



Vlaanderen  
is supercomputing

# iRODS User Training

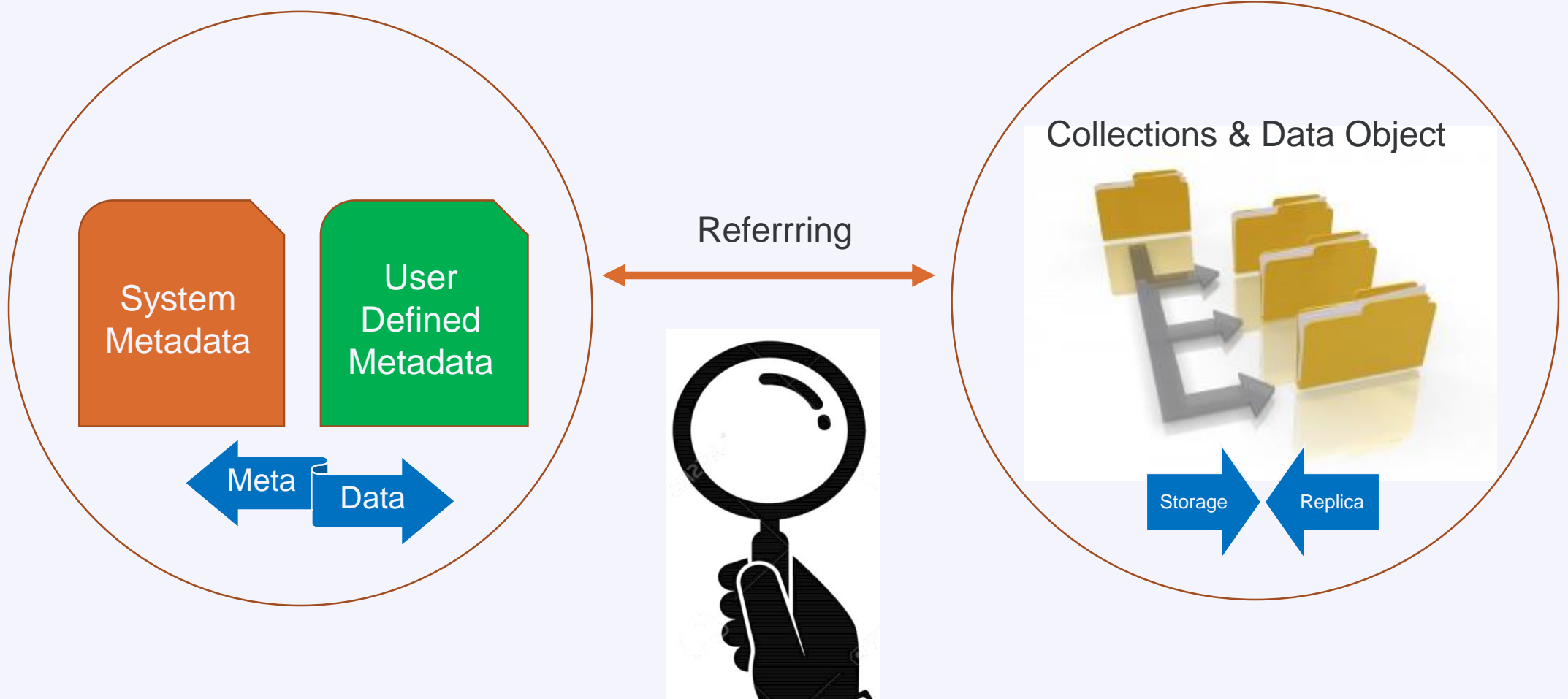
- Introduction
- Data and RDM
- Tier-1 Data platform Architecture
- What is iRODS?
- Functionalities

