LCG Applications Area – Overview, Planning, Resources
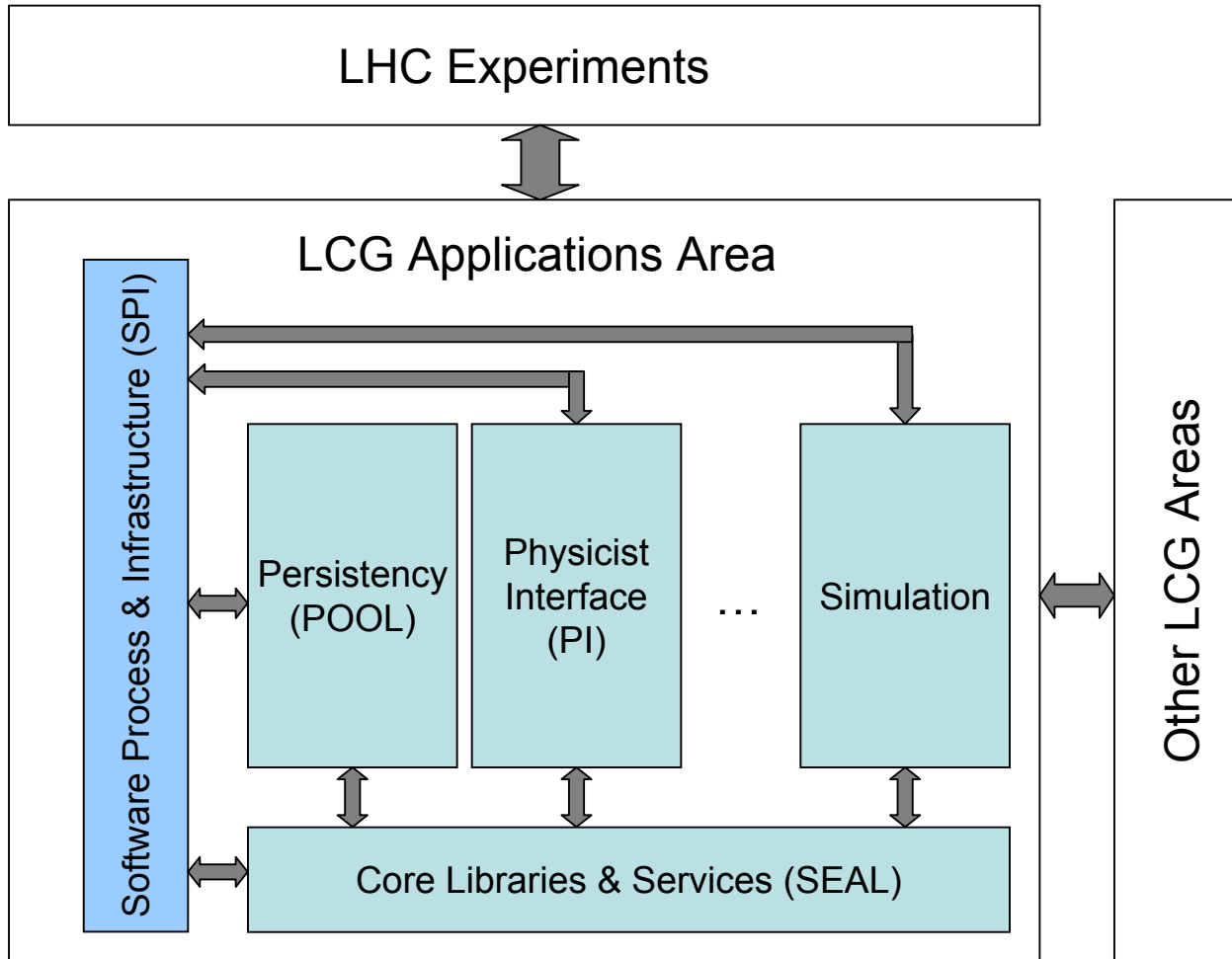
Torre Wenaus, BNL/CERN

LCG Applications Area Manager

http://lcgapp.cern.ch

Applications Area Organisation

~2 meetings/mo
Public minutes

Now developing a more collaborative
ROOT relationship than user/provider

Architects forum
AA manager (chair),
experiment architects,
project leaders,
ROOT leader

