaxies](#)

📄 WhaleGalaxy-NGC4631-Luminance-session_1-St-Sat-
SharpenAI-Focus (2).jpg 



System properties Metadata Permissions **Preview** Metadata inspection and extraction



ManGO portal: custom views

Template overrides for zone icts_icts

Source: `common/collection_view.html.j2`

```
[
  {
    "target": "common/gallery_carrousel.html.j2",
    "matches": {
      "all": {
        "metadata": {
          "match_type": "any",
          "items": [
            {
              "mg.collection_type": "gallery_carrousel"
            }
          ]
        }
      }
    }
  }
]
```




```
{
  "target": "common/collection_view_trash.html.j2",
  "matches": {
    "all": {
      "subtree": "/{{zone}}/trash"
    }
  }
}
```

- Zone specific
- Criteria: “any”, “all”
 - Path elements
 - Exact strings
 - Special variables
 - Metadata
- Yaml

ManGO portal: ACL's

Content Metadata **Permissions**

Inheritance

User / Group	Access level	Zone	
variable_stars (rodsgroup)	own	icts_icts	
variable_stars_observers (rodsgroup)	modify_object	icts_icts	
variable_stars_planets (rodsgroup)	read_object	icts_icts	

Groups: Recursive

ManGO portal: bulk operations

Move ▾ Apply

Move
Copy
Delete

available for data objects.

	Name	Owner	Created	Modified	Size	
<input type="checkbox"/>	exo_planets_past_saturn_and_jupiter	u0123318	2023-03-09 18:00:13	2023-05-31 15:09:12		
<input type="checkbox"/>	meetings	u0123318	2023-05-31 18:14:22	2023-05-31 18:15:59		
<input checked="" type="checkbox"/>	supernova_and_galaxies	u0118974	2023-04-28 17:47:39	2023-04-28 17:48:53		
<input checked="" type="checkbox"/>	00_12_57_lapl4_ap2376_conv_gimp.jpg	u0123318	2023-03-31 13:46:57	2023-03-31 13:46:58	252.9 kB	↓
<input type="checkbox"/>	m27.jpg	u0123318	2023-02-10 13:56:37	2023-02-10 13:56:37	3.2 MB	↓
<input type="checkbox"/>	ngc6888.jpg	u0123318	2023-02-10 13:56:38	2023-02-10 13:56:38	4.8 MB	↓

Delete Collection

Select destination collection

- home
 - gbiomed_eximious_pilot001
 - public
 - test_project_portal
 - tudelft
- u0123318
 - variable_stars
 - exo_planets_past_saturn_and_jupiter
 - meetings**
 - supernova_and_galaxies

ManGO portal: group management



- Via rodsadmin proxy account
- Enforced naming conventions

Group manager for realm [variable stars](#)

 variable_stars_observers

Current members

u0123318

u0118974

Remove selected users

Other members of variable_stars

u0137480

u0116999

u0089722

Add selected users

Add group



Group name suffix variable_stars_[suffix]

astronomers






cancel


ok

ManGO portal: OpenSearch plugin



Admin

-  Node
-  Template overrides
-  Opensearch
-  Statistics
-  Operator

[Regular portal](#) 

Open search index plugin

Launch ad hoc indexing job

[Add collection to index jobs](#)

Indexing thread status

Current status **active**

Indexing thread health

[Change status](#) [Restart indexing thread](#)

Client/server connection health

Query server:

Ingest server:

[Refresh client/server connections](#)

Index job queue (0)

No active jobs on this node

[Refresh](#)



Overall OpenSearch and zone stats

/icts_icts

Show stats for sub collections

Show collection stats

Collection	sub collections	data objects stats	size distribution
/icts_icts	count	count	0 Bytes - 10.0 kB
		total size	10.0 kB - 100.0 kB
		max size	100.0 kB - 1.0 MB
		min size	1.0 MB - 10.0 MB
			10.0 MB - 100.0 MB
			100.0 MB - 1.0 GB
			1.0 GB - 10.0 GB

Future



- Expand OpenSearch integration
- Refactor KU Leuven specifics into extensions (few left)
- Workflows



Photo by [Drew Beamer](#) on [Unsplash](#)

Thank You!

paul.borgermans@kuleuven.be
mariana.montes@kuleuven.be