iRODS Hands-On

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Contents

EUDAT

Demo Data Grid

- A virtual machine for the training
  - ssh *–X eudat@130.183.206.65*

IP address	hostname	user	password
130.183.206.65	irods2-eudat	eudat	eu25dat

Demo Data Grid

- iRODS installed in: "`~/iRODS`", iEnv files: "`~/.irods/.irodsEnv`"
- Set:
  - `export IRODSHOME=$HOME/iRODS`
  - `export IRODSZONE=/vzRZGEUDAT`
  - `export LOCALHOME=/vzRZGEUDAT/home/eudat`
  - `export REMOTEZONE=/vzRZGE`
  - `export REMOTEHOME=/vzRZGE/home/eudat#vzRZGEUDAT`
- iRODS user account:

iRODS zone	iRODS admin
vzRZGEUDAT	eudat

EUDAT

I. iRODS Getting Started

iRODS Control

- ./irodsctl
  - start
  - stop
  - Restart

  Start/stop/restart the iRODS server and the iCAT
  - istart
  - istop
  - irestart

  Start/stop/restart the iRODS server but not the iCAT

.irodsEnv File

```
# iRODS personal configuration file.
#
# This file was automatically created during iRODS installation.
#   Created Mon Jun 18 13:13:27 2012
#
# iRODS server host name:
irodsHost 'eudat01'
# iRODS server port number:
irodsPort 1247
# Default storage resource name:
irodsDefResource 'demoResc'
# Home directory in iRODS:
irodsHome '/vzEudat0/home/rods0'
# Current directory in iRODS:
irodsCwd '/vzEudat0/home/rods0'
# Account name:
irodsUserName 'rods0'
# Zone:
irodsZone 'vzEudat0'
```

The .irodsEnv file determines which data grid (zone) the icommands client connects to.

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iRODS i-commands

Documentation:

https://www.irods.org/index.php/icommands

(we don't provide a exhaustive list of i-commands)

icommands

- icommands of the following categories will be introduced (not an exhaustive list):
  - Informational
  - Unix and FTP like
  - Functional
  - Metadata
  - Rules
- Examples of several icommands will be shown

icommands

- Make sure the icommands can be found on the PATH

- You can find the icommands in the

`$IRODSHOME/clients/icommands/bin` folder

- Add the icommands to the path:

tcsh:

```
setenv PATH $PATH:$IRODSHOME/clients/icommands/bin
```

bash:

```
export PATH=$PATH:$IRODSHOME/clients/icommands/bin
```

EUDAT

Informational

ienv

ilsresc

imiscsvrinfo

ihelp

iuserinfo

ihelp

Display help on any of the icommands if you need more information about the command.

Usage : ihelp [-h] [icommand]

```
eudat01@eudat01:$ ihelp -h

Usage : ihelp [-ah] [icommand]
Display i-commands synopsis or a particular i-command help
text
Options are:
 -h  this help
 -a  print the help text for all the i-commands

Run with no options to display a synopsis of the i-commands

iRODS Version 3.2                    October 2012
        ihelp
```

ienv

Lists the iRODS environment variables.

Equivalent to “iinit -l”

Usage : ienv [-h]

```
eudat01@eudat01:~$ ienv

NOTICE: Release Version = rods3.2, API Version = d
NOTICE: irodsHost=eudat01
NOTICE: irodsPort=1247
NOTICE: irodsDefResource=demoResc
NOTICE: irodsHome=/vzEudat0/home/rods0
NOTICE: irodsCwd=/vzEudat0/home/rods0
NOTICE: irodsUserName=rods0
NOTICE: irodsZone=vzEudat0
```

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iuserinfo

Show information about your iRODS user account or the entered user

Usage: iuserinfo [-vVh] [user]

```
eudat01@eudat01:~$ iuserinfo

name: rods0
id: 10007
type: rodsadmin
zone: vzEudat0
info:
comment:
create time: 01340018007: 2012-06-18.13:13:27
modify time: 01340018007: 2012-06-18.13:13:27
member of group: rods0
member of group: public
```

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imiscsvrinfo

Connect to the server and retrieve some basic server information. Can be used as a simple test for connecting to the server.

Usage: imiscsrvinfo [-hvV]

```
eudat01@eudat01:~$ imiscsvrinfo

RCAT_ENABLED
relVersion=rods3.2
apiVersion=d
rodsZone=vzEudat0
up 0 days, 23:40
```

ilsresc

ilsresc lists iRODS resources and resource-groups

Usage: ilsresc [-lvVhA] [Name]

```
eudat01@eudat01:~$ ilsresc

demoResc
```

“demoResc” is created during a default installation

ilsresc

Find out the details of a specific resource:

```
eudat01@eudat01:~$ ilsresc -l demoResc

resource name: demoResc
resc id: 10010
zone: vzEudat0
type: unix file system
class: archive
location: eudat01
vault: /home/eudat01/dice/iRODS/Vault
free space:
status:
info:
comment:
create time: 01340018011: 2012-06-18.13:13:31
modify time: 01340018011: 2012-06-18.13:13:31
```

EUDAT

FTP and Unix-like

Unix-like		FTP-like
ils	ipasswd	iinit
ipwd	irsync	iput
icd	ichksum	iget
ichmod	imv	iexit
irm	icp	
imkdir		

icommands - Navigating

- Print working directory:

```
eudat01@eudat01:~$ ipwd

/vzEudat0/home/rods0
```

Directory naming convention:
/zone/home/user_name

- List directory:

```
eudat01@eudat01:~$ ils

/vzEudat0/home/rods0:
```

- Change directory:

```
eudat01@eudat01:~$ icd $IRODSHOME
```

EUDAT

icommands - ACLs

- List ACLs in a collection:

```
eudat01@eudat01:~$ ils -A
/vzEudat0/home/rods0:
        ACL - rods0#vzEudat0:own
        Inheritance - Disabled
```

icommands – Put and Get Data

- Put a file to iRODS (-v displays upload stats):

```
eudat01@eudat01:~$ iput -v put1.txt
    put1.txt    0.000MB | 0.023sec | 0 thr | 0.000 MB/s

eudat01@eudat01:~$ ils -L
/vzEudat0/home/rods0:
  rods0              0 demoResc      7 2013-10-08.17:31 & put1.txt
            generic    /home/eudat01/dice/iRODS/Vault/home/rods0/put1.txt
eudat01@eudat01:~$ ichksum put1.txt
    put1.txt                          c16d7d3488677a3348b12eb82795d28c
Total checksum performed = 1, Failed checksum = 0
```

iadmin – Administrative Functions

- Type “iadmin” to enter the admin console
  - h for help
  - quit to exit
- Add new users, modify passwords, add new resources, federate to remote zones, create resource groups,…
  - mkresc/rmresc
  - mkuser/rmuser, moduser (modify passwords)
  - mkzone/rmzone, modzone (for federation)
- Information on users, resources, tokens, etc
  - lt (el-tee)
  - lu, lr, lz,…

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Setting Up New Users

- Use iadmin
- Two steps: mkuser and moduser (for a password)

```
iadmin> mkuser user1 rodsuser
iadmin> moduser user1 password *****
```

- Use iadmin to see what user types are possible

```
iadmin> lt
        zone_type
        user_type
        data_type
        resc_type
        action_type
        rulexec_type
        access_type
        object_type
        resc_class
        coll_map
        auth_scheme_type
```

```
iadmin> lt user_type
rodsgroup
rodsadmin
rodsuser
domainadmin
groupadmin
storageadmin
rodscurators
```

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Creating New Resources

- Use iadmin mkresc

```
eudat01@eudat01:~/dice/iRODS$ mkdir Data
iadmin mkresc dataResc "unix file system" cache eudat01 "/home/eudat01/dice/iRODS/Data"
```

- Use iadmin to list resources

```
eudat01@eudat01:~/dice/iRODS$ iadmin lr dataResc
```

- Put a file to this resource

```
eudat01@eudat01:~/dice/iRODS$ iput -R dataResc put2.txt
eudat01@eudat01:~/dice/iRODS$ ils -l
  rods0        0 demoResc             7 2013-10-08.18:05 & put1.txt
  rods0        0 dataResc             5 2013-10-08.18:04 & put2.txt
```

- Check the physical location of files

```
eudat01@eudat01:~$ ls $IRODSHOME/Vault/home/rods0
  put1.txt
eudat01@eudat01:~$ ls $IRODSHOME/Data/home/rods0
  put2.txt
```

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icommands - ACLs

- Change permissions:

```
eudat01@eudat01:~$ ichmod read user1 put1.txt
```

- List ACLs in the collection again:

```
eudat01@eudat01:~$ ils -A

/vzEudat0/home/rods0:
        ACL - rods0#vzEudat0:own
        Inheritance - Enabled
  put1.txt
        ACL - user1#vzEudat0:read object   rods0#vzEudat0:own
  put2.txt
        ACL - rods0#vzEudat0:own
```