→ decisions strategy →

Applications manager

← User - provider →

ROOT

SPI project ... **POOL project** ... **SEAL project** ... **PI project** ... **Simulation project** .... consultation .... **Applications area meeting**

Projects organized into work packages

~3 meetings/mo
Open to all
25-50 attendees

Apps Area Projects and their Relationships

Focus on Experiment Need

◆ Project structured and managed to ensure a focus on real experiment needs

✓ **SC2/RTAG** process provides need-driven requirements, common project oversight by the experiments themselves

✓ **Architects Forum** involves experiment architects in day to day project management and execution

✓ **Open** information flow and decision making

✓ **Direct participation** of experiment developers in the projects

✓ Tight **iterative feedback** loop to gather user feedback from frequent releases and early feedback

◆ **Early deployment and evaluation** of LCG software in experiment contexts

◆ **Success defined by experiment adoption** and production deployment

Experiment integration/validation efforts in progress and giving feedback: the first metrics for success/failure

Implementing the Blueprint

◆ **Use what exists:** almost all work leverages existing software
  - ◆ ROOT, Gaudi/Athena, Iguana, VMC, CLHEP, Aida, Savannah, Boost, MySQL, GSL, RLS, …

◆ **Component-ware:** followed, and working well
  - ◆ the basis of SEAL, POOL, PI development as components of a coherent overall architecture

◆ **Object dictionary:** In place, in a central role
  - ◆ Meeting POOL needs and now extending to interactive apps
  - ◆ ROOT and LCG working together on dictionary convergence

◆ **Object whiteboard:** Still to come
  - ◆ Design discussions underway

◆ **Component bus/scripting:** In progress
  - ◆ Tools for Python environment and its integration with ROOT/CINT in various stages of development

◆ **User/provider relationship with ROOT:** Addressed later

Level 1 and Highlighted Level 2 milestones

- Jan 03: SEAL, PI workplans approved
- Mar 03: Simulation workplan approved
- Apr 03: SEAL V1 (Priority POOL needs)
- May 03: SPI software library fully deployed
- **Jun 03: General release of POOL (LHCC Level 1)**
  - Functionality requested by experiments for production usage
- Jul 03: SEAL framework services released (experiment directed)
- Jul 03: CMS POOL/SEAL integration
- Sep 03: ATLAS POOL/SEAL integration
- Oct 03: CMS POOL/SEAL validation (~1M events/week written)
- Dec 03: LHCb POOL/SEAL integration
- Jan 04: ATLAS POOL/SEAL validation (50TB DC1 POOL store)
- May 04: Generator event database beta in production
- Oct 04: Generic simulation framework production release
- Dec 04: Physics validation document
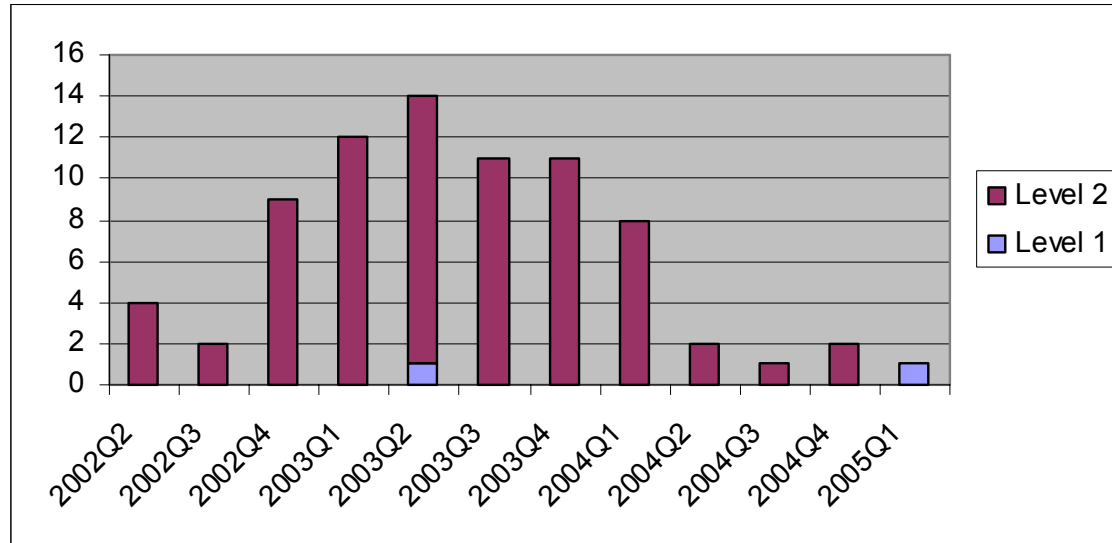- **Mar 05: Full function release of POOL (LHCC Level 1)**

