

# *Laboratory: Hands-on using EGEE Grid and gLite middleware*

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## WMS

- Choose an available site for the job execution

The user connects to User Interface using a SSH-client



User



User Interface

HG-01-GRNET



Resource Broker

HG-06-EKT



Resource Broker

[ui01.isabella.grnet.gr](http://ui01.isabella.grnet.gr)

- User's personal account and its certificate
- Command Line Interface for job submission

HellasGrid Infrastructure

HG-01-GRNET



HG-02-IASA



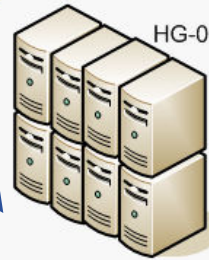
HG-04-CTI-CEID

HG-03-AUTH



HG-05-FORTH

HG-06-EKT

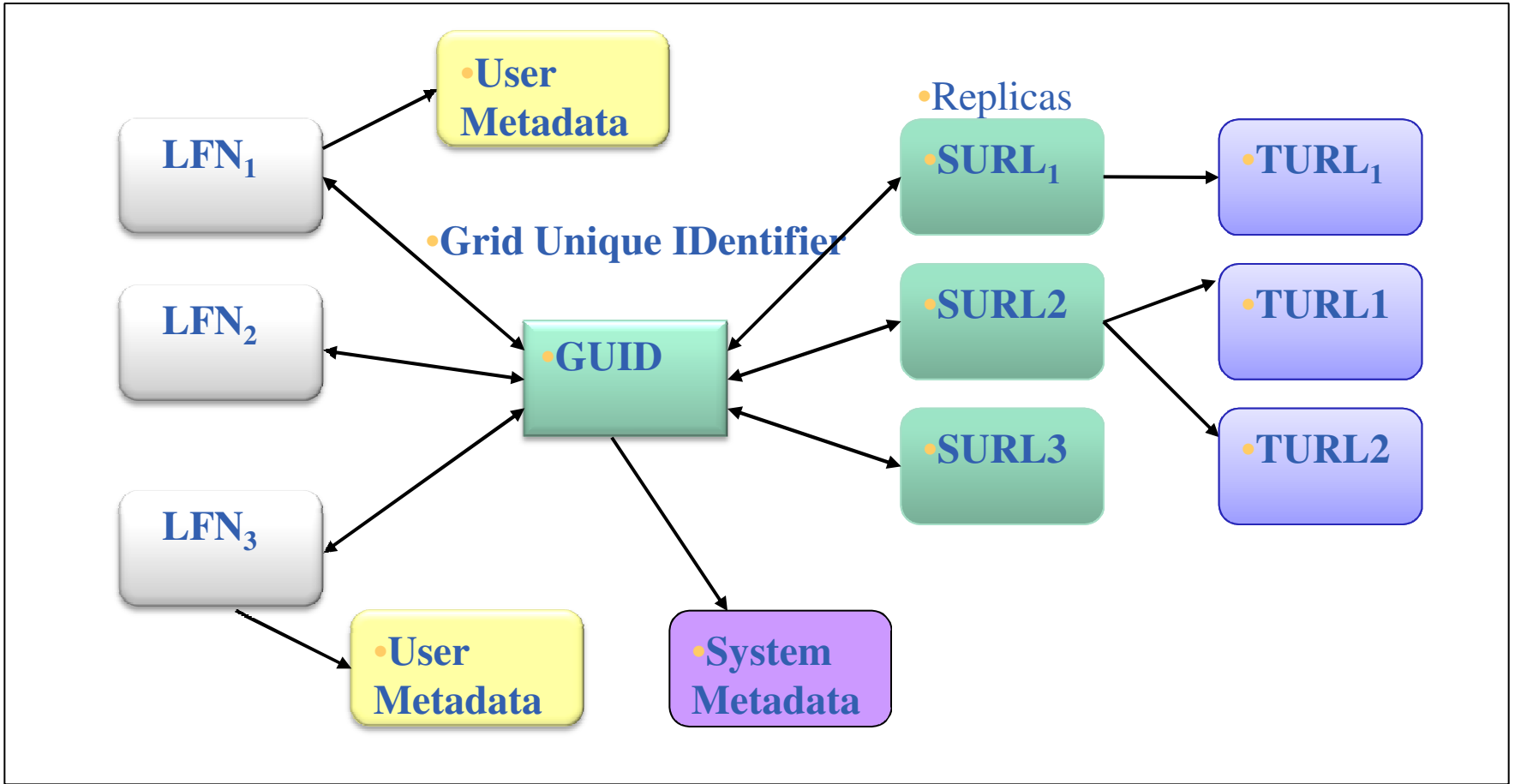


Each site has:

- Computing Element
- Storage Element
- Worker Nodes

- **Creating a proxy certificate**
  - **voms-proxy-init --voms=hgdemo**
- **Listing Computing Elements that match a job description**
  - **glite-wms-job-list-match -a testJob1.jdl**
- **Submitting a job**
  - **glite-wms-job-submit -o jobld -a testJob1.jdl**
- **Retrieving the status of a job**
  - **glite-job-status -i jobld**
- **Retrieving the output of a job**
  - **glite-wms-job-output -i jobld**

- **Grid Unique Identifier (GUID)**
  - Identifies a file uniquely
  - Example: guid:ab993b98-8bc9-4984-901e-91290276090c
  
- **Logical File Name (LFN) (User Alias)**
  - Refers to a file instead of a GUID
  - lfn:<any\_string>
  - LFC catalogue: lfn:/grid/<MyVO>/<MyDirs>/<MyFile>
  - Example: lfn:/grid/hgdemo/test\_hgdemodemo/test\_file
  
- **Storage URL (SURL) (Physical File Name-PFN)**
  - Identifies a replica in a SE