EUDAT

Functional

ireg ibun irepl

icommands – irepl

- Replicate a file to another resource:

```
eudat01@eudat01:~$ ils -l
  rods0      0 demoResc            7 2013-10-08.18:05 & put1.txt
  rods0      0 dataResc            5 2013-10-08.18:04 & put2.txt

eudat01@eudat01:~$ irepl -R dataResc put1.txt

eudat01@eudat01:~$ ils -l
/vzEudat0/home/rods0:
  rods0           0 demoResc          7 2013-10-08.18:05 & put1.txt
  rods0           1 dataResc          7 2013-10-08.18:13 & put1.txt
  rods0           0 dataResc          5 2013-10-08.18:04 & put2.txt

eudat01@eudat01:~$ ls $IRODSHOME/Data/home/rods0
  put1.txt put2.txt
```

icommands – itrim

- Trim down the number of replicas of a file in iRODS by deleting some replicas.

```
eudat01@eudat01:~$ ils -l
/vzEudat0/home/rods0:
  rods0              0 demoResc                      7 2013-10-08.18:22 & put1.txt
  rods0              1 dataResc                      7 2013-10-08.19:03 & put1.txt
  rods0              0 dataResc                      7 2013-10-08.19:03 & put2.txt
eudat01@eudat01:~$ itrim -S demoResc -N 1 put1.txt
eudat01@eudat01:~$ ils -l
  rods0              1 dataResc                      7 2013-10-08.19:03 & put1.txt
  rods0              0 dataResc                      7 2013-10-08.19:03 & put2.txt
eudat01@eudat01:~$ itrim -S demoResc -N 1 put1.txt
eudat01@eudat01:~$ ils -l
  rods0              1 dataResc                      7 2013-10-08.19:03 & put1.txt
  rods0              0 dataResc                      7 2013-10-08.19:03 & put2.txt
```

iRODS Metadata

imeta iquest idbo

iquest – Querying the iCAT

```
eudat01@eudat01:~$ iquest "SELECT DATA_NAME,DATA_CHECKSUM WHERE
DATA_RESC_NAME like 'data%'"

DATA_NAME = put1.txt
DATA_CHECKSUM = c16d7d3488677a3348b12eb82795d28c
----------------------------------------------------------
DATA_NAME = put2.txt
DATA_CHECKSUM = f632f5eaffa5607c961e22ba40291ab7
----------------------------------------------------------
```

`iquest attrs` to see attributes that can be queried

- See https://www.irods.org/index.php/iquest for examples

imeta – Add, View, Modify User Metadata

- Add metadata to an object:

```
eudat01@eudat01:~$ imeta add -d put1.txt "Date" "08.10.2013"
```

- List metadata for an object:

```
eudat01@eudat01:~$ imeta ls -d put1.txt
AVUs defined for dataObj put1.txt:
attribute: Date
value: 08.10.2013
units
```

- Remove metadata:

```
eudat01@eudat01:~$ imeta rm -d put1.txt "Date" "08.10.2013"
eudat01@eudat01:~$ imeta ls -d put1.txt
AVUs defined for dataObj put1.txt:
None
```

EUDAT

II. iRODS Data (Grid) Administration

Federation Between Data Grids

- https://www.irods.org/index.php/Federation_Administration
- Manage data on remote servers
- List, put, get files as if they are on a local server

```
eudat01@eudat01:~$ ils /
/:
  C- /
  C- /vzEudat0
  C- /vzEudat1
  C- /vzEudat2
eudat01@eudat01:~$ iadmin lz vzEudat0
zone_id: 9000
zone_name: vzEudat0
zone_type_name: local
zone_conn_string:
r_comment:
create_ts: 1170000000 : 2007-01-28.17:00:00
modify_ts: 1170000000 : 2007-01-28.17:00:00
```

```
eudat01@eudat01:~$ iadmin lz vzEudat1
zone_id: 10059
zone_name: vzEudat1
zone_type_name: remote
zone_conn_string: 145.100.57.52:1247
r_comment:
create_ts: 01381160376 : 2013-10-07.17:39:36
modify_ts: 01381160376 : 2013-10-07.17:39:36
eudat01@eudat01:~$ ils /vzEudat1/home/
/vzEudat1/home:
  C- /vzEudat1/home/public
  C- /vzEudat1/home/rods0#vzEudat0
  C- /vzEudat1/home/rods1
  C- /vzEudat1/home/rods2#vzEudat2
  C- /vzEudat1/home/userods1
```

Federation Between Data Grids

- https://www.irods.org/index.php/Federation_Administration
- Zone A acknowledges Zone B: `iadmin mkzone B remote Host:Port`
- Zone B acknowledges Zone A: `iadmin mkzone A remote Host:Port`
- Zone A adds remote users: `iadmin mkuser some_user#B`
- Zone B adds remote users: `iadmin mkuser other_user#A`
- Set up ACL for the remote user
- User can see resources in remote zone A: `ilsresc -z A`

Admin users from one grid won't necessarily be admin users on the other grid

EUDAT

Data Replication

- `irsync`
- Synchronize the data between a local copy (local file system) and the copy stored in iRODS or between two iRODS copies.
- The command can be in one of the three modes:
  - synchronization of data from the client's local file system to iRODS
  - from iRODS to the local file system
  - From one iRODS path to another iRODS path.

Data Replication

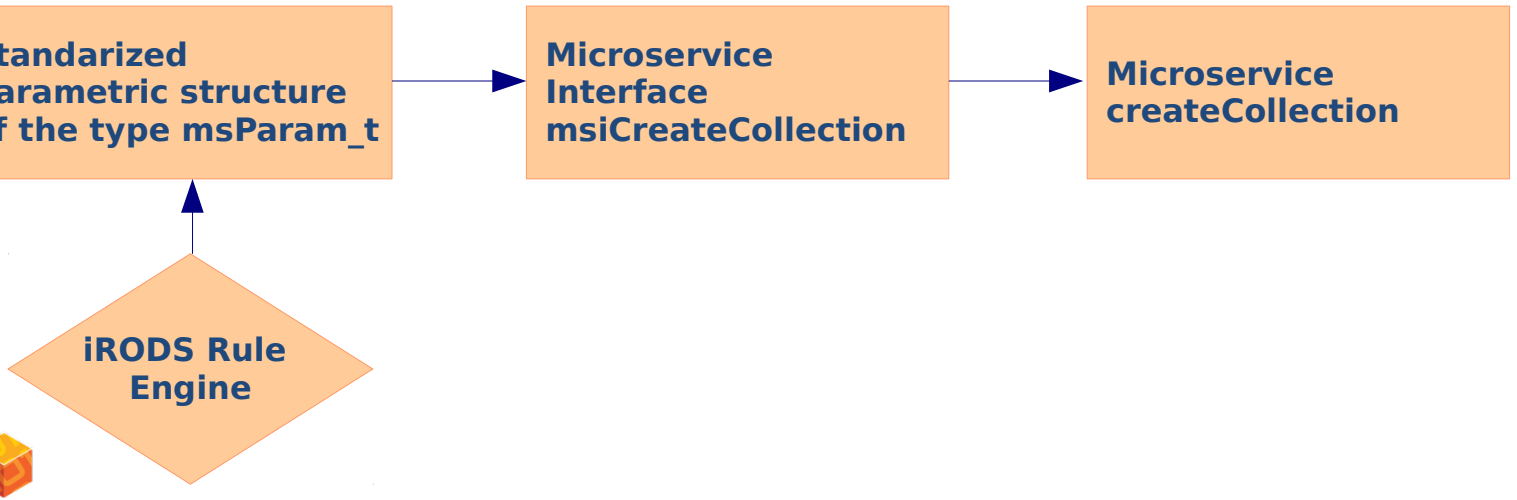
```
eudat01@eudat01:~$ irsync -R demoResc i:$IRODSZONE/home/eudat/put1.txt
i:$REMOTEHOME/put1.txt

eudat01@eudat01:~$ ils $REMOTEHOME

/vzEudat1/home/rods0#vzEudat0:

  put1.txt

eudat01@eudat01:~$ irsync -R demoResc $HOME/put2.txt
i:$REMOTEHOME/put2.txt

eudat01@eudat01:~$ ils $REMOTEHOME

/vzEudat1/home/rods0#vzEudat0:

  put1.txt

  put2.txt

eudat01@eudat01:~$ irsync -R demoResc i:$REMOTEHOME/put2.txt
$HOME/put2.txt
```

iRODS Microservices

Micro-services are small, well-defined procedures/functions that perform a simple task
https://www.irods.org/index.php/iRODS_Micro-services