Completed
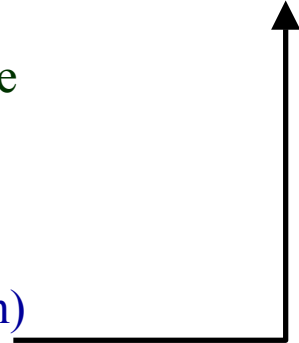
See supplemental slide for current milestone performance

L1+L2 milestone counts by quarter

- ◆ 2004 milestones will be fleshed out by
  - ◆ the workplan updates due this quarter
  - ◆ the finalization of the slate of ~10 L2 milestones for the next quarter (~2 per project) that we do before each quarterly report
- ◆ New milestones will be added in ARDA planning

Applications Area Personnel Resources

◆ LCG applications area hires complete

    ◆ 21 working; target in Sep 2001 LCG proposal was 23

    ◆ Contributions from UK, Spain, Switzerland, Germany, Sweden, Israel, Portugal, US, India, and Russia
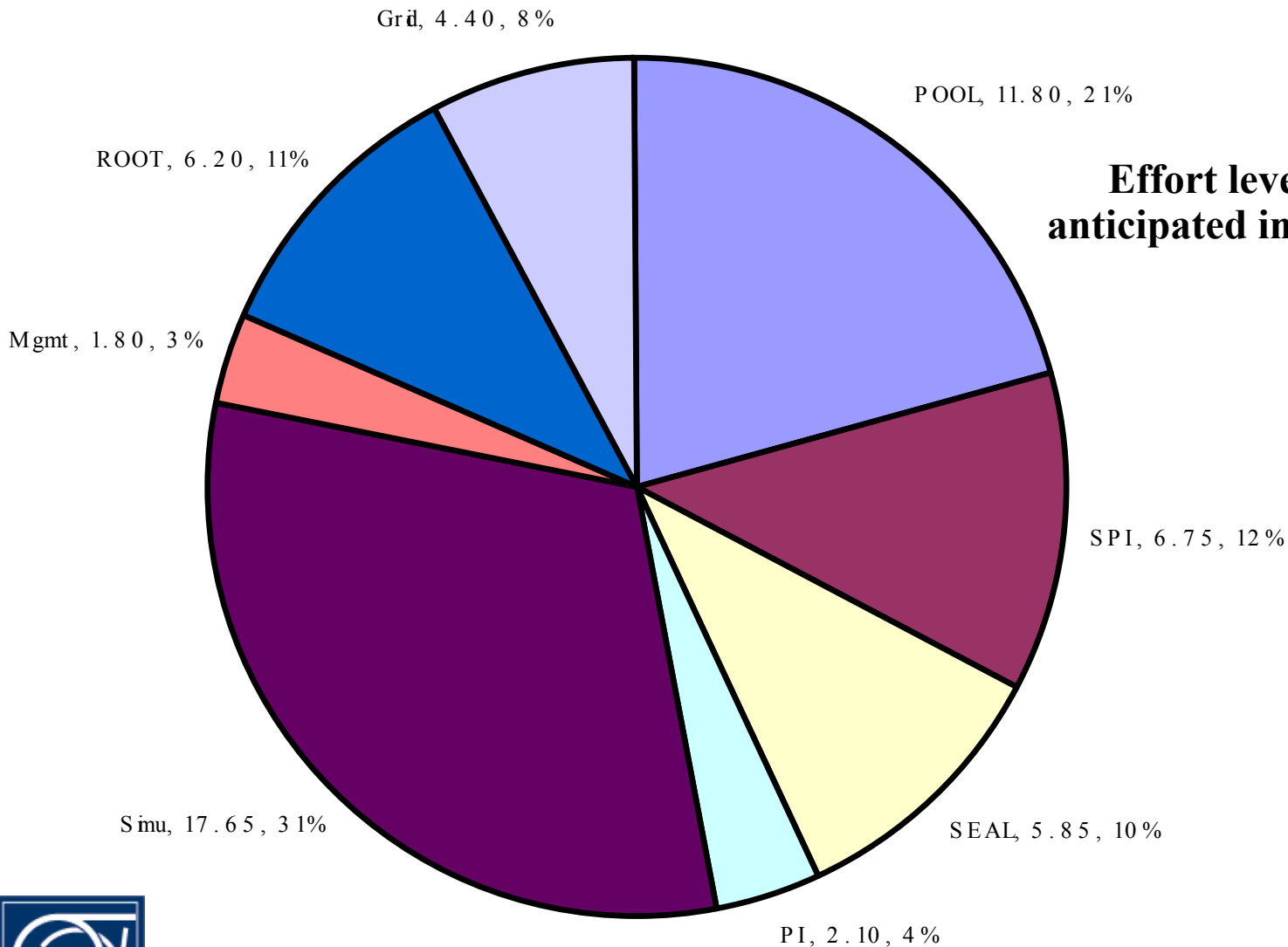
◆ Similar contribution levels from CERN, experiments
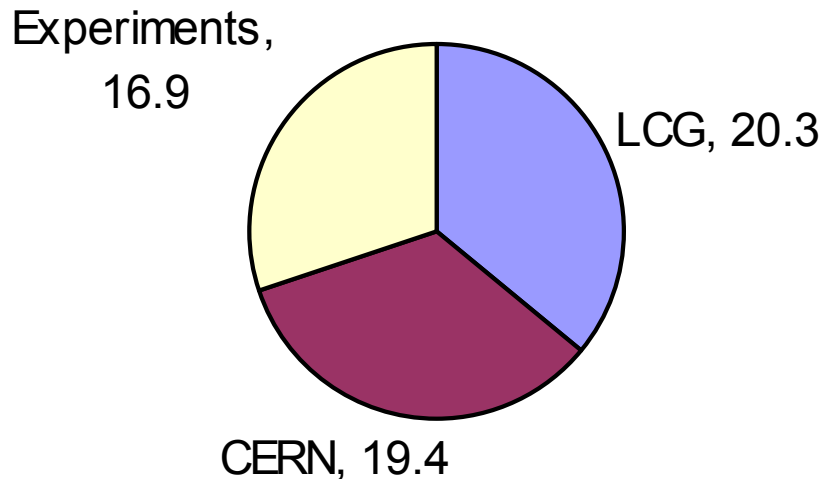
See supplemental slide for detail on personnel sources