  - <sf|srm>://<SE\_hostname>/<some\_string>
  - Example: sf://se01.isabella.grnet.gr/storage/hgdemo/generated/2007-04-20/filec4087974-dbaa-4890-91e2-3c105fa0a3df
  
- **Transport URL (TURL)**
  - A valid URI with the necessary information to access a file in a SE
  - <protocol>://<some\_string>
  - Example: gsiftp://se01.isabella.grnet.gr/storage/hgdemo/generated/2007-04-20/file1a08d327-d7dc-4d89-bb01-2c86f59eae37



- **lfc-ls:** List file / directory entries in a directory
- **lfc-mkdir:** Create directory
- **lfc-chmod:** Change access mode of a LFC file / directory
- **lfc-chown:** Change owner and group of a LFC file / directory
- **lfc-ln:** Make a symbolic link to a file / directory
- **lfc-rename:** Rename a file / directory
- **lfc-rm:** Remove a file / directory
- **lfc-setcomment:** Add / replace a comment
- **lfc-delcomment:** Delete the comment associated with a file / directory



# More advanced LFC commands

- **lfc-getacl:** Get file / directory access control lists
- **lfc-setacl:** Set file / directory access control lists
- **lfc-entergrpmap:** Defines a new group entry in the Virtual ID table
- **lfc-enterusmap:** Defines a new user entry in Virtual ID table
- **lfc-modifygrpmap:** Modifies a group entry corresponding to a given virtual gid
- **lfc-modifyusmap:** Modifies a user entry corresponding to a given virtual uid
- **lfc-rmgrpmap:** Suppresses group entry corresponding to a given virtual gid or group name
- **lfc-rmusmap:** Suppresses user entry corresponding to a given virtual uid or user name.