Examples: `msiCollCreate`, `msiDataObjRepl`, `msiDataObjChksum`, …

To convert a C function `createCollection` into a microservice create an interface `msiCreateCollection`



iRODS Rules

- A rule file replicate.r:

```
replicate{
        msiWriteRodsLog("starting replication", *status);
        msiWriteRodsLog("source = *source", *status);
        msiWriteRodsLog("collectionPath = *collectionPath", *status);
        msiDataObjRsync(*source, "IRODS_TO_IRODS", "null", *destination,
*rsyncStatus);
}
INPUT
*source="/vzEudat0/home/rods0/put3.txt",*destination="/vzEudat1/home/rods0#v
zEudat0/put3.txt"
OUTPUT ruleExecOut
```

iRODS Rules

- Execute:

```
eudat01@eudat01:~$ irule -vF replicate.r
rcExecMyRule: replicate{
        msiWriteRodsLog("starting replication", *status);
        msiWriteRodsLog("source = *source", *status);
        msiDataObjRsync(*source, "IRODS_TO_IRODS", "null", *destination, *rsyncStatus);
}

outParamDesc: ruleExecOut
ExecMyRule completed successfully.    Output

eudat01@eudat01:~$ ils $REMOTEHOME
/vzEudat1/home/rods0#vzEudat0:
  put1.txt
  put2.txt
  put3.txt
```

Delayed Execution

- Example

```
myTestRule{
        delay("<PLUSET>1m</PLUSET>"){
     writeLine("stdout","Writing message *A with a delay.");
     }
}
INPUT *A="1"
OUTPUT ruleExecOut
```

- Queue management:
  - iqstat
  - iqdel
  - iqmod

Periodic Execution

Example

```
myTestRule {
# Input parameters are:
#    Source collection path
#    Target collection path
#    Optional target resource
#    Optional synchronization mode:  IRODS_TO_IRODS
# Output parameter is:
#    Status of the operation
# Output from running the example is:
#  Synchronized collection 1 with collection 2
#
   delay("<PLUSET>5m</PLUSET>EF>1h</EF>"){
   msiCollRsync(*srcColl,*destColl,*Resource,"IRODS_TO_IRODS",*Status);
   writeLine("stdout","Synchronized collection *srcColl with collection
*destColl");
   }
}
INPUT *srcColl="/eu00Zone/home/rods/data",
*destColl="/eu00Zone/home/rods/data2", *Resource="demoResc"
OUTPUT ruleExecOut
```

EUDAT

iRODS Log Files

- `$IRODSHOME/server/log/rodsLog.<date>:`

...

Oct 8 19:45:42 pid:31026 NOTICE: Agent process 5775 started for puser=rods0 and cuser=rods0 from 127.0.0.1

Oct 8 19:45:42 pid:5775 NOTICE: rsAuthCheck user rods0#vzEudat0

Oct 8 19:45:42 pid:5775 NOTICE: rsAuthResponse set proxy authFlag to 5, client authFlag to 5, user:rods0#vzEudat0 proxy:rods0 client:rods0

Oct 8 19:45:42 pid:5775 NOTICE: msiWriteRodsLog message: starting replication

Oct 8 19:45:42 pid:5775 NOTICE: msiWriteRodsLog message: source = /vzEudat0/home/rods0/put3.txt

Oct 8 19:45:42 pid:31026 NOTICE: Agent process 5777 started for puser=rods1 and cuser=rods0 from 145.100.57.52

Oct 8 19:45:42 pid:5777 NOTICE: rsAuthCheck user rods0#vzEudat0

Oct 8 19:45:42 pid:5777 NOTICE: readAndProcClientMsg: received disconnect msg from client

Oct 8 19:45:42 pid:5777 NOTICE: Agent exiting with status = 0

Oct 8 19:45:42 pid:5775 NOTICE: readAndProcClientMsg: received disconnect msg from client

Oct 8 19:45:42 pid:5775 NOTICE: Agent exiting with status = 0

...

iRODS Rule Base

- $IRODSHOME/server/config/reConfigs/core.re

```
# iRODS Rule Base
#  The new rule language is used to express all policies
#  Recovery procedures are included for a micro-service after " ::: "
#
#Test Rules
printHello { print_hello; }
#
# These are sys admin rules for creating and deleting users and renaming
# the local zone.
acCreateUser {
  acPreProcForCreateUser;
  acCreateUserF1;
  acPostProcForCreateUser; }
acCreateUserF1 {
 ON($otherUserName == "anonymous") {
  msiCreateUser  :::  msiRollback;
  MsiCommit;  }  }
...
```

EUDAT

iRODS Rule Base

- Append to $IRODSHOME/server/config/reConfigs/core.re:

```
acPostProcForPut {
   ON($objPath like "/vzEudat0/home/rods0/data/*") {
      msiWriteRodsLog("put a file $objPath to a collection          /vzEudat0/home/rods0/data/", *status);
      delay("<PLUSET>1m</PLUSET><EF>'REPEAT 3 TIMES'</EF>") {
                  msiWriteRodsLog("put a file $objPath to a collection /vzEudat0/home/rods0/data/",
*status);
      }
   }
}
```

- iput put1.txt $LOCALHOME/data

iRODS Rule Base

Check log files:

cat $IRODSHOME/server/log/rodsLog.2013.10.06

```
Oct  9 14:25:26 pid:11809 NOTICE: Agent process 12011 started for puser=rods0 and cuser=rods0 from 127.0.0.1
Oct  9 14:25:26 pid:12011 NOTICE: rsAuthCheck user rods0#vzEudat0
Oct  9 14:25:26 pid:12011 NOTICE: rsAuthResponse set proxy authFlag to 5, client authFlag to 5, user:rods0#vzEudat0 proxy:rods0 client:rods0
Oct  9 14:25:26 pid:12011 NOTICE: msiWriteRodsLog message: put a file /vzEudat0/home/rods0/data/put2.txt to a collection /vzEudat0/home/rods0/data/
Oct  9 14:25:26 pid:12011 NOTICE: readAndProcClientMsg: received disconnect msg from client
Oct  9 14:25:26 pid:12011 NOTICE: Agent exiting with status = 0
```

cat $IRODSHOME/server/log/reLog.2013.10.06

```
Oct  9 14:29:14 pid:11811 NOTICE: reServerMain: checking the queue for jobs
Oct  9 14:29:14 pid:12033 NOTICE: msiWriteRodsLog message: put a file /vzEudat0/home/rods0/data/put2.txt to a collection /vzEudat0/home/rods0/data/
Oct  9 14:29:14 pid:12033 NOTICE: postProcRunRuleExec: exec of freq: 'REPEAT 3 TIMES'
Oct  9 14:29:14 pid:12033 NOTICE: modExeInfoForRepeat: ruleId=10089,opStatus=0,nextRepeatStatus=3
Oct  9 14:29:15 pid:12033 NOTICE: Rule id 10089 set to run again at 1381321754 (frequency 0' REPEAT 2 TIMES. ORIGINAL TIMES=3 seconds)
Oct  9 14:29:15 pid:12035 NOTICE: msiWriteRodsLog message: put a file /vzEudat0/home/rods0/data/put2.txt to a collection /vzEudat0/home/rods0/data/
Oct  9 14:29:15 pid:12035 NOTICE: postProcRunRuleExec: exec of freq: 0' REPEAT 2 TIMES. ORIGINAL TIMES=3
Oct  9 14:29:15 pid:12035 NOTICE: modExeInfoForRepeat: ruleId=10089,opStatus=0,nextRepeatStatus=3
Oct  9 14:29:15 pid:12035 NOTICE: Rule id 10089 set to run again at 1381321755 (frequency 0' REPEAT 1 TIMES. ORIGINAL TIMES=3 seconds)
Oct  9 14:29:15 pid:11811 NOTICE: reServerMain: checking the queue for jobs
Oct  9 14:29:15 pid:12037 NOTICE: msiWriteRodsLog message: put a file /vzEudat0/home/rods0/data/put2.txt to a collection /vzEudat0/home/rods0/data/
Oct  9 14:29:15 pid:12037 NOTICE: postProcRunRuleExec: exec of freq: 0' REPEAT 1 TIMES. ORIGINAL TIMES=3
Oct  9 14:29:15 pid:12037 NOTICE: modExeInfoForRepeat: ruleId=10089,opStatus=0,nextRepeatStatus=2
Oct  9 14:29:45 pid:11811 NOTICE: reServerMain: checking the queue for jobs
```

