

## HOW TO USE THE GRID COMPUTING

### INSTALLING YOUR CERTIFICATE ON A UI

Login into a User Interface machine and copy your Grid certificate in your home directory.

```
$> ssh -Y kaci@lyoserv.in2p3.fr  
passwd:
```

The certificate you get from your Certification Authority (CA) could be in one of the formats: PEM or PKCS12.

PKCS12 is the most common for certificates exported from a browser.

PEM format is needed on a WLCG/EGI User Interface machine to access the Grid.

The certificates can be converted from one format to the other using the openssl command.

Converting PKCS12 to PEM is done as follows: (assuming your certificate name is myCertif.p12)

```
$> ls -l  
total 6  
-rw-r--r-- 1 kaci exp 3250 Dec 1 14:45 myCertif2012.p12
```

```
$> openssl pkcs12 -nocerts -in myCertif2012.p12 -out userkey.pem  
Enter Import Password:  
MAC verified OK  
Enter PEM pass phrase:  
Verifying - Enter PEM pass phrase:
```

```
$> openssl pkcs12 -clcerts -nokeys -in myCertif2012.p12 -out usercert.pem  
Enter Import Password:  
MAC verified OK
```

```
$> ls -l  
total 11  
-rw-r--r-- 1 kaci exp 3250 Dec 1 14:45 myCertif2012.p12  
-rw-r--r-- 1 kaci exp 2311 Dec 1 14:56 usercert.pem  
-rw-r--r-- 1 kaci exp 1905 Dec 1 14:55 userkey.pem
```

In your home directory (\$HOME) create the directory .globus/ and copy there your certificate in PEM format, as follows:

```
$> mkdir $HOME/.globus  
$> cp usercert $HOME/.globus/  
$> cp userkey $HOME/.globus/
```

Change then the permissions like this:

```
$> cd .globus  
$> chmod 444 usercert.pem  
$> chmod 400 userkey.pem  
$> ls -l  
total 12  
-r--r--r-- 1 kaci exp 2311 Dec 1 14:56 usercert.pem  
-r----- 1 kaci exp 1905 Dec 1 14:55 userkey.pem
```

### CREATING A PROXY

To do this you are supposed to be registered as a member of the Virtual Organization vo.agata.org

```
$> voms-proxy-init -voms vo.agata.org
```

```

Enter GRID pass phrase:
Your identity: /DC=es/DC=irisgrid/O=ific/CN=mohammed.kaci
Creating temporary proxy ..... Done
Contacting cclcgvomsl01.in2p3.fr:15007 [/O=GRID-FR/C=FR/O=CNRS/OU=CC-
IN2P3/CN=cclcgvomsl01.in2p3.fr] "vo.agata.org" Done
Creating proxy ..... Done
Your proxy is valid until Sun Dec 2 03:19:25 2012

```

```

$> voms-proxy-info -all
subject : /DC=es/DC=irisgrid/O=ific/CN=mohammed.kaci/CN=proxy
issuer  : /DC=es/DC=irisgrid/O=ific/CN=mohammed.kaci
identity : /DC=es/DC=irisgrid/O=ific/CN=mohammed.kaci
type    : proxy
strength : 1024 bits
path    : /tmp/x509up_u5134
timeleft : 11:59:51
=== VO vo.agata.org extension information ===
VO      : vo.agata.org
subject : /DC=es/DC=irisgrid/O=ific/CN=mohammed.kaci
issuer  : /O=GRID-FR/C=FR/O=CNRS/OU=CC-IN2P3/CN=cclcgvomsl01.in2p3.fr
attribute : /vo.agata.org/Role=NULL/Capability=NULL
attribute : /vo.agata.org/2009_week43/Role=NULL/Capability=NULL
timeleft : 11:59:51
uri     : cclcgvomsl01.in2p3.fr:15007

```

#### GETTING INFORMATION ABOUT THE COMPUTING RESOURCES OF vo.agata.org

Use the command lcg-infosites

```

$> lcg-infosites --vo vo.agata.org ce
#CPU Free Total Jobs Running Waiting ComputingElement
-----
 808  131   0         0   0 ce03.ific.uv.es:8443/cream-pbs-short
 808  131   0         0   0 ce03.ific.uv.es:8443/cream-pbs-agataL
  40   35   5         0   5 ce02.ific.uv.es:8443/cream-pbs-infbandShort
  40   35   0         0   0 ce02.ific.uv.es:8443/cream-pbs-infbandAgataL
1512   92   0         0 4444 sbgce2.in2p3.fr:8443/cream-pbs-vo.agata.org
1392  1914   0         0   0 lyogrid07.in2p3.fr:8443/cream-pbs-vo.agata.org
 868  1070   0         0   0 ipngrid04.in2p3.fr:8443/cream-pbs-sdj
 868  1070   0         0   0 ipngrid04.in2p3.fr:8443/cream-pbs-agata

```

```

$> lcg-infosites --vo vo.agata.org se
Avail Space(Kb) Used Space(Kb) Type SEs
-----
10737418240      n.a      n.a ccsrm02.in2p3.fr
138315780        3024162  n.a srmv2.ific.uv.es
26041342623     963662709  n.a lyogrid06.in2p3.fr
138931154418    474845581  n.a storm-fe-archive.cr.cnaf.infn.it
      n.a      n.a      n.a ipnsedpm.in2p3.fr
67675753910    652356468439  n.a sbgse1.in2p3.fr

```

#### FILE AND REPLICA MANAGEMENT TOOLS

The vo.agata.org VO provides the following Storage Elements:

```

storm-fe-archive.cr.cnaf.infn.it  CNAF-Tier1
ccsrm02.in2p3.fr                  LYON-Tier1

```

```
#!/bin/sh
echo "First file:"
cat $1
echo "Second file:"
cat $2
```

Example of myJob.jdl

```
Executable = "myJob.sh";
Arguments = "fileA fileB";
StdOutput = "std.out";
StdError = "std.err";
InputSandbox = {"myJob.sh","fileA","fileB"};
OutputSandbox = {"std.out","std.err"};
```

fileA and fileB are two files that contain ascii text for example.