# Introduction

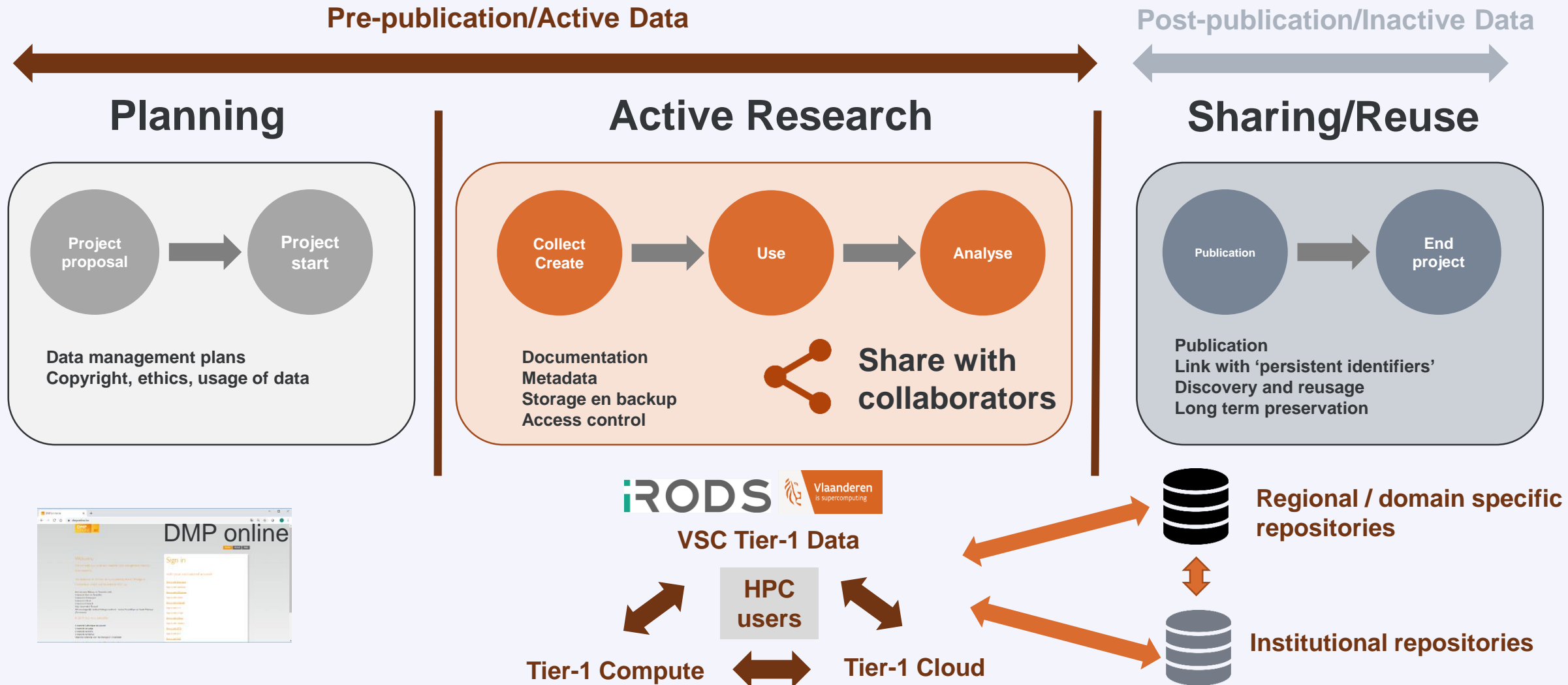
- The aim of the training is to explain basics of Tier-1 Data Service.
- iRODS training consists of general introduction, iCommands, VSC-PRC, basic irules and portal client (yoda, metalnx).
- This training is planned for VSC users.
- It includes hands-on sessions.
- Whole training may take around 3 hours, the introduction will take 15 minutes.
- Any questions, feedbacks will help us improve the quality of the training.