- **lcg\_util** tools
  - Allow users to copy files between UI, CE, WN and a SE
  - Allow users to register entries in the file catalogue and replicate files between SEs
- **Replica Management**
- **lcg-cp**: Copies a Grid file to a local destination (*download*)
- **lcg-cr**: Copies a file to a SE and registers the file in the catalogue (*upload*)
- **lcg-del**: Deletes one file (either one replica or all replicas)
- **lcg-rep**: Copies a file from one SE to another SE and registers it in the catalogue (replicate)
- **lcg-gt**: Gets the TURL for a given SURL and transfer protocol



- **File Catalogue Interaction**

**lcg-aa:** Adds an alias in the catalogue for a given GUID

**lcg-ra:** Removes an alias in the catalogue for a given GUID

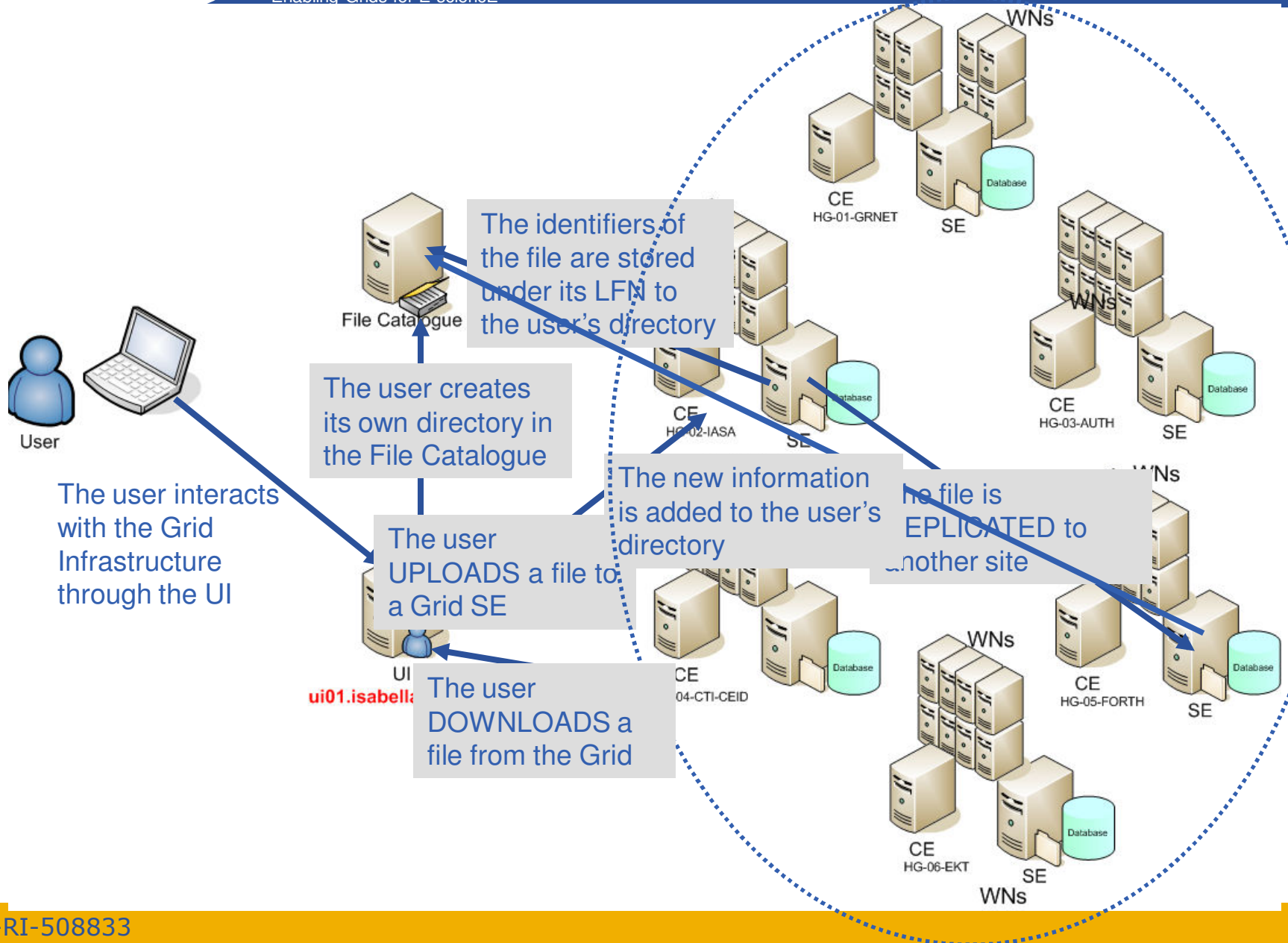
**lcg-rf:** Registers in the catalogue a file residing on an SE

