
Grid Computing School
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Practice of EGEE data management
(Command line tools)

Preparation:

On day 1 you have received a two digit number between 30-60. (XY). Use this number to login to one of the machines:

Account: budapestXY
Password: GridBUDXY

Open a terminal window and login to the GILDA UI machine:

```
ssh budapestXY@glite-tutor.ct.infn.it  
Password: GridBUDXY
```

1. **Controlling the existence of your certificate** - "usercert.pem" and "userkey.pem" must exist:

```
ls -al ~/.globus
```

2. **Gaining access right to work in the grid by creating a short term proxy certificate**

(voms-proxy-init,
voms-proxy-info,
voms-proxy-destroy)

(Your "Grid pass phrase" – associated to your secret key file "userkey.pem" will be required.
The prefabricated common certificate has the Grid pass phrase **BUDAPEST**)

2.1 Creating your proxy

Usage:

```
voms-proxy-init --voms <VO>
```

Example:

```
> voms-proxy-init --voms gilda
```

```
Cannot find file or dir: /home/budapest65/.glite/vomses  
Your identity: /C=IT/O=GILDA/OU=Personal  
Certificate/L=BUDAPEST/CN=BUDAPEST65/Email=sipos@sztaki.hu  
Enter GRID pass phrase:  
Creating temporary proxy ..... Done
```

```
Contacting voms.ct.infn.it:15001 [/C=IT/O=GILDA/OU=Host/L=INFN
Catania/CN=voms.ct.infn.it/Email=emidio.giorgio@ct.infn.it] "gilda"
Done
Creating proxy
.....
Done
Your proxy is valid until Fri Jun 30 21:56:00 2006
```

2.2 Controlling your existing proxy

Usage:

```
voms-proxy-info [-all]
```

Example:

```
> voms-proxy-info -all
```

```
subject      : /C=IT/O=GILDA/OU=Personal
Certificate/L=BUDAPEST/CN=BUDAPEST65/Email=sipos@sztaki.hu/CN=proxy
issuer       : /C=IT/O=GILDA/OU=Personal
Certificate/L=BUDAPEST/CN=BUDAPEST65/Email=sipos@sztaki.hu
identity     : /C=IT/O=GILDA/OU=Personal
Certificate/L=BUDAPEST/CN=BUDAPEST65/Email=sipos@sztaki.hu
type         : proxy
strength     : 512 bits
path         : /tmp/x509up_u4509
timeleft     : 11:58:26
=== VO gilda extension information ===
```

```
VO          : gilda
subject     : /C=IT/O=GILDA/OU=Personal
Certificate/L=BUDAPEST/CN=BUDAPEST65/Email=sipos@sztaki.hu
issuer      : /C=IT/O=GILDA/OU=Host/L=INFN
Catania/CN=voms.ct.infn.it/Email=emidio.giorgio@ct.infn.it
attribute   : /gilda/Role=NULL/Capability=NULL
timeleft    : 11:58:25
```

Note:

The highlighted area shows the Virtual Organization Management Service (VOMS) extension of the proxy.

2.3 Removing an existing proxy

Usage:

```
voms-proxy-destroy
```

Note:

If you executed the voms-proxy-destroy command then the voms-proxy-init command must be repeated! (see 2.1)

3. Controlling the settings of the LCG File catalog

```
(lcg-infosites,  
  LFC_HOST,  
  LCG_CATALOG_TYPE,  
  LCG_GFAL_INFOSYS)
```

3.1 Controlling the setting of LFC_HOST i.e. the URL of the lfc file catalog for your virtual organization

```
>set | grep LFC_HOST
```

The result should be `LFC_HOST=lfc-gilda.ct.infn.it`
If it is not set, than seek the place of it with the information system:

```
>lcg-infosites --vo gilda lfc  
lcg-infosites --vo gilda lfc
```

If the command `lcg-infosites` does not work, than set the root of the info system:

Control how the root is set by:

```
>set | grep LCG_GFAL_INFOSYS
```

and make sure that it shows to: `grid004.ct.infn.it:2170`

```
>export LCG_GFAL_INFOSYS= grid004.ct.infn.it:2170
```

and repeat the `lcg-infosites` command above.