# Data and RDM

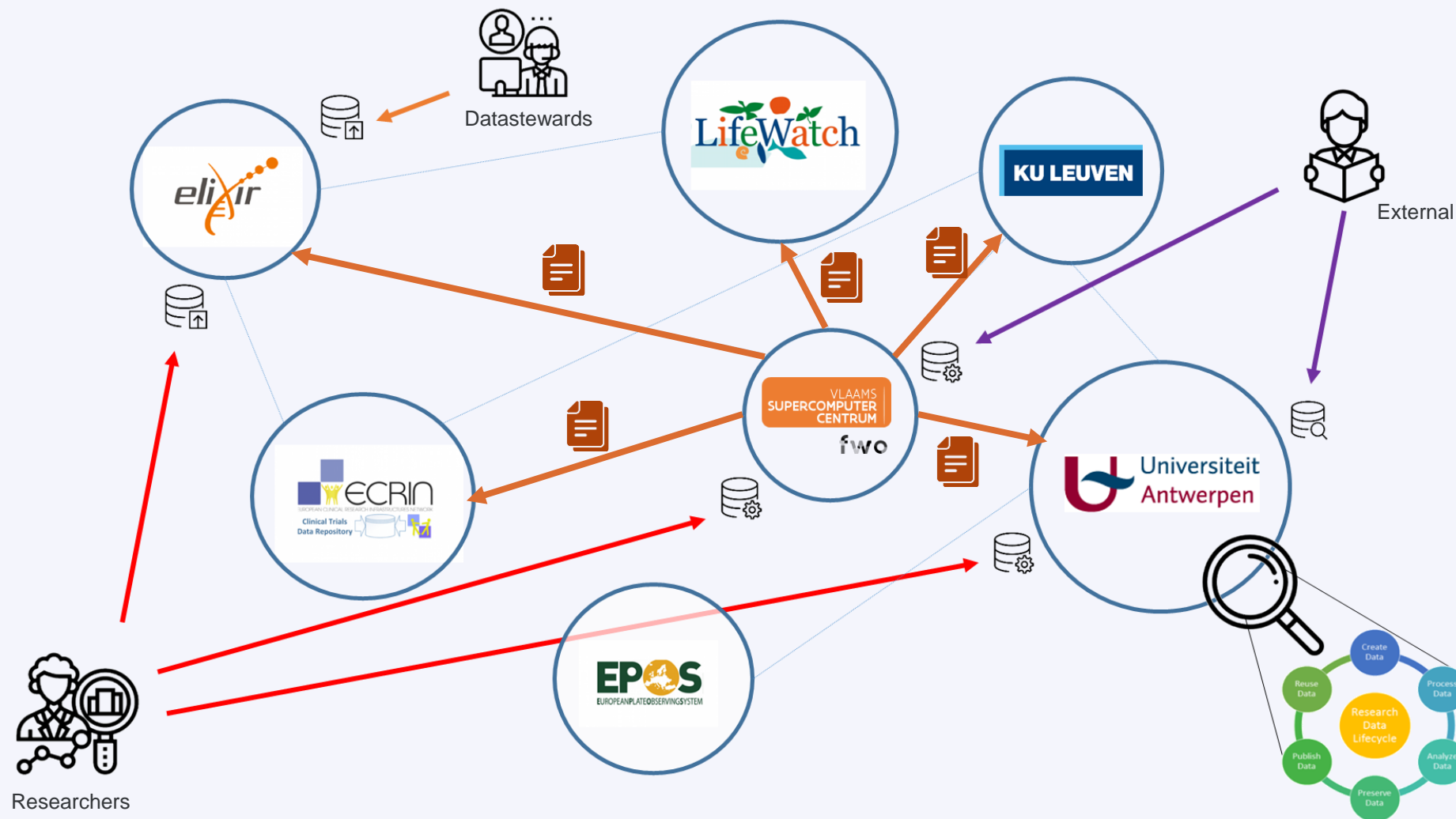
Data; what is in it? What is the problem with it?



