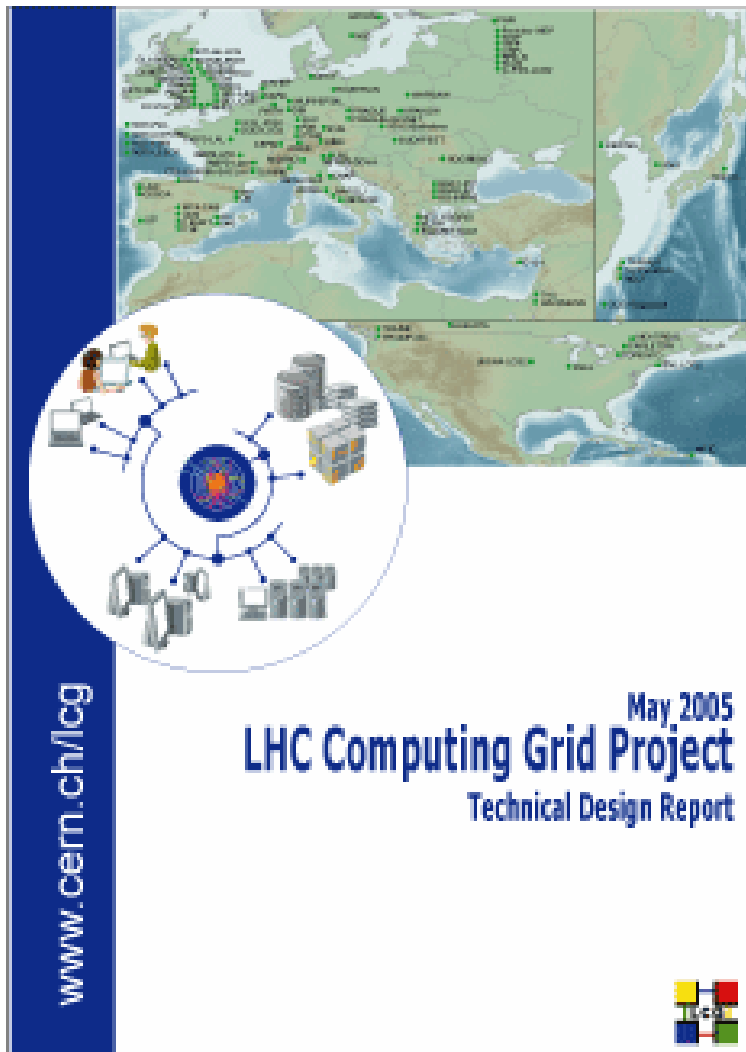




The LHC Computing Grid Project Technical Design Report

a month to go until delivery
- where do we stand?



Status Report at GDB
18 May 2005

Jürgen Knobloch
IT/LCG, CERN



LCG TDR Timeline

- June 2004: Call for Editorial Board membership (GDB etc.)
- Oct. 2004: Editorial Board established
- 19-Nov-04: First TDR-EB meeting - brainstorming - draft layout
- 8-Dec-04: Task assignments to people
- 14-Dec-04: Presentation of TDR layout to PEB
- 15-Dec-04: Experiment computing model papers - LHCC review
- Jan, Feb, Mar, Apr, May 2005: TDR-EB meetings
- 23-Mar-05: Most chapter abstracts delivered
- 18-May-05: Most chapters filled with text
- 20-Jun-05: LCG TDR delivered to LHCC (and 4 exp. TDRs)
- 29-Jun-05: Presentations at open LHCC meeting



TDR Editorial Board Composition

▪ LHC Experiments

- ALICE: Yves Schutz
- ATLAS: Roger Jones
- CMS: Claudio Grandi
- LHCb: Nick Brook

▪ Regional Centres

Laura Perini, Bruce Gibbard,
Farid Ould-Saada, Holger Marten,
Andreas Heiss, Ulrich Schwickerath

