

GridPP
UK Computing for Particle Physics

SRM client tools

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- SRM client tools.
 - Quick tour of features available in future releases.
- Troubleshooting file transfer problems.
 - Explain the origin of some common errors.

You should have got a chance to play with some of the client tools during the tutorial so this is some **revision**.

- Motivation of the **Grid File Access Library** is to hide users from complexity of interacting with Grid services.
 - Interact with the information system (BDII), catalog (LFC) and other storage (SRM).
- **GFAL-client-1.9.3-1:**
 - Posix like C API for file access.
 - Python bindings.
- **lcg_util-1.5.2-1:**
 - Command line and C API.
 - Covers most common use cases of file replication, catalogue interaction.
 - Everyone should be familiar with the `lcg-*` set of tools.

- Forthcoming release: [GFAL-client 1.10.4-1](#) and [lcg_util 1.6.3-1](#).
- Installed on the tutorial machines.

Dependencies:

`CGSI_gSOAP_2.7 ≥ 1.2.0-1`

`vdt_globus_essentials-VDT1.6`

`openldap-2.2`

```
$ lcg-cr -v --vo dteam -d lab-03.nesc.ed.ac.uk file:/etc/group
Using grid catalog type: lfc
Using grid catalog : mon.epcc.ed.ac.uk
Using LFN : /grid/dteam/generated/2007-11-14/file-326029ed-db51-4143-b9ba-8aa3f81e3095
Using SURL : srm://lab-03.nesc.ed.ac.uk/dpm/nesc.ed.ac.uk/home/dteam/generated/2007-11-1
fileaa7c2dea-8af0-4171-b027-07c2913c7321
Alias registered in Catalog: lfn:/grid/dteam/generated/2007-11-14/file-326029ed-db51-41
Source URL: file:/etc/group
File size: 2535
VO name: dteam
Destination specified: lab-03.nesc.ed.ac.uk
Destination URL for copy:gsiftp://lab-03.nesc.ed.ac.uk/lab-03.nesc.ed.ac.uk:/storage2/dt
# streams: 1
# set timeout to 0 seconds
2535 bytes 11.24 KB/sec avg 11.24 KB/sec inst
Transfer took 1000 ms
Destination URL registered in Catalog:srm://lab-03.nesc.ed.ac.uk/dpm/nesc.ed.ac.uk/home/
guid:53f15fb9-f40d-42da-9d52-b3da8580f507
```

1. Specify the **default SE type** of the source and destination endpoint:

`-D, --defaultsetype none|se|srmv1|srmv2`

- For `lcg-cp`, possible to specify the **source** and **destination** types individually.

`-T, --srcsetype none|se|srmv1|srmv2`

`-U, --destsetype none|se|srmv1|srmv2`

- N.B. if default SE type for the SRM is not present in BDII, an alternative will be used.

2. Specify the **space token description** that should be passed to the SRM:

```
lcg-cr: -s,--st spacetokendesc
```

```
lcg-cp: -s,--sst src_spacetokendesc
```

```
lcg-cp: -S,--dst src_spacetokendesc
```

- Will be used by the SRM to decide which space the file should be stored in.
- Use this to test that your SRM2.2 space configuration is correct.
- e.g., if site has reserved space on `srmHostname`, with the `mySpace` token description:

```
$ lcg-cr --vo dteam -D srmv2 --st mySpace -d srmHostname  
file:/etc/group
```

3. Option to **turn off the BDII lookup**: `-b`.

- It is then necessary to specify the **full SRM endpoint**.
- This will be useful for debugging problems just with the SRM. No need to contact the BDII for information.

```
$ lcg-cr -v --vo dteam -D srmv2 -b file:/etc/group -d  
srm://dCacheHost:8443/srm/managerv2?SFN=/pnfs/domain/data/dteam/file
```


New features: lcg-geturls, lcg-ls

- lcg-geturls is the same as lcg-gt, but takes multiple SURLs as input.
- lcg-ls allows you to list the contents of a directory in the namespace:

```
lcg-ls -l srm://dpmHost/dpm/nesc.ed.ac.uk/home/dteam/
```

```
lcg-ls -b -D srmv2
```

```
srm://dCacheHost:8443/srm/managerv2?SFN=/pnfs/domain/data/
```

- SRMv1 is the default until. . .
 - SRMv2.2 is deployed in production (coming early 2008).
 - SRMv2.2 has proven to be stable (testing is ongoing).
- In practice:
 - Get SRM type from the BDII.
 - If space token specified by user and SRMv2.2 published, use SRMv2.2;
 - Else if only SRMv2.2 published, use SRMv2.2;
 - Else, use SRMv1

- Developed at FNAL. Distributed with dCache.
- Currently in production: **dcache-client-1.7.0-39**.
- Most people will be familiar with the **srmcp** client for copying files.
- Useful alternative to the lcg-* client tools (no interaction with the BDII or LFC).
- At the moment, lcg-* does not support srmCopy.
 - Copying from one SRM to another is a 3rd party operation.
- The srmcp client supports srmCopy.