**lcg-uf:** Unregisters in the the catalogue a file residing on an SE

**lcg-la:** Lists the aliases for a given LFN, GUID or SURL

**lcg-lg:** Gets the GUID for a given LFN or SURL

**lcg-lr:** Lists the replicas for a given LFN, GUID or SURL



- The `LFC_HOST` variable must contain the hostname of the machine providing the LFC service

```

[egge@ui01.isabella.grnet.gr]# cd ~/training/dataJob
[egge@ui01.isabella.grnet.gr]# source export.sh

```

- The `LCG_GFAL_VO` variable must contain the name of the user's VO

```

[egge@ui01.isabella.grnet.gr]# export LCG_GFAL_VO=hgdemo

```

- **Creating a directory in the LFN namespace**

✓ [egee@ui01.isabella.grnet.gr]\$ **lfc-mkdir /grid/hgdemo/test\_(\$USER)**

where \$USER -> the username of each participant

- **Listing the entries of a LFC directory**

✓ [egee@ui01.isabella.grnet.gr]\$ **lfc-ls -l /grid/hgdemo/**

drwxrwxr-x 0 26158 32000 0 Apr 20 12:45 test\_hgdemodemo

- **Defining LFC\_HOME variable to point to the created directory**

✓ [egee@ui01.isabella.grnet.gr]\$ **export LFC\_HOME=/grid/hgdemo/test\_(\$USER)**

