

Presentation of iRODS : basic usages and easicmd tools

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Summary

- 1 Presentation of iRODS**
- 2 Introduction to iRODS**
- 3 easimc a tool to rule them all**

What is iRODS ?

- iRODS : integrated Rule Oriented Data System
- A data management middleware software (open source)
- Developed since 1995
- Use by CC-IN2P3, NOAO , NCDC etc...

iRODS

Why using iRODS ?

- **Virtualisation**, which provides an uniform interface for all data regardless of the heterogeneity of storage infrastructure.
- **Workflow Automation** through rules and microservices
- Secure **Collaboration** and data sharing between collaborating or distributed teams.
- Data Discovery through the use of descriptive **metadata**

iRODS-zone

- A Zone is a iRODS deployment with a single set of management policies and a single metadata catalog.
- iRODS Zones are independent administrative units. Several zones **can be federated** (world-wide)

example of zone : IbbeZone, ccin2p3

i-object

There is three kind of i-object in irods :

- file —> **dataObject (-d)**
- folder —> **Collection (-C)**
- user —> user (-u)

```
/lbbeZone/home/gdebaecker:  
  c- /lbbeZone/home/gdebaecker/article  
  /lbbeZone/home/gdebaecker/article:  
    c- /lbbeZone/home/gdebaecker/easicmd  
    /lbbeZone/home/gdebaecker/easicmd:  
      c- /lbbeZone/home/gdebaecker/example  
      /lbbeZone/home/gdebaecker/example:  
        C- /lbbeZone/home/gdebaecker/fast5_asellus <- Collection  
        /lbbeZone/home/gdebaecker/fast5_asellus:  
          FAL56806_29db37dd_250.fast5  
          FAL56806_29db37dd_251.fast5  
          FAL56806_29db37dd_252.fast5  
          FAL56806_29db37dd_253.fast5  
          FAL56806_29db37dd_25.fast5  
          c- /lbbeZone/home/gdebaecker/integrity  
          /lbbeZone/home/gdebaecker/integrity:  
            C- /lbbeZone/home/gdebaecker/NeGa  
            /lbbeZone/home/gdebaecker/NeGa:  
          }
```

Metadata : Enrichment of your data

- No limit of number for one object
- Defined by an AVU tuple :
 - a Attribute
 - a Value
 - a Unit -> can be null
- Are written in the iCAT
- Can be used to sort or search for your data
- Can be associated with dataObject, Collection or User

```
AVUs defined for dataObj /lbbeZone/home/  
attribute: technology <--- A  
value: nanopore_long_reads <--- V  
units: minion <--- U  
----  
attribute: Species <--- A  
value: Proasellus_coiffaiti <--- V  
units: <--- U  
----  
attribute: Person_in_charge <--- A  
value: George <--- V  
units: team_E3S <--- U  
----  
attribute: Date_sequencing <--- A  
value: 25_09_21 <--- V  
units: run2 <--- U  
----  
attribute: Date_prelevement <--- A  
value: 23_09_21 <--- V  
units: <--- U
```

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Inscription and Initialisation

- Ask the IT guys
- *Mkdir ~/.irods*
- Copy/create and edit the *irods_environment.json*
 - *cp /etc/irods/irods_environment.json ~/.irods*
 - "irods_zone_name" : "IbbeZone",
 - "irods_user_name" : "user_name",
 - "irods_host" : "Ibbe-irods-local",
 - "irods_port" : 1247
- *iinit* -> use your password

First step in iRODS : i-commands

- Give users a command-line interface to operate on data in iRODS
- Are Linux style shell commands
- Some of them need the type of object your work with (-d/-C/-u)
- list of icommand

[https://docs.irods.org/
4.2.10/icommands/user/](https://docs.irods.org/4.2.10/icommands/user/)

Linux	iRODS
ls	ils
cd	icd
pwd	ipwd
rsync	irsync
mkdir	imkdir
cp	icp
etc	ietc

Example : put data on iRODS

iput

ex : iput -rPKVf my_folder [path/in/iRODS]

- **-r** -> recursive
- **-P** -> progress
- **-K** -> calculate and verify the checksum on the data, client-side and server-side, and store it in the icat
- **-V** -> verbose mode
- **-f** -> force (overwrite)

If no iRODS path given folder is put in "/zone/home/user"

irsync

ex : irsync -rKV my_folder i:[path/in/irods/my_folder]

