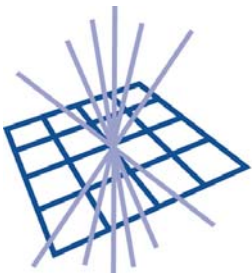# LCG2 Administrator's Course

Oxford University, 19th – 21st July 2004.

Testing a LCG-2 site
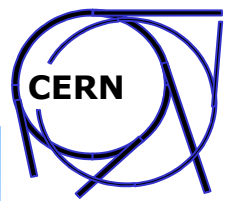
Piotr Nyczyk, CERN IT/GD

Developed in conjunction with GridPP and EGEE
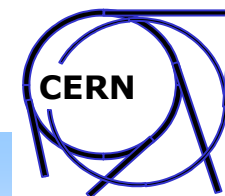
Outline

- Tests goals

- Testing a UI

- Typical job submission problems (UI)

- Typical RM problems (UI/WN)

- Testing a whole site

- Typical problems

- GIIS/GRIS testing

- PBS batch system testing

- Common mistakes

Reference materials

- LCG-2 Install Notes – appendix F

  http://markusw.home.cern.ch/markusw/
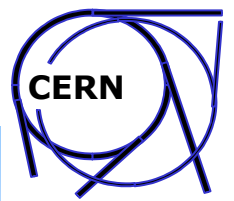 LCG2InstallNotes.html#SECTION000130000000000000000

- GOC Wiki Trouble Shooting page

 *http://goc.grid.sinica.edu.tw/gocwiki/TroubleShootingHistory*

- FAQ page maintained by Steve Traylen

  http://www.gridpp.ac.uk/tb-support/faq/

Tests goals

- Hierarchical support structure:
  Site – Primary Site(ROC) – Deployment Team

- Installation and configuration are complex

  - tests allow to spot problems and correct them quickly

  - since wrong configuration can affect other sites tests are important for stable operation.

- Learn and understand how it really works!

- Be aware of typical problems and solutions

- Maintain the site in a good condition during its operation – repeat tests, detect problems rapidly
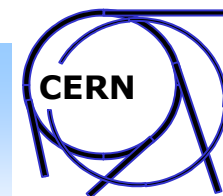
Testing steps

- First test your UI using established sites

  - failures of complex tests are confined to the other services on your site (predictable tests)

- Basic tests of local services are possible even without BDII registration (hosts certificates required):

  - Site GIIS and InfoProviders

  - Globus gatekeeper and fork jobmanager

  - Local batch system (OpenPBS, LSF)

  - Globus job manager with batch system

- Testing simple job submission using RB (BDII registration required)

- Testing a whole site (job submission and data management) with site certification test suite

- Note! If there are no problems with data management during certification tests, additional SE tests are not needed.
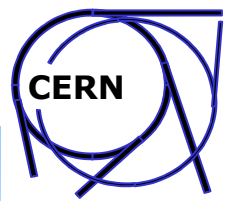
Testing a UI (1/2)

- Install your user's certificate first!

- Download a set of test scripts and JDL (from course agenda page)

- Check if grid-proxy-init works, and create proxy

- Check if globus-job-run works (with external site, in Oxford please use **t2ce01.physics.ox.ac.uk**):
  globus-job-run lxn1181.cern.ch /bin/pwd

- Check RB access with default configuration:
  edg-job-list-match --vo dteam testJob.jdl

- Check custom RB access configuration (different RB):
  edg-job-list-match -c `pwd`/lxn1177.conf --config-vo `pwd`/lxn1177.vo.conf testJob.jdl

- Test job submission, status, logging, output retrieval:
  edg-job-submit --vo dteam testJob.jdl
      edg-job-get-status <job_ID>
      edg-job-get-logging-info -v 1 <job_ID>
      edg-job-get-output <job_ID>
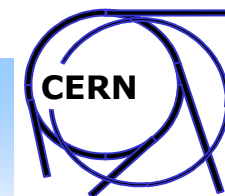
Testing a UI (2/2)

- Here in Oxford use **t2se01.physics.ox.ac.uk** as external SE
- Test if you can reach external SE (detect firewall problems):
  edg-gridftp-ls gsiftp://castorgrid.cern.ch/castor/cern.ch/grid/dteam

- Check storage resources visible by the information system:
  edg-replica-manager -v --vo dteam printInfo

- Test if you can copy a new file to grid and register it:
  – Create simple text file: testFile.<your_site_name>.txt
 – Use copyAndRegisterFile (cr) function with external SE

  edg-rm -v --vo dteam cr file://`pwd`/testFile.<sitename>.txt -l lfn:testFile.<site>.<current_time> -s castorgrid.cern.ch

