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**Joint Regional CE EGEE and SEEGRID-2  
Summer School on Grid Application Support  
www.egee.hu/grid06**



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**Practice of EGEE data management  
Part 1 – Command line tools**

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**Preparation:**

On day 1 you have received a two digit number between 01-70. (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/budapest65_2006_06_27
```

##### 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_2006_06_27
```

#### 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/budapest65_2006_06_27
```

##### 5.2 Controlling:

**Example:**

```
>lfc-ls -l ../ |grep budapest65_2006_06_27
```

```
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_2006_06_27 file:/home/budapest65/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_2006_06_27
```

**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/budapest65_2006_06_27/historyOnGrid_2006_06_27 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_2006_06_27/historyOnGrid_2006_06_27
-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_2006_06_27
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_2006_06_27/historyOnGrid_2006_06_27
lfn:/grid/gilda/budapest65_2006_06_27/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_2006_06_27 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_2006_06_27
```

## 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/budapest65_2006_06_27/historyOnGrid_2006_06_27 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_2006_06_27
```

**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 &lt;file name&gt;

**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  
>
```