- With the release of v1.8.0 of dCache, there is a new [dcache-client-1.8.0-0](#).
- This is available on the tutorial machines.
- Some examples of available tools:

```
srmcp      srm-bring-online  
srmmkdir  srm-get-space-tokens  
srmls     srm-reserve-space  
srmrmdir  srm-release-space  
srmrm     srmping
```

- Client can specify a **space token description**, identifying the space that file should go into.

```
$ srmcp -2 -debug -space_token=mySpace file:///etc/group  
srm://srmHost:8443/pnfs/domain/data/dteam/file
```

- Client can ask for a particular **RetPol** and **AccLat**. Server will honour the request.

```
$ srmcp -2 -debug -retention_policy=REPLICA -access_latency=ONLINE  
file:///etc/group srm://srmHost:8443/pnfs/domain/data/dteam/file
```

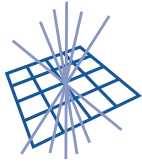
- **srmping** will be useful for a quick check that an SRM endpoint is up and responding to requests.

```
$ srmping -2 -debug srm://dpmHost:8446/srm/managerv2?SFN=/  
...  
backend_type:DPM  
backend_version:1.6.7-1
```

- **srmls** has a few different options to control how much information is returned.

```
$ srmls -l -recursion_depth=1 -count=100 srm://srmHost:844...
```

- `-l` option returns a lot of information about each file.
- N.B. for DPM, you must specify a non-zero count.



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TROUBLESHOOTING

- Everyone knows that there are problems with file transfers.
 - Tickets submitted by users and experiment production teams.
 - Strange failures reported by SAM:

http://www.gridpp.ac.uk/wiki/Random_DPM_errors_in_SAM

http://www.gridpp.ac.uk/wiki/Random_dCache_failures_in_SAM

- How do you go about finding the source of the problem?
- Many problems are understood already! Information is collected in the GOCWiki (thanks to Maarten Litmaath for this)

<http://goc.grid.sinica.edu.tw/gocwiki/SiteProblemsFollowUpFaq>

Transport endpoint is not connected

```
$ lcg-cr -v --vo ops file:/home/samops/.same/SRM/testFile.txt -l  
lfn:SRM-put-serv02.hep.phy.cam.ac.uk-1185897573 -d serv02.hep.phy.cam.ac.uk  
lcg_cr: Transport endpoint is not connected
```

- The SRM server closed the connection without further details being sent to the user.
- Caused by a broken `/etc/grid-security/grid-mapfile`.
 - i.e., incorrect permissions; not being updated by `/etc/cron.d/edg-mkgridmap`.
- Or, all pool accounts for the VO are taken.
 - Add more accounts, with the corresponding empty files in `/etc/grid-security/gridmapdir`.

No valid credential found - Bad magic number

```
$ lcg-cr -v --vo dteam file:/etc/group -d lxn1183.cern.ch
Using grid catalog type: lfc
Using grid catalog : prod-lfc-shared-central.cern.ch
send2nsd: NS002 - send error : No valid credential found
Bad magic number
lcg_cr: Communication error on send
lcg-cr -v --vo ops file:/home/samops/.same/SRM/testFile.txt -l
```

- Typically occurs when a proxy is used before it becomes valid.
- i.e., proxy was created on a machine that has its system date >5 minutes in the future, and the proxy is used too early.

Could not establish context

```
$ lcg-cr -v --vo dteam file:/etc/group -d lxn1183.cern.ch
Using grid catalog type: lfc
Using grid catalog : prod-lfc-shared-central.cern.ch
Could not establish context
lcg_cr: Communication error on send
```

- Also, in `/var/log/[dpm,dpns]/log` and `/var/log/dpm-gsiftp/gridftp.log` have a look for:

```
_Csec_get_voms_creds: Generic verification error for VOMS
```

Could not establish context

Explanation

- This happens when the VOMS extensions are present in the user proxy, but:
 - they have expired;
 - they were signed by a server whose host certificate is not present in `/etc/grid-security/vomsdir` on the SE, or its CRL is out of date, or its CA is not present;
 - the VOMS extensions were signed by a VOMS server host certificate that in the meantime has expired.

```
$ lcg-cr -v --vo ops file:/etc/group -d some-dpm.some-domain
Using grid catalog type: lfc
Using grid catalog : prod-lfc-shared-central.cern.ch
Using LFN : /grid/ops/generated/2007-10-01/file-...
Using SURL : srm://some-dpm.some-domain/dpm/some-domain/.....
http://some-dpm.some-domain:8443/srm/managerv1: Unknown error
lcg_cr: Communication error on send
```

- All pool accounts for the VO are taken.
 - Add more accounts, with the corresponding empty files in
`/etc/grid-security/gridmapdir`.

- It is clear that you should have a good working relationship with the SRM client tools to help debug problems.
- Note that you can increase the debug output of the lcg-* clients using environment variables:

```
export GLOBUS_GSI_CERT_UTILS_DEBUG_LEVEL=5
export GLOBUS_GSSAPI_DEBUG_LEVEL=5
export CSEC_TRACE=1
export CGSI_TRACE=1 ← GSOAP
```

- Good for finding out if there are problems with certificates.
- `srmcp -debug` typically gives you good information if there are problems, particularly if talking to a dCache.

- Changes in the SRM client tools to support new SRM2.2 functionality.
 - **lcg-***:
 - * `--st` to specify the space token description.
 - * `-D` to specify default SE type.
 - * `-b` to switch off BDII lookups (not related to SRM2.2, but useful).
 - **srm***:
 - * Many new commands now available to probe the endpoint.
 - * `srmls`, `srm ping`, `srm mkdir`...
- It goes without saying that a good knowledge of client tools is essential for troubleshooting problems with storage.
- Knowledge base for common problems already exists. Needs to be maintained.

- October 2007 GSSD meeting at CERN.
- https://twiki.cern.ch/twiki/pub/LCG/DataManagementUsefulPresentations/lcg_util_and_SRMv2.2.ppt
- https://twiki.cern.ch/twiki/pub/LCG/DataManagementUsefulPresentations/EGEE07_AppTrack_DM_short.odp
- lcg-* man pages.
- srm* -help.