

## Tips on using the Grid

### Getting ready with your Grid certificate

It is very likely that once you have obtained your grid certificate, you end up with a .p12 file (after you have exported your grid-certificate from your web browser). I copy here the instruction suggested CERN-CA (How to use your certificate with grid-proxy-init [↗](#)):

```
openssl pkcs12 -in myGridCert.p12 -clcerts -nokeys -out $HOME/.globus/usercert.pem
openssl pkcs12 -in myGridCert.p12 -nocerts -out $HOME/.globus/userkey.pem
chmod go-rw $HOME/.globus/userkey.pem
```

### Copying files using srmcp (SRM Storage Resource Management)


There are many ways to copy files across the Grid. I describe here an example on using srmcp:

- get on lxplus (or the UI) and set your grid environment: **source /afs/cern.ch/cms/LOG/LOG-2/UI/cms\_ui\_env.csh**
- initiate a voms proxy: **voms-proxy-init -voms cms**
- issue the command: *srmcp options source target*


If you type **srmcp --help** you will get a full description on the available options (help-srmcp.txt).

The options are the key point. We have to use SRM V.2 and tell srmcp to use a script that comes with the distribution (url-copy.sh):


```
-srm_protocol_version=2 -use_urlcopy_script=true -urlcopy= ${SRM_PATH}/sbin/url-copy.sh
```

-  Example 1: if you want to copy a file located at CERN (**srm://srm-cms.cern.ch:8443/**) you will do:

```
<lxplus231> srmcp -srm_protocol_version=2 -use_urlcopy_script=true -urlcopy=${SRM_PATH}/sbin/url-copy.sh
srm://srm-cms.cern.ch:8443/castor/cern.ch/user/r/rebassoo/CSAMuonStewCombinedWCSA/MuonStewNtupleC
file:///tmp/aosorio/test.root
```

-  Example 2: if the file is at FNAL (**srm://cmssrm.fnal.gov:8443/srm/managerv2\?SFN=**):

```
<lxplus231> srmcp -srm_protocol_version=2 -use_urlcopy_script=true -urlcopy= ${SRM_PATH}/sbin/url-copy.sh
srm://cmssrm.fnal.gov:8443/srm/managerv2\?SFN=/2/rebassoo/JR/simulation-4mu-expoPt-30-0-200-1000-
file:///tmp/aosorio/testfile.root
```

-  This last command has been tested in our Tier-3

### From FNAL to CERN

-  Example 3: from local FNAL to CERN Castor

You will first to configure Castor so it is able to receive the files. You need to create a special directory, call it **gridfiles** in your personal area and give it some special permissions:

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```
<lxplus231> nsmkdir /castor/cern.ch/user/a/aosorio/gridfiles
<lxplus231> nschmod 775 /castor/cern.ch/user/a/aosorio/gridfiles
```

Now, you should be able to copy files across using the `srmcp` tool as described before:

```
<cmslpc07> srmcp -srm_protocol_version=2 -use_urlcopy_script=true -urlcopy= ${SRM_PATH}/sbin/url-
file:///uscms_data/d1/rebassoo/LM1SusyTree/job/LM1_SUSY_Tree.root \
srm://srm-cms.cern.ch:8443/castor/cern.ch/user/a/aosorio/gridfiles/LM1_SUSY_Tree.root
```

### 🔗 From CERN to Uniandes

- 📄 Example 4: from local CERN to Uniandes

You will first to configure your **user** area at the Tier-3 Uniandes so it is able to receive the files. You need to create a directory, for instance call it **gridfiles** in your personal area and give it some special permissions (you need first to start a grid-proxy):

```
<lxplus231> rfmkdir /dpm/uniandes.edu.co/home/cms/user/a/aosorio/gridfiles
<lxplus231> rfchmod 775 /dpm/uniandes.edu.co/home/cms/user/a/aosorio/gridfiles
```

- Now, you should be able to copy files across using the `srmcp` tool as described before. We first try with a local file in your castor area:

```
<cmslpc07> srmcp -srm_protocol_version=2 -use_urlcopy_script=true -urlcopy= ${SRM_PATH}/sbin/url-
file:///afs/cern.ch/user/a/aosorio/Work/grid/Tier3-data/rpctt_results.root \
srm://moboro.uniandes.edu.co:8446/srm/managerv2\?SFN=/dpm/uniandes.edu.co/home/cms/user/a/aosorio
```

Things would work silently. You can then list the contents of your remote area:

```
<lxplus209> srm ls --count=10 srm://moboro.uniandes.edu.co:8446/srm/managerv2\?SFN=/dpm/uniandes.e
WARNING: SRM_PATH is defined, which might cause a wrong version of srm client to be executed
WARNING: SRM_PATH=/afs/cern.ch/project/gd/LCG-share/3.1.25-0/d-cache/srm
 0 /dpm/uniandes.edu.co/home/cms/user/a/aosorio/gridfiles/
 0 /dpm/uniandes.edu.co/home/cms/user/a/aosorio/gridfiles/SUSY/
4166 /dpm/uniandes.edu.co/home/cms/user/a/aosorio/gridfiles/file1.root
4166 /dpm/uniandes.edu.co/home/cms/user/a/aosorio/gridfiles/file2.root
 0 /dpm/uniandes.edu.co/home/cms/user/a/aosorio/gridfiles/ganga/
```

Note the `--count=10` option: this tells `srm ls` a maximum number of lines to display.

- 📄 Example 5: from your CERN Castor area to Uniandes

The same principle applies here. However this time you will need use the SRM protocol at both ends:

```
<lxplus209> srm ls srm://srm-cms.cern.ch:8443/castor/cern.ch/user/a/aosorio/gridfiles/tier3/rpctt_
WARNING: SRM_PATH is defined, which might cause a wrong version of srm client to be executed
WARNING: SRM_PATH=/afs/cern.ch/project/gd/LCG-share/3.1.25-0/d-cache/srm
4166 /castor/cern.ch/user/a/aosorio/gridfiles/tier3/rpctt_results.root
```

For the moment this does not work ... sorry.

- 📄 Example 6: from your Tier-2 to Uniandes

```
lxplus230> ./copy-files-SRM-2-SRM.py susy_PatLayer1_LM0.txt
```

Copying files:

```
srmcp -srm_protocol_version=2 -use_urlcopy_script=true -urlcopy= ${SRM_PATH}/sbin/url-copy.sh \
srm://grid-srm.physik.rwth-aachen.de:8443/srm/managerv2\?SFN=/pnfs/physik.rwth-aachen.de/cms/stor
srm://mohoro.uniandes.edu.co:8446/srm/managerv2\?SFN=/dpm/uniandes.edu.co/home/cms/user/a/aosorio
```

this procedure seems to be working fine!

## Places to look for data

The logical file name is not the complete story, and if you want to perform a `srm ls` command, there is usually some path you have to prepend to the lfn. Here is a list of some of the sites and their particular path where the actual files are located.

srm //	path to data
mohoro.uniandes.edu.co:8446/srm/managerv2\?SFN=	/dpm/uniandes.edu.co/ho
cms.srm.fnal.gov:8443/srm/managerv2\?SFN=	/2/ and others
srm.cms.cern.ch:8443/srm/managerv2\?SFN=	/castor/cern.ch/user
ccsrm.in2p3.fr:8443/srm/managerv2\?SFN=	/pnfs/in2p3.fr/data/cms
grid-srm.physik.rwth-aachen.de:8443/srm/managerv2\?SFN=	/pnfs/physik.rwth-aache
hephyse.oeaw.ac.at:8446/srm/managerv2\?SFN=	/dpm/oeaw.ac.at/home/cm
pccms2.cmsfarml.ba.infn.it:8443/srm/managerv2\?SFN=	/pnfs/cmsfarml.ba.infn.
srm.ms.pic.es:8443/srm/managerv2\?SFN=	/pnfs/pic.es/data/cms
stорм-se-01.ba.infn.it:8444/srm/managerv2\?SFN=	//cms
ingrid-se02.cismucl.ac.be:8444/srm/managerv2\?SFN=	/storage/data/cms

## Copying files using LCG commands


The following is a brief description on using the LCG commands in order to replicate / copy files to our Tier-3 in Bogota. This was done with the kind help from **Michael Perez** our storage expert and support in Uniandes (thanks). The first thing you need to do is to make sure you have the following environment variables at your UI:

```
[michael@yali ~]$ echo $LFC_HOST; echo $LCG_GFAL_INFOSYS; echo $LCG_CATALOG_TYPE;
prod-lfc-cms-central.cern.ch
exp-bdii.cern.ch:2170
lfc
```

- Create then a valid grid proxy for this session. We will use the command `lcg-cr` (have a look to the LCG-2 manual pages or just type `lcg-cr` to get some information):

```
[aosorio@yali ~]$ lcg-cr --vo cms -l LFN -d mohoro.uniandes.edu.co TURL
```

where LFN is the logical file name that YOU will assign to your file. TURL is the URL to your file using a Transport protocol. In order to get this, you will need to get this information using the command `lcg-gt`:

-  Example 1: the goal here is to copy files stored at the Aachen Tier-2 to our Tier-3:

```
lcg-gt \
```

```
srm://grid-srm.physik.rwth-aachen.de:8443/srm/managerv2\?SFN=/pnfs/physik.rwth-aachen.de/cms/store  
gsiftp://grid-sel02.physik.rwth-aachen.de:2811//pnfs/physik.rwth-aachen.de/cms/store/mc/Summer08/  
-2137491635
```

gsiftp is the transport protocol to be used. lcg-gt read a SURL (that points to the path to this file on the Grid) and returns something that starts with **gsiftp**.

- Now we got what we need:

```
[aosorio@yali ~]$ lcg-cr --vo cms -l lfn:/grid/cms/test_lm0_tier3 -d moboro.uniandes.edu.co \  
> gsiftp://grid-sel02.physik.rwth-aachen.de:2811//pnfs/physik.rwth-aachen.de/cms/store/mc/Summer0  
[BDII] exp-bdii.cern.ch:2170: Warning, no GlueVOInfo information found about SE 'moboro.uniandes.
```

"moboro.uniandes.edu.co" is our Storage Element (ignore the warning for the moment). **That's all!** depending on the size of the file, the system will hang in there until the file has been copied and registered. When it finishes, you can check if the file has been registered:

```
[aosorio@yali src]$ lcg-lr --vo cms lfn:/grid/cms/SUSY_LM0_sftsht_RECO_V11_1  
srm://moboro.uniandes.edu.co/dpm/uniandes.edu.co/home/cms/generated/2009-05-16/file91fe2626-22cc-
```

- You could also check by using **CMSSW edmFileUtil**:

```
[aosorio@yali src]$ edmFileUtil -d /grid/cms/SUSY_LM0_sftsht_RECO_V11_1  
rfio:/dpm/uniandes.edu.co/home/cms/grid/cms/SUSY_LM0_sftsht_RECO_V11_1
```

- Finally, I created the following script (it is sort of case specific) to copy a full data set: replicate.py.txt: replicate files using LCG cmds

## CMS Sites Information

A very useful command is **lcg-infosites**. This command allows to see information on the CE, SE associated to CMS virtual organisation.

- examples of usage:

```
<lxplus238> lcg-infosites --vo cms ce se
```

Using **lcg-infosites --vo cms closeSE** one can have a list of CE and their nearest SE. I attached in here the current Sept 06 2009 result of such command.

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