Removing / Deleting data

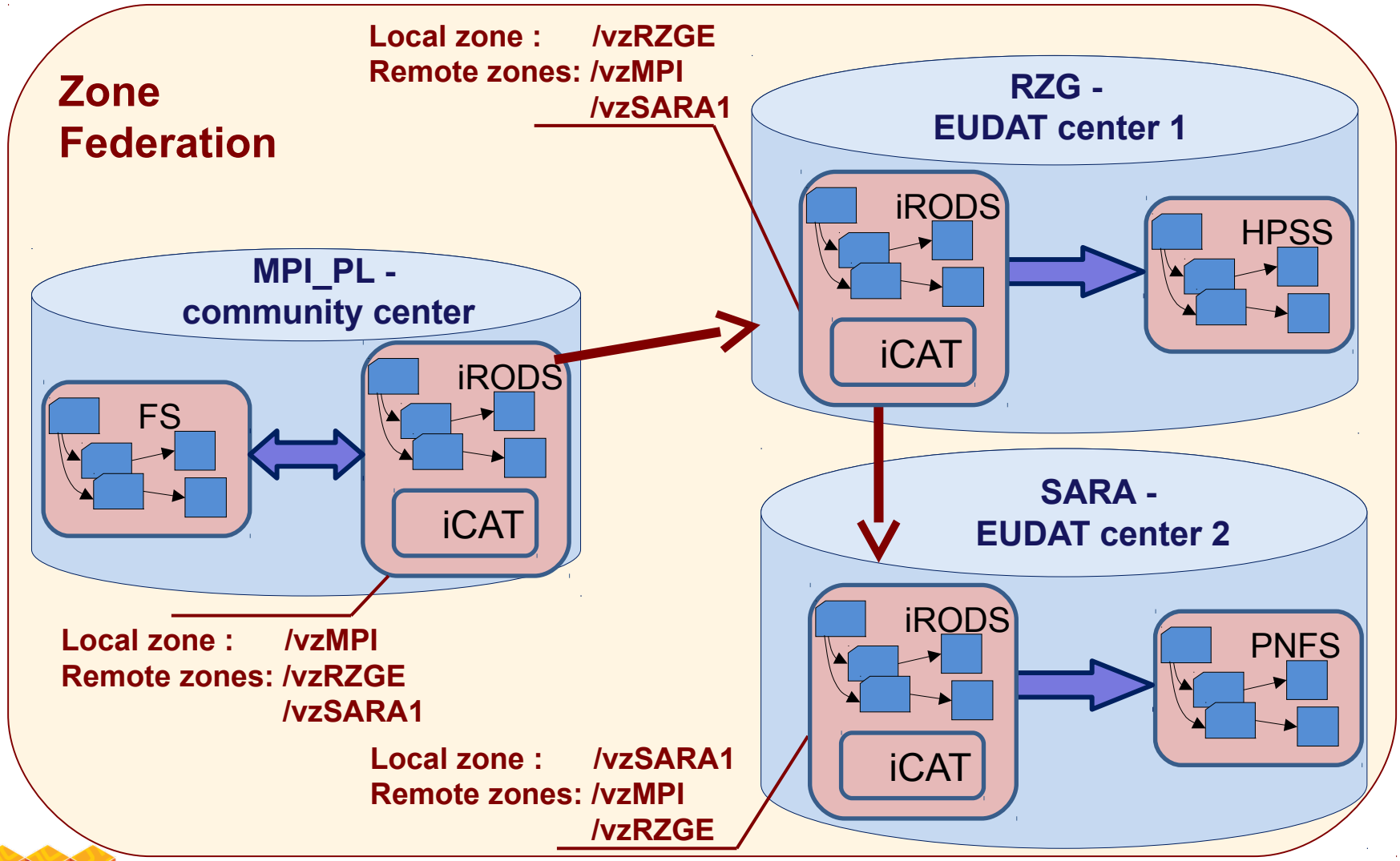
- `irm /zone/home/user/file1` removes file1 to /zone/trash/user/file1

Not physically removed from disk

- `irm -f /zone/home/user/file1` physically deletes file1
- Or use `irmtrash`
- `irm -r /zone/home/user/dir` removes iRODS collection

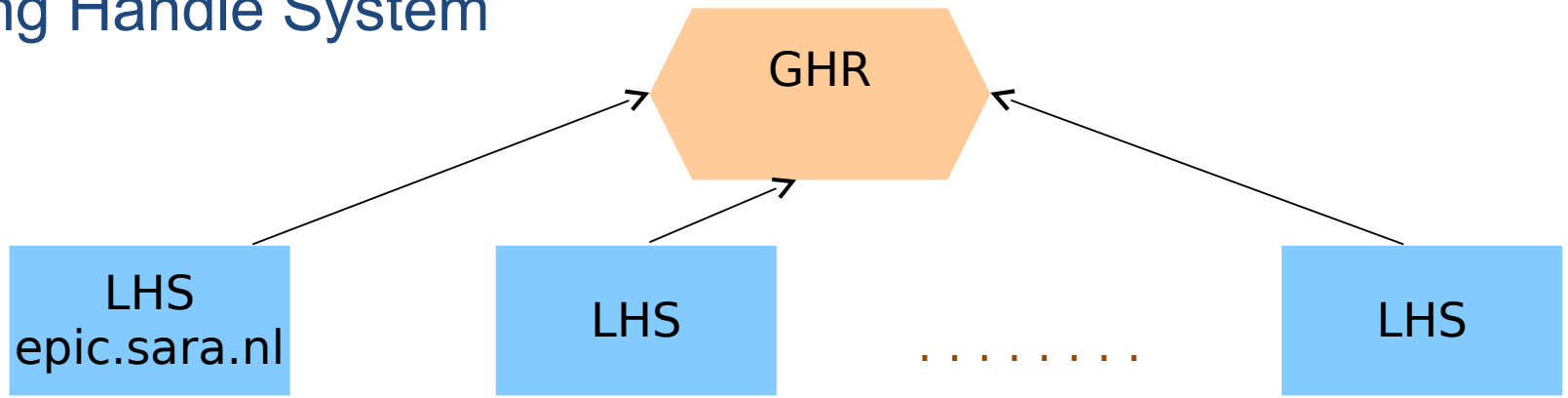
III. EUDAT Safe Replication

REPLIX-EUDAT Example



EPIC API

- Is built on SARA's RESTful Web Service for EPIC PIDs using Handle System

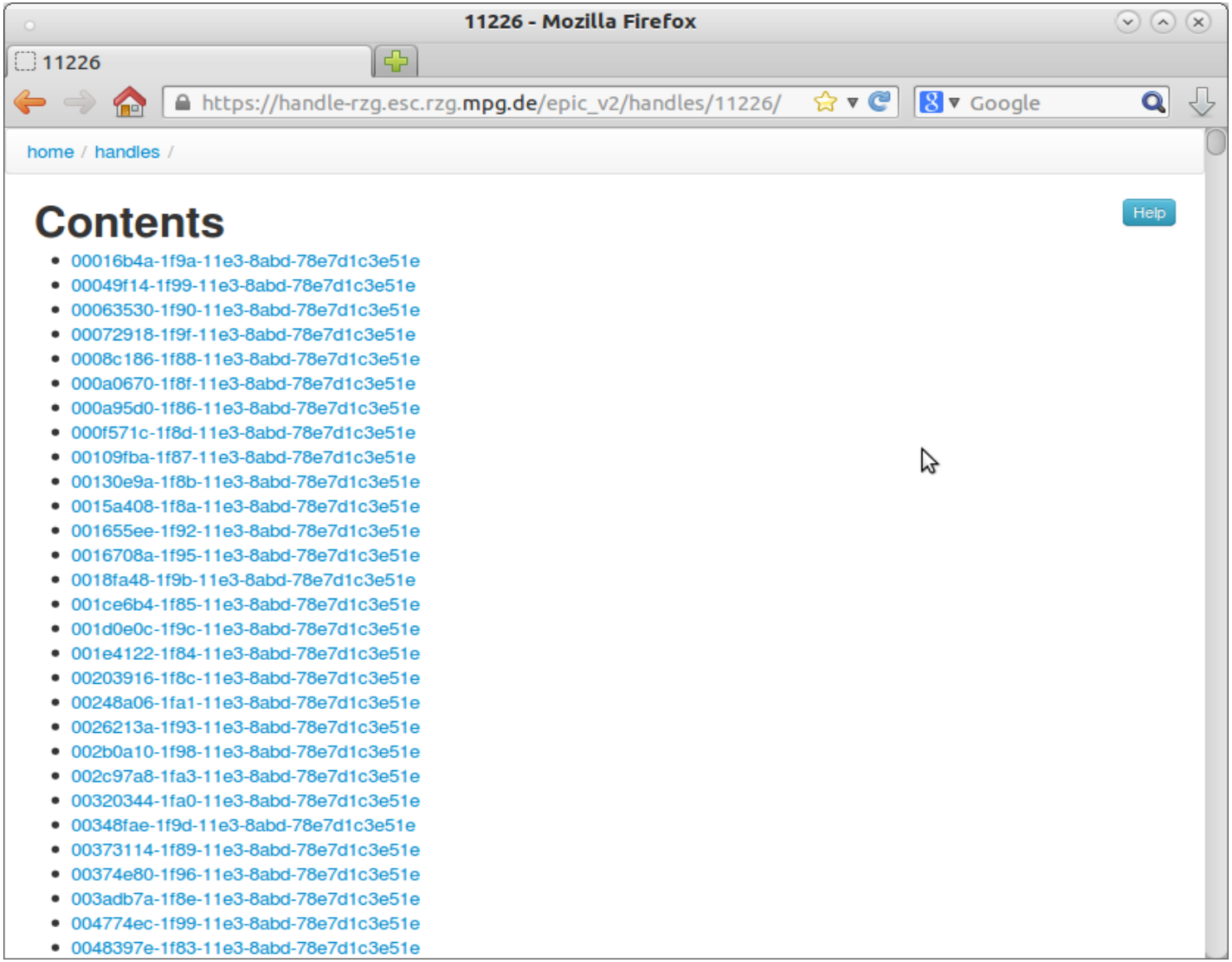


- Data representations: (X)HTML, JSON, plain text
- Namespace:

```
https://epic.sara.nl/v2_test/handles
└ <prefix>/
    └ <suffix>
```