# Tier-1 Data in the research Data Lifecycle



# The RDM landscape



# Tier-1 Data architecture



VSC Tier-1



VSC Tier-2



**auha** antwerp university association

**ASSOCIATIE KU LEUVEN**

universitaire associatie BRUSSEL

**ASSOCIATIE UNIVERSITEIT GENT**

User Clients



YODA

**metainx**

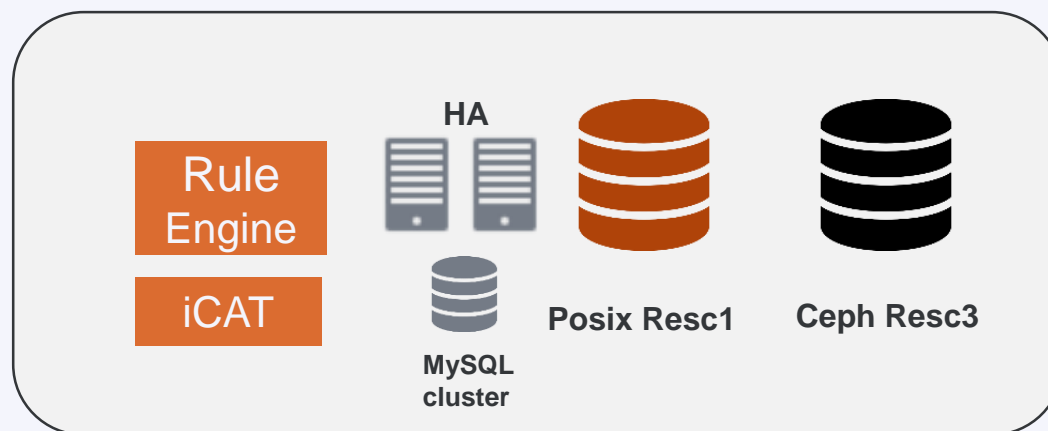


DAVRods

iCommands

iCommands PRC-Python API

VSC iRODS 1 zone



DC Heverlee

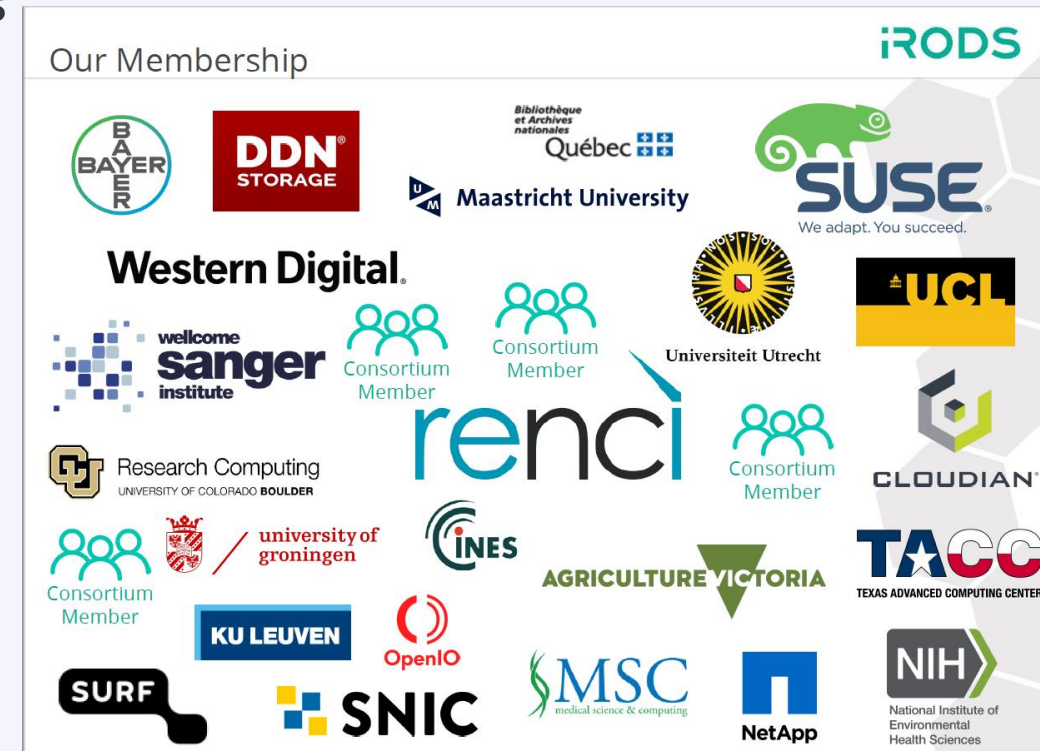
3km



DC Leuven

# What is iRODS?

- iRODS (integrated Rule-Oriented Data System)
- Open Source distributed data and storage management system
- Configurable data management policies and workflows
- Scalable
- iRODS consortium ensures sustainability by:
  - Guiding further development of the software;
  - Growing the user and developer communities; and
  - Facilitating iRODS support, education, and collaboration opportunities.





# iRODS Core competencies



## Unified Storage Namespace

Data virtualization of distributed storage systems



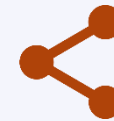
## Automation

Rule Engine to enforce data policies



## Data Discovery

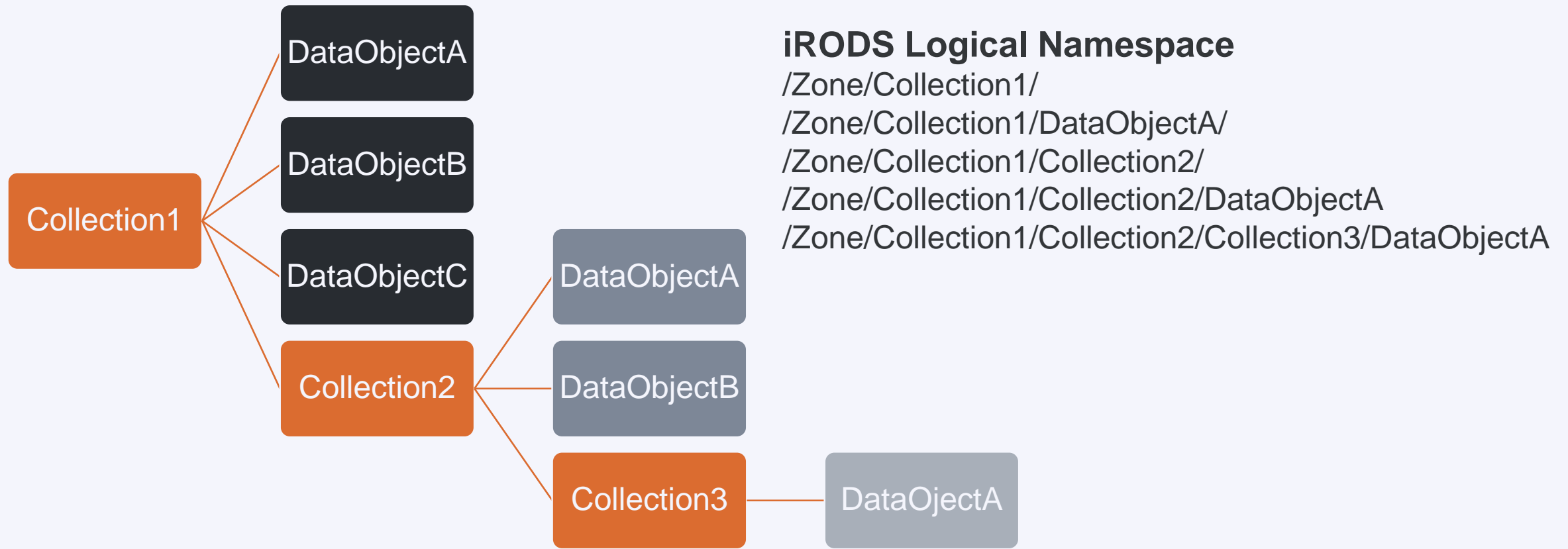
Rich Metadata for collections and data objects  
(System metadata and user-defined metadata)