- Check if file was registered using *listReplicas (lr) function:*
  edg-rm -v --vo dteam lr lfn:<lfn_from_previous_step>

- Test if you can copy file (cp) back from the grid to your UI:
  edg-rm -v --vo dteam cp lfn:<lfn> file://`pwd`/testBack.txt

- Test if you can remove the file from your SE and RLS:
  edg-rm -v --vo dteam del lfn:<lfn> -s <your_SE>

- Note! Similar tests are performed by site certification scripts

Typical job submission problems (UI)
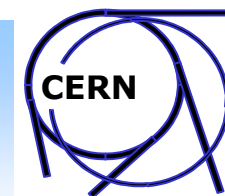
grid-proxy-init command fails:
Check if the command and other commands are in your PATH.

globus-job-run to external CE fails – grid security problems:
Check if you are using a reliable CE. Check if your certificate/proxy are valid (*grid-proxy-info*) and if you are registered in your VO correctly (dteam for site admins), the following commands give the lists of users for each LCG VO:

```
ldapsearch -LLL -x -H ldap://lcg-vo.cern.ch/ -b "o=dteam,dc=lcg,dc=org"
ldapsearch -LLL -x -H ldap://grid-vo.nikhef.nl -b "ou=lcg1,o=alice,dc=eu-datagrid,dc=org"
ldapsearch -LLL -x -H ldap://grid-vo.nikhef.nl -b "ou=lcg1,o=atlas,dc=eu-datagrid,dc=org"
ldapsearch -LLL -x -H ldap://grid-vo.nikhef.nl -b "ou=lcg1,o=cms,dc=eu-datagrid,dc=org"
ldapsearch -LLL -x -H ldap://grid-vo.nikhef.nl -b "ou=lcg1,o=lhcb,dc=eu-datagrid,dc=org"
```

edg-job-list-match fails:
Try the command with --debug option. Check your default RB configuration. Try also using a different RB with custom RB configuration.

edg-job-submit fails:
Try the command with --*debug* option and analyse the result.

edg-job-get-output fails:
Check if job is really in *"Done (Success)"* state with edg-job-status command. Check if */tmp/jobOutput* directory exists and if it has correct permissions
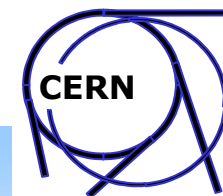
Typical RM problems (UI/WN)

Note!!! These problems are also very common on worker nodes.

edg-gridftp-ls at remote SE fails:
   Usually this means that your firewall setting is wrong.

printInfo command of RM gives empty or very short output:
   Usually you should get a long list of CEs and SEs. If not, check mds.url
   parameter in file:
   */opt/edg/var/etc/edg-replica-manager/edg-replica-manager.conf*
   The parameter defines BDII server you are using.
   Check if the BDII server is working, and if it is really the TestZone BDII.
   Try using *lxn1189.cern.ch* for Test Zone if you do not know the right one.

*copyAndRegisterFile, replicateFile or copyFile commands fail:*
   - Check if you are using correct BDII server in RM configuration
   - Use "-v" parameter to get detailed output
   - Keep the output for further analysis (contact support, rollout-list)
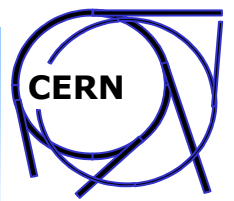
Testing a whole site

- All tests (site GIIS, job submission, data replication) are included in site certification test suite (download from course agenda page)

- Just login to your UI, download the test suite and start it:

  $ ./site-test <your_CE> <your_VO>

- The script will test your site starting from the UI, then it will submit test jobs to all queues of your CE and will test CE, WNs and SE

- The test sequence is similar as in previous slides, but it contains additional replication tests with different combinations of SE's.

- It takes several minutes but you are constantly informed about the status

- If it fails with basic tests (eg. GIIS) it will display the reason and information what to check and how.

- After the script finishes you will get the detailed report in several files. Look carefully through them to spot problems.
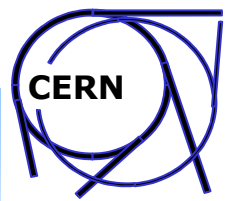
What to do in case of problems?

- Look carefully through the report and test jobs' output files.

- Try to reproduce the problem by finding the command which failed in the report, invoking it manually on your UI and analysing the output.

- Remember that Replica Manager configuration must be correct not only on the UI but also on <u>all WNs</u>.

