LHC Computing Grid Project - LCG

Report of WG1 to the GDB

9th December 2002

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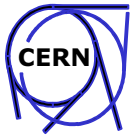


Members of WG1

- John Renner Hansen (Atlas/Nordugrid)
- David Foster (LCG)
- Simon Lin (Taiwan computer center Atlas/CMS)
- Laura Perini (Atlas/WP8)
- Yves Schutz (Alice)
- Oxana Smirnova (Atlas/Nordugrid/LCG Apps)
- Eric van Herwijnen (LHCb/WP8)
- Tony Wildish (CMS)
- Flavia Donno (invited) (LCG)

- Meetings Held 1/11/02, 8/11/02, 20/11/02, 28/11/02, 4/12/02. Next 12/12/02

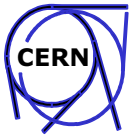
Strategic Technology Advisory Group

- Have a commitment from key individuals to advise on technology strategy.
  - Anders Waananen (Nordugrid)
  - Bob Jones (EDG)
  - Carl Kesselman (Globus)
  - Miron Livny (VDT)
  - Ruth Pordes (Glue)

Everyone has agreed and participated

Overall Planning

Suggested Completion Date	Activity	Responsible
1 Nov.	Initial meeting with WG members to discuss this document and approach.	DGF/JRH
8 Nov.	Create initial “straw man” proposal for middleware.	DGF
8 Nov	Create Prioritised List of Requirements	YS/EVH/OS/TW/LP
8 Nov	Assemble documentation of current experience	YS/EVH/OS/TW/LP
8 Nov.	Discuss with WG members	DGF
20 Nov.	Discuss updated proposal with WG members.	DGF
1 Dec.	Arrive at agreement with actions (especially where developments and support are indicated).	DGF
5 Dec.	Create GDB mid-term report. Distribute to WG4	DGF
9 Dec	GDB Meeting and present mid-term report	DGF
15 Jan.	Emerging issues with HEPCAL matching resolved.	
15 Jan.	Circulate proposal to sys-admins and collect comments.	
20 Jan.	Discuss final result with WG members.	
1 Feb.	Make Recommendation to the GDB.	



This Presentation

- All the details are in the document. However, the discussions are complex and long so detailed questions should be taken off-line.
- Concentrating on a few key issues.
- Trying to be short on a subject that everyone has strong opinions about and convey the overall strategy. Things will incrementally move forward as experience is gained.

WG1 mandate

- Recommend the minimum functionality required for LCG-1 and identify the middleware components required, define associated software delivery requirements for the projects providing the components.
  - 90% Complete
- Define a process by which requirements, priorities, and schedules for subsequent additional functionality are determined.
  - 20% Complete (Some thoughts through EGEE proposal)
- Suggest a middleware development and maintenance strategy. Recommend at which level LCG should assume maintenance and/or development responsibilities for middleware and associated scripts and tools.
  - 20% Complete (Agreements with Globus/VDT team plus some thoughts through EGEE proposal)
- Define metrics and performance targets according to those metrics to be achieved by LCG-1, and recommend a process by which the experiments accept the performance.
  - 0% Complete

WG1 strategy

- Be as specific as possible in all software product versions
  - Start from 'what works today'.
  - Need to be precise for integration purposes. Flexibility is needed however as things change rapidly with time.

January 2003	Start working with the recommended technologies – LCG-1 Pilot
June 2003	Stabilise the final configuration of LCG-1 Prototype
July 2003	LCG-1 Prototype in production
July 2003	Start work on middleware requirements for analysis DC in 2004
September 2003	Build next generation of LCG-1 to meet the DC04 requirements
December 2003	LCG-1 Prototype Meets production targets
January 2004	Start preparation of LCG-1 for CMS and Alice DC04

Assumptions

- Evolution of both the pilot and LCG-1 is recommended by the GDB
  - Needs negotiation with the middleware providers for functionality and schedules
  - Needs experiments on board to satisfy their data-challenge requirements
- LCG-1 pilot resources (HW) will be dedicated machines, not shared
  - Starting point to simplify the problem determination.
  - Existing cluster integration should follow as soon as possible based on the experience gained.

General Assumptions

- Will not satisfy all HEPCAL use-cases
  - Bottom-up: what use-cases can we satisfy with existing middleware, rather than attempt to prioritise use-cases
- Will not support interactive analysis
  - *Batch-mode only for CMS DC04*
- Cannot plan now for the whole of LCG-1
  - Cannot realistically see beyond ~August '03
- VOMS will not be mature enough for use
  - VO managed 'by hand' by experiments

WG1 Strawman

- Starting point is VDT (1.1.5) with higher level services provided by the EDG software.
  - Preliminary informal discussions with advisors (STAG) supported this as the sensible approach.
  - Discussed with the EDG technical management in detail and this is 100% aligned with the EDG strategy to base future EDG releases on a fully supported Globus base. But, the timescales are different!
  - Experiments have discussed early versions of the proposal and have commented. No major outstanding disagreements.
- The LCG-1 pilot (Jan 2003) will start with software that exists today
  - Not waiting for new releases
- Non-VDT/EDG middleware is by no means excluded if it is useful
- POOL is part of LCG-1
  - But is higher-level middleware, not obligatory to use it
  - Probably not there from day-one

Planned EDG Components

- WP1: Resource Broker
- WP2: Replica Manager, RLS, Optimiser?
- WP3: Some agents? RGMA may come.
- WP4: Monitoring agents? Will also provide the CERN management infrastructure.
- WP5: The SE may come.

OS/compiler for the pilot…

- Pilot really has to start with what exists
  - And the platform/compiler it works on today
- Cannot sustain these platform/compiler options throughout LCG-1
  - Try to drive migration to final choice as soon as possible (avoid re-integrating)
- RedHat 7.3
  - Not attempt to support older stuff
  - Be compatible with forwards migration
- GCC 3.2
  - Not excluding 2.9x
  - Not insisting the kernel be built with 3.2
  - Make the major-number transition soon
- Seems to be compatible with WG4

Worker Node Highlights

- Batch nodes may not assume WAN access
  - Grid services will need proxies or whatever
  - *Experiments need to check their work model*
  - *Middleware providers too, e.g. Condor glide-in*
- Experiment software is 'only libraries and executables, no daemons or root-access'

Data Management/Access Highlights

- Data on the grid is single-sourced, R/O
  - I.e the grid will not synchronise replicas that are modified in different places
  - *The experiment takes care of versioning it's own pseudo-static files (metadata files etc)?*

- The missing functionality of a storage element and associated access libraries is a big problem for true transparency of use.

Some Open questions

- Dagman functionality, where does it go?
- Many security issues (WG3)
- Account management – only simplest assumed.
- Weak system management, problem determination, user support and end-user tools.
- Monitoring Tools
- Packaging is, and remains an issue (WG4)

Summary

- LCG-1 will start integration very early 2003
  - Using existing software only
- Will evolve into a production service by July
  - S/W versions may change, controlled by GDB
  - Fixed-versions may need porting to new baseline
  - Evolutionary process not yet well defined
- LCG-1 in Q403 still a vague entity

- "Main Lines" are clear and agreed but WG1 needs to continue work. Vast amounts of details remain to be sorted.
  - More closely specify the functionality now.
  - Need still to scope the dev/porting work and see schedules
  - Complete work on support assumptions.
  - Understand realistic performance metrics.