Experiments, 16.9

LCG, 20.3

CERN, 19.4

In FTEs.
Experiment number includes CERN people working on experiments

Personnel Distribution

Effort levels match need anticipated in blueprint RTAG

Grid, 4.40, 8%

POOL, 11.80, 21%

ROOT, 6.20, 11%

Mgmt, 1.80, 3%

SPI, 6.75, 12%

Simu, 17.65, 31%

SEAL, 5.85, 10%

PI, 2.10, 4%

Non-CERN Participation

- Not always easy to engage non-CERN participation but it is vital to the project and we try to foster and support it
- Examples:
    - POOL collections (US)
    - POOL RDBMS data storage back end (India)
    - POOL tests (UK)
    - POOL-driven ROOT I/O development & debugging (US)
    - SEAL scripting tools (US)
    - SEAL LCG dictionary (France)
    - Generator services (Russia)
    - SPI tools (France, US)
    - Math libraries (India)
    - *New Spanish participation in POOL and Simulation projects being planned*

Integration and Experiment Support

- Clear message from integration experience and manpower, internal reviews:
    - Experiments are finding schedules and manpower to be very stretched by LCG software integration, particularly given the core experiment software manpower shortages (cf. manpower review)
- Prompt and successful integration in experiments, leading to early feedback, is essential to project success
    - "Release early and often" only works when complemented by "Integrate early and often"
- Project is responding with measures to improve integration support
    - Associating presently 'unaligned' developers with a particular experiment, to enhance liaison and integration support
        - Associations, and the tasks/time they imply, being worked out now
        - Doesn't address the experiment core software manpower shortages
    - Support CMT and SCRAM configuration files
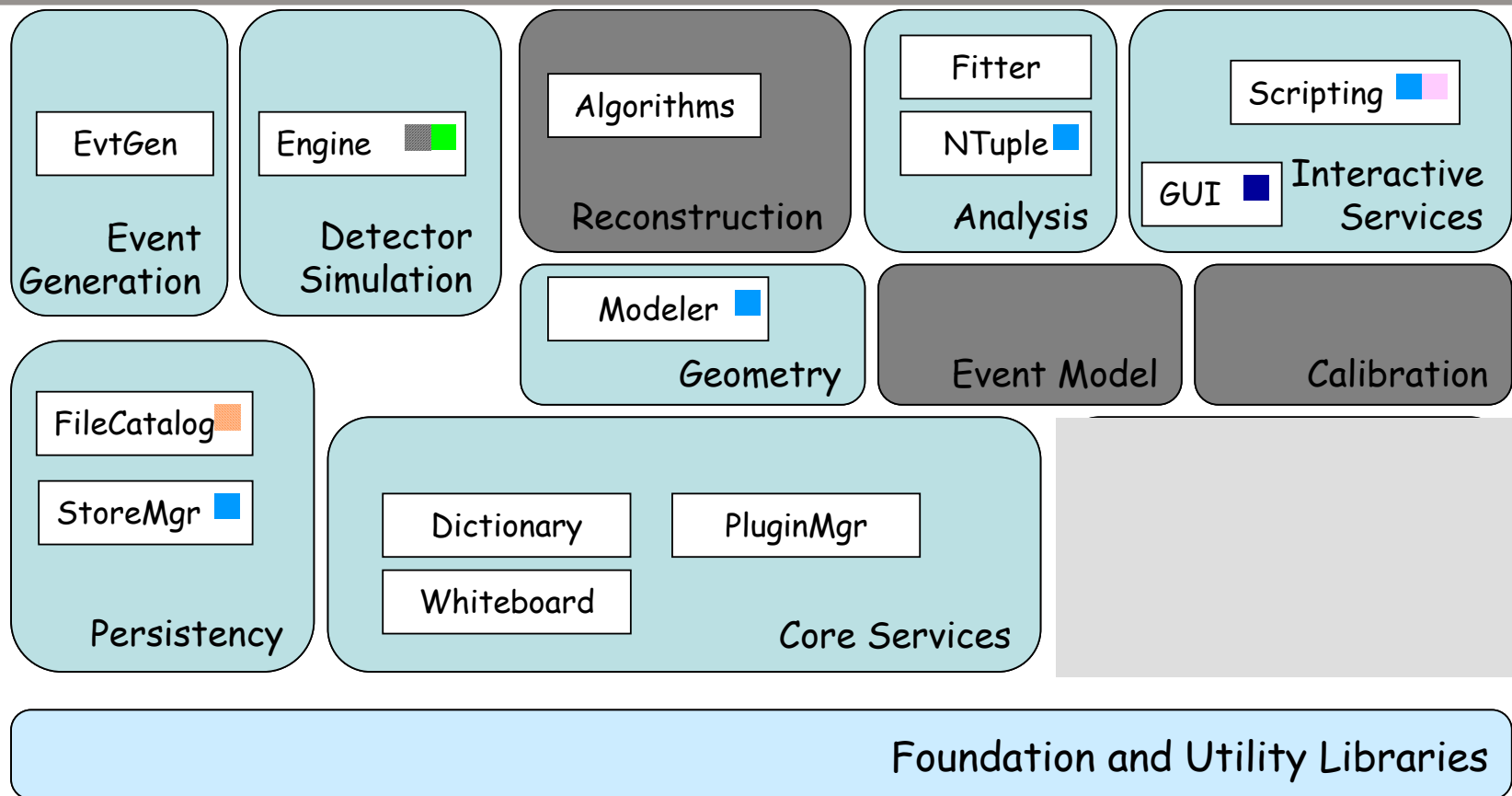   - On the lookout for other measures

… To Be Continued

◆ Internal review response and overall concluding comments will come at the end of the session.

Applications Domain Decomposition

Event Generation
- EvtGen

Detector Simulation
- Engine ▨ ■

Reconstruction
- Algorithms

Analysis
- Fitter
- NTuple ■

Interactive Services
- Scripting ■ ■
- GUI ■

Geometry
- Modeler ■

Event Model

Calibration

Persistency
- FileCatalog ■
- StoreMgr ■

Core Services
- Dictionary
- PluginMgr
- Whiteboard

Foundation and Utility Libraries

■ ROOT ■ GEANT4 ▨ FLUKA ■ MySQL ▨ DataGrid ■ Python ■ Qt . . .