Commands to use to manage the above defined Job:

to list the available CE resources to run the Job use:

```
$> glite-wms-job-list-match -a myJob.jdl
```

to submit the Job use:

```
$> glite-wms-job-submit -a myJob.jdl
```

or

```
$> glite-wms-job-submit -a -o jobid myJob.jdl
```

or

```
$> glite-wms-job-submit -a -o jobid -r <name-of-a-CE> myJob.jdl
```

to see the status of the submitted Job use:

```
$> glite-wms-job-status <Job-Identifier>
```

or

```
$> glite-wms-job-status -a -i jobid
```

to retrieve the results from a Job that is done use:

```
$> glite-wms-job-output <Job-Identifier>
```

or

```
$> glite-wms-job-output -a -i jobid
```

to cancel a submitted Job use:

```
$> glite-wms-job-cancel <Job-Identifier>
```

or

```
$> glite-wms-job-cancel -a -i jobid
```

Try these commands and see...

lyogrid06.in2p3.fr	IPNL-Tier2
sbgse1.in2p3.fr	IPHC-Tier2
ipnsedpm.in2p3.fr	IPNO-Tier2
srmv2.ific.uv.es	IFIC-Tier2

The AGATA data for the vo.agata.org VO can be stored/accessed using the following paths:

for CNAF-Tier1 srm://storm-fe-archive.cr.cnaf.infn.it:8444/agata  
 for LYON-Tier1 srm://ccsrm02.in2p3.fr:8443/pnfs/in2p3.fr/data/agata/

for IPNL-Tier2 srm://lyogrid06.in2p3.fr/dpm/in2p3.fr/home/vo.agata.org/  
 for IPHC-Tier2 srm://sbgse1.in2p3.fr/dpm/in2p3.fr/home/vo.agata.org/  
 for IPNO-Tier2 srm://ipnsedpm.in2p3.fr/dpm/in2p3.fr/home/vo.agata.org/  
 for IFIC-Tier2 srm://srmv2.ific.uv.es/lustre/ific.uv.es/grid/vo.agata.org/

The LCG Data Management Tools allow users to list and copy files between UI, CE, WN and SE, and much more

The tools that will be most used in this course are :

lcg-ls to list information about files stored on the Grid  
 lcg-cp to copy files from/to a SE  
 lcg-del to delete files from the SE

use of the lcg-xx commands:

lcg-ls srm://ccsrm02.in2p3.fr:8443/pnfs/in2p3.fr/data/agata/  
 lcg-ls -l lcg-ls -l srm://storm-fe-archive.cr.cnaf.infn.it:8444/agata/2011\_week29

lcg-cp srm://lyogrid06.in2p3.fr/dpm/in2p3.fr/home/vo.agata.org/kaci-test/file/ \  
 SRM\_AGATA\_event\_mezzdata.cdat.0000 srm://sbgse1.in2p3.fr/dpm/in2p3.fr/home/vo.agata.org/ \  
 kaci-test/SRM\_AGATA\_event\_mezzdata.cdat.0000  
 lcg-cp -v srm://sbgse1.in2p3.fr/dpm/in2p3.fr/home/vo.agata.org/kaci-test/ \  
 SRM\_AGATA\_event\_mezzdata.cdat.0000 file:///tmp/kaci/SRM\_AGATA\_event\_mezzdata.cdat.0000

lcg-del -l srm://sbgse1.in2p3.fr/dpm/in2p3.fr/home/vo.agata.org/kaci-test/ \  
 SRM\_AGATA\_event\_mezzdata.cdat.0000  
 lcg-del -l srm://sbgse1.in2p3.fr/dpm/in2p3.fr/home/vo.agata.org/tests/

## JOB MANAGEMENT

The vo.agata.org VO provides the following Storage Elements:

lyogrid07.in2p3.fr:8443/cream-pbs-vo.agata.org	IPNL-Tier2
sbgce2.in2p3.fr:8443/cream-pbs-vo.agata.org	IPHC-Tier2
ipngrid04.in2p3.fr:8443/cream-pbs-agata	IPNO-Tier2
ce03.ific.uv.es:8443/cream-pbs-short	IFIC-Tier2
ce03.ific.uv.es:8443/cream-pbs-agataL	IFIC-Tier2

The vo.agata.org VO provides also the following WMS:

https://sbgwms1.in2p3.fr:7443/glite_wms_wmproxy_server	IPHC-Tier2
https://wms01.ific.uv.es:7443/glite_wms_wmproxy_server	IFIC-Tier2

To submit a Job to the Grid you need to prepare two files:

- the myJob.sh file which will contain the actions to be executed on the WN
- the myJob.jdl file which contain the description of your Job

Example of myJob.sh :