## Secure collaboration

Three mechanisms: Permissions, Tickets and Federation.

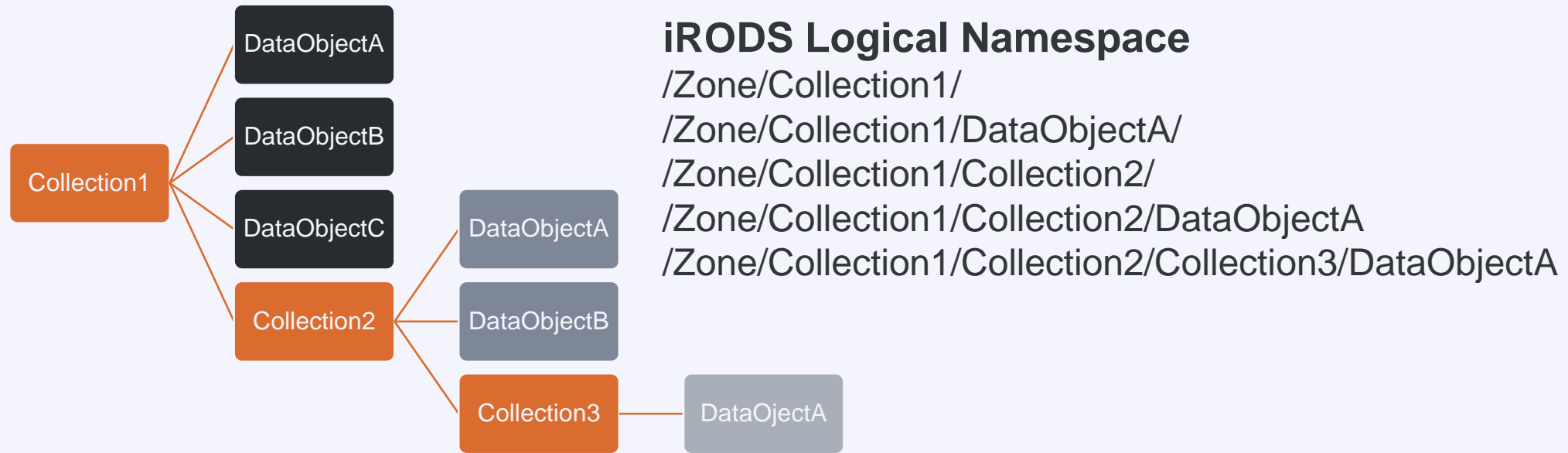
# Data organization in iRODS



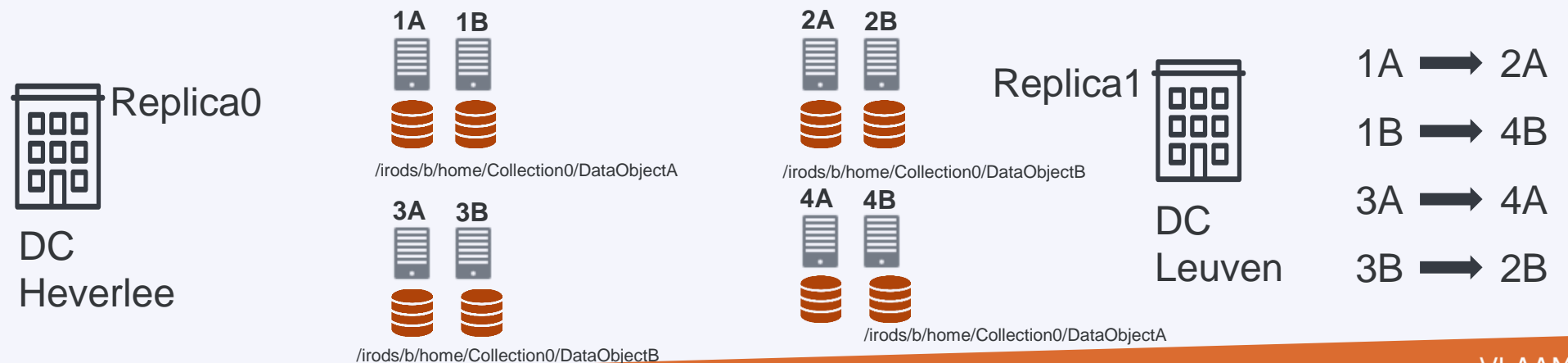
Collections ~ Directories  
DataObjects ~ Files

