

Laboratory: Hands-on using EGEE Grid and gLite middleware

Athanasia Asiki

aassiki@cslab.ece.ntua.gr

***Computing Systems Laboratory,
National Technical University of Athens***

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

ui01.isabella.grnet.gr

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

HG-06-EKT



Resource Broker

HellasGrid Infrastructure



HG-01-GRNET



HG-02-IASA



HG-03-AUTH



HG-04-CTI-CEID



HG-05-FORTH



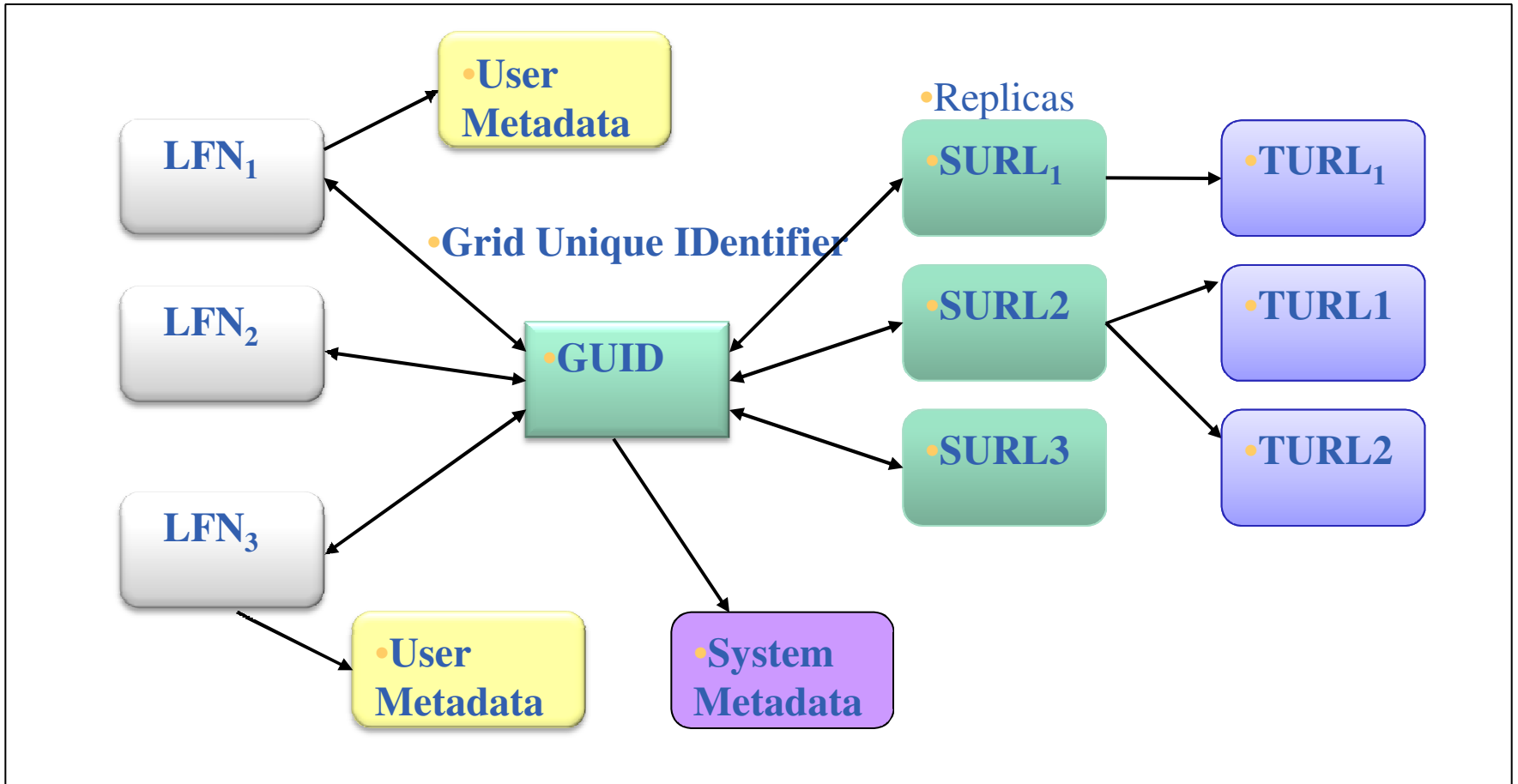
HG-06-EKT

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
 - <sfn|srm>://<SE_hostname>/<some_string>
 - Example: sfn://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