▪ Area Managers

- Grid Deployment Ian Bird
- Applications Pere Mato Vila,
Torre Wenaus
- Fabrics Bernd Panzer
- Middleware Frédéric Hemmer
- ARDA Massimo Lamanna

▪ LCG

- Resources Chris Eck
- Network David Foster
- GDB Kors Bos
- Serv.Chall. Jamie Shiers
- Project Leader Les Robertson
- TDR EB Chair Jürgen Knobloch

▪ Special Topics

- 3D Project Dirk Duellmann, Maria Girone
- Technology Sverre Jarp, Ian Fisk
- Security David Kelsey



Status

- Today there is for almost all chapters (sometimes very preliminary) text available
- Directory of drafts: <http://cern.ch/LCG/tdr/drafts/>
- Draft 20: 160 pages - far too much!
- Lots of duplication
- Some text will go to external documents (Pasta, MoU, ...) with a much shorter summary in the TDR
- Some contradictions to be sorted out



Technical Design Report?

- Not comparable to detector design reports
- Software and computing is more fluid than hardware
- LHCC requests LCG TDR - accepting limitations

- Starting from computing models - Dec 2004
- In parallel with experiments' computing TDRs

- The planning will still continue



TDR summary

- This Technical Design Report presents the current state of planning for computing in the framework of the LHC Computing Grid Project (LCG). The mission of LCG is to build and maintain a data storage and analysis infrastructure for the entire high energy physics community that will use the LHC.
- The project is a collaboration between the LHC Experiments, computer centres and software projects (Grid and others).



Summary - continued - 2

- The requirements of the experiments laid out at the beginning of the report have been defined in Computing Model documents of each of the experiments and have been refined in individual Computing Technical Design Reports appearing in parallel with the present paper. The requirements for the year 2008 sum up to a CPU capacity of 120 million SPECint2000 , to about 50 PB of random-access (disk) storage and 40 PB of mass storage (tape).



Summary - continued - 3

- The computing plans of the experiments and of LCG assume a distributed four-tiered model where the original raw data from the data acquisition systems will be recorded and archived at the Tier-0 centre at CERN where also the first-pass reconstruction will take place. The maximum aggregated bandwidth for the raw data recording for a single experiment (ALICE) is 1.25 GB/s. A second copy of the raw data will be archived in a distributed way also at the Tier-1 centres. The reconstructed data - Event Summary Data (ESD) - will be stored at CERN and at each of the Tier-1 centres associated to an experiment. To date more than 100 Tier-2 centres have been identified. Their role is to provide compute capacity for Monte Carlo event simulation and for end user analysis.



Summary - continued - 4

- The data distribution and access as well as the job submission and user authentication and authorization are handled by the Grid Middleware that is being developed by various partners and deployed by LCG.
- Developing common applications software for all experiments is part of LCG. This covers Core Software Libraries, Data Management, Event Simulation as well as Software Development Infrastructure and Services and analysis support and database support.
- The development of technology is followed to explore the expected evolution of the market of processing, storage and networking.



Summary - continued - 5

- Data challenges and service challenges probe and evaluate current software and hardware solutions in increasingly demanding and realistic environments approaching the requirements of LHC data taking and analysis.
- The LCG project depends upon and collaborates with other Grid projects around the globe such as middleware projects (Globus, Condor, VDT), Open Science Grid (OSG), Nordugrid, and EGEE (gLite toolkit), in addition to international networking projects such as GEANT, ESnet, Gloriad, etc..
- The resources required to implement the plan are defined in a Memorandum of Understanding currently open for signature by the participating institutions.



Conclusion

- The LCG TDR is still open for discussion, policy decisions, contributions, corrections over the next three weeks, say until June 10.
- There is still a lot of work to be done.
- The document delivered on June 20 will give a snapshot of our current understanding and will be far from perfect.
- Many design decisions will still be open because they depend on
 - Experience with Service Challenges
 - Progress with middleware
 - Technology evolution
 - Understanding of analysis strategies