# Data virtualization in iRODS

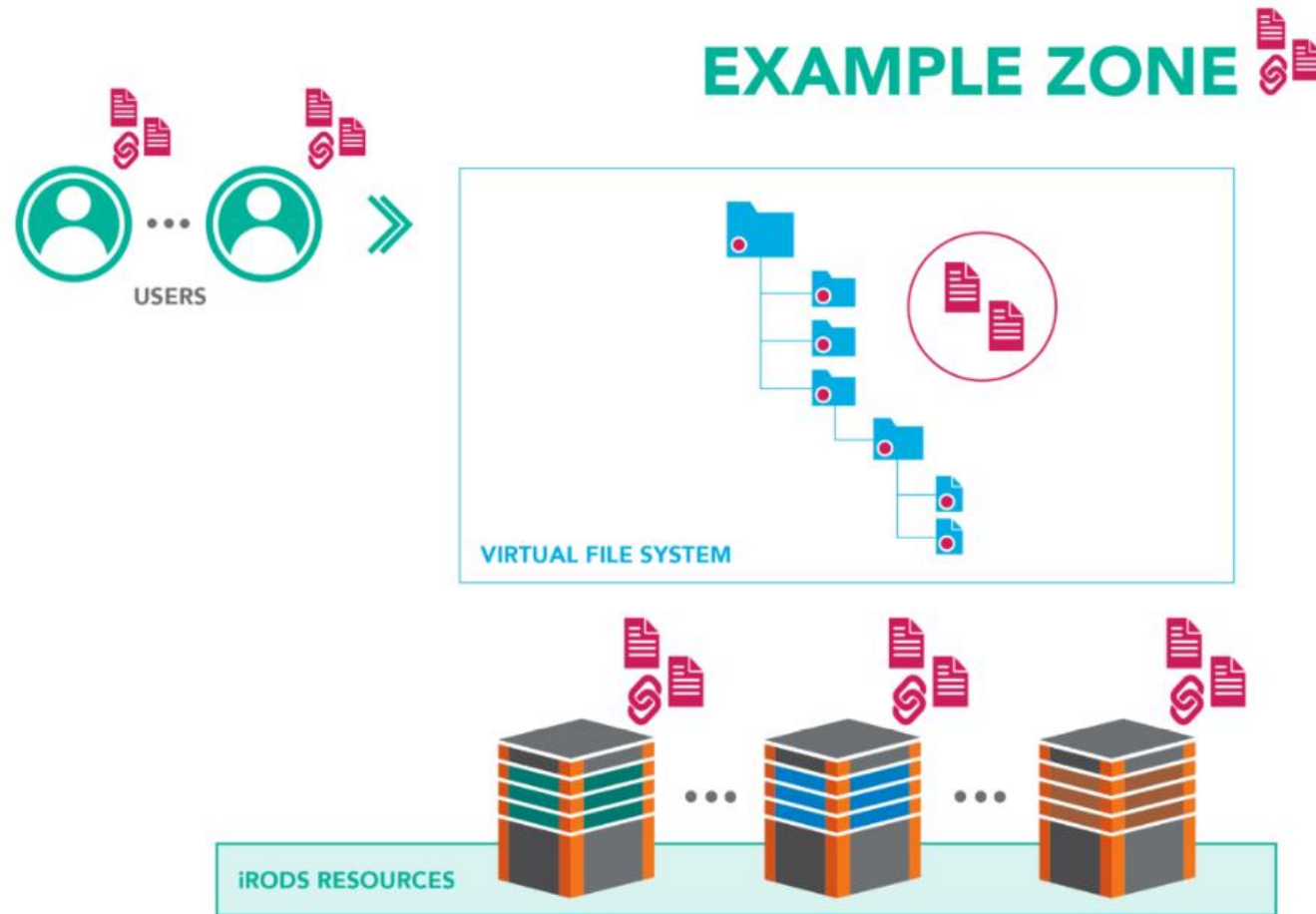
## Logical representation



## Physical representation



# Metadata in iRODS



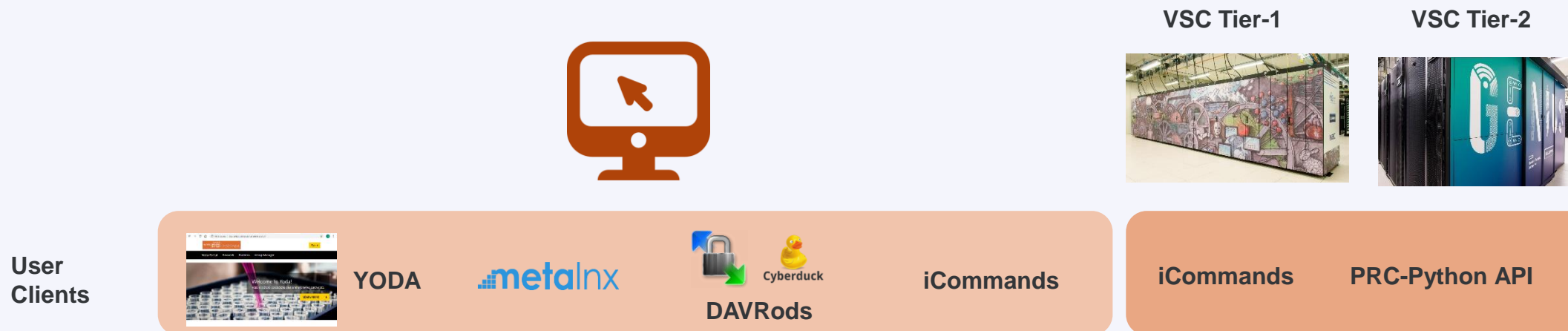
## System Metadata:

- filename, file size, creation date ...

## User Metadata:

- Manual introduction
- Metadata templates
- Automation (rules/microservices)

# Functionalities



## Interaction with iRODS

# Functionalities

## ■ icommands:

```
input - iget- irsync -imeta...
```

- uploading/downloading data
- adding metadata to data objects/collections
- querying based on metadata
- deleting data objects/collections
- synchronization of data
- ACLs to data objects/collections