- Methods: HTTP GET, HTTP PUT, HTTP POST

EPIC API


11226 - Mozilla Firefox
11226
https://handle-rzg.esc.rzg.mpg.de/epic_v2/handles/11226/
Google
home / handles /
Contents
Help
00016b4a-1f9a-11e3-8abd-78e7d1c3e51e
00049f14-1f99-11e3-8abd-78e7d1c3e51e
00063530-1f90-11e3-8abd-78e7d1c3e51e
00072918-1f9f-11e3-8abd-78e7d1c3e51e
0008c186-1f88-11e3-8abd-78e7d1c3e51e
000a0670-1f8f-11e3-8abd-78e7d1c3e51e
000a95d0-1f86-11e3-8abd-78e7d1c3e51e
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001655ee-1f92-11e3-8abd-78e7d1c3e51e
0016708a-1f95-11e3-8abd-78e7d1c3e51e
0018fa48-1f9b-11e3-8abd-78e7d1c3e51e
001ce6b4-1f85-11e3-8abd-78e7d1c3e51e
001d0e0c-1f9c-11e3-8abd-78e7d1c3e51e
001e4122-1f84-11e3-8abd-78e7d1c3e51e
00203916-1f8c-11e3-8abd-78e7d1c3e51e
00248a06-1fa1-11e3-8abd-78e7d1c3e51e
0026213a-1f93-11e3-8abd-78e7d1c3e51e
002b0a10-1f98-11e3-8abd-78e7d1c3e51e
002c97a8-1fa3-11e3-8abd-78e7d1c3e51e
00320344-1fa0-11e3-8abd-78e7d1c3e51e
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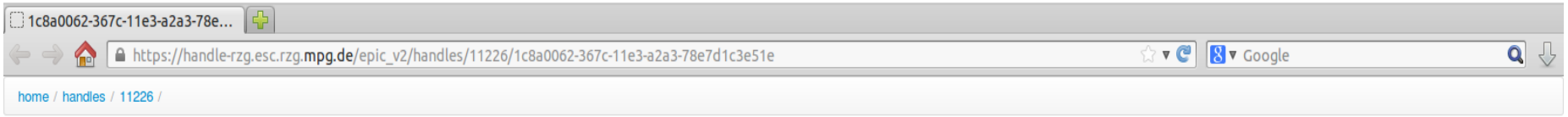
003adb7a-1f8e-11e3-8abd-78e7d1c3e51e
004774ec-1f99-11e3-8abd-78e7d1c3e51e
0048397e-1f83-11e3-8abd-78e7d1c3e51e

EPIC API



idx	type	parsed data	data	timestamp	ttl type	ttl	refs	Help privs
1	URL	ftp://ftp.rzg.mpg.de/afs/ipp-garching.mpg.de/home/f/fruwl/public/EUDAT/resolver/createPids.py	ZnRwOi8vZnRwLnJ6Zy5tcGcuZGUvYWZzL2lwcC1nYXJjaGluZy5tcGcuZGUvaG9tZS9mL2ZydXdsL3B1YmxpYy9FVURBVC9yZXNvbHZlci9jcmVhdGVQaWRz LnB5	2013-10-16T16:01:13Z	0	86400		rwr-
2	CHECKSUM	99f9164f84339364ffb22c8eaa5e1206	OTImOTE2NGY4NDMzOTM2NGZmYjIyYzhlYWE1ZTEyMDY=	2013-10-16T16:01:13Z	0	86400		rwr-
3	10320/LOC	<locations><location href="ftp://ftp.rzg.mpg.de/afs/ipp-garching.mpg.de/home/f/fruwl/public/EUDAT/resolver/createPids.py" id="0"/><location href="file:///afs/ipp-garching.mpg.de/home/f/fruwl/public/EUDAT/resolver/createPids.py" id="1"/></locations>	PGxvY2F0aW9ucz48bG9jYXRpb24gaHJlZj0iZnRwOi8vZnRwLnJ6Zy5tcGcuZGUvYWZzL2lwcC1nYXJjaGluZy5tcGcuZGUvaG9tZS9mL2ZydXdsL3B1YmxpYy9FVURBVC9yZXNvbHZlci9jcmVhdGVQaWRzLnB5IiBpZD0iMCIvPjxsb2NhdGlvbiBocmVmPSJmaWxlOi8vL2Fmcy9pcHAtZ2FyY2hpbmcubXBnLmRlL2hvbWUvZi9mcnV3bC9wdWJsaWMvRVVEQVQvcmVzb2x2ZXIvY3JlYXRlUGlkcy5weSIgaWQ9IjEiLz48L2xvY2F0aW9ucz4=	2013-10-16T16:01:14Z	0	86400		rwr-
100	HS_ADMIN	adminId 0.NA/11226 adminIdIndex 200 perms add_handle true delete_handle true add_naming_auth false delete_naming_a... false modify_value true remove_value true add_value true read_value true modify_admin true remove_admin true add_admin true list_handles false	B/MAAAAKMC5OQS8xMTIyNgAAAMgAAA==	2013-10-16T16:01:13Z	0	86400		rwr-

EPIC PID-Service version 2.3

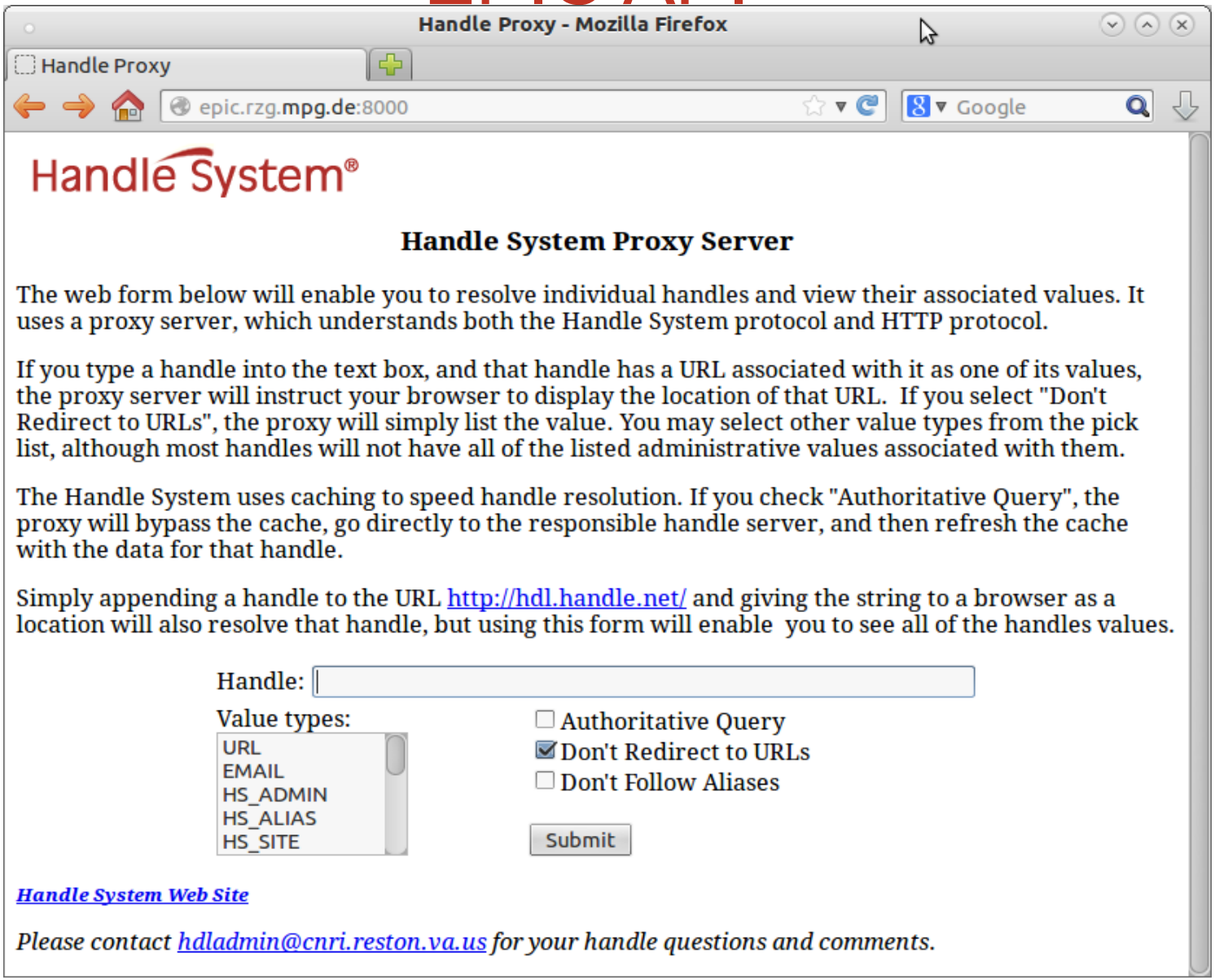
Developed by the EPIC Consortium: CSC, DKRZ, GWDG, and SURFsara

