



gLite and dCache on the EMI Grid Testbed

Tomasz Wolak (CERN)

Christian Bernardt (DESY)

Danilo Dongiovanni (INFN)

Outline

- gLite + dCache EMI Testbed - introduction
- Accessing gLite and dCache on the EMI Testbed
- Getting access to the glite-UI
- Exploring the Testbed
- gLite services (1) - grid authentication
- gLite services (2) - job submission / control
- gLite services (3) - data management
- dCache services - data management
- Configuring your service to work with gLite services
- Configuring your service to work with dCache

- Useful links
- Questions?



gLite + dCache EMI Testbed - introduction

- EMI Testbed is build with several middlewares, so far not too much integrated with each other
- Few independent Grid infrastructures:
 - gLite + dCache
 - ARC
 - UNICORE
- gLite + dCache Testbed is distributed across several sites:
 - CERN – Grid information system (site and top-level BDII), Data management services (DPM, LFC, FTS), WMS, PX, CreamCE/WNs, ...
 - INFN – VOMS, WMS, CreamCE, StoRM, DGAS, ...
 - DESY – Grid infosystem (site-level BDII), dCache
 - CESNET-Prague – gLite-LB

gLite overview:

http://www.euasiagrid.org/training/Overview_of_the_gLite_middle_ware_and_Site_Architecture_v1.2.pdf



Accessing gLite and dCache on the EMI Testbed

- Using gLite-UI
 - standard u*x shell – plus middleware environment settings and set of commands for:
 - Grid authentication
 - job submission and control
 - data management
 - and others (more details → gLite documentation, eg. gLite User Guide)
 - access to UI – often via standard ssh login: `$ ssh user@uihost.uidomain`

- Using middleware's protocols / APIs

examples:

- information system (BDII) - LDAP database
- WMS, FTS – webservices
- DPM(SE) - a number of protocols: SRM (v1, v2.2), RFIO, GsiFTP, ...
- dCache - a number of protocols: SRM, RFIO, GsiFTP, gsidcap, ...

We focus on the first point, details about services (ports, protocols , APIs) are explained on service's web pages maintained by PTs.

Getting access to the gLite-UI

- Use one of the UIs deployed in the EMI-Testbed
- Deploy and use gLite UI (or dCache client) on user's machine
 - for gLite-UI - either follow standard installation procedure:
<https://twiki.cern.ch/twiki/bin/view/LCG/GenericInstallGuide320>
 - or gLite UI tarball installation instruction:
<https://twiki.cern.ch/twiki/bin/view/LCG/UiTarInstall>
 - Installation and configuration instruction of dCache clients (also ARC and UNICORE clients) is described on the EMI Testbed twiki (“How to access the testbed”)

Getting access to the gLite-UI

Accessing one of the UIs deployed in the EMI-Testbed

- Procedure for getting account on a UI
 - described in Testbed twiki “How to access the Testbed”, briefly:
 - creating GGUS ticket requesting account on UI
 - possibly an account in the site’s infrastructure is required
- Policy of getting and accessing account on a UI may vary depending on the site, eg. :
 - CERN UI
 - to get account on UI user must have active(!) lxplus/AFS account at CERN,
 - accessing UI from outside CERN requires login to lxplus first (then from there to UI machine)
 - INFN UI
 - instructions available at this site:
[http://www.cnaf.infn.it/main/index.php/en/Reparto Rete e Sistemi Informatici/Sicurezza Informatica](http://www.cnaf.infn.it/main/index.php/en/Reparto_Rete_e_Sistemi_Informatici/Sicurezza_Informatica)

Exploring the Testbed

Sources of information about Testbed resources

- Dedicated commands: `lcg-info`, `lcg-infosites`

```
$ lcg-info --list-ce --vo testers.eu-emi.eu (list-se | ...)  
$ lcg-infosites --vo testers.eu-emi.eu se (ce | lfc | all | ...)
```

for more details:

```
$ lcg-info --list-attrs | grep SE  
$ lcg-info --list-se -attrs SENAME,Protocol,SEVOs
```

Warning note: current version of `lcg-info` does not show correctly resources when using `-vo` (at least with `--list-se...`).

- "low level" - querying directly BDII, can be done on different levels of infosystem
 - Top-level (most people use this):

```
$ ldapsearch -x -H ldap://certtb-bdii-top.cern.ch:2170 -b mds-vo-name=local,o=grid
```
 - Site-level:

```
$ ldapsearch -x -H ldap://certtb-bdii-site.cern.ch:2170 -b mds-vo-name=cert-tb-cern,o=grid
```
 - Resource-level:

```
$ ldapsearch -x -H ldap://lxbra1910.cern.ch:2170 -b mds-vo-name=resource,o=grid
```

- EMI Testbed twiki!

https://twiki.cern.ch/twiki/bin/view/EMI/TestBed#Testbed_Resources_Description

gLite services (1) - grid authentication

- VOMS Authentication

```
$ voms-proxy-init --voms <VO>
```

→ voms registered user certificate required!

Other frequently used commands:

```
$ voms-proxy-info
```

```
$ voms-proxy-destroy
```

- Using MyProxy

```
$ myproxy-init → user certificate required!
```

and also:

```
$ myproxy-info
```

```
$ myproxy-destroy
```

See also:

- https://twiki.cern.ch/twiki/bin/view/EMI/TestBed#3_Testbed_HOWTO
- gLite User Guide, ...

gLite services (2) - job submission / control

Job submission and control – example with WMS

(other submissions possible eg. : CreamCE, Globus, ...)