# Functionalities

## ■ VSC-PRC:

`Python3, python-irodsclient`

- working with data objects/collections
- adding metadata to data objects/collections
- querying based on metadata
- deleting data objects/collections
- listing the disk usage
- ACLs to data objects/collections

# Functionalities

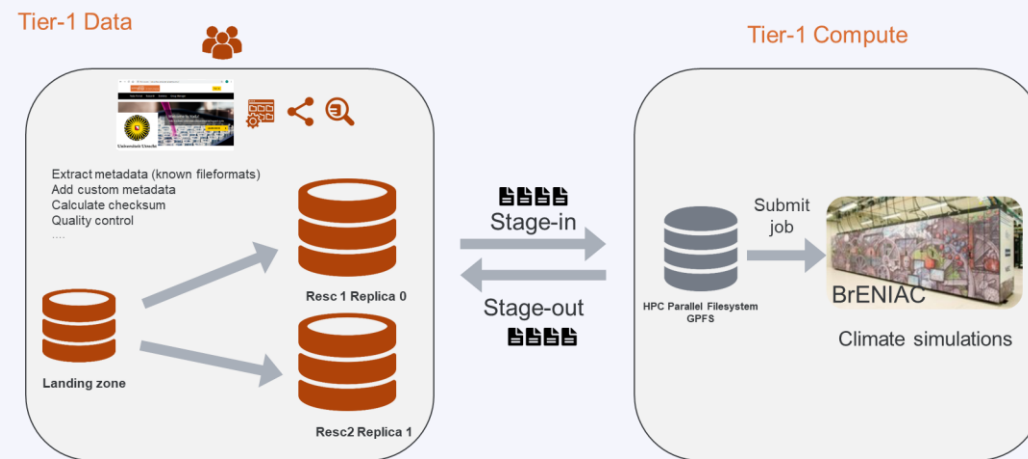
- HPC\_to\_Data:

- icommands:

```
input - iget- irsync -ibun
```

- VSC Python client:

```
vsc-prc-iget- vsc-prc-input
```





# Functionalities

## ■ Yoda:

- graphical user interface easiness
- working with data objects/collections
- adding metadata to data collections
- querying visually
- downloading data objects
- group management
- RDM workflow - UU