- **i :** -> "from iRODS"
- **Caution !** not as unix rsync :
 irsync my_folder == irsync my_folder/
 put the name of the folder in path if you want to create it
- if no iRODS path given (i :)-> create the folder in "/zone/home/user"

Example : get data from iRODS

iget

irsync

ex : iget -rPK path/in/iRODS local/path/

- -r → recursive
- -P → progress
- -K → calculate and verify the checksum on the data, client-side and server-side, and store it in the icat

ex : irsync -rKV i:[path/in/irods/my_folder] local/path/

Example : add metadata

imeta add -iobject_type path/to/iobject attribute value unit

- **imeta** -> command to work on metadata
- **add** -> option to add metadata to an iobject
- **-iobject_type** -> file/dataObject = -d , folder/Collection = -C and user = -u
- **path/to/iobject** -> path to your object in iRODS
- **attribute** -> work as a key
- **value** -> value associated with attribute
- **unit** -> can be null

Example : add metadata

imeta add -iobject_type path/to/iobject attribute value unit

```
$ imeta add -d /NeGA/Aselidae/sequencing/long-read/ONT/fast5/FAL56006_29db37dd_250.fast5 /  
seqkit LSK-110
```

```
$ imeta add -d /NeGA/Aselidae/sequencing/long-read/ONT/fast5/FAL56006_29db37dd_250.fast5 /  
flowcell R10_40
```

```
$ imeta add -d /NeGA/Aselidae/sequencing/long-read/ONT/fast5/FAL56006_29db37dd_250.fast5 /  
date 10_04_21 3_days
```

```
$ imeta add -d /NeGA/Aselidae/sequencing/long-read/ONT/fast5/FAL56006_29db37dd_250.fast5 /  
author Debaecker Gautier
```

Example : find a data

Find an object based on metadata :

imeta qu -iobject_type attribute OPERATION value

- imeta qu -d flowcell = R10_40
- imeta qu -d date like %04_21

Find an object based on name (only for file) :

ilocate name

- ilocate FAL56006_29db37dd_250.fast5
- ilocate %.fast5

A step-forward : i-rules

- Execution on server side
- Allow automatising of task
- iRODS rule language (C-like structure)

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EASy-Irods-CoMmanDs

A python script to :

- "Wrap" the principal IRODS i-commands
- Facilitate/automate the use of irods for new users
- Add the **auto-completion** for some irods i-commands

Link to the git :

git clone https://github.com/sigau/easy_irods_commands

EASy-Irods-CoMmanDs tools

```

Possible COMMANDS :

add.meta      : add.meta or add.meta [irods path]
                if you don't give an irods path you'll be asked an option ([f] for

Help          : print this help and leave
idush         : equivalent to du -sh for an irods folder

mkdir         : imkdir -p reinforce by autocompletion

irm           : irm [option]
option are [-f] for a file and [-C] for a folder
allow to irm one or multiple (if * was used) folder/file in irods. You can
also rm them

pull          : pull [option] [local path]
irsync[cl] folder/file from irods to local with autocompletion
for a file add option -f
For a folder add option -C
path can be full path or `.' for current folder
if no path given, a list of all the folder from root will be presented

push          : irsync[put] folder/file (given by a path) from local to irods with
autocompletion

rm.meta       : rm.meta or rrm.meta [irods path]
                if you don't give an irods path you'll be asked an option ([f] for

search_by_meta : search_by_meta [option] or search_by_meta
option are [-f] for a file, [-C] for a folder and [-u] for a user

search_name   : search_name [option]
option are [-f] for a file and [-C] for a folder
search for a file or a folder in irods

show_meta     : show_meta [option] or show.meta
option are [-f] for a file and [-C] for a folder

synchro       : synchre [local path to folder] [optional:irods path]
synchronise the contain of a local folder with irods [in irods path]
the folder will be synchronised on /zone/home/user/
can be fully automated with the help of when-changed (https://gitlab

See some examples on https://github.com/sigapp/easy_irods_commands