Sponsored by: CATCH+, DARIAH-DE and EUDAT

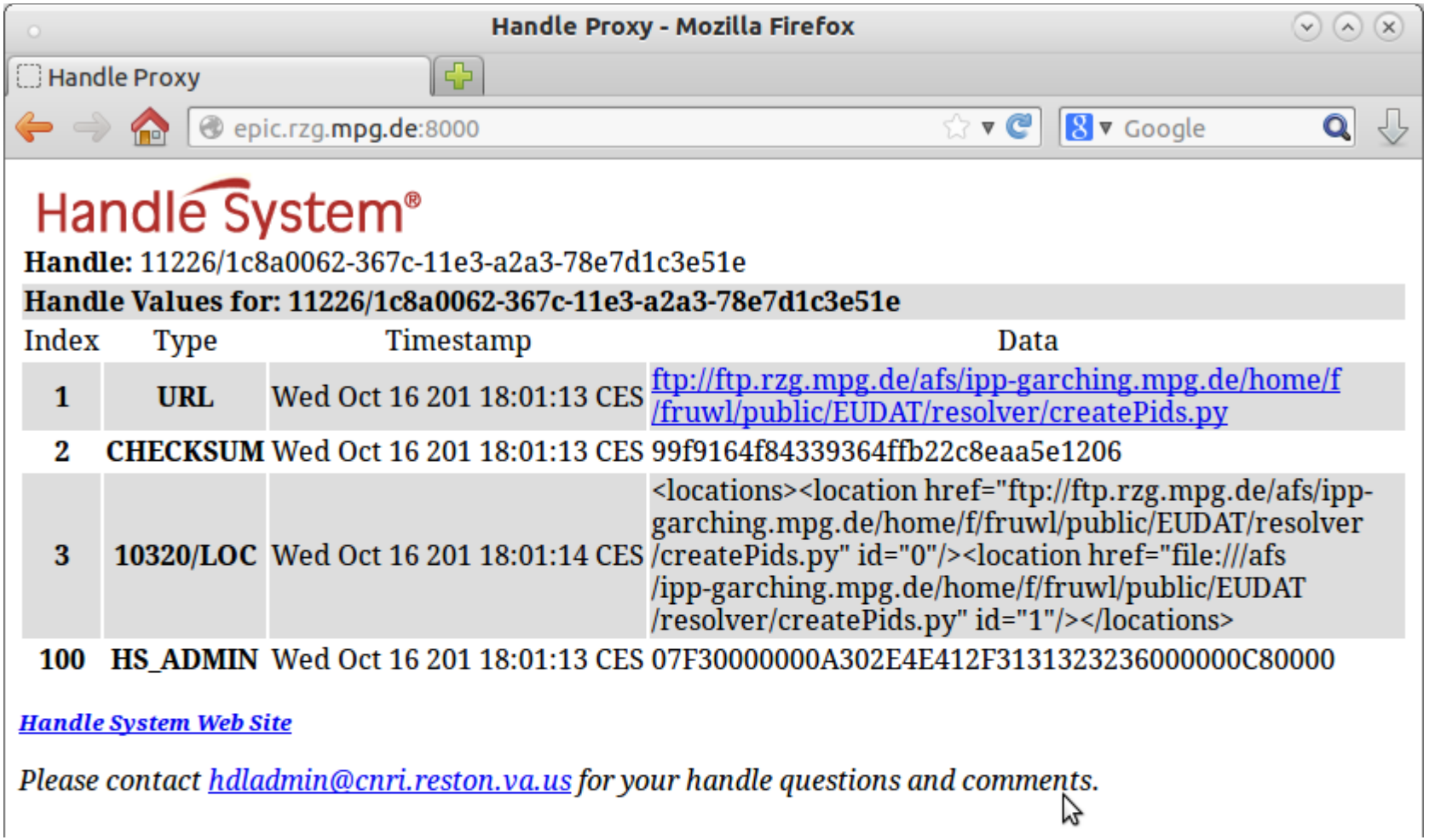
Powered by Rackful

EUDAT

EPIC API


Handle Proxy - Mozilla Firefox
Handle Proxy
epic.rzg.mpg.de:8000
Google
Handle System®
Handle System Proxy Server
The web form below will enable you to resolve individual handles and view their associated values. It uses a proxy server, which understands both the Handle System protocol and HTTP protocol.
If you type a handle into the text box, and that handle has a URL associated with it as one of its values, the proxy server will instruct your browser to display the location of that URL. If you select "Don't Redirect to URLs", the proxy will simply list the value. You may select other value types from the pick list, although most handles will not have all of the listed administrative values associated with them.
The Handle System uses caching to speed handle resolution. If you check "Authoritative Query", the proxy will bypass the cache, go directly to the responsible handle server, and then refresh the cache with the data for that handle.
Simply appending a handle to the URL http://hdl.handle.net/ and giving the string to a browser as a location will also resolve that handle, but using this form will enable you to see all of the handles values.
Handle:
Value types:
URL
EMAIL
HS_ADMIN
HS_ALIAS
HS_SITE
Authoritative Query
Don't Redirect to URLs
Don't Follow Aliases
Submit
Handle System Web Site
Please contact hdladmin@cnri.reston.va.us for your handle questions and comments.

EPIC API



Handle System®

Handle: 11226/1c8a0062-367c-11e3-a2a3-78e7d1c3e51e

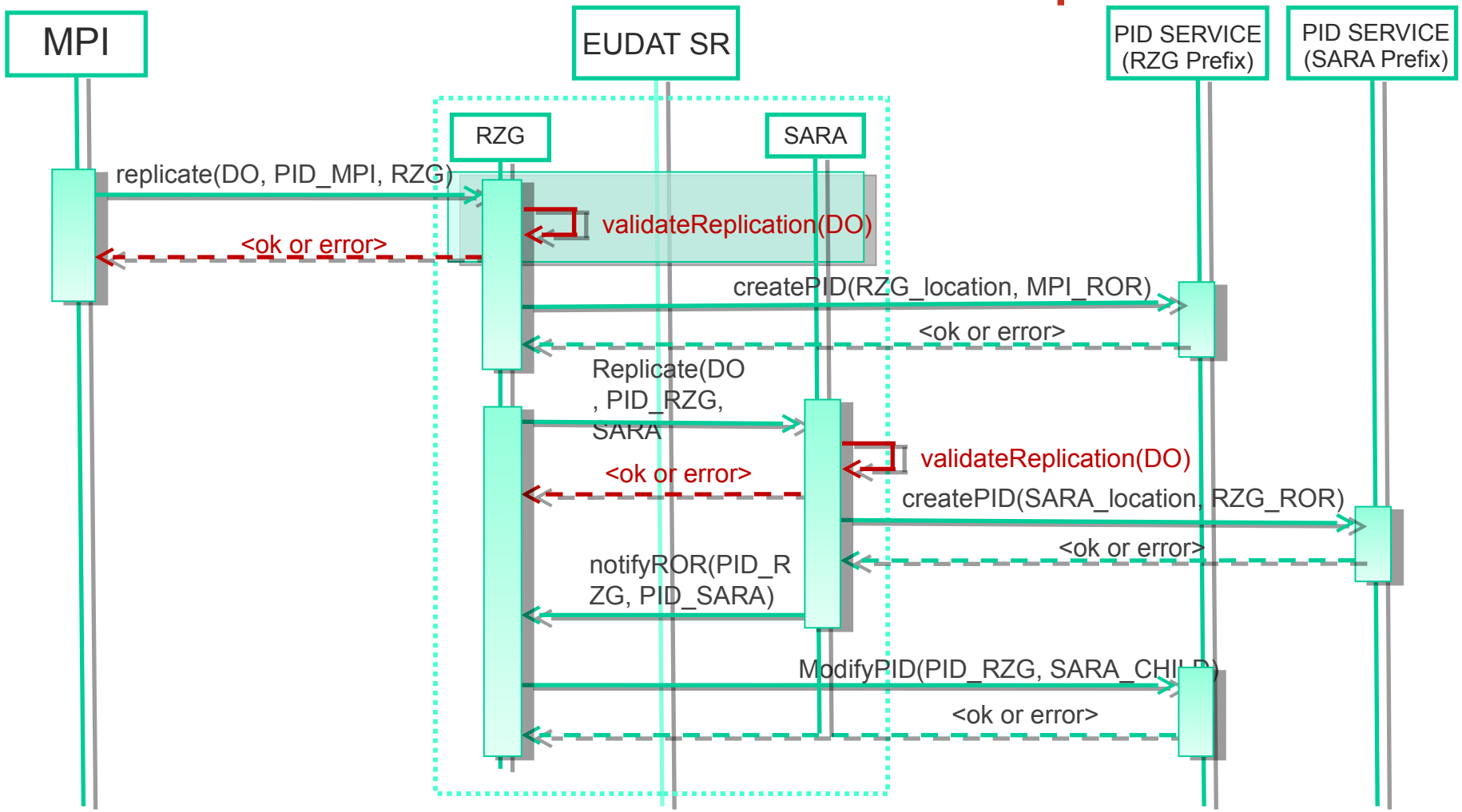
Handle Values for: 11226/1c8a0062-367c-11e3-a2a3-78e7d1c3e51e