- Look at GOC Wiki Trouble Shooting page:

  http://goc.grid.sinica.edu.tw/gocwiki/TroubleShootingHistory

- Get help from next level (Primary Site, ROC, Deployment Team)
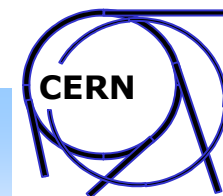
Typical site related problems

ldapsearch command fails, site is not present in BDII:
> Check if globus-mds service is running both on CE and SE. Simple
> "*service globus-mds status*" command is not sufficient in many cases. Check the running
> processes to see if "*slapd*" process is there. If not, restart the service.

site GIIS works, but SE information is missing:
> Check if globus-mds service is running on SE.

site GIIS works, but is not publishing correct information about queues:
> Login to your CE and run qstat command. If it does not return there are problems with PBS
> or one of the worker nodes.

globus-job-run command fails:
> Check if *globus-gatekeeper* service is running on your CE.
> In case of authentication problems check if your *grid-mapfile*, *gridmapdir* and pooled
> accounts are configured correctly. Check *globus-gatekeeper.log* on CE

jobmanager-lcgpbs is unable to stage out output files:
> Check if password-less authentication SSH from your WNs to your CE is configured properly
> (ssh keys, known hosts etc.). If not, check ssh configuration according to "LCG-2 Install
> Notes"
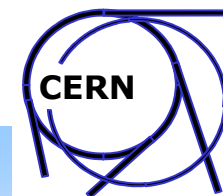
Typical SE related problems

Replica Manager is unable to find your SE:

    Check if *globus-mds* service is running both on your CE and SE. Simple "*service globus-mds status*" command is not sufficient in many cases. Check the running processes to see if "*slapd*" process is there. If not, restart the service.

Access problems for members of one or more VOs:

    Check if information provided by your information system reflects the reality.

    Look at the section that describes your SE in the report generated by printInfo

    Are all the supported VOs properly configured on your SE? (grid-mapfile, pooled accounts, storage directories, permissions...)

Replica Manager is unable to copy and register or replicate file to your SE (default SE):

    Check if *globus-gridftp* service is running on your SE.

    Check if the storage directory (eg. */storage/dteam*) exists and has correct permissions.

NOTE! Before you start to suspect your SE configuration, check if Replica Manager is configured correctly on your UI and all your worker nodes – please refer to UI testing and common problems.
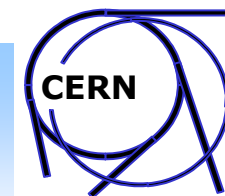
GIIS/GRIS testing

- First, check if slapd demon is running
  (*service globus-mds status* command is not sufficient)

- You can check infoproviders manually:

  (CE) /opt/edg/libexec/ceinfo-wrapper.sh

  (SE) /opt/lcg/libexec/lcg-info-wrapper

- Use ldapsearch command line interface:

  ldapsearch -x -h <CE_or_SE> -p 2135 -b mds-vo-name=local,o=grid

  ldapsearch -x -h <CE> -p 2135 -b mds-vo-name=<site-giis-name>,o=grid

  ldapsearch -x -h <BDII> -p 2170 -b o=grid

- Use graphical LDAP browser (GQ...)

- Interesting entries:

  GlueCEUniqueID, GlueSEUniqueID, GlueSEName, GlueCESEBindSEUniqueID, ...
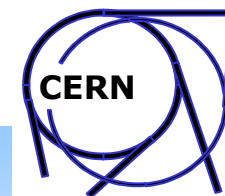
PBS batch system testing

- Check if *pbs_server* and *pbs_sched* are running on your CE

- Check if *qstat* returns without delays

- Check with "*pbsnodes -a*" if all WNs are alive

- Try submitting a simple "Hello world" script using qsub command from <u>regular</u> user account on CE

- In case of problems with getting job output:

  - check ssh keys on CE and WNs (refer LCG Install Notes)

  - try to login from <u>regular</u> user account on WN to CE – ssh should not ask for password!
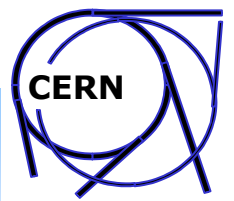
Common mistakes

- Shared directories for Experiments' software installation

  – If they are defined (other than ".") they have to exist

    • for the HEP VOs they are required

  – Correct ownership and permissions: readable by all VO members and writable by VO software managers

- Certification tests currently test only dteam VO environment. But are other VOs also configured correctly? (UI, SE, grid-mapfile, etc.)

- Test your site not only once after installation, but keep track of Test Zone reports and react in case new problems are detected

- Be sure that you keep your local settings while updating your site