```

```
[base] gdebaecker@lbb01:~/test$ ./rawtest.py idush
iFolder (empty = /zone/home/user) : /lbb01-zone/home/gdebaecker/irods/test/test_C-test/raw_test/raw_test
[1]  /lbb01-zone/home/gdebaecker/_hidden_folder
[1]  /lbb01-zone/home/gdebaecker/irods_test
[1]  /lbb01-zone/home/gdebaecker/irods_test/raw_data
[1]  /lbb01-zone/home/gdebaecker/irods_test/raw_data/raw_data_fast5
[1]  /lbb01-zone/home/gdebaecker/irods_test/test_LC_test
[1]  /lbb01-zone/home/gdebaecker/irods_test/test_LC_test/raw_test
[1]  /lbb01-zone/home/gdebaecker/irods_test/test_LC_test/raw_test2
[1]  /lbb01-zone/home/gdebaecker/irods_test/test_C-test/raw_test/raw_test3
[1]  /lbb01-zone/home/gdebaecker/irods_test/test/test_mkdir
[1]  /lbb01-zone/home/gdebaecker/irods_test/test/test_C-test/test_mkdir_subfolder
[1]  /lbb01-zone/home/gdebaecker/_Mduas
[1]  /lbb01-zone/home/gdebaecker/_r_semlos
[1]  /lbb01-zone/home/gdebaecker/test_synchro
[1]  /lbb01-zone/home/gdebaecker/test_synchro/subfolder
```

Figure – Tools available in easicmd.py

Figure – Example of autocomplete

PUSH : PUT LOCAL DATA ON IRODS AND ADD METADATA

ARGUMENT :

easicmd.py push path/to/local_object

EXAMPLE :

```
### PUT THE LOCAL FOLDER "PROJECT_1" IN THE IRODS FOLDER "MY_PROJECT" AND ADD METADATA
$ ./easicmd.py push PROJECT_1
ifolder (empty = /zone/home/user ): /lbbeZone/home/gdebaecker/MY_PROJECT
                                         /lbbeZone/home/gdebaecker/irods_test
                                         /lbbeZone/home/gdebaecker/irods_test/raw_data
                                         /lbbeZone/home/gdebaecker/irods_test/raw_data/fast5
                                         /lbbeZone/home/gdebaecker/MY_PROJECT
                                         /lbbeZone/home/gdebaecker/NeGa

Running recursive pre-scan... pre-scan complete... transferring data...
C- /lbbeZone/home/gdebaecker/MY_PROJECT/PROJECT_1:
0/2 - 0.00% of files done 0.000/0.000 MB - 0.00% of file sizes done
Processing file.fasta - 0.000 MB 2021-11-03:17:06:50
    file.fasta          0.000 MB | 0.047 sec | 0 thr | 0.000 MB/s
1/2 - 50.00% of files done 0.000/0.000 MB - 0.00% of file sizes done
Processing file.fasta - 0.000 MB 2021-11-03:17:06:50
    file.fasta          0.000 MB | 0.041 sec | 0 thr | 0.000 MB/s

add metadata ?(y/n): y
attribut (empty to stop) : client
value : MISTER_X
unit : Top_Secret

$ ils -r MY_PROJECT
/lbbeZone/home/gdebaecker/MY_PROJECT:
C- /lbbeZone/home/gdebaecker/MY_PROJECT/PROJECT_1
/lbbeZone/home/gdebaecker/MY_PROJECT/PROJECT_1:
file.fasta
file.fasta
```

PULL : GET BACK DATA FROM IRODS

ARGUMENT :

