eGee

Enabling Grids for E-sciencE

Roadmap for WMS—CREAM—LRMS parameter passing

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CAPACITIES

Parameter passing to the batch system (LRMS) was discussed during the December GDB by Douglas McNab (ScotGRID).
To implement this effectively it will have to be supported by the middleware and YAIM without additional effort of the site administrators.
All of this is tracked on `https://twiki.cern.ch/twiki/bin/view/EGEE/ParameterPassing`.

The idea is to turn requirements in the JDL like this:

```
CERequirements = "GlueHostMainMemoryRAMSize > 100 &&
other.GlueCEMaxWallClockTime >= 400 &&
other.GlueCEMaxCPUTime >= 300 ";
```

...

... into this:

```
# PBS job wrapper generated by pbs_submit.sh
...
# PBS directives:
#PBS -S /bin/bash
#PBS -o /dev/null
#PBS -e /dev/null
#PBS -l mem=100mb
#PBS -l walltime=24000
#PBS -l cput=18000
...
```

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This is the initial set of parameters to aim at. Essentially selecting on memory, wall clock and/or cpu time has obvious applications and benefits for both users and sites.

```
MainMemoryRAMSize
MaxWallClockTime
MaxObtainableWallClockTime
MaxCPUTime
MaxObtainableCPUTime
```

Especially for MPI, the following parameters will also be supported

```
SMPGranularity
WholeNodes
```

The proof-of-concept, packaged as RPM can be found here:
`http://www.nikhef.nl/~dennisvd/blah-pbs-hook/`
For trial purposes this was installed on CREAM CE
stremsel.nikhef.nl.

- Direct submission to CREAM
- submission through WMS

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Direct submission to CREAM is OK.

- CPU, memory and walltime requirements are picked up and enforced
- overrunning the CPU time results in an

  ```
  Status        = [DONE-FAILED]
  ExitCode      = [W]
  FailureReason = [pbs_reason=271]
  ```
- overrunning the wall time leads to

  ```
  Status        = [CANCELLED]
  ExitCode      = []
  ```
- Asking too many resources results in a job abortion and a BLAH error, but this is fixed in newer BLAHs (not yet in production).

The BLAH bug mentioned before results in leftovers in /tmp:

```
-rw-r--r-- 1 tomcat    tomcat      37 Mar 23 16:46 ce-req-file-1269359209171688
-rw-r--r-- 1 tomcat    tomcat      37 Mar 23 16:49 ce-req-file-1269359388531765
-rw-r--r-- 1 tomcat    tomcat      37 Mar 23 16:52 ce-req-file-1269359569560461
-rw-r--r-- 1 tomcat    tomcat      37 Mar 23 16:55 ce-req-file-1269359750346065
-rw-r--r-- 1 tomcat    tomcat      37 Mar 23 16:58 ce-req-file-1269359930309989
```

Which are the requirements translated to shell code.

Submission through WMS is not yet completely worked out, bit it should be better with the next version. At least memory and cpu time requirements are passed along. But it is still not what you'd expect: a job asking 300 minutes CPU time got matched to the 'short' queue.

This is the outcome:

```
====================== glite-wms-job-status Success =====================
BOOKKEEPING INFORMATION:

Status info for the Job : https://lb.testbed:9000/O22BYKBGR_q1Kpvj9AjoLw
Current Status:     Done (Success)
Logged Reason(s):
    - BLAH error: submission command failed (exit code = 1) (stdout:)
            (stderr:rm: cannot remove '/tmp/ce-req-file-1269393003236504':
             Operation not permitted-qsub: Job exceeds queue resource limits
             MSG=cannot satisfy queue max cput requirement-) N/A (jobId =
             CREAM231105474)
    - Job Terminated Successfully
Exit code:          0
Status Reason:      Job Terminated Successfully
Destination:        creamce.gina.sara.nl:8443/cream-pbs-short
Submitted:          Wed Mar 24 02:09:57 2010 CET
========================================================================
```

- inclusion in upcoming TORQUE_utils metapackage patch #3650 and similarly LSF_utils, SGE_utils, CONDOR_utils. Certification process still needs to start.
- YAIM variable to toggle turning the script on (open question, should it be default **ON** or **OFF**?
- WMS bugfix for bug #42288 needs to be deployed

Do we need a (early) trial run?

- selected sites
- selected users

What happens with Glue 2.0?

- https://twiki.cern.ch/twiki/bin/view/EGEE/
  ParameterPassing
- http://grid.pd.infn.it/cream/field.php?n=Main.
  ForwardOfRequirementsToTheBatchSystem