Associate the result to the environment variable `LFC_HOST`:

```
>export LFC_HOST=lfc-gilda.ct.infn.it
```

3.2 Controlling the type of the catalog

```
>set | grep LCG_CATALOG_TYPE
```

if its value is not "lfc" than set it:

```
>export LCG_CATALOG_TYPE=lfc
```

Comment:

See that these settings must be repeated at the working Nodes, when the user wants to access GRID files there.

4. Controlling the base of LFC access point and defining a new personal catalog

(lfc-ls,
lfc-mkdir)

4.1 Listing the catalogues within the virtual organisation

Usage:

```
lfc-ls [<options>] {<path>|<file>}
```

Example:

```
>lfc-ls /grid/gilda
```

4.2 Making a personal catalog -for example - with your <LOGIN_NAME_and_date>

Usage:

```
lfc-mkdir /grid/<VO>/<USER_HIERARCHY>
```

Example:

```
lfc-mkdir /grid/gilda/budapestXY
```

4.3 Controlling the existence of the new catalogue:

Option “-l” induces detailed listing

Example:

```
>lfc-ls -l /grid/gilda/ |grep budapest65_2006_06_27  
drwxrwxr-x 0 395 102 0 Jun 30 15:46 budapest65
```

5 Let use relative names by setting LFC_HOME

(LFC_HOME)

5.1 Defining the environment variable

Usage:

```
export LFC_HOME=/grid/<VO>/<ROOT_OF_USER_WORKING_DIRECTORY>
```

Example:

```
>export LFC_HOME=/grid/gilda/budapestXY
```

5.2 Controlling:

Example:

```
>lfc-ls -l ../ |grep budapestXY  
drwxrwxr-x 0 395 102 0 Jun 30 15:46 budapest65_2006_06_27
```

6. Creating a GRID file copy from one of our existing files in the local file system and use the existing file catalog to reference it

(lcg-cr)

6.1 Let us create a local file

```
history > <LOCAL_FILE_NAME>
```

Example:

```
> history >myHistory
```

6.2 Let us explore which Storage Element we can use for the GRID files in our VO "gilda":

Usage:

```
lcg-infosites --vo <VO> se
```

Example:

```
> lcg-infosites --vo gilda se
Avail Space(Kb) Used Space(Kb) Type SEs
-----
898706436      13700980      n.a  grid005.iucc.ac.il
28502656      1831908       n.a  dgt02.ui.savba.sk
63840000      10230000      n.a  egee016.cnaf.infn.it
n.a           n.a           n.a  lxcde07.pd.infn.it
67809092      3237524       n.a  trigrid-ce01.unime.it
106830000     9130000       n.a  gilda04.ihep.ac.cn
162521216     19612352      n.a  trigriden01.unime.it
28056464      3103316       n.a  testbed005.cnaf.infn.it
347010792     2023916       n.a  gilda-se-01.pd.infn.it
805039304     32924         n.a  gildase01.roma3.infn.it
3000000000    850000000     n.a  aliserv6.ct.infn.it
```

6.3 Creating the GRID File

The last column of the listing 6.2 sorts the URLs of our Storage Elements (SE) and we will use one of them as the destination (-d) tag of our subsequent command which creates a GRID copy of the local file <LOCAL_FILE_NAME> (for example "myHistory").

Let be the term <LFN_NAME> denote the logical file name by which we want refer to the grid file within the current directory of the grid file catalogue and <OWN_WORKING_DIRECTORY> must denote the prefix of the path of the local file to be copied.

Usage:

```
lcg-cr --vo <VO> -d <SE> -l lfn:<LFN_NAME>
file:<OWN_WORKING_DIRECTORY>/<LOCAL_FILE_NAME>
```

Example:

```
> lcg-cr --vo gilda -d grid005.iucc.ac.il -l lfn:historyOnGrid
file:/home/budapestXY/myHistory
guid:a2b71ba9-f7ad-4a70-8597-2e219861f836
```

Note:

The returned grid unique identifier (**guid**) indicates the successful termination of the command

6.4 Controlling the result by the Catalog

Example:

```
> lfc-ls -l
-rw-rw-r-- 1 395 102 6668 Jun 30 15:56 historyOnGrid
```

7. Making a new symbolic reference in the catalog to our Grid file

(lfc-ln,
lcg-lg,
lcg-la)

7.1 Making the alias for a new <LINK_NAME>

```
lfc-ln -s <ABSOLUTE_LFN_NAME> <LINK_NAME>
```

Caveat!