easimcd.pwd **pull iobject_type [path/to/local]**

EXAMPLE :

```
## PUT THE IRODS FOLDER "PROJECT_2" IN THE LOCAL FOLDER "MY_LOCAL_PROJECT"
$ ./easimcd.py pull -C MY_LOCAL_PROJECT/
ifolder (empty = /zone/home/user ) : /lbbZone/home/gdebaecker/MY_PROJECT/PROJECT_2
  /lbbZone/home/gdebaecker/irods_test
    /lbbZone/home/gdebaecker/irods_test/raw_data
    /lbbZone/home/gdebaecker/irods_test/raw_data/fast5
  /lbbZone/home/gdebaecker/MY_PROJECT
  /lbbZone/home/gdebaecker/MY_PROJECT/PROJECT_2
  /lbbZone/home/gdebaecker/NeGa

0/3 - 0.00% of files done 0.000/0.000 MB - 0.00% of file sizes done
Processing file_bis.r - 0.000 MB 2021-11-03:17:35:48
  file_bis.r 0.000 MB | 0.036 sec | 0 thr | 0.000 MB/s
1/3 - 33.33% of files done 0.000/0.000 MB - 0.00% of file sizes done
Processing file.fasta - 0.000 MB 2021-11-03:17:35:48
  file.fasta 0.000 MB | 0.029 sec | 0 thr | 0.000 MB/s
2/3 - 66.67% of files done 0.000/0.000 MB - 0.00% of file sizes done
Processing file.fastq - 0.000 MB 2021-11-03:17:35:48
  file.fastq 0.000 MB | 0.027 sec | 0 thr | 0.000 MB/s

$ls MY_LOCAL_PROJECT
PROJECT_2/
```

```
## PUT THE CONTAIN OF IRODS FOLDER "PROJECT_2" IN THE LOCAL FOLDER "MY_LOCAL_PROJECT"
$ ./easimcd.py pull -C MY_LOCAL_PROJECT/
ifolder (empty = /zone/home/user ) : /lbbZone/home/gdebaecker/MY_PROJECT/PROJECT_2
  ifolder (empty = /lbbZone/home/gdebaecker/irods_test) :
    ifolder (empty = /lbbZone/home/gdebaecker/irods_test/raw_data) :
      file_bis 0.000 MB | 0.037 sec | 0 thr | 0.000 MB/s
      file.fasta 0.000 MB | 0.030 sec | 0 thr | 0.000 MB/s
      file.fastq 0.000 MB | 0.035 sec | 0 thr | 0.000 MB/s

$ls MY_LOCAL_PROJECT
file_bis.r file.fasta file.fastq

## DOWNLOAD ONE SPECIFIC FAST5 IRODS FILE IN MY CURRENT LOCAL FOLDER
$ ./easimcd.py pull -f .
ifolder (empty = /zone/home/user ) : /lbbZone/home/gdebaecker/irods_test/raw_data/fast5
irods file (tap tab) : FALS6896_29db37dd_251.fast5
0/1 - 0.00% of files done 0.000/181.788 MB - 0.00% of file sizes done
Processing FALS6896_29db37dd_251.fast5 - 181.788 MB 2021-11-03:17:42:38
From server: FALS6896_29db37dd_251, fast5 - 181.788/181.788 MB - 93.48% done 2021-11-03:17:42:38
FALS6896_29db37dd_251.fast5 - 181.788/181.788 MB - 100.00% done 2021-11-03:17:42:38
FALS6896_29db37dd_251.fast 181.788 MB | 1.789 sec | 46 thr | 196.344 MB/s

$ls FALS6896_29db37dd_251.fast5
FALS6896_29db37dd_251.fast5
```

SYNCHRO : SYNCHRONIZE MODIFIED DATA FROM A LOCAL FOLDER WITH IRODS

ARGUMENT :

The folder is not yet in iRODS :

easimcd.py synchro path/to/local path/in/irods

The folder already exist in irods (or has to be put in "/zone/home/user") :

easimcd.py synchro path/to/local

EXAMPLE :

```
## SYNCHRONISE THE LOCAL FOLDER "Nanoplot" in irods folder "PROJECT_ASSELUUS/ONT_READS"
$ ls
/lbheZone/home/gdebaecker:
C- /lbheZone/home/gdebaecker/Mega
C- /lbheZone/home/gdebaecker/PROJECT_ASSELUUS

$ ls Nanoplot/
full_report.pdf QC_porechop

$ ./easimcd.py synchro /beegfs/home/gdebaecker/irule/Nanoplot /lbheZone/home/gdebaecker/PROJECT_ASSELUUS/ONT_READS/Nanoplot

$ ls PROJECT_ASSELUUS/ONT_READS/Nanoplot/
/lbheZone/home/gdebaecker/PROJECT_ASSELUUS/ONT_READS/Nanoplot:
full_report.pdf
C- /lbheZone/home/gdebaecker/PROJECT_ASSELUUS/ONT_READS/Nanoplot/QC
```

```
## SYNCHRONISE THE LOCAL FOLDER "Nanoplot" in irods folder "PROJECT_ASSELUUS/ONT_READS"
$ ls
/lbheZone/home/gdebaecker:
C- /lbheZone/home/gdebaecker/Mega
C- /lbheZone/home/gdebaecker/PROJECT_ASSELUUS

$ ls Nanoplot/
full_report.pdf QC_porechop

$ ./easimcd.py synchro /beegfs/home/gdebaecker/irule/Nanoplot /lbheZone/home/gdebaecker/PROJECT_ASSELUUS/ONT_READS/Nanoplot

$ ls PROJECT_ASSELUUS/ONT_READS/Nanoplot/
/lbheZone/home/gdebaecker/PROJECT_ASSELUUS/ONT_READS/Nanoplot:
full_report.pdf
C- /lbheZone/home/gdebaecker/PROJECT_ASSELUUS/ONT_READS/Nanoplot/QC
```