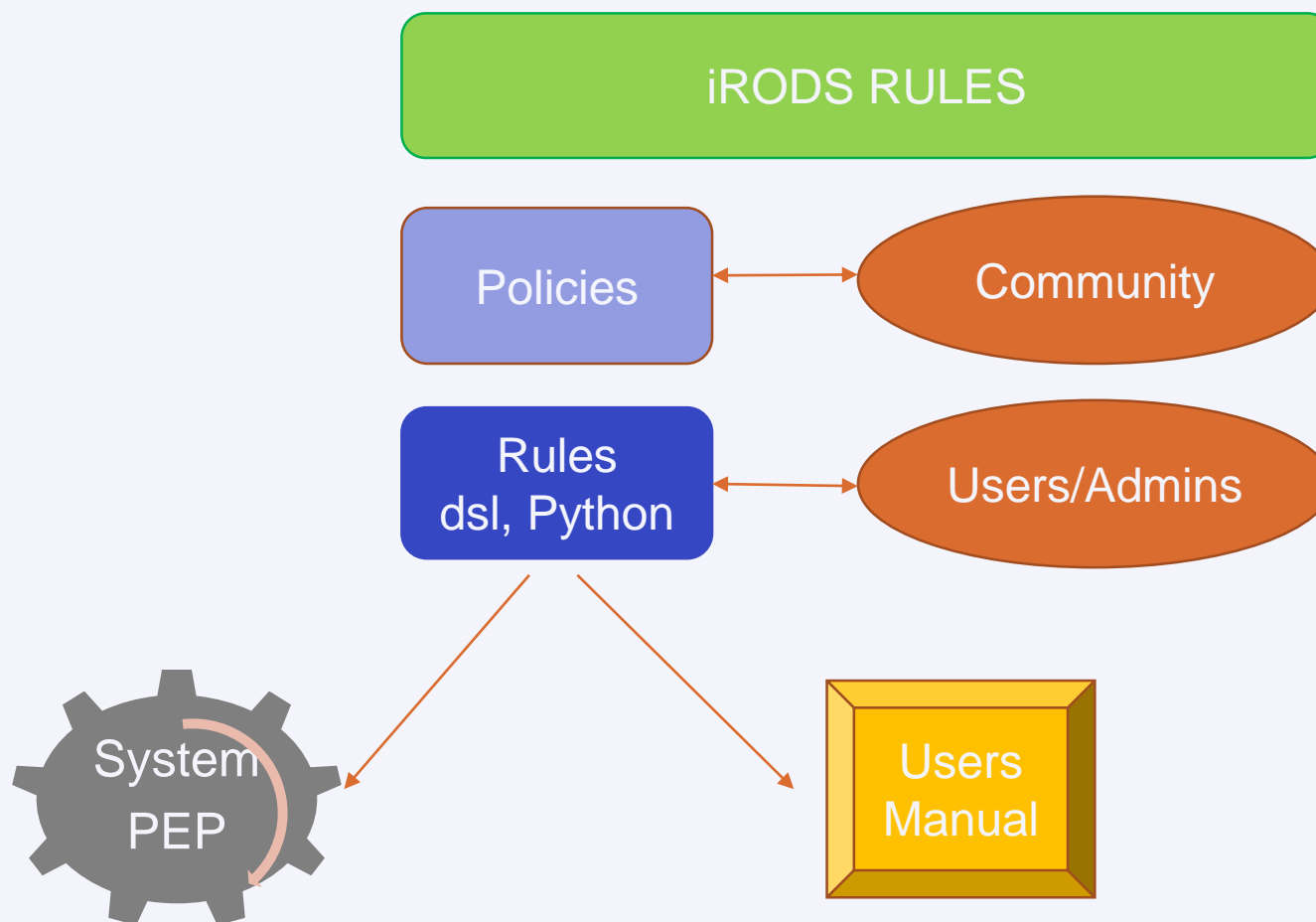
## ■ Metalnx:

- graphical user interface easiness
- working with data objects/collections
- adding metadata to data objects/collections
- downloading data objects
- permission
- iRODS design

# Functionalities

## ■ irule:

- user level rules
- written into a local file
- execute it when you need



# Documentation and support

## ■ Documentation

[https://vlaams-supercomputing-centrum-vscdocumentation.readthedocs-hosted.com/\\_/sharing/cxplsgyxzaizmf4xg7wl5jj8](https://vlaams-supercomputing-centrum-vscdocumentation.readthedocs-hosted.com/_/sharing/cxplsgyxzaizmf4xg7wl5jj8)

**NOTE:** After you click the special link above, you will reach the latest version of the VSC Documentation which doesn't include "Tier-1 Data Service". Hence you should click the version arrow on the right below side of the incoming page and chose the "data\_M" version.

## ■ Support

data@vscentrum.be



Vlaanderen  
is supercomputing

# Questions