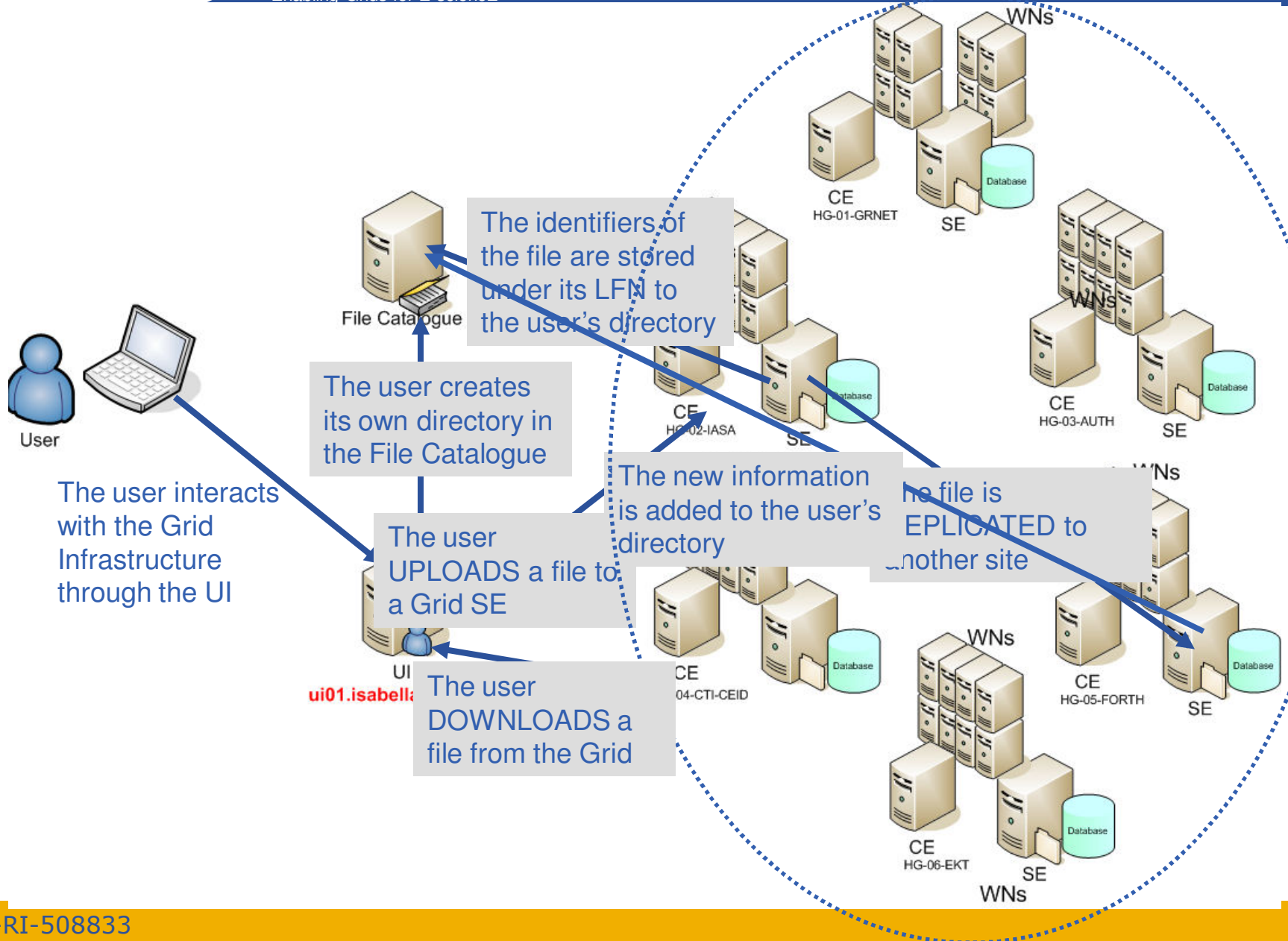
lcg-rf: Registers in the catalogue a file residing on an SE

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
 - ✓ [egee@ui01.isabella.grnet.gr]\$ **export LFC_HOST=`lcg-infosites --vo hgdemo lfc`**
 - ✓ [egee@ui01.isabella.grnet.gr]\$ **export LCG_CATALOG_TYPE=lfc**
- The **LCG_GFAL_VO** variable must contain the name of the user's VO
 - ✓ [egee@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**

