

Grid Activities at GSI*

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Abstract

This article describes the summarised work of the GSI Grid Group with the aim to set up an ALICE tier2 centre within the global environment of the LHC Computing Grid LCG [1].

ALICE tier2 centre

To fulfill the storage requirements of an ALICE tier2 centre new file servers have been bought with altogether 12 TB of disk space. The file servers have been installed with dCache [2] and interfaced via SRM (Storage Resource Manager) to LCG. An SRM is the agreed Grid interface to storage resources (disk or tape) with a standard set of required functionality. One file server has been installed with xrootd [3] to serve as an AliEn Storage Element for ALICE Data Challenges.

PROOF

The login script for setting up an individual PROOF environment [4] has been redeveloped in Python and extended by a GUI. By authenticating via Grid certificates first extensions of GSI based PROOF Clusters to GridKa using Globus methods and a self developed TCP router, succeeded. Similar tests have been done with LCG, too. Facilitating the xrootd installation mentioned above file access reliability is being measured and compared with NFS. On the experience gained at GSI a PROOF course has been given during the GridKa School 2005 [5].

The EGEE project

The EGEE project will come to its end, soon, and EGEE II will start in April 2006. GSI will continue participating, being a primary partner for regional certification of new middleware releases as well as user training in the Swiss/German Federation (DECH). The EGEE based middleware gLite [6] came to version 1.5 and will be merged with the current production software LCG 2.7 to gLite 3.0 at the beginning of this year. A gLite testbed is maintained within the DECH VO (Virtual Organisation).

The integration of the current LCG software into the GSI Debian environment has been successfully completed. Additionally the LCG Grid services have been extended by a Resource Broker (RB), which assigns Grid jobs to connected sites according to job requirements and site capabilities, and a "Local File Catalogue" (LFC) which provides the physical location of the files stored in the GSI Grid SE's. Several of the Grid services are installed on virtual XEN [7] machines.

D-Grid

The D-Grid initiative [8], announced March 2004, follows similar programs in the USA and the UK. and shall help to set up a German Grid infrastructure.

At GSI distributed analysis tools under usage of grid resources are being developed within work package 3 of the HEP community Grid. A starting point is the analysis framework ROOT. Making use of a set of abstract classes provided by ROOT (TGrid ...) an interface to gLite is being created to enable Grid access directly from within ROOT. This includes querying the File Catalogue, job submission, getting job status and output. By combining several stand-alone PROOF based analysis facilities using existing Grid Middleware large dynamically generated Grid Analysis Clusters can be created.

The WLCG project

To clarify the difference between the LCG Grid middleware and the LCG project the latter has been renamed in Worldwide LHC Computing Grid (WLCG). One of the large ongoing WLCG activities is Service Challenge 3 (SC3), in which reliable file transfers from CERN to participating tier 1 centres and transfer speed is being tested. The target to write data with a total rate of 150 MB/s to disk and 60 MB/s to tape has been achieved by most sites. A second goal is a long term Grid service stability test. The ALICE experiment has made use of the Grid services provided during SC3 to accomplish Physics Data Challenge '05 (PDC'05) in which up to now 28000 jobs doing MC simulation, tracking, and reconstruction of Pb+Pb and p+p events have been completed. GSI takes part in PDC'05 since November 2005 having produced so far 4% of the data, mainly on the new batch farm nodes installed with Debian Sarge.

In SC4, starting April 2006, the globally distributed data produced in SC3 will be analysed by using Grid Methods.

References

- [1] GSI Annual Report (2002) 212.
- [2] <http://www.dcache.org/>.
- [3] <http://xrootd.slac.stanford.edu/>.
- [4] <http://wiki.gsi.de/Grid/TheParallelRootFacility>
- [5] <http://gks05.fzk.de/>.
- [6] <http://glite.web.cern.ch/glite/>.
- [7] <http://www.cl.cam.ac.uk/Research/SRG/netos/xen/>.
- [8] www.d-grid.de.

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