Index	Type	Timestamp	Data
1	**URL**	Wed Oct 16 201 18:01:13 CES	ftp://ftp.rzg.mpg.de/afs/ipp-garching.mpg.de/home/f/fruwl/public/EUDAT/resolver/createPids.py
2	**CHECKSUM**	Wed Oct 16 201 18:01:13 CES	99f9164f84339364ffb22c8eaa5e1206
3	**10320/LOC**	Wed Oct 16 201 18:01:14 CES	<locations><location href="ftp://ftp.rzg.mpg.de/afs/ipp-garching.mpg.de/home/f/fruwl/public/EUDAT/resolver/createPids.py" id="0"/><location href="file:///afs/ipp-garching.mpg.de/home/f/fruwl/public/EUDAT/resolver/createPids.py" id="1"/></locations>
100	**HS_ADMIN**	Wed Oct 16 201 18:01:13 CES	07F30000000A302E4E412F3131323236000000C80000

Handle System Web Site

Please contact hdladmin@cnri.reston.va.us for your handle questions and comments.

REPLIX-EUDAT Example



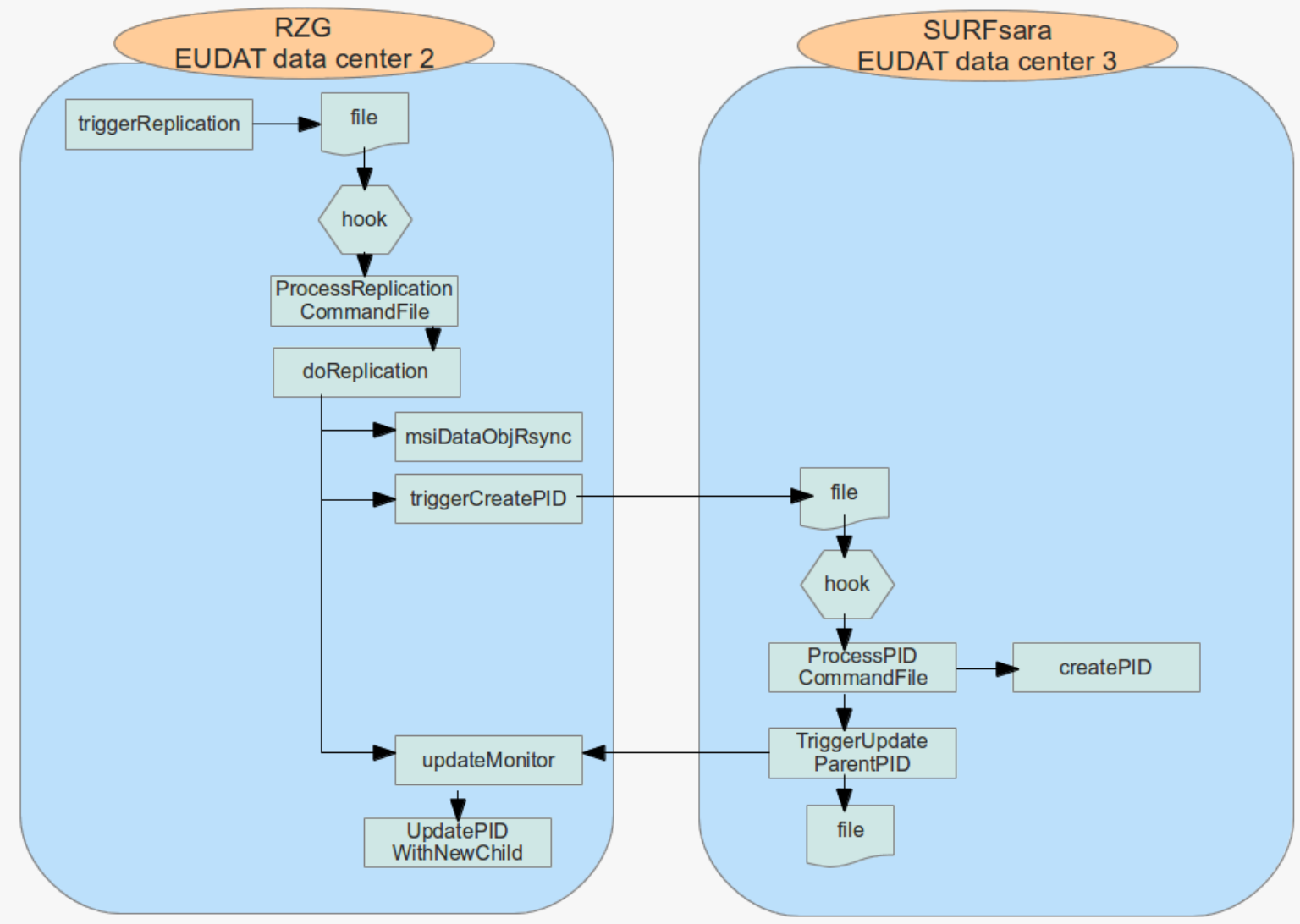
EUDAT PID Module

- $IRODSHOME/modules/EUDAT-PID
- Python script to interact with EPIC system
- Rule base file to call python methods within iRODS

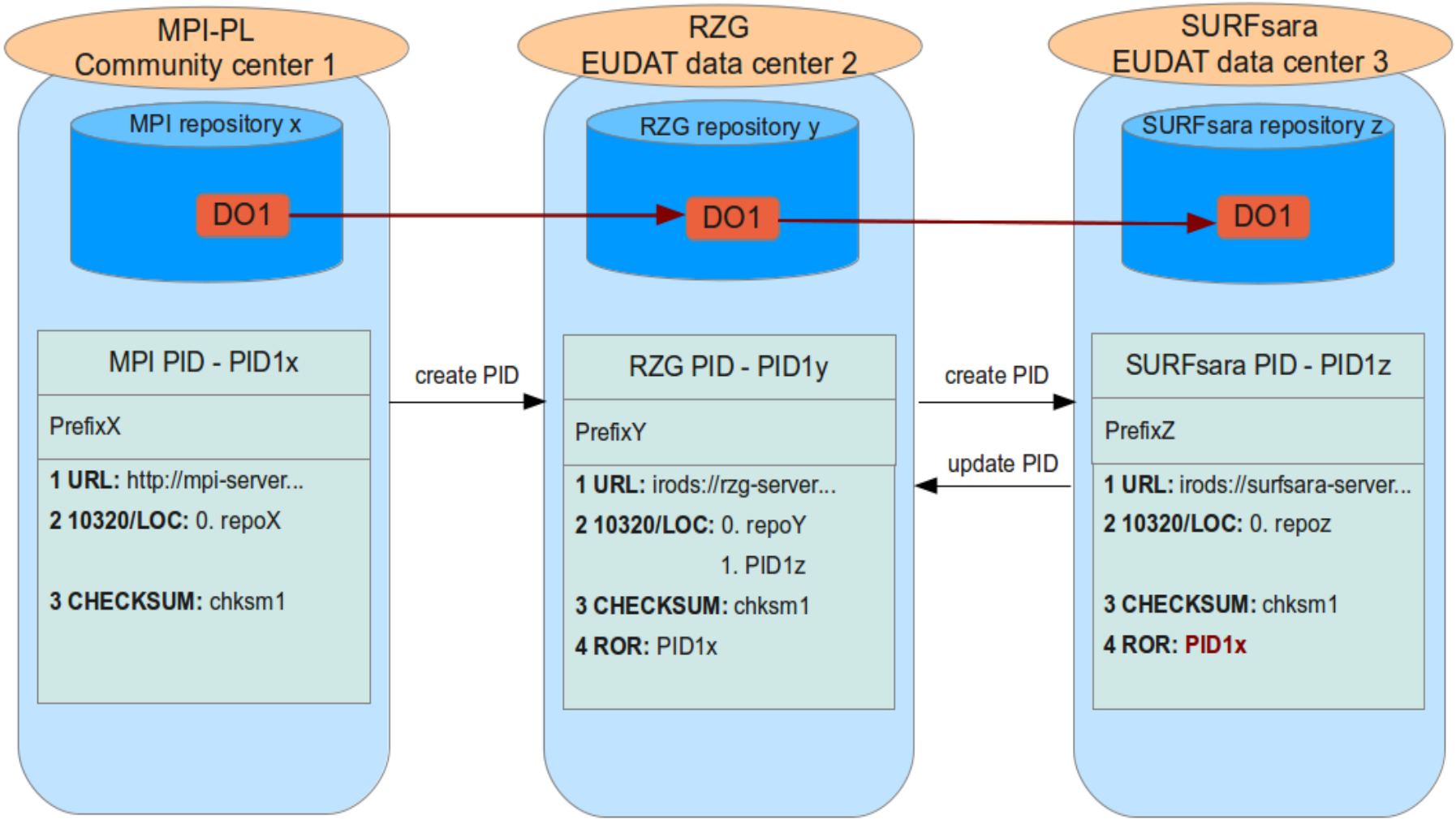
```
msiExecCmd("epicclient.py", "*credStoreType *credStorePath
create *serverID*path", "null", "null", "null", *out);
```