IMKDIR : CREATE AN IRODS WITHOUT KNOWING THE FULL TREE VIEW

ARGUMENT :

easicmd.py imkdir

EXAMPLE :

```
$ ils -r
C- /lbbeZone/home/gdebaecker/irods_test
/lbbeZone/home/gdebaecker/irods_test:
    final_summary_FAL56006_29db37dd.txt
C- /lbbeZone/home/gdebaecker/NeGa
C- /lbbeZone/home/gdebaecker/sr_aselus

$ ./easicmd.py imkdir
create : /lbbeZone/home/gdebaecker/irods_test/test_C-test/raw_test/raw_test2/new_folder

$ ils /lbbeZone/home/gdebaecker/irods_test/test_C-test/raw_test/raw_test2/
/lbbeZone/home/gdebaecker/irods_test/test_C-test/raw_test/raw_test2:
C- /lbbeZone/home/gdebaecker/irods_test/test_C-test/raw_test/raw_test2/new_folder
```

IRM : REMOVE DATA FROM IRODS

ARGUMENT :

easicmd.py **irm** **iobject_type**

EXAMPLE :

```
## REMOVE ALL THE *.r file from the "MY_PROJECT" irods folder
$ ils ./MY_PROJECT/
/lbbeZone/home/gdebaecker/MY_PROJECT:
file_bis_2.r
file_bis_3.r
file_bis_4.r
file_bis_5.r
file_bis.r
file_fastq
C- /lbbeZone/home/gdebaecker/MY_PROJECT/PROJECT_2

$ ./easicmd.py irm -f
you can use * as wildcard
ifolder (empty = /zone/home/user ): /lbbeZone/home/gdebaecker/MY_PROJECT
irods file (tap tab) :*.r

$ ils ./MY_PROJECT/
/lbbeZone/home/gdebaecker/MY_PROJECT:
file_fastq
file_fastq
C- /lbbeZone/home/gdebaecker/MY_PROJECT/PROJECT_2
```

```
REMOVE THE "MY_PROJECT" irods folder
$ ils
/lbbeZone/home/gdebaecker:
C- /lbbeZone/home/gdebaecker/irods_test
C- /lbbeZone/home/gdebaecker/MY_PROJECT
C- /lbbeZone/home/gdebaecker/NeG
C- /lbbeZone/home/gdebaecker/sr_aselus

$ ./easicmd.py irm -C
you can use * as wildcard
ifolder (empty = /zone/home/user ): /lbbeZone/home/gdebaecker/MY_PROJECT

$ ils
/lbbeZone/home/gdebaecker:
C- /lbbeZone/home/gdebaecker/irods_test
C- /lbbeZone/home/gdebaecker/NeG
C- /lbbeZone/home/gdebaecker/sr_aselus
```

ADD_META : ADD METADATA ASSOCIATED WITH AN OBJECT

ARGUMENT :

easicmd.py add_meta iobject_type

EXAMPLE :

```
### ADD METADATA TO iRODS FOLDER "sr_aselus"
$ ./easicmd.py add_meta
add metadata to folder (C) or file (f) : C
ifolder (empty = /zoumehowuser ): /lbbeZone/home/gdebaecker/sr_aselus
attribut (empty to stop) : iuchmoology
value : illumina
unit : 150pb
imeta add -C /lbbeZone/home/gdebaecker/sr_aselus technology illumina 150pb
attribut (empty to stop) : Species
value : Proselulus_coiffaiti
unit :
imeta add -C /lbbeZone/home/gdebaecker/sr_aselus Species Proselulus_coiffaiti
attribut (empty to stop) : Coverage
value : 200X
unit :
imeta add -C /lbbeZone/home/gdebaecker/sr_aselus Coverage 200X
attribut (empty to stop) :
```

```
$ imeta ls -C sr_aselus/
AVUs defined for collection /lbbeZone/home/gdebaecker/sr_aselus:
attribute: Species
value: Proselulus_coiffaiti
units:
...
attribute: technology
value: illumina
units: 150pb
...
attribute: Coverage
value: 200X
units:
```

