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# Grid Data Management Hands-on



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# Agenda

- **Data Management command line tools**
- **lcg\_utils APIs**
- **edg-gridftp APIs**
- **Globus-url-copy**



# DM CLIs & APIs: LFC API

## Low level methods (many POSIX-like):

lfc_access	lfc_deleteclass	lfc_listreplica	lfc_setacl
lfc_aborttrans	lfc_delreplica	lfc_lstat	lfc_setatime
lfc_addreplica	lfc_endtrans	lfc_mkdir	lfc_setcomment
lfc_apiinit	lfc_enterclass	lfc_modifyclass	lfc_seterrbuf
lfc_chclass	lfc_errmsg	lfc_opendir	lfc_setfszsize
lfc_chdir	lfc_getacl	lfc_queryclass	lfc_starttrans
lfc_chmod	lfc_getcomment	lfc_readdir	lfc_stat
lfc_chown	lfc_getcwd	lfc_readlink	lfc_symlink
lfc_closedir	lfc_getpath	lfc_rename	lfc_umask
lfc_creat	lfc_lchown	lfc_rewind	lfc_undelete
lfc_delcomment	lfc_listclass	lfc_rmdir	lfc_unlink
lfc_delete	lfc_listlinks	lfc_selectsrvr	lfc_utime
			send2lfc

# lcg\_utils: Data transfer & Storage

<b>lcg-cp</b>	Copies a Grid file to a local destination
<b>lcg-cr</b>	Copies a file to a SE and registers the file in the LRC
<b>lcg-del</b>	Deletes one file (either one replica or all replicas)
<b>lcg-infosites</b>	Gives information about resources on the Grid
<b>lcg-rep</b>	Copies a file from SE to SE and registers it in the LRC
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<b>lcg-gt</b>	Gets the TURL for a given SURL and transfer protocol
<b>lcg-sd</b>	Sets file status to “Done” in a specified request

# lcg\_utils: Catalog interaction

<b>lcg-aa</b>	Adds an alias for a given GUID
<b>lcg-la</b>	Lists the aliases for a given LFN, GUID or SURL
<b>lcg-lg</b>	Gets the GUID for a given LFN or SURL
<b>lcg-lr</b>	Lists the replicas for a given LFN, GUID or SURL
<b>lcg-ra</b>	Removes an alias for a given GUID
<b>lcg-rf</b>	Registers an existing SE file in the catalog
<b>lcg-uf</b>	Unregisters a file residing on an SE

# EDG gridftp commands

<b>edg-gridftp-exists</b> URL	Checks if file/dir exists on an SE
<b>edg-gridftp-ls</b> URL	Lists a directory on a SE
<b>edg-gridftp-mkdir</b> URL	Creates a directory on a SE
<b>edg-gridftp-rename</b> srcURL dstURL	Renames a file on a SE
<b>edg-gridftp-rm</b> URL	Removes a file from a SE
<b>edg-gridftp-rmdir</b> URL	Removes a directory on a SE
<b>globus-url-copy</b> srcURL dstURL	Copies files between SEs

# OutputData JDL attribute

- The OutputData JDL attribute specifies files to be copied and registered into the Grid
  - The filename (OutputData) is compulsory
  - If no LFN specified (LogicalFileName), none is set!
  - If no SE specified (StorageElement), the first close SE is chosen
- At the end of the job the files are moved from the WN and registered

```
OutputData = { [  
    OutputFile = "toto.out" ;  
    StorageElement = "adc0021.cern.ch" ;  
    LogicalFileName = "lfn:mylfn" ;],  
    [  
        OutputFile = "toto2.out" ;  
        LogicalFileName = "lfn:mylfn2" ; ]  
};
```

# Exercises

1. Create a dummy file and copy it to the grid
2. Check the LFN, GUID and SURL of the file
3. Copy the file to two SEs with lcg-rep and globus-url-copy. Check that both files exist but only one is registered
4. Register the file that was not already in the catalog
5. Copy the file back to the UI and check it
6. Delete and unregister all the files and replicas created





# Exercises

1. Store two text files on the Grid,
2. Create and submit a job that retrieves these files, read them and concatenate them back to a new file, store this result file back to the grid and replicate it.
3. When the job is finished, retrieve the file from the SE on the UI.
4. Delete and unregister all the files and replicas created

# LFC and SE hints

- Find suitable LFC:
  - `lcg-infosites --vo <vo name> lfc`
- Find suitable SEs:
  - `lcg-infosites -vo <vo name> se`
- Configure LFC:
  - `export LFC_HOST=<lfc hostname>`
  - `export LCG_CATALOG_TYPE=lfc`
  - `export LFC_HOME=<lfc hostname>:/grid/<vo name>/`
  - `export LCG_GFAL_VO=<vo name>`