Products mentioned are examples; not a comprehensive list

Project activity in all expected areas except grid services (coming with ARDA)

Level 2 Milestone Performance (v=days late)

Date	Status	Milestone	lcg	Ref
2003/6/15	Done v=15	**General release of POOL hybrid data store**	**lcg:1.1.2**	**1.2**
2003/6/30	Done v=10	Nightly builds deployed in SEAL	lcg:1.1.3	1.128
2003/6/30	Done v=18	SEAL V1 release	lcg:1.1.3	1.130
2003/6/30	Done v=0	Generator librarian and alpha version of support infrastructure in place	lcg:1.1.5.6	1.138
2003/7/1	Done v=3	Physicist interface (PI) workplan completed	lcg:1.1.4	1.153
2003/7/31	Done v=0	CMS POOL integration: POOL persistency of CMS event	lcg:1.1.2.1	1.176
2003/7/31	Late	Math library workplan in place	lcg:1.1.3	1.184
2003/8/15	Done	SPI support for Windows binary version of LCG software	lcg:1.1.1	1.170
2003/9/10	Done v=1	ATLAS POOL integration: POOL persistency in Release 7	lcg:1.1.2.1	1.177
2003/9/15	Done v=24	SEAL support for Windows binaries	lcg:1.1.3	1.187
2003/9/15	Done v=24	AIDA interface review (users) completed	lcg:1.1.4	1.171
2003/9/30	Late	POOL RDBMS independence layer in beta	lcg:1.1.2.1	1.116
2003/9/30	Late	POOL support for Windows binaries	lcg:1.1.2.1	1.181
2003/9/30	Done v=0	First cycle of EM physics validation complete	lcg:1.1.5.4	1.143
2003/9/30	Done v=24	Statement on GSL and NAG usage for math library	lcg:1.1.3.8	1.124
2003/10/31	Done v=-10	CMS POOL validation with PCP data	lcg:1.1.2.1	1.180
2003/11/15	Late	Initial POOL deployment on LCG-1	lcg:1.1.2.1	1.114
2003/11/15	Late	SPI-G4 collaborative infrastructure pilot	lcg:1.1.5.2	1.189
2003/11/30		ATLAS int: ROOT implementation of AIDA histograms in Athena	lcg:1.1.4	1.195
2003/11/30		SPI tools operational on IT CVS service	lcg:1.1.1	1.188
2003/12/15		2004-2005 persistency framework workplan complete	lcg:1.1.2	1.117
2003/12/19		LHCb POOL integration: Gaudi persistency replaced by POOL	lcg:1.1.2.1	1.191
2003/12/19		LHCb integration: SEAL plugin manager integrated in Gaudi	lcg:1.1.3	1.194
2003/12/31		ATLAS integration: SEAL Integration into Athena	lcg:1.1.3	1.193
2003/12/31		Simulation physics requirements revisited	lcg:1.1.5.4	1.140
2003/12/31		Generic simulation framework prototype available (G4 and FLUKA)	lcg:1.1.5.1	1.144
2004/1/19		ATLAS POOL validation with DC1 data	lcg:1.1.2.1	1.179
2004/1/31		ATLAS validation of POOL Metadata/event collections	lcg:1.1.2.1	1.192
2004/1/31		First cycle of hadronic physics validation complete	lcg:1.1.5.4	1.145
2004/2/28		Agreement on formats for event generator common samples	lcg:1.1.5.6	1.197
2004/3/15		POOL hierarchical cataloging production release	lcg:1.1.2.1	1.121
2004/3/31		Release of POOL implementation of conditions DB	lcg:1.1.2.1	1.120
2004/3/31		ATLAS POOL validation with complete Event Data Model	lcg:1.1.2.1	1.190

Personnel

	People	FTEs
LCG applications area personnel	21	20.25
Working directly for apps area projects	13	12.85
ROOT	2	2
Grid integration work with experiments	3	2.8
Distributed analysis (will work on ARDA)	3	2.6
Contributions from		
IT	4	3.30
EP/SFT not experiment specific	21	16.10
EP/SFT experiment specific	7	4.35
Experiments outside EP/SFT	29	12.55
Total - direct project contributions	52	30.50
Total - indirect contributions (ROOT, ALICE VMC)	9	5.80
Total directly working on apps area projects	65	43.35
Overall total	82	56.55