Absolute catalogue path must be used to define the new link name!

Example:

Let be the new symbolic name “aaa”.

```
> lfc-ln -s /grid/gilda/budapestXY/historyOnGrid aaa
```

7.2 Let us control the result by

Example:

```
> lfc-ls -l
lrwxrwxrwx 1 395 102 0 Jun 30 16:12 aaa ->
/grid/gilda/budapest65/historyOnGrid
-rw-rw-r-- 1 395 102 6668 Jun 30 15:56
historyOnGrid_2006_06_27
```

7.3 Let us see that the grid file handling commands (lcg-...) accept the symbolic names instead of original logical name:

lcg-lg returns the guid of the defined file

Usage:

```
lcg-lg --vo <VO> { lfn:<LFN_NAME> | lfn:<LINK_NAME> }
```

Example:

```
> lcg-lg --vo gilda lfn:historyOnGrid
guid:a2b71ba9-f7ad-4a70-8597-2e219861f836
> lcg-lg --vo gilda lfn:aaa
guid:a2b71ba9-f7ad-4a70-8597-2e219861f836
```

You see the same guid in both commands.

7.4 The `lcg-la` lists all aliases:

Usage:

```
lcg-la --vo <VO> lfn:{<Link_NAME>|<LFN_NAME>}
```

Example:

```
> lcg-la --vo gilda lfn:aaa
lfn:/grid/gilda/budapest65/historyOnGrid
lfn:/grid/gilda/budapest65/aaa
```

8. Associating user comments to a file

(`lfc-setcomment`,
`lfc-delcomment`)

8.1 Writing the comment

Usage:

```
lfc-setcomment {<Link_NAME>|<LFN_NAME>} <comment>
```

Example:

```
> lfc-setcomment aaa "It is a test comment to aaa"
```

8.2 Reading the comment

Usage:

```
lfc-ls --comment {<Link_NAME>|<LFN_NAME>}
```

Example:

```
> lfc-ls --comment
aaa
historyOnGrid It is a test comment to aaa
```

Note: The comment refers to the file and not to the link!

8.3 Deleting the comment

Usage:

```
lfc-delcomment {<Link_NAME>|<LFN_NAME>}
```

Example:

```
> lfc-delcomment aaa
> lfc-ls --comment
aaa
historyOnGrid
```

9. Deleting the links

(lfc-rm)

9.1 Let us make a temporary link:

Usage:

```
lfc-ln -s <ABSOLUTE_LFN_NAME>} <NEW_Link_NAME>
```

Example:

```
> lfc-ln -s /grid/gilda/budapestXY/historyOnGrid bbb
```

9.2 Let us see the result:

```
lfc-ls
```

Example:

```
> lfc-ls  
aaa  
bbb  
historyOnGrid_2006_06_27
```

9.3 Removing the <NEW_Link_NAME>

Usage:

```
lfc-rm <NEW_Link_NAME>
```

Example:

```
> lfc-rm bbb
```

9.4 Let us see the result:

Example:

```
> lfc-ls  
aaa  
historyOnGrid
```


10 Read and write the access rights:**(lfc-getacl,
lfc-setacl)****10.1 Read the access rights of grid file or of a directory****Usage:**

lfc-getacl <file name>

Example:

```
> lfc-getacl aaa
# file: aaa
# owner: /C=IT/O=GILDA/OU=Personal
Certificate/L=BUDAPEST/CN=BUDAPEST65/Email=sipos@sztaki.hu
# group: gilda
user::rw-
group::rw-          #effective:rw-
other::r-
```

10.2 Modifying the access rights**Usage:**

lfc-setacl [-d] [-m] [-s] entries file...

where d,m,s stands for delete, modify(add),set(replace) entries

an entry may be of form

```
user::perm
user:uid:perm
group::perm
group:gid:perm
mask:perm
other:perm
default:user::perm
default:user:uid:perm
default:group::perm
```

Let us revoke the write permission of group members –i.e. the other users of the VO and let us give right to execute the file for everyone.