- Control files `*.replicate`, `*.pid.create`, and `*.pid.update`

REPLIX-EUDAT Example

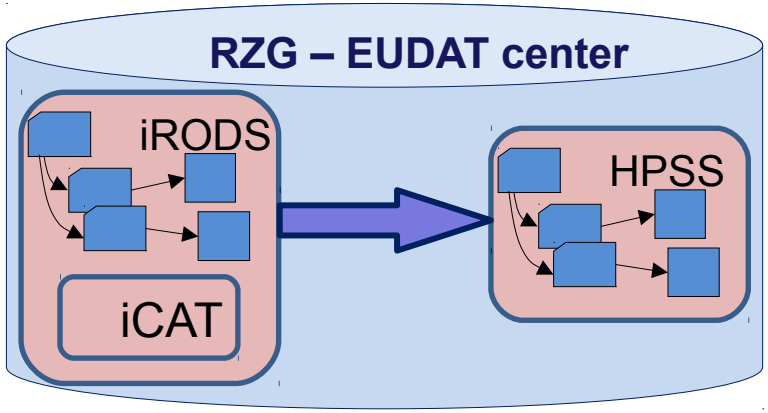


REPLIX-EUDAT Example

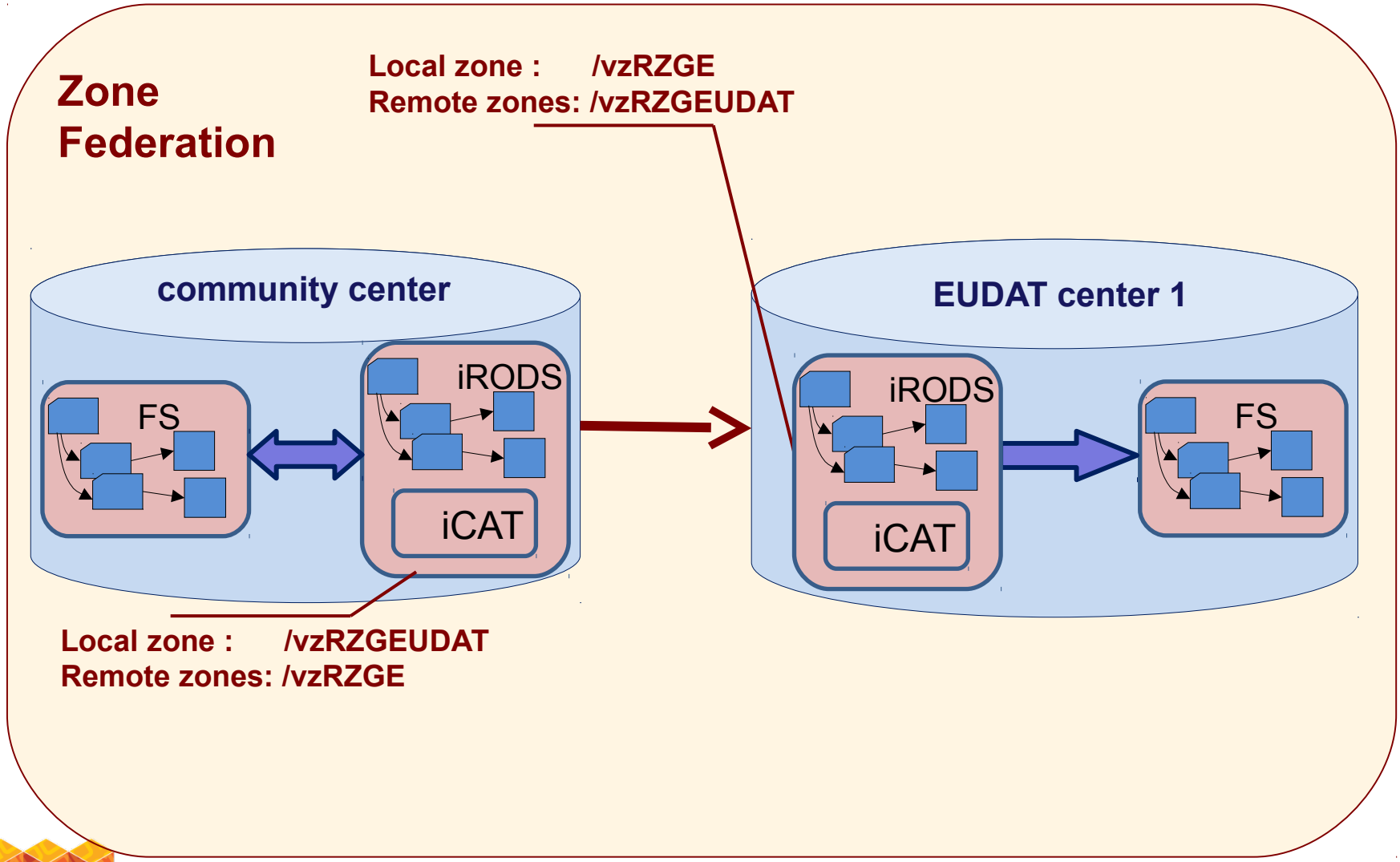


REPLIX-EUDAT Example

- iRODS is connected to the HPSS via the Universal MSS Driver
- Implemented using a compound iRODS resource



Our Training Example



Our Training Example: Setup

- EPIC API URL: https://epic.sara.nl/v2_test/handles/
- EPIC API prefix: 843
- Credentials: $IRODSHOME/modules/EUDAT-PID/cmd/credentials

Our Training Example: Community: Upload Data and Create PIDs

- Data in ~/comm_data on the FS
- Put in iRODS collection $IRODSZONE/comm_data
  `imkdir`
  `ichmod`
- Create PIDs
  set up `acPostProcForPut` in core.re
  use `addPIDWithChecksum(*path, *newPID)` from the EUDAT rule base
  iput a file
- Check PID in https://epic.sara.nl/v2_test/handles/

Our Training Example: EUDAT Data Center 1: Replicate Data to a Storage Resource

- Data is received in $IRODSZONE/comm_data in iRODS
- Configure storage resources

```
iadmin mkresc
```

- Configure copying to a storage resource

```
set up acPostProcForPut in core.re
use msiSysReplDataObj
```

Our Training Example: Community: Replicate Data to EUDAT Center 1

- Trigger a replication rule with irule -F

use `CheckReplicas(*source, *destination, *destResc, *commandFile)` from the EUDAT rule base:

It compares checksums of source and destination files,

If they are different – the replication is started:

Search PID of the file

Sync the file to the remote zone

Create PID for a replica

Update the parent PID

Practice

Community
eudat-0, eudat-3, eudat-6

- create a file

```
cd ~/comm_data/
vi repl_file_<Name>
```

- put it to iRODS

```
icd $IRODSZONE/comm_data
iput repl_file_<Name>
```

- check log

```
cat $IRODSHOME/server/log/rodsLog.<Date>
```

- check the replication to the storage resource

```
ils -l $REMOTEZONE/center1_data
```

- replicate the file

```
cd ~/rules
cp check.r check_<Name>.r
vi check_<Name>.r
irule -vF check_<Name>.r
```

- check the PID on https://epic.sara.nl/v2_test/handles/843/

- check the file in the remote zone

```
ils $REMOTEZONE/center1_data
```

- check the PID update in 2 min

```
cat $IRODSHOME/server/log/reLog.<Date>
```

EUDAT