RM_META : REMOVING METADATA ASSOCIATED WITH AN OBJECT

ARGUMENT :

easicmd.py rm_meta iobject_type

EXAMPLE :

```
$ rm REMOVE_METADATA FROM iRODS FOLDER "sr_aselus"  
or REMOVE THE "species" METADATA  
$ imeta ls -C sr_aselus/  
AVUs defined for collection /lbbZone/home/gdebaecker/sr_aselus:  
attribute: Species  
value: Proselus_coffaiti  
units:  
----  
attribute: technology  
value: illumina  
units: 150pb  
----  
attribute: Coverage  
value: 200X  
units:  
$ ./easicmd.py rm_meta  
remove metadata from folder (C) or file (F) : C  
ifolder (empty = /zone/home/user) : /lbbZone/home/gdebaecker/sr_aselus  
attribut (empty for all): Species  
  
$ imeta ls -C sr_aselus/  
AVUs defined for collection /lbbZone/home/gdebaecker/sr_aselus:  
None
```

SHOW_META : SHOW THE METADATA ASSOCIATED WITH AN OBJECT

ARGUMENT :

easicmd.py **show_meta** **iobject_type**

EXAMPLE :

```
$ ./easicmd.py show_meta -C
ifolder (empty = /zone/home/user ): /lbbeZone/home/gdebaecker/sr_aselus
AVUs defined for collection /lbbeZone/home/gdebaecker/sr_aselus:
attribute: technology
value: illumina
units: 150pb
-----
attribute: Species
value: Proassellus_coifaiti
units:
```

SEARCH_BY_META : SEARCH FOR IRODS OBJECTS (FOLDER/FILE) BASED ON THE METADATA

ARGUMENT :

easicmd.py **search_by_meta** **iobject_type**

EXAMPLE :

```
###SEARCH ALL THE IRODS FOLDER THAT HAVE THE ATTRIBUTE "technology"
./easicmd.py search_by_meta -C
attribute: technology
          auteur
          technology
          Species
value (% as *): %
          illumina
          Nanopore

collection: /lbbeZone/home/gdebaecker/irods_test/raw_data/fast5
----
collection: /lbbeZone/home/gdebaecker/sr_aselus
```

SEARCH_NAME : SEARCH FOR IRODS OBJECT BASED ON (PARTS) OF THE OBJECT NAME

ARGUMENT :

easicmd.py search_name iobject_type

EXAMPLE :

```
### FIND ALL THE ".fast5" FILES ON IRODS
$ ./easicmd.py search_name -f
your query(% as *) : %.fast5
/lbbeZone/home/gdebaecker/irods_test/raw_data/FAL56006_29db37dd_253.fast5
/lbbeZone/home/gdebaecker/irods_test/raw_data/fast5/FAL56006_29db37dd_250.fast5
/lbbeZone/home/gdebaecker/irods_test/raw_data/fast5/FAL56006_29db37dd_251.fast5
/lbbeZone/home/gdebaecker/irods_test/raw_data/fast5/FAL56006_29db37dd_252.fast5
/lbbeZone/home/gdebaecker/irods_test/raw_data/fast5/FAL56006_29db37dd_253.fast5
/lbbeZone/home/gdebaecker/irods_test/raw_data/fast5/FAL56006_29db37dd_25.fast5
/lbbeZone/home/gdebaecker/irods_test/test_C-test/raw_test/raw_test3/FAL56006_29db37dd_253.fast5

###FIND ALL THE "fastQ" FOLDER IN IRODS
$ ./easicmd.py search_name -C
your query (you can use *): *fastQ
/lbbeZone/home/gdebaecker/irods_test/raw_data/UNICORN_AND_DRAGON/fastQ
/lbbeZone/home/gdebaecker/NeGa/MY_2nd_PROJECT/TIGER/fastQ
/lbbeZone/home/gdebaecker/NeGa/MY_PROJECT/Proasellus/fastQ
```

IDUSH : AN IRODS EQUIVALENT TO du -sh

ARGUMENT :

easicmd.py **idush**

EXAMPLE :

```
$ ./easicmd.py idush
ifolder (empty = /zone/home/user ): /lbbeZone/home/gdebaecker/irods_test/raw_data/fast5
                                             /lbbeZone/home/gdebaecker/irods_test
                                             /lbbeZone/home/gdebaecker/irods_test/raw_data
                                             /lbbeZone/home/gdebaecker/irods_test/raw_data/fast5

913.7MiB
```

QUESTION ?



That's all Folks!