- job description (.jdl)

```
Executable = "/bin/hostname";
```

```
StdOutput = "std.out";
```

```
StdError = "std.err";
```

```
OutputSandbox = {"std.out", "std.err"};
```

- WMS job command examples:

```
- glite-wms-job-*
```

```
list-match, submit, status, info, cancel, output,...
```

- show matching CEs: `$ glite-wms-job-list-match -a job1.jdl`

- job submission: `$ glite-wms-job-submit -a job1.jdl`

It is possible to specify a preferred endpoint, eg.:

```
-e https://lxbra2303.cern.ch:7443/glite\_wms\_wmproxy\_server
```

- Checking job status: `$ glite-wms-job-status / logging-info <JOB_ID>`

- Retrieving output: `$ glite-wms-job-output <JOB_ID>`

- See also: [http://www.euasiagrid.org/wiki/index.php/GLite Job Management](http://www.euasiagrid.org/wiki/index.php/GLite_Job_Management)

gLite services (3) - data management

- Example of Grid data access: LFC + SE (DPM)

- Listing a directory:

```
$ lfc-ls -l lxbra2506v3:/grid/testers.eu-emi.eu/  
$ export LFC_HOST= lxbra2506v3  
$ lfc-ls -l /grid/testers.eu-emi.eu/
```

- Creating a directory:

```
$ lfc-mkdir /grid/testers.eu-emi.eu/tutorial  
$ lfc-ls -l /grid/testers.eu-emi.eu/  
$ LFC_HOME=/grid/ lfc-ls  
$ LFC_HOME=/grid/testers.eu-emi.eu/ lfc-ls
```

- Copy and register a file:

```
$ lcg-ls lfn://grid/testers.eu-emi.eu  
$ lcg-cr -l lfn:/grid/testers.eu-emi.eu/tutorial/data1 -d  
lxbra1910.cern.ch file://tmp/data1  
$ LFC_HOME=/grid/testers.eu-emi.eu/ lfc-ls -l tutorial/
```

gLite services (3) - data management

- Example of Grid data access: LFC + SE (DPM) (cont.)

- List file replicas:

```
$ lcg-lr lfn:/grid/testers.eu-emi.eu/tutorial/data1
```

- Copy back the file from SE:

```
$ lcg-cp lfn:/grid/testers.eu-emi.eu/tutorial/data1 file://tmp/data2
```

- Remove the file from SE:

```
$ lcg-del -a lfn:/grid/testers.eu-emi.eu/tutorial/data1
```

- See also: <https://grid.ct.infn.it/twiki/bin/view/GILDA/DataManagement>

dCache services - data management

Example of Grid data access: accessing dCache using SRMv2

- Checking if the service responds:

```
$ srmping -2 srm://cork.desy.de
```

- Copying a file to dCache:

```
$ srmcp -2 file:///tmp/testFile  
srm://cork.desy.de:8443/pnfs/desy.de/data/testers.eu-emi.eu/testfile
```

- Listing a directory:

```
$ srmls -2 srm://cork.desy.de:8443/pnfs/desy.de/data/testers.eu-emi.eu/
```

- Removing file from dCache:

```
$ srmrm -2 srm://cork.desy.de:8443/pnfs/desy.de/data/testers.eu-emi.eu/testfile
```

See also:

<http://www.dcache.org/downloads/1.9/index.shtml#srm-client>

<http://www.dcache.org/manuals/Book-1.9.11/start/intouch.shtml>

Configuring your service to work with gLite services

- Depends on the service, but in general your service may have to know about 2 services (at least) to make use of other services on gLite Testbed
 - Top-level BDII - for service discovery
 - VOMS - for Grid (VO) authentication
- Other services can be found exploring data from top/site level BDII ("plug-and-play" architecture), but some services still might require information about other services provided in their configuration (eg. where is MyProxy, FTS, default SE, ...)
- For more details: Grid service's documentation, YAIM guide, gLite Generic Installation Guide
- to use EMI-testbed VOMS please check detailed twiki information about VOMS and `testers.eu-emi.eu` VO configuration (https://twiki.cern.ch/twiki/bin/view/EMI/TestBed#3_Testbed_HOWTO)
- In case of any issues please contact us using standard procedure (GGUS).

Configuring your service to work with dCache

- Use the same BDII as Grid information system and VOMS for authentication
- Ways to access dCache:
 - SRM (tcp / 8443)
 - dCap protocol (tcp / 22125)
 - GSIdCap (tcp / 22128)
- Strong firewall restrictions: from CERN access to site-BDII at DESY is limited only to Top-BDII host(!), access to dCache services also is limited to specified hosts
- How to get in Touch with dCache:
<http://www.dcache.org/manuals/Book-1.9.11/start/intouch.shtml>

Useful links

- EMI Testbed
 - <https://twiki.cern.ch/twiki/bin/view/EMI/Testbed>
- EMI documentation
 - <http://www.eu-emi.eu/documentation>
- gLite
 - <http://glite.cern.ch/>
 - <http://glite.web.cern.ch/glite/documentation/default.asp>
 - http://glite.cern.ch/admin_documentation
 - <https://edms.cern.ch/document/722398/>
- dCache
 - <http://www.dcache.org/>
 - http://trac.dcache.org/projects/dcache/wiki/manuals/dCache_clients/client_list

Questions ?

- EMI Testbed related SVP ;-)



Thank you

EMI is partially funded by the European Commission under Grant Agreement INFSO-RI-261611