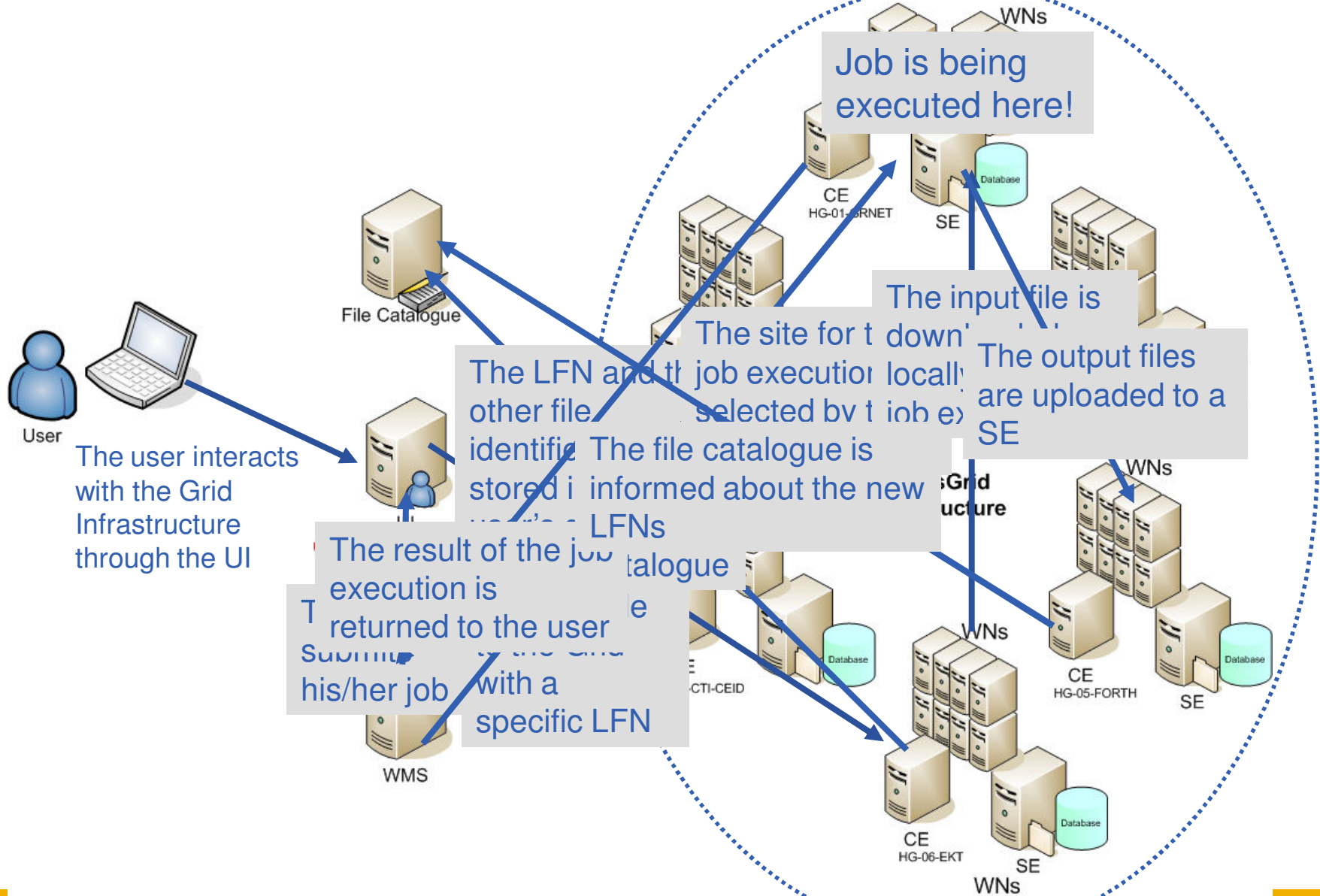
- **Removing LFNs from the LFC**

✓ [egee@ui01.isabella.grnet.gr]\$ **lfc-rm -r lfc:/grid/hgdemo/test\_(\$USER)**

- **Uploading a file to the grid with specific LFN and in a specific storage element**
  - ✓ [egee@ui01.isabella.grnet.gr]\$ **lcg-cr file:\$PWD/satimg.ppm -l lfn:satimg**  
guid:e20d1fa9-e35f-426d-aa72-cb99b18c2791
  - ✓ [egee@ui01.isabella.grnet.gr]\$ **lfc-ls /grid/hgdemo/test\_(\$USER)/satimg**
- **Replicating a file**
  - ✓ [egee@ui01.isabella.grnet.gr]\$ **lcg-rep -v lfn:satimg -d se01.athena.hellasgrid.gr**
- **Copying a file out of the Grid**
  - ✓ [egee@ui01.isabella.grnet.gr]\$ **lcg-cp lfn:satimg file:\$PWD/copy\_satimg**

- **Listing replicas**
  - ✓ [egee@ui01.isabella.grnet.gr]\$ **lcg-lr --vo hgdemo lfn:satimg**
  - ✓ **srm://se01.grid.hgdemo.gr/dpm/grid.hgdemo.gr/home/hgdemo/generated/2009-05-06/fileaaa2af18-8b10-4566-8b96-1f55f3eb2610**
  
- **Listing guides given the lfn**
  - ✓ [egee@ui01.isabella.grnet.gr]\$ **lcg-lg lfn:satimg**  
guid:e20d1fa9-e35f-426d-aa72-cb99b18c2791
  
- **Adding metadata information to LFC entries**
  - ✓ [egee@ui01.isabella.grnet.gr]\$ **lfc-setcomment /grid/hgdemo/test\_(\$USER) /satimg "Created for the training"**
  
- **View metadata of a specific file**
  - ✓ [egee@ui01.isabella.grnet.gr]\$ **lfc-ls --comment /grid/hgdemo/test\_(\$USER)/satimg**  
satimg Created for the training
  
- **Removing metadata information to LFC entries**
  - ✓ [egee@ui01.isabella.grnet.gr]\$ **lfc-delcomment /grid/hgdemo/test\_\$USER/satimg**