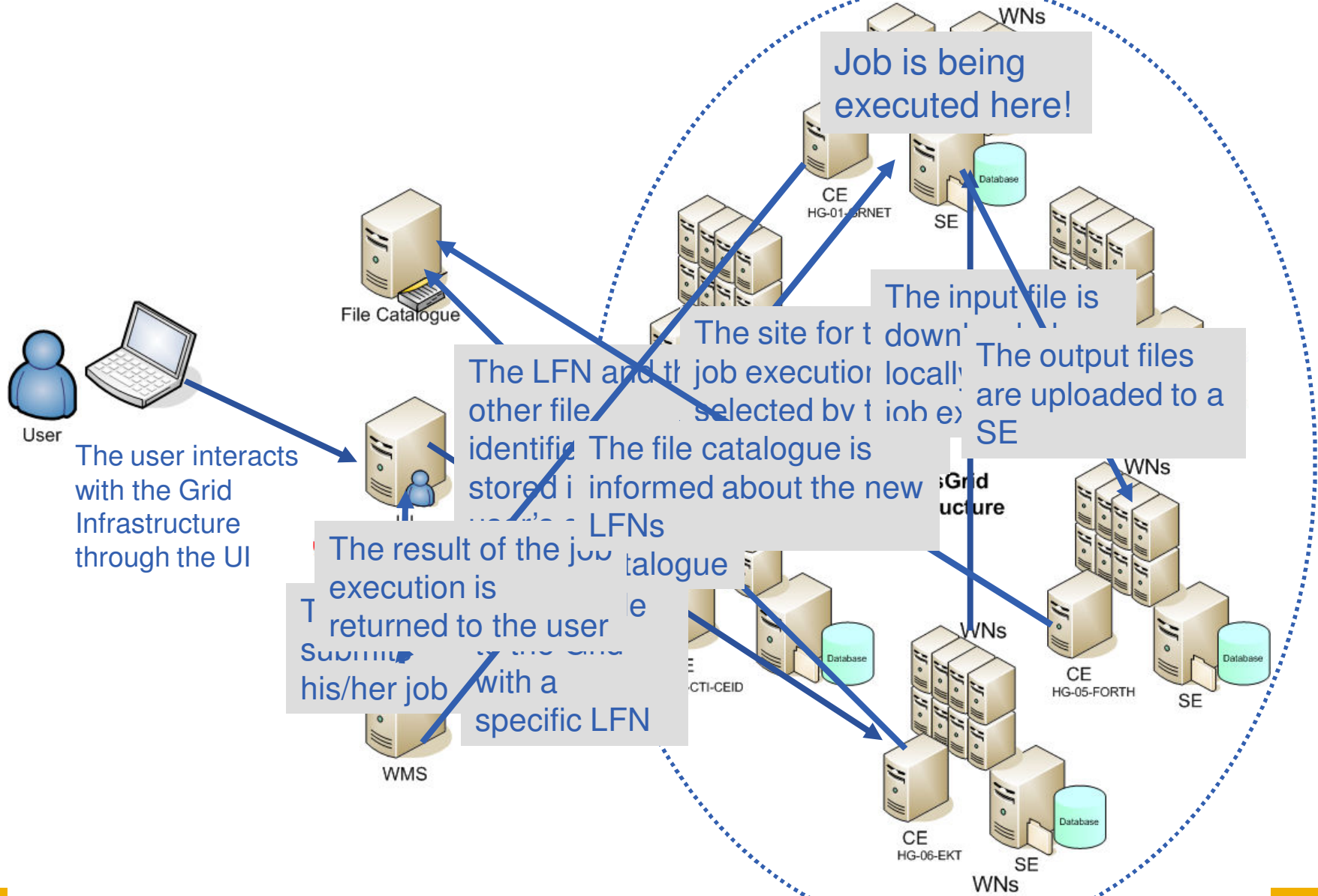
- **Listing guides given the lfn**
 - ✓ [egee@ui01.isabella.grnet.gr]\$ **lcg-lg lfn:satimg**
guid:e20d1fa9-e35f-426d-aa72-cb99b18c2791

- **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



*Ευχαριστώ
πολύ!!!*