Example:

```
> lfc-setacl -m user::rwx,group::rx,other::x aaa
```

10.3 Control the result**Example:**

```
> lfc-getacl aaa
# file: aaa
# owner: /C=IT/O=GILDA/OU=Personal
Certificate/L=BUDAPEST/CN=BUDAPEST65/Email=sipos@sztaki.hu
# group: gilda
user::rwx
```

```
group::r-x          #effective:r-x
other::--x
```

11 Copy a grid file to an other SE

(**lcg-rep,**
lcg-lr)

11.a Explore the existing storage elements:

```
> lcg-infosites --vo gilda se
```

See result at 6.2

Let us select a new SE (different from “grid005.iucc.ac.il” where our Grid file is stored) for example “gilda04.ihep.ac.cn”

11.b Executie the copy to the storage element gilda04.ihep.ac.cn:

Usage:

```
lcg-rep --vo <VO> -d <Destination SE> \
  lfn:{<Link_NAME>|<LFN_NAME>}
```

Example:

```
> lcg-rep --vo gilda -d gilda04.ihep.ac.cn lfn:aaa
```

11.c Controlling the result:

lcg-lr lists the replicas of the grid file

Usage:

```
lcg-lr --vo <VO> lfn:{<Link_NAME>|<LFN_NAME>}
```

Example:

```
> lcg-lr --vo gilda lfn:aaa
sfn://grid005.iucc.ac.il/storage/gilda/generated/2006-06-30/fileb6065103-5694-44cb-b5b9-7fc95f65720a
srm://gilda04.ihep.ac.cn/dpm/ihep.ac.cn/home/gilda/generated/2006-06-30/file9c6f98e8-bac3-4ae8-8e3e-56bab9acc46a
```

12. Revoking a grid file

(**lcg-uf,**
lcg-lg,
lcg-del)

First we will use the Storage name (surl) instead of logical one to delete the storage element we have created in step 11.

12.a Determining the absolute identifier(guid) of the symbolic name:

Usage:

```
lcg-lg --vo <VO> lfn:{<Link_NAME>|<LFN_NAME>}
```

Example:

```
> lcg-lg --vo gilda lfn:aaa
guid:a2b71ba9-f7ad-4a70-8597-2e219861f836
```

12.b Let us use the <GUID> and one of the storage name to delete the file from that storage:

Usage:

```
lcg-uf --vo <VO> <GUID> <SURL>
```

Example:

The nasty long GUID and SURL names are “copy-pasted” from 12.a and 11.c

```
> lcg-uf --vo gilda guid:a2b71ba9-f7ad-4a70-8597-2e219861f836
sfn://grid005.iucc.ac.il/storage/gilda/generated/2006-06-30/fileb6065103-5694-44cb-b5b9-7fc95f65720a
```

12.c Let us control the result:

```
lcg-lr --vo <VO> lfn:{<Link_NAME>|<LFN_NAME>}
```

Example:

```
> lcg-lr --vo gilda lfn:aaa

srm://gilda04.ihep.ac.cn/dpm/ihep.ac.cn/home/gilda/generated/2006-06-30/file9c6f98e8-bac3-4ae8-8e3e-56bab9acc46a
```

12.d An alternative to execute 11.b could have been:

Usage:

```
cg-del --vo <VO> -s <SE> {<lfn>|<surl>|<guid>}
```

Example:

```
> lcg-del --vo gilda -s aliserv6.ct.infn.it lfn:aaa
```

Note, that “aliserv6.ct.infn.it” –in our example – contained no replica of our grid file. However the delete command has produced no error message.

The basic difference between lcg-uf and lcg-del is that lcg-uf accepts only <GUID> and needs an explicit <SURL> while lcg-del accepts all kind of file definitions and may use the option -a instead of -s <SE> to delete all replicas.

13. Downloading a grid file to our local directory

(lcg-cp)

13.a lcg-cp copies a grid file to the local machine

Usage:

```
lcg-cp --vo <VO> lfn:{<Link_NAME>|<LFN_NAME>}  
file:<ABSOLUT_LOCAL_PATH>
```

Example:

```
> lcg-cp --vo gilda lfn:aaa file:/home/budapest65/myHistoryBack
```

13.b Let us compare the original and the downloaded files:

Example:

```
> ls -l my*  
-rw-r--r--    1 budapest65 users 6668 Jun 30 15:54 myHistory  
-rw-r--r--    1 budapest65 users 6668 Jun 30 16:32 myHistoryBack  
  
> diff myHistory myHistoryBack  
>
```