# Job interacting with files



✓ [ege@ui01.isabella.grnet.gr]\$ **less testJob2.sh**

- **#!/bin/sh**

**echo Information about the Worker Node**

**echo Running at `hostname`**

**echo Date `date`**

**echo Enabling the executable flag for the application**

**chmod 755 \$PWD/comprjesspeg**

**echo Fetching data from a Storage Element**

**lcg-cp --vo hgdemo \$1 file:\$PWD/local\_copy**

**echo Running executable of the user taking as input the transferred file**

**\$PWD/comprjesspeg local\_copy > local\_compressed\_copy**

**ls -al**

**echo Registering output to the Storage Elements**

**lcg-cr --vo hgdemo -l \$2 file:\$PWD/local\_compressed\_copy**

**echo Job is done!**



```

✓ [egee@ui01.isabella.grnet.gr]$ less testJob2.jdl
[
    Type = "job";
    JobType = "normal";
    RetryCount = 0;
    ShallowRetryCount = 3;
    Executable = "testJob2.sh";
    Arguments = "lfn:/grid/hgdemo/test_($USER)/sating lfn:/grid/hgdemo/te
st_($USER)/satingjpg ";
    InputSandbox = {"testJob2.sh", "compressjpeg"};
    StdOutput = "std.out";
    StdError = "std.err";
    OutputSandbox = {"std.out", "std.err"}
    DataRequirements = {
        [InputData = {"lfn:/grid/hgdemo/test_($USER)/sating"}];

        DataCatalogType = "DLI"];
    };
    DataAccessProtocol = {"gsiftp", "https"};
]
    
```

- **Uploading a file to the grid with specific LFN and in a specific storage element**
- ✓ `[egee@ui01.isabella.grnet.gr]$ lcg-cr file:$PWD/satimg.ppm -l lfn:satimg guid:594cf6b5-e3b7-49b5-a916-0d5e3054af17`
- ✓ `[egee@ui01.isabella.grnet.gr]$ lfc-ls /grid/hgdemo/test_($USER)/ satimg`

- **Submit job**

```
glite-wms-job-submit -o jobld2 -a testJob2.jdl
```

- **Watch the job status**

```
watch "glite-wms-job-status -i jobld2"
```

- **Retrieve the job output**

```
glite-wms-job-output -i jobld2
```

- **Listing the entries of a LFC directory**

```
[egee@ui01.isabella.grnet.gr]$ lfc-ls -l /grid/hgdemo/test_($USER)
```

```
-rw-rw-r-- 1 26259 32000 14110553 Nov 04 22:32 satimg
```

```
-rw-rw-r-- 1 26259 32000 1521142 Nov 04 22:36 satimgjpg
```

- Listing the entries of a LFC directory

```
[egee@ui01.isabella.grnet.gr]$ lcg-lr --vo hgdemo lfn:satimgjpg
```

```
[egee@ui01.isabella.grnet.gr]$ lcg-lr --vo hgdemo lfn:greysatimg
```

- Download output files

```
[egee@ui01.isabella.grnet.gr]$ lcg-cp -v lfn:satimgjpg file:$PWD/local_satimgjpg
```

```
[egee@ui01.isabella.grnet.gr]$ lcg-cp -t 100 lfn:greysatimg  
file:$PWD/local_greysatimg
```

- **Deleting all replicas with the specific lfn**

- ✓ [egee@ui01.isabella.grnet.gr]\$ **lcg-del -a lfn:satimg**

- ✓ [egee@ui01.isabella.grnet.gr]\$ **lcg-lr --vo hgdemo lfn:satimg**  
lcg\_lr: No such file or directory

- **Delete LFC directory**

- ✓ [egee@ui01.isabella.grnet.gr]\$ **lfc-ls /grid/hgdemo/test\_(\$USER)**

- ✓ [egee@ui01.isabella.grnet.gr]\$ **lfc-rm -r /grid/hgdemo/test\_(\$USER)**

- ✓ [egee@ui01.isabella.grnet.gr]\$ **lfc-ls /grid/hgdemo/**

- **Commandline Tutorial**

- [http://wiki.egee-see.org/index.php/Programming\\_from\\_the\\_Command\\_Line](http://wiki.egee-see.org/index.php/Programming_from_the_Command_Line)



*Ευχαριστώ  
πολύ!!!*